EXECUTIVE CHAMBERS

HONOLULU

BENJAMIN J. CAYETANO
GOVERNOR

August 8, 1995

Mr. Alan S. Hayashi, Executive Director
Convention Center Authority
841 Bishop Street, Room 222
Honolulu, Hawaii 96813

Dear Mr. Hayashi:

With this letter, I accept the Final Environmental Impact Statement for the Hawaii Convention Center, Honolulu, Oahu as satisfactory fulfillment of the requirements of Chapter 343, Hawaii Revised Statutes. The economic, social and environmental impacts which will likely occur should this project be built, are adequately described in the statement. The analysis, together with the comments made by reviewers, provides useful information to policy makers and the public.

My acceptance of the statement is an affirmation of the adequacy of that statement under the applicable laws.

I find that the mitigation measures proposed in the environmental impact statement will minimize the negative impacts of the project. Therefore, the Convention Center Authority and/or its agents should perform these, or alternative and at least equally effective, mitigation measures at the discretion of the permitting agencies. The mitigation measures identified in the environmental impact statement are listed in the attached document.

With warmest personal regards,

Very truly yours,

Benjamin J. Cayetano

BENJAMIN J. CAYETANO

Attachment
cc: Office of Environmental Quality Control

1995 - Oahu - FEIS - Convention Center I

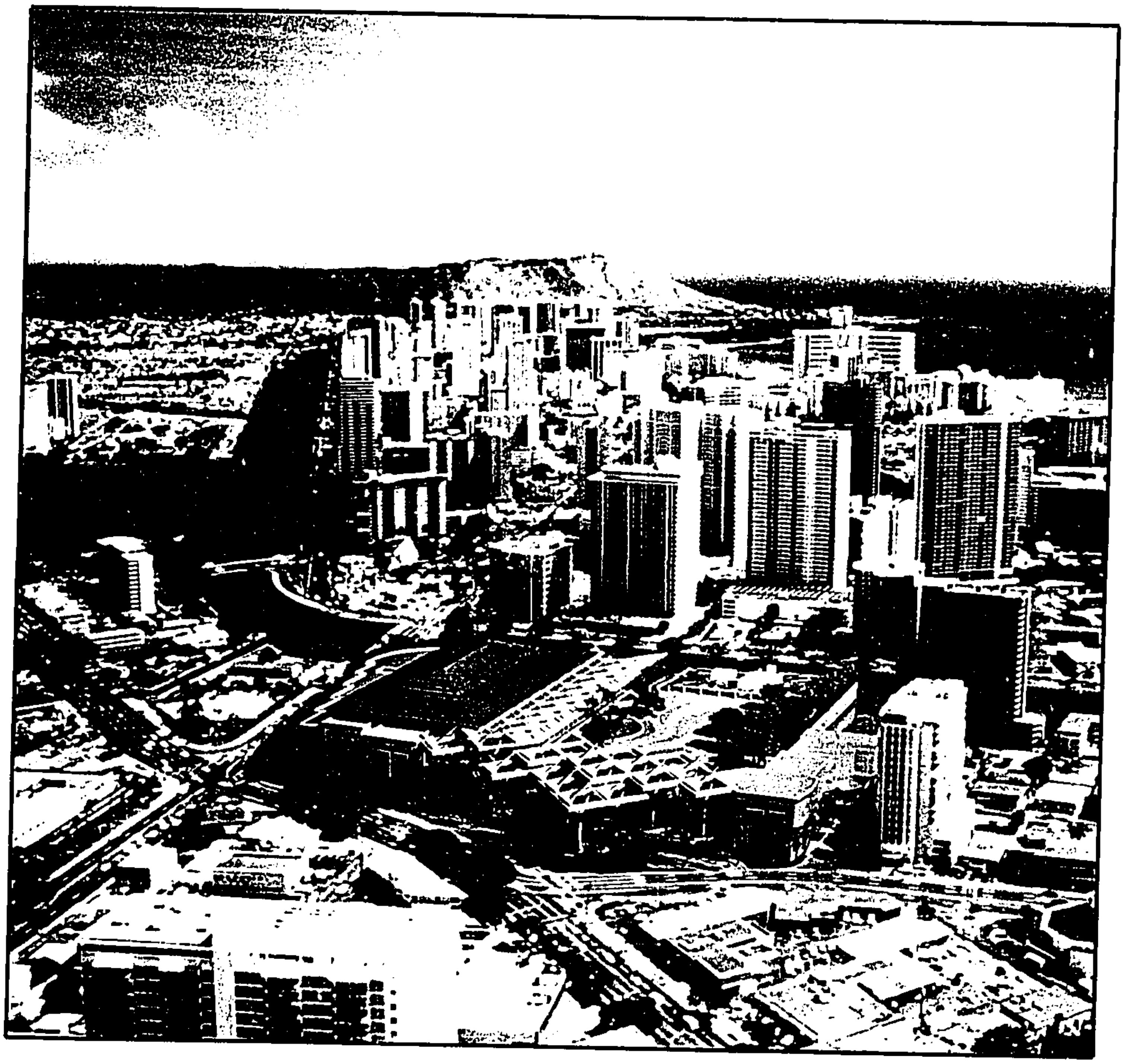
FILE COPY

ORIGINAL

# Hawai'i Convention Center

## Honolulu, Hawaii

FINAL ENVIRONMENTAL IMPACT STATEMENT
VOLUME I
THE CONVENTION CENTER AUTHORITY, STATE OF HAWAII
JULY 1995



*Hawai'i Convention Center looking east towards Diamond Head.*

# Hawai'i Convention Center
## Honolulu, Hawaii

## FINAL ENVIRONMENTAL IMPACT STATEMENT

**VOLUME I**

**PREPARED FOR:**

***CONVENTION CENTER AUTHORITY***
***State of Hawaii***

**PREPARED BY:**

***NORDIC/PCL***
***WILSON OKAMOTO & ASSOCIATES, INC.***

***JULY 1995***

# Hawai'i Convention Center
## Honolulu, Hawaii

# FINAL ENVIRONMENTAL IMPACT STATEMENT

This environmental document is prepared pursuant
to Chapter 343, Hawaii Revised Statutes.

| | |
|---|---|
| Proposing Agency: | CONVENTION CENTER AUTHORITY<br>State of Hawaii |
| Responsible Official: | Alan S. Hayashi, Executive Director<br>Convention Center Authority<br>State of Hawaii<br>Date: July 19, 1995 |
| Accepting Authority: | Governor Benjamin J. Cayetano<br>State of Hawaii |
| Prepared by: | NORDIC/PCL<br>Wilson Okamoto & Associates, Inc. |

# Convention Center Authority

1833 KALAKAUA AVENUE, SUITE 800 HONOLULU, HAWAII 96815
TELEPHONE: (808) 973-9790 FAX: (808) 973-9794


July 19, 1995

Mr. Gary L. Gill
Director
Office of Environmental Quality Control
State of Hawaii
220 South King Street, 4th Floor
Honolulu, Hawaii 96813

Dear Mr. Gill:

Subject: Hawai'i Convention Center
Final Environmental Impact Statement
(Final EIS)
Tax Map Key: 2-3-35: 01
Honolulu, Oahu, Hawaii

Pursuant to Chapter 343, Hawaii Revised Statutes, and Chapter 200 of Title 11, Department of Health Administrative Rules, the Convention Center Authority (CCA) hereby submits the enclosed Final EIS as an agency action. The Final EIS was prepared for CCA by Wilson Okamoto & Associates, Inc. on behalf of the Design/Build team of Nordic/PCL A Joint Venture. A notice for filing of the Environmental Impact Statement Preparation Notice (EISPN) was published in the May 23, 1994 issue of the OEQC Bulletin. The Draft EIS was subsequently filed with your office on January 27, 1995 and the notice of the Draft EIS was published in the February 8, 1995 issue of the OEQC Bulletin. The public comment period ended on March 25, 1995.

We respectfully request that this Final EIS be forwarded to the Governor for acceptance and that notice of this filing be published in the OEQC Bulletin.

Should you have any questions or need any additional information regarding the subject project, please contact me or our consultant, Earl Matsukawa of Wilson Okamoto & Associates, Inc. at 946-2277.

Thank you for your attention to this matter.

Sincerely,

Alan S. Hayashi
Executive Director

# PREFACE

This Final Environmental Impact Statement (EIS) for the Hawaiʻi Convention Center was prepared pursuant to Chapter 343, Hawaii Revised Statutes, and Chapter 200 of Title 11, Department of Health Administrative Rules.

Notice of the Environmental Impact Statement Preparation Notice (EISPN) was published in the May 23, 1994 issue of the Office of Environmental Quality Control (OEQC) Bulletin. The Draft EIS was subsequently filed with the OEQC on January 27, 1995 and the notice of the Draft EIS was published in the February 8, 1995 issue of the OEQC Bulletin. The public comment period ended on March 25, 1995.

Based on comments received on the Draft EIS a number of revisions were made to the EIS text. To facilitate review of this Final EIS, significant changes in the text are shown in **boldface type** in Chapters 1, 2, 3, 6, 7, and 8. Chapters 4 and 5 have major revisions and, therefore, are presented without this notation.

Appendices that have been revised include the Air Quality Impact Report (Appendix E), the Social Impact Assessment (Appendix G), the Economic and Fiscal Assessment (Appendix H) and the Traffic Impact Analysis Report (Appendix I). Additional traffic studies were also conducted, including a Traffic Assessment for Additional Intersections (Appendix J), and a Traffic Impact Analysis Report for 2005 Traffic Conditions (Appendix K).

# TABLE OF CONTENTS

**APPENDICES**



Combined Pre-Assessment and EA Comment and Response Letters are included in Volume II of the Draft Environmental Impact Statement.

## LIST OF TABLES

## LIST OF FIGURES

## GLOSSARY OF ACRONYMS

| | |
|---|---|
| AAQS . . . . . . . . . . . . . . . . . | Ambient Air Quality Standards |
| ADA . . . . . . . . . . . . . . . . . | Americans with Disabilities Act |
| CERCLA . . . . . . . . . . . . . . | Comprehensive Environmental Response, Compensation and Liability Act |
| CFR . . . . . . . . . . . . . . . . . | Code of Federal Regulations |
| CO . . . . . . . . . . . . . . . . . | carbon monoxide |
| CZM . . . . . . . . . . . . . . . . . | Coastal Zone Management |
| DA . . . . . . . . . . . . . . . . . | Department of the Army |
| dB . . . . . . . . . . . . . . . . . | decibels |
| DLNR . . . . . . . . . . . . . . . . . | Department of Land and Natural Resources, State of Hawaii |
| DOE . . . . . . . . . . . . . . . . . | Department of Education, State of Hawaii |
| DOH . . . . . . . . . . . . . . . . . | Department of Health, State of Hawaii |
| DOWALD . . . . . . . . . . . . . . | Division of Water and Land Development (Department of Land and Natural Resources) |
| DP . . . . . . . . . . . . . . . . . | Development Plan, City and County of Honolulu |
| DPLU . . . . . . . . . . . . . . . . . | Development Plan Land Use [Map], City and County of Honolulu |
| DPPF . . . . . . . . . . . . . . . . . | Development Plan Public Facilities [Map], City and County of Honolulu |
| DTS . . . . . . . . . . . . . . . . . | Department of Transportation Services, City and County of Honolulu |
| EA/EISPN . . . . . . . . . . . . . . | Environmental Assessment/Environmental Impact Statement Preparation Notice |
| EIS . . . . . . . . . . . . . . . . . | Environmental Impact Statement |
| EPA . . . . . . . . . . . . . . . . . | Environmental Protection Agency |
| FHA . . . . . . . . . . . . . . . . . | Federal Housing Administration |
| FIRM . . . . . . . . . . . . . . . . . | Flood Insurance Rate Map |
| FTE . . . . . . . . . . . . . . . . . | Full-Time Equivalent |
| HRS . . . . . . . . . . . . . . . . . | Hawaii Revised Statutes |
| HUD . . . . . . . . . . . . . . . . . | Housing and Urban Development |
| Ldn . . . . . . . . . . . . . . . . . | Day-Night Average Sound Level |
| LOS . . . . . . . . . . . . . . . . . | Level-of-Service |
| LUO . . . . . . . . . . . . . . . . . | Land Use Ordinance, City and County of Honolulu |

## GLOSSARY OF ACRONYMS

| | |
|---|---|
| mW | megawatts |
| NOx | nitrogen oxide |
| $NO_2$ | nitrogen dioxide |
| NPDES | National Pollutant Discharge Elimination System |
| NRHP | National Register of Historic Places |
| OEQC | Office of Environmental Quality Control, State of Hawaii |
| OWD | Office of Waikiki Development, City and County of Honolulu |
| OMPO | Oahu Metropolitan Planning Organization, State of Hawaii |
| PRU | Plan Review Use, Honolulu City and County |
| PUC | Primary Urban Center |
| RFP | Request for Proposals |
| SOx | sulfur oxide |
| SRHP | State Register of Historic Places |
| SHPD | State Historic Preservation Division, (Department of Land and Natural Resources) |
| SMA | Special Management Area |
| UBC | Uniform Building Code |
| UIC | Underground Injection Control |
| WQC | Section 401 Water Quality Certification, (Department of Health) |
| WSD | Waikiki Special District |

# CHAPTER ONE

## SUMMARY

# 1. SUMMARY

## 1.1 Introduction

The State of Hawaii Convention Center Authority ("Authority") selected Nordic/PCL to complete the design and construction of a "world-class" convention center facility on a 9.65-acre site in Honolulu, Hawaii.

This environmental impact statement (EIS) has been prepared in accordance with Chapter 343, HRS. The preparation of the EIS arises out of the use of State lands and funds, and because the project has the potential to significantly impact the environment. The Governor of the State of Hawaii is the accepting authority for the Final EIS.

## 1.2 Development Summary

| | |
|---|---|
| Proposing Agency: | Convention Center Authority<br>State of Hawaii<br>1833 Kalakaua Avenue, Suite 800<br>Honolulu, Hawaii 96815<br>Attention: Mr. Alan S. Hayashi, Executive Director<br>(808) 973-9790 |
| Designer/Builder | Nordic/PCL Joint Venture<br>685 Ahua Street<br>Honolulu, Hawaii 96819<br>Attention: Mr. Mits Kaneshige<br>(808) 839-4531 |
| Property Owner: | State of Hawaii |
| Accepting Authority: | Governor Benjamin J. Cayetano<br>State of Hawaii |
| Preparers of the EIS: | Wilson Okamoto & Associates, Inc.<br>1907 South Beretania Street, Suite 400<br>Honolulu, Hawaii 96826<br>Attention: Mr. Earl Matsukawa, Planning Director<br>(808) 946-2277 |
| Tax Map Keys: | Division 2, Zone 3: Plat 35, Parcel 1 |

| | |
|---|---|
| Location: | The site is located on the former Aloha Motors property, at 1777 Kapiolani Boulevard, Honolulu, adjacent to the intersection of Kapiolani Boulevard and Kalakaua Avenue. It is also bounded by Atkinson Drive to the northwest, Kahakai Drive to the west, and the Ala Wai Canal to the south. |
| State Land Use District: | Urban |
| City and County Development Plan: | Primary Urban Center;<br>Land Use Designation: Commercial Emphasis Mixed Use |
| City and County Zoning: | BMX-3, Community Business Mixed-Use District |

### 1.3 Background

The visitor industry's push for the development of a convention center gained momentum in 1986, with the formation of the non-profit Hawaii Convention Park Council. The Council's charter members include major Hawaii banks, tourism industry representatives and hotel workers union representatives.

In 1989, a master plan and Plan Review Use (PRU) application for a convention center on the former Aloha Motors site were submitted to the City and County of Honolulu by a private developer, First Development, Inc. This PRU application was submitted in response to the City's request for proposal (RFP) for the development of a municipal convention center. The proposal, which included a convention center, hotel, two apartment condominium towers, an office building and retail uses, was approved by the City Council in 1990. However, in 1993, First Development, Inc. sold the Aloha Motors site to another private party, Hawaii Convention Center Partners. This group subsequently proposed development of four hotels and a public convention center at no-cost to the State. However, some groups contended that the proposed convention facility would not provide sufficient exhibition space or be of "world class" quality.

As the merits of the Hawaii Convention Center Partners proposal were being publicly debated, the State considered other potential convention center sites and development options. At the same time, other private developers proposed similar mixed-use projects which included a convention facility. Although a number of alternative sites were being considered, opinion polls consistently found that the Aloha Motors site had the highest level of public support of all the alternatives.

In a special Legislative session in 1993, at the urging of the visitor industry and the Governor, the Legislature approved H.B. No. S7-93, which provided a mechanism for State site selection and development of a convention center facility. The bill approved raising the five percent hotel room tax to six percent to raise $350 million to buy the Aloha Motors site and construct a world-class convention center. On December 3, 1993, the State executed a binding agreement to purchase the former Aloha Motors site for development of the convention center. On March 18, 1994, the State became the owner of the Aloha Motors site.

In March 1994, the Convention Center Authority issued its RFP for design and construction of a world-class, stand-alone convention center at the Aloha Motors site and commenced preparation of an Environmental Assessment. On August 31 1994, Nordic/PCL was selected as the Design/Build Team out of a field of four teams.

### 1.4 Project Description

The convention center is to be a four level, stand-alone facility, without additional private development on-site. The facility's gross building area will be approximately 1,106,670 square feet, including 200,000 gross square feet of exhibit space on a single level, meeting room space of 100,000 square feet, and multi-purpose ballroom area of 35,000 square feet. Approximately 800 parking spaces will be provided on-site. Future expansion space will be accommodated in the design for an additional 100,000 square feet of exhibit hall and 50,000 square feet for meeting rooms.

The convention center is vertically organized with each of its four levels having a defined function. The Exhibit Hall is on the first level where it is readily accessible through the Lobby and Truck Dock. The Exhibit Hall is basically a large empty space about four football fields in area that can be divided, as necessary, into smaller spaces to simultaneously accommodate several functions or events. The ceiling is 30 feet high. The Hall is characterized by its simplicity, providing a neutral background required for the producers of events to establish individual show themes. It is fully supported with power and communication for exhibitors. Three food service staging areas are also provided.

Parking is located above the Exhibit Hall in the space created by the deep structural members needed to span the Hall below. The main entrance and exit for the Parking level will be via Kahakai Drive and the circular ramps. A secondary entry/exit to Kalakaua Avenue will be available via a single-lane ramp on which traffic flow can be reversed to accommodate the primary direction of flow. Taxi, limousine and car drop-off/pick ups will be accommodated at the Parking level.

Meeting rooms will be located above the parking level and can be partitioned to form up to 49 meeting areas, including 12 executive rooms, a teleconferencing center, press room, and two high-tech, stepped-floor audiovisual presentation theaters. A wide open-air, but weather-protected, Central Concourse featuring art niches will divide the Meeting Room level. Two landscaped courtyards will bring open air and sunlight into informal gathering areas.

The Ballroom will occupy the highest level, featuring what will be the largest ballroom in the State and a two and a half-acre Rooftop Garden. The Ballroom will be divisible into three individual rooms, each with separate food service access that can accommodate three simultaneous functions. The adjacent Rooftop Garden, landscaped to highlight Hawaiian plants and a water feature, will provide an outdoor setting for luaus, special shows or a temporary outdoor cafe.

In addition to the convention center building and grounds, the proposed project will include street and traffic improvements and installation of a new sewer line. All streets adjacent to the convention center site will be widened on convention center property. A new traffic signal will be installed at the Atkinson Drive and Kahakai Drive intersection. The streets will be *re-striped* to create new traffic flow patterns, increasing the capacities of the affected intersections. A new sewer line from the project site, under Atkinson Drive to a sewer main near the entrance of Ala Moana Park, will be installed to accommodate additional wastewater flows from the convention center.

**It is anticipated that the operation of the Hawai'i Convention Center will be contracted to a private firm. From its opening in 1998, it is projected that it will take six years for the convention center to reach 90 percent of its stabilized operating capacity while full stabilization should occur between its sixth and eighth year of operation. In its sixth year, the convention center is projected to attract approximately 52 events involving an average of 6,200 to 7,500 out-of-State persons. With a three day run for most conventions, this means that the convention center would be used approximately 156 days of the year for such events. Also in the sixth year, it is projected that larger events of approximately 10,000 persons may utilize the center for 21 days. Even larger events involving up to 14,000 persons are projected to occur once every three years.**

**In accordance with the request for proposals, the cost for designing and building the Hawai'i Convention Center is $200 million. Construction is anticipated to commence in the Summer of 1995 and the scheduled completion date is October 27, 1997.**

## 1.5 Conformance With Existing Public Plans, Policies and Controls

The project conforms with the objectives of the Hawaii State Plan and Functional Plans. The project site is within the State's Urban District and conforms with the Urban District Standards. It is outside the City and County of Honolulu's Special Management Area and the Waikiki Special District.

The subject site is within the City and County of Honolulu's Primary Urban Center (PUC) Development Plan (DP) area which designates the entire site for commercial emphasis mixed use. The site is zoned BMX-3, Community Business Mixed Use. The zoning height limits for the BMX-3 district is 350 feet. The City's Land Use Ordinance permits the development of convention centers within all zoning districts, other than residential districts, subject to approval of a master plan for a Plan Review Use (PRU). Because the 1993 Special Session of the Hawaii Legislature designated a convention center at the site, and because a PRU application was approved for a much more massive mixed-use development (including a convention center) on the site, the Authority will not submit another PRU application for this project. However, the Authority and Nordic/PCL will continue to work closely with the City during project design, construction and operation of the center. The Authority will also work closely with the City to ensure the project is consistent (within Legislative limits and project economics) with, and supports the objectives of, the Waikiki Master Plan.

In addition to the EIS requirement, environmental permits/approvals which may be required include Section 402 National Pollutant Discharge Elimination System (NPDES) permits from the State Department of Health, and historic sites concurrence from the State Historic Preservation Officer **(Section 6E, Hawaii Revised Statutes and Section 106, National Historic Preservation Act)**. Construction-related permits will be required from the City and County of Honolulu and from utility companies. Since the project will not include any modifications to the Ala Wai Canal (bridges, bulkheads, etc.), State or Federal permits for work in streams or coastal waters will not be required.

## 1.6 Summary of Potential Impacts and Mitigating Measures

### 1.6.1 Physical

Soils. The soils beneath the project site are classified as mixed fill land. All necessary geotechnical studies will be conducted to adequately design and construct the project. As discussed in this EIS, surveys and monitoring will be conducted to detect any impacts on adjacent properties due to ground vibration and dewatering during construction.

Flooding. The majority of the site is located in Zone A of the Federal Emergency Management Agency's Flood Insurance Rate Maps. Zone A indicates special flood hazard areas inundated by 100-year flood, with no base flood elevations determined. Based on a flood elevation study conducted for the site, however, the City Department of Land Utilization determined that the flood elevation is +7 feet above mean sea level (msl). A portion of the site fronting the Ala Wai Canal is in Zone AO, identified as a special flood hazard area with a flood depth of two feet. In compliance with flood district regulations, the ground floor Exhibition Hall will be at an elevation of +7 feet above msl.

Water Quality. Groundwater beneath the site is presently at depths ranging from three to five feet below the ground surface and is classified as brackish basal water. The project site is within a designated water management area. No use of groundwater is proposed. Dewatering discharge will be directed into sumps or excavations on the property and allowed to percolate back into the ground. The project has very limited requirements for dewatering since there are no major subsurface structures. The risk of subsidence problems is very low.

Due to historic use of petroleum products on the site, there is a possibility that pockets of contaminated groundwater may be encountered during construction. Should this occur, the groundwater will be treated and disposed of in accordance with applicable State and Federal hazardous waste regulations **(see also discussion of Hazardous Materials, below).**

The project site is adjacent to the Ala Wai Canal, a man-made waterway which drains a large area of Honolulu, including parts of Waikiki. The waters of the Ala Wai Canal routinely fail to meet Department of Health water quality standards. Potential construction period impacts to Ala Wai Canal water quality will be mitigated by compliance with the City and County of Honolulu's grading ordinance and provision of siltation basins, if necessary. **A permit for construction period stormwater runoff will be obtained and permit(s) for construction-related dewatering will be obtained, if applicable. In this regard,** the requirements of the National Pollutant Discharge Elimination System (NPDES) permit process, administered by the Department of Health, will be complied with. Because the site is presently paved, the project's surface water drainage is not expected to be greater than at present. Adequate storm drainage, erosion control and pollution control measures will be incorporated into the project design.

Hazardous Materials. Previous owners of the site have removed and disposed of known hazardous materials on the site. The site has undergone several environmental studies to evaluate the potential and extent of soils and/or groundwater impacted by hazardous materials. A "no further action" letter has been issued by the State Department of Health and a clearance by the San Francisco (Region IX) office of the Environmental Protection Agency has also been released. A report summarizing all past studies has been prepared for the Authority (Dames and Moore, February 1994). That report concluded that there does not appear to be pervasive groundwater contamination beneath the site. However, there is the potential for localized zones of contaminated groundwater.

Nordic/PCL will prepare hazardous materials contingency plans to be implemented in the event that unanticipated hazardous materials are encountered during construction. All State and Federal regulations regarding handling and disposal of hazardous materials will be followed.

Botanical Resources. There are no indigenous or rare plant species or wetland resources on site. Some existing street trees along Kapiolani Boulevard and Kalakaua Avenue will need to be removed or relocated during construction and subsequently replaced with similar species. **Excavation work near the boundary of the Ala Wai Promenade will require a permit to assure protection of several banyan trees in the Promenade which are listed by the City as "exceptional trees." On-going consultation with the City's certified arborist has been pursued to formulate a plan to minimize adverse impacts resulting from the removal of a portion of their root systems and pruning. None of the banyan trees in the Ala Wai Promenade will be relocated or removed.**

Archaeological, Cultural and Historic Resources. Within the property, there are no historic sites which are listed on the State Register of Historic Places (SRHP) or National Register of Historic Places (NRHP). The project area is part of a Hawaiian land unit of great importance in the prehistoric and early historic periods. The surrounding area was noted for its fishponds, taro fields and settlements, and was used extensively by the ancient Hawaiians. In the last 60 to 75 years, the project area has undergone extensive filling, excavation and development. The project site is partially on and alongside land that at one time contained a fishpond known as Loko Kuwili. Pursuant to the State's historic preservation laws, Chapter 6E, HRS, Nordic/PCL had a subsurface inventory conducted to determine the significance of sub-surface deposits and to ensure project impacts on any historic sites are mitigated. The results of the subsurface testing showed what was previously assumed about the area, namely, that it was once a lagoonal environment with little or no suitable land for habitation or human burial. Pending laboratory results, reports of pollen, faunal, and charcoal analyses will be submitted to the State Historic Preservation Division when completed **in July, 1995.**

**Both the Ala Wai Canal and Ala Wai Promenade, to the south of the project site, are integral parts of the Waikiki area. The Ala Wai Canal and Promenade were determined eligible for inclusion on the NRHP in 1985, and the Canal was listed on the SRHP in 1992. The State Department of Transportation lists the Kalakaua**

**Bridge on its Historic Bridge Inventory as Category 1, meaning it is a highly significant historic facility.**

**No construction is proposed that would affect the Ala Wai Canal or the Kalakaua Bridge. A previous proposal for the convention center facility to encroach 26 feet on the Ala Wai Promenade has been modified to eliminate any encroachment. The Ala Wai Promenade will be directly affected only to the extent that a walkway system, with appurtenant landscaping, lighting and street furniture, may be constructed within the Promenade in front of the convention center. Also, while no portion of the convention center structure will encroach upon the Promenade, the convention center structure, particularly the walls on either side of the grand stairway, will have a visual impact.**

**The State Historic Preservation Division (SHPD) will be reviewing these potential effects on the historic character of the Ala Wai Promenade pursuant to Section 106 Review process of the National Historic Preservation Act. The design/builder has been consulting with the SHPD to determine if the impacts of the convention center on the Ala Wai Promenade can be avoided or mitigated such that a finding of "no effect" can be issued.**

Air Quality. The principal source of short-term air quality impact will be construction activity. Construction vehicle activity will increase automotive pollutant concentrations along the existing streets and on the project site itself. Site preparation and earth moving will create particulate emissions, as will building and onsite road construction. Dust control will be accomplished through frequent watering of unpaved roads and areas of exposed soil as required. There will also be off-site impacts from the operation of concrete and asphalt batching plants needed for construction. Such plants routinely emit particulate matter and other gaseous pollutants. These batch plants must receive a permit for their operation from the Department of Health Clean Air Branch by demonstrating their ability to continuously comply with both emission and ambient air quality standards.

There will also be an impact on air quality from project traffic. Results of computer air quality modeling suggest that, under worst case conditions of traffic and meteorology, the federal 1-hour CO standard would be met, but the State standard may already be exceeded in close proximity to the intersections studied. Despite the growth in traffic and predicted CO levels, a general decline in CO levels is predicted over the next few years. This is due to the effect of the EPA motor vehicle emissions control program. The projected reduction in emissions from new vehicles and loss by attrition of older vehicles offsets the projected traffic increase. This is also true of worst case 1-hour and annual concentrations of $NO_2$ from diesel bus activity, which were calculated to undergo no change between existing levels and 1998 14,000-attendee convention event levels.

Factors which mitigate against the increase in CO levels being a matter for serious concern are: the predicted exceedances were found only close to the intersection and only at particular receptor locations; the probability of worst case conditions occurring and persisting for 1 to 8 hours is low; actual CO monitoring in Waikiki conducted by the DOH suggests low probability of high CO levels and shows few if any exceedances of the State standards and no exceedances of the Federal standards; and, the predicted exceedances occur with or without the project.

Noise. Unavoidable, but temporary, noise impacts will occur during the construction period from pile driving, grading, earth moving and trenching, concrete placement, hammering, etc. The properties which are predicted to experience the highest noise levels during construction are the residential condominiums and apartment along Kahakai Drive. Construction activities must comply with the provisions of the DOH Administrative Rules, Title 11, Chapter 43, "Community Noise Control for Oahu." Varying degrees of construction noise mitigation will be achieved by the use of construction noise barriers, properly muffled construction equipment, placement of heavy equipment and portable diesel engines away from residences, when possible, and adherence to State DOH construction noise limits and curfew times.

**Induced ground vibrations from pile driving operations have the potential to cause architectural and structural damage to structures. To minimize the risk of such damage, a program to detect potential damage to neighboring properties will be implemented. This program will include recording all existing damage and, with electronic instruments, determining the precise position of buildings. A monitoring program will provide early detection of potential damage as a basis for modifying operations and to repair any damages cause by vibration.**

The project's primary long-term noise impact will be due to increased traffic associated with the convention center. Along the sections of Kapiolani Boulevard, Atkinson Drive, and Kalakaua Avenue which border the project site, minimal increases in traffic noise of 0.1 to 0.4 Ldn are predicted to occur as a result of the project. The largest increase in local traffic noise of 1.9 Ldn is expected to occur along Kahakai Drive, primarily due to the relatively low volume of existing traffic on this roadway. However, a net decrease in traffic noise levels at low and mid-rise receptor locations along Kahakai Drive is expected due to the future benefit of noise shielding from the project building, which will reduce the noise contributions from traffic on Kapiolani Boulevard and Kalakaua Avenue.

The most significant traffic noise sources associated with the proposed project are the large number of buses which will transport attendees to and from the Convention Center during a major convention. Traffic noise levels along the primary bus route (Atkinson Drive to Kapiolani Boulevard to Kalakaua Avenue) between the hotels in Waikiki and the

Convention Center, are expected to increase by 4 to 6 dB during the AM peak traffic hour when the concentration of buses is expected to be the greatest.

Attenuation of traffic noise can be achieved by measures consisting of sound attenuating walls, window air conditioning units and/or the use of sound attenuating windows. Minimizing high speed idling of parked buses, the use of drive thru rather than back-up areas to limit usage of back-up alarms, the use of quiet, modern buses, and the use of lower engine RPM during acceleration can also minimize noise impacts. The project's mechanical equipment will use sound treatment to comply with State DOH noise limits and to minimize risks of noise impacts on neighboring properties. Within the parking garage, non-slick roadway surfaces, acoustic fire-proofing of ceilings and structural members, **and a solid wall along the Kahakai Drive-side of the structure** will be used to minimize parking garage noise levels. **Also, enclosure of the truck access drive to the Loading Dock area is being considered but is an unresolved issue at this time.**

Radio Frequency Interference. The project is not expected to have a significant impact on radio or television transmission facilities, as it will not include structures over 140 feet in height. An earlier proposal for the site included several tall buildings towers which raised concerns regarding potential interference with broadcast frequencies from nearby transmitters.

Scenic and Visual Resources/Urban Design. Of the important public views defined in the City and County of Honolulu's Development Plan Common Provisions and Special Provisions for the DP's Primary Urban Center, few are currently visible from public vantage points in the vicinity of the convention center site. Only small segments of the Koolau Mountains can be seen between high rises looking mauka on Atkinson Drive and Ala Wai Boulevard between Ala Moana Boulevard and Kalakaua Avenue. Views of Diamond Head from the area around the site are generally obliterated by the intensive high-rise development in Waikiki.

While the convention center structure will be clearly visible from the surrounding area, for the most part it will not block any significant public views. **Views of the Hawai'i Convention Center project site from higher floor of surrounding high-rise structures will include extensive site landscaping features, including the 2.5 acres of Rooftop Garden and 3.5 acres of site, lanai, and courtyard landscaping.** The double-pitch roof profile of the structure will impart a traditional yet aesthetic appearance.

Overall, the design of the Hawai'i Convention Center has attempted to minimize the overall height and bulk of the building. Building height has been limited to a maximum of approximately 138 feet above ground level. Building mass has been reduced by design features such as incorporating the parking level above the exhibit hall in spaces created by the wide structural beams needed to span the hall below, and by using an efficient structural framing system. These two features have reduced building height by 50 feet over a more conventionally designed building.

1.6.2 Socio-Economic

Economic and fiscal impacts of the convention center were quantitatively assessed. Potential impacts include the displacement of some vacation visitors by convention delegates and attendees, particularly eastbound Japanese visitors. This displacement effect will also reinforce an on-going "shifting" of visitor demand from Oahu to the Neighbor Islands.

Delegates and attendees will also create a demand for up to 7,500 additional hotel room-nights Statewide. Most of this demand could be absorbed on Oahu by higher occupancy at existing hotels, planned hotel units and by a shift in demand to the Neighbor Islands. The remaining Oahu demand of up to 720 hotel rooms could be met by new construction in the vicinity. Existing zoning for the Hilton Hawaiian Village Kalia Tower and the hotel at the Aloha Tower project could accommodate that remaining demand.

Projected construction employment attributable to the convention center includes direct, indirect and induced employment of 1,160 person-years in 1996 when the convention center is under construction and for 570 to 2,500 person-years in 2004 to 2008 when new hotel rooms demanded by the convention center are built on Oahu and the Neighbor Islands. Operational employment at the convention center, at hotels and for jobs indirectly created or induced throughout the State in 2008 is projected to range from 7,900 to 9,500 full-time equivalent positions, of which 4,700 to 5,200 positions would be on Oahu and the remainder would be on the Neighbor Islands.

In-migration, which is generally defined as the movement of people across county, state or international boundaries, would follow employment opportunities created and is projected at 110 persons on Oahu in 1996 when the convention center is being constructed and between 2,400 to 2,900 persons Statewide when the center is operating in 2008. In-migration could be tempered by agricultural and military job losses in the State.

Fiscal impacts of the convention center include additional tax revenue to both the State and County as well as new public expenditures for in-migrants. Net revenue in 1996, during construction of the convention center, would be negative $62,000 for the County and negative $4.9 million for the State since the facility would not create major tax benefits until it is operational and because in-migration stimulated by construction employment would require additional public expenditures. In 2008, when the center has been operating for ten years, net new County revenues are projected to range from $3.6 to $5.4 million while State net revenues would range from $70 to $119 million.

The social impacts of the convention center were qualitatively assessed. A major impact of the convention center is growth in tourism. While positive economic benefits are anticipated, growth in tourism raises potential community issues such as conflicting attitudes toward tourism, urbanization associated with tourism, the perception that visitor industry wages are low and working conditions are poor, and the commercialization of the Hawaiian culture.

Population impacts are associated with potential in-migration as a result of job creation, as discussed previously. Primary population impacts are associated with in-migration of up to 44 persons for construction jobs at the convention center site and up 40 persons, including dependents, for employment at the convention center facility. This amount of in-migration is not significant. Secondary population impacts include the projected in-migration of up to 855 persons over a ten-year period for the construction of new hotels and for work in hotels on Oahu. Cumulative population impacts are associated with the possible in-migration of up to 727 persons to fill indirect and induced construction and operational jobs Oahu. Spread throughout the island, their primary impact would be on public expenditures which, as discussed previously, would be more than offset in the long-term by increased State and County tax revenues.

Regional and neighborhood character would be primarily impacted by construction, loss of on-street parking and increased activity in the neighborhood. Secondary impacts of the convention center would be the potential acceleration of redevelopment on parcels susceptible to redevelopment in the surrounding neighborhood, and a potential change in land use policies which could introduce resort uses on parcels susceptible to redevelopment. Cumulative impacts could result if the convention center acts as a catalyst for change in the neighborhood. While many factors other than the convention center would bring about the change, the outcome may include changes in property values, taxes and rent; displacement and changes in demographics resulting from redevelopment; and, changes in residential neighborhoods where affordable housing may be replaced by more profitable uses. Public services and facilities which may not be significantly affected by primary impacts of the convention center could be affected to a greater degree by secondary and cumulative impacts of in-migration and redevelopment.

The social impact assessment also included an analysis of community issues related to the convention center. These include a general expectation that the convention center will be built; the proposed project is a product of all previous discussions and proposals for a convention center; traffic continues to be the biggest concern; redevelopment would be an inevitable consequence; there is a need for an integrated approach to deal with the project; and, there is a need to extend the "Hawaiian sense of place" beyond the physical design of the convention center.

### 1.6.3 Infrastructure, Public Facilities and Services

Traffic and Transportation Systems.

Analyses of traffic impacts in year 1998 were conducted for five (5) different scenarios relative to events at the convention center. With the existing roadways, traffic conditions at the Kalakaua Avenue/Kapiolani Boulevard intersection during a 10,000-person event would operate at level-of-service (LOS) E during the AM peak hour and LOS D during the PM peak hour. The intersection of Kapiolani Boulevard and Atkinson Drive is not significantly impacted by the convention center. Kahakai Drive at Atkinson Drive is expected to operate at LOS F conditions under unsignalized conditions. The intersection of Ala Moana Boulevard and Atkinson Drive is expected to operate at the desirable minimum of LOS D during the AM peak hour, with undesirable LOS conditions during the PM peak hour.

Under the 14,000-person convention, the intersection of Kapiolani Boulevard and Kalakaua Avenue would operate at LOS F during the AM peak hour, and the increase in PM peak hour traffic demand would exceed the intersection's existing capacity. The intersection of Kapiolani Boulevard and Atkinson Drive would continue to operate at satisfactory LOS, while Kahakai Drive would again operate at LOS F during both the AM and PM peak hours. At the Ala Moana Boulevard/Atkinson Drive intersection, the increase in the shuttle bus volumes and visitor attendee traffic significantly impacts the right-turn movement from westbound Ala Moana Boulevard to maukabound Atkinson Drive.

During the mid-day (weekday) peak hour (1:00 TO 2:00 PM), convention center traffic is expected to increase intersection traffic demand at the Kalakaua Avenue/Kapiolani Boulevard intersection. The Kapiolani Boulevard/Atkinson Drive intersection is not significantly impacted. Kahakai Drive continues to operate at LOS F.

During a 3,000-person event on a Friday evening following the PM commuter period, the intersection of Kapiolani Boulevard and Kalakaua Avenue is expected to operate at capacity. The increase in traffic on Kapiolani Boulevard at Atkinson Drive would exceed the existing intersection capacity. The intersection of Atkinson Drive and Kahakai Drive is expected to operate at LOS F, with LOS E conditions at the Ala Moana Boulevard/Atkinson Drive intersection.

The intersection of Kapiolani Boulevard and Kalakaua Avenue is expected to operate at capacity during a 1,800-person all local event on a Friday evening following the PM commuter period. Kapiolani Boulevard would be impacted since the primary movement of traffic is makaibound from the H-1. The Atkinson Drive/Kahakai Drive intersection is expected to operate at LOS F.

A number of roadway improvements to the existing street system will be constructed as part of the convention center development to mitigate the incremental effects of the project. These include: 1) widening Kapiolani Boulevard along the project frontage to provide an additional right-turn only lane in the eastbound direction, and conversion of the existing eastbound curb lane to an optional through/right-turn lane; 2) widening Kalakaua Avenue along the project frontage to provide an additional makaibound lane for use as a bus stop and a right-turn lane into the Center's Kalakaua parking ramp; 3) widening of the makaibound lanes on Kalakaua Avenue mauka of Kapiolani Boulevard; 4) widening Kahakai Drive along the project side to add two traffic lanes; 5) installation of traffic signals at the intersection of Atkinson Drive and Kahakai Drive/Kona Street; 6) provision of an exclusive left-turn lane on makaibound Atkinson Drive at Kahakai Drive; and 7) widening Atkinson Drive along the project frontage to provide additional curbside shuttle bus loading/unloading space.

With the roadway improvements, the intersection of Kapiolani Boulevard/Kalakaua Avenue would continue to operate at LOS E during the AM peak hour, improving to LOS C during the PM peak hour for a 10,000-person convention. A contra-flow coning operation on Atkinson Drive is recommended to further mitigate potential queuing on makaibound Atkinson Drive at Kahakai Drive in the AM peak hour.

During a 14,000-person convention, the proposed mitigation measures increase the overall intersection capacity to accommodate the AM and PM peak hour traffic at the Kapiolani Boulevard/Kalakaua Avenue intersection. The improvements are also expected to mitigate conditions at the intersection of Kapiolani Boulevard and Atkinson Drive. Under signalized conditions, Atkinson Drive and Kahakai Drive are expected to operate at LOS C and B, respectively.

With the mitigating actions, traffic operations at the Kapiolani Boulevard/Kalakaua Avenue intersection significantly improves to LOS C during the mid-day (weekday) peak hour. Also, traffic conditions on Kahakai Drive are expected to be significantly improved under the proposed traffic signalization.

During the 3,000-person Friday evening post-commuter event, in addition to the roadway improvements, a westbound contra-flow coning operation on Kapiolani Boulevard may be needed to accommodate the expected increase in traffic on Kapiolani Boulevard. This would mitigate the capacity conditions at the Kapiolani Boulevard/Kalakaua Avenue intersection, and significantly improve the traffic operations at the Kapiolani Boulevard/Atkinson Drive intersection. Designation of a curb lane on westbound Ala Moana Boulevard to a right-turn only lane (assuming existing roadway lanes) would improve the Ala Moana/Atkinson Drive intersection to LOS D conditions.

For the 1,800-person all local Friday evening post-commuter event, with the roadway improvements and the proposed westbound contra-flow coning operation on Kapiolani Boulevard, the capacity conditions at the Kapiolani Boulevard/Kalakaua Avenue intersection would be eased, and the intersection of Kapiolani Boulevard and Atkinson Drive improves to satisfactory LOS.

In response to comments received on the Draft EIS, ten (10) additional intersections in the project vicinity were analyzed for convention center traffic impacts. Under a 10,000-person event, the analysis concludes that all intersections would operate at LOS D or better during the AM peak hour. All of the analyzed intersections would operate at LOS D or better during the PM peak hour, except for the Kapiolani Boulevard/McCully Street intersection which is expected to operate at LOS E.

There may be some events at the convention center that exceed the parking supply, and some attendees and employees may try to find free on-street parking. Also, development of the convention center and its associated roadway improvements will require removal or use restrictions of on-street parking near the project site. These include: 1) elimination of about five parking stalls on the ewa side of Atkinson Drive between Kapiolani Boulevard and Kona Street; 2) restrict parking on the makai side of Kahakai Drive (about 5 stalls) during a large convention, as necessary; 3) restrict parking on the east side of Atkinson Drive between Kahakai Drive and Mahukona Street during the AM peak hour of a large event, as necessary; and 4) restrict about 40 stalls on both sides of Kapiolani Boulevard between Atkinson Drive and Kaheka Street during a large Friday evening post-commuter period, as necessary.

Any effort to control on-street parking in the immediate vicinity of the convention center would require City and County of Honolulu participation, such as establishment of resident parking permit programs. Alternatives to increasing the available stalls or providing alternatives to parking at the Center include provisions such as arrangements to use existing available outlying parking facilities and transporting attendees by shuttle buses; preferential on-site parking for employees and local attendees who car-pool to the Center; issuance of passes for on-site parking; provision of market-rate parking fees; and issuance of temporary public bus passes.

About 50 large truckloads of freight may be needed for a large convention/exhibition. The truck activity for convention move-in and move-out should not have significant impact on area traffic conditions since this would occur primarily on days with no conventions at the site. Smaller delivery and service vehicles would travel to and from the convention center during both move-in/move-out days and during convention events, with volumes likely to approximate 5 to 10 vehicles per hour. This should not affect area traffic conditions.

During large conventions, transit capacity of TheBus routes through Waikiki would be significantly impacted by visitor attendees using public transit during the AM peak hour. Convention center employees and local resident attendees would not significantly impact the commuter transit routes during the weekday peak hours. Mid-size and large conventions should provide and encourage the use of special convention shuttle services by visitor attendees to minimize their use and impact of public transit during the peak commuter hours.

Pedestrian traffic along streets in the vicinity of the convention center and across the Ala Wai Canal will increase as a result of the project. Pedestrian conditions at each end of the Kalakaua bridge where there are utility poles would result in undesirable levels of service (LOS D and E). Relocation of the utility poles at each end of the Kalakaua bridge would improve pedestrian conditions. Also, the sidewalk on the southeast corner of the intersection of Atkinson Drive and Kahakai Drive is inadequate to accommodate the anticipated volume of pedestrians. To improve pedestrian conditions, the sidewalk area at this corner should be expanded to accommodate pedestrian queues.

A private charter shuttle bus system will be used to provide transportation between Waikiki hotels and the convention center for visitor attendees. Based on the forecast assumptions for a 14,000-person convention, approximately 122 bus trips would be generated during the AM peak hour to transport visitor attendees to the convention center. The six (6) off-street bus berths fronting the convention center lobby should be adequate to accommodate the shuttle bus operations and estimated number of bus trips during both the AM and PM peak hours under normal conditions.

The convention center operator will designate a transportation coordinator who will be responsible for the transportation-related operations of the Center. The coordinator's primary function would be the development and implementation of a transportation management plan for events, and will also be responsible in overseeing transportation operations during the events. The transportation management plan would provide for operations such as traffic access controls, temporary on-street parking restrictions, signing and coning operations, truck deliveries, on-site and off-site parking, and shuttle bus operations.

The three key transportation elements of the City's Waikiki Master Plan which may affect, or be affected by the convention center include: 1) conversion of the sections of Kalakaua Avenue and Ala Moana Boulevard to one-way operation; 2) development of parking facilities at the periphery of Waikiki; and 3) operation of a people mover system within Waikiki.

Short-term traffic-related impacts will occur from construction of the convention center. To minimize impacts, the movement of construction vehicles to and from the site will be restricted during the morning and afternoon peak traffic periods, and flagmen or off-duty police officers will be employed to direct traffic.

The City is currently conducting the Waikiki Regional Traffic Impact Plan which is intended to analyze traffic impacts of existing and future conditions in the region in the year 2005, including the convention center project. The study is anticipated to be completed in August 1995.

An analysis of traffic conditions in year 2005 was conducted in response to comments received on the Draft EIS that the convention center is anticipated to reach its full stabilized operating capacity in that year. Based on analyses of traffic conditions for a 10,000-person event and with the project's proposed roadway improvements, four study area intersections will operate at LOS E or F. Mitigation to reduce traffic impacts include a) a right-turn only lane from westbound Ala Moana Boulevard to Atkinson Drive; b) a right-turn only lane for traffic turning from eastbound Kapiolani Boulevard to Atkinson Drive; c) a right-turn only lane for traffic turning from ewabound Kapiolani Boulevard to maukabound Kalakaua Avenue; and d) modification of the present westbound approach of Ala Wai Boulevard at Kalakaua Avenue to provide two right-turn only lanes and an optional through/left-turn lane.

For year 2005 conditions, traffic demand management procedures are recommended to accommodate the 14,000-person event, such as temporary relocation of employee parking to an off-site parking area, and designation of an existing off-site parking lot for resident visitors, who will then be shuttled by buses to the Center. Traffic

**demand management procedures are also recommended to accommodate a 10,000-person event during inclement weather, including increasing shuttle bus ridership.**

Utilities. The project will increase demands on existing wastewater, water, electrical and communications systems. The volume of wastewater that will be generated by the project is estimated to be on the order of 210,000 gallons per day based on a 14,000-person event, using a factor of 15 gallons per person per day. To accommodate projected wastewater flows from the Hawai'i Convention Center, a new 15-inch sewer line will be installed beneath Atkinson Drive leading from the project site toward Ala Moana Boulevard.

The water demand for the Hawai'i Convention is estimated at 225,700 gallons per day during a 14,000-person event. The existing water lines around the site have sufficient capacity to accommodate this demands.

Drainage from the site will be collected from roofs, terraces, landscaped areas, planters and other exposed areas and directed into a drainage system which will discharge the runoff into existing drain lines. No new drainage outlets into the Ala Wai Canal will be required. The electrical load requirement for the convention center will be between 4 and 6 megawatts (mW).

Solid Waste. Solid waste collection during operation of the convention center will be handled by private contractors, and municipal waste will either be disposed of at the Waimanalo Gulch landfill or the City's H-POWER garbage to energy plant at Campbell Industrial Park. The Hawai'i Convention Center design will incorporate several recycling operation features, including a 1,200 square foot recycling room, two loading bays for accommodating trash compactors, and a refrigerated room for holding food waste.

Police, Fire and Emergency Services. The project will increase demands for police, fire and emergency services. The project will mitigate its impact on police protection services through use of 24-hour on-site security personnel, a traffic circulation plan and large event coordination efforts to minimize traffic congestion, and design safety measures such as adequate lighting. It is anticipated that the project can be adequately serviced by existing firefighting service and emergency medical facilities.

Education and Child Care. The project should have a negligible impact on public and private educational facilities.

Recreational Resources. **Because the convention center is within walking distance to several nearby beaches, the project may facilitate increased usage of these resources by conventioneers and their spouses.**

### 1.7 Alternatives Considered

Several alternatives to the project were considered: no action, alternate site outside of Waikiki, alternate site within Waikiki, and alternative designs for the same site. The no action alternative would fail to meet the Convention Center Authority's mandate and prevent the State from attracting and accommodating major national and international events. Under the no action alternative, the subject site would still be developed in the future, probably for office and/or other commercial uses. An alternative convention center site outside of Waikiki would hamper accessibility to Waikiki hotel rooms, which were determined to be essential for the success of a convention facility. Several alternate sites within the greater Waikiki area were examined. Although many were suitable for a convention center, unlike the subject site, all of the alternate sites would require displacement and/or relocation of existing uses and users. This could have resulted in legal challenges, relocation expenses, higher development costs and project delays. Overall, analysis of the alternatives indicated that the no action and alternate site alternatives did not compare favorably to developing the convention center at the proposed site.

Alternative designs for the site included prior private proposals for a convention center complex with hotel, apartment condominium, office, and retail uses, as well as three other "stand alone" convention center designs considered during the recent design competition. The private convention center complex proposals, which would have had greater environmental and social impacts, were abandoned because financing could not be secured. The recent design competition led to the selection of the Nordic/PCL design, eliminating three other proposals in the process.

### 1.8 Unresolved Issues

**Two categories of unresolved issues were identified. The first category encompasses issues that will be resolved pending issuance of a permit or a decision by a specific agency or authority. These include issuance of National Pollutant Discharge Elimination System permits for dewatering activities; State Historic Preservation Division's (SHPD) final determination pursuant to Chapter 6E, HRS (State Historic Preservation Law), which is pending submission of archaeological laboratory reports; SHPD's determination pursuant to Section 106 (National Historic Preservation Act) regarding impacts on the Ala Wai Promenade; a decision whether or not to enclose the truck access driveway to attenuate noise; a decision as to**

whether or not to provide a sidewalk on the convention center-side of Kahakai Drive; and a decision as to how to provide sidewalk improvements that would increase pedestrian traffic capacity at the southeast corner of Atkinson and Kahakai Drive.

The second category encompasses mitigation measures which are beyond the authority of the design/builder or the CCA to implement. Most of these are related to the implementation of potential mitigation measures to address secondary and cumulative social impacts. It is recommended that a State/City Convention Center District Joint Advisory Council be formed to develop recommendations addressing social impacts affecting neighboring lands around the convention center. Other mitigation measures included in the second category involve those which may be required to address traffic conditions in 2008.

### 1.9 Pre-Assessment and EA Consultation

Prior to and during preparation of the EA, a pre-assessment consultation was conducted in accordance with Section 11-200-9, HAR, Early Assessment. A letter requesting comments and concerns was sent to 154 federal, State and City and County agencies; State Legislators; City Council members; utility companies; trade unions and other organizations and individuals. The mailing list was comprised of the Office of Environmental Quality Control (OEQC)'s standard distribution list, as well as other groups and individuals believed to have an interest in the project. In addition to the mailing, a pre-assessment consultation notice was published in the April 23, 1994 edition of the OEQC Bulletin. A total of 72 response letters were received.

Volume II of the Draft EIS included a matrix summarizing the comments received during the pre-assessment consultation, a copy of the pre-assessment consultation letters, and the complete mailing list. Issues mentioned most frequently by those commenting during the pre-assessment consultation phase included traffic congestion, parking, impacts to the Ala Wai Promenade and its trees and design issues.

Volume II also includes a matrix summarizing the comments received during the EA consultation phase, copies of all EA comment letters received, and responses to those letters. Issues mentioned most frequently by those commenting in the EA consultation phase again included traffic congestion, parking, as well as water quality and pedestrian access concern. During the EA consultation phase, a total of 42 comment letters were received.

**Volume II of the Draft EIS is incorporated as Volume II of the Final EIS and serves as documentation of the pre-assessment consultation and EA consultation process.**

**Volume III of the Final EIS documents the public review and comment process. It includes a matrix summarizing the comments received on the Draft EIS, copies of all comment letters received, and responses to those letters. Issues mentioned most frequently by those commenting include, traffic, parking, the Ala Wai Promenade, economic and social impacts. During the EIS public review phase, a total of 86 comments letters were received.**

## CHAPTER TWO

## PROJECT DESCRIPTION

# 2. PROJECT DESCRIPTION

## 2.1 Background Information

### 2.1.1 Purpose and Need for Action

The mandate for development of a convention center is contained in H.B. S7-93, approved by the Legislature in 1993. This Legislative bill, included as Appendix A, provided a mechanism for the Authority to purchase the former Aloha Motors site and develop a stand-alone, world class convention center. The bill noted that convention organizers around the country have bypassed Hawai'i for other destinations due to a lack of an adequate convention facility. The loss of this convention-related business has long-lasting and far-reaching impacts on the State's economy. It concluded that the construction and operation of a convention center are crucial to the economic well-being of the State.

H.B. S7-93 authorized the Authority to purchase the subject site at a price that would enable the convention center to be developed for no more than $350 million. The bill also established a capital and operations special fund for the convention center, and approved raising the transient accommodations tax from five percent to six percent in order to raise the $350 million. The issuance of general obligation and revenue bonds was also allowed.

The bill set forth the general development criteria for the convention center, including its stand-alone nature and minimum gross square footage, and provided that the facility be designed to accommodate future expansion and reflect a Hawaiian sense of place.

### 2.1.2 Project History

The enactment of H.B. S7-93 culminated a series of efforts to develop a world class convention center in Hawai'i. A brief chronology of events leading up to the present Convention Center project is presented below. (Rosegg, 1993).

- 1986. The non-profit Hawai'i Convention Park Council was formed to push for development of a convention center. The Council's charter members include major Hawai'i banks, tourism industry representatives, hotel workers, and union representatives.

- 1986. State Legislature approves a five percent hotel room tax beginning in 1987. A portion of the revenues from the tax were to finance a convention center.

- 1988. Legislature passes Act 96 which established the Waikiki Convention Center Authority, intended to solicit proposals from private developers to build a convention center at the International Market Place in Waikiki. This results in significant public protest by marketplace merchants opposed to the development.

- 1989. First Development, Inc. submitted an application for a Plan Review Use (PRU) to the City and County of Honolulu, in response to a request for proposal (RFP) issued by the City for the development of a municipal convention center.

- 1990. City Council approves First Development, Inc. Plan Review Use (PRU) proposal for a mixed-use facility comprised of a convention center, hotel, two apartment condominium towers, an office building and retail uses.

  Later in the year, the Convention Center Authority approves a proposal by developer Herbert Horita to construct a convention center at the International Marketplace.

- 1992. Horita withdraws his proposal due to lack of financing. The Legislature votes to extend the life of the Convention Center Authority, with a mandate to seek alternate sites.

- 1993. State Legislators agree on a proposal that would include the Aloha Motors site and the Waikiki Gateway site near Hobron Lane in a new convention center district. The plan dies because of a technical error.

- Indonesian businessman Sukarman Sukamto's Convention Center Partners purchases the Aloha Motors site from First Development, Inc. and receives City Council approval for a major modification to the previously approved PRU application. The new plan includes a "free" convention center and four hotel towers. However, tourism industry officials contend that this proposal will not provide sufficient exhibition space and would not be the "world class" convention center which the State needs.

- In a special session, the Legislature, in H.B. No. S7-93, provides a mechanism for selecting a site and financing the development of a convention center facility. The bill approves raising the five percent hotel room tax to six percent to raise $350 million to buy the Aloha Motors site and construct a world-class convention center. The Convention Center Authority is given 60 days to purchase the site.

- The State executes a binding agreement to purchase the Aloha Motors site for State Convention Center project in December 1993.

2.1.3 Convention Center Authority (CCA)

The Authority established and conducted a design competition process to select a designer/builder for the Hawai'i Convention Center. The Authority also initiated the Environmental Impact Statement (EIS) process in accordance with Chapter 343 HRS, by preparing and publishing an Environmental Assessment/EIS Preparation Notice. The following summarizes the Authority's activities during 1994:

- March 4 — *Convention Center Design/Build Request for Proposals* (RFP) issued by the Authority for a world-class, stand-alone convention center at the Aloha Motors site.
- March 18 — State acquires Aloha Motors Site.
- April 13 — Deadline for Design/Build Teams to file a *Notice of Intent (NOI) to Submit a Proposal* and a security deposit/bond in the amount of $200,000.00. Four teams file the NOI.
- May 23 — Notice of availability of *Convention Center Environmental Assessment* (EA) for public review published in OEQC Bulletin. 30-day Consultation Period begins.
- May 31 — Public Information Meeting held on *Convention Center EA* at Washington Intermediate School.
- June 22 — Last Day for submission of comments on *Convention Center EA*.
- August 5 — Deadline for Design/Build teams to submit Proposals. All four teams submit.
- August 10-16 — Four proposed Convention Center models on exhibit at Ala Moana Center for public viewing and comments.
- August 22-23 — Design team presentations before the Authority.
- August 24 — Question/answer session before the general public at Kaimuki High School.
- August 23-25 — Television broadcast (one-day delay) of Design/Build team presentations and question/answer session on 'Olelo Community Television.
- August 31 — Announcement that Nordic/PCL was selected as the winning Design/Build Team.
- October 14 — Nordic/PCL Design Team receives *Letter of Notice to Proceed* which specifies completion of construction of the convention center in 750 days.

The Authority's activities in 1995 have included the following:

- January 27 Submission of the Draft EIS to OEQC
- February 8 Notice of availability of Draft EIS for public review published in OEQC Bulletin. 45-day Comment Period begins.
- February 12 Television broadcast of Draft EIS presentation and discussion by CCCN review team.
- February 22 Public Information Meeting held on Draft EIS at Washington Intermediate School.
- March 14 Television broadcast of Question and Answer session on Draft EIS.
- March 25 Last day for submission of comments on Draft EIS.
- June 15 Public Information Meeting on revisions and refinements to be incorporated in the Final EIS at Washington Intermediate School.

2.1.4 Nordic/PCL Joint Venture

The Nordic/PCL Joint Venture is comprised of Nordic Construction, Ltd., a Hawai'i Corporation and PCL Construction Associates, Inc., a Colorado corporation. The joint venture was formed specifically to compete for the Hawai'i Convention Center design/build contract. Nordic/PCL is registered as a joint venture contractor in the State of Hawai'i.

Nordic/PCL's architectural design team includes Loschky, Marquardt & Nesholm of Seattle, Washington and Wimberly Allison Tong & Goo of Honolulu, Hawai'i. Upon completion of the project, Wimberly Allison Tong & Goo will be the architect of record.

2.1.5 Project Goal and Objectives

The goal of the Hawai'i Convention Center is to serve people of the State of Hawaii by offering a world-class facility that will secure Hawaii's future as a leading destination for business and leisure travelers. In fulfillment of this goal, the immediate objective of the convention center is to strengthen Hawaii's economy by expanding its visitor market to include convention-going visitors. With respect to the selected Hawai'i Convention Center design, the following objectives guided its development:

- Meeting the evolving standards of excellence within the convention center industry;
- Maintaining a state-of-the-art structure capable of adapting to the continuing improvements of technology;

- Offering expansion capability by making provisions, during final design and construction, to accommodate all required future building systems;

- Minimizing adverse environmental and social impacts on the surrounding neighborhoods and communities.

- Serving as a cornerstone in the initiative to re-enchant Waikiki by providing a "Hawaiian Sense of Place" in a design that:

  -- Celebrates the environment, culture and history of Hawai'i;
  -- Instills pride in all residents whether native-Hawaiian, kamaaina, or new arrival;
  -- Evokes images, memories, and emotions of Hawai'i and Waikiki long after a visitor returns home;
  -- Incorporates native flora in the landscape design, including Taro, Hala, Hau, Breadfruit, Banana, Ti, Kou, Milo, Ilima, Coconut palm, and Loulu Palms.

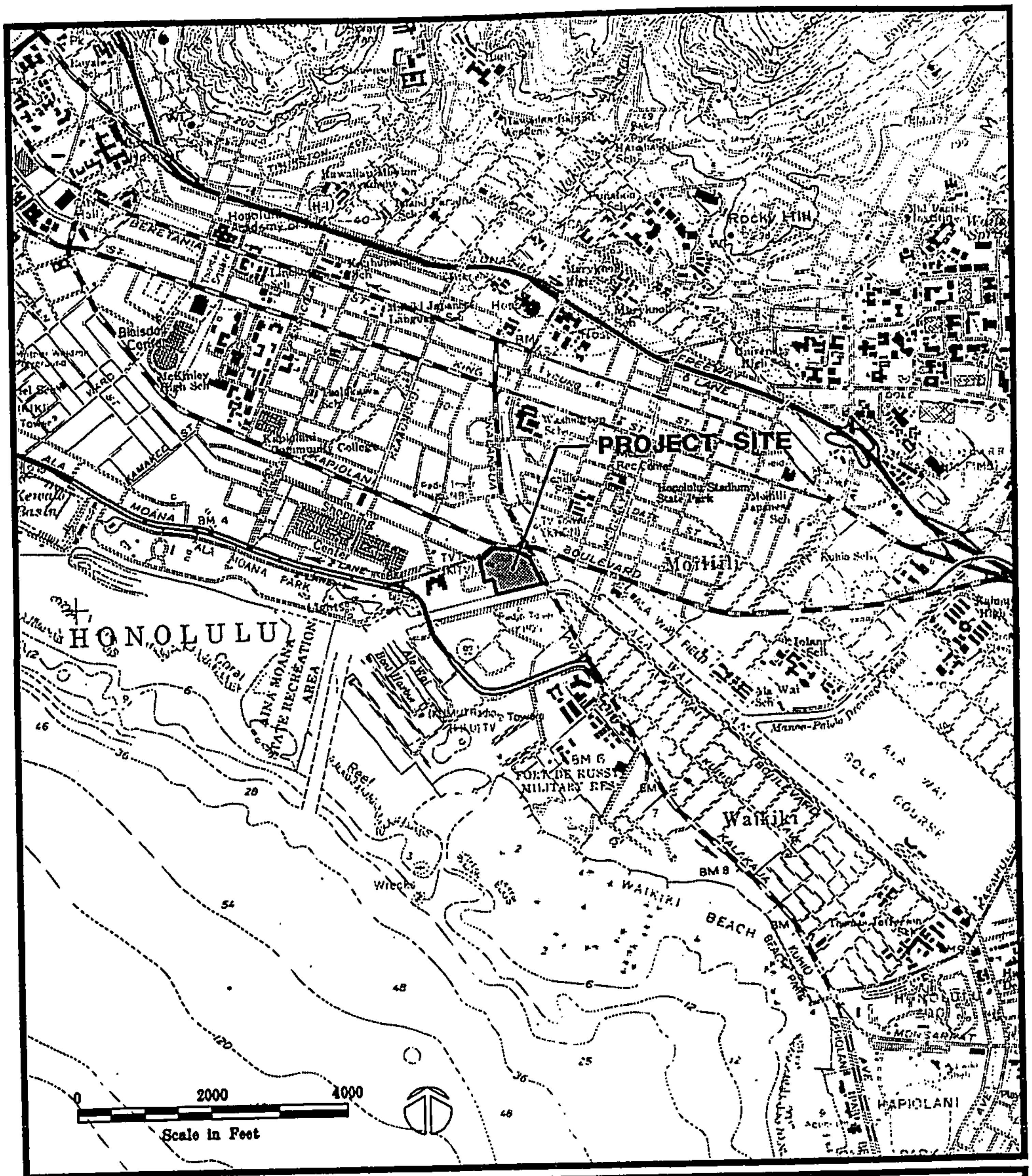
## 2.2 Project Description

### 2.2.1 Location

The project site is situated on the south shore of the Island of Oahu, in the Ala Moana area of central Honolulu (see Figure 2-1). The Ala Moana area is adjacent to and just west of Waikiki. The site is located on the former Aloha Motors property, at 1777 Kapiolani Boulevard, Honolulu, adjacent to the intersection of Kapiolani Boulevard and Kalakaua Avenue. It is also bounded by Atkinson Drive to the northwest, Kahakai Drive to the west, and the Ala Wai Canal to the south.

### 2.2.2 Building Concept

The convention center is vertically organized with each of its four levels having a defined function. The Exhibit Hall is on the first level where it is readily accessible through the Lobby and Loading Dock service area. Parking is located above the Exhibit Hall in the space created by the deep structural members needed to span the Hall below. Meeting rooms are located above the Parking level and the Ballroom is at the highest level. The high Lobby provides access to all levels (see Figure 2-2).



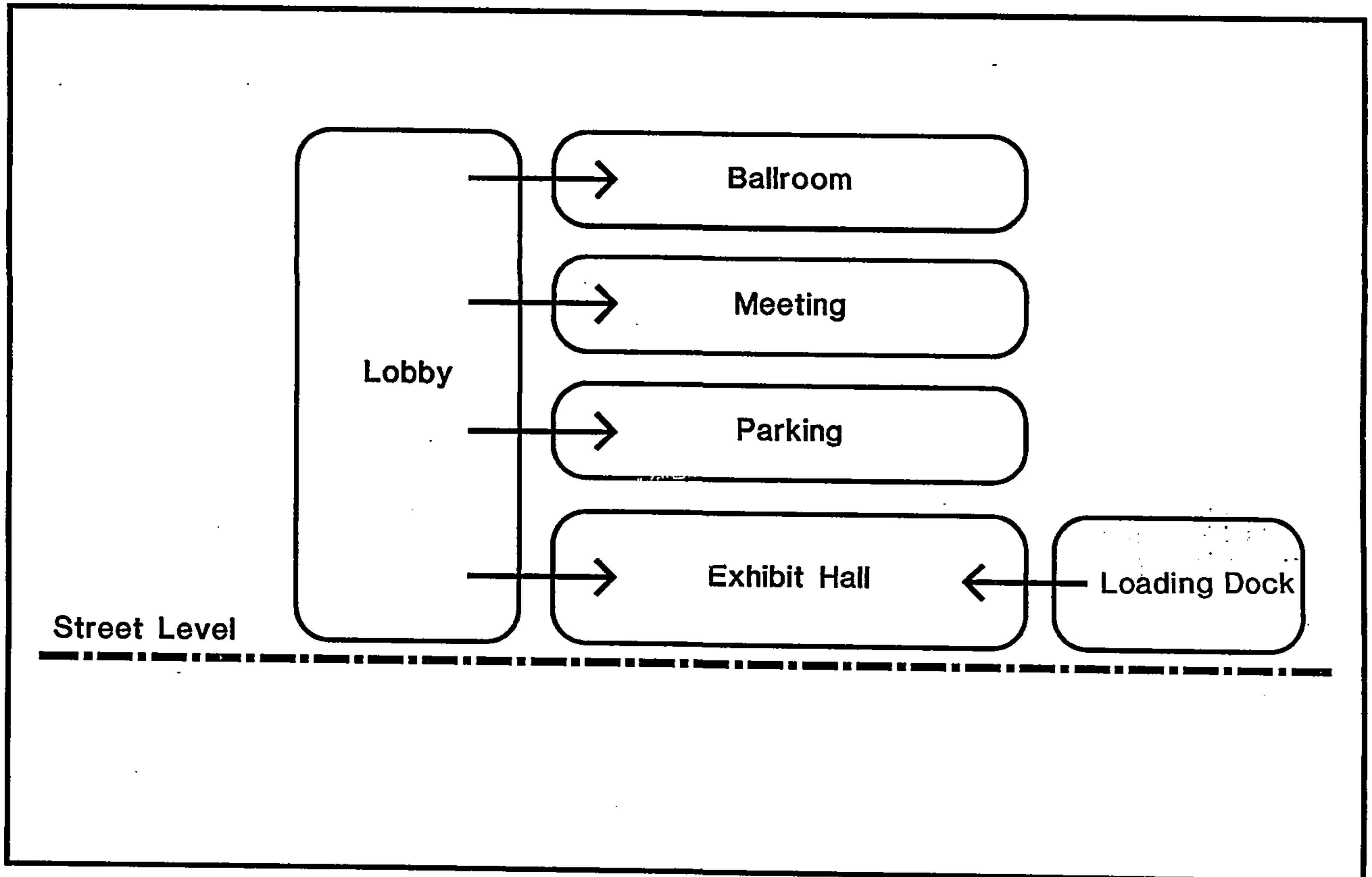

HAWAI'I CONVENTION CENTER

Fig. 2-1

## LOCATION MAP

Prepared for :
CONVENTION CENTER AUTHORITY
State of Hawaii

Prepared by :
Nordic / PCL
Wilson Okamoto & Associates, Inc.




HAWAI'I CONVENTION CENTER

Fig. 2-2
CIRCULATION CONCEPT

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State of Hawaii

Prepared by :
Nordic / PCL
Wilson Okamoto & Associates, Inc.

2.2.3 Site Plan/Elevations

The convention center structure occupies 8.16 acres of the 9.65-acre project site (See Figure 2-3). The first level is at elevation +7 feet above mean sea level. The highest point at the peak of the double pitch hip roof atop the Ballroom is 138 feet above the Exhibition Hall level.

1) Atkinson Drive/Kapiolani Boulevard Elevation

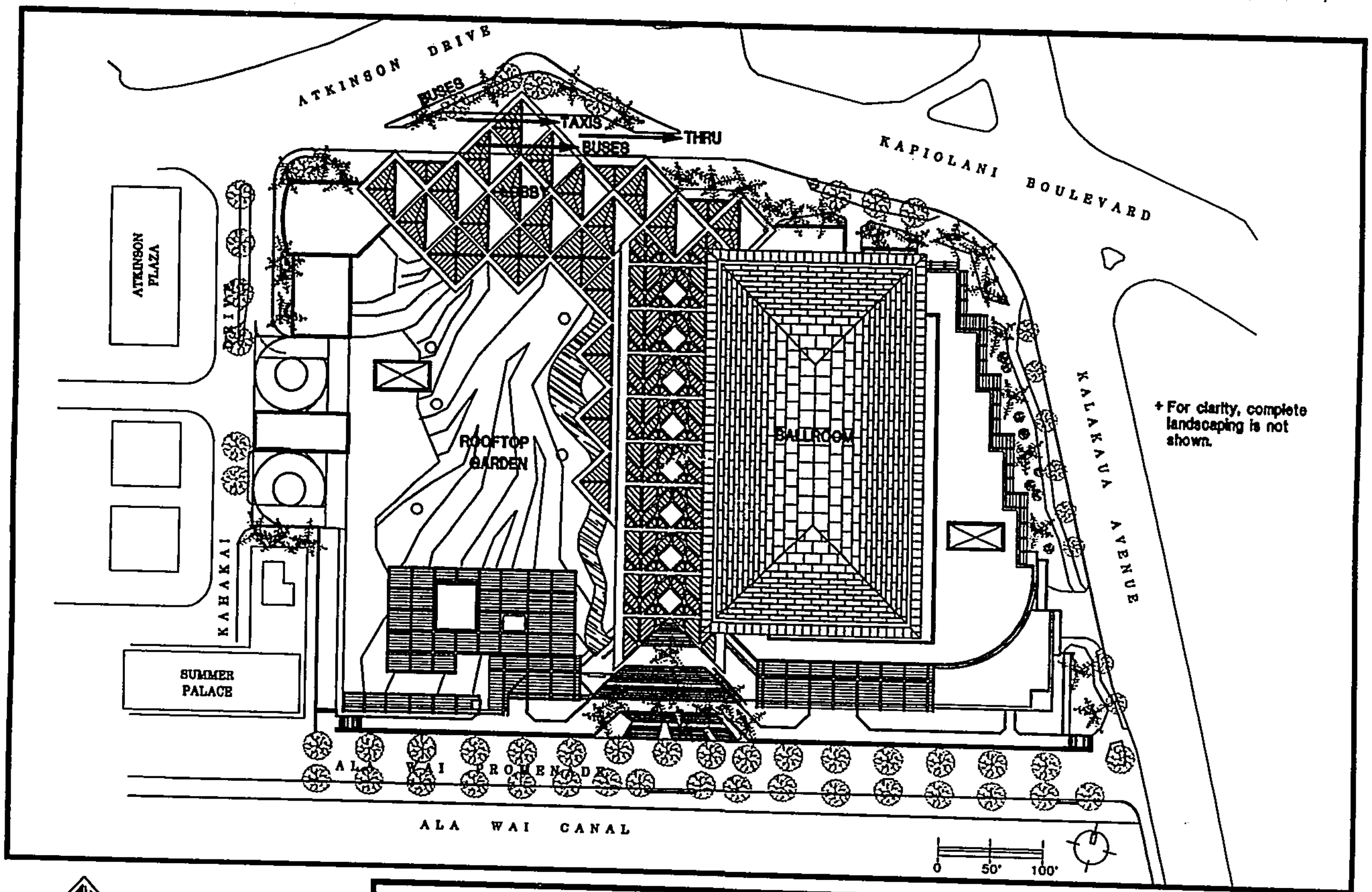
The Atkinson Drive/Kapiolani Boulevard facade features the Lobby entrance which provides arriving conventioneers with an initial sense of arrival to the Hawai'i Convention Center (See Figure 2-4). The soaring 80-foot high Lobby is enclosed by a hanging glass curtain that visually brings the outdoor space indoors. Coconut palms on either side of the glass emphasize the transparency. Fabric "sails" atop the Lobby roof will become a signature associated with the convention center.

Landscaping along this facade will include a continuous line of Monkeypods replacing those removed as a result of road widening. Coconut palms will be featured at the lobby and interspersed with the monkeypods. A low berm will partially screen the bus loading/unloading area at the corner of Atkinson Drive and Kapiolani Boulevard (not shown in elevation drawing; see site plan Figure 2-3).

2) Kalakaua Avenue Elevation

The Kalakaua Avenue facade creates a "terraced" impression as planters, balconies, trellises and building elements rise in a series of steps away from the street to the pitched roof of the Ballroom (see Figure 2-4). The intent is to reduce the visual impression of building mass. To further reduce the sense of mass, the open-perimeter Parking level on the second level is set back from the Meeting Room level above it. The perceived height of the building from the sidewalk at the planter boxes fronting the Meeting Room level is 70 feet. The Ballroom structure will not be visible from the sidewalk.

Landscaping along this facade includes a continuous row of rainbow shower trees replacing those removed as a result of road widening. A five-foot high berm along the base of the building is landscaped with mature Coconut palms, Halas, Plumerias, shrubs and Laua'e Fern, and the rebuilt sidewalk meanders through this bermed area away from the street. Higher up, building planters at the




HAWAI'I CONVENTION CENTER

Fig. 2-3

SITE PLAN

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State of Hawaii

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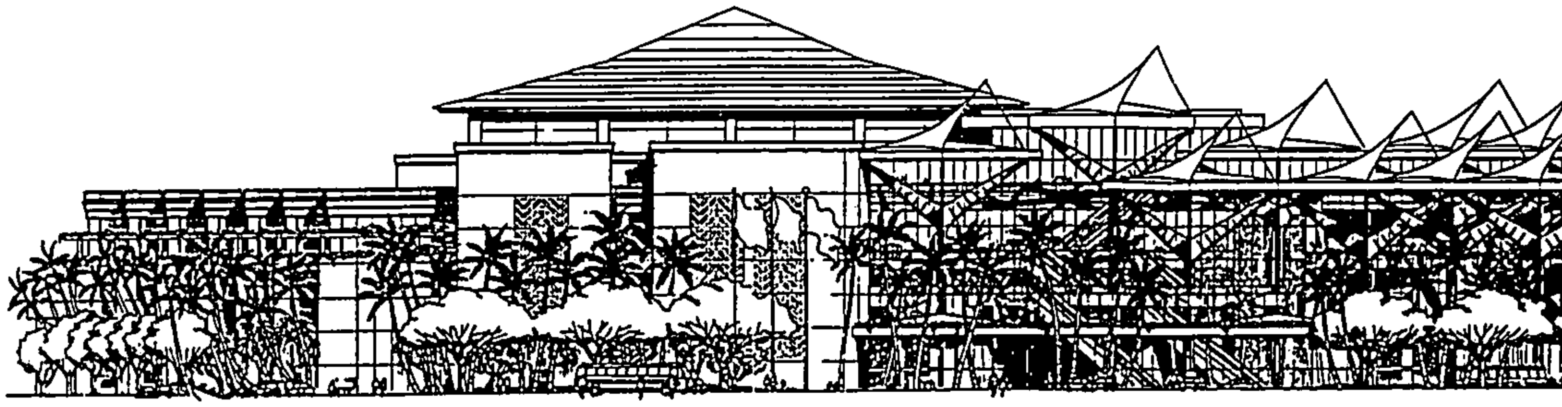
Parking level, Meeting Room level and Ballroom level as well as trellises provide additional greenery.

3) Ala Wai Promenade Elevation

**The Ala Wai Promenade facade presents a terraced landscaped park with a central stairway leading down to but not encroaching into the Promenade (See Figure 2-5). No portion of the convention center structure, including planters, will extend into the promenade. The terraces are accessible by the public over the Loading Dock and, with the stairs, form an amphitheater overseeing the canal for potential events such as Hawaiian canoe racing. The first terrace, the Upper Promenade, is 30 feet wide and runs the entire length of the convention center, paralleling the Ala Wai Promenade and accessible from it at both ends. Above it, at the Parking level, is a second terrace which is accessible from the garage. Public activities and events such as craft fairs and ethnic festivities could be staged at this terrace and extend into a portion of the Parking level if it is not being used for parking. Also, for events staged on the terrace, the Parking level access can be used for VIP drop-off.**

**The third terrace is at the meeting room level where the broad, shaded Central Concourse leads to the Lobby. Landscaping along this facade features a row of Banyan trees in planters along the entire length of the first terrace over the Loading Dock. This row of trees will complement the two rows of Banyans which presently line the Ala Wai Promenade. A plan to relocate up to five banyan trees within the Promenade, directly adjacent to the bottom of the stairway, has been withdrawn following denial of the request by the City's Exceptional Tree Committee. None of the banyan trees in the Ala Wai Promenade will be relocated or removed.**

Coconut palms in grassed terraces will dominate the central staircase and terrace area leading up to the Central Concourse at the Meeting Room Level. Landscaping in the planters at the Upper Promenade level will consist of Laua'e Ferns and flowering tropicals to complement the new Banyans. Adjacent to the west side of the staircase is a landscaped water feature with a cascading waterfall originating from the Rooftop Garden and ending at a pool on the Promenade level adjacent to the stairway, but not encroaching on the Promenade.



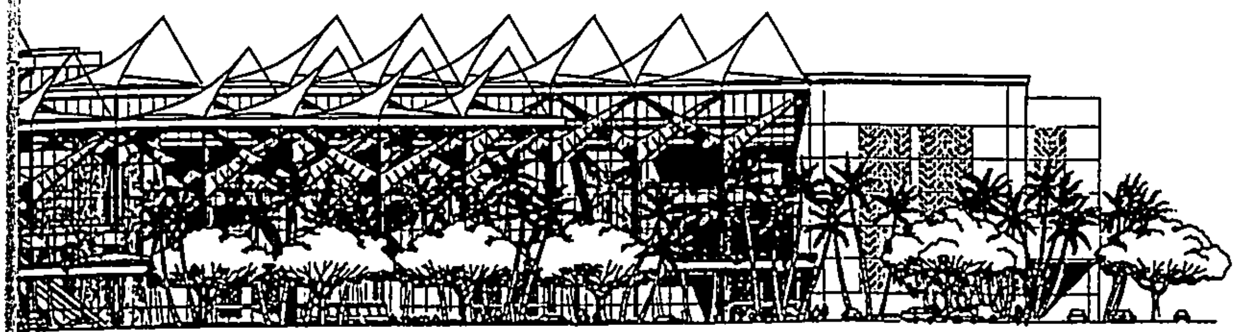
ATKINSON DRIVE/KAP

Note: The plan has been revised to withdraw the central stairway off of the Ala Wai Promenade. In this diagram, the cross-section of the Promenade extends from the Ala Wai Canal wall to approximately the second tree from the left.

HAWAI'I CONVENTION CENTER

Fig. 2-4

NORTH AND EAST ELEVATIONS



ATKINSON DRIVE/KAPIOLANI BOULEVARD ELEVATION (NORTH)

KALAKAUA AVENUE ELEVATION (EAST)


Fig. 2-4

D EAST ELEVATIONS

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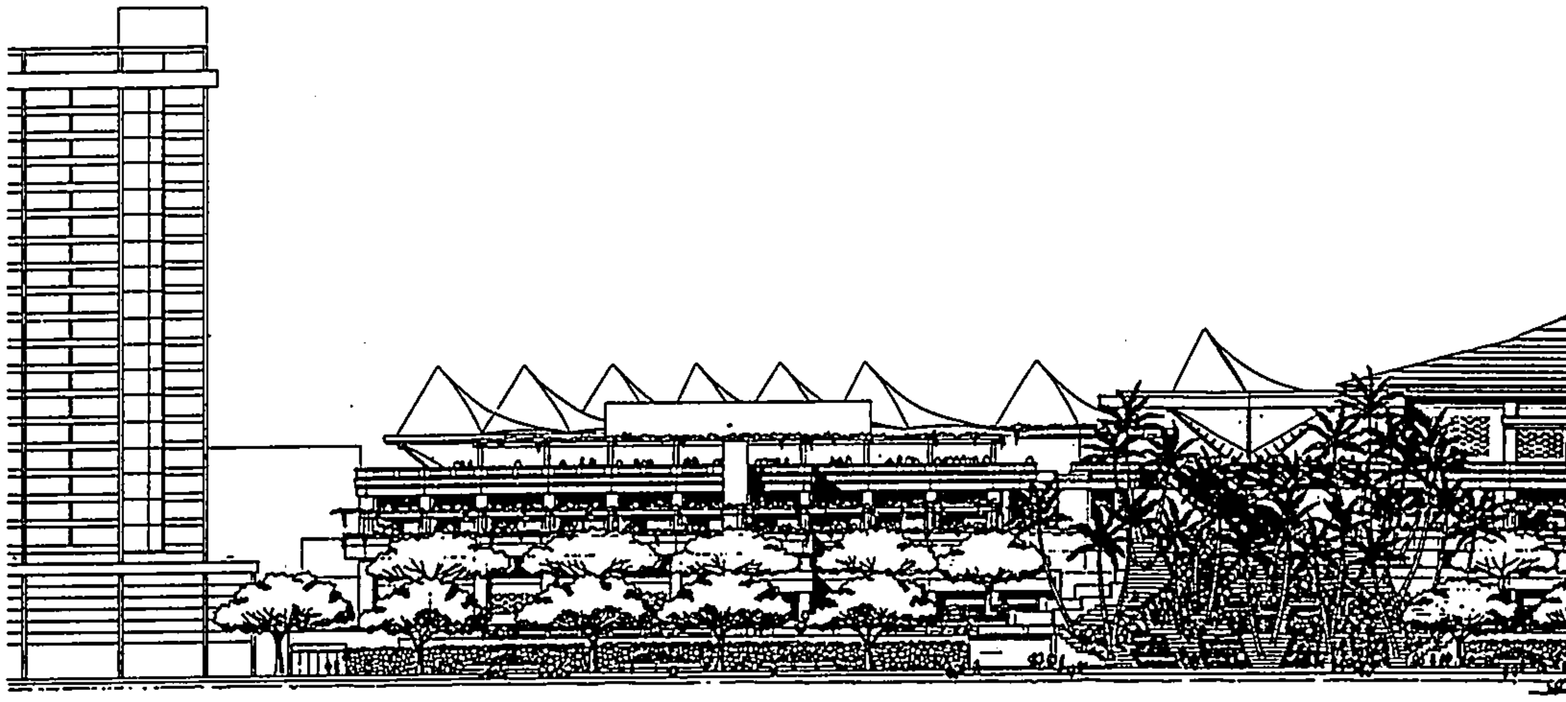


Note: The plan has been revised to preserve all existing banyan trees in the Ala Wai Promenade. Hence, there will be no opening in the lower line of trees in front of the stairway.

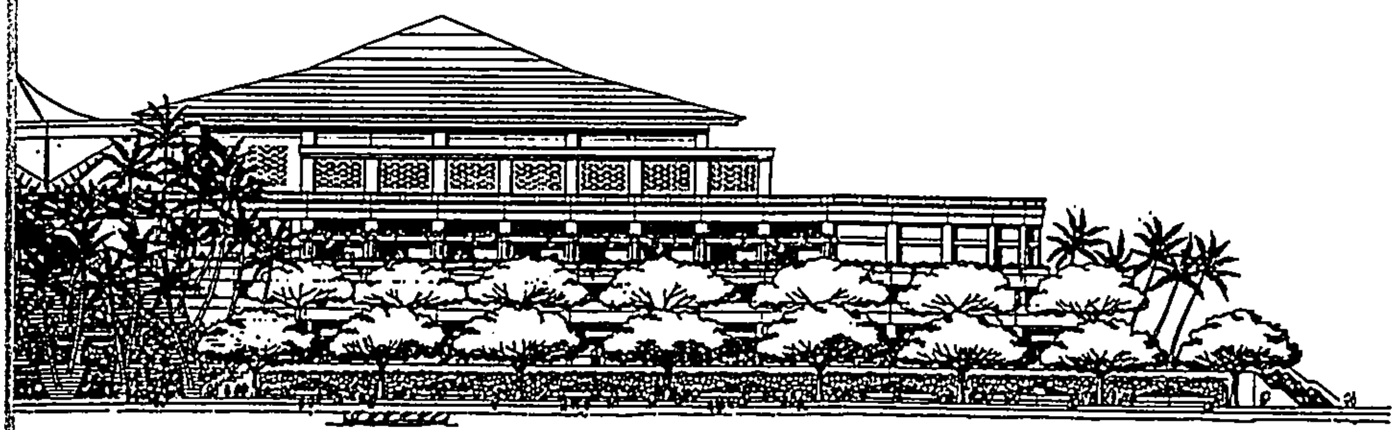
Note: The plan has been revised to withdraw the central stairway off of the Ala Wai Promenade. In this diagram, the cross-section of the Promenade extends from the Ala Wai Canal wall (fisherman) to approximately the second tree from the right.

HAWAI'I CONVENTION CENTER

Fig. 2-5

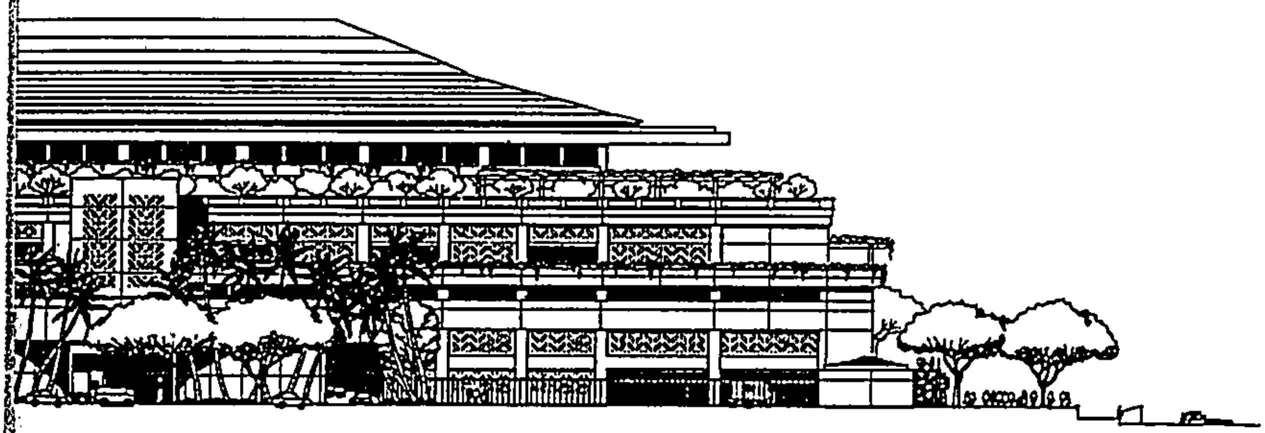
SOUTH AND WEST ELEVATIONS

Promenade.



ALA WAI PROMENADE ELEVATION (SOUTH)

Promenade. In
(fisherman) to



KAHAKAI DRIVE ELEVATION (WEST)

0 16' 32' 64' 96'

Fig. 2-5

D WEST ELEVATIONS

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**A walkway on the Ala Wai Promenade will extend from Kalakaua Boulevard to the Kahakai Drive edge of the convention center property between the two rows of Banyan trees. The configuration and finish of the walkway, additional landscaping, and whether or not any street furniture or lighting will also be provided will be determined in consultation with the State Historic Preservation Division.**

4) Kahakai Drive Elevation

The Kahakai facade is characterized by the simple geometric composition of the administrative office wing, the vehicle ramp drum, a horizontal planter marking the Parking level, landscaping on the Rooftop Garden, and the vertical tapa grille walls of various support rooms (See Figure 2-5). Vertical and horizontal separation of functional components breaks down the facade into components which are visually compatible in scale with the adjacent structures, including the high-rise Atkinson Plaza and Summer Palace condominiums.

Landscaping along this facade features Monkeypod trees and Coconut palms. The Monkeypod trees in the median will form a canopy which will soften the impact of the convention center on street views for the adjacent residential area and provide a more attractive entrance to the parking garage.

**In response to comments received on the Draft EIS, the design/builder is considering installing a sidewalk leading from The Summer Palace condominium, along the convention center-side of Kahakai Drive to Atkinson Drive. Originally, landscaping was proposed along this side of the building to soften the visual impact of the circular parking ramps. Moreover, there is a concern for pedestrian safety since the sidewalk would lead across the entry and exit ramps to the parking garage and the ingress/egress driveway to the Loading Dock. If the sidewalk is not provided, pedestrian access for this area would still be available along the sidewalk on the makai side of Kahakai Drive and a signalized crosswalk across Kahakai Drive at the Atkinson Drive corner would bring pedestrians to the same point. The decision to provide a sidewalk will be made in consultation with residents of the area and the City Department of Transportation Services.**

2.2.4 Space Allocations

The Hawai'i Convention Center floor areas are allocated as shown Table 2-1:

| Table 2-1 SPACE ALLOCATIONS | |
|---|---|
| **Hawai'i Convention Center Major Facility Areas** | **Area Provided (square feet)** |
| Exhibit Halls | 200,000 |
| Meeting Rooms | 100,000 |
| Ballroom | 35,000 |
| Lobby/Prefunction (incl. Landscaped Terrace of 105,000 square feet) | 240,655 |
| Administrative Area | 13,500 |
| VIP/Boardroom Areas | 4,600 |
| Support Areas | 252,915 |
| Parking (approx 800 stalls) | 260,000 |
| **GROSS BUILDING AREA** | **1,106,670** |
| Future Meeting Rooms | 50,000 |
| Future Exhibit Halls | 100,000 |

*Source: Loschky Marquardt & Nesholm. (Memo dated January 4, 1995.)*

2.2.5 Layout/Features

The Hawai'i Convention Center will meet the 1991 Uniform Building Code (UBC) for wind loading and 1991 UBC and City and County Building Code for seismic loading. The fire protection program is an integrated system meeting the requirements of applicable codes and establishes an acceptable level of fire protection and life safety within the building. The security systems address the use of an exterior door-monitoring system, space-protection devices, emergency-call devices, closed-circuit television cameras with monitors, and a card-access control system. The majority of these devices terminate at the security office adjacent to the Lobby. The Hawai'i Convention Center is also designed in compliance with the requirements of the Americans With Disabilities Act (ADA) as enforced by the State of Hawaii.

The following is an overview of the layout of the Hawai'i Convention Center with a discussion of key features and operations.

1) Exhibit Hall Level

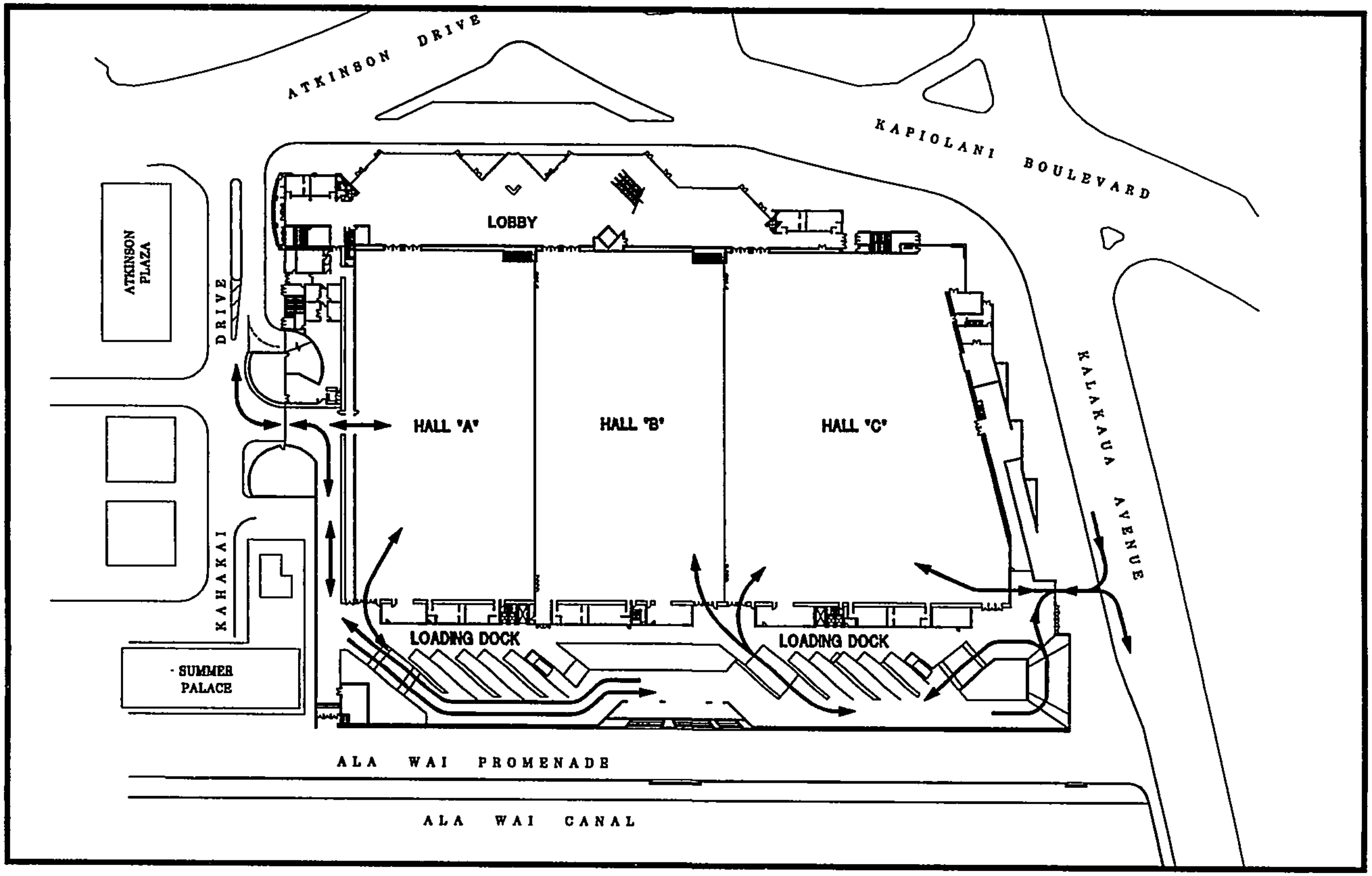
The Lobby/Registration Area is where the Hawai'i Convention Center establishes its first impression and from where all of the four levels are connected (See Figure 2-6). A 70-foot high interior waterfall and mature Joannis palms help to establish a uniquely Hawaiian Sense of Place within the Lobby. The hanging glass wall allows free visual access but keeps street vehicular emissions and noise from entering the Lobby. A first aid station and security command office are located at the west end of the Lobby next to Kahakai Drive and have direct access to all levels of the convention center. This area will also be adjacent to emergency vehicle access area for ambulances and police.

A three-lane entry drive in front of the Lobby will be the primary arrival and departure point for delegates using buses and taxis (See Figure 2-3). All vehicles will enter from Atkinson Drive and exit onto Kapiolani Boulevard. The entry drive can accommodate six buses in the drop-off lane closer to the Lobby while the outer drop-off lane can accommodate 8 taxis or three buses. The middle lane is for passing. The portion of Atkinson Drive fronting the project site will be widened to provide an additional drop-off lane accommodating two buses, if needed, for larger events. Taxis and limousines can also be received at the Lobby from the Parking level, as will be discussed subsequently.

The Exhibit Hall is basically a large empty space about four football fields in area that can be divided, as necessary, into smaller spaces to simultaneously accommodate several functions or events. The ceiling is 30 feet high.

The interior of the Exhibit Hall is characterized by its simplicity, providing a neutral background required for the producers of events to establish individual show themes. It is fully supported with power and communication for exhibitors. Three food service staging areas are also provided.

The Loading Dock area is the center of functions related to exhibition move-in, setup and move-out. **Trucks will enter and exit the Loading Dock from Kahakai Drive. The dock access driveway is located between the two circular parking ramps and leads to the Loading Dock. Due to concerns about noise generated in the Loading Dock area and from trucks on the driveway leading to the Loading Dock, the CCA and the design/builder are considering enclosing the driveway. Such an enclosure would attenuate noise at The Summer Palace condominium boundary. The driveway enclosure, however, would be considered a structure encroaching within the building setback area adjacent to The Summer Palace condominium boundary. Without the**




HAWAI'I CONVENTION CENTER

Fig. 2-6

**EXHIBITION HALL LEVEL**

**DELIVERY TRUCK ACCESS**

**Prepared for:**
CONVENTION CENTER AUTHORITY
State of Hawaii

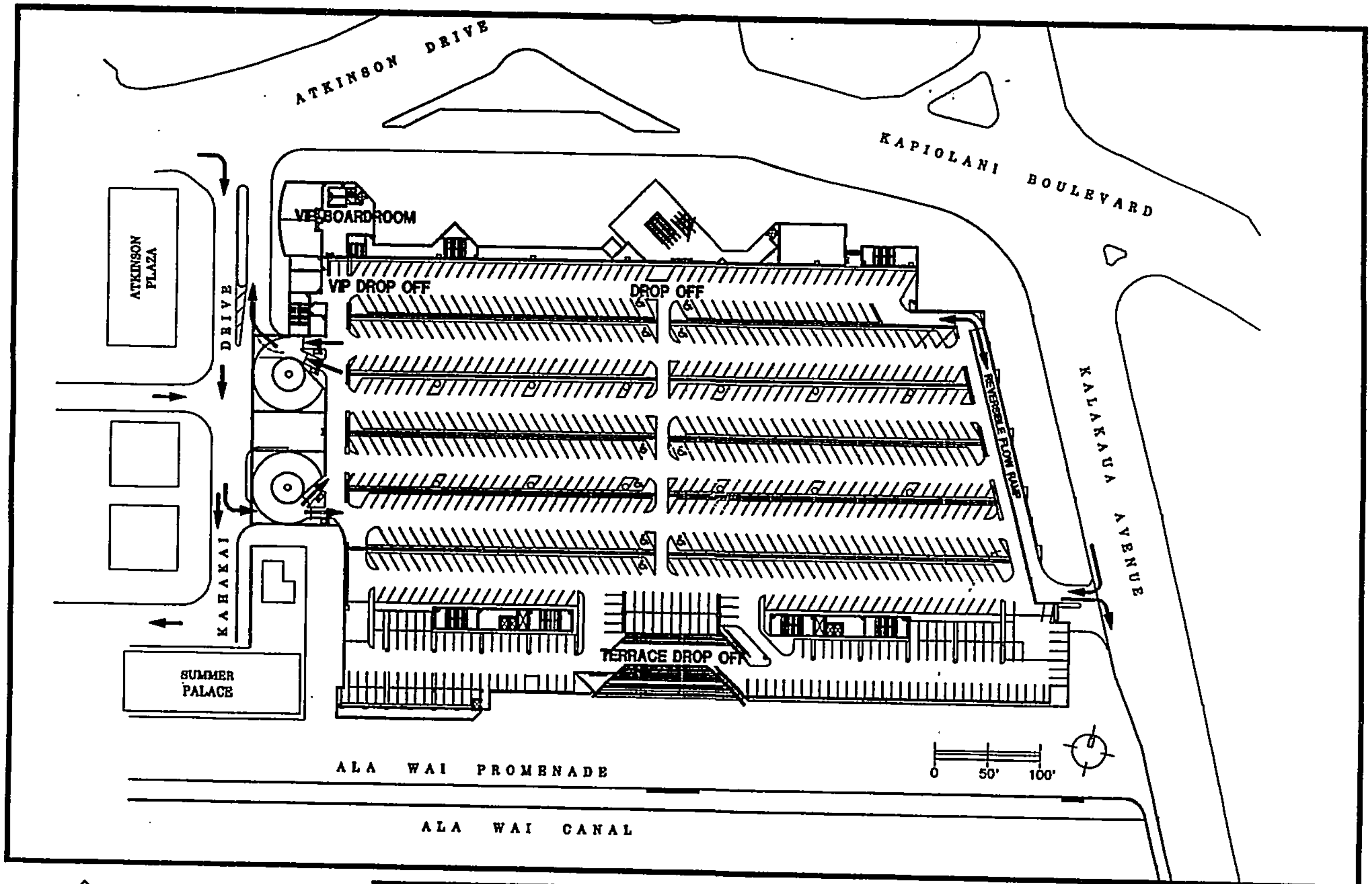
**Prepared by:**
Nordic / PCL
Wilson Okamoto & Associates, Inc.

**enclosure, the open driveway and a boundary fence or wall would be allowed in the setback. The decision to enclose the driveway will be made in consultation with the residents of The Summer Palace condominium.** All trucks will enter the Loading Dock area front-first, drive past one of 12 docks that may be assigned to them and back into the dock space. Once unloaded, the trucks will pull forward, turn around in the turning circle at the east end of the dock, and exit through Kahakai Drive front-first. Alternatively, trucks can exit front-first via the Kalakaua Avenue exit. Trucks delivering exhibits can also drive directly onto the Exhibit Hall to unload/load and exit via the turnaround area or directly onto Kalakaua Avenue. For events which may have most participants leaving at its conclusion (as opposed to a "trickling-out"), buses can be staged within the Loading Dock to be marshalled for pick-up. Ventilation is provided to maintain appropriate air quality in the Loading Dock and positive pressurization will prevent truck exhaust from entering the Exhibition Hall. The Loading Dock provides two trash bays with a recycling center and a refrigerated food waste storage facility.

A Mezzanine level (not shown) over the Loading Dock and around the perimeter of the Exhibit Hall houses various service facilities, such as mechanical, electrical and communication equipment rooms; an emergency generator; air conditioning chillers, administrative and service manager's offices; show manager's offices; a commissary supporting concession stands, vending carts and portable cafeterias; staff break rooms, and locker rooms; storage rooms; and, electrical and carpentry shops. Also at this level, a corridor will lead from the Upper Promenade terrace of the Ala Wai Promenade around the perimeter of the Exhibit Hall to the Lobby. This corridor will be used by delegates arriving or leaving on foot via the Promenade.

2) Parking Level

The Parking level can accommodate approximately 800 cars on a single level (See Figure 2-7). Because it occupies the space formed by structural members spanning over the Exhibition Hall, the Parking level is virtually column-free, which will facilitate parking maneuvers. The floor will have a surface treated to prevent "tire squeal" and the ceiling and structural members will be treated with acoustic fire-proofing which will also attenuate noise. **A wall along the Kahakai edge of the Parking Level between the parking garage entrance ramp and the corner adjacent to The Summer Palace condominium will attenuate noise from the parking lot to The Summer Palace boundary.**




HAWAI'I CONVENTION CENTER

Fig. 2-7

PARKING LEVEL

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The main entrance and exit for the Parking level are via Kahakai Drive and the circular ramps. The entry ramp is located further in Kahakai Drive than the exit ramp to maximize the distance available for vehicles to queue within the facility. Additional queue storage is provided by locating the parking ticket booths at the top of the ramps. Internal queue storage is intended to keep cars entering the parking structure from queuing on Atkinson Drive. If necessary to facilitate the flow of automobiles exiting the structure following large events, the direction of traffic on the entry ramp can be reversed.

A secondary entry/exit to Kalakaua Avenue will be available via a single-lane ramp on which traffic flow can be reversed to accommodate the primary direction of flow.

Taxi, limousine and car drop-off/pick ups can be accommodated at the Parking level. Drop-off areas are available at the Parking level Lobby entrance, at the VIP/Boardroom and at the Parking level terrace overlooking the Ala Wai Promenade. The VIP/Boardroom drop-off area provides secured access to all levels. The Promenade drop-off area is envisioned for use by officials participating in events staged at the Promenade.

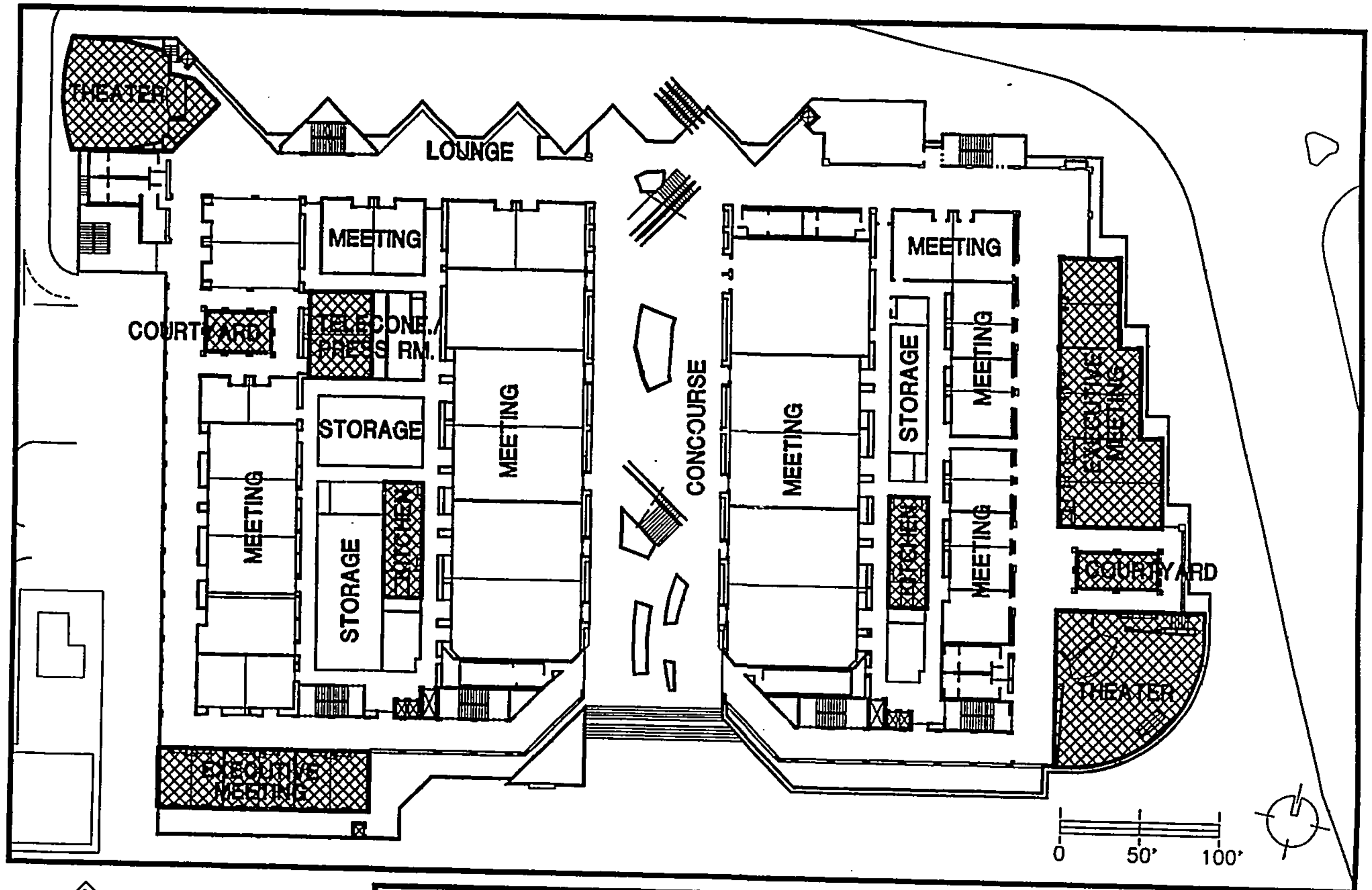
3) Meeting Room Level

The Meeting Room level can be partitioned to form up to 49 meeting areas, including 12 executive rooms, a teleconferencing center, press room, and two high-tech, stepped-floor audiovisual presentation theaters (See Figure 2-8). A wide open-air, but weather-protected, Central Concourse divides the Meeting Room level.

The landscaped concourse, featuring art niches, connects the terrace overlooking the Ala Wai Promenade with the Lobby at this level. Two landscaped courtyards bring open air and sunlight into informal gathering areas. Other informal gathering areas include terraces, lounges and balconies. Two service areas, including kitchens, storage and service elevators, are located to directly service the meeting rooms with minimal intrusion in delegate circulation areas.

4) Ballroom Level

The Ballroom level features what will be the largest ballroom in the State and a two and a half-acre Rooftop Garden (See Figure 2-9). The Ballroom will be divisible into three individual rooms, each with separate food service access that can accommodate three simultaneous functions.




HAWAI'I CONVENTION CENTER

Fig. 2-8

MEETING ROOM LEVEL

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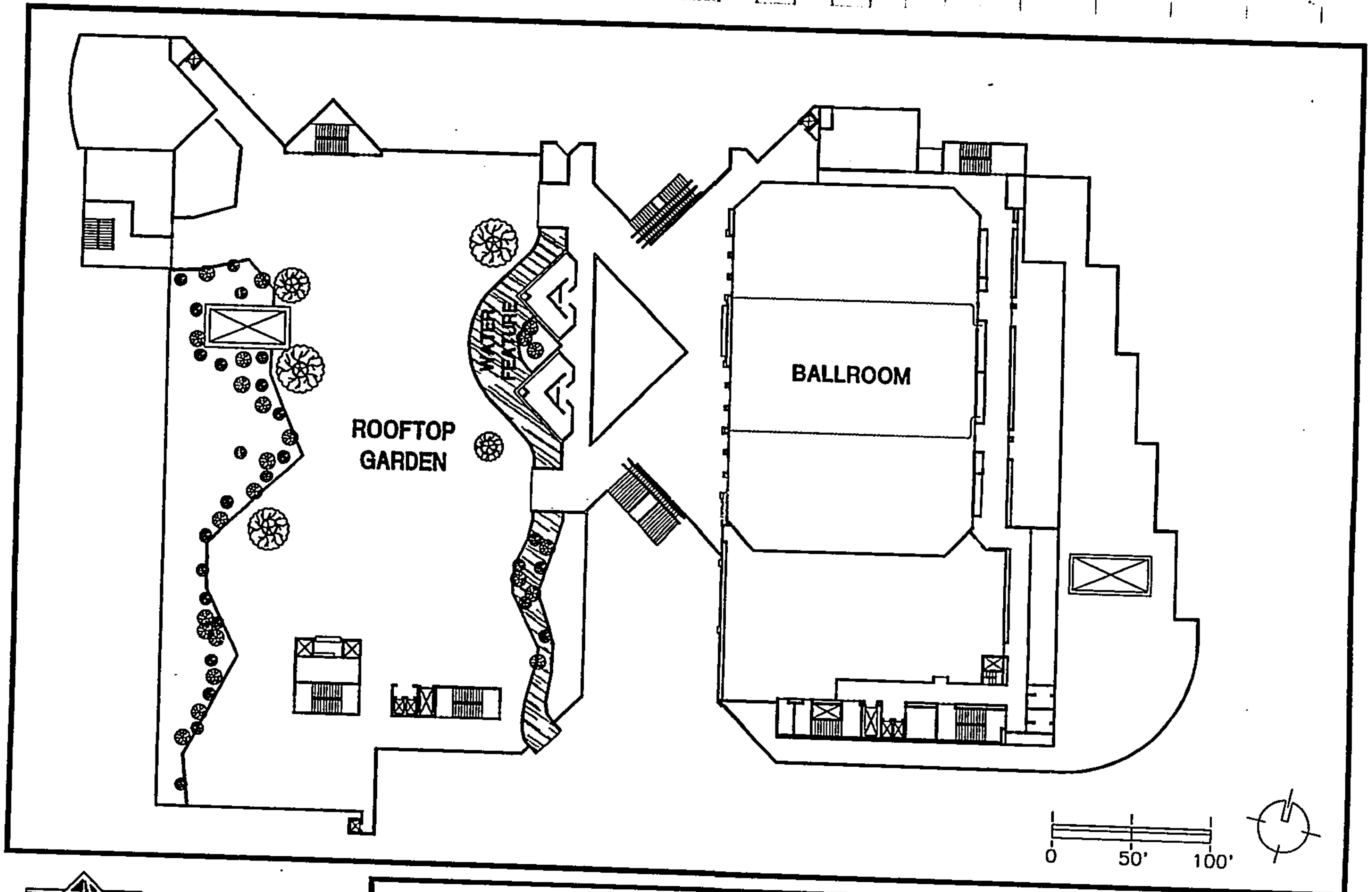


HAWAI'I CONVENTION CENTER

Fig. 2-9
BALLROOM LEVEL

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The Rooftop Garden provides an outdoor setting for luaus, special shows or a temporary outdoor cafe. A large trellis provides shade and houses stairwells. Landscaping includes native Hawaiian plants and a water feature incorporating streams, pools, a taro pond, and waterfalls that cascade to the Ala Wai Promenade and the Lobby. **Landscaping along the Kahakai Drive side of the Garden will keep people away from the edge of the deck. This will provide privacy for the recreation deck of The Summer Palace condominium which is adjacent to and below the Rooftop Garden. Keeping people away from the edge of the deck will also prevent voice sounds from being directed from the edge of the deck downward toward The Summer Palace recreation deck.**

### 2.2.6 Other Improvements

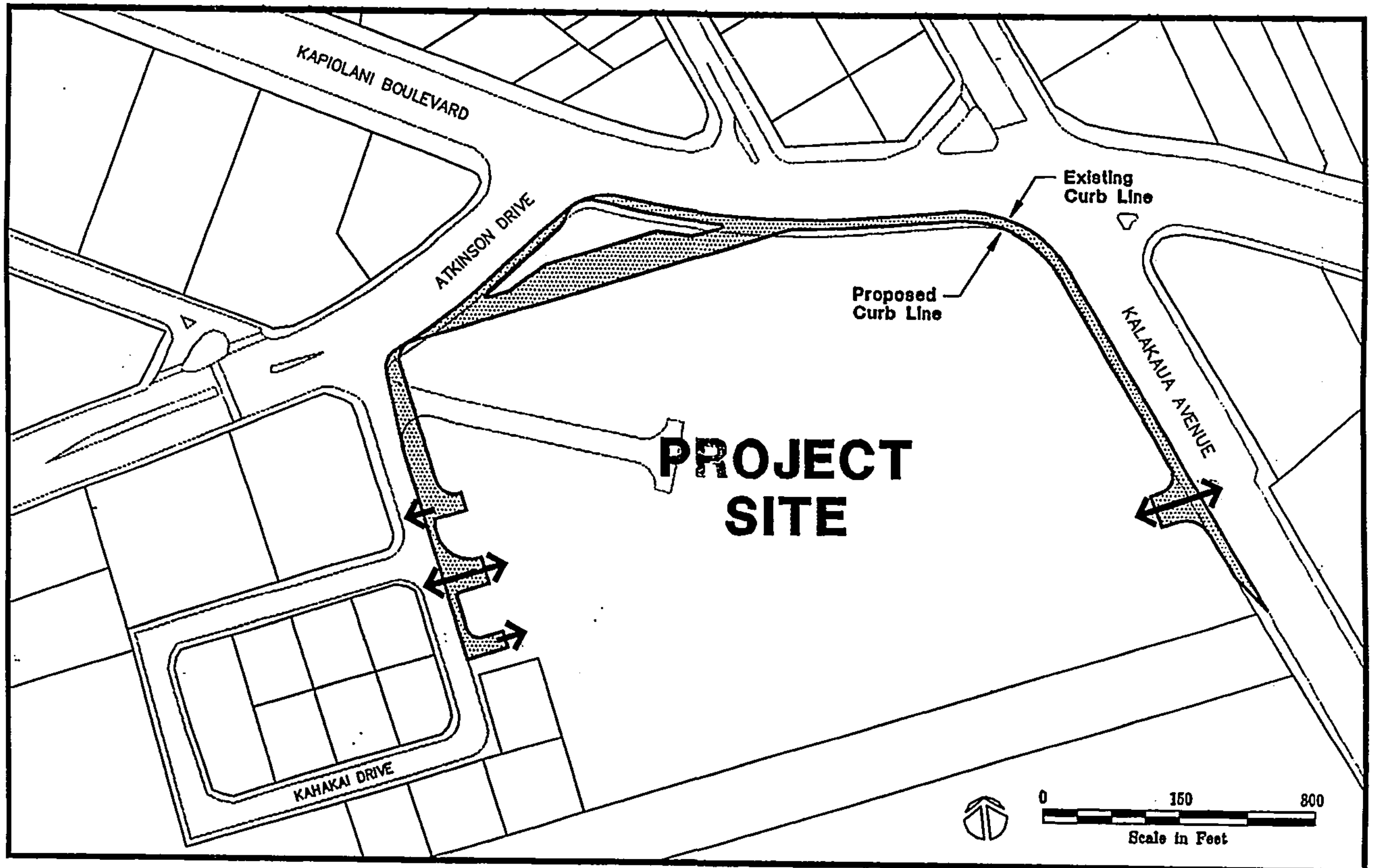
In addition to the convention center building and grounds, the proposed project also includes street and traffic improvements and installation of a new sewer line. All streets adjacent to the convention center site will be widened on convention center property (see Figure 2-10). Kapiolani Boulevard and Kalakaua Avenue will be widened by one lane; Atkinson Drive will be widened by one lane; and, Kahakai Drive will be widened by two lanes. A new traffic signal will be installed at the Atkinson Drive and Kahakai Drive intersection. The streets will be re-striped to create new traffic flow patterns increasing the capacities of the affected intersections.

A new sewer line from the project site, under Atkinson Drive to a sewer main near the entrance of Ala Moana Park, will be installed to accommodate additional wastewater flows from the convention center.

### 2.2.7 Expansion Potential

As the Hawai'i Convention Center develops its market, future expansion of the facility may become economically feasible and desirable. To accommodate this expansion, structural requirements for supporting the expansion have been incorporated in the current design. The expansion includes 50,000 square feet of meeting rooms plus supporting facilities and 100,000 square feet of leasable exhibit space. The future meeting room complex will occupy the area presently proposed as the Rooftop Garden. The structural design of the proposed project assumes that the expansion will be similar in layout to the meeting room complex beneath it. The exhibit hall expansion will lie over the meeting room expansion.

There presently is no timetable for constructing the convention center expansion. A separate environmental impact documentation process will be required for the expansion pursuant to Chapter 343, Hawaii Revised Statutes.




HAWAI'I CONVENTION CENTER

Fig. 2-10
ROAD WIDENING

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CONVENTION CENTER AUTHORITY
State of Hawaii

Prepared by :
Nordic / PCL
Wilson Okamoto & Associates, Inc.

2.2.8 Convention Center Operation

It is anticipated that the operation of the Hawai'i Convention Center will be contracted to a private firm. Marketing of the convention center will be done by the Hawaii Visitors Bureau (HVB). Based on estimates by the Authority, HVB and Nordic/PCL's consultant, it is anticipated that it will take six years for the convention center to reach 90 percent of its stabilized operating capacity while full stabilization should occur between its sixth and eighth year of operation. In its sixth year, the convention center is projected to attract approximately 52 events involving an average of 6,200 to 7,500 persons. With a three day run for most conventions, this means that the convention center would be used approximately 156 days of the year for such events. Also in the sixth year, it is projected that larger events of approximately 10,000 persons may utilize the center for 21 days. Even larger events involving up to 14,000 persons are projected to occur once every three years.

## 2.3 Estimated Project Cost/Schedule

In accordance with the request for proposals, the cost for designing and building the Hawai'i Convention Center is $200 million. **Construction is anticipated to commence in the Summer of 1995 and the scheduled completion date is October 27, 1997. A conceptual construction schedule is shown in Table 2-2.**

## Table 2-2 CONCEPTUAL CONSTRUCTION SCHEDULE

| PHASE MONTH | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Foundation | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | | | | | | | | | | | | | | | | |
| Pile Driving | ■ | ■ | ■ | ■ | ■ | ■ | | | | | | | | | | | | | | | | | | | | | | |
| Steel Delivery | ■ | ■ | ■ | ■ | ■ | ■ | | | | | | | | | | | | | | | | | | | | | | |
| Structure | | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | | | | | | | | | |
| Roofing/Building Enclosure | | | | | | | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | | | | |
| Mechanical/Electrical | | | | | | | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | |
| Finishes | | | | | | | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | |
| Clean-up/Turn Over | | | | | | | | | | | | | | | | | | | | | | | | ■ | ■ | ■ | ■ | ■ |

# CHAPTER THREE

# PHYSICAL ENVIRONMENT/IMPACTS

# 3. PHYSICAL ENVIRONMENT/IMPACTS

## 3.1 The Region

The State of Hawaii is comprised of eight major islands and 124 minor islands. The eight major islands are Oahu, Kauai, Maui, Hawaii, Lanai, Molokai, Niihau and Kahoolawe. The island of Oahu, which includes the State capital of Honolulu, is the third largest of the Hawaiian Islands, with a land area of 593 square miles. It is the most populous of the islands, with about 80 percent of the State's population, which in 1990 was about 1.1 million persons.

The project site is located in the Ala Moana area of Honolulu, on Oahu's south shore. The Ala Moana district includes a mix of commercial and office space, with some multi-family residential uses. The Ala Moana Shopping Center and Ala Moana Beach Park, both located less than one-quarter mile from the site, are major regional attractions which are heavily utilized by both residents and visitors.

The project site is at the western boundary of the Waikiki area, the center of the tourist industry in Hawaii and the traditional gateway destination for Hawaii visitors. While Waikiki encompasses approximately 507 acres, it has nearly as many visitor units as all other Hawaii destinations combined. (City and County of Honolulu, Planning Department, May 1992).

## 3.2 Climate

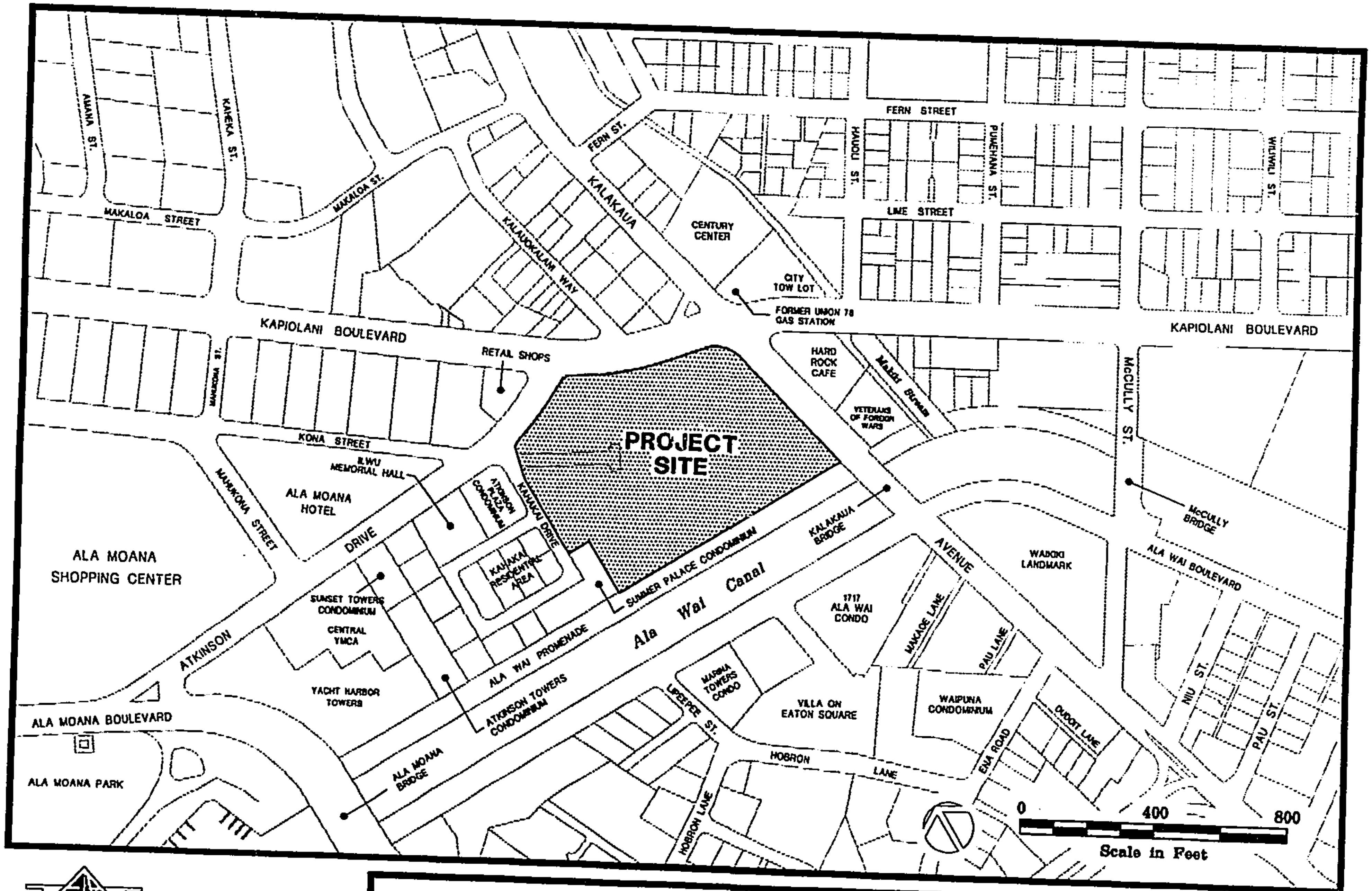
The climate of the Ala Moana area is dry, mild and uniform. Annual rainfall averages approximately 20 inches. Temperatures range from between 60 degrees Fahrenheit (January- mean low temperature) to 85 degrees Fahrenheit (mean high temperature) during the summer months.

Observed winds, as recorded at the Honolulu International Airport, are from the north, north-east and east (66.7 percent of the time) and average 17 miles per hour. Winds blow from the north to west quadrant approximately 13 percent of the time. These winds have lower speeds, approximately 8.7 miles per hour. Annual mean wind speed is 9.7 miles per hour.

The project will not have any impacts on the area's general climate.

## 3.3 Existing and Surrounding Land Uses

The site is located at the intersection of Kapiolani Boulevard and Kalakaua Avenue. As shown in Figure 3-1 and the aerial photograph in Figure 3-2, the area immediately

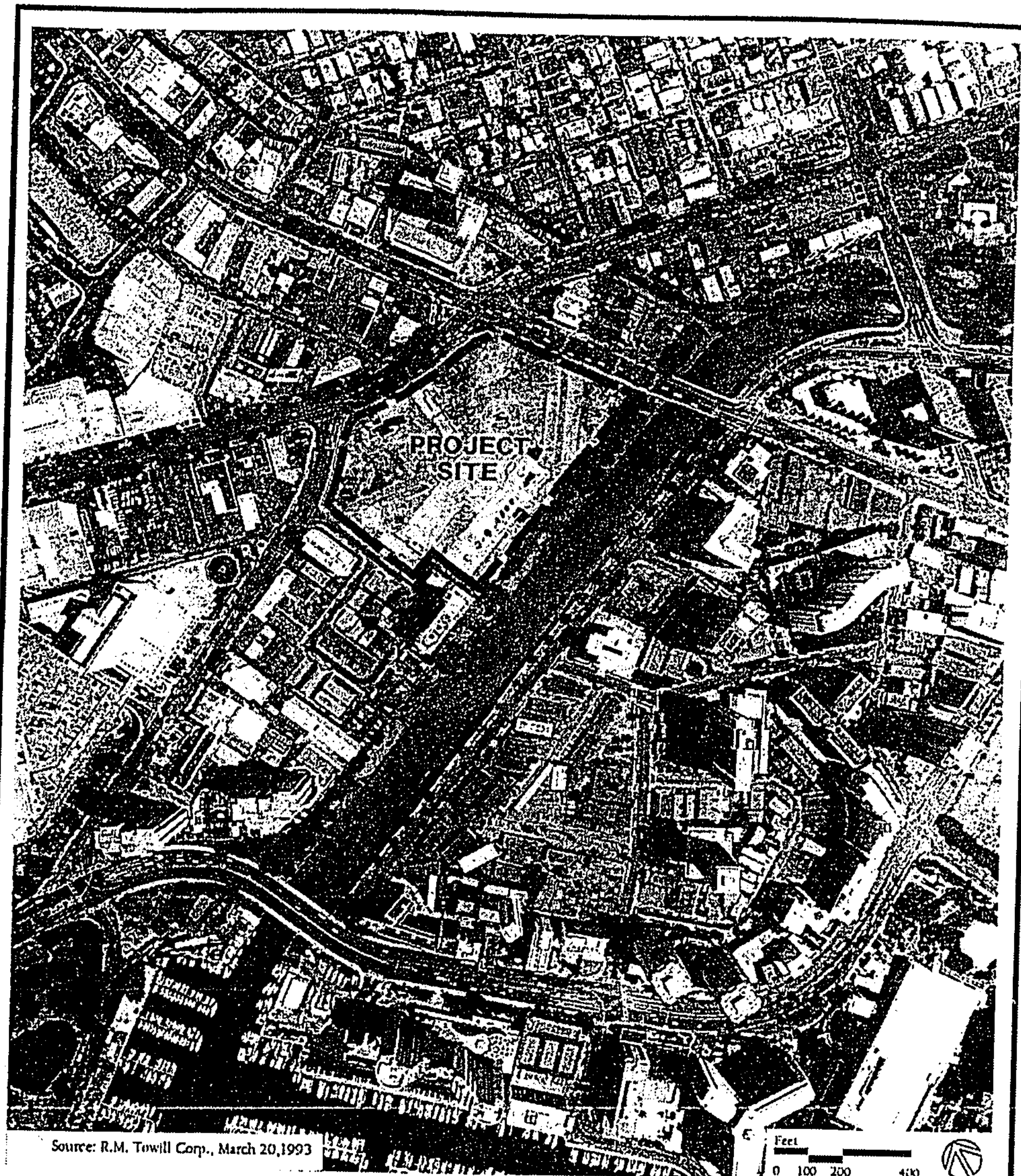



HAWAI'I CONVENTION CENTER

Fig. 3-1
**PROJECT VICINITY MAP**

Prepared for :
CONVENTION CENTER AUTHORITY
State of Hawaii

Prepared by :
Nordic / PCL
Wilson Okamoto & Associates, Inc.




HAWAI'I CONVENTION CENTER

AERIAL PHOTOGRAPH
OF PROJECT VICINITY

Fig. 3-2

Prepared for
CONVENTION CENTER AUTHORITY
State of Hawaii

Prepared by
Nordic / PCL
Wilson Okamoto & Associates, Inc.

surrounding the site is a mixture of commercial and residential uses. Typical uses along Atkinson Drive and Kapiolani Boulevard have included restaurants, travel agencies, clothing shops, convenience stores and cocktail lounges To the northeast, across the intersection of Kapiolani Boulevard and Kalakaua Avenue, are the Century Center high rise office/residential complex and on the corner, the former Union 76 gas station and City tow lot.

Kalakaua Avenue borders the site on its eastern side. Major uses on Kalakaua Avenue, across the site, are the Hard Rock Cafe (formerly the site of Coco's Restaurant) and the former Veterans of Foreign Wars (VFW) clubhouse.

The southern edge of the property borders the Ala Wai Promenade, a tree-lined pedestrian park which parallels the Ala Wai Canal. Across the canal from the site, are several high rise apartments and condominiums in the Hobron area of Waikiki.

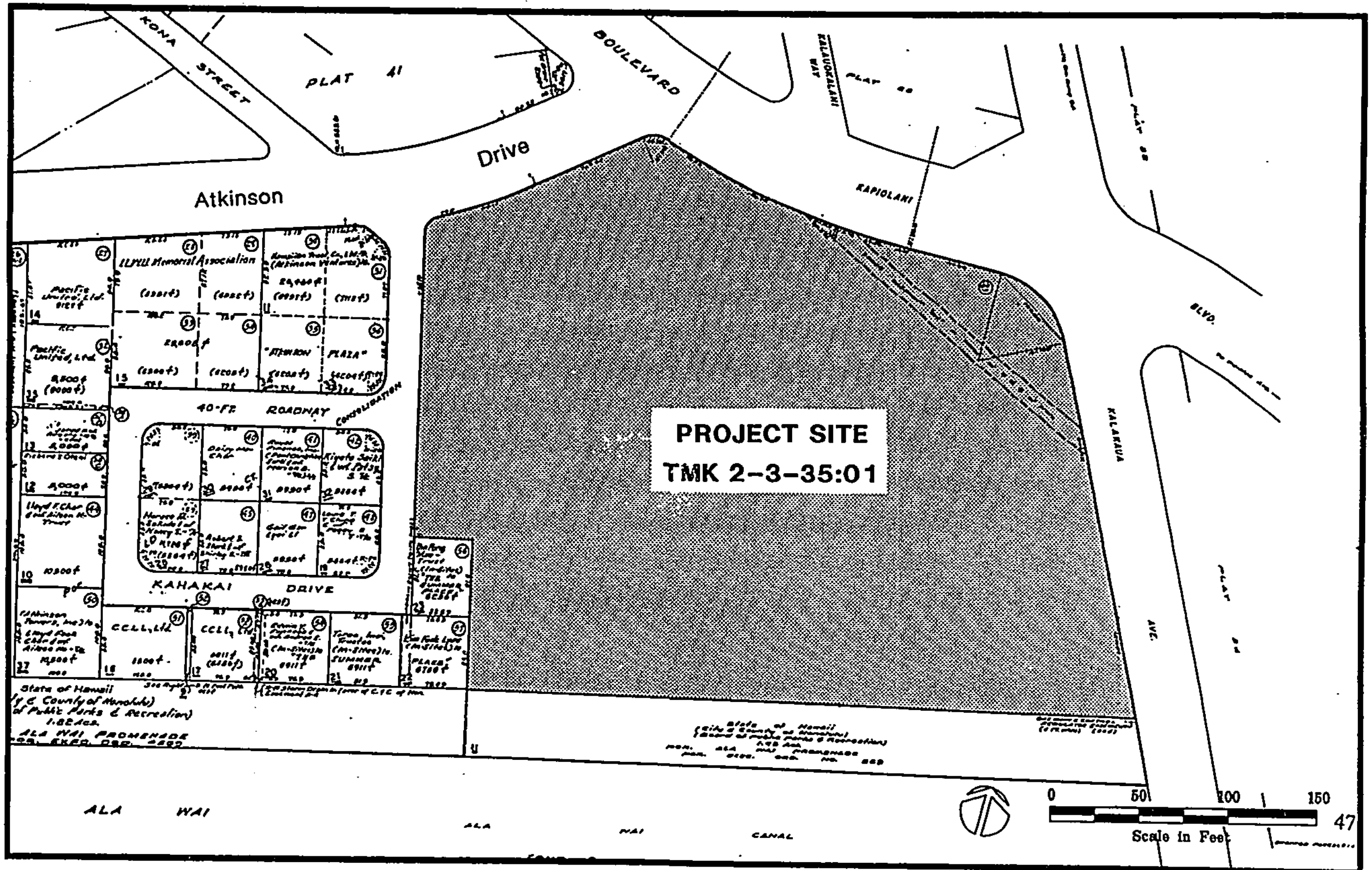
Kahakai Drive forms the western boundary of the property. This compact, loop-shaped residential street is accessible from Atkinson Drive and includes several low-rise, walk-up apartment buildings, as well as high-rise condominiums. The high-rise Atkinson Plaza condominium is located on the corner of Kahakai Drive and Atkinson Drive, directly across the site. The Summer Palace condominium on Kahakai Drive is adjacent to the site, on its southwestern corner fronting the Ala Wai Canal. The Ala Moana Hotel and Ala Moana Shopping Center are located west of the site, along Atkinson Drive.

### 3.4 Project Site

The 9.65-acre site is owned by the State of Hawaii and occupies a single tax map parcel, as shown in Figure 3-3. Presently, the property is vacant, with only concrete building slabs and foundations and asphalt pavement remaining.

Throughout most of the post-World War II period, the site has been occupied by industrial and automobile-related uses. A large portion of the property was the site of two U.S. Navy warehouses, constructed in 1942. In the 1950s, the structures were used as paint and mechanics shops. More recently, the warehouse structure was the site of the Honolulu Flea Market. The remainder of the site was paved with asphalt and used to park new and used automobiles for sale as part of the Aloha Motors operation.

All of the lots comprising the subject site were consolidated and purchased from various owners by Jyutaka Ryutsa Center Company, Ltd. in 1987. In late 1988, the site was obtained by First Development, Inc. That year, the site was cleared of remaining structures and three underground gasoline storage tanks and a waste oil storage tank were removed. In September 1993, the property was sold to Hawaii Convention Center Partners and in December 1993, the property was purchased by the State Convention




HAWAI'I CONVENTION CENTER

Fig. 3-3
TAX MAP KEY
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CONVENTION CENTER AUTHORITY
State of Hawaii

Prepared by :
Nordic / PCL
Wilson Okamoto & Associates, Inc.

Center Authority for development of a State convention center. In this transaction, Hawaii Convention Center Partners also received two parcels of publicly-owned land: the site of the Veterans of Foreign Wars clubhouse on Kalakaua Avenue, and a City-owned auto towing company lot, on Kapiolani Boulevard.

## 3.5 Geology/Topography

### 3.5.1 Existing Conditions

The project site is located on the leeward shoreline of the island of Oahu, the third largest island in the Hawaiian chain. The site is situated over coralline reef deposits formed during repeated transgressions of the sea. Layers of brown alluvial clay silts were deposited within this coralline formation during periods when the sea level was lower than at present.

At one point during the Pleistocene period, when the sea level was below the present elevation, a gully or channel was eroded through the coralline formation and a relatively thick layer of silty clay was deposited through a majority of the site. After a subsequent transgression of the sea level, another coralline reef formation was formed over the alluvium. Subsequently, a thinner layer of alluvium was deposited over the coral, and very soft lagoonal deposits consisting of silt and coral fragments were deposited up to the present sea level. The area remained a marsh until it was reclaimed in the early 1900's. (Dames and Moore, n.d.).

The site topography is relatively flat, and has been graded at an elevation of approximately 4 to 5 feet above mean sea level.

### 3.5.2 Impacts and Mitigation Measures

**Piles will be driven into the upper coral reef formation as well as through the upper formation into the lower formation to provide structural support for the convention center building. Mitigation measures for ground vibration during pile driving are discussed in Section 3.14.3.**

## 3.6 Soils

### 3.6.1 <u>Existing Conditions</u>

The soils beneath the project site are classified by the U.S. Soil Conservation Service as Fill land, mixed (FL), which consists of areas filled with material dredged from the ocean or nearby areas. Soil borings conducted for the project encountered fill material, primarily silty coralline sand and gravel, extending to depths of three to five feet below the existing ground surface. The coral fill was dredged from the adjacent Ala Wai Canal. A soils engineering study previously conducted by Dames and Moore for First Development, Inc. (ibid) indicated encountering lagoonal soils and Pleistocene corals below the surface fill.

### 3.6.2 Impacts and Mitigation Measures

Surveys will be conducted and adjacent properties will be monitored to detect any impacts on adjacent properties due to ground vibration during construction and dewatering activities. Impacts and mitigation measures for soils contamination are discussed in Section 3.9.

Grading and excavation activities associated with construction of the convention center will be regulated by the City's grading ordinance and the National Pollutant Discharge Elimination System (NPDES) permit requirement administered by the State Department of Health (see section 6.1.6).

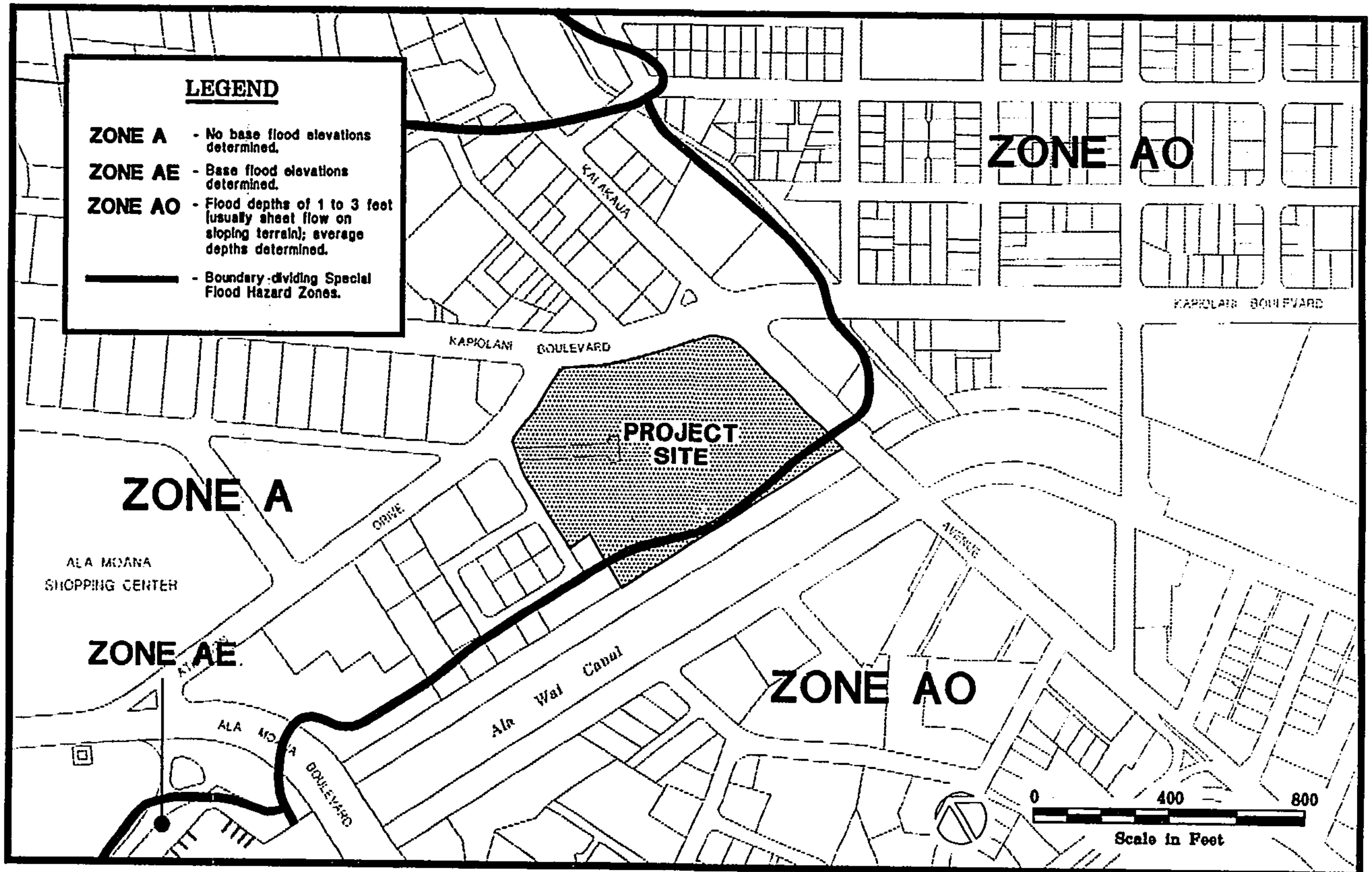
## 3.7 Flooding

### 3.7.1 Existing Conditions

The majority of the project site is designated Flood Zone A on the Federal Emergency Management Agency's Flood Insurance Rate Map (FIRM). Zone A indicates special flood hazard areas inundated by the 100-year flood, with no base flood elevations determined. To determine a base flood elevation for the site, a flood elevation study conducted in conjunction with a prior convention center complex proposal. In accordance with the findings of the study, the City Department of Land Utilization established the flood elevation at +7 feet above sea mean level (msl). A small portion of the site along the Ala Wai Canal frontage, is in Zone AO, special flood hazard area, with a flood depth of two feet. Given the average elevation of the site of approximately +5 feet above msl, the Zone AO flood depth of two feet also results in a flood elevation of +7 feet msl. Figure 3-4 illustrates the FIRM designations for the area.

### 3.7.2 Impacts

According to the City's Land Use Ordinance (LUO), all new construction and improvements of non-residential structures within the AO zone shall have the lowest floor elevated above the highest adjacent grade at least as high as the depth number specified (i.e., two feet), or, together with attendant utility and sanitary facilities, be completely flood-proofed to or above that level so that any space below that level is watertight with walls substantially impermeable to the passage of water.




HAWAI'I CONVENTION CENTER

Fig. 3-4
FIRM FLOOD ZONES

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The seaward portion of the Ala Wai Canal up to the Kalakaua Avenue bridge is designated as a tsunami evacuation area; however, historical evidence shows the south shore of Oahu, and particularly the Waikiki area, is minimally affected by tsunamis. (U.S. Army Engineer District, January 1990).

### 3.7.3 Mitigation

**The project will be designed to comply with the City's flood district regulations by constructing the first floor Exhibition Hall at an elevation of +7 feet above msl. The utility corridor beneath the Exhibition Hall floor, lower portions of the Loading Dock, as well as all elevator and escalator pits will be flood-proofed.**

## 3.8 Water Quality

An assessment of existing water quality in the project area was completed in January 1995 by AECOS, Inc. (see Appendix B). The report is summarized in the following sections.

### 3.8.1 Groundwater

There are significant groundwater resources beneath the City of Honolulu. An extensive basal aquifer containing large supplies of fresh water underlies all of southern Oahu, particularly areas near the coast. In these areas, the coastal caprock retards the seaward flow of groundwater, resulting in a higher water table than areas of the City closer to the Koolau mountain range. The entire site lies seaward of the State Department of Health's Underground Injection Control (UIC) line.

The project site is within a designated water management area, and any use of groundwater resources is regulated by the State Department of Land and Natural Resources, Commission on Water Resource Management. (Correspondence from Rae M. Loui, Deputy Director, Commission on Water Resource Management, April 6, 1994).

Groundwater lies from three to five feet below the ground surface in the vicinity of the project site. Groundwater beneath the project site is "basal" type fresh or brackish water floating on sea water. Investigations of water levels in the numerous wells drilled on the site suggest that water flow is generally north and east, with southward flow towards the Ala Wai Canal occurring near the southern boundary when the ocean tide is low.

3.8.2 Ala Wai Canal

The project site is adjacent to the Ala Wai Canal, a two-mile long man-made waterway constructed between 1921 and 1928 to drain marsh lands in the Waikiki area. The water quality in the canal is determined by its sources, including nearshore marine water, stream flow inputs, and groundwater. Marine waters enter the canal near the Ala Wai Yacht Harbor largely as a function of tidal exchange. Stream flow inputs contribute runoff from surrounding urban areas of Makiki, Manoa, St. Louis Heights, Palolo, Moiliili, Kapahulu, and parts of Kaimuki and Diamond Head. The drainage area is an estimated 16.3 square miles. (Noda and Associates, October 1992). Groundwater also seeps into the canal, although no studies have examined this source, which is probably small relative to fresh water flow and tidal exchange.

The Canal is an estuary with tidal flow bringing water into the Canal from the Ala Wai Yacht Basin and the ocean. Concurrently, there is a general surface flow of brackish water seaward, maintained by stream inputs. The portion of the Ala Wai Canal fronting the project site's southern boundary is located just seaward of the Kalakaua Avenue bridge. This seaward section has been described as the "channel" portion of the Canal.

The Ala Wai Canal is classified by the State as a "Class 2" inland waterway, the lowest quality inland water classification. The State Department of Health (DOH) water quality standards for estuaries apply to the Ala Wai Canal. (ibid). The water in the Ala Wai Canal has long been considered of poor quality. Detailed studies encompassing biota and water quality were undertaken in he 1970's which demonstrated that the canal was eutrophic and poorly mixed. Primary production was found to be high, but light-limited due to large quantities of minerals and suspended particulates. Low oxygen values were thought to limit the abundance of bottom crustaceans at the upper reaches of the canal, and to be responsible for the disappearance of mullet from the same areas.

The State's "Blue Waters Program," implemented by the Department of Health, is a loose association of biological and chemical monitoring activities aimed largely at coastal waters. Ongoing monitoring of the Ala Wai Canal is conducted under the Blue Waters Program from two monitoring stations, one located at the McCully Street Bridge and one at the Ala Moana Bridge. Bacteriological tests for enterococcus and fecal coliform are conducted, as well as chemical tests for the nutrients nitrogen and phosphorus.

Recent microbiological (bacteria) measurements by the State Department of Health indicate that the canal waters seldom meet the recreational standards established in HAR §11-54-08 of more than 7 enterococci per 100 mls (on average for marine waters) or 200 fecal coliform per 100 mls (on average for non-marine waters). Recent measurements by AECOS (1994) indicate a better compliance record for stations in the harbor than demonstrated by DOH stations on the canal. Water quality measurements taken by OI

Consultants in 1992 also show patterns of increasing fecal coliform and enterococcus in upstream locations on most sampling occasions. The canal appears to be a good example of a location where both enterococcus and fecal coliform populations originate at least in part from bird and small mammal droppings washed in during rains. Despite the high bacterial counts, the Canal is utilized heavily for training by canoe and kayak groups and by the general public for fishing and crabbing.

Other studies indicate that heavy metals, and pesticides, which travel primarily on the high sediment loads transported via stream flow to the Canal are also present in substantial quantities. The Canal also has a high sediment load and visible evidence of littering and garbage disposal. (Noda and Associates, October 1992). Measuring nutrients, which promote algal growth and eutrophic conditions, was conducted by OI Consultants (1992). These measurements, taken at several depths and numerous stations monthly for six months, showed a similar pattern of increasing nutrients towards streams feeding into the canal.

The State Department of Land and Natural Resources (DLNR), Division of Water and Land Development (DOWALD) completed an Ala Wai Canal Improvement Study in October 1992. The study, prepared by Noda and Associates, resulted in three separate reports, including: 1) a feasibility study, examining increasing water flow and circulation in the Canal; 2) a watershed management report which looked at decreasing pollutant sources through improved watershed management; and, 3) a maintenance plan for the Canal which established routine maintenance and management practices. Presently, funds for the clean-up of the Canal have not yet been provided by the State legislature.

### 3.8.3 Impacts

*Construction Period Impacts*

The convention center development will have no adverse impacts on potable groundwater resources since there are no potable wells in the vicinity of the project site. The closest potable wells are the Board of Water Supply's Wilder Wells in Makiki. The project site also lies seaward and outside of the Department of Health's Underground Injection Control line which is intended to regulate the potential pollution of ground water resources.

Potential water quality impacts may result to the Ala Wai Canal and coastal receiving waters from site construction and dewatering activities. Storm water runoff from the project site currently drains into the Ala Wai Canal. Ground disturbance activities during construction may increase the amount of sediment in stormwater runoff. **Discharging dewatering effluent into drainage systems in the area, which empty into the Ala Wai**

**Canal, or directly discharging effluent into the Canal could also increase sediment loads in the receiving waters.**

Potential contaminants in the groundwater have been examined as part of the hazardous/toxic materials assessments undertaken for the site (see Section 3.9).

Dewatering activities for constructing large below grade structures, usually for parking, have been implicated in ground subsidence of nearby properties as water-saturated soils shrink when the water table is lowered. The previous convention center complex proposed at the site had two levels of below ground parking that would have required large scale dewatering activities. Concerns were expressed at the time about the risk of subsidence at neighboring properties. The current proposal has very limited requirements for dewatering since the first floor Exhibition Hall will lie approximately two feet above present grade and there are no major subsurface structures. **Dewatering will be required for a utility corridor running the length of the Exhibition Hall, pile caps which sit atop the piles and support the convention center structure, and the footings for portions of the Loading Dock.** Given the relatively small size and depth of these structures and their distance from neighboring properties, the risk of subsidence problems is very low.

**Additional excavation and dewatering will be required to install the new sewer line beneath Atkinson Drive. To minimize disruption of traffic during construction, the line will be installed in sections. Hence, the size of the excavation at any time will be limited. This will also minimize the amount of dewatering required and lessen the chance that nearby areas would be affected.**

*Long-Term Impacts*

No long-term impacts on groundwater are anticipated from operation of the convention center. Adverse impacts arising from previous use of the site have been largely mitigated, although pervasive, low-level groundwater contamination may persist below the site. The area is fully sewered, so no on-site disposal of waste effluents would occur. Since the property is almost completely paved over, runoff volumes will not increase over present levels.

### 3.8.4 Mitigation

Adherence to State of Hawaii water quality regulations governing the dewatering of excavated sites will insure that project construction will not adversely impact receiving waters and coastal water quality.

To control stormwater runoff from a project site over five acres in size, the design/builder was required to obtain a National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Associated with Construction. Recently approved, the permit requires compliance with a Best Management Practices (BMP) plan prepared by the applicant. The plan requires compliance with City ordinances pertaining to grading, grubbing, stockpiling, soil erosion and sedimentation. Structural erosion and sediment control measures include constructing berms to contain runoff and installing silt fences to trap sediment. Building and site drainage facilities and landscaping will control soil runoff after completion of the convention center.

To control dewatering effluent discharges, the design/builder is required to obtain an NPDES General Permit for Construction Activity Dewatering. The permit application, which has yet to be approved, offers a BMP plan that eliminates the need to discharge dewatering effluent except, possibly, during heavy or prolonged storm events. Hence, the permit is requested only for emergency discharges during such storm events. To avoid discharging the effluent, retention basins, which may include excavations needed for construction, will hold the effluent until it can percolate back into the ground. In the event of a large or prolonged storm, the retention basins will serve as detention basins, holding the effluent long enough to allow sediments to settle out before it is discharged. Other required sediment reduction methods include lining excavations with filter fabrics to reduce the amount of sediment entering the effluent and using filters on intake lines.

Installation of the sewer line beneath Atkinson Drive may require the discharge of dewatering effluent, most likely into the City's storm drainage system. If it is determined that dewatering effluent will be discharged, then an NPDES construction dewatering permit will be required. A permit from the City to discharge dewatering effluent into the City's drainage system will also be required.

### 3.9 Hazardous Materials/Hazardous Waste

Previous property owners of the site have studied and removed/disposed of known hazardous waste materials on the site. However, because there is still the potential of encountering contaminated soils and/or groundwater, the design/builder has been instructed to prepare a hazardous materials contingency plan to be implemented in the event that contaminated soil is encountered. The plan is intended to minimize delays in the construction schedule.

### 3.9.1 Existing Conditions

The project site was used as an automobile sales lot since prior to World War II. In addition to the vehicular maintenance activities associated with those uses, several service stations and automobile repair businesses and military warehouses have occupied various portions of the site. Hazardous materials used by tenants have included gasoline, diesel fuel, motor oils, waste oils, hydraulic oil and chlorinated solvents.

In 1989 and 1990, soil and groundwater investigations indicated that potentially hazardous materials were released into the ground during use of the site as an auto dealership, gasoline station, and for military warehouses. These surveys revealed the presence of petroleum hydrocarbon, lead, cadmium, chromium, polychlorinated biphenyls (PCBs), and halogenated hydrocarbons contamination in various areas. Remediation activities were initiated, including the removal of underground storage tanks and the excavation and disposal of 3,737 tons of petroleum contaminated soils. Petroleum-contaminated soils in ten areas of the site were excavated, packaged and disposed of at a mainland U.S. landfill.

In March 1992, after a site investigation, the San Francisco (Region IX) office of the Environmental Protection Agency (EPA) recommended "no further remedial action" was necessary under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

In April 1993, the State of Hawaii Department of Health completed their review of site remediation and concluded that no further actions were necessary. (Correspondence to Mr. Nobuo Kuniyuki, Senior Executive Vice President, First Development, Inc. from Arlene M. Kabei, Chief, Solid and Hazardous Waste Branch, State Department of Health; April 12, 1993). In essence, known sources of contamination had presumably been removed or treated to reduce concentrations of contaminants to DOH cleanup goals. However, the possibility remains that contaminated soils and localized pockets of contaminated groundwater are present in areas not investigated, since subsurface samples targeted areas where past land use indicated contaminants might be found.

### 3.9.2 Potential Impacts and Mitigation Measures

A Due Diligence Review was conducted for the Authority by Dames and Moore in February, 1994 to evaluate the existing documentation on soil and groundwater contamination. The Dames and Moore review also assessed whether the issue of hazardous materials has been adequately mitigated. The review addressed the remaining potential for groundwater and soil contamination.

Dames and Moore noted that there does not appear to be pervasive groundwater contamination below the site. However, there is the potential for localized zones of contaminated groundwater, specifically, "a localized impact to groundwater by vinyl chloride at concentrations above the EPA [Maximum Contaminant Levels] MCL was identified in the northeastern corner of the site." The report notes that although remedial activities were performed in the northeastern portion of the site in early 1992, levels of vinyl chloride in the groundwater remained above the MCL. Remediation was terminated due to the lack of applicable water quality standards (for vinyl chloride) for locations makai of the underground injection control (UIC) line.

The Dames and Moore study indicates that "the potential exists for localized groundwater contamination beneath areas of the site where petroleum hydrocarbon contaminated soil was excavated." The study notes that if these localized zones of contaminated groundwater are drained from the site during dewatering operations, mixing would likely dilute the concentrations of contaminants to acceptable discharge levels.

The potential for remaining soil contamination on site was also noted by Dames and Moore. Although contaminated soil was removed from ten areas of the site, other areas of the site were not investigated. As a result, there is no subsurface data regarding environmental conditions in these areas. Although Dames and Moore was not aware of any information that would imply the presence of contamination, the lack of data precluded a thorough evaluation.

In summary, although all known hazardous waste has been removed from the site, the potential exists for contaminated soils and/or pockets of contaminated groundwater. This possibility will be addressed by the designer/builder team in their hazardous materials contingency plan. Any hazardous materials encountered during construction will be handled and disposed in accordance with applicable State and Federal regulations.

## 3.10 Botanical Resources

### 3.10.1 Existing Conditions

The project site has been cleared of all structures and consists of a patchwork of concrete and asphalt paving, with little existing vegetation. Botanical resources include a few trees, shrubs and other plants which are common in urbanized areas. None of the existing plants are considered indigenous or rare.

Adjacent to the site, there are large Monkeypod trees which form an overhead canopy along both sides of Kapiolani Boulevard and four small rainbow shower trees along the Kalakaua Avenue frontage of the site.

The Banyan trees along both sides of the Ala Wai promenade, which parallel the site's southern boundary, were placed on the City's Exceptional Tree List in 1992. These trees were planted by the Outdoor Circle in the 1936, as part of a promenade and bridal path from Kapiolani Park, along the Ala Wai to the yet to be developed Ala Moana Park. The City's Exceptional Tree List protects trees deemed "exceptional" due to their "historic or cultural value, age, rarity, location, size, aesthetic quality or endemic status." (Correspondence from Cynthia H. Marnie, March 22, 1994; Susan Bright Spangler, President, The Outdoor Circle, April 4, 1994).

### 3.10.2 Impacts

The project will not impact any indigenous or rare plant species or wetland resources. (Correspondence from Robert P. Smith, Field Supervisor, Pacific Islands Office, U.S. Fish and Wildlife Service, April 1, 1994).

Widening of Kapiolani Boulevard fronting the convention center will require the removal of a row of Monkeypod trees. Along Kalakaua Avenue, road widening will require the removal of a row of Shower trees.

Excavation in conjunction with the construction of the Loading Dock near the boundary of the Ala Wai Promenade is anticipated to remove a portion of the root systems and require pruning of the canopies of several Banyan Trees along the length of the convention center property.

### 3.10.3 Mitigation

The existing street trees along Kapiolani Boulevard and Kalakaua Avenue which must be removed during construction to widen the roads will be relocated to City parks, if feasible. The feasibility of relocating individual trees will depend upon their health, the quality of the specimen, and whether or not an adequate root ball can be recovered from potential entanglement in various utility lines that are within the roadways. All of the trees removed during construction will be replaced with new, healthy specimens along the widened roadways.

The design/builder has requested a permit from the City's Exceptional Tree Committee to conduct excavation that will remove a portion of the root systems and to prune the Banyan trees in the Ala Wai Promenade which are adjacent to the convention center boundary. On-going consultation with the City's certified arborist has been pursued to formulate a plan to minimize adverse impacts to the trees. The plan includes procedures such as for trimming the roots, installing a root barrier, irrigation and monitoring. Procedures and requirements will also be imposed on tree pruning. The design/builder will install an 8-foot high fence along

**the boundary between the convention center and the Promenade to keep construction activities occurring on the project site from encroaching onto the Promenade.**

**A plan to relocate up to five banyan trees within the Promenade, directly adjacent to the bottom of the stairway, has been withdrawn following denial of the request by the City's Exceptional Tree Committee. None of the banyan trees in the Ala Wai Promenade will be relocated or removed.**

## 3.11 Terrestrial Fauna

### 3.11.1 Existing Conditions

Terrestrial fauna on the site and in the vicinity are limited to rats, mice and feral cats. Avifauna include the common mynah, cardinals, pigeons, doves, white-eye, house finch, rice bird and mockingbird. These are common, exotic birds found throughout the urban areas of Honolulu. There are no rare, threatened or endangered species on the site.

### 3.11.2 Impacts

The project is not expected to impact rare, threatened or endangered species (ibid).

## 3.12 Archaeological, Cultural and Historical Resources

### 3.12.1 Existing Conditions

Within the project site there are no historic sites listed either on the Hawaii State Register of Historic Places (SRHP) or National Register of Historic Places (NRHP), nor are there any which have been presently determined eligible for inclusion on the National Register. However, both the Ala Wai Canal and Promenade were determined eligible for inclusion on the NRHP in 1985, and the Canal was listed on the SRHP in 1992. **The State Department of Transportation lists the Kalakaua Bridge on its Historic Bridge Inventory as Category 1, meaning it is a highly significant historic facility.**

An Archaeological and Historical Assessment Study for the site was conducted by Paul H. Rosendahl, Ph.D., Inc. (PHRI) in May 1994 (Appendix C). The study consisted of a literature review and historical research on the site to determine the likelihood of locating subsurface archaeological and cultural remains. The study also provided a scope of work for performing a subsequent archaeological inventory survey, in compliance with the Chapter 6E, HRS requirements.

The project site is part of a land unit that was a place of prominence in the prehistoric and early historic periods. Noted for its fishponds, taro pond fields and settlement activities, the area, known as Kalia, was extensively used by ancient Hawaiians. By the late 1800's, land use practices had been modified and by the turn of the century, most of the fishponds and taro-pond fields had been drained and filled. In the last 60 to 75 years, the project area has undergone extensive filling, excavation and development.

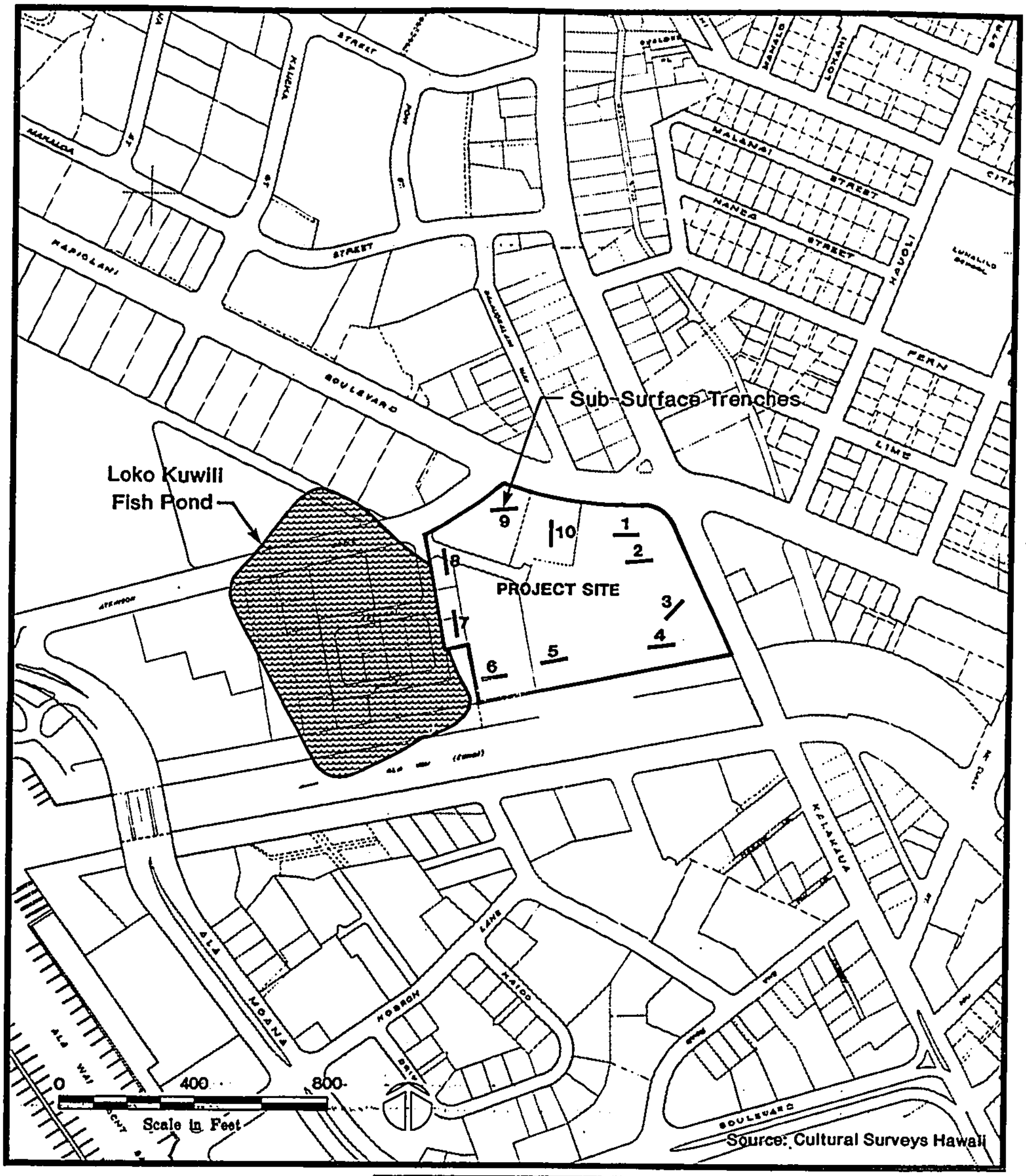
The project area is partially on, and alongside, the land that at one time contained a fishpond known as Loko Kuwili (restless, swirling; as the surface of water), and smaller neighboring fishponds (See Figure 3-5). This fishpond (State Historic Site 50-80-14-4572) fits into the class of ponds known as loko puuone (an island dune pond) which were fed by both stream and spring water and were connected to the ocean via a shoreward stream. A significant research question to be answered during the inventory survey phase will be to determine if the ponds extended into the site, and if so, what, if any subsurface cultural remains may be present to assist in understanding prehistoric land tenure practices.

3.12.2 Impacts and Mitigation

Historic Resources

**The convention center project will not involve any construction activities that will directly impact the Ala Wai Canal or the Kalakaua Bridge. A previous proposal for the convention center facility to encroach 26 feet on the Ala Wai Promenade has been modified to eliminate any encroachment. The Ala Wai Promenade will be directly affected to the extent that a walkway system, with appurtenant landscaping, lighting and street furniture, may be constructed within the Promenade in front of the convention center. Also, while no portion of the convention center structure will encroach upon the Promenade, the visual impact of the convention center structure, particularly the walls on either side of the grand stairway, is a consideration.**

**The Ala Wai Promenade has been determined to be eligible for listing on the National Register of Historic Places (NRHP) and is regarded as a "historic property" (Section 800.2, 36 Code of Federal Regulations Part 800: Protection of Historic Properties). Therefore, any "activity" that is "licensed... by a Federal agency" and "can result in changes in the character or use of historic properties" is subject to review under Section 106 of the National Historic Preservation Act of 1966 (Section 800.2 36 CFR 800). For the convention center project, it appears that the "triggering" Federal license is the National Pollutant Discharge Elimination System (NPDES) permit required for stormwater discharges from the site during construction.**




HAWAI'I CONVENTION CENTER

**LOCATION OF KUWILI FISH POND AND OF SUB-SURFACE TRENCHING**

**Fig. 3-5**

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**The Section 106 Review process involves a determination of "effect" by the State Historic Preservation Division (SHPD). If "no adverse effect" or "adverse effect" is determined, then the National Advisory Council on Historic Preservation is consulted before the permit can be issued. The design/builder has been consulting with the SHPD to determine if the impacts of the convention center on the Ala Wai Promenade can be avoided or mitigated such that a finding of "no effect" can be issued. Such a finding by the Historic Preservation Division would terminate the Section 106 review process.**

**For the purpose of determining effect, "alteration to features of the property's location, setting or use may be relevant depending on the property's significant characteristics and should be considered" (Section 800.9 36 CFR 800). The SHPD has identified three areas of potential effect: the relocation of trees within the Promenade; construction of walkways, landscaping, and installation of lighting and street furniture in the Promenade; and, the visual impact of the convention center walls on the Promenade.**

**The SHPD had indicated that their finding of no effect with respect to a proposal to relocate up to five trees within the Promenade would be consistent with whatever decision the City's Exceptional Tree Committee reached to allow or disallow any tree relocation. The SHPD participated in the Committee's proceedings that subsequently denied the tree relocation request. None of the banyan trees in the Ala Wai Promenade will be relocated or removed.**

Any construction of walkways, lighting, landscaping and street furniture in the Promenade will comply with the SHPD's determination of what it will consider as having "no effect." In general, the SHPD has indicated that pedestrian use of the Promenade is consistent with its historic character and that walkways and other improvements to promote such use would also be appropriate to some degree. Their determination of "effect" is being considered in regard to specifics such as the width of the walkways, finishes, type of lighting, etc.

The walls enclosing the Loading Dock of the convention center on either side of the grand stairway will rise approximately 20-feet high within a few feet inside the convention center property. While there will be no encroachment within the Promenade, the visual impact of the walls could be considered an "effect" on the historic character of the Promenade. The design/builder is discussing options for softening the visual impact of the walls with the SHPD, including measures such as growing vines covering the wall. The SHPD is taking into account the urban setting of the Promenade and the existing development that presently abuts it.

Archaeological Resources

Based on the findings of the May, 1994 Archaeological and Historical Assessment Study and consultation with Department of Land and Natural Resources, State Historic Preservation Division (DLNR-SHPD) staff, it was determined that subsurface testing and data analysis is required to meet DLNR-SHPD archaeological inventory survey standards pursuant to chapter 6E, HRS. An archaeological subsurface survey of the convention center site was subsequently conducted by Cultural Surveys Hawaii (CSH) in November 1994 (see Appendix D). A total of ten (10) backhoe trenches were excavated during the course of the research, and 7 core samples were taken (see Figure 3-5). The core samples have been initially analyzed by CSH, and six of the samples have been sent to a U.S. mainland laboratory for pollen analysis, as have five samples for radio carbon analysis. Upon completion of the analysis, the final archeological inventory survey will be prepared and findings of this laboratory analysis will be submitted to the DLNR-SHPD in July 1995.

The scope of the testing had two essential components. The first was to attempt to locate and sample the filled-in Kuwili Fishpond previously identified during the archaeological assessment. Second, a systematic sampling was to be conducted to determine the archaeological potential of the remainder of the project area.

Within the excavated trenches, stratigraphy was fairly consistent. In general, crushed coral fill was present over the entire project area, underlain by fill which ranged from 1.5 to 5 feet thick. Beneath the fill material, in most trenches, was water-logged (gleyed) deposits ranging from sand to clay. The base of excavation for most units was cemented coral which was encountered from 5.5 to 6.5 feet below surface.

Based on preliminary analysis, only one trench (trench 7) close to Kahakai Drive contained sediments which could be associated with the former Kuwili Pond. The remaining trenches provide documentation of the sedimentary history and archaeological potential for the rest of the project area. The deposits reflect what was previously assumed about the project area and much of the rest of Waikiki; namely, that the area was a lagoonal environment with little or no suitable land for habitation or human burial. Based on these findings, there should be no adverse impacts from the project on important archaeological or historical resources. However, in the unlikely event that either human remains or cultural deposits are encountered during construction, work shall be stopped and immediate archaeological consultation shall be sought from qualified personnel.

### 3.13 Air Quality

An assessment of existing air quality in the project area was completed in August 1989 by Barry D. Root and Barry D. Neal in conjunction with the prior private convention center complex PRU application. To supplement this report, an air quality study was conducted in November and December 1994 by J.W. Morrow Environmental Management Consultant to assess the impact of the current proposal on air quality on a local and regional scale (see Appendix E).

The focus of the study was on the project's ability to generate traffic and the resultant impact on air quality. Also assessed are the off-site air quality impacts due to increased demand for electrical energy which must be met by the combustion of some type of fuel. Lastly, air pollutant emissions will be generated onsite and off-site during construction due to vehicular movement, grading, concrete and asphalt batching, and general dust-generating construction activities. These impacts are also addressed.

#### 3.13.1 Existing Conditions

*Ambient Air Quality Standards*

National Ambient Air Quality Standards (AAQS) are specified in Section 40, Part 50 of the Code of Federal Regulations (CFR). State of Hawaii AAQS are defined in Chapter 11-59 of the Hawaii Administrative Rules. AAQS have been established for six pollutants: particulate matter, sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone and lead. The standards specify a maximum allowable concentration for a given pollutant for one or more averaging times to prevent detrimental effects.

*Present Air Quality*

Based on the findings of the 1989 Root and Neal study, State standards for particulates, sulfur dioxide, nitrogen dioxide and lead were being met in the project vicinity. An examination of 1992 data indicates that is still the case. The standards for ozone ($O_3$) and carbon monoxide (CO) were not exceeded in 1992. Ozone measurements were taken at Sand Island, about 3 miles west of the project site. Carbon monoxide is monitored by the State DOH at a station several blocks from the site. However, as the Root and Neal study noted, CO and $O_3$ concentrations may well be higher than the reported values along sidewalks in traffic congested areas.

For the purpose of the recent study, only carbon monoxide was monitored in the vicinity of the project since it is the only pollutant of potential concern which will be generated by project traffic. Federal ambient air quality standards for carbon monoxide are 10 milligrams per cubic meter ($mg/m^3$) for 8-hour concentrations, and 40 $mg/m^3$ for 1-hour concentrations. The State standards use more stringent values of 5 $mg/m^3$ and 10 $mg/m^3$ for the 8-hour and 1-hour concentrations, respectively.

Air sampling was conducted in November and December 1994 at two intersections in the vicinity of the project site; Ewa of Atkinson Drive at Kapiolani Boulevard, and at the Kalakaua Avenue and Kapiolani Boulevard intersection. Monitoring was conducted at each intersection during the morning and afternoon peak traffic periods, with varying meteorological conditions taken into account. In each case, the sampling site was within 10 meters of the road edge. A continuous carbon monoxide (CO) instrument was set up and operated during the AM and PM peak traffic hours. An anemometer and wind vane were installed simultaneously to record onsite surface winds during the sampling.

Results of the monitoring showed that CO levels at the Atkinson Drive intersection were low during both the morning and afternoon periods, i.e., less than 5 $mg/m^3$, well within the State AAQS for carbon monoxide. At the intersection of Kalakaua Avenue and Kapiolani Boulevard, greater morning traffic volumes resulted in slightly higher CO levels, even with increased wind velocity. During the afternoon peak traffic period, average CO levels were within the normal range with a few peaks greater than 10 $mg/m^3$. The average was still below the State AAQS.

### 3.13.2 Project Impacts

*Short-Term Impacts*

The principal source of short-term air quality impact will be construction activity. Construction vehicle activity will increase automotive pollutant concentrations along the existing streets and on the project site itself. Site preparation and earth moving will create particulate emissions, as will building and onsite road construction. EPA studies on fugitive dust emissions from construction sites indicate that about 1.2 tons per acre per month of activity may be expected under moderate conditions of activity, soil silt content, and precipitation and evaporation. However, onsite soils are reported to consist primarily of coralline sand and gravel. Such material has a lower silt content and, thus, less fugitive dust potential than the aforementioned estimate. This would tend to offset the greater dust potential associated with the semi-arid local climate.

There will also be off-site impacts from the operation of concrete and asphalt batching plants needed for construction. Such plants routinely emit particulate matter and other gaseous pollutants. These batch plants must receive permits for their operations from the Department of Health Clean Air Branch by demonstrating their ability to continuously comply with both emission and ambient air quality standards.

*Long-Term Impacts*

Wind Patterns

No significant changes in wind patterns in the vicinity of the project site are anticipated as a result of constructing the Hawai'i Convention Center. Winds will flow over and around the new building. Prevailing northeast tradewind streams near the ground are presently broken up by buildings surrounding the site, thereby reducing wind speed. Similarly, "kona" winds presently flow between buildings in Waikiki, which also breaks up and reduces wind speed. Tradewinds blowing over the top of the convention center structure would create a downdraft on the Ala Wai Promenade, but this is not anticipated to create any adverse effects.

Mobile Sources

To determine the impact on air quality from project traffic, air quality modeling using carbon monoxide was performed for the same two intersections which were monitored for existing CO concentrations. Based on the traffic study projections for 1989 conditions at the Atkinson Drive/Kapiolani Boulevard and Kapiolani Boulevard/Kalakaua Avenue intersections the EIS (Appendix I), two "with project" scenarios were assessed, one with a 10,000-person convention and one with 14,000 attendees. An array of 48 receptor sites at distances of 10 meters from the road edge were input to the model, and a background CO concentration of 1.0 $mg/m^3$ was assumed from surrounding streets.

The results of the modeling suggest that, under worst case conditions of traffic and meteorology, the federal 1-hour CO standard would be met, but the State standard may already be exceeded in close proximity to the intersections studied. This was predicted for both AM and PM peak hours with the former showing substantially higher values. Comparing the "No Project" scenario to the "Project" scenario for 1998, the results suggest that the project contributed 3.4 percent higher CO levels on the average. This would vary depending on time of day and the convention scenario selected.

Estimates of 8-hour concentrations were derived by applying a persistence factor of 0.5 to the 1-hour concentrations. This factor accounts for the fact that the worst case 1-hour meteorology and traffic volumes do not persist for 8 hours. Using this factor, under worst case meteorology during peak traffic days, there appears to be a potential for exceedance of the State carbon monoxide standard near both intersections. The federal 8-hour standard also appears to be approached.

Despite the growth in traffic and predicted CO levels, a general decline in CO levels is predicted over the next few years. This is due to the effect of the EPA motor vehicle emissions control program. The projected reduction in emissions from new vehicles and loss by attrition of older vehicles offsets the projected traffic increase.

**The offsetting effect of declining CO emissions against traffic growth is anticipated to continue into the future as projected in the "with project" 2005 traffic analysis (See Section 5.3.). In general, unless there is a very significant growth of traffic well above the 8 percent projected in the study, the decline in CO emission from vehicles will continue to offset a deterioration in air quality.**

Parking Deck Impacts

The 800-stall Parking level will also be a generator of emissions due to motor vehicle activity. The magnitude of this impact was assessed by treating the deck as an area source and modeling it with EPA's Industrial Source Complex model. Worst case conditions of meteorology and 100 percent turnover of parking stalls in one hour were assumed. The 1-hour and 8-hour maxima were 1.6 mg/$m^3$ and 1.2 mg/$m^3$, respectively, well below either the federal or State AAQS for carbon monoxide.

Nitrogen Oxides Impact

There has been concern expressed about the emissions of nitrogen oxides (NOx) associated with the projected increase in diesel vehicles, primarily buses, in the convention center area. In large urban areas on the mainland U.S., NOx is of interest because of its active role in the formation of photochemical oxidants which contribute to smog. While this has not been demonstrated to be a problem in Hawaii, NOx was assessed using a worst case methodology focusing on traffic generated by a 14,000-attendee convention.

Only one NOx species, nitrogen dioxide ($NO_2$), has an ambient standard and it is an annual standard, whereas traffic is generally assessed on an hourly (peak hour) basis. NOx has the potential to become $NO_2$ in the presence of ozone ($O_3$), therefore, $NO_2$ concentrations depend to a large degree on ozone levels. $NO_2$ concentrations were estimated at the computer model receptor locations using bus trip figures provided by the traffic consultant. The Mobile Source Emissions Model (MOBILE-5A) was used to generate specific NOx emission factors for the intersection legs with and without the increased number of diesel vehicles. One-hour $NO_2$ estimates were based on the highest reported historical ozone concentrations in Honolulu, while annual estimates were based on the annual average ozone level. Conversion of $NO_2$ estimates from 1-hour to annual values was accomplished by applying an EPA-recommended conversion factor.

Worst case 1-hour and annual concentrations of $NO_2$ from diesel bus activity were calculated to undergo no change between existing levels and 1998 14,000-attendee convention event levels. All estimates were below the State and federal AAQS of 70 and 100 micrograms/$m^3$, respectively.

Electrical Generation Impact
The estimated 26.5 million kilowatt hours of annual electrical demand by the project will necessitate the generation of electricity by power plants. Currently, most of Oahu's electrical energy is generated by Hawaiian Electric Company's oil-fired plants at Kahe Point and Waiau. These units fire low sulfur (0.5 percent) fuel oil. As a percentage of the latest published emissions inventory for Oahu (1980), emissions of sulfur oxides (SOx) and nitrogen oxides (NOx) to supply the project with electricity are estimated at 0.15 percent of the Oahu total. Particulate matter is estimated at 0.05 percent, and CO and volatile organic compounds both at less than 0.01 percent of the total.

It should be noted that a more recent emissions inventory would likely show higher power plant emissions on Oahu due to urban growth since 1980. Thus, projected electrical emissions for the project would be a lower percentage of the total.

Electrical Generator
A 1,500 kilowatt diesel-fired generator is proposed as an emergency backup power source for the convention center. Its actual operation and, thus, its emissions, would be minimal since, except for emergencies, it would only be tested for one to two hours per month.

### 3.13.3 Mitigation

*Short-Term Construction Related Impacts*

As noted, there is a potential for fugitive dust to be generated during construction. Dust control will be accomplished through frequent watering of unpaved roads and areas of exposed soil as required. The EPA estimates that twice daily watering can reduce fugitive dust emissions by as much as 50 percent. The establishment of landscaping at the earliest possible time will also help.

*Mobile Source Impacts*

As discussed, a decline in CO levels near the intersections studied is projected in 1998 despite traffic growth. Nevertheless, under worst case meteorology during peak traffic hours, there appears to be a potential for exceedance of the State carbon monoxide standards near the two intersections. The federal 8-hour standard also appeared to be approached. Factors which mitigate against this being a matter for serious concern are:

- the predicted exceedances were found only close to the intersection (where people would not be expected to remain for 1 or 8 hours) and only at particular receptor locations; beyond that all standards are met.

- the probability of worst case conditions occurring and persisting for 1 to 8 hours is low.
- actual CO monitoring in Waikiki conducted by the DOH in recent years suggests low probability of high CO levels and shows few if any exceedances of the State standards and no exceedances of the federal standards.
- the predicted exceedances occur with or without the project; the project itself caused a mean increase of 3.4 percent over what was predicted without the project.

**These same factors are also anticipated to mitigate against future concerns associated with the growth in traffic, as projected in the year 2005 traffic analysis (See Section 5.3).**

*Parking Garage Impact*

Under worst case conditions, the open second level parking deck will contribute less than 2 mg/m$^3$ of carbon monoxide to 1-hour or 8-hour levels. The open, elevated nature of the parking will allow for sufficient natural ventilation to minimize air quality impacts.

*Nitrogen Oxides Impact*

Worst case analysis of $NO_2$ concentrations from diesel bus activity demonstrated compliance with State and federal AAQS.

*Electrical Generation*

The estimated emissions from project electrical demand represent relatively small increases (less than 0.2 percent) over the latest available emissions inventory. The energy conserving design of the convention center will minimize this electrical demand. maximum use of natural instead of mechanical air-conditioning, and a building automation system with integral energy conservation programs will be implemented. As for HECO's facilities which provide the power, each must continuously demonstrate compliance with all applicable ambient air quality standards and control regulations in order to retain its operating permit.

*Emergency Generator*

**The proposed emergency electrical generator will require a State Department of Health Permit pursuant to the recently promulgated Chapter 11-60.1 air pollution control regulations. In order to obtain that permit, the applicant will need to**

**demonstrate and certify annually that operation of the generator will comply with all applicable air pollution control requirements and standards.**

## 3.14 Noise

A noise study was conducted in December 1994 by Y. Ebisu & Associates to describe the existing and projected noise environment in the vicinity of the HCC project (see Appendix F). **Future projections of traffic noise were based on the traffic study projections for 1998 peak-hour traffic conditions at key intersections (Appendix I). Various "with project" scenarios were assessed, including the 7,500, 10,000 and 14,000-person events.**

Existing traffic noise levels were measured during the midday and PM peak traffic hours at eight locations in the project environs to provide a basis for developing the project's traffic noise contributions along six public roadways which will service the proposed development. The noise measurement results were compared with computer model predictions of existing traffic noise levels to validate the computer model to be used for calculating project traffic conditions.

The noise descriptor generally used to assess environmental noise is the Day-Night Average Sound Level (Ldn), which incorporates the average sound level over a period of 24 hours with recognition of a greater human sensitivity for evening noise. In general, Ldn levels range from 55 to 65 Ldn in urbanized areas which are shielded from high volume streets. Residences which front major roadways are generally exposed to levels of 65 Ldn, and as high as 75 Ldn when the road is a high-speed freeway. For commercial and other non-noise sensitive land uses, exterior noise levels as high as 75 Ldn are generally considered acceptable, except when naturally ventilated office and other commercial establishments are exposed to exterior levels which exceed 65 Ldn.

For the purposes of determining noise acceptability for funding assistance from Federal agencies (Federal Housing Administration (FHA), Housing and Urban Development (HUD), and the Veterans Administration (VA)), an exterior noise level of 65 Ldn or lower in urban residential areas is considered acceptable. The 65 Ldn noise descriptor was used in the noise study as the acceptable standard.

### 3.14.1 Existing Conditions

Measurements of existing traffic noise in the project environs show that traffic noise levels along the high volume roadways fronting the project site generally exceed 70 Ldn, with the exception of Ala Wai Boulevard which is southeast of the project site. The data shows that traffic noise levels tend to increase in the direction toward the intersection of Kapiolani Boulevard and Kalakaua Avenue, due to the cumulative effect of noise levels from both streets in the vicinity of the intersection. Traffic noise along Kahakai Drive is much lower than the major roadways, primarily due to the relatively low volume of existing traffic along this roadway.

For all properties fronting the major streets in the project environs, existing traffic noise levels currently exceed the standard of 65 Ldn, and are as high as 75 Ldn along Kapiolani Boulevard, Kalakaua Avenue, and Atkinson Drive fronting the project site. Table 3-1 displays existing and projected distances to the 65, 70, and 75 Ldn contours from the street centerlines. The setback distances to the 65 Ldn contour lines are very large for the high volume streets in the project environs. The existing traffic noise levels in the project environs are in the "Significant Exposure, Normally Unacceptable" category at the lots which front Kapiolani Boulevard, Kalakaua Avenue, Ala Wai Boulevard, and Atkinson Drive.

**Table 3-1**

**Existing (1994) and CY 1998 Distances to 65, 70, and 75 Ldn Contours**

| Street Section | 65 Ldn Setback (feet) | | 70 Ldn Setback (feet) | | 75 Ldn Setback (feet) | |
|---|---|---|---|---|---|---|
| | 1994 | CY98 | 1994 | CY98 | 1994 | CY98 |
| Kapiolani Blvd. (west of site) | 313 | 337 | 99 | 107 | 31 | 34 |
| Kapiolani Blvd. (front of site) | 392 | 428 | 124 | 135 | 39 | 43 |
| Kapiolani Blvd. (east of site) | 342 | 372 | 108 | 118 | 34 | 37 |
| Kalakaua Ave. (north of site) | 186 | 202 | 59 | 64 | 19 | 20 |
| Kalakaua Ave. (front of site) | 237 | 258 | 75 | 82 | 24 | 26 |
| Kalakaua Ave. (south of site) | 165 | 192 | 52 | 61 | 17 | 19 |
| Atkinson Dr. (front of site) | 86 | 99 | 27 | 31 | 9 | 10 |
| Atkinson Dr. (south of site) | 105 | 122 | 33 | 39 | 11 | 12 |
| Kahakai Drive | 2 | 3 | 1 | 1 | 0 | 0 |
| Kona Street | 6 | 7 | 2 | 2 | 1 | 1 |
| Ala Wai Blvd. (east of site) | 72 | 91 | 23 | 29 | 7 | 9 |

3.14.2 Project Impacts

*Short-Term Impacts*

Unavoidable, but temporary, noise impacts will occur during the construction period. The total time period for construction is approximately 2.3 years, although the noisiest period (foundation work) is expected to not exceed 7 months. The actual work will move from one location to another on the project site, which will also decrease the length of exposure to noise sensitive properties. The properties which are predicted to experience the highest noise levels during construction are the residential condominiums and apartments along Kahakai Drive. Noise levels at these properties are predicted to range from 95 dB during adjacent construction of roadway improvements and building foundation, to less than 70 dB during construction near Kalakaua Avenue. The relatively high noise level at adjoining properties would degrade the acoustic environment to unacceptable levels.

It is anticipated that pile driving will be necessary to implant sheet and concrete piles in the ground during building construction. Induced ground vibrations from these pile driving operations have the potential to cause architectural and structural damage to structures. Ground vibrations generated during pile driving operations are generally described in terms of peak particle (or ground) velocity in units of inches per second.

The human being is very sensitive to ground vibrations, which are perceptible at relatively low particle velocities of 0.01 to 0.04 inches per second. Damage to structures, however, occur at even higher levels of vibration. The most commonly used damage criteria for structures is the 2.0 inches per second limit. A conservative limit of 0.2 inches per second is suggested for planning purposes on this project because of the repetitive nature of pile driving operations which can increase risks of damage due to fatiguing, and the residential nature of the adjacent buildings along Kahakai Drive.

Predictions of peak ground vibrations levels versus the scaled energy distance factor from the driven pile are not precise, with an initial uncertainty factor in the order of 10:1. If pile drivers of approximately 30,000 foot-pounds or larger ratings are used on the job site, the initial vibration predictions indicate that there is some risk of exceeding the 0.2 inches per second vibration damage criteria at 100 to 250 foot separation distances. Measures to mitigate this are discussed in section 3.14.3.

*Long-Term Impacts*

Traffic Noise

Along the sections of Kapiolani Boulevard, Atkinson Drive, and Kalakaua Avenue which border the project site, minimal increases in traffic noise of 0.1 to 0.4 Ldn are predicted to occur as a result of the project. Smaller increases in traffic noise are expected to result from the project along Ala Wai Boulevard, the sections of Kapiolani Boulevard east and west of the project site, and the section of Kalakaua Avenue north of the project site. The largest increase in local traffic noise of 1.9 Ldn are expected to occur along Kahakai Drive, primarily due to the relatively low volume of existing traffic on this roadway. However, the noise levels associated with this roadway are expected to remain less than 65 Ldn. In addition, a net decrease in traffic noise levels at low and mid-rise receptor locations along Kahakai Drive is expected due to the future benefit of noise shielding from the project building, which will reduce the noise contributions from traffic on Kapiolani Boulevard and Kalakaua Avenue.

The project building is expected to provide traffic noise shielding effects for neighboring low and high rise apartments and condominiums in the vicinity of the project site. Reductions in traffic noise levels of 1 to 9 Ldn units are predicted to occur as a result of the beneficial noise shielding effects from the project's building (see Table 3-2). The most significant traffic noise sources associated with the proposed project are the large number of buses which will transport visitors to and from the Convention Center during a major convention. Traffic noise levels along the primary bus route (Atkinson Drive to Kapiolani Boulevard to Kalakaua Avenue) between the hotels in Waikiki and the Convention Center, are expected to increase by 4 to 6 dB during the AM peak hour when the concentration of buses is expected to be the greatest.

In addition to buses, during off-peak hours on a major convention day, heavy delivery trucks are anticipated to travel to and from the convention center along Atkinson Drive and Kahakai Drive at an average rate of 10 trips per hour. These trucks and the off-peak bus trips along the streets fronting the project were included in the annually averaged Ldn calculations, and resulted in less than a 1.6 Ldn change in the relationship of the daily Ldn values to the AM and PM peak hour traffic noise levels.

**Noise associated with the growth in background traffic as projected to the year 2005 in Section 5.3.2 in the "without project" scenario is estimated to increase on the order of 1 dB, which is not a significant change. The "with project" scenario would see an increase of approximately 30 additional event days per year at the convention center. This additional number of events is also not anticipated to be a significant impact.**

**Table 3-2**

**Comparisons of Existing and Future Ldn at Various Noise Sensitive Locations**

| Map No. | Location | Receptor Height (feet) | Existing Ldn | Future Ldn | Change in Ldn |
|---|---|---|---|---|---|
| 1 | Residences at Lime and Hauoli Street | 5 | 61 | 61 | 0 |
| 2 | Residences on Kapiolani Boulevard | 5 | 73 | 73 | 0 |
| 3 | Residences Behind Veterans of Foreign Wars Site | 5 | 60 | 60 | 0 |
| 4 | 1717 Ala Wai (mauka side) | 100 | 63 | 61 | -2 |
| 4 | 1717 Ala Wai (mauka side) | 250 | 63 | 61 | -2 |
| 5 | Marina Towers (mauka side) | 75 | 60 | 58 | -2 |
| 6 | Summer Palace (mauka side) | 70 | 62 | 60 | -2 |
| 6 | Summer Palace (mauka side) | 170 | 63 | 61 | -2 |
| 7 | Atkinson Plaza | 100 | 65 | 64 | -1 |
| 8 | Kahakai Road Residences | 15 | 63 | 54 | -9 |
| 9 | Sunset Towers (mauka side) | 100 | 68 | 69 | 1 |
| 10 | Ala Moana Americana Hotel (makai side) | 200 | 62 | 63 | 1 |

Non-Traffic Noise

Potential adverse noise impacts may also be associated with on-site mechanical equipment, parking garage noise, and roof terrace activity. Mechanical equipment such as emergency electrical generators, air conditioning cooling towers and compressors, and kitchen exhaust fans are the primary on-site mechanical noise sources. These equipment, either singly or together, have the potential to exceed both the level of the residual background ambient noise as well as the allowable property line noise limits established by the State Department of Health (DOH). The State DOH noise limits, which apply along the project's property boundary planes, are 60 dB and 50 dB during the daytime and nighttime periods, respectively. Typical noise levels of untreated mechanical equipment are commonly higher by at least 10 dB than the allowable DOH noise limits.

Noise from the parking garage, such as door slamming, tire squeal, theft alarms, and excessively noisy vehicles may be audible at nearby dwelling units along Kahakai Drive.

Adverse noise impacts on neighboring properties are also possible if large assemblies are held in the Rooftop Garden area. Crowd noise from large assemblies in excess of 10,000 persons can exceed 68 dB at 300 feet distance. To insure the intelligibility of music vocal performances or voice announcements over the assembly area, amplified music or voice levels of 80 to 90 dB could be required.

### 3.14.3 Mitigation

*Short-term Construction Noise*

Construction activities must comply with the provisions of the DOH Administrative Rules, Title 11, Chapter 43, "Community Noise Control for Oahu." These rules require a noise permit if the noise levels from construction activities are expected to exceed the allowable levels stated in the Chapter 43 rules. Construction equipment and on-site vehicles requiring an exhaust of gas or air must be equipped with mufflers. (Correspondence from John C. Lewin, Director, Department of Health, May 2, 1994). Noise curfew times must be followed and noisy construction activities are not allowed on holidays under DOH regulations.

Mitigation of construction noise to inaudible levels will not be practical in all cases due to the intensity of the noise sources. Along Kahakai Drive, the use of a construction noise barriers on the order 16 feet high will reduce construction noise by 5 to 20 dB at low and mid-rise receptors. In addition, properly muffled construction equipment will be required on the job site, and heavy equipment and portable diesel engines will be located at least 400 to 500 feet from residences, when possible. State DOH construction noise limits and curfew times will be strictly adhered to during the construction phase.

To reduce the number of blows required during pile-driving, pre-drilling through the upper coral layer will be performed for those piles which must be driven down to the lower layer.

*Vibration from Pile Driving*

**The following mitigation measures are proposed by the design/builder to address vibration from pile driving. These measures are different from those discussed in the noise study.**

**To minimize risks of potential damage due to vibration from pile driving, a program to detect potential damage to neighboring buildings will be implemented. This will involve extensive documentation of existing building conditions using still photography and video recordings. All visible damages such as cracks in walls and slabs will be documented as a basis for identifying any new damage that may be**

**associated with vibrations from pile driving. In addition, electronic surveying equipment capable of detecting minute shifts in reference points to be established on the buildings will be utilized to determine if building foundations are being affected. A monitoring program for these electronic surveys will be established to provide early detection of any impacts such that pile-driving activities can be halted and modified, as necessary. The design/builder will be responsible for any damages to neighboring buildings that are attributable to pile driving or other construction activities.**

*Long-Term Traffic Noise*

Mitigation of off-site traffic noise impacts are generally performed by individual property owners or by public agencies during roadway improvement projects. Mitigation measures consist of sound attenuating walls, window air conditioning units and/or the use of sound attenuating windows.

**Because of the large number of buses expected in the AM peak hour during a major convention event, reduction of bus-related noise is important for minimizing noise impacts on surrounding noise-sensitive neighbors. Discussions with major local bus operators indicate that they are upgrading their fleets in anticipation of convention center business. Modernization of the island's bus fleet will help to reduce noise impacts. The bus staging area in front of the convention center has been designed to allow buses to operate without backing-up and setting off their back-up alarms. Finally, the CCA will recommend that the future convention center operator work with bus companies to formulate bus operation procedures within the center. Such procedures may include minimizing high speed idling, using lower engine RPM during acceleration, and avoiding maneuvers requiring backing-up.**

**Heavy delivery trucks traveling along Kahakai Drive and Atkinson Drive should comply with DOH Administrative Rules, Title 11, Chapter 42, "Vehicular Noise Control for Oahu." The CCA will also recommend that the future convention center operator establish operating procedures for heavy trucks within the center. Such procedures will be similar to those described for buses, above.**

**Specific mitigation for secondary and cumulative long-term impacts have not been identified since these activities are not under the control of the convention center and the locations of the impacts cannot be specified. However, they are well within the projected background traffic projections for 2005 and the relative contribution to traffic noise on a regional and island-wide basis is anticipated to be minimal.**

*Other Noise*

Other noise sources emanating from the site, such as fixed mechanical equipment, cars and heavy vehicles in the parking garage and loading areas, and crowd and public address system noise from assemblies on the Rooftop Garden, have the potential for exceeding the State DOH noise limits at adjacent noise sensitive properties. The project's mechanical equipment will use sound treatment to comply with these limits and to minimize risks of noise impacts on neighboring properties. Compliance with DOH noise limits should minimize risks of adverse noise impacts on neighboring properties. Within the parking garage, non-slick roadway surfaces and acoustic fire-proofing on the ceiling and structural members will attenuate parking garage noise levels.

**The Rooftop Garden area may not be used for large assemblies in excess of 10,000 persons where amplified voice or music levels of 80 to 90 dB could be generated since this would exceed State DOH noise limits of 60 (daytime) or 50 (nighttime) dB. If such assemblies are to be accommodated, noise levels must be attenuated by a minimum of 60 dB (daytime) and 50 dB (nighttime). Properly deployed portable enclosures can achieve the required noise attenuation and would be required if such assemblies are to be accommodated. Passive use of the Rooftop Garden would not exceed State noise limits.**

## 3.15 Radio Frequency Interference

### 3.15.1 Background

Several years ago, concerns were raised over a previous (First Development Inc.) development proposal for the subject site, regarding potential impacts to radio and television signals. The potential for Radio Frequency Interference (RFI) was raised, due to two proposed buildings which would be over 360 feet in height. (The tallest existing buildings in the immediate project vicinity are the Ala Moana Hotel (390 ft.) and the Century Center Building (380 ft.)).

### 3.15.2 Impacts

Unlike the earlier First Development, Inc. proposal, the project, as discussed in the previous section, will not include structures above 105 feet in height, or a maximum of 145 feet under the expansion plan. In any event, the stand alone convention center will have a much lower profile than nearby residential high rises. Many of the impacts associated with the former development proposal (which included structures over 360 feet in height) should not be of concern. A pre-consultation letter from KHON-TV2 stated that "the current generic proposal poses no impact on KHON as it relates to our transmission facility on top of Century Center." (Correspondence from Gregory K. Johnson, KHON-TV2, March 31, 1994).

## 3.16 Scenic and Visual Resources/Urban Design

### 3.16.1 Existing Conditions

The project site, located at the intersection of Kapiolani Boulevard and Kalakaua Avenue, is presently a vacant undeveloped parcel. The site is adjacent to the Ala Wai Canal and Promenade Park, which provide a significant open space resource. Formerly housing one of Honolulu's major new car dealers with a showroom, service warehouses, a multi-level auto storage structure and used car lot, the site was cleared of all structures in the late 1980's and has since remained vacant.

The City and County of Honolulu's Development Plan (DP) Common Provisions defines public views as including "views along streets and highways, mauka-makai view corridors, panoramic and significant landmark views from public places, views of natural features heritage resources and other landmarks, and view corridors between significant landmarks" (§24-1.4, Revised Ordinances of Honolulu). The Development Plan also states that "the design and siting of all structures shall reflect the need to maintain and enhance available views of significant landmarks. No development shall be permitted that will block important views."

The Special Provisions for the DP's Primary Urban Center identify important views to be protected, including "panoramic, mauka and makai and continuous views of the Koolau and Waianae mountain ranges, ridges, valleys, and coastline and the sea" and "views of natural landmarks, such as Diamond Head, Punchbowl, Pearl Harbor, and major streams and forest areas." (§24-2.2(2)(A) and (B), ROH)

Of these important views, few are currently visible from public vantage points in the vicinity of the convention center site. Only small segments of the Koolau Mountains can be seen between high rises looking mauka on Atkinson Drive and Ala Wai Boulevard between Ala Moana Boulevard and Kalakaua Avenue. Views of Diamond Head from the area around the site are generally obliterated by the intensive high-rise development in Waikiki.

### 3.16.2 Impacts and Mitigation Measures

A visual impact analysis was conducted to depict the impacts of the proposed convention center structure on public views in the vicinity of the project site. The primary public vantage points for the convention center are the main streets approaching the site. These include Kapiolani Boulevard - east and west approaches, Kalakaua Avenue - mauka and makai approaches, Atkinson Drive mauka approach, and Ala Wai Boulevard from McCully Street to Kalakaua Avenue.

Photographs were taken showing existing views from major roadways leading to the site as might be seen by a typical motorist or pedestrian. Superimposed on each photograph was a scale model photograph of the Hawai'i Convention Center as it will appear when it is fully developed. Figures 3-6 to 3-21 show the viewing locations and photographs depicting existing views and with-project views. While the convention center structure will be clearly visible from the surrounding area, for the most part it will not block any significant public views.

1. Kalakaua Avenue Looking Mauka. The convention center structure would be barely visible through the existing tree canopies.

2. Ala Wai Boulevard Looking West. The center structure would be clearly visible above the Ala Wai promenade landscaping, but no significant views would be obscured.

3. Kapiolani Boulevard Looking West. The center structure would be masked by coconut palm and site landscaping features.

4. Kalakaua Avenue Looking Makai. The center structure would be clearly visible although it would be surrounded by high-rise Waikiki buildings such as the Waikiki Landmark and Ala Wai condominiums.

5. Kapiolani Boulevard Looking East. The convention center's canvas sail roofing will be visible above the Monkeypod trees lining Kapiolani Boulevard.

6. Atkinson Drive Looking Mauka. The center's sail canopy will be clearly visible on the approach from Atkinson Drive. The dramatic signature entry scale was designed to impart a strong first impression as one approaches from Ala Moana Boulevard on Atkinson Drive. The Century Center building dominates the skyline view to the left.

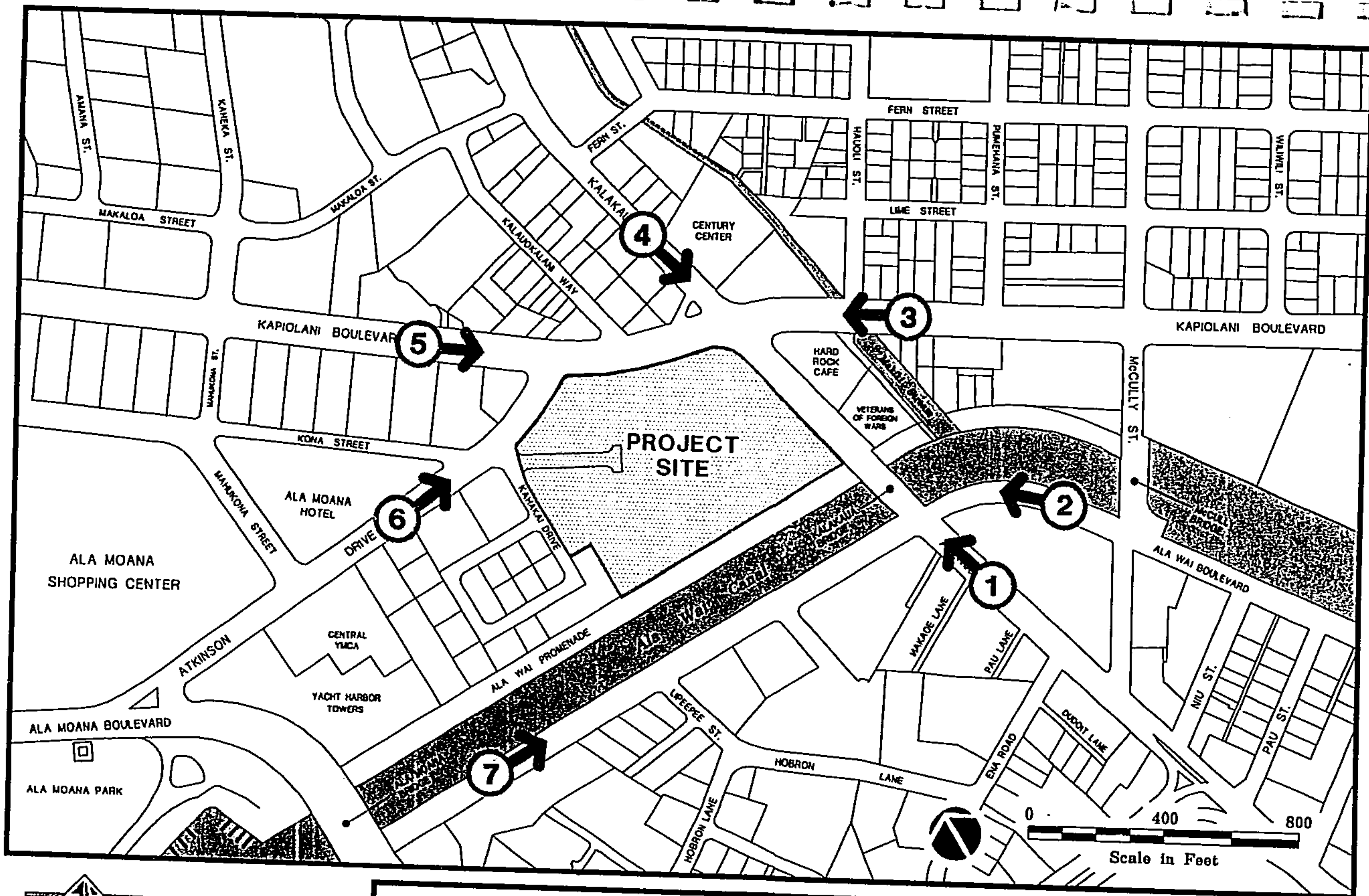
7. Ala Wai Canal Looking Mauka. Views of the Koolau Mountains would be partially obscured by the convention center structure, although existing views are already impacted by the Summer Palace Condominium. Setback terracing along the Ala Wai Canal has been incorporated in the center's design to significantly reduce the massing impact of the building from the Ala Wai vantage point.

Views of the Hawai'i Convention Center project site from surrounding high rise structures have been mitigated by incorporating expansive site landscaping features, including the 2.5 acres of Rooftop Garden and 3.5 acres of site, lanai, and courtyard landscaping. The double-pitch roof profile of the structure will impart a traditional yet aesthetic appearance.

The convention center design will accommodate future expansion if needed to provide an additional 100,000 square feet of exhibit hall space adjacent to the ballroom on the fourth level of the structure. Such expansion, however, will displace the Rooftop Garden which provides visual relief and landscaped open space on the top level of the convention center as viewed from nearby highrise structures. The future expansion is not expected to be visible from any of the approaching thoroughfares in the vicinity of the center.

Overall, the design of the Hawai'i Convention Center has attempted to minimize the overall height and bulk of the building. Building height has been limited to a maximum of 150 feet above ground level. Building mass has been reduced by design features such as incorporating the parking level above the exhibit hall in spaces created by the wide structural beams needed to span the hall below and by using an efficient structural framing system. These two features have reduced building height by 50 feet over a more conventionally designed building.

The visual impacts and mitigation measures for the secondary and cumulative growth are beyond the direct control of the convention center. However, the economic analysis indicates that future hotel demand could be met by the addition of the Kalia Tower at the Hilton Hawaiian Village and the proposed hotel at the Aloha Tower Marketplace. Both of these hotels have the necessary zoning to proceed and have submitted preliminary plans which have been available for public review. Long-term growth in housing to meet projected employment growth is expected to be accommodated in island-wide residential development and redevelopment projects.




HAWAI'I CONVENTION CENTER

Fig. 3-6 to 3-21
VIEWING LOCATIONS

Prepared for :
CONVENTION CENTER AUTHORITY
State of Hawaii

Prepared by :
Nordic / PCL
Wilson Okamoto & Associates, Inc.

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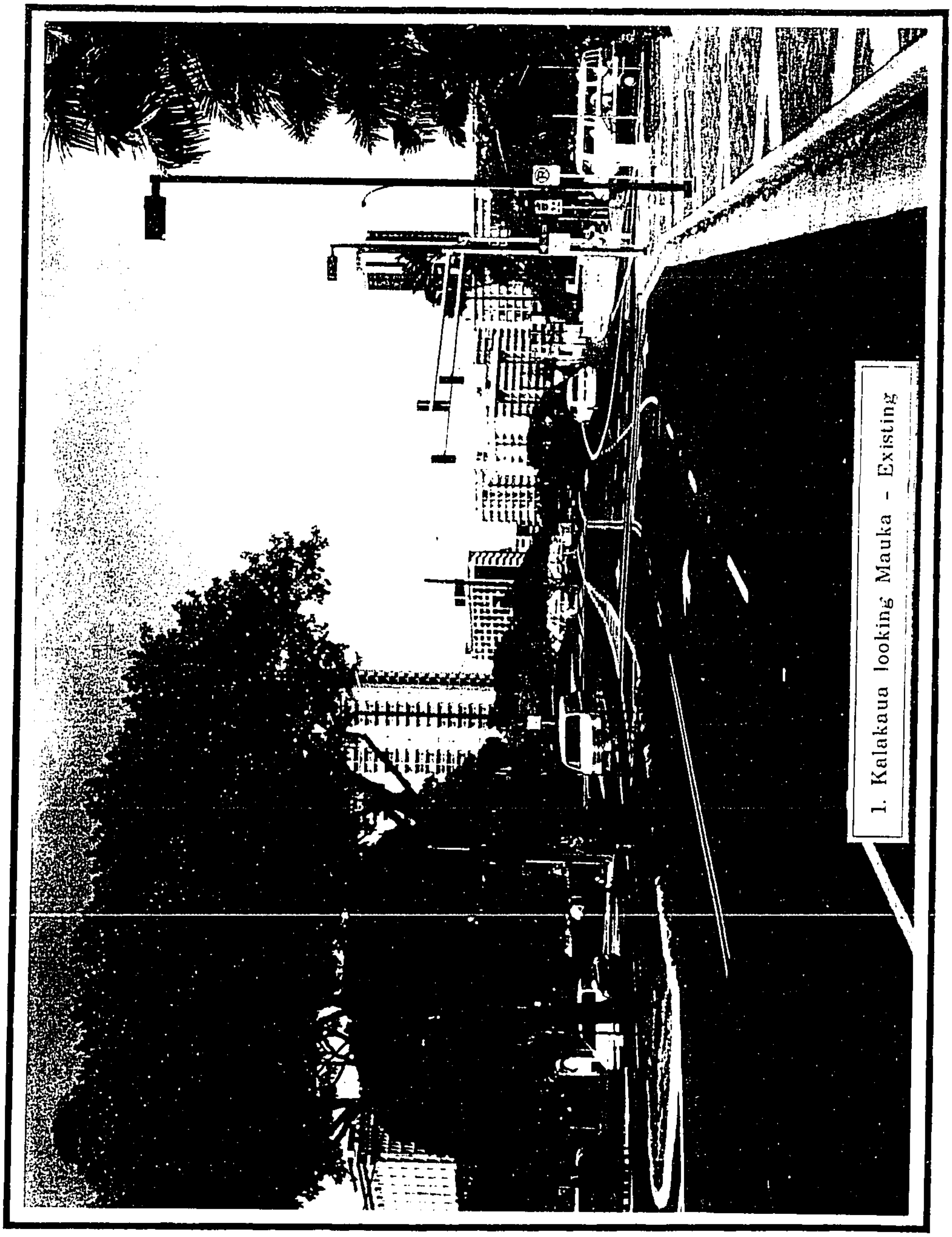

1. Kalakaua looking Mauka - Existing

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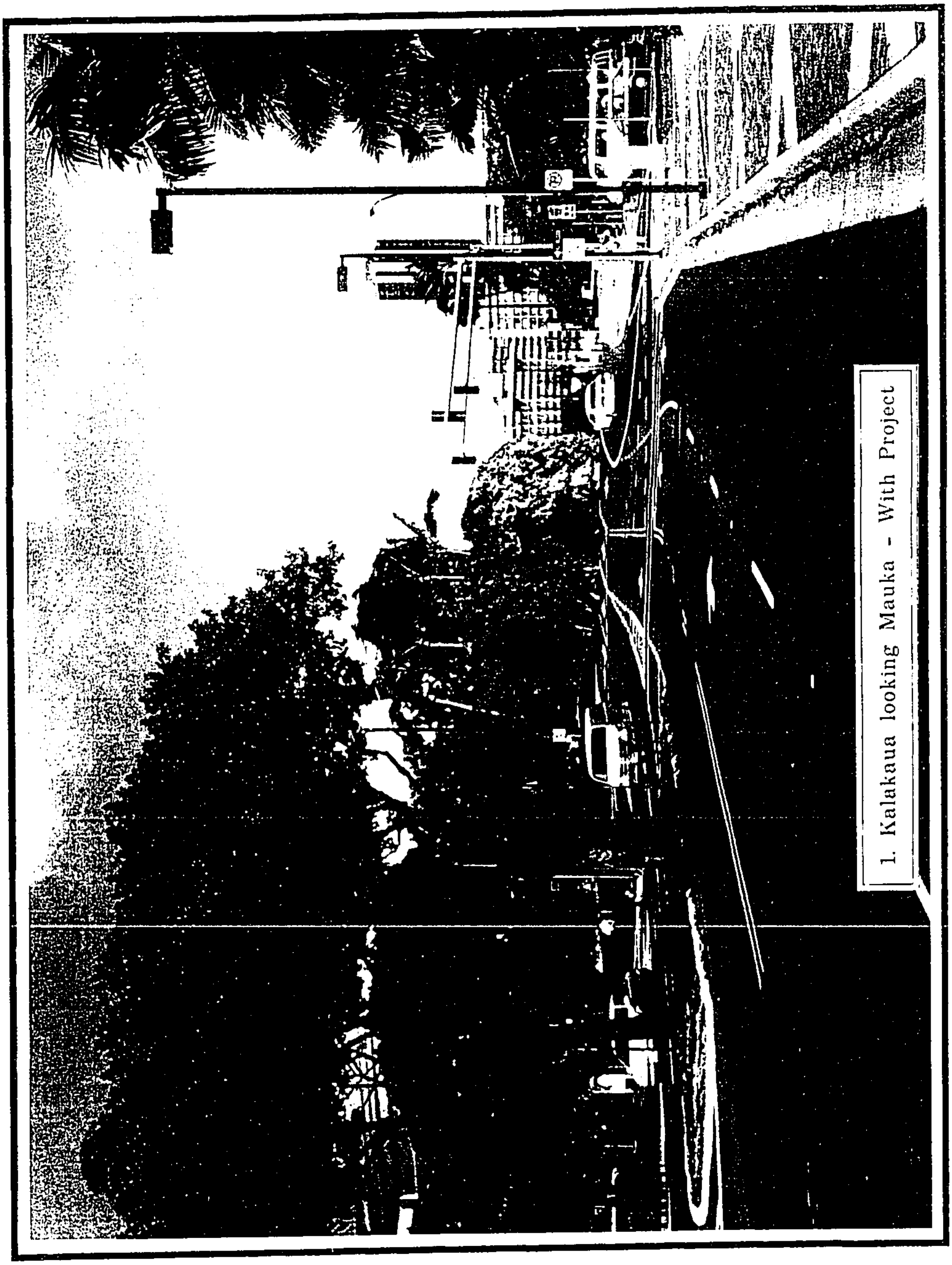

1. Kalakaua looking Mauka - With Project

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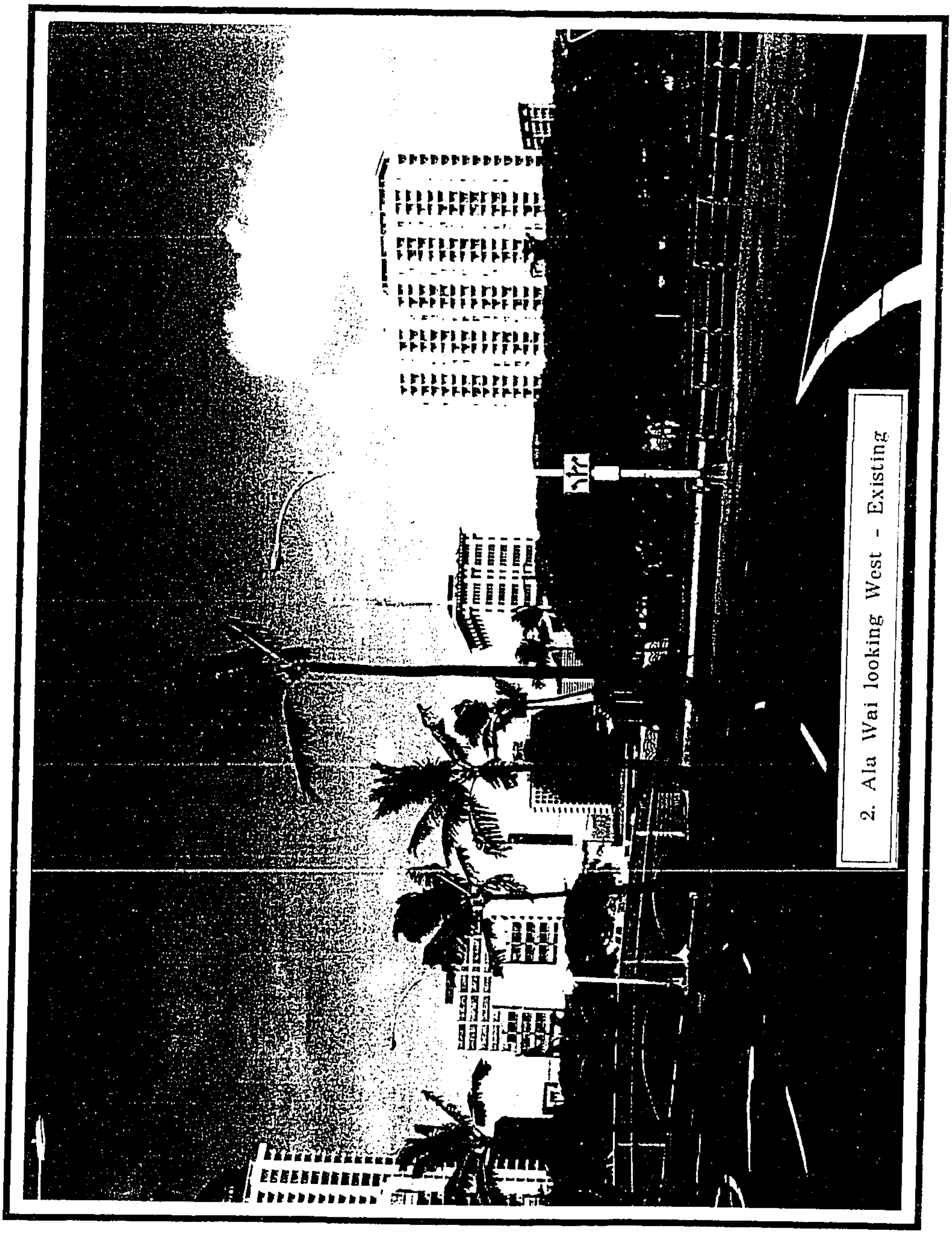

2. Ala Wai looking West - Existing

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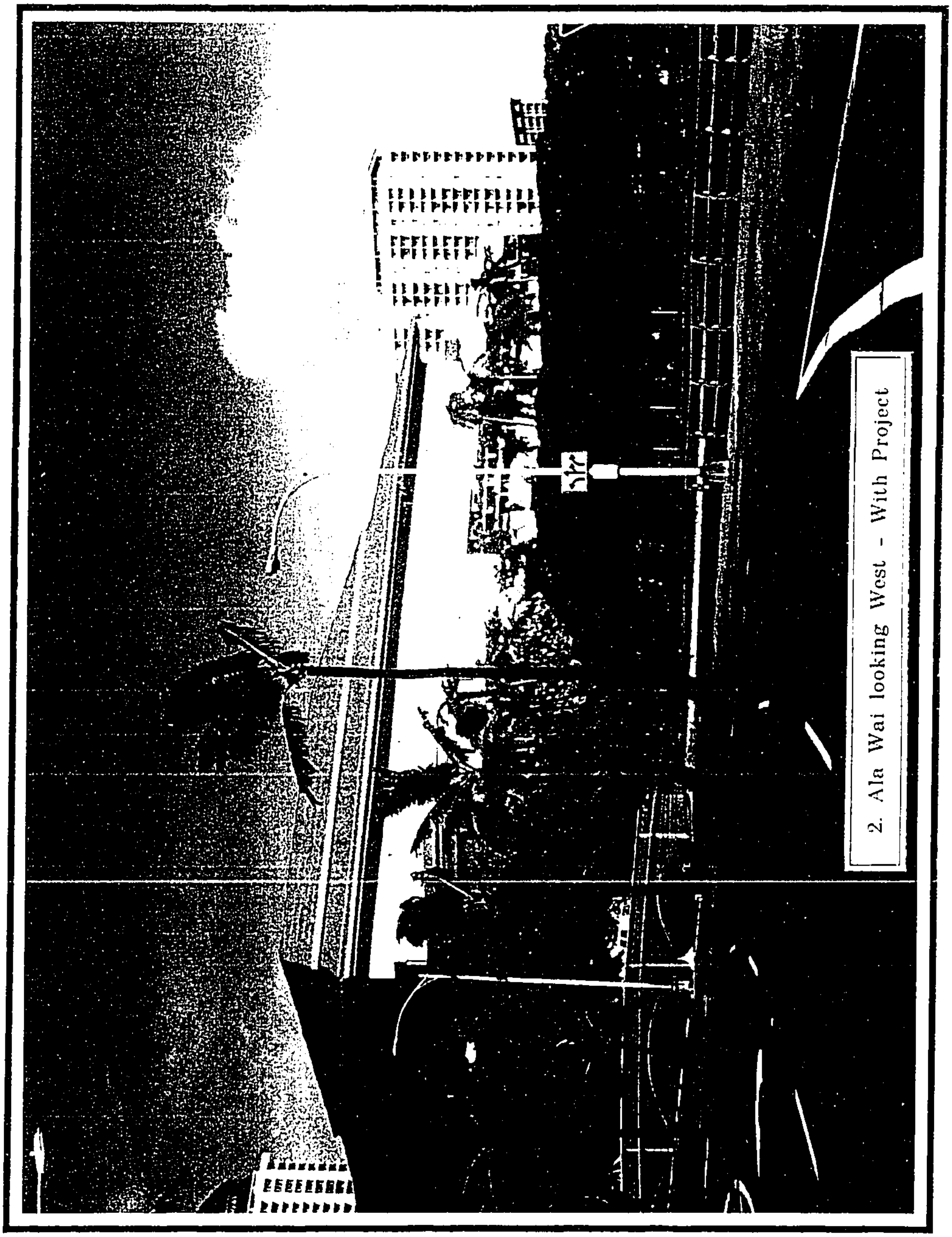

2. Ala Wai looking West - With Project

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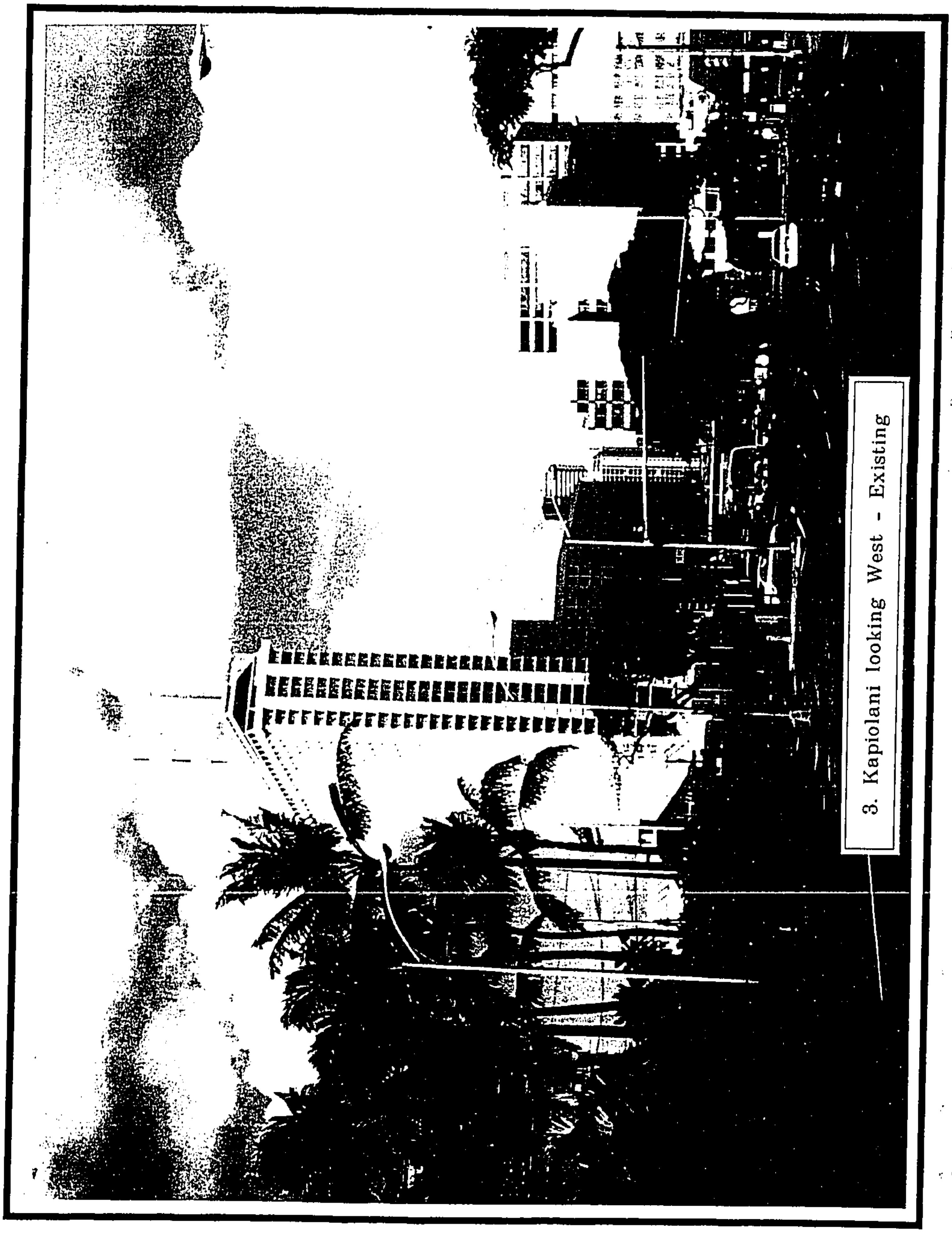

3. Kapiolani looking West - Existing

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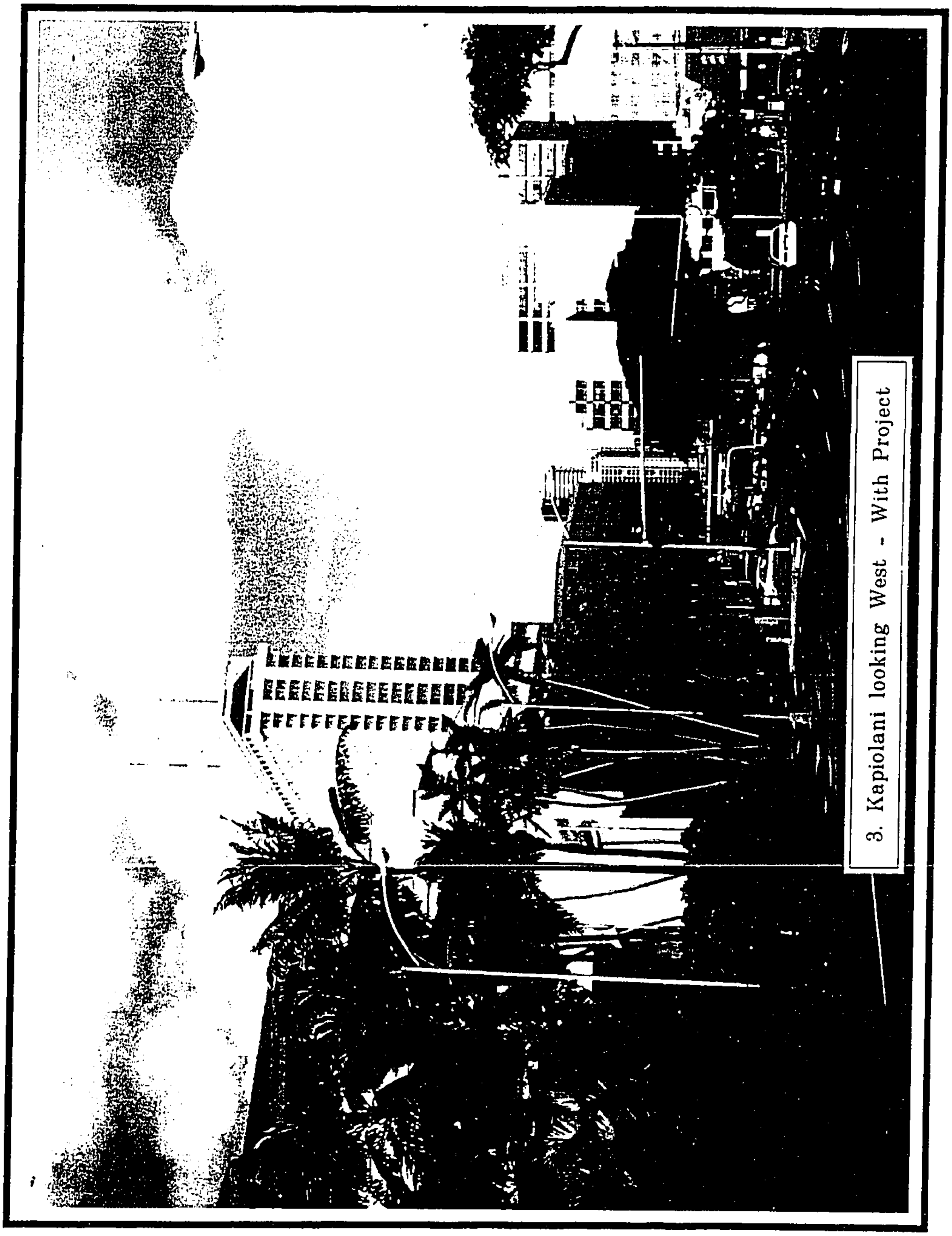

3. Kapiolani looking West - With Project

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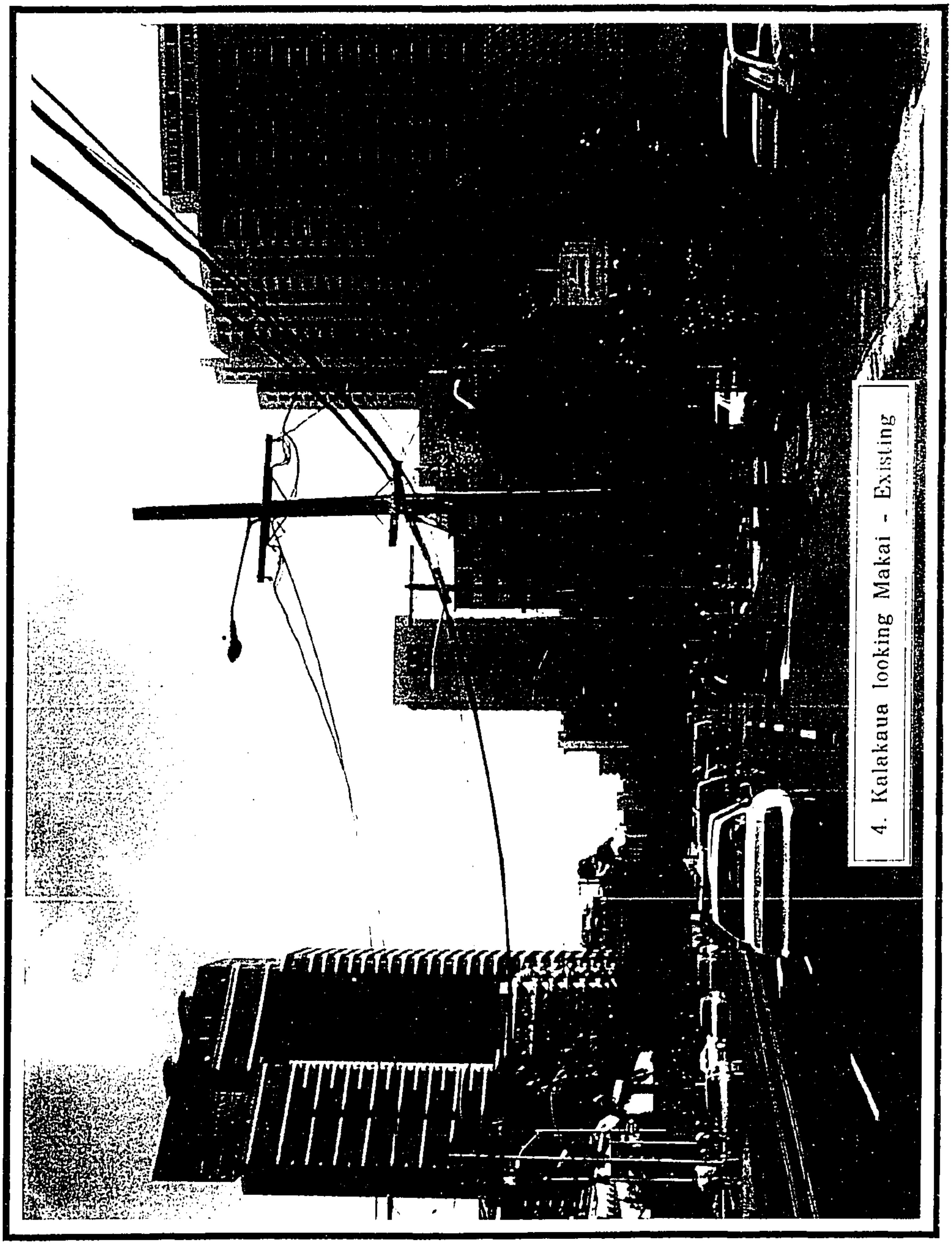

4. Kalakaua looking Makai - Existing

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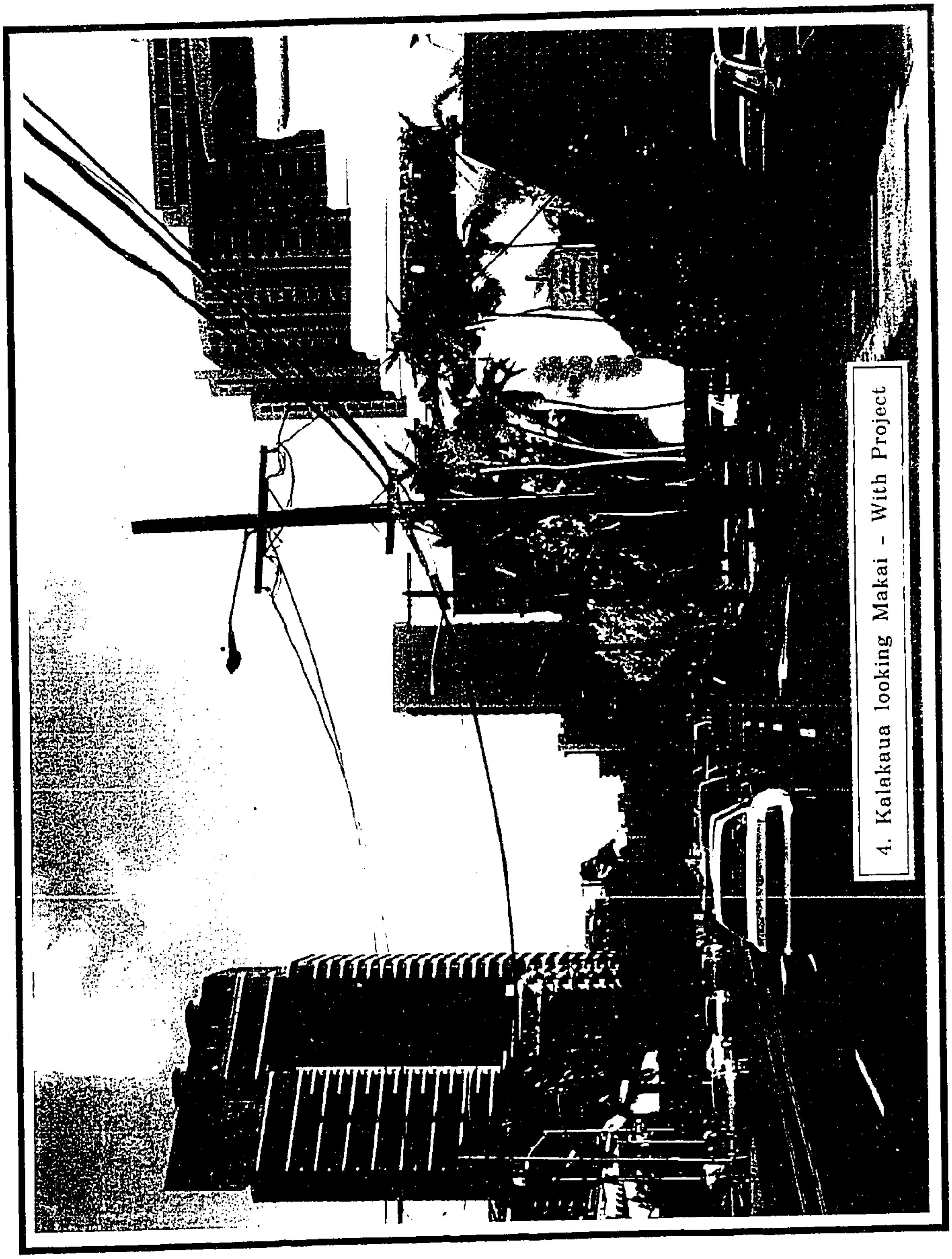

4. Kalakaua looking Makai - With Project

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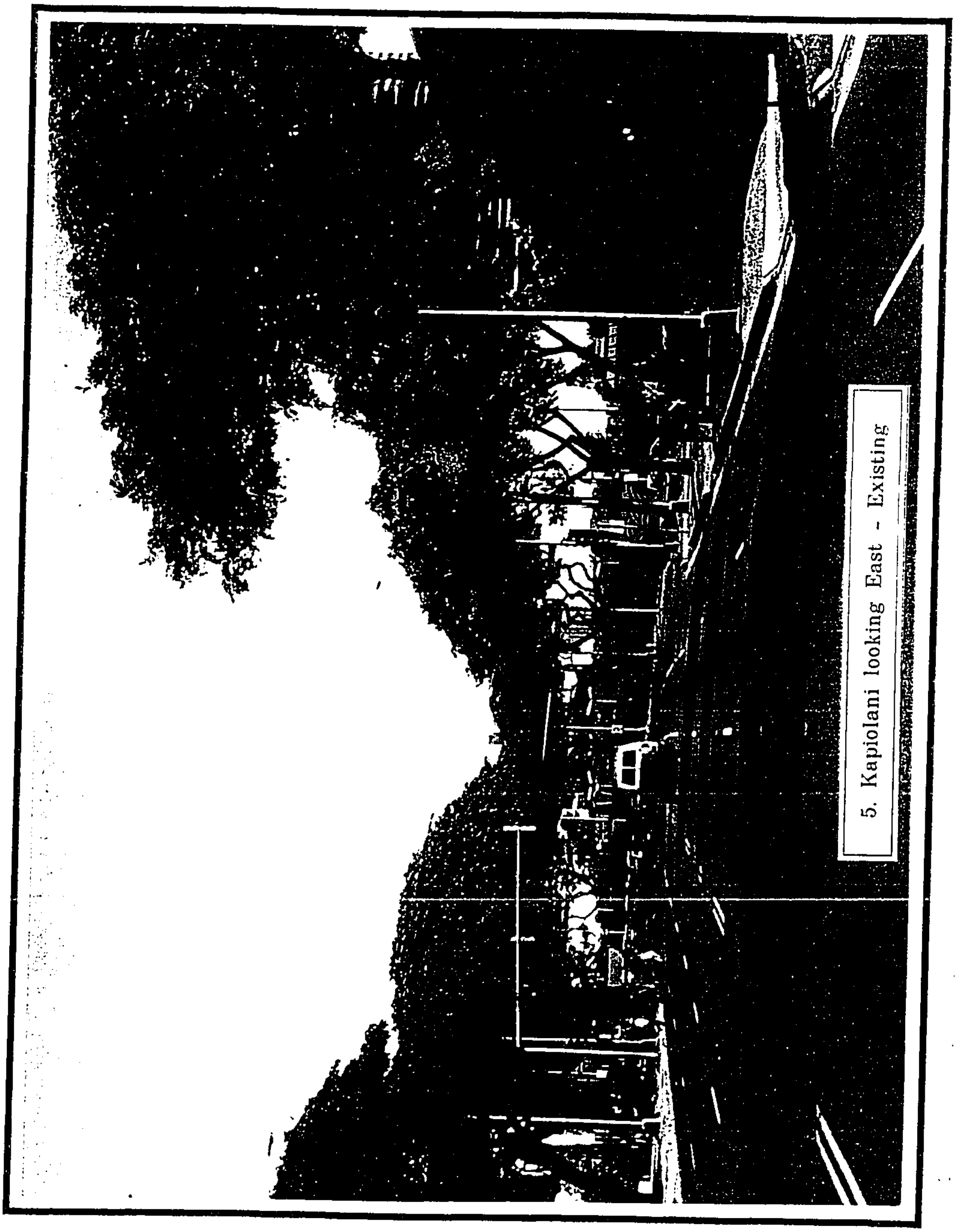

5. Kapiolani looking East - Existing

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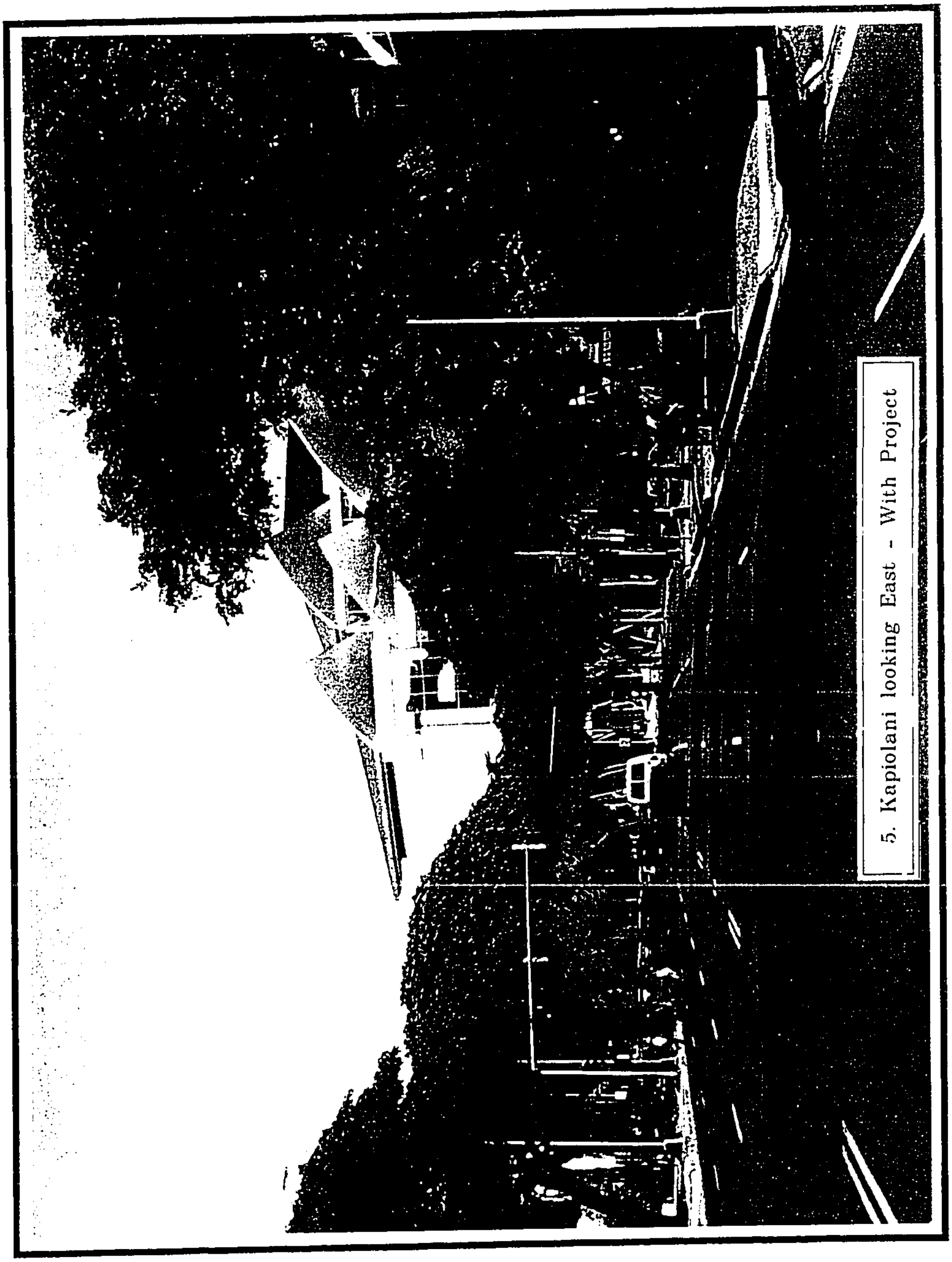

5. Kapiolani looking East - With Project

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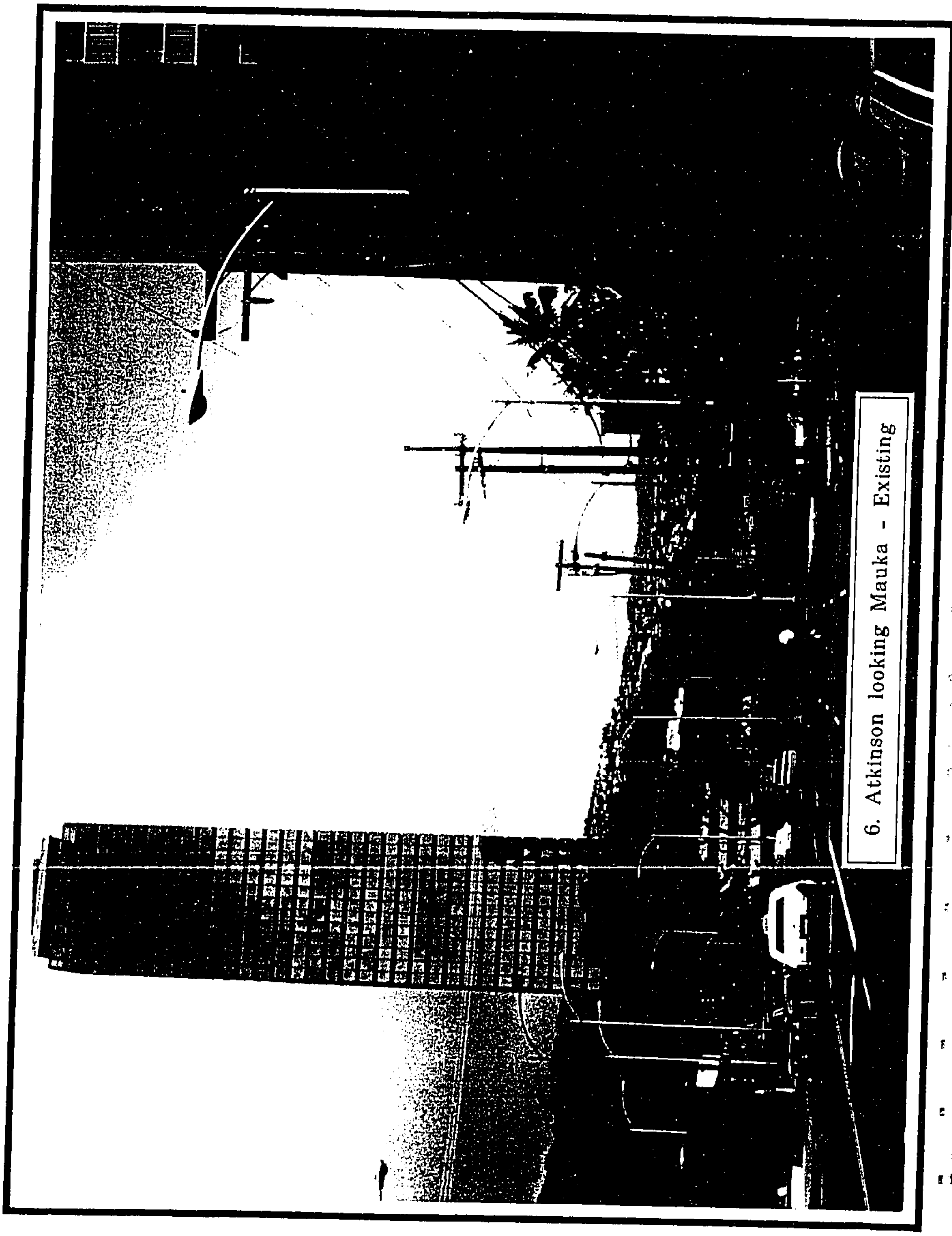

6. Atkinson looking Mauka - Existing

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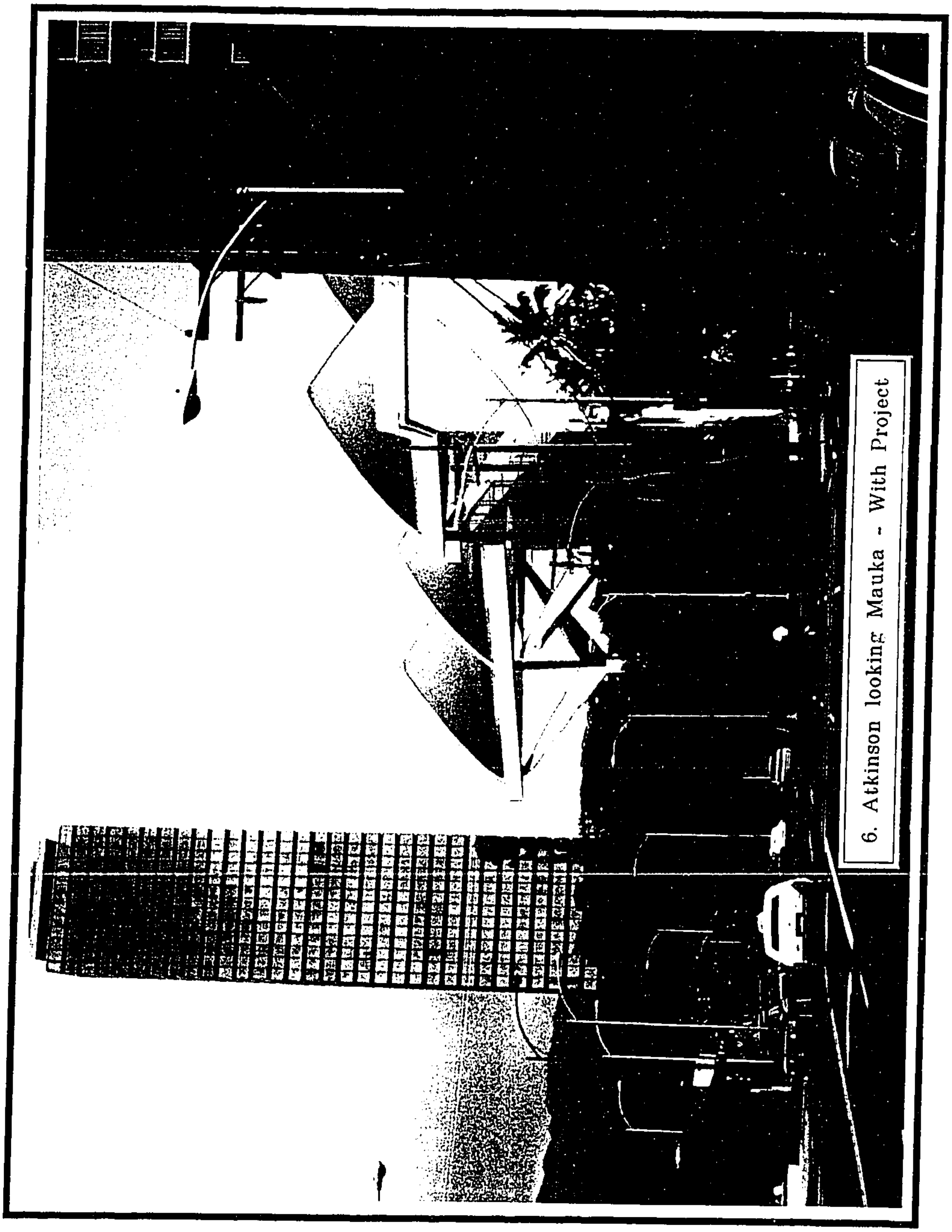

6. Atkinson looking Mauka - With Project

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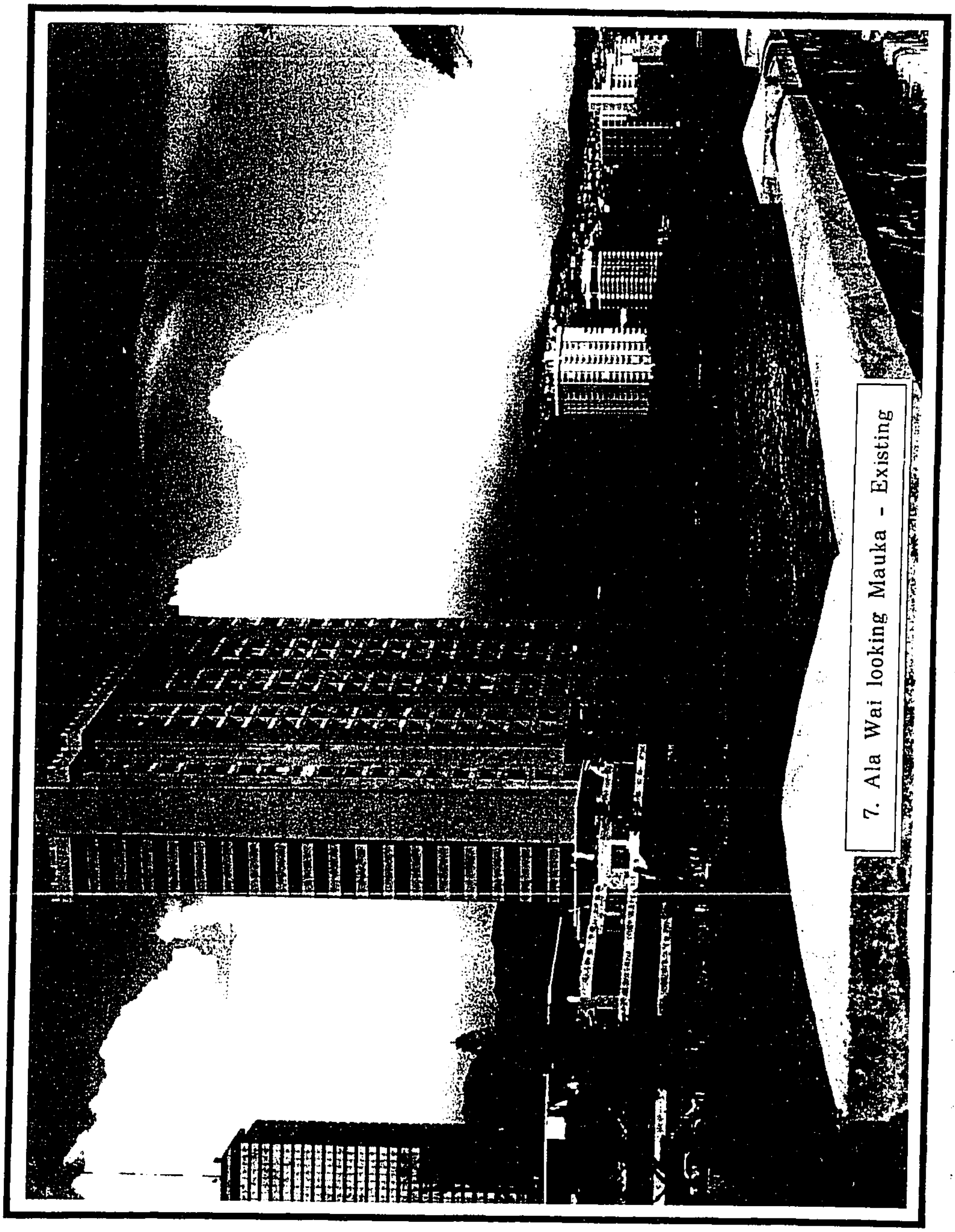

7. Ala Wai looking Mauka - Existing

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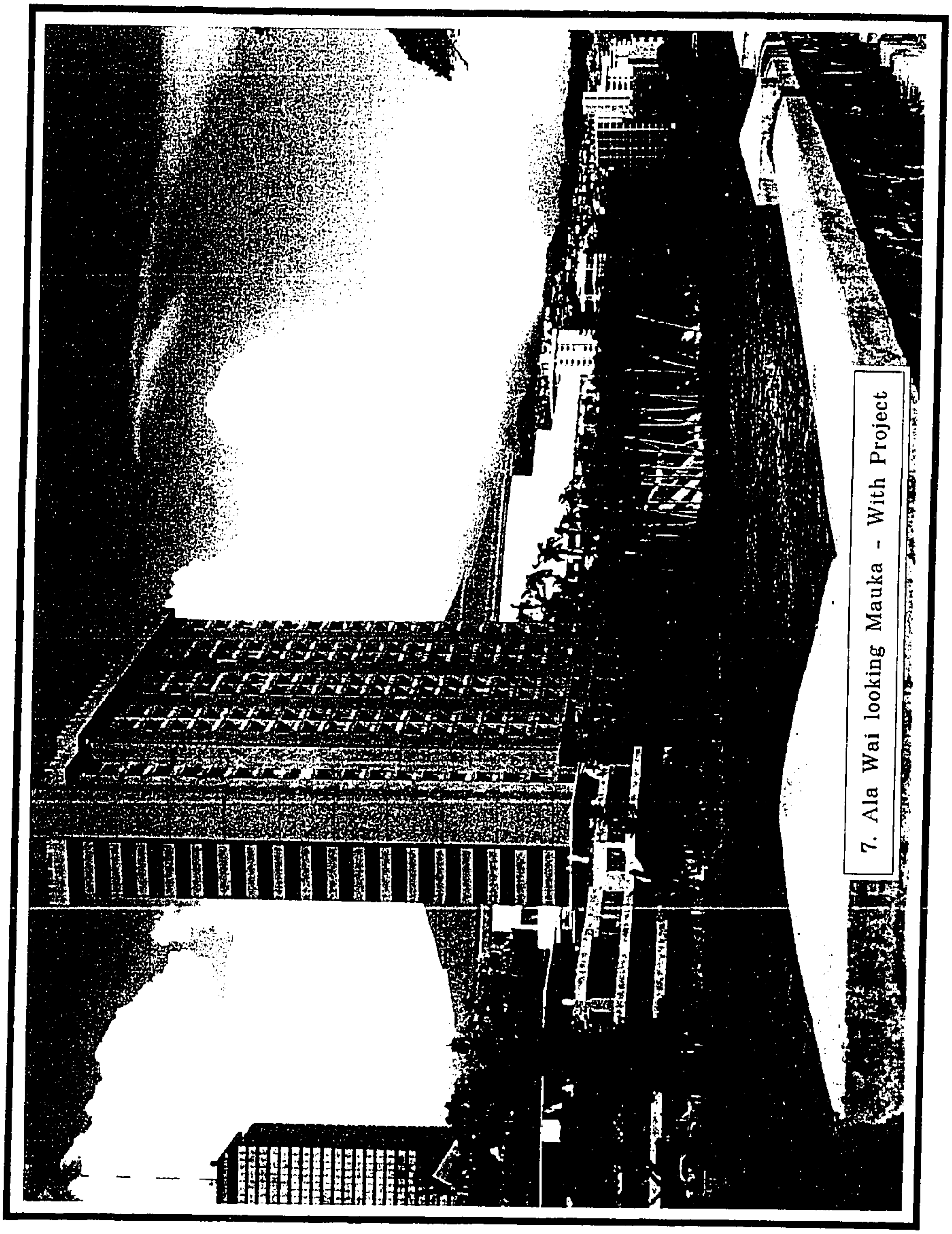

7. Ala Wai looking Mauka - With Project

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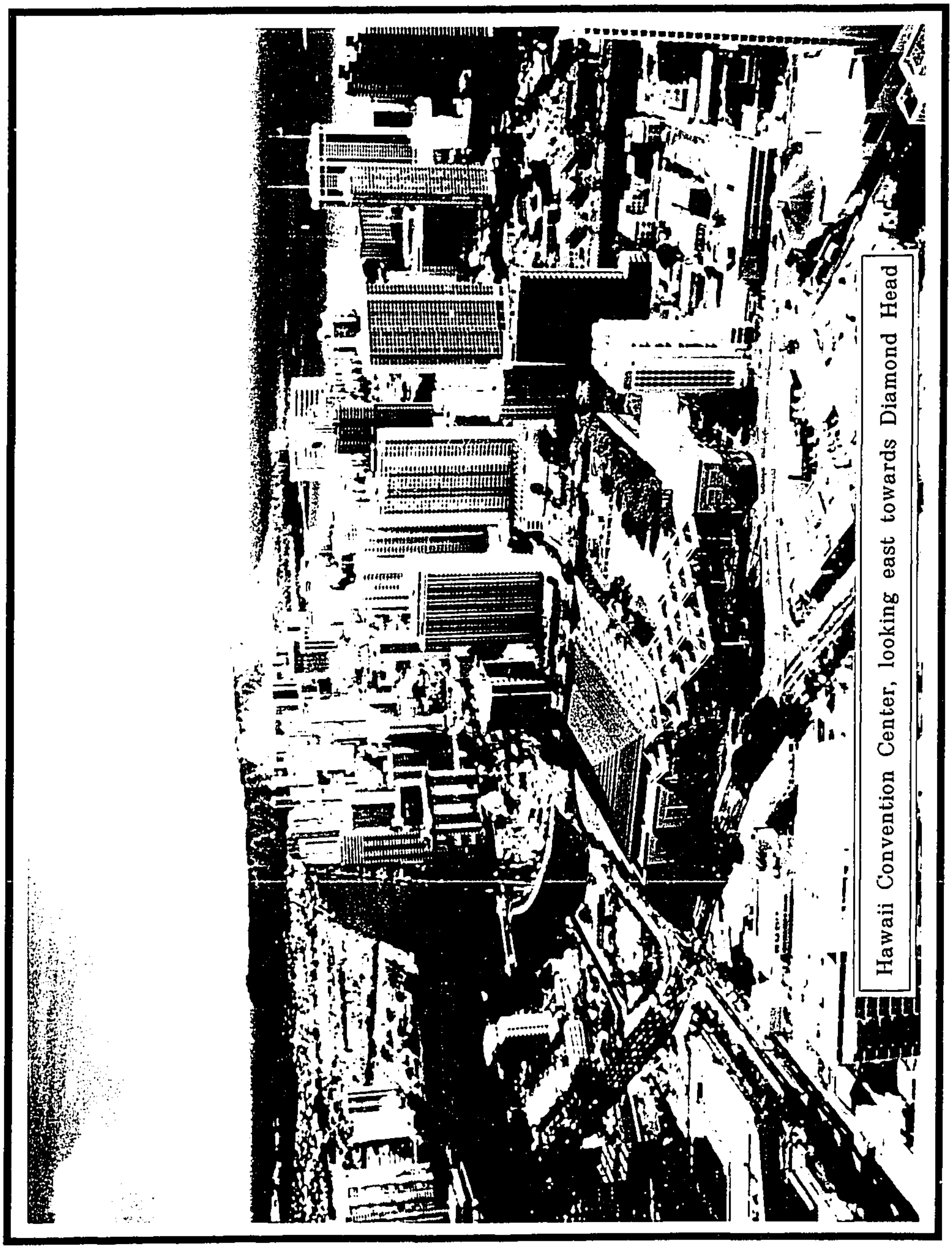


Hawaii Convention Center, looking east towards Diamond Head

# CHAPTER FOUR

# SOCIO-ECONOMIC ENVIRONMENT/IMPACTS

# 4. SOCIO-ECONOMIC ENVIRONMENT/IMPACTS

Two separate studies were conducted to assess the socio-economic impacts of the convention center project. The Social Impact Assessment (SIA) was prepared by Earthplan (Appendix G) while the Economic and Fiscal Impact Assessment was prepared by KPMG Peat Marwick LLP (Appendix H). Both studies have been revised since they were published in the Draft EIS in January 1995 based on comments received during the public review period. The findings of the revised studies are summarized in this chapter.

*Quantitative vs. Qualitative Assessment*

The Economic and Fiscal Impact assessment provides the context for the SIA by quantitatively projecting the convention center's impacts such as on hotel room demand, employment, incomes, visitor population, resident population, tax revenues and government expenditures. These projections are made on a State, County or industry level based on various available data serving as assumptions.

The SIA, on the other hand, qualitatively examines social impacts implied by the economic and fiscal impacts. One aspect of the SIA focuses on the immediate neighborhood which can be directly affected by construction activities at the convention center site and long-term changes in visitor and resident populations in the area, as well as secondarily as economic opportunities created by the convention center which could accelerate redevelopment. At the neighborhood level, however, it is difficult to predict how economic impacts quantitatively assessed at the Statewide or Countywide would be manifested. For example, while the Economic and Fiscal Impact Assessment may project the number of persons that may migrate into the County, it is impossible to project how many would move into the neighborhood. Hence, a quantitative analysis is not appropriate at this level. Another aspect of the SIA is an examination of community issues which, by nature, is a qualitative assessment.

*Use of Terms Describing Impact*

The Economic and Fiscal Impact Assessment uses the terms "direct," "indirect," and "induced" to describe the economic impacts of the convention center. The SIA, on the other hand uses the terms "primary," "secondary," and "cumulative" impacts. In other EISs, all of these terms have been used interchangeably. Within the respective contexts of the economic and fiscal assessment and the SIA, however, these terms have specific meanings and they cannot be used interchangeably between the studies. For example, while the economic assessment may consider the creation of hotel jobs as a "direct" economic impact, the SIA would regard this as a "secondary" impact of the convention center. The definitions of these terms, as used in these studies are provided below. The use of the terms in this EIS are consistent with those used in the SIA.

> Economic and Fiscal Impact Assessment - The impacts in this report are called "direct," "indirect," and "induced." The logic of this categorization follows the path of the dollars spent by delegates, exhibitors and attendees as opposed to their more familiar use in environmental and social impact studies, For instance, the most obvious direct economic impact of the convention center's operations is that it can be expected to attract visitors that would not otherwise come to the State. Therefore, any place those new visitors spend their money is said to be experiencing a direct economic impact of the Convention Center's development. This would include the convention center itself, as well as the hotels these new visitors stay at, and the restaurants and stores they may purchase meals and gifts at. Indirect and induced impacts represent the re-spending of these directly earned dollars throughout the local economy. More specifically:
>
> - **Direct Impacts** - Those variables that are affected by the direct expenditure of money by or on behalf of meeting or convention delegates or exhibitors. Examples include delegate or attendee expenditures for food, hotel rooms, entertainment and the like; event sponsors' expenditures for exhibit set-up and take-down; installation of audio/visual systems, hosted cocktail parties, company golf outings, and the like. Likewise, the employment of any person in the construction or operation of the Convention Center itself, or in the construction and operation of new hotels in which delegates and attendees may stay, is considered a direct impact of the Center's development.
>
> - **Indirect impacts** - These represent expenditures in the State by businesses that benefit from the new direct expenditures. For instance, the hotel operator that gains occupancy may purchase more proteas than previously from a farmer on Maui; an event planner may order a thousand boxes of specially packaged Kauai cookies as gifts for her delegates; the Convention Center operator pays its local phone bills, and sends uniforms out to a local laundry service.
>
> - **Induced Impacts** - These represent the re-spending of earned income throughout the State's economy by employees or proprietors of businesses that benefit from the direct or indirect expenditures. For instance a hotel worker may use her income to take her children out to the movies near her home in Mililani; a Convention Center employees may spend his

earnings to purchase groceries in McCully, and to send his children to a summer "space study" program on the Big Island.

In this manner, indirect and induced impacts become spread geographically throughout the State, as well as through the many sectors of our economy.

Social Impact Assessment - The social impacts are presented in terms of whether they are "primary," "secondary" or "cumulative" effects:

- Primary social impacts are those directly related to the presence and operation of the Hawai'i Convention Center. These impacts can be directly attributable to the facility, and would not occur if the project were not built. Examples of primary impacts include on-site employment, project-related traffic, and compatibility-related effects, such as increased activity and noise for neighbors.

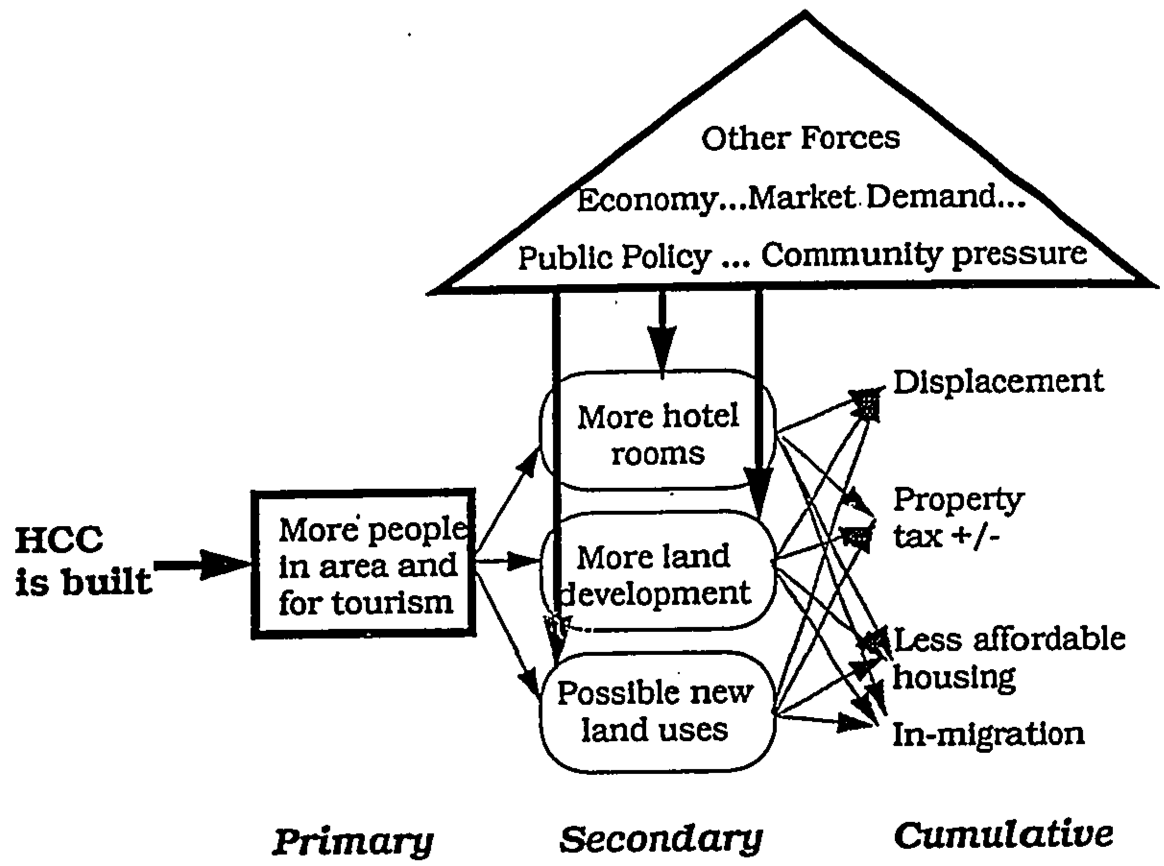
- Secondary social impacts are one-step removed from the primary impacts. While secondary impacts may be related to the presence of the project, they also depend on factors outside of the project's influence. Also, unlike primary impacts, many secondary impacts could occur regardless of project implementation, though the project may influence the timing of occurrence. Impacts which meet this criteria include development of nearby parcels, changes in neighboring land uses, hotel development and economic development.

- Cumulative impacts are those which could occur if the project were built, but the relationship between the project and the impact is less predictable than the primary and secondary impacts. Cumulative impacts would occur if the secondary impacts occurred, and, like the secondary impacts, could take place even if the project were not built. For example, population growth and related impacts due the secondary impacts are considered cumulative.

An example of how these definitions can be applied is illustrated in Figure 4-1.

*Range of Impact*

A major revision in the Economic and Fiscal Impact Assessment was the projection of a range of impacts. This range is defined, respectively, by "Scenario I: Lower Attendance and Spending at the Hawai'i Convention Center" and "Scenario II: Higher Attendance and Spending at the Hawai'i Convention Center." Scenario I presents a more




HAWAI'I CONVENTION CENTER

Fig. 4-1

EXAMPLE OF RELATIONSHIP BETWEEN HAWAII CONVENTION CENTER AND PRIMARY, SECONDARY AND CUMULATIVE SOCIAL IMPACTS

Prepared for :
CONVENTION CENTER AUTHORITY
State of Hawaii

Prepared by :
Nordic / PCL
Wilson Okamoto & Associates, Inc.

conservative assessment of the economic benefits of the convention center. Scenario II, while it presents a more optimistic projection of economic benefits, also has a greater potential for "negative" social impacts as discussed in the SIA. These would include concerns such as more in-migration, greater demand for hotel construction, greater pressure for redevelopment in the neighborhood, more traffic, etc. Hence, in the SIA, Scenario II is regarded as the conservative projection and is used as a basis for analysis.

*Order of Presentation*

In the Draft EIS, the summary of the social impact assessment was presented first, as it established the existing community that would be most directly impacted by the convention center. In this Final EIS, however, the order is reversed so that the broader context of the project's economic and fiscal impact is established before discussing how these impacts may manifest in the surrounding neighborhood.

## 4.1 Economic and Fiscal Impact

### 4.1.1. Key Assumptions

*Development and Construction*

Not all of the frequently cited $200 million development cost of the Convention Center is considered relevant to generating economic and fiscal benefits in the State of Hawaii. The $168 million construction figure used excludes bonds, overhead, profit, tax, the CCA's cash allowances and out-of-state design and consultant fees.

*Average Event Attendance*

Average event attendance is one of the two key assumptions used to establish the range of potential economic impacts of the convention center. The other is the expenditure rate, discussed subsequently. At stabilization, the CCA projects the Center will host an average of 60 events per year with an estimated 6,200 (Scenario I) to 7,500 (Scenario II) out-of-State exhibitors and delegates per event. The Convention Center is also projected by CCA to reach around 90% of stabilized operating capacity by 2003, its sixth year of operation, and full stabilization is projected to occur between its sixth and eighth year of operation. Thus, stabilized operations are reflected in 2008, which was picked as the projection horizon year simply because the center would then have been operating for a decade.

*New Delegates Attracted to Hawaii*

Gross new delegates and exhibitors attracted by the Convention Center are estimated as a function of average event size and number of events, as discussed above. In year 2008, this would represent approximately 450,000 new visitors over the year under the higher impact Scenario II, or about 372,000 visitors under Scenario I. These projections are then adjusted downward by 20,000 delegates to account for meetings and conventions that could be expected to use the Convention Center facilities, but which might have come to Hawaii anyway, even without a Convention Center. Finally, the attendees which may include spouses and others who may accompany delegates and exhibitors are added by a factor of 0.8 per delegate and exhibitor. Thus, in total, net delegates, exhibitors and attendees anticipated to be attracted to Hawaii by the Convention Center are estimated to range from 633,600 to 774,000 by the year 2008 for Scenario I and Scenario II, respectively.

*Expenditure Rates*

The expenditure rate is the second key assumption used to define the range of economic impact. Convention visitors are associated with significantly more spending than the average visitor to Hawaii, since costs of the convention, and entertainment and promotional items are added to their daily personal expenditures. HVB surveys on the meeting and convention markets show that in 1993 westbound meeting and convention visitors spent $617 per person per day while eastbound meeting and convention travelers spent $720.

To those familiar with typical other Hawaii visitor spending patterns, this figure may seem high. That is because, in addition to the money spent by each delegate or exhibitor, the sponsoring groups typically spend an even greater amount in the State (noted as "supplemental" spending by the HVB). According to the HVB, these supplementary expenditures include the following:

Hospitality activities (suite, food, beverage, service, tips, etc.)
Business entertainment/business meals
Cost of exhibit space
Local drayage/storage
Local exhibit material rental
Local audio/visual materials and equipment
Ancillary services (telefaxing, duplicating, printing, secretarial, etc.)
Union labor for exhibit set-up and take-down
Promotional or give-away items purchased locally

In the future, westbound visitors were estimated to represent 85% of delegates or exhibitors, and eastbound visitors 15%. Based on the above data, this would result in a weighted average expenditure per day for all Convention Center delegates or exhibitors of $632 in 1993 dollars, or an estimated $650 in 1994 dollars.

Future average spending per capita could be lower than historically, since the State is anticipated to attract larger events. Also, after reviewing data on supplementary expenditures per capita at the New Orleans and Orlando convention centers, KPMG estimated a supplemental expenditure rate about 20% to 40% less than observed historically in Hawaii, while personal expenditures for delegates/exhibitors and attendees remain the same at $182. This results in an average total per delegate/exhibitor expenditure of $465 to $555 per day, in 1994 dollars for Scenario I and II, respectively.

*Average Length of Stay*

In addition to average spending per person, the other key assumption affecting the projected total spending for visitors is their length of stay in the State. Over the 1991 to 1993 period, length of stay has averaged 8.57 days for westbound meeting and convention visitors, and 6.52 days for eastbound meeting and convention visitors, according HVB's annual Visitor Expenditures reports.

In order to evaluate the duration of the total stay on Oahu, as opposed to the Neighbor Islands, KPMG reviewed unpublished HVB data on meeting and convention visitors' intended length of stay by island. Based on this review and using a projected 85% westbound and 15% eastbound mix, KPMG estimated a weighted average length of stay of about 8.14 days in the State, of which 71%, or 5.77 days are on Oahu.

*Delegate and Attendee Expenditures*

Applying the average per capita expenditure to length of stay figures results in a projected $0.5 to $0.8 billion in delegate/exhibitor spending in 1998, rising to $1.3 to $1.9 billion by 2008 in 1994 dollars, based on Scenarios I and II, respectively.

Additionally, the attendees who accompany delegates or exhibitors could be expected to spend a total of about $168 to $207 million in 1998, or $417 to $509 million by 2008 in 1994 dollars, based on Scenarios I and II, respectively.

4.1.2. Economic Impacts

*Displacement of Other Visitors*

Some visitor industry representatives have expressed concern that the Convention Center could sometimes attract so many visitors to Oahu at once that other travelers, who may not book rooms as far in advance, could be displaced. To assess this concern, KPMG evaluated the seasonality patterns of meeting and convention and general visitors, and conducted interviews with a sample of the major tour wholesalers that serve Hawaii.

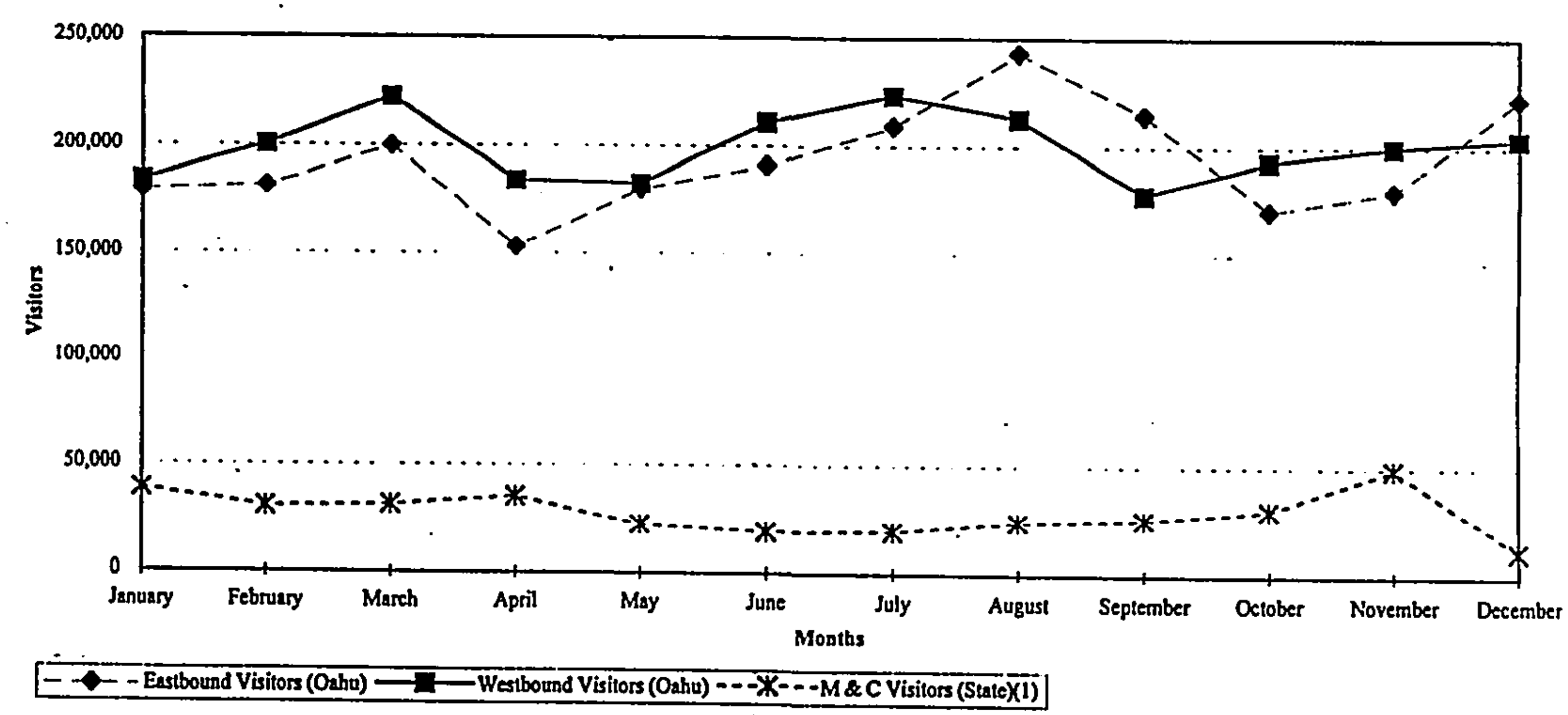
Seasonality patterns - The meetings and convention business has a different seasonality pattern from Hawaii's established vacation markets and this is one of its attractions as a supplement to Hawaii's other markets.

Figure 4-2 compares total east- and westbound visitors arrival patterns to Oahu, to those of visitors who come to attend meetings and conventions statewide. As shown, the meeting and convention market tends to peak in November and April, which are slow periods for visitor arrivals in general.

Tour wholesaler interviews - The consensus of the interviews was that the availability of Waikiki rooms is not expected to be a major issue for westbound travelers, since they are generally flexible in terms of their exact dates of travel, and already spend significant portions of their visits on the Neighborhood Islands.

Eastbound tour wholesalers, on the other hand, did express concerns with respect to the Japanese market. This is because (1) 50% to 65% of the travelers from Japan tend to seek first-class hotel accommodations (like conventioneers), (2) in general, they are less flexible than their westbound counterparts in adjusting their dates of travel, and (3) most seek to spend a significant portion of their visit in Waikiki. While trends indicate that Japanese travel patterns are changing toward greater flexibility, it appears reasonable that a certain number of potential travelers to Hawaii will choose not to come to the State at all because their preferred Waikiki accommodations are not available at the times they wish to travel.

Based on KPMG's analysis, a potential displacement factor of 60,000 persons per year was used in Scenario II of the economic and fiscal impact model. This figure is reduced 17% to 50,000 in Scenario I, in proportion to the fewer delegates/exhibitors expected to attend.




(1) Includes delegates and attendees. Data not available for Oahu alone.
Source: Hawaii Visitors Bureau.

HAWAI'I CONVENTION CENTER

**Fig. 4-2**

**SEASONALITY OF EASTBOUND AND WESTBOUND VISITORS TO OAHU AND MEETINGS AND CONVENTIONS MARKET STATEWIDE (1994)**

Prepared for :
CONVENTION CENTER AUTHORITY
State of Hawaii

Prepared by :
Nordic / PCL
Wilson Okamoto & Associates, Inc.

*Demand for Additional Rooms*

When the potential new Convention Center-related room demand on Oahu exceeds the capacity of existing supplies, other visitors are expected to either shift to the Neighbor Islands or to contribute to pressures for future development on Oahu. A few may also choose not to come to the State at all, as discussed previously.

Average Room Night Demand

The net new visitors attributable to the convention center, (633,600 and 774,000 in 2008 for Scenario I and II, respectively) drive the projected number of rooms that these new visitors could be expected to demand throughout the State and on Oahu. Average room demand is estimated based on:

- Room demand and supply;
- Average nights of stay;
- Average persons per occupied room.

After adjusting for room nights that could be lost due to displacement of pleasure visitors to the State during certain high demand months, average new room demand for the State on any given day in the stabilized year 2008 is estimated to be 6,130 for Scenario I and 7,500 for Scenario II.

"Shift" to Neighbor Island

The initial demand is anticipated to be on Oahu hotel rooms. Once Oahu's existing capacity is absorbed, however, many potential Oahu visitors may choose to stay on the Neighbor Islands, while others could contribute to pressures to develop other properties on the island of Oahu, particularly near Waikiki.

A "natural" shift of visitor demand from Oahu to the Neighbor Islands is already evident within the industry. This trend is consistent with the increasing repeat visitor factor among Hawaii's tourists and the development and marketing of new hotels, resorts and visitor attractions on the Neighbor Islands. The Convention Center can be expected to accelerate this trend by bringing more business-driven travelers to Oahu, thereby tending to create more periods of higher competition for Waikiki hotel rooms as well as putting upward pressures on Waikiki hotel room rates.

KPMG estimated that 60 percent of the unmet Oahu room demand would be represent visitors that are willing to go to and/or spend more of their time on the Neighbor Islands instead of vacationing on Oahu, and the remaining 40 percent comprised those choosing to say on Oahu.

Thus, total average daily room demand attributable to the convention center is estimated in year 2008 as:

| | Scenario I | Scenario II |
|---|---|---|
| State of Hawaii | 6,130 | 7,500 |
| Oahu | 3,460 | 3,820 |
| Neighbor Islands | 2,670 | 3,680 |

Existing Oahu Supply

The Oahu room night demand will initially be absorbed by the existing Oahu supply of hotel rooms. In 1994, Oahu had about 28,414 hotel rooms exclusive of condominium-hotels, Bed and Breakfasts, hostels and other visitor accommodations, and 86% of these were located in Waikiki, according to the HVB. This inventory is considered capable of accommodating about 2,800 more occupied rooms per day, due to the island's average annual occupancies of about 80% over the last several years. Filling these rooms would result in improved occupancies, up to an annual average of 90% on the island.

In addition, the second tower of the Hale Koa Hotel, now under construction in Waikiki, includes 396 rooms and is projected to open in fall 1995. These rooms would be restricted to retired and active military personnel, the Reserves, the National Guard, and civilian Department of Defense workers. The first Hale Koa tower has been reported to be running at an average of 96% occupancy over the last five years; overflow demand has been taken up by other Waikiki hotel rooms. Therefore, the opening of the new Hale Koa tower is likely to relieve some of this pressure. The new tower's "contribution" to the general existing visitor market is weighted at about 75% of its 396 new units, or 300 units.

Thus, the available additional Oahu room capacity based on expected inventories, as of 1997, is estimated as follows:

| | |
|---|---|
| Additional occupancy at existing hotels | 2,800 units |
| Hale Koa Hotel - second tower | 300 units |
| Total | 3,100 units |

After the absorption of the Oahu demand by the existing supply of 3,100 units, the remaining convention center demand could support the development of 360 to 720 units on Oahu by 2008 in Scenario I and Scenario II, respectively. This scale of new development is considered feasible by 2008, particularly given that zoning already exists for about 850 more hotel units in or near Waikiki alone, as follows:

| | |
|---|---|
| Hilton Hawaiian Village's Kalia Tower | 400 units |
| Aloha Tower (rounded down) | 450 units |
| Total | 850 units |

*Average Daily Visitor Population*

On an average day in 2008, net new delegates and attendees are projected to range from 14,100 to 17,300 per day for the State, or 10,000 to 12,300 on Oahu, under Scenarios I and II, respectively. After adjusting for visitors who would be displaced either out-of-state or shifted to Neighbor Islands, the Convention Center's net impact on visitor population levels on an average day in the horizon year 2008 is estimated as follows:

| | Scenario I | Scenario II |
|---|---|---|
| State of Hawaii | 13,200 | 16,300 |
| Oahu | 8,000 | 8,900 |

*Employment Impacts*

The Center will generate short-term employment during the construction of the facility, and long-term employment in the operation and support of the Center, including employment at lodging facilities.

Construction Employment

- Direct construction employment at the Convention Center includes on-site laborers, operators and craftsmen, as well as professional, managerial, sales and clerical workers whose usual place of employment may be elsewhere on the island or State. Other types of direct employment include professional consultants such as architects, engineers, and a variety of technical consultants.

- Direct construction employment also includes jobs created at hotels whose development is encouraged by the business attracted by the Convention Center.

- Indirect and induced employment includes jobs created in other industries on Oahu and within the State expected to be stimulated by the direct employment of construction workers at the Center and at other hotel developments.

Total direct, indirect and induced construction employment for Scenarios I and II, in the peak employment periods of 1996 and 2004 to 2008, is summarized below.

Projected Direct, Indirect and Induced Construction Employment
Generated by the Convention Center: Statewide
(average annual person-years)

| | Scenario I | Scenario II |
|---|---|---|
| 1996 (peak of HCC construction period): | | |
| Direct | 450 | 450 |
| Indirect and induced | 710 | 710 |
| Total | 1,160 | 1,160 |
| 2004 to 2008 (peak of HCC operating period)(1): | | |
| Direct | 220 | 970 |
| Indirect and induced | 350 | 1,520 |
| Total | 570 | 2,490 |

(1)Figures represent total person-years over the five-year period.

Operational Employment

- Direct operational employment at the Center was estimated at 350 full-time equivalent (FTE) jobs.

- Additional direct operational employment at lodging facilities will be required to meet the new demand for hotel rooms attributable to the Center's development. This would include the demand for labor at existing hotels due to improved occupancies, as well as that at new hotels.

- Indirect and induced employment due to the Center's development is expected to be generated elsewhere on Oahu and in the State.

Total direct, indirect and induced operational employment is projected to range as follows at the horizon year.

Projected Full-time Equivalent Operational Employment Attributable to the Convention Center: Statewide 2008

| | Scenario I | Scenario II |
|---|---|---|
| Direct - Convention Center operations | 350 | 350 |
| Direct - lodging facilities | 4,000 | 4,900 |
| Indirect and induced | 3,500 | 4,200 |
| Total (rounded) | 7,900 | 9,500 |

Operational Employment - Oahu

Considering the portion of room demand expected to occur on Oahu, the comparable Honolulu County impacts are projected to range as follows:

Projected Full-time Equivalent Operational Employment Attributable to the Convention Center: Oahu 2008

| | Scenario I | Scenario II |
|---|---|---|
| Direct - Convention Center operations | 350 | 350 |
| Direct - lodging facilities | 2,200 | 2,500 |
| Indirect and induced | 2,100 | 2,300 |
| Total (rounded) | 4,700 | 5,200 |

*Population Impacts*

The Convention Center can be expected to attract more residents and visitors to the State. Many of these impacts would be felt on the Neighbor Islands, as well as on Oahu. In-migrants to Oahu and the State can be attributed to employment generated by:

- The construction of the Convention Center and related hotels - these impacts are considered temporary.
- Operations of the Convention Center - these impacts are considered permanent.
- Operations of the hotels and other businesses such as restaurants, retail centers, souvenir manufacturers and etc. that could be expected to benefit from the Center's operations. The new hotel business could be manifested either in terms of improved occupancies or market support for new construction. Such impacts are considered permanent.

- Indirect and induced impacts of the above employment generators.

The resident population impacts of the Center's development and operations in the highest impact construction period year (1996) and operational period year (2008) are summarized as follows:

Projected Resident In-migrants Attributable to the Center
(1996 and 2008)

| | Scenario I | | Scenario II | |
|---|---|---|---|---|
| 1996 (peak of HCC construction period)(1): | Direct | Total | Direct | Total |
| To Oahu | 40 | 110 | 40 | 110 |
| To the State | 40 | 110 | 40 | 110 |
| 2008 (peak of HCC operating period): | | | | |
| To Oahu | 800 | 1,400 | 900 | 1,600 |
| To the State | 1,300 | 2,400 | 1,600 | 2,900 |

(1) Figures are assumed to represent temporary residents, on an average annual full-time equivalent basis.

Much of these projected population increases could be expected to occur on the Neighbor islands as opposed to on Oahu, following the room demand of delegates and exhibitors as well as shifts in visitation patterns by pleasure visitors to the islands. A potential tempering effect on the population increases would be the loss of jobs in the State. Such losses could result in a greater number of residents filling the jobs created by the Convention Center and there would be less in-migration. In June 1995, a survey showed that over the next two years, more than 1,200 direct primary jobs are at risk on Oahu alone. While some 1,566 potential new jobs are under discussion, these are still uncertain.

*Economic Impacts*

Visitor Expenditures

Direct spending by visitors attracted by events at the Center are projected to impact the State as follows:

- Spending by or on behalf of convention delegates and exhibitors was discussed previously, and is projected to average between $465 and $555 per delegate per day in 1994 dollars. Attendees, who accompany delegates/exhibits, spend significantly less, as their daily expenditures do not include the convention-related expenses.

- Based on the average length of stay of about 8.14 days, direct annual visitor spending due to Center attendance is projected to amount to nearly $1.3 to $1.9 billion by 2008, depending on the scenario.
- Indirect and induced spending adds another $0.77 to the economy per direct dollar spent by convention center visitors.
- The total effect of direct, indirect and induced spending attributable to the Center is projected to range as follows in the year 2008:

Projected Annual Visitor Expenditures Attributable to the Convention Center: Statewide, 2008 (1994 dollars, in millions)

| | Scenario I | Scenario II |
|---|---|---|
| Direct expenditures (1) | $1,648 | $2,331 |
| Indirect and induced | 1,269 | 1,795 |
| Total (rounded) | $2,918 | $4,125 |

(1) Net of lost spending by potential displacement of visitors out-of-State and the existing Oahu meeting capacity.

Personal Income

Personal income is defined as the wages and salaries paid to the direct construction, operational and lodging employees attributable to development of the Center. Personal income is projected on the basis of average industry wages and salaries for the various anticipated occupational categories and on the projected future employment demands.

Stated in 1994 dollars, personal income paid to Hawaii residents employed in the construction and operations of the Center could be expected to range as follows:

Projected Total Personal Income from Direct Employment at the Center
(1994 dollars, in millions, 1996 and 2008)

| | 1996 (peak of HCC construction period: | 2008 (peak of HCC operating period: |
|---|---|---|
| Scenario I | \$23.2 | \$113.0 |
| Scenario II | \$23.2 | \$143.7 |

*Fiscal Impacts*

Fiscal impacts are evaluated by comparing the operating tax revenues with the new operating expenditures that are projected to be incurred by the State and County governments.

Revenues

The development of the Center would bring additional tax revenue to both the County and the State governments.

For the County, there are two main sources of revenue: government service taxes and real property taxes. Government service tax revenues include fuel, utility, motor vehicle and other nongrant taxes. As a State-owned facility, the Center will be exempt from real property taxes. However, real property taxes would be collected from new hotel rooms developed on Oahu as a result of demand generated by visitors to the Center. The Convention Center could support the development of approximately 360 to 720 hotel rooms on Oahu by 2008, as shown previously.

The County's allocation of the State transient accommodation tax (TAT) collections is the most significant source of new revenues modeled. As of July 1994, the State is required to distribute its TAT collections as follows:

- The first one-sixth to the State's Convention Center Capital and Operations Special Fund (equivalent to 16.7% of total collections)
- Of the remainder, 5% to the State (equivalent to 4.2% of the total)
- Of the remainder, 44.1% to Honolulu County (equivalent to 34.9% of the total)

- The remainder to the other Neighbor Island counties.

Honolulu County's 34.9% share of the statewide collections could amount to $7.3 to $8.9 million per year by 2008, under Scenarios I and II, respectively.

In total, including other revenue sources, new County revenues are projected to range from $10.5 million to $13.0 million in 2008. Revenue sources to the State government are composed primarily of general excise taxes (GET) on development costs, on construction materials and on visitor expenditures; personal income taxes paid by new State residents; and the TAT paid on the additional hotel earnings attributable to visitors attending events at the Center. In addition, GET taxes on indirect and induced spending stimulated by direct spending are also included in determining total new revenues to the State.

Total new State tax revenues attributable to the Center are projected to range from about $137.7 to $194.6 million by 2008, for Scenarios I and II, respectively.

Expenditures

New residents attracted to the County and State by the development or operations of the Center would also necessitate additional expenditures of State and County public resources. In-migrant residents would require additional public expenditures for public safety, maintenance of highways, recreational facilities and natural resources, health and sanitation measures, special cash capital improvements, education, mass transportation, retirement and pension funds, public welfare and other government functions. All of these government expenditures are allocated to residents who benefit from these services. Visitors, however, do not require government tax resources for items like retirement and pension funds and certain other services. Therefore, these expenses are not allocated to visitors.

New expenditures by the County over the construction period are projected to be negligible. However, when completion of the Center brings significant levels of new in-migrant employees and visitors during its operations, County expenditures are projected to grow accordingly.

State government operating expenditures per capita are significantly greater than for the County. During development of the Center, State expenditures attributable to population are projected to be relatively low. However, by 2008, additional State operating expenditures also follow the increase in population.

Other significant costs to the State attributable to the Center include the cost of operating the Center, operating expenses for the Convention Center Authority (CCA), and the cost of debt incurred to finance the purchase of the land and the development costs of the Center.

In total, net additional State expenditures attributable to the center are projected to range from $67.4 to $75.1 million by 2008 for Scenarios I and II, respectively.

<u>County Revenue and Expenditure Analysis</u>

The new fiscal impacts of the Center to the County are estimated by comparing the projected operating revenues and expenditures for the County. Financially, the County experiences negligible operating expenses through the construction period of Center. However, County expenditures grow once the Center becomes operational and its resident and visitor impacts increase.

The analysis indicates that additional County government revenues projected to be generated by the Center are below the additional operating expenses during the construction period, but catch up during its operations, principally as a result of the sharing of the State TAT. If State policy is changed to reduce the allocation of TAT to the County, as has been proposed by the legislature previously, this conclusion could be significantly impacted. The County revenue and expenditures are shown for each of the two scenarios in Table 4-1.

<u>State Revenue and Expenditure Analysis</u>

The State could also benefit fiscally from the Center. During the construction period, the State's expenditures exceed revenues, largely because of the lack of revenue sources available to meet the debt service on financing for Center's development. However, visitor and other expenditures in the State are expected to increase greatly when the Center becomes operational, the net effects to the State reverse, as shown in Table 4-1.

*Other Impacts*

Two other potential impacts of the Center's development that do not pertain specifically to the other sections of this report, are as follows:

Table 4-1
PROJECTED RANGE OF FISCAL IMPACTS ATTRIBUTABLE TO HCC

FOR THE CITY AND COUNTY OF HONOLULU AND STATE OF HAWAII, IN THOUSANDS OF 1994 DOLLARS

| | HCC construction period | | | HCC operational period | | |
|---|---|---|---|---|---|---|
| | 1995 (1) | 1996 | 1997 | 1998 | 2003 | 2008 |
| City and County of Honolulu: | | | | | | |
| Net additional revenues: | | | | | | |
| Scenario I | $(34) | $(62) | $(39) | $1,000 | $2,500 | $3,600 |
| Scenario II | (34) | (62) | (39) | 1,100 | 3,900 | 5,400 |
| Revenue/expenditure ratio: | | | | | | |
| Scenario I | 0.3 | 0.3 | 0.3 | 1.4 | 1.4 | 1.5 |
| Scenario II | 0.3 | 0.3 | 0.3 | 1.3 | 1.5 | 1.7 |
| State of Hawaii: | | | | | | |
| Net additional revenues: | | | | | | |
| Scenario I | $(4,600) | $(4,900) | $(12,700) | $(800) | $48,300 | $ 70,300 |
| Scenario II | (4,600) | (4,900) | (12,700) | 17,400 | 89,300 | 119,500 |
| Revenue/expenditure ratio: | | | | | | |
| Scenario I | 0.5 | 0.6 | 0.3 | 1.0 | 1.7 | 2.0 |
| Scenario II | 0.5 | 0.6 | 0.3 | 1.3 | 2.2 | 2.6 |

- By creating a stronger demand for visitor rooms, some owners of condominium units in Waikiki could be encouraged to take their units out of the residential market and put them into visitor rental pools. This could cause displacement of some residents in Waikiki.

- The greater assured volume of paid traffic to the islands could encourage major airline carriers to provide more lift capacity to the State. This could be beneficial to residents traveling from Hawaii as well as visitors traveling to the State.

## 4.2 Social Impact Assessment

A Social Impact Assessment (SIA) was prepared by Earthplan in November and December 1994, and revised in June 1995, for the Hawai'i Convention Center project (see Appendix G). The report is summarized below.

### 4.1.1 <u>The Existing Community</u>

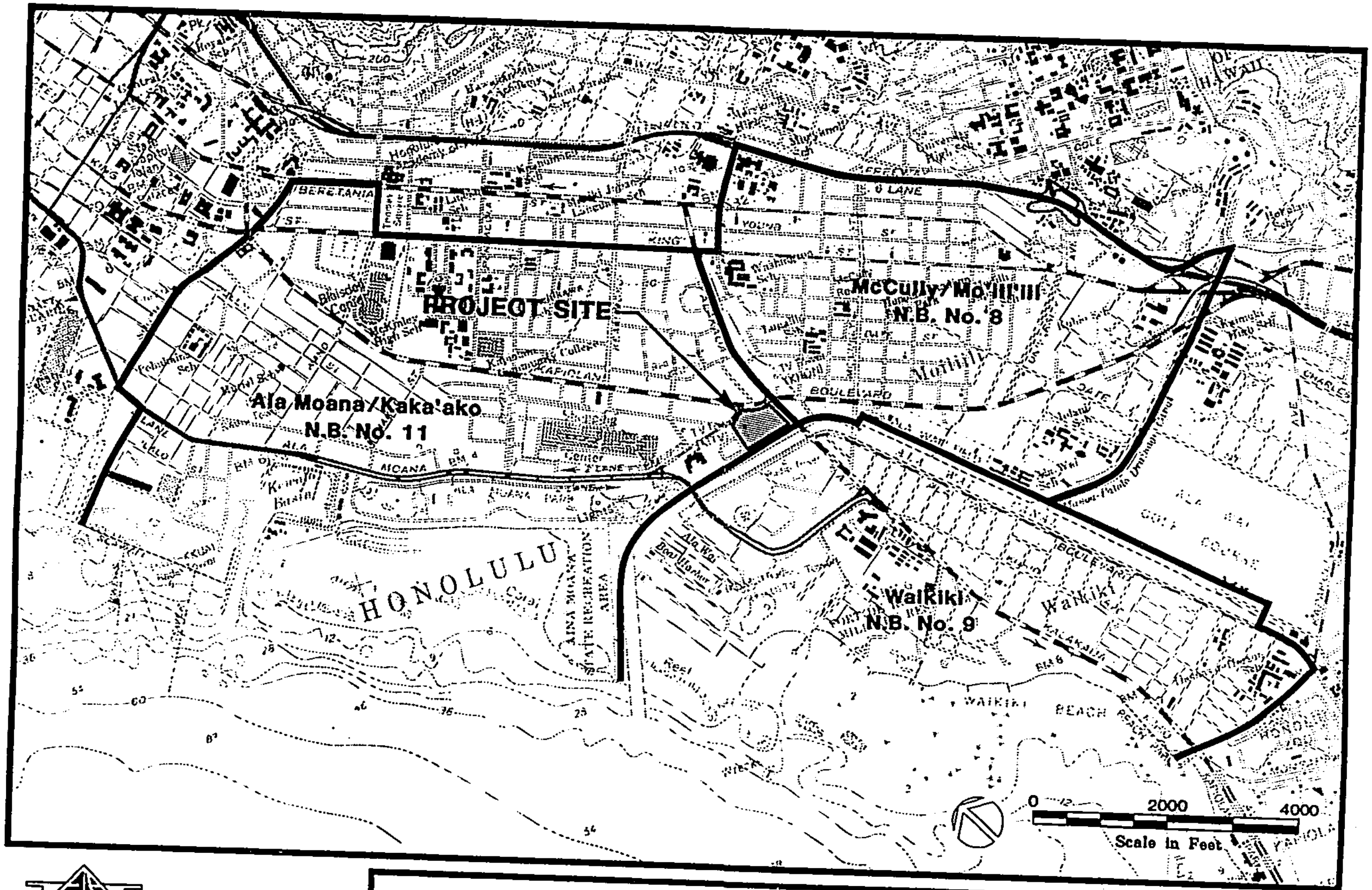
The Study Area for the SIA included three subareas: Ala Moana/Kakaako, McCully/Moiliili, and Waikiki. The boundaries of these subareas are coterminous with the respective Neighborhood Boards (see Figure 4-3).

According to the most recent census, almost 59,000 people lived in the Study Area in 1990. With about 28,500 residents, the McCully/Moiliili had almost the same population as the combined population of Waikiki (19,757 persons) and Ala Moana/Kakaako (10,943 persons).

These subareas had several distinct characteristics. In terms of age, the Study Area was generally older than the islandwide community. In 1990, Oahu's median age was 32.2 years. Waikiki and Ala Moana/Kakaako were significantly older with median ages of 42.3 years and 42 years, respectively. The McCully/Moiliili subarea had a median age of 35.9 years in 1990.

In terms of ethnicity, both Ala Moana/Kakaako and McCully/Moiliili had high proportions of Japanese and Koreans, when compared to islandwide statistics. Over 60 percent of the Waikiki area were Caucasian. The proportions of Filipinos and Hawaiians were relatively very low in all of the subareas.

Overall, the Study Area residents received slightly more education than islandwide residents, and there was a slightly larger civilian labor force.




HAWAI'I CONVENTION CENTER

Fig. 4-3

NEIGHBORHOOD BOARD BOUNDARIES

Prepared for :
CONVENTION CENTER AUTHORITY
State of Hawaii

Prepared by :
Nordic / PCL
Wilson Okamoto & Associates, Inc.

Households were small in the Study Area. There was an average of 1.88 persons per household, compared to 3.02 islandwide. The Study Area tended to be less family-oriented; families comprised only 44 percent of the total households. On Oahu, three fourths of the households were family households. Most of the Study Area's occupied housing units were occupied by renters, with 57 percent in this category. The highest housing vacancy rate was found in Waikiki, and 31 percent of Waikiki's housing units were held as seasonal or vacation homes.

4.1.2 Potential Social Impacts

*Implications for the Visitor Industry*

If the project meets State objectives, the Hawai'i Convention Center will allow for the expansion of tourism in Hawaii and specifically on Oahu. From an economic perspective, the growth of tourism is beneficial in that it would ideally boost the economy and provide opportunities for local residents to improve their financial situation.

A study by KPMG Peat Marwick found that the Hawai'i Convention Center could require up to 7,500 hotel room nights in 2008. Considering the increased occupancy to existing Oahu hotels, new unit supply added by the Hale Koa hotel as well as the demand which can be absorbed by neighbor island hotels, up to 720 units could still be needed on Oahu, all of which can be accommodated under current zoning.

The social impact assessment centered on the social implications of tourism growth from a qualitative perspective. This analysis is not intended to be a comprehensive study of the social impacts of tourism, which would be well beyond the scope of this report. Rather, the discussion is meant to stimulate awareness regarding the current social issues and concerns related to promoting tourism.

Five fundamental issues were explored.

- Conflicting attitudes towards tourism. In a comprehensive statewide survey on tourism, there was overwhelming agreement that tourism has been good for the community and good for the respondents' own lives. Yet, there were also strong anti-growth feelings and opposition to any further hotel development. The strongest negative feelings were exhibited in areas with a high presence of tourism. A few economically troubled areas favored more hotels and nearby tourism jobs.

- Tourism and urbanization. For many, tourism has become the ultimate symbol of urbanization because it is associated with times of growth, economic development and progress. Tourism caused land use changes by introducing resort development and large land areas are used for supporting activities, such as golf courses.

This association between tourism and increased urbanization becomes particularly poignant for people who prefer the slower pace of life in the days before tourism was a major influence. For them, the increase in tourism, and hence economic development, means the end of mom-and-pop stores, small town relationships, and general feelings of ohana and safety.

- Tourism wages and working conditions. A common perception is that visitor industry jobs pay low wages. In addition, there is also concern that visitor industry employees work under less than desirable conditions.

- Tourism and cultural effects. Hawaii's visitor industry uses Hawaiian culture and aloha in its marketing. Mainland and foreign visitors are attracted to advertisements featuring hula dancers and luaus. Industry critics feel that tourism has exploited aloha. They assert that aloha has become simply a marketing tool, a commercial gimmick. Moreover, it has been pointed out that tourism, in its commercialization of aloha and Hawaiian culture, has had harmful effects on the kanaka maoli.

- An emerging approach to tourism. Various groups in our community, including business and environmental interest, are warning that development of high-density resort areas and increased urbanization will eventually hurt the industry itself. They stress that visitors come to Hawaii to experience something different from their home environment, and do not want to see high-density development, major traffic jams and overcrowded beaches.

  An emerging suggestion from environmental interests is that Hawaii depart from conventional growth-is-good mentality, and strive for sustainable development. This includes an economy which is indigenous and self-reliant, and is based on maximum citizen participation.

As the convention center becomes a reality, it is important that public decision makers, the visitor industry, the business community, landowners and developers continue to consider the less tangible social effects in their evaluation of project impacts.

*Population Impacts*

The creation of jobs associated with the construction and operation of the convention center as well as for the construction and operation of lodging facilities, including increased occupancy at existing hotels are employment impacts that may arise as a result of project implementation of the convention center. The relevance of employment to social impacts is that new residents may move to Oahu and Hawaii to fill some of these jobs.

Primary population impacts for the three year construction period include in-migrants coming to Hawaii for convention center-related construction jobs. Depending on the level of activity, it is estimated that about 24 in-migrants may come the first year, 44 in the second year and 20 in the last year. Long-term impacts of operation of the Hawai'i Convention Center may generate up to 350 on-site jobs, of which, five-percent, or about 18 positions, may be filled by in-migrants. The total in-migration for on-site employment may amount to about 40 persons, including dependents. The short-term in-migration of 44 people during construction and 40 permanent residents is not considered significant.

Secondary population impacts under the high-impact scenario include an in-migration of up to another 855 persons to fill jobs during construction of new hotels, or to fill positions in hotels after they are completed. The addition of 855 persons to Oahu over a ten-year period is not considered a significant impact. Although it is difficult to project where these new in-migrants will choose to live on Oahu, it is likely that many may want to live close to their jobsites in or around Waikiki. If this is the case, then current planning for these areas may be able to account for the resident population increase. If all the project's primary and secondary impacts were to be concentrated within the Waikiki, Ala Moana/Kakaako and McCully/Moiliili Neighborhood Board areas, the new population would account for 5.6 percent of the projected 2010 population. The City's projection of corresponding housing unit increase of over 9,600 units in the Study Area would provide an adequate supply of housing for primary and secondary in-migration.

Cumulative impacts under the high-impact scenario include the possible in-migration of up to 727 persons to Oahu to fill indirect and induced construction and operational jobs. These are jobs related to supporting the visitor industry once the convention center and new hotels are built. There will be cumulative impacts related to public services and facilities, and it is expected that most of the impacts will be mitigated by the increased tax base resulting from the additional population.

*Regional and Neighborhood Character*

The project will affect the neighboring community by introducing a new use and providing a gathering place for thousands of people.

Three primary impacts include:

- Construction Impacts

  Activities due to the construction of the center may affect the quality of life for near-by residences, especially those at home during construction hours. For the nearby small businesses, construction activities may hamper operations during business hours.

- Loss of on-street parking

  Proposed roadway improvement will cause the loss of a minimum of ten on-street parking stalls in the surrounding neighborhood. Since older residential structures do not have adequate parking facilities, nor do they offer visitor stalls, on-street parking is already at a premium.

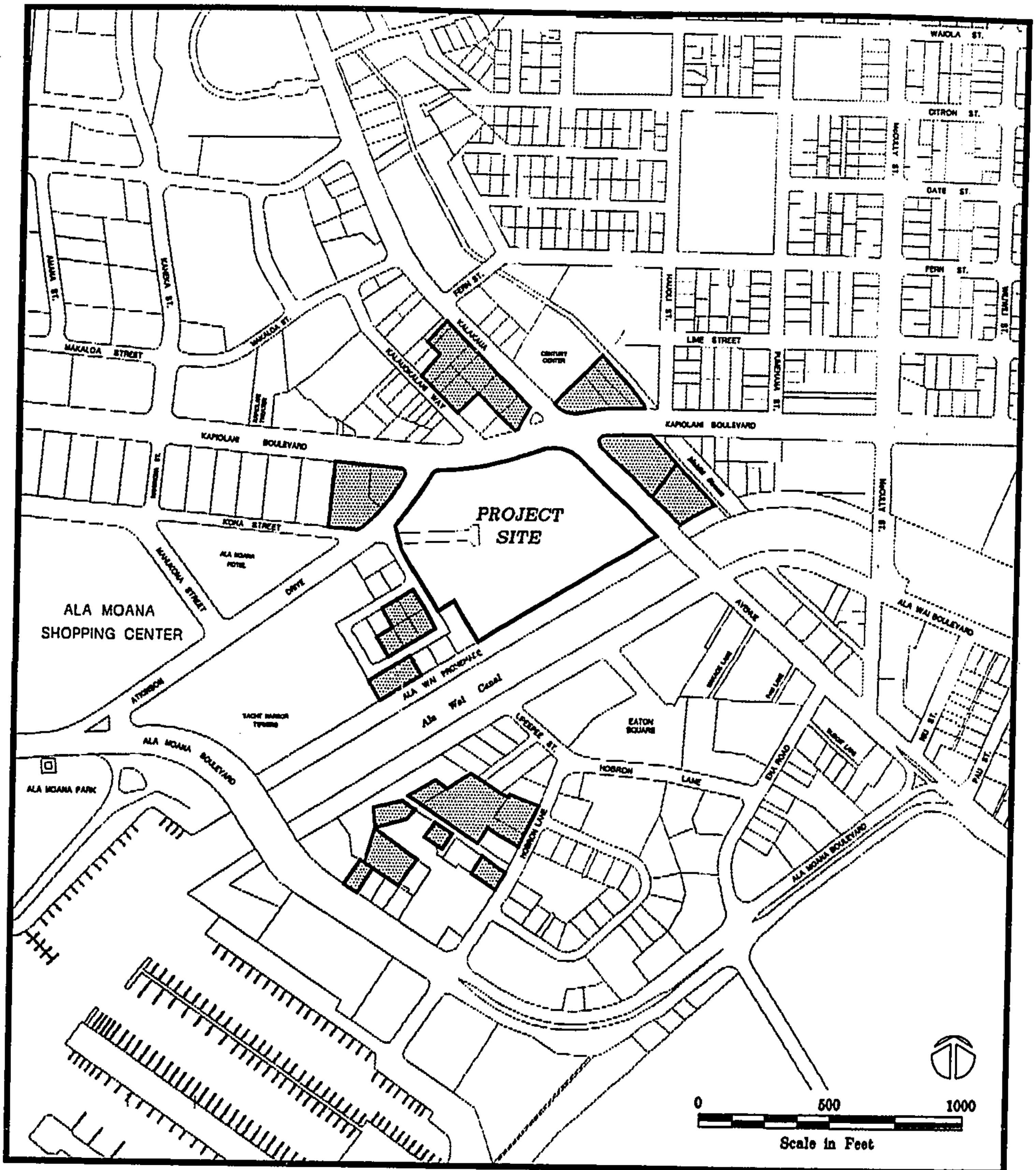
- Increase in activity and de facto population

  The convention center will transform what is currently open space into a gathering area which will sometimes hold thousands of people. This will change the neighborhood quality by increasing the intensity of activity. Residents may have more new faces in their neighborhood. This would benefit businesses, especially those that depend on walk-in clients. The increased traffic, however, may also deter customers arriving in their own cars during conventions.

To evaluate the secondary impacts on the neighborhood, nearby areas were assessed to determine their susceptibility to redevelopment if the Hawai'i Convention Center were to be built. The analysis included (1) a review of what is allowed under current zoning, (2) an assessment of the extent to which lots have been built up, given present zoning, and (3) a review of landownership patterns based on information available at the State Department of Taxation.

Parcels which were found to be susceptible to change include (see Figure 4-4):

- More than half of the middle Kahakai Drive cul-de-sac;




HAWAI I CONVENTION CENTER

**LAND AREAS WHICH ARE LIKELY OR SUSCEPTIBLE TO CHANGE**

Fig. 4-4

Prepared for :
CONVENTION CENTER AUTHORITY
State of Hawaii

Prepared by :
Nordic / PCL
Wilson Okamoto & Associates, Inc.

- The Diamond Head area on Kahakai Drive between Summer Palace and Atkinson Towers;
- The corners of Atkinson Drive, Kapiolani Boulevard and Kona Street;
- The Makai half of the block bounded by Kapiolani Boulevard, Kalakaua Avenue, Kalauokalani Way and Makaloa Street;
- The corners of Kalakaua Avenue, Kapiolani Boulevard and Hauoli Street;
- The corner of Kalakaua Avenue and Kapiolani Boulevard;
- The former veterans of Foreign Wars clubhouse site; and
- The Ala Wai Gateway area

The project's impacts on these sites are two-fold. First, the presence of the Hawai'i Convention Center could accelerate the timing of redevelopment of these sites. Second, the land uses may be changed to be more responsive to convention center needs. Landowners may see the potential for resort uses on these parcels, particularly those located in Waikiki.

The proposed convention center is highly visitor-oriented and this quality introduces another level of possible changes to this residential neighborhood. While the convention center may not be the cause of change, it may serve as a catalyst for the development of neighboring parcels. A stand-alone convention center on a site located outside of the major resort district may create opportunities for redevelopment and financial gain. The possible cumulative effects of the project are as follows:

- Changes in assessed property values and rents

  Due to the secondary relationship between the convention center and the redevelopment potential of the surrounding area, it is not possible to determine and quantify the economic impact of the project on assessed property value. However, the presence of the convention center may enhance property values in the immediate neighborhood due to improved infrastructure and other factors. Should property values increase, two impacts would arise from a social perspective. First, property tax would increase which may become a burden for those with fixed incomes, such as elderly residents. Second, landowners and condominium owners may offset the additional taxes by raising rent. This would create problems for renters and small businesses alike.

- Displacement and change in demographics

  The convention center could contribute to cumulative displacement in two ways. First, residents and businesses on redeveloped parcels would be displaced, and this would be especially burdensome for those who are occupying the units because of low rent. Second, cumulative displacement could occur in existing residential complexes where units double as short term rentals and transient accommodations. Should the owners of such units decide to permanently convert the unit to transient accommodations, then the renters will be displaced. In all, an estimated 1,650 persons may be displaced as a part of the cumulative scenario.

- Changes in residential neighborhoods

  With the redevelopment of nearby parcels could come a change in land uses to other more profitable uses. This will result in a transformation of residential neighborhoods, particularly those which contain affordable housing. Further, urban qualities will be intensified, and there may be changes in wind and light patterns if several high rises are added.

Four affected groups would experience a high level of impact due to primary, secondary and cumulative impacts of the project. These areas include: (1) residents in the Kahakai Drive area, (2) small businesses along Atkinson Drive (3) businesses and residents along Kalauokalani Way and residents Diamond Head of the Ala Wai Canal. Most impacted are the residents along Kahakai Drive who are subject to construction noise, dust and traffic impacts, as well as new traffic circulation, general increase in activity, and reduced on-street parking.

*Impacts on Public Services and Facilities*

- Police Protection

  The Hawai'i Convention Center's primary impact on police protection is that it will increase the need for such protection in the area by providing a gathering place for thousands of people. A secondary impact may occur due to the in-migration of residents who may work in the construction and operation of new hotels, as well as due to the increase in visitors in these new hotels. Cumulative impacts may arise because of the long-term increase in residents and tourists.

- Fire Protection

  The project site would be served by the Pawaa Fire Station No. 2. Back-up service would be provided by the Moiliili-McCully Fire Station No. 29. Additional back-up service may be provided by fire stations in Makiki, Waikiki and Kakaako. These facilities and existing personnel levels are expected to provide adequate services at this time, so the project is expected to have minimal primary impacts on fire protection services. A secondary impact could occur due to the redevelopment of nearby parcels and the development of new hotels in or near Waikiki.

- Medical Services

  Ambulance dispatch through the 911 system is available within the required eight minute response time from a number of medical facilities, including Queen's Medical Center, the Kaiser Clinic, Saint Francis Medical Center, Kapiolani Hospital and several private ambulances. It is anticipated the project can be adequately serviced by existing facilities. A secondary impact could occur due to the in-migration of 1,800 residents and their families who may hold construction or operational jobs related to the new hotels, as well as due to the increase in visitors in these new hotels. Cumulative impacts may arise as well because of the long-term increase in residents and tourists.

- Recreation

  Because of its proximity to the beach, the project may facilitate increased usage of these resources, specifically at Ala Moana Park, Fort DeRussy, as well as the beach fronting the Ilikai Hotel and Hilton Hawaiian Village.

  The project will improve that portion of the Ala Wai Promenade nearest to the convention center. It will provide a pleasant path for resident and visitors alike, and eventually may encourage other passive uses, such as picnicking.

  The project is not expected to have significant primary impacts on these uses and users in that no water transportation system or bridge improvements are included as a part of the project. Secondary and cumulative impacts may result due to potential redevelopment of nearby parcels, more hotel development and related cumulative resident and de facto population increases. Although the project does not include a water transport system, its presence on the canal may encourage private entrepreneurs to take advantage of this situation and establish a ferry system. Such a system may interfere with groups that use the canal for canoe and kayak training.

*Mitigation*

Table 4-2 identifies mitigation measures to address primary, secondary and cumulative social impacts of the Hawai'i Convention Center. Also identified are entities that may be responsible or appropriate for implementing these measures. Mitigation measures for primary impacts, which are construction-related, will be the responsibility of the design/builder. Potential secondary and cumulative impacts will require mitigation measures which are beyond the authority of the design/builder and the CCA to implement.

**Table 4-2**
**POSSIBLE SOCIAL IMPACT MITIGATION MEASURES FOR CONSIDERATION**

| | |
|---|---|
| **SHORT-TERM IMPACTS (CONSTRUCTION PHASE)** | |
| **Impact: Construction impacts on nearby residents** | |
| Proposed Mitigation Measures: | Responsible for implementation: |
| Establish a program for keeping nearby residents and businesses apprised of construction activities and potential adverse noise, traffic or other impacts that may be anticipated during the various phases of construction. | Design/Builder |
| Establish a hotline to respond to concerns which may arise during the convention center's construction phase. | Design/Builder |
| **SECONDARY AND CUMULATIVE IMPACTS** | |
| **Impact: In-migration of construction and long-term employees in new hotels and their families.** | |
| Possible Mitigation Measures: | Responsible for implementation: |
| Minimize in-migration by initiating job training programs for residents who may lose their jobs due to military base closures, plantation closures or other job reductions. | State Department of Labor and Industrial Relations/City Human Resources Department |
| **Impact: Accelerated interest and timing of development of parcels susceptible to change** | |
| Possible Mitigation Measures | Responsible for implementation: |
| Revise inconsistent City policies to establish consistent public direction regarding additional hotel rooms in Waikiki. Example: the Waikiki Master Plan recognizes hotel development in areas near the project site; the City Development Plan calls for a cap on hotel rooms. | City Planning Department/ City Council |
| Revise the Primary Urban Center Development Plan Special Provisions to prohibit resort development on parcels near the convention center, particularly in the areas identified as susceptible to development. | City Planning Department/ City Council |

**Table 4-2**
**POSSIBLE SOCIAL IMPACT MITIGATION MEASURES FOR CONSIDERATION**

| | |
|---|---|
| **Impact: Accelerated interest and timing of development of parcels susceptible to change (cont.)** | |
| Possible Mitigation Measures | Responsible for implementation: |
| Support the City's planning effort to determine the direction for growth and change in the nearby communities; work with Neighborhood Boards to determine the scope and boundaries of this effort. | Convention Center District Joint Advisory Council (CCDJAC) recommendation to City Planning Department |
| Establish land use and development policies based on neighborhood plans which encourage nearby landowners to maintain current land uses and density, and concentrate on rehabilitation. | CCDJAC recommendation to City Planning Department |
| **Impact: Contribution to negative perceptions and issues about tourism** | |
| Possible Mitigation Measures: | Responsible for implementation: |
| Sponsor and support efforts intended to resolve issues related to (1) promoting appreciation and understanding of fundamental values of Hawai'i's indigenous culture, as well as our multi-ethnic community; (2) visitor industry employment; and (3) community attitudes towards tourism. | Hawaii Visitors Bureau (HVB) and Hawaiian Cultural Organizations |
| Encourage each convention to include programs which promote Hawai'i's multi-ethnic cultures, with an emphasis on native Hawaiian values which create the convention center's Hawaiian sense of place. | HVB and Hawaiian Cultural Organizations |
| **Impact: In-migration of people to fill indirect and induced jobs will affect public services and facilities** | |
| Possible Mitigation Measures: | Responsible for implementation: |
| Use capital improvements programs funded by increased tax base to mitigate impacts of in-migration. | State Legislature, Governor, City Council, Mayor |

**Table 4-2**
**POSSIBLE SOCIAL IMPACT MITIGATION MEASURES FOR CONSIDERATION**

| | |
|---|---|
| **Impact: Changes in assessed property values and rent** | |
| Possible Mitigation Measures: | Responsible for implementation: |
| Revise laws to encourage landowners to maintain affordable rent structures. | CCDJAC Recommendation to City Administration and Council |
| Revise laws to restrict rent increases in specified area. | CCDJAC Recommendation to City Administration and Council |
| **Impact: Displacement due to redevelopment and reduction of affordable rentals in Waikiki.** | |
| Possible Mitigation Measures: | Responsible for implementation: |
| Establish a relocation plan for specified areas which are likely to change as a result of the cumulative effects of the convention center. Plan should include a funding/contribution plan and a schedule of payment. | CCDJAC Recommendation to City Administration and Council |
| **Impact: Possible establishment of water transport system in Ala Wai Canal** | |
| Possible Mitigation Measures: | Responsible for implementation: |
| Implement established mechanisms which regulate commercial uses in Ala Wai Canal | State Department of Land and Natural Resources (DLNR), DOT Harbors Division, City Department of Parks and Recreation (DPR) |
| Ensure minimal disruption and continued use of the Ala Wai Canal by Hawaiian canoeing. | State DLNR, DOT Harbors Division, City DPR |

Of particular concern are secondary and cumulative impacts on the neighborhood surrounding the convention center site. Due to its proximity to the project site, issues such as redevelopment, displacement, and in-migration would be more acute in the neighborhood. Toward addressing potential secondary and cumulative social impacts in the neighborhood around the convention center site, it is recommended that a Convention Center District Joint Advisory Council be established. The potential goals, purpose, membership, powers, funding and area of jurisdiction of such a council are contained in Table 4-3.

**Table 4-3**
**CONVENTION CENTER DISTRICT JOINT ADVISORY COUNCIL**

Identification of Need: Both the State and the City have long-term interests in the success of the Convention Center, the viability of the Waikiki visitor industry and the well-being of the surrounding community and its environs.

Goal: To provide an on-going means by which the State and the City can continue to work together following the completion of the EIS to resolve issues arising out of the convention center development and its impacts on the surrounding community.

Purpose of the Council: To monitor the impacts of the convention center on the surrounding community; to recommend mitigation measures, programs, and improvements to alleviate problems generated by the center (directly and indirectly); and to recommend sources and allocations of funds to be used to mitigate the impacts.

Membership: The council should be made up to the heads of key State agencies (CCA, DOT, DSSH, DLNR, etc.) key City agencies (Planning Dept. DTS, Office of Waikiki Devel., DLU, etc.) and designated representatives of the three Neighborhood Boards serving the area.

Powers: Advisory body to the State and City Administrations.

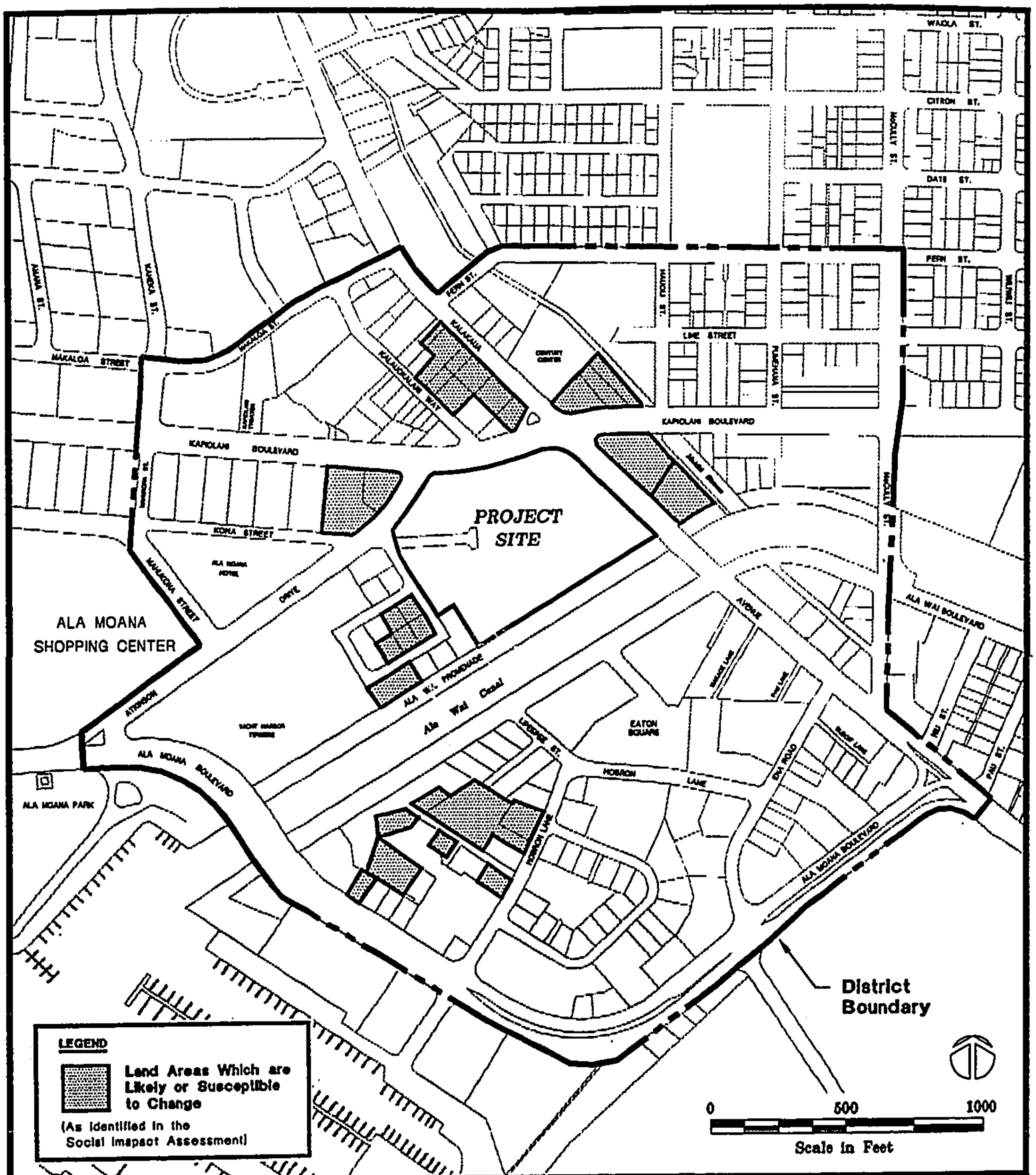
Funding: State would fund the operations of the Council and any studies that it decides to undertake.

Boundaries of the District: See Figure 4-5.

*Community Issues*

The social impact assessment included an analysis of community issues, based on interviews held for this report, and project-related correspondence and meeting minutes held in 1994. The findings of this issues analysis is summarized as follows:

- There is an expectation that this project will be built. At this point in time, the community generally expects that the Hawai'i Convention Center will be built as proposed. Economic pressures, legislative actions and the sheer length of time during which a convention center has been contemplated all lead people to believe that this facility is the one which will be built. Those who favored other sites or other proposals do not anticipate the revival of past alternatives. Further, even those who oppose the concept of a convention center seem resigned to the implementation of this project.




HAWAI I CONVENTION CENTER

**CONVENTION CENTER DISTRICT**

**Fig. 4-5**

Prepared for :
CONVENTION CENTER AUTHORITY
State of Hawaii

Prepared by :
Nordic / PCL
Wilson Okamoto & Associates, Inc.

- This project is considered a product of all previous discussions and proposals for a convention center. Our issues analysis indicate that people generally view this project as the evolution of previous convention center proposals. The project is seen as accommodating major issues related to other proposals, especially regarding building density and height. There is also a general sense that the spaces and functional requirements, which were sometimes considered compromised in previous proposals, can be met in the current proposal.

- Traffic continues to be the biggest concern. Project-related traffic was the number one issue for those interviewed and in project-related correspondence. Traffic is frequently addressed by the Neighborhood Boards. This concern is universal. Regardless of one's interest in the project, there is concern that the project's traffic will exacerbate an already bad situation, will burden nearby residents and businesses, will hurt Waikiki and will be a problem for the development of other parcels. So far, the project's proposal for traffic mitigation has satisfied some people, but many remain skeptical that any solution will be effective.

- Optimism is tempered by redevelopment realities. There is a great deal of concern and sensitivity regarding project effects on the surrounding neighborhoods. While construction impacts are an issue, a larger concern is the anticipated redevelopment of nearby properties. Even though people are optimistic about the beautification and economic development aspects of the convention center, they are concerned that whole residential neighborhoods will eventually give way to development pressures. This concern transcends one's affiliation or interests; all of the interview groups raised this issue.

- There is a need for an integrated approach in dealing with project impacts. The Hawai'i Convention Center is not viewed as a singular project on a nine-acre parcel. It has many systemic effects related to land use, economics, social aspects, and infrastructure. It requires State and City actions and funds; it depends on participation of the private sector. The community sees these interrelationships and many people are trying to bring the different pieces together. Currently, the Convention Center Community Network is attempting to provide a forum for a comprehensive review of the project. Such efforts need to be continued to ensure an integrated approach.

- "Hawaiian sense of place" extends beyond physical design. This term is a fundamental design characteristic required by the Convention Center Authority. Interview findings suggest that this characteristic extends past architecture and be incorporated in the programs and operation of the convention center. While the facility is designed to physically welcome people, there needs to be an attitude of encouraging the gathering place function and reflecting Hawaiian culture.

## CHAPTER FIVE

## INFRASTRUCTURE, PUBLIC FACILITIES AND SERVICES/IMPACTS

Hawai'i Convention Center

# 5. INFRASTRUCTURE, PUBLIC FACILITIES AND SERVICES/IMPACTS

## 5.1 1998 Traffic and Transportation Systems

A Transportation Impact Analysis Report (TIAR) was conducted in July 1995 for the HCC project which provides analysis of the potential transportation-related impacts of the convention center in year 1998 (see Appendix I). The TIAR analyzes key issues concerning traffic, parking, trucks and deliveries, public transportation, and pedestrians in the project vicinity. Mitigation measures, including roadway improvements, are discussed. The TIAR employs as a basis the *Hawaii Convention Center Transportation Impact Assessment* prepared by Wilbur Smith Associates dated May 16, 1994 (WSA/TIA) for input to the *Convention Center Environmental Assessment* (May 1994) (see Appendix L). Portions of the TIAR, originally prepared in January 1995 for the project's Draft Environmental Impact Statement (EIS), have been revised based upon comments received on the Draft EIS, subsequent discussions the City and County of Honolulu Department of Transportation Services (DTS) and other key government agencies and organizations, and previously unavailable studies and information. The following is a summary discussion of the TIAR.

For the purpose of this TIAR, analyses have been conducted for five (5) different scenarios relative to events at the convention center:

- Analysis of the weekday morning and afternoon peak hour traffic based on a national or international convention, or combination of conventions, with 10,000 attendees. This is a level that may be reached or exceeded approximately 15 to 20 days per year. The weekday morning peak one-hour traffic typically extends from about 7:15 AM to 8:15 AM, with the afternoon peak one-hour volumes occurring 4:00 PM to 5:00 PM.

- Analysis of the weekday morning and afternoon peak hour traffic based on a national or international convention, or combination of conventions, with 14,000 attendees. This level may be reached or exceeded once every three years, and is used to represent a "worst case" scenario for analysis of traffic impacts.

- Analysis of the mid-day (weekday) peak hour of traffic for a 14,000-person convention. The period of analysis occurs between 1:00 PM to 2:00 PM.

- Analysis based on a 3,000-person function hosted by a national convention on a Friday evening following the afternoon commuter peak period. The period of analysis occurs between 6:30 PM to 7:30 PM.

- Analysis based on an all-local event with 1,800 attendees held on a Friday evening following the afternoon commuter peak period. The period of traffic analysis occurs between 6:30 PM to 7:30 PM.

### 5.1.1 Existing Conditions

The project site is centrally located with respect to Waikiki area hotels as well as Honolulu's business district and highly populated residential areas. At present, roadways near the site are often congested, particularly during peak commute periods.

*Existing Roadways*

The project site is bordered by three major streets (Kapiolani Boulevard, Kalakaua Avenue, and Atkinson Drive) and one local street (Kahakai Drive). The three major streets connect the site to downtown Honolulu, Waikiki, and the Kapiolani business areas. The existing streets in the immediate project vicinity are described below.

Kapiolani Boulevard is a principal six-lane arterial serving the east side of the Central Honolulu area, providing access to downtown Honolulu, the Kapiolani business district, and the H-1 Freeway. During the weekday peak periods, the City places traffic cones along Kapiolani Boulevard to accommodate the large amount of resident commuter traffic traveling on the street. The coning provides an additional (fourth) reversed traffic lane to serve the peak travel direction, with only two lanes remaining to serve the off-peak travel direction (contra-flow operation). Left-turns are prohibited from the off-peak travel direction when the traffic cones are in place.

Kalakaua Avenue is a major four to five-lane arterial connecting the Waikiki area to the Kapiolani Boulevard and King Street-Beretania Street corridors. It also provides an access route to/from the H-1 Freeway. Mauka of Ala Wai Boulevard, Kalakaua Avenue is a two-way street. From Ala Wai Boulevard to Ena Road, Kalakaua Avenue provides inbound and outbound access to/from Waikiki. Koko Head of Ena Road, Kalakaua Avenue provides one-way movement into Waikiki.

Atkinson Drive is a five to seven-lane major street connecting Kapiolani Boulevard to Ala Moana Boulevard. The left-turn movement from makaibound Atkinson Drive onto Kahakai Drive is permitted from the median through lane.

Kahakai Drive is a two-lane local street providing access to the project site and to condominiums and apartment buildings. The loop portion of the street operates in a one-way clockwise direction and forms a STOP sign-controlled T-intersection at Kahakai Drive. The Kahakai Drive approach to Atkinson Drive is STOP sign-controlled.

Kona Street is a two-lane, privately owned roadway providing east-west circulation along the mauka side of Ala Moana Center and Ala Moana Hotel, between Atkinson Drive and Piikoi Street.

Ala Wai Boulevard for most of its length, is a major three to four-lane street which operates as a one-way west-bound couplet with east-bound Kalakaua Avenue to service the entire length of Waikiki. Beyond its intersection with Kalakaua Avenue at its ewa end, it serves as a two-way collector street for the Hobron Lane area.

Ala Moana Boulevard is a primary arterial providing access to the Downtown Honolulu, Honolulu Harbor, and Waikiki areas. It is a six-lane divided highway, with three lanes in the ewabound direction and three Diamond Head-bound lanes.

*Existing Traffic Conditions*

The traffic analysis focuses on conditions at the five key intersections in the vicinity of the project site which would be most affected by convention center traffic: Kapiolani Boulevard and Kalakaua Avenue, Kapiolani Boulevard and Atkinson Drive, Atkinson Drive and Kahakai Drive/Kona Street, Ala Moana Boulevard and Atkinson Drive, and Kalakaua Avenue and Ala Wai Boulevard. Based on comments received on the Draft EIS, analysis was also conducted of the T-intersection of Kahakai Drive and the Kahakai Drive internal loop street.

Recent traffic volume counts are provided in the TIAR. Based on analysis of the existing traffic volumes, four peak traffic periods have been determined to most likely be frequently affected by convention center traffic. These periods include the AM peak hour of weekday traffic, the PM peak hour of weekday traffic, the mid-day peak hour of weekday traffic, and the Friday evening peak hour following the PM peak commuter period. This study analyzes conditions at those key intersections for each of the four peak traffic periods that are likely to be most directly affected by travel to/from the convention center.

The intersection analyses were performed using procedures outlined in the *Highway Capacity Manual, Special Report 209* (HCM), Transportation Research Board, 1985, as amended, which are based on a concept referred to as Level-of-Service. In general, this method describes traffic conditions in a letter basis from A to F, which signify excellent to unacceptable conditions. For traffic signal controlled intersections, the level-of-service is based on average delay time per vehicle. Level-of-Service (LOS) D is considered acceptable as a design basis for peak hour conditions. The volume-to-capacity (v/c) ratio is also provided to indicate the portions of the theoretical capacity of the intersections being used by the existing or estimated traffic volumes.

The principal findings of the intersection analyses are indicated below and in Table 5-1.

Existing AM Peak Hour

Kapiolani Boulevard operates at acceptable levels during the westbound contra-flow operations. The intersection of Kapiolani Boulevard and Kalakaua Avenue is the busiest intersection in the study area, with LOS D conditions currently existing during the morning peak hour. Traffic exiting Kahakai Drive onto Atkinson Drive experiences LOS E conditions under unsignalized conditions. Traffic operates at LOS A conditions at the STOP sign-controlled T-intersection of the Kahakai Drive loop at Kahakai Drive.

Existing PM Peak Hour

Kapiolani Boulevard again operates well under the eastbound contra-flow operations with restricted turning movements. The intersection of Kapiolani Boulevard and Kalakaua Avenue operates at LOS C, with LOS D conditions at the Atkinson Drive and Ala Moana Boulevard intersection. Traffic exiting Kahakai Drive makaibound onto Atkinson Drive experiences LOS E under unsignalized conditions. Traffic operates at LOS A conditions at the STOP sign-controlled T-intersection of the Kahakai Drive loop at Kahakai Drive.

Existing Mid-day (Weekday) Peak Hour

Traffic on Kapiolani Boulevard is evenly distributed in the eastbound and westbound directions during the mid-day (weekday) peak hour. Existing conditions at the Kapiolani Boulevard-Kalakaua Avenue and Kapiolani Boulevard-Atkinson Drive intersections are LOS D and LOS B, respectively. Eastbound traffic on Kapiolani Boulevard queues back across the Atkinson Drive intersection during brief periods. Traffic on Atkinson Drive is also evenly distributed in the maukabound and makaibound directions. Traffic exiting Kahakai Drive experiences LOS E under unsignalized conditions.

## Table 5-1. Existing Peak Hour Capacity Analysis Without Project

| Intersection | AM | | | PM | | | Mid-Day (Weekday) | | | Friday Evening Post-Commuter | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LOS | V/C | Delay (seconds) | LOS | V/C | Delay (seconds) | LOS | V/C | Delay (seconds) | LOS | V/C | Delay (seconds) |
| Kapiolani Boulevard and Kalakaua Avenue | D | 1.000 | 34.4 | C | 0.881 | 19.6 | D | 0.962 | 28.8 | C | 0.862 | 23.5 |
| Kapiolani Boulevard and Atkinson Drive | B | 0.785 | 5.2 | B | 0.702 | 14.6 | B | 0.726 | 14.3 | B | 0.807 | 14.2 |
| Atkinson Drive and Kahakai Drive/ Kona Street | E* | --- | --- | D | --- | --- | E* | --- | --- | E* | --- | --- |
| Kahakai Loop and Kahakai Drive | A* | --- | --- | A* | --- | --- | --- | --- | --- | --- | --- | --- |
| Kalakaua Avenue and Ala Wai Boulevard | B | 0.729 | 12.8 | A | 0.825 | 14.3 | N/A | N/A | N/A | N/A | N/A | N/A |
| Ala Moana Boulevard and Atkinson Drive | C | 0.817 | 22.6 | D | 0.821 | 36.7 | N/A | N/A | N/A | D | 0.786 | 33.8 |

*Note: Kahakai Drive and Kahakai Loop LoS under unsignalized conditions.
N/A: Not applicable
Ref.: The Traffic Management Consultant

Existing Friday Evening Post-Commuter Peak Hour

Traffic entering the intersection of Kapiolani Boulevard and Kalakaua Avenue totals almost 5,400 vph, or about 84 percent of the commuter peak hour volumes, and operating at LOS C conditions. During brief periods, eastbound traffic on Kapiolani Boulevard queues back across the Atkinson Drive intersection. Traffic exiting Kahakai Drive onto Atkinson Drive experiences LOS E under unsignalized conditions. The intersection of Ala Moana Boulevard and Atkinson Drive operates at LOS D.

*Public Transit Access*

A number of TheBus trunk routes provide public transit access to the project site. TheBus service is provided along Kalakaua Avenue by Route 2 (Waikiki-Liliha), which provides service in each direction. Routes 3 (Kaimuki-Pearl Harbor) and 9 (Palolo Valley) operate along Kapiolani Boulevard. Also, TheBus urban trunk routes 8, 19, 20, and many suburban trunk routes, provide service along Kona Street on the mauka side of Ala Moana Center. Furthermore, TheBus Route 4 provides service along McCully Street. Bus stops for all these routes are located in the immediate or near vicinity of the project site, including the mauka side of Ala Moana Center, Mahukona Street, Kalakaua Avenue, Kapiolani Boulevard, McCully Street bridge Koko Head of the project site, and Ala Moana Boulevard.

*Pedestrian Activity*

Sidewalks in the project vicinity are typically four feet in width with some sections up to 10 feet in width. In addition to bus patrons transferring between bus routes at the Kalakaua Avenue/Kapiolani Boulevard intersection, other pedestrians include recreational walkers and joggers and Hard Rock Cafe patrons. Between 30 and 100 pedestrians per hour typically use each of the sidewalks and crosswalks in the area.

5.1.2 1998 Traffic Conditions Without the Project

Future traffic volumes were estimated for 1998 without development of the convention center project. The year 1998 is used for this analysis since the convention center is anticipated to be completed and available for convention usage by early that year. The 1998 volumes and conditions without the project provide a "baseline" condition from which to identify the location and magnitude of traffic impacts which are likely to result from development of the convention center. The analysis of baseline conditions without the convention center project assumes that the former Aloha Motors site remains undeveloped (vacant) in 1998. No roadway modifications are included in the analysis of 1998 conditions without the project.

An annual growth traffic growth rate of 1.5 percent per year has been assumed through 1998 for weekday peak traffic hours, mid-day (weekday), and Friday evening post-commuter traffic. This increase has been uniformly factored against all existing traffic volumes within the project vicinity. Table 5-2 summarizes the levels of service, v/c ratios, and average vehicle delays for each of the four peak hours of traffic analyzed in the TIAR.

1998 AM Peak Hour

Under existing roadway conditions, the 1998 AM peak hour traffic without project results in an overall increase in congestion and travel delays. The intersection of Kapiolani Boulevard and Kalakaua Avenue operates at LOS E and at a v/c of 1.074; i.e., the projected traffic demands exceed the intersection's carrying capacity.

1998 PM Peak Hour

Similarly, the 1998 PM peak hour traffic without project also results in an overall increase in congestion and travel delays. The intersection of Kapiolani Boulevard and Kalakaua Avenue continues to operate at LOS C, although the v/c ratio increases to 0.952 with an increase in vehicle delay of 22.5 seconds.

1998 Mid-day (Weekday) Peak Hour

During the 1998 mid-day (weekday) peak hour without project, the intersection of Kapiolani Boulevard and Kalakaua Avenue operates at LOS D and at a v/c of 1.02; i.e., the projected traffic demands exceed the theoretical capacity by 2 percent.

1998 Friday Evening Post-Commuter Peak Hour

The 1998 Friday evening post-commuter peak hour traffic without project results in an overall increase in congestion and travel delays. The intersection of Kapiolani Boulevard and Kalakaua Avenue operates at LOS D at a v/c ratio of 0.935. At the intersection of Ala Moana Boulevard and Atkinson Drive, the LOS conditions remain at LOS D, although the v/c ratio increases to 0.816, with a vehicle delay of 34.6 seconds.

### 5.1.3 Project Impacts

The analysis year is 1998, the first full year of operations for the convention center. To obtain a conservative basis for the purpose of analyzing transportation impacts, the TIAR assumes the convention center to hold the same size events as would be in its stabilized years.

## Table 5-2. 1998 Peak Hour Capacity Analysis Without Project

| Intersection | AM | | | PM | | | Mid-Day (Weekday) | | | Friday Evening Post-Commuter | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LOS | V/C | Delay (seconds) | LOS | V/C | Delay (seconds) | LOS | V/C | Delay (seconds) | LOS | V/C | Delay (seconds) |
| Kapiolani Boulevard and Kalakaua Avenue | E | 1.074 | 53.8 | C | 0.952 | 22.5 | D | 1.02 | 37.9 | D | 0.935 | 27.2 |
| Kapiolani Boulevard and Atkinson Drive | B | 0.843 | 6.0 | C | 0.759 | 15.7 | B | 0.806 | 14.7 | B | 0.890 | 14.2 |
| Atkinson Drive and Kahakai Drive/ Kona Street | E* | — | — | E* | — | — | E* | — | — | E* | — | — |
| Kahakai Loop and Kahakai Drive | A* | — | — | A* | — | — | N/A | N/A | N/A | N/A | N/A | N/A |
| Kalakaua Avenue and Ala Wai Boulevard | B | 0.801 | 14.0 | C | 0.897 | 16.3 | N/A | N/A | N/A | N/A | N/A | N/A |
| Ala Moana Boulevard and Atkinson Drive | C | 0.869 | 24.8 | D | 0.873 | 38.0 | N/A | N/A | N/A | D | 0.816 | 34.6 |

*Note: Kahakai Drive and Kahakai Loop LoS under unsignalized conditions.
N/A: Not applicable
Ref.: The Traffic Management Consultant

*Project Access*

Site access for the proposed convention center is separated into four components to effectively separate different types of traffic to minimize conflicts between vehicle types and modes of transportation. The main entrance to the convention center is located on the corner of Kapiolani Boulevard and Atkinson Drive and accommodates vehicular drop-off/pick-up and general pedestrian access leading to the lobby. All vehicles would enter this area via a right-turn from Atkinson Drive and exit onto Kapiolani Boulevard as traffic conditions permit. Vehicular access to the parking garage is provided by two ramps on Kahakai Street and a reversible direction ramp on Kalakaua Avenue. The separate entry and exit ramps on Kahakai Drive are one-way, single-lane spiral ramps. The gate control/parking attendant stations are located at the top of the entry ramp, providing about 225 feet of queue storage. The Kalakaua Avenue ramp would operate as an entrance ramp most times and can be used as an exit ramp during peak exiting periods. The ramp could be restricted to right-turn in during the entry operation and right-turn out during the exit operation.

Access to the loading dock area is located on Kahakai Street at an access separate from the parking garage ramps. The truck dock access ramp includes provisions for a turnaround area, thus minimizing potential queuing of service vehicles back onto the streets. Truck access to the loading dock is also provided with a right-turn in and right-turn out driveway on Kalakaua Avenue.

Pedestrian access is provided at the lobby entrance on the corner of Kapiolani Boulevard and Atkinson Drive, with a pedestrian-only access along the Ala Wai Promenade. Waikiki pedestrian traffic is expected to cross the Ala Wai Canal via the Ala Moana Boulevard bridge and the Kalakaua Avenue bridge and walk to the convention center along the Ala Wai Promenade.

*Travel Forecast Assumptions and Trip Generation*

The travel forecast assumptions and modal shares used in the WSA/TIA and the EIS TIAR were developed pursuant to discussions with persons with extensive experience in convention center operations across the nation and those associated with major Waikiki hotels which host convention events. Specifically, information was obtained through discussions held with managers and others associated with the Los Angeles, San Diego, Miami, Moscone Center (San Francisco), Portland, and Sacramento convention centers. The information obtained was further supplemented and verified in consultation with the State CCA's technical evaluation board member on convention center operations and with the CCA's Marketing Director. Validation of the travel forecast and modal split assumptions are included in the TIAR.

The traffic impact analysis is conducted for five (5) different event scenarios relative to events at the convention center:

1. Analysis of the weekday morning and afternoon peak traffic hour based on a national or international convention, or combination of conventions, with 10,000 attendees. Conventions of this size are likely to occur on no more than 20 days per year, and thus this size represents a reasonable "typical large recurring event" to use as a basis for identifying potential transportation impacts and mitigative actions. For the purpose of the EIS TIAR, the travel forecast assumptions used in the WSA/TIA have been adapted to the proposed convention center design to analyze the traffic impacts of a 10,000-person convention event.

   The following are the resultant levels of travel for a 10,000-person convention, based on the following factors and assumptions:

   - About 6,400 attendees would arrive during the morning peak hour, which would coincide with the commute peak hour.
   - There would be a gradual exodus of attendees throughout the mid-day and afternoon period, with about 2,000 expected to exit during the afternoon peak commute hour.
   - For a large national convention, 95 percent or more of the attendees would be visitors to Oahu, and 5 percent or less would be local residents.
   - A system of charter bus routes will be used to provide convenient shuttle service between Waikiki hotels and the convention center to augment the regularly scheduled public transportation services in the area. Approximately 45 percent of visitor attendees will be shuttled by charter bus to and from the convention center.
   - During the morning peak hour, about 35 percent of the 6,080 visitors to Oahu would walk to the convention center.
   - Approximately 5 percent of Oahu visitors will use rental cars to the convention center, at an average of 2.3 attendees per vehicle. Another 5 percent of Oahu visitors will use a taxi to travel to Center, with an average of 2.3 attendees per vehicle.

Approximately 10 percent of Oahu visitors will use TheBus to travel to/from the Center.

- Ninety (90) percent of local resident attendees are expected to travel via personal auto, with an average of 2.3 persons per vehicle. Ten (10) percent of local attendees are estimated to ride TheBus to/from the convention center.

- Approximately 150 full-time and part-time employees will work at the convention center facility each day during a major convention, exclusive of exhibitors and the additional food service workers needed for any special large banquets. Eighty (80) percent would be arriving/departing during the peak traffic hours. Thirty (30) percent of regular employees are assumed to use public transit, with 70 percent commuting by automobile with an average of 1.2 persons per vehicle. The large numbers of food service or other workers needed for special events are assumed to arrive and depart during the off-peak hours of traffic.

- Vendor deliveries and other service vehicles will typically average 5 to 10 vehicles per hour.

- In the morning peak hour, an estimated 533 vehicle trips would enter and 217 vehicles would exit the convention center. In the afternoon peak hour, an estimated 84 vehicles would enter and 233 vehicles would exit the center.

2. Analysis of the weekday morning and afternoon peak traffic hour based on a national or international convention, or combination of conventions, with 14,000 attendees. The analysis is used to represent a "worst-case" traffic situation, that which may be reached once every three years. This analysis of a larger size event is conducted in response to comments received on the Environmental Assessment for the Convention center, including the City Department of Transportation Services. This quantitative analysis is based on travel forecast assumptions used for the 10,000-person convention, which have been revised to achieve a more conservative basis for transportation impact analysis.

   The following are the resultant levels of travel for a 14,000-person convention, based on the following factors and assumptions:

- About 8,960 attendees would arrive during the morning peak hour, which would coincide with the commute peak hour.

- There would be a gradual exodus of attendees throughout the mid-day and afternoon period, with about 2,800 expected to exit during the afternoon peak commute hour.

- For a large national convention, 95 percent or more of the attendees would be visitors to Oahu, and 5 percent or less would be local residents.

- Approximately 70 percent of visitor attendees will be shuttled by charter bus to and from the convention center. This is greater than the 45 percent assumed to travel by shuttle bus for the 10,000-person convention. The 70 percent is similar to the ratio achieved by mainland convention centers without adjacent hotel complexes. A maximum seating capacity of 49 passengers is assumed in comparison to the shuttle bus load of 45 persons used for the 10,000-person convention.

- During the morning peak hour, about 10 percent of the 8,512 visitors to Oahu would walk to the convention center. The walk trip assumptions for Oahu visitors have been conservatively reduced from the 10,000-person convention which assumed a 35 percent walk mode. The cumulative reduction in the walk trip percentage reflects reductions in walk trip assumptions for each of the walking distance zones from the convention center to Waikiki hotels.

- Approximately 5 percent of Oahu visitors will use rental cars to the convention center, at an average of 1.2 attendees per vehicle. Another 5 percent of Oahu visitors will use a taxi to travel to Center, with an average of 2.3 attendees per vehicle. Approximately 10 percent of Oahu visitors will use TheBus to travel to/from the Center.

- Ninety (90) percent of local resident attendees are expected to travel via personal auto, with an average of 1.2 persons per vehicle. Ten (10) percent of local attendees are estimated to ride TheBus to/from the convention center.

- Approximately 150 full-time and part-time employees will work at the convention center facility each day during a major convention, exclusive of exhibitors and the additional food service workers needed for any special large banquets. Eighty (80) percent would be arriving/departing during the peak traffic hours. Thirty (30) percent of regular employees are assumed to use public transit, with 70 percent commuting by automobile with an average of 1.2 persons per vehicle. The large numbers of food service or other workers needed for special events are assumed to arrive and depart during the off-peak hours of traffic.

- Vendor deliveries and other service vehicles will typically average 5 to 10 vehicles per hour.

- In the morning peak hour, an estimated 908 vehicle trips would enter and 343 vehicles would exit the convention center. In the afternoon peak hour, an estimated 170 vehicles would enter and 396 vehicles would exit the center.

3. During the mid-day (weekday) peak traffic period, Kapiolani Boulevard carries about 75 percent of the peak hour traffic volume. The analysis of the mid-day (weekday) peak hour traffic was conducted in response to concerns expressed by the City Department of Transportation Services. Traffic impacts are a concern since the contra-flow coning operation and turn restrictions are not in effect during this period. With the absence of the contra-flow coning operations, traffic along Kapiolani Boulevard remains at an elevated traffic level (although considerably below the AM and PM peak traffic hours).

   The traffic impacts are analyzed under the following travel forecast assumptions:

   - The travel assumptions employed for PM peak traffic hour analysis for the 14,000-person convention are applied to this mid-day peak hour analysis. The analysis of the mid-day (weekday) peak hour occurs between 1:00 PM and 2:00 PM.

   - According to the State CCA, conventions generate very little traffic during the off-peak hours. Throughout the afternoon, conventioneers tend to "trickle-out", in contrast to the "rush" characterizing the morning arrival. Therefore, it is assumed that

25 percent of the attendees would leave the convention center facility during any given off-peak hour. It is also assumed that 12.5 percent of the attendees would enter or re-enter the facility during the off-peak hour.

- Seventy (70) percent of Oahu visitor attendees leaving the convention center facility during the mid-day peak hour (1,862 persons) are assumed to leave by shuttle bus.

- During the mid-day (weekday) peak traffic hour, an estimated 271 vehicles would enter the convention center and 342 vehicles would exit the center.

4. Analysis based on a 3,000-person function hosted by a national convention on a Friday evening following the afternoon commuter peak period. The 3,000-person event is based on the estimated seating capacity of the 35,000 square-foot ballroom at the convention center where recurring evening food function events could be held. As perceived by the general public, traffic entering Waikiki is predominantly heavy during the early evening hours on Friday and Saturday. Friday evening was selected to represent a "worst-case" situation, when the residual afternoon commuter peak period traffic overlaps visitor and resident traffic entering Waikiki. The period of traffic analysis occurs between 6:30 PM to 7:30 PM.

The following are the resultant levels of travel for the Friday evening post-commuter peak hour 3,000-person event:

- A higher percentage (40 percent) of Oahu resident attendees is assumed, since local attendees would likely be accompanied by a spouse or guest to an evening event. The analysis reflects that 90 percent would use automobiles, with an average of 2.3 attendees per vehicle which is a typical rate for a social event. Approximately 10 percent of local residents will use a taxi to travel to and Center, with an average of 2.3 attendees per vehicle.

- The remaining 60 percent of attendees will be comprised of Oahu visitor attendees and spouses. Approximately 25 percent of Oahu visitors will use rental cars to travel to the event. Rental car usage would be more significant for an evening event as Oahu visitor conventioneers are more likely to bring their spouses along, and assuming those spouses have rented cars for vacation-type activities during the convention.

- Sixty (60) percent of Oahu visitor attendees would be shuttled by charter bus to the event. Approximately 10 percent of Oahu visitors will use a taxi to travel to the Center, with an average of 2.3 attendees per vehicle. Since this would be an evening event, no Oahu visitors are assumed to travel by public transit to and from the event. Also, it is assumed that only 5 percent of visitor attendees would walk to the event (majority from Ala Moana Hotel) since this would be a more formal event.

5. Analysis based on an all-local event with 1,800 attendees held on a Friday evening following the afternoon commuter peak period. In general, the convention center will not be a primary venue to local events. Large indoor local events will continue to be staged at the Blaisdell Center or at the various hotel ballrooms in Waikiki and elsewhere. Nevertheless, the convention center could supplement the existing venues. The all-local event is assumed to occur on a Friday or Saturday evening in the 35,000 square-foot ballroom. The intent is to analyze the maximum size event at the convention center that could be accommodated by the number of on-site parking stalls. Larger events would require use of existing off-site parking and require that attendees be shuttled by buses to and from the convention center. The period of traffic analysis occurs between 6:30 PM to 7:30 PM.

   The following are the resultant levels of travel for an all-local 1,800-person event on a Friday evening following the post-commuter peak period:

   - Ninety (90) percent of the attendees will arrive in private vehicles at an occupancy rate of 2.3 persons per vehicle.

   - The remaining 10 percent of local residents will use a taxi to travel to the site, with an average of 2.3 attendees per vehicle.

*Traffic Assignment*

Vehicular access to the three-lane entry drive fronting the convention center lobby at the corner of Kapiolani Boulevard and Atkinson Drive would be via right-turn in from maukabound Atkinson Drive and right-turn out onto eastbound Kapiolani Boulevard.

Shuttle buses, taxis and vehicles from Waikiki travelling to the lobby entrance drop-off/pick-up area will be directed to approach the convention center from westbound Ala Moana Boulevard, turn right on maukabound Atkinson Drive, and turn right to the lobby entrance. The left-turn movement makaibound on Atkinson Drive into the main entry drive of the convention center will be prohibited. Vehicles exiting the lobby entry drive onto Kapiolani Boulevard will either proceed eastbound on Kapiolani Boulevard or turn right at Kalakaua Avenue.

Vehicles travelling to the convention center's parking garage entrance at Kahakai Drive will approach either from Ala Moana Boulevard (eastbound or westbound), turn right onto Atkinson Drive, and right onto Kahakai Drive; or from Kapiolani Boulevard (eastbound or westbound), turn onto Atkinson Drive, and left onto Kahakai Drive. Vehicles approaching the secondary access along Kalakaua Avenue would approach makaibound. Container trucks will be directed to approach the convention center by way of Nimitz Highway/Ala Moana Boulevard/Atkinson Drive to provide the most convenient route with the least impacts to traffic.

*Peak Hour Traffic Impacts*

The level-of-service (LOS), volume-to-capacity ratio (v/c), and average vehicle delays without mitigation (i.e., under existing roadway conditions) for each of the five (5) analyzed scenarios are presented in Tables 5-3, 5-4, 5-5, 5-6, and 5-7, respectively.

<u>1998 AM and PM Peak Hour Traffic Impacts for a 10,000-Person Convention</u>

**a. Kapiolani Boulevard and Kalakaua Avenue**

The intersection of Kapiolani Boulevard and Kalakaua Avenue is expected to experience a 4.1 percent traffic increase in the AM peak hour. Traffic conditions would continue to operate at LOS E, increasing the v/c ratio from 1.074 to 1.099 during the AM peak hour without mitigation (see Table 5-3). The westbound approach would deteriorate from LOS E to LOS F with a 10,000-person convention. The other critical movements would continue to operate at LOS F, including the makaibound approach on Kalakaua Avenue and the left-turn movement from maukabound Kalakaua Avenue. The traffic impacts during the AM peak hour are marginal, yet significant enough to require appropriate mitigation.

**Table 5-3. 1998 AM and PM Peak Hour Capacity Analysis 10,000-Person Convention**

| Intersection | Peak Hr | Action | LOS | V/C Ratio | Delay (seconds) |
|---|---|---|---|---|---|
| Kapiolani Boulevard and Kalakaua Avenue | AM | Without Mitigation | E | 1.099 | 56.7 |
| | | With Mitigation | E | 1.079 | 51.0 |
| | PM | Without Mitigation | D | 1.014 | 25.8 |
| | | With Mitigation | C | 0.879 | 21.8 |
| Kapiolani Boulevard and Atkinson Drive | AM | Without Mitigation | B | 0.843 | 6.8 |
| | PM | Without Mitigation | C | 0.759 | 15.8 |
| Atkinson Drive and Kahakai Drive/Kona Street | AM | Without Mitigation | F* | --- | --- |
| | | With Mitigation | C | 0.442 | 17.2 |
| | PM | Without Mitigation | F* | --- | --- |
| | | With Mitigation | B | 0.369 | 13.1 |
| Kalakaua Avenue and Ala Wai Boulevard | AM | Without Mitigation | C | 0.909 | 17.0 |
| | PM | Without Mitigation | C | 0.926 | 19.3 |
| Ala Moana Boulevard and Atkinson Drive | AM | Without Mitigation | D | 0.973 | 28.4 |
| | PM | Without Mitigation | E | 0.903 | 43.1 |

*Note: Kahakai Drive LOS under unsignalized conditions.
"Without Mitigation" = with existing roadway facilities.
Ref.: The Traffic Management Consultant

During the PM Peak hour, the intersection is expected to deteriorate to LOS D. The maukabound, makaibound and westbound approaches are not affected by convention center traffic. However, by impacting only the peak direction of traffic (i.e., right-turn movement on eastbound Kapiolani Boulevard to Wakiki-bound Kalakaua Avenue), the intersection capacity is exceeded by 1.4 percent. The relatively small increase in overall intersection demand (1.3 percent) causes significant impacts to the right-turn movement on eastbound Kapiolani Boulevard, resulting in LOS F without mitigation.

**b. Kapiolani Boulevard and Atkinson Drive**

The intersection of Kapiolani Boulevard and Atkinson Drive is not significantly impacted by the proposed convention center during the AM and PM peak hours of traffic. The critical movement during the AM peak hour is the eastbound through movement which is unaffected by convention center traffic. During the PM peak hour, intersection traffic demand is increased by less than 1 percent by convention center traffic.

**c. Atkinson Drive and Kahakai Drive/Kona Street**

Kahakai Drive is expected to be significantly impacted by convention center traffic. Kahakai Drive at Atkinson Drive is expected to operate at LOS F conditions during both the AM and PM peak hours of traffic under unsignalized conditions. The left-turn movement from makaibound Atkinson Drive to Kahakai Drive may occasionally block through traffic in the shared through lane, especially during the AM peak hour.

**d. Kalakaua Avenue and Ala Wai Boulevard**

The intersection of Kalakaua Avenue and Ala Wai Boulevard is expected to continue to operate at acceptable LOS during the AM and PM peak hours of traffic; however the traffic demands during both peak hours are expected to approach capacity conditions. The intersection is impacted primarily by the shuttle buses and taxis returning to Waikiki from the convention center. Traffic mitigation is not recommended at this intersection.

**e. Ala Moana Boulevard and Atkinson Drive**

The intersection of Ala Moana Boulevard and Atkinson Drive is expected to operate at the desirable minimum LOS D during the AM peak hour of traffic. The convention center traffic would use 10.4 percent of the existing intersection capacity. The primary traffic impact would occur on the right-turn movement on westbound Ala Moana Boulevard resulting from visitor traffic approaching the convention center.

During the PM peak hour, increase in traffic would only utilize 3 percent of intersection capacity; however, the overall intersection operation would worsen from LOS D to LOS E. The relatively small increase (2.4 percent) in PM peak hour traffic resulting from the convention center is sufficient to lower the LOS to undesirable conditions.

<u>1998 AM and PM Peak Hour Traffic Impacts for a 14,000-Person Convention</u>

**a. Kapiolani Boulevard and Kalakaua Avenue**

During the AM peak hour, the intersection of Kapiolani Boulevard and Kalakaua Avenue would operate at LOS F without mitigation (see Table 5-4). The increase in AM peak hour traffic demand, resulting from the 14,000-person convention, would also exceed the intersection's capacity; however, the LOS would be unaffected during the 1998 AM peak hour without project. The increase in PM peak hour traffic demand resulting from the 14,000-person convention also exceeds the intersection's existing capacity.

**Table 5-4. 1998 AM and PM Peak Hour Capacity Analysis 14,000-Person Convention**

| Intersection | Peak Hr | Action | LOS | V/C Ratio | Delay (seconds) |
|---|---|---|---|---|---|
| Kapiolani Boulevard and Kalakaua Avenue | AM | Without Mitigation | F | 1.125 | 62.9 |
| | | With Mitigation | E | 1.096 | 54.1 |
| | PM | Without Mitigation | D | 1.036 | 27.5 |
| | | With Mitigation | C | 0.919 | 23.0 |
| Kapiolani Boulevard and Atkinson Drive | AM | Without Mitigation | B | 0.843 | 7.3 |
| | PM | Without Mitigation | C | 0.763 | 15.8 |
| Atkinson Drive and Kahakai Drive/ Kona Street | AM | Without Mitigation | F* | — | — |
| | | With Mitigation | C | 0.538 | 17.6 |
| | PM | Without Mitigation | F* | — | — |
| | | With Mitigation | B | 0.430 | 13.7 |
| Kahakai Loop and Kahakai Drive | AM | Without Mitigation | B** | — | — |
| | PM | Without Mitigation | A** | — | — |
| Kalakaua Avenue and Ala Wai Boulevard | AM | Without Mitigation | C | 0.962 | 23.3 |
| | PM | Without Mitigation | C | 0.945 | 21.5 |
| Ala Moana Boulevard and Atkinson Drive | AM | Without Mitigation | E | 1.024 | 42.8 |
| | PM | Without Mitigation | E | 0.929 | 45.2 |

Notes: *Kahakai Drive LOS unsignalized conditions.
"Without Mitigation" = with existing roadway facilities.
**Side street LOS under unsignalized conditions.
Ref.: The Traffic Management Consultant

**b. Kapiolani Boulevard and Atkinson Drive**

The intersection of Kapiolani Boulevard and Atkinson Drive would continue to operate at satisfactory LOS during the AM and PM peak traffic hours. The westbound through movement on Kapiolani Boulevard continues to be the critical intersection movement during the AM peak hour and is unaffected by convention center traffic. Without the added right-turn lane in front of the project, the increase in right-turn traffic from Kapiolani Boulevard to Kalakaua Avenue would worsen queuing in the eastbound lanes of Kapiolani Boulevard beyond Atkinson Drive during the PM peak hour. (The addition of the right-turn lane would alleviate this problem).

**c. Atkinson Drive and Kahakai Drive/Kona Street**

Under this scenario, traffic on Kahakai Drive is expected to be significantly increased by convention center traffic, particularly during the AM peak hour. Kahakai Drive would again operate at LOS F during both AM and PM peak hours under unsignalized conditions as a result of heavier traffic demands on Atkinson Drive.

**d. Kahakai Loop and Kahakai Drive**

Traffic exiting Kahakai Loop would experience a minor increase in delay due to the increase in inbound traffic to the convention center's parking garage entrance ramp on Kahakai Drive. During the AM peak hour of the 14,000-person convention, the LOS on Kahakai Loop at Kahakai Drive would deteriorate from LOS A to LOS B, which is still considered a satisfactory LOS.

During the PM peak hour of the 14,000-person convention, the LOS on Kahakai Loop at Kahakai Drive would remain unchanged at LOS A since the inbound traffic volumes on Kahakai Drive are minimal. Furthermore, traffic exiting the loop street would not conflict with the vehicles egressing the convention center parking garage since the Center's exit ramp is located closer to Atkinson Drive.

**e. Kalakaua Avenue and Ala Wai Boulevard**

The circulating shuttle bus and taxi traffic increases the demand levels at this intersection to near capacity conditions during both the AM and PM peak hours. However, the intersection is expected to continue to operate at acceptable LOS during the peak hours of traffic. No mitigating actions are recommended.

**f. Ala Moana Boulevard and Atkinson Drive**

The traffic operations at the intersection of Ala Moana Boulevard and Atkinson Drive are expected to worsen from LOS D without project to LOS E during the AM peak hour under the 14,000-attendee scenario. The convention center traffic demand is expected to add 12.5 percent traffic to the 1998 AM peak hour traffic without project. The cumulative traffic demand is expected to exceed the existing intersection capacity during the AM peak hour. The 14,000-person convention scenario significantly increases the shuttle bus volumes and visitor attendee traffic, impacting the right-turn movement from westbound Ala Moana Boulevard to maukabound Atkinson Drive. The heavy right-turn movement from the shared right-turn/through lane on Ala Moana Boulevard further impacts the westbound through movement.

Mid-day (Weekday) Peak Hour Traffic Impacts

**a. Kapiolani Boulevard and Kalakaua Avenue**

During the mid-day (weekday) peak hour, convention center traffic is expected to increase intersection traffic demand by 3.6 percent; however, the increase in traffic delays are sufficient to result in LOS E conditions with the existing street lanes (see Table 5-5). The mid-day convention center traffic is similar to the PM peak hour traffic; i.e., the primary impact is caused by the circulating shuttle bus traffic travelling back to Waikiki.

**Table 5-5. 1998 Mid-day (Weekday) Peak Hour Capacity Analysis 14,000-Person Convention**

| Intersection | | LOS | V/C Ratio | Delay (seconds) |
|---|---|---|---|---|
| Kapiolani Boulevard and Kalakaua Avenue | Without Mitigation | E | 1.040 | 40.2 |
| | With Mitigation | C | 0.849 | 22.0 |
| Kapiolani Boulevard and Atkinson Drive | Without Mitigation | C | 0.85 | 15.6 |
| Atkinson Drive and Kahakai Drive/Kona Street | Without Mitigation | F* | — | — |
| | With Mitigation | B | 0.54 | 14.7 |

*Note: Kahakai Drive LOS under unsignalized conditions
"Without Mitigation" = with existing roadway facilities.
Ref.: The Traffic Management Consultant

**b. Kapiolani Boulevard and Atkinson Drive**

The intersection of Kapiolani Boulevard and Atkinson Drive is not significantly impacted by the proposed project during the mid-day (weekday) peak hour of traffic. The convention center traffic adds only 1.8 percent to the intersection demand. The intersection continues to operate at acceptable LOS. No further mitigating actions are recommended.

**c. Atkinson Drive and Kahakai Drive/Kona Street**

Under unsignalized conditions, Kahakai Drive is expected to operate at LOS F during the mid-day (weekday) peak hour. Through traffic on Atkinson Drive is heavy in both directions during the mid-day peak hour, making it difficult for the increased number of vehicles to exit Kahakai Drive.

<u>Friday Evening Post-Commuter Peak Hour Traffic Impacts (3,000-Person Event)</u>

**a. Kapiolani Boulevard and Kalakaua Avenue**

With the existing street lanes, the intersection of Kapiolani Boulevard and Kalakaua Avenue is expected to operate at capacity (see Table 5-6). The intersection traffic demand would increase by 7.1 percent prior to the beginning of the Friday evening post-commuter event. All approaches are affected by convention center traffic approaching the site, as well as shuttle bus and taxi traffic returning to Waikiki.

**b. Kapiolani Boulevard and Atkinson Drive**

The increase in convention center traffic on Kapiolani Boulevard at Atkinson Drive would exceed the existing intersection capacity, resulting in LOS F conditions. The increase in left-turn traffic demand on westbound Kapiolani Boulevard to Atkinson Drive could queue back to Kalakaua Avenue. The increase in eastbound Kapiolani Boulevard traffic headed for the convention center further adds to the PM post-commuter peak traffic heading into Waikiki.

**c. Atkinson Drive and Kahakai Drive/Kona Street**

Under the present stop sign controls, the intersection of Atkinson Drive and Kahakai Drive is expected to operate at LOS F during the Friday evening post-commuter peak hour of traffic as a result of the increase in convention center traffic and the heavy through traffic on Atkinson Drive in both directions. The increase in left-turn demand on the shared left-turn/through lane on makaibound Atkinson Drive to Kahakai Drive would queue traffic back to Kapiolani Boulevard.

**Table 5-6. 1998 Friday Evening Post-Commuter Peak Hour Capacity Analysis 3,000-Person Event**

| Intersection | | LOS | V/C Ration | Delay (seconds) |
|---|---|---|---|---|
| Kapiolani Boulevard and Kalakaua Avenue | Without Mitigation | D | 0.992 | 32.6 |
| | With Mitigation | D | 0.952 | 26.6 |
| Kapiolani Boulevard and Atkinson Drive | Without Mitigation | F | 1.174 | 65.8 |
| | With Mitigation | B | 0.838 | 10.9 |
| Atkinson Drive and Kahakai Drive/ Kona Street | Without Mitigation | F* | — | — |
| | With Mitigation | B | 0.516 | 14.8 |
| Ala Moana Boulevard and Atkinson Drive | Without Mitigation | E | 0.895 | 56.4 |
| | With Mitigation | D | 0.870 | 36.2 |

*Note: Kahakai Drive LOS under unsignalized conditions
"Without Mitigation" = with existing roadway facilities.
Ref.: The Traffic Management Consultant

**d. Ala Moana Boulevard and Atkinson Drive**

The traffic operation at the intersection of Ala Moana Boulevard and Atkinson Drive is expected to operate at LOS E during the Friday evening post-commuter peak hour without mitigation. The critical traffic movements (i.e., eastbound left-turn and the westbound through/right-turn movements) would operate at LOS F without traffic mitigation.

<u>Friday Evening Post-Commuter Peak Hour Traffic Impacts (1,800-Person All Local Event)</u>

**a. Kapiolani Boulevard and Kalakaua Avenue**

With the present street lanes, the intersection of Kapiolani Boulevard and Kalakaua Avenue is expected to operate at capacity during the Friday evening post-commuter all-local 1,800-person event (see Table 5-7). Traffic on Kapiolani Boulevard is heavier than under the 3,000-person Friday evening post-commuter event hosted by a national convention.

**Table 5-7. 1998 Friday Evening Post-Commuter Peak Hour Capacity Analysis 1,800-Person All-Local Event**

| Intersection | | LOS | V/C Ratio | Delay (seconds) |
|---|---|---|---|---|
| Kapiolani Boulevard and Kalakaua Avenue | Without Mitigation | D | 1.001 | 37.4 |
| | With Mitigation | D | 0.981 | 28.4 |
| Kapiolani Boulevard and Atkinson Drive | Without Mitigation | F | 1.181 | 67.4 |
| | With Mitigation | B | 0.868 | 11.5 |
| Atkinson Drive and Kahakai Drive/ Kona Street | Without Mitigation | F* | — | — |
| | With Mitigation | B | 0.573 | 11.5 |
| Ala Moana Boulevard and Atkinson Drive | Without Mitigation | D | 0.838 | 37.2 |

*Note: Kahakai Drive LOS under unsignalized conditions
"Without Mitigation" = with existing roadway facilities.
Ref.: The Traffic Management Consultant

**b. Kapiolani Boulevard and Atkinson Drive**

During a national convention, the primary movement of traffic is between Waikiki and the convention center, approaching the site on maukabound Atkinson Drive. The all-local 1,800-person event impacts Kapiolani Boulevard since the primary movement of traffic is makaibound from the H-1 Freeway turning onto Kapiolani Boulevard to approach the convention center. The traffic turning from Kapiolani Boulevard on to Atkinson Drive results in LOS F and over-capacity conditions.

**c. Atkinson Drive and Kahakai Drive/Kona Street**

As under the previously analyzed Friday evening post-commuter 3,000-person event scenario, the intersection of Atkinson Drive and Kahakai Drive is expected to operate at LOS F during the Friday evening peak hour of traffic with the existing roadway lanes. The maukabound convention center traffic on Atkinson Drive is lower than the previous scenario, with a corresponding increase in makaibound traffic. The increased makaibound traffic demand from Kapiolani Boulevard to Atkinson Drive would also increase the potential queuing problem on Atkinson Drive, where the vehicles waiting to turn left into Kahakai Drive may stack back to Kapiolani Boulevard.

**d. Ala Moana Boulevard and Atkinson Drive**

The intersection of Ala Moana Boulevard and Atkinson Drive is not expected to be significantly impacted by an all-local 1,800-person Friday evening post-commuter event. Convention center traffic would increase traffic demand at the intersection by 4.5 percent; however, only 2.2 percent of the existing capacity would be utilized. The intersection would operate at LOS D and a v/c ratio of 0.838. No mitigation action is recommended.

*On- and Off-Site Parking*

Adequacy of On-Site Parking

The convention center will include 800 parking stalls on site, which appear sufficient to accommodate most national and international events at the center, assuming that market rates are charged for parking. There may be some such events, as well as local events, that may exceed the parking supply. Also, some employees and attendees may try to find free on-street parking to avoid the parking charges for the convention center garage.

Effects Upon On-Street Parking

On-street parking along most streets near the convention center is intensely used throughout the daytime and evening hours. Areas particularly sensitive to any parking "overflow" from the convention center include the Kahakai Drive loop, the section of Ala Wai Boulevard across from the project site, and Kalauokalani Drive mauka of Kapiolani Boulevard.

Development of the convention center and its associated roadway improvements will require removal or use restriction of on-street parking near the project site. Temporary restrictions along some streets would be needed during certain large conventions during daytime hours or for special evening events. The on-street parking that would be affected includes:

> **Atkinson Drive:** Parking on the ewa side of Atkinson Drive between Kapiolani Boulevard and Kona Street (about 5 stalls) will be eliminated to provide an exclusive left-turn lane on makaibound Atkinson Drive at Kahakai Drive.

Parking on the east side of Atkinson Drive between Kahakai Drive to Mahukona Street (9 stalls) would be restricted during the AM peak period to permit provision of the proposed contra-flow operation to mitigate traffic impacts.

**Kapiolani Boulevard:** Parking on both sides of Kapiolani Boulevard between Atkinson Drive and Kaheka Street may be restricted (approximately 40 stalls) during the Friday evening post-commuter peak period for traffic flow. The existing daytime parking restriction would be extended through the proposed contra-flow operation period.

**Kahakai Drive:** Parking on the makai side of Kahakai Drive (5 stalls) would be restricted during large convention events to provide for two (2) inbound lanes.

In the Draft EIS TIAR, it was indicated that parking along the project frontage on Kahakai Drive (7 stalls) will be removed to provide for two (2) outbound lanes on Kahakai Drive. However, on-street parking along the project frontage of Kahakai Drive is currently prohibited due to emergency access concerns. The EIS TIAR referenced these stalls in recognition that Kahakai Drive residents presently park along this side of the roadway.

*Trucks and Deliveries*

Large trucks will be needed for movement of exhibit materials and equipment to and from the convention center, and for regular activities such as refuse collection. About 50 large truckloads of freight may be needed for a large convention/exhibition, which would result in 50 truck trips to and from the convention center on move-in and move-out days. The container trucks will likely be arriving from and returning to convention freight consolidation/storage contractor facilities in the Mapunapuna-Kalihi Kai area. The truck activity for convention move-in and move-out should not have any significant impact on area traffic conditions since this would occur primarily on days with no conventions at the site. The truck movements could occasionally affect traffic flow along Kahakai Drive as vehicles enter/exit via this street, although such inconveniences would be of short duration.

Smaller delivery and service vehicles would travel to and from the convention center both during move-in/move-out days and during convention events, with volumes likely to approximate 5 to 10 vehicles per hour. This should not affect area traffic conditions.

*Public Transportation*

TheBus Services

Analysis of TheBus services is based on a 14,000-person convention since this scenario is anticipated to have the most significant affect on public transit of the five convention scenarios previously analyzed. An estimated 851 visitors to Oahu and 81 Oahu residents would travel to the convention center via TheBus during the morning peak hour. In the afternoon peak hour, an estimated 266 visitors to Oahu and 54 residents would use TheBus to leave the facility. The Oahu residents would be dispersed among buses on Routes 2, 4, 8, 19, 20, 47, 57, and 58, as well as the routes operating from the Ala Moana Center. However, most visitors to Oahu will use Route 2, with some using the routes operating along Ala Moana Boulevard.

**AM Peak Hour:** During the morning peak hour, the total transit capacity of Route 2 (from Kuhio Avenue onto Kalakaua Avenue) and Route 4 (from Kuhio Avenue, Kalakaua Avenue, Ala Wai Boulevard, and onto McCully Street) is 1,440 passengers. For City buses operating ewabound using Ala Moana Boulevard (Routes 8, 19, 20, 47, and 57), the transit capacity totals 1,215 passengers during the morning peak hour. Based on an average "crush load" capacity (seated and standing passengers) of 80 passengers per bus (with the exception of the articulated buses on Route 8 which have an average crush load of 90 passengers per bus), the total transit capacity of buses operating from Waikiki to the convention center during the AM peak hour is 2,815 passengers. Thus, the convention visitor attendees would use about 30 percent of the overall transit capacity between Waikiki and the convention center if spread throughout this one-hour period.

During large conventions, transit capacity of TheBus would be significantly impacted by visitor attendees using public transit during the AM peak hour. Convention center employees and local resident attendees using TheBus would not significantly impact the commuter transit routes during the weekday peak hours. Under existing transit conditions, significant numbers of visitor attendees boarding TheBus at the east end of Kuhio Avenue could fully load the buses and result in increased pass-ups, resulting in delays to local residents and visitors waiting to board buses at the west end of Kuhio Avenue.

**PM Peak Hour:** During the afternoon peak hour, the total transit capacity from the convention center to Waikiki (Routes 2, 3, 8, 19, 20, 47, and 58) is 2,660 passengers. The projected PM peak hour transit demand generated by convention visitor attendees represents about 10 percent of the overall transit capacity between the convention center and Waikiki.

*Pedestrian Access*

Pedestrian traffic along streets in the vicinity of the convention center and across the Ala Wai Canal will increase as a result of the project. The analysis of pedestrian impacts to the convention center is based on the 10,000-person convention due to its higher walk mode (35 percent) in comparison to the 14,000-person convention (10 percent). It is estimated that about 35 percent of convention delegates will walk from their hotels to the Center. The morning peak hour pedestrian trips were estimated for the principal routes between the Waikiki hotels and the convention center. The largest volumes occur on the Kalakaua Avenue bridge, with 970 pedestrians. Other high-volume corridor segments include 820 along Kalakaua Avenue mauka of Ena Road, 740 across the Ala Moana Boulevard bridge, and 720 along Atkinson Drive.

A key concern is the adequacy and safety of pedestrian traffic across the makai sidewalk of the Kalakaua Avenue bridge. An assessment was made of the makai sidewalk across the bridge using the procedures outlined in the *1985 Highway Capacity Manual.* These procedures use a level-of-service concept similar to that for roadways, with conditions denoted by letters ranging from excellent (LOS A) to undesirable (LOS F). Each level of service is associated with a certain average space per pedestrian and/or flow rate expressed in the average number of pedestrians passing a point per minute per foot of width.

The pedestrian service level was evaluated at four locations on or near the Kalakaua bridge: at the center of the bridge crossing where there are no impediments to pedestrian flow; at each end of the bridge where there are utility poles within the walkway; and at the crosswalk across Ala Wai Boulevard. The analysis assumes that 50 percent of the peak hour pedestrians cross in a single 15-minute time period. Table 5-8 summarizes the results for average conditions, and for conditions within platoons crossing the bridge (due to traffic signal effects or slow walkers).

The assessment shows that the center of the bridge crossing where there are no impediments is adequate to accommodate the anticipated convention center-related pedestrian flows. However, at each end of the bridge where there are the utility poles, conditions would result in undesirable levels of service (LOS D and E).

Previous studies indicated that further analysis may be required for the sidewalk area along the Diamond Head side of Atkinson Drive between the Kona Street crosswalk and Kahakai Drive. The visitor conventioneers staying at the Ala Moana Hotel would likely walk along the ewa side of Atkinson Drive, cross Kona Street, and use the proposed relocated crosswalk across Atkinson Drive to access the convention center. Also, convention attendees arriving by TheBus and disembarking at either Ala Moana Center or Ala Moana Boulevard would walk to the convention center using both sides of Atkinson Drive.

**Table 5-8. Kalakaua Bridge Crossing Pedestrian Service Levels**

| Location | Average Condition | | Platoon Condition | |
|---|---|---|---|---|
| | PMF | LOS | PMF | LOS |
| Center of Crossing | 8.9 | C | 12.9 | D |
| Pole at End near Site | 17.0 | E | 21.0 | E |
| Pole at End near Waikiki | 10.3 | D | 14.3 | D |
| At Ala Wai Crosswalk | 47.0* | B | 15.4* | D |

PMF = Pedestrians per Minute per Foot of Width.
LOS = Level-of-Service.
* = Average square feet of area per pedestrian during crossing
Source: Wilbur Smith Associates.

The pedestrian analysis indicates that the existing sidewalks on both sides of Atkinson Drive are adequate to accommodate the cumulative pedestrian volume of convention attendees walking to the convention center during the AM peak hour of a large convention. The crosswalks at the intersection of Atkinson Drive and Kahakai Drive are also expected to operate at satisfactory levels of service. The area of concern is on the southeast corner of the intersection of Atkinson Drive and Kahakai Drive. Pedestrians on the ewa side of Atkinson Drive would cross over to the southeast corner of the intersection, converging with the pedestrians walking along the Diamond Head side of Atkinson Drive. Up to about 1,000 pedestrians can be expected to cross Kahakai Drive during the AM peak hour of a large convention from the southeast corner of the intersection. Under existing curb return geometrics, the projected pedestrian volume would result in LOS F conditions. This corner sidewalk area is inadequate to accommodate the projected volume of pedestrians waiting for the proposed pedestrian signal to cross Kahakai Drive, and will cause pedestrians to queue up along the Atkinson and Kahakai sidewalks waiting for the light to change.

### 5.1.4 Mitigation

*Traffic*

A number of roadway improvements to the existing street system will be constructed as part of the convention center development to mitigate the incremental effects of the project (see Figures 5-1 and 5-2). These improvements include the following:

Proposed Roadway Improvements

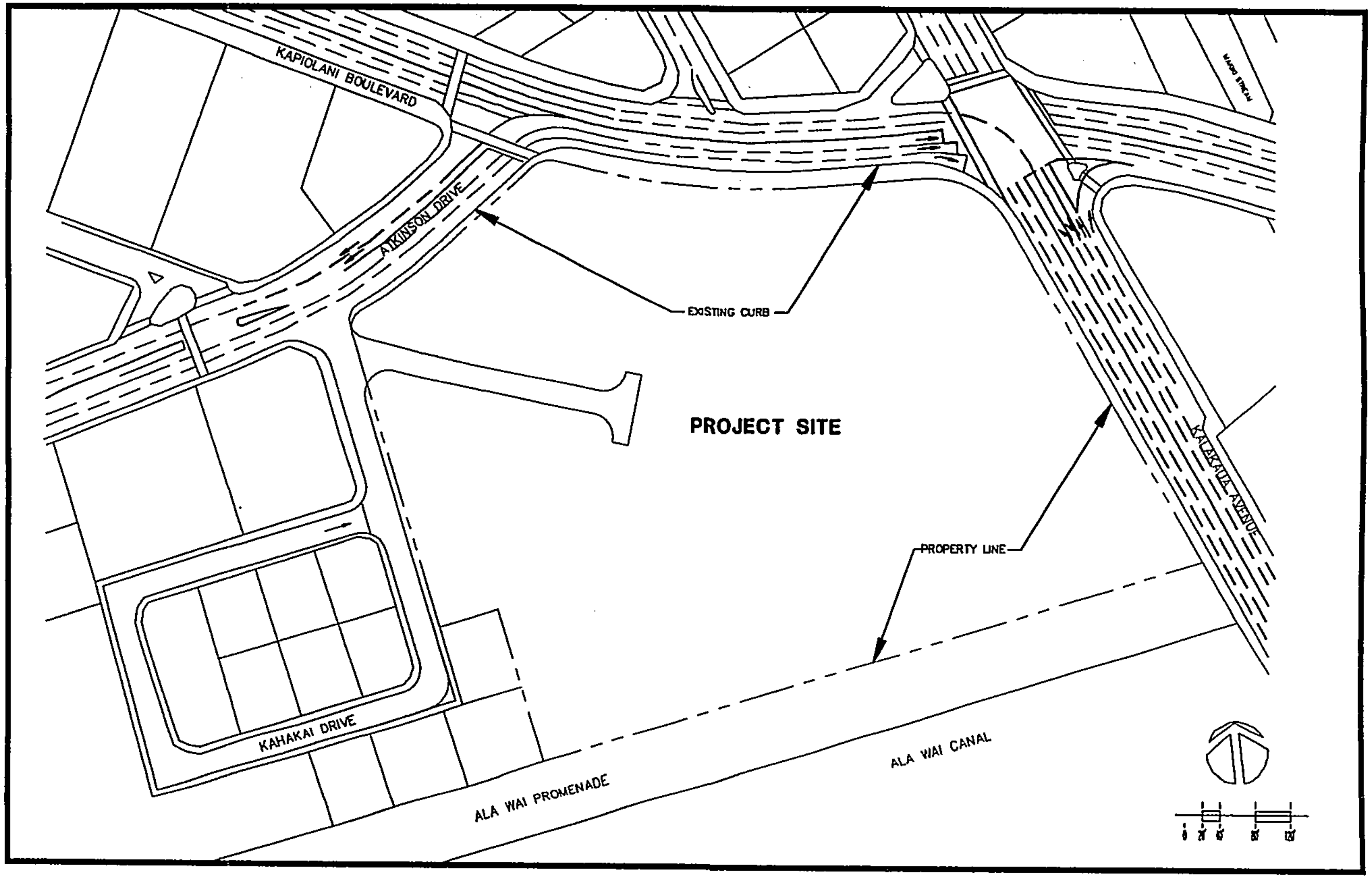
A number of roadway improvements to the existing street system will be constructed as part of the convention center project (see Figures 5-1 and 5-2). These improvements include:

1. Kapiolani Boulevard will be widened by 10 feet along the project frontage to provide an additional right-turn only lane in the eastbound direction. The existing eastbound curb lane will be converted to an optional through/right-turn lane.

2. Kalakaua Avenue will be widened by 12 feet along the project frontage from Kapiolani Boulevard to the Ala Wai Canal bridge to provide an additional 10-foot wide makaibound lane for use as a bus stop and a right-turn lane into the Center's Kalakaua Avenue parking ramp. Also, the maukabound lanes on Kalakaua Avenue at Kapiolani Boulevard will be restriped to provide double left-turn lanes, one through lane, and a shared through/right-turn lane. The widening of Kalakaua Avenue provides the opportunity to increase the present substandard left-turn traffic lane widths on maukabound Kalakaua Avenue to 10 feet.

3. The makaibound lanes on Kalakaua Avenue at Kapiolani Boulevard will be widened from 10-foot to 11-foot wide lanes by reducing or eliminating the existing striped median on the Kalakaua Avenue approach.

4. Kahakai Drive will be widened on the project side to add two traffic lanes. With this widening, Kahakai Drive will be improved to provide two (2) 10-foot wide outbound lanes, a 10-foot wide landscaped median, and two (2) 10-foot wide inbound lanes. The outbound lanes provide separate left- and right-turn lanes onto Atkinson Drive. The inbound lanes separate convention center traffic from the residential traffic on Kahakai Drive. The left inbound lane provides access to the parking garage and loading dock areas of the convention center facility, and the right inbound

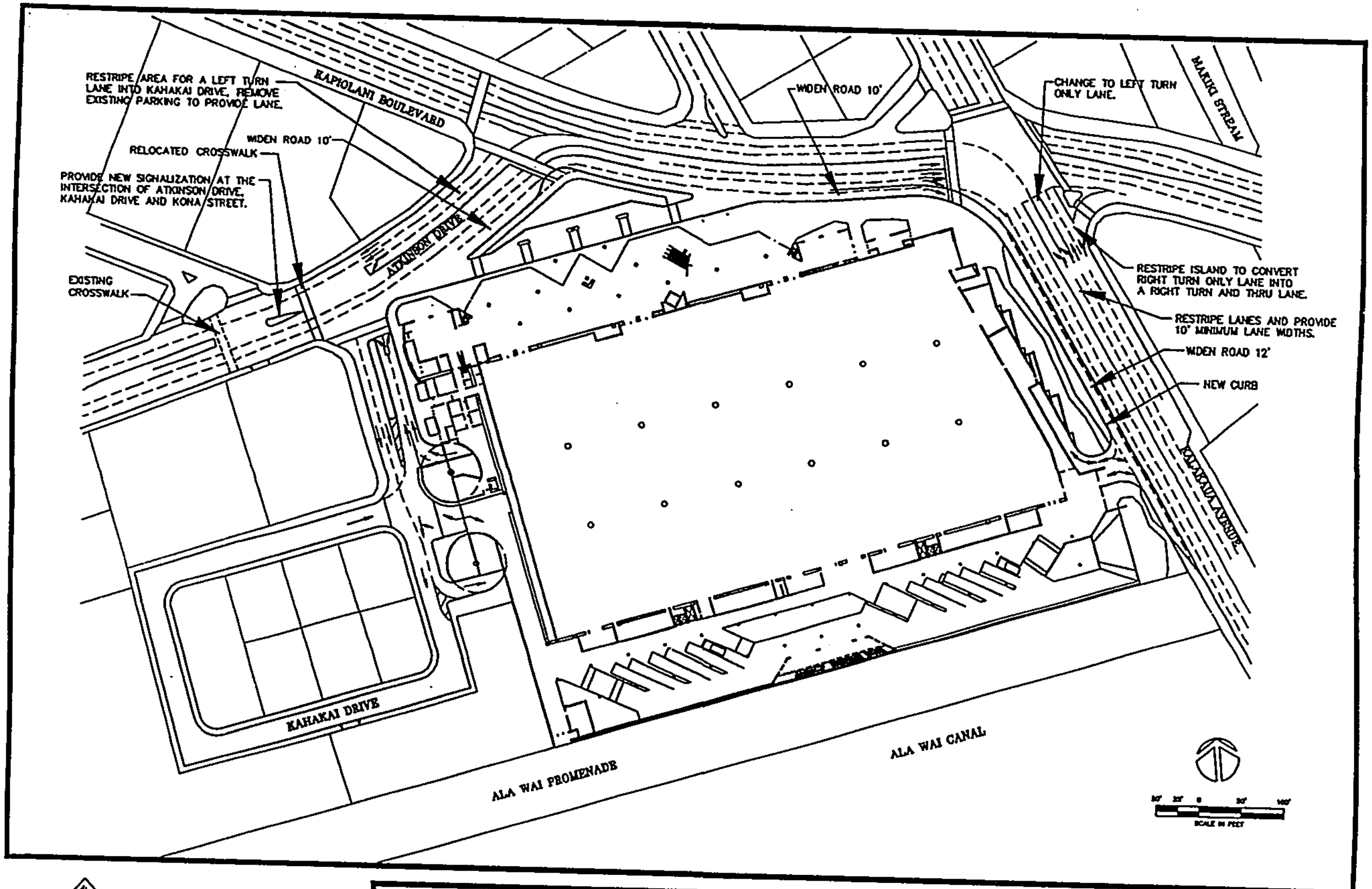



HAWAI'I CONVENTION CENTER

**Fig. 5-1**
**EXISTING ROADWAY SYSTEM**

Prepared for :
CONVENTION CENTER AUTHORITY
State of Hawaii

Prepared by :
Nordic / PCL
Wilson Okamoto & Associates, Inc.




HAWAI'I CONVENTION CENTER

**Fig. 5-2**
**PROPOSED ROADWAY SYSTEM**

Prepared for :
CONVENTION CENTER AUTHORITY
State of Hawaii

Prepared by :
Nordic / PCL
Wilson Okamoto & Associates, Inc.

lane provides access to the Kahakai Drive residential area. On-street parking on the makai side of Kahakai Drive would be restricted during large convention events, involving about five (5) parking spaces.

5. Traffic signals will be installed at the intersection of Atkinson Drive and Kahakai Drive/Kona Street, which would also include signalizing the left-turn movement from maukabound Atkinson Drive to Kona Street. The traffic signal would provide a signal-controlled crossing point for pedestrians walking between the convention center and the Ala Moana Hotel and Ala Moana Center. The existing pedestrian crossing on Atkinson Drive at that intersection will be relocated to the mauka side of Kona Street. The traffic signals would be coordinated with the traffic signals at the intersection of Kapiolani Boulevard and Atkinson Drive to minimize queuing on Atkinson Drive back to Kapiolani Boulevard.

6. An exclusive left-turn lane will be provided on makaibound Atkinson Drive at Kahakai Drive, extending back to Kapiolani Boulevard. Provision of this approximately 210-foot long lane will be accomplished within the existing roadway width by prohibiting on-street parking on the ewa side of Atkinson Drive between Kapiolani Boulevard and Kona Street, eliminating about five (5) existing parking spaces, and restriping the existing through lanes. The exclusive left-turn lane would separate left-turn traffic from through traffic, thereby reducing delay to makaibound through traffic on Atkinson Drive.

7. The portion of Atkinson Drive along the project frontage between Kahakai Drive and Kapiolani Boulevard will be widened by 10 feet to provide additional curbside shuttle bus loading/unloading space along Atkinson Drive if needed for the larger events.

*Mitigation for Peak Hour Traffic Impacts*

The level-of-service (LOS), volume-to-capacity ratio (v/c), and average vehicle delays with the proposed traffic mitigation measures discussed above for each of the five (5) analyzed scenarios are presented in Tables 5-3, 5-4, 5-5, 5-6, and 5-7, respectively.

1998 AM and PM Peak Hour Traffic for a 10,000-Person Convention

**a. Kapiolani Boulevard and Kalakaua Avenue**

With the planned widening of Kapiolani Boulevard along the project frontage for provision of the additional right-turn only eastbound lane, the net result would increase the capacity of eastbound Kapiolani Boulevard, improving the LOS F conditions on the right-turn movement to LOS D (see Table 5-3). The restriping of the maukabound left-turn lanes on Kalakaua Avenue improves the left-turn movement to LOS E. The widening of the makaibound lanes on Kalakaua Avenue at Kapiolani Boulevard improves the makaibound approach to LOS E.

With these traffic mitigation measures, the intersection of Kapiolani Boulevard and Kalakaua Avenue would continue to operate at LOS E, and the v/c ratio improves to 1.079 during the AM peak hour. During the PM peak hour, the intersection improves to LOS C and a v/c ratio of 0.879. No additional measures are needed to mitigate project impacts.

**b. Atkinson Drive and Kahakai Drive/Kona Street**

During large conventions, to further mitigate potential queuing on makaibound Atkinson Drive at Kahakai Drive in the AM peak hour, a contra-flow operation should be implemented on Atkinson Drive between Kapiolani Boulevard and Mahukona Street to provide three (3) through lanes in the makaibound direction. This can be accomplished by coning the median left-turn lane to convert it to an additional makaibound direction lane. To provide two through maukabound lanes on Atkinson Drive, on-street parking would be restricted on the east side of Atkinson Drive between Mahukona Street and Kahakai Drive, involving about nine (9) parking stalls. The left maukabound lane on Atkinson Drive also would be coned between Kapiolani Boulevard and Kahakai Drive to reverse the travel direction, and would be signed as an exclusive left-turn lane from makaibound Atkinson Drive to Kahakai Drive.

During the AM peak period, the curb lane on maukabound Atkinson Drive at Kahakai Drive would be used primarily by convention center traffic either turning right to Kahakai Drive or to the lobby entrance drop-off/pick-up area. Temporary informational signs should be installed on maukabound Atkinson Drive, directing convention center traffic to the curb lane (and left-turn traffic to Kona Street into the left lane).

**c. Ala Moana Boulevard and Atkinson Drive**

With the large volume of vehicles turning right onto Atkinson Drive, which would be increased with the convention center, it would be desirable to add a right-turn lane along the mauka side of Ala Moana Boulevard. The right-turn lane would primarily be of benefit during the more critical afternoon peak period when congested conditions are expected to occur along ewabound Ala Moana Boulevard, although there would be relatively few vehicles traveling from Waikiki to the convention center during the peak period.

In recent discussions between the State CCA and the State Department of Transportation (DOT), the DOT has indicated that they will further evaluate the right-turn lane on westbound Ala Moana Boulevard at Atkinson Drive as part of its Ala Moana Boulevard improvement project. In comments submitted in response to the Draft EIS TIAR, the State DOT suggests that a right-turn lane could be provided by relocating the median divider, reducing lane widths to 11 feet, and relocating the mauka sidewalk onto landscaping makai of Yacht Harbor Towers. The decision by the State DOT to implement this improvement, however, is subject to the results of the City's Waikiki Regional Traffic Impact Plan which is anticipated for completion in August 1995.

<u>1998 AM and PM Peak Hour Traffic for a 14,000-Person Convention</u>

**a. Kapiolani Boulevard and Kalakaua Avenue**

The proposed mitigation actions described under the 10,000-person traffic impact analysis increase the overall intersection capacity to accommodate the AM and PM peak traffic hours under the 14,000-person scenario (see Table 5-4). The proposed eastbound right-turn lane at the Kapiolani Boulevard/Kalakaua Avenue intersection accommodates the heavy right-turn movement which would occur in the AM peak hour. The additional right-turn only lane significantly improves the eastbound capacity on Kapiolani Boulevard, which is the critical direction of traffic during the PM peak hour. With the proposed mitigation, PM peak hour traffic conditions are improved slightly over the 1998 PM peak hour conditions without project. No further mitigating actions are recommended at the intersection of Kapiolani Boulevard and Kalakaua Avenue during the AM and PM peak hours for the 14,000-person convention.

**b. Kapiolani Boulevard and Atkinson Drive**

The proposed roadway improvements at the Kalakaua Avenue and Kapiolani Boulevard intersection as previously discussed in this section under <u>Proposed Roadway Improvements</u> are expected to mitigate conditions at the intersection of Kapiolani

Boulevard and Atkinson Drive. No further mitigation is recommended at this intersection.

**c. Atkinson Drive and Kahakai Drive/Kona Street**

The mitigating actions discussed under the 10,000-person scenario for this intersection should accommodate the 14,000-person convention event. Under signalized conditions, Atkinson Drive and Kahakai Drive are expected to operate at LOS C and LOS B during the AM and PM peak hours of traffic, respectively. As under the 10,000-person scenario, the existing median left-turn lane should be coned to provide an additional makaibound lane from Kahakai Drive to Mahukona Street during the AM peak hour. This mitigating measure increases makaibound capacity on Atkinson Drive and reduces the potential of queuing from Kahakai Drive back to Kapiolani Boulevard.

**d. Ala Moana Boulevard and Atkinson Drive**

As indicated under the 10,000-person convention scenario, it would be desirable to add a right-turn lane along the mauka side of Ala Moana Boulevard with the large volume of vehicles turning right onto Atkinson Drive, which would be increased by the convention center. The right-turn lane would primarily be of benefit during the morning and afternoon peak periods when congested conditions are expected to occur along ewabound Ala Moana Boulevard.

In recent discussions between the State CCA and the State DOT, the DOT has indicated that they will further evaluate the right-turn lane on westbound Ala Moana Boulevard at Atkinson Drive as part of its Ala Moana Boulevard improvement project. In comments submitted in response to the Draft EIS TIAR, the State DOT suggests that a right-turn lane could be provided by relocating the median divider, reducing lane widths to 11 feet, and relocating the mauka sidewalk onto landscaping makai of Yacht Harbor Towers. The decision by the State DOT to implement this improvement, however, is subject to the results of the City's Waikiki Regional Traffic Impact Plan which is anticipated for completion in August 1995.

<u>Mid-day (Weekday) Peak Hour Traffic</u>

**a. Kapiolani Boulevard and Kalakaua Avenue**

With the mitigating actions previously described for this intersection, traffic operations at this intersection significantly improves to LOS C, reduces vehicle delay, and increases intersection capacity (see Table 5-5). The additional right-turn lane on eastbound

Kapiolani Boulevard mitigates the impacts of the shuttle bus traffic. No further mitigating actions are recommended.

**b. Atkinson Drive and Kahakai Drive/Kona Street**

Traffic conditions on Kahakai Drive are expected to be significantly improved under the proposed traffic signalization. The left-turn movement from Kahakai Drive to makaibound Atkinson Drive is expected to improve from LOS F under unsignalized conditions without project to LOS B under signalized conditions with project. Traffic signal coordination with the Kapiolani Boulevard signal should minimize queuing on makaibound Atkinson Drive.

Friday Evening Post-Commuter Peak Hour Traffic (3,000-Person Event)

**a. Kapiolani Boulevard and Kalakaua Avenue**

In addition to the roadway improvement mitigation proposed for this intersection, further traffic mitigation may be needed to accommodate the expected increase in traffic on Kapiolani Boulevard for large size evening events (see Table 5-6). A westbound contra-flow coning operation, similar to that now used by the City during the AM peak hour, may be needed on Kapiolani Boulevard between the Makiki Drainage Canal crossing (east of Kalakaua Avenue) and Kaheka Street prior to the start of a Friday evening event at the convention center. Together with the roadway improvement mitigating actions described previously, the capacity conditions at the intersection of Kapiolani Boulevard and Kalakaua Avenue would be mitigated, resulting in a v/c ratio of 0.952.

**b. Kapiolani Boulevard and Atkinson Drive**

The westbound contra-flow operation on Kapiolani Boulevard would extend through the Atkinson Drive intersection as far as Kaheka Street. The existing daytime parking restrictions on both sides of Kapiolani Boulevard between Atkinson Drive and Kaheka Street would be extended into the period of the contra-flow operation. The existing eastbound capacity on Kapiolani Boulevard is maintained by the restricting of on-street parking. The westbound contra-flow operation would provide dual left-turn lanes from westbound Kapiolani Boulevard to makaibound Atkinson Drive. The proposed contra-flow operation significantly improves the traffic operation to LOS B and a v/c ratio of 0.838.

**c. Atkinson Drive and Kahakai Drive/Kona Street**

The installation of traffic signals at the intersection of Atkinson Drive and Kahakai Drive/Kona Street would improve LOS F conditions of the Kahakai Drive approach to LOS C. The exclusive left-turn lane on makaibound Atkinson Drive at Kahakai Drive reduces delays to through traffic by separating left-turn traffic. Traffic in the right-lane on maukabound Atkinson Drive at Kahakai Drive would primarily be comprised of convention center traffic, either turning right to Kahakai Drive or to the lobby entrance drop-off/pick-up area. Temporary traffic control signs should be installed to direct convention center traffic to the curb lane and Kapiolani Boulevard-bound traffic to the remaining two through lanes. The three (3) maukabound lanes would be reduced to two right-turn lanes at Kapiolani Boulevard due to the proposed westbound contra-flow operation. The makaibound contra-flow operation on Atkinson Drive proposed for the AM peak period would not be required during the early Friday evening post-commuter traffic operations.

**d. Ala Moana Boulevard and Atkinson Drive**

Assuming the current roadway lanes, designation of the curb lane on westbound Ala Moana Boulevard to a right-turn only (except for City buses) onto Atkinson Drive would improve the intersection traffic operations to LOS D. This could be accomplished by signing and coning the right-lane to redirect through traffic to the remaining through lanes on westbound Ala Moana Boulevard. With this mitigating action, critical traffic movements (i.e., eastbound left-turn and the westbound through/right-turn movements) would improve to LOS E.

<u>Friday Evening Post-Commuter Peak Hour Traffic (1,800-Person All Local Event)</u>

**a. Kapiolani Boulevard and Kalakaua Avenue**

The westbound contra-flow coning operation is also again recommended on Kapiolani Boulevard prior to the start of a Friday evening post-commuter large all-local event at the convention center (see Table 5-7). Together with the mitigating actions described under the 10,000-person scenario, the capacity conditions at this intersection would be eased. Informational signs should be installed on makaibound Kalakaua Avenue to direct convention center traffic to the Kalakaua Avenue parking garage entrance.

**b. Kapiolani Boulevard and Atkinson Drive**

Under the proposed contra-flow coning operations described in the Friday evening 3,000-person event scenario, the intersection of Kapiolani Boulevard and Atkinson Drive improves to satisfactory LOS. Informational signs should be installed on eastbound Kapiolani Boulevard to direct convention center traffic to the Kalakaua Avenue parking garage entrance, as well as the Kahakai Drive entrance.

**c. Atkinson Drive and Kahakai Drive/Kona Street**

The installation of traffic signals at the intersection of Atkinson Drive and Kahakai Drive/Kona Street would improve the LOS F conditions on the Kahakai Drive approach to LOS C.

*On- and Off-Site Parking*

Any effort to control on-street parking in the areas in the immediate vicinity of the convention center would require City and County of Honolulu participation. Most such effort, such as removal of parking, posted time limits, parking meters, or establishment of resident parking permit programs, would provide some degree of inconveniences to area residents and their visitors.

<u>Parking Alternatives</u>

To accommodate those events which would require more parking than the approximately 800 on-site stalls, a parking management plan should be established. Several alternatives are offered that could become part of an overall transportation management plan which would increase the number of available stalls or provide alternatives to parking at the convention center.

a. Arrangements to use existing outlying parking facilities that may be available during the event. The attendees would be transported by shuttle buses to and from the convention center.

b. Provision of parking at host hotels for local event attendees, who would be transported by shuttle bus to/from the convention center with the Oahu visitor attendees.

c. Arrangements to relocate employee parking to nearby hotels, commercial offices, and possibly residential condominiums that may have available parking, thereby freeing up employee stalls for attendees.

d. Preferential on-site parking for employees and local attendees who car-pool to a convention center event, thereby freeing up more available parking stalls.

e. Passes for on-site parking could be issued to pre-registered conventioneers. All other convention attendees would be notified prior to the event that no on-site parking would be provided without a pass.

f. Provision of market rate fees (no free parking) for on-site parking to encourage attendees and employees to use public transit and ridesharing.

g. A program to issue temporary public bus passes to convention center employees could be implemented by the convention center operator to free up parking stalls for use for convention events.

h. The truck dock loading area could be used during special events for valet service tandem parking when truck activities are not occurring.

*Trucks and Deliveries*

To reduce potential disruption of traffic flow on Kahakai Drive attributed to trucks, the scheduling of the arrival of trucks at the site should minimize the number of truck arrivals and departures during the morning and afternoon peak hours. Also, the truck drivers should be instructed to use the Nimitz Highway-Ala Moana Boulevard-Atkinson Drive route so as to minimize impacts.

The transportation coordinator of the convention center should monitor the affect of the arrival and departures of the smaller service and delivery vehicles on traffic conditions in the immediate area. Should traffic conditions be adversely affected, the transportation coordinator should limit the arrival and departure of these smaller delivery and service vehicles during the peak traffic hours.

*TheBus Services*

Given the present crowded conditions on the Waikiki transit routes, TheBus could not accommodate the additional convention visitor attendee ridership during a large convention event without adding more bus capacity, either more shuttle buses or City bus vehicles or use of higher-capacity articulated buses. The following measure is recommended to mitigate the transit impacts resulting from increased ridership attributed to the convention center:

- Mid-size and large conventions should provide and encourage the use of special convention shuttle services by visitor attendees to minimize their use and impact of public transit during the peak commuter hours. Convention literature should promote use of such systems and a convenient system of shuttle buses should be provided between the hotels and the convention center. Visitor attendees not staying at the major host hotels should be instructed to walk to the nearest convenient shuttle bus pick-up point for transport to the convention center.

*Pedestrian Access*

Relocation of the utility poles at each end of the Kalakaua bridge could improve conditions to the levels indicated for the center of the bridge crossing where there are no impediments within the walkway. With the pole relocations, pedestrian conditions (LOS C/D) appear acceptable for a large 10,000-person convention, given the assumptions used in the analysis. The traffic signal located on the utility pole on the Waikiki side of the Kalakaua Avenue bridge may be required to be relocated to a new mast arm to maintain visibility to motorists.

To improve pedestrian conditions at the southeast corner of the intersection of Atkinson Drive and Kahakai Drive, the sidewalk area at this corner should be expanded to accommodate pedestrian queues. During a large convention in the AM peak hour, a traffic control officer should also be stationed at the Kahakai Drive crosswalk to maintain pedestrian safety.

### 5.1.5 Private Shuttle Bus Service

**Shuttle Bus Operations**

A private charter shuttle bus system will be used to provide transportation between Waikiki hotels and the convention center for most visitor attendees. All large conventions will require a shuttle bus operator to plan and coordinate a shuttle bus transportation system for conventioneers. A shuttle bus operator is typically hired by the convention planner to provide transportation services for event attendees. The shuttle bus operator is responsible for chartering the bus vehicles and developing routes and schedules. The bus operator would work closely with the convention planner to coordinate the shuttle bus schedules in accordance with convention activities.

In order to provide the most cost-effective operation, the shuttle bus operator will typically minimize the number of bus vehicles and drivers required to accommodate the projected ridership. An efficient shuttle bus system is dependent upon convention attendees staying at the fewest number of hotels, located within easy vehicular access of the convention center. Several shuttle bus routes would be developed, each providing service to a large block of hotel rooms.

In planning the shuttle bus operation for an event at the convention center, the operator will take into account the expected daily attendance and the number of attendees that are expected to be transported by shuttle bus during the peak hour. The shuttle bus operator will also seek to charter the largest available bus vehicle (passenger capacity). Based upon the current private bus fleets, the large tour coaches can accommodate a capacity of 49 or more seated passengers. The shuttle bus operator is expected to maximize use of the buses during the peak arrival/ departure hours. In general, shuttle bus loads can vary from trip to trip, with some buses containing empty seats, while others are carrying standing passengers. Overall, however, the average bus load is expected to be equivalent to the seated capacity of the bus. The shuttle bus operator could also use the standing capacity to accommodate an unexpected surge in ridership demand (i.e., during inclement weather conditions). If the standing passenger capacity accommodate a higher than expected ridership demand, or if the average bus load is less than expected, the shuttle bus operator would have to make additional bus trips over an extended period of time to transport the total number of passengers.

The most critical period for the shuttle bus operation is during the AM peak hour, when a large number of attendees need to be transported from the hotels to the convention center. The shuttle bus operator should coordinate the scheduling of shuttle buses with the convention planner and the convention center transportation coordinator to minimize congestion at the hotels, on the public streets, and at the convention center, respectively. At the convention center, route schedules should result in reasonably uniform arrival times so bus unloading activities do not overwhelm the Center's lobby driveway area. Also, the shuttle bus operator should have personnel stationed at the lobby entry driveway to direct shuttle buses into and out of the passenger loading/unloading area so as to prevent queuing back onto the streets.

During the remainder of the day, attendees are expected to gradually depart the convention center facility to return to their hotels or go to other destinations. During this time, the shuttle bus service would run at a regularly scheduled operation between the convention center and host hotels, and as a reduced service rate and vehicle occupancy.

**Shuttle Bus Capacity Analysis**

An analysis of the shuttle bus loading and unloading operations for an event at the convention center was conducted using the 14,000-person convention as a basis for this analysis. The forecast assumptions previously presented assumes a greater number of Oahu visitor conventioneers (70 percent) using the shuttle bus to/from the convention center. This capacity analysis is based on an average passenger load of 49 persons per bus, which approximates the lowest seated capacity of the large charter coaches, which range in size from 49 to 65 seats, with 54 seats being the most common size.

AM Peak Hour

Based on the forecast assumptions for a 14,000-person convention, 70 percent of the Oahu visitor attendees would use the shuttle bus to travel to the convention center during the AM peak hour. The shuttle buses would operate with an average load approximating the seated capacity. A fleet of approximately 60 to 70 charter buses would be required to transport the estimated 5,958 Oahu visitor attendees to the convention center during the AM peak hour. This would result in about 122 bus trips during this peak hour period.

Based on methodology in the *Highway Capacity Manual Special Report 209* (HCM, published by the Transportation Research Board, 1985, as amended, five (5) bus berths at the convention center would be required to accommodate the shuttle bus operations during the morning peak hour. The six (6) off-street bus berths provided at the main entry drive fronting the convention center lobby should be adequate to accommodate the shuttle bus operations and number of bus trips during the AM peak hour under normal conditions. Two (2) additional on-street bus berths can be provided on the proposed widened portion of Atkinson Drive fronting the project site.

PM Peak Hour

The shuttle bus operation during the afternoon peak period is oriented more toward service than efficiency as visitor attendees are expected to leave the convention center throughout the afternoon. The afternoon shuttle bus service would be provided at about 75 percent of its AM peak hour operation. Since the shuttle bus service would be more schedule-oriented during the afternoon period, the buses would operate at a much lower average occupancy rate of 20 passengers per bus. Based on the forecast assumptions for a 14,000-person convention, about 94 shuttle bus trips would be required to transport the approximately 1,862 visitor attendees back to Waikiki hotels during the PM peak hour.

Based on methodology in the HCM, a minimum of three (3) bus berths would be required during the PM peak hour shuttle bus operation for a 14,000-person convention. All six (6) bus berths in the main entry drive of the convention center would be available during the PM peak hour. For events which may have most attendees or participants leaving at its conclusion (as opposed to "trickling-out" during the afternoon), up to 20 shuttle buses can be staged within the truck loading dock prior to the end of the event. The shuttle buses would enter the truck dock via Kalakaua Avenue.

5.1.6 Transportation Management Plan

Prior to the opening of the Hawai'i Convention Center, the State CCA will engage the services of an operator to manage the operations of the Center. Among the primary duties entailed in operating a convention center is the management of transportation-related activities associated with events held at the Center.

The procedures outlined in this section are intended to serve as a framework for the development of a transportation management plan to be employed by the convention center operator for specific events. It will be the responsibility of the State CCA to ensure that these transportation management plan guidelines and procedures are provided to the convention center operator for use in developing and implementing such plans for events. These guidelines are intended to identify principle operational measures which should be considered by the convention center operator on an event-related basis. It will be the responsibility of the convention center operator to develop a detailed transportation management plan for implementation, as deemed necessary. Once the convention center is operational, judgement and experience will determine which specific operational mitigation measures would be implemented for a particular event.

The convention center operator will designate a transportation coordinator who will be responsible for the transportation-related operations of the convention center. The transportation coordinator's primary function would be the development of a series of master transportation management plans for different types and sizes of convention center events, and the overseeing of plan refinements/modifications for each event at the convention center, as deemed necessary. The transportation coordinator will also be responsible in overseeing the transportation operations which occur during the event.

**Transportation Management Plan Guidelines**

The transportation management plan would provide a description and diagrams (as appropriate) of operational traffic improvements or measures intended to ensure maximum efficiency of transportation-related activities for an event at the convention center. Basic plans will be developed for different types and sizes of events. Prior to the opening of the convention center, a master transportation management plan would be developed by the transportation coordinator which would include operational procedures and guidelines which would be necessary to meet the traffic and transportation-related needs of the Center's events. The master transportation management plan will be submitted to the City Department of Transportation Services for review and approval prior to the opening of the Center.

Prior to each event at the convention center, the transportation coordinator and the respective convention planner will review the master transportation plan and implement only those elements which would be necessary to meet the needs of the particular event. Should the transportation procedures or measures deemed necessary for a particular event deviate from those in the master transportation plan, the transportation coordinator would then submit the event-related plan to the City DTS for review and approval.

The management plan would provide for the following transportation operations:

Traffic Access Controls: Traffic control personnel would be stationed at key access points or intersections in and around the convention center site to facilitate the movement of traffic during large events. In general, traffic control personnel would be responsible to minimize traffic delays on public streets resulting from the convention center, maintaining the flow of traffic into and out of the convention center site and adjacent streets, and ensuring safe pedestrian crossings at the Center's driveways. The transportation coordinator would also implement operational procedures to expedite the entry of vehicles into the convention center's parking garage to minimize any queuing back onto the streets.

Temporary On-Street Parking Restrictions: The transportation coordinator will be responsible to obtain a street usage permit from the City DTS for on-street parking restrictions. The coordinator will also be responsible to coordinate the installation and removal of the temporary signs notifying of the parking restrictions.

Contra-Flow Coning Operations: Implementation of the proposed contra-flow coning operation on Kapiolani Boulevard prior to a large Friday evening post-commuter event will require a street usage permit from the City DTS. The transportation coordinator would be responsible for preparing a coning plan and submitting it to the City DTS for review and approval. The transportation coordinator would also be responsible for the implementation of the contra-flow coning operations. Furthermore, the transportation coordinator would be responsible for coordinating the coning operation with the City DTS' PM peak period contra-flow coning operations along Kapiolani Boulevard.

Signing and Coning Operations: As previously discussed, it may be necessary for the transportation coordinator to install temporary informational or regulatory signs and to implement coning operations to accommodate certain events at the convention center. The transportation coordinator would be responsible to prepare a signing and coning plan for submittal to either the City DTS and the State DOT for review, as appropriate, and for the coordination of the installation and removal of the signs and cones.

Traffic Signal Operations: To enable traffic to more efficiently flow according to actual traffic demand in the affected areas, the transportation coordinator should work with the City DTS to develop special traffic signal timing and coordination on the major roadways in the vicinity of the convention center to reflect traffic flows prior to or following a large event, as appropriate.

Delivery Truck Operations: The transportation coordinator would monitor and coordinate and oversee the scheduling of arrivals and departures of container/freight trucks delivering exhibit materials to and from the convention center. Such scheduling should minimize the number of trucks arriving and departing the convention center site during the morning and afternoon peak traffic periods. For the smaller delivery and service vehicles travelling to and from the convention center site throughout the day, the transportation coordinator should monitor the affect of the arrival and departures of these vehicles on traffic conditions in the immediate area. Should traffic conditions be adversely affected, the transportation coordinator should limit the arrival and departure of these smaller delivery and service vehicles during the peak traffic hours.

On-Site Parking: The transportation coordinator will be responsible to coordinate with the convention planner on the specific parking needs of the convention attendees/exhibitors, and with the special event manager on the parking requirements for convention center employees.

Off-Site Parking: In the event that parking in excess of the number of on-site stalls is needed, the transportation coordinator will be responsible to identify candidate sites for off-site convention center parking and to develop a standing agreement and arrangements for use of these facilities.

Shuttle Bus Operations: The transportation coordinator would monitor shuttle bus operations at the convention center and oversee the development of shuttle bus plans by the shuttle bus operator to minimize congestion at the Center. In coordination with the shuttle bus operator, personnel should be stationed at the lobby entry driveway to direct shuttle buses into and out of the passenger loading/unloading area so as to prevent queuing back onto the streets and to ensure pedestrian safety.

Transportation Demand Management: The transportation coordinator should coordinate with the State DOT Highway Division's Transportation Demand Management Office in developing and implementing transportation management techniques for the convention center operations.

5.1.7 Relationship to Proposed Transportation Projects

The City and County of Honolulu has developed a Waikiki Master Plan to guide development and design features within the area. The three key transportation elements of the Waikiki Master Plan which may affect, or be affected by the convention center include: 1) conversion of the section of Kalakaua Avenue and Ala Moana Boulevard at the ewa end of Waikiki to one-way operation; 2) development of a network of several parking facilities at the periphery of the Waikiki area; and 3) operation of a people mover system providing circulation within Waikiki.

The City Planning Department is currently preparing the Waikiki People Mover and Peripheral Parking Study which is the next step towards implementing some of the transportation and circulation goals of the Waikiki Master Plan. A draft of the study was completed and issued in January 1995. This study examines three separate but connected systems: traffic circulation within Waikiki; the people mover system; and peripheral parking.

*City's Proposed One-Way Circulation*

In an effort to provide a more attractive landscaped entry into Waikiki along Ala Moana Boulevard, the City is considering converting portions of Ala Moana Boulevard and Kalakaua Avenue at the ewa end of Waikiki to one-way operation. This would allow for widened landscape and pedestrian areas. The City is currently studying three circulation alternatives within this area:

i. Continue with the existing circulation patterns;
ii. Convert Ala Moana Boulevard, Kalakaua Avenue, and Atkinson Drive to a one-way counter-clockwise circulation system; and
iii. Convert Ala Moana Boulevard and Kalakaua Avenue to one-way operations to form a clockwise circulation system.

Both of the one-way systems include construction of a new circulator roadway across the former Aloha Motors site to permit the one-way traffic flow to circulate between Kalakaua Avenue and Atkinson Drive without having to use Kapiolani Boulevard. The following effects are based on the current convention center design.

**Counter-Clockwise One-Way System**

1. Given the design requirements for the proposed convention center and the site constraints, construction of the Center precludes future construction of the circulator road within the project site.

2. Conversion of the streets to the counter-clockwise operation would adversely affect the passenger drop-off/pick-up operations at the lobby entry drive of the convention center, and make it operationally infeasible for buses and taxis westbound on Kapiolani Boulevard to enter the main entry drive. To allow for vehicular access to the convention center main entry drive area, this would require major modifications, such as:

   - Install a traffic signal on Kapiolani Boulevard near the convention center to allow buses and taxis to turn left into the main entry drive of the Center from Kapiolani Boulevard.

   - Provide a counter-flow lane on maukabound Atkinson Drive between Ala Moana Boulevard and the convention center to allow provision of a right-turn into the main entry drive of the convention center by taxis and other vehicles.

   - Convert Kapiolani Boulevard to a one-way westbound operation to allow provision of vehicles to safely access the main entry drive of the convention center.

   Each of these potential modifications will have significant impacts on traffic circulation in the area.

**Clockwise One-Way System**

1. Given the design requirements and site constraints for the convention center, construction of the Center precludes future construction of the circulator road or any additional widening within the site.

2. Development of the convention center could potentially restrict conversion of the streets to one-way operation depending on the adequacy of right-of-way within the existing streets.

3. Conversion of the streets to the clockwise operation would not significantly affect vehicular traffic operations at the convention center lobby entry drive area since the planned vehicular approach and circulation to this area would be maintained.

*Waikiki Peripheral Parking*

The City's draft Waikiki People Mover and Peripheral Parking Study reviews various potential peripheral parking sites around Waikiki, and provides an assessment of the constraints, impacts, capacity, and accessibility of each. The peripheral parking system would be integrated into a new traffic/circulation plan for Waikiki, and served by a shuttle van service. Four publicly-held sites were selected by the City Planning Department for evaluation of peripheral parking sites. The four sites, along with the proposed number of stalls, are:

1. Ala Moana Beach Park (Middle play field - 900 stalls, and Magic Island parking lot - 1,440 stalls);
2. Ala Wai Play Fields (Southeast corner of McCully Street and Kapiolani Boulevard - 880 stalls, Main play fields - 1,600 stalls, and at the southern end of University Avenue - 900 stalls);
3. Ala Wai Golf Course (along the Ala Wai Canal - 770 stalls, along the Manoa-Palolo Stream - 1,200 stalls, along Date Street - 400 stalls, and along Kapahulu Avenue, north of the Base Yard - 165 stalls; and
4. Kapahulu Base Yard (within the site boundaries - 400 stalls, and beyond the site boundaries - 650 stalls.

The study findings of the evaluation conclude that in general, none of the sites appear to be well-suited for the development of peripheral parking as each site has a number of significant land-use constraints, particularly since they are publicly-held lands primarily utilized for recreation/park usage. It further indicates that sites beyond those covered in the study will need to be considered for peripheral parking facilities. Furthermore, the study indicates that Ala Moana Center and the convention center have been mentioned as possible sites for peripheral parking facilities, and suggests that these sites should be explored further. The following are general effects with respect to the convention center regarding the peripheral parking facilities.

- The future convention center operator could designate the Center's facility to serve as a parking function during the non-convention or "dark" days. However, because the parking will not be available on a regular basis, it would be infeasible to consider it as a permanent parking site.

- Use of the planned parking (800 stalls) on the convention center site during non-convention days as peripheral parking for Waikiki would potentially increase the traffic volumes forecast for site driveways and adjacent street sections, and could potentially result in the need for additional roadway improvements. Also, the requirement set forth in the Request for Proposals (RFP) process to accommodate an additional 200 on-site parking spaces for future expansion of the facility was abandoned by the State CCA after it was determined that the cost of adding the parking spaces would be economically prohibitive.

- Development of peripheral parking facilities near the convention center could provide some additional parking needed to accommodate large local events at the center in the evenings, or for the large number of food service workers needed for large banquets. Special shuttle service would be needed if the peripheral parking is farther away than convenient walking distance.

*Waikiki People Mover System*

The proposed people mover system would travel a route of approximately five miles, and would be targeted to serve tourists by providing a local circulator within Waikiki and connecting to major hotels and shopping centers. The people mover system is proposed as a supplement to the City's bus system. The City's draft Waikiki People Mover and Peripheral Parking Study reviews available options for the people mover system and offers a recommendation for system vehicle type and technology, identifies a recommended system route and potential stops, and describes operational and facility requirements for the system.

Key transit stops would include the convention center, the convention center/Hard Rock Cafe, Ala Moana Center, the Waikiki Trade Center, the Honolulu Zoo, the International Market Place, and the Hilton Hawaiian Village. A diesel-powered trolley replica style vehicle is recommended for the Waikiki people mover. The system's projected capacity along the route is 480 passengers per hour. According to the study, the recommended operation plan would be to accommodate the early morning and evening transportation requirements of the convention center attendees.

The following are general effects with respect to the convention center regarding the people mover system.

- The people-mover system could increase the transit capacity in Waikiki and augment transit access between Waikiki and the convention center, depending upon the routing and scheduling of the service. The projected capacity of 480 passengers per hour may accommodate a major portion of the small to average convention size, but would not meet the needs of the larger conventions during the AM peak hour (i.e., 10,000- and 14,000-person conventions), unless more vehicles or higher capacity vehicles are added to the route. It would be likely that most conventioneers would opt to use the convention's shuttle bus transportation system in lieu of paying fares to take the people mover. Therefore, the people mover could serve as a supporting system for the convention center.

- Except during peak hours of the large conventions, the two bus berths on Atkinson Drive fronting the convention center could be available as people mover stops. Also, there is the planned City bus stop on Kalakaua Avenue that may be used by the people mover.

*Rapid Transit*

The City and County of Honolulu has long planned to develop a regional rapid transit system, with the alignment passing across or adjacent to the former Aloha Motors site and with a station located at the intersection of Kapiolani Boulevard and Kalakaua Avenue. Although the development work on the rapid transit project has largely ceased due to the lack of a dedicated local funding source, it is possible that continuing increases in traffic congestion may result in the eventual future development of a transit guideway through this area.

The most recent rapid transit development project plans included an elevated transit guideway extending along Kona Street, crossing Atkinson Drive, continuing along the Atkinson and Kapiolani edges within the project site, and then crossing Kalakaua Avenue and continuing in a new median section along Kapiolani Boulevard. A transit station would have been included within the segment crossing the project site.

The design plan for the convention center would affect the physical feasibility of future construction of a rapid transit guideway through the project area, the location of a transit station within the area, and the visual appearance and costs of the guideway. The current convention center design precludes any alignment straight across the site, and would require that any future alignment be located along the periphery of the site. This could require the taking of right-of-way from other properties and may affect operation speeds. Construction of the guideway along the periphery of the site would affect the visual appearance and operations of the convention center. The proposed convention center design would preclude the future location of a transit station on the project site. Location of a transit station near the project site would improve resident and employee access to the convention center and reduce vehicle trips. Reductions in Waikiki visitor vehicle trips would require the construction of a Waikiki transit line.

### 5.1.8 Other Transportation Issues

*Construction Period Traffic and Parking*

During construction of the Hawai'i Convention Center, short-term traffic impacts will occur from construction vehicles such as earthmovers and heavy trucks transporting equipment, building materials, and excavated materials. These construction vehicles could impede traffic flow since they are relatively slow and difficult to maneuver. This increased traffic should not be significant, but may cause inconveniences to the residents and businesses in the vicinity. Commuting construction workers will also add to vehicular traffic.

Under union rules, the contractor will be obligated to provide off-site parking for construction employees during the duration of the construction, which may include a reserved location near the site. Therefore, there should be no competition for on-street parking in the vicinity of the site during the construction period.

To avoid potential traffic congestion, movement of construction vehicles to and from the project site will be restricted during the morning and afternoon peak traffic periods. Flagmen or off-duty police officers will be employed to direct traffic during significant phases of construction to minimize traffic congestion.

Construction of the convention center will also require the temporary closure of the existing sidewalks along the project frontages of Kalakaua Avenue, Kapiolani Boulevard, Atkinson Drive, and Kahakai Drive for pedestrian safety concerns. Temporary informational and directional signs will be installed in the immediate project vicinity to direct pedestrians to use the adjacent sidewalks.

In conjunction with the convention center project, a new sewerline will be installed beneath Atkinson Drive leading from the project site toward Ala Moana Boulevard to the existing sewer main in Ala Moana Park. Short-term impacts will occur from construction vehicles and temporary lane closures. The movement of construction vehicles to and from the site, along with conducting the work, will be restricted during the morning and afternoon peak traffic periods.

*Regional Traffic Impacts*

The City and County of Honolulu is currently conducting the Waikiki Regional Traffic Impact Plan which is intended to analyze traffic impacts of existing and future conditions in the region in the year 2005, including the convention center project, and to recommend mitigation measures for overall traffic impacts in the area (including those which would be the responsibility of the State). The study area limits for the regional study are the H-1 Freeway, Pensacola Street, Ala Moana Boulevard/Kalakaua Avenue, and Kapahulu Avenue. The regional traffic study, which will also reevaluate the change in traffic circulation and patterns of the major streets in the area, is anticipated to be completed in August 1995.

In previous meetings between the State CCA and the City DTS, it was agreed that the City would incorporate the traffic data from the convention center traffic study into its regional study. Also, the State CCA has been participating in the Waikiki Regional

Traffic Impact Plan task force as the convention center is but one traffic generator in the area.

*Emergency Vehicle Access*

An issue which has been raised is the potential impact of convention center-related traffic congestion on emergency vehicle access. Of particular concern was the impact of locating major project entrances or exits on Kahakai Drive.

Among the most important project mitigation measure is the provision of an additional lane along the project frontages of Kalakaua Avenue and Kapiolani Boulevard, an additional lane along Atkinson Drive, and two (2) additional traffic lanes along Kahakai Drive to accommodate convention center traffic. All of these road widenings will be on the convention center property and, in combination, are anticipated to offset the impacts of additional traffic generated by the convention center during peak traffic hours. Furthermore, as required, the convention center's transportation management plan could include the stationing of traffic control personnel at key access points to facilitate the movement of traffic and emergency vehicles during large convention events.

On Kahakai Drive, two inbound lanes will be provided from Atkinson Drive to the Kahakai loop roadway, with the left (centerline) lane used by convention center traffic and the right (curbside) lane used by traffic to the Kahakai loop area. The convention center traffic should not be using the right inbound lane since left turns into the convention center driveways cannot be made from this lane, and thus the lane should remain open for Kahakai residents and for emergency vehicles during major events at the Center.

*Water Transport System*

Current plans for the convention center do not include any improvements associated with using the Ala Wai Canal as a waterborne avenue of approach by conventioneers. Several concerns need to be resolved before pursuing such a concept, including potential navigational and recreational conflicts with other groups and individuals who use the canal for boating and canoeing. Furthermore, such a system would likely require that portions of the Ala Wai Canal be dredged and docking facilities installed. The proposed convention design, however, would not preclude such a use of the Ala Wai Canal in the future.

As it is envisioned that potential boating vessels associated with this concept would likely be of the low passenger volume mode, such water transport is not likely to have a significant impact on peak hour vehicle use and should not be viewed as a significant traffic mitigation measure for the convention center.

5.1.9 Future Convention Center Expansion

Future expansion plans for the convention center includes about 50,000 square feet of meeting rooms plus supporting facilities and 100,000 square feet of leasable exhibit space. The increase would better accommodate the infrequent larger conventions and provide more space to better serve the mid-size conventions. The requirement to accommodate 200 additional parking spaces was abandoned by the State CCA after it was determined that the cost would be economically prohibitive.

Future expansion, if implemented, would result in a 20 percent increase in the size of the typical large convention, or combination of simultaneous small conventions, using the Center. This would increase the large convention size, used as the basis for the 14,000-person convention analysis, to 16,700 attendees.

The time frame for future expansion of the convention center remains undetermined. Therefore, a quantitative analysis of the impacts on traffic resulting from the expansion would not be possible at this time. A supplemental EIS, including a traffic impact analysis, would need to be prepared when the decision is made to pursue such expansion.

## 5.2 1998 Traffic Assessment of Additional Intersections

An analysis of potential convention center traffic-related impacts to intersections located beyond the EIS TIAR study area was conducted by Parsons Engineering Science, Inc. in June 1995 (see Appendix J). This Traffic Impact Assessment (TIA) was conducted in response to comments received on the Draft EIS that additional intersections in the project vicinity should be analyzed for convention center traffic impacts.

This TIA assesses ten (10) intersections in the vicinity of the convention center project site. These intersections, which were selected on the basis of approach and departure routes to and from the convention center site, are identified as follows:

1. Atkinson Drive at Mahukona Street
2. Ena Road at Kalakaua Avenue
3. McCully Street at Kalakaua Avenue
4. McCully Street at Ala Wai Boulevard
5. McCully Street at Kapiolani Boulevard
6. Hobron Lane at Ala Moana Boulevard

7. Ala Moana Boulevard at Ena Road/Kalia Road
8. Ala Moana Boulevard at Kalakaua Avenue
9. Makaloa Street at Kalakaua Avenue
10. Mahukona Street/Kaheka Street at Kapiolani Boulevard

The assessment is conducted for the following scenarios from the 1998 EIS TIAR:

- 1998 AM Peak Hour Without Project
- 1998 PM Peak Hour Without Project
- 1998 AM Peak Hour for a 10,000-Person Convention
- 1998 PM Peak Hour for a 10,000-Person Convention
- 1998 AM Peak Hour for a 14,000-Person Convention
- 1998 PM Peak Hour for a 14,000-Person Convention

### 5.2.1 Assumptions and Methodology

This analysis is based on the existing street patterns and roadway widths, and is conducted using the same trip generation, travel forecast assumptions, modal splits, vehicle occupancies, traffic assignments, and 1998 analysis year for the EIS TIAR. Existing traffic counts were obtained from the most recent data available from the City Department of Transportation Services, and from new counts taken for specific intersections by Parsons Engineering Science, Inc. Traffic counts were projected to analysis year 1998, using the 1.5 percent per year traffic growth factor in the EIS TIAR.

The Level-of-Service (LOS) analysis was conducted using the Planning Method as described in the 1985 *Highway Capacity Manual.* This methodology analyzes isolated intersections and assumes that the traffic signal phasing and synchronization are optimized (see Table 5-9).

### 5.2.2 Trip Generation and Trip Distribution and Assignment

Trips generated by the Hawai'i Convention Center for the additional intersections were estimated for the various event scenarios using the modal splits and vehicle occupancies in the EIS TIAR. Trip distributions and assignments were also based on the distributions indicated in the EIS TIAR, and applied to the additional assessed intersections.

### 5.2.3 Project Impacts

The results of the LOS analysis for the additional assessed intersections are summarized in Table 5-9). The conclusions of the analysis for the 10,000-person convention scenario are as follows:

## Table 5-9. 1998 Level-of-Service Analysis
## Additional Intersections

| Intersection | 1998 Without Project | | | | 10,000-Person Event | | | | | | 14,000-Person Event | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | AM Peak Hour (Scenario 1) | | PM Peak Hour (Scenario 2) | | AM Peak Hour (Scenario 3) | | | PM Peak Hour (Scenario 4) | | | AM Peak Hour (Scenario 5) | | | PM Peak Hour (Scenario 6) | |
| | V/C | LOS | V/C | LOS | V/C | LOS | Chng. | V/C | LOS | Chng. | V/C | LOS | Chng. | V/C | LOS |
| Atkinson Dr. at Mahukona St. | 0.551 | A | 0.497 | A | 0.562 | A | 0.011 | 0.519 | A | 0.022 | 0.565 | A | 0.014 | 0.528 | A |
| Ena Road at Kalakaua Ave. | 0.553 | A | 0.808 | D | 0.598 | A | 0.045 | 0.841 | D | 0.033 | 0.616 | B | 0.063 | 0.857 | D |
| McCully St. at Kalakaua Ave. | 0.323 | A | 0.432 | A | 0.367 | A | 0.044 | 0.465 | A | 0.033 | 0.385 | A | 0.062 | 0.480 | A |
| McCully St. at Ala Wai Blvd. | 0.756 | C | 0.783 | C | 0.770 | C | 0.014 | 0.784 | C | 0.001 | 0.775 | C | 0.019 | 0.784 | C |
| McCully St. at Kapiolani Blvd. | 0.770 | C | 0.974 | E | 0.773 | C | 0.003 | 0.974 | E | 0.000 | 0.774 | C | 0.004 | 0.974 | E |
| Hobron Lane at Ala Moana Blvd. | 0.614 | B | 0.819 | D | 0.695 | B | 0.081 | 0.834 | D | 0.015 | 0.724 | C | 0.110 | 0.840 | D |
| Ala Moana Blvd. at Ena Rd./Kalia Rd. | 0.607 | B | 0.759 | C | 0.837 | D | 0.230 | 0.783 | C | 0.024 | 0.945 | E | 0.338 | 0.793 | C |
| Ala Moana Blvd. at Kalakaua Ave. | 0.707 | C | 0.844 | D | 0.742 | C | 0.035 | 0.875 | D | 0.031 | 0.756 | C | 0.049 | 0.890 | D |
| Makaloa St. at Kalakaua Ave. | 0.649 | B | 0.742 | C | 0.659 | B | 0.010 | 0.744 | C | 0.002 | 0.662 | B | 0.013 | 0.745 | C |
| Mahukona St./Kaheka St. at Kapiolani Blvd. | 0.488 | A | 0.892 | D | 0.488 | A | 0.000 | 0.894 | D | 0.002 | 0.488 | A | 0.000 | 0.895 | D |

Ref.: Parsons Engineering Science, Inc.

1. All intersections would operate at LOS D or better during the AM peak hour.

2. The intersection of Kapiolani Boulevard at McCully Street is expected to operate at LOS E during the PM peak hour. The remaining intersections would operate at LOS D or better during the PM peak hour.

3. The intersection of Kapiolani Boulevard at McCully Street would operate at LOS E during the 1998 PM peak hour without the project. The v/c ratio and, therefore the LOS, would not change with the convention center traffic. Convention center traffic would have no impact on PM peak hour traffic conditions at this intersection.

4. The calculated LOS for existing conditions is not indicative of the observed levels-of-service at the intersection of Ala Moana Boulevard at Kalakaua Avenue. Observed conditions appear worse than would be expected based on the level-of-service calculations.

The conclusion of the analysis is that there is sufficient existing lane capacity at the analyzed intersections to accommodate traffic generated by a 10,000-person event at the convention center. However, the full capacity of the intersections appears not to be effectively used due to backups from adjacent intersections and/or imbalances in the distribution of traffic among the travel lanes.

The analysis also indicates that traffic conditions could be improved with optimization of traffic signal phasing and coordination. The traffic signal phasing and timings should be examined to determine if the backups can be reduced or eliminated by optimizing the traffic signal timings.

### 5.3 2005 Traffic Conditions

Based on comments received on the Draft EIS, a Traffic Impact Analysis Report of traffic conditions in the year 2005 (2005 TIAR) was conducted for the Hawai'i Convention Center project in June 1995 (see Appendix K). Concern was expressed that the convention center is anticipated to reach its full stabilized operating capacity in year 2005, and an analysis of convention center traffic-related impacts should be conducted in that year to be consistent with the stabilized operational year.

The year 2005 analysis was conducted for a 10,000-person event and a 14,000-person event at the convention center. As with the EIS TIAR (1998 conditions), the 14,000-person event was used to represent a "worst case" scenario for analysis of traffic impacts. Analysis was also conducted for a 10,000-person event to reflect a reduction in the percentage of persons walking to the convention center, such as during inclement weather. The 2005 TIAR analyzed the 15 intersections studied in the year 1998 conditions, plus the convention center's shuttle bus entrance and exit along Atkinson Drive and Kapiolani Boulevard, respectively.

5.3.1 Existing Conditions

*Existing Peak Hour Traffic Volumes and Conditions*

The AM and PM peak hour traffic volumes were obtained from three sources. Traffic volumes for key intersections were obtained from counts conducted for the City's Waikiki Regional Traffic Impact Plan. For the intersections studied in the EIS TIAR, but not included in the Waikiki regional study, volumes were expanded to reflect the approach and departure volumes for the intersections at which current traffic counts were available. Field counts for the remaining intersections were performed by Parsons Engineering Science, Inc. in April and June 1995.

The planning method described in the 1985 *Highway Capacity Manual* was used to analyze the operating efficiency of the signalized intersections in the study area. This method, which was selected in consultation with the City DTS, involves the calculation of a volume-to-capacity (v/c) ratio which is related to a level-of-service (LOS). A maximum intersection capacity based on the number of phases was used for the v/c calculations.

The results of the existing level-of-service analysis are shown in Table 5-10. All of the study intersections operate at LOS D or better, with the exception of Kapiolani Boulevard at Kalakaua Avenue, which operates at LOS E during the AM peak hour. The v/c ratio is 0.921, indicating that this intersection is operating near capacity. The remaining intersections operate at levels-of-serve acceptable for urban peak hour conditions.

Although the intersections are indicated to operate at LOS E or better, the calculated LOS for existing conditions is not indicative of the observed levels of service at several of the study intersections. In general, observed conditions are worse than would be expected based on the level-of-service calculations. The conclusion of the calculations and the observations is that there is sufficient lane capacity at these intersections, but the full capacity of the intersections appears not to be effectively used due to back-ups from adjacent intersections, imbalances in the distribution of traffic among the travel lanes, and/or less than optimum traffic signal phasing and timing.

**Table 5-10. Results of Level-of-Service Analysis for Existing Conditions**

| Intersection | AM Peak Hour | | PM Peak Hour | |
|---|---|---|---|---|
| | V/C | LoS | V/C | LoS |
| Atkinson Dr. at Ala Moana Blvd. | 0.746 | C | 0.889 | D |
| Atkinson Dr. at Mahukona St. | 0.506 | A | 0.468 | A |
| Atkinson Dr. at Kahakai Dr./Kona St. | Not Signalized | | | |
| Atkinson Dr. at Kapiolani Blvd. | 0.842 | D | 0.606 | B |
| Kapiolani Blvd. at Kalakaua Ave. | 0.921 | E | 0.779 | C |
| Ala Wai Blvd. at Kalakaua Ave. | 0.724 | C | 0.787 | C |
| Ena Rd. at Kalakaua Ave. | 0.474 | A | 0.720 | C |
| McCully St. at Kalakaua Ave. | 0.267 | A | 0.372 | A |
| McCully St. at Ala Wai Blvd. | 0.644 | B | 0.615 | B |
| McCully St. at Kapiolani Blvd. | 0.714 | C | 0.879 | D |
| Hobron Ln. at Kapiolani Blvd. | 0.551 | A | 0.742 | C |
| Ala Moana Blvd. at Ena Rd./Kalia Rd. | 0.471 | A | 0.688 | B |
| Ala Moana Blvd. at Kalakaua Ave. | 0.610 | B | 0.726 | C |
| Makaloa St. at Kalakaua Ave. | 0.567 | A | 0.656 | B |
| Mahukona St./Kaheka St. at Kapiolani Blvd. | 0.444 | A | 0.824 | D |

Legend:
V/C = Volume-to-Capacity Ratio
LoS = Level-of-Service

Since the analyses imply that traffic conditions could be improved with optimization of traffic signal phasing and coordination, the traffic signal phasing and timing should be examined to determine if the present backups can be reduced or eliminated by modifying the existing traffic signal timings.

### 5.3.2 2005 Cumulative Traffic Conditions Without the Project

The background growth rate represents the ambient growth in traffic resulting from regional growth not associated with a specific project, known projects which do not have a specific project description from which to quantify trips generated, and from projects for which no traffic study is required. The growth rate is typically based on historical traffic data or anticipated growth in population, employment, housing, etc. The 2005 TIAR analysis uses a growth factor of 8 percent, or 0.7 percent per year (growth that is not directly attributable or associated with the convention center) derived in consultation with the City DTS. This is the average increase in several socio-economic parameters in and adjacent to Waikiki.

The other component used in estimating cumulative traffic volumes is the traffic generated by other proposed or planned projects in the vicinity. Related projects are defined as those that are under construction, or have been approved for construction by the City and would significantly impact traffic at the study intersections. A total of 12 projects were identified, four of which have traffic studies with quantitative trip generation data. The trips generated by these four projects were added to the background growth rate to obtain the estimated 2005 cumulative traffic volumes. These projects are as follows:

- Waikiki Landmark
- Pawaa Redevelopment Project
- Hale Koa Expansion
- Haseko Keeaumoku Superblock

Although these projects are, in theory, included in the background growth rate and, therefore, may be double-counted, they have been included in the 2005 cumulative traffic volumes in order to conservatively assess the impacts at the intersections in the vicinity of the convention center. The resulting cumulative 2005 AM and PM peak hour traffic projections without the convention center project are shown in Table 5-11. The projected traffic increases along the area streets and intersections range between 10 and 24 percent above 1995 traffic volumes.

### 5.3.3 Project-Related 2005 Traffic Conditions

*Trip Generation*

Given the uniqueness of each convention center, the trips to be generated by the Center are estimated using assumptions relative to event size, mode split, vehicle occupancies, and attendance ratios. Several traffic-related assumptions used in the 1998 TIAR were adjusted for the purposes of the 2005 TIAR.

**Table 5-11. 2005 Level-of-Service Summary Analysis
10,000-Person Event**

| No. | Intersection | 2005 Cumulative (Without Project) | | | | 2005 10,000-Person Event | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AM Peak Hour (Case 1) | | PM Peak Hour (Case 2) | | AM Peak Hour (Case 3) | | | PM Peak Hour (Case 4) | | |
| | | V/C | LoS | V/C | LoS | V/C | LoS | Change | V/C | LoS | Change |
| 1 | Atkinson Dr. at Ala Moana Blvd. | 0.835 | D | 0.991 | E | 0.929 | E | 0.094 | 1.037 | F | 0.046 |
| 2 | Atkinson Dr. at Mahukona St. | 0.560 | A | 0.505 | A | 0.572 | A | 0.012 | 0.528 | A | 0.023 |
| 3 | Atkinson Dr. at Kahakai Dr./Kona St. | 0.568 | A | 0.304 | A | 0.399 | A | -0.169 | 0.334 | A | 0.030 |
| 4 | Atkinson Dr. at Bus Bay Entrance | 0.489 | A | 0.348 | A | 0.254 | A | -0.235 | 0.363 | A | 0.015 |
| 5 | Atkinson Dr. at Kapiolani Blvd. | 0.924 | E | 0.672 | B | 0.954 | E | 0.030 | 0.683 | B | 0.011 |
| 6 | Kapiolani Blvd. at Bus Bay Exit | 0.630 | B | 0.495 | A | 0.770 | C | 0.140 | 0.475 | A | -0.020 |
| 7 | Kapiolani Blvd. at Kalakaua Ave. | 1.016 | F | 0.878 | D | 0.987 | E | -0.029 | 0.904 | E | 0.026 |
| 8 | Ala Wai Blvd. at Kalakaua Ave. | 0.823 | D | 0.883 | D | 0.868 | D | 0.045 | 0.916 | E | 0.033 |
| 9 | Ena Road at Kalakaua Ave. | 0.563 | A | 0.821 | D | 0.607 | B | 0.044 | 0.854 | D | 0.033 |
| 10 | McCully St. at Kalakaua Ave. | 0.328 | A | 0.439 | A | 0.372 | A | 0.044 | 0.471 | A | 0.032 |
| 11 | McCully St. at Ala Wai Blvd. | 0.767 | C | 0.795 | C | 0.782 | C | 0.015 | 0.795 | C | 0.000 |
| 12 | McCully St. at Kapiolani Blvd. | 0.784 | C | 0.991 | E | 0.788 | C | 0.004 | 0.991 | E | 0.000 |
| 13 | Hobron Lane at Ala Moana Blvd. | 0.624 | B | 0.833 | D | 0.704 | C | 0.080 | 0.847 | D | 0.014 |
| 14 | Ala Moana Blvd. at Ena Road/Kalia Road | 0.544 | A | 0.797 | C | 0.633 | B | 0.089 | 0.828 | D | 0.031 |
| 15 | Ala Moana Blvd. at Kalakaua Ave. | 0.718 | C | 0.858 | D | 0.753 | C | 0.035 | 0.888 | D | 0.030 |
| 16 | Makaloa St. at Kalakaua Ave. | 0.659 | B | 0.754 | C | 0.669 | B | 0.010 | 0.756 | C | 0.002 |
| 17 | Mahukona St./Kaheka St. at Kapiolani Blvd. | 0.495 | A | 0.908 | E | 0.495 | A | 0.000 | 0.910 | E | 0.002 |

Ref.: Parsons Engineering Science, Inc.

*Mode Splits and Vehicle Occupancies*

In the 1998 TIAR, the vehicle occupancies and mode splits between the 10,000-person and the 14,000-person events were varied to analyze a "worst-case" scenario relative to vehicles and pedestrians. For the 2005 TIAR, the mode splits and vehicle occupancies are consistent for the 10,000-person and 14,000-person events.

The percentage of visitor attendees walking to and from the convention center have been reduced from 35 percent to 10 percent to examine the impacts of a scenario in which the number of pedestrians would be significantly reduced, such as during inclement weather, and with increased traffic impacts. The remaining 25 percent of visitor attendees resulting from the reduction in walk mode have been distributed among the shuttle buses, taxis, limousines, and passenger/rental automobiles.

The 2005 TIAR assumes the same vehicle occupancies for all three analyzed scenarios. The occupancy for the shuttle bus mode, however, has been reduced from 45 passengers per vehicle to 35 passengers, or approximately 80 percent of the number of seats on the smallest of the full-size charter coaches. This reduction assumes that the shuttle buses would probably not be operating with average loads equalling 100 percent of the seating during the peak hours.

Future traffic volumes with the project were determined by superimposing the project-generated traffic on the 2005 cumulative traffic volumes.

### 5.3.4 2005 Project Impacts

*Definition of Significant Impacts*

Criteria for determining if a project has significant traffic impact for which mitigation measures must be investigated have been established based on traffic impact study guidelines used in various other cities. Generally, if the LOS without the project is E or F and the v/c ratio changes less than 0.020, then impacts are considered insignificant. However, if the v/c ratio change is greater than 0.020, then mitigation measures which will reduce the v/c ratio change to less than 0.020 must be identified. If the LOS with the project is LOS D or better, than no mitigation measures need to be identified.

*Project-Related Traffic Impacts*

The analysis was performed for conditions that included the proposed convention center-related roadway improvements discussed in section 5.1.4 Mitigation above. In addition, it was assumed that the City would continue implementation of the current AM and PM peak traffic period contra-flow coning operations along Kapiolani Boulevard.

The 2005 level-of-service analysis for a 10,000-person event is summarized in Table 5-11. As shown, even with the roadway improvements implemented as part of this project, four intersections will operate at LOS E or F and have a v/c ratio change of 0.020 or greater.

a. **Atkinson Drive at Ala Moana Boulevard**
During the AM peak hour, the v/c ratio is expected to increase from 0.835 without the project to 0.929 with the project. This impact is the result of the heavy right-turn movement from westbound Ala Moana Boulevard to Atkinson Drive associated with the convention center. During the PM peak hour, the v/c ratio is expected to increase from 0.991 without the project to 1.037 with the project.

b. **Atkinson Drive at Kapiolani Boulevard**
During the AM peak hour, the v/c ratio is expected to increase from 0.924 without the project to 0.954 with the project.

c. **Kapiolani Boulevard at Kalakaua Avenue**
During the PM peak hour, the v/c ratio is excepted to increase from 0.878 without the project to 0.904 with the project.

d. **Ala Wai Boulevard at Kalakaua Avenue**
During the PM peak hour, the v/c ratio is expected to increase from 0.883 without the project to 0.916 with the project, an increase of 0.033.

*Secondary Impacts*

While growth of traffic beyond 1998 will not be a direct impact of the convention center, it could be reasoned that some of that future growth in traffic could be a cumulative impact of induced secondary growth by the convention center. Due to many uncertainties regarding the timing and character of development in the area, such induced development cannot be predicted, much less the traffic impacts associated with such development. To account for this, the 2005 TIAR includes the 0.7 percent per year traffic growth factor and considers a number of proposed or planned projects within the study area which may be developed within that time frame. Furthermore, it would be the responsibility of the developer of any proposed project to assess the traffic impacts and provide mitigation measures to reduce the impacts accordingly.

5.3.5 2005 Mitigation

a. **Atkinson Drive at Ala Moana Boulevard**

A right-turn only lane from westbound Ala Moana Boulevard to Atkinson Drive would reduce the AM peak hour v/c ratio to 0.821, which is an improvement compared to the 2005 without project condition. During the PM peak hour, the right-turn only lane would improve the v/c ratio to 0.814.

As indicated under section 5.1.4 Mitigation, in recent discussions between the State CCA and the State DOT, the DOT has indicated that they will further evaluate the right-turn lane on westbound Ala Moana Boulevard at Atkinson Drive as part of its Ala Moana Boulevard improvement project. The decision by the State DOT to implement this improvement, however, is subject to the results of the City's Waikiki Regional Traffic Impact Plan which is anticipated for completion in August 1995.

b. **Atkinson Drive at Kapiolani Boulevard**

A right-turn only lane for traffic turning from eastbound Kapiolani Boulevard to Atkinson Drive would reduce the AM peak hour v/c ratio to 0.922, which is an improvement compared to the 2005 without project condition.

c. **Kapiolani Boulevard at Kalakaua Avenue**

A right-turn only lane for traffic turning from ewabound Kapiolani Boulevard to maukabound Kalakaua Avenue would reduce the peak hour v/c ratio to 0.843, which is a significant improvement compared to the 2005 without project condition.

d. **Ala Wai Boulevard at Kalakaua Avenue**

To mitigate project-related impacts at this intersection, the westbound approach of Ala Wai Boulevard at Kalakaua Avenue, along with traffic signals, should be modified to provide two exclusive right-turn lanes onto maukabound Kalakaua Avenue, and an optional through/left-turn lane. This can be accomplished by reconfiguring the existing lanes within the existing roadway width. This would allow more green time to the Waikiki-bound traffic on Kalakaua Avenue and, therefore, increase the capacity in that direction. The modification would decrease the PM peak hour v/c ratio at the Ala Wai Boulevard/Kalakaua Avenue intersection from 0.916 to 0.892, and improve the level-of-service from LOS E to LOS D. The AM peak hour level-of-serve would also improve from LOS D to LOS C, with a decrease in the v/c ratio from 0.868 to 0.715.

**Traffic Demand Management**

The transportation coordinator of the convention center would develop a plan to accommodate the traffic expected from a large event or during inclement weather. Using the traffic generation calculation presented in the 2005 TIAR, an estimate of the programs required for each of these events has been developed.

For a 14,000-person event, the plan would involve the following:

1. Temporary relocation of employees to a satellite lot and transporting them to the convention center via shuttle buses.

2. Designation of an existing satellite parking lot for resident visitors and provision of shuttle buses to accommodate approximately 50 percent of the anticipated resident visitors to the convention center.

3. Reallocation of the mode splits and the number of vehicles available for non-resident visitors. Vehicle occupancies would have to be higher for convention center shuttle buses and a larger percentage would be encouraged to walk.

The inclement weather scenario is a "worst-case" condition for traffic-related impacts associated with a 10,000-person event. This a condition for which the percentage of visitors walking to the convention center would be significantly less than for the project design scenario. Those visitors would change travel modes from walking to shuttle buses, taxis, limos, or automobiles with a resulting increase in traffic volumes in the study area.

To reduce the traffic generated to levels comparable to the project design scenario, the transportation management plan should be designed for the following:

a. The proportion of non-resident attendees walking to the convention center would decrease to 5 percent or less.

b. The percentage of non-resident attendees using the shuttle buses would increase to 75 percent.

c. Taxi use by non-resident attendees would also be expected to increase.

To accommodate these, the transportation management plan should address the following:

a. The need for more passenger loading/unloading area for the additional shuttle buses. The transportation coordinator should coordinate with the shuttle bus operator for use of the Center's loading dock area for bus staging so as to eliminate the potential of buses queuing on the streets.

b. The need for more taxi loading/unloading area for passengers. An area within the convention center parking garage could be designated for this purpose. The placement of directional signing would be required to route taxis to the designated loading/unloading areas, and to direct passengers to the Center's lobby from the drop-off area.

## 5.4 Wastewater System

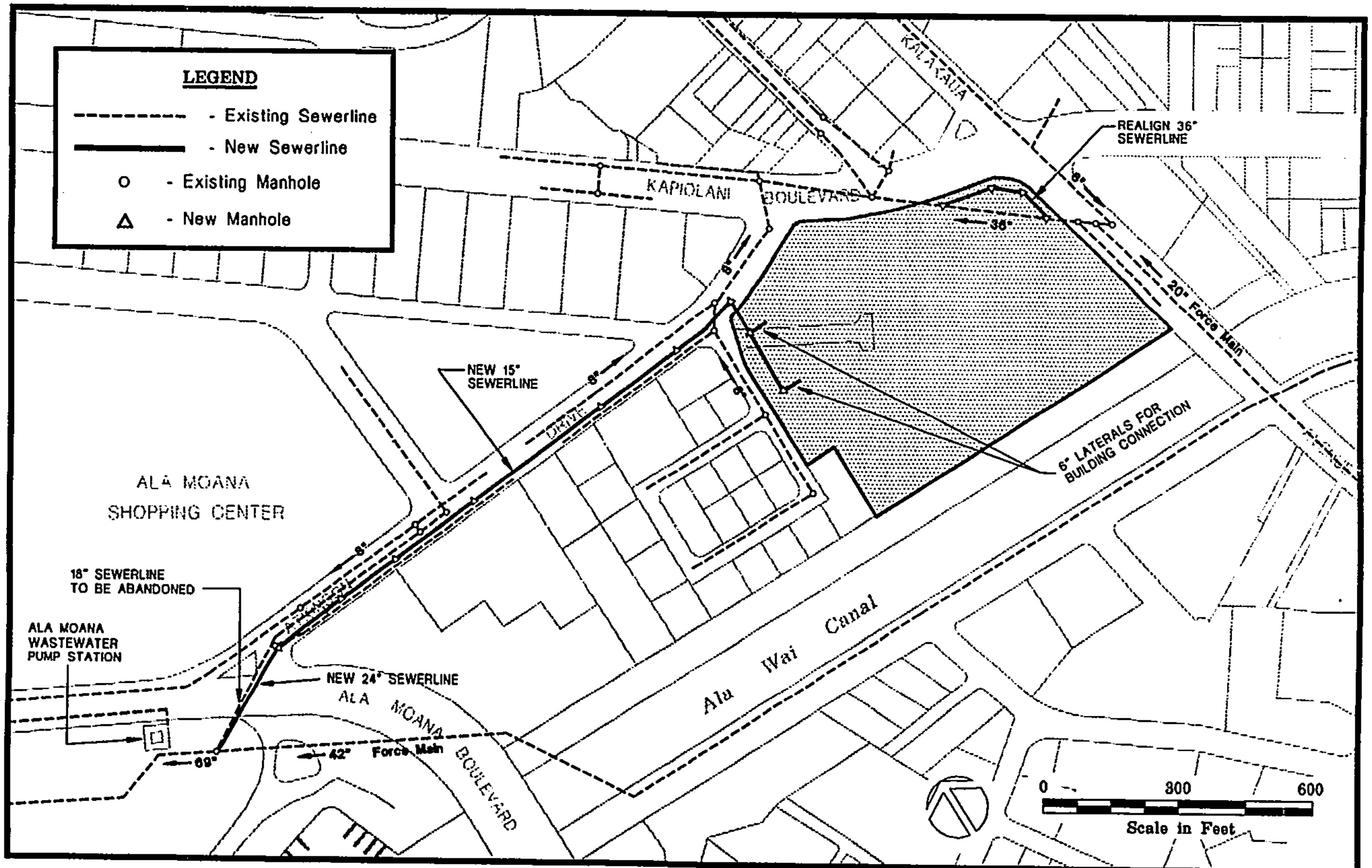
### 5.4.1 Existing Conditions

Sewer service is provided to the site by the City and County of Honolulu's existing wastewater system. Sewer mains in the project vicinity include a 36-inch line along Kapiolani Boulevard flowing in a northwest direction; an 8-inch line and a 20-inch force main (line carrying sewage being pumped uphill) on Kalakaua which converge on the 36-inch line; and, two 8-inch lines on Atkinson Drive which also flow into the 36-inch line. (see Figure 5-3). The 36-inch sewer main and easement cross the property at the corner of Kapiolani Boulevard and Kalakaua Avenue. (Wilson Okamoto & Associates, August 1989).

The municipal wastewater system converges at the wastewater treatment plant at Sand Island. The Sand Island Treatment Plant has an 82 mgd capacity, and provides advanced primary treatment. Treated effluent is discharged via an 84-inch diameter ocean outfall.

### 5.4.2 Impacts

Wastewater that will be generated by the project is estimated to be on the order of 210,000 gallons per day based on a 14,000-person event using a factor of 15 gallons per person per day. According to the City's Department of Wastewater Management, the 36-inch line along Kapiolani Boulevard has insufficient capacity to accommodate this additional volume of flow.




HAWAI'I CONVENTION CENTER

Fig. 5-3
EXISTING AND PROPOSED SEWER SYSTEM

Prepared for :
CONVENTION CENTER AUTHORITY
State of Hawaii

Prepared by :
Nordic / PCL
Wilson Okamoto & Associates, Inc.

The potential secondary impact of redevelopment that may be accelerated by the convention center and the construction of new hotel rooms in response to demand created by the convention center would have the cumulative impact of increasing demand on the wastewater systems.

The portion of the 36-inch line crossing the northeast corner of the property interferes with the proposed convention center design and must be rerouted around the edge of the property.

5.4.3. Mitigation

To accommodate projected wastewater flows from the Hawai'i Convention Center, a new 15-inch sewer line will be installed beneath Atkinson Drive leading from the project site toward Ala Moana Boulevard. At the corner of Atkinson Drive and Ala Moana Boulevard, the new line will intercept flows from two existing lines that currently flow into an 18-inch line. From there a new 24-inch line carrying flows from all three lines will cross Ala Moana Boulevard and connect with an existing 69-inch sewer main in Ala Moana Park. According to the City's Department of Wastewater Management, the 69-inch line is the nearest main with sufficient capacity to accommodate flows from the convention center. These improvements are based on consultation with the City and County of Honolulu, Department of Wastewater Management and includes additional capacity to accommodate potential demand arising from future redevelopment in the vicinity of the convention center. Any other new hotels constructed in Waikiki or elsewhere would need to provide their own improvements to the wastewater system to accommodate their respective demand.

Standard mitigation measures for minimizing impacts of utility installation in roadways on neighboring residences and businesses will be provided. These include conducting the work during off-peak traffic hours; covering open trenches with metal plates when work is not being conducted and providing appropriate signage and warning lights to insure public safety and facilitate traffic flow; using flagmen, as necessary, to direct traffic while construction work is on-going; and, installing the sewer line in sections to minimize the length of roadway affected at any time during construction. In addition, if it is determined that dewatering is required for construction, a National Pollutant Discharge Elimination System (NPDES) permit and a permit for discharging dewatering effluent into the City's drainage system will be obtained prior to construction. Additional discussion regarding permit requirements is included in Section 3.8 Water Quality.

### 5.5 Water Supply

#### 5.5.1 Existing Conditions

Water service to the site is provided by the Honolulu Board of Water Supply through its existing distribution system. Existing 12-inch waterlines are found on Atkinson Drive, Kapiolani Boulevard and a portion of Kalakaua Avenue (see Figure 5-4). The 12-inch waterline on Kalakaua Avenue reduces to an 8-inch line approximately half-way along the property boundary. (Wilson Okamoto & Associates, Inc., August 1989).

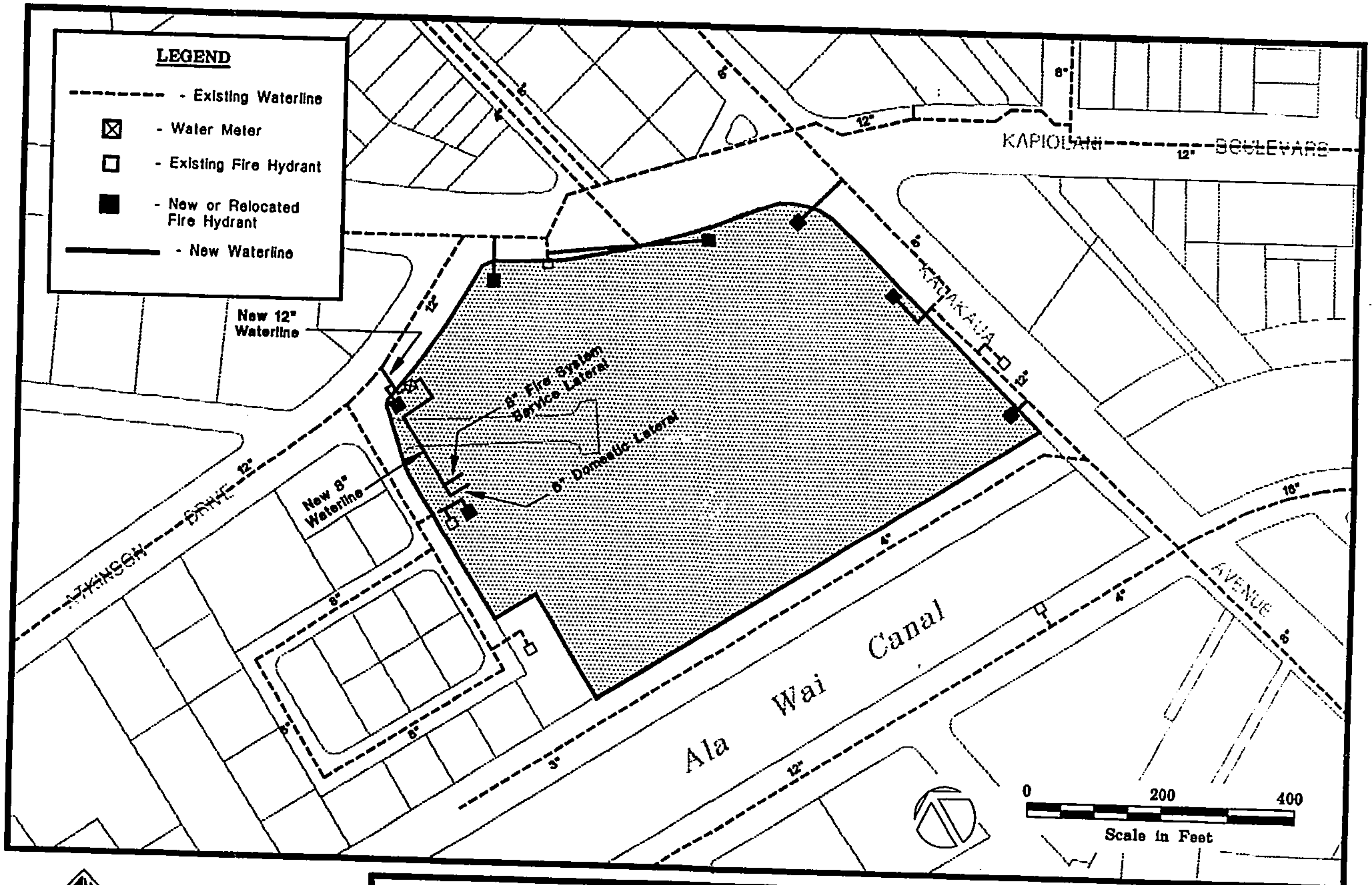
#### 5.5.2 Impacts/Mitigation

The water demand for the Hawai'i Convention Center is estimated at 225,700 gallons per day during a 14,000-person event. This figure was derived by adding the wastewater generation volume (210,000 gpd) and adding landscaping irrigation demand (15,700 gpd). According to the City and County of Honolulu Board of Water Supply (BWS), the existing water lines around the site have sufficient capacity to accommodate these demands. The proposed connection to the BWS system was determined in consultation with the BWS. The official commitment of water will be made when the building permit application is submitted to the Board of Water Supply for review and approval.

The Board of Water Supply indicated that based on the projected demand being less than 250,000 gallons per day, the developer will be required to pay the standard Water System Facilities Charges. (Correspondence from Kazu Hayashida, Manager and Chief Engineer, Board of Water Supply, July 13, 1994) The charge will be assessed when the building permit is issued.

The use of non-potable water (brackish, reclaimed sewage effluent, etc.) was considered but there are no systems distributing reclaimed or other non-potable water in the vicinity of the convention center. Toward conserving water resources, however, the drainage from interior landscape boxes will be reused to irrigate both interior and exterior landscape boxes as well as perimeter landscaping.

The potential secondary impact of redevelopment that may be accelerated by the convention center and the construction of new hotel rooms in response to demand created by the convention center would have the cumulative impact of increasing demand on water systems. Such developments would be required to provide their own improvements to the water system, if needed, to accommodate their respective demand.




HAWAI'I CONVENTION CENTER

Fig. 5-4
EXISTING AND PROPOSED WATER SYSTEM

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CONVENTION CENTER AUTHORITY
State of Hawaii

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Wilson Okamoto & Associates, Inc.

## 5.6 Drainage

### 5.6.1 Existing Conditions

There are existing drainage facilities, managed by the City and County Department of Public Works, in the vicinity of the project site. Most of these drainage lines empty into the Ala Wai Canal. Two drainage lines cross portions of the project site, including an 18-inch line originating near the dead-end of Kona Street, and an 18-inch line at the eastern corner of the parcel (see Figure 5-5). A 6' x 7' box culvert, which receives flow from a 36-inch line on Atkinson Drive and other lines on Kona Street, runs along Kahakai Drive. All of these facilities drain into the Ala Wai Canal. (Wilson Okamoto & Associates, Inc., August 1989).

### 5.6.2 Impacts

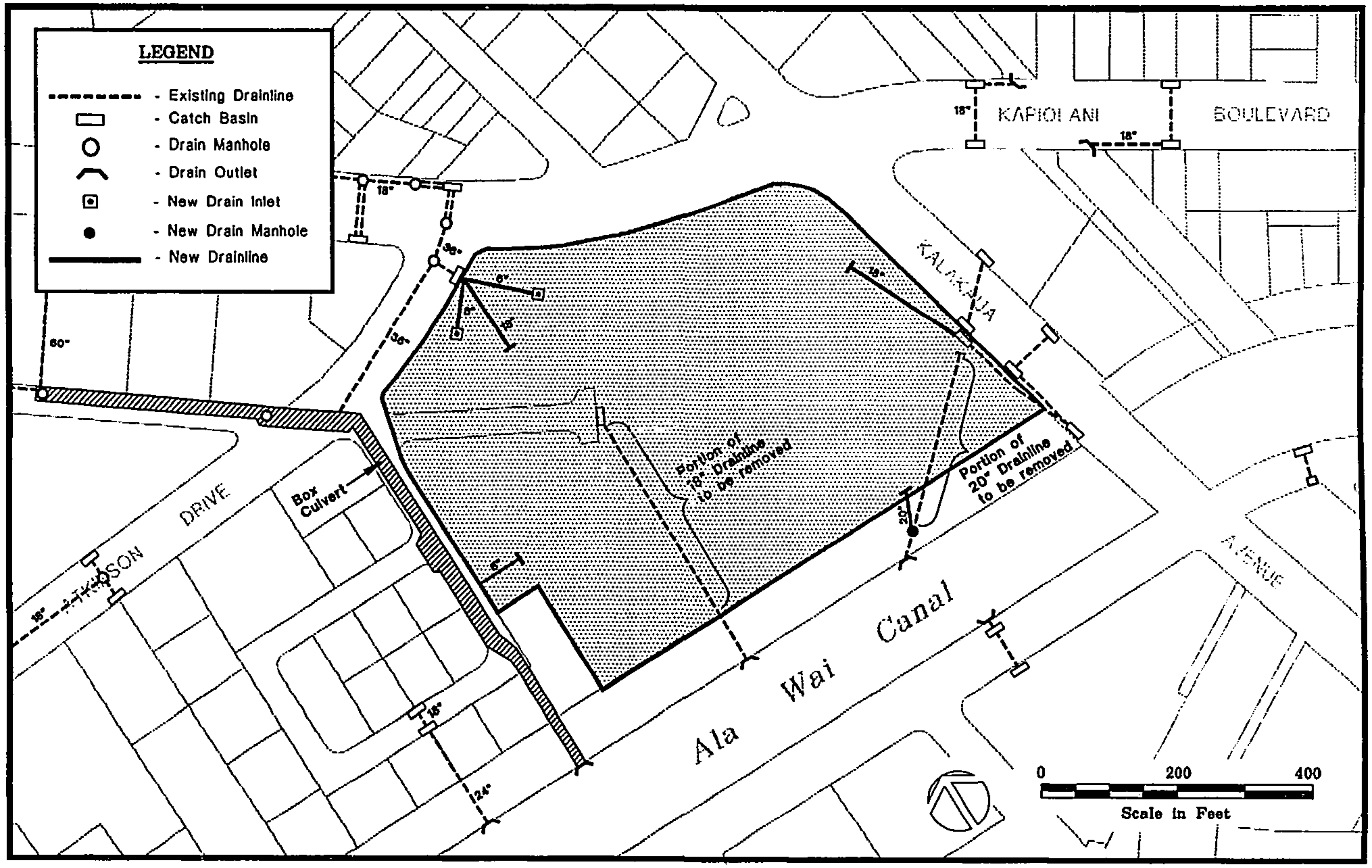
*Construction Period*

During the project construction period, storm runoff may carry increased amounts of sediment into the storm drain system, as a result of erosion from newly exposed land. This could potentially impact the water quality of the Ala Wai Canal and nearshore areas, but should be adequately mitigated by compliance with the City grading ordinance and the Department of Health (DOH) National Pollutant Discharge Elimination System (NPDES) permit requirements, as discussed subsequently.

Dewatering during construction may be required for work on structures and utilities that will lie below the water table. Dewatering effluent is generated by pumping required to keep water out of the area being worked on. For the project site, this will include construction of the utility corridor running the length of the Exhibition Hall, "pile caps" which sit on top of the piles to carry the load of the structure above them, the footings for a portion of the Loading Dock, as well as the elevator and escalator pits.

*Operational*

Drainage from the site will be collected from roofs, terraces, landscaped areas, planters and other exposed areas and directed into a drainage system which will discharge the runoff into existing drain lines. These lines include a 36-inch drainline at the corner of Atkinson Drive and Kapiolani Boulevard; two drainlines along the Ala Wai Promenade, and one along Kalakaua Avenue. Portions of two drainlines within the project site will be removed but their outlets on the Ala Wai Canal will be preserved. No new drainage outlets into the Ala Wai Canal will be needed.




HAWAI'I CONVENTION CENTER

**Fig. 5-5**
**EXISTING AND PROPOSED DRAINAGE SYSTEM**

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CONVENTION CENTER AUTHORITY
State of Hawaii

Prepared by :
Nordic / PCL
Wilson Okamoto & Associates, Inc.

The volume of runoff discharged into the Ala Wai Canal will be no greater than present since most of the site is paved, preventing infiltration. With the addition of significant landscaping for the project, the amount of infiltration could increase, thereby reducing the volume of runoff.

### 5.6.3 Mitigation

*Construction Period*

An NPDES Permit for stormwater discharges has been approved by the State Department of Health. The approval requires compliance with the City grading ordinance and with the approved grading plan. In addition, the Best Management Practices (BMP) plan requires berms to detain runoff and silt fences to filter silt from runoff.

It has been determined that dewatering requirements for work on the project site can be accommodated by on-site retention basins which will allow the dewatering effluent to percolate back in the ground. An NPDES dewatering permit application has been filed with the Department of Health to discharge effluent only in the event of a large or prolonged storm event. Mitigation measures proposed include retention basins which will completely contain effluent, except possibly in the event of a large or prolonged storm event; filter lining of dewatered pits to minimize the amount of silt in the dewatering effluent; and, filters in the pump to trap additional silt. Should treated dewatering effluent be discharged from the retention basins during a large of prolonged storm event, it will be controlled together with stormwater runoff as discussed for the NPDES stormwater permit.

*Operational*

Structural measures such as storm drains and landscaping will be incorporated to control runoff after construction. Screens in all drain inlets will filter debris and organic matter.

## 5.7 Electrical Power and Communication Systems

### 5.7.1 Existing Conditions

Electrical power is provided by Hawaiian Electric Company, Inc. through its existing lines on Atkinson Drive and Kapiolani Boulevard. Telephone service is provided by Hawaiian Telephone Company from an existing line on Atkinson Drive. Oceanic Cable has existing aerial cable facilities along Kalakaua Avenue and Atkinson Drive to service the Kahakai Drive area, and will be providing service to the convention center. The

Kalakaua Avenue cable is the company's main feed route to service the Waikiki area. (Correspondence from Don Camacho, Oceanic Cable, March 28, 1994).

5.7.2 Impacts

Hawaiian Electric Company has estimated that the final load requirement for the convention center will be between 4 and 6 megawatts (mW). Service date for the project will trigger the construction date for the 138/25 kV substation addition at Kewalo Substation, and the extension of 25 kV ducts and cables from the substation to the convention center. (Correspondence from William A. Bonnet, Hawaiian Electric Company, Inc., March 31, 1994).

Utility company personnel will continue to be consulted throughout the project design to confirm the adequacy of the existing facilities and for any recommendations on necessary improvements.

In furtherance of the State Environmental Policy (Chapter 226, HRS) and the Hawaii State Planning Act (Chapter 226, HRS) as related to energy conservation and energy self-sufficiency, the convention center design/build request for proposal required that the Hawai'i Convention Center design comply with the Hawaii Model Energy Code of July 1993.

The potential secondary impact of redevelopment that may be accelerated by the convention center and the construction of new hotel rooms in response to demand created by the convention center would have the cumulative impact of increasing electrical demand. Such developments would be required to coordinate with the utility company to assure that their respective demands can be met.

## 5.8 Solid Waste

5.8.1. Existing Conditions

There is no solid waste being generated at the currently vacant site.

5.8.2. Short-Term Impacts/Mitigation

Solid waste generated during construction of the Hawai'i Convention Center will be disposed of through privately contracted waste disposal services. Due to the unique design, construction methods and complex assemblage of building materials, estimates of the volume of solid waste that may be generated during construction were unavailable.

Methods of estimating waste volumes applicable to more common developments such as housing and office buildings are inappropriate for the convention center.

Nordic/PCL will establish a program for collecting and recycling waste material throughout the construction of the facility. Categories of materials that will be considered for recycling on-site, if possible, include: concrete, ferrous materials, aluminum, copper, glass, plastics, paper, cardboard and wood.

### 5.8.3 Long-term Impacts/Mitigation

Solid waste collection during operation of the convention center will be handled by private contractors, and municipal waste will either be disposed of at the Waimanalo Gulch landfill or the City's H-POWER garbage to energy plant at Campbell Industrial Park.

As required by the convention center design/build request for proposal, the Hawai'i Convention Center design incorporates several recycling operation features, including a 1,200 square foot recycling room, two loading bays for accommodating trash compactors, and a refrigerated room for holding food waste. These facilities will be located in the Truck Dock.

The potential secondary impact of redevelopment that may be accelerated by the convention center and the construction of new hotel rooms in response to demand created by the convention center would have the cumulative impact of increasing solid waste generation. Such developments would be required to coordinate with the City and private contractors to assure that their respective demands can be met.

## 5.9 Police Protection

### 5.9.1 Existing Conditions

Police services are provided by the Honolulu Police Department, which has seven police districts on the island of Oahu. The project site is located in District I, which extends from Koko Head to Nuuanu and contains 94 police beats. The project site is part of Beat 58.

### 5.9.2 Impacts

The project will increase the demand for police services in the area by providing a gathering place for thousands of people at one time. In a pre-assessment consultation letter from the City and County of Honolulu Police Department, the department stated that additional officers will be needed to handle calls for service at the convention center. However, the Department emphasized that this did not preclude the need for adequate private security at the facility. The Department expressed concern about traffic and road conditions in the project vicinity, and the need to reduce the project's traffic impacts. Adequate parking for convention delegates and employees and adequate loading zones for both passengers and freight are needed. Also, the importance of clear emergency routes to and from the convention center was emphasized. The Police Department also indicated that noise from the convention center should be kept at a minimum to avoid disturbing residential tenants in surrounding areas. (Correspondence from Eugene Uemura, Assistant Chief of Police, Administrative Bureau, March 30, 1994).

The Social Impact Assessment (SIA) prepared for the Draft EIS and revised in this Final EIS additionally notes that the increased potential for crime is not expected to be significant, nor is a change in the nature of crime, such as increased drug trafficking and prostitution, anticipated to occur. In research conducted for the EIS, it was found that convention centers are typically planned to revitalize an underdeveloped area and this provides increased public safety. Further, it was noted that convention centers tend to attract professional conventioneers, whereas prostitution activities tend to be more evident with other tourists. Hawaii is also anticipated to attract more families to conventions to combine the business trip with family vacations.

A secondary impact could occur due to the in-migration of residents who may work in the construction of new hotels as well as the operation of new and existing hotels. More residents could also be working in the new hotels and in hotels operating at higher occupancy rates. Similarly, more visitors would also be present as a result of increased hotel occupancy rates and new hotel rooms. This would have a cumulative effect of increased demand for police services.

### 5.9.3 Mitigation

The project can help mitigate its impact on police protection services in several ways. First, 24-hour on-site security personnel can monitor the facility and supplement its efforts with necessary equipment. Second, the traffic circulation plan and large event coordination efforts will help to minimize traffic congestion. Third, the design of the facility will ensure that safety measures such as adequate lighting are common.

## 5.10 Fire Protection

The project is served by the Pawaa Fire Station (#2) of the Honolulu Fire Department, located at the corner of Kaheka and Makaloa Streets, just over one-quarter mile from the site. The Pawaa station contains an engine and ladder company as well as a rescue unit. There are a minimum of 13 firefighters on duty during each shift.

Back-up firefighting service would be available from the Moiliili-McCully Fire Station (#29), located at the corner of Date Street and University Avenue. This is an engine and ladder company with nine firefighters at each shift. The Makiki Fire Station (#3) and Kakaako Fire Station (#9) could also provide back up service.

According to the Social Impact Assessment (Appendix G), the Fire Department presented a plan to relocate the ladder truck from the Moiliili-McCully Fire Station to the new Kapolei Fire Station in the summer before the Neighborhood Boards. No objections were raised, and the Fire Department proceeded with its plans.

These facilities and existing personnel levels are expected to provide adequate services at this time so the project is expected to have minimal primary impact on fire protection facilities. The level of service may change if the Station 29 ladder truck is relocated to Kapolei, although the Fire Department will provide appropriate fire coverage and response procedures will be adjusted to accommodate this change.

Review of the building design plans for conformance to the Fire Code of the City and County of Honolulu will occur during application for the project's building permit.

The potential secondary impact of redevelopment that may be accelerated by the convention center and the construction of new hotel rooms in response to demand created by the convention center would have the cumulative impact of increasing fire protection demands. Such developments would be required to coordinate with the City to assure that their respective fire protection demands can be met.

### 5.11 Emergency Services

Major medical facilities in the vicinity of the project site include Straub Clinic and Hospital located on King Street and Ward Avenue, the Kaiser Permanente Medical Center's Honolulu Clinic on Pensacola Street, and the Queen's Medical Center located on the corner of Beretania and Punchbowl Streets.

Ambulance dispatch through the 911 system is available within the required eight minutes response time from a number of medical facilities including Queen's Medical Center, the Kaiser Clinic, Saint Francis Medical Center, Kapiolani Hospital, and several private ambulance services. It is anticipated that the project can be adequately serviced by existing facilities.

A secondary impact could occur due to the in-migration of residents who may work in the construction of new hotels as well as the operation of new and existing hotels. More residents could also be working in the new hotels and in hotels operating at higher occupancy rates. Similarly, more visitors would also be present as a result of increased hotel occupancy rates and now hotel rooms. This will have a cumulative effect on the increased demand for emergency services.

## 5.12 Education and Child Care

### 5.12.1 Existing Conditions

Public schools in the area include Lunalilo Elementary School, about one-quarter mile from the site, and Washington Intermediate School, about one-half mile from the site. Ala Wai Elementary School, and the private Iolani School are both located just over one-mile from the project site.

### 5.12.2 Impacts

The proposed project is not anticipated to impact public or private educational facilities. During the pre-assessment consultation, the State Department of Education (DOE) had no comment on the proposed project (Correspondence from Herman Aizawa, Acting Superintendent, DOE, March 29, 1994). In an earlier consultation for the former First Development, Inc. project, the DOE stated that the project "should have a negligible impact on our public schools." (Correspondence from Eugene Imai, Assistant Superintendent, February 23, 1989).

Child care needs of the First Development, Inc. proposal were examined in 1989 by Peat Marwick Main and Company. Children of convention center employees were identified as possibly requiring child care. Because many of these children already receive day care, a more precise indicator of need was 1) children in households where both adults are employed at the convention center and 2) children of new labor force entrants. The 1989 study was reviewed as a comparison between the employment created at the State's presently proposed "stand alone" convention center and the private convention center complex proposed in 1989. The previous proposal included an 800 room hotel as well as an office building, retail center and 800 condominium units, all of which would have created significantly greater employment and residential opportunities on-site and raised the question of whether or not a child care center within the complex would have been necessary. The employment projection on-site for the previous proposal was 1,910 jobs by 1997. By comparison, the current proposal projects 350 full-time equivalent jobs. Moreover, the current proposal has no associated residential uses for which child care needs were also considered in the 1989 study. The 1989 study noted that the projected additional demand for child care was inadequate to justify an on-site day care facility for the much larger facility. The demand for child care in the proposed "stand alone" facility would be inadequate to warrant construction of a child care facility.

A secondary impact could occur due to the in-migration of residents who may work in the construction of new hotels as well as the operation of new and existing hotels. More residents could also be working in the new hotels and in hotels operating at higher occupancy rates. This could have a cumulative effect on the increased demand for child care, but it would be geographically dispersed.

## 5.13 Recreational Resources

### 5.13.1 Existing Conditions

*Parks and Beaches*

The project site is centrally located, near to outdoor recreational facilities, including one regional park, the 76.3 acre Ala Moana Beach Park. Other beach parks in the vicinity include the Kuhio Beach and Fort DeRussy Beach Parks.

Neighborhood park facilities which are more resident-oriented include a district park (McCully Recreation Center), two community parks (Ala Wai Field and Sheridan Park) and one neighborhood park (Ala Wai Playground). Several mini-parks are located in the Moiliili-McCully area, and several urban park squares are in Waikiki.

*Ala Wai Canal*

The Ala Wai Canal is a two-mile long man-made waterway, which originates near Kapahulu Avenue and empties into the ocean at the Ala Wai Yacht basin. The Canal and the Ala Wai Promenade, a pedestrian walkway which parallels the Canal, form the southern boundary of the project site. The Ala Wai Canal is heavily utilized by outrigger canoe and kayak clubs for training, as well as by the general public for fishing and crabbing.

The primary recreational use of the Ala Wai Canal is outrigger canoeing. Over 20 canoe paddling clubs utilize the canal. The canoe clubs start training in January, with the heaviest use of the canal during the months of April to August. High school clubs use the canal from October through March. During the outrigger canoe paddling season, from June to October, the canal is used for training seven days a week.

Three main groups of kayakers also utilize the Ala Wai Canal: Interscholastic League of Honolulu (ILH) high schools, Hawaii Canoe/Kayak Team (HCKT) and individuals. The ILH kayakers utilize the canal for training and competition during September and October, and the HCKT members train year round on the canal. Approximately 200 individual kayakers a week use the Ala Wai Canal for training and recreation. Ocean-going kayakers put their boats in at the Ala Wai Canal and enter the ocean at the Ala Wai Yacht Harbor. (Helber Hastert & Fee, Planners, June 1992).

*Ala Wai Promenade*

The tree-lined Ala Wai Promenade, which parallels the Ala Wai Canal, provides an important open space and visual resource for the area. The Promenade is frequented by pedestrians and joggers. A portion of the Promenade makai of the Kalakaua Avenue Bridge is proposed for improvement as a pedestrian and picnic recreational space, as part of the City's Waikiki Master Plan.

5.13.2 Impacts

The primary impact of the Hawai'i Convention Center on recreational facilities is that it would be a gathering place for thousands of people and, therefore, would expose these people to nearby beaches and recreational facilities.

*Parks*

Because the facility is within walking distance to several nearby beaches, the project may encourage increased usage of these resources. Beaches at the Ala Moana Park and Fort DeRussy, as well as those fronting the Ilikai Hotel and Hilton Hawaiian Village, may be frequented by conventioneers and their spouses. At this time, no mitigation is proposed to alleviate potential crowding at these beaches, though some mitigation may occur with the development of nearby parks, as proposed in the Waikiki Master Plan, particularly at Fort DeRussy and with the Ala Wai complex. In addition, the majority of the conventions will take place during the off-peak visitor seasons with conventioneers filling what would have been unoccupied hotel rooms. Therefore, the actual number of visitors using the beaches should not be significantly greater than the number currently using them during the peak visitor seasons.

The potential secondary impact of redevelopment that may be accelerated by the convention center and the construction of new hotel rooms in response to demand created by the convention center could increase the number of residents and visitors that would be present in the vicinity of the parks. This could have the cumulative impact of increasing demands on park facilities island-wide.

*Ala Wai Canal*

The project is not expected to have significant primary impact on current uses and users of the Ala Wai Canal in that no water transportation system or bridge improvements are included as part of the convention center proposal. The facility may have secondary and cumulative impacts on recreational facilities due to potential redevelopment of nearby parcels, more hotel development and related cumulative resident and de facto population increases.

Although the project does not include a water transport system, its presence on the canal may encourage private entrepreneurs to take advantage of this situation and establish a ferry or water taxi system as an alternative mode of transportation to conventioneers. If this system is implemented, it may interfere with routes and time frames of existing users. This would impede their training efforts, especially in the absence of a comparable area in the vicinity. Any proposal to establish a commercial water taxi or ferry system would require City permission to use the canal walls for loading and unloading passengers. Also, such an operation would be under the jurisdiction of the State Harbors Division. These authorities can serve to insure that potential conflicts among uses are minimized.

*Ala Wai Promenade*

The proposed convention center will not have a primary impact on the Ala Wai Promenade. A previous proposal for the convention center facility to encroach 26 feet on the Ala Wai Promenade has been modified to eliminate any encroachment. The Ala Wai Promenade will be directly affected only to the extent that a walkway system, with appurtenant landscaping, lighting and street furniture, may be constructed within the Promenade in front of the convention center. Nevertheless, such construction could potentially have an adverse effect on the historic character of the Promenade, which has been determined to be eligible for listing on the National Register of Historic Places (NRHP). Therefore, the design/builder has been in consultation with the State Historic Preservation Division (SHPD) to determine how such construction can elicit a finding of "no effect." In general, the SHPD has indicated that pedestrian use of the Promenade is consistent with its historic character and that walkways and other improvements to promote such use would also be appropriate to some degree. Their determination of "effect" is being considered in regard to specifics such as the width of the walkways, finishes, type of lighting, etc.

The potential secondary impact of redevelopment that may be accelerated by the convention center and the construction of new hotel rooms in response to demand created by the convention center could increase the number of residents and visitors that would be present in the vicinity of the Promenade. This could have the cumulative impact of increasing pedestrian activity in the Promenade, however, such activity would be consistent with the historic character of the Promenade.

# CHAPTER SIX

# CONFORMANCE WITH EXISTING PLANS, POLICIES AND CONTROLS

# 6. CONFORMANCE WITH EXISTING PLANS, POLICIES AND CONTROLS

The Chapter summarizes the project's conformance with public plans, policies and controls. A summary listing of major permits and approvals which may be required for the project is presented in Table 6-1.

## 6.1 State of Hawaii

### 6.1.1 Hawaii State Plan and State Functional Plans

The Hawaii State Plan (Chapter 226, Hawaii Revised Statutes, as amended) establishes a set of guidelines for the statewide planning system, and provides the overall theme, goals, objectives, policies and priority guidelines. The Hawaii State Plan directs the appropriate State agencies to prepare functional plans for their respective program areas. Individual State Functional Plans serve as the primary implementing vehicle for the goals, objectives and policies of the Hawaii State Plan. The Functional Plans guide implementation of State and county actions in the following areas: agriculture, conservation lands, education, employment, energy, health, higher education, historic preservation, housing, human services, recreation, tourism, transportation and water resources development. The project generally conforms with the State and Functional Plan objectives and policies.

### 6.1.2 State Land Use Law, Chapter 205, Hawaii Revised Statutes

All lands in the State have been classified in one of four land use districts (Urban, Rural, Agricultural and Conservation) by the State Land Use Commission, pursuant to Chapter 205, HRS. The project site and surrounding areas, including the Ala Wai Canal, are located in the Urban District. The proposed project is consistent with Urban District designation.

### 6.1.3 Coastal Zone Management, Chapter 205A, Hawaii Revised Statutes

Chapter 205A, Hawaii Revised Statutes, as amended, establishes special controls on development along the shoreline in an effort by the State of Hawaii to preserve and protect the natural resources of the coastal zones. **The Coastal Zone Management (CZM) area includes all lands of the State of Hawaii and the area extending seaward from the shoreline to the limit of the State's police power and management authority, including the United States territorial sea.** The project lies within the State's Coastal Zone Management area and is generally consistent with the policies and objectives of Chapter 205A.

**Table 6-1**
**Required Permits and Approvals**

| Permit/Approval | Approving Authority |
|---|---|
| **State** | |
| Chapter 343, HRS, Environmental Impact Statements | Governor |
| Chapter 6E, HRS Historic Preservation | DLNR Historic Pres. Div. |
| **Section 106, National Historic Preservation Act** | **DLNR Historic Pres. Div.** |
| Section 402, National Pollutant Discharge Elimination System (NPDES) permit | Dept. of Health |
| **City and County of Honolulu** | |
| Water and Water System Requirements | Board of Water Supply |
| Subdivision permit (completed) (consolidation and subdivision of parcels) | Dept. of Land Utilization |
| Grubbing permit | Dept. of Public Works |
| Grading permit | Dept. of Public Works |
| Construction Dewatering permit | Dept. of Public Works |
| Excavation permit | Dept. of Public Works |
| Permit to Excavate Public Right-of-Way | Dept. of Public Works |
| Sewer Connection permits | Dept. of Wastewater Mgmt. |
| Sewer Extension, Oversizing and Relief Sewer Requirements | Dept. of Wastewater Mgmt. |
| Building permit | Building Department |
| Electrical permit | Building Department |
| Plumbing permit | Building Department |
| Sidewalk/Driveway Work permit | Building Department |
| Demolition permit | Building Department |
| Sign permit (to be reviewed by DLU) | Building Department |
| Certificate of Occupancy | Building Department |
| **Utilities** | |
| Permits regarding work on utility lines | Hawaiian Telephone Company<br>Hawaiian Electric Company |

6.1.4 Environmental Impact Statements, Chapter 343, Hawaii Revised Statutes

This **Final** EIS has been prepared by the Authority in accordance with Chapter 343, HRS, Environmental Impact Statements. The **Final** EIS represents the **third and final** step in the Chapter 343 process. The first step was completed when the Authority filed and distributed for public review the environmental assessment (EA)/EIS Preparation Notice for the project. The EIS Preparation Notice is the Authority's determination that an EIS is required because the development involves the use of State lands and funds, and the project has the potential to significantly impact the environment. **The second step was completed when the Authority distributed for public review the Draft EIS.** Through the Draft EIS, comments were be solicited regarding its thoroughness in disclosing the environmental and social impacts of the project. Based on comments received, the EIS was modified, as appropriate, and this Final EIS was prepared. The Governor or the State of Hawaii will be the accepting authority for the Final EIS.

6.1.5 Historic Preservation, Chapter 6E, Hawaii Revised Statutes

Chapter 6E, HRS compliance is administered by the Department of Land and Natural Resources, *State Historic Preservation Division* (DLNR-SHPD). The DLNR-SHPD determined that for this project, subsurface testing and analysis are required to meet the Chapter 6E archaeological inventory survey standards. That survey has been completed, however, laboratory analysis of recovered samples has yet to be received. Upon receiving the laboratory analysis, the complete report will be submitted to the SHPD for review. Written concurrence and approval of the archaeological survey will be obtained from DLNR-SHPD prior to commencement of the project.

6.1.6 National Historic Preservation Act of 1966

**The Ala Wai Promenade has been determined to be eligible for listing on the National Register of Historic Places (NRHP) and is regarded as a "historic property" (Section 800.2, 36 Code of Federal Regulations Part 800: Protection of Historic Properties). Therefore, any "activity" that is "licensed... by a Federal agency" and "can result in changes in the character or use of historic properties" is subject to review under Section 106 of the National Historic Preservation Act of 1966 (Section 800.2 36 CFR 800). For the convention center project, it appears that the "triggering" Federal license is the National Pollutant Discharge Elimination System (NPDES) permit for stormwater discharges from the site during construction.**

**The Section 106 Review process involves a determination of "effect" or "adverse effect" by the State Historic Preservation Division (SHPD). If an "effect" or "adverse effect" is determined, then the National Advisory Council on Historic**

**Preservation is consulted before the permit can be issued. The design/builder has been consulting with the SHPD to determine if the impacts of the convention center on the Ala Wai Promenade can be avoided or mitigated such that a finding of "no effect" can be issued. Such a finding by the Historic Preservation Division would terminate the Section 106 review process.**

**For the purpose of determining effect, "alteration to features of the property's location, setting or use may be relevant depending on the property's significant characteristics and should be considered" (Section 800.9 36 CFR 800). The SHPD identified three areas of potential effect: the relocation of trees within the Promenade; construction of walkways, landscaping, and installation of lighting and street furniture in the Promenade; and, the visual impact of the convention center walls on the Promenade. Subsequently, the proposal to relocate trees within the Promenade was withdrawn. The design/builder is coordinating the design of the proposed convention center with the SHPD to assure that a determination of "no effect" can be issued. (See Section 3.12.2 for additional discussion).**

6.1.7 National Pollutant Discharge Elimination System (NPDES) Permit, Hawaii Administrative Rules, Title 11 Department of Health, Chapter 55, Water Pollution Control

Section 402 of the federal Clean Water Act prohibits point source pollution discharges into waters of the U.S. unless specifically permitted. The National Pollutant Discharge Elimination System (NPDES) requirements for issuing permits pursuant to Section 402 is codified in Hawaii Administrative Rules Title 11 Department of Health, Chapter 55, Water Pollution Control, and is administered by the State Department of Health, Environmental Management Division, Clean Water Branch. **An NPDES General Permit for Storm Water Associated with Construction Activity is required to control storm water discharges from construction sites over five acres in size, as in the case of the approximately 10-acre project site. In addition, an NPDES General Permit for Construction Activity Dewatering is required for discharging dewatering effluent into City drainage systems or the Ala Wai Canal.**

**The NPDES stormwater permit for the convention center construction was recently approved by the Sate Department of Health. The permit requires compliance with a Best Management Practices (BMP) plan prepared by the design/builder. The plan requires compliance with City ordinances pertaining to grading, grubbing, stockpiling, soil erosion and sedimentation. Structural erosion and sediment control measures include constructing berms to contain runoff and installing silt fences to trap sediment. Building and site drainage facilities and landscaping will control soil runoff after completion of the convention center.**

**The NPDES dewatering permit, which is pending approval, offers a BMP plan that eliminates the need to discharge dewatering effluent except, possibly, during heavy or prolonged storm events. Hence, the permit is requested only for emergency discharges during such storm events. To avoid discharging the effluent, retention basins, which may include excavations needed for construction, will hold the effluent until it can percolate back into the ground. In the event of a large or prolonged storm, the retention basins will serve as detention basins, holding the effluent long enough to allow sediments to settle out before it is discharged. Other required sediment reduction methods include lining excavations with filter fabrics to reduce the amount of sediment entering the effluent and using filters on intake lines.**

**Installation of the sewer line beneath Atkinson Drive may require the discharge of dewatering effluent, most likely into the City's storm drainage system. If it is determined that dewatering effluent will be discharged, then an NPDES permit and a City Construction Dewatering permit will be required.**

The convention center's storm drainage system will connect into the existing City and County system. It will not require new discharge points into the Ala Wai Canal; therefore, an operational-period NPDES permit is not required.

## 6.2 City and County of Honolulu

### 6.2.1 General Plan

The General Plan for the City and County of Honolulu (adopted 1977) was recently amended by the City Council in 1992. The plan is a statement of the long-range social, economic, environmental and design objectives for the general welfare and prosperity of the people of Oahu. The plan is also a statement of broad policies which facilitate the attainment of the objectives of the plan. Eleven subject areas provide the framework for the City's expression of public policy concerning the needs of the people and functions of government. These areas include population; economic activity; the natural environment; housing; transportation and utilities; energy; physical development and urban design; public safety; health and education; culture and recreation; and government operations and fiscal management. The project is consistent with the objectives and policies of the General Plan.

### 6.2.2 Primary Urban Center Development Plan

The City and County of Honolulu's Development Plan (DP) program provides a relatively detailed framework for implementing the objectives and policies of the General Plan on an area-wide basis. A total of eight DP regions have been established on Oahu.

The project area is within the Primary Urban Center (PUC) Development Plan area, which encompasses the most heavily populated areas of Oahu, and extends from the Waialae-Kahala area in the east to Pearl City in the west.

*Land Use*

As shown in Figure 6-1, the DP Land Use Map for the PUC designates the entire project site (approximately 9.65 acres) as Commercial Emphasis Mixed Use. The Development Plan Common Provisions define Commercial Emphasis Mixed Use as "areas where commercial uses may be the predominant type of development Where appropriate, the ground floor may be designed primarily for commercial uses which support establishing a new or maintaining an existing pedestrian-oriented environment." Areas to the north of the site, toward Atkinson Drive and Kapiolani Boulevard, are also designated Commercial Emphasis Mixed Use. The areas to the west toward Kahakai Drive are designated Medium Density Apartment and encompass mid-rise, medium-density multi-family residential structures. The Ala Wai Promenade is designated Park, and the Canal itself is designated Preservation. Areas directly across the Ala Wai Canal are designated Residential Emphasis Mixed Use and Resort Mixed Use.

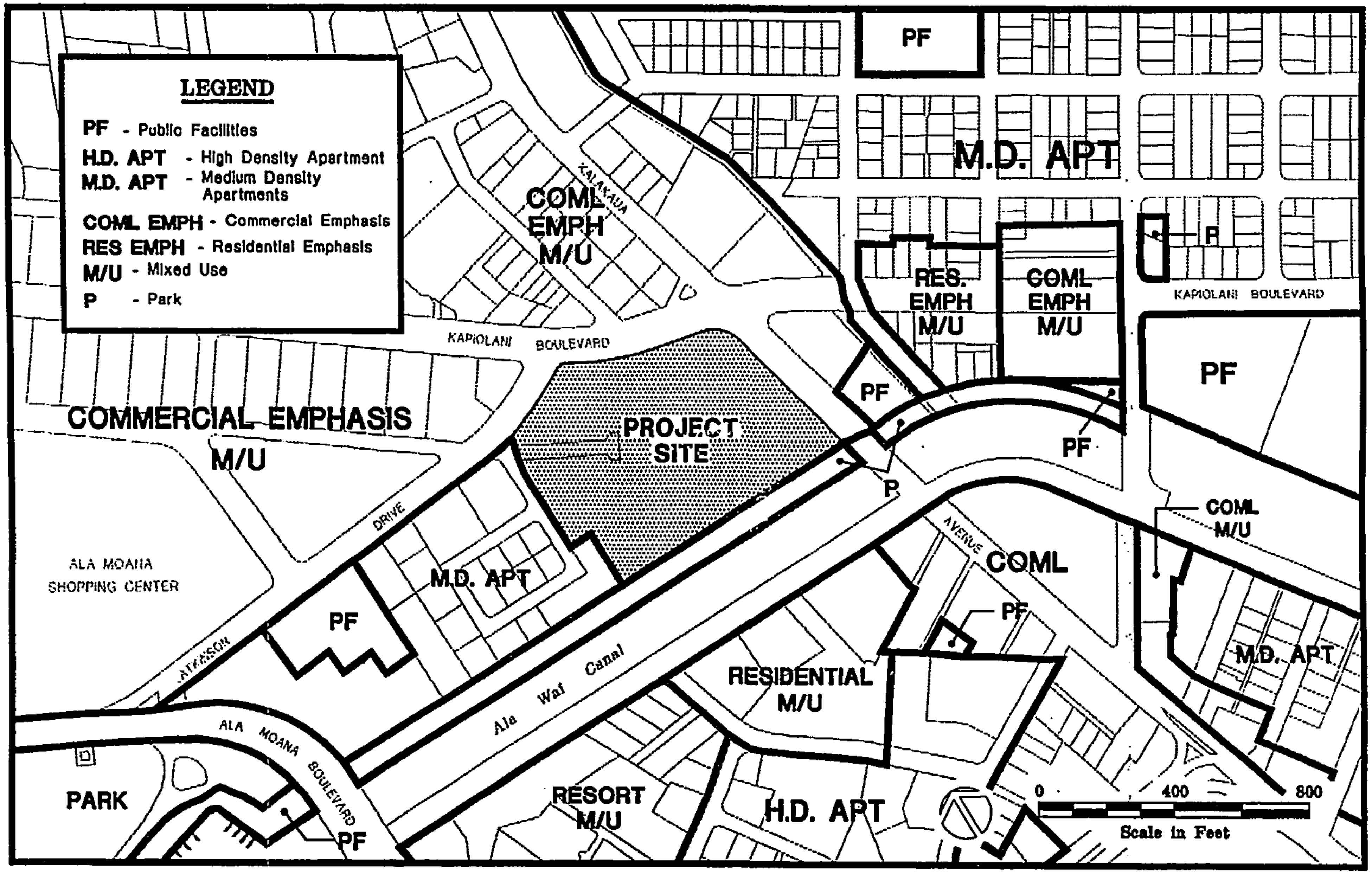
The site is within the PUC DP's Ala Moana subdistrict and adjacent to the Waikiki subdistrict. The PUC DP Special Provisions note that within the Ala Moana subdistrict, "hotels and convention facilities shall be permitted as principal uses as part of a commercial emphasis mixed use development in the area bounded by Kapiolani Boulevard, Kalakaua Avenue, the Ala Wai Canal, the medium-density apartment designated area, Atkinson Drive and Mahukona Street."

The Special Provisions also make reference to the Ala Wai Canal, within the Waikiki subdistrict, by noting that "the present open space nature and character of dominant physical features along the perimeter of this area shall be preserved and enhanced. These features directly contribute to the present attractiveness and quality of the area as well as to the surrounding communities...all public and private developments or improvements shall be designed to preserve and enhance the visual and physical access to these features."

*Public Facilities*

The DP Public Facilities Map, shown in Figure 6-2, identifies three major roadway improvements in the general project vicinity. These include:

- Kalakaua Avenue, from near King Street to Fort DeRussy, targeted for additional rights-of-way and new streets within six years

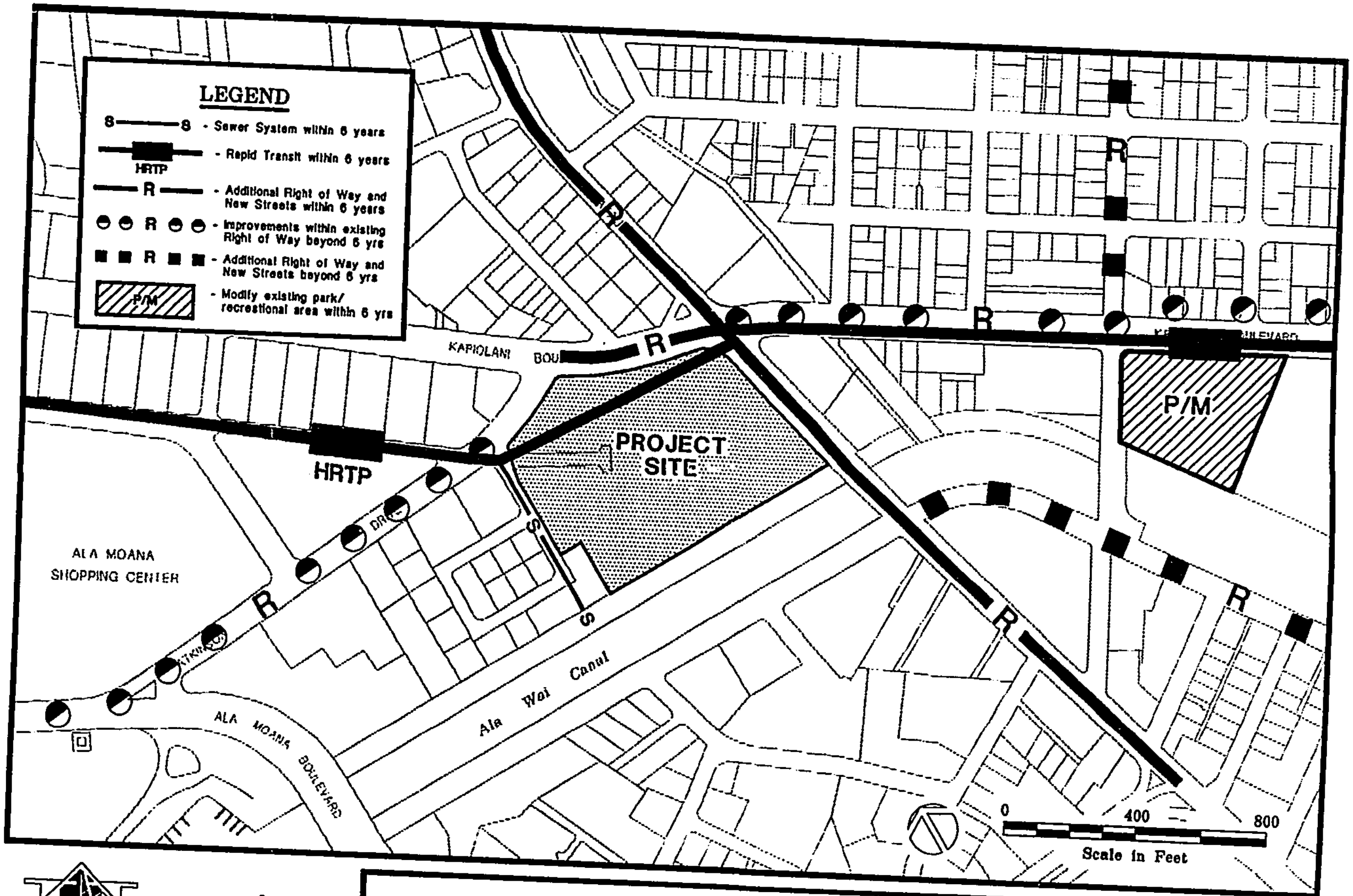



HAWAI'I CONVENTION CENTER

Fig. 6-1
CITY & COUNTY OF HONOLULU
DEVELOPMENT PLAN LAND USE MAP

Prepared for :
CONVENTION CENTER AUTHORITY
State of Hawaii

Prepared by :
Nordic / PCL
Wilson Okamoto & Associates, Inc.




HAWAI'I CONVENTION CENTER

Fig. 6-2
CITY & COUNTY OF HONOLULU
DEVELOPMENT PLAN PUBLIC FACILITIES MAP

Prepared for :
CONVENTION CENTER AUTHORITY
State of Hawaii

Prepared by :
Nordic / PCL
Wilson Okamoto & Associates, Inc.

# CORRECTION

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SEE FRAME(S)
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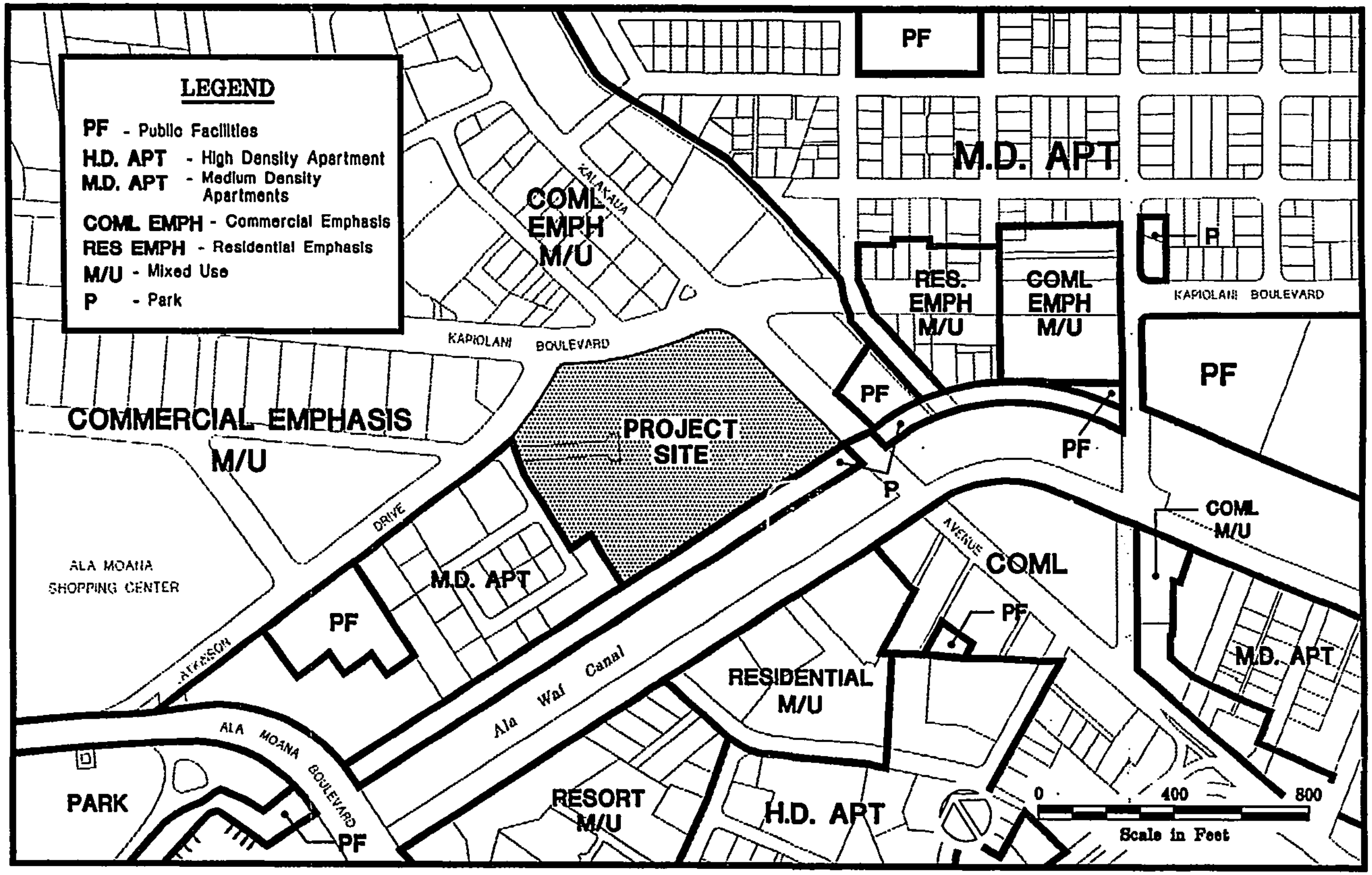


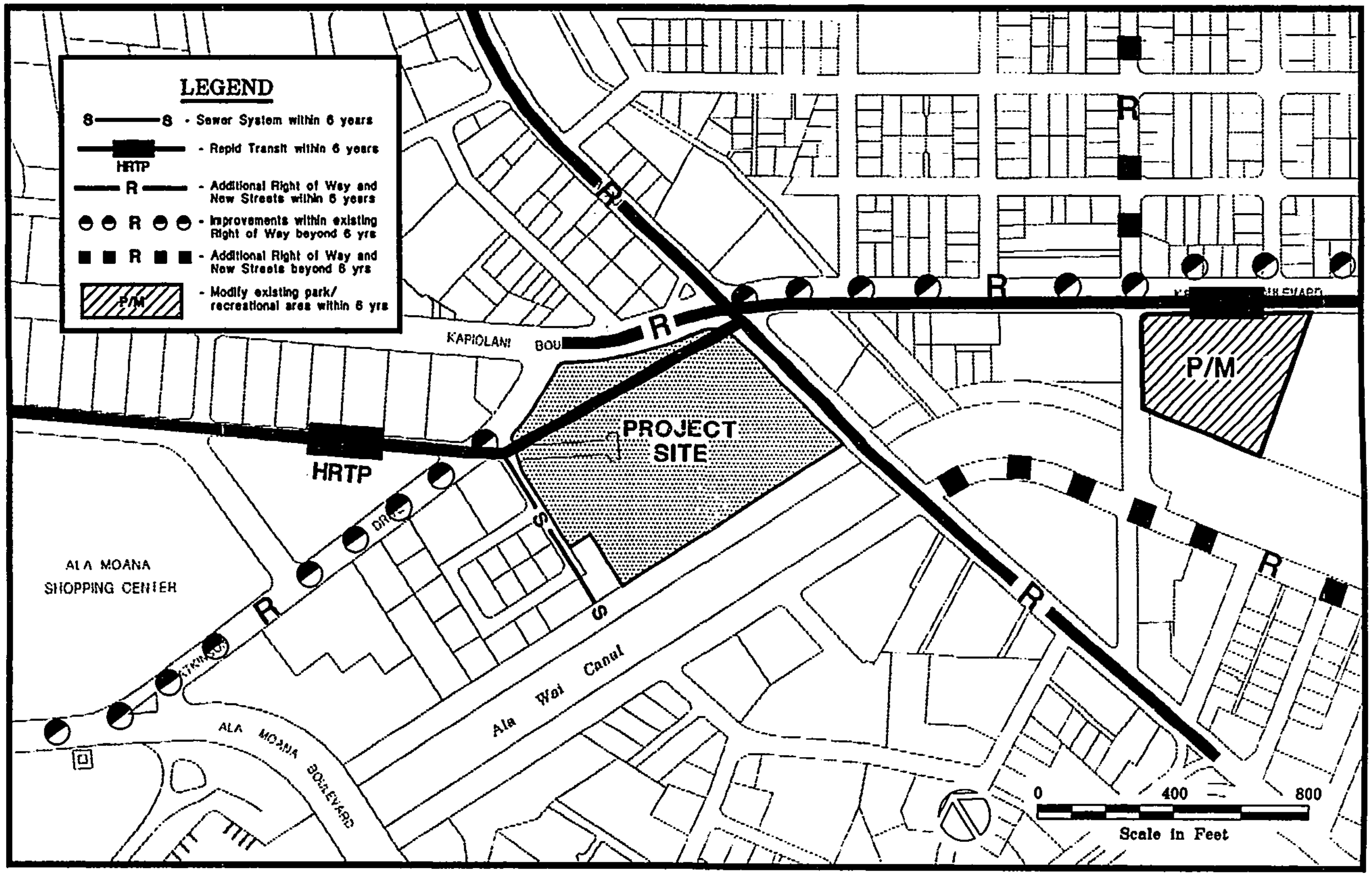

HAWAI'I CONVENTION CENTER

Fig. 6-1

CITY & COUNTY OF HONOLULU
DEVELOPMENT PLAN LAND USE MAP

Prepared for :
CONVENTION CENTER AUTHORITY
State of Hawaii

Prepared by :
Nordic / PCL
Wilson Okamoto & Associates, Inc.




HAWAI'I CONVENTION CENTER

Fig. 6-2
CITY & COUNTY OF HONOLULU
DEVELOPMENT PLAN PUBLIC FACILITIES MAP

Prepared for :
CONVENTION CENTER AUTHORITY
State of Hawaii

Prepared by :
Nordic / PCL
Wilson Okamoto & Associates, Inc.

- Improvements within the existing right-of-way are planned for Ala Moana Boulevard, Atkinson Drive, Ala Wai Boulevard and Kapiolani Boulevard beyond six years.
- The proposed rapid transit system, which would follow Kona Street, intersect the project site and continue east (Diamond Head) along Kapiolani Boulevard.
- Construction of a new sewer line along Kahakai Drive is identified for commencement within six years.

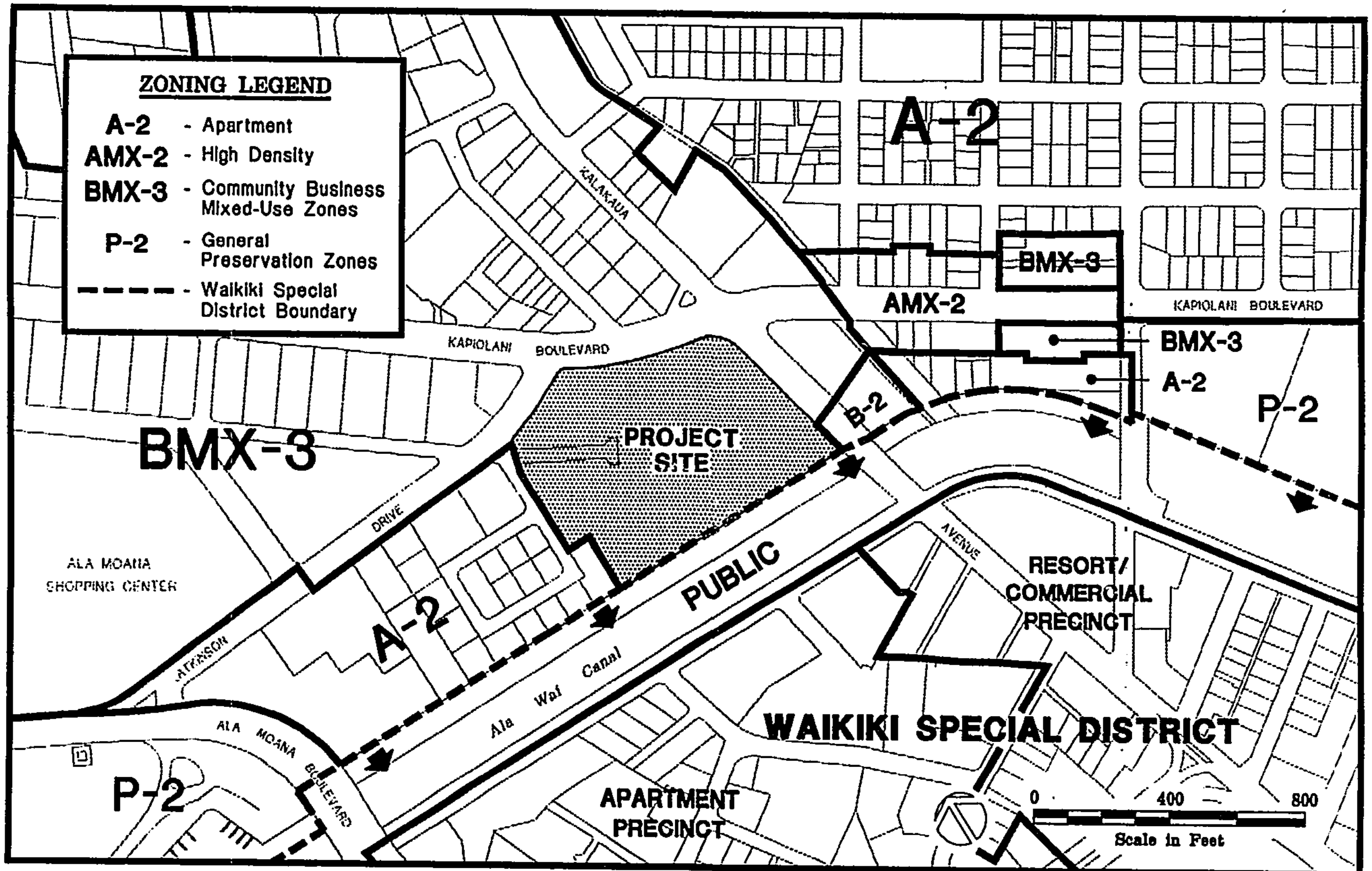
### 6.2.3 Land Use Ordinance

The City and County's Land Use Ordinance (LUO) zoning designations are shown in Figure 6-3. The project site is zoned BMX-3, Community Business Mixed Use. The intent of BMX-3 zoning is to provide areas for both commercial and residential uses outside the Central Business Mixed Use District. The maximum building height in this district as indicated on the zoning map is 350 feet.

The area surrounding the site is a mixture of commercial and residential, primarily zoned BMX-3, except for the area near Kahakai Drive which is zoned A-2. The area east of the project site lies within the City's Waikiki Special District (WSD). The Ala Wai Promenade and Canal lie within Public Precinct which permits public uses and structures. Areas across the Ala Wai Canal (to the south of the site) are designated Apartment Precinct and Resort Commercial Precinct.

The LUO permits the development of convention centers within all zoning districts, other than in residential districts, subject to approval of a five-year master plan for a Plan Review Use (PRU) (Section 3.160-1(d)). The purpose of the PRU is to establish a review and approval procedure for uses of a permanent and institutional nature which may impact surrounding land uses. The LUO does not provide specific parking standards for PRU projects, as these types of facilities involve complex transportation needs that are more appropriately evaluated on a site and project-specific basis.

Because the 1993 Special Session of the Hawaii Legislature designated a convention center at the site and because a PRU application was approved for a much more massive mixed use development, including a convention center, the Authority opted not to submit a PRU application for the current project. Although the previous PRU is not applicable to the current project, the Authority and selected design/builder will continue to work closely with the City during project design, construction and operation of the center.




HAWAI'I CONVENTION CENTER

Fig. 6-3
CITY & COUNTY OF HONOLULU
ZONING / WAIKIKI SPECIAL DISTRICT

Prepared for :
CONVENTION CENTER AUTHORITY
State of Hawaii

Prepared by :
Nordic / PCL
Wilson Okamoto & Associates, Inc.

6.2.4 Special Management Area

The Coastal Zone Management Act contains the general objectives and policies upon which all counties within the State have structured specific legislation which created Special Management Areas (SMA). The project site is not within Oahu's SMA, which is located south (makai) of Ala Moana Boulevard.

6.2.5 Waikiki Master Plan

The Waikiki Master Plan was prepared by the City in 1992 to reflect a two year planning effort by the City, other government agencies, the visitor industry, and a variety of professional associations and citizens organizations. The plan is intended to guide the physical development of Waikiki during the next 20 years, with the purpose of enhancing the district's unique qualities, addressing its problems, and assuring its viability as a world-class visitor destination and residential community. The plan recognizes the development of the convention center at the Aloha Motors site.

The Waikiki Master Plan area is bordered, on its west (Ewa) and north (mauka) sides, by the Ala Wai Canal. Although project site is not part of this area, several aspects of the Waikiki Master Plan may impact the project. Specifically, the plan's proposed traffic and transportation improvements are of concern to the convention center project.

The overall goals of the Waikiki Master Plan are:

- Enhance the financial viability of Waikiki's visitor industry by enhancing the physical environment of Waikiki.
- Provide incentives to stimulate redevelopment and creation of more public open space
- Accommodate moderate growth in visitor unit inventory while observing the principle "no substantial increase in density."
- Preserve and enhance existing residential neighborhoods, accommodating moderate growth in the number of residential units and encouraging affordable housing where feasible.
- Stabilize vehicular traffic and parking at or below current levels.

As part of the Waikiki Master Plan, the City's Office of Waikiki Development (OWD) is preparing the Waikiki Regional Traffic Study. The study, which has already commenced, will examine regional traffic patterns and examine potential alternative solutions. Several of these alternatives have been the subject of prior studies, including one-way traffic circulation patterns, and a people-mover system with associated peripheral parking sites serving Waikiki. Construction of the Hawai'i Convention Center may affect the feasibility or operations of some of these alternatives, as discussed in the Hawai'i Convention Center Transportation Impact Analysis Report (TIAR) (Appendix I). Data from the convention center TIAR will be provided to the consultant preparing the regional traffic study.

#### 6.2.6 Plan Review Use Permit

As stated previously, the Authority will not submit another PRU application for the convention center. However, the Authority will continue to work closely with the City to ensure the project is consistent (within Legislative limits and project economics) with City policies and plans.

#### 6.2.7 Ministerial Permits and Approvals

The Authority recognizes the importance of coordinating design and construction activities with the City and County of Honolulu to minimize disruption and to maintain communication with the City agencies. A summary of the major permits and approvals is presented in Table 6-1.

### 6.3 Other Environmental Permits and Approvals

The previous EA had identified several potential Federal and State permits that would be required if the project should include improvements to the Ala Wai Canal. However, the proposed project will not involve any modification or improvements to the Ala Wai Canal; thus, the previously mentioned permits will not be required for this project.

# CHAPTER SEVEN

# ALTERNATIVES TO THE PROPOSED ACTION

# 7. ALTERNATIVES TO THE PROPOSED ACTION

**The process for selecting the proposed convention center site has a long history, including a 1985 site selection analysis prepared by Pannell, Kerr & Forster which examined nine sites in Waikiki; the Department of Business and Economic Development study of 1987, which considered the Ala Wai Golf Course site (Kapahulu side), a Kakaako site and the International Market Place site; and, a 1987 site selection study prepared by the Legislative Reference Bureau, which evaluated the Ala Wai Golf Course, Fort Armstrong, Fort DeRussy, and the Waikiki Shell/Kapiolani Park sites. In 1993, the Legislature considered the Hobron site, the Ala Wai Golf Course site (Ewa side) and the Aloha Motors site before selecting the currently proposed site. The following summarizes the primary alternatives to the proposed action: no action; an alternate convention center site outside of Waikiki; an alternate site within Waikiki; and alternate development proposals at the Aloha Motors lot.**

## 7.1 No Action

Under the no action alternative, a world class convention center would not be constructed in Hawaii. Local and regional meetings and conventions could continue to use hotel convention facilities and exhibition space at the Blaisdell Center. However, under the no action alternative, Hawaii would be unable to attract and accommodate major national and international events, which generally require larger facilities and more exhibit space than is currently available. As a result, the anticipated increase in convention visitors, tax revenue and employment generated would not be realized, and Hawaii would lose the opportunity to revitalize its tourism industry. In time, the subject site would still be developed, probably for office and/or other commercial use based on the existing zoning.

## 7.2 Convention Center Outside the Waikiki Area

**Previous site selection studies examined one major site outside of Waikiki at Fort Armstrong in Kakaako.** However, virtually every site selection study concluded that the best site for a convention center is in or near Waikiki. These studies have concluded that the most important locational factor determining the success of a convention center is proximity to hotel rooms. A Waikiki location would be easily accessible from a large number of hotels. Convention delegates based in Waikiki would also have access to supporting infrastructure, such as entertainment, dining and business services. A survey of meeting planners conducted in 1987 found that only five percent would choose Hawaii for their convention if the center were outside Waikiki (SMS Research 1993). Therefore, it was determined that a site outside of Waikiki would not provide the features which are critical for a successful convention facility.

### 7.3 Alternate Site Within Waikiki

Several alternate sites within the greater Waikiki area were examined in a number of studies and their merits debated in recent years. Most recently, primary attention has been focussed on potential development at the Ala Wai Golf Course, Ala Wai Gateway site at Hobron Lane, Fort DeRussy, and the International Marketplace. Other sites which were considered in the past included Jefferson School, the Honolulu Zoo, Kapiolani Park and the Magoon Estate.

All these sites provide the advantage of proximity to Waikiki hotels and other visitor facilities. Most of them would provide adequate land area for development. However, other considerations generally made them less desirable than the proposed site. Unlike the subject site, all of the alternate sites are currently developed or actively used, requiring displacement and/or relocation of existing uses and users. In some instances, this possibility has generated considerable public controversy. For example, the Ala Wai Golf Course site would displace a popular recreational amenity, which is acknowledged to be the busiest golf course in the country. Selection of the Ala Wai Gateway site would require land condemnation, assembly of several parcels and relocation of renters and businesses. The Fort DeRussy site was actively opposed by the federal government as well as Hawaii's Congressional delegation, as it is needed to meet the military's recreational needs. The International Marketplace site was widely criticized as not being of sufficient size, and its consideration caused a massive outcry from the existing merchants who faced displacement.

Overall, the opposition to each of these sites could have resulted in costly legal challenges for the State, relocation costs for displaced individuals, and extensive project delays. Because all of the alternative sites require demolition of existing structures and/or site preparation, development costs would have been higher than with the selected site, which is cleared and ready for development. Finally, environmental constraints, such as the Ala Wai Golf Course's floodway location, affected the feasibility of some alternatives.

Overall, none of the alternate sites discussed compare favorably to the subject site, which meets the Waikiki locational criteria, is cleared of structures and can be developed immediately.

### 7.4 Alternate Development Proposals at Aloha Motors Site

Several alternative designs have been proposed within the subject site. These included a prior private proposal for a convention center complex with hotel, apartment condominium, office, and retail uses, as well as three other "stand alone" convention center designs considered during the recent design competition.

The first private convention center complex proposal was submitted to the City and County of Honolulu by a private developer, First Development, Inc., in response to the City's request for proposal (RFP) for the development of a municipal convention center. The proposal, which included a convention center, hotel, two apartment condominium towers, an office building and retail uses, required a PRU which was approved by the City Council in 1990. Based on its much higher building height, greater building density, and mixture of land uses, the FDI proposal would have had greater environmental and social impacts than the current "stand-alone" facility.

However, in 1993, First Development, Inc., citing an inability to secure financing, sold the Aloha Motors site to another private party, Hawaii Convention Center Partners. Indonesian businessman Sukarman Sukamto's Convention Center Partners received City Council approval for a major modification to the previously approved PRU application. The new plan included a "free" convention center and four hotel towers. However, tourism industry officials contended that the proposal would not provide sufficient exhibition space and would not be the "world class" convention center which the State needs. At the time, the proposal was not evaluated for its environmental impacts. However, like the previous proposal, the greater building density would have likely contributed to increased environmental and social impacts from the project.

In March 1994, the Convention Center Authority issued its RFP for design and construction of a world-class, stand-alone convention center at the Aloha Motors site. Four design proposals were submitted for review by the CCA technical evaluation board and were evaluated on the basis of site design, building design, and project management and quality control plans. A design evaluation board also reviewed each proposal for criteria related to the physical impression of the buildings (i.e. a Hawaiian sense of place and aloha spirit), and the overall benefits of each proposal to the State of Hawaii. On August 31 1994, Nordic/PCL was selected as the Design/Build Team.

### 7.5 Conclusion

None of the actions discussed here were considered to be preferable to development of the Nordic/PCL project at the Aloha Motors site. The no action alternative would prevent the State from realizing the long-term economic benefits of a convention center development. A site outside Waikiki would not provide the proximity to hotel rooms which is required for the success of a convention facility. Although other sites within the Waikiki vicinity are suitable for a convention center, none of them are cleared and ready for immediate development. These sites would involve displacement of existing land uses and tenants, and could result in legal challenges, substantial relocation expenses and delays in development. Two separate public polls conducted in 1993 by Omnitrak Group, Inc. and the Honolulu Star Bulletin indicated a clear public preference for the proposed Aloha Motors site.[1]

With a clear preference established for the Aloha Motors site, the RFP process was implemented to select the best possible design for a new convention center. In summary, the proposed action was measured against a variety of criteria and was judged to be the most prudent and feasible project for the chosen site.

[1] Omnitrak Group, Inc. April 1993 indicated of 405 residents surveyed, 55% preferred Aloha Motors versus 20% for Ala Wai Golf Course, 5% Ala Wai Gateway, 16% Don't Know and 4% No Convention Center. Star Bulletin, June 1993 indicated of 419 registered voters surveyed, 43% preferred Aloha Motors versus 10% Ala Wai Golf Course, 6% Ala Wai Gateway, 11% both Aloha Motors and Ala Wai Gateway, 13% Somewhere Else and 17% Not Sure.

## CHAPTER EIGHT

# LONG-TERM CONSIDERATIONS
# UNRESOLVED ISSUES

Hawai'i Convention Center

# 8. LONG-TERM CONSIDERATIONS/UNRESOLVED ISSUES

## 8.1 Irreversible and Irretrievable Commitments of Resources

In the short-term, construction of the convention center will require an irreversible and irretrievable commitment of a number of resources including land, capital, construction materials, manpower, energy, and water. Financial, material, and manpower resources will also be irretrievably committed to the planning and design of the improvements.

**Development of the project will involve the long-term commitment of land for attaining the project objectives. Upon completion, it is likely that this use would preclude future development of the site for alternative uses during the economic and physically useful life of the project. Land committed to this project was previously urbanized; therefore, the proposed action represents an intensified urban use of land resources as opposed to the commitment of any undeveloped land resource. While potential alternative uses of the land would be curtailed, the proposed use for a convention facility is considered appropriate in terms of long-range planning by the City.**

**In some respects, the project would irretrievably commit the Ala Wai Promenade, which is a historical resource, to serve as a pedestrian access route for the convention center. In general, however, the State Historic Preservation Division (SHPD) has indicated that pedestrian use of the Promenade is consistent with its historical character.**

**Other potential impacts on this historic resource, including the construction of a walkway system, with appurtenant landscaping, lighting and street furniture would only be pursued to the extent that such construction would have no effect on the historic character of the Promenade. Similarly, the visual impact of the convention center structure on the Promenade will be mitigated to the degree that it will have no effect on its historic character. Hence, in this regard, there will be no irretrievable or irreversible commitment of this historic resource.**

Operation of the project, when completed, will also require the irretrievable and irreversible commitment of certain resources, including labor, materials, and resources (consumption of potable water, gas and petroleum-generated electricity) which will be required for effective operation and maintenance.

**A secondary impact of the convention center could be the acceleration of redevelopment in its vicinity as well as the creation of new demand for hotel rooms that could lead to the construction of new hotel rooms in Waikiki and elsewhere,**

**including the Neighbor Islands. Also, existing hotels could be upgraded to cater to the convention and meeting market. Such development, redevelopment and upgrading would irreversibly and irretrievably commit a number of resources including land, capital, construction materials, manpower, energy, and water. Similarly, operations and maintenance associated with such development, redevelopment and upgrading would also require the irretrievable and irreversible commitment of certain resources, including labor, materials, and natural resources (consumption of potable water, gas and petroleum-generated electricity).**

**Another secondary impact of the convention center could be the in-migration of residents who may work at the convention center. A cumulative impact could also be the in-migration of residents to work at new hotels developed in response to demand created by the convention center and at existing hotels which experience higher occupancy rates as a result of such demand. Such in-migrants would require the irretrievable and irreversible commitment of resources associated with housing and for public services. The projected tax revenue generated by the convention center would more than offset the cost of public services in the long-term.**

## 8.2 Relationship Between Local Short-Term Uses of the Human Environment and the Maintenance and Enhancement of Long-Term Productivity

### 8.2.1 Short-Term Uses

The proposed project will involve short-term uses of the environment during the construction phase of the project. These uses will have both positive and negative impacts. Construction activities associated with the proposed project will create some degree of adverse impacts such as disruptions of traffic and increased noise and air quality nuisances in the vicinity of the project site, as discussed in this document.

In the short-term, the project will also confer some positive benefits in the local area. **Projected construction employment attributable to the convention center includes direct, indirect and induced employment of 1,160 person-years in 1996 when the convention center is under construction. As a secondary impact, however, in-migration could follow employment opportunities created and is projected at 110 persons on Oahu in 1996 when the convention center is being constructed. In the short-term, new public expenditures for in-migrants would outpace tax revenues that will later be generated when the convention center becomes operational. Hence, in the 1996 projection, during construction of the convention center, net revenue would be negative $62,000 for the County and negative $4.9 million for the State.**

8.2.2 Long-Term Productivity

The long-term productivity of the site would be affected by the proposed use since it will preclude any other uses. Based on the existing zoning for the site, such an alternative use could accommodate a mixed-use development with residential and commercial office and retail uses in structures up to 350 feet high. While such a use would have positive economic impacts as well as potential negative environmental and social impacts, it would not likely have as significant positive economic impact on the visitor industry as the proposed convention center.

Long-term use of the project site for the proposed convention center will have both positive and negative impacts. Long-term impacts include those on the air quality, noise, traffic, parking, view planes, public services and socio-economic effects.

Long-term economic productivity of the site in the proposed use includes direct, indirect, and induced employment as well as fiscal benefits to the State and City. Direct, indirect and induced construction employment is project at 570 to 2,500 person-years in 2004 to 2008 when new hotel rooms demanded by the convention center are built on Oahu and the Neighbor Islands. Operational employment at the convention center, at hotels and for jobs indirectly created or induced throughout the State in 2008 is projected to range from 7,900 to 9,500 full-time equivalent positions, of which 4,700 to 5,200 positions would be on Oahu and the remainder would be on the Neighbor Islands.

Fiscal impacts of the convention center to both the State and City is projected to be positive in the long-term when tax revenues from the operation of the convention center offset the cost of public services to projected in-migrants. In 2008, when the center has been operating for ten years, net new County revenues are projected to range from $3.6 to $5.4 million while State net revenues would range from $70 to $119 million.

Long-term social impacts would also be a consideration in regard to the long-term productivity of the site. Regional and neighborhood character would be primarily impacted by construction, loss of on-street parking and increased activity in the neighborhood. Secondary impacts of the convention center would be the potential acceleration of redevelopment on parcels susceptible to redevelopment in the surrounding neighborhood, and a potential change in land use policies which could introduce resort uses on parcels susceptible to redevelopment. Cumulative impacts could result if the convention center acts as a catalyst for change in the neighborhood. While many factors other than the convention center would bring about the change, the outcome may include changes in property values, taxes and rent; displacement and changes in demographics resulting from redevelopment; and, changes in residential neighborhoods where affordable housing may be replaced by more profitable uses.

## 8.3 Probable Adverse Environmental Effects Which Cannot Be Avoided

Adverse impacts can be defined as short-term and long-term effects relative to the construction and implementation of a specific use. Short-term impacts are usually construction-related which will occur during the course of construction and cease upon completion of the project. Long-term impacts generally result from the implementation of the proposed project. The following summary is offered without discussion of proposed measures which may completely mitigate the impact. Environmental and social impacts of the project as well as mitigation measures are discussed in Chapters 3 to 5.

### 8.3.1 Short-Term Effects

Unavoidable adverse short-term impacts during construction include anticipated as well as potential impacts that may or may not occur.

Water Quality. During construction, exposed soils are subject to runoff which could affect the quality of receiving water, particularly the Ala Wai Canal. Dewatering activities on the site will not require discharging of effluent except, possibly, during large or prolonged storm events. Dewatering activities during the installation of a sewer line under Atkinson Drive could require discharging effluent into the City's drainage system.

Hazardous Materials. Previous owners of the site have removed and disposed of known hazardous materials on the site; however, there is a possibility that pockets of contaminated groundwater may be encountered during construction.

Botanical Resources. Removal of several street trees will be required. Also, excavation work near the boundary of the Ala Wai Promenade will require the removal of a portion of the root system and pruning of several banyan trees in the Promenade which are listed by the City as "exceptional trees."

Archaeological Resources. The project site is partially on and alongside land that at one time contained a fishpond known as Loko Kuwili. Subsurface testing showed that the area was once a lagoonal environment with little or no suitable land for habitation or human burial. Laboratory results, reports of pollen, faunal, and charcoal analyses are pending and subject to review by the SHPD.

Air Quality. Construction vehicle activity will increase automotive pollutant concentrations along the existing streets and on the project site itself. Site preparation and earth moving will create particulate emissions, as will building and on-site road construction.

Noise. Noise impacts will occur during the construction period from pile driving, grading, earth moving and trenching, concrete placement, hammering, etc. The properties which are predicted to experience the highest noise levels during construction are the residential condominiums and apartments along Kahakai Drive.

Vibration. Induced ground vibrations from pile driving operations have the potential to cause architectural and structural damage to structures.

Traffic and Transportation Systems. Construction related traffic, including commuting workers and trucks hauling materials and equipment to and from the site will increase demand on roads in the vicinity.

Solid Waste. During construction, the project will increase demand for disposal of solid waste associated with construction materials.

Economic. In the short-term, new public expenditures would outpace tax revenues that will later be generated when the convention center becomes operational. Hence, the 1996 projection, during construction of the convention center, net revenue would be negative $62,000 for the County and negative $4.9 million for the State.

Social. Construction activities will create noise, dust and traffic that may affect neighboring businesses and residents.

### 8.3.2 Long-Term Effects

Unavoidable adverse long-term impacts during convention center operation include anticipated as well as potential impacts that may or may not occur. Also discussed are potential secondary and cumulative impacts.

Flooding. The majority of the site is located in a special flood hazard area inundated by potential 100-year flood, with a base flood elevation +7 feet above mean sea level (msl).

Historical. The project will involve the construction of walkways, lighting, landscaping and street furniture in the Ala Wai Promenade. Also, the exterior walls of the convention center Loading Dock could have a visual impact on the historical character of the Promenade.

Water Quality. The convention center drainage system will discharge storm runoff and landscape irrigation runoff into the drainage system.

Air Quality. There will also be an impact on air quality from project-related traffic. Results of computer air quality modeling suggest that, under worst case conditions of traffic and meteorology, the federal 1-hour CO standard would be met, but the State standard may already be exceeded in close proximity to the intersections studied.

Noise. The project's primary long-term noise impact will be due to increased traffic associated with the convention center. The most significant traffic noise sources associated with the proposed project are the large number of buses which will transport attendees to and from the Convention Center during a major convention.

Economic. The demand for hotel rooms by convention delegates and attendees could displace vacation visitors, particularly eastbound Japanese visitors.

Social. The convention center will promote growth in tourism. While positive economic benefits are anticipated, growth in tourism raises potential community issues such as conflicting attitudes toward tourism, urbanization associated with tourism, the perception that visitor industry wages are low and that working conditions are poor, and the commercialization of the Hawaiian culture.

Secondary impacts of the convention center would be the potential acceleration of redevelopment on parcels susceptible to redevelopment in the surrounding neighborhood, and a potential change in land use policies which could introduce resort uses on parcels susceptible to redevelopment.

Cumulative impacts could result if the convention center acts as a catalyst for change in the neighborhood. While many factors other than the convention center would bring about the change, the outcome may include changes in property values, taxes and rent; displacement and changes in demographics resulting from redevelopment; and, changes in residential neighborhoods where affordable housing may be replaced by more profitable uses.

Public services and facilities, including those discussed below, which may not be significantly affected by primary impacts of the convention center could be affected to a greater degree by secondary and cumulative impacts of in-migration and redevelopment.

Traffic and Transportation Systems. Operation of the convention center will generate significant volumes of bus and automobile traffic during events and significant truck traffic during convention set-up and take-down. Also, any redevelopment which is spurred by the convention center operations will also generate additional traffic.

Utilities. The project will increase demands on existing wastewater, water, electrical and communications systems.

Solid Waste. Operation of the convention center will increase the demand for the disposal of solid waste.

Police, Fire and Emergency Services. The project will increase demands for police, fire and emergency services.

Recreational Resources. Because the convention center is within walking distance of several nearby beaches, the project may facilitate increased usage of these resources by conventioneers and their spouses. A potential secondary impact is the creation of demand for water transportation services to convention delegates on the Ala Wai Canal. Such services may conflict with current recreational use of the canal.

## 8.4 Summary of Mitigation Measures

Two categories of mitigation measures are provided. The first category includes proposed mitigation measures which will be implemented during the construction or operational phase of the convention center (Table 8-1). These mitigation measures have been committed to by the design/builder or the Convention Center Authority (CCA). The second category includes recommended mitigation measures which are supported by the CCA but are beyond the authority of either the design/builder or the CCA to commit to (Table 8-2).

Within the second category are several mitigation measures which are intended to address the secondary and cumulative impacts which the convention center may have with respect to the possible acceleration of redevelopment in the vicinity of the convention center. As discussed in Chapter 4, it is recommended that these mitigation measures be pursued by a Convention Center District Joint Advisory Council.

| Table 8-1<br>PROPOSED MITIGATION MEASURES | |
|---|---|
| | RESPONSIBLE FOR IMPLEMENTATION |
| **SHORT TERM IMPACTS (CONSTRUCTION PHASE)** | |
| **Physical Environment** | |
| WATER QUALITY<br><br>Comply with approved Best Management Practices as approved through the NPDES Permit Process for controlling storm runoff during construction, including any requirement for detention basins. | Design/Builder |
| HAZARDOUS MATERIALS/WASTE<br><br>Prepare a contingency plan for approval by the DOH Hazardous Evaluation and Emergency Response Office to include provisions for:<br>- cessation of work in the immediate area of encountered or suspected contamination;<br>- notification to the State Department of Health (DOH) and State Convention Center Authority (CCA);<br>- approval of planned remediation actions by the DOH;<br>- approval of clean-up work by the DOH before construction proceeds in the affected area. | Design/Builder |
| BOTANICAL RESOURCES<br><br>Coordinate with the City Parks Department the relocation of street trees removed as a result of road widening and replace all removed or relocated street trees with specimens of comparable or larger size. | Design/Builder |
| Comply with requirements of the City's Exceptional Tree Committee for excavation on the project site that will remove a portion of the root systems and require pruning of Banyan trees in the Ala Wai Promenade which are adjacent to the convention center boundary. | Design/Builder |
| Install an 8-foot high fence along the boundary between the convention center and the Promenade to keep construction activities on the convention property out of the Promenade. | Design/Builder |
| ARCHAEOLOGICAL<br><br>Submit the final archaeological inventory survey to the State Historic Preservation Division (DLNR) for review and approval pursuant to Chapter 6E, HRS. | Design/Builder |

| Table 8-1<br>PROPOSED MITIGATION MEASURES | |
|---|---|
| | RESPONSIBLE FOR IMPLEMENTATION |
| AIR QUALITY - Dust Control | |
| Place a temporary gravel working surface over the entire construction site. | Design/Builder |
| Frequently water exposed dry soil areas and heavily traveled areas. | Design/Builder |
| Cover trucks hauling material that would generate significant amounts of dust in transit to or from the project site. | Design/Builder |
| If necessary to comply with DOH rules, erect dust screens to protect nearby low-level properties. | Design/Builder |
| Install landscaping in completed open areas as soon as feasible. | Design/Builder |
| NOISE/VIBRATION | |
| Obtain a noise permit limiting hours of construction for activities expected to exceed allowable noise levels. | Design/Builder |
| Erect construction noise barriers up to 16 feet high along Kahakai Drive. | Design/Builder |
| To reduce the number of blows required during pile-driving, pre-drill through the upper coral layer for piles which must be driven down to the lower layer. | Design/Builder |
| Stage noisier equipment such as generators in locations at least 400 to 500 feet away from the residences, when possible. | Design/Builder |
| Record existing damage to adjacent property as a basis for monitoring and repairing any new damage potentially caused by ground vibration. | Design/Builder |
| Utilize instruments to precisely record present positions of buildings and periodically monitor for any minute building movements that may be caused by ground vibration. | Design/Builder |
| TRAFFIC AND TRANSPORTATION SYSTEMS | |
| Flagmen or off-duty policemen will direct traffic during significant phases of construction to minimize traffic congestion. | Design/Builder |
| Provide off-site parking for construction employees during the duration of the construction. | Design/Builder |

**Table 8-1**
**PROPOSED MITIGATION MEASURES**

| | RESPONSIBLE FOR IMPLEMENTATION |
|---|---|
| TRAFFIC AND TRANSPORTATION SYSTEMS (Cont.) | |
| Movement of construction vehicles to and from the project site will be restricted during the morning and afternoon peak traffic periods. | Design/Builder |
| Due to temporary closure of sidewalks along project frontages, temporary informational and directional signs will be installed in the immediate project vicinity to direct pedestrians to use the adjacent sidewalks. | Design/Builder |
| Work on the new sewer line to be installed beneath Atkinson Drive leading from the project site toward Ala Moana Blvd. to the existing sewer main at Ala Moana Park will be restricted during the morning and afternoon peak traffic periods. | Design/Builder |
| SOLID WASTE | |
| Establish a program for collecting and recycling waste material throughout the construction of the facility | Design/Builder |
| SOCIAL IMPACTS | |
| Establish a program for keeping nearby residents and businesses apprised of construction activities and potential adverse noise, traffic or other impacts that may be anticipated during the various phases of construction. | Design/Builder |
| Establish a hotline to respond to concerns which may arise during the convention center's construction phase. | Design/Builder |
| **LONG-TERM IMPACTS (OPERATIONAL PHASE)** | |
| FLOODING | |
| In conformance with the City's Land Use Ordinance Requirements, the lowest occupied floor (the Exhibition Hall) will be elevated 7 feet above mean sea level. | Design/Builder |
| HISTORICAL | |
| Any construction of walkways, lighting, landscaping and street furniture in the Promenade will meet the State Historic Preservation Division's (SHPD) determination that it will have "no effect" on the historic character of the Ala Wai Promenade. | Design/Builder |
| The visual impact of the Loading Dock exterior walls on either side of the stairway will be mitigated to meet SHPD's determination that it will have "no effect" on the historic character of the Ala Wai Promenade. | Design/Builder |

**Table 8-1**
**PROPOSED MITIGATION MEASURES**

| | RESPONSIBLE FOR IMPLEMENTATION |
|---|---|
| <u>WATER QUALITY</u> | |
| Provide screens on all drain inlets to filter debris and organic materials. | Design/Builder |
| <u>NOISE</u> | |
| Work with bus companies to formulate bus operation procedures within the Center. Such procedures may include complying with State DOH vehicular noise limits and curfews, minimizing high speed idling, using lower engine RPM during acceleration, and avoiding maneuvers requiring backing up. | CCA Requirement of Convention Center Operator |
| Work with trucking companies to formulate truck operation procedures within the Center. Such procedures may include complying with State DOH vehicular noise limits and curfews, minimizing high speed idling, using lower engine RPM during acceleration, and avoiding maneuvers requiring backing up. | CCA Requirement of Convention Center Operator |
| If the rooftop area is used for large assemblies, amplified music or voice levels of 80 to 90 dB are anticipated, and portable enclosures may be required to keep sound levels to acceptable levels. | CCA Requirement of Convention Center Operator |
| Within the parking garage, non-slick roadway surfaces and acoustic fire-proofing on the ceiling and structural members will attenuate parking garage noise levels. | Design/Builder |
| Build a solid wall along a portion of the Kahakai Drive side of the second level parking garage between the entrance ramp and the corner adjacent to the Summer Palace to shield noise from the parking garage. | Design/Builder |
| <u>TRAFFIC AND TRANSPORTATION</u> | |
| Widen eastbound Kapiolani Boulevard by 10 feet along the project frontage to provide an additional right-turn only lane at Kalakaua Avenue. The existing eastbound curb lane on Kapiolani Boulevard will be converted to an optional through-right-turn lane. | Design/Builder |

**Table 8-1**
**PROPOSED MITIGATION MEASURES**

| | RESPONSIBLE FOR IMPLEMENTATION |
|---|---|
| TRAFFIC AND TRANSPORTATION (Cont.) | |
| Widen Kalakaua Avenue by 12 feet along the project frontage, from Kapiolani Boulevard to Kalakaua Bridge, to provide an additional 10-foot wide makaibound lane for use as a bus stop and a right-turn lane into the Kalakaua parking garage. Restripe the maukabound lanes on Kalakaua Avenue at Kapiolani Boulevard to provide two double left-turn lanes, one through lane, and a shared through/right-turn lane. Increase the left-turn lane widths on maukabound Kalakaua Avenue to 10 feet. | Design/Builder |
| Widen the makaibound lanes on Kalakaua Avenue mauka of Kapiolani Boulevard from 10 feet to 11 feet by reducing or eliminating the existing striped median on the Kalakaua Avenue approach. | Design/Builder |
| Widen Kahakai Drive along the project frontage to add two traffic lanes. Kahakai Drive will be improved to provide two 10-foot wide inbound lanes, two 10-foot wide outbound lanes, and a 10-foot wide landscaped median. | Design/Builder |
| Install traffic signals at the intersection of Atkinson Drive and Kahakai Drive/Kona Street, which will also include signalizing the left-turn movement from maukabound Atkinson Drive to Kona Street, and provision of a signal crossing for pedestrians. Relocate the existing pedestrian crossing on Atkinson Drive near Kona Street to the mauka side of Kona Street. | Design/Builder |
| Provision of an exclusive left-turn lane on makaibound Atkinson Drive at Kahakai Drive, extending back to Kapiolani Boulevard. | Design/Builder |
| Widen the project frontage of Atkinson Drive by 10 feet between Kahakai Drive and Kapiolani Boulevard to provide additional curb-side shuttle bus loading/unloading space along Atkinson Drive if needed for larger events. | Design/Builder |
| **Pedestrian Access** | |
| Relocate the utility poles at each end of the Kalakaua Bridge to improve pedestrian conditions. | CCA |
| Expand the sidewalk area at the southeast corner of the intersection of Atkinson Drive and Kahakai Drive to accommodate pedestrian queues. | Design/Builder or CCA |

**Table 8-1**
**PROPOSED MITIGATION MEASURES**

| | RESPONSIBLE FOR IMPLEMENTATION |
|---|---|
| **TheBus Services** | |
| Encourage the use of special convention shuttle services for mid-size and large conventions. Convention literature should promote the use of such systems. | CCA Requirement of Convention Center Operator |
| **Trucks and Deliveries** | |
| Schedule freight trucks to limit the number arriving and departing the convention center site during the morning and afternoon peak traffic hours. | CCA Requirement of Convention Center Operator |
| Monitor the affect of the arrival and departures of the smaller service and delivery vehicles on traffic conditions in the immediate area. Should traffic conditions be adversely affected, the transportation coordinator should limit the arrival and departure of these vehicles during the peak traffic hours. | CCA Requirement of Convention Center Operator |
| **Operational Traffic Improvement Measures** | |
| Cone the median left-turn lane on maukabound Atkinson Drive during the AM peak period to provide an additional makaibound lane from Kahakai Drive to Mahukona Street, if deemed necessary by the transportation management plan. | CCA Requirement of Convention Center Operator |
| Implement the westbound contra-flow coning operation on Kapiolani Boulevard (4 westbound lanes and 2 eastbound lanes) between the Makiki Drainage Canal crossing and Kaheka Street during a Friday evening post-commuter peak period event at the convention center, if deemed necessary by the transportation management plan. | CCA Requirement of Convention Center Operator |
| Restrict on-street parking on the east side of Atkinson Drive (about 9 stalls) prior to a large Friday evening post-commuter event to provide a dedicated lane on Atkinson Drive for convention center traffic, if deemed necessary by the transportation management plan. | CCA Requirement of Convention Center Operator |
| Restrict parking on the makai side of Kahakai Drive (about 5 stalls) between Atkinson Drive and the internal loop street during large convention events to provide a through lane on Kahakai Drive for residential traffic, if deemed necessary by the transportation management plan. | CCA Requirement of Convention Center Operator |

| Table 8-1<br>PROPOSED MITIGATION MEASURES | |
|---|---|
| | RESPONSIBLE FOR IMPLEMENTATION |
| **Operational Traffic Improvement Measures (Cont.)** | |
| Restrict the existing curb lane of westbound Ala Moana Boulevard to a right-turn only lane at Atkinson Drive during a Friday evening post-commuter event, if deemed necessary by the transportation management plan. | CCA Requirement of Convention Center Operator |
| Designate a transportation coordinator who will be responsible for transportation-related operations of the convention center. The coordinator's primary function would be the development of a series of transportation management plans for each event at the convention center, as deemed necessary, and will also be responsible in overseeing the transportation operations which occur during the event. | CCA Requirement of Convention Center Operator |
| Station traffic control personnel at key access points/intersections in and around the convention center site during large events to facilitate traffic flow and safe pedestrian crossing. | CCA Requirement of Convention Center Operator |
| In coordination with the City DTS, develop special traffic signal timing and coordination on major roadways in the vicinity of the convention center to disperse traffic at the end of a large event. | CCA Requirement of Convention Center Operator |
| Arrange for the use of the loading dock area to accommodate the staging of shuttle buses during pick-up/drop-off operations. | CCA Requirement of Convention Center Operator |
| **Shuttle Bus Operations** | |
| Coordinate the shuttle bus schedules with the host hotels and the convention center transportation coordinator to minimize congestion at the hotels, on the public streets, and at the convention center. | CCA Requirement of Shuttle Bus Operator |
| Station personnel at the convention center lobby entrance driveway to direct shuttle buses into and out of the bus loading/unloading area, as well as the reserve shuttle bus berths on Atkinson Drive, to maintain efficient flow of operations. | CCA Requirement of Shuttle Bus Operator |

**Table 8-1**
**PROPOSED MITIGATION MEASURES**

| | RESPONSIBLE FOR IMPLEMENTATION |
|---|---|
| **Parking** | |
| For events requiring parking for more than 800 cars, arrange to use existing outlying parking facilities that may be available and/or provide parking at host hotels for local attendees who would be transported by shuttle bus to/from the convention center. | CCA Requirement of Convention Center Operator |
| For large events, arrange for additional employee parking with nearby hotels, commercial offices, and possibly residential condominiums that may have available parking, thereby freeing up employee stalls for attendees. | CCA Requirement of Convention Center Operator |
| Give preferential on-site parking for employees and local attendees who car-pool to an event at the convention center. | CCA Requirement of Convention Center Operator |
| For large events, issue parking passes to pre-registered conventioneers. Notify other attendees that no on-site parking will be provided without a pass. | CCA Requirement of Convention Center Operator |
| Provide market rate fees (no free parking) for on-site parking to encourage attendees and employees to use public transit and ridesharing. | CCA Requirement of Convention Center Operator |
| Issue temporary public bus passes to convention center employees during large events. | CCA Requirement of Convention Center Operator |
| Utilize the truck loading dock as valet service tandem parking when truck activities are not occurring. | CCA Requirement of Convention Center Operator |
| **Transportation Management Plan** | |
| Preparation of a master transportation management plan by the convention center operator to address the specific transportation-related needs of convention center events. The plan would be approved and coordinated with the City DTS and the State DOT, as appropriate. | CCA Requirement of Convention Center Operator |

| Table 8-1<br>PROPOSED MITIGATION MEASURES | |
|---|---|
| | RESPONSIBLE FOR IMPLEMENTATION |
| **2005 Traffic Demand Management**<br><br>In year 2005 for a 14,000-person event, the following traffic management measures could be undertaken, as deemed necessary:<br><br>-Arrange for use of an existing off-site parking facility or lot for convention center employees and transport them to the Center by shuttle buses.<br><br>-Arrange for use of an existing off-site parking facility or lot for local resident attendees and transport them to the convention center by shuttle buses.<br><br>-Increase vehicle occupancies for convention center shuttle buses, and encourage a larger percentage of visitor attendees to walk to the Center from Waikiki hotels. | CCA Requirement of Convention Center Operator |
| **2005 Traffic Conditions - Inclement Weather Scenario**<br><br>Arrange for additional shuttle bus loading/unloading area. The convention center's transportation coordinator should coordinate with the shuttle bus operator for use of the Center's loading dock area for bus staging so as to eliminate the potential of buses queuing on the streets. | CCA Requirement of Convention Center Operator |
| Designate additional taxi loading/unloading area for passengers. The convention center's transportation coordinator should designate an area within the Center's parking garage for this purpose. The placement of directional signing would be required to route taxis to the designated loading/unloading areas, and to direct passengers to the Center's lobby from the drop-off area. | CCA Requirement of Convention Center Operator |
| WASTEWATER SYSTEM<br><br>Construct a new sewer line from the convention center beneath Atkinson Drive to a sewer main near Ala Moana Park. | Design/Builder |
| SOLID WASTE<br><br>Convention Center will have space allocated for solid waste recycling operations. | Design/Builder |

| Table 8-1<br>PROPOSED MITIGATION MEASURES | |
|---|---|
| | RESPONSIBLE FOR IMPLEMENTATION |
| <u>POLICE PROTECTION</u> | |
| Provide 24-hour security for Convention center premises. | CCA Requirement of Convention Center Operator |
| Provide adequate security for convention center events. | CCA Requirement of Convention Center Operator |
| Provide a space within the convention center for the police department, if needed. | CCA Requirement of Convention Center Operator |

| Table 8-2<br>POSSIBLE MITIGATION MEASURES FOR CONSIDERATION | |
|---|---|
| | RESPONSIBLE FOR IMPLEMENTATION |
| **Social Environment** | |
| <u>SECONDARY AND CUMULATIVE IMPACTS</u> | |
| Minimize in-migration by initiating job training programs for residents who may lose their jobs due to military base closures, plantation closures or other job reductions. | State Department of Labor and Industrial Relations/City Human Resources Department |
| Revise inconsistent City policies to establish consistent public direction regarding additional hotel rooms in Waikiki. Example: the Waikiki Master Plan recognizes hotel development in areas near the project site; the City Development Plan calls for a cap on hotel rooms. | City Planning Department/ City Council |
| Revise the Primary Urban Center Development Plan Special Provisions to prohibit resort development on parcels near the convention center, particularly in the areas identified as susceptible to development. | City Planning Department/ City Council |
| Support the City's planning effort to determine the direction for growth and change in the nearby communities; work with Neighborhood Boards to determine the scope and boundaries of this effort. | Convention Center District Joint Advisory Committee (CCDJAC) Recommendation to City Planning Department |

Table 8-2
POSSIBLE MITIGATION MEASURES FOR CONSIDERATION

| | RESPONSIBLE FOR IMPLEMENTATION |
|---|---|
| SECONDARY AND CUMULATIVE IMPACTS (Cont.) | |
| Establish land use and development policies based on neighborhood plans which encourage nearby landowners to maintain current land uses and density, and concentrate on rehabilitation. | CCDJAC Recommendation to City Planning Department |
| Sponsor and support efforts intended to resolve issues related to (1) promoting appreciation and understanding of fundamental values of Hawai'i's indigenous culture, as well as our multi-ethnic community; (2) visitor industry employment; and (3) community attitudes towards tourism. | Hawaii Visitors Bureau (HVB) and Hawaiian Cultural Organizations |
| Encourage each convention to include programs which promote Hawai'i's multi-ethnic cultures, with an emphasis on native Hawaiian values which create the convention center's Hawaiian sense of place. | HVB and Hawaiian Cultural Organizations |
| Use capital improvements programs funded by increased tax base to mitigate impacts of in-migration. | State Legislature, Governor, City Council, Mayor |
| Revise laws to encourage landowners to maintain affordable rent structures. | CCDJAC Recommendation to City Administration and Council |
| Revise laws to restrict rent increases in specified area. | CCDJAC Recommendation to City Administration and Council |
| Establish a relocation plan for specified areas which are likely to change as a result of the cumulative effects of the convention center. Plan should include a finding/contribution plan and a schedule of payment. | CCDJAC Recommendation to City Administration and Council |

| Table 8-2<br>POSSIBLE MITIGATION MEASURES FOR CONSIDERATION | |
|---|---|
| | RESPONSIBLE FOR IMPLEMENTATION |
| **Infrastructure/Public Services** | |
| TRAFFIC AND TRANSPORTATION SYSTEMS | |
| **Other Mitigation** | |
| Traffic signal phasing and timings should be examined to determine if current traffic back-ups from adjacent intersections can be reduced or eliminated by optimizing the traffic signal timings. | City Department of Transportation Services (DTS) |
| Issue parking passes for Kahakai Residents to reserve on-street parking stalls. | City DTS |
| **2005 Traffic Conditions** (To be implemented in 2005, if needed) | |
| Provide an additional right-turn only lane on eastbound Kapiolani Boulevard at Atkinson Drive. | State Legislature, City DTS |
| Provide an additional right-turn only lane on ewabound Kapiolani Boulevard at Kalakaua Avenue. | State Legislature, City DTS |
| Modify the westbound approach of Ala Wai Boulevard at Kalakaua Avenue, along with traffic signals, to provide two exclusive right-turn lanes on westbound Ala Wai Boulevard onto maukabound Kalakaua Avenue, and an optional through/left-turn lane. | City DTS |
| Provide a right-turn only lane from westbound Ala Moana Blvd. to Atkinson Drive. | State Department of Transportation (DOT) |
| RECREATIONAL RESOURCES | |
| Implement established mechanisms which regulate commercial uses in Ala Wai Canal | State Department of Land and Natural Resources (DLNR), DOT Harbors Division, City Department of Parks and Recreation (DPR) |
| Ensure minimal disruption and continued use of the Ala Wai Canal by Hawaiian canoeing. | State DLNR, DOT Harbors Division, City DPR |

## 8.5 Unmitigated Impacts

**Several impacts will not be mitigated or potential mitigation measures not be implemented, as discussed below:**

8.5.1. Short-Term Impacts

Noise/Vibration. Noise generated by pile drivers can be controlled at the source of noise by a structural enclosure as discussed in the Noise Study (Appendix F). This technology, however, is not known to be available in the U.S. and its viability for this project is unknown.

Construction noise can also be controlled at an affected residence or business by temporarily closing windows and doors and providing acoustic reinforcement. Air conditioning would also be required to replace natural ventilation. This mitigation measure is economically unfeasible given the number of residences and businesses in the area.

Vibrations generated by pile drivers have the potential for being felt in nearby areas and for potentially causing damage to nearby properties. Mitigation measures to address property damage were discussed in Section 3.14.3, however, the impact of vibrations being felt at nearby residences cannot be totally mitigated.

Economic. The construction phase of the convention center will have short-term negative fiscal impacts on the City and the State. Net revenue in 1996, during construction of the convention center, would be negative $62,000 for the County and negative $4.9 million for the State since the facility would not create major tax benefits until it is operational and because in-migration stimulated by construction employment would require additional public expenditures. This impact cannot be mitigated in the short-term, but in the long-term tax revenues generated by the convention center are projected to more than offset the short-term negative impacts.

8.5.2. Long-Term Impacts

Air Quality. Air quality impacts of vehicular traffic cannot be effectively mitigated; however, despite the growth in traffic and predicted CO levels, a general decline in CO levels is predicted over the next few years. This is due to the effect of the EPA motor vehicle emissions control program. The projected reduction in emissions from new vehicles and loss by attrition of older vehicles offsets the projected traffic increase. This is also true of worst case 1-hour and annual concentrations of $NO_2$ from diesel bus activity.

Economic. The potential displacement of some vacation visitors, particularly eastbound visitors from Japan cannot be mitigated; however, Japanese visitor travel patterns suggest increasing flexibility in travel times and destinations as well as increased visitation to the Neighbor Islands.

**Traffic and Transportation. Modifications to Atkinson Drive will require the permanent displacement of 5 existing on-street parking stalls which cannot be replaced elsewhere. Other stalls on Atkinson, Kahakai and Kapiolani will be restricted during certain events.**

## 8.6 Summary of Unresolved Issues

**There are two categories of unresolved issues. The first are those issues that will be resolved pending issuance of a permit or a decision by an specific agency or authority. The second category includes mitigation measures which are beyond the authority of the design/builder or the CCA to implement. These are listed in Table 8-2. Discussed below are issues pending resolution by a permit or decision:**

Water Quality: It has not been resolved at this time whether an NPDES dewatering permit will be approved for construction activities on the site. A permit application to allow emergency dewatering discharges during large or prolonged storm events has been submitted to the DOH for approval. Also, it is uncertain at this time whether or not an NPDES dewatering permit will be required for the installation of a sewer line beneath Atkinson Drive. A City permit to allow discharges into the City drainage system may also be required.

Archaeological: Pursuant to Chapter 6E, HRS, the SHPD required that a subsurface inventory survey be conducted on the project site. That survey has been completed, however, laboratory analysis of recovered samples has yet to be received. If the SHPD determines that the survey was sufficient to find all historic sites and that any historic resources found have been adequately assessed, it will concur that the survey is adequate. Once it is determined that there are no significant impacts to historic resources, as is anticipated based on preliminary findings, the SHPD will issue a determination of no adverse effect.

**Historical: Pursuant to Section 106 of the National Historic Preservation Act, the SHPD will make a determination of what walkway improvements in the Ala Wai Promenade would have no effect on its historic character. Similarly, a Section 106 determination is pending regarding the requirements for mitigating the visual impact of the exterior wall of the convention center Loading Dock on the historic character of the Promenade.**

**Noise: The decision to enclose the truck access driveway leading to the Loading Dock is pending. Since the enclosure would be considered a structure, it would need a variance to encroach on the setback area. This decision will either be pursued with the City Department of Land Utilization or be made by the CCA.**

**Pedestrian Access: A decision regarding the need to provide a sidewalk on the convention center-side of Kahakai Drive is pending. The decision will be made by the City Department of Transportation Services following consultation with neighboring property owners.**

**To improve pedestrian conditions at the southeast corner of the intersection of Atkinson Drive and Kahakai Drive, the sidewalk area at this corner should be expanded to accommodate pedestrian queues. Alternatives to accomplish this are still being evaluated.**

# CHAPTER NINE

# REFERENCES

## 9. REFERENCES

AECOS, Inc. *Water Quality Considerations for the Hawai'i Convention Center Complex.* Prepared for Convention Center Authority. January 1995.

Astor, Kanellos, Group 2 + International. Memoranda to Ty Sutton, dated April 11, 1994.

______. Personal communication, May 16, 1994.

Dames and Moore. *Due Diligence Review of Environmental Reports and Regulatory Agency Documents Interviews with Project Personnel, Proposed Honolulu Convention Center. February 4, 1994.*

_____. *Phase II Foundation Investigation, Proposed Honolulu Convention Center. n.d.*

Dooley, James. "Aloha Motors Transactions a Tangled Web," Honolulu Advertiser. December 3, 1993.

Earthplan. *Hawai'i Convention Social Impact Assessment.* Prepared for Wilson Okamoto & Associates, Inc. January 1995.

______. *Social Impact Assessment for the Honolulu Convention Center Complex.* Prepared for First Development, Inc. August 1989.

Ebisu, Y. and Associates. *Noise Study for the Hawai'i Convention Center.* Prepared for Wilson Okamoto & Associates, Inc. January 1995.

______. *Noise Study for the Honolulu Convention Center Complex.* Prepared for First Development, Inc. August 1989.

_____. *Radio Frequency Interface Study for the Honolulu Convention Center Complex.* Prepared for First Development, Inc. August 1989.

Engineers Surveyors Hawaii, Inc. *Ala Moana Regional Park Master Design Plan: Summary Report.* Prepared for Department of Parks and Recreation. May 1992.

Hammatt, Hallett H., Ph.D.; Douglas F. Borthwick; and Brian L. Colin. Cultural Surveys Hawaii. *Archaeological Sub-Surface Survey at the Waikiki Convention Center Site.* January 1995.

Hawaii, State of; Convention Center Authority. *Convention Center Design/Build Request for Proposals, Volume I.* March 4, 1994.

______. *Convention Center Design/Build Request for Proposals, Volume II.* March 4, 1994.

______. Department of Business, Economic Development and Tourism. *State of Hawaii Data Book 1992.* 1992.

______. Department of Health, Clean Air Branch. *Hawaii Air Quality Data, January 1988-December 1990.*

______. Office of State Planning. *Hawaii State Plan.* 1991.

Helber Hastert & Fee, Planners and Wilbur Smith Associates. *Waikiki Transportation Improvement Plan: Direct Access to the H-1 Freeway From Waikiki, Alternatives and Findings.* November 1992.

Honolulu, City and County of; Department of Land Utilization. *Land Use Ordinance.* December 1990, as amended.

______. *Plan Review Use Application Report 89/PRU-5.* March 14, 1990.

______. Department of General Planning. *General Plan.* 1992, as amended.

______. *Waikiki Master Plan.* May 15, 1992.

______. Department of Transportation Services. *Waikiki Regional Traffic Study.* October 1993.

J.W. Morrow. Environmental Management Consultant. *Air Quality Impact Report: Hawai'i Convention Center.* Prepared for Wilson Okamoto & Associates, Inc. and Nordic/PCL - A Joint Venture. January 1995.

KPMG Peat Marwick. *Economic and Fiscal Assessment of the Hawai'i Convention Center.* Prepared for Wilson Okamoto & Associates, Inc. January 1995.

Kaser, Thomas. "Convention Center Urged on State," Honolulu Advertiser. January 30, 1993.

Lau, Ed. Department of Land and Natural Resources, Division of Water and Land Development. Personal communication, April 8, 1994.

MTWK, Inc. with Okita Kunimitsu & Associates, Inc. *Plan Review Use Application, Honolulu Convention Center Complex, Volume 2 Appendices.* August 1, 1989.

Noda, Edward K & Associates. *Ala Wai Canal Improvement, Executive Summary.* Prepared for State of Hawaii, Department of Land and Natural Resources, Division of Water and Land Development. October 1992.

______. *Ala Wai Canal Improvement Feasibility Report.* Prepared for State of Hawaii, Department of Land and Natural Resources, Division of Water and Land Development. October 1992.

______. *A Management Plan for the Ala Wai Canal Watershed.* Prepared for State of Hawaii, Department of Land and Natural Resources, Division of Water and Land Development. October 1992.

Omnitrak Group, Inc. *Convention Center Site Study.* 1993.

Paul H. Rosendahl, Ph.D., Inc. *Archaeological and Historical Assessment Study, Convention Center Project Area.* May 1994.

Peat Marwick Main and Co. *Education and Child Care Study for the Honolulu Convention Center Complex.* Prepared for First Development, Inc. August 1989.

Root, Barry and Barry D. Neal. *Air Quality Study for the Honolulu Convention Center Complex.* Prepared for First Development, Inc. August 1989.

Rosegg, Peter. "Aloha Motors Deal Approved by State," Honolulu Advertiser. December 4, 1993.

Ryan, Tim. "Ala Wai Canal is Heavily Polluted," Honolulu Star Bulletin. April 22, 1985.

SMS Research. *The Opportunity for a World-Class Convention Center in Hawaii, a Technical Report.* Prepared for Hawaii Visitors Bureau. August 3, 1992, updated January 25, 1993.

TRB Hawaii, Ltd. *Glare Study.* Prepared for First Development, Inc. August 1989.

Teruya, Terry, Department of Health, Clean Water Branch. Personal communication April 21, 1994.

Tian, Xijun, Department of Business, Economic Development and Tourism, Research Section. Personal communication, May 5, 1994.

The Traffic Management Consultant. *Traffic Impact Analysis Report: Hawai'i Convention Center.* Prepared for Convention Center Authority.

U.S. Army Engineer District Honolulu. *Draft EIS, Development of the Armed Forces Recreation Center, Fort DeRussy, Waikiki, Hawaii.* January 1990.

Unitek Environmental Consultants, Inc. *Surface/Subsurface Contamination Assessment for the Honolulu Convention Center Complex.* Prepared for First Development, Inc. August 1989.

Usagawa, Barry, Board of Water Supply. Personal communication, April 12, 1994.

Wilbur Smith Associates. *Hawaii Convention Center Transportation Impact Assessment.* May 16, 1994.

Wilson Okamoto and Associates, Inc. *Infrastructure-Engineering Report for the Honolulu Convention Center Complex.* Prepared for First Development, Inc. August 1989.

# CHAPTER TEN

# PREPARERS OF THE EIS

# 10. PREPARERS OF THE EIS

## 10.1 Proposing Agency

**Convention Center Authority (CCA), State of Hawaii**

| | |
|---|---|
| Alan S. Hayashi | Executive Director |

## 10.2 Design/Build Team

**Nordic/PCL Joint Venture**

<u>Nordic Construction, Ltd.</u>

| | |
|---|---|
| Mitsuru "Mits" Kaneshige | Chairman of the Board |

<u>PCL Construction Associates, Inc.</u>

| | |
|---|---|
| Pat Klein | Project Director |
| Dennis Smith | Manager of Construction Operations |

## 10.3 EIS Consultant

**Wilson Okamoto and Associates, Inc.**

| | |
|---|---|
| Earl K. Matsukawa, AICP | Project Manager |
| Frances Yamada | Senior Planner |
| Rodney Funakoshi, AICP | Senior Planner |
| Bruce Gorst | Senior Planner |
| Allison Fritts | Planner/Researcher |
| Allen Kam | Planner/Researcher |
| Edwin Kagawa | Planner/Researcher |
| Ernest Takahashi | CADD Specialist |
| Malcolm Ching | CADD Technician |
| Glynn Mayeshiro | Design Layout |

## 10.4 EIS Technical Studies

| | |
|---|---|
| ***AECOS*, Inc.** | |
| Eric Guinther | Water Quality |
| **Cultural Surveys Hawaii** | |
| Hallett H. Hammatt, PhD. | Archaeology |
| **Environmental Management Consultant** | |
| J.W. Morrow | Air Quality |

| | |
|---|---|
| **Y. Ebisu and Associates, Inc.** | |
| Yoichi Ebisu, P.E. | Noise |
| **Earthplan** | |
| Berna Cabacungan | Social Impact |
| **KPMG Peat Marwick** | |
| Ann Bouslog | Economic Assessment |
| **The Traffic Management Consultant** | |
| Randall S. Okaneku, P.E. | Traffic |
| **Parsons Engineering Sciences, Inc.** | |
| Phillip J. Rowell, P.E. | Traffic |

## 10.5 EA/EISPN Consultant

| | |
|---|---|
| **Helber Hastert and Fee, Planners** | |
| Mark H. Hastert, AICP | President |
| Thomas A. Fee, AICP | Vice President |
| Leslie Kurisaki | Senior Associate |

## 10.6 EA/EISPN Technical Studies

| | |
|---|---|
| **Paul H. Rosendahl, PhD. Inc.** | |
| Paul H. Rosendahl, PhD | Archaeology |
| **Wilbur Smith Associates** | |
| Bryant T. Brothers, P.E. | Traffic |

# APPENDICES

Hawai'i Convention Center

*APPENDIX A*

*HOUSE BILL NO. 27-93/S.D. 1*

Hawai'i Convention Center

HOUSE OF REPRESENTATIVES
SEVENTEENTH LEGISLATURE, 1993
STATE OF HAWAII

# H.B. NO. S7-93 S.D. 1

# A BILL FOR AN ACT

RELATING TO A CONVENTION CENTER.

**BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF HAWAII:**

PART I.

SECTION 1. The legislature finds that existing convention facilities in Hawaii are inadequate for the needs of many convention groups. The legislature declares that any convention center facility should be centrally located within or near Waikiki to best address the needs of prospective conventioneers, and that the most appropriate existing sites are what is popularly known as the Aloha Motors site and what is popularly known as the Ala Wai golf course site. These sites are located near the visitor hub of Waikiki, surrounded by several major hotels and in walking distance from many other hotels. In this context, a convention center is presented with the capacity to act in synergism with the surrounding uses. Building a convention center facility at either of these sites would serve the purpose of providing an easily accessible convention center.

The legislature finds that the public interest requires the construction of a convention center facility at either of the above-named sites.

SECTION 2. Chapter 206X, Hawaii Revised Statutes, is amended by adding a new section to be appropriately designated and to read as follows:

"§206X- General criteria for development of a convention center. The following criteria shall apply to any convention center facility built or developed in any convention center district:

(1) The convention center facility shall be a stand-alone facility, without additional private development on-site;

(2) The convention center facility shall be owned and operated by the authority;

(3) The flexible meeting rooms, ballrooms, and support space shall consist of a minimum of 675,000 gross square feet, of which a minimum of 200,000 gross square feet shall be exhibit space; provided that the exhibit space and related support space shall be on a single level with direct vehicle access to the exhibit floor;

(4) The convention center facility shall be designed and developed to accommodate future expansion; and

(5) The convention center facility shall reflect a Hawaiian sense of place."

SECTION 3. Section 46-11, Hawaii Revised Statutes, is amended to read as follows:

"§46-11 Federal flood insurance. The convention center authority in regard to the convention center district and the mayor or executive officer and the council of the various counties, in regard to the respective counties, may participate and apply on behalf of their respective district and counties for flood insurance coverage pursuant to any applicable provisions of Public Law 1016, Eighty-fourth Congress, Second Session, (70 Stat. 1078). [They] The convention center authority, in regard to the convention center district, and the mayor or executive officer and the council of the various counties, in regard to the respective counties, shall be vested with the functions, powers, and duties which are necessary to enable their respective district and counties to qualify, participate, and apply for the flood insurance coverage."

SECTION 4. Section 206X-5, Hawaii Revised States, is amended to read as follows:

"§206X-5 [Designation of convention center district; convention] Convention center development plan. [(a) The authority shall conduct a survey of potentially appropriate sites both in Waikiki; and other areas in the State and a study of criteria for development within a convention center district and report to the legislature not less than twenty days prior to the convening of the regular session of 1993 with an update of its recommendations of appropriate sites and criteria for development to be approved by the legislature.

(b)] (a) The authority shall review for approval the convention center development plan of a developer which shall include a convention center and other improvements proposed for development within the convention center district. In its review of any proposed convention center development plan pursuant to this chapter, the authority shall apply the criteria of the convention center district rules and any criteria for development within the convention center district established by the legislature.

[(c)] (b) The authority may enter into cooperative agreements with qualified persons or public agencies, where the powers, services, and capabilities of such persons or agencies are deemed necessary and appropriate for review by the authority of the development of the convention center development plan.

[(d)] (c) Whenever possible, the convention center development plan shall be consistent with federal, state, and county plans. Consideration shall be given to state goals and policies, adopted state plan or land use guidance policies, county general plans, development plans, and ordinances.

[(e) The authority shall hold a public hearing on a proposed convention center development plan pursuant to chapter 91.]"

SECTION 5. Section 206X-6, Hawaii Revised Statutes, is amended to read as follows:

"§206X-6 Convention center district rules. The authority shall establish rules for the development within the convention center district under chapter 91 on health, safety, building, planning, zoning, [and] land use, land development, and flood plain management, including mitigation and permitting, which, upon final approval by the authority of a convention center development plan, shall supersede all other inconsistent ordinances and rules relating to [the use,] health, safety, building, planning, zoning, [planning, and development of land and construction thereon.] land use, land development, and flood plain management, including mitigation and permitting, and provision of access and utilities thereto. The convention center development plan approved by the authority shall be made a part of, and shall have the same force and effect as, the rules aforesaid. [Any development proposal within the boundaries of the Waikiki special design district and within the designated convention center district under agreement with a developer shall be subject to the requirements of chapter 343 relating to environmental impact statements and shall be provided for in the rules. The environmental impact statement shall include the disclosure of the environmental effects of the proposed development, effects of the proposed development on the economic and social welfare of the community and State including the welfare of persons to be dislocated by the proposed development, effects of the economic activities arising out of the proposed development, measures proposed to minimize adverse effects, and alternatives to the action and their environmental effects.] Rules adopted under this section shall follow existing law, rules, ordinances, and regulations as closely as is consistent with standards meeting minimum requirements of good design, pleasant amenities, health, safety, and coordinated development[.], and accomplishment of the purposes of this chapter.

For purposes of chapters 501, 502, and 514A, the authority may certify maps and plans of lands and real property interests within the convention center district as having complied with applicable laws and ordinances relating to consolidation, subdivision of lands, and condominium property regimes, and such maps and plans shall be accepted for registration or recordation by the land court and registrar."

SECTION 6. Section 206X-8, Hawaii Revised Statutes, is amended to read as follows:

"[[]§206X-8[]] Use of public lands [; acquisition of state lands]. [(a)] Any provision of chapter 171 to the contrary notwithstanding, the governor may set aside, transfer, convey, or lease public lands [located within the convention center development district] wherever situated and whether or not set aside to any department or agency of the State or any political subdivision of the State, to the authority for its use.

[(b) If state lands under the control and management of other public agencies are required by the authority for its purposes, the agency having the control and management of those required lands shall, upon request by the authority and with the approval of the governor, convey or lease such lands to the authority upon such terms and conditions as may be agreed to by the parties.

(c) Notwithstanding the foregoing, no public lands shall be set aside, conveyed, or leased to the authority as above provided if such setting aside, conveyance, or lease would impair any covenant between the State or any county or any department or board thereof and the holders of bonds issued by the State or such county, department, or board.]"

SECTION 7. The convention center authority established by section 206X-3, Hawaii Revised Statutes, is authorized to negotiate with the appropriate person for the purchase of the undeveloped Aloha Motors site. The purchase price of the site, and any other lands acquired by any means in connection with the development of the convention center, together with convention center development costs, including the cost to construct the convention center, shall not exceed $350,000,000.

The negotiations shall result in a binding agreement for the purchase and sale of the undeveloped Aloha Motors site, which negotiations, binding agrement, and purchase and sale shall be specifically exempt from the requirements of chapter 343. The binding agreement shall require transfer of the land by deed with full warranty of title free and clear of all liens and subject to only such encumbrances and easements as shall be acceptable to the State.

Upon the execution of a binding agreement, the Aloha Motors site is designated to be the convention center district.

The binding agreement pursuant to this section shall be executed by the convention center authority and the appropriate person with respect to the Aloha Motors site by 11:59 p.m. on the sixtieth calendar day following the approval of this Act or if the sixtieth calendar day falls on a Saturday, Sunday, or state holiday, by 11:59 p.m. on the weekday immediately following the sixtieth calendar day; provided that any period of time during which a court with appropriate jurisdiction has enjoined negotiations or agreement shall not be included in the computation of the sixty-day period.

For purposes of this Act, the Aloha Motors site is defined as that parcel of land consisting of approximately 9.67 acres and more particularly identified as tax map key 2-3-35:1,2,4,5,8,10, and tax map key 2-3-36:18,24,25.

SECTION 8. In the event of the repeal of SECTION 7 of this Act pursuant to SECTION 32 of this Act, the Ala Wai golf course site is designated to be the convention center district and the convention center authority shall exercise its powers to effectuate the development of a convention center facility at the Ala Wai golf course site upon the transfer of the use and control of the Ala Wai golf course site to the convention center authority pursuant to section 46-65.7, Hawaii Revised Statutes. For purposes of this Act, the Ala Wai golf course site is defined as that parcel of land consisting of approximately 16.0 acres generally situated at the Ewa portion of the Ala Wai golf course and being a portion of that parcel of land more particularly identified as tax map key 2-7-36:2.

Upon the designation of the Ala Wai golf course site as the convention center district, the governor is authorized to transfer the use, operation, and control of the Kapolei golf course to the city and county of Honolulu; provided that the transfer shall be made only if the city and county of Honolulu agrees to accept the transfer. For purposes of this Act, the

Kapolei golf course is defined as that parcel of land more particularly identified as tax map key 9-1-16: por. 35.

If development of a convention center facility at the Ala Wai golf course site is effectuated pursuant to this section, then wasteshed management activities shall be implemented to carry out the clean up and maintenance of the Ala Wai canal.

The purchase price of the site and any other lands acquired by any means in connection with the development of the convention center, together with convention center development costs, including the cost to construct the convention center, shall not exceed $350,000,000, including, but not limited to the cost of the transfer of the Kapolei golf course and the clean up of the Ala Wai canal.

SECTION 9. Section 46-65.7, Hawaii Revised Statutes, is amended to read as follows:

"[[]§46-65.7[]] Ala Wai golf course. The fair commission of Hawaii is abolished and the functions and authority of the fair commission of Hawaii relating to the Ala Wai golf course are transferred to the city and county of Honolulu, together with the use and control of all lands, property, and facilities under its jurisdiction; provided that the lands, property, and facilities shall be used for the purposes of operating a municipal golf course; and provided further that the governor may by executive order transfer the use and control of the lands, property, and facilities or any part of the lands, property, and facilities to the appropriate department or agency of the State designated by the governor upon the giving of [one year's] six months' written notice before the date of the transfer back to the State to the city and county of Honolulu."

SECTION 10. The convention center authority shall provide for construction of the convention center utilizing a request for proposals process.

PART II.

SECTION 11. Findings and purpose. The legislature finds that convention organizers from around the country have bypassed Hawaii for other destinations because the State lacks the facilities to house these participants, sessions and workshops, and displays in a professional manner. The loss of convention-related business to other destinations could have long-lasting and far-reaching impacts on the State, not only on Oahu but on the neighbor islands as well, since Hawaii's economy is heavily dependent on the tourist trade generated by these conventions.

It is necessary for the State and the counties to make certain sacrifices today in order to build a world-class convention center, and ensure Hawaii's place as one of the world's prime visitor destinations tomorrow. The State and the counties will benefit from future increases in convention-related business, which will add an estimated $335,000,000 a year in new tax revenues. Conversely, future decreases in convention-related business because of the lack of a convention center will result in less revenues being generated through the general excise tax and transient accommodations tax and less moneys for the State and the counties alike.

The transient accommodations tax is derived primarily from visitors from outside of the State and convention travelers comprise a significant portion of these visitors. The legislature finds that a convention center would stimulate economic activity in the visitor industry and the resulting increase in revenue from the transient accommodations tax and the general excise tax will be substantially attributable to the presence of a convention center. The legislature further finds that the construction and operation of a convention center are crucial to the economic well-being of the State and the counties and are for a public purpose.

The revenue bonds issued by the authority to finance the convention center are to be repaid entirely from the convention center capital and operations special fund. This special fund is funded by revenues from the transient accommodations tax and operations of the convention center. The transient accommodations tax is substantially derived from a function of the convention center to increase and maintain sales of hotel rooms and other transient accommodations.

SECTION 12. Chapter 206X, Hawaii Revised Statutes, is amended by adding a new section to be appropriately designated and to read as follows:

"§206X- Convention center capital and operations special fund. (a) There is established in the state treasury the convention center capital and operations special fund, into which shall be deposited:

(1) A portion of the revenues from the transient accommodations tax, as provided by section 237D-6.5;

(2) All revenues derived from the operations of the convention center;

(3) All or a portion of all revenues derived from the operation of parking and garage facilities and other concessions at the convention center;

(4) All proceeds from revenue bonds issued by the authority; and

(5) Appropriations by the legislature to the convention center capital and operations special fund.

(b) In addition to the powers of the authority specified in section 206X-4, the authority may:

(1) Define, through rules adopted in accordance with chapter 91, the term "revenues derived from the operations of the convention center" or like terms; and

(2) Do any and all things deemed necessary to administer the convention center capital and operations special fund.

(c) Moneys in the convention center capital and operations special fund may be placed in interest-bearing accounts or otherwise invested by the authority until such time as the moneys may be needed. All interest accruing from the investment of these moneys shall be credited to the convention center capital and operations special fund.

(d) Moneys in the convention center capital and operations special fund shall be used by the authority for the following purposes:

(1) Planning, design, improvement, construction, land acquisition, equipment, and furnishing necessary for the development or maintenance of a convention center;

(2) Constructing, operating, maintaining, and improving the convention center and any public facilities related thereto;

(3) Payment of debt service on revenue bonds issued by the authority for purposes of the convention center,

<u>establishment of debt service and other reserves deemed necessary by the authority or the State, and reimbursement of the state general fund for debt service on general obligation bonds or reimbursable general obligation bonds issued by the State for purposes of the convention center; and</u>

<u>(4)</u> <u>Any other purpose deemed necessary by the authority for the purpose of planning, improving, developing, operating, and maintaining the convention center facility.</u>"

SECTION 13. Section 206X-2, Hawaii Revised Statutes, is amended by adding a new definition to be appropriately inserted and to read as follows:

"<u>"Convention center facility" or "convention center" means any combination of land, buildings, and improvements thereon, suitable for use as a convention center; any other structure or facility required or useful for the operation of a convention center facility, including, but not limited to, commercial, office, community service, parking, garage, and other supporting service structures; and all necessary, useful, and related equipment, furnishings, and appurtenances.</u>"

SECTION 14. Section 36-27, Hawaii Revised Statutes, is amended to read as follows:

"§36-27 Transfers from special funds for central service expenses. Except as hereinafter provided, and notwithstanding any provisions of any other law to the contrary, there shall be deducted from time to time by the director of finance, for the purpose of defraying the prorated estimate of central service expenses of government in relation to all special funds, except the special summer school fund under section 298-3.5; the school cafeteria special funds of the community colleges[,] and the department of education; the special funds of the student housing, summer session, division of continuing education and community service, campus center, and bookstores of the University of Hawaii; [and] the state educational facilities improvement special fund[,]; and the convention center capital and operations special fund, five per cent of all receipts of each such special fund, which deduction shall be transferred to the general fund of the State and become general realizations of the State. All officers of the State and other persons having power to allocate or disburse any special funds shall cooperate with the director in effecting these transfers."

SECTION 15. Section 206X-2, Hawaii Revised Statutes, is amended by amending the definition of "developer" to read:

""Developer" means any person, partnership, cooperative, firm, nonprofit or for-profit corporation, or public agency possessing the competence, expertise, experience, and resources, including financial, personal, and tangible resources, required to [carry out] effectuate, directly or through other developers, the development of a convention center[.], including planning, design, and construction."

SECTION 16. Section 206X-4, Hawaii Revised Statutes, is amended by amending subsection (b) to read as follows:

"(b) Except as otherwise limited by this chapter, the authority also may:

(1) Sue and be sued;

(2) Have a seal and alter the same at pleasure;

(3) Make and execute contracts and all other instruments necessary or convenient for the exercise of its powers and functions under this chapter;

(4) Make and alter bylaws for its organization and internal management;

(5) [Make] Adopt rules in accordance with chapter 91 with respect to its projects, operations, properties, and facilities[, which rules shall be in conformance with chapter 91];

(6) Through its executive director appoint officers, agents, and employees, prescribe their duties and qualifications, and fix their salaries, without regard to chapters 76 and 77;

(7) Review and approve the convention center development plan proposed by a developer, for the convention center district; inspect and approve development within the convention center district for compliance with convention center development plans and rules; and upon [dedication] construction of the convention center facility [to the State, to], manage, operate, and maintain or enter into contracts for the professional management, operation, and maintenance of the convention center facility;

(8) Cause a developer to prepare plans, specifications, and designs for the construction, reconstruction, rehabilitation, improvement, alteration, or repair of any project, and from time to time, to modify such plans, specifications, or designs; provided that the plans, specifications, or designs shall be subject to review and approval by the authority;

(9) Procure insurance against any loss and any liability in connection with [its property] the convention center and other related assets and operations in such amounts and from such insurers as it deems desirable;

(10) Contract for and accept gifts or grants in any form from any public agency, or [from] any other source;

(11) Upon the [authority determining that a developer, acting in good faith, is unable to develop the convention center facility in cooperation with the holders of any interest in property in the convention center district, and upon making a finding that the acquisition of such] request of the authority and the approval of the governor, condemn any real property [interest is] interests as the authority deems necessary for [its use for the purposes of this chapter, may acquire the property by condemnation] the development of a convention center pursuant to chapter 101[, notwithstanding any contract to the contrary]; provided[, however,] that the valuation of any such property acquired pursuant to the exercise of the authority's power under this subsection shall be done without regard to any increase or decrease in the value of the property resulting from the application of this chapter. Property [so] acquired by condemnation shall not be subject to chapter 171[. If the convention center site is acquired partially or wholly by eminent domain action, the developer shall reimburse to the State the sum of money equal to the just compensation or damages for the taking of the convention center site under the provisions of section 101-29];

(12) Negotiate with the developer for contribution by the developer to defray costs relating to the relocation of persons displaced because of the development;

[(13) Ancillary to the development of the convention center facility, permit the development by the developer of the convention center facility, hotels, condominiums, commercial, retail, and office space, and other improvements which would increase the utilization of the convention center facility;

(14)] (13) On behalf of the State, accept the authority to operate, manage, and maintain the convention center facility upon [its dedication to the State; provided that it deems this action to be in the best interest of the State;] completion or acquisition of such facility;

[(15)] (14) Issue revenue bonds, subject to the approval of the legislature. All revenue bonds shall be issued pursuant to part III of chapter 39, except as provided in this [[]chapter[]]. [The] All revenue bonds shall be issued in the name of the authority and not in the name of the State. The final maturity date of the revenue bonds may be any date not exceeding thirty years from the date of issuance;

[(16) If [section 9, Act 159, Session Laws of Hawaii 1992, enacting the Waikiki task force] becomes effective, assist the Waikiki task force established thereby, whenever the task force considers convention center matters; and] (15) Pledge or assign all or any part of the receipts and revenues of the authority;

(16) Set and collect rents, fees, charges, or other payments for the lease, use, occupancy, or disposition of the convention center facility acquired, constructed, or reconstructed by the authority pursuant to this chapter;

(17) Acquire, lease as lessee or lessor, own, rent, hold, and dispose of real and personal property in the exercise of its powers and the performance of its duties under this chapter;

(18) Acquire by purchase, lease, or otherwise, and develop, construct, operate, own, manage, repair, reconstruct, enlarge, or otherwise effectuate, either directly or through developers, a convention center;

(19) Reimburse the state general fund for debt service on general obligation bonds or reimbursable general obligation bonds issued by the State for purposes of the convention center;

[(17)] (20) Do any and all things necessary to carry out its purposes and exercise the powers given and granted in this chapter[.]; and

(21) By itself, or in combination or association with qualified persons, by any form of request for proposals, as determined by the authority, any law to the contrary notwithstanding, solicit, accept, review, reject, modify, or approve proposals, and thereafter enter into agreements, for a convention center development plan, and for the initiation, undertaking, supervision and regulation of the design, development, financing, operation and maintenance of a convention center facility and any related developments."

SECTION 17. Section 206X-7, Hawaii Revised Statutes, is amended by amending subsection (c) to read as follows:

"(c) As a further condition and consideration of the right to develop the real property within the convention center district under the agreement[,] and pursuant to this chapter, the developer shall pay a reasonable sum determined by the authority as contribution for the payment of costs relating to:

(1) The temporary or permanent relocation of existing licensees and lessees, if any, who are displaced because of the development within the convention center

district pursuant to the convention center development plan by the developer; or

(2) Settlement payments in lieu of payments provided under paragraph (1) to existing licensees and lessees, if any, who are displaced by the developer because of the development within the convention center district pursuant to the convention center development plan; provided that each displaced licensee or lessee shall have the option to select either relocation or a settlement payment.

Upon the approval by the authority of the relocation plan, which shall be prepared and submitted by the developer to the authority, the developer shall deliver to the authority for deposit into the convention center [development revolving] capital and operations special fund the sum determined by the authority in the form of a certified check, an irrevocable letter of credit, or surety bond. The sum determined by the authority shall be used for the implementation of the relocation plan[,]; provided that the sum and all interest accrued thereon shall be refunded to the developer in the event this chapter expires and becomes void.

The relocation plan shall include an agreement by the developer to give every displaced licensee or lessee who does not elect to receive a settlement payment under paragraph (2) an unassignable right of first refusal of any license or lease of space within the convention center district developed and offered for [such] those activities similar in size and nature to the business conducted by the licensee or lessee at the time of displacement, unless [such] this right is waived by any licensee or lessee.

The authority shall [cause to be established] establish a task force to assist in the implementation of the relocation plan. The task force shall include persons representing agencies, organizations, government, and private interests."

SECTION 18. Section 237D-2, Hawaii Revised Statutes, is amended by amending subsection (a) to read as follows:

"(a) There is levied and shall be assessed and collected each month a tax of five per cent for the period beginning on January 1, 1987, to June 30, 1994, and a tax of six per cent for the period beginning July 1, 1994, and thereafter, on the gross rental or gross rental proceeds derived from furnishing transient accommodations."

SECTION 19. Section 237D-6.5, Hawaii Revised Statutes, is amended to read as follows:

"[[]§237D-6.5[]] Remittances; distribution to counties. (a) All remittances of taxes imposed under this chapter shall be made by cash, bank drafts, cashier's check, money order, or certificate of deposit to the office of the taxation district to which the return was transmitted.

(b) For the fiscal year beginning July 1, 1990, and for each fiscal year thereafter, until June 30, 1994, revenues collected under this chapter shall be distributed as follows: five per cent of the revenues collected under this chapter shall be retained by the State [to be used for the costs of assessment, collection, and disposition of the transient accommodations taxes under this chapter]. Of the remainder, Kauai county shall receive 14.5 per cent; Hawaii county shall receive 18.6 per cent; city and county of Honolulu shall receive 44.1 per cent; and Maui county shall receive 22.8 per cent.

For the fiscal year beginning July 1, 1994, and for each fiscal year thereafter, revenues collected under this chapter shall be distributed as follows:

(1) One-sixth of the revenues collected under this chapter shall be deposited into the convention center capital and operations special fund;

(2) Of the remaining revenues, five per cent shall be retained by the State; and

(3) Of the remainder, Kauai county shall receive 14.5 per cent; Hawaii county shall receive 18.6 per cent; city

and county of Honolulu shall receive 44.1 percent; and Maui county shall receive 22.8 per cent.

All transient accommodations taxes shall be paid into the state treasury each month within ten days after collection, and shall be kept by the state director of finance in special accounts for distribution as provided in this subsection[; provided that, all taxes levied and assessed under this chapter for periods before July 1, 1990, but collected after June 30, 1990, shall be state realizations].

(c) On or before January or July 1 of each year or after the disposition of any tax appeal with respect to an assessment for periods after June 30, 1990, the state director of finance shall compute and pay the amount due as provided [for] in subsection (b) to the director of finance of each county to become a general realization of the county expendable as such, except as otherwise provided by law."

SECTION 20. Section 206X-10, Hawaii Revised Statutes, is repealed.

["§206X-10 Convention center development revolving fund. There is created the convention center development revolving fund into which all receipts and revenues of the authority and all legislative appropriations to the revolving fund shall be deposited. Proceeds from the fund shall be used for the purposes of this chapter."]

SECTION 21. The director of finance shall transfer to the credit of the convention center capital and operations special fund on the effective date of this Act, all unexpended or unencumbered balances remaining in the convention center development revolving fund scheduled for repeal on the effective date of this Act.

SECTION 22. There is appropriated out of the convention center capital and operations special fund the sum of $150,000, or so much thereof as may be necessary for fiscal year 1993-1994, to be expended by the authority for the purposes of this Act.

SECTION 23. The director of finance is authorized to issue general obligation bonds or reimbursable general obligation bonds, or any combination thereof in the aggregate principal amount of $350,000,000 or so much thereof as may be necessary, and the same amount, or so much thereof as may be necessary, is appropriated for fiscal years 1993-1994, and 1994-1995, to be expended by the authority for the purposes of this Act, including, without limitation, the financing and refinancing of all or any part of the cost of planning, designing, improving, acquiring, constructing, equipping, or furnishing the convention center facility authorized in this Act; the financing of any public facilities related thereto that are capable of being financed with the proceeds of the bonds, and the payment of interest on such bonds that will accrue during the construction period and for six months thereafter.

SECTION 24. The authority, with the approval of the director of finance and the governor, is authorized to issue revenue bonds in an aggregate principal amount of $350,000,000, or so much thereof as may be necessary, and the same amount, or so much thereof as may be necessary, is appropriated for fiscal years 1993-1994, and 1994-1995, from moneys in the convention center capital and operations special fund, to be expended by the authority for the purposes of this Act, including, without limitation, the financing and refinancing of all or any part of the cost of planning, designing, improving, acquiring, constructing, equipping, or furnishing the convention center facility authorized in this Act; the financing of any public facilities related thereto that are capable of being financed with the proceeds of the bonds, and the payment of interest on such bonds that will accrue during the construction period and for six months thereafter.

SECTION 25. There is appropriated out of the convention center capital and operations special fund the sum of $4,125,000, or so much thereof as may be necessary for fiscal year 1993-1994, and the sum of $8,250,000, or so much thereof as may be necessary for fiscal year 1994-1995, to be expended by the authority to pay for debt service on revenue bonds issued by the authority and to reimburse the state general fund for debt service on general obligation bonds or reimbursable general obligation bonds issued by the State for purposes of the convention center.

SECTION 26. There is appropriated out of the general revenues of the State of Hawaii the sum of $4,125,000, or so much thereof as may be necessary for fiscal year 1993-1994, and the sum of $8,250,000, or so much thereof as may be necessary for fiscal year 1994-1995, to be expended by the department of budget and finance to pay for debt service on general obligation bonds or reimbursable general obligation bonds issued by the State for purposes of the convention center.

SECTION 27. The state supreme court shall have exclusive and original jurisdiction over any controversy or dispute regarding the financing of the convention center through the issuance of revenue bonds, general obligation bonds, and reimbursable general obligation bonds, and the security provisions therefor, and the imposition and collection of the transient accommodations tax to repay or provide security for the bonds; provided that such jurisdiction be limited to the applicability of Article VII of the Constitution of the State of Hawaii to such matters.

PART III.

SECTION 28. Declaration of findings with respect to the general obligation bonds authorized by this Act. Pursuant to the clause in Article VII, section 13, of the State Constitution which states: "Effective July 1, 1980, the legislature shall include a declaration of findings in every general law authorizing the issuance of general obligation bonds that the total amount of principal and interest, estimated for such bonds and for all bonds authorized and unissued and calculated for all bonds issued and outstanding, will not cause the debt limit to be exceeded at the time of issuance," the legislature finds and declares as follows:

(1) Limitation on general obligation debt. The debt limit of the State is set forth in Article VII, section 13, of the State Constitution, which states in part: "General obligation bonds may be issued by the State; provided that such bonds at the time of issuance would not cause the total amount of principal and interest payable in the current or any future fiscal year, whichever is higher, on such bonds and on all outstanding general obligation bonds to exceed: a sum equal to twenty percent of the average of the general fund revenues of the State in the three fiscal years immediately preceding such issuance until June 30, 1982; and thereafter, a sum equal to eighteen and one-half percent of the average of the general fund

revenues of the State in the three fiscal years immediately preceding such issuance." Article VII, section 13, also provides that in determining the power of the State to issue general obligation bonds, certain bonds are excludable, including "reimbursable general obligation bonds issued for a public undertaking, improvement or system but only to the extent that reimbursements to the general fund are in fact made from the net revenue, or net user tax receipts, or combination of both, as determined for the immediately preceding fiscal year" and "bonds constituting instruments of indebtedness under which the State or any political subdivision incurs a contingent liability as a guarantor, but only to the extent the principal amount of such bonds does not exceed seven percent of the principal amount of outstanding general obligation bonds not otherwise excluded under this section."

(2) Actual and estimated debt limits. The limit on principal and interest on general obligation bonds issued by the State, actual for fiscal year 1992-93 and estimated for each fiscal year from 1993-94 to 1996-97, is as follows:

| Fiscal Year | Net General Fund Revenues | Debt Limit |
|---|---|---|
| 1989-90 | $2,418,273,831 | |
| 1990-91 | 2,654,706,036 | |
| 1991-92 | 2,672,238,596 | |
| 1992-93 | 2,773,716,000 | $477,621,805 |
| 1993-94 | 2,779,671,000 | 499,540,739 |
| 1994-95 | 2,910,923,000 | 507,246,912 |
| 1995-96 | 3,099,945,000 | 521,965,783 |
| 1996-97 | (Not Applicable) | 542,083,238 |

For fiscal years 1992-93, 1993-94, 1994-95, 1995-96, and 1996-97 respectively, the debt limit is derived by multiplying the average of the net general fund revenues for the three preceding fiscal years by eighteen and one-half percent. The net general fund revenues for fiscal years 1989-90, 1990-91, and 1991-92 are actual, as certified by the director of finance in the Statement of the Debt Limit of the State of Hawaii as of July 1, 1992, dated December 1, 1992. The net general fund revenues for fiscal years 1992-93 to 1995-96 are estimates, based on general fund revenue estimates made as of April 15, 1993, by the council on revenues, the body assigned by Article VII, section 7, of the State Constitution to make such estimates, and based on estimates made by the department of budget and finance of those receipts which cannot be included as general fund revenues for the purpose of calculating the debt limit, all of which estimates the legislature finds to be reasonable.

(3) Principal and interest on outstanding bonds applicable to the debt limit. (A) According to the department of budget and finance, the total amount of principal and interest on outstanding general obligation bonds, after the exclusions permitted by Article VII, section 13, of the State Constitution, for determining the power of the State to issue general obligation bonds within the debt limit as of July 1, 1993, is as follows for fiscal year 1993-94 to fiscal year 1999-2000:

| Fiscal Year | Principal and Interest |
|---|---|
| 1993-94 | $285,166,913 |
| 1994-95 | 317,338,889 |
| 1995-96 | 361,199,046 |
| 1996-97 | 326,344,538 |
| 1997-98 | 299,295,544 |
| 1998-99 | 269,080,899 |
| 1999-2000 | 264,411,466 |

The department of budget and finance further reports that the amount of principal and interest on outstanding bonds applicable to the debt limit generally continues to decline each year from fiscal year 2000-2001 to fiscal year 2012-13 when the final installment of $25,889,838 shall be due and payable.

(B) The department of budget and finance further reports that the outstanding principal amount of bonds constituting instruments of indebtedness under which the State may incur a contingent liability as a guarantor is $222,600,000, part of which is excludable in determining the power to the State to issue general obligation bonds, pursuant to Article VII, section 13, of the State Constitution.

(4) Amount of authorized and unissued general obligation bonds and guaranties and proposed bonds and guaranties.

(A) As calculated from the state comptroller's bond fund report as of March 31, 1993, adjusted for (1) appropriations to be funded by general obligation bonds as provided in Act 35, Session Laws of Hawaii 1993, in the amount of $136,500,000; (2) lapses as provided in Act 289, Session Laws of Hawaii 1993 (the General Appropriations Act of 1993) amounting to $6,526,821;

(3) lapses as provided in Act 277, Session Laws of Hawaii 1993 (the Judiciary Appropriations Act of 1993) amounting to $38,387,000; and (4) the issuance of $130,245,000 general obligation bonds of 1993, Series BE, the total amount of authorized but unissued general obligation bonds is $347,070,798. The total amount of general obligation bonds authorized by this Act is $350,000,000. The findings and declaration of the legislature regarding this sum was also made in House Bill No. S1-93 (Relating to State Bonds) passed by this Special Session of 1993. The amount of general obligation bonds authorized by this Act does not result in an increase in general obligation bonds authorized in House Bill No. S1-93. The total amount of general obligation bonds previously authorized and unissued and the general obligation bonds authorized by this Act is $1,396,717,596. (B) As reported by the department of budget and finance, the outstanding principal amount of bonds constituting instruments of indebtedness under which the State may incur a contingent liability as a guarantor is $222,600,000, part of which is excludable in determining the power to the State to issue general obligation bonds, pursuant to Article VII, section 13, of the State Constitution.

(5) Proposed general obligation bond issuance. As reported herein for fiscal years 1992-93, 1993-94, 1994-95, 1995-96, and 1996-97, the State proposes to issue $350,000,000 during the first half of fiscal year 1993-94, $237,500,000 during the second half of fiscal year 1993-94, and $100,000,000 in each half of fiscal year 1994-95, $200,000,000 during the first half of fiscal year 1995-96, $212,500,000 during the second half of fiscal year 1995-96, and $100,000,000 in each half of fiscal year 1996-97. It has been the practice of the State to issue twenty-year serial bonds with principal repayments beginning the third year, the bonds maturing in substantially equal installments of principal, and interest payments commencing six months from the date of issuance and being paid semiannually thereafter. It is assumed that this practice will continue to be applied to the bonds which are proposed to be issued.

(6) Sufficiency of proposed general obligation bond issuance to meet the requirements of authorized and unissued bonds, as adjusted, and bonds authorized by this Act. From the schedule reported in paragraph (5), the total amount of general obligation bonds which the State proposes to issue during the fiscal years 1992-93

to 1995-96 is $1,200,000,000. An additional $200,000,000 is proposed to be issued in fiscal year 1996-97. The total amount of $1,200,000,000 which is proposed to be issued through fiscal year 1995-96 is sufficient to meet the requirements of the authorized and unissued bonds, as adjusted, and the bonds authorized by this Act, the total amount of which is $1,396,717,596, as reported in paragraph (4), except for $196,717,596. It is assumed that the appropriations to which an additional $196,717,596 in bond issuance needs to be applied will have been encumbered as of June 30, 1996. The $200,000,000 which is proposed to be issued in fiscal year 1996-97 will be sufficient to meet the requirements of the June 30, 1996, encumbrances in the amount of $196,717,596. The amount of assumed encumbrances as of June 30, 1996, is reasonable and conservative. Thus, taking into account the amount of authorized and unissued bonds, as adjusted, and the bonds authorized by this Act versus the amount of bonds which is proposed to be issued by June 30, 1996, and the amount of June 30, 1996, encumbrances versus the amount of bonds which is proposed to be issued in fiscal year 1996-97, the legislature finds that in the aggregate, the amount of bonds which is proposed to be issued is sufficient to meet the requirements of all authorized and unissued bonds and the bonds authorized by this Act.

(7) Bonds excludable in determining the power of the State to issue bonds. As noted in paragraph (1), certain bonds are excludable in determining the power of the State to issue general obligation bonds. (A) General obligation reimbursable bonds can be excluded under certain conditions. It is not possible to make a conclusive determination as to the amount of reimbursable bonds which are excludable from the amount of each proposed bond issued because:

(i) It is not known exactly when projects for which reimbursable bonds have been authorized in prior acts and in this Act will be implemented and will require the application of proceeds from a particular bond issue; and

(ii) Not all reimbursable bonds may qualify for exclusion.

However, the legislature notes that with respect to the principal and interest on outstanding general obligation bonds, according to the department of budget and finance, the average proportion of principal and interest which is excludable each year from calculation against the debt limit is 8.7 percent for the ten years from fiscal year 1993-94 to fiscal year 2002-2003. For the purpose of this declaration, the assumption is made that five percent of each bond issue will be excludable from the debt limit, an assumption which the legislature finds to be reasonable and conservative.

(B) Bonds constituting instruments of indebtedness under which the State incurs a contingent liability as a guarantor can be excluded but only to the extent the principal amount of such guaranties does not exceed seven percent of the principal amount of outstanding general obligation bonds not otherwise excluded under subparagraph (A) of this paragraph (7) and provided that the State shall establish and maintain a reserve in an amount in reasonable proportion to the outstanding loans guaranteed by the State as provided by law. According to the department of budget and finance and the assumptions presented herein, the total principal amount of outstanding general obligation bonds and general obligation bonds proposed to be issued, which are not otherwise excluded under Article

VII, section 13, of the State Constitution for the fiscal years 1993-94, 1994-95, 1995-96, and 1996-97 are as follows:

| Fiscal Year | Total Amount of General Obligation Bonds Not Otherwise Excluded by Article VII, Section 13, of the State Constitution |
|---|---|
| 1993-94 | $2,947,712,065 |
| 1994-95 | 2,949,933,228 |
| 1995-96 | 3,087,163,098 |
| 1996-97 | 3,025,309,239 |

Based on the foregoing and based on the assumption that the full amount of a guaranty is immediately due and payable when such guaranty changes from a contingent liability to an actual liability, the aggregate principal amount of the portion of the outstanding guaranties and the guaranties proposed to be incurred, which does not exceed seven percent of the average amount set forth in the last column of the above table and for which reserve funds have been or will have been established as heretofore provided by, can be excluded in determining the power of the State to issue general obligation bonds. As it is not possible to predict with a reasonable degree of certainty when a guaranty will change from a contingent liability to an actual liability, it is assumed in conformity with fiscal conservatism and prudence, that all guaranties not otherwise excluded pursuant to Article VII, section 13, of the State Constitution will become due and payable in the same fiscal year in which the greatest amount of principal and interest on general obligation bonds, after exclusions, occurs. Thus, based on such assumptions and on the determination in paragraph (8), the aggregate principal amount of the portion of the outstanding guaranties and the guaranties proposed to be incurred, which must be included in determining the power of the State to issue general obligation bonds is $12,427,666.

(8) Determination whether the debt limit will be exceeded at the time of issuance. From the foregoing and on the assumption that all of the bonds identified in paragraph (5) will be issued at an interest rate of 7.5 percent, it can be determined from the following schedule that the bonds which are proposed to be issued, which include all authorized and unissued bonds previously authorized, as adjusted, general obligation bonds and instruments of indebtedness under which the

State incurs a contingent liability as a guarantor authorized in this Act, will not cause the debt limit to be exceeded at the time of such issuance:

| Time of Issuance and Amount to be Counted Against Debt Limit | Debt Limit at Time of Issuance | Greatest Amount and Year of Highest Principal and Interest on Bonds and Guaranties |
|---|---|---|
| 1st half FY 1993-94 $332,500,000 | 499,540,736 | 398,564,212 (FY 1995-96) |
| 2nd half FY 1993-94 $225,625,000 | 499,540,736 | 415,486,087 (FY 1995-96) |
| 1st half FY 1994-95 $95,000,000 | 507,246,912 | 422,611,087 (FY 1995-96) |
| 2nd half FY 1994-95 $95,000,000 | 507,246,912 | 429,736,087 (FY 1995-96) |
| 1st half FY 1995-96 $190,000,000 | 521,965,783 | 439,451,618 (FY 1996-97) |
| 2nd half FY 1995-96 $201,875,000 | 521,965,783 | 454,592,243 (FY 1996-97) |
| 1st half FY 1996-97 $95,000,000 | 542,083,238 | 442,708,200 (FY 1997-98) |
| 2nd half FY 1996-97 $95,000,000 | 542,083,238 | 449,833,200 (FY 1997-98) |

(9) Overall and concluding finding. From the facts, estimates, and assumptions stated in this declaration of findings, the conclusion is reached that the total amount of principal and interest estimated for the general obligation bonds authorized in this Act and for

all bonds authorized and unissued and calculated for all bonds issued and outstanding and guaranties, will not cause the debt limit to be exceeded at the time of issuance.

SECTION 29. Authorization for issuance of general obligation bonds. General obligation bonds may be issued as provided by law in an amount that may be necessary to finance projects authorized in this Act and designated to be financed from the general obligation bond fund and from the general obligation bond fund with debt service cost to be paid from special funds; provided that the sum total of the general obligation bonds so issued shall not exceed $350,000,000.

Any law to the contrary notwithstanding, general obligation bonds may be issued from time to time in accordance with section 39-16, Hawaii Revised Statutes, in such principal amount as may be required to refund any general obligation bonds of the State of Hawaii heretofore or hereafter issued pursuant to law.

PART IV.

SECTION 30. If any provision of this Act, or the application thereof to any person or circumstance is held invalid, the invalidity shall not affect other provisions or applications of the Act that can be given effect without the invalid provision or application, and to this end the provisions of this Act are severable.

SECTION 31. Statutory material to be repealed is bracketed. New statutory material is underscored.

SECTION 32. This Act shall take effect upon its approval; provided that SECTION 7 of this Act is repealed if the convention center authority and the appropriate person with respect to the Aloha Motors site have not executed the binding agreement in accordance with the provisions of SECTION 7 of this Act.

*APPENDIX B*

*WATER QUALITY STUDY*

*AECOS, Inc.*

*AECOS* No. 798

# WATER QUALITY CONSIDERATIONS FOR THE HAWAI'I CONVENTION CENTER COMPLEX

Prepared for:

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January 1995

## INTRODUCTION

The Hawai'i Convention Center site is located approximately 75 feet north of the mauka bank of the Ala Wai Canal immediately beyond the Ala Wai Promenade. Construction of the Convention Center engenders two areas of concern with respect to water quality impacts: ground water beneath the site and surface waters directly adjacent to the site (i.e., the Ala Wai Canal). Both of these water bodies have prior histories of water quality concerns. The proposed project could have short term, construction-related impacts on surface water quality, and may require pumping of ground water into the Ala Wai Canal (site dewatering) during early phases of the construction.

## EXISTING CONDITIONS

### Ala Wai Canal

The Ala Wai Canal was constructed between 1921 and 1928 to drain marsh lands in the Waikiki area. It presently receives land runoff from valleys mauka of Waikiki as well as local street drainage from adjacent portions of Waikiki, Makiki, Moiliili, Kapahulu, Kaimuki, and Diamond Head. Runoff reaching the canal flows seaward through the Ala Wai Yacht Harbor existing via the harbor channel. The canal functions as a sediment deposition basin reducing the amount of sediment entering the nearshore coastal waters (Edward K. Noda & Associates, 1992). The sediments deposited in the canal contain urban pollutants (Spencer, et al., 1993) as well as inert sediment. Excessive phytoplankton growth (Harris, 1975) attests to the nutrient loading and long residence time of the water in the canal. This results in an aquatic environment which is not conducive to the aesthetic and recreational value of the water body.

The Ala Wai Canal is regarded as an integral part of the aesthetic quality of Waikiki. Due to its poor water quality and physical condition, it has long been the focus of studies to improve its appeal both physically and aesthetically. Because of State of Hawaii interest in improving the quality of the Ala Wai Canal, a number of studies have been recently completed addressing water quality and circulation (Edward K. Noda & Assoc., 1992), watershed management (Fox and Freeman, 1992), and canal maintenance (Edward K. Noda & Assoc., 1992). Plans have been considered to increase the turnover of water in the canal by injecting sea water near the upper end.

The water quality in the Ala Wai Canal is determined by its sources, including nearshore marine waters, stream flow inputs, and groundwater. Marine waters enter the canal largely as a function of tidal exchange. Additional intrusion occurs as subsurface flows of seawater are drawn upstream into the canal as surface flows entrain and carry the upper layer of the subsurface flow back out to sea in a brackish stream. The quality of marine waters in the canal is that of waters derived from nearshore areas of south Oahu. In addition, however, marine water quality is influenced to some degree by its passage through the Ala Wai Boat Harbor before entering the canal.

Stream flow inputs contribute to the brackish surface layer in the canal. These flows are derived from a drainage area encompassing about 10,600 acres (4.3 x 107 m2) of Manoa, Palolo, and Makiki Valleys (Gonzalez, 1971). Urbanized areas of Honolulu contributing surface runoff into Ala Wai Canal or into streams feeding the canal include Makiki, Manoa, St. Louis Heights, Palolo, Moiliili, Kapahulu, and parts of Kaimuki and Diamond Head (Edward K. Noda & Assoc., 1992). A distinct surface layer of fresh or brackish water about 1.5 feet (0.5 m) thick forms under most conditions. This layer flows seaward with a residence time of between 2 and 30 hours, depending upon runoff and wind conditions (Gonzalez, 1971). Deeper waters are saline, but more sluggish. Dye studies suggest a flushing constant (T50) on the order of 40 to 60 hours for the canal (Edward K. Noda & Assoc., 1992).

Groundwater undoubtedly seeps into the canal, but no studies have examined this source as a contributor to the water quality of the canal (see below). Groundwater inputs are probably small relative to fresh water flow and tidal exchange.

The canal is subject to the accumulation of silt, mostly derived from surface runoff, and must be dredged periodically. The last maintenance dredging was conducted in 1978. Estimated sediment deposition rates made by Gonzalez (1971) of 8 to 11 inches/year (20 to 28 cm/yr) appear to generally hold true today. Comparing present bathymetry with the 1978 dredging design indicates an average rate of sediment deposition of 10,300 yd3/year (7,875 m3/yr) (Edward K. Noda & Assoc., 1992).

Detailed studies encompassing biota and water quality were undertaken in the 1970's (Gonzalez, 1971; Harris, 1975; Miller, 1975). These surveys demonstrated that the canal was eutrophic and poorly mixed. Primary production was found to be high, but light-limited due to large quantities of mineral, suspended particulates (i.e., fine sediment) (Harris, 1975). A variety of animals adapted to estuarine conditions were described by Miller (1975) as inhabiting the canal. Low oxygen values were then thought to limit the abundance of bottom crustaceans (mostly crabs) at the upper reaches of the canal. Gonzalez (1971) noted frequent anoxic or anaerobic conditions in the bottom water layer in this section of the canal. Cox and Gordon (1970) also noted that "...mullet that were once common in the upper reaches of the canal have disappeared, probably as the result of... stagnation and anaerobic conditions... toward the canal head." Anoxic conditions were promoted by a shallow area or sill located just upstream from McCully Street. This sill, which was removed during dredging of the canal in 1978, had isolated the deeper water of the inner canal (Gonzalez, 1971).

The water in the Ala Wai Canal has long been considered of poor quality. Cox and Gordon (1970) noted that the Ala Wai canal did not meet Department of Health (microbiology) standards during the period of 1959 to 1969. The canal was then described as "....muddy during flood periods, and [generated] ....complaints of floating trash.... ". More recent microbiological (bacteria) measurements by Department of Health provide a clear indication that the canal waters seldom meet the recreational standards established in HAR §11-54-08 of more than 7 enterococci per 100 mls (on average for marine waters) or 200 fecal coliform per 100 mls (on average for nonmarine waters). Recent data from DOH STORET (computerized data files) show that two stations are sampled regularly (3 to 5 times per month) by DOH. Table 1 summarizes these recent data by calculating the percent of the time measured values exceeded one or the other of the standards. Although the Ala Wai Boat Harbor was once thought to be the source of high enteric bacteria counts found in the canal, Gonzalez (1971) demonstrated that runoff was the more likely source and that transport of these organisms from the harbor into the canal was unlikely. Recent measurements by AECOS (1994) indicate a better compliance record for stations in the harbor than demonstrated by the DOH stations on the canal. Water quality measurements were taken by OI Consultants, Inc. (1992) at stations distributed throughout the Ala Wai Canal from beyond its mouth at Ala Wai Boat Harbor, upstream to its terminus with stations sited at points of stream inflow. These measurements consistently showed patterns of increasing fecal coliform and increasing enterococcus from the harbor moving upstream on most sampling occasions. Particularly elevated values at the DOH stations (Nos. 320 ad 321) are coincident with land runoff as indicated by either low salinity or the word "rainfall" coded with the data.

Table 1. Recent Department of Health fecal coliform and enterococcus data for Ala Wai Canal, summarized by station (after DOH, 1994).

| | | | Percent of samples exceeding standard | | | |
|---|---|---|---|---|---|---|
| Station No. | STATION | period of records | Enterococcus standard exceeded | n | Fecal coliform standard exceeded | n |
| 320 | Ala Moana Bridge | 1/91 - 8/94 | 99.4 | 166 | 34.5 | 168 |
| 321 | McCully Street Bridge | 1/91 - 8/94 | 100 | 106 | 54.6 | 108 |

Although the Ala Wai Canal almost never meets the State of Hawaii standard, the human health significance of this fact is not really known. However, it would be prudent to assume that at least some health risks exists. Harrigan (1991) discusses the reliability of enterococcus as an indicator of water-borne disease risk in Hawaii. The Ala Wai is a good example of a location where both enterococcus and fecal coliform populations originate at least in part from bird and small mammal droppings washed in during rains (see Fujioka, 1990; Fujioka and Charoenca, 1991). However, the federal marine recreational standard is based upon enterococcus (a threshold of 35 cells per 100) and epidemiological data on incidence of water-borne diseases are not available for Hawaii.

Measuring nutrients, which promote algal growth and eutrophic conditions, have been included in other studies of the canal. Gonzalez (1971) found highest phosphate and nitrate values in the surface layer (i.e., the brackish layer) and attributed the elevated values to runoff and stream inputs. Harris (1975) noted that nitrate and phosphate concentrations were high and non-limiting (that is, usually present in amounts which exceed the needs of the phytoplankton for growth). She indicated stream inputs and in situ regeneration were principal sources. The OI Consultants (1992) study, measuring nutrients at several depths and numerous stations monthly for six months, provides striking evidence of a gradient of increasing nutrients extending from outside the boat harbor inward to streams feeding into the canal.

**Ground Water**

The Convention Center Site was once occupied by an auto dealership (Aloha Motors), military warehouses, and a gasoline station (Dames & Moore, 1994). A number of potentially hazardous materials were used or stored on site and initial soil and ground water investigations (Unitek Environmental Consultants, Inc., 1989) indicated that releases had occurred.

In this area, the ground water lies from three to five feet below the ground surface. The soil at these shallow depths is "mixed fill" material, mostly gravel, sand, and clay. Deeper layers represent marine and lagoonal sediments (Unitek Environmental Consultants, Inc., 1989). The ground water body is a "basal" type: fresh or brackish water floating on sea water. Outflow would be in the direction of the shore, in this case, the Ala Wai Canal. However, investigations of water levels in the numerous wells drilled on site suggest water flow is generally north and east, with southward flow (towards the Ala Wai canal) near the southern boundary when the ocean tide is low (Unitek Environmental Consultants, Inc., 1990). The site lies seaward (makai) of the Underground Injection Control (UIC) line; however, the entire island is within a designated Water Management Area (Loui, 1994) and use of ground water resources are regulated by the Commission on Water Resource Management in DLNR (HAR §13-171).

Site investigations by Unitek Environmental Consultants, Inc. (1989, 1990) were undertaken to assess environmental concerns associated with the property. These surveys were conducted after all buildings had been removed from the site and included subsurface investigation (test borings). The surveys revealed that petroleum hydrocarbon, lead, cadmium, chromium, polychlorinated biphenyls (PCBs), and halogenated hydrocarbons contamination existed in various areas and remediation activities involving soils and ground water on the site were initiated (see Harding Lawson Assoc., 1992). Underground storage tanks (USTs) were removed between 1988 and 1989. Between December 1991 and May 1992, 3,737 tons of petroleum-contaminated soils were excavated and disposed of at a U.S. mainland landfill site.

In March 1992 the U.S. EPA Region IX office concluded that no remedial action was necessary under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) based on a site investigation by Bechtel Environmental, Inc. (1992). Because petroleum products are exempted from CERCLA and halogenated volatile organic compounds (HVOCs, which includes vinyl chloride) were not considered, this investigation only addressed the metals and PCB contamination.

In April 1993, the State of Hawaii, Department of Health (DOH) completed their review of site remediation and concluded that no further actions were necessary. In essence, known sources of contamination had presumably been removed or treated to reduce concentrations of contaminants to DOH cleanup goals. In February, Dames & Moore (1994) completed a due diligence review, addressing whether the presence of hazardous materials had been adequately mitigated. This report concluded that "...widespread contamination plumes at concentrations above DOH cleanup levels or EPA Maximum Contaminant Levels (MCLs) are not present in groundwater beneath the site." Further, the cleanup objectives at ten specific locations where petroleum-impacted soils were identified (Unitek Environmental Consultants, Inc., 1990) was achieved.

Vinyl chloride at ground water concentrations above EPA MCL (0.002 ppm) was present in a localized area at the northeast corner of the site. Attempts to reduce the levels of vinyl chloride met with some success, but concentrations remain above the MCL. DOH recommended *no further action* due to the fact that no water quality standards exist for this substance at locations makai of the UIC line (Dames & Moore, 1994). The possibility remains that contaminated soils and localized pockets of contaminated ground water are present in areas not investigated, since subsurface samples were largely limited to areas where land-use practices indicated contaminants might be found.

## IMPACTS ASSESSMENT

### Short-Term (Construction)

The possibility exists that localized pockets of contaminated soil are present on the site (Dames & Moore, 1994). Any hazardous material encountered during construction would be handled and disposed of in accordance with applicable state and federal regulations. Excavation of the site will not be extensive. No large underground structures (such as below-grade parking) are proposed. Excavations extending below the water table are contemplated for only three features: a utility corridor and footings for the elevator shaft and the truck loading dock.

Of particular concern in relation to water quality impacts associated with construction will be the treatment and disposal of dewatering discharges. To the extent possible, because of the complexity and costs associated with treatment and continuous monitoring, dewatering discharge will be directed into sumps or excavations on the property and allowed to percolate back into the ground. Initial design plans suggest that by phasing construction, enough land would be available to contain runoff and to eliminate or minimize the need to discharge dewatering effluent. Ground water not discharged into the Ala Wai canal or the street storm drains would not come under the State dewatering regulations.

Additional ground water sampling, and perhaps monitoring, may be necessary to insure that ground water encountered in excavations does not exceed the DOH clean-up goals negotiated for the site (Table 2, column 1). However, any dewatering discharge could be held to more stringent standards for toxic substances if the discharge is directed off site (Table 2, column 2). Numeric standards for toxic pollutants are found in HAR §11-54-03 (DOH, 1992). Standards have been developed for only a relatively few compounds, and different limits may apply depending upon the receiving water (fresh or salt water). Where a standard has not been promulgated in HAR §11-54, a clean up goal, drinking water MCL, or other level imposed by the Department of Health may be substituted.

Table 2. Relevant maximum contaminant levels (in ppb) for potentially hazardous or toxic substances, Honolulu Convention Center complex site.

| Contaminant | DOH Goal[1] | Water Quality Standard[2] |
|---|---|---|
| TPH | 10,000 | 10,000† |
| Benzene | 5 | 1,700 |
| Toluene | 2,000 | 2,100 |
| Total xylenes | 10,000 | 10,000† |
| Ethylbenzene | 700 | 140 |
| Total lead | 50 | 140* |
| Organic lead | non-detectable | --- |
| PCBs | 5 | 10 |
| Chlorobenzene | 100 | 100† |
| Carbon tetrachloride | 500 | 16,000 |
| 1,4-dichlorobenzene | 75 | 660 |
| 1,2-dichloroethane | 600 | 38,000 |
| Vinyl chloride | 2 | 2† |

1 - Cleanup goals proposed by the State of Hawai, Department of Health for ground water (after DOH, 1991).
2 - DOH numeric standards for toxic pollutants: saltwater acute toxicity standards (HAR §11-54-04(b)(3)). † = ns; value is clean-up goal;
* - soluble fraction only.

**Long-Term**

The proposed Convention Center is not anticipated to have any long-term impacts on water quality. The process of preparing the site for construction has resulted in considerable effort at hazardous material removal and clean-up. Long-term adverse impacts arising from previous use of the site have been largely mitigated, although Dames & Moore (1994) noted that pervasive, low-level ground water contamination may exist below the site. Regulations and awareness of environmentally harmful substances and practices insure that future activities on the property will not recontaminate the ground or ground water. The area is fully sewered, so no disposal of waste effluents would occur on site.

Much of the property has been covered by structures or paved over in the past, so the completion of the Convention Center will not increase runoff volume during rain storms beyond that which has already been occurring (Wilson Okamoto & Associates, Inc.).

## MITIGATION

Adherence to State of Hawaii regulations governing the dewatering of construction sites will insure that this aspect of the project will not have an adverse impact on the Ala Wai canal. Because the site exceeds five acres, the project must submit and comply with erosion control measures and other Best Management Practices to limit runoff contamination of the Ala Wai Canal resulting from heavy rainfall during construction (HAR §11-54-03).

## REFERENCES CITED


*AECOS*, Inc. 1994. Water quality considerations for the Hilton Lagoon Project, Waikiki, Oahu. *AECOS* No. 586B.

Bechtel Environmental, Inc. March 4, 1994. Site Inspection Report prepared for the U.S. Environmental Protection Agency Region IX.

Cox, D. C. and L. C. Gordon. 1970. Estuarine pollution in the State of Hawaii. Volume I: statewide study. Univ. of Hawaii, Water Resources Research Center, Tech. Rept. 31: 151 p.

Dames & Moore. 1994. Due diligence review of environmental reports and regulatory agency documents, interviews with project personnel, proposed Honolulu Convention Center, 1777 Kapiolani Boulevard, Honolulu, Oahu, Hawaii. Prep. for the Convention Center Authority, State of Hawaii. 8 p. plus appendices.

DOH. 1992. Hawaii Administrative Rules, Title 11, Department of Health, Chapter 54, Water Quality Standards [as revised, effective October 29, 1992]. 67 p.

______. 1991. letter dated January 10, 1991 to Mr. Nobuo Kuniyuki of First Development, Inc., reviewing the Convention Center site assessment report by Unitek Environmental Consultants, Inc., 3 p. + attachments.

______. 1993. Letter dated April 12, 1993 to Mr. Nobuo Kuniyuki of First Development, Inc., relating to the need for further remedial actions. 2 p.

Edward K. Noda & Assoc. 1992. Job No. 31-OL-1, Ala Wai Canal Improvement, Honolulu, Oahu, Hawaii. Prep. for the State of Hawaii, Dept. Land & Natural Resources, Div. of Water and Land Development.

Fujioka, R. 1990. Evaluation of *Clostridium perfringens* as a suitable indicator for recreational water standard. Prep. for the Dept. of Health, State of Hawaii. Univ. of Hawaii, Water Resources Research Center. 37 p.

______ and N. Charoenca. 1991. Establishing the concentrations of *Staphylococcus*, *Vibrio*, *Pseudomonas* bacteria and phosphate in Hawaii's recreational waters. Prep. for the Dept. of Health, State of Hawaii. Univ. of Hawaii, Water Resources Research Center. 178 p.

Gonzalez, F. I. 1971. Descriptive study of the physical oceanography of the Ala Wai Canal. Univ. of Hawaii, Hawaii Inst. Geophysics, HIG-71-7: 98 p.

Harding Lawson Associates. 1992. Groundwater remediation, Honolulu Convention Center complex, Honolulu, Hawaii. February 5, 1992.

Harrigan, J. F. 1991. Report on Water Quality. Volume I: Bacteriology - on the relationship between monitoring data and the marine recreational standard. Part B. Rationale for revision of the marine recreational waters standard - based on analysis of data from 11 monitoring stations on Oahu. State of Hawaii, Department of Health. November 1991: 33 p.

Harris, Carol L. 1975. Primary production in the Ala Wai Canal, a small tropical estuary. Univ. Hawaii, Hawaii Inst. Geophysics, HIG-75-7: 34 p. + appendix tables.

Helber, Hastert, & Fee, Inc. 1994. Convention Center EA.

Loui, Rae M. 1994. Letter dated Apr. 6, 1994 to Mr. Thomas Fee of Helber, Hastert & Fee, pre-assessment consultation, Convention Center Environmental Assessment. 2 p. + encl.

Miller, Jacquelin N. 1975. Ecological studies of the biota of the Ala Wai Canal., Univ. Hawaii, Hawaii Inst. Geophysics, HIG-75-8: 37 p. + appendix tables.

OI Consultants. 1992. Appendix to Ala Wai Canal Improvement Project, feasibility report by Edward K. Noda & Assoc.

Spencer, K. J., E. H. DeCarlo, and G.M. McMurty. 1993. Isotopic clues to sources of natural and anthropogenic lead in sediments and soils from Oahu, Hawai'i (abstract). EOX, 74 (43 suppl.): p. 261.

Unitek Environmental Consultants, Inc. 1989. Appendix K, surface and subsurface contamination assessment for the Honolulu Convention Center Complex, Honolulu, Hawaii. Prep. for First Development, Inc.

______. 1990. Hazard verification site characterization at former Aloha Motors site, 1777 Kapiolani Boulevard, Honolulu, Hawaii. Prep. for First Development, Inc. Proj. No. 7007.

# APPENDIX C

## ARCHAEOLOGY STUDY

**Paul H. Rosendahl, Ph.D., Inc.**

Hawai'i Convention Center

Report 1511-051694

# Archaeological and Historical Assessment Study Convention Center Project Area

Land of Waikīkī
Kona District, Island of O'ahu

**PHRI** Paul H. Rosendahl, Ph.D., Inc.
*Archaeological • Historical • Cultural Resource Management Studies & Services*

Report 1511-051694

Archaeological and
Historical Assessment Study
Convention Center Project Area

Land of Waikīkī
Kona District, Island of O'ahu
(TMK: 2-3-35 and 2-3-36:018,024,025)

BY

*Kepā Maly • Cultural Resources Specialist*
*Lets J. Franklin, M.A. • Projects Supervisor*

*and*

*Paul H. Rosendahl, Ph.D. • Principal Archaeologist*

PREPARED FOR

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*MAY 1994*



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# INTRODUCTION

## BACKGROUND AND SCOPE OF WORK

At the request of Ms. Leslie Kurisaki, of Helber Hastert & Fee, for their client, the Convention Center Authority, Paul H. Rosendahl Ph.D., Inc. (PHRI) has conducted this Archaeological and Historical Assessment Study of the proposed Convention Center project site, in the Kālia section of Waikīkī, O'ahu (Figure 1). This report provides an overview of Hawaiian settlement and land-use practices within and in the vicinity of the proposed Convention Center project area (the former Aloha Motors lot). The overall objective of this study is to provide information appropriate for satisfaction of historic preservation regulatory review requirements of the Department of Land and Natural Resources-State Historic Preservation Division (DLNR-SHPD). At this time it does not appear that any federal permits are required for this project, and therefore the Section 106 Federal Review Process is not required. Should some future activities be proposed which would require federal permits, appropriate Section 106 review procedures will be complied with.

Based on a specific familiarity with the project area, extensive familiarity with the current requirements of review authorities, and discussions with Dr. Tom Dye, DLNR-SHPD staff archaeologist for O'ahu, the following basic tasks were determined to constitute an adequate and appropriate scope of work for the archaeological and historical assessment study:

1. Perform literature review and historical research on the proposed Convention Center (Aloha Motors) Site-including examination of Land Commission Awards (LCA), *ahupua'a* records, historic maps, archival materials, archaeological reports, and other historical sources. Resources would include, but not be limited to, Bishop Museum Archives, State Archives, State Survey Office, Bureau of Conveyances, Hawaiian language newspapers, local-informant resources, and the Department of Land and Natural resources-State Historic Preservation Division library; and

2. Prepare an appropriate report on the results of the literature review and historical research. The report would include an assessment of the likelihood of locating subsurface archaeological remains and a scope-of-work for performing an archaeological inventory survey.

As a result of findings of the assessment study research and subsequent conversations with Dr. Tom Dye, it was determined that subsurface testing and data analyses would be required to meet DLNR-SHPD archaeological inventory survey standards. The remainder of this report presents the information that was used to arrive at this assessment.

## ASSESSMENT STUDY

The study area is situated in the Kona District of O'ahu, in the northwest portion of Waikīkī, and is located in the *'ili* (a small traditional land unit) known as Kālia, which sits on the *kula kahakai* (coastal flats) situated below the valley of Mānoa. Legendary and early

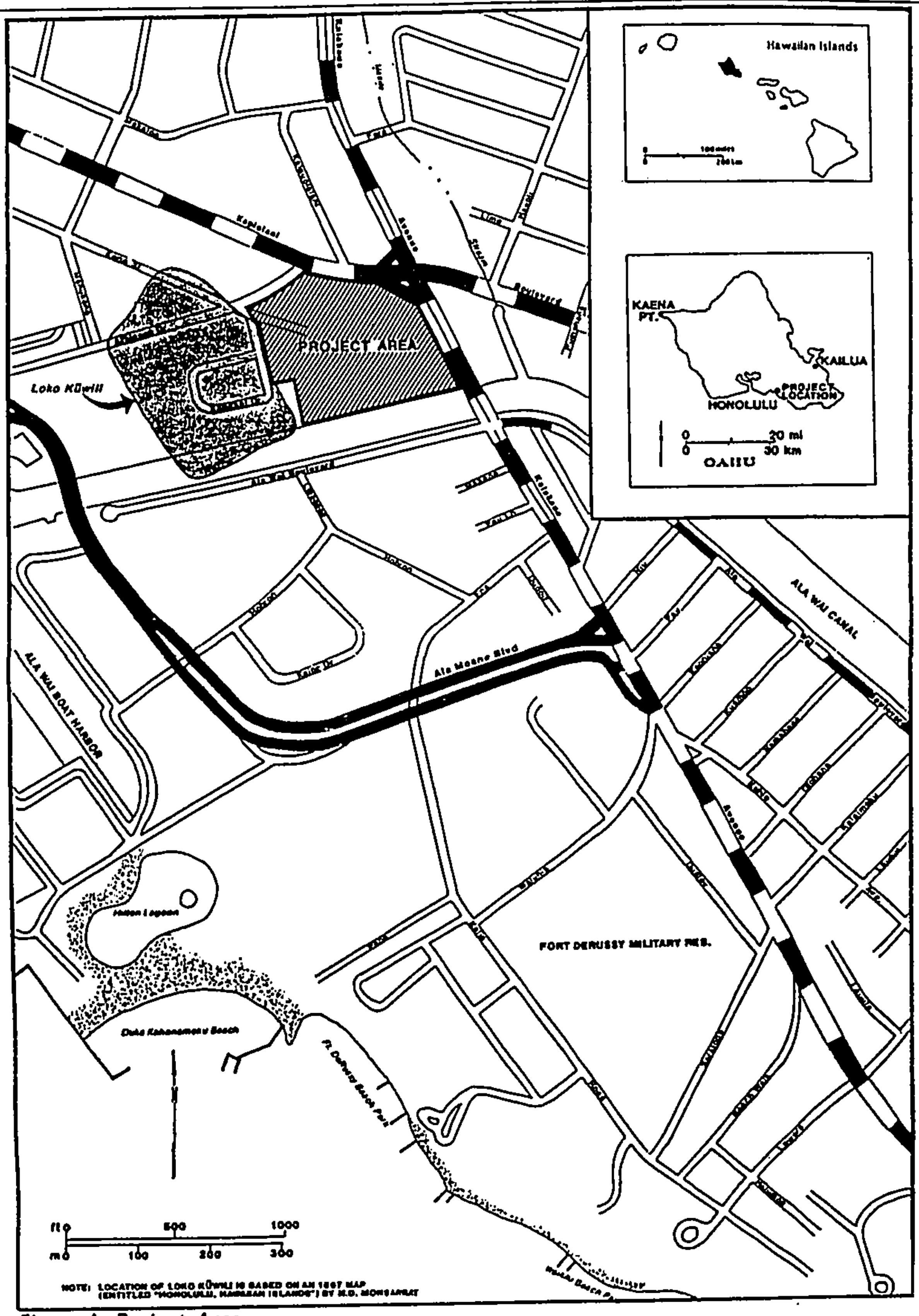


*Figure 1. Project Area*

historical descriptions of the Kālia-Waikīkī area depict a rich land of *loko i'a* (fishponds), *lo'i kalo* (taro pond fields), *kula* or *kīhāpai* (dry-land agricultural parcels), and large native communities. Historic-period documentation for the larger community of Waikīkī describes a dynamic community that through the 1800s and 1900s quickly evolved into a visitor destination and gathering place for Hawai'i's prominent business families.

Sources of information for this study include legendary and proto-historic narratives recorded by native writers in the 1800s and early 1900s (including excerpts from a recently translated account of events set in approximately the 11th to 12th centuries)*, journals and documentation concerning early historic-period Hawaiians and foreigners, government land records, and historic-period accounts leading up to modern times. Additional historical research has been published in previous archaeological reports for projects in the Waikīkī - Honolulu area, including reports by B. Davis (1984, 1991), L. Kalima (1992), and Maly and Kalima (1993). Those reports may be consulted for additional information.

The proposed Convention Center project area is part of a land unit that was a place of prominence in the prehistoric and early-historic periods. Noted for its fishponds, taro pond fields and settlement activities, Kālia was extensively used by the ancient Hawaiians. By the late 1800s, land use practices had been modified and adapted to growing western business influences. By the turn of the century, most of the fishponds and taro-pond fields had been drained and filled, and the last of the ponds were "reclaimed" by 1929. In the last 60 to 75 years, the project area has undergone extensive filling, excavation, and development. During the World War II era, warehouses on the project site were used for military operations, and more recently, the property was home to the Aloha Motors auto dealership, and various offices and warhouse storage facilities.

* *Though diacritical (macron and glottal) marks were not generally used at the time that most of the Hawaiian language narratives were originally written, they have been added in LCA testimonies and legendary accounts when the original meaning and/or pronunciation of the words could be determined. In cases where people and/or place names have several possible interpretations and in which the intended meaning is not clear, diacritical marks have not been used. In addition, for certain composite words, hyphens have been inserted to identify separate words within a particular name. Quotations from books and articles have been written as they were originally printed, generally without diacritical marks. Brackets are used to identify author's annotations and parentheses generally enclose translations.*



# PREHISTORIC PERIOD

## *HAWAIIAN SETTLEMENT*

Current theory places Polynesian settlement voyages between Hawai'i and Kahiki (the ancestral homelands of the Hawaiian gods and people) in two major periods: AD 300 to 600 and AD 1100 to 1250 (Emory IN Tatar 1982:16-18). Handy speculates that when the first settlers reached the Hawaiian islands, they found a flora that was much like that of their ancestral homeland (Handy and Handy 1972:12), but the topography of the islands was considerably different. The broad, watered flatlands of Kaua'i, O'ahu, and Maui, and the expansive cultivable mountain slopes of Kona and Ka'ū, on Hawai'i, permitted the development of a systematic and elaborate planting culture. These topographical features were not present on the ancestral islands; thus practices associated with agriculture evolved to a higher level in Hawai'i than in other Polynesian islands (ibid.:16).

It is believed that for generations following initial settlement of Hawai'i, the population clustered along the better watered *ko'olau* (or windward) shores, where fresh water was available, agricultural production could become established, and fishing was good. Small bays generally had a cluster of houses where the families of fishermen lived (Handy and Handy 1972:287). Only after the best areas became populated and perhaps crowded (c. AD 800 to 1000), did the Hawaiians begin settling more remote, and less desirable areas. Though situated on the *kona*, or leeward side, of the O'ahu, Waikīkī, set against the well watered valleys of Nu'uanu, Mānoa, and Pālolo, "offered ideal conditions for early settlement" (Handy and Handy 1972:268).

When the Hawaiian settlers came to Hawai'i from Kahiki, they brought with them many things that were necessary for their survival. Among these "purposeful introductions" were the basic plants (e.g., dryland and wetland taros, sweet potatoes, yams, gourds, breadfruit, coconuts, 'awa, sugar canes, and wauke). In a discussion on early settlement, Hawaiian scholar Mary Kawena Pukui expressed the thought that her ancestors also brought with them numerous non-material things that were of importance to ancient life:

> It is impossible to enumerate the hundreds of gods and goddesses of old Hawai'i. Some of the gods were inherited from exceedingly ancient times, from our ancestors who came from southern islands and they can be said to have been 'brought' along by them, just as truly as were the material things in the canoes because they [the gods and goddesses] were in their minds and souls...(M.K. Pukui Ms. P. 2).

While describing the divisions of traditional tasks in the ancient community, Handy and Handy state:

> Although women cultivated small sweet-potato patches by the shore and in the vicinity of dwellings, farming was essentially men's work. With their digging sticks they prepared the land for cultivation, excavated and constructed ditches and *lo'i* (irrigated terraces) for wet taro, and cleared land on the slopes and in the uplands, where dry taro was planted along with sweet

potato, breadfruit, banana, and sugar cane. The selection of varieties suitable for particular locations and soils was the responsibility of men, and likewise the decisions as to time of planting and harvesting. Women's work was mat plaiting and cloth making, the gathering of shellfish, salt, and seaweed to enrich the diet, and the nursing of children. Men worked in the fields and did the fishing (1972:20).

Early colonizers in the Kālia-Waikīkī region lived near the ocean, where there were readily available marine food-resources, and numerous springs and marshlands where the settlers planted their first crops. These marshlands were later developed into the extensive wetland and dryland plantations of this region.

While discussing areas of habitation and land use, Handy and Handy describe the setting of Waikīkī (c. 14th century) (Handy and Handy 1972:480):

> This favorably situated area with its fine beach and rich hinterland, became the ruling seat of Kona very early in the history of ruling chiefs of Oahu. At the time which marked the end of the ruling line established by Kumuhonua...the new *ali'i nui*, Mailikukahi, transferred the seat of government to Waikiki. Beckwith (1940:pp. 383-384) has this to say of it:
>
> > Land reforms and other means of strengthening the power of the ruling chief and stabilizing control over a growing population were carried out on Oahu...by [the Alii nui] Mailikukahi, successor on the Moikeha line of the last ruling chief of the elder Kumuhonua line, who was forced to retire because of his unpopularity...With Mailikukahi, Waikiki became the ruling seat of the chiefs of Oahu. He carried out strict laws, marked out land boundaries, and took the firstborn son of each [*ali'i*] family to be educated in his own household. He honored the priests, built heiaus, and discountenanced human sacrifice.

## HAWAIIAN LAND MANAGEMENT PRACTICES

As ancient Hawaiian practices associated with land use and resources management evolved, the *moku puni* (or islands) were subdivided into land units of varying sizes. The largest division was the *moku-o-loko* (district, literally: interior island). The project area is situated in the Kona District of O'ahu. In the Hawaiian language, the word *kona* may be translated as leeward or southwestern and is also used to describe a geographical location on each Hawaiian Island. The Kona regions of the Hawaiian Islands are also associated with the lore of Lono, a Hawaiian god of agriculture, whose attributes include the billowing horizon clouds and the rain laden clouds that are a manifestation of the seasonal *kona*, or southerly, storms (Handy and Handy 1972:14).

The large districts were in turn further divided into *'okana* and/or *kalana* (regions smaller than the *moku-o-loko*, yet comprising several other units of land). The next traditional unit of land were the *ahupua'a*; these were sub-divisions of land that were usually marked by an altar with a pig image placed upon it. Generally, *ahupua'a* are wedge-shaped pieces of land that stretch from the ocean that fronts the land unit, to the island's interior. Like the larger land units,



the *ahupua'a* were also divided into smaller, more manageable parcels. These small land units, such as the *'ili lele*, *kīhāpai*, *māla*, and *kō'ele* (detached parcels with resources in various environmental zones; gardens; dry-land agricultural parcels; and agricultural parcels worked by commoners for the chiefs), were inhabited and managed by the *maka'āinana* (people of the land) and their extended families. The common people who lived in individual *ahupua'a* generally had access to all of the resources it contained, from mountain slopes to the ocean.

Entire *ahupua'a*, or portions thereof, were generally under the jurisdiction of appointed *konohiki* or lesser chief-landlords, who answered to an *ali'i-'ai-ahupua'a* (the chief who controlled the *ahupua'a* resources). The *ali'i-'ai-ahupua'a* in turn answered to an *ali'i 'ai moku* (the chief who claimed the abundance of the entire district or island). Thus *ahupua'a* resources also supported the royal community of regional and/or island kingdoms. This system of subdividing districts was integral to Hawaiian life and was the product of strictly adhered-to resources management planning.

The district of Kona, O'ahu extends from Moanalua, in the north, to the Kuli'ou'ou boundary of the *kuapā* (walled fish pond) at Maunalua, in the south. Within Kona, is Waikīkī, which extends from Kukuluāe'o in the north (now Ala Moana), to an area below Leahi (Diamond Head), in the south. In the Land Commission Awards of the 1848–53 Māhele, Waikīkī is identified as an *ahupua'a*. This is an interesting anomaly in the traditional system of land division, as described above, because it appears that the *ahupua'a* of Makiki, Mānoa, and Pālolo were without direct access to ocean resources. While discussing the environment of Kona, including Waikīkī, Handy and Handy (1972) observe:

> Waikiki, doubtless because of its pristine beauty, and because it attracted *ali'i* whose favorite sport was surf riding, was commonly the home of high chiefs of Kona...This area is subject to the cyclonic southerly (*kona*) storms in winter months, but through most of the year is cooled by trade winds sweeping through the low gaps in the Ko'olau range at the top of Moanalua, Kalihi, Nu'uanu, and Manoa Valleys. There were abundant rain, ever flowing streams, springs, pools, verdant interior valleys, broad slopes and well-watered lowlands, fishpond areas, harbors, beaches, and lagoons. Altogether Kona was, for O'ahu, the area richest in natural resources and the most pleasant for abundant and comfortable living (1972:473-474).

## KA 'ĀINA - THE LAND AND THE LEGENDARY SETTING

As stated above, many of the legendary accounts of Waikīkī center on the role and activities of the *ali'i* of ancient O'ahu. There are many narratives that describe both the setting of royal courts at Waikīkī, and the activities that occurred in the region. Rather than repeat those extensive accounts, this report includes the following narratives, which are excerpts from a Hawaiian legend that ran in the Hawaiian language newspaper *Ka Hōkū o Hawai'i*, (published in Hilo 1906-1948). The story, *He Mo'olelo Ka'ao no Kepaka'ili'ula* (A Legendary Tale of Kepaka'ili'ula), attributed to the Hawaiian scholar, David Malo, appeared between March 20, 1919 and December 9, 1920. The earliest written accounts of Kepaka'ili'ula date back to c. 1863. The version excerpted here has been translated recently, as part of a PHRI Hawaiian language newspaper indexing project. It should also be noted, that this version of the legend of Kepaka'ili'ula contains much more detail than the versions published in the Fornander Collection of Hawaiian Antiquities and Folk-lore (1917 Volume IV, Part III:498-516 and 1919 Volume V, Part II:384-405); the Fornander versions are set in the 1500s.

The events described below were said to have occurred a short distance *makai* (shoreward) of the project area, on the shores of Ka-lehua-wehe (The *lehua* garland removed), and near the present-day Hilton Hawaiian Village Hotel. Although the narrative does not refer specifically to the immediate vicinity of the project area, the story contains a general description of the Waikīkī community and its resources, and it can be assumed that important events shoreward of the project area, had some effect on the project area community and resources. Additionally, this legend shows how events at Waikīkī affected other island localities.

## He Mo'olelo Ka'ao no Kepaka'ili'ula

*He Mo'olelo Ka'ao No Kepaka'ili'ula* concerns a young man named Kepaka'ili'ula, who was born in an *'e'epa* (premature - mysterious) form, and was given up as dead by his parents. Kepaka'ili'ula's father was Maka-o-Kū, and his mother was Hina-ai-ka-malama, both of whom were descended from Kūahailo and Hina, the *akua ali'i* (god-royalty) who came from Kahiki (the distant ancestral homelands of Hawai'i's people) and established the highest chiefly bloodlines of Hawai'i. At the time of Kepaka'ili'ula's birth, Makaokū and Hina dwelt near Moku-ola and ruled the district of Hilo.

Kepaka'ili'ula's birth was accompanied by numerous unusual displays of natural phenomena, such as fragmented rainbows that rested upon the ocean, rains pouring upon the land, and the rivers flowing forcefully upon the land. His maternal uncles, Ki'inobo and Ki'ihele, took these signs as omens of Kepaka'ili'ula's true nature.

Without the knowledge of Makaokū or Hina, Ki'inobo and Ki'ihele rescued Kepaka'ili'ula and raised him. They instructed him in all manner of fighting techniques and in the uses of his supernatural powers. When Kepaka'ili'ula came of age, his uncles went in search of a suitably beautiful and highly ranked chiefess to whom Kepaka'ili'ula could be married. The journey took them around Hawai'i, where they met with the chief Keolonāhihi and his wife Kahalu'u, who were parents of the sacred chiefess Mākole'ā. A wedding was arranged, but Keolonāhihi broke the betrothal, setting in motion a series of battles that led to Kepaka'ili'ula's gaining control of Hawai'i and Maui, and the narratives to be referenced in this report:

> Unknown to his attendants and companions, Kepaka'ili'ula obtained a canoe and departed from Maui and journeyed till he was outside of Maunalua, O'ahu. Kepaka'ili'ula waited in his canoe until daylight began to appear, and with the coming of dawn, he saw the island of O'ahu. He then continued in his canoe until he was directly outside of Waikīkī. It was here that Kepaka'ili'ula landed his canoe on the shore. Now while Kepaka'ili'ula had been out on the ocean, a rainbow had arched over the spot where he waited, and when he landed, the rainbow accompanied him to the shore. Because of this sign, the people on the land had known that an *ali'i* of a very high blood line was on the canoe.
>
> The chief who reigned over O'ahu at this time was Kaumō'ali, and he was a close relation of Kepaka'ili'ula's father, Makaokū. As the battle between Kepaka'ili'ula and Kaikipa'ananea was being fought on Maui, news of the conflict spread to O'ahu, and Kaumō'ali knew that this stranger was his nephew. Understanding the sacred nature of the rainbow symbol of Kepaka'ili'ula's lineage, Kaumō'ali made ready to welcome his nephew.



As Kepaka'ili'ula landed his canoe on the shores of Waikīkī, six men took up the canoe, with Kepaka'ili'ula still in it, to carry it to the place of the canoes. Now the reason the men did this was to be helpful, for these commoners saw that the passenger was truly fair to look upon, and they did not know his status as a high chief. When the *makua ali'i* (royal father) Kaumō'ali arrived near the shore, he saw that the men had taken up the canoe; and they did not know the sacred nature of Kepaka'ili'ula, Kaumō'ali had the men taken up and killed, and placed on the *lele* (altar).

Although these men had only been trying to be helpful, they were put to death, and Kaumō'ali had this done without first conferring with Kepaka'ili'ula. The action of his chiefly uncle was something for which Kepaka'ili'ula had no respect, and it was because of this that Kepaka'ili'ula determined not to stay long on the island of O'ahu. The killing of those men who simply carried the chief's canoe, shows how severe the restrictions of sacred *ali'i* of high blood lines were.

Kepaka'ili'ula went with his uncle to the chief's residence, where he was welcomed with all the things fitting to his status. It was here that Kepaka'ili'ula told his royal uncle about his trip to Kahiki to seek out their common ancestors. It was at this time that the chief Kaumō'ali thought to ask Kepaka'ili'ula these questions, "O my heavenly chief, why is it that you travel without attendants, why do you paddle your own canoe? Your canoe is not adequate to carry supplies for your journey, and it is not fitting of your status as an *ali'i 'ai moku* (chief who consumes [controls the resources of] the island).

Hearing the comments of his uncle, Kepaka'ili'ula told Kaumō'ali about his *'aikāne* (companion) on Maui, and that this *'aikāne* had commanded that all the canoes of that island be smashed to prevent Kepaka'ili'ula's starting on his long journey. For this reason, Maui was without any appropriate canoes. Indeed if one old fisherman of Kā'anapali had not had this canoe, no canoe would have been found.

Kaumō'ali began to think about a way to gain fame (approval) from Kepaka'ili'ula, and he secretly sent his messenger to order all his people to destroy their canoes. So that no canoe could be found for Kepaka'ili'ula's journey to Kahiki. Upon departing from the chief's compound, Kepaka'ili'ula went toward the shore where he saw the pieces of his canoe which had been smashed with a *ko'i pāhoa* (battle axe), and upon looking within the chiefs' *hālau wa'a* (canoe long houses), he saw that all of the chiefs' great canoes had been destroyed as well. Kepaka'ili'ula then realized his uncle was also trying to stop him from making the journey, and he regretted having told Kaumō'ali about the occurrence on Maui.

Kepaka'ili'ula then thought about taking a journey around the island of O'ahu, thinking that perhaps some canoe had been hidden and not destroyed; that perhaps there would be a canoe like the one he had obtained from the old fishermen at Kā'anapali. Upon looking around, Kepaka'ili'ula saw a large *papa he'e nalu* (surf board) made of *wiliwili* wood (*Erythrina sandwicensis*). This surfboard belonged to the chief Kaumō'ali, and it was used by him while

> surfing with his wife. The board was so large, that the chiefess could ride on the front of it without getting wet in the ocean, on the surf of Ka-lehua-wehe.
>
> Kepaka'ili'ula thought that he would take this *wiliwili* surf board and encircle the island of O'ahu in search of a canoe, and if he could not locate one, he would take the board and travel to another island. He did not reveal his thoughts to anyone lest all the surfboards of O'ahu be destroyed as well. Kepaka'ili'ula then returned to the compound of his uncle and went to sleep. As the early morning light began to appear, Kepaka'ili'ula rose and went straight to the *hālau* wa'a where he took up the surfboard and a paddle and went straight to the shore, where he paddled into the sea, beyond the reef of Waikīkī. As Kepaka'ili'ula paddled, he moved as swiftly as the *mālolo* (flying fish) of 'Ewa (4/22/1920).

As the story continues, readers are told of Kaumō'ali's efforts at locating his royal nephew; in the meantime, Kepaka'ili'ula had traveled to Wai'anae, and then on to Mākaha, and Makua, where he secured a canoe and traveled to Kaua'i and Ni'ihau on his way to Kahiki.

> Following a long sojourn in Kahiki, Kepaka'ili'ula dreamed of learning that his wife, the chiefess Mākole'ā, had been abducted by Ka'aka'alaneo, the chief of Kaua'i. Kepaka'ili'ula departed from *ka 'āina akua o Kuaihelani* (Kuaihelani the land of the gods), and returned to Hawai'i. One day when Kepaka'ili'ula awakened, he saw the mountain ridges of the "*mokupuni o Hawai'i nui kuauli*" (great island of Hawai'i with the green ridges) in the distance. The next day Kepaka'ili'ula passed along the windward side of Moloka'i and saw "*ka mokupuni 'ai ali'i o Kākuhihewa*" (the island controlled by the chief Kākuhihewa [O'ahu]) and he traveled along the side of the Ko'olau peaks, passing near Moloka'i.
>
> Kepaka'ili'ula landed his canoe on the shores of Waikīkī, which was the home of the chiefs of this land [O'ahu]. When the people saw this canoe landing upon the shore, they knew that it was the sacred high chief of Hawai'i, that is Kepaka'ili'ula, the chief who had also subdued Maui. The people greeted this chief with the honors befitting an island king. A great feast was held and Kepaka'ili'ula ate with the *ali'i* of O'ahu. During the feast, the chief told Kepaka'ili'ula about Mākole'ā's journey in search of her husband [Kepaka'ili'ula himself], and how the chiefess had come to be taken by the chief of Kaua'i. Upon hearing the chief's words, Kepaka'ili'ula thought of the dream he had had while he was at *Kūkulu o Kahiki* (the foundation of Kahiki). Kepaka'ili'ula then enlisted the assistance of the chief of O'ahu, asking that war canoes and warriors be given to him so that he could go get the wife of his beardless days [the wife of his youth] (11/25/1920).
>
> Kepaka'ili'ula also asked that one canoe be dispatched to go to Maui and fetch his maternal uncles, Ki'inoho and Ki'ihele. It was Kepaka'ili'ula's wish that his uncles be upon a canoe with warriors as they traveled from O'ahu to fight with the "large handed" (thieving) chief of the island of Kaua'i...



> Following a tearful reunion with his uncles and attendants, everything was made ready for the journey to Kaua'i. As the war canoes moved together [the scene was described] – *ua uhi pū 'ia ke kai o Māmala i ka nui lehulehu maoli o nā wa'a kaua* (the ocean of Māmala [fronting Kewalo - Honolulu] was completely covered by the great numbers of assembled war canoes). Departing from Waikīkī, the canoes crossed the ocean and landed on the shore near Wailua river.
>
> The warring sides met on the *kahua kaua* (battle field) of the chief Ka'aka'alaneo. Though the battle was fierce, Ka'aka'alaneo was defeated and his warriors were secured in defeat. This battleground came to be call "*Ke Kahua Kaua o Kapa'a*" (The Battle Field of Ka-pa'a [the secured one]); and this is how the name Kapa'a came to be used to this day.
>
> After regaining his wife, Kepaka'ili'ula returned to O'ahu with her and with his uncles, and the warriors and chiefs of O'ahu and Maui. Kepaka'ili'ula and companions remained at Waikīkī for a short time where they enjoyed the famous surf of Kalehuawehe before returning to *Hawai'i nui o Keawe* (Great Hawai'i, Island of Keawe; 12/9/1920).

Among the other chiefs of antiquity who are associated with Waikīkī are Kalamakua, the grandfather of the famed Maui chief, Kiha-a-Pi'ilani (c.1500 AD). It is Kalamakua who is credited with the construction of the large taro pond field systems of Waikīkī. Also among these chiefs was Kākuhihewa (c. 1500-1600 AD), a chief famed for the peace he brought to O'ahu; and Kūali'i (c. 1555-1730 AD), a sacred chief who was famed for his strength and credited with uniting the Hawaiian Islands under his rule. All of these *ali'i* lived for a time at Waikīkī and are credited with various improvements to the land, including fishponds, taro pondfields, and irrigation systems; the communities under their rule prospered.

# WAIKĪKĪ IN THE PROTO-HISTORIC AND EARLY HISTORIC PERIODS (1778 - 1820)

During the proto-historic period, Waikīkī appears to have remained an important retreat for the *ali'i* of Hawai'i. It was at Waikīkī that the chief Kahekili lived after gaining control of O'ahu (c. 1783) and adding it to his kingdom, which included the islands of Maui, Moloka'i, Lāna'i, and Kaho'olawe. In his old age, Kahekili lived at Waikīkī, having left Maui in the care of his son, Kalanikūpule. During the decisive battle at 'Īao in 1790, Kamehameha I gained control of Maui over Kahekili's heir. Kamehameha then sent two messengers to O'ahu; one was to speak with Kahekili, who dwelt along the shores of Waikīkī, and the other was to seek out the famous priest Kapoukāhi, who was living at Kamoku in land of Waikīkī.

It was Kapoukāhi who instructed Kamehameha I that by building the *heiau* of Pu'ukoholā, he would secure his rule over Hawai'i. Hawaiian historian Samuel Kamakau (1961) describes the meeting between Kahekili and Kikāne, Kamehameha's messenger:

> Ki-kane, Kamehameha's messenger to Ka-hekili threw down two maika stones, a black one and a white one. Ka-hekili said when he saw these stones, "This stone (the white one) brings life through farming and fishing, rearing men, and providing them with food; this other stone (the black) brings war." Let the reader ponder the meaning of this answer. Ka-hekili asked, "Is Kamehameha coming to Oahu to fight?" "Yes," answered Ki-kane...(1961:150)

Kahekili, his counselors and Kikāne discussed the areas that might serve as a landing site for the battle fleet. It was determined that Waikīkī was not a good place for conflict, instead, it was "a place for cultivating food, not a battlefield" (Kamakau 1961:150.). Following the discussion, Kahekili asked Kikāne to return to his chief with the following message:

> Go back and tell Kamehameha to return to Hawaii and watch, and when the black tapa covers Ka-hekili and the black pig rests at his nose, then is the time to cast the stones. Then, when the light is snuffed out at Kahiki, that is the time to come and take the land (Kamakau 1961:150).

While Kahekili was living at Waikīkī, he was visited by Captain Douglas of the ship *Iphigenia*, a description of the 1789 visit was recorded by John Meares:

> He (Captain Douglas) was received very cordially by Titeeree (Kahekili) who took him round the village, showed him several plantations, and conducted him to some large ponds, which appeared to be full of fish. He mentioned also some others where he had a quantity of turtle (IN Handy and Handy 1972:482).

Captain George Vancouver also visited with Kahekili and described the community of Waikīkī (Vancouver 1798, Vol. 1:161-164):

> On the shores [of the bay] the villages appeared numerous and in good repair; and the surrounding country pleasingly interspersed with deep, though not extensive valleys; which, with the plains near the sea-side, presented a high



> degree of cultivation and fertility...To the northward through the village...an exceedingly well-made causeway, about twelve feet broad, with a ditch on either side. This opened to our view a spacious plain, which...had the appearance of the open common fields of England; but on advancing, the major part appeared divided into fields of irregular shape and figure, which were separated from each other by low stone walls, and were in a very high state of cultivation. These several portions of land were planted with the eddo or taro root, in different stages of inundation; none being perfectly dry, and some from three to six or seven inches under water. The causeway led us near a mile from the beach, at the end of which was the water we were in quest of. It was a rivulet five or six feet wide, and about two or three feet deep, well banked up, and nearly motionless; some small rills only, finding a passage through the dams that checked the sluggish stream, by which a constant supply was afforded to the taro plantations....In this excursion we found the land in a high state of cultivation, mostly under immediate crops of taro; and abounding with a variety of wild fowl, chiefly of the duck kind....The plain, however, if we may judge from the labor bestowed on their cultivation, seemed to afford the principal proportion of the different vegetable productions on which the inhabitants depend for their subsistence.

Archibald Menzies, a surgeon and naturalist who was with Vancouver, had this to say about the visit:

> ...The verge of the shore was planted with a large grove of cocoanut palms, affording a delightful shade to the scattered habitations of the natives. Some of those near the beach were raised a few feet from the ground upon a kind of stage, so as to admit the surf to wash underneath them. We pursued a pleasing path back to the plantation, which was nearly level and very extensive, and laid out with great neatness into little fields planted with taro, yams, sweet potatoes and the cloth plant [*wauke*]. These, in many cases, were divided by little banks on which grew the sugar cane and a species of Dracaena without the aid of much cultivation, and the whole was watered in a most ingenious manner by dividing the general stream into little aqueducts leading in various directions so as to be able to supply the most distant fields at pleasure, and the soil seemed to repay the labor and industry of these people by the luxuriancy of it productions. Here and there we met with ponds of considerable size, and besides being well stocked with fish, they swarmed with waterfowl of various kinds such as ducks, coots, water hens, bitterns, plovers and curlews (Menzies 1920:23-24).

Kahekili died at his residence, at 'Ulu-kou, in Waikīkī (c. 1793). His body was taken by Kamehameha's uncles, Kame'e'iamoku and Kamanawa, to Hawai'i, where Kamehameha had it buried secretly, in a cave (Kamakau 1961:166). Kamehameha then set about his task of bringing O'ahu into his kingdom. In 1795, Kamehameha landed his force at Waikīkī, "where it covered the beaches from Wai'alae to Waikiki" (Kamakau ibid.:172). They defeated the forces of Ka'eo-kū-lani, Kahekili's brother, in the battle of Nu'uanu. Having gained O'ahu, Kamehameha then formally united with his sacred wife Ke-ōpū-o-lani, at Waikīkī, and of this union were born Kamehameha's heirs Liholiho and Kauikeaouli, Kamehameha II and III respectively (Kamakau 1961:172-173, 260).

Following Kamehameha's conquest of O'ahu (1795), he too lived at Waikīkī for a short time, preparing to add Kaua'i to his kingdom. In early 1796, Kamehameha and his men departed for Kaua'i from Wai'anae, in a great canoe fleet. In the Ka'ie'ie-waho channel, the *Kūlepe* winds arose and the sea swamped many of the canoes; thus, this expedition nearly ended in total disaster. Later in 1796, Kamehameha was called back to Hawai'i to quell the uprising led by the chief Nāmakehā (Kamakau 1961:173).

Approximately six years later, in 1802, Kamehameha set sail to O'ahu from Hawai'i with a great fleet of canoes. The king and his court lived at Waikīkī and prepared again for the conquest of Kaua'i, but in late 1803 or early 1804, a great epidemic struck at the Hawaiian population. Called *ma'i 'ōku'u* (bending over disease; perhaps dysentery or cholera) many of Kamehameha's trusted advisors, warriors, and relatives died, and Kamehameha himself was seriously ill; thus, according to Hawaiian historian John Papa I'i, Kaua'i remained free of Kamehameha's control (I'i 1959:16). I'i offers the following description of Kamehameha's court at Waikīkī:

> Kamehameha's houses were at Puaaliilii, makai of the old road, and extended as far as the west side of the sands of Apuakehau. Within it was Helumoa, where Kaahumanu ma went to while away the time. The king built a stone house there, enclosed by a fence....This place has long been a residence of chiefs. It is said that it had been Kekuapoi's home through her husband Kahahana, since the time of Kahekili (I'i 1959:17).

Although these events occurred approximately one mile away from the project area, there is an indication that Kamehameha's activities included cultivation of crops and fish throughout the flatlands between Waikīkī and Honolulu. Kamakau documents activities of the time:

> After the pestilence had subsided the chiefs again took up farming, and Kamehameha cultivated the land at Waikiki, Honolulu, and Kapalama, and fed the people. He fished and made huge hauls, and gave food to the chiefs and people. Thus he cared for both chiefs and commoners (Kamakau 1961:190).

As is expected because of the nature of the royal community associated with Waikīkī, there were several *heiau* (ceremonial sites) identified by early writers in the region; none of the mentioned *heiau* appear to be near the project area. The *heiau* of Helumoa, at 'Āpuakehau (little more than one mile from the project area), and the *heiau* of Papa'ena'ena on the slopes of Lē'ahi (Diamond Head), were two of the important sites associated with state worship in Waikīkī. Indeed, Papa'ena'ena was one of the last *heiau* used for human sacrifice (c. 1809), by the chief Kamehameha I. It was at Papa'ena'ena, that Kamehameha's nephew, Kanihonui, was sacrificed as a result of his having slept with the chiefess Ka'ahumanu (Kamakau 1961:194 and McAllister 1933:71-78). Though no ceremonial sites are known to be recorded for the project area, it is known that many agricultural and fishpond sites, as well as habitation sites, had, various features at which prayers and rituals were offered.

Honolulu harbor was very well protected, and according to Kamakau, the number of visits by foreign ships were increasing during this time, and opportunities for trade increased as well. Kamehameha I divided his time between Waikīkī and Honolulu, and Liholiho (Kamehameha II) took up living at Honolulu (Kamakau 1961:271). According to I'i:

> Kamehameha I, who had been living at Waikiki since 1804, moved his court to Honolulu in 1809. His immediate court consisted of high-ranking chiefs and their retainers, but in the area also lived those who contributed to the welfare and enjoyment of court members, from fishermen and warriors to whites and the chiefs of lesser rank. In those days, the area was not called Honolulu. Instead, each land section had its own name...[then] in the latter part of 1812 Kamehameha and most of his court, including Liholiho and I'i, went to Hawai'i, where he remained until his death in 1819 (IN Rockwood 1957).



I'i also described the trails leading from Honolulu to various locations on the island, in reference to Waikīkī (Figure 2):

> The trail from Kealia led to Kukuluaeo, then along the graves of those who died in the small pox epidemic of 1853, and into the center of the coconut grove of Honuakaha...Our description of the trails of the royal town is finished, but we have not yet told of the trails going to lower Waikiki, Kamoiliili, and Manoa. A trail led out of town at the south side of the coconut grove of Honuakaha and went on to Kalia. From Kalia it ran eastward along the borders of the fish ponds and met the trail from lower Waikiki (ibid.:92, 89).

I'i's description above, and the map prepared by Ober (Figure 2) place an important Honolulu-Waikīkī trail just below the Kūwili fishpond which appears to be partially within the current project area.

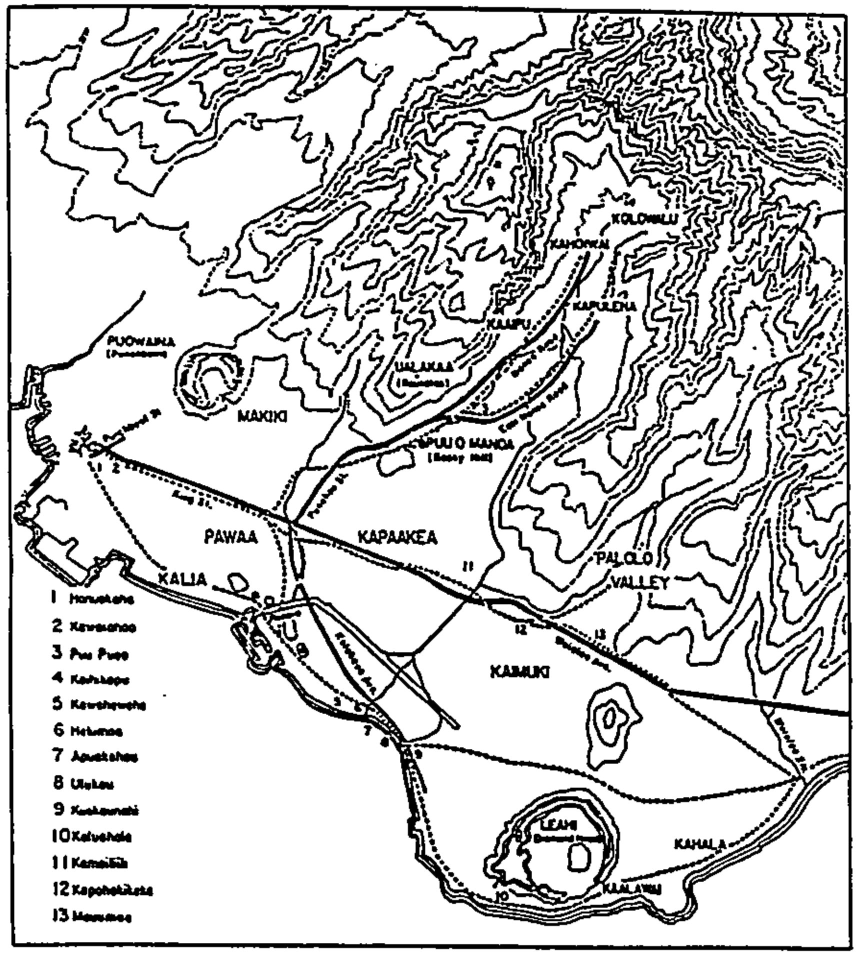


*Figure 2. Trails from Punchbowl Street to Wai'alae as Described by I'i (1959:93) (Map by Gerald Ober)*



# WAIKĪKĪ IN THE HISTORIC PERIOD

In late 1823 King Liholiho (Kamehameha II), his wives Kamāmalu and Liliha, and a royal party, went to England to see the outside world and meet with King George IV. Kamakau relates that this trip was also motivated by Liholiho's shame: following the 1819 overthrow of the *kapu* system and 1820 arrival of the missionaries, "no taxes had been collected for him or gifts received from the chiefs and people, and he had no lands left to give away" (Kamakau 1961:256). Liholiho and Kamāmalu died in England and their remains were returned to Hawai'i by Lord Byron on the H.M.S. *Blonde*. The naturalist with Byron, Andrew Bloxam, described the extensive fish ponds of Waikīkī as he saw them in 1825:

> The whole distance of the village of Whyteete is taken up with innumerable artificial fishponds extending a mile inland from the shore, in these the fish taken by nets in the sea are put, and though most of the ponds are fresh water, yet the fish seem to thrive and fatten. Most of the fish belong to the chiefs, and are caught as wanted. The ponds are several hundred in number and are the resort of ducks and other water fowl (1925:35-36).

Bloxam also described the village of Waikīkī as being "built along the shore among numerous groves of coconut and other trees" (IN Handy and Handy 1972:482).

In 1831, German voyager, Meyen, visited Hawai'i; he made the following comment (1834) on Waikīkī:

> At the village of Waititi, where running and standing water is at hand, the tarro fields and valuable coconut plantations begin, and stretch along the shore of the ocean until they became quite thick; beneath the poor shade of these trees stand the neat huts of the Indians (IN Handy and Handy 1972:482).

During the 19th century, there were many changes in the Hawaiian kingdom. Perhaps most notably, the Hawaiian population was steadily decreasing, and this was in part due to a number of foreign introductions. Hawai'i popularity as a cross-roads of the Pacific grew, and the number of foreign visitors and residents grew as well. Americans, British, French, and other businessmen found Hawai'i to be a perfect wintering and provisioning stop for whalers and other ships plying the Pacific, and in 1820, American missionaries also found the Hawaiian Islands to be a rich field for the "harvest." Within a few years, these missionaries became a powerful force in kingdom politics.

One vivid example of the changes that occurred in Waikīkī during this period may be found in the differing descriptions of the area as recorded by Bloxam (1825) and Levi Chamberlain (1828). In 1825, the area's fishponds were numerous and "extended a mile inland from the shore...Most of these fish belong to the chiefs..." (Bloxam 1925:35-6). Just three years later, in 1828, Levi Chamberlain, business agent of the Sandwich Islands Mission, toured the island of O'ahu and described much of the formerly cultivated lands and some of the ponds in Waikīkī as lying unused:

> ...Our path led us along the borders of extensive plats of marshy ground, having raised banks on one or more sides, and which were once filled with water, and replenished abundantly with esculent fish; but now overgrown with tall rushes waving in the wind. The land all around for several miles has

> the appearance of having once been under cultivation. I entered into conversation with the natives respecting this present neglected state. They ascribed it to the decrease of population...(Chamberlain 1957:26).

## KA LOKO KŪWILI (THE KŪWILI FISHPOND)

The project area is situated partially on, and alongside, a land parcel that at one time contained an important fishpond which was known as Kūwili (restless, swirling; as the surface of water) (Figures 3 and 4). Land Grant records and certain historic maps (see the following section titled "Land Tenure") also provide documentation that there were smaller ponds and *'auwai* (drainage ditch systems) adjacent to Kūwili as well. Thus, smaller ponds and associated features appear to have been situated on the project area lands as well.

Kūwili and the smaller unnamed *loko* (ponds) fit into the class of ponds known either as *loko pu'uone* (an inland dune pond) which were fed by both stream and spring water and were connected to the ocean via a shoreward stream, or *loko wai* (inland fresh water ponds which were usually natural lakes or swamps, and which were connected to rivers that provided access to the ocean). As mentioned above, Hawaiian writers and early western visitors have described the extensive aquaculture and agriculture that took place on the Waikīkī plain. Bloxam noted in 1825, for example, that the fishponds were numerous and "extended a mile inland from the shore..." (1925:35-6). Hawaiian historian Samuel Kamakau (1976) offers readers the following insights into the nature of *loko pu'uone*, and the value of fishponds to the neighboring lands:

> Fishponds, *loko i'a*, were things that beautified the lands, and a land with many fishponds was called "fat" land (*'aina momona*). They date from very ancient times...The making of fishponds and their walls is very ancient. It is known which chiefs built some of them, but the majority of their builders is not known. However, one can see that they were built as "government" projects...Pu'uone ponds and taro patch ponds, *loko i'a kalo*, belonged to commoners, land holders, and land agents, the *maka'ainana*, *haku*, and *konohiki*. The ponds cultivated for a chief, *pu'uone haku ko'ele*, belonged to the holder of the land, *haku 'aina*, as did the taro patch ponds [on *ko'ele* lands].
>
> The *pu'uone* ponds near the sea (*loko kai pu'uone*) were much desired by farmers, and these ponds were stocked (*ho'obolo*) with fish...the "native sons" (*kelki papa*) of places that had taro patches and *pu'uone* fishponds loved the lands where they dwelt... So too did the native sons love the lands where the freshwater ponds, *loko wai*, were, for they furnished them with fresh *'opae*, crisp *limu-kala-wai*, reddish *'o'opu* roe, and *hi'au*. The people of the old days who lived on such lands lacked nothing (Kamakau 1976:47-50).

## LAND TENURE

Between 1790 and the 1840s, the Hawaiian kingdom underwent radical changes as Western influence over the *ali'i* (rulers) of Hawai'i grew. In 1848, during the reign of Kauikeaouli (Kamehameha III, 1833-1854), the traditional Hawaiian land distribution system was replaced with a Western-style ownership system. This radical restructuring was called The Great *Māhele* (Division [of land]). The *Māhele* defined the land interests of the King, the high-

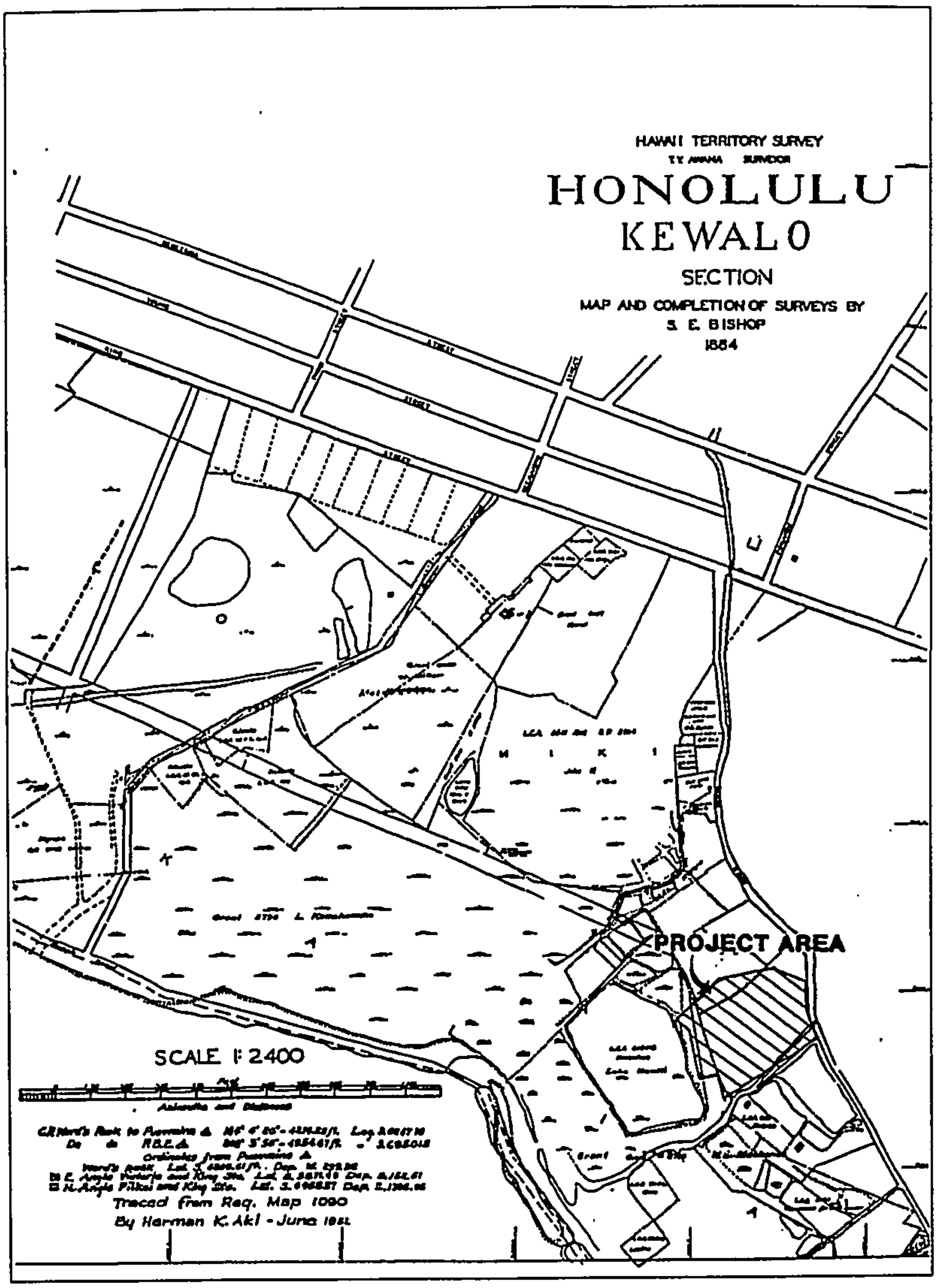


**Figure 3. Portion of 1884 Bishop Map of Waikīkī Showing Loko Kūwili, LCA and Grants, and Surrounding Ponds (State of Hawai'i Survey Branch)**

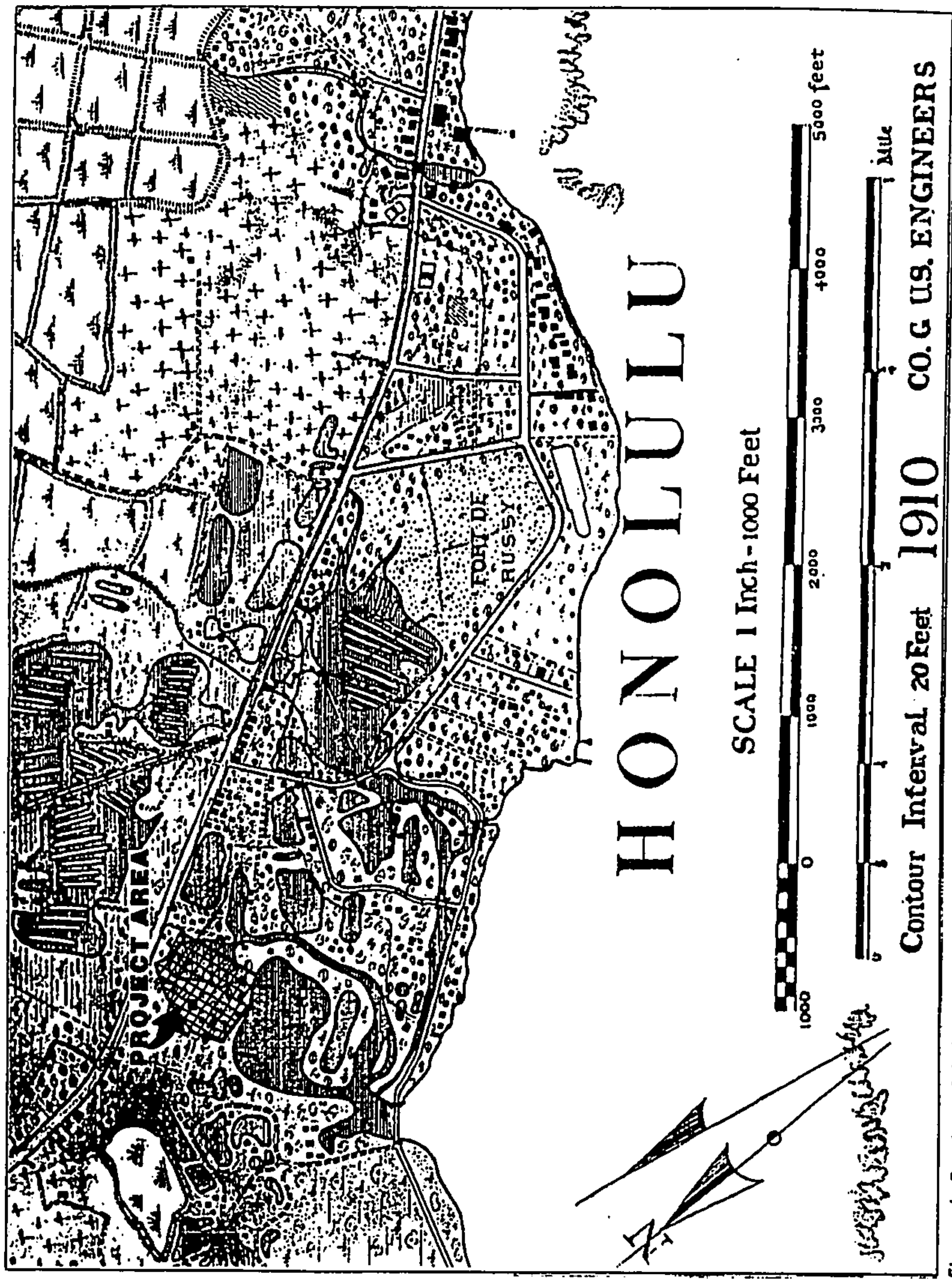


Figure 4. Portion of 1910 CO. G. U.S. Engineer's Map of Honolulu Showing Loko Kawili, Neighboring Ponds, and Ocean Access (Archives of the State of Hawai'i)

ranking chiefs, and the *konohiki*, who were originally those in charge of tracts of land on behalf of the king or a chief (Chinen 1958:vii; 1961:13).

During the *Māhele*, all land was placed in one of three categories: Crown Lands (for the occupant of the throne), Government Lands, and Konohiki Lands. These were all "subject to the rights of the native tenants" (Laws of Hawaii 1848:22). The *hoa'āina* or native tenants were the common Hawaiian people who lived on the land and worked it for their subsistence and for the welfare of the chiefs. Once a commoner's claim was confirmed, a survey was required before the Land Commission was authorized to issue any award. The commoner's lands became known as "Kuleana Lands" (ibid:30). By the time the Land Commission was dissolved, on March 31, 1855, it had issued only 8,421 *kuleana* claims, totaling 28,658 acres of land, to the native tenants (Kame'eleihiwa 1992:295).

The process of proving claims for Kuleana Awards resulted in a number of volumes of registry and testimony (Board of Commissioners 1929) that contain valuable information on land-use practices, crop production and resource harvesting, and on the various structures present on the parcels at the time of the awards.

During the *Māhele*, Loko Kūwili was awarded to a chiefess named Kaunuohua in LCA 6450:2 (Figure 3). Kaunuohua was the granddaughter of the sacred chief Keawema'uhili, descended from a line of distinguished Hawai'i Island *ali'i*, and she had been a *kahu* (guardian, or attendant) to Alexander Liholiho (Kamehameha IV). During the period of recording *Māhele* land claims, Kaunuohua formalized her claim with the following record:

> LCA 6450 (Native Register 5:372 / Native Testimony 3:728)
>
> *...Ke ha'i aku nei au iā 'oukou i ko'u mau kuleana 'āina mai ka Mō'ī mai, a mau loa aku. Eia ua mau 'āina la:*
>
> *Pu'ulena - 'Ili no Waikīkī, Kona, O'ahu;*
> *Mokauea - 'Ili, Kalihi, Kona, O'ahu;*
> *Kalaupapa - Ahupua'a, Ko'olau o Moloka'i.*
>
> *O kēia mau 'āina 'ekolu, 'oia ua mau kuleana la. E 'ike 'oukou i kēia. O wau no me ka mahalo.*
> *L. Kaunuohua (Kaluaokapili 5, Feb. 1848)*
>
> *Eia kēia poina - Ki'okapu, 'Ili no Waikīkī, Kona, O'ahu. E ho'okomo i ka ho'onā kuleana. 'Oia ka pau.*
>
> ...I tell you of my land rights, which have come from the King forever. Here are those lands:
>
> Pu'ulena, a parcel in Waikīkī, Kona District, O'ahu;
> Mokauea, a parcel in Kalihi, Kona District, O'ahu;
> Kalaupapa, a land in the Ko'olau District, Moloka'i.
>
> These three lands, are my claim. It is known to you. I am respectfully yours.
> L. Kaunuohua (at Kaluaokapili February 5, 1848)
>
> Here is one thing that was forgotten, Ki'okapu, a land parcel at Waikīkī, Kona District of O'ahu. Enter the quit claim. That is it.



Unfortunately, the records above, do not clearly specify which of the *'ili*, or land parcels–Pu'ulena or Ki'okapu–is associated with Loko Kūwili. But, that a woman of such distinguished lineage as Kaunuohua was awarded this land is an indication of the importance of the project area lands (fishpond) during the *Māhele*.

Kaunuohua had married W.L. Moehonua, who was an uncle of Kalākaua, who later became the last King of Hawai'i (Kame'eleihiwa 1992:264). Moehonua's name is also recorded on early maps, as having received a Grant (Grant No. 2789) in 1861. Research conducted at the Bureau of Conveyances and State Archives, show that Moehonua's Grant encircled Loko Kūwili in its' entirety, and included the entire project area as well (Figure 3). The Grant records, provide readers with a description of his land award, and as a part of the description of the property, Moehonua notes that there are several ponds and open, dry land sections in his claim.

> Helu 2789 (78 1/2 eka)
> *PALAPALA SILA NUI*
> 24, June 1861
>
> W.L. Moehonua...
> ...*ma Kālia, Waikīkī, Kona, ma ka Mokupuni o Oahu...*
>
> *He mau Loko a me Kula*
>
> *E ho'omaka i ke ana ma ke kihi Ak., mauka o kēia i ke kihi Hik., ho'i ia o ke kuleana o Ku'ewa ma ka lihi makai o ke Alanui Aupuni a holo...e pili ana me ko Ku'ewa a i ke kihi Ak., o ko Kaunuohua mau loko (Kūwili)... Alaila (kihi hem. O Kūwili loko)...o pili ana me ko Kaunuohua a hiki ke 'Auwai komo kai. Alaila...hiki i ka 'ae kai. Alaila ho'i hou ma ke kihi mua i ho'omaka'i a holo...e pili ana me ke Alanui Aupuni a hiki i ka lihi Hem., o ka Uapo a me ka 'Auwai o Pi'inaio kihi 'Akau o ka Ap. 6 o M. Kekūanāo'a, alaila holo e like me ko M. Kekūanāo'a...i ke kihi Ak., o ko Pā'ao e pili ana i ke Alanui ma ke lihi Kom., o ka Uapo. Alaila...e pili ana me ko Pā'ao a hiki i ka 'ae kai (Kai piha). Alaila holo ana ma ke kahakai a hiki i ka pau ana o ka 'ao'ao 'elwa o ka holo mua ana.*
>
> *Koe na'e ke kuleana o Kīnaka*
>
> Number 2789 (78 1/2 acres)
> Grant - 24, June 1861
>
> W.L. Moehonua
> ...at Kālia, Waikīkī, Kona, on the Island of Oahu
>
> Several ponds and dryland [agricultural or open flatland areas], cf. *kula*.
>
> The survey starts on the northern, inland corner which is the eastern corner of the land of Ku'ewa, situated on the shoreward side of the Government Road. [The survey] proceeds on...bordering Ku'ewa's land, and to the northern corner of Kaunuohua's fishponds (Kūwili)...and (continues to the southern corner of Kūwili pond), bordering Kaunuohua's land and on to the ditch [drainage] which enters in the sea...from here [the ditch] the property continues to the shore. Then, back from where the survey started, [the

> property] borders the Government Road and continues to the south side of the pier and the ditch ('auwai) of Pi'inaio which is at the northern corner of parcel 6 of M. Kekūanāo'a's land. The boundary then proceeds parallel to M. Kekūanāo'a's land [meets and bounds continued], to the northern corner of Pā'ao's land, and bordering the road on the western side of the pier [and continues on], bordering Pā'ao's land to the shore (the high water, cf. Kai piha). Then following the shore the boundary continues to where the ninth side [boundary] ends at the beginning.
>
> The land claims of the people are retained.
> (Translated by Kepā Maly)

Information contained within the Grant of Moehonua (recorded as having been turned over to John 'Ena) documents several features which were on, or neighboring the project area at the time of Moehonua's award. Though not clearly identified in Figure 3., the outline of several unnamed ponds or swampy areas are indicated on historic maps of the region (e.g., Bishop 1881 and 1884). Additionally, the swampy nature of the area, and the fact that numerous ponds were situated in the region, has been discussed above. It is reasonable to assume that water levels in the smaller ponds and swampy areas may have been variable, and that their importance could have diminished, or that they could have been drier in the mid- to late-1800s, thus, they were not recorded in greater detail by Bishop. Traditionally, both dryland and wetland areas, whether used for taro and/or fish cultivation, were left fallow, dependent upon the season, water levels and/or the length of site use as well.

Figure 4, a portion of USGS Map of the area, produced in 1910, and a USGS map produced in 1918 (based on surveys conducted between 1908-1913) place wetlands within the Moehonua Grant - current project area. Thus, one of the components of the field work tasks might be to confirm the occurrence of such wetlands in the project area, through subsurface field work. That the area was important, is substantiated by both legendary references and the presence of royal LCA and Grant claims.

## LAND USE IN THE 20TH CENTURY

As noted above, Waikīkī was a favored retreat for the *ali'i* of O'ahu in the prehistoric and proto-historic periods. Although the Hawaiian population was in continual decline, Waikīkī retained this "resort" status, as foreign residents began acquiring land in the area. By the late 1800s, many "business" families were moving to the Kālia-Waikīkī area where they built single-family dwellings. As the popularity of Waikīkī increased, this trend gave way to hotel and inn development, and tourism evolved as an important business in Waikīkī. The growth of tourism in Waikīkī brought with it interest in draining and "reclaiming" lands that had previously been valued for their fishponds and taro pond fields. As early as 1906, according to Thrum (1923:65), the Territorial Government was considering the "Waikīkī Reclamation Project."

In a paper on commercial fisheries and fishponds, J.N. Cobb (1904) noted that Waikīkī once had its fishponds. Cobb noted that there were fifteen ponds in use at Kālia and Waikīkī as late as 1901, although this number was only half of the total in the 1880s. He also noted that the number of fishponds before the 1880s must have been even greater, because many had been filled in (Cobb, 1904:748 and Plate 106). In Cobb's 1901 survey, the fishpond of Kūwili was one of eight ponds for which a name was still remembered. The "Waikīkī Reclamation Project"



was begun in 1921 with the construction of the Ala Wai Canal. Thrum (1923:66) stated that "the area to be drained and filled comprises 1400 acres." Thrum closed the article with the following comments:

> The picturesque as well as odoriferous duck ponds are fast becoming but a memory. The tourists who saw only the artist side of the duck ponds will be equally satisfied with the beauty of the canal, boulevards and park strip that is fast taking the place of the too-long neglected menace that the duck ponds were to the health of Honolulu. (Thrum 1923:67)

By 1929 the remaining ponds and irrigated fields at Kālia and Waikīkī had been filled (Davis 1984:19).

While much of the property around the project area has been used for residential purposes, and more recently, for a variety of businesses such as restaurants, shops, and gas stations, the project area itself has been used for warehouses, gas stations, and automobile sales and storage lots. The following descriptions are excerpts from a 1989 surface/subsurface contamination assessment for the project area, prepared by Unitek Environmental Consultants, Inc.

> TMK 2-3-35:002, (Lot 24-a) is 211,856 square feet and encompasses the majority of the project site. The predominant structure on this lot was two adjoining warehouses 400 feet by 96 feet each constructed by the U.S. Navy in 1942. A concrete slab provided the foundation for the wood framed, corrugated metal structures which extend on to TMK 2-3-35:010, (Lot 26-C) to the west. Corrugated metal was added over the years to the 50 foot space between the two warehouses. This space was used as a paint shop in 1952. Aloha Motors took deed too this lot in 1946. Portions of the warehouse, as well as the covered area to the south of the warehouse along the Ala Wai Promenade were used as mechanics shops. In recent years the warehouse structure was the site of the Honolulu Flea Market.
>
> East of the warehouses, two four story elevator parking structures were constructed in 1961 to store new automobile. Each structure measured 135 feet by 39 feet.
>
> The remainder of lot TMK 2-3-35:002 has been paved with asphalt since at least 1952 and used to park new and used automobiles for sale.
>
> On the southeast corner of the subject sites, TMK 2-3-35:001, (Lot 2-A) was formerly residential property owned by Magoon trust from 1943 to 1962. In 1962 Magoon trust leased the site to Standard Oil and a gas station was constructed with two service bays, five gas pumps, and office space. Magoon Estate, Ltd. Deeded the property to Aloha Motors in 1979(Unitek Environmental Consultants, Inc., 1989:6).

Additional uses noted for lots on TMK 2-3-35:004,005, TMK 2-3-36:018,024, and 025 include office space and parking (owned by Mutual Telephone Company), the Murphy Motors car lot, and low-rise apartments. All of the structures on these lots were removed in 1988, and three underground storage tanks were removed in 1988. At the time of writing the Unitek report, there were also plans for removing a subsurface waste oil tank, and questions remained regarding the Standard Oil subsurface tanks (Unitek Environmental Consultants, Inc., 1989:6-7).

# PREVIOUS ARCHAEOLOGICAL RESEARCH

The following section summarizes the previous archaeological research that has been undertaken in Waikīkī. The discussion is divided into two sections: *early archaeology* and *modern contract archaeology research*. The overall quality and quantity of archaeological research has improved greatly since the advent of contract archaeology (c. mid-1960s), and this is due largely to the enactment of historic resources legislation. Historic resources received partial protection by the federal Antiquities Act of 1906 and the Historic Sites Act of 1935, although these acts carried little weight in preventing the destruction of cultural resource data in the bourgeoning development of the 20th century. Archaeological studies pre-dating the mid-1960s were largely descriptive, often focusing on the more impressive architectural features (i.e., in Hawai'i, Thrum's *heiau* reports) or on the speedy excavation of burials found during construction activities. These reports were often sketchy and impressionistic, with many categories of data (i.e., botanical remains, agricultural features) often being overlooked.

It was not until the passage of the National Historic Preservation Act of 1966 (and subsequent amendments) and the National Environmental Policy Act of 1969, that the evaluation and mitigation of cultural resources, and the assessment of the *potential* for a property's containing significant cultural resources, were required prior to any development using federal funding. Complementary acts have also been passed in many of the state and territorial legislatures that strengthen the requirements for cultural resource studies prior to the permitting of any development that may impact historic resources.

*Table 1* summarizes the information presented in the following discussions. Note that there is a great deal of variation in the level of study within the category of "salvage archaeology." This category is used in this table to indicate those projects where studies were undertaken in response to the inadvertent findings of subsurface cultural deposits and/or human remains. In general, the salvage archaeology studies undertaken during the time of modern contract archaeology (since c. 1966) have been controlled, research-oriented data recovery studies, although there are a few exceptions. The locations of project areas of the modern contract archaeology studies discussed in this report are presented in *Figure 6*. A summary of sites recorded in the Waikīkī area is presented in *Table 1*, and the approximate locations of these sites are shown in *Figure 6*.

## EARLY ARCHAEOLOGY IN WAIKĪKĪ

The first report of archaeological remains in Waikīkī dates to the beginning of the 20th century. Emerson (1902) reported on the excavation of human remains found at a private residence during trenching for a sewer pipe near Diamond Head (near the present B.P.O.E. Club). Emerson (1902:19) found at least four individuals of Hawaiian ancestry buried with "a number of conical beads of whale teeth..., a number of round glass beads of large size, ...and a small-sized *niho-alaloa* such as was generally appropriated to the use of chiefs."

In the first part of this century, Thrum (1907) compiled descriptions of the known *heiau* sites on O'ahu. He did not visit all of the sites that he described—some *heiau* had been destroyed before Thrum's time and are known only through the stories of local informants. Thrum did not record any *heiau* in Waikīkī, although he did know of three sites in Manoa: Hipawai, Kawapopo, and Hakika, also called Paliluahine. Hipawai *heiau* was located on the *makai* side of Manoa Church, and was partially destroyed at the time of Thrum's visit. Kawapopo, situated in lower Manoa, and Hakika-Palilulahine had both been destroyed before 1850.

*Table 1.*
***Previous Archaeological Research in Waikiki***

| Researcher | Year | Level of Study | Location |
|---|---|---|---|
| Emerson | 1902 | Salvage excavation | Present location of B.P.O.E. club |
| Thrum | 1916 | Recorded heiau sites | Island of O'ahu |
| McAllister | 1933 | Limited reconnaissance survey | Island of O'ahu |
| Bishop Museum | 1961 | Salvage excavation | 331 Saratoga Road |
| Bishop Museum | 1963 | Salvage excavation | Both Prince Edward St. and present site of Outrigger Canoe Club |
| Bishop Museum | 1964 | Salvage excavation | Location of old Outrigger Canoe Club (present site of Surfrider Hotel) |
| Bishop Museum | 1976 | Salvage excavation | Hale Koa Hotel |
| Sinoto | 1977 | Reconnaissance | Hilton Hawaiian Village |
| Rogers-Jourdane | 1978 | Reconnaissance | Halekulani Hotel |
| Neller | 1980 | Salvage excavation | Hilton Hawaiian Village |
| Neller | 1981 | Reconnaissance | Halekulani Hotel |
| Davis | 1984 | Salvage excavation | Halekulani Hotel |
| Neller | 1984 | Salvage excavation | Queen Liliuokalani Gardens hotel and condominiums |
| Kaschko | 1985 | Salvage excavation, data recovery | Pacific Beach Hotel |
| Griffin | 1987 | Salvage excavation | Kalakaua Avenue (near Moana Hotel) |
| Simons | 1988 | Monitoring, salvage excavation | Moana Hotel |
| Rosendahl | 1988 | Assessment study | Portions of Honolulu and Waikiki |
| Rosendahl | 1989 | Subsurface reconnaissance | Hale Koa Hotel |
| Davis | 1989 | Subsurface reconnaissance | Fort DeRussy |
| Davis | 1991 | Archaeological monitoring | Fort DeRussy |
| Hurlbett, Carter, and Goodfellow | 1992 | Monitoring | Hilton Hawaiian Village |
| Cleghorn and Jackson | 1992 | Salvage excavation, data recovery | Fort DeRussy |
| Pietrusewsky | 1992 | Osteological analysis on human mandible found by hotel guest | Sheraton Moana Surfrider Hotel |

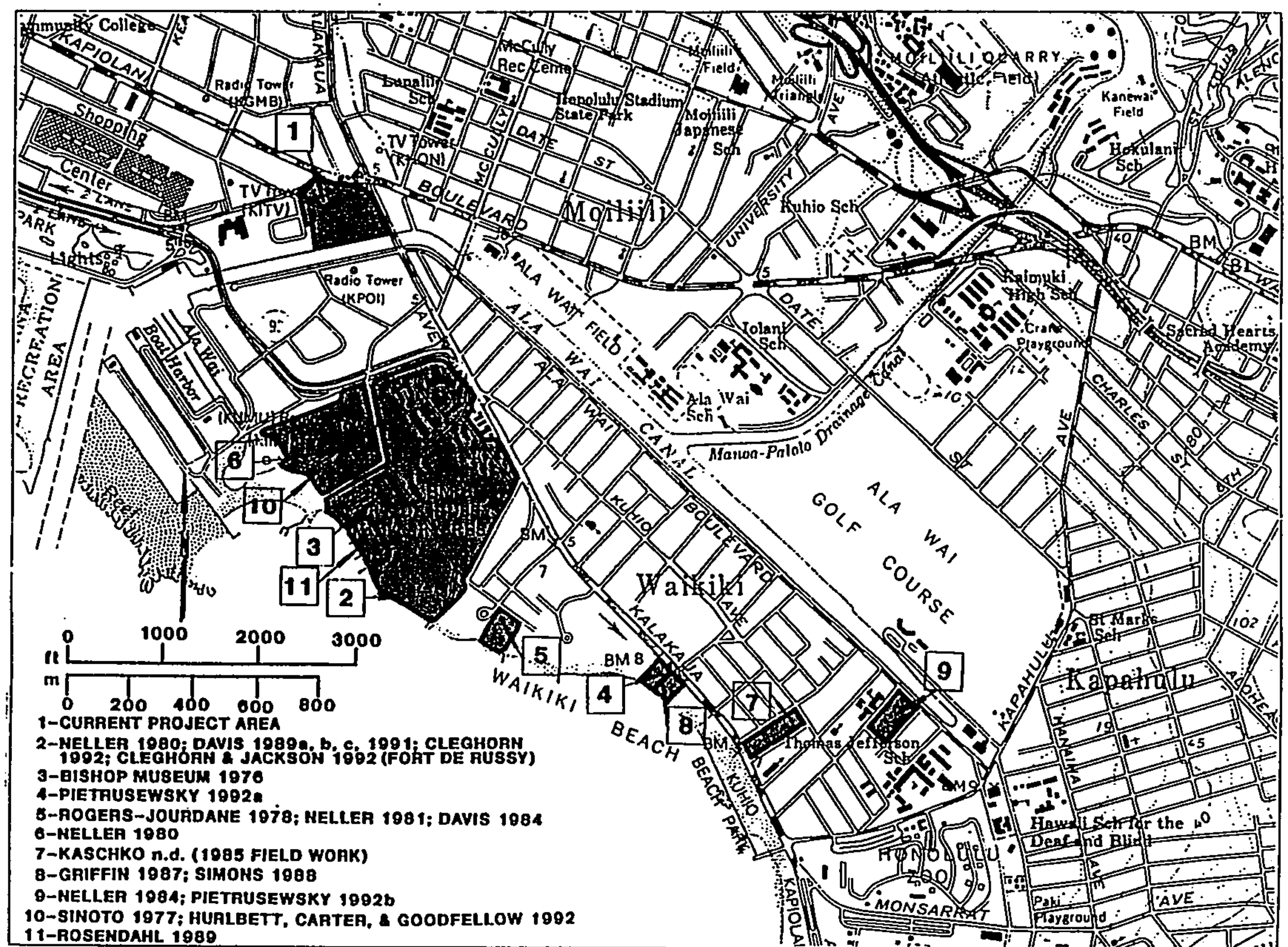


Figure 5. Previous Contract Archaeology Research in Waikiki Area

**Table 2.**
***List of Archaeological Sites Reported in Waikiki and Vicinity****

| Date of Source /Find | Description and Location | BPBM Site No. | State Site No. 50-80-14- |
|---|---|---|---|
| 1901 | Human burials from James B. Castle property on beach front near Diamond Head | - | - |
| 1925 | Artifacts from construction of Royal Hawaiian Hotel at Helumoa on Waikiki Beach | - | 9980 |
| 1933 | Kukaoo *heiau* in Manoa Valley, still standing in 1957; McAllister's Site 64 | Oa-A4-1 | - |
| 1933 | Papaenaena *heiau*, at the base of Diamond Head near La Pietra; McAllister's Site 58 | Oa-A4-2 | - |
| 1933 | Kawapopo *heiau*, atop knoll in Manoa Valley; moderate-sized; reported destroyed before 1850, although the remains were relocated in 1975; McAllister's Site 65 | | 3986 |
| 1933 | Hakika-Paliuahine *heiau* in lower Manoa Valley; reported destroyed before 1850, McAllister's Site 65 | - | - |
| 1933 | Hipawai *heiau*; Thrum (1907:45) described as "of large size and pookanaka class"; this site was destroyed before 1933; McAllister's Site 63 | | |
| 1933 | Mauoki *heiau* in Kamo'ili'ili at foot of ridge between Manoa and Palolo Valleys; destroyed in 1883; McAllister's Site 62 | Oa-A4-5 | - |
| 1933 | Pahu-a-Maui; small *heiau* at the present location of Leahi lighthouse; McAllister's Site 59 | | |
| 1940 | Unnamed *heiau* reportedly in Helumoa at Waikiki Beach at the end of the 18th century | - | - |
| 1961 | Human burial and 19th century artifacts found Saratoga Road; adjacent to Fort DeRussy | Oa-A4-19 | 3706 |
| 1963 | Human burials from site of the new Outrigger Canoe Club on beach front near Diamond Head | - | - |
| 1963 | Human burials from site on Prince Edward St. in the area of Waikiki formerly known as Pua'ali'ili | Oa-A4-23 | 3707 |
| 1964 | Human remains eroded from beach fronting the old Outrigger Canoe Club, now site of the Surfrider Hotel, at Helumoa on Waikiki Beach. | Oa-A4-24 | 3705 |
| 1976 | Human burials from construction of Hale Koa Hotel on beach fronting Fort DeRussy | Oa-A4-25 | 9500 |
| 1980 | Human burials and 19th century artifacts from construction of Tapa Tower at the Hilton Hawaiian Village Hotel near Fort DeRussy | - | 2870 |
| 1981 | Human burials and 19th century artifacts from construction of Halekulani Hotel at Kalia on Waikiki Beach; archaeological excavations undertaken 12/1981-02/82 | Oa-A4-26 | 9957 |
| 1983 | Human burials and 19th century artifacts from construction of Queen Liliuokalani Gardens on Ala Wai Boulevard in Waikiki | - | - |
| 1985 | Human burials, prehistoric and historic site deposits encountered during construction at the Pacific Beach Hotel | - | - |
| 1987 | Historic remains found during construction at the Hilton Hawiian Village Hotel across from Fort DeRussy | - | 2870 |
| 1987 | Human burial found on Kalakaua Avenue fronting Moana Hotel | - | 3745 |
| 1988 | Human burials, prehistoric and historic site deposits encountered during renovation at the Moana Hotel | Oa-A4-27 | 9901 |
| 1989 | Intact prehistoric and early-historic fishponds and associated habitation deposits found at Fort DeRussy | Oa-A4-25 | 9500 |

**Adapted from Davis 1991:18-19*

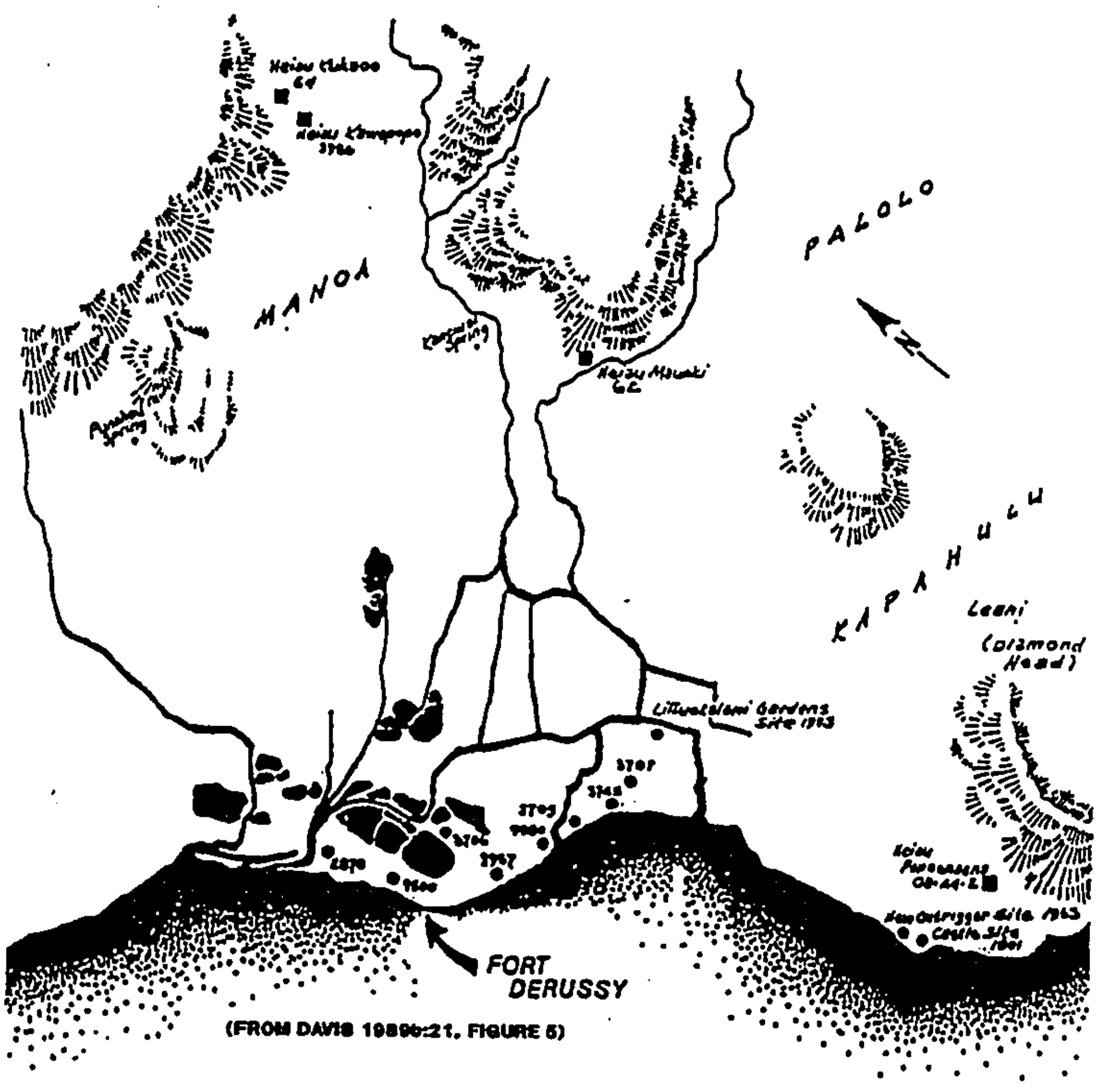


*Figure 6. Recorded Archaeological Sites, Waikiki Area (from Davis 1989b:21 Figure 5)*

McAllister (1933) conducted the first general archaeological survey of the island of O'ahu, revisiting the locations of many of the *heiau* recorded by Thrum, as well as many sites that Thrum overlooked. McAllister's comments on *heiau* recorded in the Waikīkī-Manoa area are mostly updates of Thrum's descriptions. This information is included in *Table 2*. The importance of Papa'ena'ena as an important ceremonial site associated with state worship was discussed earlier in this report. Later attempts to relocate the site met with mixed results (Emory and Sinoto 1961), although the *heiau* appears on maps dating to 1875 to 1883 near the present location of the Hawaii School for Girls at La Pietra (Lyons 1877, Diamond Head Properties 1883).

In 1961, the Bishop Museum conducted salvage excavations of human remains found during construction at 331 Saratoga Road in Waikīkī. Unfortunately, the findings were not documented except for brief notes in the museum files that a mandible was found in association with two glass bottles and nut shell fragments in a layer of charcoal and refuse c. 0.6 m deep (Bishop Museum 1961). Shortly after this find, in 1963, additional salvage excavations were undertaken at Prince Edward Street and at the present location of the Outrigger Canoe Club (Bishop Museum 1963). The remains of c. 25 individuals were recovered at salvage excavations at the present-day Outrigger Canoe Club site. Little information is available on this excavations except for a newspaper article reporting on an interview with the Field Director, Robert Brown [Bowen?] of the Bishop Museum:

> One of the burials, he said, was discovered in a sitting position with the knees drawn up to the chin. Other skeletons were found stretched out flat or in a semi-flexed position...
>
> One of the burials had a fish skeleton beside it...
>
> In a layer of sand above the burials he found charcoal, bits of rusted iron, broken bottles, Chinese dishes, a bottle marked San Jose Fruit Packing Co., Patenct 1898, and cut pig bones (Honolulu Advertiser, 25 January 1963 IN Davis 1984:29-31)

In 1964, the Bishop Museum was called in when a human tibia was collected from the beach side of the old Outrigger Canoe Club (Bishop Museum 1964). Again, infomation on this find is sketchy.

## MODERN CONTRACT ARCHAEOLOGY IN WAIKĪKĪ

Contract work in Waikīkī begins with the 1977 Bishop Museum walk-through survey of the Hilton hotel grounds (Sinoto 1977). No surface features were found, although Sinoto recommended that further subsurface construction activities be monitored by a qualified archaeologist. Three years later, Neller (1980) reported on the recovery of a at least three individuals in burial excavations at the Tapa Tower of the Hilton Hawaiian Village. Although no controlled excavations were undertaken at this site, Neller also found late 19th century trash pits which he believed may have been associated with the residences of two local politicians (W.L. Green and R.F. Bickerton) of the last quarter of the 19th century (IN Davis 1989b). Hurlbett, Carter, and Goodfellow (1992) later reported on construction monitoring of renovations at the Hilton Hawaiian Village. Inspection of trenches resulted in the identification of 15 horizontal features, mostly historic trash pits, with dated artifacts placing historic lands use of the area to after 1881. No human remains were encountered.



Rogers-Jourdane (1978) conducted a surface reconnaissance at the Halekulani Hotel. No cultural resources, other than historic structures, were observed. Rogers-Jourdane recommended that the construction of the hotel should be monitored in the event that intact subsurface deposits were encountered. Neller (1981) conducted an emergency reconnaissance survey for the Halekulani Hotel, when human remains were encountered during construction activities. The remains of two individuals had been unearthed and prepared for burial by the construction workers when state archaeologists intervened. Two additional burials and 19th century trash pits were found, although despite a letter from the State Historic Preservation Office to the Halekulani Corporation, construction activities proceeded without archaeological data recovery.

The Bishop Museum, responding to subsequent findings of additional human burials during construction at the Halekulani, conducted salvage excavations that, ultimately, led to the discovery of 43 subsurface features, including human and animal burials, earth ovens, fire pits, historic trash pits, and at least two privies (Davis 1984). Dates on volcanic glass suggest that one component dated to the mid-17th century. Davis (1984:25) comments on these excavations noting that: "For the first time in Waikīkī, this led to the full-scale excavation of intact prehistoric Hawaiian occupation deposits underlying intact 19th century Euro-American remains."

Neller (1984) reported on human burials and 19th century household-related artifacts found during construction monitoring of the Queen Liliuokalani Gardens hotel and condominium complex on Ala Wai Boulevard. This multi-component site is situated at what was once one of the residences of Queen Liliuokalani. Hence, the findings have special significance in that they relate to the life of a famous person in Hawaiian history. During Neller's excavations, a minimum of nine individuals were found. These remains were later described by Pietrusewsky (1992b). Four of the individuals were Polynesian, three were of probable Polynesian ancestry, and the ethnicity of the last two burials could not be determined. Pietrusewsky 's burial analysis suggested that, based on the existence of tooth avulsion, the burials dated to the late prehistoric to early historic period (Pietrusewsky and Douglas 1992). Neller had also observed that the presence of indigenous artifacts and the lack of nonindigenous artifacts associated with the burials indicated that the burials likely dated to over 200 years ago. Unfortunately, no further work was undertaken at this site, and research questions about the length and nature of occupation of this site remain unanswered.

Kaschko conducted monitoring and data recovery field work in 1985 at the Pacific Beach Hotel (Kaschko, in prep.; S. Athens, personal communication to L. Franklin, 13 May 1994). The work comprised of the burial excavation of four individuals (Athens 1990) and the excavation of habitation deposits, including intact hearth features. The intact cultural deposits were underlain by beach sand, and were limited to only a small portion of the property. Three radiocarbon samples yielded dates in the c. A.D. 1400 to 1500 range, placing the deposits well within the prehistoric time period. A historic component to the site was also identified, and included the discovery of a privy and associated cultural deposits. Final reporting of the project findings is currently in preparation.

Griffin (1987) reported on the discovery of a single burial from gas pipeline excavations on Kalakaua Avenue. Again, the remains were no longer *in situ* by the time that the archaeologists were called in. These remains were reported in Lee and Pietrusewsky (1988), who describe the individual as a young adult male of probable Polynesian ancestry. The following year and only a short distance away, archaeologists from the Bishop Museum (Simons 1988) reported on finding eight burials and both pre-contact and historic cultural deposits during monitoring and excavations in the basement of the Moana Hotel. Davis (1989b:26) comments: "If the Halekulani excavations belied the argument that developed properties contain nothing of archaeological value, the Moana Hotel site proved this point emphatically. Intact archaeological features were 'cheek-to-jowl' against major structural members of the building."

Rosendahl (1988) conducted an assessment study of alternative corridors for the proposed Honolulu Rapid Development Project. This study involved a literature search and a limited amount of historical research. No field work was conducted and only a small portion of Waikīkī was examined.

When the Hale Koa Hotel was built in 1976, the remains of six individuals were found during construction activities (Bishop Museum 1976). A burial cluster of 5 individuals, either prehistoric or early historic was found. An additional burial was found in a separate grave; however, this individual was a more recent burial. When a pool and a *luau* facility at the Hale Koa were slated for renovation in 1989, Rosendahl (1989a, 1989b) conducted a subsurface inventory survey in the areas of the proposed renovations. Backhoe trenching failed to identify any intact subsurface archaeological deposits in the study area. Two years later, Davis (1991) conducted subsurface testing on Fort DeRussy, near the area tested by Rosendahl. Davis found a pattern of discontinuous subsurface deposits dating to the early post-contact times (c. AD 1780s and 1790s) through the mid-19th century.

Davis (1989b) conducted a subsurface reconnaissance survey of Fort DeRussy consisting of random backhoe trenches and auger samples of all the entire Fort DeRussy property. Davis knew that ten freshwater fishponds (*loko wai*) were, during historic times, situated in the Fort DeRussy property. The trenching program undertaken in Davis 1989 work resulted in the identification of buried pond walls, as well as discontinuous deposits of intact prehistoric and early historic habitation deposits found throughout the Fort DeRussy property. Based on the findings of Davis (1989b), Streck (1992:Item 1) summarizes the archaeological findings to date for the Fort DeRussy property and potential future findings, noting:

> Virtually all of the pre-modern (prehistoric to late 1800's native Hawaiian) cultural remains are buried under varying depths of dredged coral and/or terrigenous fill material. These ancient Hawaiian cultural remains consist of extensive fishpond features, the walls, water channels (*'auwai*), and contained sediments of which are available for archaeological analysis; 19th century *kuleana* homesteads extending from and situated along shoreline containing indigenous and historic artifacts (shell, glass, metal, bone, and other artifacts), buried house foundations, functional features like hearths, fireplaces, and graves, and other remains; and prehistoric (pre-AD 1790) cultural deposits which are found discontinuously over large portions of the entire property.

The most recent work conducted at Fort DeRussy, monitoring and subsurface testing for the realignment of Kalia Road, has not yet been published (Cleghorn and Jackson 1992 , Jackson et al. 1992). Cleghorn (1992) prepared a data recovery and sampling plan for additional work. Streck (1992) has reported on the recovery of a human burial at Fort DeRussy by BioSystems Analysis. The stratigraphic context of the burial placed the interment during the late prehistoric period (c. AD 1600 to 1700s).

Most recently, Pietrusewsky (1992a) reported on the right half of a human mandible found by a hotel guest at the Sheraton Moana Surfrider Hotel. Pietrusewsky was not able to examine the bone *in situ*, as the mandible had been collected and turned over to the Honolulu Police Department. Osteological analysis determined that the remains appeared to be of Hawaiian ancestry.



# PREDICTIVE MODEL FOR ARCHAEOLOGICAL FINDINGS

Based on legendary and early historic period accounts of the Kālia-Waikīkī area, and on the previous archaeological research in Waikīkī, a variety of functional features associated with Hawaiian settlement and habitation of the area are expected to have once been present in the project area. The functional types may include features of community and residential complexes (i.e., sleeping houses, cooking houses, ceremonial structures, sheds, men's houses, cemeteries, etc.) and subsistence-activities (i.e., agricultural terraces, fish ponds, etc.). Formal feature types might include buried midden, or refuse, mounds; architectural walls, platforms, terraces, enclosures, or alignments; excavated and constructed earthworks; and human burials.

While the fishponds and taro fields of Waikīkī were drained and filled prior to 1929, the question still remains as to how destructive the land reclamation activities were. For instance, were the ponds merely filled and capped, or were they excavated and compacted prior to being filled? In the latter scenario, the chance for intact subsurface deposits remaining in the project area is slim. If the land reclamation activties capped, rather than destroyed, archaeological features, then have they remained intact over the past last 60 to 75 years of development?

Archaeological coverage of Waikīkī has been, in general, poor, as most of the the land was developed prior to the advent of modern contract archaeology. As can be seen in *Table 1*, most of the studies that have been conducted in Waikīkī during the time of modern contract archaeology were undertaken as a result of inadvertent findings of cultural deposits, often human remains, during renovation activities. Several of these studies conducted over the past ten years have had encouraging results *re* the possibility of subsurface deposits lying intact beneath modern development (i.e., Davis 1984, Simons 1988, Kaschko n.d.). While pond fields and taro fields were filled in during land reclamation projects in Waikīkī, the stratigraphic profiles of many of these earthworks should remain intact beneath the historic fill, unless the historic fill has subsequently suffered extensive modifications. Details on the construction of these features, if found intact, may be gleaned from cross-sectional studies. The possibility always exists that subsurface deposits relating to the habitation of this area (i.e., refuse middens) may also lie intact beneath the fill layer.

Historic maps of the Waikīkī region (Bishop 1881, Monsarrat 1897) depict a fishpond, Loko Kūwili, and a Land Commission Award (LCA 6450:2, awarded to Kauuohua) in the location of the present project area (*Figure 1*). Further work should be done to test the areas where the fishpond walls are shown on historic maps. In addition, a systematic subsurface sample of backhoe trenches should be excavated to explore the project area for both (a) intact stratigraphy pre-dating the land reclamation projects, and (b) any intact cultural deposits within the project area.

# CONCLUSION

## ARCHAEOLOGICAL AND HISTORICAL ASSESSMENT SUMMARY

The proposed Convention Center project area is part of a land unit of great importance in the prehistoric and early-historic periods. Noted for its fishponds, taro pond fields, and settlements, Kālia was extensively used by the ancient Hawaiians. Thus, it is likely that at one time archaeological features associated with agriculture, aquaculture, habitation, transportation, and possibly, ceremonial activities, were present. By the late 1800s, land use practices had changed greatly in response to growing western business influences. By the turn of the century, most of the ponds for aquaculture and taro pondfields had been drained and filled, and the last of the ponds were "reclaimed" by 1929. In the last 60 to 75 years, the project area has undergone extensive development.

Historical research has resulted in the identification of one LCA, a fishpond, and one Grant, including several ponds and dryland parcels, within the project area. The large fishpond (LCA 6450:2) is identified on many historic maps. Some of the smaller ponds contained within Grant 2789 appear only on the 1910 and 1918 USGS maps, but not an 1884 map prepared by Bishop. This lack of correlation could have two possible explanations. First, Bishop may have applied different criteria to what he showed on his 1884 map of the area. For instance, he may not have included fishponds that were no longer viable at the time of his survey. An abandoned fishpond may have been classified as a wet or marshy area. This could also be the result of a seasonal difference: the fishpond may have been in a "fallow" state at the time of Bishop's visit. Second, the fishpond may have been built after Bishop mapped the area in 1884 and before the 1910 and 1918 USGS surveys. However, this second scenario is unlikely in that between the 1880s and 1900s, some 15 fishponds in the area had been abandoned and the land reclaimed. The construction of new ponds would have defied logic.

The Ala Wai Canal and promenade are now integral parts of the Waikīkī area. According to Dr. Don Hibbard, DLNR-SHPD Administrator, both the Ala Wai Canal and the promenade have been determined to be eligible for the National Register of Historic Places, and the Ala Wai Canal has been placed on the Hawai'i Register of Historic Places (personal communication, 26 April 1994). Also according to Dr. Hibbard, a Department of Transportation (DOT) Bridge Survey lists the Kalākaua Bridge in the DOT Category 1, which means that it is a significant site and is to be preserved. Although the current project area does not include these historic properties, they are adjacent to the convention center site and every effort should be made to minimize any potential impacts to them that might arise out of development of the convention center. Dr. Hibbard also indicated that, based on the historic significance of the Ala Wai Canal, it is unlikely that the construction of any new overpasses/bridges would be permitted, and any proposed work that may in any way detract from the integrity of the area must be reviewed by DLNR-SHPD (personal communication, 26 April 1994).



## RECOMMENDATIONS

Currently, it does not appear that Federal review requirements of Section 106 will apply to this project. Should this status change, applicable Section 106 requirements would be complied with. As a result of the findings of this assessment study, it appears that there is a possibility that subsurface archaeological remains may exist in the project area. In order to meet inventory-level work requirements, subsurface testing, data analyses, and preparation of a final report describing findings will be required. The following recommended scope of work for subsurface evaluations is based upon DLNR-SHPD regulatory requirements for an archaeological inventory survey:

1. Conduct subsurface testing in order (a) to determine the presence or absence of potentially significant subsurface cultural deposits and features (e.g., fish pond walls and/or embankments, pond deposits, and possible neighboring habitation features, etc.); and (b) to obtain suitable samples for age determination analyses

2. Analyze data collected through subsurface field work; and

3. Preparation of the final report which incorporates the assessment study background review, subsurface field work findings, and post-field data analyses.

The subsurface testing (Item 1a) should include two basic approaches: (a) focused trenching where pond walls are thought to occur (based on historic research); and (b) a systematic sampling of the remainder of the project area to determine if any other significant subsurface remains are present. Ancillary to this will be the determination if intact stratigraphy pre-dating historic land reclamation activities still exists within the project area. This work could be accomplished through backhoe trenching and the preparation of trench cross-section drawings and stratigraphic descriptions. The backhoe trenching may be supplemented by hand excavations, as appropriate. This work could be done as a part of an archaeological survey, or in conjunction with various soil studies or other project area subsurface and/or engineering studies.

## REFERENCES CITED


Athens, S.
1990 Inventory of Human Skeletal Remains from Hawaii at International Archaeological Research Institute (IARII). Letter on file at State Historic Preservation Office, Honolulu.

Beckwith, M.
1940 *Hawaiian Mythology*. New Haven: Yale University Press.

Bishop Museum
1961-76 Miscellaneous notes in site files.

Bloxam, A.
1925 The Diary of Andrew Bloxam. *B.P. Bishop Museum Special Publication* 10. Honolulu.

Board of Commissioners
1929 *Indices of Awards made by the Board of Commissioners to Quiet Land Titles in the Hawaiian Islands*. Honolulu: Star-Bulletin Publishing

Chamberlain, L.
1957 Tour Around Oahu, 1828. *Annual Report of the Hawaiian Historical Society for the Year 1956.*

Chinen, J.J.
1958 *The Great Mahele: Hawaii's Land Division of 1848.* Honolulu: University of Hawaii Press.

1961 *Original Land Titles in Hawaii.* Honolulu: privately published.

Cleghorn, P.L.
1992 Data Recovery Plan for Archaeological Monitoring and Sampling for the Realignment of Kalia Road at Fort DeRussy, O'ahu Island, Hawaii. BioSystems Analysis, Inc.. Prepared for the U.S. Army Corps of Engineers, Honolulu.

Cleghorn, P.L. and R.J. Jackson
1992 Post Field Summary Report of Archaeological Data Recovery Operations at Ft. DeRussy, Waikiki, O'ahu Island, Hawaii. BioSystems Analysis, Inc.. Prepared for the U.S. Army Corps of Engineers, Honolulu.

Cobb, J.N.
1904 Commercial Fisheries of the Hawaiian Islands: *U.S. Fish Comm., Bull. for 1903*, Vol. 23, pt. 2.





Davis, B.D.
1984 The Halekūlani Hotel Site: Archaeological and Historical Investigations in Waikiki, O'ahu, Hawai'i. Department of Anthropology, B.P. Bishop Museum. Prepared for the Halekulani Corporation.

1989a Research Design for Archaeological Surface and Subsurface Reconnaissance Survey at Fort DeRussy, Waikiki, Island of O'ahu, Hawai'i. IARII. Prepared for the U.S. Army Engineer District, Honolulu.

1989b Subsurface Archaeological Reconnaissance Survey and Historical Research at Fort DeRussy, Waikiki, Island of O'ahu, Hawai'i. IARII. Prepared for the U.S. Army Engineer District, Honolulu.

1991 Review Draft: Archaeological Monitoring of Environmental Baseline Survey and Excavations in Hawaiian Land Commission Award 1515 ('Apana 2) at Fort DeRussy, Waikiki, O'ahu. IARII. Prepared for the U.S. Army Corps of Engineers, Honolulu.

Diamond Head Properties
1883 Registered Government Survey Map RM 1502.

Emerson, N.B.
1902 A Preliminary Report of a Find of Human Bones Exhumed in the Sands of Waikiki IN *Tenth Annual Report of the Hawaiian Historical Society for the Year 1901*, pp. 18-20. Hawaiian Historical Society.

Emory, K.P. and Y. Sinoto
1961 Hawaiian Archaeology: O'ahu Excavations. *B.P. Bishop Museum Special Publications* 49. Honolulu: Bishop Museum Press.

Fornander, A.
1917-1919 Collection of Hawaiian Antiquities and Folk-lore. *Memoirs of the Bernice Pauahi Bishop Museum*. Bishop Museum Press, Honolulu. (Kraus Reprint 1985, 9 vols.)

Griffin, A.
1987 Kalakaua Avenue Gas Pipe Excavation Burial Recovery, Waikiki, Central Honolulu, Oahu. Ms. on file at the State Historic Preservation Office, Honolulu.

Handy, E.S.C., and E.G. Handy
1972 Native Planters in Old Hawaii, Their Life, Lore, and Environment. *B.P. Bishop Museum Bulletin* 223. B.P. Bishop Museum Press. (with M.K. Pukui)

Hurlbett, R., L.A. Carter, and S.T. Goodfellow
1992 Archaeological Monitoring of Mechanical Loop Excavations, Hilton Hawaiian Village, Land of Waikiki, Honolulu (Kona) District, Island of O'ahu. PHRI Report 1159-030692. Prepared for Hilton Hawaiian Village Joint Venture.

I'i, J.P.
1959 *Fragment of Hawaiian History*. Honolulu: Bishop Museum Press.

Jackson, R.J., P.L. Cleghorn, and T.L. Jackson
1992 Data Recovery Plan for Archaeological Investigations at Fort DeRussy, O'ahu Island, Hawaii. BioSystems Analysis, Inc., Prepared for the U.S. Army Corps of Engineers, Honolulu.

Kalima, L.
1992 Appendix D IN R. Hurlbett, L. Carter, and S.T. Goodfellow, Archaeological Monitoring of Mechanical Loop Excavations, Hilton Hawaiian Village, Land of Waikiki, Honolulu (Kona) District, Island of O'ahu. PHRI Report 1159-030692. Prepared for Hilton Hawaiian Village Joint Venture.

Kamakau, S.M.
1961 *Ruling Chiefs of Hawaii*. Honolulu: The Kamehameha Schools Press.

1976 The Works of the People of Old, *Na hana a ka Po'e Kahiko*. *B.P. Bishop Museum Special Publication* 61. Bishop Museum Press, Honolulu.

Kame'eleihiwa, L.
1992 *Native Land and Foreign Desires*. Bishop Museum Press: Honolulu.

Kaschko, M.W.
in prep. Report on Excavations at the Pacific Beach Hotel in Waikiki, Honolulu, Hawai'i. IARII.Lee, L.J.M and M. Pietrusewsky

Lee, L.J.M. and M. Pietrusewsky
1988 A Human Skeleton Found at the Moana Hotel, Waikiki, Oahu. University of Hawaii-Manoa, Honolulu. Ms. on file at the State Historic Preservation Office, Honolulu.

Lyons, C.J.
1877 Survey Map (1855-1857).

Maly, K., and L. Kalima
1993 Appendix B IN Dunn and Rosendahl Archaeological Inventory Survey Nuuanu Court Project, Land of Nu'uanu Kona District, Island of Oahu. PHRI Report 1338-012093. Prepared for Harbor Court Developers.

McAllister, J.G.
1933 Archaeology of O'ahu. *B.P. Bishop Museum Bulletin* 104. Honolulu: Bishop Museum Press.



Menzies, A.
1920 *Hawaii Nei, 128 Years Ago*. Honolulu: The New Freedom Press. (Edited by William F. Wilson)

Neller, E.
1980 The Kalia Burial Site No. 50-O1-2870: Rescue Archaeology in Waikiki, Hawaii. Honolulu: State Historic Preservation Office.

1981 An Archaeological Reconnaissance of the New Construction Site at the Halekulani Hotel, Waikiki. Honolulu: State Historic Preservation Office.

1984 An Informal Narrative Report on the Recovery of Human Skeletons from a Construction Site in Waikiki on Paokalani Street, Honolulu, Hawaii. Ms. on file at State Historic Preservation Office, Honolulu.

Pietrusewsky, M.
1992a A Mandible Fragment found at the Sheraton Moana Surfrider Hotel, Waikiki. Ms. on file at the State Historic Preservation Office, Honolulu.

1992b Human Remains from the Lili'uokalani Gardens Site, Hamohamo, Waikiki, O'ahu. Ms. on File at the State Historic Preservation Office, Honolulu

Pietrusewsky, M. and M.T. Douglas
1992 Tooth Avulsion in Ancient Hawai'i. *American Journal of Physical Anthropology Supplement* 14:131-132 (Abstract).

Pukui, M.K.
Ms. On file, Paul H. Rosendahl, Ph.D., Inc. Hilo, Hawaii.

Rockwood, P.G.
1957 *Honolulu in 1810*. Honolulu: Bishop Museum Press. (with D. Barrere)

Rogers-Jourdane, E.
1978 Archaeological Walk-through Survey of Grounds of the Halekulani Hotel, Waikiki, Oahu. Ms. 0-274, Department of Anthropology, B.P. Bishop Museum, Honolulu.

Rosendahl, M.L.K.
1988 Archaeological Study of Alternative Corridors, Honolulu Rapid Transit Development Project, Honolulu, Island of Oahu. PHRI Report 323-100388. Prepared for Spencer Mason Architects.

Rosendahl, P.H.
1989a Interim Report upon the Completion of Field Work, Hale Koa Hotel Site Subsurface Inventory Survey, Kalia, Land of Waikiki, District of Kona, Island of Oahu. PHRI Report 515-022289. Prepared for Hale Koa Hotel.

1989b Preliminary Report upon the Completion of Field Work, Hale Koa Hotel Site Subsurface Inventory Survey, Kalia, Land of Waikiki, District of Kona, Island of Oahu. PHRI Report 515-071089. Prepared for Hale Koa Hotel.

Simons, J.A.
1988 Interim Field Summary of Archaeological Monitoring and Excavations at the Moana Hotel Historical Rehabilitation Project, Waikiki, Honolulu, Hawaii. Ms. on file, Department of Anthropology, B.P. Bishop Museum, Honolulu.

Sinoto, A.
1977 Archaeological Reconnaissance Survey on the Grounds of Hilton Hawaiian Village Hotel, Waikiki, O'ahu, Ms. 0-276, Department of Anthropology, B.P. Bishop Museum, Honolulu.

Streck, C.
1992 Human Burial Discovery during Archaeological Data Recovery Excavations at Fort DeRussy, Waikiki, Oahu Island, Hawaii, 20 May 1992. Memorandum for Record on file at the State Historic Preservation Office, Honolulu.

Tatar, E.
1982 Nineteenth Century Hawaiian Chant. Pacific *Anthropological Records No. 33*. B.P. Bishop Museum Press, Honolulu.

Thrum, F.W.
1923 The Waikiki Reclamation Project. IN *The Hawaiian Almanac* and *Annual*. Honolulu, Hawaii.

Thrum, T.G.
1907 *Hawaiian Annual and Almanac* 1907:44-48.

Vancouver, G.
1978 *A Voyage of Discovery to the North Pacific Ocean and Round the World* (1790-95). London.

Unitek Environmental Consultants, Inc.
1989 Appendix KK, Surface/Subsurface Contamination Assessment for the Honolulu Convention Center Complex. Prepared for First Development, Inc., Honolulu.

*APPENDIX D*

*ARCHAEOLOGY STUDY*

*Cultural Surveys Hawaii*

# Archaeological Sub-surface Survey at the Hawai'i Convention Center Site

by

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for

Wilson Okamoto & Associates

Cultural Surveys Hawaii
January 1995

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## INTRODUCTION

Cultural Surveys Hawaii, Inc. conducted the sub-surface archaeological testing field work, per scope of work (CSH 6/19/94), on Nov. 17 and 18, 1994. A total of 10 backhoe trenches were excavated during the course of the research (Figure 1). The trenches were plotted on the 1" = 40' General Plan Drawing that was provided to us by Wilson Okamoto and Associates. All the trenches were subsequently backfilled by our backhoe contractor, Amazon Construction.

In addition to the trenching, 7 core samples were taken. The seven samples were taken at Trenches 2 (Core 1), 3 (Core 2), 5 (Core 3), 6 (Core 4), 7 (Core 5), 8 (Core 6) and 9 (Core 7). The core samples have been initially analyzed by Cultural Surveys of Hawaii (Table 1). A total of six samples have been sent for pollen analysis along with five samples for radio carbon analysis. The pollen samples are being analyzed by Dr. Jerome Ward, Pacific Palenology, of Auburn, AL and the charcoal samples were sent to Beta Analytic in Coral Gables, Fl. Faunal materials collected are currently being analyzed by Dr. Allen Zigler.

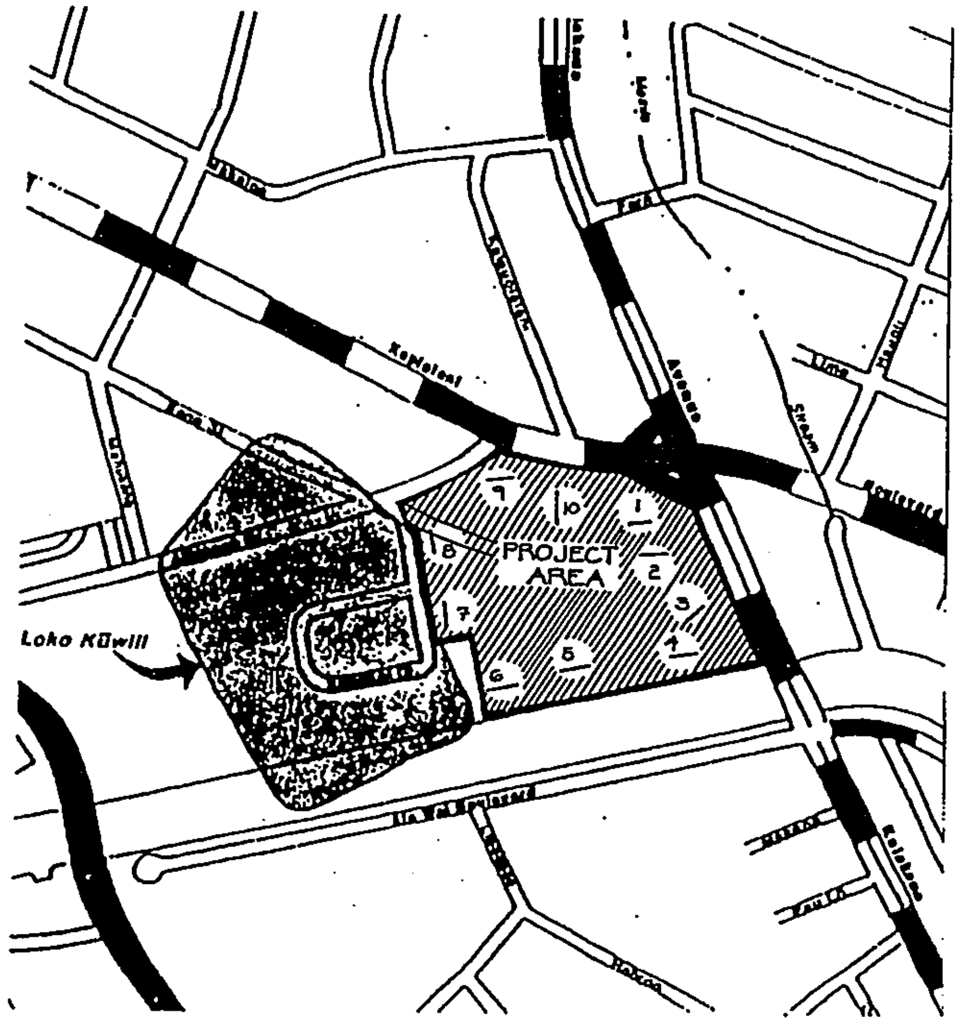



Figure 2 Trench Locations within Convention Center Site



## FINDINGS

The stratigraphy was fairly consistent within the excavated trenches. Crushed coral fill was utilized over the entire project area. The fill layer(s) ranged from 1.5 feet thick to nearly 5 feet thick. Underlying the fill material, in most trenches, was water-logged (gleyed) deposits ranging from sand to clay. The base of excavation for most units was cemented coral which was encountered from 5.5 to 6.5 feet below surface.

The scope of work has two essential components. The first was to attempt to locate and sample the filled-in Kūwili Fishpond which was identified during the archaeological Assessment of the Convention Center site (Maby and Rosendahl 1994). Second, sub-surface work was to be organized so as to access the archaeological potential of the remainder of the project area.

Trenches 6, 7, and 8 were located and excavated to address the Kūwili Fishpond portion of the scope of work. In-field observation and preliminary analysis indicated that only within Trench 7 there were sediments which could be associated with the former Kūwili Pond. The remaining trenches provide documentation of the sedimentary history and archaeological potential for the rest of the project area. There were variations in stratigraphy, for example, Trench 4, in the southeast corner of the project area, contained a stratum of dry beach sand below the shallowest of fill layers (1.5 ft.), this layer was not as well expressed in other trenches.

Table 1 CORE SAMPLE CATALOG

| Core | Trench | Stratum/ Horizon | Depth (cm) | Core Length (cm) | Munsell color | H2O | Texture | Structure |
|---|---|---|---|---|---|---|---|---|
| 1 | 2 | II | 110-140 | 31 | 10YR 7/2 light gray to 10YR 4/3 dark brown | moist | sandy clay loam to clay | structureless very fine granular |
| *1 | 2 | III | 140-190 | 26 | 5GY 4/1 dark gray to 5GY 7/1 light greenish gray | moist | clay loam to sandy clay | structureless very fine granular |
| 2 | 3 | I/II | 145-173 | 25 | 10YR 4/3 dark brown, 5Y4/1 dark gray, 5Y7/1 light gray | moist | clay loam, loamy sand | weak very fine granular |
| 3 | 4 | III | 155-200 | 13 | 10YR6/1 gray | moist | sandy clay loam | structureless fine to very fine granular |
| *3 | 4 | IV | 200-300 | 50 | 10YR4/1 dark gray | moist | sandy | structureless graded fine to very fine granular |
| 4 | 6 | II | 90-157 | 35 | 5Y 4/1 dark gray | moist | clay | structureless very fine granular |
| *5A | 7 | II | 115-137 | 25 | 5Y 7/1 light gray | moist | clay | structureless very fine granular |
| *5A&5B | 7 | III | 137-157 | 19 | N6 gray | moist | loamy sand | structureless graded fine to very fine granular |
| *5B | 7 | IV | 157-170 | 13 | 5GY 4/1 | moist | clay | structureless very fine granular |
| *6A | 8 | II | 130-155 | 27 | 2.5Y 4/4 | moist | clay | structureless very fine granular |
| 6A | 8 | III | 155-200 | 28 | 5GY 4/1 | moist | clay | structureless very fine granular |
| 7 | 9 | II | 140-150 | 23 | 2.5Y N4 to 5/2 dark gray to grayish brown | moist | clay | structureless very fine granular |
| 7 | 9 | III | 150-190 | 25 | 5GY 4/1 dark gray | moist | clay | structureless very fine granular |

*Pollen sample collected

| Core | Trench | Stratum/ Horizon | Depth (cm) | Core Length (cm) | Consistence Dry I Wet I Moist | Plasticity | Cementation | Effervescence |
|---|---|---|---|---|---|---|---|---|
| 1 | 2 | II | 110-140 | 31 | slightly hard I non-sticky I very friable | non-plastic | not cemented | strong |
| *1 | 2 | III | 140-190 | 26 | slightly hard I non-sticky I very friable | non-plastic | not cemented | strong |
| 2 | 3 | I/II | 145-173 | 25 | weakly coherent I slightly sticky I very friable | non-plastic | not cemented | strong |
| 3 | 4 | III | 155-200 | 13 | loose I non-sticky I loose | non-plastic | not cemented | strong |
| *3 | 4 | IV | 200-300 | 50 | loose I non-sticky I loose | non-plastic | not cemented | strong |
| 4 | 6 | II | 90-157 | 35 | hard I slightly sticky I very friable | slightly plastic | non-cemented | strong |
| *5A | 7 | II | 115-137 | 25 | very hard I slightly sticky I very friable | non-plastic | non-cemented | strong |
| *5A&5B | 7 | III | 137-157 | 19 | weakly coherent I non-sticky I loose | non-plastic | non-cemented | strong |
| *5B | 7 | IV | 157-170 | 13 | slighty hard I slightly sticky I very friable | non-plastic | non-cemented | strong |
| *6A | 8 | II | 130-155 | 27 | slightly hard I friable I slightly sticky | slightly plastic | non-cemented | strong |
| 6A | 8 | III | 155-200 | 28 | slightly hard I friable I slightly sticky | slightly plastic | non-cemented | strong |
| 7 | 9 | II | 140-150 | 23 | hard I friable I slightly sticky | slightly plastic | non-cemented | strong |
| 7 | 9 | III | 150-190 | 25 | hard I friable I slightly sticky | slightly plastic | non-cemented | strong |

*Pollen sample collected

Table 2 BULK SOIL SAMPLE CATALOG

SOIL SAMPLES CATALOG

CULTURAL SURVEYS HAWAII

Project: Waikiki Convention Center

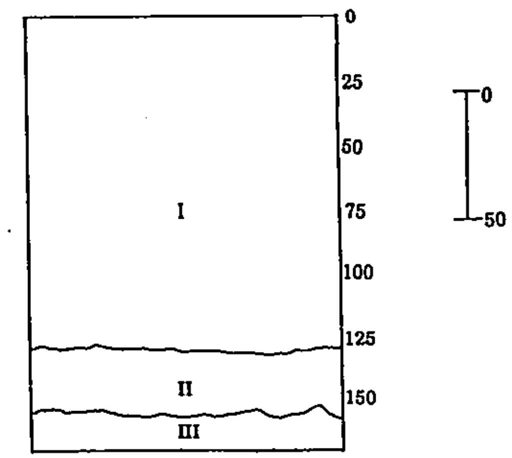
| Acc# | Trench | Stratum | Depth (cm) | Weight (gms) | Description |
|---|---|---|---|---|---|
| S-1 | 2 | III | 140-190 | 2604 | |
| S-2 | 4 | III | 85-95 | 1204 | |
| S-3 | 4 | III | 95-105 | 812 | |
| S-4 | 4 | III | 105-115 | 560 | |
| S-5 | 4 | III | 115-125 | 812 | |
| *S-6 | 4 | IV/top | | 2268 | |
| S-7 | 4 | IV/base | | 2128 | |
| S-8 | 5 | V | 115-180 | 2632 | |
| S-9 | 6 | II | | 4956 | gleyed over coral hard pan |
| S-10 | 7 | II | | 4649 | |
| S-11 | 7 | III | | 3080 | |
| *S-12 | 7 | IV | | 3248 | |
| S-13 | 8 | II | | 2184 | |
| S-14 | 8 | III | | 4732 | |
| S-15 | 9 | II | | 1204 | |
| S-16 | 9 | III | | 7952 | w/ bird bones |
| S-17 | 10 | II/top | 120-140 | 1960 | |
| S-18 | 10 | II/base | 140-160 | 1568 | |
| *S-19 | 10 | III/top | 160-175 | 1932 | |
| S-20 | 10 | III/base | 175-190 | 1540 | |

* = samples sent to Beat Analytic for dating analysis

A draft of the final report will be prepared upon the completion of pollen analysis, faunal analysis, and radiocarbon dating.

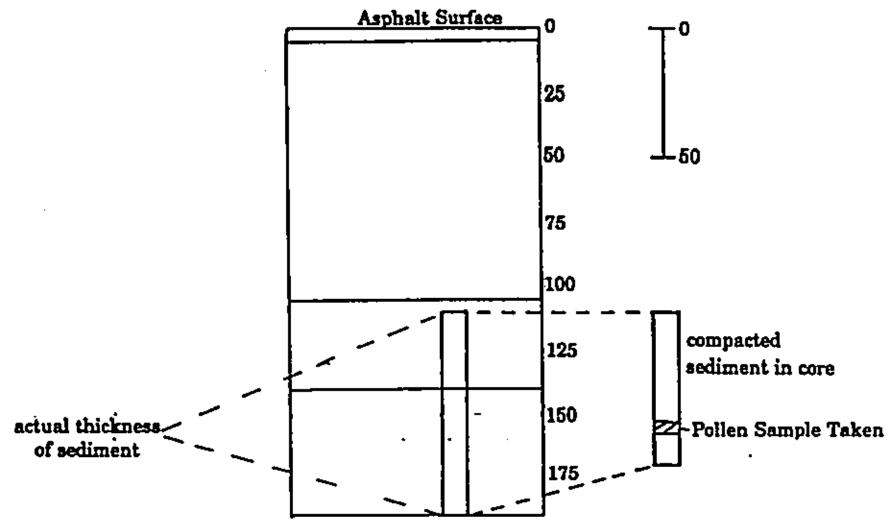
Due to the types of deposits encountered during the test trenching it is unlikely that either human remains or cultural deposits associated with prehistoric Hawaiian habitation will be encountered during subsequent excavations. The deposits encountered reflect what was previously assumed about the project area and much of the rest of Waikiki. Lagoonal environment in which there was little to no suitable land for habitation or human burial is represented. Upon the completion of the final report which will include the results of the faunal, pollen, and charcoal analysis it presently appears that adequate information will have been obtained to address the archaeological signigicance of the project area. During construction in the unlikely event that either human remains or cultural deposits are encountered work should be stopped in that area and qualified personal be notified to access the situation.






| | | Depth | Description |
|---|---|---|---|
| TRENCH 1 | Stratum I: Fill | 0-130cmbs | Various fill layers including 10YR 6/3 pale brown sandy clay and 10YR 4/2 dark grayish brown sandy loam with coral 8fragments |
| | Stratum II: Marine sand | 130-155cmbs | 10YR 7/6 yellow coarse to fine sand |
| | Stratum III: Marine clay | 155-170cmbs | N/7 light gray with pockets of 5GY 4/1 light greenish gray gleyed sandy clay |
| | Base of excavation: | 170cmbs | Coral hardpan |

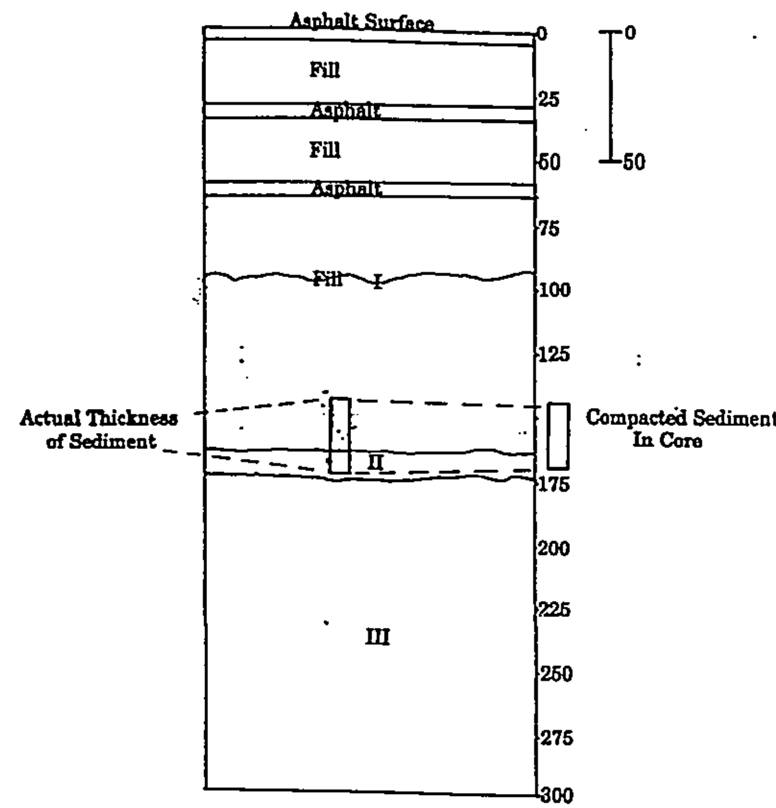
Figure 3 Profile Trench 1




| | | Depth | Description |
|---|---|---|---|
| TRENCH 2 | Surface: | 0-5cmbs | Asphalt |
| | Stratum I: Fill | 5-105cmbs | 10YR 8/1 white fine sand to cobbles of crushed coral fill with horizontal lenses of 10YR 3/4 dark yellowish brown cinder throughout layer |
| | Stratum II: Marine sand | 105-140cmbs | 10YR 7/2 light gray medium to coarse sandy clay loam to 10YR 4/3 dark brown organic clay loam at base; clay content increases with depth |
| | Stratum III: Marine clay | 140-190cmbs | 5GY 4/1 dark gray to 5GY7/1 light greenish gray clay loam at top gradiating to a sandy clay at base; land snails present |
| | Base of excavation: | 190cmbs | Coral hardpan |

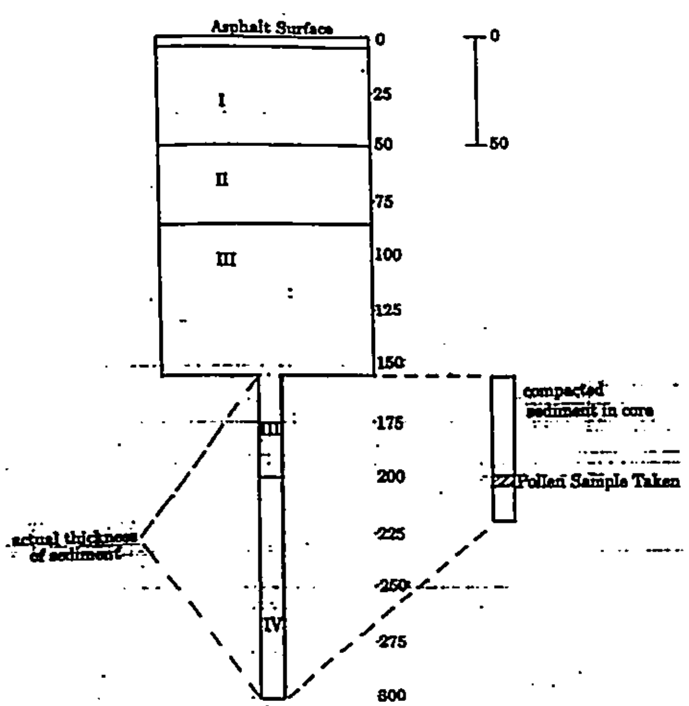
Figure 4 Profile Trench 2, Core 1






| | | Depth | Description |
|---|---|---|---|
| TRENCH 3 | Surface: | 0-5cmbs | Asphalt |
| | Stratum I: Fill | 5-165cmbs | Three layers of asphalt separated by roadfill layers of mottled construction fill, crushed coral fill, and 10YR 4/3 dark brown clay loam |
| | Stratum II: Marine sand | 165-173cmbs | 5Y 4/1 dark gray to 5Y 7/1 light gray loamy sand |
| | Stratum III: Marine sand | 200-300cmbs | 5Y 7/1 light gray gleyed natural coral rubble and sand |
| | Base of excavation: | 300 cmbs | Stratum III continues |

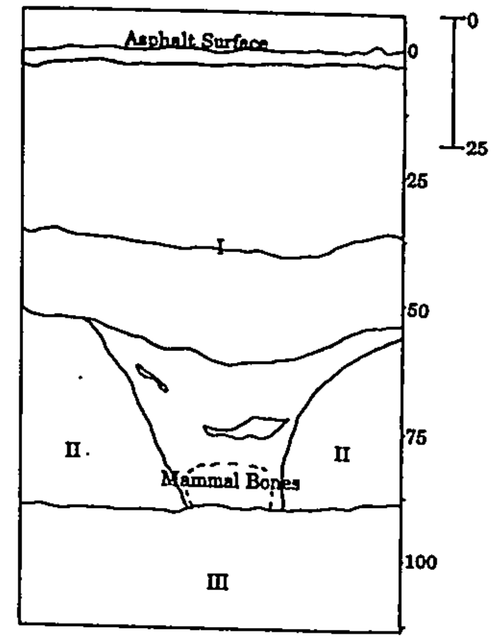
Figure 5 Profile Trench 3, Core 2




| TRENCH 4 | | Depth | Description |
|---|---|---|---|
| | Surface: | 0-5cmbs | Asphalt |
| | Stratum I: | 5-50cmbs | Various fill layers including road gravel, crushed coral, and a base of imported 5YR 4/4 reddish brown clay |
| | Stratum II: Marine sand | 50-85cmbs | 10YR 8/6 yellow, poorly sorted, very coarse to fine marine sand with subangular coral fragments; intrusive to Stratum II are organic soil filled features dated to the post contact era as shown by associated metal fragments; small mammal bones also present |
| | Stratum III: Marine sandy clay | 85-200cmbs | 10YR 6/1 gray sandy clay loam with fine to medium sand lenses; horizontal bedding present in 5 to 10 cm thick lenses |
| | Stratum IV: Gleyed sand | 200-300cmbs | 5B 6/1 bluish gray, well sorted, very fine sand with silt. Contains marine shells |
| | Base of excavation: | 300 cmbs | Gleyed sand |

Figure 6 Profile Trench 4, Core 3

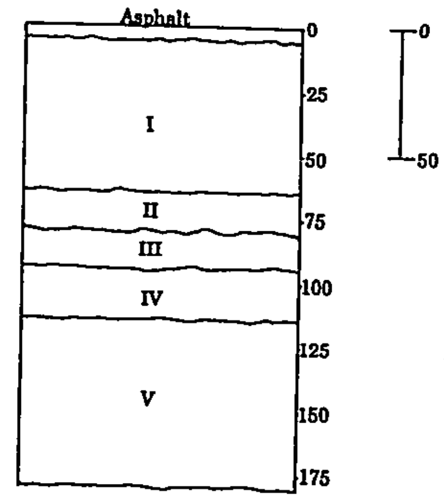





| TRENCH 4 | | Depth | Description |
|---|---|---|---|
| | Surface: | 0-5cmbs | Asphalt |
| | Stratum I: | 5-50cmbs | Various fill layers including road gravel, crushed coral, and a base of imported 5YR 4/4 reddish brown clay |
| | Stratum II: Marine sand | 50-85cmbs | 10YR 8/6 yellow, poorly sorted, very coarse to fine marine sand with subangular coral fragments |
| | Feature: | 55-85cmbs | 10YR 3/3 dark brown with pockets of 10YR 6/3 pale brown sandy loam, medium to small mammal skeleton at base of feature |
| | Stratum III: Marine sandy clay | 85-200cmbs | 10YR 6/1 gray sandy clay loam with fine to medium sand lenses; horizontal bedding present in 5 to 10 cm thick lenses |

Base of excavation: Not displayed on this profile (see Fig. 6)

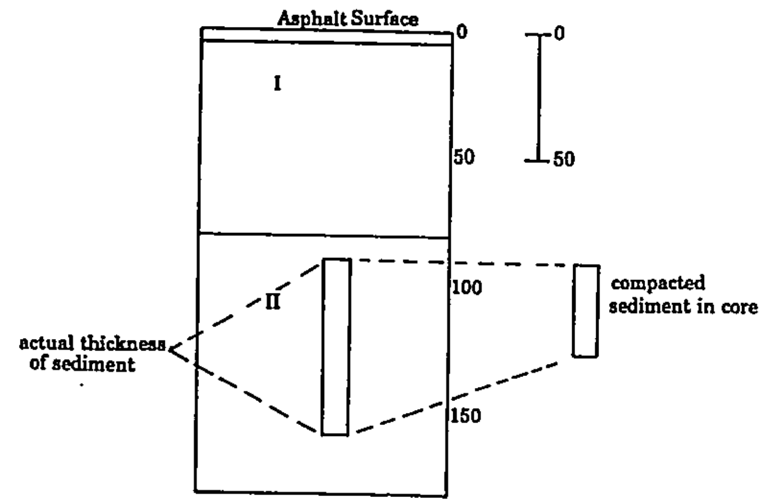
Figure 7 Profile Trench 4, South of Southeast Face, Displaying Feature with mammal bones




| TRENCH 5 | | Depth | Description |
|---|---|---|---|
| | **Surface:** | 0-5cmbs | Asphalt |
| | **Stratum I:** Fill | 5-65cmbs | Various fill layers including road gravel, crushed coral, and a base of imported 5YR 4/4 reddish brown clay |
| | **Stratum II:** Dredged marine sediment | 65-80cmbs | 10YR 7/6 yellow to 10YR 7/1 light gray fine sandy clay; possible dredged material from the Ala Wai Canal |
| | **Stratum III:** Dredged marine sediment | 80-95cmbs | 10YR 5/2 grayish brown sandy clay; top 5 cm. contains 10YR 2/1 historic/modern burning slag |
| | **Stratum IV:** Marine sand | 95-115cmbs | 10YR 8/6 yellow, poorly sorted, very coarse to fine sand |
| | **Stratum V:** Marine sand | 115-180cmbs | 5B 6/1 bluish gray, well sorted, very fine loamy sand |
| | **Base of excavation:** | 180cmbs | Coral hardpan |

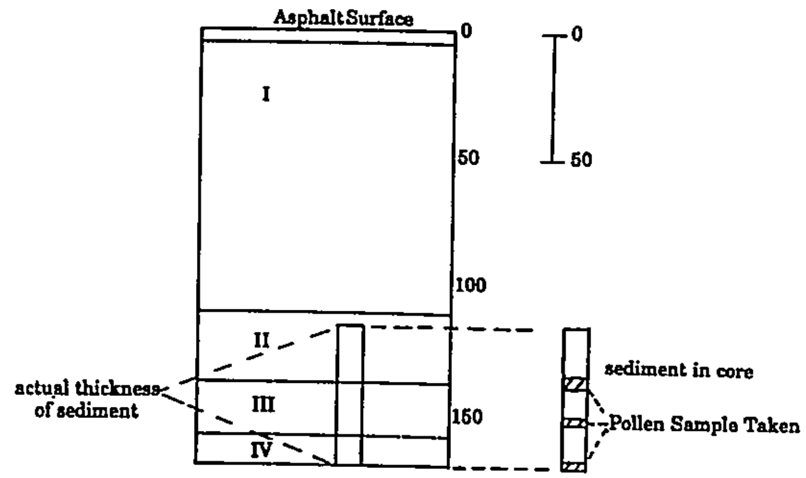
Figure 8 Profile Trench 5






| TRENCH 6 | | Depth | Description |
|---|---|---|---|
| | **Surface:** | 0-5cmbs | Asphalt |
| | **Stratum I:** Fill | 5-80cmbs | 10YR 7/2 light gray crushed coral fill |
| | **Stratum II:** Marine sand | 80-180cmbs | 5Y 4/1 dark gray clay with 2 to 3% coarse sand present |
| | **Base of excavation:** | 180 cmbs | Coral hardpan |

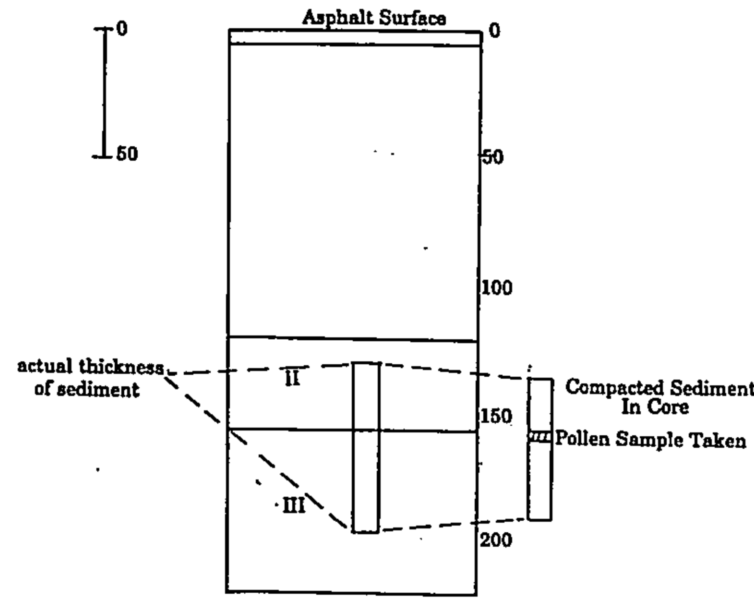
Figure 9 Profile Trench 6, Core 4




| TRENCH 7 | | Depth | Description |
|---|---|---|---|
| | Surface: | 0-5cmbs | Asphalt |
| | Stratum I: Fill | 5-110cmbs | 10YR 8/2 pale brown crushed coral fill |
| | Stratum II: Dredged Marine sediment | 110-137cmbs | 5Y 7/1 light gray grades downward from sandy clay to clay; well sorted dredged fill from the Ala Wai Canal; vegetative material present at base of Stratum II |
| | Stratum III: Kūwili Pond sediment? | 137-157cmbs | N6 gray loamy sand; grades from coarse sand at top to very fine loamy sand at base; probable pond sediment |
| | Stratum IV: Marine clay | 157-170cmbs | 5GY 4/1 dark greenish gray clay with a high organic content |
| | Base of excavation: | 170cmbs | Coral hardpan |

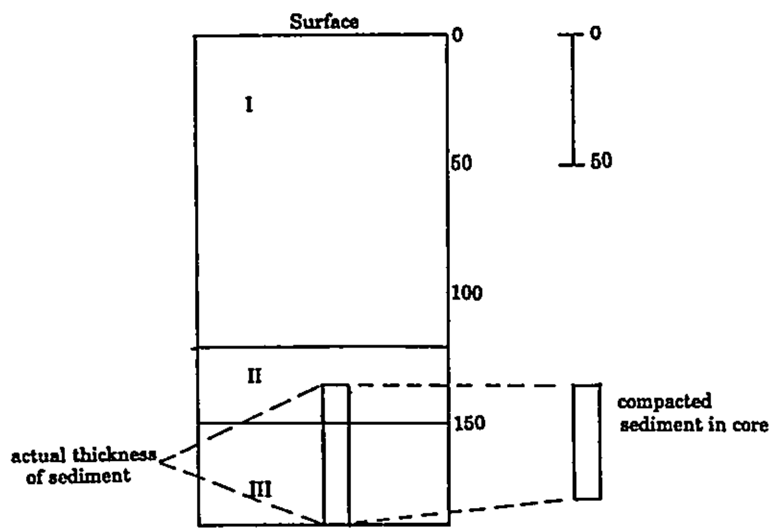
Figure 10 Profile Trench 7, Core 5






| TRENCH 8 | | Depth | Description |
|---|---|---|---|
| | Surface: | 0-6cmbs | Asphalt |
| | Stratum I: Fill | 6-120cmbs | 10YR 7/2 light gray crushed coral fill |
| | Stratum II: Marine clay | 120-155cmbs | 2.5Y 4/4 olive brown gleyed clay with 2 to 3% coarse sand inclusions and numerous small land snails; small mammal bones were also present |
| | Stratum III: Marine clay | 155-220cmbs | 5GY 4/1 dark greenish gray clay with 2 to 3% coarse sand inclusions and marine shells present |
| | Base of excavation: | 220cmbs | Coral hardpan |

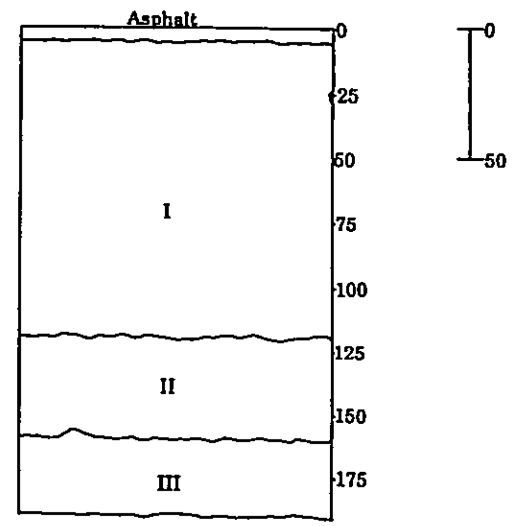
Figure 11 Profile Trench 8, Core 6




| | | Depth | Description |
|---|---|---|---|
| TRENCH 9 | Stratum I: Fill | 0-120cmbs | 10YR 7/1 light gray crushed coral fill |
| | Stratum II: Marine clay | 120-150cmbs | 2.5Y N4 to 5/2 dark gray to grayish brown gleyed clay with 5 to 10% sand and shell component |
| | Stratum III: Marine clay | 150-190cmbs | 5GY 4/1 gleyed clay with 5 to 10% sand and marine shell component; bird bones also present |
| | Base of excavation: | 190cmbs | Coral hardpan |

Figure 12 Profile Trench 9, Core 7






| | | Depth | Description |
|---|---|---|---|
| TRENCH 10 | Surface: | 0-5cmbs | Asphalt |
| | Stratum I: Fill | 5-120cmbs | 10YR 7/1 light gray crushed coral fill |
| | Stratum II: Marine clay | 120-160cmbs | 5GY 6/1 to 5Y6/1 light gray gleyed sandy clay |
| | Stratum III: Marine clay | 160-190cmbs | 5G 4/1 to 5GY 4/1 dark gray gleyed silty clay |
| | Base of excavation: | 190cmbs | Coral hardpan |

Figure 13 Profile Trench 10

*APPENDIX E*

*AIR QUALITY IMPACT REPORT*

*Environmental Management Consultant*
*J. W. Morrow*

*Hawai'i Convention Center*

# AIR QUALITY IMPACT REPORT

## HAWAI'I CONVENTION CENTER

27 June 1995
(Revised)

PREPARED FOR:

Wilson Okamoto & Associates, Inc.

and

Nordic/PCL - A Joint Venture

PREPARED BY:

J. W. MORROW
Environmental Management Consultant
1481 South King Street, Suite 548
Honolulu, Hawaii 96814



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## 1. INTRODUCTION

Nordic/PCL - A Joint Venture, was selected to construct Hawaii's first convention center at the edge of Waikiki on the island of Oahu (Figure 1). The site, formerly occupied by the Aloha Motors automobile dealership, is located at the corner of Kapiolani Boulevard and Kalakaua Avenue and is now vacant (Figure 2).

Based on program requirements of the State of Hawaii Convention Center Authority, the proposed facility will include the following components:

| | Area ($ft^2$) |
|---|---|
| - exhibit halls | 200,000 |
| - meeting rooms | 100,000 |
| - ballroom | 35,000 |
| - lobby/prefunction area | 240,655 |
| - administration areas | 13,500 |
| - VIP/boardroom | 4,600 |
| - support areas | 252,915 |
| - parking (approx. 800 spaces) | 260,000 |
| Total: | 1,106,670 |

The purpose of this report is to assess the impact of the proposed development on air quality on a local and regional scale. The overall project can be considered an "indirect source" of air pollution as defined in the federal Clean Air Act [1] since its primary association with air quality is its inherent attraction for mobile sources, i.e., motor vehicles. Much of the focus of this analysis, therefore, is on the project's ability to generate traffic and the resultant impact on air quality. Air quality impact was evaluated for existing (1994) and future (1998) conditions.

A project such as this also has offsite impacts due to increased demand for electrical energy which must be met by the combustion of some type of fuel. This combustion process results in pollutant emissions to the air which have been addressed in the report.





FIGURE 1

PROJECT LOCATION

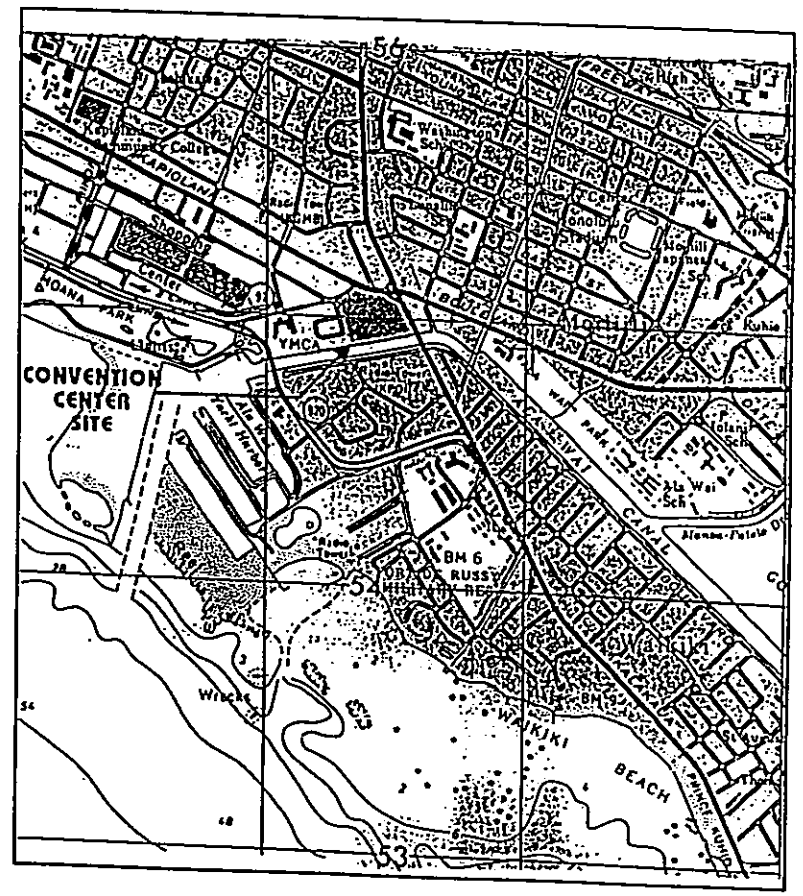
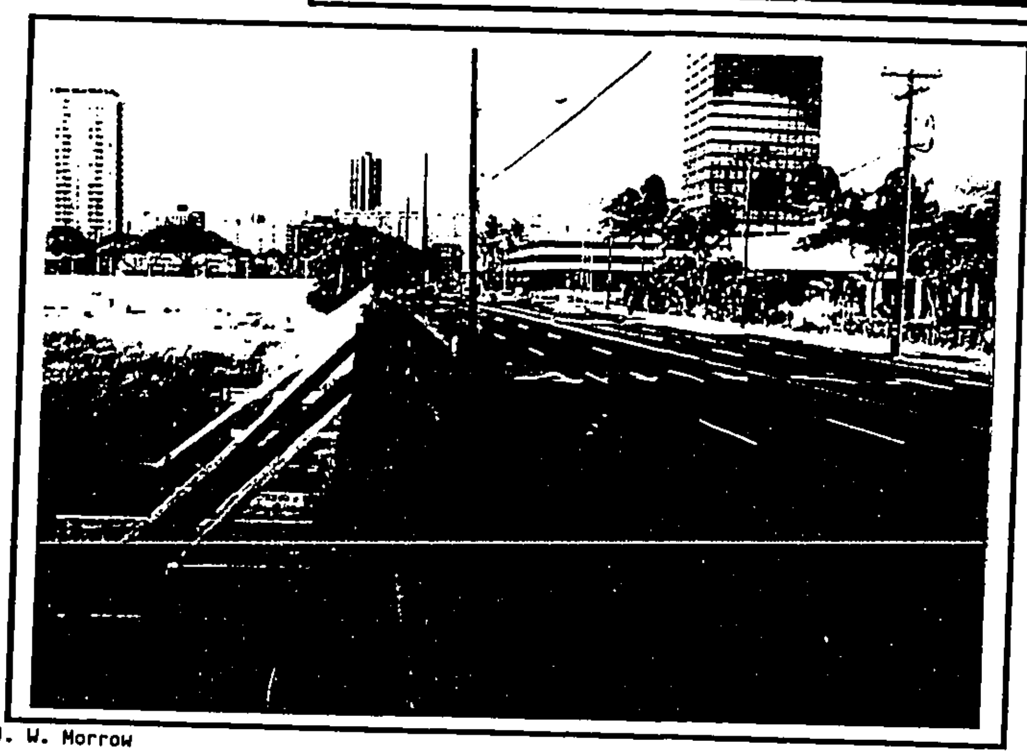


FIGURE 2

EXISTING SITE CONDITIONS
DECEMBER 1994

**Facing west across the currently vacant project site**



**Facing northwest along the Kalakaua Avenue property line**

J. W. Morrow

Finally, during construction of the various buildings and facilities, air pollutant emissions will be generated onsite and offsite due to vehicular movement, grading, concrete and asphalt batching, and general dust-generating construction activities. These impacts have also been addressed.

## 2. AIR QUALITY STANDARDS

A summary of State of Hawaii and national ambient air quality standards is presented in Table 1 [2, 3]. Note that Hawaii's standards are not divided into primary and secondary standards as are the federal standards.

Primary standards are intended to protect public health with an adequate margin of safety while secondary standards are intended to protect public welfare through the prevention of damage to soils, water, vegetation, man-made materials, animals, wildlife, visibility, climate, and economic values [4].

Some of Hawaii's standards (CO, $NO_2$, and $O_3$) are clearly more stringent than their federal counterparts but, like their federal counterparts, may be exceeded once per year. It should also be noted that in November 1993, the Governor signed amendments to Chapter 59, Ambient Air Quality Standards [3], adopting the federal standard for particulate matter equal to or less than 10 microns in diameter ($PM_{10}$). Since measurement data in Hawaii indicate that $PM_{10}$ comprises about 50% of total suspended particulate matter (TSP), the adoption of that federal standard with a numerical value equal to the original state TSP standard of 150 $\mu g/m^3$ represents a substantial relaxation of the standard (approximately doubling it).

In the case of the automotive pollutants [carbon monoxide (CO), oxides of nitrogen (NOx), and photochemical oxidants (Ox)], there are only primary standards. Until 1983, there was also a hydrocarbons standard which was based on the precursor role hydrocarbons play in the formation of photochemical oxidants rather than any unique toxicological effect they had at ambient levels. The hydrocarbons standard was formally eliminated in January, 1983 [5].

The U.S. Environmental Protection Agency (EPA) is mandated by Congress to periodically review and re-evaluate the federal standards in light of new research findings [1]. The last review resulted in the relaxation of the oxidant standard from 160 to 235 micrograms/cubic meter (ug/m$^3$) [6]. The carbon monoxide (CO), particulate matter, sulfur dioxide ($SO_2$), and nitrogen dioxide ($NO_2$) standards have been reviewed, but no new standards were proposed.





TABLE 1

SUMMARY OF STATE OF HAWAII AND FEDERAL AMBIENT AIR QUALITY STANDARDS

| POLLUTANT | SAMPLING PERIOD | NAAQS PRIMARY | NAAQS SECONDARY | STATE STANDARDS |
|---|---|---|---|---|
| $PM_{10}$ | Annual | 50 | 50 | 50 |
| | 24-hr | 150 | 150 | 150 |
| $SO_2$ | Annual | 80 | --- | 80 |
| | 24-hr | 365 | --- | 365 |
| | 3-hr | --- | 1,300 | 1,300 |
| $NO_2$ | Annual | 100 | --- | 70 |
| CO | 8-hr | 10 | --- | 5 |
| | 1-hr | 40 | --- | 10 |
| $O_3$ | 1-hr | 235 | --- | 100 |
| $H_2S$ | 1-hr | --- | --- | 35 |
| Pb | Calendar Quarter | 1.5 | --- | 1.5 |

KEY:
- $PM_{10}$ - particulate matter < 10 microns
- $SO_2$ - sulfur dioxide
- $NO_2$ - nitrogen dioxide
- CO - carbon monoxide
- $O_3$ - ozone
- Pb - lead

All concentrations in micrograms per cubic meter ($\mu g/m^3$) except CO which is in milligrams per cubic meter ($mg/m^3$).

Finally, the State of Hawaii also has fugitive dust regulations for particulate matter (PM) emanating from construction activities [7]. There simply can be no visible emissions from fugitive dust sources.

## 3. EXISTING AIR QUALITY

3.1 General. The State Department of Health (DOH) maintains a limited network of air monitoring stations around the state to gather data on the following regulated pollutants:

- particulate matter ≤ 10 microns ($PM_{10}$)
- total suspended particulate matter (TSP)
- sulfur dioxide ($SO_2$)
- carbon monoxide (CO)
- ozone ($O_3$)

In the case of $PM_{10}$ and $SO_2$, measurements are made on a 24-hour basis to correspond with the averaging period specified in State and Federal standards. Samples are collected once every six days in accordance with U.S. Environmental Protection Agency (EPA) guidelines. Carbon monoxide and ozone, however, are measured on a continuous basis due to their short-term (1-hour) standards. Lead concentrations are determined from the TSP samples which are sent to an EPA laboratory for analysis. It should also be noted that the majority of these pollutants are monitored only in Honolulu.

3.2 Department of Health Monitoring. There are no permanent air monitoring stations in the immediate vicinity of the project site except for a CO monitoring instrument in Waikiki. A summary of the most recent published air quality data from the nearest stations is presented in Table 2.

3.4 Onsite Carbon Monoxide Sampling. In conjunction with this study, air sampling was conducted in November and December 1994, in the vicinity of the project site. In each case the sampling site was within 10 meters of the road edge. A continuous carbon monoxide (CO) instrument was set up and operated during the a.m. and p.m. peak traffic hours. An anemometer and vane were installed to record onsite surface winds during the sampling. A simultaneous manual count of traffic was also performed. The variability of each of the parameters measured during the peak hours is clearly seen in Figures 3 - 6.





TABLE 2

AIR QUALITY DATA
DEPARTMENT OF HEALTH MONITORING SITES
1988 - 1990

| POLLUTANT | Concentration ($\mu g/m^3$) | | |
|---|---|---|---|
| | 1988 | 1989 | 1990 |
| Total suspended particulate matter (TSP) | 15 - 45<br>26 | 16 - 48<br>29 | 13 - 47<br>30 |
| Particulate matter < 10 microns ($PM_{10}$) | 9 - 25<br>17 | 10 - 33<br>16 | 8 - 36<br>15 |
| Sulfur dioxide ($SO_2$) | <5 - <5<br><5 | <5 - 8<br><5 | <5 - <5<br><5 |
| Carbon monoxide (CO) DOH Bldg: | 0.2 - 10.3<br>1.7 | 0.3 - 9.7<br>1.9 | 0.1 - 7.1<br>1.5 |
| Waikiki: | 0.3 - 7.3<br>2.6 | 0.8 - 9.0<br>2.9 | 0.6 - 11.7<br>2.1 |
| Ozone ($O_3$) | 0 - 92<br>14 | 0 - 94<br>15 | 4 - 116<br>36 |
| Lead (Pb) | 0 - 0.1<br>0 | 0 - 0.1<br>0 | 0 - 0<br>0 |

Notes:
1. Values indicate range and annual mean.
2. TSP, $SO_2$, and Pb are from the DOH building.
3. CO values are $mg/m^3$.
4. $PM_{10}$ data are from the Liliha site.
5. $O_3$ data are from the Sand Island site.

Onsite weather conditions during the morning of 14 November 1994 were light easterly winds with a neutral atmosphere. Total traffic counted through the intersection was about 4% lower than the peak hour values reported in the latest traffic assessment [8]. CO concentrations measured on the Ewa side of Atkinson Drive at Kapiolani Boulevard were of the same order of magnitude as the historical Waikiki data (Table 2) and somewhat lower than the "worst case" computor-predicted concentrations discussed later in this report.

FIGURE 3

A.M. PEAK HOUR CONDITIONS
ATKINSON DRIVE @ KAPIOLANI BOULEVARD
14 NOVEMBER 1994

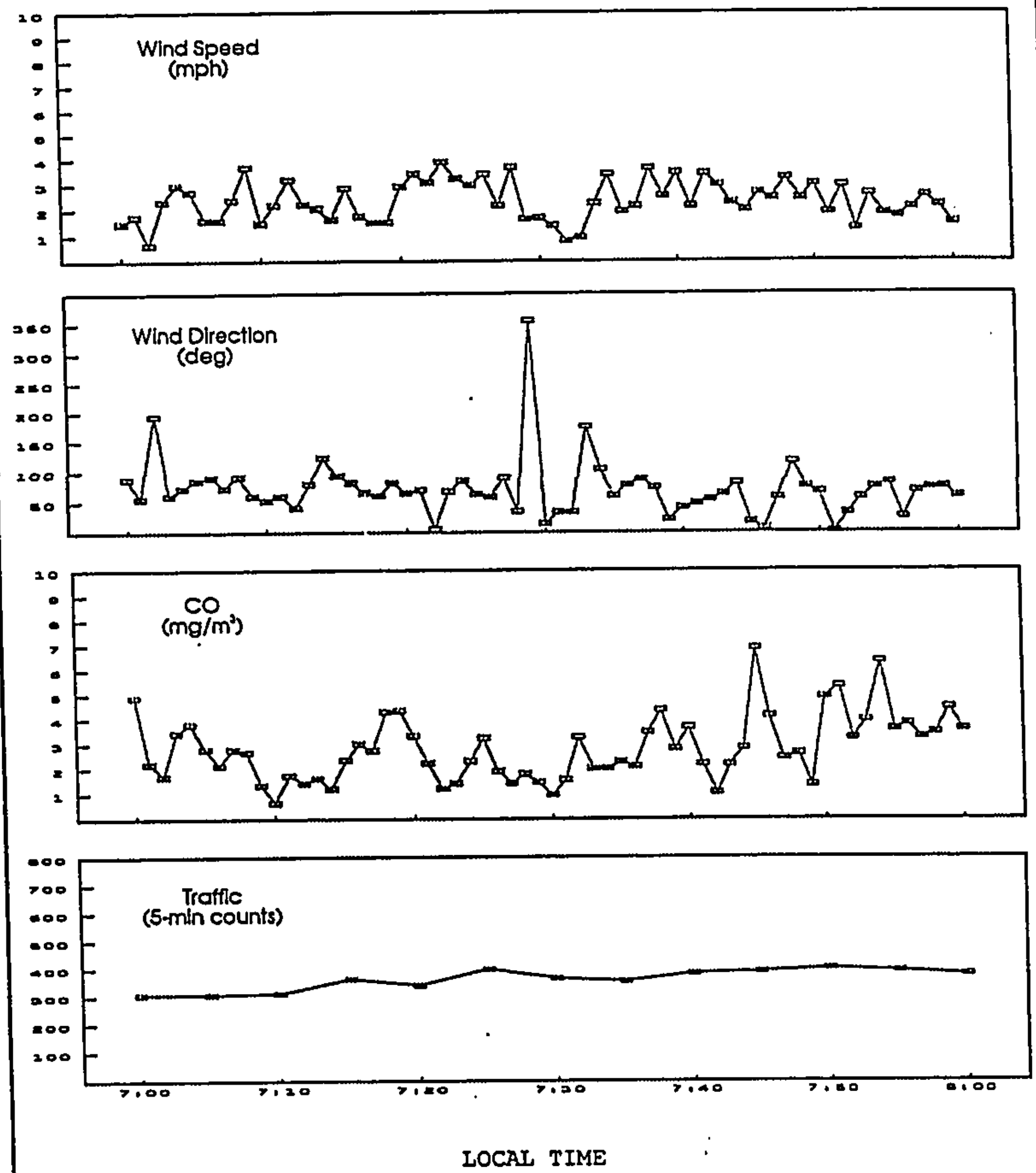



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FIGURE 4

P.M. PEAK HOUR CONDITIONS
ATKINSON DRIVE @ KAPIOLANI BOULEVARD
14 NOVEMBER 1994

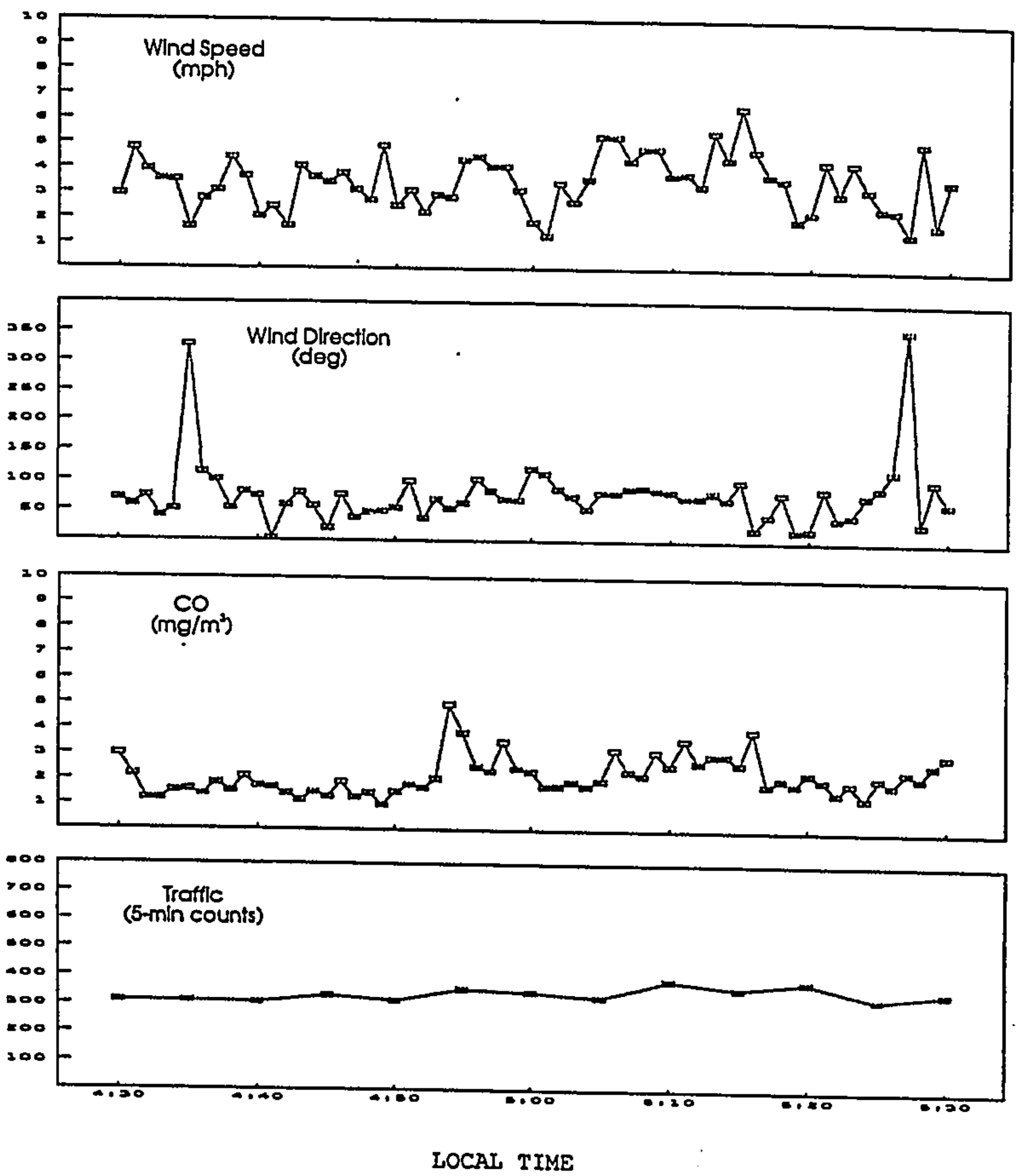

FIGURE 5

A.M. PEAK HOUR CONDITIONS
KAPIOLANI BOULEVARD @ KALAKAUA AVENUE
15 NOVEMBER 1994

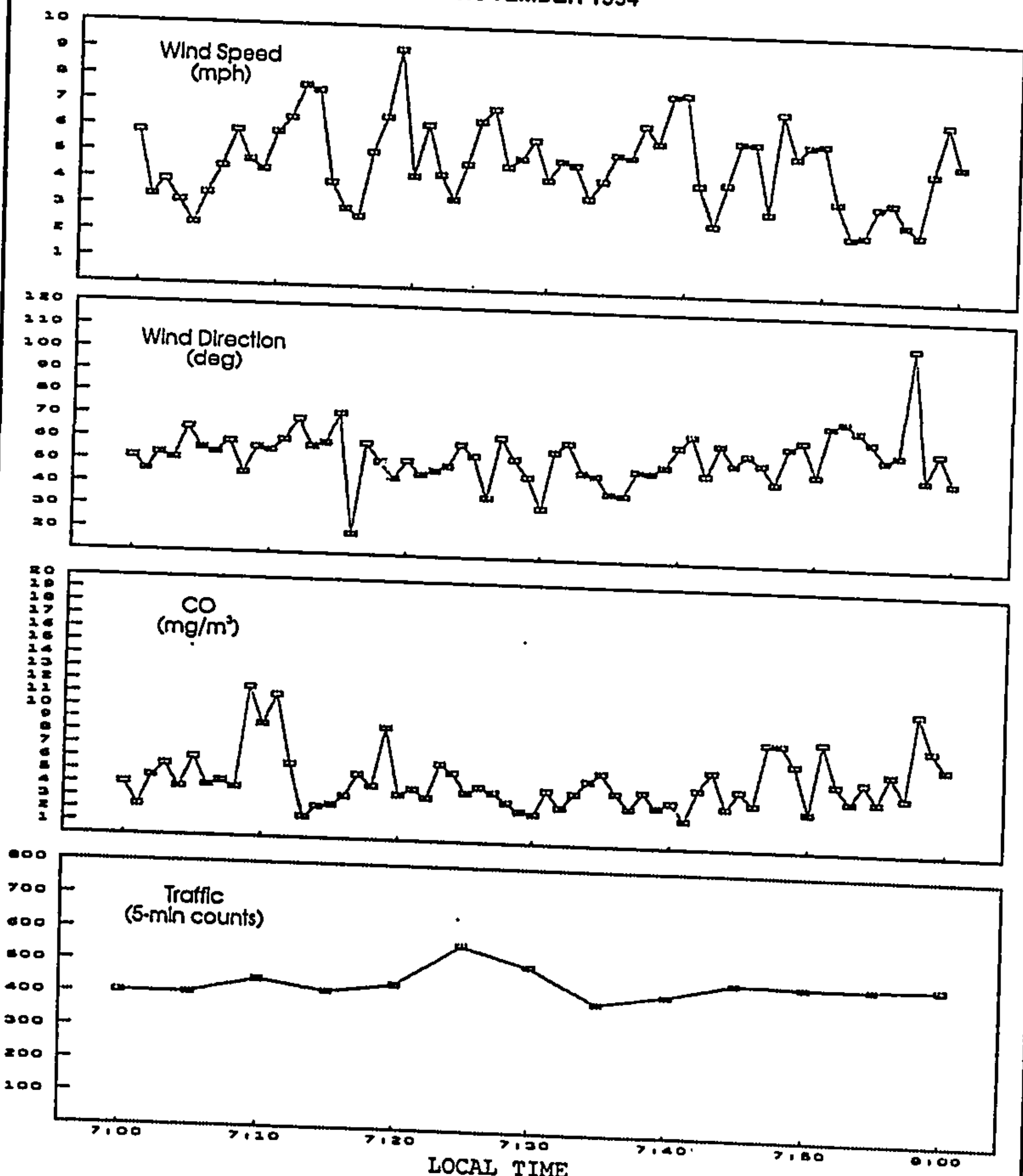


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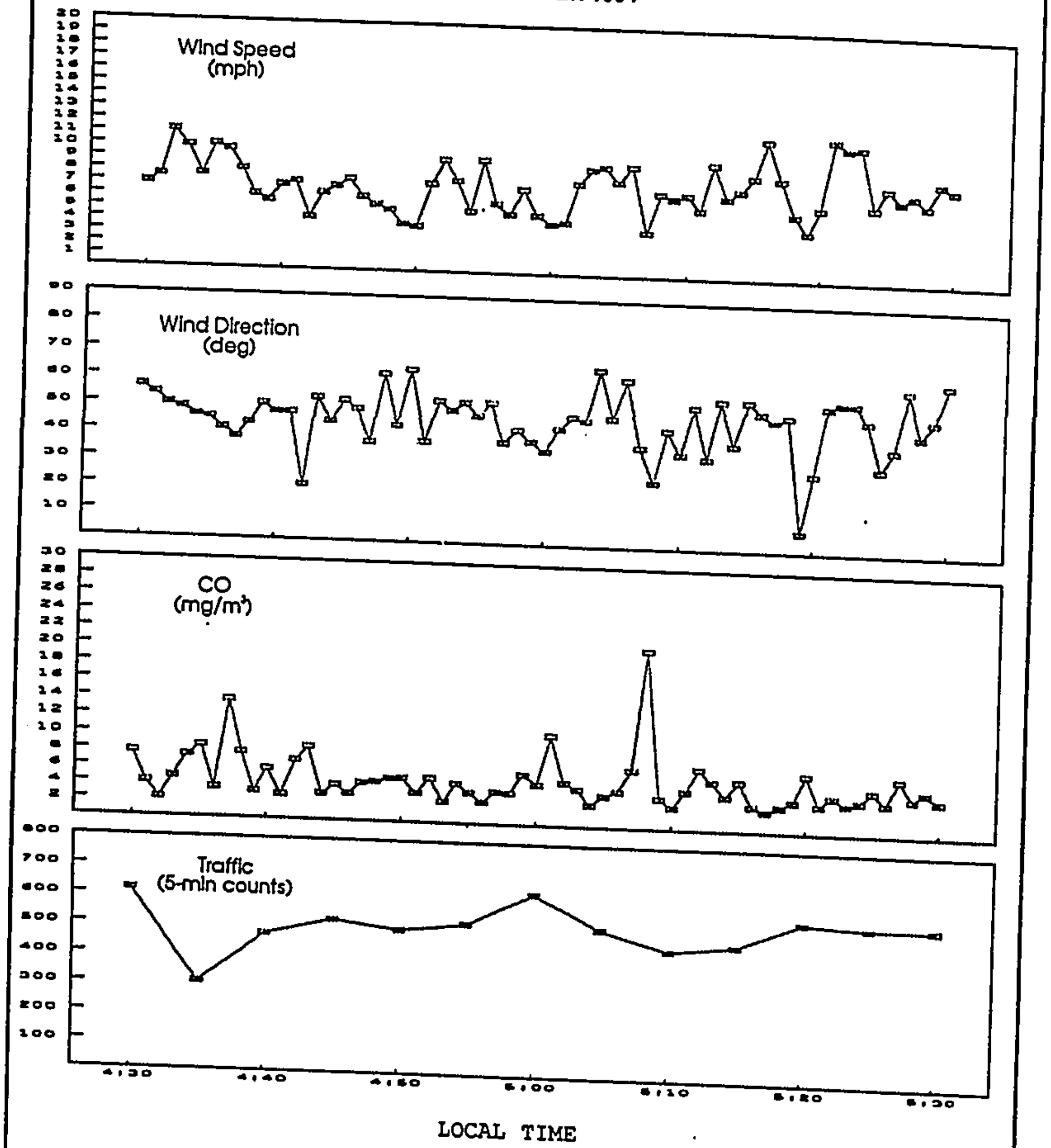
FIGURE 6

P.M. PEAK HOUR CONDITIONS
KAPIOLANI BOULEVARD @ KALAKAUA AVENUE
7 DECEMBER 1994

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On the afternoon of 14 November 1994, winds were slightly higher than they had been in the morning and generally northeasterly in direction. Skies were clear to partly cloud, and atmospheric stability was slightly unstable throughout most of the time. Traffic count at the Atkinson Drive intersection were within 5% of that reported in the traffic assessment [8], and the CO level was again low, i.e., less than 5 $mg/m^3$.

Winds on the morning of 15 November 1994, were northeasterly trades with higher velocities than the preceding day. Traffic level was about 10% lower than the a.m. peak volume predicted for the Kalakaua - Kapiolani intersection in the traffic assessment [8]. The greater traffic volume at this intersection as compared to the Atkinson Drive intersection resulted in slightly higher CO levels even with increased wind velocity.

On the afternoon of 7 December 1994, winds picked up substantially due to a high pressure system north of the islands causing strong northeast trades gusting 30 - 40 mph. CO levels continued within the "normal" range indicated by historical DOH data with a few peaks greater than 10 $mg/m^3$. Measured traffic volume was within 0.01% of that predicted [8].

## 4. CLIMATE AND METEOROLOGY

4.1 Temperature and Rainfall. Temperatures in the project area are expected to be similar to those found elsewhere in Hawaii. The nearest long-term weather station operated by the National Weather Service is located at the Honolulu International Airport. In an annual summary for that station, the National Climatic Center has summarized Honolulu's temperature regime as follows:

> Hawaii's equable temperatures are associated with the small seasonal variation in the amount of energy received from the sun and the tempering effect of the surrounding ocean. The range of temperatures averages only 7 degrees between the warmest months (August and September) and the coolest months (January and February) and about 12 degrees between day and night. Daily maximums run from the high 70's in winter to the mid-80's in summer, and daily minimums from the mid-60's to the low 70's. However, the Honolulu Airport area has recorded as high as 93 degrees and as low as 53 [9].

Historical rainfall data from the Honolulu International Airport indicate an annual average of 23 inches. Based on this average and in accordance with Thornwaite's scheme for climatic classification, the area is considered semi-arid [10].





4.2 Surface Winds. Meteorological data records were reviewed from the nearby Honolulu International Airport and Hickam Air Force Base. The annual prevalence of northeast trade winds is clearly shown in Table 3. A closer examination of the data, however, indicates that low velocities (less than 10 mph) occur frequently and that the "normal" northeasterly trade winds tend to break down in the Fall giving way to more light, variable wind conditions through the Winter and on into early Spring. It is during these times that Honolulu generally experiences elevated pollutant levels. This seasonal difference in wind conditions can be easily contrasted by comparing August and January wind roses (Figures 7 and 8).

Of particular interest from an air pollution standpoint were the stability wind roses prepared for Hickam Air Force Base [11]. These data indicated that stable conditions, i.e., Pasquill-Gifford stability categories E and F [12], occur about 28% of the time on an annual basis and 36% of the time during the peak winter month (January). It is under such conditions that the greatest potential for air pollutant buildup from groundlevel sources, e.g., motor vehicles, exists.

## 5. SHORT-TERM IMPACTS

5.1 Onsite Impacts. The principal source of short-term air quality impact will be construction activity. Construction vehicle activity will increase automotive pollutant concentrations along the existing streets as well as on the project site itself. The additional construction vehicle traffic should not exceed street capacities although the presence of large trucks can reduce a roadway's capacity as well as lower average travel speeds.

The site preparation and earth moving will create particulate emissions as will building and onsite road construction. Construction vehicle movement on unpaved on-site roads will also generate particulate emissions. EPA studies on fugitive dust emissions from construction sites indicate that about 1.2 tons/acre per month of activity may be expected under conditions of medium activity, moderate soil silt content (30%), and a precipitation/evaporation (P/E) index of 50 [10,13].

Previous soils engineering studies conducted by Dames and Moore reported onsite soils composed of fill material, primarily coralline sand and gravel. Such material would have a lower silt content and, thus, less fugitive dust potential than the aforementioned EPA estimate. This would tend to offset the greater dust potential associated with the semi-arid local climate (P/E Index 28.9).

TABLE 3

ANNUAL JOINT FREQUNCY DISTRIBUTION
OF WIND SPEED AND DIRECTION
HONOLULU INTERNATIONAL AIRPORT

| Dir | Wind Speed (mph) | | | | | | |
|---|---|---|---|---|---|---|---|
| deg | 6.2 | 9.0 | 11.6 | 14.4 | 17.0 | ≥17.0 | All |
| 10 | 0.0065 | 0.0038 | 0.0023 | 0.0016 | 0.0009 | 0.0001 | 0.0151 |
| 20 | 0.0082 | 0.0041 | 0.0025 | 0.0023 | 0.0011 | 0.0001 | 0.0183 |
| 30 | 0.0100 | 0.0061 | 0.0051 | 0.0038 | 0.0028 | 0.0007 | 0.0286 |
| 40 | 0.0188 | 0.0157 | 0.0258 | 0.0222 | 0.0174 | 0.0040 | 0.0039 |
| 50 | 0.0268 | 0.0290 | 0.0449 | 0.0385 | 0.0307 | 0.0054 | 0.0752 |
| 60 | 0.0344 | 0.0289 | 0.0436 | 0.0273 | 0.0238 | 0.0041 | 0.0621 |
| 70 | 0.0250 | 0.0181 | 0.0197 | 0.0122 | 0.0096 | 0.0009 | 0.0855 |
| 80 | 0.0113 | 0.0081 | 0.0065 | 0.0039 | 0.0009 | 0.0003 | 0.0310 |
| 90 | 0.0073 | 0.0049 | 0.0040 | 0.0009 | 0.0008 | 0.0000 | 0.0179 |
| 100 | 0.0031 | 0.0016 | 0.0014 | 0.0006 | 0.0002 | 0.0000 | 0.0068 |
| 110 | 0.0027 | 0.0019 | 0.0010 | 0.0007 | 0.0005 | 0.0001 | 0.0069 |
| 120 | 0.0027 | 0.0013 | 0.0019 | 0.0009 | 0.0003 | 0.0003 | 0.0075 |
| 130 | 0.0022 | 0.0032 | 0.0018 | 0.0015 | 0.0007 | 0.0002 | 0.0096 |
| 140 | 0.0034 | 0.0033 | 0.0039 | 0.0018 | 0.0011 | 0.0006 | 0.0141 |
| 150 | 0.0022 | 0.0030 | 0.0019 | 0.0003 | 0.0002 | 0.0005 | 0.0081 |
| 160 | 0.0024 | 0.0033 | 0.0023 | 0.0010 | 0.0005 | 0.0000 | 0.0094 |
| 170 | 0.0031 | 0.0046 | 0.0023 | 0.0007 | 0.0003 | 0.0000 | 0.0109 |
| 180 | 0.0055 | 0.0042 | 0.0018 | 0.0008 | 0.0005 | 0.0000 | 0.0128 |
| 190 | 0.0065 | 0.0038 | 0.0013 | 0.0002 | 0.0000 | 0.0000 | 0.0117 |
| 200 | 0.0057 | 0.0032 | 0.0011 | 0.0001 | 0.0000 | 0.0000 | 0.0101 |
| 210 | 0.0076 | 0.0038 | 0.0016 | 0.0001 | 0.0000 | 0.0000 | 0.0131 |
| 220 | 0.0083 | 0.0077 | 0.0016 | 0.0001 | 0.0001 | 0.0000 | 0.0179 |
| 230 | 0.0076 | 0.0049 | 0.0014 | 0.0001 | 0.0001 | 0.0000 | 0.0141 |
| 240 | 0.0042 | 0.0016 | 0.0013 | 0.0000 | 0.0000 | 0.0000 | 0.0071 |
| 250 | 0.0040 | 0.0010 | 0.0003 | 0.0000 | 0.0000 | 0.0000 | 0.0054 |
| 260 | 0.0064 | 0.0023 | 0.0005 | 0.0000 | 0.0000 | 0.0000 | 0.0091 |
| 270 | 0.0065 | 0.0010 | 0.0005 | 0.0002 | 0.0000 | 0.0000 | 0.0082 |
| 280 | 0.0099 | 0.0005 | 0.0002 | 0.0000 | 0.0000 | 0.0000 | 0.0106 |
| 290 | 0.0123 | 0.0003 | 0.0002 | 0.0001 | 0.0000 | 0.0000 | 0.0130 |
| 300 | 0.0167 | 0.0018 | 0.0011 | 0.0000 | 0.0000 | 0.0000 | 0.0197 |
| 310 | 0.0235 | 0.0022 | 0.0015 | 0.0001 | 0.0000 | 0.0000 | 0.0272 |
| 320 | 0.0200 | 0.0022 | 0.0013 | 0.0006 | 0.0001 | 0.0000 | 0.0241 |
| 330 | 0.0121 | 0.0023 | 0.0011 | 0.0005 | 0.0000 | 0.0000 | 0.0159 |
| 340 | 0.0094 | 0.0010 | 0.0003 | 0.0001 | 0.0000 | 0.0000 | 0.0109 |
| 350 | 0.0082 | 0.0025 | 0.0016 | 0.0002 | 0.0000 | 0.0000 | 0.0125 |
| 360 | 0.0093 | 0.0027 | 0.0022 | 0.0006 | 0.0005 | 0.0001 | 0.0154 |
| All | 0.3537 | 0.1898 | 0.1917 | 0.1240 | 0.0932 | 0.0174 | 0.9698 |
| | | | | | | Calms: | 0.0302 |

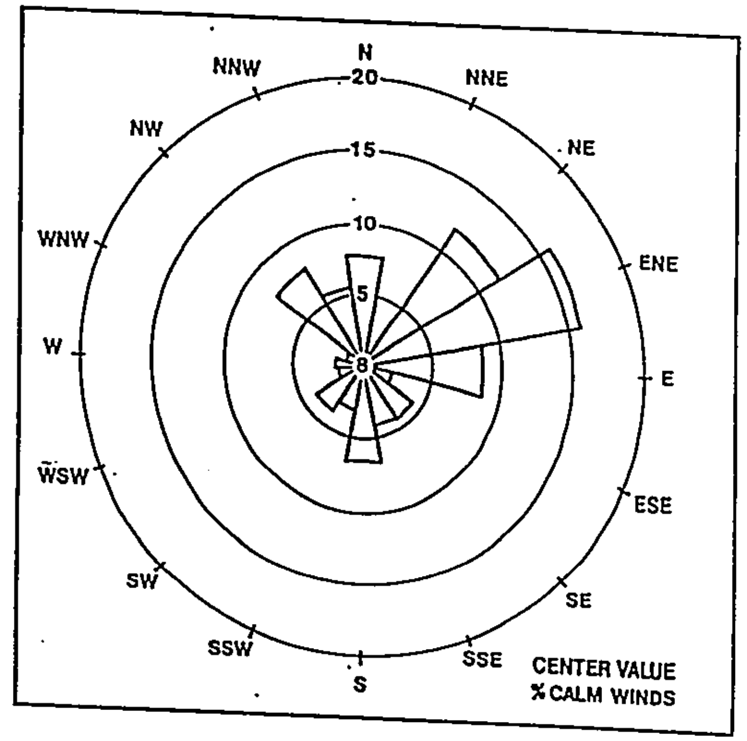
SOURCE: National Weather Service, 1992





FIGURE 7

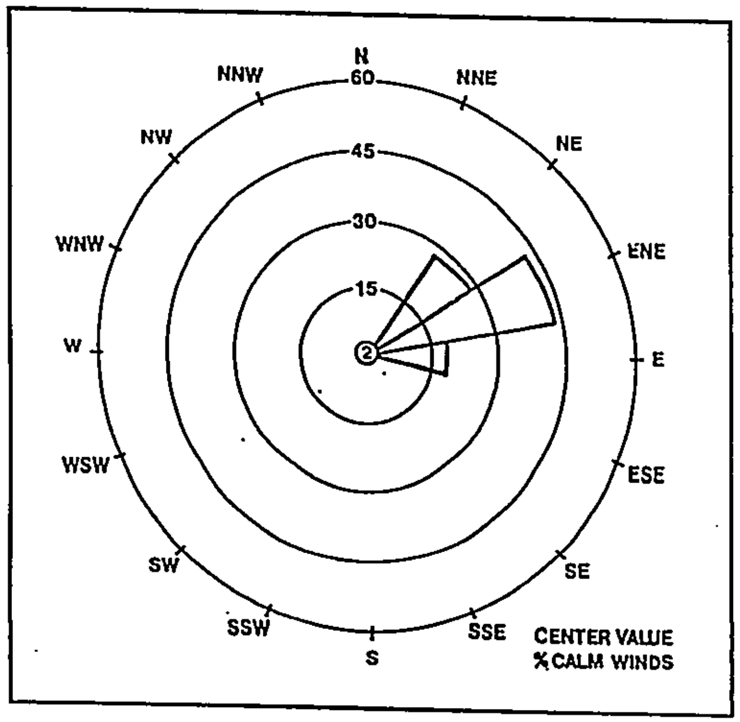
JANUARY WIND ROSE
HONOLULU INTERNATIONAL AIRPORT




SOURCE: National Weather Service
Historical Records, 1940-67

FIGURE 8

AUGUST WIND ROSE
HONOLULU INTERNATIONAL AIRPORT




SOURCE: National Weather Service
Historical Records, 1940-67





5.2 Offsite Impacts. In addition to the onsite impacts attributable to construction activity, there will also be offsite impacts due to the operation of concrete and asphalt batching plants needed for construction. Such plants routinely emit particulate matter and other gaseous pollutants. It is too early, however, to identify the specific facilities that will be providing these materials and thus the discussion of air quality impacts is necessarily generic. The batch plants which will be producing the concrete for foundations, curbing, etc. and the asphalt for roadways must be permitted by the Department of Health Clean Air Branch pursuant to state regulations [7]. In order to obtain these permits they must demonstrate their ability to continuously comply with both emission [7] and ambient air quality [3] standards. Under the recently promulgated federal Title V operating permit requirements [15], now incorporated in Hawaii's rules [7], air pollution sources must regularly attest to their compliance with all applicable requirements.

6. LONG-TERM IMPACTS

6.1 Mobile Sources

6.1.1 Mobile Source Activity. The traffic assessment prepared for the proposed project served as the basis for this mobile source impact analysis [8]. Existing peak-hour traffic volumes and projections for 1998 for the major intersections serving the project area were provided. The existing configuration of the Atkinson Drive and Kalakaua Avenue intersections with Kapiolani Boulevard are depicted in Figures 9 and 10, respectively.

6.1.2 Emission Factors. Automotive emission factors for carbon monoxide (CO) were generated for calendar years 1994 and 1998 using the Mobile Source Emissions Model (MOBILE-5A) [16]. To localize the emission factors as much as possible, the September 1988 age distribution for registered vehicles in the City & County of Honolulu [17] was input in lieu of national statistics. That same age distribution was the basis for the distribution of vehicle miles travelled as well.

6.1.3 Modeling Methodology. Due to the present state-of-the-art in air quality modeling, analyses such as this generally focus on estimating concentrations of non-reactive pollutants. For projects involving mobile sources as the principal source, carbon monoxide is normally selected for modeling because it has a relatively long half-life in the atmosphere (ca. 1 month)[18], and it comprises the largest fraction of automotive emissions.

FIGURE 9

ATKINSON DRIVE AT KAPIOLANI BOULEVARD
DECEMBER 1994

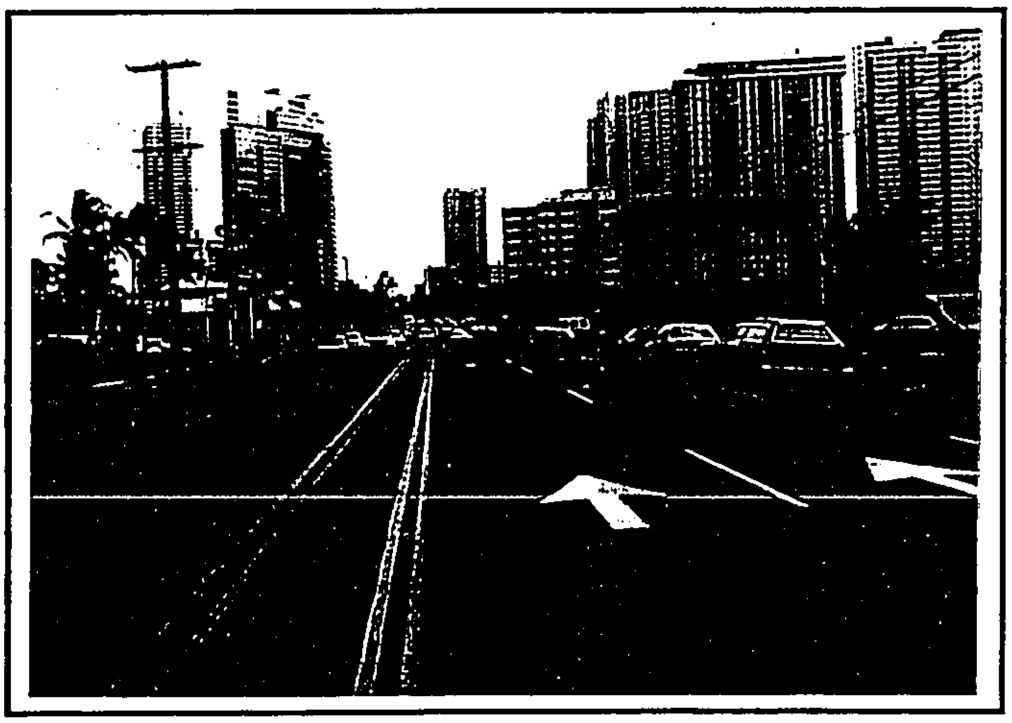
**Atkinson Drive approach to Kapiolani Boulevard facing northeast.**

**Kapiolani Boulevard approach to Atkinson Drive facing southeast.**

FIGURE 10

KALAKAUA AVENUE AT KAPIOLANI BOULEVARD
DECEMBER 1994

**Kapiolani Boulevard approach to Kalakaua Avenue facing east.**



**Kalakaua Avenue approach to Kapiolani Boulevard facing southeast.**

J. W. Morrow

Using the traffic data provided, modeling was performed for the Atkinson Drive and Kalakaua Avenue intersections with Kapiolani Boulevard for 1994 and 1998 (with and without the project). As was the case with the traffic study, two "with project" scenarios were assessed, one with a 10,000-person convention and one with 14,000 attendees.

To ensure a "worst case" analysis, a slightly stable atmosphere (Category "E") [19] was assumed for both morning and afternoon peak hours. A 1 meter per second (m/sec) wind speed was also assumed as worst case meteorological conditions.

The EPA guideline model CAL3QHC [20,21] was employed to estimate near-intersection carbon monoxide concentrations. An array of 48 receptor sites at distances of 10 meters from the road edge were input to the model. Because the area is urbanized with numerous active streets, a background CO concentration of 1.0 milligram per cubic meter ($mg/m^3$) was assumed. The model uses an iterative process to identify the wind direction producing the maximum CO concentration at each receptor location.

6.1.4 Results: 1-Hour Concentrations. The results of this modeling are presented in Figures 11 and 12. Each figure depicts the locations of the 48 receptor sites around the respective intersections. Maximum estimated concentrations in milligrams per cubic meter ($mg/m^3$) for each of the evaluated scenarios are also presented along with the particular receptor location at which they were predicted.

The results suggest that, under worst case conditions of traffic and meteorology, the federal 1-hour CO standard would be met, but the state standard may already be exceeded in close proximity (< 10 meters) to the intersections studied. This was predicted for both a.m. and p.m. peak hours with the former showing substantially higher values.

The trend, however, over the next few years, is a general decline in carbon monoxide (CO) levels despite the growth in traffic. This is due to the effect of the EPA motor vehicle emissions control program. Basically, the projected reduction in emissions from new vehicles and loss by attrition of older vehicles offsets the projected growth in the number of vehicles.

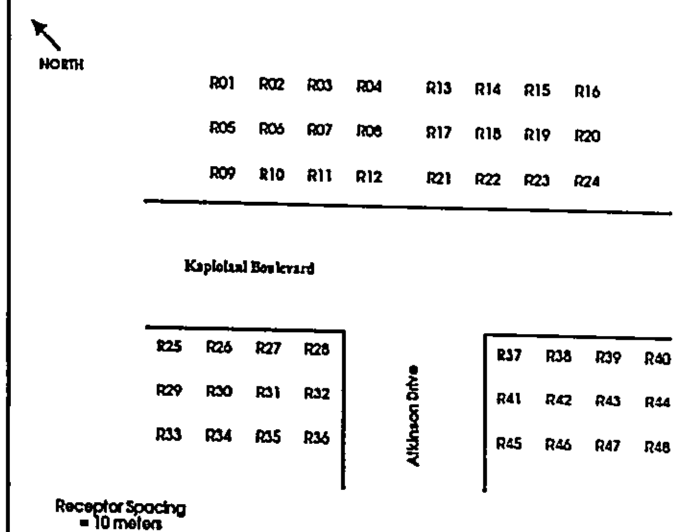
Comparing the "No Project" scenario to the "Project" scenario for 1998, the results suggest that the project contributed on the average 3.4% higher CO levels and varied depending on time of day and convention scenario selected.





FIGURE 11

ESTIMATES OF MAXIMUM 1-HOUR CARBON MONOXIDE CONCENTRATIONS
Atkinson Drive @ Kapiolani Boulevard
Peak Traffic Hours
1994 - 1998

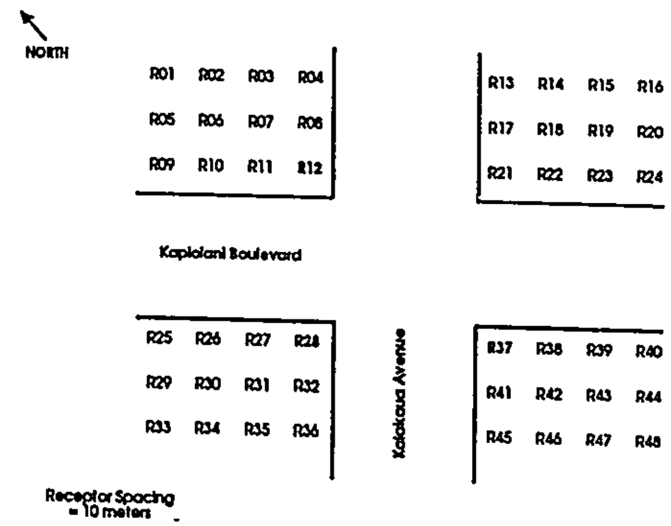



Estimated Maximum Concentrations ($mg/m^3$)

| Period | Existing 1994 | 1998 No Project | 1998 10k Event | 1998 14k Event |
|---|---|---|---|---|
| A.M. | 18.6 R10 | 16.5 R10 | 16.5 R25 | 16.9 R25 |
| P.M. | 10.1 R37 | 9.6 R37 | 10.1 R37 | 10.1 R37 |

FIGURE 12

ESTIMATES OF MAXIMUM 1-HOUR
CARBON MONOXIDE CONCENTRATIONS
Kapiolani Boulevard @ Kalakaua Avenue
Peak Traffic Hours
1994 - 1998




Estimated Maximum Concentrations
($mg/m^3$)

| Period | Existing 1994 | No Project | 1998 10k Event | 14k Event |
|---|---|---|---|---|
| A.M. | 18.4<br>R12 | 17.7<br>R12 | 17.9<br>R12 | 18.1<br>R12 |
| P.M. | 13.0<br>R28 | 12.4<br>R37 | 13.2<br>R28 | 13.6<br>R28 |





6.1.5 Results: 8-Hour Concentrations. Estimates of 8-hour concentrations can be derived by applying a "persistence" factor to the 1-hour concentrations. This "persistence" factor accounts for the fact that the worst case 1-hour meteorology and traffic volumes do not persist for 8 hours. EPA recommends calculation of a persistence factor based on actual 1-hour and 8-hour CO measurements. For the purposes of this study, the most recent available CO data from the Department of Health's Waikiki monitoring station were obtained and used to generate the local 8-hour persistence factor. The following table summarizes the results of applying that factor to the concentration values in Figures 11 and 12.

TABLE 4

ESTIMATED MAXIMUM 8-HOUR
CARBON MONOXIDE CONCENTRATIONS
1994 - 1998

| | 1994 Existing | 1998 No project | 1998 - 10k Convention | 1998 - 14k Convention |
|---|---|---|---|---|
| | Concentrations ($mg/^3$) | | | |
| Atkinson Drive @ Kapiolani Blvd | | | | |
| A.M. | 6.2 | 5.7 | 5.9 | 6.1 |
| P.M. | 4.7 | 4.5 | 4.7 | 4.7 |
| Kapiolani Blvd @ Kalakaua Avenue | | | | |
| A.M. | 7.0 | 6.5 | 6.6 | 6.7 |
| P.M. | 6.1 | 5.8 | 6.2 | 6.3 |

Note: Concentrations based on a 0.47 persistance factor computed from 1993 CO monitoring data.

Under the assumption of "worst case" conditions of meteorology and traffic, there appears to be a potential for exceedance of the State carbon monoxide standard at the Atkinson-Kapiolani and Kapiolani-Kalakaua intersections.

6.1.6 Parking Deck Impacts. The 800-stall parking deck (Level 2) will also be a generator of emissions due to motor vehicle activity. The magnitude of this impact was assessed by treating the deck as an area source and modeling it with EPA's Industrial

Source Complex model [22]. Worst case conditions of meteorology and 100% turnover of parking stalls in one hour were assumed. The model was run with a full year of Honolulu Airport meteorological data (1991) to identify the worst case 1-hour and 8-hour CO concentrations in the area. The 1-hour and 8-hour maxima were 1.6 $mg/m^3$ and 1.2 $mg/m^3$, respectively.

6.1.7 Nitrogen Oxides Impact. The ambient impact of motor-vehicle generated nitrogen oxides (NOx) is not often modeled because of the reactive nature of NOx. The NOx species emitted undergo chemical reactions in the atmosphere, thereby changing their individual concentrations. Only one NOx species, $NO_2$, has an ambient standard and it is an annual, standard whereas traffic is generally assessed on an hourly (peak hour) basis. In large urban areas on the mainland U.S., NOx is of interest because of its active role in the formation of photochemical oxidants which has not been demonstrated to be a problem in Hawaii.

The foregoing notwithstanding, there has been concern expressed about the emissions of NOx associated with the projected increase in diesel vehicles, e.g., buses, in the convention center area. Therefore, we have assessed this impact using a "worst case" methodology which focuses on a 14,000-attendee convention.

Using modal split figures provided by the traffic consultant [23] which indicate that 70% of the arriving visitors will be moved in 122 shuttle bus trips during the a.m. peak hour, we estimated $NO_2$ concentrations at the receptor locations shown in Figure 9. These were selected because of their proximity to the route of the arriving and departing shuttle buses, all of which were assumed to be diesel-powered.

MOBILE-5A was used to generate specific NOx emission factors for the intersection legs with and without the increased number of diesel vehicles. The conversion of NOx to $NO_2$ was accomplished in accordance with the "ozone limiting method" (OLM) [24]. Since estimated NOx levels were higher than historical ozone levels (1990) in Honolulu [25], the total $NO_2$ concentration estimates were based on an ozone - $NO_2$ equivalency plus 10% thermal NOx-to-$NO_2$ conversion as recommended by the OLM. One-hour estimates were based on the highest reported ozone concentration while annual estimates were based on the annual average ozone level. Conversion from 1-hour to annual values was accomplished by applying an EPA-recommended conversion factor of 0.1 [26] to the vehicle-related $NO_2$ before adding it to the background ozone-based $NO_2$. The results are summarized in Table 5. The annual values can be compared to state and federal standards and show compliance. As noted above, there are no 1-hour $NO_2$ standards.





TABLE 5

ESTIMATED $NO_2$ CONCENTRATIONS
(micrograms per cubic meter)

| Scenario | Receptor (Figure 9) | 1-hr | Annual |
|---|---|---|---|
| 1994 Existing | R28 | 168 | 40.2 |
| 1998 w/o Project | R12 | 157 | 39.1 |
| 1998 w/14k Convention | R21 | 168 | 40.2 |

6.2 Electrical Generation Impact. The estimated 26.5 million kilowatt hours (kwhrs) of annual electrical demand by the project will necessitate the generation of electricity by power plants. Currently, most of Oahu's electrical energy is generated by Hawaiian Electric Company's oil-fired plants and Kahe Point and Waiau. These units fire low sulfur (0.5%) fuel oil. The estimated emissions resulting from fuel burned to provide the power needed by the project are presented in Table 6. For comparative purposes, they are also expressed as a percentage of the latest published emissions inventory for Oahu. While that inventory is dated, a more recent inventory would likely show higher emissions due to urban growth on Oahu since 1980 and thus the projected electrical emissions as a percentage of that inventory would then be lower.

A 1,500 kilowatt diesel-fired generator is also being proposed as an emergency backup power source. Its actual operations and thus its emissions would be minimal since, except for emergencies, it would only be tested one to two hours per month. The generator will require a Department of Health permit pursuant to the recently promulgated Chapter 11-60.1 air pollution control regulations. In order to obtain that permit, the applicant will have to demonstrate and certify annually that operation of the generator will comply with all applicable air pollution control requirements and standards.

TABLE 6

ESTIMATES OF ANNUAL EMISSIONS DUE TO ELECTRICAL GENERATION

| Pollutant | Emissions (T/yr) | Percent of 1980 Emissions Inventory |
|---|---|---|
| Sulfur oxides (SOx) | 72.2 | 0.15 |
| Nitrogen oxides (NOx) | 61.6 | 0.15 |
| Particulate matter (PM) | 7.2 | 0.05 |
| Carbon monoxide (CO) | 4.6 | < 0.01 |
| Volatile organic compounds (VOC) | 0.7 | < 0.01 |

## 7. DISCUSSION, CONCLUSIONS AND MITIGATION

7.1 Short-Term Impacts. Since as noted in Section 5, there is a potential for fugitive dust due to the dry climate, it will be important for adequate dust control measures to be employed during the construction period. Dust control will be accomplished through frequent watering of unpaved roads and areas of exposed soil as required. The EPA estimates that twice daily watering can reduce fugitive dust emissions by as much as 50% [13]. The soonest possible landscaping of completed areas will also help.

7.2 Long-Term Impacts.

7.2.1 Mobile Source Impacts. As noted in Section 6, a decline in carbon monoxide (CO) levels near the intersections studied is projected despite traffic growth. Nevertheless, under worst case meteorology during peak traffic hours, there appears to be a potential for exceedance of the State carbon monoxide standards near the Atkinson-Kapiolani and Kapiolani-Kalakaua intersections. Factors which mitigate against this being a matter of serious concern for the proposed project are:

- the predicted exceedances were found only close to the intersection (where people would not be expected to remain for 1 or 8 hours) and only at particular receptor locations, not all close-in receptors; beyond that all standards are met.





- the probability of "worst case" conditions occurring and persisting for 1 to 8 hours is low.
- actual CO monitoring in Waikiki conducted by the DOH in recent years suggests low probability of high CO levels and shows few if any exceedances of the state standards and no exceedances of federal health standards.
- the predicted exceedances occur with or without the project; the project itself caused a mean increase of 3.4% over what was predicted without the project.

7.2.2 Parking Garage Impact. The open second level parking deck will contribute to ambient CO levels in the area but at a relatively low level, i.e., less than 2 mg/m³ to 1-hour or 8-hour levels under worst case conditions. The open, elevated (second level) nature of the parking will allow for sufficient natural ventilation to minimize air quality impacts.

7.2.3 Nitrogen Oxides Impact. Worst case analysis of $NO_2$ concentrations arising from anticipated increased diesel bus activity in the convention center area demonstrated compliance with state and federal ambient air quality standards.

7.2.4 Electrical Generation. The proposed project will increase electrical demand which, in turn, will cause more fuel to be burned and more pollutants to be emitted into Oahu's air. The estimated emissions represent relatively small increases (< 0.2%) over the latest available county emissions inventory. The energy conserving design of the convention center minimizes electrical demand. Maximum use of Hawaii's fine climate in lieu of mechanical air conditioning has been implemented. A building automation system (BAS) with integral energy conservation programs is another key feature. As for HECO's facilities which provide the power, each must continuously demonstrate compliance with all applicable ambient air quality standards and control regulations in order to retain its operating permit.

A proposed emergency generator will have minimal impact due to its limited operation. The applicant must obtain a state operating permit which will require annual certification of compliance with all applicable air pollution control requirments and standards.

## REFERENCES

1. Clean Air Act, 42 U.S.C.A. § 7409 (CAA § 109), National primary and secondary ambient air quality standards.

2. Code of Federal Regulations, Title 40, Protection of Environment, Part 50, National Primary and Secondary Ambient Air Quality Standards.

3. State of Hawaii. Title 11, Administrative Rules, Chapter 59 Ambient Air Quality Standards, as amended, November 1993.

4. Library of Congress, Congressional Research Service. A Legislative History of the Clean Air Amendments of 1970, Volume 1, p. 411, January 1974.

5. U.S. Environmental Protection Agency. National Ambient Air Quality Standards for Hydrocarbons: Final Rulemaking, Federal Register, Volume 48, No. 3, p. 628, January 1983.

6. U.S. Environmental Protection Agency. National Ambient Air Quality Standards for Photochemical Oxidants: Final Rulemaking, Federal Register, Volume 44, No. 28, p. 8202, February 8, 1979

7. State of Hawaii. Title 11, Administrative Rules, Chapter 60.1, Air Pollution Control, November 1993.

8. The Traffic Management Consultant (TMC). Traffic data provided by Mr. Randall S. Okaneku, P.E., 22 Nov 94.

9. U.S. Department of Commerce, National Oceanographic and Atmospheric Administration, National Environmental Satellite, Data and Information Service, National Climatic Center. Local Climatological Data: Annual Summary with Comparative Data, 1982, Honolulu, Hawaii.

10. Thornwaite, C. W. Climates of North America According to a New Classification, Geog. Rev. 21: 633-655, 1931.

11. U.S. Air Force, Environmental Technical Applications Center Report No. 7461: Stability Wind Roses, Hickam AFB, HI, 0000-2400 LST By Boundary Layer Section, 4 Sep 74.





12. U.S. Environmental Protection Agency. Workbook of Atmospheric Dispersion Estimates, AP-26 (Sixth Edition), 1973.

13. U.S. Environmental Protection Agency. Compilation of Air Pollutant Emission Factors, Fourth Edition, with Supplements A-F, 1993.

14. Buckman, H.O. and N.C. Brady. The Nature and Properties of Soils, 6th Edition, 1966.

15. Clean Air Act Amendments of 1990, P.L. 101-549, 15 Nov 90.

16. U.S. Environmental Protection Agency. MOBILE-5A (Mobile Source Emission Factor Model), March 1993.

17. City & County of Honolulu, Department of Data Systems. Age Distribution of Registered Vehicles in the City & County of Honolulu (unpublished report), September 1988.

18. Seinfeld, John H. Air Pollution: Physical and Chemical Fundamentals, p. 69, McGraw-Hill Book Company, 1975

19. U.S. Environmental Protection Agency. Workbook of Atmospheric Dispersion Estimates, AP-26 (Sixth Edition), 1973.

20. U.S. Environmental Protection Agency. Guideline on Air Quality Models (Revised) with Supplements A and B, EPA-450/2-78-027R, July 1986.

21. U.S. Environmental Protection Agency. User's Guide to CAL3QHC Version 2.0: A Modeling Methodology for Predicting Pollutant Concentrations Near Roadway Intersections, EPA-450/R-92-006, November 1992.

22. U.S. Environmental Protection Agency. User's Guide for the Industrial Source Complex (ISC2) Dispersion Models, Volume I, EPA-450/4-92-008a, March 1992.

23. The Traffic Management Consultant (TMC). Modal split assumptions provided by Mr. Randall S. Okaneku, P.E., 28 Nov 94.

24. Cole, H.S. and J. E. Summerhays. A Review of Techniques Available for Estimating Short-Term $NO_2$ Concentrations, J. Air Pol. Con. Assoc., Vol. 29, No. 8, 813-817, August 1979.

25. State of Hawaii, Department of Health. Hawaii Air Quality Data, January 1988 - December 1990.

26. U.S. Environmental Protection Agency. Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised, EPA-454/R-92-019, October 1992.

*APPENDIX F*

*NOISE STUDY*

*Y. Ebisu and Associates*

# NOISE STUDY
# FOR THE
# HAWAI'I CONVENTION CENTER
# HONOLULU, HAWAII

Prepared for:

**WILSON OKAMOTO AND ASSOCIATES, INC.**

Prepared by:

**Y. EBISU & ASSOCIATES**
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**JANUARY 1995**

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## CHAPTER I. SUMMARY

The existing and future traffic noise levels in the vicinity of the proposed Hawai'i Convention Center were evaluated for their potential impact on residents and visitors. The future traffic noise levels along the primary access roadways to the project were calculated for the Year 1998. Along the sections of Kapiolani Boulevard, Atkinson Drive, and Kalakaua Avenue which border the project site, minimal increases in traffic noise of 0.1 to 0.4 Ldn are predicted to occur as a result of the project. Smaller increases in traffic noise are expected to result from the project along Ala Wai Boulevard, the sections of Kapiolani Boulevard east and west of the project site, and the section of Kalakaua Avenue north of the project site. The largest increase in local traffic noise of 1.9 Ldn are expected to occur along Kahakai Drive, primarily due to the relatively low volume of existing traffic on this roadway. However, a net decrease in traffic noise levels at low and mid-rise receptor locations along Kahakai Drive is expected due to the future benefits of noise shielding from the project building, which will reduce the noise contributions from traffic on Kapiolani Boulevard and Kakakaua Avenue.

The project building is expected to provide traffic noise shielding effects for neighboring low and high rise apartments and condominiums in the vicinity of the project site. Reductions in traffic noise levels of 1 to 9 Ldn units are predicted to occur as a result of the beneficial noise shielding effects from the project's building.

The most significant traffic noise sources associated with the proposed project are the large number of buses which will transport visitors to and from the Convention Center during a major convention. Traffic noise levels along the primary bus route (Atkinson Drive to Kapiolani Boulevard to Kalakaua Avenue) between the hotels in Waikiki and the Convention Center, are expected to increase by 4 to 6 dB during the AM peak hour when the concentration of buses is expected to be the greatest.

Unavoidable, but temporary, noise impacts may occur during the construction period. Because noise from construction activities are predicted to be audible and relatively high at adjoining properties, the quality of the acoustic environment may be degraded to unacceptable levels during periods of construction. Mitigation measures to minimize noise and vibration during the site and foundation work at the project site are recommended, particularly where short separation distances between the high intensity noise and vibration sources and the existing residences are expected to occur. Mitigation measures to reduce construction noise to inaudible levels may not be practical in all cases. Where feasible, the use of quiet equipment, large buffer distances to heavy equipment staging areas, noise barriers, and construction curfew periods as required under the State Department of Health (DOH) noise regulations are recommended to minimize construction noise impacts.

Other noise sources emanating from the site, such as fixed mechanical equipment, cars and heavy vehicles in the parking gargage and loading areas, and crowd and public address system noise from assemblies on the Roof Terrace, have the potential for exceeding the State DOH noise limits at adjacent noise sensitive properties. Noise mitigation measures designed to limit the noise levels from these sources to the State DOH limits are recommended for minimizing risks of adverse noise impacts from these sources.

## CHAPTER II. PURPOSE

The objectives of this study were to describe the existing and future noise environment in the vicinity of the proposed Hawai'i Convention Center on the site of the former Aloha Motors facility. Traffic noise level increases and impacts associated with the Convention Center were to be determined within the project site as well as along the public roadways expected to service the project traffic. A specific objective was to determine future traffic noise level increases associated with both project and non-project traffic, and the potential noise impacts associated with these increases. Recommendations for minimizing these noise impacts were also to be provided as required. Assessments of future noise impacts from the proposed Convention Center activities and from temporary construction activities at the project site were also included in the noise study objectives.

It was assumed that the facility would be acoustically designed to comply with local noise regulations, and that automobiles, buses, and trucks traveling to and from the Convention Center would also comply with local vehicular noise limits. Compliance with local noise regulations should minimize risks of adverse noise impacts from mechanical and vehicular noise sources. Therefore, evaluations of special noise mitigation measures associated with potential vehicular and mechanical equipment noise emissions from the project site were not included in this study.

## CHAPTER III. NOISE DESCRIPTORS AND THEIR RELATIONSHIP TO LAND USE COMPATIBILITY

The noise descriptor currently used by federal agencies to assess environmental noise is the Day-Night Average Sound Level (Ldn). This descriptor incorporates a 24-hour average of instantaneous A-Weighted Sound Levels as read on a standard Sound Level Meter. The minimum averaging period for the Ldn descriptor is 24 hours (by definition). Additionally, sound levels which occur during the nighttime hours of 10:00 PM to 7:00 AM are increased by 10 decibels (dB) prior to computing the 24-hour average by the Ldn descriptor. A more complete list of noise descriptors is provided in **APPENDIX B** to this report.

**TABLE 1**, derived from **Reference 1**, presents current federal noise standards and acceptability criteria for residential land uses. Noise levels typical of communities on Oahu are shown in **FIGURE 1**. As a general rule, noise levels of 55 Ldn or less occur in rural areas, or urbanized areas which are shielded from high volume streets. In urbanized areas, Ldn levels generally range from 55 to 65 Ldn, and are usually controlled by motor vehicle traffic noise. Residences which front major roadways are generally exposed to levels of 65 Ldn, and as high as 75 Ldn when the roadway is a high speed freeway. In the Waikiki area, noise levels at lots which front the major roadways are typically above 70 Ldn. Due to noise shielding effects from intervening structures, interior lots are usually exposed to 3 to 10 Ldn lower noise levels than the street frontage lots which are not shielded from the traffic noise.

For the purposes of determining noise acceptability for funding assistance from federal agencies (FHA/HUD and VA), an exterior noise level of 65 Ldn or lower is considered acceptable. This standard is applied nationally (**Reference 2**), including Hawaii. Because of our open-living conditions, the predominant use of naturally ventilated dwellings, and the relatively low exterior-to-

## TABLE 1

## EXTERIOR NOISE EXPOSURE CLASSIFICATION (RESIDENTIAL LAND USE)

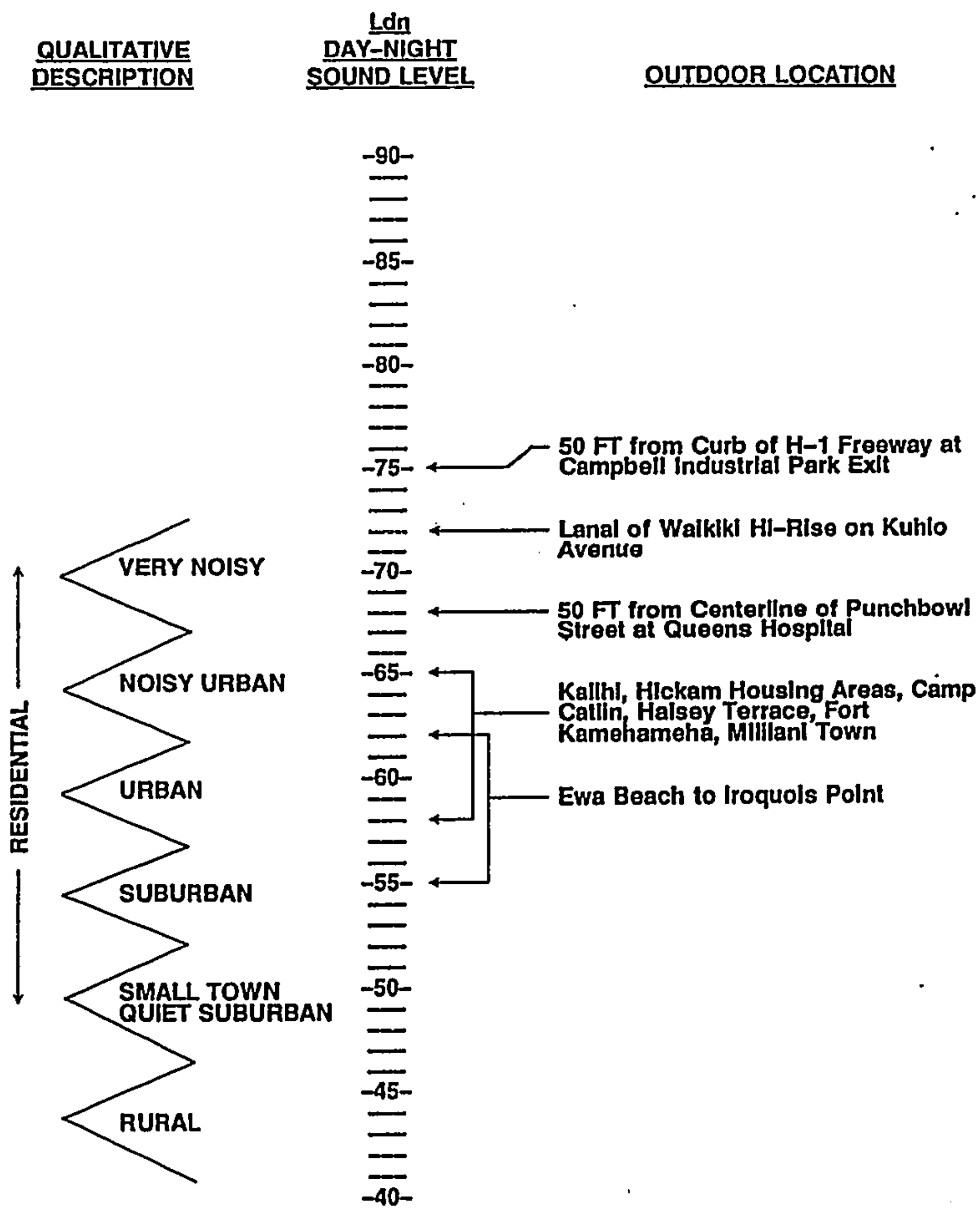
| NOISE EXPOSURE CLASS | DAY-NIGHT SOUND LEVEL | EQUIVALENT SOUND LEVEL | FEDERAL(1) STANDARD |
|---|---|---|---|
| Minimal Exposure | Not Exceeding 55 $L_{dn}$ | Not Exceeding 55 $L_{eq}$ | Unconditionally Acceptable |
| Moderate Exposure | Above 55 $L_{dn}$ But Not Above 65 $L_{dn}$ | Above 55 $L_{eq}$ But Not Above 65 $L_{eq}$ | Acceptable(2) |
| Significant Exposure | Above 65 $L_{dn}$ But Not Above 75 $L_{dn}$ | Above 65 $L_{eq}$ But Not Above 75 $L_{eq}$ | Normally Unacceptable |
| Severe Exposure | Above 75 $L_{dn}$ | Above 75 $L_{eq}$ | Unacceptable |

Notes: (1) Federal Housing Administration, Veterans Administration, Department of Defense, and Department of Transportation.

(2) FHWA uses the $L_{eq}$ instead of the $L_{dn}$ descriptor. For planning purposes, both are equivalent if: (a) heavy trucks do not exceed 10 percent of total traffic flow in vehicles per 24 hours, and (b) traffic between 10:00 PM and 7:00 AM does not exceed 15 percent of average daily traffic flow in vehicles per 24 hours. The noise mitigation threshold used by FHWA for residences is 67 $L_{eq}$.

## FIGURE 1

RANGE OF EXTERIOR BACKGROUND AMBIENT NOISE LEVELS

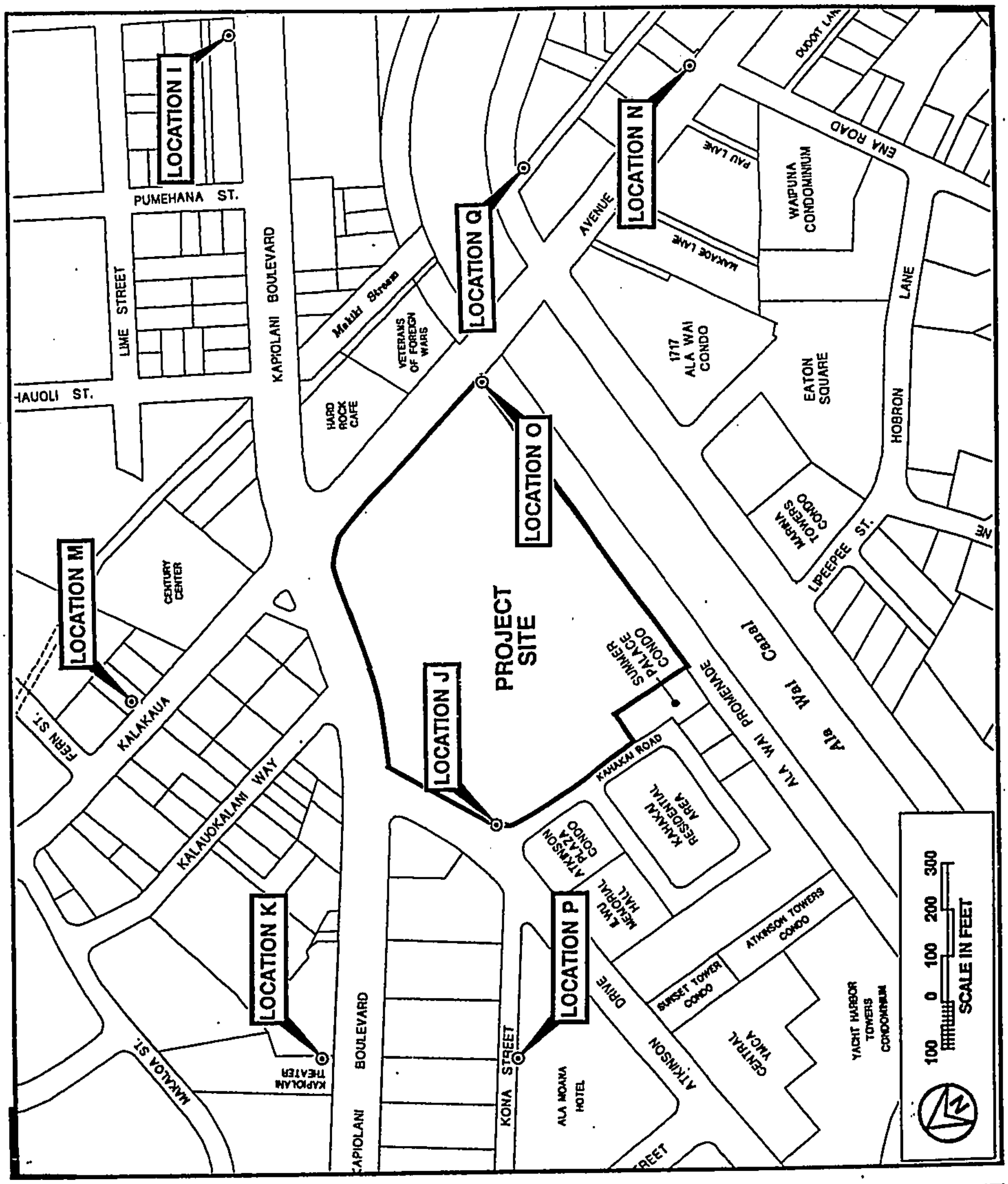


interior sound attenuation afforded by these naturally ventilated structures, an exterior noise level of 65 Ldn does not eliminate all risks of noise impacts. For these reasons, and as recommended in **Reference 3**, a lower level of 55 Ldn is considered as the "Unconditionally Acceptable" (or "Near-Zero Risk") level of exterior noise. However, after considering the cost and feasibility of applying the lower level of 55 Ldn, government agencies such as FHA/HUD and VA have selected 65 Ldn as a more appropriate regulatory standard.

## CHAPTER IV. GENERAL STUDY METHODOLOGY

Existing traffic noise levels were measured at eight locations in the project environs to provide a basis for developing the project's traffic noise contributions along six public roadways which will service the proposed development: Kapiolani Boulevard, Kalakaua Avenue, Atkinson Drive, Ala Wai Boulevard, Kona Street, and Kahakai Drive. The locations of the measurement sites (Sites "I" thru "Q") are shown in **FIGURE 2**. Noise measurements were performed during the month of November 1994, and were performed during both the midday and PM peak traffic hours. The noise measurement results, and their comparisons with computer model predictions of existing traffic noise levels are summarized in **TABLE 2**. The results of the noise measurements were also compared with calculations of existing traffic noise levels to validate the computer model used.

Traffic noise calculations for the existing conditions as well as noise predictions for the Year 1998 following completion of the proposed development were performed using the Federal Highway Administration (FHWA) Noise Prediction Model (**Reference 4**). Traffic data entered into the noise prediction model were: hourly traffic volumes, average vehicle speeds, and estimates of traffic mix. The traffic assignments for the project (**Reference 5**), Hawaii State DOT traffic counts on Kalakaua Avenue (**Reference 6**), and City and County of Honolulu traffic counts at the intersection of Kapiolani Boulevard and Kalakaua Avenue (**Reference 7**), were the primary sources of data inputs to the model. For existing and future traffic without the project, it was assumed that the PM peak hour Leq(h) was 2.7 dB less than the 24-hour Ldn. This assumption was based on computations of the hourly Leq and 24-hour Ldn of traffic noise at the Kapiolani Boulevard/Kalakaua Avenue intersection (see **FIGURE 3**). For future traffic with the project, calculations of the effects of heavy vehicle traffic to and from the Convention Center during the peak and non-peak hours were used




LOCATIONS OF NOISE MEASUREMENT SITES

FIGURE 2

## TABLE 2

### NOISE MEASUREMENT RESULTS
### ( NOVEMBER 1994 )

| LOCATION | Time of Day (HRS) | Ave. Speed (MPH) | --Hourly Traffic Volume-- AUTO | M.TRUCK | H.TRUCK | Measured Leq (dB) | Predicted Leq (dB) |
|---|---|---|---|---|---|---|---|
| I. 50 FT from the center-line of Kapiolani Blvd. (11/7/94). | 1315 TO 1415 | 34 | 2,419 | 15 | 31 | 68.5 | 68.6 |
| J. 60 FT from the center-line of Atkinson Dr. (11/7/94). | 1440 TO 1540 | 34 | 1,396 | 7 | 8 | 64.7 | 64.7 |
| J. 60 FT from the center-line of Atkinson Dr. (11/7/94). | 1620 TO 1720 | 34 | 1,341 | 5 | 7 | 65.0 | 64.4 |
| K. 50 FT from the center-line of Kapiolani Blvd. (11/9/94). | 1010 TO 1110 | 34 | 1,867 | 41 | 46 | 69.1 | 69.2 |
| K. 50 FT from the center-line of Kapiolani Blvd. (11/9/94). | 1630 TO 1730 | 34 | 3,435 | 15 | 26 | 69.6 | 69.2 |
| M. 50 FT from the center-line of Kalakaua Ave. (11/9/94). | 1015 TO 1115 | 34 | 1,703 | 22 | 41 | 68.3 | 68.0 |

## TABLE 2 ( CONTINUED )

## NOISE MEASUREMENT RESULTS
## ( NOVEMBER 1994 )

| LOCATION | Time of Day (HRS) | Ave. Speed (MPH) | --Hourly Traffic Volume-- AUTO | M.TRUCK | H.TRUCK | Measured Leq (dB) | Predicted Leq (dB) |
|---|---|---|---|---|---|---|---|
| M. 50 FT from the center-line of Kalakaua Ave. (11/10/94). | 1645 TO 1745 | 34 | 2,483 | 22 | 41 | 68.6 | 68.7 |
| N. 50 FT from the center-line of Kalakaua Ave. (11/9/94). | 1145 TO 1245 | 34 | 1,979 | 21 | 49 | 67.8 | 68.7 |
| O. 50 FT from the center-line of Kalakaua Ave. (11/9/94). | 1155 TO 1255 | 34 | 2,523 | 49 | 62 | 67.6 * | 69.9 |
| P. 20 FT from the center-line of Kona St. (11/9/94). | 1425 TO 1525 | 25 | 311 | 8 | 3 | 64.7 ** | 59.0 |
| Q. 40 FT from the center-line of Ala Wai Blvd. (11/10/94). | 1455 TO 1555 | 33 | 1,309 | 17 | 9 | 65.1 | 65.3 |

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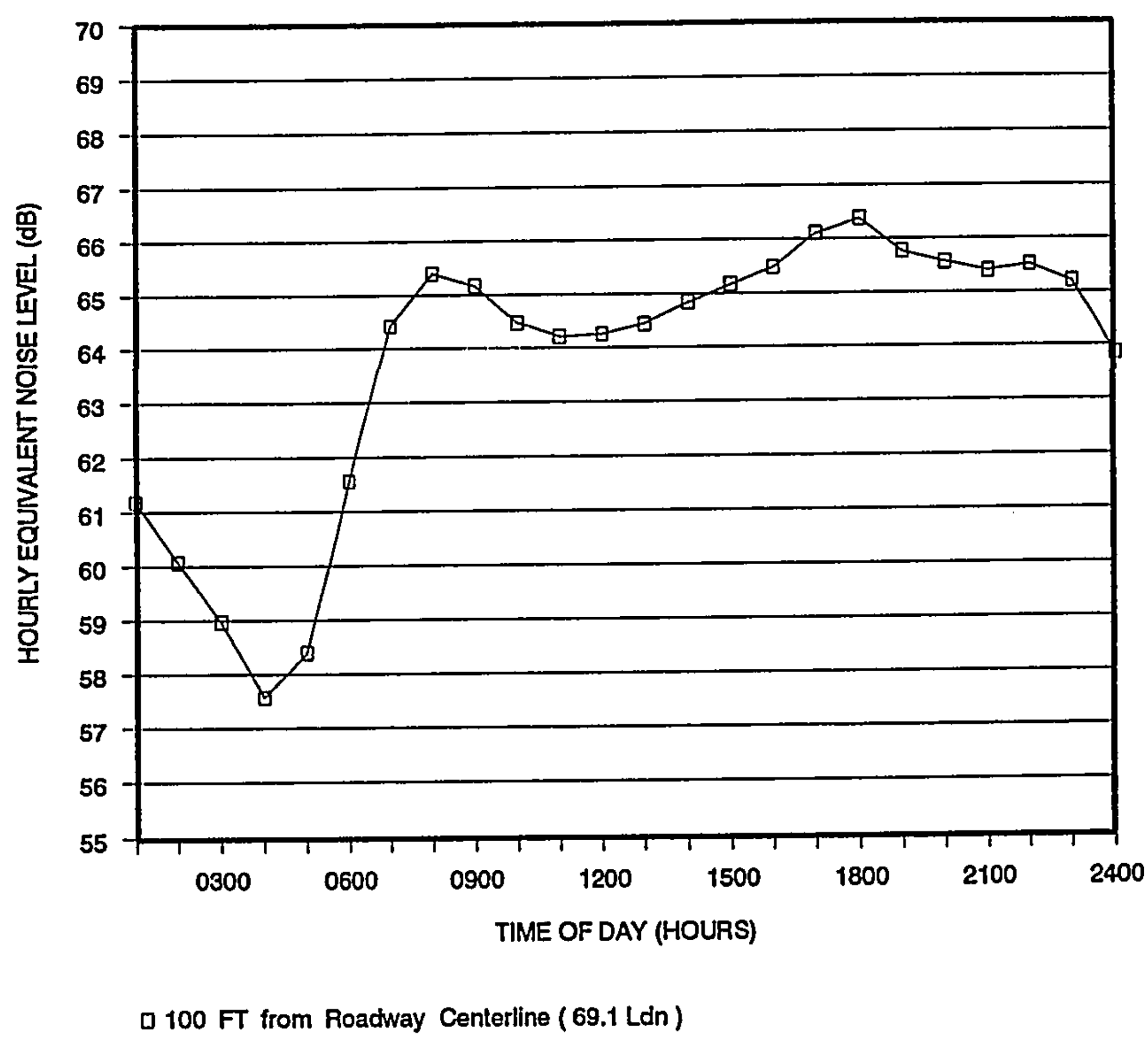
NOTE:

* Partial shielding of road noise was present at measurement Location.

** Measured Leq high due to noise contribution from Kapiolani Blvd. and Atkinson Dr.

FIGURE 3

HOURLY VARIATIONS OF TRAFFIC NOISE AT 100 FT SETBACK DISTANCE FROM THE CENTERLINE OF KALAKAUA AVENUE AT ALA WAI BRIDGE ( SEPTEMBER 28, 1994 )



to estimate the new relationships between the PM peak hour Leq and the 24-hour Ldn.

Traffic noise contours depicting the existing and future conditions in the project environs were developed for the worst case conditions of a high-rise receptor without the benefit of shielding effects. The projected increases in traffic noise levels attributable to project-related traffic were calculated, and noise impact risks evaluated. The relative contributions of non-project and project-related traffic to the total noise levels were also calculated, and an evaluation of possible traffic noise impacts was made.

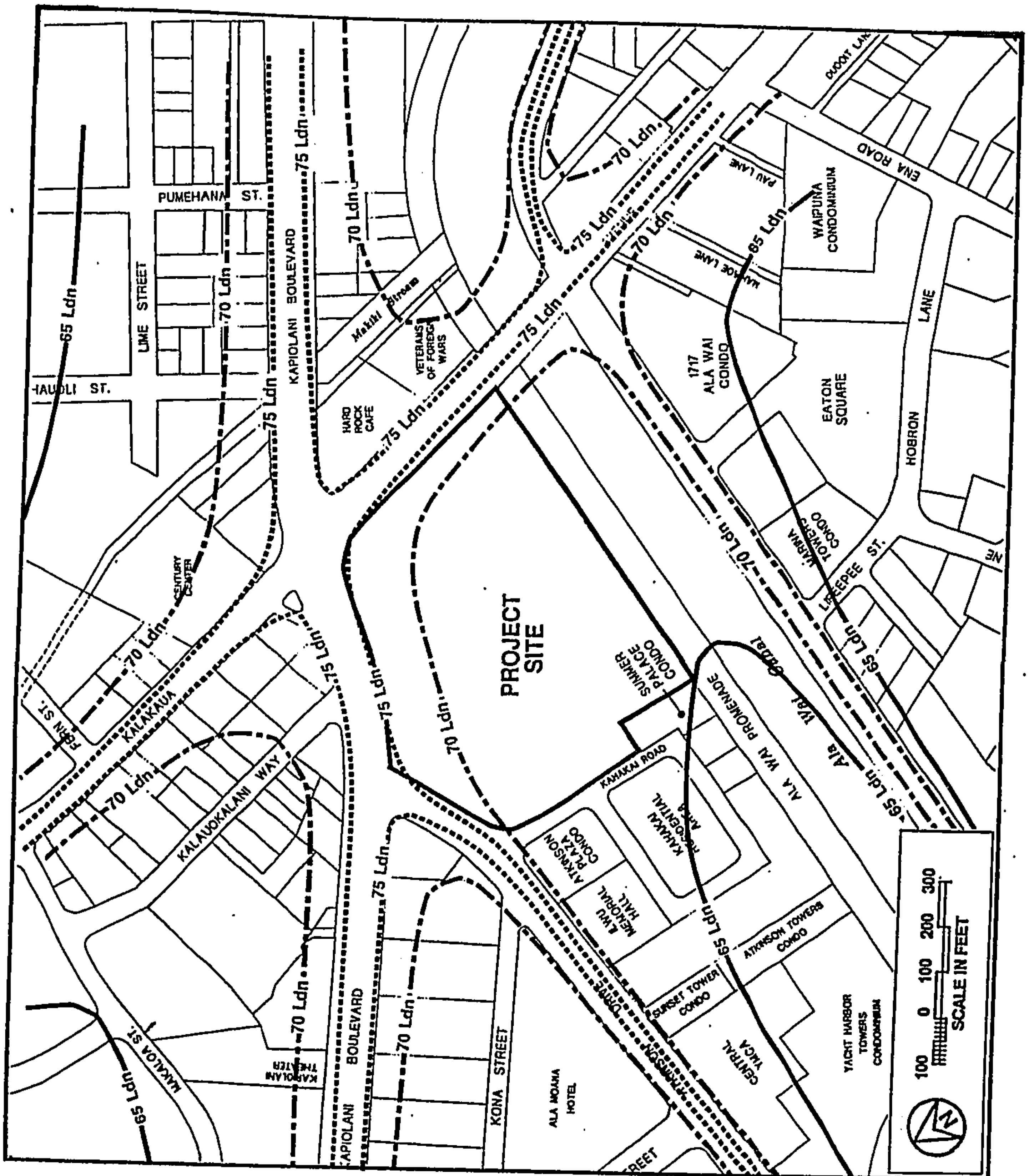
The possibility of adverse noise impacts from activities at the Roof Terrace were evaluated. Predicted sound levels from these on-site activities along the south and west property lines of the project were compared with the noise limits of the State Department of Health (DOH) noise regulation (**Reference 8**). Additionally, noise levels from on-site construction activities were also estimated to assess the risks of adverse noise impacts at the neighboring noise sensitive properties due to short-term construction activities.

## CHAPTER V. EXISTING NOISE ENVIRONMENT

The existing traffic noise levels in the project environs are in the "Significant Exposure, Normally Unacceptable" category at the lots which front Kapiolani Boulevard, Kalakaua Avenue, Ala Wai Boulevard, and Atkinson Drive. Traffic noise levels along the Right-of-Way of a roadway generally represent the worst case (or highest) levels due to the proximity of the Right-of-Way to the noise sources. Existing traffic noise levels (in Ldn) along the property lines which front these high volume streets are depicted as traffic noise contours in **FIGURE 4**. As indicated in the figure, traffic noise levels along the high volume roadways generally exceed 70 Ldn, with the exception of the section of Ala Wai Boulevard which is south of the project site. Traffic noise levels tend to increase in the direction toward the intersection of Kapiolani Boulevard and Kalakaua Avenue, due to the cumulative effect of noise levels from both streets in the vicinity of the intersection.

The noise contours shown in **FIGURE 4** are believed to be accurate on the project site because the site is currently vacant, and has a hard ground cover. The accuracy of the noise contours decreases at receptor locations which are shielded from the roadways by intervening building structures. At these receptor locations, which are shielded from the roadways, the traffic noise levels are approximately 3 to 10 Ldn less than the contour values shown in **FIGURE 4**. However, it can be concluded from the figure that, for all properties fronting the major streets in the project environs, existing traffic noise levels currently exceed the FHA/HUD standard of 65 Ldn.

Calculations of existing traffic noise levels during the AM and PM peak traffic hours are presented in **TABLES 3A thru 3F**. The hourly Leq (or Equivalent Sound Level) contribution from each street section in the project environs was calculated for input into the noise contour computer model used, as well as for compar-



EXISTING TRAFFIC NOISE CONTOURS
(FREE SPACE CONDITIONS)

FIGURE
4

## TABLE 3A

### COMPARISONS OF EXISTING AND FUTURE TRAFFIC NOISE LEVELS ALONG ACCESS ROADS TO PROJECT SITE DURING 7,500-PERSON CONVENTION DAY (AM PEAK HOUR AND 50 FT FROM ROADWAY CENTERLINES)

| LOCATION | SPEED (MPH) | VPH | **** HOURLY LEQ IN dB **** AUTO | MT | HT | ALL VEH |
|---|---|---|---|---|---|---|
| **EXISTING (CY 1994) AM PEAK HR. TRAFFIC:** | | | | | | |
| Kapiolani Blvd (West of Site) | 34 | 2,955 | 66.7 | 58.5 | 66.2 | 69.8 |
| Kapiolani Blvd (Front of Site) | 34 | 4,486 | 68.5 | 60.3 | 68.0 | 71.6 |
| Kapiolani Blvd (East of Site) | 34 | 3,736 | 67.7 | 59.5 | 67.2 | 70.8 |
| Kalakaua Ave (North of Site) | 34 | 1,867 | 64.2 | 56.0 | 63.7 | 67.3 |
| Kalakaua Ave (Front of Site) | 34 | 2,640 | 65.7 | 57.5 | 65.2 | 68.8 |
| Kalakaua Ave (South of Site) | 34 | 1,709 | 63.8 | 55.6 | 63.3 | 66.9 |
| Atkinson Dr (Front of Site) | 34 | 1,687 | 64.8 | 53.5 | 59.5 | 66.2 |
| Atkinson Dr (South of Site) | 34 | 1,463 | 64.2 | 52.9 | 58.8 | 65.5 |
| Kahakai Drive | 20 | 82 | 41.8 | 36.9 | 45.0 | 47.1 |
| Kona Street | 25 | 283 | 50.9 | 47.2 | 50.0 | 54.4 |
| Ala Wai Blvd (East of Site) | 33 | 1,421 | 62.5 | 55.5 | 58.9 | 64.6 |
| **CY 1998 AM PEAK HR. TRAFFIC WITH PROJECT:** | | | | | | |
| Kapiolani Blvd (West of Site) | 34 | 3,290 | 67.2 | 58.9 | 66.6 | 70.2 |
| Kapiolani Blvd (Front of Site) | 34 | 4,967 | 68.9 | 60.7 | 70.8 | 73.2 |
| Kapiolani Blvd (East of Site) | 34 | 4,028 | 68.0 | 59.8 | 67.5 | 71.1 |
| Kalakaua Ave (North of Site) | 34 | 2,055 | 64.6 | 56.4 | 64.1 | 67.7 |
| Kalakaua Ave (Front of Site) | 34 | 3,103 | 66.3 | 57.7 | 69.2 | 71.2 |
| Kalakaua Ave (South of Site) | 34 | 2,165 | 64.7 | 56.2 | 68.6 | 70.2 |
| Atkinson Dr (Front of Site) | 34 | 2,022 | 65.5 | 54.3 | 68.4 | 70.3 |
| Atkinson Dr (South of Site) | 34 | 1,870 | 65.1 | 57.8 | 68.4 | 70.3 |
| Kahakai Drive | 20 | 392 | 48.6 | 47.6 | 45.5 | 52.2 |
| Kona Street | 25 | 303 | 51.2 | 47.5 | 50.3 | 54.7 |
| Ala Wai Blvd (East of Site) | 33 | 1,823 | 63.6 | 56.6 | 59.9 | 65.7 |

**ASSUMED VEHICLE MIXES DURING 7,500-PERSON CONVENTION DAY:**

| STREET | *** CY 1994 (EXISTING) *** AUTO | M.T. | H.T. | * CY 1998 (WITH PROJECT) * AUTO | M.T. | H.T. |
|---|---|---|---|---|---|---|
| Kapiolani Blvd (West of Site) | 97.5% | 1.0% | 1.5% | 97.5% | 1.0% | 1.5% |
| Kapiolani Blvd (Front of Site) | 97.5% | 1.0% | 1.5% | 96.4% | 1.0% | 2.6% |
| Kapiolani Blvd (East of Site) | 97.5% | 1.0% | 1.5% | 97.5% | 1.0% | 1.5% |
| Kalakaua Ave (North of Site) | 97.5% | 1.0% | 1.5% | 97.5% | 1.0% | 1.5% |
| Kalakaua Ave (Front of Site) | 97.5% | 1.0% | 1.5% | 95.9% | 0.9% | 3.2% |
| Kalakaua Ave (South of Site) | 97.5% | 1.0% | 1.5% | 95.1% | 0.9% | 4.0% |
| Atkinson Dr (Front of Site) | 99.0% | 0.5% | 0.5% | 96.3% | 0.4% | 3.3% |
| Atkinson Dr (South of Site) | 99.0% | 0.5% | 0.5% | 95.3% | 1.2% | 3.5% |
| Kahakai Drive | 96.6% | 1.7% | 1.7% | 95.4% | 4.2% | 0.4% |
| Kona Street | 96.6% | 2.5% | 0.9% | 96.6% | 2.5% | 0.9% |
| Ala Wai Blvd (East of Site) | 98.0% | 1.3% | 0.7% | 98.0% | 1.3% | 0.7% |

TABLE 3B

COMPARISONS OF EXISTING AND FUTURE TRAFFIC NOISE LEVELS ALONG ACCESS ROADS TO PROJECT SITE DURING 7,500–PERSON CONVENTION DAY ( PM PEAK HOUR AND 50 FT FROM ROADWAY CENTERLINES )

| LOCATION | SPEED (MPH) | VPH | **** HOURLY LEQ IN dB **** AUTO | MT | HT | ALL VEH |
|---|---|---|---|---|---|---|
| **EXISTING (CY 1994) PM PEAK HR. TRAFFIC:** | | | | | | |
| Kapiolani Blvd (West of Site) | 34 | 3,303 | 67.2 | 59.0 | 66.6 | 70.3 |
| Kapiolani Blvd (Front of Site) | 34 | 4,139 | 68.1 | 59.9 | 67.6 | 71.2 |
| Kapiolani Blvd (East of Site) | 34 | 3,615 | 67.6 | 59.3 | 67.0 | 70.7 |
| Kalakaua Ave (North of Site) | 34 | 2,208 | 64.9 | 56.7 | 64.4 | 68.0 |
| Kalakaua Ave (Front of Site) | 34 | 2,807 | 66.0 | 57.7 | 65.4 | 69.1 |
| Kalakaua Ave (South of Site) | 34 | 1,961 | 64.4 | 56.2 | 63.9 | 67.5 |
| Atkinson Dr (Front of Site) | 34 | 1,196 | 63.3 | 52.0 | 58.0 | 64.7 |
| Atkinson Dr (South of Site) | 34 | 1,457 | 64.2 | 52.9 | 58.8 | 65.5 |
| Kahakai Drive | 20 | 106 | 42.9 | 38.0 | 46.1 | 48.2 |
| Kona Street | 25 | 227 | 49.9 | 46.3 | 49.0 | 53.4 |
| Ala Wai Blvd (East of Site) | 33 | 1,194 | 61.8 | 54.7 | 58.1 | 63.9 |
| **CY 1998 PM PEAK HR. TRAFFIC WITH PROJECT:** | | | | | | |
| Kapiolani Blvd (West of Site) | 34 | 3,562 | 67.5 | 59.3 | 67.0 | 70.6 |
| Kapiolani Blvd (Front of Site) | 34 | 4,515 | 68.5 | 60.3 | 70.2 | 72.7 |
| Kapiolani Blvd (East of Site) | 34 | 3,924 | 67.9 | 59.7 | 67.4 | 71.0 |
| Kalakaua Ave (North of Site) | 34 | 2,392 | 65.3 | 57.1 | 64.7 | 68.4 |
| Kalakaua Ave (Front of Site) | 34 | 3,110 | 66.3 | 58.2 | 68.6 | 70.9 |
| Kalakaua Ave (South of Site) | 34 | 2,306 | 65.0 | 56.4 | 68.0 | 70.0 |
| Atkinson Dr (Front of Site) | 34 | 1,342 | 63.7 | 52.5 | 67.3 | 68.9 |
| Atkinson Dr (South of Site) | 34 | 1,685 | 64.7 | 58.0 | 67.4 | 69.6 |
| Kahakai Drive | 20 | 213 | 45.7 | 47.7 | 46.3 | 51.4 |
| Kona Street | 25 | 270 | 50.7 | 47.0 | 49.8 | 54.2 |
| Ala Wai Blvd (East of Site) | 33 | 1,505 | 62.8 | 55.7 | 59.1 | 64.9 |

ASSUMED VEHICLE MIXES DURING 7,500–PERSON CONVENTION DAY:

| STREET | *** CY 1994 (EXISTING) *** AUTO | M.T. | H.T. | * CY 1998 (WITH PROJECT) * AUTO | M.T. | H.T. |
|---|---|---|---|---|---|---|
| Kapiolani Blvd (West of Site) | 97.5% | 1.0% | 1.5% | 97.5% | 1.0% | 1.5% |
| Kapiolani Blvd (Front of Site) | 97.5% | 1.0% | 1.5% | 96.5% | 1.0% | 2.5% |
| Kapiolani Blvd (East of Site) | 97.5% | 1.0% | 1.5% | 97.5% | 1.0% | 1.5% |
| Kalakaua Ave (North of Site) | 97.5% | 1.0% | 1.5% | 97.5% | 1.0% | 1.5% |
| Kalakaua Ave (Front of Site) | 97.5% | 1.0% | 1.5% | 96.2% | 1.0% | 2.8% |
| Kalakaua Ave (South of Site) | 97.5% | 1.0% | 1.5% | 95.8% | 0.9% | 3.3% |
| Atkinson Dr (Front of Site) | 99.0% | 0.5% | 0.5% | 95.7% | 0.5% | 3.8% |
| Atkinson Dr (South of Site) | 99.0% | 0.5% | 0.5% | 95.5% | 1.4% | 3.1% |
| Kahakai Drive | 96.6% | 1.7% | 1.7% | 91.2% | 7.9% | 0.9% |
| Kona Street | 96.6% | 2.5% | 0.9% | 96.6% | 2.5% | 0.9% |
| Ala Wai Blvd (East of Site) | 98.0% | 1.3% | 0.7% | 98.0% | 1.3% | 0.7% |

TABLE 3C

COMPARISONS OF EXISTING AND FUTURE TRAFFIC NOISE LEVELS ALONG ACCESS ROADS TO PROJECT SITE DURING 10,000-PERSON CONVENTION DAY (AM PEAK HOUR AND 50 FT FROM ROADWAY CENTERLINES)

| LOCATION | SPEED (MPH) | VPH | **** HOURLY LEQ IN dB **** AUTO | MT | HT | ALL VEH |
|---|---|---|---|---|---|---|
| EXISTING (CY 1994) AM PEAK HR. TRAFFIC: | | | | | | |
| Kapiolani Blvd (West of Site) | 34 | 2,955 | 66.7 | 58.5 | 66.2 | 69.8 |
| Kapiolani Blvd (Front of Site) | 34 | 4,486 | 68.5 | 60.3 | 68.0 | 71.6 |
| Kapiolani Blvd (East of Site) | 34 | 3,736 | 67.7 | 59.5 | 67.2 | 70.8 |
| Kalakaua Ave (North of Site) | 34 | 1,867 | 64.2 | 56.0 | 63.7 | 67.3 |
| Kalakaua Ave (Front of Site) | 34 | 2,640 | 65.7 | 57.5 | 65.2 | 68.8 |
| Kalakaua Ave (South of Site) | 34 | 1,709 | 63.8 | 55.6 | 63.3 | 66.9 |
| Atkinson Dr (Front of Site) | 34 | 1,687 | 64.8 | 53.5 | 59.5 | 66.2 |
| Atkinson Dr (South of Site) | 34 | 1,463 | 64.2 | 52.9 | 58.8 | 65.5 |
| Kahakai Drive | 20 | 82 | 41.8 | 36.9 | 45.0 | 47.1 |
| Kona Street | 25 | 283 | 50.9 | 47.2 | 50.0 | 54.4 |
| Ala Wai Blvd (East of Site) | 33 | 1,421 | 62.5 | 55.5 | 58.9 | 64.6 |
| CY 1998 AM PEAK HR. TRAFFIC WITH PROJECT: | | | | | | |
| Kapiolani Blvd (West of Site) | 34 | 3,281 | 67.1 | 58.9 | 66.6 | 70.2 |
| Kapiolani Blvd (Front of Site) | 34 | 4,976 | 68.9 | 60.7 | 71.6 | 73.7 |
| Kapiolani Blvd (East of Site) | 34 | 4,026 | 68.0 | 59.8 | 67.5 | 71.1 |
| Kalakaua Ave (North of Site) | 34 | 2,051 | 64.6 | 56.4 | 64.1 | 67.7 |
| Kalakaua Ave (Front of Site) | 34 | 3,125 | 66.3 | 57.8 | 70.2 | 71.8 |
| Kalakaua Ave (South of Site) | 34 | 2,192 | 64.7 | 56.2 | 69.7 | 71.0 |
| Atkinson Dr (Front of Site) | 34 | 2,022 | 65.4 | 53.3 | 69.8 | 71.2 |
| Atkinson Dr (South of Site) | 34 | 1,939 | 65.2 | 57.9 | 69.7 | 71.2 |
| Kahakai Drive | 20 | 416 | 48.8 | 47.7 | 45.7 | 52.4 |
| Kona Street | 25 | 303 | 51.2 | 47.5 | 50.3 | 54.7 |
| Ala Wai Blvd (East of Site) | 33 | 1,819 | 63.6 | 56.6 | 59.9 | 65.7 |

ASSUMED VEHICLE MIXES DURING 10,000-PERSON CONVENTION DAY:

| STREET | *** CY 1994 (EXISTING) *** AUTO | M.T. | H.T. | * CY 1998 (WITH PROJECT) * AUTO | M.T. | H.T. |
|---|---|---|---|---|---|---|
| Kapiolani Blvd (West of Site) | 97.5% | 1.0% | 1.5% | 97.5% | 1.0% | 1.5% |
| Kapiolani Blvd (Front of Site) | 97.5% | 1.0% | 1.5% | 95.9% | 1.0% | 3.1% |
| Kapiolani Blvd (East of Site) | 97.5% | 1.0% | 1.5% | 97.5% | 1.0% | 1.5% |
| Kalakaua Ave (North of Site) | 97.5% | 1.0% | 1.5% | 97.5% | 1.0% | 1.5% |
| Kalakaua Ave (Front of Site) | 97.5% | 1.0% | 1.5% | 95.1% | 0.9% | 4.0% |
| Kalakaua Ave (South of Site) | 97.5% | 1.0% | 1.5% | 94.0% | 0.9% | 5.1% |
| Atkinson Dr (Front of Site) | 99.0% | 0.5% | 0.5% | 95.1% | 0.4% | 4.5% |
| Atkinson Dr (South of Site) | 99.0% | 0.5% | 0.5% | 94.2% | 1.2% | 4.6% |
| Kahakai Drive | 96.6% | 1.7% | 1.7% | 95.6% | 4.0% | 0.4% |
| Kona Street | 96.6% | 2.5% | 0.9% | 96.6% | 2.5% | 0.9% |
| Ala Wai Blvd (East of Site) | 98.0% | 1.3% | 0.7% | 98.0% | 1.3% | 0.7% |

## TABLE 3D

## COMPARISONS OF EXISTING AND FUTURE TRAFFIC NOISE LEVELS ALONG ACCESS ROADS TO PROJECT SITE DURING 10,000-PERSON CONVENTION DAY ( PM PEAK HOUR AND 50 FT FROM ROADWAY CENTERLINES )

| LOCATION | SPEED (MPH) | VPH | **** HOURLY LEQ IN dB **** AUTO | MT | HT | ALL VEH |
|---|---|---|---|---|---|---|
| EXISTING (CY 1994) PM PEAK HR. TRAFFIC: | | | | | | |
| Kapiolani Blvd (West of Site) | 34 | 3,303 | 67.2 | 59.0 | 66.6 | 70.3 |
| Kapiolani Blvd (Front of Site) | 34 | 4,139 | 68.1 | 59.9 | 67.6 | 71.2 |
| Kapiolani Blvd (East of Site) | 34 | 3,615 | 67.6 | 59.3 | 67.0 | 70.7 |
| Kalakaua Ave (North of Site) | 34 | 2,208 | 64.9 | 56.7 | 64.4 | 68.0 |
| Kalakaua Ave (Front of Site) | 34 | 2,807 | 66.0 | 57.7 | 65.4 | 69.1 |
| Kalakaua Ave (South of Site) | 34 | 1,961 | 64.4 | 56.2 | 63.9 | 67.5 |
| Atkinson Dr (Front of Site) | 34 | 1,196 | 63.3 | 52.0 | 58.0 | 64.7 |
| Atkinson Dr (South of Site) | 34 | 1,457 | 64.2 | 52.9 | 58.8 | 65.5 |
| Kahakai Drive | 20 | 106 | 42.9 | 38.0 | 46.1 | 48.2 |
| Kona Street | 25 | 227 | 49.9 | 46.3 | 49.0 | 53.4 |
| Ala Wai Blvd (East of Site) | 33 | 1,194 | 61.8 | 54.7 | 58.1 | 63.9 |
| CY 1998 PM PEAK HR. TRAFFIC WITH PROJECT: | | | | | | |
| Kapiolani Blvd (West of Site) | 34 | 3,562 | 67.5 | 59.3 | 67.0 | 70.6 |
| Kapiolani Blvd (Front of Site) | 34 | 4,513 | 68.5 | 60.3 | 70.9 | 73.1 |
| Kapiolani Blvd (East of Site) | 34 | 3,927 | 67.9 | 59.7 | 67.4 | 71.0 |
| Kalakaua Ave (North of Site) | 34 | 2,392 | 65.3 | 57.1 | 64.7 | 68.4 |
| Kalakaua Ave (Front of Site) | 34 | 3,136 | 66.4 | 57.8 | 69.5 | 71.4 |
| Kalakaua Ave (South of Site) | 34 | 2,362 | 65.1 | 56.5 | 69.0 | 70.6 |
| Atkinson Dr (Front of Site) | 34 | 1,344 | 63.6 | 52.5 | 68.6 | 69.9 |
| Atkinson Dr (South of Site) | 34 | 1,690 | 64.6 | 57.7 | 68.7 | 70.4 |
| Kahakai Drive | 20 | 242 | 46.3 | 47.7 | 46.4 | 51.6 |
| Kona Street | 25 | 275 | 50.8 | 47.1 | 49.8 | 54.3 |
| Ala Wai Blvd (East of Site) | 33 | 1,505 | 62.8 | 55.7 | 59.1 | 64.9 |

ASSUMED VEHICLE MIXES DURING 10,000-PERSON CONVENTION DAY:

| STREET | *** CY 1994 (EXISTING) *** AUTO | M.T. | H.T. | * CY 1998 (WITH PROJECT) * AUTO | M.T. | H.T. |
|---|---|---|---|---|---|---|
| Kapiolani Blvd (West of Site) | 97.5% | 1.0% | 1.5% | 97.5% | 1.0% | 1.5% |
| Kapiolani Blvd (Front of Site) | 97.5% | 1.0% | 1.5% | 96.1% | 1.0% | 2.9% |
| Kapiolani Blvd (East of Site) | 97.5% | 1.0% | 1.5% | 97.5% | 1.0% | 1.5% |
| Kalakaua Ave (North of Site) | 97.5% | 1.0% | 1.5% | 97.5% | 1.0% | 1.5% |
| Kalakaua Ave (Front of Site) | 97.5% | 1.0% | 1.5% | 95.7% | 0.9% | 3.4% |
| Kalakaua Ave (South of Site) | 97.5% | 1.0% | 1.5% | 95.1% | 0.9% | 4.0% |
| Atkinson Dr (Front of Site) | 99.0% | 0.5% | 0.5% | 94.3% | 0.5% | 5.2% |
| Atkinson Dr (South of Site) | 99.0% | 0.5% | 0.5% | 94.5% | 1.3% | 4.2% |
| Kahakai Drive | 96.6% | 1.7% | 1.7% | 92.2% | 7.0% | 0.8% |
| Kona Street | 96.6% | 2.5% | 0.9% | 96.6% | 2.5% | 0.9% |
| Ala Wai Blvd (East of Site) | 98.0% | 1.3% | 0.7% | 98.0% | 1.3% | 0.7% |

TABLE 3E

COMPARISONS OF EXISTING AND FUTURE TRAFFIC NOISE LEVELS ALONG ACCESS ROADS TO PROJECT SITE DURING 14,000-PERSON CONVENTION DAY
( AM PEAK HOUR AND 50 FT FROM ROADWAY CENTERLINES )

| LOCATION | SPEED (MPH) | VPH | **** HOURLY LEQ IN dB **** AUTO | MT | HT | ALL VEH |
|---|---|---|---|---|---|---|
| EXISTING (CY 1994) AM PEAK HR. TRAFFIC: | | | | | | |
| Kapiolani Blvd (West of Site) | 34 | 2,955 | 66.7 | 58.5 | 66.2 | 69.8 |
| Kapiolani Blvd (Front of Site) | 34 | 4,486 | 68.5 | 60.3 | 68.0 | 71.6 |
| Kapiolani Blvd (East of Site) | 34 | 3,736 | 67.7 | 59.5 | 67.2 | 70.8 |
| Kalakaua Ave (North of Site) | 34 | 1,867 | 64.2 | 56.0 | 63.7 | 67.3 |
| Kalakaua Ave (Front of Site) | 34 | 2,640 | 65.7 | 57.5 | 65.2 | 68.8 |
| Kalakaua Ave (South of Site) | 34 | 1,709 | 63.8 | 55.6 | 63.3 | 66.9 |
| Atkinson Dr (Front of Site) | 34 | 1,687 | 64.8 | 53.5 | 59.5 | 66.2 |
| Atkinson Dr (South of Site) | 34 | 1,463 | 64.2 | 52.9 | 58.8 | 65.5 |
| Kahakai Drive | 20 | 82 | 41.8 | 36.9 | 45.0 | 47.1 |
| Kona Street | 25 | 283 | 50.9 | 47.2 | 50.0 | 54.4 |
| Ala Wai Blvd (East of Site) | 33 | 1,421 | 62.5 | 55.5 | 58.9 | 64.6 |
| CY 1998 AM PEAK HR. TRAFFIC: | | | | | | |
| Kapiolani Blvd (West of Site) | 34 | 3,367 | 67.3 | 59.0 | 66.7 | 70.3 |
| Kapiolani Blvd (Front of Site) | 34 | 5,090 | 68.9 | 60.4 | 72.6 | 74.3 |
| Kapiolani Blvd (East of Site) | 34 | 4,043 | 68.0 | 59.8 | 67.5 | 71.1 |
| Kalakaua Ave (North of Site) | 34 | 2,088 | 64.7 | 56.5 | 64.2 | 67.8 |
| Kalakaua Ave (Front of Site) | 34 | 3,298 | 66.5 | 58.0 | 71.4 | 72.7 |
| Kalakaua Ave (South of Site) | 34 | 2,306 | 64.9 | 56.4 | 71.0 | 72.1 |
| Atkinson Dr (Front of Site) | 34 | 2,222 | 65.8 | 53.7 | 71.4 | 72.5 |
| Atkinson Dr (South of Site) | 34 | 2,147 | 65.6 | 58.0 | 71.3 | 72.5 |
| Kahakai Drive | 20 | 656 | 50.9 | 47.6 | 44.7 | 53.2 |
| Kona Street | 25 | 306 | 51.2 | 47.6 | 50.3 | 54.7 |
| Ala Wai Blvd (East of Site) | 33 | 1,859 | 63.7 | 56.7 | 60.0 | 65.8 |

ASSUMED VEHICLE MIXES DURING 14,000-PERSON CONVENTION DAY:

| STREET | *** CY 1994 (EXISTING) *** AUTO | M.T. | H.T. | * CY 1998 (WITH PROJECT) * AUTO | M.T. | H.T. |
|---|---|---|---|---|---|---|
| Kapiolani Blvd (West of Site) | 97.5% | 1.0% | 1.5% | 97.5% | 1.0% | 1.5% |
| Kapiolani Blvd (Front of Site) | 97.5% | 1.0% | 1.5% | 95.3% | 0.9% | 3.8% |
| Kapiolani Blvd (East of Site) | 97.5% | 1.0% | 1.5% | 97.5% | 1.0% | 1.5% |
| Kalakaua Ave (North of Site) | 97.5% | 1.0% | 1.5% | 97.5% | 1.0% | 1.5% |
| Kalakaua Ave (Front of Site) | 97.5% | 1.0% | 1.5% | 94.1% | 0.9% | 5.0% |
| Kalakaua Ave (South of Site) | 97.5% | 1.0% | 1.5% | 92.5% | 0.9% | 6.6% |
| Atkinson Dr (Front of Site) | 99.0% | 0.5% | 0.5% | 93.7% | 0.4% | 5.9% |
| Atkinson Dr (South of Site) | 99.0% | 0.5% | 0.5% | 92.9% | 1.1% | 6.0% |
| Kahakai Drive | 96.6% | 1.7% | 1.7% | 97.3% | 2.5% | 0.2% |
| Kona Street | 96.6% | 2.5% | 0.9% | 96.6% | 2.5% | 0.9% |
| Ala Wai Blvd (East of Site) | 98.0% | 1.3% | 0.7% | 98.0% | 1.3% | 0.7% |

## TABLE 3F

### COMPARISONS OF EXISTING AND FUTURE TRAFFIC NOISE LEVELS ALONG ACCESS ROADS TO PROJECT SITE DURING 14,000–PERSON CONVENTION DAY ( PM PEAK HOUR AND 50 FT FROM ROADWAY CENTERLINES )

| LOCATION | SPEED (MPH) | VPH | **** HOURLY LEQ IN dB **** AUTO | MT | HT | ALL VEH |
|---|---|---|---|---|---|---|
| EXISTING (CY 1994) PM PEAK HR. TRAFFIC: | | | | | | |
| Kapiolani Blvd (West of Site) | 34 | 3,303 | 67.2 | 59.0 | 66.6 | 70.3 |
| Kapiolani Blvd (Front of Site) | 34 | 4,139 | 68.1 | 59.9 | 67.6 | 71.2 |
| Kapiolani Blvd (East of Site) | 34 | 3,615 | 67.6 | 59.3 | 67.0 | 70.7 |
| Kalakaua Ave (North of Site) | 34 | 2,208 | 64.9 | 56.7 | 64.4 | 68.0 |
| Kalakaua Ave (Front of Site) | 34 | 2,807 | 66.0 | 57.7 | 65.4 | 69.1 |
| Kalakaua Ave (South of Site) | 34 | 1,961 | 64.4 | 56.2 | 63.9 | 67.5 |
| Atkinson Dr (Front of Site) | 34 | 1,196 | 63.3 | 52.0 | 58.0 | 64.7 |
| Atkinson Dr (South of Site) | 34 | 1,457 | 64.2 | 52.9 | 58.8 | 65.5 |
| Kahakai Drive | 20 | 106 | 42.9 | 38.0 | 46.1 | 48.2 |
| Kona Street | 25 | 227 | 49.9 | 46.3 | 49.0 | 53.4 |
| Ala Wai Blvd (East of Site) | 33 | 1,194 | 61.8 | 54.7 | 58.1 | 63.9 |
| CY 1998 PM PEAK HR. TRAFFIC: | | | | | | |
| Kapiolani Blvd (West of Site) | 34 | 3,565 | 67.5 | 59.3 | 67.0 | 70.6 |
| Kapiolani Blvd (Front of Site) | 34 | 4,567 | 68.5 | 60.4 | 71.7 | 73.6 |
| Kapiolani Blvd (East of Site) | 34 | 3,940 | 67.9 | 59.7 | 67.4 | 71.0 |
| Kalakaua Ave (North of Site) | 34 | 2,392 | 65.3 | 57.1 | 64.7 | 68.4 |
| Kalakaua Ave (Front of Site) | 34 | 3,230 | 66.4 | 57.9 | 70.6 | 72.2 |
| Kalakaua Ave (South of Site) | 34 | 2,472 | 65.3 | 56.7 | 70.2 | 71.6 |
| Atkinson Dr (Front of Site) | 34 | 1,397 | 63.7 | 52.7 | 70.2 | 71.1 |
| Atkinson Dr (South of Site) | 34 | 1,797 | 64.8 | 57.9 | 70.3 | 71.6 |
| Kahakai Drive | 20 | 299 | 47.3 | 47.8 | 46.1 | 51.9 |
| Kona Street | 25 | 296 | 51.1 | 47.4 | 50.2 | 54.6 |
| Ala Wai Blvd (East of Site) | 33 | 1,505 | 62.8 | 55.7 | 59.1 | 64.9 |

ASSUMED VEHICLE MIXES DURING 14,000–PERSON CONVENTION DAY:

| STREET | *** CY 1994 (EXISTING) *** AUTO | M.T. | H.T. | * CY 1998 (WITH PROJECT) * AUTO | M.T. | H.T. |
|---|---|---|---|---|---|---|
| Kapiolani Blvd (West of Site) | 97.5% | 1.0% | 1.5% | 97.5% | 1.0% | 1.5% |
| Kapiolani Blvd (Front of Site) | 97.5% | 1.0% | 1.5% | 95.5% | 1.0% | 3.5% |
| Kapiolani Blvd (East of Site) | 97.5% | 1.0% | 1.5% | 97.5% | 1.0% | 1.5% |
| Kalakaua Ave (North of Site) | 97.5% | 1.0% | 1.5% | 97.5% | 1.0% | 1.5% |
| Kalakaua Ave (Front of Site) | 97.5% | 1.0% | 1.5% | 94.8%. | 0.9% | 4.3% |
| Kalakaua Ave (South of Site) | 97.5% | 1.0% | 1.5% | 94.1% | 0.9% | 5.1% |
| Atkinson Dr (Front of Site) | 99.0% | 0.5% | 0.5% | 92.3% | 0.5% | 7.2% |
| Atkinson Dr (South of Site) | 99.0% | 0.5% | 0.5% | 93.0% | 1.3% | 5.7% |
| Kahakai Drive | 96.6% | 1.7% | 1.7% | 93.7% | 5.7% | 0.6% |
| Kona Street | 96.6% | 2.5% | 0.9% | 96.6% | 2.5% | 0.9% |
| Ala Wai Blvd (East of Site) | 98.0% | 1.3% | 0.7% | 98.0% | 1.3% | 0.7% |

## TABLE 4

## EXISTING AND CY 1998 DISTANCES TO 65, 70, AND 75 Ldn CONTOURS

| STREET SECTION | 65 Ldn SETBACK (FT) | | 70 Ldn SETBACK (FT) | | 75 Ldn SETBACK (FT) | |
|---|---|---|---|---|---|---|
| | EXISTING | CY 1998 | EXISTING | CY 1998 | EXISTING | CY 1998 |
| Kapiolani Blvd (West of Site) | 313 | 337 | 99 | 107 | 31 | 34 |
| Kapiolani Blvd (Front of Site) | 392 | 428 | 124 | 135 | 39 | 43 |
| Kapiolani Blvd (East of Site) | 342 | 372 | 108 | 118 | 34 | 37 |
| Kalakaua Ave (North of Site) | 186 | 202 | 59 | 64 | 19 | 20 |
| Kalakaua Ave (Front of Site) | 237 | 258 | 75 | 82 | 24 | 26 |
| Kalakaua Ave (South of Site) | 165 | 192 | 52 | 61 | 17 | 19 |
| Atkinson Dr (Front of Site) | 86 | 99 | 27 | 31 | 9 | 10 |
| Atkinson Dr (South of Site) | 105 | 122 | 33 | 39 | 11 | 12 |
| Kahakai Drive | 2 | 3 | 1 | 1 | 0 | 0 |
| Kona Street | 6 | 7 | 2 | 2 | 1 | 1 |
| Ala Wai Blvd (East of Site) | 72 | 91 | 23 | 29 | 7 | 9 |

**Notes:**

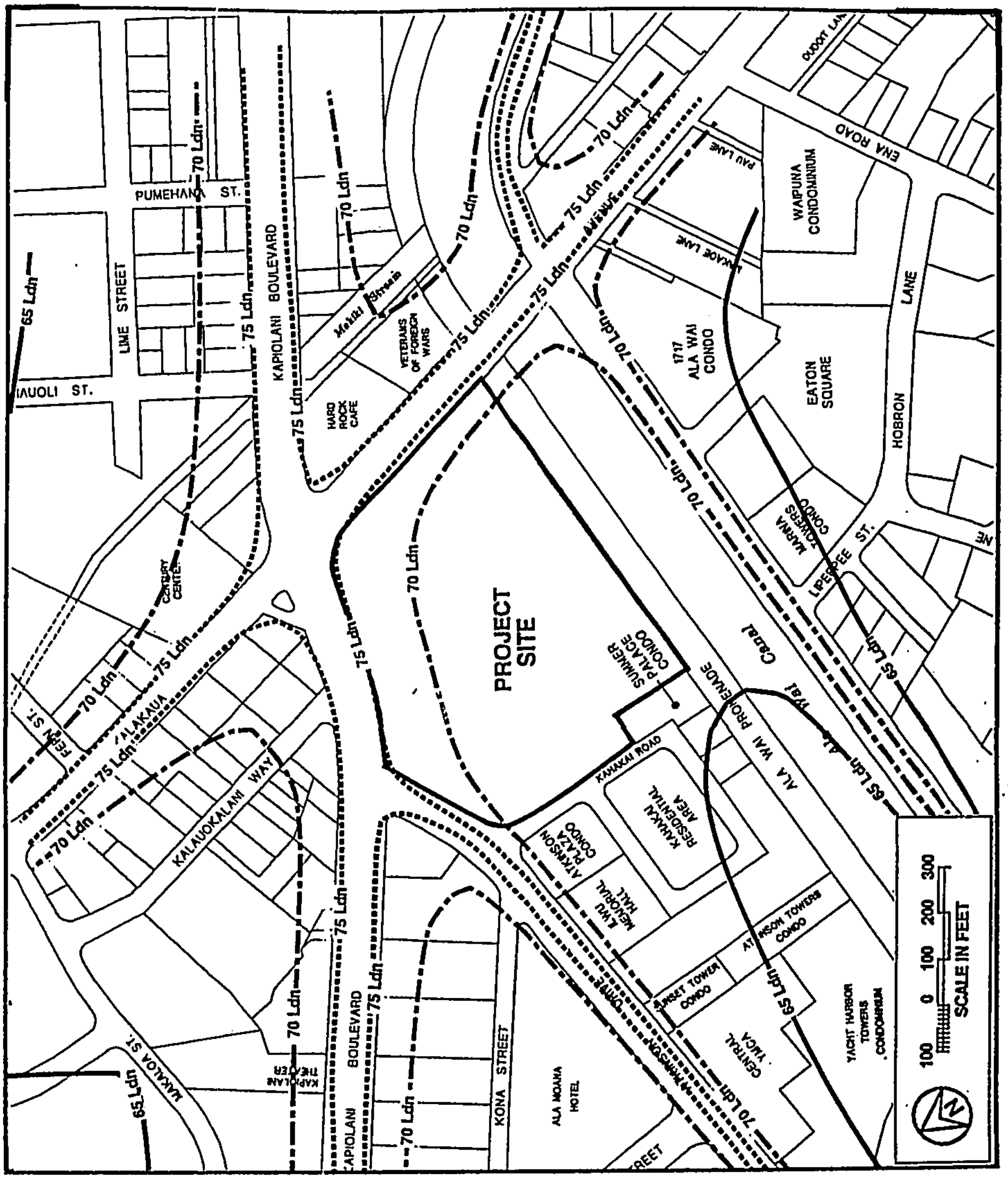
(1) All setback distances are from the roadways' centerlines.
(2) See TABLES 3A thru 3F for traffic volume, speed, and mix assumptions.
(3) Existing Ldn values assumed to be equal to PM Peak Hour Leq plus 2.7 dB.
(4) All CY 1998 Ldn values were annually averaged assuming 1 day with 14,000−person convention, 21 days with 10,000−person convention, 150 days with 7,500−person convention, and 193 days without conventions.
(5) Setback distances are for unobstructed line−of−sight conditions and hard ground cover.

## CHAPTER VI. FUTURE TRAFFIC NOISE ENVIRONMENT

Predictions of future traffic noise levels were made using the traffic volume assignments of **Reference 5**. **FIGURE 5** depicts the predicted traffic noise contours in the project area following completion of the project in 1998. The future projections of project and non-project traffic on the roadways which would service the project are shown in **TABLES 3A thru 3F** for the AM and PM peak hours of traffic during days with Convention Center events of 7,500, 10,000, and 14,000 persons. Anticipated frequencies of the various sizes of Convention Center events were: 150 days per year for the 7,500-person events; 21 days per year for the 10,000-person events; and 1 day per year for the 14,000-person event.

**TABLE 4** summarizes the predicted increases in setback distances to the 65, 70, and 75 Ldn traffic noise contour lines along the roadways servicing the project and attributable to increases in project plus non-project traffic by CY 1998. The setback distances in **TABLE 4** do not include the effects of noise shielding or the effects of additive contributions of noise from intersecting streets. They do include the annual averaging effects of the various frequencies of the different sizes of Convention Center events, as well as the effects from reduced project traffic during the 193 days per year which are anticipated to be free of major conventions.

During a major convention event at the project site, traffic noise levels are expected to be significantly higher during the AM peak hour period due to the buses which are expected to transport convention participants to the center. The maximum number of 121 bus trips were projected to occur during the AM peak traffic hour of a 14,000-person event (see **Reference 5**), with all trips entering the center from Atkinson Drive, and departing the center along the Kapiolani Boulevard and Kalakaua Avenue sections which front the project site. The number of bus trips during the AM peak hour were expected to be less during a 10,000-person and 7,500-person



**FUTURE TRAFFIC NOISE CONTOURS (FREE SPACE CONDITIONS)**

**FIGURE 5**

convention at 82 and 57 bus trips, respectively.

During the off-peak hours between 8:00 AM thru 8:00 PM (but excluding the PM peak hour) on a 10,000-person thru 14,000-person convention day, heavy delivery trucks are anticipated to travel to and from the Convention Center along Atkinson Drive and Kahakai Drive at an average rate of 10 trips per hour. During a 7,500-person convention day, heavy delivery truck trips are expected to diminish to an average rate of 5 trips per hour. Addition of these heavy delivery trucks, plus the additional off-peak bus trips along Atkinson Drive and Kapiolani Boulevard and Kalakaua Avenue fronting the project site, were also included in the annually averaged Ldn calculations, and resulted in less than a 1.6 Ldn change in the relationship of the daily Ldn values to the AM and PM peak hour traffic noise levels shown in **FIGURE 3**.

**TABLE 5** summarizes the increases in annually-averaged traffic noise levels in CY 1998 associated with project and non-project traffic as measured by the Ldn descriptor system. As indicated in **TABLE 5**, the increases in traffic noise are evenly split between non-project and project traffic along the street segments which border the project site, except along Kahakai Drive. Because of the relatively low volume of existing traffic on Kahakai Drive, the increase in future traffic noise levels associated with project traffic along this roadway is expected to be moderately higher at 1.9 dB. However, the increase in noise levels from traffic on Kahakai Drive is expected to be more than matched by the reduction in distant traffic noise due to the beneficial noise shielding effects of the Convention Center building along Kahakai Drive (see Chapter VII and **TABLE 6**). Traffic noise levels along the high volume roadways (Kapiolani Boulevard, Kalakaua Avenue, Atkinson Drive, and Ala Wai Boulevard) servicing the project are relatively high during the current period, and are not expected to increase significantly as a result of the proposed project.

The worst case locations of the 65, 70, and 75 Ldn traffic noise contours applicable to the future conditions with the pro-

TABLE 5

CALCULATIONS OF PROJECT AND NON-PROJECT TRAFFIC NOISE CONTRIBUTIONS (CY 1998)

| STREET SECTION | NOISE LEVEL INCREASE (Ldn) DUE TO NON-PROJECT TRAFFIC | PROJECT TRAFFIC |
|---|---|---|
| Kapiolani Blvd (West of Site) | 0.3 | 0.0 |
| Kapiolani Blvd (Front of Site) | 0.3 | 0.1 |
| Kapiolani Blvd (East of Site) | 0.3 | 0.0 |
| Kalakaua Ave (North of Site) | 0.3 | 0.0 |
| Kalakaua Ave (Front of Site) | 0.2 | 0.1 |
| Kalakaua Ave (South of Site) | 0.3 | 0.3 |
| Atkinson Dr (Front of Site) | 0.3 | 0.3 |
| Atkinson Dr (South of Site) | 0.3 | 0.4 |
| Kahakai Drive | 0.3 | 1.9 |
| Kona Street | 0.3 | 0.2 |
| Ala Wai Blvd (East of Site) | 1.0 | 0.0 |

ject completed can be estimated from **FIGURE 5**. Not depicted in **FIGURE 5**, however, are the beneficial shielding effects of the Convention Center Building. Estimated noise reductions below the future noise contour levels depicted in **FIGURE 5** are on the order of 1 to 10 Ldn, which are significant when compared to the forecasted increases in project traffic noise levels along the roadways expected to service the project.

## CHAPTER VII. DISCUSSION OF PROJECT RELATED TRAFFIC NOISE IMPACTS AND POSSIBLE NOISE MITIGATION MEASURES

The increases in traffic noise levels attributable to the project are predicted to be 0.4 Ldn or less along Kapiolani Boulevard, Kalakaua Avenue, Atkinson Drive, Ala Wai Boulevard and Kona Street. Although future traffic noise levels along the high volume roadways are predicted to remain above the FHA/HUD standard of 65 Ldn along the lots fronting these roadways, an increase of 0.4 Ldn or less along these roadways will be difficult to perceive.

Although projected noise level increases of 1.9 Ldn are predicted along Kahakai Drive, the noise levels associated with this roadway are expected to remain relatively low and less than 65 Ldn. Although high-rise apartment units are located on Kahakai Drive, at the higher elevations above street level, traffic noise from Kapiolani Boulevard, Atkinson Drive, and Kalakaua Avenue will dominate over the lower traffic noise levels from Kahakai Drive.

**TABLE 6** presents a comparison of existing and predicted total (project plus non-project) traffic noise levels at various noise sensitive properties in the project environs. The noise shielding effects from buildings as well as the elevation of the receptor locations above street level were included in the calculations of traffic noise at the various locations. The locations of the various receptor positions identified in **TABLE 6** are shown in **FIGURE 6**. The following conclusions can be derived from the results of **TABLE 6**:

- No significant traffic noise impacts are expected in the McCully area north and east of the project site (Locations #1, #2, and #3). This is due to the relatively small changes in traffic noise expected along the section of Kalakaua Avenue north of the project site and along the section of Kapiolani Boulevard east of the project site.

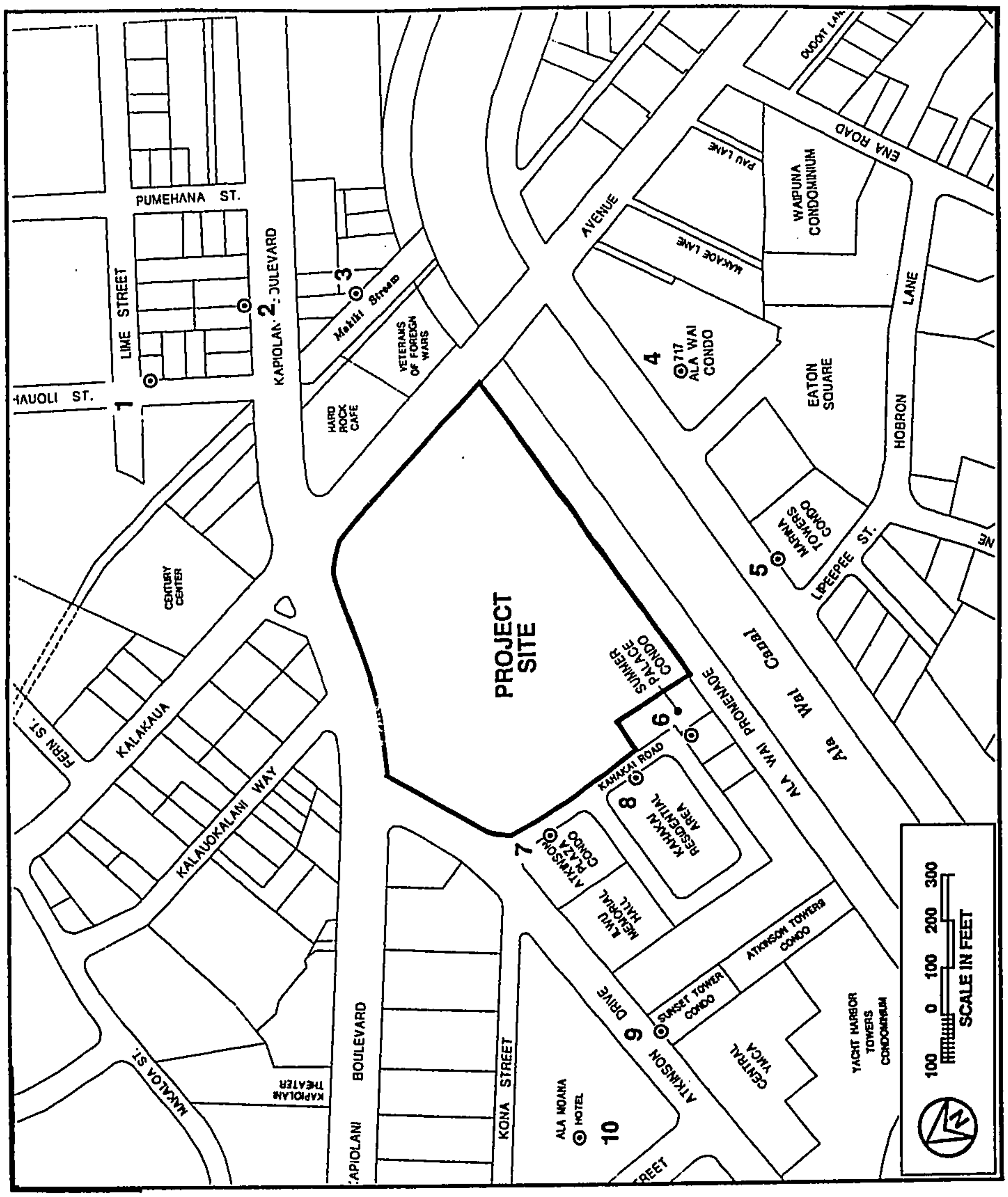
## TABLE 6

## COMPARISONS OF EXISTING AND FUTURE LDN AT VARIOUS NOISE SENSITIVE LOCATIONS

| MAP LOCATION NUMBER* | DESCRIPTION OF LOCATION | RECEPTOR HEIGHT (FT) | EXISTING LDN | FUTURE LDN | CHANGE IN LDN |
|---|---|---|---|---|---|
| 1 | Residences at Lime and Hauoli Street | 5 | 61 | 61 | 0 |
| 2 | Residences on Kapiolani Boulevard | 5 | 73 | 73 | 0 |
| 3 | Residences Behind Veterans of Foreign Wars Site | 5 | 60 | 60 | 0 |
| 4 | 1717 Ala Wai (Mauka Side) | 100 | 63 | 61 | −2 |
| 4 | 1717 Ala Wai (Mauka Side) | 250 | 63 | 61 | −2 |
| 5 | Marina Towers (Mauka Side) | 75 | 60 | 58 | −2 |
| 6 | The Summer Palace (Mauka Side) | 70 | 62 | 60 | −2 |
| 6 | The Summer Palace (Mauka Side) | 170 | 63 | 61 | −2 |
| 7 | Atkinson Plaza | 100 | 65 | 64 | −1 |
| 8 | Kahakai Road Residences | 15 | 63 | 54 | −9 |
| 9 | Sunset Towers (Mauka Side) | 100 | 68 | 69 | 1 |
| 10 | Ala Moana Americana Hotel (Makai Side) | 200 | 62 | 63 | 1 |

NOTE:

* See FIGURE 6 for receptor site locations.



LOCATIONS OF NOISE SENSITIVE RECEPTOR SITES

FIGURE 6

- Neighboring residential condominiums, such as 1717 Ala Wai, Marina Towers, etc., along the south side of Ala Wai Canal are predicted to experience no significant traffic noise impacts from the project. Traffic noise levels at these condominiums are not expected to increase significantly, and are predicted to decrease in some cases due to the noise shielding effects of the project's building.

- Although traffic volume along Kahakai Drive is expected to increase, total noise levels on the sides of the Atkinson Plaza and The Summer Palace condominium buildings which face the project are not expected to increase significantly, and are predicted to decrease at the lower elevations due to the noise shielding effects of the project's building on noise from other major streets in the area.

- Traffic noise levels along Atkinson Drive (Locations #9 and #10) are expected to increase by approximately 1 Ldn due to increases in project and non-project traffic. Noise sensitive receptors at these locations will not benefit from the noise shielding effects of the project's building.

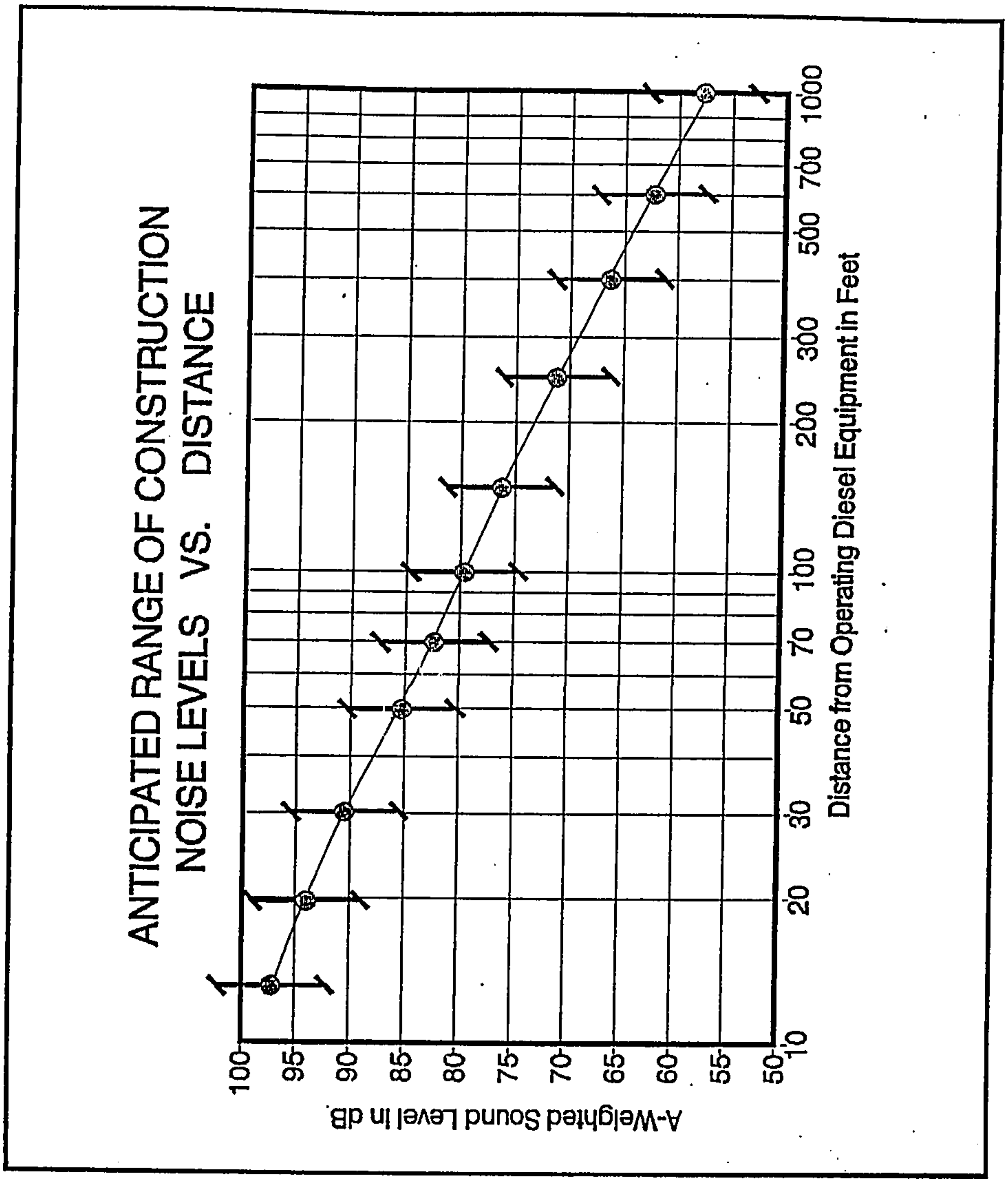
Mitigation of off-site traffic noise impacts are generally performed by individual property owners along the roadways' Right-of-Way or by public agencies during roadway improvement projects. These mitigation measures generally take the form of sound attenuating walls, window air conditioning units and/or the use of sound attenuating windows. Because of the large number of buses expected in the AM peak hour during a major convention event, management of the bus traffic during these events is recommended to minimize noise impacts on surrounding noise sensitive neighbors. Minimizing high speed idling of parked buses, the use of drive thru rather than back-up areas to minimize usage of back-up alarms, the use of quiet, modern, buses, and the use of lower engine RPM during acceleration are all recommended to minimize noise impacts from the added bus traffic during days of a major convention event. Heavy delivery trucks traveling along Kahakai Drive and Atkinson Drive should comply with existing State DOH vehicular noise limits and curfew periods. In addition, noise mitigation measures described for buses are also recommended for these heavy trucks.

## CHAPTER VIII. OTHER NON-TRAFFIC NOISE CONSIDERATIONS

**Construction Noise**. Audible construction noise will be unavoidable during the planned project construction period. The total time period for construction is approximately 2.3 years, although the noisiest period (Foundation Work) is expected to not exceed 7 months. It is also anticipated that the actual work will be moving from one location on the project site to another during that period. Actual length of exposure to construction noise at any receptor location will probably be less than the total construction period for the entire project. Typical levels of noise during the noisier phases of construction activity (excluding pile driving activity) are shown in **FIGURE 7**. The impulsive noise levels of impact pile drivers are approximately 15 dB higher than the levels shown in **FIGURE 7**, while the intermittent noise levels of vibratory pile drivers are at the upper end of the noise level ranges depicted in the figure. Construction noise levels south of the project across the Ala Wai Canal are expected to range from 75 to 55 dB, which are comparable to current noise levels from street traffic. The noise sensitive properties which are predicted to experience the highest noise levels during construction are the residential condominiums and apartments along Kahakai Drive. Along Kahakai Drive, construction noise levels are predicted to range from 95 dB during close-in construction of the roadway improvements and building foundation, to less than 70 dB during construction of the project near Kalakaua Avenue.

During impact pile driving operations on the project site, maximum noise levels of 104 dB at 50 FT distance, decreasing to 78 dB at 1,000 FT distance can be expected without mitigation measures. Indoors, typical levels of pile driving noise within naturally ventilated and air conditioned structures are approximately 10 and 22 dB less, respectively, than the outdoor levels listed above.

Mitigation of construction noise to inaudible levels may not




HAWAII CONVENTION CENTER
CONSTRUCTION NOISE LEVELS VS. DISTANCE

FIGURE
7

be practical in all cases due to the intensity of construction noise sources (80 to 90+ dB at 50 FT distance), and due to the exterior nature of the work (pile driving, grading and earth moving, trenching, concrete pouring, hammering, etc.). However, the following noise mitigation measures should be implemented if determined to be feasible:

- The use of construction noise barriers along Kahakai Drive (in the order of 8 to 16 FT high) can reduce construction noise by 5 to 20 dB at low and mid-rise receptors, but are not effective at reducing noise at high-rise receptors.

- The use of temporary closure and/or acoustical reinforcement of windows and doors of noise sensitive dwelling units may be the only effective means of reducing indoor noise levels during some periods of noisy construction activities. In addition, installation of air conditioning units may be required due to the loss of flow-through ventilation.

- The use of properly muffled construction equipment should be required on the job site. Heavy equipment and portable diesel engines and generators should be located at least 400 to 500 FT from residences, if possible.

- Reduction of pile driving noise by approximately 30 dB may be possible through the use of noise abatement towers which enclose the driven pile and hammer. In addition, if soil conditions allow, the use of vibratory pile driving equipment is also recommended for minimizing noise impacts from pile driving operations. Pre-drilling may reduce the number of blows required to drive a pile to refusal, but is not expected to significantly reduce pile driving noise levels, particularly at refusal. The use of bored-and-cast-in-situ piles can reduce the high level impact noise associated with driven piles by 25 to 30 dB. However, the implementation of these mitigation measures may not be feasible for the specific conditions of the project.

- The incorporation of State Department of Health construction noise limits and curfew times (which are applicable on Oahu) during the construction phases of this project is another noise mitigation measure which is normally used. **TABLE 7** depicts the allowed hours of construction for normal construction noise (levels which do not exceed 95 dB at the project's property line) and for construction noise which exceeds 95 dB at the project's property line. Noisy construction activities are not allowed on holidays under the DOH permit procedures.

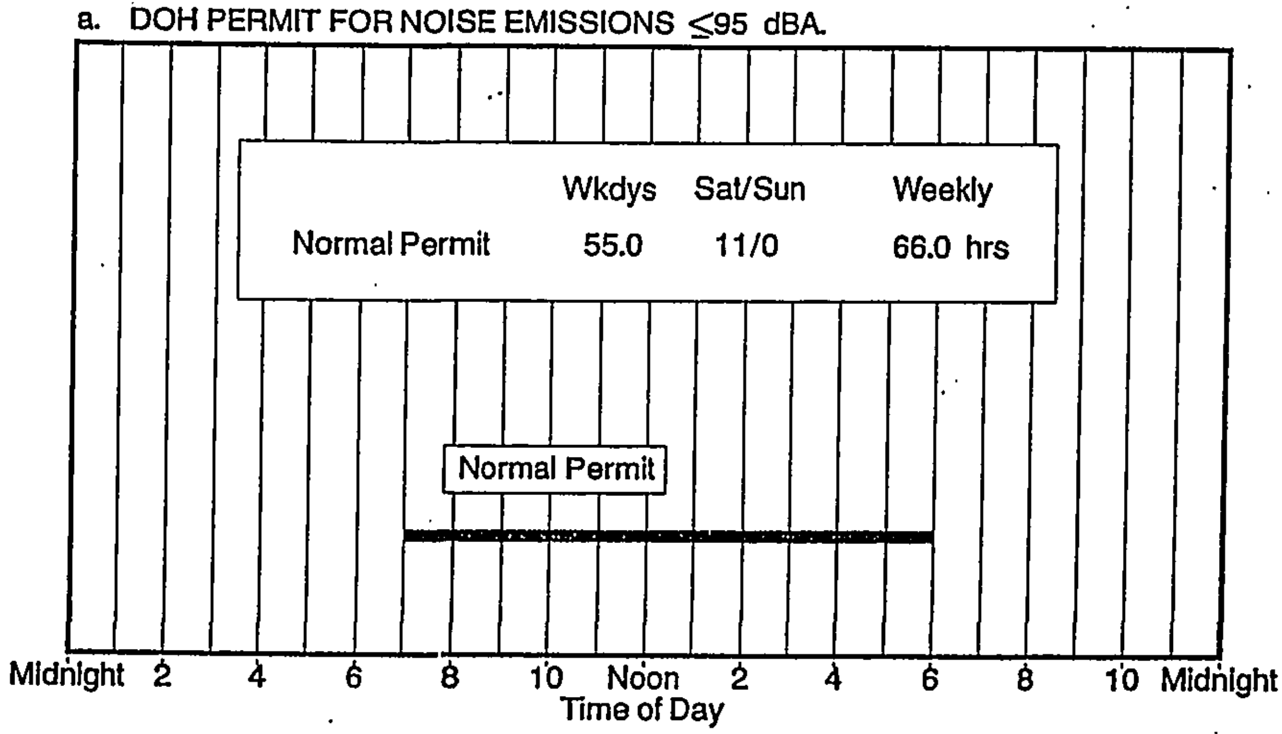
***On-Site Mechanical Equipment***. New mechanical equipment such as emergency electrical generators, air conditioning cooling towers, air conditioning compressors, kitchen exhaust fans, and other exhaust fans are the primary on-site noise sources expected to be located on the project site. Noise from these equipment will be difficult to hear at adjoining properties if the noise radiated beyond the property boundaries are at or below the residual background ambient noise levels of approximately 50 to 55 dB along Kahakai Drive.

These equipment, singly or together, have the potential of exceeding both the level of the residual background ambient noise in the area as well as the allowable property line noise limits of the State Department of Health noise regulations (**Reference 8**). The State DOH noise limits, which apply along the project's property boundary planes, are 60 dB and 50 dB during the daytime and nighttime periods, respectively. Typical noise levels of untreated mechanical equipment are significantly higher (by as much as 10 dB) than the allowable DOH noise limits, such that sound attenua-

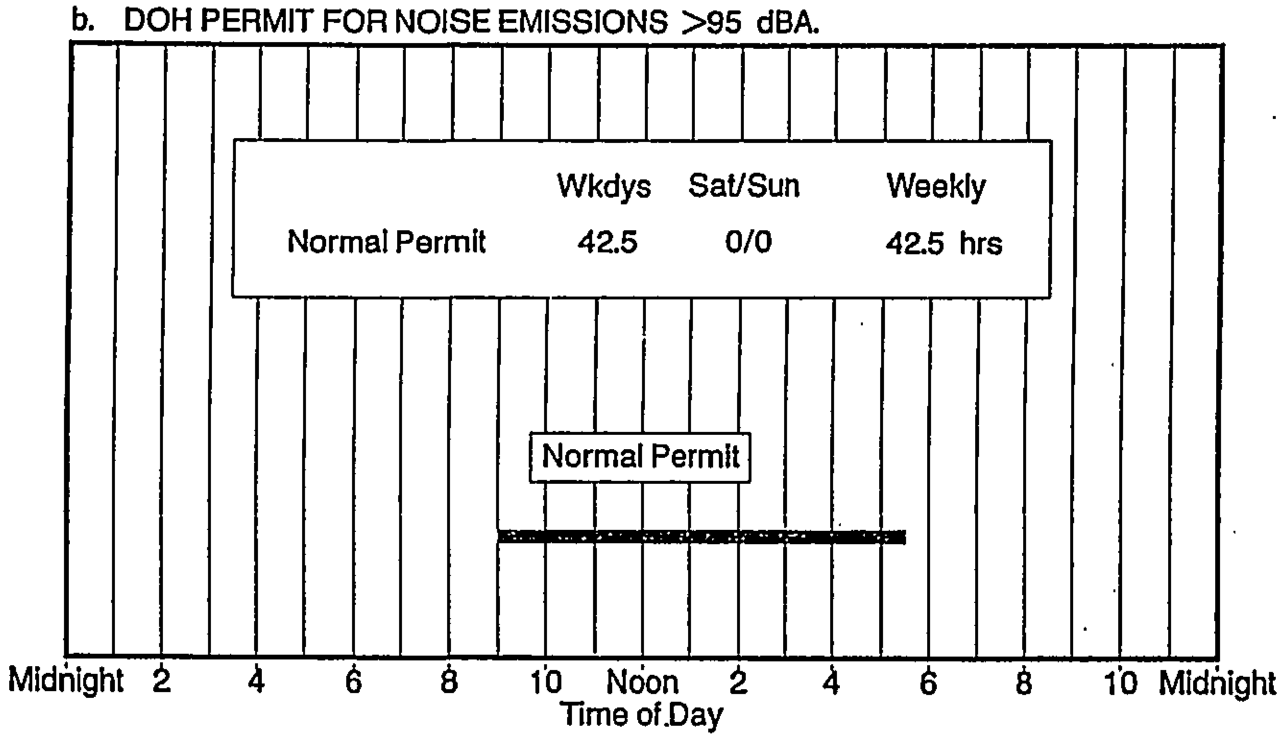
## TABLE 7

## AVAILABLE WORK HOURS UNDER DOH PERMIT PROCEDURES FOR CONSTRUCTION NOISE

a. DOH PERMIT FOR NOISE EMISSIONS ≤95 dBA.




b. DOH PERMIT FOR NOISE EMISSIONS >95 dBA.



tion treatment of the mechanical equipment will probably be required for compliance with the DOH regulations. In addition, compliance with the Octave Band limits as contained within Honolulu's Land Use Ordinance will be required. In summary, the project's mechanical equipment will probably require sound treatment to comply with existing property line noise limits and to minimize risks of noise impacts on neighboring properties. Because the residual background ambient noise levels in the area are relatively similar to the State DOH noise limits, compliance with the DOH noise limits should minimize risks of adverse noise impacts on neighboring properties.

**Parking Garage and Loading Dock Noise**. Noise from the parking garage, such as door slamming, tire squeal, theft alarms, and excessively noisy vehicles may be audible at nearby dwelling units along Kahakai Drive. Loading dock noise, such as from forklifts and backup alarms, may also be audible at nearby dwelling units along Kahakai Drive. To minimize these potential noise impacts from these areas, use of non-slick roadway surfaces, absorptive ceiling finishes, or closure/screening of garage openings may be possible. Minimizing parking garage and loading dock noise levels to not exceed the State DOH noise limits of 60 and 50 dB during the daytime and nighttime periods, respectively, should also minimize potential noise impacts from these areas.

**Roof Terrace Assembly Area**. Adverse noise impacts on neighboring properties are possible if large assemblies are held in the Roof Terrace area, and particularly so if sound reinforcement or paging systems are used. Background ambient noise levels of 55 to 70 dB are expected in the Roof Terrace area due to roadway traffic as well as conversations among groups of people. Crowd noise from large assemblies in excess of 10,000 persons can exceed 68 dB at 300 FT distance. In order to insure the intelligibility of music vocal performances or voice announcements over the entire assembly area, amplified music or voice levels of 80 to 90 dB will be required. These levels which will be required to address or entertain large gatherings could generate adverse impacts at the neighboring properties, and probably exceed the State DOH daytime limit of 60 dB. For these reasons, use of the Roof Terrace area for large assemblies is not recommended unless special noise mitigation measures are employed.

The use of portable enclosures to house large assemblies and/or smaller groups when amplified sound systems are required is a possible noise mitigation measures. The design of these enclosures should allow for a minimum of 30 dB of noise reduction or to limit noise emissions to levels below the applicable State DOH noise limits of 60 or 50 dB.

If the Roof Terrace area is used for personal exercise or passive activities in a park setting, noise impacts are not expected to occur, and special mitigation measures are not required.

**Vibration from Pile Driving.** Pile driving will probably be necessary to implant sheet and concrete piles into the ground over the project site. Induced ground vibrations from these pile driving operations have the potential to cause architectural and structural damage to structures.

Ground vibrations generated during pile driving operations are generally described in terms of peak particle (or ground) velocity in units of inches/second. The human being is very sensitive to ground vibrations, which are perceptible at relatively low particle velocities of 0.01 to 0.04 inches/second. Damage to structures, however, occur at even higher levels of vibration as indicated in **TABLE 8**. The most commonly used damage criteria for structures is the 2.0 inches/second limit derived from work by the U.S. Bureau of Mines. A more conservative limit of 0.2 inches/second is also used, and is suggested for planning purposes on this project because of the repetitive nature of pile driving operations which can increase risks of damage due to fatiguing, and

## TABLE 8

## SUMMARY OF BUILDING DAMAGE CRITERIA

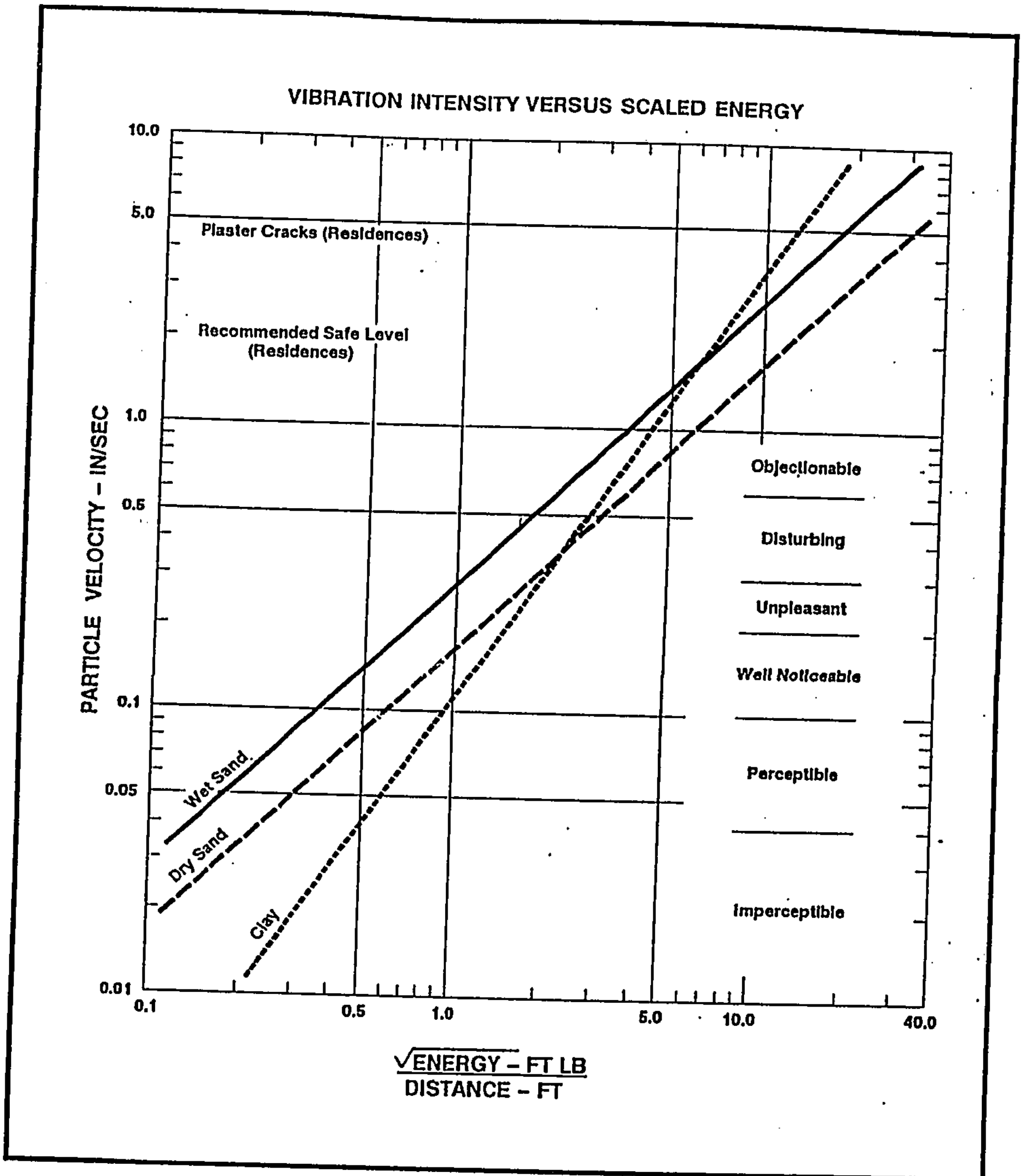
| PEAK GROUND VELOCITY (mm/sec) | PEAK GROUND VELOCITY (in/sec) | COMMENT |
|---|---|---|
| 193.04 | 7.6 | Major damage to buildings (mean of data). |
| 137.72 | 5.4 | Minor damage to buildings (mean of data). |
| 101.16 | 4.0 | 'Engineer structures' safe from damage. |
| 50.8 | 2.0 | Safe from damage limit (probability of damage <5%). |
| | | No structural damage. |
| 33.02 | 1.3 | Threshold of risk of 'architectural' damage for houses. |
| 25.4 | 1.0 | No data showing damage to structures for vibration <1 in./sec. |
| 15.24 | 0.6 | No risk of 'architectural' damage to normal buildings. |
| 10.16 | 0.4 | Threshold of damage in older homes. |
| 5.08 | 0.2 | Statistically significant percentage of structures may experience minor damage (including earthquake, nuclear event, and blast data for old and new structures). |
| | | No 'architectural' damage. |
| 3.81 | 0.5 to 0.15 | Upper limits for ruins and ancient monuments. |
| 1.0 | 0.04 | Vertical vibration clearly perceptible to humans. |
| 0.32 | 0.01 | Vertical vibration just perceptible to humans. |

Source: 'State-of-the-Art Review: Prediction and Control of Groundborne Noise and Vibration from Rail Transit Trains'; U.S. Department of Transportation; December 1983.

the residential nature of the adjacent buildings along Kahakai Drive.

Based on measured vibration levels during pile driving operations under various soil conditions and at various distances, estimates of ground vibration levels vs. distance from the pile driver have been made for various soil conditions and for various energy ratings of the pile drivers. **FIGURE 8**, which was extracted from **Reference 9**, may be used to predict vibration levels for the soil conditions indicated. When coral layers must be penetrated, vibration levels can be expected to be higher than those shown in **FIGURE 8**, particularly if the adjacent structures are supported by the common coral layer. From **FIGURE 8**, and for wet sand soil conditions, the 0.2 inches/second vibration damage criteria will be exceeded at a scaled energy distance factor of approximately 0.7. The scaled energy distance factor is equal to the square root of the energy (in foot-pounds) per blow of the hammer divided by the distance (in feet) between the pile tip and the monitoring location. For a 30,000 foot-pound pile driver, a scaled energy distance of 0.7 equates to a separation distance of 247 FT. Under clay soil conditions, and using the prediction procedures contained in **FIGURE 8**, a shorter separation distance of 115 FT is required to not exceed the 0.2 inches/second criteria when using a 30,000 foot-pound pile driver. It should be noted that 0.2 inches/second vibration levels were measured from a 22,400 foot-pound pile driver at even shorter separation distances of approximately 30 FT in sandy, layered soil (**Reference 10**). The measurement data reported in **Reference 10** are significantly lower than the vibration levels predicted by the methodology of **Reference 9.**

As indicated above, predictions of peak ground vibration levels vs. scaled energy distance factor from the driven pile are not precise, with initial uncertainty factor for a given location in the order of 10:1. For this reason, it is standard practice to employ seismograph monitoring of ground vibrations during pile




MAXIMUM VIBRATION INTENSITIES EXPECTED FROM PILE DRIVING

FIGURE 8

driving operations with a 3-axis geophone or accelerometer. If pile drivers of approximately 30,000 foot-pounds or larger ratings are anticipated to be used on the job site, the initial vibration predictions indicate that there is some risk of exceeding the 0.2 inches/second vibration damage criteria at 100 to 250 FT separation distances, and monitoring during pile driving operations is warranted. Monitoring alone, however, may not be a practical mitigation measure unless there are alternative pile driving methods or foundation plans which can be employed if the damage criteria is exceeded. For these reasons, the following preventative measures are recommended for implementation during the planning and design phases of the project:

- In addition to the normal planning and design concerns regarding potential damage due to settling and heaving during construction, consideration should also be given to risks of damage due to vibration from pile driving. A damage criteria of 0.2 inches/second should be initially used in conjunction with the vibration prediction method of **Reference 9** to identify the potential damage risk distances to the driven piles.

- If predicted vibration levels from pile driving exceed 0.2 inches/second at nearby buildings, and predicted levels cannot be reduced by sizing of the pile driver or through the use of alternate types of piles (bored or non-displacement types), test piles should be driven and its vibrations monitored and recorded. The monitoring of the test piles should be designed to measure the expected peak, 3-axis vibration levels at the historic buildings. The results of the monitoring, in addition to the specific types of adjacent structures, should be used to define the empirical distance from the driven pile to the damage risk location, and to reevaluate the risks of structural damage to the adjacent structures during actual construction.

- If predicted vibration levels from pile driving exceed 2.0 inches/second at the adjacent buildings, the use of alternate types of piles should be considered for implementation during the design phase.

## APPENDIX A. REFERENCES


(1) "Guidelines for Considering Noise in Land Use Planning and Control;" Federal Interagency Committee on Urban Noise; June 1980.

(2) "Environmental Criteria and Standards, Noise Abatement and Control, 24 CFR, Part 51, Subpart B;" U.S. Department of Housing and Urban Development; July 12, 1979.

(3) "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety;" Environmental Protection Agency (EPA 550/9-74-004); March 1974.

(4) Barry, T. and J. Reagan, "FHWA Highway Traffic Noise Prediction Model;" FHWA-RD-77-108, Federal Highway Administration; Washington, D.C.; December 1978.

(5) Existing and Future Traffic Assignments for the Hawai'i Convention Center Project; The Traffic Management Consultant; November - December 1994.

(6) September 28, 1994 24-Hour Traffic Counts and Vehicle Type Classification, Station SL-51, Kalakaua Avenue at Ala Wai Canal Bridge; State Department of Transportation.

(7) May 19-20, 1992 24-Hour Traffic Counts of All Inbound Traffic at Kalakaua Avenue and Kapiolani Boulevard Intersection; Honolulu Department of Transportation Services.

(8) "Title 11, Administrative Rules, Chapter 43, Community Noise Control for Oahu;" Hawaii State Department of Health; November 6, 1981.

(9) Wiss, John F., Janney, Elstner and Assoc.; "Damage of Pile Driving Vibration;" Highway Research Record, Number 155.

(10) Gutowski, T.G., Wittig, L.E., and Dym, C.L.; "Some Aspects of the Ground Vibration Problem;" Noise Control Engineering; May-June 1978.

# APPENDIX B

# EXCERPTS FROM EPA'S ACOUSTIC TERMINOLOGY GUIDE

Descriptor Symbol Usage

The recommended symbols for the commonly used acoustic descriptors based on A-weighting are contained in Table I. As most acoustic criteria and standards used by EPA are derived from the A-weighted sound level, almost all descriptor symbol usage guidance is contained in Table I.

Since acoustic nomenclature includes weighting networks other than "A" and measurements other than pressure, an expansion of Table I was developed (Table II). The group adopted the ANSI descriptor-symbol scheme which is structured into three stages. The first stage indicates that the descriptor is a level (i.e., based upon the logarithm of a ratio), the second stage indicates the type of quantity (power, pressure, or sound exposure), and the third stage indicates the weighting network (A, B, C, D, E.....). If no weighting network is specified, "A" weighting is understood. Exceptions are the A-weighted sound level and the A-weighted peak sound level which require that the "A" be specified. For convenience in those situations in which an A-weighted descriptor is being compared to that of another weighting, the alternative column in Table II permits the inclusion of the "A". For example, a report on blast noise might wish to contrast the LCdn with the LAdn.

Although not included in the tables, it is also recommended that "Lpn" and "LepN" be used as symbols for perceived noise levels and effective perceived noise levels, respectively.

It is recommended that in their initial use within a report, such terms be written in full, rather than abbreviated. An example of preferred usage is as follows:

The A-weighted sound level (LA) was measured before and after the installation of acoustical treatment. The measured LA values were 85 and 75 dB respectively.

Descriptor Nomenclature

With regard to energy averaging over time, the term "average" should be discouraged in favor of the term "equivalent". Hence, Leq, is designated the "equivalent sound level". For Ld, Ln, and Ldn, "equivalent" need not be stated since the concept of day, night, or day-night averaging is by definition understood. Therefore, the designations are "day sound level", "night sound level", and "day-night sound level", respectively.

The peak sound level is the logarithmic ratio of peak sound pressure to a reference pressure and not the maximum root mean square pressure. While the latter is the maximum sound pressure level, it is often incorrectly labelled peak. In that sound level meters have "peak" settings, this distinction is most important.

"Background ambient" should be used in lieu of "background", "ambient", "residual", or "indigenous" to describe the level characteristics of the general background noise due to the contribution of many unidentifiable noise sources near and far.

With regard to units, it is recommended that the unit decibel (abbreviated dB) be used without modification. Hence, DBA, PNdB, and EPNdB are not to be used. Examples of this preferred usage are: the Perceived Noise Level (Lpn was found to be 75 dB. Lpn = 75 dB). This decision was based upon the recommendation of the National Bureau of Standards, and the policies of ANSI and the Acoustical Society of America, all of which disallow any modification of bel except for prefixes indicating its multiples or submultiples (e.g., deci).

Noise Impact

In discussing noise impact, it is recommended that "Level Weighted Population" (LWP) replace "Equivalent Noise Impact" (ENI). The term "Relative Change of Impact" (RCI) shall be used for comparing the relative differences in LWP between two alternatives.

Further, when appropriate, "Noise Impact Index" (NII) and "Population Weighed Loss of Hearing" (PHL) shall be used consistent with CHABA Working Group 69 Report Guidelines for Preparing Environmental Impact Statements (1977).

## APPENDIX B (CONTINUED)

### TABLE I

### A-WEIGHTED RECOMMENDED DESCRIPTOR LIST

| TERM | SYMBOL |
|---|---|
| 1. A-Weighted Sound Level | $L_A$ |
| 2. A-Weighted Sound Power Level | $L_{WA}$ |
| 3. Maximum A-Weighted Sound Level | $L_{max}$ |
| 4. Peak A-Weighted Sound Level | $L_{Apk}$ |
| 5. Level Exceeded x% of the Time | $L_x$ |
| 6. Equivalent Sound Level | $L_{eq}$ |
| 7. Equivalent Sound Level over Time (T) (1) | $L_{eq(T)}$ |
| 8. Day Sound Level | $L_d$ |
| 9. Night Sound Level | $L_n$ |
| 10. Day-Night Sound Level | $L_{dn}$ |
| 11. Yearly Day-Night Sound Level | $L_{dn(Y)}$ |
| 12. Sound Exposure Level | $L_{SE}$ |

(1) Unless otherwise specified, time is in hours (e.g. the hourly equivalent level is $L_{eq(1)}$). Time may be specified in non-quantitative terms (e.g., could be specified a $L_{eq(WASH)}$ to mean the washing cycle noise for a washing machine).

SOURCE: EPA ACOUSTIC TERMINOLOGY GUIDE, BNA 8-14-78, NOISE REGULATION REPORTER.

## APPENDIX B (CONTINUED)

### TABLE II

### RECOMMENDED DESCRIPTOR LIST

| TERM | A-WEIGHTING | ALTERNATIVE[(1)] A-WEIGHTING | OTHER[(2)] WEIGHTING | UNWEIGHTED |
|---|---|---|---|---|
| 1. Sound (Pressure) [(3)] Level | $L_A$ | $L_{pA}$ | $L_B$, $L_{pB}$ | $L_p$ |
| 2. Sound Power Level | $L_{WA}$ | | $L_{WB}$ | $L_W$ |
| 3. Max. Sound Level | $L_{max}$ | $L_{Amax}$ | $L_{Bmax}$ | $L_{pmax}$ |
| 4. Peak Sound (Pressure) Level | $L_{Apk}$ | | $L_{Bpk}$ | $L_{pk}$ |
| 5. Level Exceeded x% of the time | $L_x$ | $L_{Ax}$ | $L_{Bx}$ | $L_{px}$ |
| 6. Equivalent Sound Level | $L_{eq}$ | $L_{Aeq}$ | $L_{Beq}$ | $L_{peq}$ |
| 7. Equivalent Sound Level [(4)] Over Time(T) | $L_{eq(T)}$ | $L_{Aeq(T)}$ | $L_{Beq(T)}$ | $L_{peq(T)}$ |
| 8. Day Sound Level | $L_d$ | $L_{Ad}$ | $L_{Bd}$ | $L_{pd}$ |
| 9. Night Sound Level | $L_n$ | $L_{An}$ | $L_{Bn}$ | $L_{pn}$ |
| 10. Day-Night Sound Level | $L_{dn}$ | $L_{Adn}$ | $L_{Bdn}$ | $L_{pdn}$ |
| 11. Yearly Day-Night Sound Level | $L_{dn(Y)}$ | $L_{Adn(Y)}$ | $L_{Bdn(Y)}$ | $L_{pdn(Y)}$ |
| 12. Sound Exposure Level | $L_S$ | $L_{SA}$ | $L_{SB}$ | $L_{Sp}$ |
| 13. Energy Average value over (non-time domain) set of observations | $L_{eq(e)}$ | $L_{Aeq(e)}$ | $L_{Beq(e)}$ | $L_{peq(e)}$ |
| 14. Level exceeded x% of the total set of (non-time domain) observations | $L_{x(e)}$ | $L_{Ax(e)}$ | $L_{Bx(e)}$ | $L_{px(e)}$ |
| 15. Average $L_x$ value | $L_x$ | $L_{Ax}$ | $L_{Bx}$ | $L_{px}$ |

(1) "Alternative" symbols may be used to assure clarity or consistency.

(2) Only B-weighting shown. Applies also to C,D,E,.....weighting.

(3) The term "pressure" is used only for the unweighted level.

(4) Unless otherwise specified, time is in hours (e.g., the hourly equivalent level is Leq(1). Time may be specified in non-quantitative terms (e.g., could be specified as Leq(WASH) to mean the washing cycle noise for a washing machine.

## APPENDIX G

## SOCIAL IMPACT ASSESSMENT

*Earthplan*

# Hawai'i Convention Center Social Impact Assessment

Prepared for Wilson Okamoto and Associates

by Earthplan

Revised June 1995



## Contents

# Tables and Figures

## Tables



## Figures







# 1 Background and Introduction

## 1.1 Report Purpose and Preparation

The Convention Center Authority, hereafter referred to as the Authority, proposes to develop a stand-alone convention center in Honolulu. The Authority has determined that an Environmental Impact Statement (EIS) is to be prepared for the project because the development includes the use of State lands and funds. Further, the convention center has the potential to significantly impact the various components of the physical, social and economic environment.

The Authority selected the team headed by Nordic/PCL to design and build the convention center. Nordic/PCL is preparing the EIS for the Authority, and the Governor is the accepting authority.

This report assesses the potential social impacts of the proposed actions. It describes the existing social context for the project, as well as examines major forces for changes within the affected community. Potential social impacts are then identified. Also included is a discussion of community issues. This report is summarized in and appended to the EIS.

This social impact assessment report was prepared by Earthplan, whose offices are located at 81 South Hotel Street, Suite 211 in Honolulu. Berna Cabacungan, principal of Earthplan, was project manager, and primary researcher, analyst and writer. Assistance was provided by three independent contractors.

Lani Nedbalek assisted in several areas. She conducted research related to land use policies, landownership of neighboring parcels, and private development possibilities. She also interviewed people with islandwide and regional environmental, business and cultural perspectives, and analyzed impacts related to police and fire protection.

Keawe Liu interviewed residents and businesses in the neighborhood and reviewed minutes of three Neighborhood Boards. Traver Carroll analyzed census statistics and gathered information related to tourism impacts.

## 1.2 Report Organization

The remaining portions of Section 1 discuss the functions of social impact assessment and describe the proposed project.

Section 2 describes the existing community in terms of population trends, demographic characteristics, labor force and education statistics, household and family characteristics, and housing information.

Section 3 presents a future scenario of the area without the proposed project. The section includes information about public policies and other proposed projects which may be forces for change independent of the proposed plan.

Potential social impacts are discussed in Section 4. Included in this discussion are social implications for the visitor industry, the effect on the adjacent communities, possible changes in the neighborhood, and impacts on public services and facilities.

In Section 5, preliminary issues about the project are presented, based on community interviews conducted for the SIA.





## 1.3 Description of Social Impact Assessment

The social aspects of an area relates to people living and interacting with other people. Social impact analysis explores how the physical environment of a community or neighborhood may be changed by a proposed land development, and how these changes may affect the neighborhood as a social environment. [1]

Social impact assessment, hereafter referred to as SIA, is a field of applied social science, and its primary function has to do with the development and disclosure of social information relevant to informing the decision-making process and/or designing management actions to deal with problematic social outcomes of a proposed project.

Commonly identified uses of SIAs include:

- **Understanding the ability of a community or group to adapt to changing conditions**

  In identifying social consequences of a proposed action, cause-and-effect relationships are complex. People of various social and cultural backgrounds react differently to similar events. An important function of SIAs is therefore to obtain and analyze the necessary information about community organization and likely responses to changing conditions. As such, the non-project social scenario is as important as the with-project scenarios because it provides the analyst with a realistic social context for the proposed action.

1. Christiansen, 1976.

- **Defining the problems or clarifying the issues involved in a proposed change**

  Frequently, opposition to or support for a proposed project can only be understood and addressed when the proponent is aware of cultural tendencies, underling issues, vested interests, and misperceptions. The SIA is the basis for defining and clarifying project or program issues in a systematic approach within the EIS framework.

- **Illuminating the meaning and importance of anticipated change**

  An important objective of SIA is to determine what meaning a probable impact would have for a community and its residents. Whereas a certain impact may have relatively low social significance in some communities, it may be given more importance or significance in other settings or communities.

- **Identifying mitigation opportunities or requirements.**

  Another function of SIA is to explore how a proposed action can cause the least adverse and most beneficial impacts, and to identify responses from the community and affected persons. SIA information can be crucial in determining what mitigation is necessary, what mitigation alternatives exist, and which mitigation strategies are most likely to work.[1]

## 1.4 Project Background and Description

A convention center in Hawai'i has been contemplated and discussed by the public and private sector for several years. Its pros and cons have been debated in public forums, and many sites

1. *Adapted from Branch, etal., 1984.*





have been considered. Individual groups and neighborhoods have opposed and supported the various proposals.

Hence, from a social perspective, this proposal for a convention center is the realization of the many years of effort, study and debate. To understand the social context in which this project is being proposed, a chronological overview of highlights in the last nine years is provided in *Table 1*.

**Table 1: Convention Center Background**

| Year | Highlight |
|---|---|
| 1985 | A study commissioned by the State Department of Planning and Economic Development finds that a convention center is feasible and evaluates nine sites; the Ala Wai Golf Course is the highest ranked. |
| 1986 | Private non-profit Hawai'i Convention Park Council is formed to promote a convention center.<br>State Legislature approves a five percent hotel room tax. A portion of the tax is designated to finance a convention center. |
| 1988 | The State Department of Business and Economic Development selects three planning firms to act as advocates for three convention center sites, including Fort Armstrong in Kaka'ako, the Ala Wai Golf Course and a Waikiki site.<br>State Legislature passes Act 96 to establish the Waikiki Convention Center Authority, with the intent to solicit proposals for the International Market Place site. Public protest ensues. |

**Table 1: Convention Center Background** *(Continued)*

| Year | Highlight |
|---|---|
| 1989 | First Development, Inc. submits a Plan Review Use (PRU) application for a privately funded convention center, two hotels, two residential towers and office uses on the Aloha Motors site. |
| 1990 | The Honolulu City Council approves the PRU application, including the allowance of building height up to 500 feet.<br>The Convention Center Authority approves another proposal for a convention center at the International Marketplace. |
| 1992 | The International Marketplace proposal is withdrawn because of lack of financing. The State Legislature votes to extend the Convention Center Authority, with a mandate to seek alternate sites.<br>The Convention Center Authority conducts a site selection survey. Of the 39 sites reviewed, six were considered for their high degree of conformance to the criteria. The six include the Ala Wai Gateway, two areas of the Ala Wai Golf Course, the Aloha Motors site, Fort DeRussy and Jefferson School. |





**Table 1: Convention Center Background** *(Continued)*

| Year | Highlight |
|---|---|
| 1993 | The State Legislature agrees on a proposal that would include the Aloha Motors site and the Waikiki Gateway site near Hobron Lane in a new convention center district. The plan is not implemented because of a technical error.<br>The Convention Center Partners, headed by developer Sukarman Sukamto, purchase the Aloha Motors site from First Development, Inc. The new owners receive approval for modifications to the previously approved PRU, but tourism industry leaders contend that more exhibition space is needed to create a world class convention center.<br>The State Legislature approves increasing the hotel room tax to six percent to raise funds to buy the Aloha Motors sites. The Convention Center is given 60 days to purchase the site. |
| 1994 | The State owns the Aloha Motors site on March 18. |

The project site comprises 9.67 acres and is located at the intersection of Kapi'olani Boulevard and Kalakaua Avenue. These two thoroughfares, along with Atkinson Drive, Kahakai Street and the Ala Wai Promenade, form the boundaries of this roughly rectangular site.

The convention center is designed to accommodate international and national conventions, trade shows, exhibitions and meetings. It is expected that a typical event would have between 6,200 and 7,500 people; this would occur about 60 times a year at stabilization. Events for groups of 10,000 persons are estimated to occur approximately three times or ten days a year. Larger events for up to 14,000 people would occur once every three years.

To accommodate these estimates, the convention center will have the following major components:

- a main lobby and registration area enclosed by a 70-foot high hanging glass curtain
- approximately 200,000 square feet of ground floor exhibition hall
- meeting rooms, two high-tech theaters and atrium gathering areas
- food service for banquets and meetings
- a 35,000 square-foot ballroom
- a 2.5-acre landscaped rooftop garden next to the ballroom
- staging area for shuttle buses and taxis
- approximately 800 parking stalls
- enclosed truck docks and direct truck access onto the exhibition hall floor
- internal traffic circulation system to prevent queuing on streets
- road widening on Kapi'olani Boulevard, Kalakaua Avenue, and Atkinson and Kahakai Drives.





# 2 Profile of the Existing Community

The project site is located at the crossroads of communities which differ in character and function. To the east is McCully, a residential neighborhood. Southeast of the project site is Waikiki, the hub of Hawai'i's visitor industry. The mixed uses of Ala Moana and Kaka'ako provide diversity west of the project site. This section defines the report's Study Area in Section 2.1.

Demographic information for the Study Area is presented in Section 2.2, and education and labor force characteristics are contained in Section 2.3. In Section 2.4, household and family statistics are presented, followed by housing information in Section 2.5.

## 2.1 Description of the Study Area

To understand the full social context in which the Hawai'i Convention Center will be developed, this report includes the following three regions in the Study Area, which is illustrated in *Figure A.*

- **Ala Moana/Kaka'ako Sub-Area**

  This subarea is coterminous with the area covered by the Ala Moana/Kaka'ako Neighborhood Board No. 11. The project site is located in this Neighborhood Board area, which extends from Kalakaua Avenue and the Ala Wai Canal to South Street, and from King Street to the ocean. This region is visited daily by islandwide residents and visitors to the State. The Ala Moana Beach Park is a regional recreational resource and the Ala Moana Shopping Center is a retail center for residents and visitors alike. Another prominent

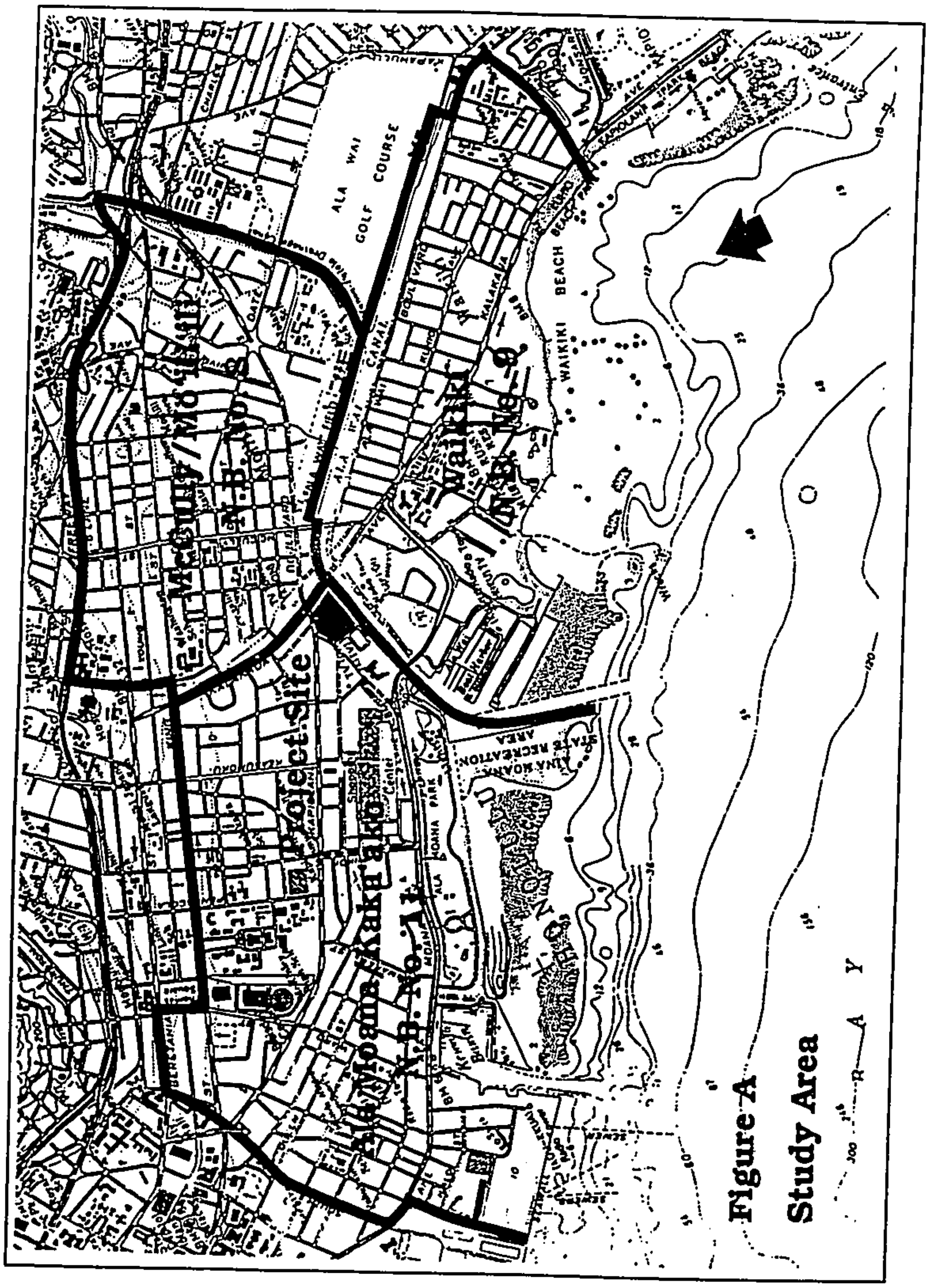



**Figure A**
**Study Area**

feature in this region is the Neal Blaisdell Center which serves as a venue for a variety of cultural events, product shows and general entertainment.

The residential neighborhoods in this region have distinct characteristics. The neighborhood in the eastern portion of this Neighborhood Board area, between Kalakaua Avenue and Ke'eaumoku Street, has a city-like atmosphere and contains several high rise apartments. Between Ke'eaumoku and Pensacola Streets, the apartments are mostly two- and three-story walk-ups, the streets are narrower, and the ambience is generally quieter. Residential uses become sparse west of Pensacola Street, and most residential buildings are recent high-rise developments which are part of redevelopment efforts in the Kaka'ako Community Development District, as designated by the State Legislature.

- **McCully/Mo'ili'ili Sub-Area**

This subarea is coterminous with the area covered by the McCully/Mo'ili'ili Neighborhood Board No. 8. This Neighborhood Board Area extends from the Manoa - Palolo Drainage Canal to Kalakaua Avenue, and from the H-1 Freeway to the Ala Wai Canal. This residential neighborhood has a fairly homogenous character. Walk-up apartments are predominant, and single family houses can still be found here. Residential highrises line Kapi'olani Boulevard; including the Marco Polo, University Plaza, Iolani Court Plaza, Skyline, Regency and Kapiolani Gardens.

Commercial establishments can be found along the major thoroughfares. These are generally neighborhood-oriented shops, with the exception of the high-rise Century Center along Kalakaua Avenue. Kapi'olani Boulevard is commercially-oriented near the project site, but becomes





primarily residential past McCully Street. Nearest the project site on Kapi'olani Boulevard are the Hard Rock Cafe, the McCully Shopping Center and the Kapiolani Plaza Shopping Center.

- **Waikiki Sub-Area**

This subarea is coterminous with the area covered by the Waikiki Neighborhood Board No. 9. This Neighborhood Area extends from the Ala Wai Canal to Kapi'olani Park and from Kalakaua Avenue to the ocean. As Hawai'i's primary tourist destination, Waikiki contains major hotels, and its streets are lined with souvenir and gift shops, apparel boutiques, restaurants and travel-related service establishments.

Waikiki is also a prime location for people who prefer a high-density urban environment, or who want to live and work in Waikiki. The neighborhood across the Ala Wai Canal from the project site is densely-populated. High-rise towers in this area include 1717 Ala Wai, Marina Towers, the Villa on Eaton Square, Waipuna, Kalia and Wailana. These are mixed with walk-up residential structures, such as the Ala Wai Terrace Apartments, along the canal.

## 2.2 Demographic Characteristics

In 1990, almost 59,000 people lived in the Study Area. This was seven percent of the islandwide population of 836,000 persons.

With about 28,500 residents, the McCully/Mo'ili'ili had almost the same population as the combined populations of Waikiki (19,757 persons) and Ala Moana/Kakaako (10,943 persons). *Table 2* contains further demographic information.

**Table 2: Study Area Age and Ethnicity, 1990**

| | O'ahu | Study Area | | | |
|---|---|---|---|---|---|
| | | Total | McCully Mo'ili'ili | Waikiki | Ala Moana Kaka'ako |
| **Population** | 836,231 | 59,166 | 28,466 | 19,757 | 10,943 |
| **Age** | | | | | |
| Less than 18 years | 24.5% | 11.4% | 15.3% | 7.2% | 8.7% |
| 18 to 44 years | 46.3% | 48.8% | 51.1% | 46.9% | 46.2% |
| 45 to 64 years | 18.3% | 21.6% | 19.4% | 24.7% | 21.5% |
| 65 years or older | 10.9% | 18.3% | 14.2% | 21.1% | 23.5% |
| **Median Age** [a] | 32.3 years | 39.2 years | 35.9 years | 42.3 years | 42.0 years |
| **Ethnicity** | | | | | |
| Caucasian | 31.7% | 36.6% | 22.4% | 61.1% | 29.5% |
| Chinese | 7.6% | 11.1% | 14.5% | 6.9% | 9.5% |
| Filipino | 14.2% | 4.4% | 4.2% | 3.8% | 5.7% |
| Japanese | 23.8% | 29.0% | 39.5% | 12.0% | 32.4% |
| Korean | 2.7% | 6.4% | 7.2% | 2.8% | 10.9% |
| Hawaiian | 10.8% | 5.2% | 5.4% | 4.8% | 5.4% |
| Other | 9.3% | 7.3% | 6.8% | 8.5% | 6.6% |

*a. The Study Area median was calculated as a weighted mean of medians.*

*Source: U. S. Department of Commerce, undated*





The Study Area community was generally older than the County-wide population. O'ahu's median age was 32.2 years in 1990; the Study Area's median was 39.2 years at the same time. The Waikiki and Ala Moana/Kaka'ako subareas were both significantly older, with median ages of 42.3 years and 42 years, respectively. The McCully/Mo'ili'ili subarea had a median age of 35.9 years in 1990.

These high median ages are due to the very low presence of minors, and significantly high proportions of elderly people in the Study Area. On O'ahu, one-fourth of the population was 18 years old or younger. Only eleven percent of the Study Area population were minors in 1990. The smallest proportion of young people was in Waikiki, where only seven percent of the population was 18 years or younger.

Proportionally, there were over twice as many elderly people in Ala Moana/Kaka'ako and Waikiki at 24 percent and 21percent, respectively, when compared to O'ahu's eleven percent.

In terms of ethnicity, the Study Area as a whole had fairly similar ethnic proportions as the islandwide profile. Significant exceptions included a very low proportion of Filipinos (four percent compared to O'ahu's 14 percent), a low proportion of Hawaiians (five percent compared to O'ahu's eleven percent), and a relatively high proportion of Koreans (six percent compared to O'ahu's three percent).

The different subareas had distinct ethnic characteristics:

- Compared to islandwide statistics, the **Ala Moana/Kaka'ako subarea** had high proportions of Japanese (32 percent) and Koreans (eleven percent); the proportions of Filipinos and Hawaiians were very low at six and five percent, respectively.

About 30 percent of this subarea's residents were Caucasian.

- In the McCully/Mo'ili'ili subarea, there were also high proportions of Japanese (39 percent) and Koreans (seven percent) when compared to O'ahu's population; the proportion of Chinese (14 percent) was high as well. As with Ala Moana/Kaka'ako, the proportions of Filipinos and Hawaiians were very low at six and five percent, respectively.
- Caucasians made up over 61 percent of the resident population in the Waikiki subarea. Consequently, all other ethnicities were significantly less represented in this area.

## 2.3 Education and Labor Force

Of O'ahu residents who are 25 years and older, about 19 percent did not graduate from high school, and 28 percent received high school diplomas. Another 28 percent completed less than four years of college, and an additional 25 percent had at least four years of college education. *Table 3* contains similar information for the Study Area.

**Table 3: Education and Labor Force, 1990**

| | O'ahu | Study Area | | | |
|---|---|---|---|---|---|
| | | Total | McCully Mo'ili'ili | Waikiki | Ala Moana Kaka'ako |
| **Educational Attainment** *(for residents 25 years and older* | | | | | |
| Less than high school | 18.8% | 17.2% | 18.9% | 12.4% | 22.0% |





**Table 3: Education and Labor Force, 1990** *(Continued)*

| | O'ahu | Study Area | | | |
|---|---|---|---|---|---|
| | | Total | McCully Mo'ili'ili | Waikiki | Ala Moana Kaka'ako |
| High school graduate | 28.4% | 26.2% | 26.9% | 26.1% | 25.0% |
| Some college | 28.2% | 28.5% | 26.3% | 32.1% | 27.0% |
| Four or more years of college | 24.6% | 28.0% | 27.8% | 29.4% | 26.0% |
| **Labor Force** *(for persons 16 years and older)* | | | | | |
| Civilian labor force | 62.9% | 65.5% | 70.0% | 62.0% | 61.1% |
| Armed forces | 8.2% | 0.8% | 0.3% | 1.3% | 0.9% |
| Not in the labor force | 28.9% | 33.7% | 29.7% | 36.6% | 38.0% |
| Unemployed | 3.1% | 3.5% | 2.5% | 5.6% | 1.5% |
| **Civilian Occupations** | | | | | |
| Managerial/professional | 27.7% | 28.8% | 28.5% | 29.4% | 28.6% |
| Technical/sales | 34.6% | 37.3% | 38.5% | 36.8% | 35.0% |
| Service | 16.8% | 17.5% | 16.2% | 19.7% | 17.3% |
| Farm/fishing | 1.5% | 0.8% | 0.8% | 0.7% | 0.7% |
| Precision/craft | 9.9% | 8.5% | 8.5% | 7.4% | 10.6% |
| Operation/laborer | 9.5% | 7.1% | 7.5% | 6.0% | 7.9% |

**Table 3: Education and Labor Force, 1990** *(Continued)*

| | O'ahu | Study Area | | | |
|---|---|---|---|---|---|
| | | Total | McCully Mo'ili'ili | Waikiki | Ala Moana Kaka'ako |
| **Mean travel time to work** (in minutes) | 24.8 | 18.8 | 19.2 | 19.0 | 17.6 |

*Source: U. S. Department of Commerce, undated*

Overall, the Study Area residents received slightly more education than islandwide residents. There were more people who completed four or more years of college (28 percent) and slightly less who did not complete high school (17 percent).

Of the subareas, McCully/Mo'ili'ili residents exhibited fairly similar proportions of educational attainment as the islandwide profile. In the Waikiki subarea, over 62 percent either had some post-high school education (32 percent) or were able to complete four years of college (30 percent). The educational profile of Ala Moana/Kaka'ako differed in that slightly more people (22 percent) did not graduate from high school, but 26 percent completed at least four years of college.

The Study Area had a slightly larger civilian labor force at 66 percent of those 16 years and older, than O'ahu, where 63 percent were in the civilian labor force. Non-participation was also high, however, and 34 percent of the potential labor force did not work or were not unemployed. [3] By comparison, 29 percent of O'ahu's qualified adults were not in the labor force. Less than one percent of the Study Area's potential labor force were in the military.

3. *Non-participation in the labor force is where a person is not part of the labor force due to illness, injury, age, lifestyle choice or other reason. Such a person would not be considered unemployed.*





The non-participation rates in two subareas were much higher than that of O'ahu. In the Ala Moana/Kaka'ako and Waikiki subareas, respectively 38 and 37 percent were not in the labor force. This reflects the high proportion of elderly residents, many of whom are likely retired.

The unemployment rate at the time of the 1990 census was 3.1 percent for O'ahu, and 3.5 percent for the Study Area. Within the subareas, unemployment rates were low in Ala Moana/Kaka'ako (two percent) and McCully/Mo'ili'ili (three percent), but high in Waikiki (six percent).

The occupational profile of Study Area residents was generally similar to the islandwide profile. Exceptions included more people in technical and sales occupations (37 percent compared to O'ahu's 35 percent), less people in farming and fishing occupations (0.8 percent compared to the island's two percent), and fewer operators/laborers (seven percent compared to O'ahu's ten percent).

The subareas were mostly consistent with the overall Study Area profile. The Waikiki subarea differed somewhat in that there were higher proportions of people in service (20 percent), managerial and professional (29 percent) and technical sales (37 percent) occupations.

The Study Area is in the midst of urban Honolulu's major employment centers and its residents consequently spent less time commuting to work than islandwide residents. The mean travel time to work for O'ahu residents was 24.8 minutes in 1990. For the Study area, the mean travel time ranged from 17.6 minutes in the Ala Moana/Kaka'ako region to 19.2 minutes in McCully/Mo'ili'ili.

## 2.4 Household and Family Characteristics

The Study Area contained 31,100 households in 1990, which accounted for twelve percent of the 265,600 households on O'ahu. *Table 4* contains further household and family information.

Note that the Study Area accounted for only seven percent of O'ahu's 1990 population. The larger share of households suggest smaller household sizes in the Study Area, and the 1990 census indicates significantly small households in the Study Area. The median household size for O'ahu was 3.02 persons; for the Study Area, the weighted median household size was 1.88 persons in 1990. This suggests a significantly high proportion of single person households in the Study Area.

Households in the Waikiki and Ala Moana/Kaka'ako subareas were significantly small with averages of, respectively, 1.71 and 1.72 persons per household. The McCully /Mo'ili'ili subarea had an average of 2.08 persons per household in 1990.

### Table 4: Households and Families, 1990

| | O'ahu | Study Area | | | |
|---|---|---|---|---|---|
| | | Total | McCully Mo'ili'ili | Waikiki | Ala Moana Kaka'ako |
| **Households** | 265,625 | 31,091 | 13,428 | 11,445 | 6,218 |
| Average household size | 3.02 persons | 1.88 persons | 2.08 persons | 1.71 persons | 1.72 persons |
| Residence in 1985 *(for persons 5 years and older)* | | | | | |
| Same house | 50.3% | 43.5% | 48.1% | 34.3% | 48.3% |





### Table 4: Households and Families, 1990 *(Continued)*

| | O'ahu | Study Area | | | |
|---|---|---|---|---|---|
| | | Total | McCully Mo'ili'ili | Waikiki | Ala Moana Kaka'ako |
| Same island | 25.9% | 30.6% | 33.2% | 27.4% | 29.6% |
| Other island | 1.1% | 1.4% | 1.5% | 1.0% | 0.8% |
| Other state | 17.3% | 15.4% | 7.7% | 27.3% | 13.3% |
| Abroad | 5.3% | 9.2% | 9.1% | 9.9% | 8.0% |
| **Family households as part of total households** | 75.1% | 43.6% | 50.9% | 36.4% | 40.9% |
| Average family size | 3.49 persons | 2.63 persons | 2.83 persons | 2.39 persons | 2.48 persons |
| Married couple | 81.5% | 73.5% | 70.0% | 77.6% | 76.1% |
| *with children under 18* | *39.4%* | *21.9%* | *27.2%* | *15.4%* | *18.2%* |
| Female householder | 13.1% | 19.4% | 22.4% | 16.1% | 16.5% |
| *with children under 18* | *5.6%* | *8.1%* | *9.6%* | *7.2%* | *5.4%* |
| Median family income [a] | $45,313 | $35,810 | $35,686 | $37,241 | $33,779 |
| Families below poverty level | 5.4% | 6.7% | 6.7% | 6.5% | 7.3% |

*a. The Study Area median was calculated as a weighted mean of medians.*
*Source: U. S. Department of Commerce, undated*

Proportionally, there was less residential stability in the Study Area than in the O'ahu-wide community, where 50 percent lived in the same house five years prior to the 1990 census. Slightly over one-fourth of the islandwide households lived on the same island in

1985, and one percent lived on another island. Approximately 23 percent lived in another state or were in a foreign country five years previous.

Of the three subareas, McCully/Mo'ili'ili tended to be the most stable. About 48 percent lived in the same house and 33 percent had lived on another island. Seventeen percent lived in another site or abroad in 1985.

The highest level of in-migration was found in the Waikiki subarea. Only 34 percent lived in the same house, and 27 percent lived on the same island five years prior to the census. Over 36 percent lived in another state or in a foreign country in 1985.

The Study Area also tended to be less family-oriented than the islandwide community. On O'ahu, three-fourths of the households were families, of which 81 percent had married couples. In contrast, families comprised only 44 percent of the Study Area households, and only 73 percent had married couples. Single females headed over 19 percent of the Study Area families.

Further, fewer Study Area families had children under 18 years of age. Islandwide, over 45 percent of the family households had children; in the Study Area, 30 percent of the family households contained children.

In the individual subareas, the smallest proportion of family households was found in Waikiki, where 36 percent were in this category. Respectively, 51 and 41 percent of McCully/Mo'ili'ili's and Ala Moana/Kaka'ako's households were family households.





In Waikiki, only 22 percent of the family households contained children 18 years and younger. At the other end of the spectrum was McCully/Mo'ili'ili, where 38 percent of the family households had children.

The presence of households headed by single women was high in McCully/Mo'ili'ili. Over 22 percent of the total households were headed by single women, and children under 18 were present in ten percent of these households.

At $35,810, the median family income in the Study Area was significantly lower than O'ahu's median of $45,313. Within the Study Area, the median ranged from a low of $33,779 in Ala Moana/Kaka'ako to $37,241 in Waikiki.

There were proportionally more families below poverty level in the Study Area than on O'ahu, where five percent were in this category. In Ala Moana/Kaka'ako, which had the lowest family median income, over seven percent of the families were below poverty level in 1990.

## 2.5 Housing Information

Of O'ahu's 281,700 housing units, 49 percent were owner-occupied and 45 percent contained renters. The remaining six percent were vacant. In the Study Area, rentals were more common at 57 percent, and over 18 percent of the units were vacant at the time of the 1990 census.

As shown on *Table 5*, Waikiki, with 17,100 units, contained the largest number of housing units, even though it was second in terms of population. This discrepancy is due to the large presence of vacant units at 34 percent. Of the total vacant units, 40 percent were rentals, and 31 percent were held as vacation units. Only two percent of the vacant units were on the market for sale.

The housing units in both McCully/Mo'ili'ili and Ala Moana/Kaka'ako are mostly occupied by renters at 68 and 63 percent, respectively. Most of McCully/Mo'ili'ili's vacant units, or 52 percent, were used as rentals. In Ala Moana/Kaka'ako, over 40 percent of the vacant units were either sold or rented but unoccupied at the at the time of census; this likely due to housing developments in Kaka'ako which had just completed construction in early 1990.

### Table 5: Housing Units, 1990

| | O'ahu | Study Area | | | |
|---|---|---|---|---|---|
| | | Total | McCully Mo'ili'ili | Waikiki | Ala Moana Kaka'ako |
| Housing Units | 281,683 | 37,944 | 14,046 | 17,137 | 6,761 |
| Owner-occupied | 49.0% | 25.0% | 28.3% | 20.9% | 28.6% |
| Renter-occupied | 45.2% | 56.6% | 67.5% | 45.3% | 62.8% |
| Vacant | 5.8% | 18.3% | 4.2% | 33.8% | 8.6% |
| Vacancy status | | | | | |
| For sale only | 4.5% | 2.2% | 2.4% | 2.0% | 3.8% |
| For rent | 35.8% | 40.0% | 51.8% | 40.4% | 23.8% |
| Seasonal or vacation homes | 27.0% | 29.2% | 9.0% | 31.0% | 31.3% |
| Other [a] | 32.8% | 28.7% | 36.8% | 26.6% | 41.1% |
| Units per structure | | | | | |
| 1 detached | 44.9% | 2.9% | 6.1% | 0.6% | 2.0% |





### Table 5: Housing Units, 1990 *(Continued)*

| | O'ahu | Study Area | | | |
|---|---|---|---|---|---|
| | | Total | McCully Mo'ili'ili | Waikiki | Ala Moana Kaka'ako |
| 1 attached | 10.2% | 0.9% | 1.7% | 0.3% | 0.5% |
| 2 to 9 units | 13.4% | 14.0% | 27.9% | 4.1% | 10.5% |
| 10 or more units | 30.1% | 79.6% | 63.6% | 90.4% | 85.6% |
| Other | 1.4% | 2.6% | 0.7% | 4.5% | 1.4% |
| Median value of owner-occupied units [b] | $281,500 | $280,900 | $270,600 | $257,500 | $345,500 |
| Median rent of renter-occupied units [c] | $663 | $631 | $582 | $716 | $586 |
| Persons per room | | | | | |
| 1.01 to 1.50 persons [d] | 6.9% | 5.4% | 6.7% | 3.9% | 5.1% |
| 1.51 or more persons [e] | 7.7% | 9.9% | 9.6% | 8.8% | 12.4% |

*a. Includes homes for migrant workers, and units that were sold or rented but unoccupied at the time of census taking.*
*b. The Study Area median was calculated as a weighted mean of medians.*
*c. The Study Area median was calculated as a weighted mean of medians.*
*d. Indicates mildly crowded conditions.*
*e. Indicated very crowded conditions.*
*Source: U. S. Department of Commerce, undated*

As may be expected, the Study Area's housing supply is typical of high-density urban housing. Most units are in apartment buildings or high-rises. Whereas 30 percent of O'ahu's housing supply are in structures with ten or more units, 80 percent of the Study Area's supply were in this category. The highest proportion of medium and high density structures was in Waikiki, where 90 percent of the housing units were in structures with ten or more units.

In the overall Study Area, the median value of owner-occupied units was generally similar to O'ahu's median of $281,500. Among the sub-areas, the medians varied from a low of $257,500 in Waikiki to $345,500 in the more recently developed Ala Moana/Kaka'ako.

Rents varied also. The median rents in McCully/Mo'ili'ili and Ala Moana/Kaka'ako were similar, at $582 and $585, respectively. Waikiki's 1990 median rent of $716 was higher than these two sub-areas, as well as the islandwide median rent of $663.

The crowding index developed by the U.S. Bureau of the Census is based on the ratio of persons in the household to rooms in the unit. More than one person per room is considered crowded. Of the total occupied units on O'ahu, seven percent were considered mildly crowded with 1.01 to 1.5 persons per room. Almost eight percent were considered very crowded with 1.51 or more persons per room.

In the overall Study Area, five percent were mildly crowded, and another ten percent were very crowded. Crowding was particularly high in the Ala Moana/Kaka'ako subarea, where twelve percent met very crowded conditions, and another five percent were mildly crowded. In the McCully/Mo'ili'ili subarea, seven percent were mildly crowded and another ten percent were very crowded. Waikiki had proportionally the least crowded conditions; four percent were mildly crowded and nine percent were very crowded.





# 3 Major Forces for Change

This section extends the baseline information established in Section 2 by exploring major influences which can direct the future of the Study Area.

Section 3.1 reviews the direction for growth set forth in land use policies, and Section 3.2 identifies development projects independent of the Hawai'i Convention Center.

## 3.1 Land Use Policy Directives

The Study Area, including the neighborhoods surrounding the project site, reflects a diversity of urban uses. Rules and regulations have been established to maintain or revitalize specific areas, some near or around the proposed convention center site. This section examines policies generally affecting the Study Area to determine possible changes in the area regardless of implementation of the convention center.

### 3.1.1 General Plan of the City and County of Honolulu

The General Plan for the City and County of Honolulu, as amended by the City Council in 1992, contains long-range objectives and broad policy statements directed toward improving the general welfare and prosperity of the people of O'ahu.

The project site is located within the Primary Urban Center, hereafter referred to as the PUC. The island's most populated geographical district, the PUC extends from Pearl City to Wai'alae Kahala. Enacted policies and procedures emphasize that urban planning efficiently accommodate more intensive commercial, governmental, residential, and recreational functions in a manner that safeguards and adds to the existing amenities of the city's urban environment.

Population estimates included in the General Plan are contained in *Table 6*. By 2010, the PUC is projected to contain approximately 45.1 to 49.8 percent of the islandwide population. Based on the M-K population projections prepared by the State Department of Business, Economic Development, this share translates into a population of approximately 450,800 to 497,800 persons.

### Table 6: Population Distribution by Development Plan Area

| Development Plan Area | Population Distribution | 2010 Population Range |
|---|---|---|
| PUC [illegible] | 45.1% to 49.8% | 450,774 to 497,751 |
| 'Ewa | 12.0% to 13.3% | 119,940 to 132,934 |
| Central O'ahu | 14.9% to 16.5% | 148,926 to 164,917 |
| East Honolulu | 5.3% to 5.8% | 52,974 to 57,971 |
| Ko'olaupoko | 11.0% to 12.2% | 109,945 to 121,939 |
| Ko'olauloa | 1.3% to 1.4% | 12,994 to 13,993 |
| North Shore | 1.6% to 1.8% | 15,992 to 17,991 |
| Wai'anae | 3.8% to 4.2% | 37,981 to 41,979 |
| Total O'ahu | 95.0% to 105.0% | 949,525 to 1,049,475 |

### 3.1.2 Primary Urban Center Development Plan

The City's Development Plans provide the framework to implement the objectives of the General Plan by providing relatively detailed land use guidelines, including those pertaining to allowable heights and activities.



Hawai'i Convention Center Social Impact Assessment
Prepared by Earthplan

The Special Provisions for the PUC Development Plan target certain communities in the Study Area for specific design or other policies. Those which are relevant to the project or the project site are as follows:

- **McCully-Mo'ili'ili Special Area**

  Bounded by the H-1 Freeway, the Manoa-Palolo Stream, the Ala Wai Canal and the Makiki Drainage Ditch, this area is part of the McCully/Mo'ili'ili subarea of this report. Growth in this area is generally limited to medium-density apartments in combination with complementary commercial and mixed uses along major transportation corridors. With a few exceptions, the general height for medium-density apartment commercial emphasis mixed-use, and residential emphasis mixed-use areas is 150 feet.

  Where possible, a variety of housing and open space amenities are to be provided for families, and elderly and childless households.

- **The Alapai-Sheridan Special Area**

  This special area is located north of the project site, and is bounded by Alapa'i Street, the H-1 Freeway, Punahou Street, Makiki Drainage Ditch, Kapi'olani Boulevard, and Pi'ikoi and King Streets. Growth within this area is generally limited to medium-density and high-density apartments in combination with commercial and mixed-use developments. Height limits range from 350 feet to 150 feet depending on uses and locations within the special area. Policy direction for the vicinity nearest the project site include:

  - Commercial emphasis mixed use makai of Kanunu Street and Diamond Head of Kaheka and Mahukona Streets and the high-density apartment and residential emphasis mixed use area mauka of Rycroft and Kanunu Streets; and

- Commercial emphasis mixed use Diamond Head of Kalakaua Avenue.

• **The Waikiki Special Area**

This area is in the Waikiki subarea of this report, and is bounded by Kapahulu Avenue, the shoreline and, across the project site, by the Ala Wai Canal. Primary focus of the area provisions deal with enhancing the attractiveness and quality of Hawai'i's primary tourist destination area and its residential areas. Guidelines for the areas nearest the project include:

- Resort and related commercial activities are to be concentrated in the area makai of Kuhio Avenue and Ala Moana Boulevard;
- Apartments intended for Honolulu's residents who prefer a high density urban living environment are to be located mauka of Kuhio Avenue and in the Hobron Lane area.

The Special Provisions place a cap of 32,800 visitor units in the Waikiki Special Area with the provisions that "...review will occur in 1997 and every five years thereafter to assure that the economic viability of Waikiki as a tourist destination area is maintained."

Information compiled by the Hawaii Visitors Bureau estimate the 1993 visitor unit count in Waikiki to be approximately 31,966. This number includes apartment/hotels, bed and breakfast units, condos, cottages, hostels and so on.





• **Ala Moana Special Area**

The Special Provisions of the PUC Development Plan establish the project site within the Ala Moana Subarea, an area bounded by Pi'ikoi Street, Kapiolani Boulevard, Makiki Drainage Ditch, Ala Wai Canal, and Ala Moana Boulevard. Hotels and convention centers are permitted as principal uses in the area bounded by Kapi'olani Boulevard, Kalakaua Avenue, the Ala Wai Canal, the medium-density apartment designated area, Atkinson Drive and Mahukona Drive.

The majority of the project site, or 9.22 acres, is designated Commercial Emphasis Mixed Use on the PUC Development Plan Land Use Map. This land use category allows commercial uses to be the predominant development and, where appropriate, the ground floor may be designed primarily for commercial uses which support establishing a new or maintaining an existing pedestrian-oriented environment.

The remaining 0.43-acre portion of the site is designated Medium Density Apartment; these areas are designed to accommodate a density of approximately 90 dwelling units per acre.

The City Planning Department has prepared forecasts for 2005, based on land use policies in the Development Plans. The projections are based on the assumption that capacity will be provided to meet the market demand, and that only as much capacity will be consumed as there is demand; hence, full build-out of a project is not assumed. *Table 7* summarizes population, housing and hotel unit changes projected by the Planning Department. The projections indicate that the Study Area is expected to grow by approximately 14,650 persons, with over half of this growth occurring in the Ala Moana - Kaka'ako Neighborhood

Board area. Both the Waikiki and Ala Moana - Kaka'ako Neighborhood Board areas are expected to grow at rates higher than that of the overall island. In terms of hotel development, the City Planning Department projects an additional 1,022 units for Waikiki in 2005.

### Table 7: Study Area Projections for 2005 by the City Planning Department

| | O'ahu | Neighborhood Board Area | | |
|---|---|---|---|---|
| | | Waikiki | McCully-Mo'ili'ili | Ala Moana - Kaka'ako |
| **Population** | | | | |
| 1990 | 836,231 | 19,768 | 28,446 | 10,978 |
| 2005 | 965,135 | 23,753 | 30,543 | 19,503 |
| Change | 15.4% | 20.2% | 7.4% | 77.7% |
| **Housing Units** | | | | |
| 1990 | 281,683 | 17,198 | 14,046 | 6,779 |
| 2005 | 339,165 | 19,082 | 15,191 | 13,388 |
| Change | 20.4% | 11.0% | 8.2% | 97.5% |
| **Hotel Units** | | | | |
| 1990 | 29,966 | 26,465 | 0 | 1,386 |
| 2005 | 36,249 | 27,487 | 0 | 1,329 |
| Change | 21.0% | 3.9% | 0% | -4.1% |

*Source: Letter dated 18 May 1995 from Cheryl D. Soon, Chief Planning Officer, City Planning Department to Earl Matsukawa, Wilson Okamoto and Associates. Note that the letter contained a map of "Traffic Assessment Zones" which were the basic units for projections. The letter map contained mapping errors, and Earthplan obtained subsequently received corrected maps from the department staff.*





### 3.1.3 PUC Public Facilities Map

The DP Public Facilities Map identifies three major improvements near and around the area of the proposed project. These include:

- Additional rights-of-way and new streets along Kalakaua Avenue, near King Street to Fort DeRussy (within six years);
- existing rights-of-way improvements for Ala Moana Boulevard, Atkinson Drive, Ala Wai Boulevard and Kapiolani Boulevard (beyond six years); and
- and new sewer line construction along Kahakai Street (within six years).

The PUC Public Facilities map also designates proposed rapid transit system improvements which would intersect the project site from Kona Street and continue Diamond Head along Kapi'olani Boulevard. That project is inactive at the time of this writing.

### 3.1.4 Waikiki Master Plan

Completed in 1992, the Waikiki Master Plan provides a framework for public and private improvements to guide Waikiki into the 21st century by redirecting growth and economic development. The effort, spearheaded by the City Planning Department, includes an assessment of Waikiki visitor units and proposals for major redevelopment, affordable housing and open spaces. The plan establishes goals and policies for urban design, transportation networks, and management of Waikiki services and improvements.

The growth policy recommended by the Waikiki Master Plan would permit the addition of between 3,000 to 5,000 new visitor units. Realization of this growth would require zoning modifications, but not substantial increase in allowable densities. This increase is less than the State forecasts of 4,000 to 8,000 units, and well below another projected demand of 13,000 by 2010.[4]

To plan for and direct future changes in Waikiki, the plan looked at areas which are resistant to change, susceptible to change, and likely to change.

In identifying the areas which are likely to change, the plan found that the entrance to Waikiki at the Ala Moana Boulevard bridge is likely to change, and it was noted that a large number of parcels have been assembled in anticipation of change. Located southeast of the project site and across the Ala Wai Canal, this area has been eyed for development, and is most recently known for the "Waikiki Gateway Project." The plan recommends that this area be included in the Resort Mixed Use district, with allowable building heights of between 200 and 350 feet.[5] Immediately across the Ala Wai Canal is recommended for Apartment Precinct designation, with allowable building heights of 180 to 220 feet.

### 3.1.5 Kaka'ako Community Development District

Another major force for change in the Study Area is the State government through the Hawai'i Community Development Authority. Hereby referred to as HCDA, this Authority is responsible for planning and implementing community development programs in a portion of the Study Area. The Kaka'ako Community Development District comprises Mauka and Makai Areas, which cover approximately 450 acres.

4. *The latter projection was estimated by Pannell Kerr Forster in conjunction with the preparation of the Waikiki Master Plan.*
5. *This project is further discussed in Section 3.2.*





HCDA has prepared a plan which provides a framework for district-wide development and improvements through the year 2012; the plan guides public and private sector actions in the area's revitalization. In the Mauka Area, which is bounded by Pi'ikoi Street, Ala Moana Boulevard, Punchbowl Street and King Street, the plan provides for the potential development of 36.1 million square feet of floor area. Thirty-eight percent is allocated for commercial uses, 15 percent for industrial uses, and 47 percent for residential uses.

The Mauka Area Plan emphasizes the need for mixed use development in Kaka'ako, and consolidated blocks, those which are combinations of two or more city blocks, are encouraged as a mechanism for optimizing mixed uses. A typical mixed use project would have parking, commercial and industrial uses in platforms up to 45 feet. Abutting or above the platforms would be towers containing residential, office and commercial uses.

In terms of residential development, Kaka'ako's residential component is to be a mixture of densities and building types, as well as building configurations. Social and economic integration is to occur both vertically and horizontally. Further, there is to be an increased supply of housing for residents with low- and moderate incomes. At maximum build-out, approximately 19,000 housing units may be developed.

### 3.1.6 Zoning in the Project Vicinity

The site's zoning corresponds to its Development Plan Land Use designations. The 9.22-acre portion is zoned BMX-3, community business mixed use; the remaining area is zoned A-2, medium density apartment.

The BMX-3 zoning district provides for both commercial and residential uses outside the central business mixed use district, especially in areas where the existing land use pattern is already a mixture of commercial and residential uses. The maximum density with open space bonuses is a Floor Area Ratio (FAR) of 3.5. The A-2 zoning districts provide areas for medium-density, multi-family dwellings primarily for concentrated urban areas where public services are centrally located and infrastructure capacities are adequate.

Zoning in the surrounding areas is as follows: [6]

- **'Ewa side of Atkinson Drive**

  This area is zoned BMX-3, Community Business Mixed Use. Building height limits vary here, and, in general, range from 350 feet at the Ala Moana Hotel site, 250 feet and 350 feet along Kona Street, and 100 feet at the Ala Moana Center. Permitted uses among the various residential and commercial uses include multi-family dwellings, meeting facilities, and indoor amusement and recreation facilities. Joint development is permitted with approval of a Conditional Use Permit, Type 1. Hotels, permitted as principal uses in BMX-4 and Resort districts, are not permitted in the BMX-3 district.

- **Diamond Head of Atkinson Drive**

  The area is zoned A-2, Medium Density Apartment, with height limits of 150 feet.

- **Kahakai Drive Neighborhood**

  The area is zoned A-2, Medium Density Apartment District,

6. *See Section 5.2 for discussion of existing uses.*





with a general height limit of 150 feet. Permitted uses include dwellings, boarding facilities, meeting facilities (subject to site plan review), consulates, and other limited uses. Joint development is permitted with approval of a Conditional Use Permit, Type 1.

- **Mauka of Kapi'olani Boulevard**

  The parcels on Kapi'olani Boulevard closest to the site, between Kaheka Street, Kalakaua Avenue, and Makaloa Street are zoned BMX-3 with a general height limit of 350 feet.

- **Kalakaua Avenue**

  The area occupied by the Hard Rock Cafe is currently zoned BMX-3, with the adjacent parking lot area zoned B-2, Community Business District. The intent of this zoning district is to provide areas for community-wide business establishments in areas accessible to vehicles and pedestrians. More restrictive than the BMX-3, multi-family dwellings are not permitted uses.

## 3.2 Development Proposals

In the late 1980s, the area near the project site, particularly along Kapi'olani Boulevard, was slated for major development. Aggressive buyer interest and rapid response to new parcels on the market once coined Kapi'olani Boulevard the "Wilshire Boulevard of Honolulu." [7] With the downturn in the economy, however, much of the development interest has waned, and construction activity in the Study Area is mostly confined to government projects. *Table 8*

7. *Earthplan, 1989.*

contains information on development projects which have received major development approvals.

**Table 8: Status of Study Area Development Projects Which Have Received Major Approvals**

| Project | Number of Units | Status |
|---|---|---|
| Ala Moana/Kaka'ako | | |
| 404 Piikoi | 1,400 | 304 units completed; remaining project delayed indefinitely |
| Symphony Park | 301 | Scheduled for completion between 1996 and 2000; some sitework completed |
| King Street Place | 284 | Scheduled for completion between 1996 and 2000; implementation dependent on economic climate |
| Queen Emmalani Tower | 267 | Site currently used as a parking lot |
| Waterfront Towers | 560 | |
| Ke'eaumoku Superblock | 300 | Delayed indefinitely |
| State Housing Projects in Kaka'ako | | |
| The Honuakaha | 244 | Under construction |
| Pohukaina | 600 | Scheduled for completion between 1996 - 2000 |
| Waikiki Subarea | | |
| Tusitala | 147 | Scheduled for completion between 1996 - 2000 |
| Waikikian/Tahitian Lanai | 264 | Delayed indefinitely |

*Source: City Planning Department, 1994 and field observations*





Currently, the only large project being considered in the vicinity of the project site is the Waikiki Gateway project site. The Waikiki Master Plan identifies this area, in addition to sites at Beachwalk/ Lewers, Jefferson School, King Kalakaua Plaza, and International Marketplace, as a potential major redevelopment project which offers significant opportunities for change.

The plan includes the Gateway Project as a proposed mixed-use development of resort and residential uses that would create a new gateway entrance into Waikiki and would provide a connection across the Ala Wai Canal to the new Convention Center site on the Aloha Motors property. Proposals for redevelopment include:

- Development oriented toward the Ala Wai Canal with Ala Wai Boulevard closed makai of Lipe'epe'e Street.
- Right-of-way designed as a pedestrian promenade with shops, hotels or residential uses opening onto it.
- A new pedestrian bridge constructed over the Ala Wai Canal at Lipe'epe'e Street to provide walkways to the convention center and Ala Moana Center.

The plan proposes that gateway streets would be created at Ala Moana Boulevard and Kalakaua Avenue providing special entrances into Waikiki. The gateways would be enhanced by extensive landscaping and special features such as lighting, art work, water features and decorative paving.

In 1994, the Honolulu City Council proposed to redesignate approximately 8.7 acres of land on the Waikiki Gateway site from Resort Mixed Use to High Density Apartment. This portion of the overall site contains approximately 25 structures held by various owners. The reasons for this redesignation include inadequate infrastructure to service resort mixed uses, the need to preserve the existing scarce rental housing in Waikiki, and possible exceedance of the hotel room cap for Waikiki.

The Chief Planning Officer is recommending that the proposed amendment be denied. The Planning Department found that, given the State's intent to develop a stand-alone convention center nearby, there is a need for area resort facilities. It was noted that the Gateway site is highly suitable for resort mixed use because of its proximity to the convention center and its location at one of Waikiki's gateways. The City Council has deferred its decision on the amendment until September 1995, pending resolution of several areas of concern by the developer.





# 4 Potential Social Impacts

This section explores the various effects of the proposed Hawai'i Convention Center on the social environment. Social impacts are presented in terms of whether they are primary, secondary or cumulative effects.

*Primary social impacts* are those directly related to the presence and operation of the Hawai'i Convention Center. These impacts can be directly attributable to the facility, and would not occur if the project were not built. Examples of primary impacts include on-site employment, project-related traffic, and compatibility-related effects, such as increased activity and noise for neighbors.

*Secondary social impacts* are one step removed from the primary impacts. While secondary impacts may be related to the presence of the project, they also depend on factors outside of the project's influence. Also, unlike primary impacts, many secondary impacts could occur regardless of project implementation, though the project may influence the timing of occurrence. Impacts which meet this criteria include development of nearby parcels, changes in neighboring land uses, hotel development and economic development.

*Cumulative impacts* are those which could occur if the project were built, but the relationship between the project and the impact is less predictable than the primary and secondary impacts. Cumulative impacts would occur if the secondary impacts occurred, and, like the secondary impacts, could take place even if the project were not built. For example, the population growth and related impacts due to the secondary impacts are considered cumulative.

An example of how these definitions can be applied is illustrated in *Figure B.*

Section 4.1 discusses implications for the visitor industry. In Section 4.2, the surrounding neighborhood is described and the project's potential impacts on this neighborhood are presented. Impacts on public services and facilities are identified in Section 4.3. Mitigation measures raised for consideration are presented in Section 4.4.

## 4.1 Implications for the Visitor Industry

The growth and development of tourism can have both positive and negative impacts on our community. The Hawai'i Convention Center is the product of private and public efforts to expand the State's visitor industry.

This section explores the various aspects of the project's effects on tourism by first providing a profile of the visitor industry in Section 4.1.1. Section 4.1.2 looks at the relationship between the realization of the convention center and the need to increase the supply of visitor units in or near Waikiki. In Section 4.1.3, there is a discussion of the cumulative social implications of tourism growth.

### 4.1.1 Profile of Hawai'i's Visitor Industry

Tourism is the major force in the State's economic development. It is Hawai'i's largest export, the source of two-thirds of total external receipts, nearly three times receipts from merchandise exports and six times receipts from other service exports. [8]

[8] *Bank of Hawaii, 1994.*





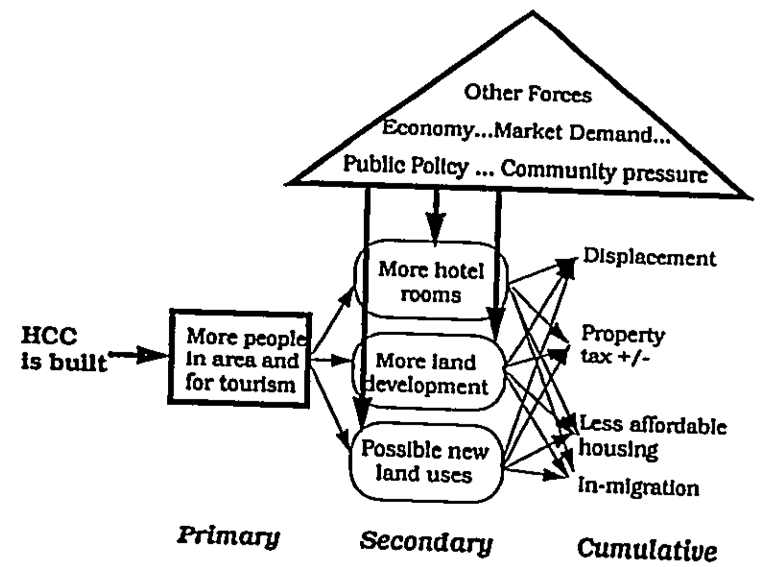



**Figure B**
**Example of Relationship Between Hawai'i Convention Center and Primary, Secondary and Cumulative Social Impacts**

When considering all jobs directly and indirectly related to tourism, it is estimated that the visitor industry is responsible for more than half of all jobs in Hawai'i. Visitor industry jobs extend well beyond hotels, retail shops and restaurants. Indirectly related jobs are those which have to do with the purchases of goods and services by visitors, by businesses that service visitors, and by employees supported by the visitor industry. These include jobs provided by airlines and airports; companies that supply goods and services to airlines; car rental companies; bus companies; auto repair shops for rental cars and buses; oil companies that provide fuel for airplanes, ships, cars, buses and trucks; the telephone, electric and cable TV companies that service visitors and employees; construction companies that work on hotels and related improvements; landscaping and maintenance companies; and so on. [9]

State policies clearly advocate the continued growth of tourism and stress that economic planning should be directed so that "the visitor industry constitutes a major component of steady growth for Hawai'i's economy." [10] The State Functional Plan on Tourism contains policies and actions intended to further the visitor industry, but within a context of an optimum growth rate which balances economic benefits with maintaining environmental integrity and the quality of life.

*Table 9* shows that Hawai'i's tourist industry experienced a steady decline in visitors and revenue since 1991. Visitor arrivals have decreased over the past few years, and consequently visitor expenditures are down.

9. *Plasch, 1993.*
10. *Office of the Governor, 1991.*





While there was an increase in hotel rooms in the late 1980s and early 1990s, the supply has since decreased because of the effects of Hurricane Iniki in 1992.

### Table 9: Tourism in Hawai'i, 1992 to 1993

| | 1991 | 1992 | 1993 | Change between 1991 and 1992 | Change between 1992 and 1993 |
|---|---|---|---|---|---|
| **Total visitor arrivals** *(in thousands)* | 6,873.9 | 6,513.9 | 6,124.2 | -5.3% | -6.0% |
| *Westbound* | *4,584.5* | *3,980.0* | *3,764.5* | *-13.0%* | *-5.4%* |
| *Eastbound* | *2,289.4* | *2,533.8* | *2,359.7* | *10.7%* | *-6.9%* |
| **Average daily census** | 158,214 | 153,807 | 148,959 | -2.8% | -3.2% |
| | | | | | |
| **Total visitor expenditures** *(in millions of dollars)* | $10,633.8 | $9,558.9 | $8,677.6 | -10.4% | -9.2% |
| **Number of hotel rooms** | 72,575 | 73,779 | 70,542 | 1.7% | -4.4% |
| **Hotel occupancy** | 71.9% | 73.7% | 72.0% | 2.5% | -2.3% |
| **Average room rates** | $104.98 | $105.50 | $104.04 | 0.5% | -1.3% |
| | | | | | |
| **Hotel job count** | 40,800 | 40,950 | 38,000 | 0.3% | -7.2% |

*Source: Bank of Hawaii, 1994.*

Preliminary 1994 information suggests that the industry is beginning to improve. A slow start extended through mid-1994, but the third quarter showing appears to be somewhere between 1992 and 1993 levels. The average daily census in 1994 was near the 1990 level, which means that the number of rooms occupied was similar to that of four years ago.

In terms of hotel jobs, there have been major uninterrupted increases in jobs from 1988 through mid-1992. The 30 percent increase meant record total wages of $841 million in 1992; total wages declined only two percent in 1993. The subsequent decrease in hotel jobs was mostly due to a belated acknowledgment of room and staff inventory surplus. It is expected that current levels of hotel employment will be maintained. [11]

#### 4.1.2 Effect of Convention Center on Visitor Unit Supply

The process of estimating the new hotel development which may be stimulated by the Hawai'i Convention Center is summarized as follows:

1. KPMG estimates that the Hawai'i Convention Center will require up to 7,500 hotel room nights in 2008. Of these, 4,900 room nights are needed on O'ahu, based on an average of 5.77 days spent on O'ahu out of 8.14 conventioneer days. [12]

2. KPMG estimates that 2,800 hotel units are currently

*11. Bank of Hawaii, 1994.*
*12. Report on Economic and Fiscal Impacts prepared by KPMG Peat Marwick, June 27, 1995, Exhibit 2-B. Note that KPMG created two scenarios in for its analysis. The first is based on lower attendance and spending at the Hawai'i Convention Center; the second, on higher attendance and spending. For the purposes of this report, the second scenario is used to examine the "worst-case" possibilities.*





available to meet this new demand. This estimate is based on a ten percent increase in occupancy rates of a total inventory of 28,414 units and a current 80 percent occupancy rate. In addition, 300 units would also be added to the unit supply due to the new units at the Hale Koa tower at Fort DeRussy. [13]

3. This leaves 1,800 units still needed to meet the requirements of the Hawai'i Convention Center. It is estimated that the Neighbor Island hotel units will be able to absorb 60 percent of this demand.

4. The highest level of impact is that about 720 units would still be needed on O'ahu to support the Hawai'i Convention Center. This need can likely be met in or near Waikiki without further rezoning. The Kalia Tower at the Hilton Hawaiian Village is zoned for 400 units, and another 450 units are scheduled for the Aloha Tower project, which is in proximity to the convention center.

As this analysis shows, the demand for new hotel rooms in and near Waikiki may be met by projects which are already zoned. The potential stimulation for the development of new hotel units in and near the project site is a secondary impact. Related impacts on a neighborhood level are discussed in Section 4.3.

*13. KPMG estimates that 75 percent of the new 396 rooms at Hale Koa hotel would help relieve some pressure for demand for hotel rooms. See Chapter 1 of the economic report.*

### 4.1.3 Social Considerations Regarding the Cumulative Effects on Tourism

If the project meets State objectives, the Hawai'i Convention Center will allow for the expansion of tourism in Hawai'i and specifically on O'ahu. From an economic perspective, the growth of tourism is beneficial in that it would ideally boost the economy and provide opportunities for local residents to improve their financial situation.

This discussion centers on the long-range, cumulative social implications of tourism growth from a qualitative perspective. This analysis is not intended to be a comprehensive study of the social impacts of tourism, which would be well beyond the scope of this report. Rather, this discussion is meant to stimulate awareness regarding the current social issues and concerns related to promoting tourism. Some of these concerns have been expressed for several years, and public and visitor industry officials have been working to find a balance between economic benefits and social costs. Other concerns have emerged only over the last few years.

- **Conflicting attitudes towards tourism**

  In a comprehensive statewide survey on tourism, there was overwhelming agreement that tourism has been good for the community and good for the respondents' own lives. Three-fourths of the respondents felt that "Overall, tourism has brought more benefits than problems to this island."

  At the same time, almost 70 percent expressed anti-growth feelings and opposed any further hotel development on their particular island; about 60 percent did not want more tourism jobs in their own section of the island. Maui and Kaua'i, islands which experienced major tourism growth, exhibited strong anti-growth tendencies. A few economically troubled areas, such as Moloka'i and East Hawai'i, favored more hotels and nearby tourism jobs.





  The main reasons for resident opposition to more tourism growth stemmed from the respondents' correlation between the rapid population growth of the 1980s and the perceived negative side effects of tourism. These effects included the high cost of housing, traffic, the cost of food and clothing and crime. [14]

- **Tourism and urbanization**

  Honolulu underwent major transformations in the last three decades. Residential subdivisions took over thousands of agricultural acres, freeways linked communities to each other, shopping malls replaced the neighborhood stores. Our population diversified as more and more newcomers arrived, and the educational process allowed more people access to jobs previously held by the upper socio-economic classes.

  While we enjoyed the increasing modernization, convenience and mobility, we also paid the price. Traffic clogged the highways, and schools quickly became crowded. Waiting in line became common, and we locked our doors at night. At our banks and favorite restaurants, there were more unfamiliar faces and we expect to see crowds at the shopping centers.

  For many, tourism has become the ultimate symbol of urbanization because it is associated with these times of growth, economic development and progress. Tourism caused land use changes by introducing resort development; sometimes hotels line miles of an island's coastline. Roads join the living spaces with airports, recreation facilities, and scenic vantage points. Also, large land areas are used for supporting activities, such as golf courses, restaurants,

14. *Community Resources, Inc., 1989.*

entertainment, shopping malls, cultural centers, and so on.

This association between tourism and increased urbanization becomes particularly poignant for people who prefer the slower pace of life in the days before tourism was a major influence. They remember when the landscape was characterized by small farms, sugarcane fields and open space. For them, the increase in tourism, and hence economic development, means the end of mom-and-pop stores, small town relationships, and general feelings of ohana and safety.

Further, this apprehension is not confined to hotel development. People often have strong concerns about uses to support a resort, if they believe the new development will eventually lead to an increase in hotel rooms or luxury home development. Recently, to increase the financial viability of a resort operation, a new golf course was proposed for Hana. While the community wanted to see the existing hotel remain financially viable, residents expressed strong concern that the area around the golf course will be developed into luxury housing. [15]

- **Tourism wages and working conditions**

A common perception is that visitor industry jobs pay low wages. Although statistics can either prove or disprove this perception, this issue continues to be raised in relationship to the expansion of the visitor industry.

For example, when resort development proponents raise jobs as a project benefit, community opponents respond that the jobs offer low wages and little opportunity for upward mobility. Opponents argue that outsiders often have the

15. *Earthplan, 1992.*





more high paying jobs, and that the jobs for locals typically have the potential for demeaning situations.

While a recent study admits that the average annual wages in hotels, eating and drinking establishments and retail shops were generally lower than the statewide average annual wage, it noted that wages are only one way to measure the personal economic gains from tourism. The study cited tips, unreported cash income and other benefits which make tourism employment comparable to other occupations. Further, it was pointed out that hotel, retail and restaurant jobs account for only 30 percent of visitor industry-related jobs. Other types of visitor jobs pay higher wages. [16]

In addition to the perception that tourism jobs are low-paying, there is also concern that visitor industry employees work under less than desirable conditions. In the statewide comprehensive survey on tourism, respondents generally agreed that "tourism jobs have poor work hours . . ." and that "most tourism jobs don't have much chance for advancement." There was almost an even split on statements that "most visitor industry jobs pay pretty well," and "people from Hawai'i have a hard time competing with outsiders for the best tourism jobs." [17]

- **Tourism and cultural effects**

Hawai'i's visitor industry uses Hawaiian culture and aloha in its marketing. Mainland and foreign visitors are attracted to advertisements featuring hula dancers and lu'aus. Once here, tour guides and hotel personnel greet them with a lei and an "a-looo-ha!" Resorts often give lei-making and hula lessons to interested guests, and visitors are introduced to

16. *Plasch, 1993.*
17. *Community Resources, 1989.*

new foods at crowded lu'aus. They buy flowered-print mu'umu'u and shirts, and bring home pineapple and macadamia nuts.

Though there are varying degrees of cultural education and awareness, these types of activities are common portrayals of Hawaiian culture and aloha in the visitor industry.

While many people accept this form of tourism, industry critics feel that tourism has exploited aloha. Aloha is the Hawaiian concept of unconditional sharing and giving; the practice of aloha is a personal commitment and value that permeates interactions with others and with nature. Critics assert that aloha has become a marketing tool sold on T-shirts and souvenirs. They point out that there has been little improvement from the 1930s to 1950s, when Hawaiian songs and dances were characterized in movies by the "sonorous ringing of steel guitars accompanying hapa-haole hulas sung in English." [18]

Moreover, it has been pointed out that tourism, in its commercialization of aloha and Hawaiian culture, has had harmful effects on the kanaka maoli. Critics believe tourism industry has treated Hawaiian people as "artifacts" to be viewed, and that tourism has "done nothing good for the Hawaiians, it has exploited them, evicted them and demeaned them." [19]

- **An emerging approach to tourism**

Various groups in our community, including business and environmental interests, are warning that development of high-density resort areas and increased urbanization will

18. *Farrell, 1982.*
19. *Kelly, 1994.*





eventually hurt the industry itself. They point out that tourists are attracted to Hawai'i because of the natural beauty, the people and the climate. They stress that visitors come to Hawai'i to experience something different from their home environment, and do not want to see high-density development, major traffic jams and overcrowded beaches.

An emerging suggestion from environmental interests is that Hawai'i depart from conventional growth-is-good mentality, and strive for sustainable development. This includes an economy which is indigenous and self-reliant, and is based on maximum citizen participation. Further, a sustainable economy would satisfy both material and nonmaterial needs, such as self-expression, creativity, artistic expression, spirituality and so on.

This approach promotes "green tourism," one which strives for environmental balance which would conserve water and energy and promote recycling. This ecotourism would be decentralized and occur on small, manageable scales. The visitor attractions would have a strong local emphasis in places such as Hawaiian cultural parks, plantation villages and "home-grown" tours. [20]

As the convention center becomes a reality, it is important that public decision makers, the visitor industry, the business community, landowners and developers continue to consider the less tangible, cumulative social effects in their evaluation of project impacts.

20. *Rohter, 1994.*

## 4.2 Population Impacts

The construction, convention center and lodging facilities jobs are employment impacts which may arise as a result of project implementation, and the projections are contained in the economic report. The relevance of employment to social impacts is that new residents may move to O'ahu and Hawai'i to fill some of these jobs.

**Primary population impacts.**

KPMG projects that, in the three year construction period, in-migrants may come to O'ahu for convention center-related construction jobs. It is estimated that 24 in-migrants may come to O'ahu in the first year, 44 in the second, and 20 in the last year of construction. The construction labor force is expected to fluctuate depending on the level of activity, and the in-migrant estimates are cumulative.

In terms of long-term operational employment, it is estimated that, by 2008, the Hawai'i Convention Center may generate approximately 350 on-site jobs.[21] Approximately five percent of these jobs may be filled by people from a Neighbor Island or the continental U.S.[22] which translates into 18 in-migrants. The total in-migration for on-site employment may amount to 40 persons, including dependents.

The short term in-migration of up to 44 people during construction and 40 permanent residents is not a significant impact.

21. KPMG, 1995, Exhibit 2-8.
22. Based on discussions between KPMG and human resources personnel at Ihilani Hotel and the Hawaii Prince Hotel.





**Secondary population impact.**

Another 855 persons is estimated to migrate to O'ahu to hold construction jobs for the new hotels or fill jobs in new hotels once their built. [23]

The addition of 855 persons to O'ahu over a ten-year period is not considered a significant impact. It is estimated that in 2010, O'ahu's population may reach one million people [24] and the additional population would account for less than 0.1 percent of the total island population.

It is difficult to predict where the new employees and their families will choose to live on O'ahu over the ten-year period. It is likely that many may want to live close to their jobsites in and around Waikiki. If this is the case, then current planning for these areas may be able to account for the residential population increase. City planners project that over 14,600 people may move into the Waikiki, Ala Moana - Kaka'ako and McCully - Mo'ili'ili Neighborhood Board Areas. If all of the project's primary and secondary population impact would occur in these areas, the new population would account for about 5.6 percent of the projected 2010 population. Further, the City projects a corresponding housing unit increase of over 9,600 units in the Study Area, which would provide an adequate supply of housing for primary and secondary in-migration.

Access to the Waikiki area and the convention center from other parts of the island is facilitated by a series of roadways and bus routes, and it is also possible that the new residents may choose to live in a more suburban setting and commute to work.

23. Report on Economic and Fiscal Impacts prepared by KPMG Peat Marwick, June 27, 1995, Exhibit 2-D.
24. See Table 6.

**Cumulative Population Impact**

KPMG also estimates that the project may cause the in-migration of up to 727 persons to O'ahu to fill indirect and induced construction jobs, as well as indirect and induced operational jobs.[25] These are jobs related to supporting the visitor industry once the convention center and new hotels are built.

There will be cumulative impacts related to public services and facilities, and it is expected that most of these impacts will be mitigated by the increased tax base resulting from the additional population.

## 4.3 Regional and Neighborhood Character

The project will affect the neighboring community by introducing a new use and providing a gathering place for thousands of people. The following two levels of impacts were the bases for this analysis:

- **Primary impacts: Construction, operation and general presence of the Hawai'i Convention Center**

  These would be generated during the construction and solely due to the operation of the convention center.

- **Secondary and cumulative impacts: Development of nearby parcels and possible cumulative changes which could occur.**

  The convention center would enhance the development potential of certain individual and combined parcels which are susceptible to change because of current underutilization based on what is allowed under existing zoning, as well as

25. *Report on Economic and Fiscal Impacts prepared by KPMG Peat Marwick, June 27, 1995, Exhibit 2-D.*





landownership patterns. In this scenario, we assume that these parcels would redevelop, and examine potential impacts accordingly.

Section 4.3.1 sets the social context by describing the existing character of the neighborhood. Primary neighborhood impacts resulting from the Hawai'i Convention Center are discussed in Section 4.3.2. Secondary neighborhood impacts are identified in Section 4.3.3, followed by cumulative impacts in Section 4.3.4. Areas which will be most impacted are identified in Section 4.3.5.

### 4.3.1 Existing Character of the Surrounding Neighborhood

The areas surrounding the project site reflect a wide mixture of uses, characteristic of the multi-faceted nature of the Primary Urban Center. Older wooden structures stand beside newer, multi-story buildings. Here and there vacant lots and empty structures exist amidst the density. The following describes the various characteristics in the surrounding neighborhood:

- **'Ewa Side of Atkinson Drive**

  Commercial enterprises characterize the 'Ewa side of Atkinson Drive. In the area bounded by Ala Moana Boulevard and Kapi'olani Boulevard, major facilities include the Ala Moana Center, Ala Moana Hotel, and a neighborhood shopping area. The latter mall contains a diversity of establishments in a wooden single-story complex; these include a bicycle shop, a convenience store, a pizza parlor, a restaurant and an airline ticket office. Makai of this mall is another bicycle shop and an optician shop.

  Kona Street bisects the area, providing an additional connection to Mahukona Street, Kapi'olani Boulevard, and Pi'ikoi Street beyond. Kona Street contains a number of businesses including bars, boutiques, and banks.

- **Kahakai Drive**

  Adjacent to the site on the makai side, Kahakai Drive, a two-lane one-way street off Atkinson Drive, creates a square cul-de-sac of condominiums and apartments. The medium-rise Summer Palace and Atkinson Plaza condominiums and low-rise walkups occupy the street's outer edges. Older two- and three-story wooden and concrete walkup apartments and duplexes, arranged side-by-side, form the street's rectangular center.

- **Diamond Head of Atkinson Drive**

  The Diamond Head side of Atkinson Drive includes a mixture of public and private uses. The ILWU Headquarters is located mauka of a small two-story commercial building containing a liquor store, a clothing boutique and bookstore. This complex is next to the residential Sunset Towers and Central YMCA. The Yacht Harbor Towers is situated at the corner of Atkinson Drive and Ala Moana Boulevard.

- **Diamond Head of the Ala Wai Canal**

  The residential area continues across the Ala Wai Canal to Ala Wai Boulevard, Lipe'epe'e Street, and Hobron Lane. Here a mixture of low-rise, walkup apartments and a few medium- and high-rise condominiums provide a variety of housing choices and form a transition toward the resort uses of Waikiki.

- **Mauka portion of Kapi'olani Boulevard**

  The mauka section of Kapi'olani Boulevard, directly across the project site, contains a renovated two-story building being readied for occupancy, a nightclub, and a vacant





  building formerly occupied by a piano store.

  Behind this streetfront facade, through Kalauokalani Way, residences are found in several old wooden, two-story walkups, triplexes, and duplexes. These are adjacent to warehouses for clothing stores, a graphic arts establishment and other businesses.

  Still mauka of Kapi'olani Boulevard, on the Diamond Head side of Kalakaua Avenue, is a vacant lot which was formerly used as a gas station and a City Tow Lot, which contain heavy equipment and tow trucks.

- **Kalakaua Avenue**

  Across the site on Kalakaua Avenue, the Hard Rock Cafe leases the former Coco's Restaurant site. The neighboring lot, until recently associated with the Veterans of Foreign Wars, has been cleared, covered with gravel, and now serves as a parking lot. The newly completed Landmark condominium complex occupies the block across the Ala Wai Canal from the Ala Wai Boulevard to McCully Street.

### 4.3.2 Primary Impacts on Neighborhood

**Construction impacts.**

Activities related to construction of the convention center will likely add to the noise level and increase dust for the neighboring businesses and residents. In addition, although construction-related traffic will be generally scheduled during non-peak hours, this additional traffic may be regarded as a nuisance during off-peak hours.

These changes would affect the quality of life of nearby residents, and problems would be particularly acute for those who are at home during typical construction hours. As the demographic information indicates, the Waikiki and Ala Moana/Kaka'ako Neighborhood Areas have high proportions of elderly people. Assuming that the surrounding neighborhoods reflect this tendency, the elderly who are home during the day would be exposed to construction-related activities.

For the nearby small businesses, construction activities may hamper operations due to noise and construction-related traffic during business hours.

**Loss of on-street parking**

Proposed roadway improvements will cause the elimination of five on-street parking stalls on the 'Ewa side of Atkinson Drive between Kapi'olani Boulevard and Kona Street. Further, five stalls on the makai side of Kahakai Drive will be restricted during large convention events. Other potential temporary losses of parking stalls may occur on Atkinson Drive and Kapi'olani Boulevard. Further, convention center attendees may choose to use on-street parking even though there will be on-site facilities. This will be a negative impact in that on-street parking in this area is already at a premium. Many of the older residential structures in the Kahakai area do not have adequate parking facilities, and do not offer stalls for visitors.

**Increase in activity and de facto population**

The convention center will transform what is currently open space into a gathering area which will sometimes hold thousands of people. This will change the neighborhood quality by increasing the intensity of activity. Conventioneers will be circulating in and around the facility; there will be more cars and buses; and noise levels may increase.





This will affect the neighborhood by increasing the potential for visitor interaction. Residents may have more new faces in their neighborhood. For businesses, this would benefit those depending primarily on walk-in clients. The increased traffic, however, may deter customers arriving in their own cars during conventions.

Physical changes may also occur. Views may be altered, and those buildings closest to the center may feel that their privacy has been reduced because of proximity to the convention center.

### 4.3.3 Secondary Impacts on the Neighborhood

The impacts on the neighborhood vary, depending on the nature of existing uses and whether other landowners will want to redevelop their parcels.

To evaluate the proposed project's potential impact on the neighborhood, we assessed the nearby areas to determine which portions were susceptible to change if the Hawai'i Convention Center were built. Our analysis included (1) a review of what is allowed under current zoning;[26] (2) an assessment of the extent to which lots have been built up, given present zoning; and (3) a review of landownership patterns based on information available at the State Department of Taxation.

- **Low likelihood for change**

  It was found that several landowners of nearby parcels have held their properties for decades and have developed the sites to a large extent. Hence, due to scope or mass of the structures contained on their sites, the probability of major redevelopment is low. Structures in this category include:

  - Summer Palace;

26. *Zoning information is presented in Section 3.1.6.*

- Atkinson Towers;
- Sunset Towers;
- Ala Moana Hotel;
- Ala Moana Center;
- Atkinson Plaza;
- Yacht Harbor Towers;
- Central YMCA;
- ILWU Memorial Hall; and
- Century Center.

• **Susceptible to change**

Some parcels were found to be susceptible to redevelopment for several reasons. In a comparison between allowable uses and building height limits, these parcels were generally underutilized based on parcel size and existing uses. Further, tax office information showed that, in some areas, there were large underutilized areas made up of parcels under single ownership.[27] Areas which were found to have a combination of these conditions included the following:

- More than half of the middle of the Kahakai Drive cul-de-sac;
- The Diamond Head area on Kahakai Drive between Summer Palace and Atkinson Towers;
- The corners of Atkinson Drive, Kapi'olani Boulevard and Kona Street;
- The makai half of the block bounded by Kapi'olani Boulevard, Kalakaua Avenue, Kalauokalani Way and Makaloa Street;

27. *Relatively smaller lots under single ownership were not included because the likelihood of consolidation is unknown at this time.*





- The corners of Kalakaua Avenue, Kapi'olani Boulevard and Haouli Street;
- The corner of Kalakaua Avenue and Kapi'olani Boulevard;
- The former Veterans of Foreign Wars clubhouse site; and
- the Ala Wai Gateway area.

*Figure C* illustrates these sites.

The project's impacts on these sites are two-fold. First, the presence of the Hawai'i Convention Center could accelerate the timing of development of these sites. The City Planning Department projects major growth in the Study Area over the next ten years. It is projected that the population in Waikiki will increase by 20 percent by 2005; in Ala Moana - Kaka'ako, the population is projected to almost double by 2005.[28]

Second, land uses may be changed to be more responsive to convention center needs. Landowners may see the potential for resort uses on these parcels, particularly those located in Waikiki.

One area in which resort uses are allowed in the Special Provisions of the Primary Urban Center Development Plan is just 'Ewa of the project site. Hotels and convention facilities are permitted on the block bounded by Kapi'olani Boulevard, Atkinson Drive, and Mahukona and Kona Streets. Our research found that except for the parcels designated in Figure C, the parcels on this block are

28. *In preparing these estimates, the City assumed that the convention center is built.*

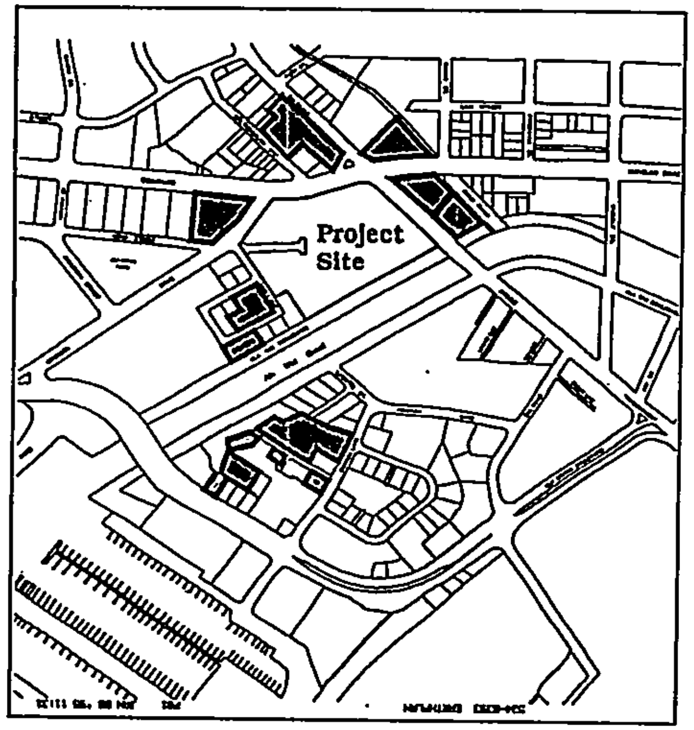



**Figure C
Land Areas Which
Are Likely or
Susceptible to
Change**





owned by different owners, or are relatively smaller, or are extensively developed. Nevertheless, the Development Plan designation and the convention center may encourage a motivated developer to pursue a program for resort development on these sites.

### 4.3.4 Cumulative Effects in the Neighborhood

The proposed convention center is not the sole cause of change to the neighborhood, and the surrounding area will likely change even if the facility were not built. As discussed in Section 3, the project site may already be developed for the high intensity uses allowable under its present zoning. A shopping complex could be developed here, as well as other forms of commercial, office and residential mixed use development.

The proposed convention center is inherently visitor-oriented, however, and this quality introduces another level of possible changes to this residential neighborhood. While the convention center may not be the cause of change, it may serve as a catalyst for the development of neighboring parcels. A stand-alone convention center on a site located outside of the major resort district may create opportunities for redevelopment and financial gain. This is particularly so for parcels on which older buildings, earning negligible profit, can be replaced by higher yield uses. The possible cumulative effects of the project are as follows:

- **Changes in assessed property values and rents**

  Due to the secondary relationship between the convention center and the redevelopment potential of the surrounding area, it is not possible to determine and quantify the economic impact of this project on assessed property values. [29] We note, however, that the presence of a convention center may enhance property values in the immediate neighborhood because of improved infrastructure and other factors. For example, in anticipation of redevelopment in the area, the City Department of Wastewater Management is requiring that the new sewer line under Atkinson Drive from the convention center to the main line near the entrance of Ala Moana Park be sized to accommodate flows greater than that of the center alone.

If property values increase, two impacts would arise from a social perspective. First, property tax would increase, and this may be a burden for those on fixed incomes. This could be an impact for several people in the area, given the potentially high proportion of elderly residents.

Second, landowners and condominium owners may choose to offset the additional tax by raising rent. Renters would therefore need to adjust their budget accordingly or seek alternative housing. This is especially a problem for renters who live in these neighborhoods primarily for affordability, or for small businesses who rent or lease their space.

- **Displacement and change in demographics**

The convention center could contribute to cumulative displacement in two ways. First, residents on redeveloped parcels would be displaced, and this would be especially burdensome for those who are living in their units because of low rent. While finding comparable housing in terms of convenience may be possible, it may be difficult to find a similar combination of affordability and convenience within the vicinity. The problems are similar for businesses; their clients would also need to adjust to their new location.

29. *Property value assessment is typically outside the scope of a social impact assessment, but is raised here because of possible social ramifications on the surrounding residents and landowners.*





Our study finds that there are currently 294 residential units on the parcels identified in Figure C.[30] If all of these units were demolished to make way for redevelopment, it is estimated that approximately 550 persons may be displaced, based on an average household size of 1.88 persons.[31]

Second, cumulative displacement could occur in existing residential complexes where units double as short term rentals and transient accommodations. According to the City Planning Department, approximately 640 resort condos also serve as affordable rentals during the low tourist season.[32] If the owners of these units decide to permanently convert these units to transient accommodations, then the renters will be displaced. Based on a household size of 1.7,[33] it is estimated that 1,100 persons may be displaced because of the elimination of these resort condos from the rental market.

In all, an estimated 1,650 persons may be displaced as part of the cumulative scenario.

With displacement may come a change in demographics. The newer residents may exhibit higher income levels because they could afford the presumably more expensive new units. Information regarding specific residential areas and actual development proposals would be needed to predict other changes in demographics.

- **Changes in residential neighborhoods**

With the redevelopment of nearby parcels could come a

30. *This includes 82 units in the Kahakai area, 18 units in the area mauka of Kapi'olani Boulevard, and 194 units in the area across the Ala Wai Canal.*
31. *The average household size for the Study Area in 1990 was 1.88 persons. See Section 2.4 for further detail.*
32. *Based on letter dated 18 May 1995 from Cheryl Soon, City Planning Director to Earl Matsukawa, Wilson Okamoto and Associates.*
33. *The average household size for the Waikiki Neighborhood Board area was 1.7 persons in 1995.*

change in land uses to other more profitable uses. This will result in a transformation of residential neighborhoods, particularly those which contain affordable housing. Further, urban qualities will be intensified, and there may be changes in wind and light patterns if several high rises are added.

*Table 10* discusses these possible social impacts of the project as they relate to specific uses and areas in the surrounding neighborhood.

### Table 10: Summary of Primary, Secondary and Cumulative Impacts

| Affected area and summary of existing characteristics | Potential neighborhood impacts: Primary impacts due to construction, operation and general presence | Potential neighborhood impacts: Secondary and cumulative impacts |
|---|---|---|
| **Residents** | | |
| **Kahakai area**<br>Quiet residential neighborhood<br>Mixture of low and medium-rise apartments | Construction impacts<br>Change in the quiet ambience due to influx of visitors<br>Increase in traffic<br>If property values increase, increase in market potential of individual units.<br>If property values increase, likely rent and property tax increase<br>If property values decrease, difficulty in selling units and less property taxes<br>Alteration of view towards the mountains<br>Possible decrease in privacy on recreational deck, especially for Summer Palace<br>Permanent loss of five on-street parking stalls, and temporary restrictions on five stalls. | **Secondary:**<br>Project may accelerate development of nearby parcels<br>**Cumulative:**<br>Construction impacts over an undetermined period of time, as other parcels are developed<br>Possible change in light and wind patterns due more tall buildings<br>If Kahakai parcels are rezoned to allow resort development, increase in likelihood for visitor interaction and visitor-support traffic<br>Displacement of residents on redeveloped parcels<br>Possible rent and property tax increase<br>Additional pedestrian access to Waikiki if bridge near Lipe'epe'e is built |





### Table 10: Summary of Primary, Secondary and Cumulative Impacts *(Continued)*

| Affected area and summary of existing characteristics | Potential neighborhood impacts: Primary impacts due to construction, operation and general presence | Potential neighborhood impacts: Secondary and cumulative impacts |
|---|---|---|
| **Along Atkinson Drive**<br>Includes Atkinson Plaza, Sunset Towers and Yacht Harbor Towers<br>Mixed use district, with commercial and residential interspersed<br>Along a highly traveled roadway | Construction impacts, especially for Atkinson Towers; less impacts for others<br>If property value increases, likely increase in rent, property tax and market potential of individual units.<br>Increase in traffic which affects travel to and from home | **Secondary:**<br>Project may accelerate development of nearby commercial properties<br>**Cumulative**<br>If Atkinson and Kapi'olani parcels are rezoned to allow resort development, increase in visitor and visitor-support traffic, such as tour buses |
| **Diamond Head of Ala Wai Canal**<br>Mixture of low-rise, walkup apartments and a few medium-rise condominiums<br>Primarily residential neighborhood, with resort and commercial uses in close proximity | Change in view; vacant project site replaced with convention center as currently designed<br>Increase in vehicular and pedestrian activity | **Secondary:**<br>Project may accelerate development interest, particularly in hotel units<br>**Cumulative:**<br>Increase in visitor interaction<br>Increase in visitors and visitor-support traffic, such as tour buses<br>Displacement of residents on redeveloped parcels<br>For other residents, possible rent or property tax increase<br>Additional pedestrian access to convention center if bridge near Lipe'epe'e is built |

Table 10: Summary of Primary, Secondary and Cumulative Impacts (Continued)

| Affected area and summary of existing characteristics | Potential neighborhood impacts | |
|---|---|---|
| | Primary impacts due to construction, operation and general presence | Secondary and cumulative impacts |
| **Along and mauka of Kapi'olani Boulevard**<br>Mostly high rise residential structures in busy, mixed use neighborhood<br>Low rise old apartments, triplexes and duplexes along Kalauokalani Way | Construction impacts, especially for those on Kalauokalani Way<br>Change in view for those in high-rises facing site; vacant project site replaced with convention center as currently designed<br>Increase in traffic which affects travel to and from home | **Secondary:**<br>Project may accelerate development interest, particularly in hotel units<br>**Cumulative:**<br>Change from commercial/residential character to commercial and resort area<br>Construction impacts over an undetermined period of time, as other parcels are developed<br>Displacement of residents on redeveloped parcels<br>If susceptible parcels are rezoned to allow resort development, increase in likelihood for visitor interaction<br>If susceptible parcels are rezoned to allow resort development, increase in visitor and visitor-support traffic, such as tour buses |





Table 10: Summary of Primary, Secondary and Cumulative Impacts (Continued)

| Affected area and summary of existing characteristics | Potential neighborhood impacts | |
|---|---|---|
| | Primary impacts due to construction, operation and general presence | Secondary and cumulative impacts |
| **Small Business** | | |
| **Along Atkinson Drive**<br>Small businesses in low-rise complexes<br>Variety of businesses ranging from bicycle shops to book store to optician shop | Traffic during construction may deter potential clientele<br>Conventioneers may be potential clientele for restaurants and business depending primarily on walk-in traffic | **Secondary:**<br>Project may accelerate development interest<br>Possible change in lease terms as landowners decide whether to redevelop; business operates on short-term time frame<br>**Cumulative:**<br>Traffic during construction may deter potential clientele<br>Displacement of businesses on redevelopment parcels<br>Increase in potential clientele if susceptible areas are rezoned for resort development<br>Competition from new businesses on redeveloped lots<br>Possible rent increase |

### Table 10: Summary of Primary, Secondary and Cumulative Impacts *(Continued)*

| Affected area and summary of existing characteristics | Potential neighborhood impacts | |
|---|---|---|
| | Primary impacts due to construction, operation and general presence | Secondary and cumulative impacts |
| **Mauka of Kapi'olani Boulevard**<br>Mix of old and recently renovated low rise structures<br>Commercial uses in warehouses and older structures | Possible change in lease terms as landowners decide whether to redevelop; business then operates on short-term time frame<br>Traffic during construction may deter potential clientele | **Secondary:**<br>Project may accelerate development interest<br>Possible change in lease terms as landowners decide whether to redevelop; business operates on short-term time frame<br>**Cumulative:**<br>Traffic during construction may deter potential clientele<br>Displacement of businesses on redevelopment parcels<br>Possible increase in rent for remaining businesses<br>Increase in potential clientele if susceptible areas are rezoned for resort development<br>Competition from new businesses on redeveloped lots |





### Table 10: Summary of Primary, Secondary and Cumulative Impacts *(Continued)*

| Affected area and summary of existing characteristics | Potential neighborhood impacts | |
|---|---|---|
| | Primary impacts due to construction, operation and general presence | Secondary and cumulative impacts |
| **Diamond Head of Kalakaua Avenue**<br>A restaurant and parking areas | Traffic during construction may deter potential clientele<br>Conventioneers may be potential clientele for restaurants and business depending primarily on walk-in traffic | **Secondary:**<br>Project may accelerate development interest<br>Possible change in lease terms as landowners decide whether to redevelop; business operates on short-term time frame<br>**Cumulative:**<br>Traffic during construction may deter potential clientele<br>Displacement of businesses on redeveloped parcels<br>Possible increase in rent for remaining businesses<br>Increase in potential clientele if susceptible areas are rezoned for resort development<br>Competition from new businesses on redeveloped lots |

**Table 10: Summary of Primary, Secondary and Cumulative Impacts** *(Continued)*

| Affected area and summary of existing characteristics | Potential neighborhood impacts: Primary impacts due to construction, operation and general presence | Potential neighborhood impacts: Secondary and cumulative impacts |
|---|---|---|
| **Large Businesses and Non-Commercial Uses** | | |
| **Various areas around site**<br>Includes Ala Moana Hotel, Ala Moana Shopping Center, YMCA and ILWU | Traffic during construction may deter potential clientele<br>Conventioneers may be potential clientele for restaurants and business depending primarily on walk-in traffic<br>Opportunities for leasing surplus parking spaces to convention center<br>Increase in hotel business | **Secondary:**<br>Project may accelerate development interest<br>**Cumulative:**<br>Traffic during construction may deter potential clientele<br>Increase in potential clientele if susceptible areas are rezoned for resort development<br>Competition from new businesses on redeveloped lots |

### 4.3.5 High Impact Areas

Our study finds that four affected groups would experience a high level of impact due to primary, secondary and cumulative impacts of the project. These areas include (1) residents in the Kahakai Drive area, (2) small businesses along Atkinson Drive, (3) businesses and residents along Kalauokalani Way, and (4) residents Diamond Head of the Ala Wai Canal.

The affected group that would be most impacted by the proposed convention center are the residents in the Kahakai Drive area. They will experience construction noise, dust and traffic impacts due to the convention center development. When the center is operational, these residents will need to adjust to new circulation patterns and increased traffic, as well as a general increase in the





intensity of activity. Further, some on-street parking will be eliminated.

Currently the Kahakai area is the only residential neighborhood in the vicinity of the project site. Our study found that several parcels could be developed into higher density residential apartments without major land use permits. Further, a motivated landowner may choose to seek rezoning to allow for visitor units which would primarily serve the convention center. Any form of resort development in this area would diminish the residential ambience of this area. Displacement is also a major social impact which would eventually occur as the Kahakai area develops. All residents in the redeveloped parcels would be displaced, and other residents may need to move if they cannot afford increased rents.

A high level of impact could also be experienced by small businesses along Atkinson Drive. These would be subject to increased traffic, which may deter potential customers during peak traffic hours, and there may be business uncertainty if landowners may choose to shorten lease terms to leave development options open. In addition, there may be displacement of small businesses currently located on property found to be susceptible to change.

Along Kalauokalani Way, businesses and residents would be impacted by the construction and operation of the convention center. In addition, there were several parcels which were found to be susceptible to change and redevelopment is likely in this area. Hence, increased rents and displacement may occur especially for the residents and small businesses.

A fourth area of high impact would be the area Diamond Head of the Ala Wai Canal. The convention center may affect pedestrian and circulation patterns in this area. Further, the facility will likely serve as a stimulus for redevelopment of the Gateway site. It is noted, however, that the Gateway project is likely to eventually undergo some change regardless of implementation of the convention center project. Neighborhood changes are highly likely even if there is no Hawai'i Convention Center.

## 4.4 Impacts on Public Services and Facilities

### 4.4.1 Police Protection

The Honolulu Police Department divides O'ahu into seven districts. The project site is located in District 1, which generally extends from the Koko Head side of Pua Lane in Kalihi, the 'Ewa side of Punahou Street, Tantalus/Pacific Heights to the ocean. The district includes the downtown substation. Twenty-one beats make up District 1, with one officer per beat. The project site is part of Beat 58. [34]

The Hawai'i Convention Center's primary impact on police protection is that it will increase the need for police protection in the area by providing a gathering place for thousands of people at one time. The increase in density could result in increased opportunities for crime and traffic congestion.

It is not expected that this increase potential for crime is significant, nor is a change in the nature of crime, such as increased drug trafficking and prostitution, anticipated to occur. In research conducted for the EIS, it was found that convention centers are typically planned to revitalize an underdeveloped area.

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34. *Personal communications with Officer Wallace Choy, Administrative Assistant of the Police Chief, December 1994*





Convention centers in Los Angeles, New Orleans, Seattle, New York and San Diego have tended to revitalize the neighboring community and increased public safety. Further, it was noted that convention centers tend to attract professional conventioneers, whereas prostitution activities tend to be more evident with other tourists. [35] Hawai'i also tends to attract more families to conventions to combine the business trips with family vacations.

A secondary impact could occur due to the in-migration of residents who may work in the construction and operation of new hotels, as well as due to the increase in visitors in these new hotels. Cumulative impacts may arise as well because of the long-term increase in residents and tourists.

### 4.4.2 Fire Protection

The project site would be served by the Pawa'a Fire Station No. 2, which is located at the corner of Kaheka and Makaloa Streets. This station contains an engine and ladder company, as well as a rescue unit. At minimum, there are 13 active firefighters at this station during each of the three shifts.

Backup service would be provided by the Mo'ili'ili-McCully Fire Station No. 29, located at the corner of Date Street and University Avenue. This is an engine and ladder company and nine firefighters are stationed here during each shift. Additional backup service may be provided by fire stations in Makiki, Waikiki and Kaka'ako.

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35. *Telephone memorandum dated 14 June 1995 by Frances Yamada, Planner, Wilson Okamoto and Associates.*

The Fire Department is planning to relocate the ladder truck from the Mo'ili'ili-McCully Fire Station to the new Kapolei Fire Station in the summer. When this proposal was brought before the Neighborhood Boards, no objections were raised, and the Fire Department proceeded with its plans. [36]

These facilities and existing personnel levels are expected to provide adequate services at this time,[37] so the project is expected to have minimal primary impact on fire protection facilities. The level of service may change if the Station 29 ladder truck is relocated to Kapolei, although the Fire Department will provide appropriate fire coverage and response procedures will be adjusted to accommodate this change.

A secondary impact could occur due to the redevelopment of nearby parcels and the development of new hotels in or near Waikiki.

### 4.4.3 Medical Services

Major medical facilities in the vicinity of the project site include Straub Clinic and Hospital located on King Street and Ward Avenue, the Kaiser Permanente Medical Center's Honolulu Clinic on Pensacola Street, and the Queen's Medical Center located on the corner of Beretania and Punchbowl Streets.

Ambulance dispatch through the 911 system is available within the required eight minute response time from a number of medical facilities including Queen's Medical Center, the Kaiser Clinic, Saint Francis Medical Center, Kapiolani Hospital, and several private ambulance services. It is anticipated that the project can be adequately serviced by existing facilities. [38]

36. *Telephone memorandum dated 3 April 1995 written by Frances Yamada, Planner, Wilson Okamoto and Associates.*
37. *Personal communications with Battalion Chief Alvin Tomita, Battalion Chief of Administration Services, December 1994.*





A secondary impact could occur due to the in-migration of 1,800 residents and their families who may hold construction or operational jobs related to the new hotels, as well as due to the increase in visitors in these new hotels. Cumulative impacts may arise as well because of the long-term increase in residents and tourists.

### 4.4.4 Recreation

The primary impact of the Hawai'i Convention Center on recreational facilities is that it would be a gathering place for thousands of people, and therefore expose these people to nearby beaches and recreational facilities. Further, competition with existing canal-based activities may occur, as follows:

- **Beaches.**

  Because the facility is within walking distance to several nearby beaches, the project may facilitate increased usage of these resources. Beaches at the Ala Moana Park and Fort DeRussy, as well as those fronting the Ilikai Hotel and Hilton Hawaiian Village, may be frequented by conventioneers and their spouses.

- **Ala Wai Promenade**

  The project will impact the promenade by improving that portion nearest the convention center. In that the project proposes to improve the area, this impact is considered positive. It will provide a pleasant path for residents and visitors alike, and eventually may encourage other passive uses, such as picnicking.

38. *Personal communication with Kenneth Yoshida, Research Statistician at the State Health Planning and Development Agency, State Department of Health; and Clay Chan, Emergency Medical Services Program Specialist, Emergency Medical Services Systems Branch, State Department of Health.*

- **Ala Wai Canal Users**

The waters of Ala Wai Canal are calm, and it is the only long navigable waterway in urban Honolulu. It is therefore a popular resource for canoe and kayak training. The Hawaii Canoe and Kayak Team training program conducted here is a major feeder into the U.S. Canoe and Kayak National Team. [39] Canoe clubs which are registered to use the canal include the Waikiki Surf, Outrigger, Lokahi, Ke'ala, O'ahu Canoe Racing Association, Healani, Lui Lanakilo and South Shore. Three regattas are held yearly. There are also other clubs and events which finish their races in the Ala Wai.

The canal is used by high school canoe paddlers and kayakers who participate in the ILH and OIA leagues. The student kayakers generally use the area in October and November, and number around 100 students; the canoe paddlers practice from December to February and number around 100 to 150 people. [40]

In addition, individual kayakers practice here, and fishers can be found pole or net fishing all along the canal.

The project is not expected to have significant primary impact on these uses and users in that no water transportation system or bridge improvements are included as part of this proposal.

39. *Letter dated 6 June 1994 from Robert Harbold III, American Canoe Association, to Ms. Leslie Kurisaki, Helber Hastert and Fee Planners, Inc.*
40. *Usage information provided by Joyce Spoehr, Recreation Director for the Ala Wai Community Park, December 7, 1994.*





The facility may have secondary and cumulative impacts on recreational facilities due to potential redevelopment of nearby parcels, more hotel development and related cumulative resident and de facto population increases. The location of these impacts is undetermined at this time due to the difficulty in identifying the possible locations for such impacts.

The Hawai'i Convention Center may contribute to cumulative impact on the users of the Ala Wai Canal. Although the project does not include a water transport system, its presence on the canal may encourage private entrepreneurs to take advantage of this situation and establish a ferry system as an alternative mode of transportation to conventioneers. If this system is implemented, it may interfere with routes and time frames of existing users. This would impede their training efforts, especially in the absence of a comparable area in the vicinity.

## 4.5 Mitigation Measures for Consideration

*Table 11* identifies mitigation measures to address the primary, secondary and cumulative social impacts of the Hawai'i Convention Center. These measures are identified for consideration by the Convention Center Authority, State and City public agencies, visitor industry officials and the private sector.

**Table 11: Summary of Social Impacts and Mitigation Measures for Consideration**

| Potential Social Impact *(Please refer to text for full discussion of impacts)* | Nature of Impact | Mitigation Measures for Consideration |
|---|---|---|
| Primary Impacts | | |
| Short term in-migration of up to 44 people over three year construction period. | Low impact | No mitigation needed. |

## Table 11: Summary of Social Impacts and Mitigation Measures for Consideration *(Continued)*

| Potential Social Impact *(Please refer to text for full discussion of impacts)* | Nature of Impact | Mitigation Measures for Consideration |
|---|---|---|
| Construction impacts on nearby residents over three years | Negative; may be high, particularly for elderly | - Develop an informational program to inform residents of schedule of major construction events, and provide status reports<br>- Establish a hotline for people to call with questions or problems |
| Construction impacts on nearby businesses over three years | Negative | - Develop an informational program to inform business owners and landowners of schedule of major construction events, and provide status reports<br>- Establish a hotline for people to call with questions or problems |
| Permanent loss of up to 5 on-street parking stalls, and additional temporary losses during large conventions and peak hour traffic | Negative | - Provide parking stalls for Kahakai area residents in convention center parking lot<br>- Issue parking passes for Kahakai residents to reserve on-street parking stalls |
| Permanent in-migration of 40 persons, including on-site employees and their families | Low impact because may be spread over entire island. If near project site, still low given projections for the Study Area. | No mitigation needed. |





## Table 11: Summary of Social Impacts and Mitigation Measures for Consideration *(Continued)*

| Potential Social Impact *(Please refer to text for full discussion of impacts)* | Nature of Impact | Mitigation Measures for Consideration |
|---|---|---|
| Intensification of activities, resulting in increased traffic, increased interaction with visitors, possible decrease in privacy. | Negative for residents, particularly those living nearest site; may have positive value for businesses | - Event organizers should coordinate vehicular traffic generated by facility users<br>- Off-site pedestrian conventioneer traffic in neighboring community is minimized by shuttle system.<br>- Work with adjacent residential complexes to devise design solutions to maintain privacy of nearby recreational decks |
| Alter views | May be positive for some, and negative for others. | Project designed to be aesthetically pleasing and its low-rise configuration minimizes view blockages |

## Table 11: Summary of Social Impacts and Mitigation Measures for Consideration *(Continued)*

| Potential Social Impact *(Please refer to text for full discussion of impacts)* | Nature of Impact | Mitigation Measures for Consideration |
|---|---|---|
| Increase need for on-site police protection | Negative | - 24-hour on-site security personnel will monitor the facility<br>- Convention center security staff should be increased during the larger events<br>- Convention center security should patrol the Kahakai area and the Ala Wai promenade<br>- Convention center traffic around the facility should be controlled by event organizers and convention center security<br>- Facility design should include well-lit common areas and other security measures<br>- Facility should include space for police department, if needed |
| Increased need for fire protection services | Negative, but current level is adequate | No mitigation needed at this time, but needs to be reevaluated if ladder truck in Station 29 is relocated to Kapolei |





## Table 11: Summary of Social Impacts and Mitigation Measures for Consideration *(Continued)*

| Potential Social Impact *(Please refer to text for full discussion of impacts)* | Nature of Impact | Mitigation Measures for Consideration |
|---|---|---|
| Increased need for medical services | Negative, but current level is adequate | - Establish on-site first aid facilities<br>- Make sure that emergency access is well designed |
| Increased competition for recreational facilities and beaches | Negative, except for improvement of Ala Wai promenade | - On nearby beaches and parks, land area is limited, so little can be done to expand if the quantity of users reach capacity. May be somewhat mitigated because most conventions are held during off-peak visitor centers.<br>- On Ala Wai Promenade, work with community to retain exceptional trees and establish desired landscaping.<br>- On Ala Wai Canal users, no mitigation needed for primary impacts |

## Table 11: Summary of Social Impacts and Mitigation Measures for Consideration *(Continued)*

| Potential Social Impact *(Please refer to text for full discussion of impacts)* | Nature of Impact | Mitigation Measures for Consideration |
|---|---|---|
| **Secondary Impacts** | | |
| In-migration of up to 855 persons, including construction and long-term employees in new hotels and their families | Negative for immediate neighborhood if in-migrants choose to live in or near Waikiki, but has low significance if impacts are spread over island | • Through public policy, maintain current level of housing units in and near Waikiki to encourage in-migrants to live outside the area<br>• The State can help minimize in-migration by initiating job training programs for residents who may lose their jobs due to military base or plantation closure |
| Increase potential for hotel development in or near Waikiki | Negative because of neighborhood impacts, but may have positive economic value. Note that the demand for new hotel rooms may be met by development which is already approved through the zoning process | • Revise inconsistent City policies to establish consistent public direction regarding additional hotel rooms in Waikiki. Example: the Waikiki Master Plan recognizes hotel development in areas near the project site; the City Development Plan calls for a cap on hotel rooms.<br>• Revise the Primary Urban Center Development Plan Special Provisions to prohibit resort development on parcels near the convention center, particularly in the areas identified in Figure C. |





## Table 11: Summary of Social Impacts and Mitigation Measures for Consideration *(Continued)*

| Potential Social Impact *(Please refer to text for full discussion of impacts)* | Nature of Impact | Mitigation Measures for Consideration |
|---|---|---|
| Accelerate interest in and timing of development of parcels susceptible to change | Negative because of neighborhood impacts, but may have positive economic value | • State and City planning agencies and the Convention Center Authority should co-sponsor a planning effort to determine the direction for growth and change in the nearby communities; work with Neighborhood Boards to determine the scope and boundaries of this effort.<br>• State should work with City to establish land use and development policies based on neighborhood plans which encourage nearby landowners to maintain current land uses and density, and concentrate on rehabilitation |
| Increased need for police and fire protection, and medical services for up to 855 in-migrants, including construction and long-term employees of new hotels and their families | Negative, but has low significance if impacts are spread over island | No mitigation required |

**Table 11: Summary of Social Impacts and Mitigation Measures for Consideration** *(Continued)*

| Potential Social Impact *(Please refer to text for full discussion of impacts)* | Nature of Impact | Mitigation Measures for Consideration |
|---|---|---|
| Increased competition for recreational facilities due to secondary in-migration of up to 855 people | Negative, but has low significance if impacts are spread over island | No mitigation required |
| **Cumulative Impacts** | | |
| May contribute to negative perceptions and issues about tourism | Negative | - The CCA should sponsor and support efforts intended to resolve issues related to (1) promoting appreciation and understanding of fundamental values of Hawai'i's indigenous culture, as well as our multi-ethnic community; (2) visitor industry employment; and (3) community attitudes towards tourism<br>- The CCA should encourage each convention to include programs which promote Hawai'i's multi-ethnic cultures, with an emphasis on native Hawaiian values which create the convention center's Hawaiian sense of place. |





**Table 11: Summary of Social Impacts and Mitigation Measures for Consideration** *(Continued)*

| Potential Social Impact *(Please refer to text for full discussion of impacts)* | Nature of Impact | Mitigation Measures for Consideration |
|---|---|---|
| In-migration of undetermined number of people to fill indirect and induced jobs; will affect police and fire protection, medical services and recreation | Negative, but impacts are lessened if new residents live in other parts of urban Honolulu, and in Central O'ahu and 'Ewa | In-migration would occur over ten year period and can be mitigated through capital improvements programs currently used by public officials in allocating resources; further, increased tax base would help offset these impacts |
| Possible establishment of water transport system in Ala Wai Canal | Negative for canal users and uses | - Implement established mechanisms which regulate commercial uses in Ala Wai Canal.<br>- State DLNR should work with the City Parks and Recreation Department and DOT as well as existing users to ensure minimal disruption and continued training. |
| Change in assessed property values and rents | Negative for people on fixed incomes, or those who rely on low housing costs; positive for landowners and condominium owners who wish to use the increased equity or sell their unit | - Revise laws to encourage landowners to maintain affordable rent structures<br>- Revise laws to restrict rent increases in a specified area |

**Table 11: Summary of Social Impacts and Mitigation Measures for Consideration** *(Continued)*

| Potential Social Impact *(Please refer to text for full discussion of impacts)* | Nature of Impact | Mitigation Measures for Consideration |
|---|---|---|
| Displacement due to redevelopment and reduction of affordable rentals in Waikiki | Negative, and significant for estimated 1,650 persons living on parcels susceptible to change | State legislature should direct the appropriate State agency to establish a relocation plan for specified areas which are likely to change as a result of the cumulative effects of the convention center. Plan should include a funding/contribution plan and a schedule of payment |
| Changes in residential neighborhoods | Negative, particularly for those who have lived in the area for a long time and/or who depend on affordable rental rates | • State and City planning agencies and the Convention Center Authority should co-sponsor a planning effort to determine the direction for growth and change in the nearby communities; work with Neighborhood Boards to determine the scope and boundaries of this effort.<br>• State should work with City to establish land use and development policies based on neighborhood plans which encourage nearby landowners to maintain current land uses and density, and concentrate on rehabilitation |





# 5 Preliminary Community Issues

Potential social impacts are changes which are likely to occur due to the proposed project; community issues are people's reactions to the proposed actions. Issues are opinions, and they change over time, as people's priorities and values change. Also, in some cases, the proposed action changes in response to issues raised by the community and public officials.

The convention center is a good example of fluctuations in public opinion and changing project plans over the years. As discussed in Section 1, a convention center in Hawai'i has been discussed for many years. The need for a convention center has been frequently debated, though less so with the current proposal. Further, the center has been proposed for several sites, and each proposal elicited a variety of issues and concerns.

This section presents preliminary issues related to the Hawai'i Convention Center, as identified in December 1994. As the plan evolves through the various land use processes, some issues may no longer be considered important, while others may arise.

Section 5.1 provides the background and methodology for the issues analysis. Section 5.2 presents non-interview findings, and a summary of interview comments is presented in Section 5.3. Section 5.4 contains an analysis of issues.

## 5.1 Background and Methodology

### 5.1.1 Description of Issues Analysis

Issues analysis is designed to identify and analyze community concerns about a proposed action. To ensure that the project is reviewed in an overall social context in which the project is proposed, feelings and concerns about the existing community need to be considered as well. Also, trends are part of the overall social context. For example, it is helpful to understand if a project is unique in terms of its issues, or if reactions are consistent with previous proposals or other development projects.

Issues analysis differs from statistical surveys, the latter of which are designed to focus on frequency of reactions. Polls are valuable because they tell us about the opinions of the majority or the minority. The survey instrument is typically not conducive to dialogue, however, and the personalized reasons for these opinions are often not evident in the responses. In contrast, the only time we make reference to the quantity of opinion in issues analysis is where there is significant difference of number, such as "almost all respondents" or "only two respondents."

### 5.1.2 Sources of Information

Several sources of information were used in the issues analysis for this report. To gain an understanding of the resident-based issues in the surrounding regions, we reviewed minutes of three Neighborhood Boards over a two-year period. [26]

We reviewed letters submitted to the Convention Center Authority in conjunction with the environmental assessment prepared for this project. In addition, we reviewed minutes of project-related meetings held with community groups.

Our primary source of information for this analysis were interviews held with various people in the community. Two interviewers

26. *We reviewed minutes of the Neighborhood Boards representing Ala Moana/Kaka'ako (No. 11), Waikiki (No. 9) and McCully/Mo'ili'ili (No. 8).*





conducted interviews, which were informal; most were held in person.

Interviewees were informed that their individual conversations are confidential, and that their comments would be collectively analyzed. Those interviewed were asked to share information and opinions as individuals. They were not asked to represent or take positions for their organizations, unless the group had taken a formal position on the convention center.

To achieve a cross section of interests while ensuring input from those who may be immediately impacted by the project, four groups of people were targeted in these interviews. Interviews with each group started with a slightly different focus, followed by project-related questions. The four groups and a description of the interviews are as follows:

- **Nearby residents and small businesses**

  Those who live or operate a business near the convention center could be directly affected by the convention center on a daily basis. We interviewed twelve people who lived in the adjacent neighborhoods, and they represented a mixture of renters and owner-occupants. Two renters asked that their names be kept confidential.

  We also interviewed twelve businesses in the adjacent areas. About half of the businesses were small, and we were able to contact the owner or president. Of the other half, one is a labor union and another is a non-profit recreational organization.

  These people were asked to first discuss their feelings about their neighborhood or place of business. We asked them to identify the advantages of living or doing business in this area, and also to describe the biggest problems. We also asked business people about plans to expand or modify their operations. After a project description was provided, those interviewed were then asked to discuss their views regarding positive points and problems. Their recommendations for the project were also solicited.

- **Nearby landowners and/or developers**

  As discussed in Section 4, owners and developers of nearby properties would be affected by the project in that the convention center may act as a catalyst for future development. Six representatives of such entities were contacted for this study, and all but one of the entities controlled more than one parcel.

  We began these interviews with questions related to current plans for the parcel. We asked if there were any plans or applications currently pending, and whether they had short or long term plans for change. We then asked if the convention center will affect their plans, in terms of implementation acceleration or other effects.

- **Regional or islandwide organizations and public agencies**

  Several regional and islandwide organizations have expressed interest in the convention center, either as presently proposed, or as a previous proposal, or as a general concept. We asked representatives of several organizations to discuss their views of the Hawai'i Convention Center. Of these 20 individuals interviewed in this group, five were on a Neighborhood Board [27] and eight were members of organizations which advocate environmental protection or

[27] *We contacted members of the Neighborhood Boards representing Ala Moana/Kaka'ako (No. 11), Waikiki (No. 9) and McCully/Mo'ili'ili (No. 8).*





citizenry rights. Two people provided a Hawaiian cultural perspective because of their position in a cultural agency, and another three were involved in a public agency. One person provided views representative of the Chamber of Commerce. Three were interviewed because of their knowledge of the usage of the Ala Wai Canal.

Organizational interviewees were asked if their group had taken a position on a convention center in Hawai'i, or a previous convention center proposal or the Hawai'i Convention Center; they were also asked to explain the nature of that stance. They were then asked to comment on the current proposal, particularly as it relates to the organizations' overall purpose and previous position on a convention center.

- **Visitor industry officials**

  The Hawai'i Convention Center is being proposed as a major asset to the visitor industry. To gain an understanding of how industry officials view the current proposal, we contacted five people who were active in visitor industry organizations.

  Organizational interviewees were asked if their group had taken a position on a convention center in Hawai'i, or a previous convention center proposal or the Hawai'i Convention Center; they were also asked to explain the nature of that stance. They were then asked to comment on the current proposal, particularly as it relates to the organizations' overall purpose and previous position on a convention center.

In all, 55 people were interviewed for this study, and *Appendix A* contains a list of interviewees.

## 5.2 Non-Interview Findings

### 5.2.1 Neighborhood Board concerns

The Neighborhood Board system is a formal mechanism for citizen input to public agencies regarding islandwide City policies, specific community problems and other matters, and proposed changes. This study included a review and analysis of Neighborhood Board minutes to understand some of the issues and concerns addressed by the residential communities. The project site is part of the Ala Moana/Kaka'ako Neighborhood Board No. 11, and adjacent to the areas covered by Waikiki Neighborhood Board No. 9 and McCully/Mo'ili'ili Neighborhood Board No. 8. We reviewed the minutes of meetings held by these three Boards over a two-year period beginning in January 1993.

The three Boards addressed some common issues. Discussions related to traffic were common agenda items, and there were various suggestions to signalize or improve neighborhood roadways. Another issue common to all three was the presence of nightclubs and the issuance of liquor licenses. The Boards generally opposed applications to issue the licenses, citing noise and neighborhood disruptions as problems.

Each Board also had its own set of issues, and dealt with these items from a unique perspective. The Ala Moana/Kaka'ako Neighborhood Board deals with an area which has been in transition for several years. While it is currently the least populated region in the Study Area for this report, the Ala Moana/Kaka'ako Neighborhood Area is expected to undergo the greatest change because of current underutilization and plans for redevelopment. The Hawai'i Community Development Authority





often presents plans for projects in the Kaka'ako Community Development District, and the Board addresses issues related to these changes. This Neighborhood Board area also has regional recreational facilities, and improvements to the Ala Moana Park are ongoing agenda items.

In terms of a convention center, the Ala Moana/Kaka'ako Neighborhood Board has opposed a facility at the Ala Wai Golf Course, and supported a stand-alone convention center. The Board's concerns about the current proposal are related to the inadequate infrastructure system in the area, and the need to accurately assess the significance of negative impacts. It also suggests that a cooperative effort which includes State, City and private entities, is needed to correct anticipated problems.

The McCully/Mo'ili'ili Neighborhood Board area contains the oldest residential communities in the Study Area. The neighborhoods are well-established and many of this Board's issues deal with improving the quality of life for its residents. For example, the Board supports beautification of and increased access and bike lanes around the Ala Wai Canal, as well as the concept of expanding the Ala Wai Park. The Board was very concerned about a proposed electricity substation in a residential area and felt it is inappropriate to install overhead lines of high voltages in this area.

This Board opposed a convention center at the Ala Wai Golf Course, and noted several concerns in its response to the environmental assessment for this project. The Board urges a realistic traffic study, and asks for an accurate economic accounting of the realistic costs of fully implementing the project, including off-site improvements. Further, the McCully/Mo'ili'ili Neighborhood Board asks that the EIS address the problems of "unconstrained development in the surrounding neighborhoods."

Of the three Boards in our Study Area, the Waikiki Neighborhood Board has the greatest level of activity in a high density environment. The underlying presence of the visitor industry often presents challenges to this Board in trying to meet the needs of its residents. This Board deals with tour buses in residential areas, and the displacement of residents due to the elimination of affordable rentals. It addresses problems having to do with street vendors and pedicabs, while reviewing applications to improve hotel properties and establish an artificial reef.

In August 1993, the Board voted to approve a convention center at the Ala Wai Golf Course. As of May 1993, the Board did not submit comments on the EIS for the Hawai'i Convention Center.

### 5.2.2 Correspondence and minutes of project-related meetings

Community input provided through correspondence on the environmental assessment and minutes of project-related meetings indicate concerns related to the design and operation of the Hawai'i Convention Center, as well as project impacts on neighboring uses and activities.

The issues in these sources were raised prior to the selection of the selected project team. Some dealt with design and are therefore moot given the selection of a specific design. Other issues were also raised in interviews conducted for this study, and are discussed in the next section. A summary of issues raised in the correspondence and community meetings are as follows:

- *Design issues:* Setback requirements; perimeter facade; aesthetics; promenade beautification; Hawaiian sense of place; use as an emergency shelter for the area; pedestrian safety; accommodation of expansion needs





- *Economic feasibility:* Presenting the full costs of the project, including off-site improvements; cost-benefit analysis
- *Traffic and parking:* Traffic congestion; accurate assessment of traffic impacts; cumulative traffic impacts given other development; bus traffic; trash pickup; adequate parking, parking overflow in the McCully area
- *Cleaning of the Ala Wai Canal:* The need to clean the canal to complement the convention center; the cost of this undertaking
- *Recreation impacts:* Impact on recreation facilities in the area and on recreational users of the Ala Wai Canal
- *Impact on nearby land uses:* The potential for commercial, residential and resort redevelopment created by the convention center; property values; displacement of residents; loss of affordable housing; noise
- *Community input:* In the design and selection of the construction team; in designing mitigation programs; in assessing environmental impacts
- *Plans for addressing environmental impacts:* Dewatering; archaeological; sewage
- *Construction impacts:* Dust and noise, traffic

## 5.3 Interview Findings

This section presents a summary of interview comments offered by the four interview groups. A synthesis and analysis of the overall issues are presented in Section 5.4.

### 5.3.1 Nearby residents and businesses

In terms of the existing community, residents liked where they lived. They liked their neighbors, and felt that their neighborhood was mostly quiet and safe. Convenience was a major factor for residents and businesses alike. Both types of interviewees pointed out that they are near major bus routes and roadways. For residents, this means easy access to work and shopping. Business people felt that their present location gave them high visibility.

Residents and businesses shared the same concerns about neighborhood problems.[28] Traffic was often mentioned as a problem for commuting and for business patrons. Both groups also cited hostess bars as a big problem. They felt that these establishments were noisy, and their patrons were rowdy.

Noise from traffic and the general environment bothered residents, and it was noted that the Kahakai area is beginning to need some rehabilitation. According to residents and businesses, crime was up and they wanted to see more police protection in their area.

When asked if there were positive points of the Hawai'i Convention Center, nearby residents and businesses named the following. One person felt that the project had no positive value.

- **Economic benefits**

  Both residents and business people felt that the convention center was good for tourism and good for the economy.

- **Improvement over previous proposal**

  Residents were appreciative that the current proposal did not include hotels and other high-rises. They liked the relatively

*28. Three residents felt that there were no problems with their neighborhood.*





  low building height, and felt that the project would generally have less impact on the residential neighborhood. They liked the increase in traffic lanes and hoped that these improvements would help alleviate congestion. It was also felt that the current site is better than a Waikiki location.

- **Design and neighborhood enhancement**

  Those who felt that the nearby areas need rehabilitation hoped that the project will help beautify the area. They liked the facility design, as well as the improvement to the promenade and the garden terrace. They hoped that their own property value will improve as a result, and were optimistic that hostess bars may eventually be forced out of the area.

- **More exposure for nearby businesses**

  Business people wanted the new convention center to bring more economic activity for their operation. They looked forward to the increase in exposure, and two people hoped to perhaps provide their services to convention center operators.

Those interviewed also cited several problems with the proposed project, as follows:

- **Construction impacts**

  Residents and business people were very concerned about increased noise, and were worried particularly about large machinery and pile driving. They felt that construction-related traffic would cause long delays at an already busy intersection. Also there was concern that the construction-generated dust would enter air conditioning systems of nearby residences and businesses. Further, residents did not want construction workers competing for onstreet parking or loitering in residential areas.

- **Traffic and parking**

  This was a major concern for those interviewed. They were apprehensive about proposed traffic mitigation because they were not sure if the extra lanes and signalization would be effective. They felt that the bus routing plan was optimistic, and the increase in vehicles, particularly buses, was viewed as a generator of air pollution.

- **Redevelopment pressure**

  While interviewees liked the potential for beautification, they were simultaneously afraid of the effects of redevelopment of neighboring areas. They did not want to lose the low-rise affordable housing, or the low density commercial space. They were concerned that walkup apartments and small businesses would be replaced with high rise condominiums and shopping malls. Moreover, they were concerned about their own displacement if the area redevelops.

- **Transients**

  It was pointed out that the area already attracts loiterers and homeless people. Business people noted that homeless people gravitate towards gathering places and were concerned that homeless people would use the convention center when it is not in use. Further, residents did not want to see prostitution and drug dealing occurring in the residential neighborhoods.

Another concern was the proximity of the convention center to some residences; it was feared that property value would be lowered because no one would want to rent or buy an apartment which is looking directly into the convention center.





Recommendations from nearby residents and businesses are as follows:

- Control dust and noise during construction.
- Inform the community of convention center activities. Post construction activity schedules or mail these to neighbors. Alert people to major events so they can adjust their own schedules.
- Have a central contact point during construction for problem solving purposes.
- Clean the Ala Wai Canal and the promenade. Provide handicap access to the promenade. Provide bike and skating paths along the Ala Wai.
- Make use of the Ala Wai Canal as water transportation to the convention center.
- Build two bridges across the canal to increase pedestrian access and decrease vehicular circulation.
- Do not have any foot bridges across the Ala Wai to keep conventioneers out of the residential neighborhoods in Waikiki.
- Increase and improve traffic arteries into Waikiki. If you restrict vehicular access, you impact neighborhoods all around Waikiki.
- Upgrade infrastructure for the project vicinity, not just for the convention center. This will eventually be needed anyway.
- Government should carefully evaluate all land use permits for other parcels to minimize project-specific and cumulative impacts.

- Use nearby hotels and meeting facilities for project team meetings during construction.
- Come up with a plan for facility use when there are no conventions. Work with the YMCA to provide youth activities. Prevent loitering at the convention center.
- Offer extra parking spaces to the general public and nearby businesses.

### 5.3.2 Nearby landowners and/or developers

Four of the six landowner representatives interviewed indicated that plans for their properties would be affected by the Hawai'i Convention Center. One landowner representative had no plans to develop, and another said that one of his parcels will be developed regardless of the presence of the convention center.

Except for one landowner who felt that the project had no positive value, this group generally looked forward to the development of the convention center. They believed that the facility would be good for tourism and Hawai'i's economy. In the immediate neighborhood, it was felt that the convention center would bring in business for existing establishments, and more buyers may be attracted to nearby residential units. Further, it was noted that a stand-alone convention center implies more options for nearby landowners. They will be able to consider higher yield uses, such as resort development, when developing plans for their properties.

In terms of potential problems, this group named traffic as a big concern. It was felt that the traffic solution presented by the selected project team was the least acceptable of the proposals, and may not be effective. Interviewees were concerned that traffic congestion may hamper the development of their properties in the future.





It was also noted that the project site is not contiguous to and far from support services. Pedestrians and vehicles must cross busy intersections or the canal to access such services.

These interviewees had three recommendations. First, they strongly urged an objective assessment of traffic solutions to ensure the effectiveness of proposed improvements. Second, they recommended that the Ala Wai Canal be cleaned as part of this project, and that a pedestrian bridge be built over the canal to Waikiki. Third, it was suggested that construction impacts be minimized to avoid inconvenience, discomfort and disruption for nearby residents.

### 5.3.3 Regional or islandwide organizations and public agencies

There was a wide variety of organizational and agency representatives interviewed for this study. Six of these interviewees did not take a position on the convention center in general or a previous proposal for a convention center. It was inappropriate for their agency or organization to do so, or the group was unable to reach consensus.

Groups which supported a convention center in general often did not favor a specific site. They felt that a convention center was good for Hawai'i and preferred proposals which would optimize the use of the site and allow expansion.

Opposition to specific previous proposals, either on this or another site, stemmed from density and land use concerns. The previous proposal for this site elicited strong concern in several respects. People did not want to see hotel rooms outside of the Waikiki core, and some felt that public monies would have been used for eventual private profit. A major issue was the previous project's high density and tall buildings. It was strongly felt that this site was inappropriate for that level of development, and two organizations interviewed were co-plaintiffs in a lawsuit against the previous developer.

There was also opposition to a proposal for a convention center at the Gateway site. Of major concern was the displacement of the Hobron area residences and redevelopment of the overall area.

When asked about positive characteristics of this project, particularly as it relates to organizational or agency function, those interviewed provided the following input. Two people felt that the project had no positive value because Hawai'i did not need a convention center.

- **Economic development**

  A major positive characteristic was the project's contribution to Hawai'i's tourism industry. Those interviewed felt that we need more jobs to keep residents in Hawai'i, and that tourism has been a reliable and stable employer for many people. They hoped that the creation of new jobs will also stimulate increased efforts in job training for local residents.

- **Better than previous proposals**

  Interviewees generally preferred the current proposal over previous proposals and other sites. It was felt that the proposed density was acceptable, and that the selected project team offers a good design. Those interviewed also liked that there were no on-site uses or residents who would be displaced by the project.

  There were also comments about the selected project team. Interviewees felt that Nordic/PCL has been responsive and





communicative with the community, and stated that some of their concerns have already been addressed in the design because of this working relationship. For those who preferred another site or another team, that choice did not preclude their appreciation for this particular proposal or project team.

- **Stimulus for revival of local interest in Waikiki**

  Interviewees pointed out that many local residents avoid Waikiki. They said that residents do not like traffic, and feel unwelcome because of Waikiki's strong visitor-orientation and lack of local-oriented activities. It was hoped that the project will bring people closer to Waikiki because of its gathering place functions and the creation of a Hawaiian sense of place. Interviewees wanted to see local residents reclaim Waikiki and urged convention center planners to make sure the facility is inviting for residents and visitors alike.

Problems cited by organizational and agency interviewees are as follows:

- **Impetus for development**

  There was strong concern that the project will stimulate development in neighboring communities. It was noted that, even though the project did not directly cause displacement, it would eventually result in displacement because of land use changes stimulated by the convention center.

  Interviewees especially did not want to see the Hobron or Kahakai areas become annexes to the convention center; they feared the loss of the older communities and affordable housing and residential displacement. They also did not want to see the creation of a new resort district in the Ala

Moana/Kaka'ako area to serve convention center needs.

- **Credibility of project-generated studies**

  Those interviewed questioned the accuracy and premises of project-generated studies. It was felt that the economic benefits were highly over-stated, and that possible indirect costs, such as those related to cleaning the Ala Wai Canal, should be included in the overall balance sheet. There was also concern that the traffic information in the environmental assessment was overly optimistic, and that, by the time government realizes the full problem, solutions will be too expensive or precluded by other factors.

- **Duplication of facilities**

  It was hoped that the convention center will be successful in attracting conventioneers. This will alleviate convention pressures at municipal gathering places and leave these facilities for local residents. It was warned, however, that if marketing is unsuccessful, then the convention center may need to capture a portion of the local market; this would hurt the existing facilities which depend on local events for their business.

- **Environmental concerns**

  Those interviewed cited the impacts of dewatering as a concern. They also asked if all hazardous waste has been removed from the site. Further, there was concern about the increase in air pollution due to the additional cars and buses involved in convention center business.





Three interviewees strongly expressed their frustrations about the futility in opposing the convention center. They felt that the convention center is a "done deal," and that environmental findings and community opposition would do little to change the course of implementation.

Recommendations cited by those interviewed include the following:

- Create a real Hawaiian sense of place. Make the convention center inviting to local residents. When rooms are not used, let the community use them at reasonable rates.
- Purchase and use artwork created by Hawaiian artists.
- Landscape the area with indigenous and endemic plants, and label the plants with information on traditional and contemporary uses.
- If you use non-native plants, use fragrant flowering varieties.
- Include Hawaiian language in signage and other written material.
- Incorporate live and recorded Hawaiian music where appropriate.
- Balance urbanization with the Hawaiian spirit of the building.
- Local residents need to reconnect with Waikiki. Invite them to the facility.
- Provide linkages with Waikiki's entertainment, retail establishments and restaurants via pedestrian bridges and green belts.

- Make sure the facility and promenade are handicap accessible.
- Enforce laws which govern undesirable activities at the convention center, such as drug dealing, "First Amendment selling," and prostitution.
- Make use of water taxis, but do not displace canoe paddlers and kayakers.
- Add more bus stalls.
- Make sure convention center traffic is not permitted to intrude upon small neighborhoods.
- Do not allow early morning construction, or construction during peak hours.
- Make sure convention center walls are soundproofed.
- Establish a community relations program to deal with day-to-day problems.
- Don't build the facility. Use the money for education.

### 5.3.4 Visitor industry officials

All of the visitor industry officials interviewed for this study had previously supported a convention center in Hawai'i. They had a variety of opinions regarding the most appropriate site and the best design, but agreed that the actual convention center should be a state-of-the-art facility regardless of its location.

It was noted that a convention center will expand the types of visitor who visits Hawai'i. Currently, Hawai'i is mostly dependent on leisure travelers who are generally budget-conscious. A convention center brings in people who are on company business incurring mostly company expenses. It was pointed out that





business travelers are generally less concerned about expenses and spend more than westbound and eastbound leisure travelers.

Those interviewed felt positively about the proposed convention center. They approved of the ground floor exhibition hall, and of the generous space allocated to exhibitions and meeting functions. They said that the selected design reflected a true Hawaiian sense of place, and appreciated the landscape plan. It was hoped that the design of the facility will promote Hawai'i as the meeting place of the Pacific.

In terms of problems with the current proposal, traffic was a major concern; there was doubt that the proposed traffic plan could solve project-generated impacts. Further, the impact on Kahakai residents was a frequent concern, and the site was considered too small for future expansion.

Recommendations raised by this group included:

- Provide a full range of transportation options including maximum pedestrian accessways, people movers, ferry transportation and reduction of one-way streets.
- Clean the Ala Wai Canal.
- Do not delay the project further; build the convention center now.
- Increase education efforts to help the community understand tourism.
- Avoid the vendor problem experienced by Waikiki.

## 5.4 Analysis

5. **There is an expectation that this project will be built.**

   At this point in time, the community generally expects that the Hawai'i Convention Center will be built as proposed. Economic pressures, legislative actions and the sheer length of time during which a convention center has been contemplated all lead people to believe that this facility is the one which will be built. Those who favored other sites or other proposals do not anticipate the revival of past alternatives. Further, even those who oppose the concept of a convention center seem resigned to the implementation of this project.

6. **This project is considered a product of all previous discussions and proposals for a convention center.**

   Our issues analysis indicate that people generally view this project as the evolution of previous convention center proposals. The project is seen as accommodating major issues related to other proposals, especially regarding building density and height. There is also a general sense that the spaces and functional requirements, which were sometimes considered compromised in previous proposals, can be met in the current proposal.

7. **Traffic continues to be the biggest problem.**

   Project-related traffic was the number one issue for those interviewed and in project-related correspondence. Traffic is frequently addressed by the Neighborhood Boards. This concern is universal. Regardless of one's interest in the project, there is concern that the project's traffic will exacerbate an already bad situation, will burden nearby residents and businesses, will hurt Waikiki and will be a





   problem for the development of other parcels. So far, the project's proposal for traffic mitigation has satisfied some people, but many remain skeptical that any solution will be effective.

8. **Optimism tempered by redevelopment realities**

   There is a great deal of concern and sensitivity regarding project effects on the surrounding neighborhoods. While construction impacts are an issue, a larger concern is the anticipated redevelopment of nearby properties. Even though people are optimistic about the beautification and economic development aspects of the convention center, they are concerned that whole residential neighborhoods will eventually give way to development pressures. This concern transcends one's affiliation or interests; all of the interview groups raised this issue.

9. **There is a need for an integrated approach in dealing with project impacts.**

   The Hawai'i Convention Center is not viewed as a singular project on a nine-acre parcel. It has many systemic effects related to land use, economics, social aspects, and infrastructure. It requires State and City actions and funds; it depends on participation of the private sector. The community sees these interrelationships and many people are trying to bring the different pieces together. Currently, the Convention Center Network is attempting to provide a forum for a comprehensive review of the project. Such efforts need to be continued to ensure an integrated approach.

10. **"Hawaiian sense of place" extends beyond physical design.**

   This term is a fundamental design characteristic required by the Convention Center Authority. Interview findings suggest that this characteristic extend past architecture and be incorporated in the programs and operation of the convention center. While the facility is designed to physically welcome people, there needs to be an attitude of encouraging the gathering place function and reflecting Hawaiian culture.





# References

Bank of Hawaii. **Hawaii 1994: Annual Economic Report, Vol. 44.**

Branch, Kristi, Douglas A. Hooper, James Thompson, James Dreighton. **Guide to Social Assessment: A Framework for Assessing Social Change.** Westview Press. 1984.

Christiansen, Kathleen. **Social Impacts of Land Development: An Initial Approach for Estimaing Impacts on Neighborhood Usages and Perceptions.** The Urban Institute. 1976.

City and County Department of General Planning. **Waikiki Master Plan.** May 15, 1992.

City and County of Honolulu Neighborhood Commission. *Minutes of meetings held by the Ala Moana/Kaka'ako Neighborhood Board No. 11.* January 1993 through December 1994.

City and County of Honolulu Neighborhood Commission. *Minutes of meetings held by the McCully/Mo'ili'ili Neighborhood Board No. 8.* January 1993 through December 1994.

City and County of Honolulu Neighborhood Commission. *Minutes of meetings held by the Waikiki Neighborhood Board No. 9.* January 1993 through December 1994.

City and County of Honolulu Planning Department. **Development Plan Annual Report: Fiscal Year 1994.** September 1, 1994.

Community Resources, Inc. **1988 Statewide Tourism Impact CORE Survey: Summary and Volume 1.** Prepared for the Hawai'i State Department of Business and Economic Development. August 1989.

The Convention Center Authority, State of Hawai'i. **Convention Center Environmental Assessment.** May 1994.

The Convention Center Authority, State of Hawai'i. **Convention Center Environmental Assessment: Summary of EA and EISPN Public Comment Period.** June 30, 1994.

Earthplan. **Hana Ranch Country Club: Updated Social Impact Assessment.** Prepared for Keola Hana, Inc. May 1992.

Earthplan. **Honolulu Convention Center: Social Impact Assessment.** Prepared for First Development, Inc. August 1989.

Farrell, Bryan H. **Hawaii, the legend that sells.** Univeristy Press of Hawaii. 1982.

Hawai'i Convention Center Authority. **1992 Convention Center Site Selection Survey.** December 21, 1992.

Hawai'i State Department of Business, Economic Development and Tourism. **Tourism Functional Plan.** May 1991.

Hawai'i State Legislative Reference Bureau. **Convention Cente Site Selection Study.** Report No. 3. 1987.

Kelly, Marion. *Foreign Investment in Hawai'i.* **Social Process in Hawaii.** Volume 34. University of Hawaii Press. 1994.





Office of the Governor. **The Hawaii State Plan.** Prepared by the Office of State Planning. 1991.

Plasch, Bruce S. *Tourism and Jobs: Does tourism provide mostly low income jobs?* **The Price of Paradise: Volume II.** 1993.

Rohter, Ira. *A Green Economy for Hawai'i.* **Social Process in Hawaii.** Volume 34. University of Hawaii Press. 1994.

R.M. Towill Corporation. **Convention Center: Site Assessment Study - Waikiki, Summary Report.** Prepared for Hawai'i State Depatment of Business and Economic Development. February 1988.

Tucker, Ken. *Tourist Destination: Is Hawai'i becoming less attractive as a tourist destination?* **The Price of Paradise: Volume II.** 1993.

Wilson Okamoto and Associates, Inc. **Convention Center: Ala Wai Golf Course, Executive Summary.** Prepared for Hawai'i State Department of Business and Economic Devleopment. 1988.

U. S. Department of Commerce, Bureau of the Census. **User-Defined Areas Program: Demographic, Social, Economic, and Housing Tables for the 1990 Census of Population and Housing User-Defined Areas Program (UDAP) Printed Report.**

# Appendix A
# List of People Interviewed

Note: Those interviewed were asked to share their opinions and ideas as individuals. They were not asked to represent the views or positions of their organizations, but were asked to explain a position if their group had taken a previous stance on a convention center or related proposals. Affiliations are provided to give the reader an idea of the cross section of interests.

| Name | Affiliation or Organization |
|---|---|
| **Nearby Residents** | |
| Elizabeth Atkinson | Lives in Kahakai area |
| William Bonzo | Resident and Manager of Atkinson Plaza |
| Nora Boone | Resident and owner of nearby residential unit<br>Secretary of Board of Directors of Summer Palace |
| Don Davis | Resident and Manager of 1717 Ala Wai |
| John Franklin | Resident and Manager of Kapi'olani Manor |
| Kay Hanashiro | Resident and Manager of Kahakai Apartments |
| George Koutouzos | Resident and Manager of the Kapi'olani Bel Aire |
| Peggy Nelson | Owner of residential unit in Kahakai area |





| Name | Affiliation or Organization |
|---|---|
| Frank Silva | Resident and owner of nearby residential unit |
| John Stunkard | Resident and owner of nearby residential unit<br>President of the Board of Directors of 1717 Ala Wai |
| -- | Renter at the Commodore Apartments |
| -- | Renter in Kahakai area |
| **Nearby Businesses** | |
| Mike Baker | Operations Manager of Century Center |
| John Cushnie | General Manager of the Ala Moana Hotel<br>Member of Hawai'i Hotel Association |
| Fernando Cazares | Owner of Portillos Pizza |
| Guy Fujimura | Secretary - Treasurer of ILWU Local 142<br>Member of the Convention Center Authority<br>Board member of the Aloha United Way |
| Sam Luna | Associate Executive of the Central YMCA |
| Tony Miller | Owner of the Eye Glass Shoppe |
| Lyn Naruo | Owner of Step-n-Up Hawaii |
| Wally Parcels | Owner of The Bike Factory |
| Richard Pascua | Leasing Manager for McCully Shopping Center |
| Denis Perron | Owner of Pacific Book House |
| Leigh Tonai | President of Local Motion |

| Name | Affiliation or Organization |
|---|---|
| Dwight Yoshimura | General Manager of the Ala Moana Center<br>Member of the Waikiki Improvement Association<br>Member of the Pacific and Asian Affairs Council<br>Member of the Japanese Chamber of Commerce |
| **Nearby Landowners and/or Developers** | |
| Doug Carlson | Public relations consultant for the Sukamto Holding Company |
| Han Ching | Partner of Aloha Securities and Investment Company |
| Bill Head | Member of Urban Planning and Development of the McCormack Properties, Ltd. |
| John Hill | Chair of Trustees of Excelsior Lodge No. 1, International Order of Oddfellows |
| Daniel Ide | Vice President of Urban Planning and Development of the McCormack Properties, Ltd.<br>Member of Hawai'i Board of Realtors |
| Nubuo Kuniyuki | President of Daiichi Hawaii Real Estate<br>Senior Executive Vice President of First Development, Inc. |
| **Regional or Islandwide Organizations and Public Agencies** | |
| Haunani Apoliona | Chief Executive Officer and President of Alu Like, Inc. |
| Bart Aronoff | Chair of the Planning and Traffic Committee, McCully/Mo'ili'ili Neighborhood Board No. 8 |





| Name | Affiliation or Organization |
|---|---|
| Manu Boyd | Cultural Specialist of the Culture Division of the State Office of Hawaiian Affairs |
| Sam Bren | Resident of owner of residential unit on the Waikiki side of the Ala Wai Canal<br>Chair of Waikiki Neighborhood Board<br>Vice President of Neighbors of the Ala Wai |
| Alice Froiseth | President of Waikiki Surf Club |
| John Fuhrmann | Events and Sales Manager of the Neal Blaisdell Center<br>Member of the International Association of Auditorium Managers |
| David Frankel | Sierra Club |
| James Koshi | President of the League of Women Voters<br>Member of the Neighborhood Commission<br>Member of the Honolulu District School Advisory Council<br>President of Friends of McCully/Mo'ili'ili Library |
| Christina Kemmer | Executive Director of the Office of Waikiki Development<br>Past President of the Waikiki Improvement Association<br>Member of Waikiki Rotary |
| Jack Levin | Member of McCully/Mo'ili'ili Neighborhood Board No. 8<br>President of Convention Center Community Network |

| Name | Affiliation or Organization |
|---|---|
| **Ray Lilly** | Chair of the Ala Moana/Kaka'ako Neighborhood Board<br>Member of the Advisory Committee of the Convention Center Authority<br>Member of Mayor's Traffic Study Task Force |
| **David McFaull** | Past President of Protect Ala Wai Skyline<br>Owner of Kawika Aina Corporation<br>User of Ala Wai Yacht Harbor |
| **Sandy J. Miyoshi** | Director of Government Affairs of the Chamber of Commerce of Hawai'i |
| **Briana Pollon** | Executive Director of Waikiki Tenants Association |
| **Janet Sheppler** | Former Chair of the McCully/Mo'ili'ili Neighborhood Board |
| **John Sutherland** | Member of the Outrigger Canoe Club |
| **Susan Spangler** | President of The Outdoor Circle |
| **Joyce Spoehr** | Recreation Director of the Ala Wai Community Park, City Department of Parks and Recreation |
| **Annie Szvetecz** | Life of the Land |
| **Donna Wong** | Hawai'i's Thousand Friends |
| **Visitor Industry Officials** | |
| **Janet Clark** | Executive Director of the Waikiki/O'ahu Visitors Association<br>Member of Hawai'i Convention Park Council<br>Vice President of the Kiely Company<br>Member of Hawai'i Hotel Association |





| Name | Affiliation or Organization |
|---|---|
| **Michael A. Carr** | President of the Hawai'i Convention Park Council<br>President of Polynesian Adventure Tours |
| **Hillary Kelly** | Director of Travel Industry Relations of the Hawai'i Visitors Bureau<br>Member of Hawai'i Convention Park Council |
| **Murray E. Towill** | President of Hawai'i Hotel Association |
| **Charlian Wright** | Interim President of Waikiki Improvement Association<br>Promotion Director of the Royal Hawaiian Shopping Center |

*APPENDIX H*

# *ECONOMIC AND FISCAL ASSESSMENT*

*KPMG Peat Marwick*

Hawai'i Convention Center

KPMG

The Global Leader

Wilson Okamoto & Associates, Inc.

# ECONOMIC AND FISCAL IMPACT ASSESSMENT FOR THE PROPOSED HAWAI'I CONVENTION CENTER Waikiki, Oahu

Final Report
July 1995

KPMG Peat Marwick LLP

Management Consultants

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1001 Bishop Street
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Telephone 808 531 7286

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July 14, 1995

Mr. Earl Matsukawa
Wilson Okamoto & Associates, Inc.
1907 South Beretania Street
Honolulu, HI 96826

**Re: Economic and Fiscal Impact Assessment for the Proposed Hawai'i Convention Center**

Dear Mr. Matsukawa:

KPMG Peat Marwick LLP is pleased to submit this report, which presents our assessment of the economic and fiscal impacts of the planned Hawai'i Convention Center ("Convention Center" or "Center") for the State of Hawaii ("State") and the City and County of Honolulu ("County").

This letter describes the planned development, the study background and our approach, and provides definitions of key terms used herein. The report attached to this letter is organized as follows:

1. **Summary of Study Findings** - Text providing an executive summary of the findings that are detailed in the exhibits (report chapters 2 and 3), and further explanation of study parameters and assumptions. Readers are encouraged to also refer to chapters 2 and 3 for a more complete understanding of this study.
2. **Scenario I Exhibits** - Detailed analyses and conclusions for the "lower attendance and spending" operational scenario for the Convention Center (see page three of this letter).
3. **Scenario II Exhibits** - Detailed analyses and conclusions for the "higher attendance and spending" operational scenario for the Convention Center (see page three of this letter).
4. **Appendices** - Further data in support of some of the key study parameters and findings.

## PROJECT DESCRIPTION

The State of Hawaii proposes to develop the Hawai'i Convention Center on Atkinson Drive and Kapiolani Boulevard near Waikiki, on the island of Oahu. The joint venture team of Nordic/PCL was chosen by the State to design and build the facility.

The plans for the 1,106,670 square foot complex include the following key features:

| | Square feet |
|---|---|
| Exhibit halls | 200,000 |
| Meeting rooms | 100,000 |
| Ballroom | 35,000 |
| Lobby/prefunction | 240,655 |
| Support areas | 252,915 |
| Parking (appx. 800 stalls) | 260,000 |
| Other | 18,100 |
| Gross building area | 1,106,670 |

According to Nordic/PCL, ground breaking is projected for the Summer of 1995, and completion is projected by the end of 1997.

The Convention Center is proposed to be designed and marketed to attract conventions and visitors from the U. S. mainland, the Pacific Rim, Europe and the rest of the world.

## STUDY BACKGROUND

KPMG Peat Marwick LLP (KPMG) was engaged to estimate the economic and fiscal impacts of the Convention Center in the State and the County, given data already developed in the many Hawaii Visitors Bureau surveys, market and financial feasibility studies, development cost studies and other work already prepared for convention center proposals in recent years. Several of the key construction phase assumptions were provided by Nordic/PCL, the design/builder, and the Hawai'i Convention Center authority (CCA), which is the State coordinating agency for the project. KPMG also obtained information from other State agencies, travel wholesalers, hotel operators, convention centers and experienced convention center planners and consultants.

KPMG's scope of work did not include revisiting the market or financial feasibility of the Center, nor did it include estimating the economic and fiscal benefits of the Center to the various Neighbor Island counties. Additionally, mitigation measures for the potentially negative impacts suggested by this study are outlined in the separate report on the social impacts of the Convention Center, prepared by the firm Earthplan.

The assumptions used are outlined in this text and in the footnotes to its exhibits. KPMG's projections of the Center's economic and fiscal impacts are generally based on the inputs provided by the above sources. Where no guidelines had been previously prepared, our judgment of the "most likely" "typical" or "average" input for any given assumption was applied, unless we felt the most likely outcome could not be projected on a supportable basis. In those cases, we assumed conservative outcomes. For instance, so as not to over-estimate the secondary and tertiary County real property tax benefits of the Center's development, we assumed no renovations of existing properties stimulated by the Center, no nonhotel development, no proprietary income earned from the Convention Center's construction or operations, and no taxes on the above benefits.

For purposes of this report, all monetary projections are stated in constant 1994 dollars.

## STUDY APPROACH

Any projection of economic and fiscal impacts is necessarily dependent on numerous assumptions and other inputs, that cannot be predicted with certainty. Among the many assumptions used in this study, the levels of attendance at conventions or meetings and the levels of spending by the delegates who attend are two of the most critical.

Thus, this study presents a range of possible results based on two scenarios, the first reflecting relatively lower attendance at Center events and lower average delegate spending, and the second reflecting relatively higher attendance and spending. In addition, a displacement factor for existing tourism was also estimated (see chapter 1, pages 1 - 3 to 1 - 5), and this factor varies between the two scenarios in proportion to their stabilized event sizes. In summary, the two scenarios are defined as follows:

| | | Average delegate and exhibitor spending per day (1) (1994 dollars) | | |
|---|---|---|---|---|
| | Average event attendance at stabilization (2) | Personal | Supplementary | Total |
| Scenario I | 6,200 | $182 | $283 | $465 |
| Scenario II | 7,500 | $182 | $373 | $555 |

(1) Does not address spending by attendees, (those who accompany the delegates). See definitions, below. Figures refer to spending averaged throughout the delegate or exhibitor's entire stay in the State.
(2) Out-of-State attendance only. Provided by Group 2+ international Inc. on behalf of the Convention Center Authority. See Appendix A.

The above variables are highlighted on Exhibit 1-A of the exhibits for each scenario. Much of the discussion in this summary text focuses on Scenario II, since it implies the highest impacts for the State and County, both in terms of what may be considered desirable and undesirable impacts.

## DEFINITION OF KEY TERMS

This report uses a number of terms common in the convention and meeting business, which are defined herein as follows:

- **Event** - A corporate or other meeting, or a convention. Incentive travel, another frequently cited type of group activity, is generally not considered a likely candidate for use of the Convention Center.

- **Delegate** - The person who attends a meeting or convention, and is registered for the event. In this report, association staff members who may attend and help to produce an event are also considered to be delegates.

- **Exhibitor** - Those who attend an event and also sponsor or staff an exhibit; exhibitors may also be delegates.

- **Attendee** - A spouse, friend or other person who accompanies a delegate or exhibitor to Hawaii and may attend some functions, but is not registered for the event.

Also in this report, we segregate our projected results into impacts that are called "direct", "indirect", and "induced." The logic of this categorization follows the path of the dollars spent by delegates, exhibitors and attendees, as opposed to their more familiar use in environmental and social impact studies. For instance, the most obvious direct economic impact of the Convention Center's operations is that it can be expected to attract visitors that would not otherwise come to the State. Therefore, any place those new visitors spend their money is said to be experiencing a direct economic impact of the Convention Center's development. This would include the Convention Center itself, as well as the hotels these new visitors stay at, and the restaurants and stores they may purchase meals and gifts at. Indirect and induced impacts represent the respending of these directly earned dollars throughout the local economy. More specifically:

- **Direct impacts** - Those variables that are affected by the direct expenditure of money by or on behalf of meeting or convention delegates or exhibitors. Examples include delegate or attendee expenditures for food, hotel rooms, entertainment and the like; event sponsors' expenditures for exhibit set-up and take-down; installation of audio/visual systems, hosted cocktail parties, company golf outings, and the like. Likewise, the employment of any person in the construction or operation of the Convention Center itself, or in the hotels in which delegates and attendees may stay, is considered a direct impact of the Center's development.

- **Indirect impacts** - These represent expenditures in the State by businesses that benefit from the new direct expenditures. For instance, the hotel operator that gains occupancy may purchase more proteas than previously from a farmer on Maui; an event planner may order a thousand boxes of specially packaged Kauai cookies as gifts for her delegates; the Convention Center operator pays its local phone bills, and sends uniforms out to a local laundry service.

- **Induced impacts** - These represent the respending of earned income throughout the State's economy by employees or proprietors of businesses that benefit from direct or indirect expenditures. For instance, a hotel worker may use her income to take her children out to the movies near her home in Mililani; a Convention Center employee may spend his earnings to purchase groceries in McCully, and to send his child to a summer "space study" program on the Big Island.

In this manner, indirect and induced impacts become spread geographically throughout the State, as well as through the many sectors of our local economy.

Another less-commonly understood term is "in-migrant." It is used throughout this report to mean the following:

- **In-migrant** - A person who moves his or her principal place of residence across state or county lines. Demographers use this term to distinguish such movers from those who move across international boundaries (the latter are referred to as "immigrants"). However, to simplify discussions in this report, the term "in-migrant" is meant to include those who move across county, state or international boundaries.

* * * * * * *

KPMG appreciates the opportunity to be of assistance by preparing this economic and fiscal impact study for the Hawai'i Convention Center.

Very truly yours,

KPMG Peat Marwick LLP

Wilson Okamoto & Associates

# ECONOMIC AND FISCAL IMPACT ASSESSMENT FOR THE PROPOSED HAWAI'I CONVENTION CENTER

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Wilson Okamoto & Associates

# ECONOMIC AND FISCAL IMPACT ASSESSMENT FOR THE PROPOSED HAWAI'I CONVENTION CENTER

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# 1 - SUMMARY OF STUDY FINDINGS

This chapter explains the study assumptions, parameters and key findings. It references exhibits located in chapters 2 (Scenario I) and 3 (Scenario II), and readers are encouraged to examine those exhibits to gain a better understanding of the study findings.

The respective exhibits for the two scenarios used are numbered identically to facilitate their comparison. Thus, where this text refers to Exhibit 1-A, for instance, the reader may wish to refer both to Exhibit 1-A for Scenario I as well as to Exhibit 1-A for Scenario II.

## DEVELOPMENT AND OPERATIONAL PARAMETERS

Key development and operational parameters of this study are presented in Exhibits 1-A and 1-B. This section provides further explanation of some of those assumptions.

### Development and Construction (Exhibit 1-A)

Not all of the frequently cited $200 million development cost of the Convention Center is considered relevant to generating economic and fiscal benefits in the state of Hawaii. The $168 million figure noted in Exhibit 1-A is based on the following information provided by Nordic/PCL:

| | Development cost, in millions |
|---|---|
| Cost items considered in this study: | |
| Building construction costs | $ 149 |
| Site preparation, landscaping, utilities, *etc.* | 13 |
| Design fees to be expended in Hawaii | 6 |
| **Subtotal** | **$168** |
| Cost items not considered in this study: | |
| Bond, overhead, profit, tax | $ 17 |
| Authority's cash allowances | 5 |
| Design fees to be expended out-of-state | 10 |
| **Subtotal** | 32 |
| **Total** | **$200** |

The development period is assumed to have begun in October 1994, when the State awarded Nordic/PCL its contract to design and build the Center. Therefore, the "1995" projection period shown throughout this report actually represents a 15-month period from October 1994 to December 1995. All other projection years are calendar years unless otherwise noted.

For purposes of this study, the Center is assumed to begin operations on January 1, 1998.

### Average Event Attendance (Exhibit 1-A)

At stabilization, the CCA projects the Center will host an average of 60 events per year with an estimated 6,200 (Scenario I) to 7,500 (Scenario II) out-of-State exhibitors and delegates per event, as shown in Exhibit 1-A. The Convention Center is also projected by CCA to reach around 90% of stabilized operating capacity by 2003, its sixth year of operation, and full stabilization is projected to occur between its sixth and eighth year of operation. Thus, stabilized operations are reflected in 2008, which was picked as the projection horizon year simply because the center would then have been operating for a decade.

Appendix A presents the CCA's analysis in support of the projected average event size.

### New Delegates Attracted to Hawaii by the HCC (Exhibit 1-A)

- **Gross new delegates and exhibitors** attracted by the Convention Center are estimated as a function of average event size and number of events, as also shown in Exhibit 1-A. In year 2008, this would represent approximately 450,000 new visitors over the year under the higher impact Scenario II, or about 372,000 visitors under Scenario I.

- **The above projections are adjusted** to reflect those meetings and conventions that could be expected to use the Convention Center facilities, but which might have come to Hawaii anyway, even without a Convention Center. This adjustment is based on an estimate of the County's past success in attracting events of 1,500 or more delegates.

  In 1992 and 1993, an estimated 175,000 and 156,000 visitors, respectively, attended conventions and meetings in Hawaii. This is based on half of the reported 350,000 and 312,000 persons, respectively, whose stated purpose of visit to the state was to attend a convention or meeting, since:

  - HVB indicates that the above figures include delegates as well as their spouses or other attendees, and

  - Recent HVB data suggests the ratio of attendees to delegates has been around 0.8 to 1.0.

  Of this market, an estimated 20,000 to 30,000 delegates came to attend events of 1,500 or more delegates on Oahu, representing a sizable established market. According to local meeting coordinators, however, out-of-State planners for these larger groups are increasingly frustrated with the coordination and inconvenience of dealing with multiple venues, particularly given the growing number of convention center options in other destinations. Thus, many planners have indicated they will no longer bring large groups to the State until a convention center is built, and hotel meeting coordinators report they are already booking fewer large events.

  Hawaii hotel representatives estimate that anywhere from 35% to 60% of these larger groups are at risk of not returning to the islands. Conversely, this would imply that somewhere between 8,000 (40% of 20,000 delegates) and 20,000 (65% of 30,000 delegates) of this existing larger-group market could be expected to continue to come to Hawaii, even without development of the Center. Based on this analysis, the gross delegate attendance projections are reduced by a worst case (in terms of net new impact of the Convention Center) "existing Oahu meeting capacity" factor of 20,000 delegates.

  This results in an estimate of the net new delegates/exhibitors attributable to the Center's development.

- **Finally, the attendees,** or spouses and others who may accompany delegates and exhibitors are estimated at 0.8 per delegate and exhibitor. This factor is a compromise between:

  - The rough 0.8 to 1.0 estimate based on a comparison of hotel room counts (where each hotel room is assumed to include one or more delegates) to total attendee and delegate counts for recent Hawaii events, reported by the HVB.

  - The experiences reported by meeting planners who have brought large events to Hawaii, and representatives of other convention destinations. These sources suggest a typical attendee to delegate ratio for large U. S. mainland groups or destinations of around 0.7.

  - The experience of the Sheraton Waikiki and Hilton Hawaiian Village, Oahu's two major existing meeting and convention venues, which is that those accompanying delegates represent about 0.75 to 0.79 persons per delegate.

Thus, in total, net new delegates, exhibitors and attendees anticipated to be attracted to Hawaii by the Convention Center are estimated to range from 633,600 to 774,000 by the year 2008. These figures are shown on Exhibit 1-A of the Scenario I and Scenario II exhibits, respectively.

**Displacement of Other Visitors Out-of-State (Exhibit 1-A)**

Some visitor industry representatives have expressed concern that the Convention Center could sometimes attract so many visitors to Oahu at once that other travelers, who may not book rooms as far in advance, could be displaced. To assess this concern, KPMG evaluated the seasonality patterns of meeting and convention and general visitors, and conducted interviews with a sample of the major tour wholesalers that serve Hawaii.

- **Seasonality patterns** - The meetings and convention business has a different seasonality pattern from Hawaii's established vacation markets and this is one of its attractions as a supplement to Hawaii's other markets.

  Table 1 compares total east- and westbound visitor arrival patterns to Oahu, to those of visitors who come to attend meetings and conventions statewide (the latter data is not available by island or county). As shown, the meeting and convention market tends to peak in November and April, which are slow periods for visitor arrivals in general, except that eastbound arrivals tend to peak in the last week of April, when Japan's "Golden Week" traditionally begins (this subtlety is lost when the month is viewed as a whole).

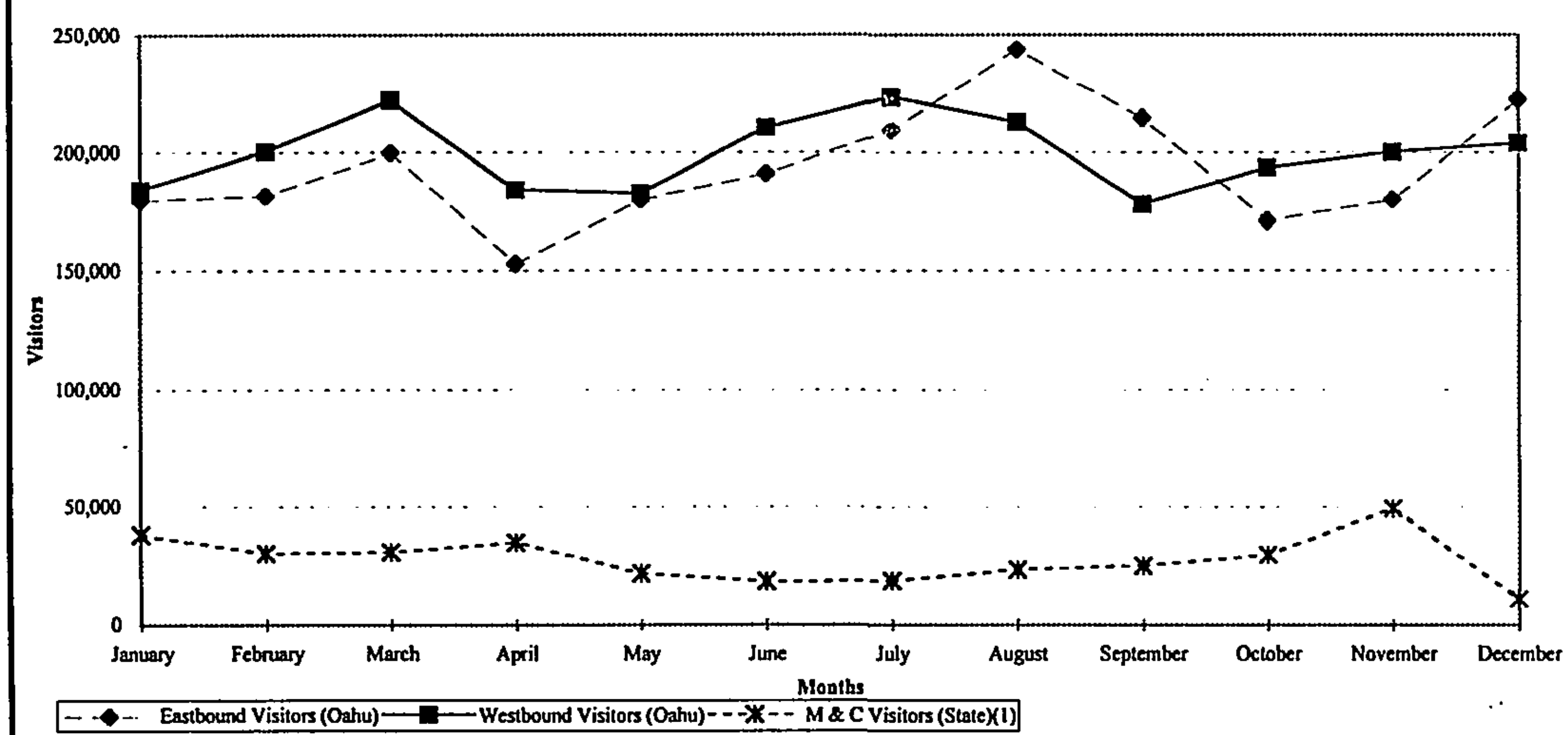
  By "stacking" the monthly arrivals data one upon the other, the months of greatest potential conflict for rooms are revealed. As shown in Table 2, the months of greatest visitor demand in 1994 were March, July, August and December. However, with the meeting and convention market significantly down in December, the months of potential concern were March, July and August. An analysis for 1993 (shown in Appendices B-1 and B-2) shows a similar pattern, but with January, July, and August being the months of potentially highest conflict.

- **Tour wholesaler interviews** - To further understand the potential competition for rooms, KPMG conducted interviews with:

  - Three of the major tour wholesalers to the islands who market to the U. S., Canada and Australia.

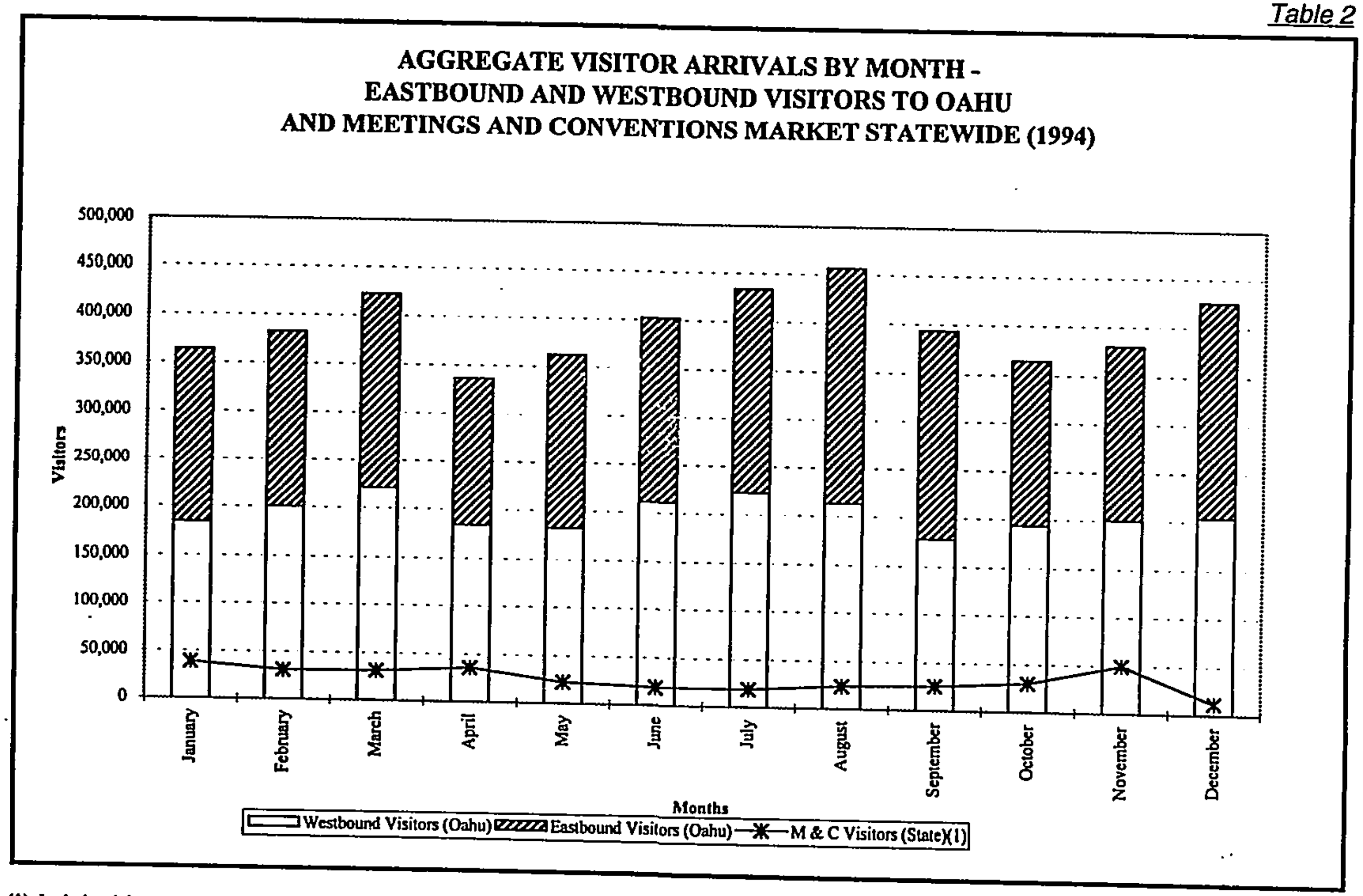
*Table 1*

**SEASONALITY OF EASTBOUND AND WESTBOUND VISITORS TO OAHU AND MEETINGS AND CONVENTIONS MARKET STATEWIDE (1994)**




(1) Includes delegates and attendees. Data not available for Oahu alone.
Source: Hawaii Visitors Bureau.

*Table 2*




(1) Includes delegates and attendees. Data not available for Oahu alone.
Source: Hawaii Visitors Bureau.

- Five of the major eastbound tour wholesalers to the islands, who represent primarily Japanese markets, but also cover Taiwan, South Korea and China.

- Other informed sources, including representatives of the Hawaii Hotel Association, the Convention Park Council, Duty Free Shoppers, a major nationwide travel service, the leaders of major hotel chains, and former market consultants to the Convention Center.

The consensus of the interviews was that the availability of Waikiki rooms is not expected to be a major issue for westbound travelers, since they are generally flexible in terms of their exact dates of travel, and already spend significant portions of their visits on the Neighbor Islands. Wholesalers and travel agencies already report a receptiveness of westbound visitors to shuffle the order of their various island visits or their specific accommodations (within a budget range) to work around the occasional nonavailability of their first choice accommodations in Waikiki.

However, eastbound tour wholesalers and others did express concerns with respect to the Japanese market. This is because (1) 50% to 65% of the travelers from Japan tend to seek first-class hotel accommodations (like conventioneers), (2) in general, they are less flexible than their westbound counterparts in adjusting their dates of travel, and (3) most seek to spend a significant portion of their visit in Waikiki.

The period of greatest concern is Golden Week (generally the end of April/beginning of May); others include the New Year's season (end of December through first week of January) and Obon Week (mid-August). One wholesaler also mentioned October and November, but based on the analysis of seasonality, these months do not appear to be problematic.

However, many also cited various circumstances that could mitigate against a major displacement of Japanese visitors from the islands. These include:

- Japanese are already spending more of their stay in Hawaii on the Neighbor Islands; travel wholesalers and retailers are encouraging this trend.

- As more and more Japanese are repeat visitors to the State, the above trend should accelerate. As of 1993, the average visitor from Japan had been to Hawaii on 2.5 prior occasions, according to the HVB.

- Japanese travel to Hawaii is becoming somewhat less seasonal, as travelers take advantage of greater bargains available in off-peak seasons.

- It can be expected that the meeting and convention markets would likewise have a natural tendency to avoid the periods of peak demand by Japanese and other travelers, since room rates and airfares tend to be bid-up in those periods.

- Since the competition for rooms is principally expected for the 25% to 30% of Waikiki's first class or superior standard rooms, the Convention Center-stimulated demand is expected to encourage more properties to upgrade their facilities, thus expanding the supply of the most desired room types without any new room development.

- Finally, most were aware of a few Waikiki area hotel projects that may be expected to develop over the next several years, thus providing further supply to meet the new demand (see discussion beginning on page 1 - 8).

- **Assessment of displacement factor** - Despite the potentially mitigating circumstances noted above, it appears reasonable that a certain number of potential travelers to Hawaii will choose not to come to the State at all because their preferred Waikiki accommodations are not available at the times they wish to travel. This could be due to the blocking of rooms for Convention Center delegates or to the ripple effects of that new demand. It also appears that such displacement is most likely to impact Japanese visitors. To estimate a reasonable displacement factor, eastbound visitor arrivals in the relatively high-competition months of March, April, July and August were evaluated:

**Estimation of Out-of-State Displacement Factor**

| Eastbound visitor arrivals to Oahu: | 1993 | 1994 |
|---|---|---|
| High travel demand months: | | |
| March | 165,270 | 199,730 |
| April (1) | 144,510 | 152,780 |
| July | 203,990 | 209,500 |
| August | 215,510 | 243,370 |
| **Total, 4 months** | **729,280** | **805,380** |
| **Total for the year** | 2,125,390 | 2,323,930 |
| % in 4 months | 34% | 35% |
| Potential displacement: | | |
| 5% of 4 months | 36,500 | 40,300 |
| 10% of 4 months | 72,900 | 80,500 |
| **Average** | 54,700 | 60,400 |

(1) Included due to Golden Week; aggregate visitor accounts for the month as a whole tend to be below average, as shown previously in Table 2.

Source: Hawaii Visitors Bureau, "Visitor Statistics 1993" and preliminary 1994 figures.

Of the 729,000 to 805,000 eastbound visitors that arrive in these four months, approximately 64% are Japanese. Moreover, according to the Japanese tour wholesalers interviewed, between 50% and 65% of their visitors typically seek to stay in deluxe Waikiki accommodations that conventioneers also tend to like. The potential displacement is thought to most likely occur among these deluxe or first class Japanese travelers during certain high travel periods such as Golden Week and Obon. Those who estimated the amount of displacement that could occur during these high travel periods put it at 15% to 20% of arrivals. Combining the two key factors would suggest that up to 10% or 13% of visitors could be displaced during the highest volume travel periods, as follows:

| | Low | High |
|---|---|---|
| Japanese share of eastbound arrivals | 64% | 64% |
| Estimated Japanese displacement | x 15% | x 20% |
| | = 10% | = 13% |

However, since the figures are being applied to arrival data for the entire four months in question, rather than only the highest demand periods within each (typically a week to 10 days), an adjustment figure of 5% to 10% is applied to the four-month eastbound Oahu arrivals data.

Based on this analysis, a potential displacement factor of 60,000 persons per year is used in Scenario II of the economic and fiscal impact model. This figure is reduced 17% to 50,000 in Scenario I, in proportion to the fewer delegates/exhibitors expected to attend.

Although these displaced visitors could theoretically include travelers from anywhere, the model conservatively assumes that they are all Japanese travelers, with their higher spending and shorter length of stay in the State, but proportionately longer stay on Oahu. Based on the 1993 and 1994 data shown, these potentially displaced visitors would represent 2.6% to 2.8% of eastbound visitors to the State.

The projected loss of 50,000 to 60,000 visitors per year could be a high estimate, particularly in the later years of the projection period, as the various mitigating trends noted above become more pronounced. However, so as not to overestimate economic benefits, these displacement figures are held constant over the projection period.

**Expenditures Per Person (Exhibit 1-A)**

Convention visitors are associated with significantly more spending than the average visitor to Hawaii, since costs of the convention, and entertainment and promotional items are added to their daily personal expenditures. In estimating a range of expenditures per person, KPMG reviewed HVB surveys on the meeting and convention markets as reported in its *Visitor Expenditure Reports* for 1991, 1992, and 1993, the most recent available. The HVB data shows that in 1993 westbound meeting and convention visitors spent $617 per person per day while eastbound meeting and convention travelers spent $720.

To those familiar with typical other Hawaii visitor spending patterns, this figure may seem high. That is because, in addition to the money spent by each delegate or exhibitor, the sponsoring groups typically spend an even greater amount in the State (noted as "supplemental" spending by the HVB). These supplemental business expenditures, which occur in Hawaii and may be spent by the event organizer or other sponsors, are averaged over all delegates and exhibitors and their entire length of stay in the State. According to the HVB, these supplementary expenditures include the following:

Hospitality activities (suite, food, beverage, service, tips, etc.)
Business entertainment/business meals
Cost of exhibit space
Local drayage/storage
Local exhibit material rental
Local audio/visual materials and equipment
Ancillary services (telefaxing, duplicating, printing, secretarial, etc.)
Union labor for exhibit set-up and take-down
Promotional or give-away items purchased locally

For 1993, the HVB reported the following expenditure data on meeting and convention visitors to the State:

| | Personal | Supplemental | Total | Percent Mix |
|---|---|---|---|---|
| Westbound travelers: | | | | |
| Convention delegates | $ 152 | $ 406 | $ 558 | 76% |
| Corporate meeting delegates | 202 | 602 | 804 | 24% |
| Weighted average | $ 164 | $ 453 | $ 617 | 100% |
| Eastbound travelers: | | | | |
| Convention delegates | $ 236 | $ 406 | $ 642 | 72% |
| Corporate meeting delegates | 320 | 602 | 922 | 28% |
| Weighted average | $ 260 | $ 461 | $ 720 | 100% |

Source: Hawaii Visitors Bureau, *Visitor Expenditures* 1993.

In the future, westbound visitors were estimated to represent 85% of delegates or exhibitors, and eastbound visitors 15%, based on conservative projected capture rates of eastbound groups. (In 1992 and 1993, convention and meeting delegates visiting the state were reported as 19% and 17% eastbound travelers, respectively.) Based on the above data, this would result in a weighted average expenditure per day for all Convention Center delegates or exhibitors of $632 in 1993 dollars, or an estimated $650 in 1994 dollars.

Future average spending per capita could be lower than historically, since the State is anticipated to attract larger events. Also, after reviewing data on supplementary expenditures per capita at the New Orleans and Orlando convention centers, the $650 benchmark was adjusted downwards as follows:

| | Personal | Supplemental | Total |
|---|---|---|---|
| Benchmark (1) | $182 | $468 | $650 |
| Scenario I: | | | |
| Adjustment from benchmark | 100% | (40%) | |
| Projected spending | $182 | $283 | $465 |
| Scenario II: | | | |
| Adjustment from benchmark | 100% | (20%) | |
| Projected spending | $182 | $373 | $555 |

(1) Based on 1993 data on Hawaii meeting and convention visitor spending, inflated to 1994 dollars at 2.8% and assuming a mix of 15% eastbound visitors and 85% westbound visitors.

Thus, this study assumes that supplementary expenditures are about 20% to 40% less than observed historically in Hawaii, while personal expenditures for delegates/exhibitors and attendees remain the same at $182. This results in an average total per delegate/exhibitor expenditure of $465 to $555 per day, in 1994 dollars, as shown above and in Exhibit 1-A.

**Average Length of Stay in the State and on Oahu (Exhibits 1-A and 1-C)**

In addition to average spending per person, the other key assumption affecting the projected total spending for visitors is their length of stay in the State. Over the 1991 to 1993 period, length of stay has averaged 8.57 days for westbound meeting and convention visitors, and 6.52 days for eastbound meeting and convention visitors, according HVB's annual *Visitor Expenditures* reports.

In order to evaluate the amount of the total stay that is spent on Oahu, as opposed to the Neighbor Islands, KPMG reviewed unpublished HVB data on meeting and convention visitors' intended length of stay by island. Based on 1993 data (the most recent available) and using a projected 85% westbound and 15% eastbound mix, we estimate a weighted average length of stay of about 8.14 days in the State, of which 71%, or 5.77 days are on Oahu. Average visitor nights are estimated as average days less one.

**Delegate and Attendee Expenditures (Exhibit 1-A)**

Applying the average per capita expenditure to length of stay figures results in a projected $0.5 to $0.8 billion in delegate/exhibitor spending in 1998, rising to $1.3 to $1.9 billion by 2008, based on Scenarios I and II, respectively (see Exhibit 1-A).

Additionally, the attendees who accompany delegates or exhibitors could be expected to spend a total of about $168 to $207 million in 1998, or $417 to $509 million by 2008, based on Scenarios I and II, respectively.

**Demand for Additional Rooms (Exhibit 1-B)**

When the potential new Convention Center-related room demand on Oahu exceeds the capacity of existing supplies, other visitors are expected to either shift to the Neighbor Islands or to contribute to pressures for future development on Oahu. A few may also choose not to come to the State at all, but these are assumed to be accounted for in the out-of-State displacement factor discussed above.

This section discusses the demand shifts to the Neighbor Islands versus demand for new development on Oahu.

- **Existing Oahu Supply** - In 1994, Oahu had about 28,414 hotel rooms exclusive of condominium-hotels, B&B's, hostels and other visitor accommodations, and 86% of these were located in Waikiki, according to the HVB. This inventory is considered capable of accommodating about 2,800 more room nights per day, due to the island's average annual occupancies of about 80% over the last several years. Filling these rooms would result in improved occupancies, up to an annual average of 90% on the island, based on the figures shown in Table 3.

  This estimated existing hotel capacity assumes Oahu continues to attract the same level of tourism it has historically. It does not account for potential losses of Oahu market share if a convention center is not built. Such losses could occur due to:

  - Development of increasingly competitive beach resort destinations in generally lower-cost areas such as Mexico, the Caribbean, Indonesia, Malaysia, Thailand, Vietnam and Australia.

  - Hawaii's growing repeat visitor base, and the corresponding difficulty of attracting visitors for the fourth, fifth or sixth time, particularly given the many new competitive destinations.

  - Potential losses of airline lift capacity to the islands.

  In addition, the second tower of the Hale Koa Hotel, now under construction in Waikiki, includes 396 rooms and is projected to open in fall 1995. These rooms would be restricted to retired and active military personnel, the Reserves, the National Guard, and civilian Department of Defense workers. The first Hale Koa tower has been reported to be running at an average of 96% occupancy over the last five years; overflow demand has

# There is current capacity for about 2,800 additional hotel rooms per night on Oahu, and about 5,800 per night statewide

HOTEL ROOM INVENTORY AND ADDITIONAL CAPACITY: 1994

| | Hotel rooms | 1994 average occupancy | Average nightly additional room capacity (1) |
|---|---|---|---|
| Oahu | 28,414 | 80% | 2,800 |
| Hawaii | 6,703 | 63% | 1,500 |
| Maui | 8,934 | 74% | 1,000 |
| Molokai | 245 | 42% | 100 |
| Lanai | 363 | 60% (2) | 100 |
| Kauai | 2,652 | 77% | 200 |
| Total | 47,311 | 75% | 5,700 |

Summary of existing additional capacity based on improved visitor unit occupancies:

| | |
|---|---|
| On Oahu | 2,800 |
| On the Neighbor Islands | 2,900 |

Sources: Hawaii Visitors Bureau "1994 Visitor Plant Inventory"; Ibid,"Visitor Plant Inventory 1993"; PKF, Trends in the Hotel Industry - Hawaii, December 1994.

(1) Based on 90% average annual occupancies on Oahu and 85% on other islands.
(2) Occupancy figure is assumed since PKF does not provide estimates.

been taken up by other Waikiki hotel rooms. Therefore, the opening of the new Hale Koa tower is likely to relieve some of this pressure. The new tower's "contribution" to the general existing visitor market is weighted at about 75% of its 396 new units, or 300 units.

The Kahala Mandarin Oriental (former Kahala Hilton), which closed for renovations in 1995 and is projected to reopen prior to completion of the Convention Center, is not added back in, since its rooms were already counted in the 1994 inventory.

Thus, the available additional Oahu room capacity based on expected inventories, as of 1997, is estimated as follows:

| | | |
|---|---|---|
| Additional occupancy at existing hotels | 2,800 | units |
| Hale Koa Hotel - second tower | 300 | units |
| Total | 3,100 | units |

- **Projected impacts on Oahu development** - Once this existing capacity is also absorbed, many potential Oahu visitors may choose to stay on the Neighbor Islands, while others could contribute to pressures to develop other properties on the island of Oahu, particularly near Waikiki.

  A "natural" shift of visitor demand from Oahu to the Neighbor Islands is already being noticed within the industry, as shown in Table 4. In 1994, 40% of westbound visitors by-passed Oahu entirely, while 60% visited Oahu and possibly the Neighbor Islands also. This trend is consistent with the increasing repeat visitor factor among Hawaii's tourists and the development and marketing of new hotels, resorts and visitor attractions on the Neighbor Islands. The Convention Center can be expected to accelerate this trend by bringing more business-driven travelers to Oahu, thereby tending to create more periods of higher competition for Waikiki hotel rooms as well as putting upward pressures on Waikiki hotel room rates. Some of this shifting demand is also expected to move from Waikiki to outlying areas of Oahu such as Ko'Olina and Kuilima; however, that is not modeled here since it would still be within the County.

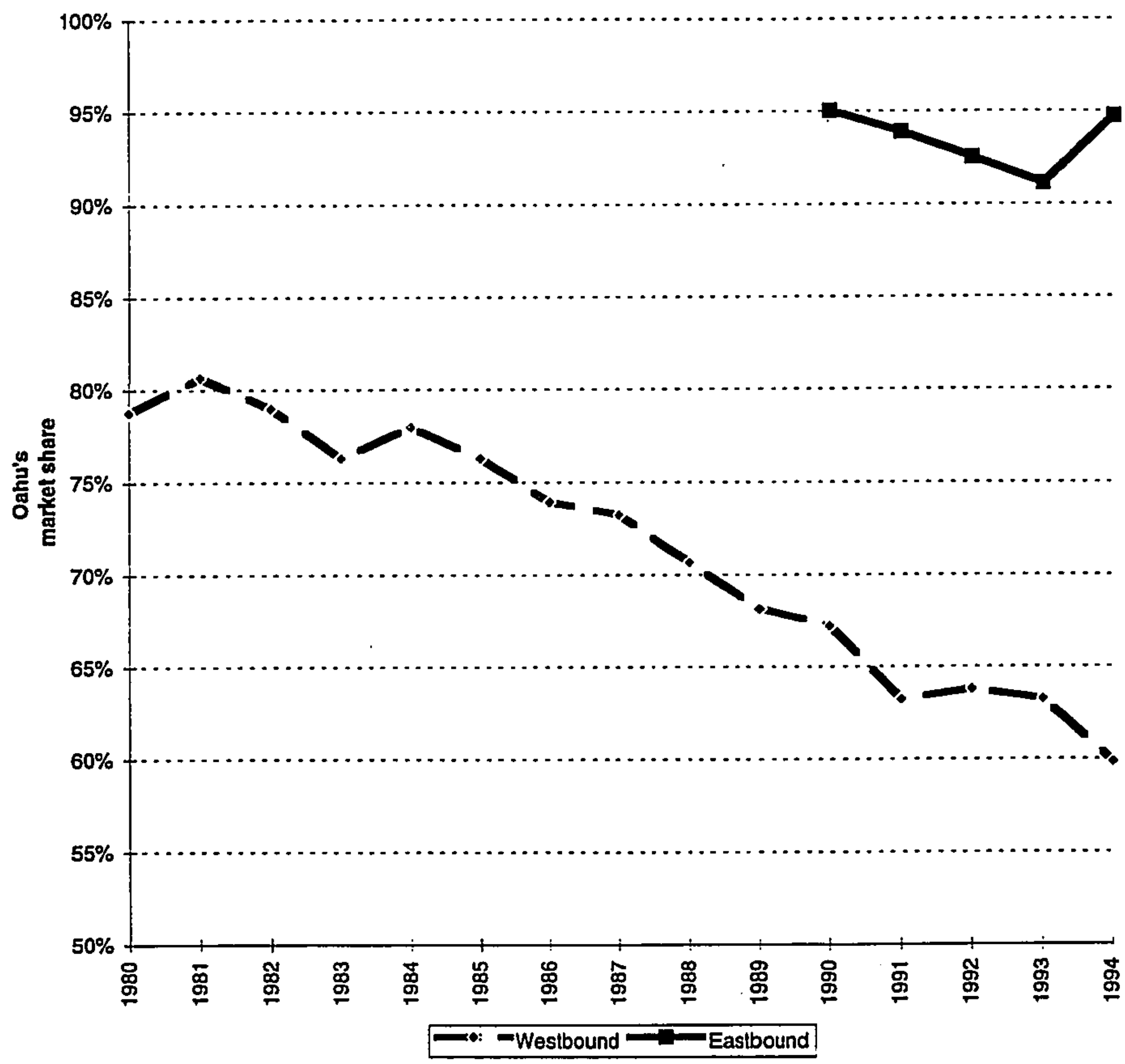
  Based on 60% of the unmet Oahu room demand representing visitors that are willing to go to the Neighbor Islands instead of vacationing on Oahu for at least a portion of their Hawaii vacation, and the remaining 40%, representing those choosing to stay on Oahu, the Convention Center could be expected to create demand to support the development of 360 to 720 more hotel rooms on Oahu by 2008, based on Scenarios I and II, respectively. (The 60% "shift" to the neighbor islands is considered highly feasible given the already dramatic shift of westbound visitor demand to the neighbor islands, as shown in Table 4, and the additional factors cited previously that are affecting both westbound and eastbound visitors.) This scale of new development is considered feasible by 2008, particularly given that zoning already exists for about 850 more hotel units in or near Waikiki alone, as follows:

| | |
|---|---|
| Hilton Hawaiian Village's Kalia Tower | 400 units |
| Aloha Tower (rounded down) | 450 units |
| Total | 850 units |

- **Projected impacts on the Neighbor Islands** - The projected "shift" of about 60% of the unmet potential demand on Oahu to the Neighbor Islands is considered to be part of an already established trend, as noted above. Based on Scenarios I and II, the Neighbor Islands could see Convention Center-driven demand for 2,670 to 3,680 more

# Oahu's market share of State visitors has declined in recent years

PERCENT OF WESTBOUND AND EASTBOUND VISITORS TO THE STATE REPORTING INTENTION TO VISIT OAHU: 1980 TO 1994




(1) Prior to 1989, eastbound data is available for visitor arrivals from Japan only; HVB estimates the Oahu market share of those Japanese visitors as 95% from 1980 to 1989.

Source: Hawaii Visitors Bureau, "Island Supplement."

rooms per day by 2008, including those attributable to the shifted demand and those attributable to the delegates, exhibitors and attendees who spend portions of their stays on the Neighbor Islands, as shown in Exhibit 1-B. Most of this new demand could be accommodated by existing Neighbor Island inventories, where another approximately 2,900 rooms could be occupied per night by improving occupancies on existing 1994 Neighbor Island hotel inventories to about 80%, as shown in Table 3. Beyond this existing capacity, the Convention Center can be anticipated to indirectly support development of up to 780 more hotel units on the Neighbor Islands [3,680 net new room nights less 2,900 existing capacity, as also shown on Exhibit 1-B (Scenario II)].

In addition, hotel zoning also exists for over 20,000 units statewide, of which over 13,000 are located on the Neighbor Islands, as shown in Table 5. The impacts of many of these projects have already been considered in Environmental Impact Statements, Environmental Assessments and similar planning documents, including public and governmental agency review. Thus, these are units for which the Counties and/or the State have already granted approvals. To the extent new development might be proposed in other locations that are not now zoned, such public review processes may also be required.

**Average Room Nights (Exhibit 1-B)**

The net new visitors attributable to HCC, as shown previously on Exhibit 1-A, also drive the projected number of rooms that these new visitors could be expected to demand throughout the State and on Oahu. Average room demand is estimated based on:

- The above analysis of room demand and supply;
- Average nights of stay, or average days of stay less one; and
- Average persons per occupied room, which is estimated at 1.9 since each delegate/exhibitor is projected to be accompanied by 0.8 other party members, yet in some cases, delegates can be expected to share rooms.

After adjusting for room nights that could be lost due to displacement of pleasure visitors to the State during certain high demand months, and (for Oahu), voluntary movement to the Neighbor Islands, average new room demand on any given day in the stabilized year 2008 is estimated to range as follows:

| | Scenario I | Scenario II |
|---|---|---|
| State of Hawaii | 6,130 | 7,500 |
| Oahu | 3,460 | 3,820 |
| Neighbor Islands | 2,670 | 3,680 |

The displacement factor on Oahu is projected at only 90% of that statewide, since losing visitors to the State who sought to stay primarily in Waikiki could also be expected to result in some loss of room nights on the Neighbor Islands. This would be attributed to "side trips" that would have been taken by these visitors. Thus, not all of the statewide loss of room nights would be observed on Oahu.

**Average Daily Visitor Population (Exhibit 1-C)**

Length of stay and the supply/demand analysis of room nights are also used to estimate the net total impact of the Convention Center on the State's and Oahu's average daily visitor populations. After adjusting for the existing meeting capacity, on an average day in 2008, net

# There is capacity for over 20,000 additional rooms on land zoned for hotel development statewide

SIGNIFICANT PARCELS OF ZONED HOTEL LAND AVAILABLE FOR DEVELOPMENT: AS OF APRIL 1995

| Resort/Project | Estimated number of units (1) | Comments (2) |
|---|---|---|
| Oahu: | | |
| Kalia Tower (Hilton Hawaiian Village) | 400 | |
| Aloha Tower | 459 | |
| Ko Olina Resort | 3,613 | 4,000 total, less 1 hotel. |
| Ewa Marina | 950 | |
| Pacific Basin Conference Resort | 300 | Corporate conference center with additional zoned land. |
| Kuilima Resort | 1,553 | 4,000 resort units x 51% less 1 hotel. |
| Oahu subtotal | 7,275 | |
| Hawaii: | | |
| Four Seasons Hotel (Kaupulehu) | 358 | Under construction. |
| Princess Hotel (Kaupulehu) | 600 | |
| Kohanaiki Resort | 1,050 | |
| Chalon's Mahukona | 240 | |
| Regent Kona Coast (Kuki'o) | 350 | |
| Mauna Lani Resort | 2,100 | 3,000 units less 2 hotels; 78 ac. available for hotel use. |
| Keauhou Resort | 2,204 | Includes closed Kona Lagoon site; 1,100 units still need water. |
| Punaluu Resort | 100 | |
| Waikoloa Beach Resort | 1,218 | 3,000 units less 2 hotels. Maximum allowed under SMA. Zoning permits more. |
| Hawaii subtotal | 8,218 | |
| Maui: | | |
| Kaanapali Beach Hotel expansion | 215 | |
| Kapalua Bay Hotel expansion | 127 | |
| Maui Palms Hotel | 243 | |
| Kamaole Land Ventures | 450 | |
| Maui subtotal | 1,035 | |
| Kauai: | | |
| Marriott Kauai | 356 | Scheduled to reopen July 1995. |
| Coco Palms | 390 | Reopening date unknown. |
| Stouffer Waiohai | 426 | Reopening date unknown. |
| Poipu Beach Hotel | 138 | Reopening date unknown. |
| Sheraton Kauai-beachfront site | 237 | Reopening date unknown. |
| Kauai Lagoons | 400 | |
| Princeville Resort | 400 | Limited by height, SMA and other regulations. Zoning allows up to 600 units. |
| Former Hanalei Plantation site | 200 | |
| Waipouli/Kapaa area | 1,500 | Represents 3 beachfront sites leased by Niu Pia Farms, Ltd. |
| Kauai subtotal | 4,047 | |
| Total | 20,575 | |

Sources: County Planning Departments and project representatives.
(1) Represents remaining zoned capacity unless a specific project has been proposed.
(2) Most planned resort projects are "on hold" due to the current economic environment. Construction/completion dates are indefinite for all projects unless otherwise noted.

new delegates and attendees are projected to range from 14,100 to 17,300 per day for the State, or 10,000 to 12,300 on Oahu, under Scenarios I and II, respectively.

The other pleasure visitors who could be displaced by convention and meeting travelers are weighted at an average 6.41 days of stay, based on the 1994 average length of stay in the State for eastbound travelers, as reported by the HVB. On Oahu, the impacts are estimated at 90% of the statewide visitor impacts for the displaced visitors. This is based on HVB data on travel patterns of Japanese visitors who come to Oahu. The shift in demand of other travelers from Oahu to the Neighbor Islands is estimated based on occupied room nights times an occupancy factor of 1.9 persons per room, plus an allowance for 20% of an additional day. After adjusting for these factors, the Convention Center's net impact on visitor population levels on an average day in the horizon year 2008 is estimated as follows (see respective Exhibits 1-B):

| | Scenario I | Scenario II |
|---|---|---|
| State of Hawaii | 13,200 | 16,300 |
| Oahu | 8,000 | 8,900 |

## EMPLOYMENT IMPACTS

The Center will generate short-term employment during the construction of the facility, and long-term employment in the operation and support of the Center, including employment at lodging facilities.

Projections are made for the most direct impacts for which a reasonable quantifiable basis for projection exists. Thus, the study itemizes the impacts of construction and operational employment at the Convention Center itself, as well as at the directly supported hotel units on Oahu and the Neighbor Islands.

Additionally, some hoteliers reported that if the Convention Center were built, they would upgrade their existing facilities and provide a higher level of services. The potential additional staffing for upgrading of service levels is not evaluated quantitatively.

### Construction Employment (Exhibit 2-A)

- **Direct construction employment at the Convention Center** includes on-site laborers, operators and craftsmen, as well as professional, managerial, sales and clerical workers whose usual place of employment may be elsewhere on the island or State. Other types of direct employment include professional consultants such as architects, engineers, and a variety of technical consultants.

  Direct construction employment has been projected based on the actual budgeted cost and time attributable to construction, subcontractors and consultants, as provided by Nordic/PCL. The projections also consider 1993 and 1994 average industry wages as reported by the State of Hawaii, Department of Labor and Industrial Relations. The 1993 wage data was inflated 2.8% to estimate 1994 dollars.

  For the 1995, 1996 and 1997 periods of construction, direct construction employment of the HCC is projected to require about 240, 450 and 270 full-time equivalent (FTE) positions, respectively, as shown in Exhibit 2-A.

- **Direct construction employment for hotels** whose development is encouraged by the business attracted by the Convention Center is estimated at 0.9 full-time equivalent jobs per hotel unit, based on the construction experience of other first-class hotel properties in the State. In Exhibit 2-A, such employment is shown as total person-years over the 1999 to 2003 and the 2004 to 2008 periods. Subsequent exhibits show the impacts of this employment on an average annual basis (estimated at 20% of each of these five-year periods).

- **Indirect and induced employment** within other industries on Oahu and within the State are expected to be stimulated by the direct employment of construction workers at the Center and at other hotel developments. Indirect and induced employment is estimated based on a ratio prepared by the United States Department of Commerce, Bureau of Economic Analysis (BEA). The BEA's Regional Input-Output Model (RIMS) Multipliers for Honolulu County estimates that an additional 1.57 full-time equivalent positions are created in the County for every full-time equivalent job in the building construction industry.

- **Total direct, indirect and induced construction employment** for Scenarios I and II, in the peak employment periods of 1996 and 2004 to 2008, is summarized as shown on the following page for the State as a whole (see Exhibit 2-A of the respective scenarios):

Projected Direct, Indirect and Induced Construction Employment
Generated by the Convention Center: Statewide
(average annual person-years)

| | Scenario I | Scenario II |
|---|---|---|
| 1996 (peak of HCC construction period): | | |
| Direct | 450 | 450 |
| Indirect and induced | 710 | 710 |
| Total | 1,160 | 1,160 |
| 2004 to 2008 (peak of HCC operating period)(1): | | |
| Direct | 220 | 970 |
| Indirect and induced | 350 | 1,520 |
| Total | 570 | 2,490 |

(1) Figures represent total person-years over the five-year period.

## Operational Employment - Statewide (Exhibit 2-B)

- **Direct operational employment at the Center** was estimated at 350 full-time equivalent (FTE) jobs, as provided by the consulting firm Group 2+ international Inc. of Bellevue, Washington. Group 2+ international Inc. is the operations and food service consultant to the CCA, and was engaged by the CCA to provide such consultation.

  This total is broken into approximately 120 FTE positions in areas such as administration, management, sales and marketing, housekeeping, maintenance, food services, conversion crews, security and parking. In addition, there is likely to be an on-call food service staff of approximately 230 FTE positions, for a combined total staff of about 350 FTE employees. It is likely that the State will contract a private management team to operate the facility, and that food services will also be subcontracted. These projections do not vary between Scenarios I and II.

- **Additional direct operational employment at lodging facilities** will be required to meet the new demand for hotel rooms attributable to the Center's development. This would include the demand for labor at existing hotels due to improved occupancies, as well as that at new hotels. In addition to new jobs, these new FTE positions could also represent formerly part-time or on-call jobs that would offer more hours or more stability.

  Based on the "Hawaii Hotel Industry Compensation Survey" prepared by KPMG Peat Marwick LLP in 1995, staffing requirements at first class hotels represent about 0.65 employees per room. Applying this factor to the projected growth in hotel room demand generated by the Center, an additional 4,000 to 4,900 FTE positions would be required statewide by the time the Center reaches stabilized levels. This estimate could be conservative since it adjusts for the incremental increase in demand for hotel rooms, and is calculated based on occupied room nights only with no allocation for an additional vacancy factor.

- **Indirect and induced employment** due to the Center's development is expected to be generated elsewhere on Oahu and in the State. As also estimated by BEA's RIMS multiplier, 0.79 positions are estimated to be created for each new direct position at the Center and each direct position created in the lodging industry.

- **Total direct, indirect and induced operational employment** is projected to range as follows at the horizon year (see respective Exhibits 2-B):

Projected Full-time Equivalent Operational Employment Attributable to the Convention Center: Statewide, 2008

| | Scenario I | Scenario II |
|---|---|---|
| Direct - Convention Center operations | 350 | 350 |
| Direct - lodging facilities | 4,000 | 4,900 |
| Indirect and induced | 3,500 | 4,200 |
| Total (rounded) | 7,900 | 9,500 |

**Operational Employment - Oahu (Exhibit 2-C)**

Considering the portion of room demand expected to occur on Oahu, the comparable Honolulu County impacts are projected to range as follows (see also respective Exhibits 2-B):

Projected Full-time Equivalent Operational Employment Attributable to the Convention Center: Oahu, 2008

| | Scenario I | Scenario II |
|---|---|---|
| Direct - Convention Center operations | 350 | 350 |
| Direct - lodging facilities | 2,200 | 2,500 |
| Indirect and induced | 2,100 | 2,300 |
| Total (rounded) | 4,700 | 5,200 |

## POPULATION IMPACTS

The Convention Center can be expected to attract more residents and visitors to the State. Many of these impacts would be felt on the Neighbor Islands, as well as on Oahu.

**Resident Population - Direct, Indirect and Induced Impacts (Exhibit 2-D)**

In-migrants (see definition of term in transmittal letter) to Honolulu County and the State can be attributed to employment generated by:

- **The construction of the Convention Center and related hotels** - these impacts are considered temporary.
- **Operations of the Convention Center** - these impacts are considered permanent.
- **Operations of the hotels and other businesses** such as restaurants, retail centers, souvenir manufacturers and etc. that could be expected to benefit from the Center's operations. The new hotel business could be manifested as either in terms of improved occupancies or market support for new construction. Such impacts are considered permanent.
- **Indirect and induced impacts** of the above employment generators.

Key assumptions include the number of employees to be required, and the share of those that would come from out-of-State or off-island. These assumptions and the population impact conclusions are explained below:

- **Hawaii's resident population** is expected to meet most of the needs of employment for the Center during its development. It is likely, however, that a nominal number of employees will be drawn from the neighbor islands or from the U. S. mainland to fill specialty construction or design/consultant positions. In this case, Hawaii's and Honolulu County's populations are expected to increase slightly.
- **Nordic/PCL estimates that 90% to 95% of required construction jobs** at the Center will be met by Hawaii residents. Thus, approximately 7.5% or between 18 and 34 employees are projected to have temporarily moved to the County and State from out-of-State during the construction period. It is estimated that another 5 to 8 dependents could accompany these construction employees to the islands, in any given year, as shown in Exhibit 2-D.
- **Construction jobs associated with new hotel development** on Oahu and the Neighbor Islands are even more likely than Convention Center employment to be met by Hawaii residents. This is due to the extensive experience and skill Hawaii's construction labor market has in the area of building hotels. Thus, while the same 7.5% in-migration rate used for the Center is applied to hotel development, this is considered a worst-case estimate in that it could tend to produce a higher population impact estimate, and thus make the fiscal cost/benefit analyses err on the side of greater costs to government.

  Statewide, such in-migration is projected to average about from 3 to 15 FTE employees per year by 2008, as shown in Exhibit 2-D of Scenarios I and II, respectively. Again, some of these construction workers temporarily residing in the islands could be expected to be accompanied during their stay by dependents.

- **An in-migration factor for operational employment** is based on information on initial staffing characteristics at recently opened hotels and visitor-oriented restaurants and retail facilities:

  - With respect to Oahu hotels, the Ihilani Resort & Spa (opened in 1993) and the Hawaii Prince Hotel (opened in 1990) reportedly drew only about 2% of their initial staff from out-of-State, with another 2% to 3% coming from the Neighbor Islands.

  - On Kauai, reports from the Marriott Kauai (reopening in 1995) are that about 5% of initial hires are from out-of-State.

  - With respect to Waikiki-area retail and restaurant facilities, the Warner Brothers store and Planet Hollywood (opened in 1994 and 1995, respectively) are reported to have drawn from 7% to 13% of their initial staff from out-of-State, with most other employees being either long-time Hawaii residents or those who have resided in the State from 1 to 5 years previously.

  Based on the above, an average figure of about 7.5% is considered a reasonable estimate of employees likely to be hired from out-of-State or off-island within any particular facility. However, this figure is being applied to an employment estimate for only Convention Center and hotel workers. Thus, to estimate the total direct potential in-migrant impacts of the Center, including those at retail, restaurant, and other convention-related businesses, the figure is doubled to 15%.

- **Direct operations of the Center, related hotels and other impacted facilities** are projected to draw in-migrants to the State, and hence also Oahu. This would be a result of stimulated staffing at the Convention Center, as well as at the hotels, restaurants, retail centers and other facilities it may impact. Approximately 1,300 to 1,600 persons depending on the scenario, are projected to be drawn from new in-migrants to the State by 2008. Likewise, approximately 15% of operational positions, or from 800 to 900 new in-migrants are projected to arrive to the County in 2008. Many of the in-migrants to the State could represent persons moving directly to the Neighbor Island's from out-of-State.

- **Indirect and induced** employment opportunities created by these direct jobs could also draw new residents from off-island or out-of-State. These impacts are estimated to be proportional to the relationship between indirect and induced labor requirements and direct labor requirements for the construction and operational employees, as shown in Exhibit 2-D. These State figures also include those who may move to the Neighbor Islands from out-of-State.

The resident population impacts of the Center's development and operations in the highest impact construction period year (1996) and operational period year (2008) are summarized as follows (see also Exhibit 2-D of the respective scenarios):

Projected Resident In-migrants Attributable to the Center
(1996 and 2008)

| | Scenario I | | Scenario II | |
|---|---|---|---|---|
| 1996 (peak of HCC construction period) (1): | Direct | Total | Direct | Total |
| To Oahu | 40 | 110 | 40 | 110 |
| To the State | 40 | 110 | 40 | 110 |
| 2008 (peak of HCC operating period): | | | | |
| To Oahu | 800 | 1,400 | 900 | 1,600 |
| To the State | 1,300 | 2,400 | 1,600 | 2,900 |

(1) Represent temporary residents, on an average annual full-time equivalent basis.

Much of these projected population increases could be expected to occur on the Neighbor Islands as opposed to on Oahu, following the room demand of delegates and exhibitors as well as shifts in visitation patterns by pleasure visitors to the islands.

**Resident Population - Ultimate Impacts**

The above in-migrant projections are considered the resident population impacts of the Center's development, since they represent the new State or County residents one might actually find working at the identified facilities or at businesses benefited by indirect or induced impacts of the Center. However, for every new job created at the Center, in a hotel, or other directly or indirectly impacted position an employee may have been hired away from another existing job in the State. If the re-filling of that vacated position subsequently attracts a new resident to Oahu or the State, then that population growth may be considered an additional, ultimate impact of the Center's development.

The relationship between job increases and population growth statewide has been a subject of debate for years, with some claiming that since Hawaii's rate of natural population increase (the excess of "local" births over deaths) is relatively low, nearly every new job created ultimately attracts a new resident or serves to keep an existing one from leaving. On the other hand, portions of Hawaii's in-migration are not job-driven. These would include those who immigrate from abroad to escape conditions elsewhere, and those who come to Hawaii to retire or for lifestyle reasons.

Resolution of this debate is beyond the scope of this study, but the historical relationship of new jobs to ultimate population impacts could differ over the next few years since Oahu in particular, and Hawaii in general, now face unique possibilities of job losses. These stem from possible military base closings and/or reductions in federal funds to the State, the planned closures of major sugar plantations throughout the State, and discussions of State worker layoffs. In addition to the primary jobs that could be lost, these jobs at risk also support other service jobs throughout Hawaii. Such impacts are already being seen in bankruptcy filings, which are reaching record high levels in 1995, with 20% more than in 1994, which had in turn been 6% over 1993. The rise is mostly due to individual bankruptcies, as reported by *Pacific Business News* (June 19, 1995).

Thus, the numbers of labor force members available for work could rise over the next few years as the impact of the weakening of these major industry sectors is felt. In June 1995, a survey showed that over the next two years, more than 1,200 direct primary jobs are at risk on Oahu alone; while some 1,766 potential new jobs are under discussion, these are still uncertain, as shown in Table 6.

# Announced Workforce Adjustments in Primary Industries on Oahu

| | Estimated number of jobs to be lost | Estimated number of jobs to be created | Net job loss | Projected date of job losses |
|---|---|---|---|---|
| Agricultural: | | | | |
| Oahu Sugar | (350) | 0 | (350) | 1995 |
| Waialua Sugar | (360) | 100 | (260) | 1996 |
| Subtotal | (710) | 100 | (610) | |
| Military: | | | | |
| Pearl Harbor (1) | N/A | N/A | N/A | N/A |
| Barbers Point | (300) | 0 | (300) | 1996 |
| Other Navy (2) | (0) | 1,666 | 1,666 | N/A |
| Subtotal | (300+) | 1,666 +/- | 1,366 +/- | |
| State government (3) | (225+) | 0 | (225+) | by FY96 |
| Total | (1,235+) | 1,766 +/- | 531 +/- | |

N/A - Not available.

(1) Data not made available by Pearl Harbor public affairs/information personnel. However, elimination of jobs and/or possible downsizing of military civilian jobs at Pearl Harbor has been discussed.

(2) Proposed action by U. S. Base Realignment and Closure Commission; must be upheld by Congress (as of 6/23/95).

(3) Proposal made by Hawaii State Democrats announced in Honolulu Star-Bulletin, June 27, 1995. Proposal also includes a one-day-per-month furlogh, which could affect tens of thousands of State workers.

Sources: State of Hawaii, Department of Labor and Industrial Relations; Oahu Sugar; Waialua Sugar; Pacific Business News (June 5, 1995); Honolulu Star-Bulletin (June 23, 1995 and June 27, 1995).

### Visitor Population (Exhibits 1-A and 1-C)

The Convention Center's anticipated impacts on visitor population levels were discussed previously, and are presented in Exhibits 1-A and 1-C of the two scenarios.

## ECONOMIC IMPACTS

### Visitor Expenditures (Exhibit 2-E)

As the Convention Center reaches stabilized levels of operations, bookings are expected to amount to about 60 events per year, averaging from 6,200 to 7,500 delegates and exhibitors at each event, as projected by the CCA.

Direct spending by visitors attracted by events at the Center are projected to impact the State as follows:

- **Spending by or on behalf of convention delegates and exhibitors** was discussed previously, and is projected to average between $465 and $555 per delegate per day in 1994 dollars. This represents $182 per person per day in personal spending and $283 to $373 per day in other costs of the convention, including transportation, promotion, rental of the convention space, entertainment, etc. The HVB data, on which these estimates are based, are averaged over the entire length of stay of the delegates. Attendees, who accompany delegates/exhibitors, spend significantly less, as their daily expenditures do not include the convention-related expenses.
- **Based on the average length of stay of about 8.14 days, direct** annual visitor spending due to Center attendance is projected to amount to $1.6 to $2.3 billion by 2008, as shown in the Exhibit 2-E, depending on the scenario.
- **Indirect and induced spending** adds another $0.77 to the economy per direct dollar spent by convention center visitors.
- **The total effect of direct, indirect and induced spending** attributable to the Center is projected to range as follows in the year 2008:

Projected Annual Visitor Expenditures Attributable to the Convention Center: Statewide, 2008 (1994 dollars, in millions)

| | Scenario I | Scenario II |
|---|---|---|
| Direct expenditures (1) | $1,648 | $2,331 |
| Indirect and induced | 1,269 | 1,795 |
| Total (rounded) | $2,918 | $4,125 |

(1) Net of lost spending by potential displacement of visitors out-of-State and the existing Oahu meeting capacity.

### Personal Income (Exhibit 2-F)

Personal income is defined as the wages and salaries paid to the direct construction, operational and lodging employees attributable to development of the Center. Personal income is projected on the basis of average industry wages and salaries for the various anticipated occupational categories and on the projected future employment demands, as shown in Exhibit 2-F.

Stated in 1994 dollars, personal income paid to Hawaii residents employed in the construction and operations of the Center could be expected to range as follows:

Projected Total Personal Income from Direct Employment at the Center
(1994 dollars, in millions, 1996 and 2008)

| | 1996 (peak of HCC construction period): | 2008 (peak of HCC operating period): |
|---|---|---|
| Scenario I | $23.2 | $113.0 |
| Scenario II | $23.2 | $143.7 |

These estimates of income benefits are conservative in that they do not quantify other factors that could generate further income, including:

- Benefits and other nonsalary compensation of individuals, nor proprietary income, rent, stock and similar nonearned income that could result from the economic activity induced by the Convention Center.
- Wages, salaries and nonearned income related to indirect and induced jobs.
- Potentially higher skilled jobs and thus higher compensation levels that might be available to hotel and other employees due to upgrades in the class of service offered at their hotel or other place of work.

## FISCAL IMPACTS

Fiscal impacts are evaluated by comparing the operating tax revenues with the new operating expenditures that are projected to be incurred by the State and County governments.

The development of the Center would bring additional tax revenue to both the County and the State governments. Tax revenue comes from many sources, including general excise taxes on goods and services; taxes assessed to residents and visitors for government services such as fuel, vehicle, public safety, highways and the like; transient accommodation taxes on hotel rooms; and real property taxes.

New residents attracted to the County and State by the development or operations of the Center would also necessitate additional expenditures of State and County public resources. In-migrant residents would require additional public expenditures for public safety, maintenance of highways, recreational facilities and natural resources, health and sanitation measures, special cash capital improvements, education, mass transportation, retirement and pension funds, public welfare and other government functions. All of these government expenditures are allocated to residents who benefit from these services. Visitors, however, do not require government tax resources for items like retirement and pension funds and certain other services. Therefore, these expenses are not allocated to visitors.

### County Government Revenues (Exhibits 3-A and 3-B)

For the County, there are two main sources of revenue: government service taxes and real property taxes.

- **Government service tax revenues** include fuel, utility, motor vehicle and other nongrant taxes. When evaluated on a per capita basis, collections of such taxes amount to about $280 per person in 1994 dollars, whether that person is a resident or a "full-time equivalent" tourist. Based on the increased direct, indirect and induced County population levels projected previously, by 2008, such taxes could range from $2.6 million to $2.9 million in new County revenue, as shown in Exhibit 3-A.

- **Real property taxes** as a State-owned facility, the Center will be exempt from real property taxes. (It should be noted that, whether or not a convention center is built on this site, and so long as the State owns the land and any facilities on it, it will not generate real property taxes for the County under current taxation practices). However, real property taxes would be collected from new hotel rooms developed on Oahu as a result of demand generated by visitors to the Center.

  The Convention Center could support the development of approximately 360 to 720 hotel rooms on Oahu by 2008, as shown previously. An analysis of real property taxes currently paid by first-class Waikiki and Ala Moana area hotels shows that property taxes paid per room average about $1,635 in 1994. Using this benchmark, real property taxes on newly developed hotel inventory could amount to about $0.6 to $1.2 million by the year 2008, for Scenarios I and II, respectively (see Exhibit 3-B).

  This estimate is considered conservative because: 1) it is based on hotel room demand, or expected occupied rooms, whereas property taxes would be paid on the entire hotel property regardless of room occupancy; 2) additional property taxes would be generated from new nonhotel development such as new development or renovations of existing commercial retail, office and industrial properties and new homes for the new residents; and 3) there are potentially increasing property values at properties that are not redeveloped, but appreciate in value due to their location near to other properties that are improved, or due to the higher sales levels attributable to the business the Convention Center stimulates. As a result, the County is expected to indirectly experience further tax benefits beyond those modeled here.

- **TAT** - The County's allocation of the State transient accommodation tax (TAT) collections is the most significant source of new revenues modeled. As of July 1994, the State is required to distribute its TAT collections as follows:

  - The first one-sixth to the State's Convention Center Capital and Operations Special Fund (equivalent to 16.7% of total collections)
  - Of the remainder, 5% to the State (equivalent to 4.2% of the total)
  - Of the remainder, 44.1% to Honolulu County (equivalent to 34.9% of the total)
  - The remainder to the other Neighbor Island counties

  The calculation of total TAT collections attributable to the Center's development is shown in Exhibit 3-C, and is explained below. Honolulu County's 34.9% share of the statewide collections could amount to $7.3 to $8.9 million per year by 2008, under Scenarios I and II, respectively (see Exhibit 3-B).

### State Government Revenues (Exhibits 3-C and 3-D)

Revenue sources to the State government are composed primarily of general excise taxes (GET) on development costs, on construction materials and on visitor expenditures; personal income taxes paid by new State residents; and the TAT paid on the additional hotel earnings attributable to visitors attending events at the Center. In addition, GET taxes on indirect and induced spending stimulated by direct spending are also included in determining total new revenues to the State.

- **General excise taxes related to construction activity** would continue into the Center's operating period. During the two-and a quarter HCC construction period, about $7.0 million are projected to be generated from the development cost of building the Center, and another $110,000 from a materials tax on wholesale construction materials for it.

  During its operational period, construction activity would continue to generate GET revenues, based on the estimated budgets for the additional hotel development attributable to the Center's operations. This estimate ranges from $0.4 to $1.7 million for the 4.17% GET and negligibly more for the 0.5% wholesale materials tax in the peak year of 2008, for Scenarios I and II, respectively (see Exhibit 3-D).

  These estimates do not include the construction-related GET that would also be generated by other related effects of the Center's development, such as renovations of existing hotels and commercial properties, the development of new restaurants and retail areas that might cater to the new delegates or homes for in-migrant residents.

- **General excise taxes from visitor spending** represent the largest source of new State revenues attributable to the Center. By 2008, GET on direct visitor spending attributed to the Center are projected to range from $68.7 to $97.1 million, based on the two scenarios. GET taxes would also be collected from the indirect and induced spending these direct visitor expenditures support, as also shown in Exhibit 3-D.

- **Income and other individual taxes** assessed to new residents employed in the construction and operation of the Center, and in new jobs created in the lodging, retail and related industries constitute another growing source of revenue to the State. Income and other individual State taxes from these new employment sources, including their direct, indirect and induced impacts could increase to about $11.1 to $14.3 million in 2008, based on the two scenarios. These figures account for taxes on the Center's direct employment impacts only; the indirect jobs would generate further earnings and hence income and other taxes.

- **The State's retained share of the TAT** amounts to 20.9% of total collections, of which 16.7% would go to the Convention Center Capital and Operations Special Fund, and 4.2% to the general fund. At stabilization, the additional hotel room expenditures made by convention and meeting visitors are projected to generate from $4.3 to $5.3 million in net additional TAT for the State, after adjusting for Oahu's existing meeting capacity and the potential displacement of visitors out-of-State, as detailed in Exhibit 3-C.

- **Corporate income taxes** may be a source of revenue for the State, however, a projection of new corporate income involves many indeterminable variables that make a supportable projection infeasible. Some of the problems in these variables include determining incremental corporate revenue due to the Center's development; estimating corporate profitability when, as a goal, businesses either distribute or minimize income in avoidance of taxes, thereby minimizing profits; and estimating corporate profits of tourist-related businesses, many of which have ownership out-of-state or out-of-country, necessitating consideration of many incalculable expenses, distribution policies, and foreign tax policies that would impact the Hawaii profits.

  Finally, corporate income taxes comprise a minor source of revenue for the State, generating less than 3% of total tax collections. Therefore, for purposes of this study, projections of State tax revenue have been limited to the above-stated sources.

- **Total new State tax revenues** attributable to the Center are thus projected to range from about $137.7 to $194.6 million by 2008, for Scenarios I and II, respectively, as shown in Exhibit 3-D.

## County Government Expenditures (Exhibits 4-A and 4-B)

County government expenditures per capita are estimated at $840 for residents, and about $710 for visitors, as shown in Exhibit 4-A. This assumption does not vary between the two scenarios. New expenditures by the County over the construction period are projected to be negligible, at about $50,000 to $92,000 per year through 1997. However, when completion of the Center brings significant levels of new in-migrant employees and visitors during its operations, County expenditures are projected to grow accordingly. In the horizon year 2008, such expenditures are estimated at about $6.9 to $7.6 million per year for Scenarios I and II, respectively, as enumerated in Exhibit 4-B.

## State Government Expenditures (Exhibits 4-C and 4-D)

A similar analysis shows that State government operating expenditures per capita are significantly greater than for the County at $4,590 per resident, and $1,750 per visitor per year, as shown in Exhibit 4-C. Like the County expenditure basis, this would not vary between the two scenarios. During development of the Center, State expenditures attributable to higher population levels are projected to be relatively low at about $275,000 to $505,000 per year. However, by 2008, additional State operating expenditures from the increase in population could range from $34.1 to $41.8 million, based on the two scenarios (as shown in Exhibit 4-D).

Other significant costs to the State attributable to the Center include the cost of operating the Center, operating expenses for the Convention Center Authority (CCA), and the cost of debt incurred to finance the purchase of the land and the development costs of the Center. These assumptions do not vary between the two scenarios and are also presented in Exhibit 4-D.

- **Net expenditures for the operation of the Center** are projected to be about $4 million in 1998, declining to about $2 million per year as operating capacity reaches stabilization.

- **Operating expenses for the Convention Center Authority** are estimated at about $500,000 per year by the CCA. The State has approved funding for the CCA through 1997, at which point the legislature must again approve funding for the continued operation of this office. For purposes of this study and in order to be conservative in terms of the project's net revenue contributions, it is assumed that the State will continue funding for the CCA or some other State entity, and that the entity will continue in its marketing and business development capacity for the Center.

- **By 1997, the State will have issued $350 million in general obligation bonds** to finance the land purchase and development of the Center. The annual debt service on these bonds begins at about $8 million in 1995, peaks in the year 2000 at about $41 million and declines as principal and interest are repaid, with the final payment occurring in 2017, according to the State Department of Budget and Finance.

In total, net additional State expenditures attributable to the center are projected to range from $67.4 to $75.1 million by 2008 for Scenarios I and II, respectively, as summarized in Exhibit 4-D.

### County Revenue and Expenditure Analysis (Exhibit 4-E)

The new fiscal impacts of the Center to the County are estimated by comparing the projected operating revenues and expenditures for the County. Financially, the County experiences negligible operating expenses through the construction period of Center. However, County expenditures grow once the Center becomes operational and its resident and visitor impacts increase.

The analysis indicates that additional County government revenues projected to be generated by the Center are below the additional operating expenses during the construction period, but catch up during its operations, principally as a result of the sharing of the State TAT. If State policy is changed to reduce the allocation of TAT to the County, as has been proposed by the legislature previously, this conclusion could be significantly impacted. The County revenue and expenditures are shown for each of the two scenarios in Exhibit 4-E.

### State Revenue and Expenditure Analysis (Exhibit 4-F)

The State could also benefit fiscally from the Center. During the construction period, the State's expenditures exceed revenues, largely because of the lack of revenue sources available to meet the debt service on financing for Center's development. However, visitor and other expenditures in the State are expected to increase greatly when the Center becomes operational, the net effects to the State reverse, as shown in Exhibit 4-F.

The County and State fiscal impacts are summarized in Table 7.

## OTHER IMPACTS

Throughout this report, impacts that could not be quantified are identified. Two other potential impacts of the Center's development that do not pertain specifically to the other sections of this report, are as follows:

- By creating a stronger demand for visitor rooms, some owners of condominium units in Waikiki could be encouraged to take their units out of the residential market and put them into visitor rental pools. This could cause displacement of some residents in Waikiki, and is further discussed in the Social Impact Study by Earthplan.
- The greater assured volume of paid traffic to the islands could encourage major airline carriers to provide more lift capacity to the State. This could be beneficial to residents traveling from Hawaii as well as visitors traveling to the State.

# Projected Range of Fiscal Impacts Attributable to the Hawai'i Convention Center

FOR THE CITY AND COUNTY OF HONOLULU AND STATE OF HAWAII, IN THOUSANDS OF 1994 DOLLARS

| | HCC construction period | | | HCC operational period | | |
|---|---|---|---|---|---|---|
| | 1995 (1) | 1996 | 1997 | 1998 | 2003 | 2008 |
| **City and County of Honolulu:** | | | | | | |
| Net additional revenues: | | | | | | |
| Low (Scenario I) | $(34) | $(62) | $(39) | $1,000 | $2,500 | $3,600 |
| High (Scenario II) | (34) | (62) | (39) | 1,100 | 3,900 | 5,400 |
| Revenue/expenditure ratio: | | | | | | |
| Low (Scenario I) | 0.3 | 0.3 | 0.3 | 1.4 | 1.4 | 1.5 |
| High (Scenario II) | 0.3 | 0.3 | 0.3 | 1.3 | 1.5 | 1.7 |
| **State of Hawaii:** | | | | | | |
| Net additional revenues: | | | | | | |
| Low (Scenario I) | $(4,600) | $(4,900) | $(12,700) | $(800) | $48,300 | $70,300 |
| High (Scenario II) | (4,600) | (4,900) | (12,700) | 17,400 | 89,300 | 119,500 |
| Revenue/expenditure ratio: | | | | | | |
| Low (Scenario I) | 0.5 | 0.6 | 0.3 | 1.0 | 1.7 | 2.0 |
| High (Scenario II) | 0.5 | 0.6 | 0.3 | 1.3 | 2.2 | 2.6 |

(1) Represents the period from October 1994 to December 1995. All other periods are calendar years.

Wilson Okamoto & Associates

# ECONOMIC AND FISCAL IMPACT ASSESSMENT FOR THE PROPOSED HAWAI'I CONVENTION CENTER

Table of Contents

Exhibit 1-A

# Scenario I: Lower Attendance and Spending at the Hawai'i Convention Center

DEVELOPMENT AND OPERATIONAL PARAMETERS - STATE OF HAWAII
(1994 Dollars, $000's, except "Assumptions" column unless noted)

| | Assumptions | | HCC Construction period | | | HCC Operating period | | |
|---|---|---|---|---|---|---|---|---|
| | | | 1995 (1) | 1996 | 1997 | 1998 | 2003 | 2008 |
| **Development assumptions - HCC:** | | | | | | | | |
| Development schedule: | Total building area (sf): | | | | | | | |
| Percent complete | 1,106,670 | | 25% | 72% | 100% | | | |
| Cost of construction: | Hawaii construction cost ($000's)(2): | | | | | | | |
| Annual expenditure | $168,120 | | $41,980 | $79,070 | $47,070 | 0 | 0 | 0 |
| Cumulative expenditure | | | 41,980 | 121,050 | 168,120 | | | |
| **Operational assumptions - HCC:** | | | | | | | | |
| Annual events (3) | | | | | | 30 | 52 | 60 |
| Average number of delegates per event (3) | | | | | | 5,400 | 6,200 | 6,200 |
| New visitors due to attendance at HCC: | | | | | | | | |
| Delegates/Exhibitors at HCC (3) | | | | | | 162,000 | 322,400 | 372,000 |
| Less existing Oahu meeting capacity (4) | 20,000 | annual visitors | | | | (20,000) | (20,000) | (20,000) |
| New delegate/exhibitors | | | | | | 142,000 | 302,400 | 352,000 |
| Attendees (others in party) (5) | 0.8 | per delegate/exhibitor | | | | 113,600 | 241,900 | 281,600 |
| New delegates/exhibitors/attendees in State | | | | | | 255,600 | 544,300 | 633,600 |
| Less displacement of visitors out-of-state (6) | 50,000 | annual visitors | | | | (50,000) | (50,000) | (50,000) |
| Total, net new visitors attributable to HCC | | | | | | 205,600 | 494,300 | 583,600 |
| Delegate/attendee expenditures (7) | 8.14 | days (length of stay) | | | | | | |
| Delegate/Exhibitor | $465 | per person/day | | | | $537,500 | $1,144,600 | $1,332,400 |
| Attendee | $182 | per person/day | | | | 168,100 | 357,900 | 416,600 |

(1) Represents the period from October 1994 to December 1995. All other periods are calendar years.
(2) As provided by Nordic/PCL; Construction Bid Estimate as proposed to the Hawaii Convention Center Authority. Total development cost for HCC, excluding land, is $200 million. The stated construction cost represents cost of labor, materials and in-state consulting and subcontracts only. Expenses such as bonding, taxes, profit, cash allowances were excluded, as were out-of-state consulting services. See accompanying text for further explanation.
(3) Estimate based on projections made by the Hawaii Convention Center Authority (HCCA).
(4) Based on HVB data on those who attend conventions and meetings on Oahu in 1994. In the projection period, such visitors are assumed to continue to come to Hawaii but to use the Hawaii Convention Center rather than previously existing facilities. Thus, their attendance at the HCC is not included in the net additional new visitors attributable to the development of the HCC.
(5) Those who accompany delegates or exhibitors, such as spouses. Hawaii Visitors Bureau, Visitor Expenditures Report, Conventions and Meetings, annual.
(6) Those displaced out-of-state due to excess demand on Oahu. May tend to be to be primarily Japanese visitors. Adjusted downward from Scenario II proportionately to the fewer projected delegate/exhibitors in this scenario.
(7) Based on (1) the per person per day average expenditures shown (derived from 1993 meetings and convention visitors expenditure data from HVB, adjusted to 1994 dollars); and (2) the average length of stay (in days) shown. Does not consider potential loss of expenditures due to displacement of visitors out-of-state (see Exhibit 2-E).



See Chapter 1 text for further explanation.

# Scenario I: Lower Attendance and Spending at the Hawai'i Convention Center

*Exhibit 1-B*

## AVERAGE DAILY VISITOR ROOM DEMAND PARAMETERS - STATE AND OAHU

| | Assumptions | HCC Construction period 1995 (1) | 1996 | 1997 | HCC Operating period 1998 | 2003 | 2008 |
|---|---|---|---|---|---|---|---|
| **State of Hawaii:** | | | | | | | |
| Average daily room nights - | 1.9 persons per room (3) | | | | | | |
| For net new delegates, exhibitors and attendees | 7.14 nights (length of stay) | | | | 2,630 | 5,600 | 6,520 |
| Less displacement of visitors out-of-state | 5.41 nights (LOS) (2) | | | | (390) | (390) | (390) |
| Net new room nights | | | | | 2,240 | 5,210 | 6,130 |
| **Oahu:** | | | | | | | |
| Potential average daily room nights - | 1.9 persons per room (3) | | | | | | |
| For delegates, exhibitors and attendees | 4.77 nights (length of stay) | | | | 1,760 | 3,740 | 4,360 |
| Less displacement of visitors out-of-state | 90% of State | | | | (350) | (350) | (350) |
| Potential additional demand on Oahu | | | | | 1,410 | 3,390 | 4,010 |
| Supply to meet potential additional demand - | | | | | | | |
| Existing Oahu supply | 3,100 units (4) | | | | 3,100 | 3,100 | 3,100 |
| Demand met by existing supply | | | | | 1,410 | 3,100 | 3,100 |
| Room demand unmet by existing Oahu supply (5) | | | | | 0 | 290 | 910 |
| Satisfaction of remaining unmet demand - | | | | | | | |
| Neighbor Islands | 60% of unmet Oahu room demand | | | | 0 | 170 | 550 |
| **New Oahu hotel unit construction (cumulative) (6)** | 40% of unmet Oahu room demand | | | | 0 | 120 | 360 |
| Total unmet room demand | | | | | 0 | 290 | 910 |
| **Summary of hotel room demand:** | | | | | | | |
| Oahu - | | | | | | | |
| Potential additional demand on Oahu | | | | | 1,410 | 3,390 | 4,010 |
| Less shift to Neighbor Islands | | | | | 0 | (170) | (550) |
| Net new room nights | | | | | 1,410 | 3,220 | 3,460 |
| Neighbor Islands - | | | | | | | |
| Delegate, exhibitor, and attendee excursions (7) | | | | | 830 | 1,820 | 2,120 |
| Plus shift of other visitors from Oahu | | | | | 0 | 170 | 550 |
| Net new room nights | | | | | 830 | 1,990 | 2,670 |
| State net new room nights | | | | | 2,240 | 5,210 | 6,130 |

(1) Represents the period from October 1994 to December 1995. All other periods are calendar years.
(2) Based on 1994 average length of stay for eastbound visitors to the State.
(3) Based on 0.8 attendees per delegate/exhibitor, plus an allowance for delegates who share rooms.
(4) Based on existing available hotel unit inventory on Oahu of 2,800 units (10% of 28,414 inventory in 1994) and the addition of the Hale Koa Hotel's second tower (weighted at 300 units); see Chapter 1 text.
(5) Difference of new demand for room nights on Oahu and demand met by existing supply.
(6) Assumes that new development on Oahu follows room demand "unmet by existing Oahu supply," as shown above, so long as the implied development pace appears reasonable in terms of required time periods for additional entitlement activities, if any (note currently zoned capacity on Oahu of about 7,000 hotel units, as shown in Appendix), and design, financing and construction periods; also, no new developments are projected to be completed prior to 1998.
(7) State net new room nights less Honolulu County net new room nights.



See Chapter 1 text for further explanation.

Exhibit 1-C

# Scenario I: Lower Attendance and Spending at the Hawai'i Convention Center

## AVERAGE DAILY VISITOR POPULATION PARAMETERS - STATE AND OAHU

| | Assumptions | HCC Construction period | | | HCC Operating period | | |
|---|---|---|---|---|---|---|---|
| | | 1995 (1) | 1996 | 1997 | 1998 | 2003 | 2008 |
| **State of Hawaii:** | | | | | | | |
| Average daily visitor population (2): | | | | | | | |
| Net new delegates/exhibitors/attendees (rounded) | 8.14 days (length of stay) | | | | 5,700 | 12,100 | 14,100 |
| Less visitors displaced out-of-state (rounded) | 6.41 days (LOS) (3) | | | | (880) | (880) | (880) |
| Net total impact on visitor population (rounded) | | | | | 4,800 | 11,200 | 13,200 |
| **Oahu:** | | | | | | | |
| Average daily visitor population (2): | | | | | | | |
| New delegates/exhibitors/attendees (rounded) | 71% of State (4) | | | | 4,000 | 8,600 | 10,000 |
| Less - | | | | | | | |
| Out-of-state (rounded) | 90% of State | | | | (790) | (790) | (790) |
| Shift to the Neighbor Islands (rounded) | 1.9 persons per room night plus 20% (5) | | | | 0 | (390) | (1,250) |
| Net total impact on visitor population (rounded) | | | | | 3,200 | 7,400 | 8,000 |

(1) Represents the period from October 1994 to December 1995. All other periods are calendar years.
(2) Net new visitors divided by 365 days, times average length of stay shown (in days).
(3) Based on 1994 average length of stay for eastbound visitors to the State.
(4) Percent based on an assumed 5.77 days spent on Oahu of a total of 8.14 days spent in the State.
(5) Additional 20% to account for additional partial day.



See Chapter 1 text for further explanation.

# Scenario I: Lower Attendance and Spending at the Hawai'i Convention Center

## PROJECTED DIRECT, INDIRECT AND INDUCED CONSTRUCTION EMPLOYMENT - STATE OF HAWAII AND COUNTY OF HONOLULU

(Full-time equivalent (FTE) person-years)

| | Assumptions | | HCC Construction period | | | HCC Operating period | | |
|---|---|---|---|---|---|---|---|---|
| | Budgeted cost labor (in $000's) (3) | Total FTE employees (4) | 1995 (1) | 1996 | 1997 | 1998 | 1999-2003 (2) | 2004-2008 (2) |
| **Oahu direct employment:** | | | | | | | | |
| **Construction of HCC:** | | | | | | | | |
| Consultants: | | | | | | | | |
| Architect | $1,500 | 22 | 5 | 9 | 6 | 0 | 0 | 0 |
| Engineers | $1,100 | 16 | 4 | 7 | 5 | 0 | 0 | 0 |
| Other consultants | $600 | 14 | 4 | 6 | 5 | 0 | 0 | 0 |
| Construction: | | | | | | | | |
| Direct labor (5) | $15,800 | 238 | 59 | 112 | 67 | 0 | 0 | 0 |
| Subtrades (6) | $44,600 | 672 | 168 | 316 | 188 | 0 | 0 | 0 |
| Subtotal, HCC construction employment (FTE) (rounded) | | | 240 | 450 | 270 | 0 | 0 | 0 |
| **Construction of new hotels:** | | | | | | | | |
| New unit construction - cumulative | See Exhibit 1-B | | 0 | 0 | 0 | 0 | 120 | 360 |
| New unit construction - in period | | | 0 | 0 | 0 | 0 | 120 | 240 |
| Subtotal, FTE employment (rounded) | 0.9 FTE jobs per unit (7) | | 0 | 0 | 0 | 0 | 110 | 220 |
| **Total, Oahu direct construction employment** | | | 240 | 450 | 270 | 0 | 110 | 220 |
| **Neighbor Island direct employment:** | | | | | | | | |
| New unit construction - cumulative | | | 0 | 0 | 0 | 0 | 0 | 0 |
| New unit construction - in period | | | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total, Neighbor Island direct construction employment** | 0.9 FTE jobs per unit (7) | | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total direct construction employment, State** | | | 240 | 450 | 270 | 0 | 110 | 220 |
| **Indirect and induced construction employment (rounded)** | 1.57 jobs per direct FTE job (9) | | 380 | 710 | 420 | 0 | 170 | 350 |
| **Total, direct, indirect and induced employment (rounded)** | 2.57 jobs per direct FTE job (9) | | 620 | 1,160 | 690 | 0 | 280 | 570 |
| **Total jobs over HCC construction and operating period (rounded)** | | | | | 2,470 | | | 850 |

(1) Represents the period from October 1994 to December 1995.
(2) Employment figures shown represent total person years over the five-year period.
(3) Cost of labor shown is estimated at 50% of consultant and construction contract value as budgeted by Nordic/PCL.
(4) Department of Labor and Industrial Relations, "Labor Area News", October 1994; Selected Wage Information for Hawaii, 1993. Number of employees calculated by dividing the total labor cost by the average salary with a 30% allowance for benefits. Average salaries for architects, engineers and other consultants, are $53,600, $51,500, and $32,200, respectively, before. See Exhibit 2-F, footnote #5 for more complete explanation.
(5) Department of Labor and Industrial Relations, "Labor Area News", October 1994. Average annual construction salary is $51,100, before factoring in benefits. Total direct construction labor cost is actual budgeted amount for labor as shown in Nordic/PCL's bid estimate.
(6) Ibid. Labor cost estimate based on portion of labor costs of total direct construction costs. Labor cost calculated at 37% of total bid amount budgeted to subtrades. Construction wages are $51,100.
(7) Based on interviews with construction companies and reported labor requirements of other Hawaii hotel developments.
(8) Assumes existing additional Neighbor Island capacity of 2,900 hotel rooms, as shown in Table 3, Chapter 1. Thus, new construction is projected to occur only where net new room demand (Exhibit 1-B) exceeds 2,900 units.
(9) Multiplier for total employment from new construction is 2.57 jobs per direct job as provided by "RIMS II Multipliers for Honolulu County, Hawaii", Bureau of Economic Analysis, U.S. Department of Commerce.



See Chapter 1 text for further explanation.

# Scenario I: Lower Attendance and Spending at the Hawai'i Convention Center

## PROJECTED DIRECT, INDIRECT AND INDUCED OPERATIONAL EMPLOYMENT - STATE OF HAWAII

(Full-time equivalent (FTE) person-years)

| Employment type | Assumptions | HCC Construction period 1995 (1) | 1996 | 1997 | HCC Operating period 1998 | 2003 | 2008 |
|---|---|---|---|---|---|---|---|
| | FTE employees at stabilization | | | | | | |
| **Direct operational employment at HCC (2):** | | | | | | | |
| Administrative and technical personnel | 80 | 4 | 6 | 10 | 40 | 70 | 80 |
| Food Service - full-time staff | 12 | 0 | 0 | 0 | 6 | 11 | 12 |
| Maintenance, security, conversion crews | 30 | 0 | 0 | 0 | 15 | 27 | 30 |
| Food services - on-call staff (3) | 230 | 0 | 0 | 0 | 120 | 210 | 230 |
| **Subtotal direct operational employment (rounded)** | | 4 | 6 | 10 | 180 | 320 | 350 |
| **Direct operational employment - Lodging** Net additional demand for average room nights (4) | | 0 | 0 | 0 | 2,240 | 5,210 | 6,130 |
| **Subtotal direct employment at lodging facilities (rounded)** | 0.65 FTE employees per room night (5) | 0 | 0 | 0 | 1,500 | 3,400 | 4,000 |
| **Total direct operational employment (rounded)** | | 4 | 6 | 10 | 1,700 | 3,700 | 4,400 |
| **Indirect and induced operational employment** | 0.79 jobs per direct FTE position (6) | 3 | 5 | 8 | 1,300 | 2,900 | 3,500 |
| **Total direct, indirect and induced operational employment (rounded)** | 1.79 jobs per direct FTE position (6) | 7 | 11 | 18 | 3,000 | 6,600 | 7,900 |

(1) Represents the period from October 1994 to December 1995. All other periods are calendar years.
(2) Staffing projections by Group 2+ International Inc., prepared for HCCA.
(3) Ibid. On-call food service staff varies with the number of on-going events is estimated at about of 200-250 FTE employees at stabilization. May be subcontracted.
(4) Net of adjustments for existing Oahu meeting capacity and visitors displaced out-of-state, as shown in Exhibit 1-B.
(5) Proprietary survey by KPMG Peat Marwick LLP, draft, May 1995; survey includes FTE employees per room for Hawaii hotels by facility level.
(6) Multiplier for hotels and lodging places as provided by "RIMS II Multipliers for Honolulu County, Hawaii", Bureau of Economic Analysis, U. S. Department of Commerce.



See Chapter 1 text for further explanation.

# Scenario I: Lower Attendance and Spending at the Hawai'i Convention Center

## PROJECTED DIRECT, INDIRECT AND INDUCED OPERATIONAL EMPLOYMENT - OAHU

| | Assumptions | HCC Construction period | | | HCC Operating period | | |
|---|---|---|---|---|---|---|---|
| | | 1995 (1) | 1996 | 1997 | 1998 | 2003 | 2008 |
| **Direct operational employment at HCC** | See Exhibit 2-B | 4 | 6 | 10 | 180 | 320 | 350 |
| **Direct operational employment on Oahu - Lodging:** | | | | | | | |
| Net new hotel room night demand (2) | See Exhibit 1-B | 0 | 0 | 0 | 1,410 | 3,220 | 3,460 |
| Employees | 0.65 per room night (3) | 0 | 0 | 0 | 900 | 2,100 | 2,200 |
| **Total direct operational employment (rounded)** | | 4 | 6 | 10 | 1,100 | 2,400 | 2,600 |
| **Indirect and induced operational employment** | 0.79 jobs per direct FTE position (4) | 3 | 5 | 8 | 900 | 1,900 | 2,100 |
| **Total direct, indirect and induced operational employment (rounded)** | 1.79 jobs per direct FTE position (4) | 7 | 11 | 18 | 2,000 | 4,300 | 4,700 |

(1) Represents the period from October 1994 to December 1995. All other periods are calendar years.
(2) Per day; after adjustment for existing Oahu meeting capacity, visitors displaced out-of-state, and visitors displaced to Neighbor Islands, as shown in Exhibit 1-B.
(3) Proprietary survey by KPMG Peat Marwick LLP, draft, May 1995; survey includes FTE employees per room for Hawaii hotels by facility level.
(4) Multiplier for hotels and lodging places as provided by "RIMS II Multipliers for Honolulu County, Hawaii", Bureau of Economic Analysis, U. S. Department of Commerce.



See Chapter 1 text for further explanation.

# Scenario I: Lower Attendance and Spending at the Hawai'i Convention Center

## PROJECTED ADDITIONAL RESIDENT POPULATION IN HONOLULU COUNTY AND THE STATE OF HAWAII ATTRIBUTABLE TO THE HCC (1)

| | Assumptions | HCC Construction period | | | HCC Operating period | | |
|---|---|---|---|---|---|---|---|
| | Direct in-migrants as a percentage of total employment and Dependents as a percentage of in-migrants (1) | 1995 (2) | 1996 | 1997 | 1998 | 2003 (3) | 2008 (3) |
| **In-migrants to Honolulu County:** | | | | | | | |
| Direct - | | | | | | | |
| Construction employment | 7.5% of total (4) | 18 | 34 | 20 | 0 | 8 | 17 |
| Construction dependents | 0.25 per employee | 5 | 8 | 5 | 0 | 2 | 4 |
| Operational employment | 15% of total (5) | 1 | 1 | 2 | 165 | 360 | 390 |
| Operational dependents | 1.0 per employee | 1 | 1 | 2 | 165 | 360 | 390 |
| Subtotal, direct in-migrants | | 24 | 44 | 28 | 330 | 730 | 801 |
| Indirect and induced - | | | | | | | |
| Construction employment | 1.57 of direct in-migrants | 28 | 53 | 32 | 0 | 13 | 26 |
| Construction dependents | 0.25 per employee | 7 | 13 | 8 | 0 | 3 | 6 |
| Operational employment | 0.79 of direct in-migrants | 0 | 1 | 1 | 130 | 284 | 308 |
| Operational dependents | 1.0 per employee | 0 | 1 | 1 | 130 | 284 | 308 |
| Subtotal, indirect and induced in-migrants | | 36 | 68 | 42 | 261 | 585 | 649 |
| **Total in-migrants to County (rounded)** | | 60 | 110 | 70 | 600 | 1,300 | 1,400 |
| **In-migrants to the State:** | | | | | | | |
| Direct - | | | | | | | |
| Construction employment | 7.5% of total (4) | 18 | 34 | 20 | 0 | 2 | 3 |
| Construction dependents | 0.25 per employee | 5 | 8 | 5 | 0 | 0 | 1 |
| Operational employment | 15% of total (5) | 1 | 1 | 2 | 255 | 555 | 660 |
| Operational dependents | 1.0 per employee | 1 | 1 | 2 | 255 | 555 | 660 |
| Subtotal, direct in-migrants | | 24 | 44 | 28 | 510 | 1,112 | 1,324 |
| Indirect and induced - | | | | | | | |
| Construction employment | 1.57 of direct in-migrants | 28 | 53 | 32 | 0 | 3 | 5 |
| Construction dependents | 0.25 per employee | 7 | 13 | 8 | 0 | 1 | 1 |
| Operational employment | 0.79 of direct in-migrants | 0 | 1 | 1 | 201 | 438 | 521 |
| Operational dependents | 1.0 per employee | 0 | 1 | 1 | 201 | 438 | 521 |
| Subtotal, indirect and induced in-migrants | | 36 | 68 | 42 | 403 | 880 | 1,049 |
| **Total in-migrant population impact, State (rounded)** | | 60 | 110 | 70 | 900 | 2,000 | 2,400 |

(1) See accompanying text in Chapter 1 for discussion of cumulative effects.
(2) Represents the period from October 1994 to December 1995. All other periods are calendar years.
(3) Hotel construction during the HCC operating period would be spread throughout 1999 to 2008. Therefore, the in-migrant impact in the single years of 2003 and 2008 is estimated based on 20% of the projected full-time equivalent employment in each of the preceding five years, as shown in Exhibit 2-A.
(4) Calculated based on Statewide and Oahu employment estimates shown in Exhibits 2-A and 2-B. In-migrant share as estimated by Nordic/PCL for construction of HCC; is considered maximum for hotel construction.
(5) May represent additional employment needs at the HCC and other impacted facilities.



See Chapter 1 text for further explanation.

# Scenario I: Lower Attendance and Spending at the Hawai'i Convention Center

**PROJECTED ANNUAL VISITOR EXPENDITURES - STATE OF HAWAII**
**(1994 Dollars, $000's, except for "Assumptions" column)**

| | Assumptions | HCC Construction period | | | HCC Operating period | | |
|---|---|---|---|---|---|---|---|
| | | 1995 | 1996 | 1997 | 1998 | 2003 | 2008 |
| **Direct new visitor expenditure:** | | | | | | | |
| Delegate/Exhibitor | 8.14 days (length of stay) | | | | | | |
| Attendee | $465 per person/day | -- | -- | -- | $537,500 | $1,144,600 | $1,332,400 |
| Subtotal | $182 per person/day | -- | -- | -- | 168,100 | 357,900 | 416,600 |
| | | | | | 705,600 | 1,502,500 | 1,749,000 |
| Less spending by visitors displaced out-of-state (1) | $314 per person/day | | | | (100,600) | (100,600) | (100,600) |
| Net direct total visitor spending | | | | | 605,000 | 1,401,900 | 1,648,400 |
| **Indirect and induced new spending (2)** | $0.77 per net direct dollar | -- | -- | -- | 465,900 | 1,079,500 | 1,269,300 |
| **Total direct, indirect and induced spending (rounded)** | $1.77 per net direct dollar | | | | $1,070,900 | $2,481,400 | $2,917,700 |

(1) Based on average daily 1993 expenditure for Japanese visitors, as reported by Hawaii Visitors Bureau, adjusted to 1994 dollars at 2.8%.
(2) Total direct, indirect and induced spending projected at $1.77 per one dollar of direct visitor expenditure based on 1991 ratios derived from the DBED Input-Output Model and Hawaii Econometric Model, as published in the "Hawaii State Data Book", 1992.


See Chapter 1 text for further explanation.

# Scenario I: Lower Attendance and Spending at the Hawai'i Convention Center

## PROJECTED DIRECT PERSONAL INCOME FROM DIRECT EMPLOYMENT AT HCC - STATE OF HAWAII
(1994 Dollars, $000's, except individual salary figures in "Assumptions" column)

| | Assumptions | HCC Construction period | | | HCC Operating period | | |
|---|---|---|---|---|---|---|---|
| | | 1995 (1) | 1996 | 1997 | 1998 | 2003 | 2008 |
| **Direct employment (FTE persons):** | | | | | | | |
| Design and construction - HCC: | | | | | | | |
| Architect | | 5 | 9 | 6 | 0 | 0 | 0 |
| Engineers | | 4 | 7 | 5 | 0 | 0 | 0 |
| Other consultants | | 4 | 6 | 5 | 0 | 0 | 0 |
| Construction (direct and subtrades) | | 227 | 428 | 254 | 0 | 0 | 0 |
| Construction - new lodging facilities on Oahu (2) | | 0 | 0 | 0 | 0 | 20 | 40 |
| Construction - new lodging facilities on Neighbor Islands (2) | | 0 | 0 | 0 | 0 | 0 | 0 |
| Operational employment - HCC (3) | | 4 | 6 | 10 | 180 | 320 | 350 |
| Operational employment - Lodging (4) | | 0 | 0 | 0 | 1,500 | 3,400 | 4,000 |
| **Total annual direct employment (rounded)** | | 240 | 460 | 280 | 1,700 | 3,700 | 4,400 |
| **Direct personal income:** | Annual salary (5): | | | | | | |
| Design and construction - HCC | | | | | | | |
| Architect | $53,500 | $300 | $500 | $300 | $0 | $0 | $0 |
| Engineers | 51,300 | 200 | 400 | 200 | 0 | 0 | 0 |
| Other consultants | 32,100 | 100 | 200 | 200 | 0 | 0 | 0 |
| Construction (direct and subtrades) | 51,100 | 11,600 | 21,900 | 13,000 | 0 | 0 | 0 |
| Construction - new lodging facilities (2): | | | | | | | |
| Oahu | 51,100 | 0 | 0 | 0 | 0 | 1,000 | 2,000 |
| Neighbor Islands | 51,100 | 0 | 0 | 0 | 0 | 0 | 0 |
| Operational employment - HCC | 26,900 | 100 | 200 | 300 | 4,800 | 8,600 | 9,400 |
| Operational employment - Lodging | 25,400 | 0 | 0 | 0 | 38,100 | 86,400 | 101,600 |
| **Total annual personal income (rounded)** | | $12,300 | $23,200 | $14,000 | $42,900 | $96,000 | $113,000 |

(1) Represents the period from October 1994 to December 1995. All other periods are calendar years.
(2) Based on figures shown in Exhibit 2-A, adjusted to reflect employment and earnings attributable to single year (2-A shows total FTE jobs over preceding five-year period).
(3) As shown in Exhibit 2-B.
(4) Based on new jobs as shown in Exhibit 2-B; net of adjustments for existing Oahu meeting capacity and visitors displaced out-of-state.
(5) Architectural, engineering and other consultant salaries are based on data from the Department of Labor and Industrial Relations (DLIR), "Selected Wage Information for Hawaii 1993"; and DLIR Research and Statistics Office. Average 1993 salaries inflated by estimated 1993-1994 Honolulu Consumer Price Index for all urban consumers, which increased 2.8%, as reported by Bank of Hawaii, Economics Department, February 17, 1995. General construction and operational employment salaries are based on average hourly and weekly wages by industry as shown in DLIR, "Labor Area News," October 1994. HCC direct operational employment assumed to consist principally of administrative/technical, maintenance and food and beverage service personnel, with a mix as shown previously in Exhibit 2-B. Figures and all calculations do not consider employee benefits and other nonsalary compensation.

See Chapter 1 text for further explanation.

# Scenario I: Lower Attendance and Spending at the Hawai'i Convention Center

PROJECTED NEW GOVERNMENT SERVICE TAX REVENUES COLLECTED BY HONOLULU COUNTY
(1994 Dollars, $000's, except annual revenue per capita figures)

**County tax collections per person:**

| Collection sources | Total collections FY'92 ($000's)(1) | Service population(2) | Annual revenue: Per resident | Annual revenue: Per visitor |
|---|---|---|---|---|
| Liquid fuel | $44,165 | 915,600 | $48 | 48 |
| Utility franchise | 14,616 | 915,600 | 16 | 16 |
| Motor vehicle weight | 22,554 | 915,600 | 25 | 25 |
| Other (nongrant) sources | 156,480 | 915,600 | 171 | 171 |
| Total 1992 dollars | $237,815 | | 260 | 260 |
| Annual per capita tax collection - 1994 dollars, rounded (3) | | | $280 | $280 |

| | HCC Construction period | | | HCC Operating period | | |
|---|---|---|---|---|---|---|
| | 1995 (4) | 1996 | 1997 | 1998 | 2003 | 2008 |
| **Increase in resident and visitor population due to HCC:** | | | | | | |
| Additional in-migrants to the County (5) | 60 | 110 | 70 | 600 | 1,300 | 1,400 |
| Average daily visitor population (6) | 0 | 0 | 0 | 3,200 | 7,400 | 8,000 |
| Total increase in daily population (rounded) | 60 | 110 | 70 | 3,800 | 8,700 | 9,400 |
| **Projected non-RPT revenue:** | | | | | | |
| Resident generated revenue | $17 | $31 | $20 | $200 | $400 | $400 |
| Visitor generated revenue | 0 | 0 | 0 | 900 | 2,100 | 2,200 |
| **Total new nonreal property taxes to the County, attributable to HCC** | $17 | $31 | $20 | $1,100 | $2,500 | $2,600 |

(1) County government operating revenues for fiscal year ended June 30, 1992 as reported in Tax Foundation of Hawaii, "Government in Hawaii," 1993.
(2) De facto population estimates for the County as of January 1, 1992 as reported by Federal-State Cooperative Program for Population Estimates.
(3) Adjusted to 1994 dollars based on CPI-U increases from 1992 to 1994 as reported by Bank of Hawaii Economics Department, February 17, 1995.
(4) Represents the period from October 1994 to December 1995. All other projection periods are calendar years.
(5) Including direct, indirect and induced impacts, as shown in Exhibit 2-D.
(6) Net of existing meeting capacity, visitors displaced out-of-state, and visitors choosing to stay on the Neighbor Islands, as shown in Exhibit 1-C.


See Chapter 1 text for further explanation.

# Scenario I: Lower Attendance and Spending at the Hawai'i Convention Center

PROJECTED TOTAL NEW TAX REVENUES TO HONOLULU COUNTY
(1994 Dollars, $000's, except in "Assumptions" column)

| | Assumptions | HCC Construction period | | | HCC Operating period | | |
|---|---|---|---|---|---|---|---|
| | | 1995 (1) | 1996 | 1997 | 1998 | 2003 | 2008 |
| **Real property tax revenue - HCC (2)** | | $0 | $0 | $0 | $0 | $0 | $0 |
| **Real property tax revenue - New hotel development:** | | | | | | | |
| Assumed new unit development on Oahu (3) | | 0 | 0 | 0 | 0 | 120 | 360 |
| Projected new hotel real property tax revenues (4) | $1,635 annual real property tax per hotel room | $0 | $0 | $0 | $0 | $200 | $600 |
| **New nonreal property County tax revenues (5)** | | 17 | 31 | 20 | 1,100 | 2,500 | 2,600 |
| **Redistribution of State-collected TAT** | See Exhibit 3-C | 0 | 0 | 0 | 2,700 | 6,200 | 7,300 |
| **Total new County revenue (rounded)** | | $17 | $31 | $20 | $3,800 | $8,900 | $10,500 |

(1) Represents the period from October 1994 to December 1995. All other periods are calendar years.
(2) HCC is exempt from paying real property taxes. Prior to acquisition of the 9.6-acre site by HCCA, property taxes collected were approximately $1.1 million, annually.
(3) Attributable to demand generated by the HCC; as shown in Exhibit 1-B.
(4) Based on average real property taxes per room collected from selected first-class Oahu hotels in 1994.
(5) As shown in Exhibit 3-A.



See Chapter 1 text for further explanation.

*Exhibit 3-C*

# Scenario I: Lower Attendance and Spending at the Hawai'i Convention Center

**PROJECTED REVENUES FROM TRANSIENT ACCOMODATIONS TAX (TAT)**
(1994 Dollars, $000's, except in "Assumptions" column)

| | Assumptions | HCC Construction period | | | HCC Operating period | | |
|---|---|---|---|---|---|---|---|
| | | 1995 | 1996 | 1997 | 1998 | 2003 | 2008 |
| **Calculation of total TAT revenues collected by State:** | | | | | | | |
| Occupied room nights, State of Hawaii (1) | | 0 | 0 | 0 | 817,600 | 1,901,650 | 2,237,450 |
| Revenue from hotel occupancy (2) | $155 Average daily rate | $0 | $0 | $0 | $126,700 | $294,800 | $346,800 |
| Total transient accomodations tax (rounded) | 6.0% | 0 | 0 | 0 | 7,600 | 17,700 | 20,800 |
| **Allocation of TAT revenues:** | | | | | | | |
| **State of Hawaii -** | | | | | | | |
| Convention Center special fund | 16.7% (1/6th of total) | 0 | 0 | 0 | 1,300 | 3,000 | 3,500 |
| Other State retention | 4.2% (5% of remainder) | 0 | 0 | 0 | 300 | 700 | 900 |
| Total to State (rounded) | 20.9% | 0 | 0 | 0 | 1,600 | 3,700 | 4,300 |
| **City and County of Honolulu (rounded)** | 34.9% (44.1% of net remaining) | 0 | 0 | 0 | 2,700 | 6,200 | 7,300 |
| **Neighbor Island Counties (rounded)** | 44.3% (55.9% of net remaining) | 0 | 0 | 0 | 3,400 | 7,800 | 9,200 |
| **Total TAT revenues (rounded)** | | $0 | $0 | $0 | $7,700 | $17,700 | $20,800 |

(1) Net of existing meeting capacity and visitors displaced out-of-state, based on numbers shown in Exhibit 1-B. Occupied room nights are annualized average daily room nights.
(2) Average daily room rate estimate based on survey of quoted convention room rates at area hotels, 1994 dollars. Displaced room nights assumed to be at same rate basis as new room nights, since they would refer to the same hotels, class of rooms and periods of the year.



See Chapter 1 text for further explanation.

Exhibit 3-D

# Scenario I: Lower Attendance and Spending at the Hawai'i Convention Center

**PROJECTED TOTAL NEW TAX REVENUES TO THE STATE GOVERNMENT**
**(1994 Dollars, $000's, except in "Assumptions" column unless noted)**

| | Assumptions | HCC Construction period | | | HCC Operating period | | |
|---|---|---|---|---|---|---|---|
| | | 1995 (1) | 1996 | 1997 | 1998 | 2003 | 2008 |
| **Spending on new hotel construction (2):** | | | | | | | |
| New unit construction since prior date | | 0 | 0 | 0 | 0 | 120 | 240 |
| Total construction costs in year | $190 per unit (3) | $0 | $0 | $0 | $0 | $5,000 | $9,000 |
| **General Excise Tax:** | | | | | | | |
| GET on construction (4) | 4.17% GET rate on HCC and hotel costs | 1,700 | 3,300 | 2,000 | 0 | 200 | 400 |
| GET wholesale tax on construction materials | 0.50% GET rate on $23,000 ($000's) materials cost - HCC plus 45% of hotels | 30 | 50 | 30 | 0 | 10 | 20 |
| Direct visitor spending | Exhibit 2-E | 0 | 0 | 0 | 605,000 | 1,401,900 | 1,648,400 |
| GET on direct visitor spending | 4.17% GET rate | 0 | 0 | 0 | 25,200 | 58,400 | 68,700 |
| GET on indirect and induced spending (5) | $0.77 per direct dollar | 1,300 | 2,500 | 1,500 | 19,400 | 45,100 | 53,200 |
| **Subtotal-G.E.T. attributable to HCC (rounded)** | | 3,000 | 5,900 | 3,500 | 44,600 | 103,700 | 122,300 |
| **Income and other individual taxes (6):** | | | | | | | |
| Direct personal income - | | | | | | | |
| Design/construction | Exhibit 2-F | 12,200 | 23,000 | 13,700 | 0 | 1,000 | 2,000 |
| Operations/lodging | Exhibit 2-F | 100 | 200 | 300 | 42,900 | 95,000 | 111,000 |
| Total annual personal income | | 12,300 | 23,200 | 14,000 | 42,900 | 96,000 | 113,000 |
| Income and other individual taxes - | | | | | | | |
| Design/construction | 11.7% of personal income(7) | 1,430 | 2,690 | 1,600 | 0 | 120 | 230 |
| Operations | 9.8% of personal income(7) | 10 | 20 | 30 | 4,200 | 9,310 | 10,880 |
| Total income and other individual taxes (rounded) | | 1,400 | 2,700 | 1,600 | 4,200 | 9,400 | 11,100 |
| **Transient accomodations tax** | 20.9% of total State collections (see Exhibit 3-C) | 0 | 0 | 0 | 1,600 | 3,700 | 4,300 |
| **Total new State tax revenue attributable to HCC (rounded)** | | $4,400 | $8,600 | $5,100 | $50,400 | $116,800 | $137,700 |

(1) Represents the period from October 1994 to December 1995. All other periods are calendar years.
(2) Estimated to be spread over 1999 to 2008 period; based on figures shown in Exhibit 2-A. Construction costs shown are based on average annual new construction in preceeding five year period (20%).
(3) Based on interviews with general contrators and other construction company representatives regarding labor requirements of other Hawaii hotel developments.
(4) Based on portion of HCC construction budget anticipated to be spent in Hawaii (as estimated in Nordic/PCL's construction budget), as shown in Exhibit 1-A; plus hotel construction budgets shown on line above.
(5) Projected at $0.77 per one dollar of direct GET on visitor spending and construction, based on 1991 ratios derived from the DBED Input-Output Model and Hawaii Econometric Model, as published in the "Hawaii State Data Book," 1992.
(6) For direct employment impacts only.
(7) Based on estimated direct personal income, as shown above, and effective total state tax burdens including income taxes, gas taxes, motor vehicle weight tax, gross excise taxes, and specific excise taxes. Effective rates are estimated based on the relative tax burdens, as presented in "The Tax Burden of the Amie Aloha Family," Tax Foundation of Hawaii, 1991, and 1994 income tax brackets for married persons filing jointly with average incomes of $51,000 (design/construction personnel) and $26,000 (operations personnel).



See Chapter 1 text for further explanation.

# Scenario I: Lower Attendance and Spending at the Hawai'i Convention Center

## COUNTY OF HONOLULU PER CAPITA GOVERNMENT EXPENDITURES

| Collection sources | Total expenditures FY'92 ($000's)(1) | Service population(2) | Annual expenditure Per resident | Per visitor |
|---|---|---|---|---|
| General government | $83,564 | 915,600 | $91 | $91 |
| Public safety | 170,563 | 915,600 | 186 | 186 |
| Highways | 26,480 | 915,600 | 29 | 29 |
| Health and sanitation | 89,396 | 915,600 | 98 | 98 |
| Recreation | 51,452 | 915,600 | 56 | 56 |
| Interest | 61,525 | 915,600 | 67 | 67 |
| Bond redemption | 32,927 | 915,600 | 36 | 36 |
| Retirement and pension | 33,951 | 858,400 | 40 | — |
| Mass transit | 71,717 | 915,600 | 78 | 78 |
| Cash capital improvements | 23,321 | 915,600 | 25 | 25 |
| Miscellaneous | 75,528 | 858,400 | 88 | — |
| Total 1992 dollars (rounded) | 720,400 | | 795 | 667 |
| Total 1994 dollars (rounded) (3) | $764,300 | | $840 | $710 |

(1) County government operating expenditures for fiscal year ended June 30, 1992, as reported in Tax Foundation of Hawaii, "Government in Hawaii," 1993.

(2) Resident and de facto population estimates for the County as of January 1, 1992, based on estimates reported by Federal-State Cooperative Program for Population Estimates.

(3) Adjusted to 1994 dollars based on an estimated increase of 3.2% and 2.8% from 1992 to 1993, and 1993 to 1994, respectively, as reported by Bank of Hawaii Economics Department, February 17, 1995.



See Chapter 1 text for further explanation.

Exhibit 4-B

# Scenario I: Lower Attendance and Spending at the Hawai'i Convention Center

PROJECTED ANNUAL HONOLULU COUNTY GOVERNMENT EXPENDITURES ATTRIBUTABLE TO HCC
(1994 Dollars, $000's, except "Assumptions" column)

| | Assumptions | HCC Construction period | | | HCC Operating period | | |
|---|---|---|---|---|---|---|---|
| | | 1995 (1) | 1996 | 1997 | 1998 | 2003 | 2008 |
| **Average daily population:** | | | | | | | |
| Visitor population (2) | | 0 | 0 | 0 | 3,200 | 7,400 | 8,000 |
| In-migrant residents to County (3) | | 60 | 110 | 70 | 600 | 1,300 | 1,400 |
| **New County expenditure ($000's):** | | | | | | | |
| Visitor population | $710 per FTE visitor (4) | $0 | $0 | $0 | $2,300 | $5,300 | $5,700 |
| In-migrant residents to County | $840 per resident (4) | 50 | 92 | 59 | 500 | 1,100 | 1,200 |
| **Total new County expenditures (rounded)** | | $50 | $92 | $59 | $2,800 | $6,400 | $6,900 |

(1) Represents the period from October 1994 to December 1995. All other periods are calendar years.
(2) Net of existing Oahu meeting capacity, visitors displaced out-of-state, and visitor demand shifting to the Neighbor Islands, as shown in Exhibit 1-C.
(3) Direct, indirect and induced populations, as shown in Exhibit 2-D.
(4) As shown in Exhibit 4-A.



See Chapter 1 text for further explanation.

# Scenario I: Lower Attendance and Spending at the Hawai'i Convention Center

## STATE OF HAWAII ADDITIONAL GOVERNMENT EXPENDITURES

| Function | Total expenditures FY'92 ($000's)(1) | Service population(2) | Annual expenditure Per resident | Per visitor |
|---|---|---|---|---|
| General government | $438,192 | 1,273,400 | $382 | $382 |
| Public safety | 158,512 | 1,273,400 | 124 | 124 |
| Highways | 114,516 | 1,273,400 | 90 | 90 |
| Natural resources | 40,363 | 1,273,400 | 32 | 32 |
| Health and sanitation | 171,209 | 1,273,400 | 134 | 134 |
| Hospitals and institutions | 271,018 | 1,148,000 | 236 | --- |
| Public welfare | 657,728 | 1,148,000 | 573 | --- |
| Education | 1,333,918 | 1,148,000 | 1,162 | --- |
| Recreation | 40,118 | 1,273,400 | 32 | 32 |
| Utilities and other enterprises | 265,340 | 1,273,400 | 208 | 208 |
| Debt service | 301,937 | 1,273,400 | 237 | 237 |
| Retirement and pension | 163,137 | 1,148,000 | 142 | --- |
| Employees' health insurance | 1,076 | 1,148,000 | 1 | --- |
| Unemployment compensation | 134,692 | 1,148,000 | 117 | --- |
| Grants-in-aid to counties | 825 | 1,273,400 | 1 | 1 |
| Urban redevelopment and housing | 416,931 | 1,148,000 | 363 | --- |
| Cash capital improvements | 528,513 | 1,273,400 | 415 | 415 |
| Miscellaneous | 94,915 | 1,148,000 | 83 | --- |
| Total 1992 dollars (rounded) | 5,132,900 | | 4,330 | 1,650 |
| **Total 1994 dollars (rounded)(3)** | $5,445,500 | | $4,590 | $1,750 |

(1) State government operating expenditures for fiscal year ended June 30, 1992 as reported in Tax Foundation of Hawaii, "Government in Hawaii," 1993.
(2) Resident and de facto population estimates for the State as of January 1, 1992, based on estimates reported by Federal-State Cooperative Program for Population Estimates.
(3) Adjusted to 1994 dollars based on CPI-U increase of 3.2% for 1992 to 1993 and 2.8% for 1993 to 1994, as reported by Bank of Hawaii Economics Department, February 17, 1995.

 See Chapter 1 text for further explanation.

# Scenario I: Lower Attendance and Spending at the Hawai'i Convention Center

STATE OF HAWAII NEW GOVERNMENT EXPENDITURES
(1994 Dollars, $000's, except "Assumptions" column)

| | Assumptions | HCC Construction period | | | HCC Operating period | | |
|---|---|---|---|---|---|---|---|
| | | 1995 (1) | 1996 | 1997 | 1998 | 2003 | 2008 |
| **State expenditures due to increase in daily population:** | | | | | | | |
| Average daily population: | | | | | | | |
| Visitor population (2) | | 0 | 0 | 0 | 4,800 | 11,200 | 13,200 |
| In-migrant residents to State (3) | | 60 | 110 | 70 | 900 | 2,000 | 2,400 |
| Total daily population | | 60 | 110 | 70 | 5,700 | 13,200 | 15,600 |
| New State expenditures ($000's)(rounded): | | | | | | | |
| Visitor population | $1,750 per FTE visitor (4) | $0 | $0 | $0 | $8,400 | $19,600 | $23,100 |
| In-migrant residents to State | $4,590 per resident (4) | 275 | 505 | 321 | 4,100 | 9,200 | 11,000 |
| New State expenditure due to increase in daily population (rounded) | | 275 | 505 | 321 | 12,500 | 28,800 | 34,100 |
| **State expenditures due to operation of HCC:** | | | | | | | |
| Projected new State expenditures due to loss from HCC operations, before interest and depreciation (5) | | 0 | 0 | 0 | 4,000 | 2,000 | 2,000 |
| Convention Center Authority operating expenses (6) | | 500 | 500 | 500 | 500 | 500 | 500 |
| Debt service, including principal repayment, on general obligation bonds used to fund HCC (7) | | 8,200 | 12,500 | 17,000 | 34,200 | 37,200 | 30,800 |
| Total State expendutres due to operation of HCC | | 8,700 | 13,000 | 17,500 | 38,700 | 39,700 | 33,300 |
| **Total new State expenditures attributable to HCC (rounded)** | | $9,000 | $13,500 | $17,800 | $51,200 | $68,500 | $67,400 |

(1) Represents the period from October 1994 to December 1995. All other periods are calendar years.
(2) Net of existing meeting capacity and visitors displaced out-of-State, as shown in Exhibit 1-C.
(3) Direct, indirect and induced populations, as shown in Exhibit 2-D.
(4) As shown in Exhibit 4-C.
(5) Estimate based on "1991 Industry Profile Survey" of convention center operations by International Association of Auditorium Managers Inc.
(6) As provided by Convention Center Authority (CCA). As per the CCA, funds for its operation have been approved through 1997, but continued operations must be budgeted and approved by the Legislature.
(7) As provided by State of Hawaii, Department of Budget and Finance, January 1995.



See Chapter 1 text for further explanation.

# Scenario I: Lower Attendance and Spending at the Hawai'i Convention Center

SUMMARY OF COUNTY GOVERNMENT REVENUES AND EXPENDITURES
(1994 Dollars, $000's)

| | HCC Construction period | | | HCC Operating period | | |
|---|---|---|---|---|---|---|
| | 1995 (1) | 1996 | 1997 | 1998 | 2003 | 2008 |
| New County revenues (2) | $17 | $31 | $20 | $3,800 | $8,900 | $10,500 |
| New County expenditures (3) | 50 | 92 | 59 | 2,800 | 6,400 | 6,900 |
| **Net increase (decrease) in revenues** | ($34) | ($62) | ($39) | $1,000 | $2,500 | $3,600 |
| **Revenue/expenditure ratio** | 0.3 | 0.3 | 0.3 | 1.4 | 1.4 | 1.5 |

(1) Represents the period from October 1994 to December 1995. All other periods are calendar years.
(2) As shown in Exhibit 3-B.
(3) As shown in Exhibit 4-B.


See Chapter 1 text for further explanation.

*Exhibit 4-F*

# Scenario I: Lower Attendance and Spending at the Hawai'i Convention Center

SUMMARY OF STATE GOVERNMENT REVENUES AND EXPENDITURES
(1994 Dollars, $000's)

| | HCC Construction period | | | HCC Operating period | | |
|---|---|---|---|---|---|---|
| | 1995 (1) | 1996 | 1997 | 1998 | 2003 | 2008 |
| New State revenues (2) | $4,400 | $8,600 | $5,100 | $50,400 | $116,800 | $137,700 |
| New State expenditures (3) | 9,000 | 13,500 | 17,800 | 51,200 | 68,500 | 67,400 |
| Net increase (decrease) in revenues | (4,600) | (4,900) | (12,700) | ($800) | $48,300 | $70,300 |
| Revenue/expenditure ratio | 0.5 | 0.6 | 0.3 | 1.0 | 1.7 | 2.0 |

(1) Represents the period from October 1994 to December 1995. All other periods are calendar years.
(2) As shown in Exhibit 3-D.
(3) As shown in Exhibit 4-D.



See Chapter 1 text for further explanation.

Wilson Okamoto & Associates

# ECONOMIC AND FISCAL IMPACT ASSESSMENT FOR THE PROPOSED HAWAI'I CONVENTION CENTER

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# Scenario II: Higher Attendance and Spending at the Hawai'i Convention Center

DEVELOPMENT AND OPERATIONAL PARAMETERS - STATE OF HAWAII
(1994 Dollars, $000's, except "Assumptions" column unless noted)

| | Assumptions | | HCC Construction period | | | HCC Operating period | |
|---|---|---|---|---|---|---|---|
| | | 1995 (1) | 1996 | 1997 | 1998 | 2003 | 2008 |
| **Development assumptions - HCC:** | | | | | | | |
| Development schedule: | Total building area (sf): | | | | | | |
| Percent complete | 1,106,670 | 25% | 72% | 100% | | | |
| Cost of construction: | Hawaii construction cost ($000's)(2): | | | | | | |
| Annual expenditure | $168,120 | $41,980 | $79,070 | $47,070 | 0 | 0 | 0 |
| Cumulative expenditure | | 41,980 | 121,050 | 168,120 | | | |
| **Operational assumptions - HCC:** | | | | | | | |
| Annual events (3) | | | | | 30 | 52 | 60 |
| Average number of delegates per event (3) | | | | | 6,500 | 7,500 | 7,500 |
| New visitors due to attendance at HCC: | | | | | | | |
| Delegates/Exhibitors at HCC (3) | | | | | 195,000 | 390,000 | 450,000 |
| Less existing Oahu meeting capacity (4) | 20,000 annual visitors | | | | (20,000) | (20,000) | (20,000) |
| New delegate/exhibitors | | | | | 175,000 | 370,000 | 430,000 |
| Attendees (others in party) (5) | 0.8 per delegate/exhibitor | | | | 140,000 | 296,000 | 344,000 |
| New delegates/exhibitors/attendees in State | | | | | 315,000 | 666,000 | 774,000 |
| Less displacement of visitors out-of-state (6) | 60,000 annual visitors | | | | (60,000) | (60,000) | (60,000) |
| Total, net new visitors attributable to HCC | | | | | 255,000 | 606,000 | 714,000 |
| Delegate/attendee expenditures (7) | 8.14 days (length of stay) | | | | | | |
| Delegate/Exhibitor | $555 per person/day | | | | $790,600 | $1,671,500 | $1,942,600 |
| Attendee | $182 per person/day | | | | 207,100 | 437,900 | 508,900 |

(1) Represents the period from October 1994 to December 1995. All other periods are calendar years.
(2) As provided by Nordic/PCL; Construction Bid Estimate as proposed to the Hawaii Convention Center Authority. Total development cost for HCC, excluding land, is $200 million. The stated construction cost represents cost of labor, materials and in-state consulting and subcontracts only. Expenses such as bonding, taxes, profit, cash allowances were excluded, as were out-of-state consulting services. See accompanying text for further explanation.
(3) Estimate based on projections made by the Hawaii Convention Center Authority (HCCA).
(4) Based on HVB data on those who attend conventions and meetings on Oahu in 1994. In the projection period, such visitors are assumed to continue to come to Hawaii but to use the Hawai'i Convention Center rather than previously existing facilities. Thus, their attendance at the HCC is not included in the net additional new visitors attributable to the development of the HCC.
(5) Those who accompany delegates or exhibitors, such as spouses. Hawaii Visitors Bureau, Visitor Expenditures Report, Conventions and Meetings, annual.
(6) Those displaced out-of-state due to excess demand on Oahu. May tend to be to be primarily Japanese visitors. Adjusted downward from Scenario II proportionately to the fewer projected delegate/exhibitors in this scenario.
(7) Based on (1) the per person per day average expenditures shown (derived from 1993 meetings and convention visitors expenditure data from HVB, adjusted to 1994 dollars); and (2) the average length of stay (in days) shown. Does not consider potential loss of expenditures due to displacement of visitors out-of-state (see Exhibit 2-E).



See Chapter 1 text for further explanation.

# Scenario II: Higher Attendance and Spending at the Hawai'i Convention Center

Exhibit 1-B

## AVERAGE DAILY VISITOR ROOM DEMAND PARAMETERS - STATE AND OAHU

| | Assumptions | HCC Construction period 1995 (1) | 1996 | 1997 | HCC Operating period 1998 | 2003 | 2008 |
|---|---|---|---|---|---|---|---|
| **State of Hawaii:** | | | | | | | |
| Average daily room nights - | 1.9 persons per room (3) | | | | | | |
| For net new delegates, exhibitors and attendees | 7.14 nights (length of stay) | | | | 3,240 | 6,860 | 7,970 |
| Less displacement of visitors out-of-state | 5.41 nights (LOS) (2) | | | | (470) | (470) | (470) |
| Net new room nights | | | | | 2,770 | 6,390 | 7,500 |
| **Oahu:** | | | | | | | |
| Potential average daily room nights - | 1.9 persons per room (3) | | | | | | |
| For delegates, exhibitors and attendees | 4.77 nights (length of stay) | | | | 2,170 | 4,580 | 5,320 |
| Less displacement of visitors out-of-state | 90% of State | | | | (420) | (420) | (420) |
| Potential additional demand on Oahu | | | | | 1,750 | 4,160 | 4,900 |
| Supply to meet potential additional demand - | | | | | | | |
| Existing Oahu supply | 3,100 units (4) | | | | 3,100 | 3,100 | 3,100 |
| Demand met by existing supply | | | | | 1,750 | 3,100 | 3,100 |
| Room demand unmet by existing Oahu supply (5) | | | | | 0 | 1,060 | 1,800 |
| Satisfaction of remaining unmet demand - | | | | | | | |
| Neighbor Islands | 60% of unmet Oahu room demand | | | | 0 | 640 | 1,080 |
| **New Oahu hotel unit construction (cumulative) (6)** | 40% of unmet Oahu room demand | | | | 0 | 420 | 720 |
| Total unmet room demand | | | | | 0 | 1,060 | 1,800 |
| **Summary of hotel room demand:** | | | | | | | |
| Oahu - | | | | | | | |
| Potential additional demand on Oahu | | | | | 1,750 | 4,160 | 4,900 |
| Less shift to Neighbor Islands | | | | | 0 | (640) | (1,080) |
| Net new room nights | | | | | 1,750 | 3,520 | 3,820 |
| Neighbor Islands - | | | | | | | |
| Delegate, exhibitor, and attendee excursions (7) | | | | | 1,020 | 2,230 | 2,600 |
| Plus shift of other visitors from Oahu | | | | | 0 | 640 | 1,080 |
| Net new room nights | | | | | 1,020 | 2,870 | 3,680 |
| State net new room nights | | | | | 2,770 | 6,390 | 7,500 |

(1) Represents the period from October 1994 to December 1995. All other periods are calendar years.
(2) Based on 1994 average length of stay for eastbound visitors to the State.
(3) Based on 0.8 attendees per delegate/exhibitor, plus an allowance for delegates who share rooms.
(4) Based on existing available hotel unit inventory on Oahu of 2,800 units (10% of 28,414 inventory in 1994) and the addition of the Hale Koa Hotel's second tower (weighted at 300 units); see Chapter 1 text.
(5) Difference of new demand for room nights on Oahu and demand met by existing supply.
(6) Assumes that new development on Oahu follows room demand "unmet by existing Oahu supply," as shown above, so long as the implied development pace appears reasonable in terms of required time periods for additional entitlement activities, if any (note currently zoned capacity on Oahu of about 7,000 hotel units, as shown in Appendix), and design, financing and construction periods; also, no new developments are projected to be completed prior to 1998.
(7) State net new room nights less Honolulu County net new room nights.



See Chapter 1 text for further explanation.

# Scenario II: Higher Attendance and Spending at the Hawai'i Convention Center

## AVERAGE DAILY VISITOR POPULATION PARAMETERS - STATE AND OAHU

| | Assumptions | HCC Construction period | | | HCC Operating period | | |
|---|---|---|---|---|---|---|---|
| | | 1995 (1) | 1996 | 1997 | 1998 | 2003 | 2008 |
| **State of Hawaii:** | | | | | | | |
| Average daily visitor population (2): | | | | | | | |
| Net new delegates/exhibitors/attendees (rounded) | 8.14 days (length of stay) | | | | 7,000 | 14,900 | 17,300 |
| Less visitors displaced out-of-state (rounded) | 6.41 days (LOS) (3) | | | | (1,050) | (1,050) | (1,050) |
| Net total impact on visitor population (rounded) | | | | | 6,000 | 13,900 | 16,300 |
| **Oahu:** | | | | | | | |
| Average daily visitor population (2): | | | | | | | |
| New delegates/exhibitors/attendees (rounded) | 71% of State (4) | | | | 5,000 | 10,600 | 12,300 |
| Less - | | | | | | | |
| Out-of-state (rounded) | 90% of State | | | | (950) | (950) | (950) |
| Shift to the Neighbor Islands (rounded) | 1.9 persons per room night plus 20% (5) | | | | 0 | (1,460) | (2,460) |
| Net total impact on visitor population (rounded) | | | | | 4,100 | 8,200 | 8,900 |

(1) Represents the period from October 1994 to December 1995. All other periods are calendar years.
(2) Net new visitors divided by 365 days, times average length of stay shown (in days).
(3) Based on 1994 average length of stay for eastbound visitors to the State.
(4) Percent based on an assumed 5.77 days spent on Oahu of a total of 8.14 days spent in the state.
(5) Additional 20% to account for additional partial day.

# Scenario II: Higher Attendance and Spending at the Hawai'i Convention Center

## PROJECTED DIRECT, INDIRECT AND INDUCED CONSTRUCTION EMPLOYMENT - STATE OF HAWAII AND COUNTY OF HONOLULU

(Full-time equivalent (FTE) person-years)

| | Assumptions: Budgeted cost labor (in $000's) (3) | Assumptions: Total FTE employees (4) | HCC Construction period: 1995 (1) | HCC Construction period: 1996 | HCC Construction period: 1997 | HCC Operating period: 1998 | HCC Operating period: 1999-2003 (2) | HCC Operating period: 2004-2008 (2) |
|---|---|---|---|---|---|---|---|---|
| **Oahu direct employment:** | | | | | | | | |
| **Construction of HCC:** | | | | | | | | |
| Consultants: | | | | | | | | |
| Architect | $1,500 | 22 | 5 | 9 | 6 | 0 | 0 | 0 |
| Engineers | $1,100 | 16 | 4 | 7 | 5 | 0 | 0 | 0 |
| Other consultants | $600 | 14 | 4 | 6 | 5 | 0 | 0 | 0 |
| Construction: | | | | | | | | |
| Direct labor (5) | $15,800 | 238 | 59 | 112 | 67 | 0 | 0 | 0 |
| Subtrades (6) | $44,600 | 672 | 168 | 316 | 188 | 0 | 0 | 0 |
| Subtotal, HCC construction employment (FTE) (rounded) | | | 240 | 450 | 270 | 0 | 0 | 0 |
| **Construction of new hotels:** | | | | | | | | |
| New unit construction - cumulative | See Exhibit 1-B | | 0 | 0 | 0 | 0 | 420 | 720 |
| New unit construction - in period | | | 0 | 0 | 0 | 0 | 420 | 300 |
| Subtotal, FTE employment (rounded) | 0.9 FTE jobs per unit (7) | | 0 | 0 | 0 | 0 | 380 | 270 |
| **Total, Oahu direct construction employment** | | | 240 | 450 | 270 | 0 | 380 | 270 |
| **Neighbor Island direct employment:** | | | | | | | | |
| New unit construction - cumulative | | | 0 | 0 | 0 | 0 | 0 | 780 |
| New unit construction - in period | 0.9 FTE jobs per unit (7) | | 0 | 0 | 0 | 0 | 0 | 780 |
| **Total, Neighbor Island direct construction employment** | | | 0 | 0 | 0 | 0 | 0 | 700 |
| **Total direct construction employment, State** | | | 240 | 450 | 270 | 0 | 380 | 970 |
| **Indirect and induced construction employment (rounded)** | 1.57 jobs per direct FTE job (9) | | 380 | 710 | 420 | 0 | 600 | 1,520 |
| **Total, direct, indirect and induced employment (rounded)** | 2.57 jobs per direct FTE job (9) | | 620 | 1,160 | 690 | 0 | 980 | 2,490 |
| **Total jobs over HCC construction and operating period (rounded)** | | | | | 2,470 | | | 3,470 |

(1) Represents the period from October 1994 to December 1995.
(2) Employment figures shown represent total person years over the five-year period.
(3) Cost of labor shown is estimated at 50% of consultant and construction contract value as budgeted by Nordic/PCL.
(4) Department of Labor and Industrial Relations, "Labor Area News", October 1994; Selected Wage Information for Hawaii, 1993. Number of employees calculated by dividing the total labor cost by the average salary with a 30% allowance for benefits. Average salaries for architects, engineers and other consultants, are $53,600, $51,500, and $32,200, respectively, before. See Exhibit 2-F, footnote #5 for more complete explanation.
(5) Department of Labor and Industrial Relations, "Labor Area News", October 1994. Average annual construction salary is $51,100, before factoring in benefits. Total direct construction labor cost is actual budgeted amount for labor as shown in Nordic/PCL's bid estimate.
(6) Ibid. Labor cost estimate based on portion of labor costs of total direct construction costs. Labor cost calculated at 37% of total bid amount budgeted to subtrades. Construction wages are $51,100.
(7) Based on interviews with construction companies and reported labor requirements of other Hawaii hotel developments.
(8) Assumes existing additional Neighbor Island capacity of 2,900 hotel rooms, as shown in Table 3, Chapter 1. Thus, new construction is projected to occur only where net new room demand (Exhibit 1-B) exceeds 2,900 units.
(9) Multiplier for total employment from new construction is 2.57 jobs per direct job as provided by "RIMS II Multipliers for Honolulu County, Hawaii", Bureau of Economic Analysis, U.S. Department of Commerce.



See Chapter 1 text for further explanation.

# Scenario II: Higher Attendance and Spending at the Hawai'i Convention Center

## PROJECTED DIRECT, INDIRECT AND INDUCED OPERATIONAL EMPLOYMENT - STATE OF HAWAII
(Full-time equivalent (FTE) person-years)

| Employment type | Assumptions | | HCC Construction period 1995 (1) | 1996 | 1997 | HCC Operating period 1998 | 2003 | 2008 |
|---|---|---|---|---|---|---|---|---|
| | FTE employees at stabilization | | | | | | | |
| **Direct operational employment at HCC (2):** | | | | | | | | |
| Administrative and technical personnel | 80 | | 4 | 6 | 10 | 40 | 70 | 80 |
| Food Service - full-time staff | 12 | | 0 | 0 | 0 | 6 | 11 | 12 |
| Maintenance, security, conversion crews | 30 | | 0 | 0 | 0 | 15 | 27 | 30 |
| Food services - on-call staff (3) | 230 | | 0 | 0 | 0 | 120 | 210 | 230 |
| **Subtotal direct operational employment (rounded)** | | | 4 | 6 | 10 | 180 | 320 | 350 |
| **Direct operational employment - Lodging** | | | | | | | | |
| Net additional demand for average room nights (4) | | | 0 | 0 | 0 | 2,770 | 6,390 | 7,500 |
| **Subtotal direct employment at lodging facilities (rounded)** | 0.65 | FTE employees per room night (5) | 0 | 0 | 0 | 1,800 | 4,200 | 4,900 |
| **Total direct operational employment (rounded)** | | | 4 | 6 | 10 | 2,000 | 4,500 | 5,300 |
| **Indirect and induced operational employment** | 0.79 | jobs per direct FTE position (6) | 3 | 5 | 8 | 1,600 | 3,600 | 4,200 |
| **Total direct, indirect and induced operational employment (rounded)** | 1.79 | jobs per direct FTE position (6) | 7 | 11 | 18 | 3,600 | 8,100 | 9,500 |

(1) Represents the period from October 1994 to December 1995. All other periods are calendar years.
(2) Staffing projections by Group 2+ International Inc., prepared for HCCA.
(3) Ibid. On-call food service staff varies with the number of on-going events is estimated at about of 200-250 FTE employees at stabilization. May be subcontracted.
(4) Net of adjustments for existing Oahu meeting capacity and visitors displaced out-of-state, as shown in Exhibit 1-B.
(5) Proprietary survey by KPMG Peat Marwick LLP, draft, May 1995; survey includes FTE employees per room for Hawaii hotels by facility level.
(6) Multiplier for hotels and lodging places as provided by "RIMS II Multipliers for Honolulu County, Hawaii", Bureau of Economic Analysis, U. S. Department of Commerce.


See Chapter 1 text for further explanation.

# Scenario II: Higher Attendance and Spending at the Hawai'i Convention Center

## PROJECTED DIRECT, INDIRECT AND INDUCED OPERATIONAL EMPLOYMENT - OAHU

| | | HCC Construction period | | | HCC Operating period | | |
|---|---|---|---|---|---|---|---|
| | Assumptions | 1995 (1) | 1996 | 1997 | 1998 | 2003 | 2008 |
| **Direct operational employment at HCC** | See Exhibit 2-B | 4 | 6 | 10 | 180 | 320 | 350 |
| **Direct operational employment on Oahu - Lodging:** | | | | | | | |
| Net new hotel room night demand (2) | See Exhibit 1-B | 0 | 0 | 0 | 1,750 | 3,520 | 3,820 |
| Employees | 0.65 per room night (3) | 0 | 0 | 0 | 1,100 | 2,300 | 2,500 |
| **Total direct operational employment (rounded)** | | 4 | 6 | 10 | 1,300 | 2,600 | 2,900 |
| **Indirect and Induced operational employment** | 0.79 jobs per direct FTE position (4) | 3 | 5 | 8 | 1,000 | 2,100 | 2,300 |
| **Total direct, Indirect and Induced operational employment (rounded)** | 1.79 jobs per direct FTE position (4) | 7 | 11 | 18 | 2,300 | 4,700 | 5,200 |

(1) Represents the period from October 1994 to December 1995. All other periods are calendar years.
(2) Per day; after adjustment for existing Oahu meeting capacity, visitors displaced out-of-state, and visitors displaced to Neighbor Islands, as shown in Exhibit 1-B.
(3) Proprietary survey by KPMG Peat Marwick LLP, draft, May 1995; survey includes FTE employees per room for Hawaii hotels by facility level.
(4) Multiplier for hotels and lodging places as provided by "RIMS II Multipliers for Honolulu County, Hawaii", Bureau of Economic Analysis, U. S. Department of Commerce.



See Chapter 1 text for further explanation.

# Scenario II: Higher Attendance and Spending at the Hawai'i Convention Center

## PROJECTED ADDITIONAL RESIDENT POPULATION IN HONOLULU COUNTY AND THE STATE OF HAWAII ATTRIBUTABLE TO THE HCC (1)

| | Assumptions | HCC Construction period | | | HCC Operating period | | |
|---|---|---|---|---|---|---|---|
| | Direct in-migrants as a percentage of total employment and Dependents as a percentage of in-migrants (1) | 1995 (2) | 1996 | 1997 | 1998 | 2003 (3) | 2008 (3) |
| **In-migrants to Honolulu County:** | | | | | | | |
| Direct - | | | | | | | |
| Construction employment | 7.5% of total (4) | 18 | 34 | 20 | 0 | 29 | 20 |
| Construction dependents | 0.25 per employee | 5 | 8 | 5 | 0 | 7 | 5 |
| Operational employment | 15% of total (5) | 1 | 1 | 2 | 195 | 390 | 435 |
| Operational dependents | 1.0 per employee | 1 | 1 | 2 | 195 | 390 | 435 |
| Subtotal, direct in-migrants | | 24 | 44 | 28 | 390 | 816 | 895 |
| Indirect and induced - | | | | | | | |
| Construction employment | 1.57 of direct in-migrants | 28 | 53 | 32 | 0 | 45 | 32 |
| Construction dependents | 0.25 per employee | 7 | 13 | 8 | 0 | 11 | 8 |
| Operational employment | 0.79 of direct in-migrants | 0 | 1 | 1 | 154 | 308 | 344 |
| Operational dependents | 1.0 per employee | 0 | 1 | 1 | 154 | 308 | 344 |
| Subtotal, indirect and induced in-migrants | | 36 | 68 | 42 | 308 | 672 | 727 |
| **Total in-migrants to County (rounded)** | | 60 | 110 | 70 | 700 | 1,500 | 1,600 |
| **In-migrants to the State:** | | | | | | | |
| Direct - | | | | | | | |
| Construction employment | 7.5% of total (4) | 18 | 34 | 20 | 0 | 6 | 15 |
| Construction dependents | 0.25 per employee | 5 | 8 | 5 | 0 | 1 | 4 |
| Operational employment | 15% of total (5) | 1 | 1 | 2 | 300 | 675 | 795 |
| Operational dependents | 1.0 per employee | 1 | 1 | 2 | 300 | 675 | 795 |
| Subtotal, direct in-migrants | | 24 | 44 | 28 | 600 | 1,357 | 1,608 |
| Indirect and induced - | | | | | | | |
| Construction employment | 1.57 of direct in-migrants | 28 | 53 | 32 | 0 | 9 | 23 |
| Construction dependents | 0.25 per employee | 7 | 13 | 8 | 0 | 2 | 6 |
| Operational employment | 0.79 of direct in-migrants | 0 | 1 | 1 | 237 | 533 | 628 |
| Operational dependents | 1.0 per employee | 0 | 1 | 1 | 237 | 533 | 628 |
| Subtotal, indirect and induced in-migrants | | 36 | 68 | 42 | 474 | 1,078 | 1,285 |
| **Total in-migrant population Impact, State (rounded)** | | 60 | 110 | 70 | 1,100 | 2,400 | 2,900 |

(1) See accompanying text in Chapter 1 for discussion of cumulative effects.
(2) Represents the period from October 1994 to December 1995. All other periods are calendar years.
(3) Hotel construction during the HCC operating period would be spread throughout 1999 to 2008. Therefore, the in-migrant impact in the single years of 2003 and 2008 is estimated based on 20% of the projected full-time equivalent employment in each of the preceding five years, as shown in Exhibit 2-A.
(4) Calculated based on Statewide and Oahu employment estimates shown in Exhibits 2-A and 2-B. In-migrant share as estimated by Nordic/PCL for construction of HCC; is considered maximum for hotel construction.
(5) May represent additional employment needs at the HCC and other impacted facilities.



See Chapter 1 text for further explanation.

# Scenario II: Higher Attendance and Spending at the Hawai'i Convention Center

PROJECTED ANNUAL VISITOR EXPENDITURES - STATE OF HAWAII
(1994 Dollars, $000's, except for "Assumptions" column)

| | Assumptions | HCC Construction period | | | HCC Operating period | | |
|---|---|---|---|---|---|---|---|
| | | 1995 | 1996 | 1997 | 1998 | 2003 | 2008 |
| **Direct new visitor expenditure:** | 8.14 days (length of stay) | | | | | | |
| Delegate/Exhibitor | $555 per person/day | -- | -- | -- | $790,600 | $1,671,500 | $1,942,600 |
| Attendee | $182 per person/day | -- | -- | -- | 207,100 | 437,900 | 508,900 |
| Subtotal | | | | | 997,700 | 2,109,400 | 2,451,500 |
| Less spending by visitors displaced out-of-state (1) | $314 per person/day | | | | (120,800) | (120,800) | (120,800) |
| Net direct total visitor spending | | | | | 876,900 | 1,988,600 | 2,330,700 |
| **Indirect and induced new spending (2)** | $0.77 per net direct dollar | -- | -- | -- | 675,200 | 1,531,200 | 1,794,600 |
| **Total direct, indirect and induced spending (rounded)** | $1.77 per net direct dollar | | | | $1,552,100 | $3,519,800 | $4,125,300 |

(1) Based on average daily 1993 expenditure for Japanese visitors, as reported by Hawaii Visitors Bureau, adjusted to 1994 dollars at 2.8%.
(2) Total direct, indirect and induced spending projected at $1.77 per one dollar of direct visitor expenditure based on 1991 ratios derived from the DBED Input-Output Model and Hawaii Econometric Model, as published in the "Hawaii State Data Book", 1992.



See Chapter 1 text for further explanation.

Exhibit 2-F

# Scenario II: Higher Attendance and Spending at the Hawai'i Convention Center

## PROJECTED DIRECT PERSONAL INCOME FROM DIRECT EMPLOYMENT AT HCC - STATE OF HAWAII
(1994 Dollars, $000's, except individual salary figures in "Assumptions" column)

| | Assumptions | HCC Construction period | | | HCC Operating period | | |
|---|---|---|---|---|---|---|---|
| | | 1995 (1) | 1996 | 1997 | 1998 | 2003 | 2008 |
| **Direct employment (FTE persons):** | | | | | | | |
| Design and construction - HCC: | | | | | | | |
| Architect | | 5 | 9 | 6 | 0 | 0 | 0 |
| Engineers | | 4 | 7 | 5 | 0 | 0 | 0 |
| Other consultants | | 4 | 6 | 5 | 0 | 0 | 0 |
| Construction (direct and subtrades) | | 227 | 428 | 254 | 0 | 0 | 0 |
| Construction - new lodging facilities on Oahu (2) | | 0 | 0 | 0 | 0 | 80 | 50 |
| Construction - new lodging facilities on Neighbor Islands (2) | | 0 | 0 | 0 | 0 | 0 | 140 |
| Operational employment - HCC (3) | | 4 | 6 | 10 | 180 | 320 | 350 |
| Operational employment - Lodging (4) | | 0 | 0 | 0 | 1,800 | 4,200 | 4,900 |
| **Total annual direct employment (rounded)** | | 240 | 460 | 280 | 2,000 | 4,600 | 5,400 |
| **Direct personal income:** | | | | | | | |
| Design and construction - HCC | Annual salary (5): | | | | | | |
| Architect | $53,500 | $300 | $500 | $300 | $0 | $0 | $0 |
| Engineers | 51,300 | 200 | 400 | 200 | 0 | 0 | 0 |
| Other consultants | 32,100 | 100 | 200 | 200 | 0 | 0 | 0 |
| Construction (direct and subtrades) | 51,100 | 11,600 | 21,900 | 13,000 | 0 | 0 | 0 |
| Construction - new lodging facilities (2): | | | | | | | |
| Oahu | 51,100 | 0 | 0 | 0 | 0 | 4,100 | 2,600 |
| Neighbor Islands | 51,100 | 0 | 0 | 0 | 0 | 0 | 7,200 |
| Operational employment - HCC | 26,900 | 100 | 200 | 300 | 4,800 | 8,600 | 9,400 |
| Operational employment - Lodging | 25,400 | 0 | 0 | 0 | 45,700 | 106,700 | 124,500 |
| **Total annual personal income (rounded)** | | $12,300 | $23,200 | $14,000 | $50,500 | $119,400 | $143,700 |

(1) Represents the period from October 1994 to December 1995. All other periods are calendar years.

(2) Based on figures shown in Exhibit 2-A, adjusted to reflect employment and earnings attributable to single year (2-A shows total FTE jobs over preceding five-year period).

(3) As shown in Exhibit 2-B.

(4) Based on new jobs as shown in Exhibit 2-B; net of adjustments for existing Oahu meeting capacity and visitors displaced out-of-state.

(5) Architectural, engineering and other consultant salaries are based on data from the Department of Labor and Industrial Relations (DLIR), "Selected Wage Information for Hawaii 1993"; and DLIR Research and Statistics Office. Average 1993 salaries inflated by estimated 1993-1994 Honolulu Consumer Price Index for all urban consumers, which increased 2.8%, as reported by Bank of Hawaii, Economics Department, February 17, 1995. General construction and operational employment salaries are based on average hourly and weekly wages by industry as shown in DLIR, "Labor Area News," October 1994. HCC direct operational employment assumed to consist principally of administrative/technical, maintenance and food and beverage service personnel, with a mix as shown previously in Exhibit 2-B. Figures and all calculations do not consider employee benefits and other nonsalary compensation.



See Chapter 1 text for further explanation.

# Scenario II: Higher Attendance and Spending at the Hawai'i Convention Center

PROJECTED NEW GOVERNMENT SERVICE TAX REVENUES COLLECTED BY HONOLULU COUNTY
(1994 Dollars, $000's, except annual revenue per capita figures)

**County tax collections per person:**

| Collection sources | Total collections FY'92 ($000's)(1) | Service population(2) | Annual revenue Per resident | Annual revenue Per visitor |
|---|---|---|---|---|
| Liquid fuel | $44,165 | 915,600 | $48 | 48 |
| Utility franchise | 14,616 | 915,600 | 16 | 16 |
| Motor vehicle weight | 22,554 | 915,600 | 25 | 25 |
| Other (nongrant) sources | 156,480 | 915,600 | 171 | 171 |
| Total 1992 dollars | $237,815 | | 260 | 260 |
| Annual per capita tax collection - 1994 dollars, rounded (3) | | | $280 | $280 |

| | HCC Construction period | | | HCC Operating period | | |
|---|---|---|---|---|---|---|
| | 1995 (4) | 1996 | 1997 | 1998 | 2003 | 2008 |
| **Increase in resident and visitor population due to HCC:** | | | | | | |
| Additional in-migrants to the County (5) | 60 | 110 | 70 | 700 | 1,500 | 1,600 |
| Average daily visitor population (6) | 0 | 0 | 0 | 4,100 | 8,200 | 8,900 |
| Total increase in daily population (rounded) | 60 | 110 | 70 | 4,800 | 9,700 | 10,500 |
| **Projected non-RPT revenue:** | | | | | | |
| Resident generated revenue | $17 | $31 | $20 | $200 | $400 | $400 |
| Visitor generated revenue | 0 | 0 | 0 | 1,100 | 2,300 | 2,500 |
| **Total new nonreal property taxes to the County, attributable to HCC** | $17 | $31 | $20 | $1,300 | $2,700 | $2,900 |

(1) County government operating revenues for fiscal year ended June 30, 1992 as reported in Tax Foundation of Hawaii, "Government in Hawaii," 1993.
(2) De facto population estimates for the County as of January 1, 1992 as reported by Federal-State Cooperative Program for Population Estimates.
(3) Adjusted to 1994 dollars based on CPI-U increases from 1992 to 1994 as reported by Bank of Hawaii Economics Department, February 17, 1995.
(4) Represents the period from October 1994 to December 1995. All other projection periods are calendar years.
(5) Including direct, indirect and induced impacts, as shown in Exhibit 2-D.
(6) Net of existing meeting capacity, visitors displaced out-of-state, and visitors choosing to stay on the Neighbor Islands, as shown in Exhibit 1-C.

 See Chapter 1 text for further explanation.

# Scenario II: Higher Attendance and Spending at the Hawai'i Convention Center

PROJECTED TOTAL NEW TAX REVENUES TO HONOLULU COUNTY
(1994 Dollars, $000's, except in "Assumptions" column)

| | Assumptions | HCC Construction period | | | HCC Operating period | | |
|---|---|---|---|---|---|---|---|
| | | 1995 (1) | 1996 | 1997 | 1998 | 2003 | 2008 |
| **Real property tax revenue - HCC (2)** | | $0 | $0 | $0 | $0 | $0 | $0 |
| **Real property tax revenue - New hotel development:** | | | | | | | |
| Assumed new unit development on Oahu (3) | | 0 | 0 | 0 | 0 | 420 | 720 |
| Projected new hotel real property tax revenues (4) | $1,635 annual real property tax per hotel room | $0 | $0 | $0 | $0 | $700 | $1,200 |
| **New nonreal property County tax revenues (5)** | | 17 | 31 | 20 | 1,300 | 2,700 | 2,900 |
| **Redistribution of State-collected TAT** | See Exhibit 3-C | 0 | 0 | 0 | 3,300 | 7,600 | 8,900 |
| **Total new County revenue (rounded)** | | $17 | $31 | $20 | $4,600 | $11,000 | $13,000 |

(1) Represents the period from October 1994 to December 1995. All other periods are calendar years.
(2) HCC is exempt from paying real property taxes. Prior to acquisition of the 9.6-acre site by HCCA, property taxes collected were approximately $1.1 million, annually.
(3) Attributable to demand generated by the HCC; as shown in Exhibit 1-B.
(4) Based on average real property taxes per room collected from selected first-class Oahu hotels in 1994.
(5) As shown in Exhibit 3-A.

Exhibit 3-C

# Scenario II: Higher Attendance and Spending at the Hawai'i Convention Center

## PROJECTED REVENUES FROM TRANSIENT ACCOMODATIONS TAX (TAT)
(1994 Dollars, $000's, except in "Assumptions" column)

| | Assumptions | HCC Construction period | | | HCC Operating period | | |
|---|---|---|---|---|---|---|---|
| | | 1995 | 1996 | 1997 | 1998 | 2003 | 2008 |
| **Calculation of total TAT revenues collected by State:** | | | | | | | |
| Occupied room nights, State of Hawaii (1) | | 0 | 0 | 0 | 1,011,050 | 2,332,350 | 2,737,500 |
| Revenue from hotel occupancy (2) | $155 Average daily rate | $0 | $0 | $0 | $156,700 | $361,500 | $424,300 |
| Total transient accomodations tax (rounded) | 6.0% | 0 | 0 | 0 | 9,400 | 21,700 | 25,500 |
| **Allocation of TAT revenues:** | | | | | | | |
| **State of Hawaii -** | | | | | | | |
| Convention Center special fund | 16.7% (1/6th of total) | 0 | 0 | 0 | 1,600 | 3,600 | 4,300 |
| Other State retention | 4.2% (5% of remainder) | 0 | 0 | 0 | 400 | 900 | 1,100 |
| Total to State (rounded) | 20.9% | 0 | 0 | 0 | 2,000 | 4,500 | 5,300 |
| **City and County of Honolulu (rounded)** | 34.9% (44.1% of net remaining) | 0 | 0 | 0 | 3,300 | 7,600 | 8,900 |
| **Neighbor Island Counties (rounded)** | 44.3% (55.9% of net remaining) | 0 | 0 | 0 | 4,200 | 9,600 | 11,300 |
| **Total TAT revenues (rounded)** | | $0 | $0 | $0 | $9,500 | $21,700 | $25,500 |

(1) Net of existing meeting capacity and visitors displaced out-of-state, based on numbers shown in Exhibit 1-B. Occupied room nights are annualized average daily room nights.
(2) Average daily room rate estimate based on survey of quoted convention room rates at area hotels, 1994 dollars. Displaced room nights assumed to be at same rate basis as new room nights, since they would refer to the same hotels, class of rooms and periods of the year.


See Chapter 1 text for further explanation.

# Scenario II: Higher Attendance and Spending at the Hawai'i Convention Center

PROJECTED TOTAL NEW TAX REVENUES TO THE STATE GOVERNMENT
(1994 Dollars, $000's, except in "Assumptions" column unless noted)

| | Assumptions | HCC Construction period | | | HCC Operating period | | |
|---|---|---|---|---|---|---|---|
| | | 1995 (1) | 1996 | 1997 | 1998 | 2003 | 2008 |
| **Spending on new hotel construction (2):** | | | | | | | |
| New unit construction since prior date | | 0 | 0 | 0 | 0 | 420 | 1,080 |
| Total construction costs in year | $190 per unit (3) | $0 | $0 | $0 | $0 | $16,000 | $41,000 |
| **General Excise Tax:** | | | | | | | |
| GET on construction (4) | 4.17% GET rate on HCC and hotel costs | 1,700 | 3,300 | 2,000 | 0 | 700 | 1,700 |
| GET wholesale tax on construction materials | 0.50% GET rate on $23,000 ($000's) materials cost - HCC plus 45% of hotels | 30 | 50 | 30 | 0 | 40 | 90 |
| Direct visitor spending | Exhibit 2-E | 0 | 0 | 0 | 876,900 | 1,988,600 | 2,330,700 |
| GET on direct visitor spending | 4.17% GET rate | 0 | 0 | 0 | 36,500 | 82,900 | 97,100 |
| GET on indirect and induced spending (5) | $0.77 per direct dollar | 1,300 | 2,500 | 1,500 | 28,100 | 64,400 | 76,100 |
| **Subtotal-G.E.T. attributable to HCC (rounded)** | | 3,000 | 5,900 | 3,500 | 64,600 | 148,000 | 175,000 |
| **Income and other individual taxes (6):** | | | | | | | |
| Direct personal income - | | | | | | | |
| Design/construction | Exhibit 2-F | 12,200 | 23,000 | 13,700 | 0 | 4,100 | 9,800 |
| Operations/lodging | Exhibit 2-F | 100 | 200 | 300 | 50,500 | 115,300 | 133,900 |
| Total annual personal income | | 12,300 | 23,200 | 14,000 | 50,500 | 119,400 | 143,700 |
| Income and other individual taxes - | | | | | | | |
| Design/construction | 11.7% of personal income(7) | 1,430 | 2,690 | 1,600 | 0 | 480 | 1,150 |
| Operations | 9.8% of personal income(7) | 10 | 20 | 30 | 4,950 | 11,300 | 13,120 |
| Total income and other individual taxes (rounded) | | 1,400 | 2,700 | 1,600 | 5,000 | 11,800 | 14,300 |
| **Transient accomodations tax** | 20.9% of total State collections (see Exhibit 3-C) | 0 | 0 | 0 | 2,000 | 4,500 | 5,300 |
| **Total new State tax revenue attributable to HCC (rounded)** | | $4,400 | $8,600 | $5,100 | $71,600 | $164,300 | $194,600 |

(1) Represents the period from October 1994 to December 1995. All other periods are calendar years.
(2) Estimated to be spread over 1999 to 2008 period; based on figures shown in Exhibit 2-A. Construction costs shown are based on average annual new construction in preceeding five year period (20%).
(3) Based on interviews with general contrators and other construction company representatives regarding labor requirements of other Hawaii hotel developments.
(4) Based on portion of HCC construction budget anticipated to be spent in Hawaii (as estimated in Nordic/PCL's construction budget), as shown in Exhibit 1-A; plus hotel construction budgets shown on line above.
(5) Projected at $0.77 per one dollar of direct GET on visitor spending and construction, based on 1991 ratios derived from the DBED Input-Output Model and Hawaii Econometric Model, as published in the "Hawaii State Data Book," 1992.
(6) For direct employment impacts only.
(7) Based on estimated direct personal income, as shown above, and effective total state tax burdens including income taxes, gas taxes, motor vehicle weight tax, gross excise taxes, and specific excise taxes. Effective rates are estimated based on the relative tax burdens, as presented in "The Tax Burden of the Amie Aloha Family," Tax Foundation of Hawaii, 1991, and 1994 income tax brackets for married persons filing jointly with average incomes of $51,000 (design/construction personnel) and $26,000 (operations personnel).

See Chapter 1 text for further explanation.

# Scenario II: Higher Attendance and Spending at the Hawai'i Convention Center

## COUNTY OF HONOLULU PER CAPITA GOVERNMENT EXPENDITURES

| Collection sources | Total expenditures FY'92 ($000's)(1) | Service population(2) | Annual expenditure Per resident | Annual expenditure Per visitor |
|---|---|---|---|---|
| General government | $83,564 | 915,600 | $91 | $91 |
| Public safety | 170,563 | 915,600 | 186 | 186 |
| Highways | 26,480 | 915,600 | 29 | 29 |
| Health and sanitation | 89,396 | 915,600 | 98 | 98 |
| Recreation | 51,452 | 915,600 | 56 | 56 |
| Interest | 61,525 | 915,600 | 67 | 67 |
| Bond redemption | 32,927 | 915,600 | 36 | 36 |
| Retirement and pension | 33,951 | 858,400 | 40 | --- |
| Mass transit | 71.717 | 915,600 | 78 | 78 |
| Cash capital improvements | 23,321 | 915,600 | 25 | 25 |
| Miscellaneous | 75,528 | 858,400 | 88 | --- |
| Total 1992 dollars (rounded) | 720,400 | | 795 | 667 |
| **Total 1994 dollars (rounded)(3)** | $764,300 | | $840 | $710 |

(1) County government operating expenditures for fiscal year ended June 30, 1992, as reported in Tax Foundation of Hawaii, "Government in Hawaii," 1993.

(2) Resident and de facto population estimates for the County as of January 1, 1992, based on estimates reported by Federal-State Cooperative Program for Population Estimates.

(3) Adjusted to 1994 dollars based on an estimated increase of 3.2% and 2.8% from 1992 to 1993, and 1993 to 1994, respectively, as reported by Bank of Hawaii Economics Department, February 17, 1995.


See Chapter 1 text for further explanation.

Exhibit 4-B

# Scenario II: Higher Attendance and Spending at the Hawai'i Convention Center

PROJECTED ANNUAL HONOLULU COUNTY GOVERNMENT EXPENDITURES ATTRIBUTABLE TO HCC
(1994 Dollars, $000's, except "Assumptions" column)

| | Assumptions | HCC Construction period | | | HCC Operating period | | |
|---|---|---|---|---|---|---|---|
| | | 1995 (1) | 1996 | 1997 | 1998 | 2003 | 2008 |
| **Average daily population:** | | | | | | | |
| Visitor population (2) | | 0 | 0 | 0 | 4,100 | 8,200 | 8,900 |
| In-migrant residents to County (3) | | 60 | 110 | 70 | 700 | 1,500 | 1,600 |
| **New County expenditure ($000's):** | | | | | | | |
| Visitor population | $710 per FTE visitor (4) | $0 | $0 | $0 | $2,900 | $5,800 | $6,300 |
| In-migrant residents to County | $840 per resident (4) | 50 | 92 | 59 | 600 | 1,300 | 1,300 |
| **Total new County expenditures (rounded)** | | $50 | $92 | $59 | $3,500 | $7,100 | $7,600 |

(1) Represents the period from October 1994 to December 1995. All other periods are calendar years.
(2) Net of existing Oahu meeting capacity, visitors displaced out-of-state, and visitor demand shifting to the Neighbor Islands, as shown in Exhibit 1-C.
(3) Direct, indirect and induced populations, as shown in Exhibit 2-D.
(4) As shown in Exhibit 4-A.



See Chapter 1 text for further explanation.

# Scenario II: Higher Attendance and Spending at the Hawai'i Convention Center

## STATE OF HAWAII ADDITIONAL GOVERNMENT EXPENDITURES

| Function | Total expenditures FY'92 ($000's)(1) | Service population(2) | Annual expenditure Per resident | Annual expenditure Per visitor |
|---|---|---|---|---|
| General government | $438,192 | 1,273,400 | $382 | $382 |
| Public safety | 158,512 | 1,273,400 | 124 | 124 |
| Highways | 114,516 | 1,273,400 | 90 | 90 |
| Natural resources | 40,363 | 1,273,400 | 32 | 32 |
| Health and sanitation | 171,209 | 1,273,400 | 134 | 134 |
| Hospitals and institutions | 271,018 | 1,148,000 | 236 | --- |
| Public welfare | 657,728 | 1,148,000 | 573 | --- |
| Education | 1,333,918 | 1,148,000 | 1,162 | --- |
| Recreation | 40,118 | 1,273,400 | 32 | 32 |
| Utilities and other enterprises | 265,340 | 1,273,400 | 208 | 208 |
| Debt service | 301,937 | 1,273,400 | 237 | 237 |
| Retirement and pension | 163,137 | 1,148,000 | 142 | --- |
| Employees' health insurance | 1,076 | 1,148,000 | 1 | --- |
| Unemployment compensation | 134,692 | 1,148,000 | 117 | --- |
| Grants-in-aid to counties | 825 | 1,273,400 | 1 | 1 |
| Urban redevelopment and housing | 416,931 | 1,148,000 | 363 | --- |
| Cash capital improvements | 528,513 | 1,273,400 | 415 | 415 |
| Miscellaneous | 94,915 | 1,148,000 | 83 | --- |
| Total 1992 dollars (rounded) | 5,132,900 | | 4,330 | 1,650 |
| Total 1994 dollars (rounded)(3) | $5,445,500 | | 4,590 | 1,750 |

(1) State government operating expenditures for fiscal year ended June 30, 1992 as reported in Tax Foundation of Hawaii, "Government in Hawaii," 1993.
(2) Resident and de facto population estimates for the State as of January 1, 1992, based on estimates reported by Federal-State Cooperative Program for Population Estimates.
(3) Adjusted to 1994 dollars based on CPI-U increase of 3.2% for 1992 to 1993 and 2.8% for 1993 to 1994, as reported by Bank of Hawaii Economics Department, February 17, 1995.


See Chapter 1 text for further explanation.

# Scenario II: Higher Attendance and Spending at the Hawai'i Convention Center

## STATE OF HAWAII NEW GOVERNMENT EXPENDITURES
(1994 Dollars, $000's, except "Assumptions" column)

| | Assumptions | HCC Construction period | | | HCC Operating period | | |
|---|---|---|---|---|---|---|---|
| | | 1995 (1) | 1996 | 1997 | 1998 | 2003 | 2008 |
| **State expenditures due to increase in daily population:** | | | | | | | |
| Average daily population: | | | | | | | |
| Visitor population (2) | | 0 | 0 | 0 | 6,000 | 13,900 | 16,300 |
| In-migrant residents to State (3) | | 60 | 110 | 70 | 1,100 | 2,400 | 2,900 |
| Total daily population | | 60 | 110 | 70 | 7,100 | 16,300 | 19,200 |
| New State expenditures ($000's)(rounded): | | | | | | | |
| Visitor population | $1,750 per FTE visitor (4) | $0 | $0 | $0 | $10,500 | $24,300 | $28,500 |
| In-migrant residents to State | $4,590 per resident (4) | 275 | 505 | 321 | 5,000 | 11,000 | 13,300 |
| New State expenditure due to increase in daily population (rounded) | | 275 | 505 | 321 | 15,500 | 35,300 | 41,800 |
| **State expenditures due to operation of HCC:** | | | | | | | |
| Projected new State expenditures due to loss from HCC operations, before interest and depreciation (5) | | 0 | 0 | 0 | 4,000 | 2,000 | 2,000 |
| Convention Center Authority operating expenses (6) | | 500 | 500 | 500 | 500 | 500 | 500 |
| Debt service, including principal repayment, on general obligation bonds used to fund HCC (7) | | 8,200 | 12,500 | 17,000 | 34,200 | 37,200 | 30,800 |
| Total State expendutres due to operation of HCC | | 8,700 | 13,000 | 17,500 | 38,700 | 39,700 | 33,300 |
| **Total new State expenditures attributable to HCC (rounded)** | | $9,000 | $13,500 | $17,800 | $54,200 | $75,000 | $75,100 |

(1) Represents the period from October 1994 to December 1995. All other periods are calendar years.
(2) Net of existing meeting capacity and visitors displaced out-of-State, as shown in Exhibit 1-C.
(3) Direct, indirect and induced populations, as shown in Exhibit 2-D.
(4) As shown in Exhibit 4-C.
(5) Estimate based on "1991 Industry Profile Survey" of convention center operations by International Association of Auditorium Managers Inc.
(6) As provided by Convention Center Authority (CCA). As per the CCA, funds for its operation have been approved through 1997, but continued operations must be budgeted and approved by the Legislature.
(7) As provided by State of Hawaii, Department of Budget and Finance, January 1995.


See Chapter 1 text for further explanation.

# Scenario II: Higher Attendance and Spending at the Hawai'i Convention Center

SUMMARY OF COUNTY GOVERNMENT REVENUES AND EXPENDITURES
(1994 Dollars, $000's)

| | HCC Construction period | | | HCC Operating period | | |
|---|---|---|---|---|---|---|
| | 1995 (1) | 1996 | 1997 | 1998 | 2003 | 2008 |
| New County revenues (2) | $17 | $31 | $20 | $4,600 | $11,000 | $13,000 |
| New County expenditures (3) | 50 | 92 | 59 | 3,500 | 7,100 | 7,600 |
| **Net increase (decrease) in revenues** | ($34) | ($62) | ($39) | $1,100 | $3,900 | $5,400 |
| **Revenue/expenditure ratio** | 0.3 | 0.3 | 0.3 | 1.3 | 1.5 | 1.7 |

(1) Represents the period from October 1994 to December 1995. All other periods are calendar years.
(2) As shown in Exhibit 3-B.
(3) As shown in Exhibit 4-B.


See Chapter 1 text for further explanation.

Exhibit 4-F

# Scenario II: Higher Attendance and Spending at the Hawai'i Convention Center

SUMMARY OF STATE GOVERNMENT REVENUES AND EXPENDITURES
(1994 Dollars, $000's)

| | HCC Construction period | | | HCC Operating period | | |
|---|---|---|---|---|---|---|
| | 1995 (1) | 1996 | 1997 | 1998 | 2003 | 2008 |
| New State revenues (2) | $4,400 | $8,600 | $5,100 | $71,600 | $164,300 | $194,600 |
| New State expenditures (3) | 9,000 | 13,500 | 17,800 | 54,200 | 75,000 | 75,100 |
| **Net Increase (decrease) in revenues** | ($4,600) | ($4,900) | ($12,700) | $17,400 | $89,300 | $119,500 |
| **Revenue/expenditure ratio** | 0.5 | 0.6 | 0.3 | 1.3 | 2.2 | 2.6 |

(1) Represents the period from October 1994 to December 1995. All other periods are calendar years.
(2) As shown in Exhibit 3-D.
(3) As shown in Exhibit 4-D.



See Chapter 1 text for further explanation.

Wilson Okamoto & Associates

# ECONOMIC AND FISCAL IMPACT ASSESSMENT FOR THE PROPOSED HAWAI'I CONVENTION CENTER

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APPENDIX A

# GROUP 2+ international Inc.

Owners Representation for Public Assembly Facilities

FAXED JUN 23 1995

**Date:** June 23, 1995

**To:** Ann Bouslog
KPMG Peat Marwick LLP
1001 Bishop St., #2100
Honolulu, HI 96813

**FAX 808-541-9320 / 2 Pages**
***HARD COPY enroute via mail***

**From:** Kanellos J. Astor

**Subject:** ***CCA's Projected Number of Events per Year and Estimated Number of Attendees***

Ann,

This memo is in response to your request regarding the development of CCA's estimates (finalized in June 1994) of the number of *convention* events and number of attendees anticipated to utilize the Hawaii Convention Center over the first ten years of operations.

Over the past several years there have been various studies conducted and projections of market potential made by various groups on behalf of the Hawaii Visitor Bureau (HVB) and Hawaii Convention Park Council (HCPC). The projections made in these reports regarding the market potential for events and attendees formed the basis of the current projections for number of events and attendees.

From 1991 through mid-1994, the CCA, working with the HVB and HCPC, began to refine the market potential using the previous research/studies/reports along with data from mainland convention centers to establish a range of number of events and attendees. Also taken into consideration was the predicated growth rates for attendees from studies by leading publications in the industry—*Trade Show Week, Association Management, Meetings & Conventions,* and *Successful Meetings*—ranging from 3.7 to 6.4 percent.

In mid-1994, the CCA and HVB met jointly to mutually agree to the final projections and establish the marketing objectives for the first ten years of operations. Subsequent to these projections, the CCA decided that a range of the average number of attendees would be more appropriate, and established that we would use 6,200 attendees on the low-end and 7,500 attendees for the high-end of the range. The following table represents the final estimate of event and attendee figures reached jointly by the CCA and HVB.

Convention/Conference Centers • Stadiums • Arenas
East 713 Pointes Drive West • Shelton, Washington 98584 • Ph. 360-426-1718, Fax 360-426-1749

MEMO to Ann Bouslog
June 23, 1995
Page two

| YEAR | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| EVENTS | 30 | 35 | 40 | 45 | 50 | 52 | 54 | 56 | 58 | 60 |
| ATTENDEES | | | | | | | | | | |
| *High* | 6,500 | 7,000 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 |
| *Low* | 5,400 | 5,800 | 6,200 | 6,200 | 6,200 | 6,200 | 6,200 | 6,200 | 6,200 | 6,200 |

The projection for the average number of attendees includes: 1) delegates and staff of the association(s); and 2) approximately 1,330 exhibitor personnel (an average of total exhibitors attending 75% of the events with exhibits). *Note: All attendees are from out-of-state.*

In conclusion, based on the information and data available, the CCA, HVB and I feel that the projections are within a reasonable range of expectation.

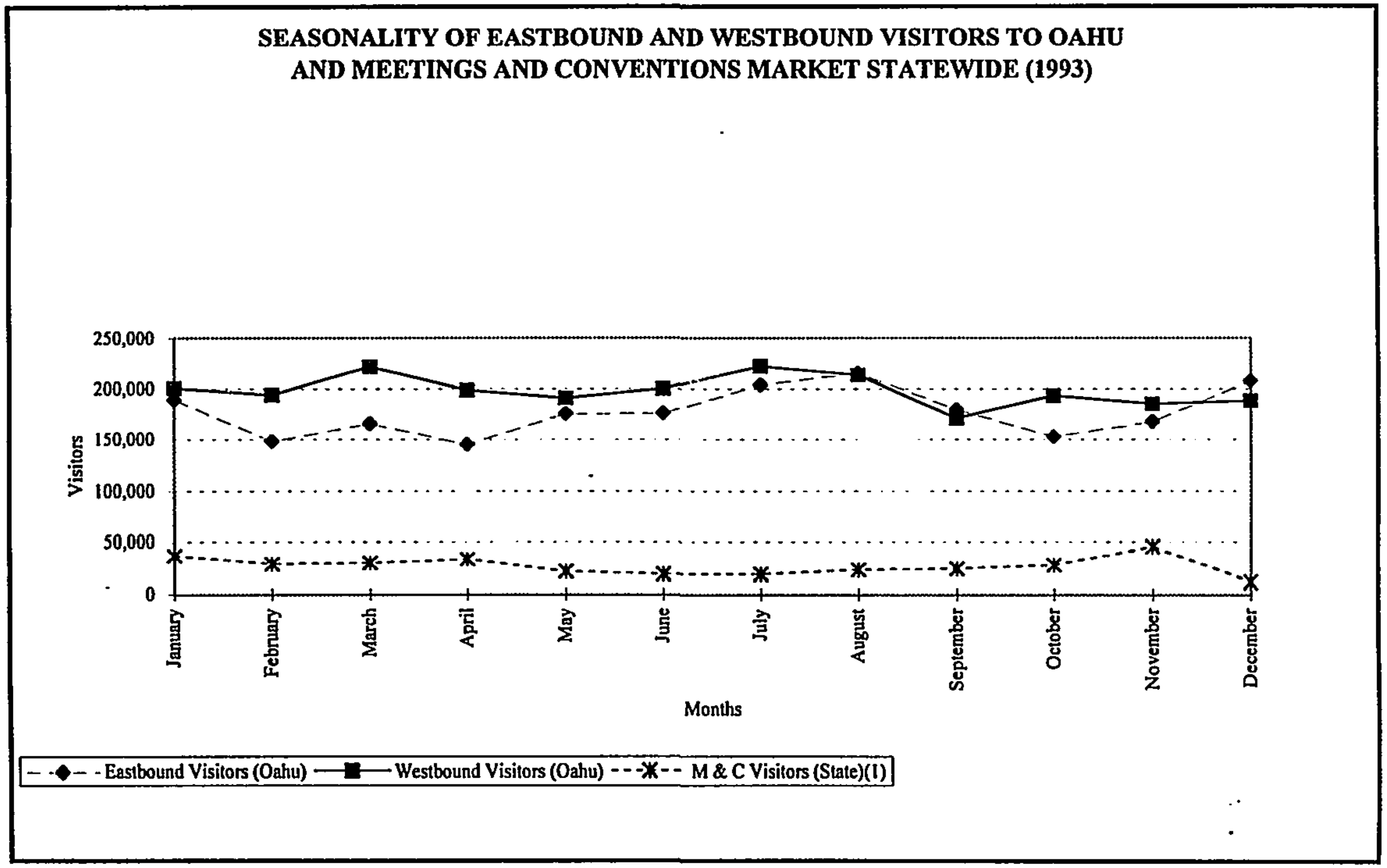
We hope this information will help you conclude your review.

Sincerely,

KJAstor

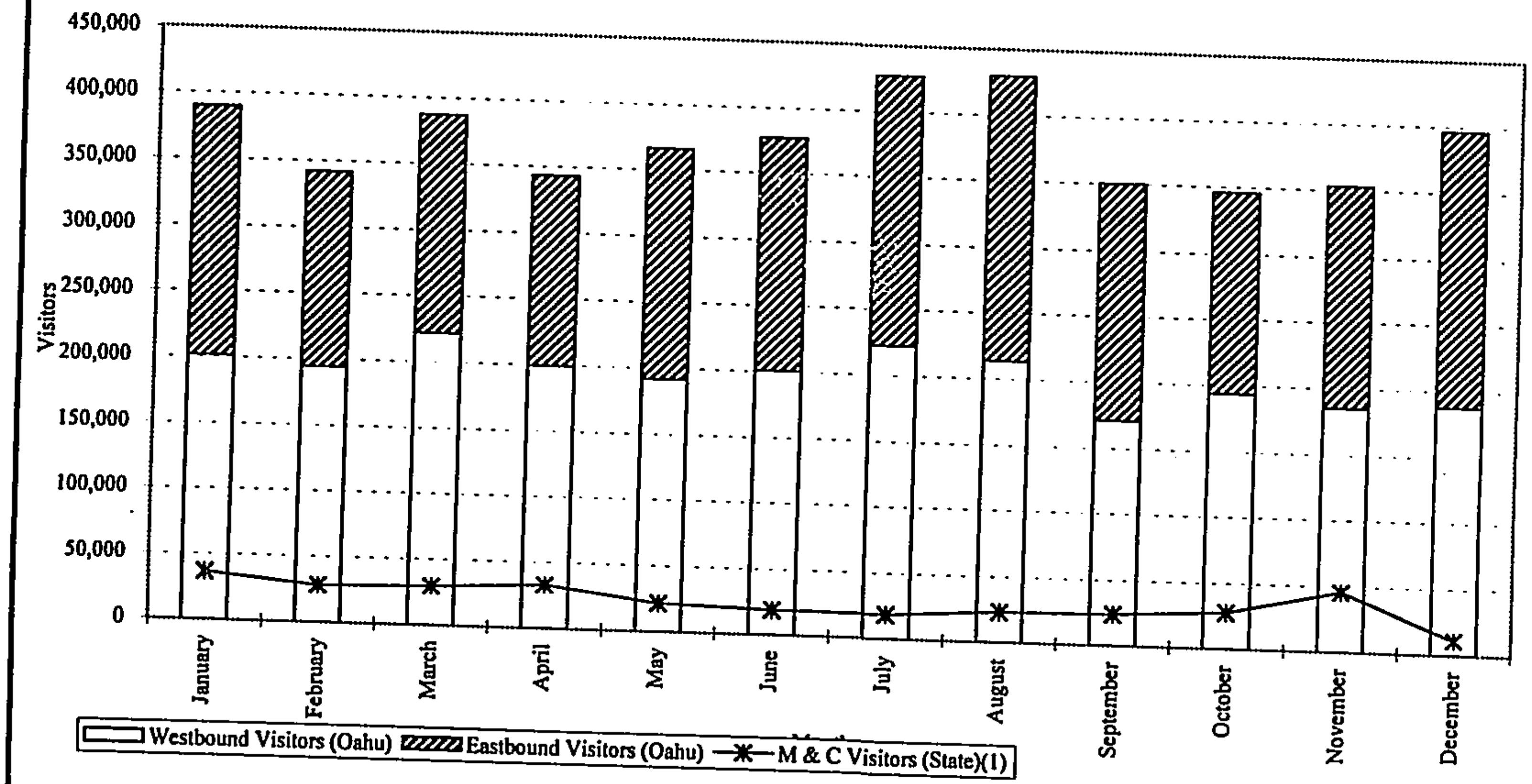
Kanellos J. Astor

KJA:lms
cc: Alan S. Hayashi
Janet Yoshida Brown




(1) Includes delegates and attendees. Data not available for Oahu alone.
Source: Hawaii Visitors Bureau.

## AGGREGATE VISITOR ARRIVALS BY MONTH - EASTBOUND AND WESTBOUND VISITORS TO OAHU AND MEETINGS AND CONVENTIONS MARKET STATEWIDE (1993)




(1) Includes delegates and attendees. Data not available for Oahu alone.
Source: Hawaii Visitors Bureau.

*APPENDIX I*

*TRANSPORTATION IMPACT ANALYSIS REPORT*

*Wilson Okamoto & Associates, Inc.*

*and*

*The Traffic Management Consultant*

# TRANSPORTATION IMPACT ANALYSIS REPORT

# HAWAI'I CONVENTION CENTER

Prepared by:

Wilson Okamoto & Associates, Inc.

and

The Traffic Management Consultant

July 1995

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# EXECUTIVE SUMMARY

## 1. INTRODUCTION

The State of Hawaii Convention Center Authority (State CCA) has selected the former Aloha Motors site as the location for the new Hawai'i Convention Center, which is located at the corner of Kapiolani Boulevard and Kalakaua Avenue adjacent to the ewa end of Waikiki.

This Transportation Impact Analysis Report (TIAR) provides analysis of the potential transportation-related impacts of the convention center and analyzes key issues concerning traffic, parking, trucks and deliveries, public transportation, and pedestrians in the project vicinity.

### A. PROJECT DESCRIPTION

The State of Hawaii Convention Center Authority (State CCA) intends that the primary users of the convention center will be national and international conventions, trade shows, exhibitions, and meetings. Such events are expected to produce from 2,000 to 14,000 in total attendance. Trade shows and exhibitions directed towards Oahu residents are expected to continue using the City and County of Honolulu's Blaisdell facilities, or facilities at the major Waikiki hotels.

The proposed "stand-alone" convention center project will consist of approximately 1,106,670 square feet (SF) of facility areas, of which the main areas include approximately 200,000 SF of exhibition hall, 100,000 SF of meeting rooms, a 35,000-SF ballroom, a lobby and adjacent entry drive area, an approximately 800-stall parking garage, a loading dock area, and various support and administrative facilities. Future expansion space includes an additional 100,000 square feet of exhibit halls and 50,000 square feet for meeting rooms. Structural requirements for supporting the expansion have been incorporated in the current design.

### B. STUDY PURPOSE AND SCOPE

This analysis of the transportation-related impacts of the convention center is prepared for input to the Environmental Impact Statement (EIS) for the project. The TIAR employs as a basis the *Hawaii Convention Center Transportation Impact Assessment* prepared by Wilbur Smith Associates dated May 16, 1994 (WSA/TIA). The WSA/TIA was prepared for input to the *Convention Center Environmental Assessment* (May 1994) prepared for the Convention Center Authority by Helber Hastert & Fee, Planners (May 1994). The WSA/TIA provided a preliminary assessment of the potential transportation-related effects of the convention center project and identified key issues concerning traffic, parking, public transportation, and pedestrians in the vicinity.

The analysis is based on the existing transportation system street patterns, roadway widths, and pedestrian facilities. The analysis year is 1998, the first full year of operations for the convention center. An analysis has been made of traffic conditions at nearby key intersections to include:

- Existing conditions;
- Future (1998) conditions without the convention center as a baseline from which to measure project impacts;
- Future (1998) conditions with the convention center.

The traffic impact analysis is conducted for five (5) different event scenarios which could be held at the convention center:

1. Analysis of the weekday morning and afternoon peak traffic hour based on a national or international convention, or combination of conventions, with 10,000 attendees. This size represents a reasonable "typical large recurring event" to use as a basis for identifying potential transportation impacts and mitigative actions.

2. Analysis of the weekday morning and afternoon peak traffic hour based on a national or international convention, or combination of conventions, with 14,000 attendees. This analysis is used to represent a "worst-case" event as a basis for identifying potential transportation impacts and mitigative measures.

3. Analysis of the mid-day (weekday) peak traffic hour for a 14,000-person convention. The period of traffic analysis occurs between 1:00 PM to 2:00 PM.

4. Analysis based on a 3,000-person function hosted by a national convention on a Friday evening following the afternoon commuter peak period. The period of traffic analysis occurs between 6:30 PM to 7:30 PM.

5. Analysis based on an all-local event with 1,800 attendees held on a Friday evening following the afternoon commuter peak period. The period of traffic analysis occurs between 6:30 PM to 7:30 PM.

### C. STUDY AREA

The overall study area encompasses the following intersections:

- Kapiolani Boulevard and Kalakaua Avenue
- Kapiolani Boulevard and Atkinson Drive
- Atkinson Drive and Kahakai Drive/Kona Street
- Ala Moana Boulevard and Atkinson Drive
- Kalakaua Avenue and Ala Wai Boulevard

The intersection analyses were performed using procedures outlined in the *Highway Capacity Manual, Special Report 209* (HCM), Transportation Research Board, 1985, as amended, which are based on a concept referred to as Level-of-Service. In general, this method describes traffic conditions in a letter basis from A to F, which signify excellent to unacceptable conditions. Level-of-Service (LOS) D is considered acceptable as a design basis for peak hour conditions. The volume-to-capacity (v/c) ratio is also provided to indicate the portions of the theoretical capacity of the intersections being used by the existing or estimated traffic volumes.

## 2. EXISTING CONDITIONS

### A. AM PEAK HOUR TRAFFIC

Kapiolani Boulevard operates at acceptable levels during the westbound contra-flow operations. The intersection of Kapiolani Boulevard and Kalakaua Avenue is the busiest intersection in the study area, with LOS D conditions currently existing during the morning peak hour. Traffic exiting Kahakai Drive onto Atkinson Drive experiences LOS E conditions under unsignalized conditions. Traffic operates at LOS A conditions at the STOP sign-controlled T-intersection of the Kahakai Drive loop at Kahakai Drive.

### B. PM PEAK HOUR TRAFFIC

Kapiolani Boulevard again operates well under the eastbound contra-flow operations with restricted turning movements. The intersection of Kapiolani Boulevard and Kalakaua Avenue operates at LOS C, with LOS D conditions at the Atkinson Drive and Ala Moana Boulevard intersection. Traffic exiting Kahakai Drive makaibound onto Atkinson Drive experiences LOS E under unsignalized conditions. Traffic operates at LOS A conditions at the STOP sign-controlled T-intersection of the Kahakai Drive loop at Kahakai Drive.

### C. MID-DAY (WEEKDAY) PEAK HOUR TRAFFIC

Traffic on Kapiolani Boulevard is evenly distributed in the eastbound and westbound directions during the mid-day (weekday) peak hour. Existing conditions at the Kapiolani Boulevard-Kalakaua Avenue and Kapiolani Boulevard-Atkinson Drive intersections are LOS D and LOS B, respectively. Eastbound traffic on Kapiolani Boulevard queues back across the Atkinson Drive intersection during brief periods. Traffic on Atkinson Drive is also evenly distributed in the maukabound and makaibound directions. Traffic exiting Kahakai Drive experiences LOS E under unsignalized conditions.

### D. FRIDAY EVENING POST-COMMUTER PEAK HOUR TRAFFIC

Traffic entering the intersection of Kapiolani Boulevard and Kalakaua Avenue totals almost 5,400 vph, or about 84 percent of the commuter peak hour volumes, and operates at LOS C conditions. During brief periods, eastbound traffic on Kapiolani Boulevard queues back across the Atkinson Drive intersection. Traffic exiting Kahakai Drive onto Atkinson Drive experiences LOS E under unsignalized conditions. The intersection of Ala Moana Boulevard and Atkinson Drive operates at LOS D.

## 3. 1998 TRAFFIC CONDITIONS WITHOUT THE CONVENTION CENTER

Future traffic volumes were estimated for 1998 without development of the convention center project. The year 1998 is used for this analysis since the convention center is anticipated to be completed and available for convention usage by early that year. The analysis of baseline conditions without the convention center project assumes that the former Aloha Motors site remains undeveloped (vacant) in 1998. No roadway modifications are included in the analysis of 1998 conditions without the project. An annual traffic growth rate of 1.5 percent per year has been assumed through 1998.

### A. AM PEAK HOUR

With the existing roadway facilities, the 1998 AM peak hour traffic without project results in an overall increase in congestion and travel delays. The intersection of Kapiolani Boulevard and Kalakaua Avenue operates at LOS E and at a v/c of 1.074; i.e., the projected traffic demands exceed the intersection's carrying capacity.

### B. PM PEAK HOUR

Similarly, the 1998 PM peak hour traffic without project also results in an overall increase in congestion and travel delays. The intersection of Kapiolani Boulevard and Kalakaua Avenue continues to operate at LOS C, although the v/c ratio increases to 0.952 with an increase in vehicle delay of 22.5 seconds.

### C. MID-DAY (WEEKDAY) PEAK HOUR

During the 1998 mid-day (weekday) peak hour without project, the intersection of Kapiolani Boulevard and Kalakaua Avenue operates at LOS D and at a v/c of 1.02; i.e., the projected traffic demands exceed the theoretical capacity by 2 percent.

**D. FRIDAY EVENING POST-COMMUTER PEAK HOUR**

The 1998 Friday evening post-commuter peak hour traffic without project results in an overall increase in congestion and travel delays. The intersection of Kapiolani Boulevard and Kalakaua Avenue operates at LOS D at a v/c ratio of 0.935. At the intersection of Ala Moana Boulevard and Atkinson Drive, the conditions remain at LOS D, with a vehicle delay of 34.6 seconds, although the v/c ratio increases to 0.816.

**4. ANALYSIS OF PROJECT IMPACTS ON 1998 TRAVEL CONDITIONS**

**A. PROJECT SITE ACCESS**

Site access for the proposed convention center is separated into four components. The main entrance to the convention center is located on the corner of Kapiolani Boulevard and Atkinson Drive. The main entrance accommodates vehicular drop-off/pick-up and general pedestrian access leading to the lobby. Access to the parking garage is provided by two ramps on Kahakai Street and a secondary reversible ramp on Kalakaua Avenue. Access to the loading dock is located on Kahakai Street via a driveway separate from the parking garage ramps. A major pedestrian access to the convention center is located along the Ala Wai Canal Promenade.

**B. PROPOSED ROADWAY IMPROVEMENTS WITH THE PROJECT**

A number of roadway improvements to the existing street system will be constructed as part of the convention center project. These improvements include:

1. Kapiolani Boulevard will be widened by 10 feet along the project frontage to provide an additional right-turn only lane in the eastbound direction. The existing eastbound curb lane will be converted to an optional through/right-turn lane.

2. Kalakaua Avenue will be widened by 12 feet along the project frontage from Kapiolani Boulevard to the Ala Wai Canal bridge to provide an additional 10-foot wide makaibound lane for use as a bus stop and a right-turn lane into the Center's Kalakaua Avenue parking ramp. Also, the maukabound lanes on Kalakaua Avenue at Kapiolani Boulevard will be restriped to provide double left-turn lanes, one through lane, and a shared through/right-turn lane. The widening of Kalakaua Avenue provides the opportunity to increase the present substandard left-turn traffic lane widths on maukabound Kalakaua Avenue to 10 feet.

3. The makaibound lanes on Kalakaua Avenue mauka of Kapiolani Boulevard will be widened from 10-foot to 11-foot wide lanes by reducing or eliminating the existing striped median on the Kalakaua Avenue approach.

4. Kahakai Drive will be widened on the project side to add two traffic lanes. With this widening, Kahakai Drive will be improved to provide two (2) 10-foot wide outbound lanes, a 10-foot wide landscaped median, and two (2) 10-foot wide inbound lanes. The outbound lanes provide separate left- and right-turn lanes onto Atkinson Drive.

5. Traffic signals will be installed at the intersection of Atkinson Drive and Kahakai Drive/Kona Street, which would also include signalizing the left-turn movement from maukabound Atkinson Drive to Kona Street. The traffic signal would provide a signal-controlled crossing point for pedestrians walking between the convention center and the Ala Moana Hotel and Ala Moana Center. The existing pedestrian crossing on Atkinson Drive at that intersection will be relocated to the mauka side of Kona Street.

6. An exclusive left-turn lane will be provided on makaibound Atkinson Drive at Kahakai Drive, extending back to Kapiolani Boulevard. Provision of this approximately 210-foot long lane will be accomplished within the existing roadway width by prohibiting on-street parking on the ewa side of Atkinson Drive between Kapiolani Boulevard and Kona Street, eliminating about five (5) existing parking spaces, and restriping the existing through lanes.

7. The portion of Atkinson Drive along the project frontage between Kahakai Drive and Kapiolani Boulevard will be widened by 10 feet to provide additional curbside shuttle bus loading/unloading space along Atkinson Drive if needed for the larger events.

## C. TRAFFIC IMPACT ANALYSIS OF 10,000-PERSON CONVENTION

Analysis of the weekday morning and afternoon peak traffic hour is based on a national or international convention, or combination of conventions, with 10,000 attendees. Conventions of this size are likely to occur on no more than 20 days per year, and thus this size represents a reasonable "typical large recurring event" to use as a basis for identifying potential transportation impacts and mitigative actions. The following are the resultant levels of travel for a 10,000-person convention, based on the factors and assumptions presented in Chapter 4.

- About 6,400 attendees would arrive during the morning peak hour, which would coincide with the commute peak hour.
- There would be a gradual exodus of attendees throughout the mid-day and afternoon period, with about 2,000 expected to exit during the afternoon peak commute hour.
- For a large national convention, 95 percent or more of the attendees would be visitors to Oahu, and 5 percent of less would be local residents.
- Approximately 45 percent of visitor attendees will be shuttled by charter bus to and from the convention center.
- During the morning peak hour, about 35 percent of the 6,080 visitors to Oahu would walk to the convention center.
- During a large convention, there would be about 150 permanent workers at the convention center, exclusive of exhibitors and the additional food service workers needed for any special large banquets.
- In the morning peak hour, an estimated 533 vehicle trips would enter and 217 vehicles would exit the convention center. In the afternoon peak hour, an estimated 84 vehicles would enter and 233 vehicles would exit the center.

**1998 AM and PM Peak Hour Traffic Impacts**

With existing roadways, traffic conditions at the Kalakaua Avenue/Kapiolani Boulevard intersection during a 10,000-person event would operate at level-of-service (LOS) E during the AM peak hour and LOS D during the PM peak hour. The intersection of Kapiolani Boulevard and Atkinson Drive is not significantly impacted by the convention center. Kahakai Drive at Atkinson Drive is expected to operate at LOS F conditions under unsignalized conditions. The intersection of Ala Moana Boulevard and Atkinson Drive is expected to operate at the desirable minimum of LOS D during the AM peak hour, with undesirable LOS conditions during the PM peak hour.

Traffic Impacts With Mitigating Actions

With the roadway improvements, the intersection of Kapiolani Boulevard/Kalakaua Avenue would continue to operate at LOS E during the AM peak hour, improving to LOS C during the PM peak hour for a 10,000-person convention. A contra-flow coning operation on Atkinson Drive is recommended to further mitigate potential queuing on makaibound Atkinson Drive at Kahakai Drive in the AM peak hour.

## D. ANALYSIS OF 14,000-PERSON CONVENTION

Analysis of the weekday morning and afternoon peak traffic hour is based on a national or international convention, or combination of conventions, with 14,000 attendees. The analysis is used to represent a "worst-case" traffic situation, that which may be reached once every three years. This analysis of a larger size event is conducted in response to comments received on the Environmental Assessment for the Convention center, including the City Department of Transportation Services. The following are the resultant levels of travel for a 14,000-person convention, based on the following factors and assumptions:

- About 8,960 attendees would arrive during the morning peak hour, which would coincide with the commute peak hour.
- There would be a gradual exodus of attendees throughout the mid-day and afternoon period, with about 2,800 expected to exit during the afternoon peak commute hour.
- For a large national convention, 95 percent or more of the attendees would be visitors to Oahu, and 5 percent or less would be local residents.
- Approximately 70 percent of visitor attendees will be shuttled by charter bus to and from the convention center. This is greater than the 45 percent assumed to travel by shuttle bus for the 10,000-person convention. The 70 percent is similar to the ratio achieved by mainland convention centers without on-site hotels. A maximum seating capacity of 49 passengers is assumed in comparison to the shuttle bus load of 45 persons used for the 10,000-person convention.
- During the morning peak hour, about 10 percent of the 8,512 visitors to Oahu would walk to the convention center. The walk trip assumptions for Oahu visitors have been conservatively reduced from the 10,000-person convention which assumed a 35 percent walk mode. The cumulative reduction in the walk trip percentage reflects reductions in walk trip assumptions for each of the walking distance zones from the convention center to Waikiki hotels.
- During a large convention, there would be about 150 permanent workers at the convention center, exclusive of exhibitors and the additional food service workers needed for any special large banquets.

- In the morning peak hour, an estimated 908 vehicle trips would enter and 343 vehicles would exit the convention center. In the afternoon peak hour, an estimated 170 vehicles would enter and 396 vehicles would exit the center.

**1998 AM and PM Peak Hour Traffic Impacts**

Under the 14,000-person convention, the Kalakaua Avenue/Kapiolani Boulevard intersection would operate at LOS F during the AM peak hour, and the increase in PM peak hour traffic demand would exceed the intersection's existing capacity. The intersection of Kapiolani Boulevard and Atkinson Drive would continue to operate at satisfactory LOS, while Kahakai Drive would again operate at LOS F during both the AM and PM peak hours. At the Ala Moana Boulevard/Atkinson Drive intersection, the increase in the shuttle bus volumes and visitor attendee traffic significantly impacts the right-turn movement from westbound Ala Moana Boulevard to maukabound Atkinson Drive.

<u>Traffic Impacts With Mitigating Actions</u>

During a 14,000-person convention, the proposed mitigation actions increase the overall intersection capacity to accommodate the AM and PM peak hour traffic at the Kapiolani Boulevard/Kalakaua Avenue intersection. The improvements are also expected to mitigate conditions at the intersection of Kapiolani Boulevard and Atkinson Drive. Under signalized conditions, Atkinson Drive and Kahakai Drive are expected to operate at LOS C and B, respectively.

With the large volume of vehicles turning right onto Atkinson Drive, which would be increased with the convention center, it would be desirable to add a right-turn lane along the mauka side of Ala Moana Boulevard. In recent discussions between the State CCA and the State Department of Transportation (DOT), the DOT has indicated that they will further evaluate the right-turn lane on westbound Ala Moana Boulevard at Atkinson Drive as part of its Ala Moana Boulevard improvement project.

## E. ANALYSIS OF MID-DAY (WEEKDAY) PEAK HOUR TRAFFIC

During the mid-day (weekday) peak traffic period, Kapiolani Boulevard carries about 75 percent of the peak hour traffic volume. The analysis of the mid-day (weekday) peak hour traffic was conducted in response to concerns expressed by the City Department of Transportation Services. Traffic impacts are a concern since the contra-flow coning operation and turn restrictions are not in effect during this period. With the absence of the contra-flow coning operations, traffic along Kapiolani Boulevard remains at an elevated traffic level (although considerably below the AM and PM peak traffic hours).
The traffic impacts are analyzed under the travel forecast assumptions presented in Chapter 4.

- The travel assumptions employed for PM peak traffic hour analysis for the 14,000-person convention are applied to this mid-day peak hour analysis. The analysis of the mid-day (weekday) peak hour occurs between 1:00 PM and 2:00 PM.

- Throughout the afternoon, conventioneers tend to "trickle-out", in contrast to the "rush" characterizing the morning arrival. Therefore, it is assumed that no more than 25 percent of the attendees would leave the convention center facility during any given off-peak hour. It is also assumed that 12.5 percent of the attendees would enter or re-enter the facility during the off-peak hour.

- Seventy (70) percent of Oahu visitor attendees leaving the convention center facility during the mid-day peak hour (1,862 persons) are assumed to leave by shuttle bus.

- During the mid-day (weekday) peak traffic hour, an estimated 271 vehicles would enter the convention center and 342 vehicles would exit the center.

**1998 Mid-day (Weekday) Peak Hour Traffic Impacts**

During the mid-day (weekday) peak hour, convention center traffic is expected to increase intersection traffic demand at the intersection of Kalakaua Avenue and Kapiolani Boulevard. The Kapiolani Boulevard/Atkinson Drive intersection is not significantly impacted. Kahakai Drive operates at LOS F.

Traffic Impacts With Mitigating Actions

With the mitigating actions, traffic operations at the Kapiolani Boulevard/Kalakaua Avenue intersection significantly improves to LOS C during the mid-day (weekday) peak hour. Also, traffic conditions on Kahakai Drive are expected to be significantly improved under the proposed traffic signalization.

## F. ANALYSIS OF FRIDAY EVENING POST-COMMUTER 3,000-PERSON EVENT

Analysis is based on a 3,000-person function hosted by a national convention on a Friday evening following the afternoon commuter peak period. The 3,000-person event is based on the estimated seating capacity of the 35,000 square-foot ballroom at the convention center where recurring evening food function events could be held. As perceived by the general public, traffic entering Waikiki is predominantly heavy during the early evening hours on Friday and Saturday. Friday evening was selected to represent a "worst-case" situation, when the residual afternoon commuter peak period traffic overlaps visitor and resident traffic entering Waikiki. The period of traffic analysis occurs between 6:30 PM to 7:30 PM. The following are the resultant levels of travel for the Friday evening post-commuter peak hour 3,000-person event, based on the factors and assumptions presented in Chapter 4.

- A higher percentage (40 percent) of Oahu resident attendees is assumed, since local attendees would likely be accompanied by a spouse or guest to an evening event. The analysis reflects that 90 percent would use automobiles, with an average of 2.3 attendees per vehicle which is a typical rate for a social event.

- The remaining 60 percent of attendees will be comprised of Oahu visitor attendees and spouses. Approximately 25 percent of Oahu visitors will use rental cars to travel to the event. Rental car usage would be more significant for an evening event as Oahu visitor conventioneers are more likely to bring their spouses along, and assuming those spouses have rented cars for vacation-type activities during the convention.

- Sixty (60) percent of Oahu visitor attendees would be shuttled by charter bus to the event.

- The high automobile usage is assumed to represent a "worst-case" traffic analysis for this type of event.

**1998 Friday Evening Post-Commuter Peak Hour Traffic Impacts for a 3,000-Person Event**

During a 3,000-person event on a Friday evening following the PM commuter period, the intersection of Kapiolani Boulevard and Kalakaua Avenue is expected to operate at capacity. The increase in traffic on Kapiolani Boulevard at Atkinson Drive would exceed the existing intersection capacity. The intersection of Atkinson Drive and Kahakai Drive is expected to operate at LOS F, with LOS E conditions at the Ala Moana Boulevard/Atkinson Drive intersection.

Traffic Impacts With Mitigating Actions

During the 3,000-person Friday evening post-commuter event, in addition to the roadway improvements, a westbound contra-flow coning operation on Kapiolani Boulevard may be needed to accommodate the expected increase in traffic on Kapiolani Boulevard. This would mitigate the capacity conditions at the Kapiolani Boulevard/Kalakaua Avenue intersection, and significantly improve the traffic operations at the Kapiolani Boulevard/Atkinson Drive intersection. Designation of the curb lane on westbound Ala Moana Boulevard to a right-turn only lane (assuming existing roadway lanes) would improve the Ala Moana/Atkinson Drive intersection to LOS D conditions.

## G. ANALYSIS OF ALL-LOCAL 1,800-PERSON EVENING EVENT

Analysis is based on an all-local event with 1,800 attendees held on a Friday evening following the afternoon commuter peak period. In general, the convention center will not be a primary venue to local events. Large indoor local events will continue to be staged at the Blaisdell Center or at the various hotel ballrooms in Waikiki and elsewhere. Nevertheless, the convention center could supplement the existing venues. The all-local event is assumed to occur on a Friday or Saturday evening in the 35,000 square-foot ballroom. The intent is to analyze the maximum size event at the convention center that could be accommodated by the number of on-site parking stalls. Larger events would require use of existing off-site parking and require that attendees be shuttled by buses to and from the convention center. The period of traffic analysis occurs between 6:30 PM to 7:30 PM. The following are the resultant levels of travel for an all-local 1,800-person event on a Friday evening following the post-commuter peak period, based on the factors and assumptions presented in Chapter 4.

- Ninety (90) percent of the attendees will arrive in private vehicles at an occupancy rate of 2.3 persons per vehicle.
- The remaining 10 percent of local residents will use a taxi to travel to the site.

**1998 1,800-Person All-Local Event Traffic Impact Analysis**

The intersection of Kapiolani Boulevard and Kalakaua Avenue is expected to operate at capacity during a 1,800-person all local event on a Friday evening following the PM commuter period. Kapiolani Boulevard would be impacted since the primary movement of traffic is makaibound from the H-1. The Atkinson Drive/Kahakai Drive intersection is expected to operate at LOS F.

Traffic Impacts With Mitigating Actions

For the 1,800-person all local Friday evening post-commuter event, with the roadway improvements and the proposed westbound contra-flow coning operation on Kapiolani Boulevard, the capacity conditions at the Kapiolani Boulevard/Kalakaua Avenue intersection would be eased, and the intersection of Kapiolani Boulevard and Atkinson Drive improves to satisfactory LOS.

## H. PARKING

**Adequacy of On-Site Parking**

The convention center will include 800 parking stalls on site, which appear sufficient to accommodate most national and international events at the center, assuming that market rates are charged for parking. There may be some such events, as well as local events, that may exceed the parking supply. Also, some employees and attendees may try to find free on-street parking to avoid the parking charges for the convention center garage.

**Effects Upon On-Street Parking**

On-street parking along most streets near the convention center is intensely used throughout the daytime and evening hours. Development of the convention center and its associated roadway improvements will require removal or use restriction of on-street parking near the project site. Temporary restrictions along some streets would be needed during certain large conventions during daytime hours or for special evening events. The on-street parking that would be affected includes:

**Atkinson Drive:** Parking on the ewa side of Atkinson Drive between Kapiolani Boulevard and Kona Street (about 5 stalls) will be eliminated to provide an exclusive left-turn lane on makaibound Atkinson Drive at Kahakai Drive.

Parking on the east side of Atkinson Drive between Kahakai Drive to Mahukona Street (9 stalls) would be restricted during the AM peak period to permit provision of a the proposed contra-flow operation to mitigate traffic impacts.

**Kapiolani Boulevard:** Parking on both sides of Kapiolani Boulevard between Atkinson Drive and Kaheka Street may be restricted (approximately 40 stalls) during the Friday evening post-commuter peak period for traffic flow. The existing daytime parking restriction would be extended through the proposed contra-flow operation period.

**Kahakai Drive:** Parking on the makai side of Kahakai Drive (5 stalls) would be restricted during large convention events to provide for two (2) inbound lanes.

Parking Alternatives

To accommodate those events which would require more parking than the approximately 800 on-site stalls, a parking management plan should be established. Several alternatives are offered that could become part of an overall transportation management plan which would increase the number of available stalls or provide alternatives to parking at the convention center.

a. Arrangements to use existing outlying parking facilities that may be available during the event. The attendees would be transported by shuttle buses to and from the convention center.

b. Provision of parking at host hotels for local event attendees, who would be transported by shuttle bus to/from the convention center with the Oahu visitor attendees.

c. Arrangements to relocate employee parking to nearby hotels, commercial offices, and possibly residential condominiums that may have available parking, thereby freeing up employee stalls for attendees.

d. Preferential on-site parking for employees and local attendees who car-pool to a convention center event, thereby freeing up more available parking stalls.

e. Passes for on-site parking could be issued to pre-registered conventioneers. All other convention attendees would be notified prior to the event that no on-site parking would be provided without a pass.

f. Provision of market rate fees (no free parking) for on-site parking to encourage attendees and employees to use public transit and ridesharing.

g. A program to issue temporary public bus passes to convention center employees could be implemented by the convention center operator to free up parking stalls for use for convention events.

h. The truck dock loading area could be used during special events for valet service tandem parking when truck activities are not occurring.

## I. TRUCKS AND DELIVERIES

About 50 large truckloads of freight may be needed for a large convention/exhibition. The truck activity for convention move-in and move-out should not have significant impact on area traffic conditions since this would occur primarily on days with no conventions at the site. Smaller delivery and service vehicles would travel to and from the convention center during both move-in/move-out days and during convention events, with volumes likely to approximate 5 to 10 vehicles per hour. This should not affect area traffic conditions.

## J. PUBLIC TRANSPORTATION

**TheBus Services**

During large conventions, transit capacity of TheBus routes through Waikiki would be significantly impacted by visitor attendees using public transit during the AM peak hour. Convention center employees and local resident attendees would not significantly impact the commuter transit routes during the weekday peak hours. Mid-size and large conventions should provide and encourage the use of special convention shuttle services by visitor attendees to minimize their use and impact of public transit during the commuter peak hours.

## K. PRIVATE SHUTTLE BUS SERVICE

A private charter shuttle bus system will be used to provide transportation between Waikiki hotels and the convention center for visitor attendees. Based on the forecast assumptions for a 14,000-person convention, approximately 122 bus trips would be generated during the AM peak hour to transport visitor attendees to the convention center. The six (6) off-street bus berths fronting the convention center lobby should be adequate to accommodate the shuttle bus operations and estimated number of bus trips during both the AM and PM peak hours under normal conditions.

## L. PEDESTRIAN ACCESS

A key concern is the adequacy and safety of pedestrian traffic across the makai sidewalk of the Kalakaua Avenue bridge. A pedestrian assessment shows that the center of the bridge crossing where there are no impediments is adequate to accommodate the anticipated convention center-related pedestrian flows. However at each end of the bridge where there are the utility poles, conditions would result in undesirable levels of service (LOS D and E). Relocation of the utility poles at each end of the Kalakaua bridge would improve pedestrian conditions. Also, the sidewalk on the southeast corner of the intersection of Atkinson Drive and Kahakai Drive is inadequate to accommodate the anticipated volume of pedestrians. To improve pedestrian conditions, the sidewalk area at this corner should be expanded to accommodate pedestrian queues.

### M. TRANSPORTATION MANAGEMENT PLAN

The convention center operator will designate a transportation coordinator who will be responsible for the transportation-related operations of the Center. The coordinator's primary function would be the development and implementation of a transportation management plan for events, and will also be responsible in overseeing transportation operations during the events. The transportation management plan would provide for operations such as traffic access controls, temporary on-street parking restrictions, signing and coning operations, truck deliveries, on-site and off-site parking, and shuttle bus operations.

### N. FUTURE CONVENTION CENTER EXPANSION

Future expansion plans for the convention center includes about 50,000 square feet of meeting rooms plus supporting facilities and 100,000 square feet of leasable exhibit space. The increase would better accommodate the infrequent larger conventions and provide more space to better serve the mid-size conventions. The requirement to accommodate 200 additional parking spaces was abandoned by the State CCA after it was determined that the cost would be economically prohibitive.

The time frame for future expansion of the convention center remains undetermined. Therefore, a quantitative analysis of the impacts on traffic resulting from the expansion would not be possible at this time. A supplemental EIS, including a traffic impact analysis, would need to be prepared when the decision is made to pursue such expansion.

## 5. RELATIONSHIP TO PROPOSED TRANSPORTATION PROJECTS

The three key transportation elements of the City's Waikiki Master Plan that can be affected by the convention center include: 1) conversion of the sections of Kalakaua Avenue and Ala Moana Boulevard to one-way operation; 2) development of parking facilities at the periphery of Waikiki; and 3) operation of a people mover system within Waikiki.

### A. ONE-WAY STREET COUPLET

The City is currently studying three circulation alternatives within this area:

i. Continue with the existing circulation patterns;
ii. Convert Ala Moana Boulevard, Kalakaua Avenue, and Atkinson Drive to a one-way counter-clockwise circulation system; and
iii. Convert Ala Moana Boulevard and Kalakaua Avenue to one-way operations to form a clockwise circulation system.

Both of the one-way systems include construction of a new circulator roadway across the former Aloha Motors site to permit the one-way traffic flow to circulate between Kalakaua Avenue and Atkinson Drive without having to use Kapiolani Boulevard. Given the design requirements for the proposed convention center and the site constraints, construction of the center precludes future construction of the circulator road within the project site. Development of the convention center could potentially restrict conversion of the streets to one-way operation depending on the adequacy of right-of-way within the existing streets.

### B. PERIPHERAL PARKING

The City's draft Waikiki People Mover and Peripheral Parking Study reviews various potential peripheral parking sites around Waikiki, and provides an assessment of the constraints, impacts, capacity, and accessibility of each. Four publicly-held sites were selected by the City Planning Department for evaluation of peripheral parking sites, including the Ala Moana Beach Park, Ala Wai Playfields, Ala Wai Golf Course, and Kapahulu Base Yard. The study indicates that sites beyond those covered in the study will need to be considered for peripheral parking facilities. Development of peripheral parking facilities near the convention center could provide some additional parking needed to accommodate large local events at the Center in the evenings, or for the large number of food service workers needed for large banquets.

## C. PEOPLE MOVER SYSTEM

The proposed people mover system would travel a route of approximately five miles, and would be targeted to serve tourists by providing a local circulator within Waikiki and connecting to major hotels and shopping centers. Key transit stops would include the convention center, the convention center/Hard Rock Cafe, Ala Moana Center, the Waikiki Trade Center, the Honolulu Zoo, the International Market Place, and the Hilton Hawaiian Village. The recommended operation plan would be to accommodate the early morning and evening transportation requirements of the convention center attendees. The projected capacity of the system is 480 passengers per hour. The people-mover system could increase the transit capacity in Waikiki and augment transit access between Waikiki and the convention center, depending upon the routing and scheduling of the service.

## D. RAPID TRANSIT GUIDEWAY AND STATION

Although the development work on the rapid transit project has largely ceased due to the lack of a dedicated local funding source, it is possible that continuing increases in traffic congestion may result in the eventual future development of a transit guideway through this area. The most recent rapid transit development project plans included an elevated transit guideway extending along Kona Street, crossing Atkinson Drive, continuing along the Atkinson and Kapiolani edges within the project site, and then crossing Kalakaua Avenue and continuing in a new median section along Kapiolani Boulevard. Earlier transit plans included alignments extending straight through the project site. A transit station would have been included within the segment crossing the project site.

The design plan for the convention center would affect the physical feasibility of future construction of a rapid transit guideway through the project area, the location of a transit station within the area, and the visual appearance and costs of the guideway. Construction of the guideway along the periphery of the site would affect the visual appearance and operations of the convention center.

## E. WATER TRANSPORT SYSTEM

Current plans for the convention center do not include any improvements associated with using the Ala Wai Canal as a waterborne avenue of approach by conventioneers. Several concerns need to be resolved before pursuing such a concept, including potential navigational and recreational conflicts with other groups and individuals who use the canal for boating and canoeing. As it is envisioned that potential boating vessels associated with this concept would likely be of the low passenger volume mode, such water transport is not likely to have a significant impact on peak hour vehicle use and should not be viewed as a significant traffic mitigation measure for the convention center.

# 1. INTRODUCTION

The State of Hawaii Convention Center Authority (State CCA) has selected the former Aloha Motors site as the location for the new Hawai'i Convention Center . The approximately 9.65-acre site is located at the Ewa end of the 1.5-mile long Waikiki area, with the site separated from Waikiki by the Ala Wai Canal. The site is located adjacent to the Kalakaua Avenue bridge crossing into the Waikiki area (see Figure 1-1).

This Transportation Impact Analysis Report (TIAR) provides analysis of the potential transportation-related impacts of the convention center project. The report analyzes key issues concerning traffic, parking, public transportation, and pedestrians in the project vicinity.

## A. PROPOSED PROJECT

The State CCA intends that the primary users of the convention center will be national and international conventions, trade shows, exhibitions, and meetings. Such events are expected to produce from 2,000 to 14,000 persons in attendance per event. Trade shows and exhibitions directed toward Oahu residents are expected to continue using the City and County of Honolulu's Blaisdell Center, or ballroom/meeting room facilities at the major Waikiki hotels.

Development of the convention center will include a four level, stand-alone facility, without additional private development on-site. The facility's gross building area will be approximately 1,106,670 square feet, allocated within the following major facility areas:

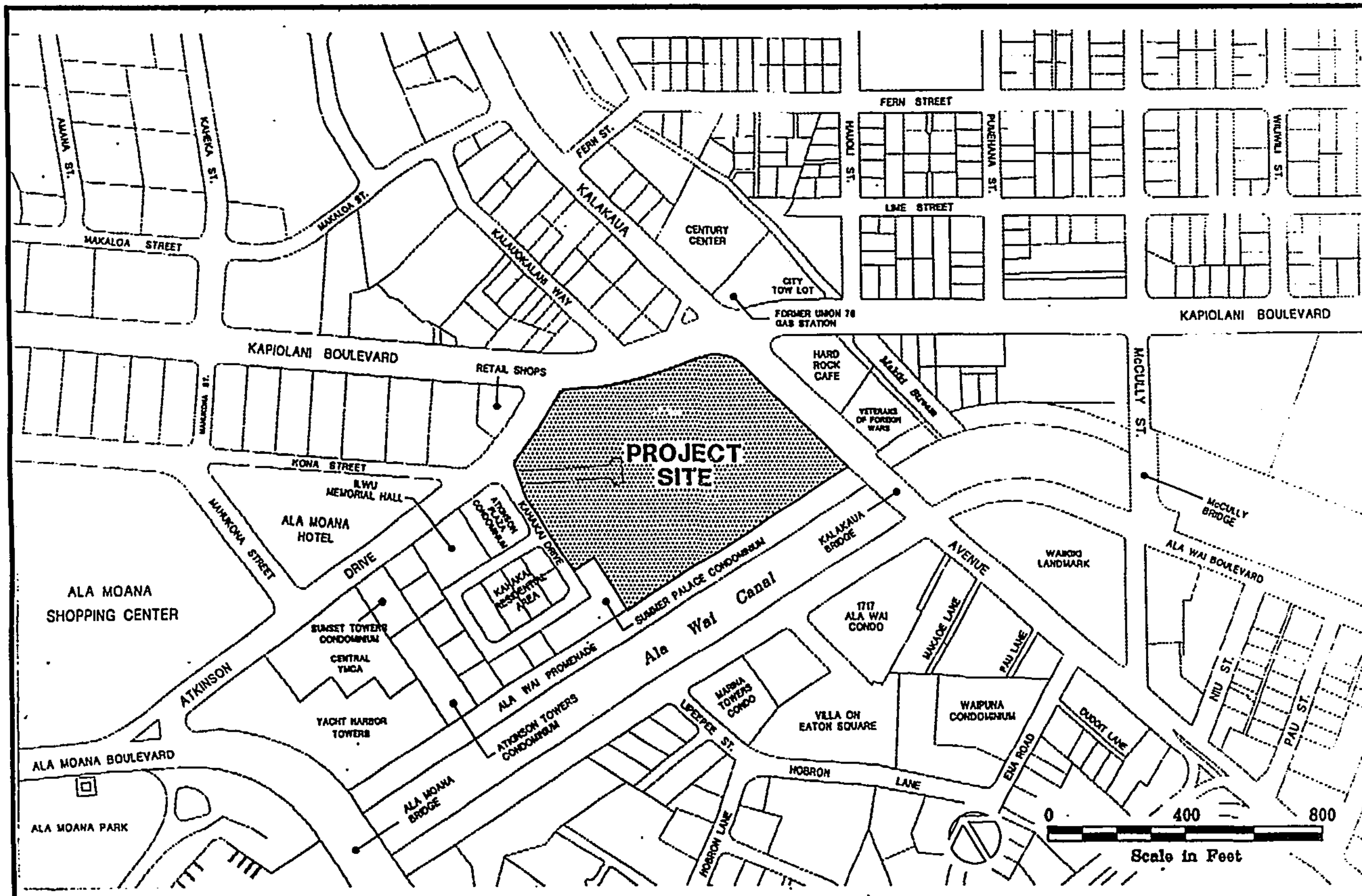
- 200,000 square feet of Exhibit Halls
- 100,000 square feet of Meeting Rooms
- 35,000 square feet for the Ballroom
- 240,665 square feet of Lobby/Prefunction Areas (including Landscaped Terrace of 105,000 square feet)
- 13,500 square feet of Administrative Area
- 4,600 square feet of VIP/Boardroom Areas
- 252,915 square feet of Support Areas
- 260,000 square feet of Parking (approximately 800 stalls)

The project will provide approximately 800 parking stalls on-site to serve convention center activities.

The general time frame for development of the convention center project is anticipated as follows:

- Project Design: .................... 1994-1995
- Environmental Impact Statement (EIS) Development and Review Process: ........ 1994-1995
- Construction: ...................... 1995-1997
- First Year at Full Operation: ............... 1998

In the future, expansion of the convention center facility may become economically feasible and desirable. To accommodate this expansion, structural requirements for supporting the expansion have been incorporated in the current design. Future expansion space for the convention center includes an additional 100,000 square feet of exhibit halls and 50,000 square feet for meeting rooms plus supporting facilities. Due to uncertainty of the time frame for future expansion of the facility, a supplemental EIS would need to be prepared when the decision is made to pursue such expansion. A traffic impact analysis would need to be conducted for the supplemental EIS.




TRAFFIC IMPACT ANALYSIS REPORT

HAWAI'I CONVENTION CENTER

Fig. 1-1
LOCATION MAP

WILSON OKAMOTO & ASSOCIATES, INC.
and
THE TRAFFIC MANAGEMENT CONSULTANT

## B. STUDY PURPOSE AND SCOPE

This analysis of the transportation-related impacts of the Hawai'i Convention Center is prepared for input to the project's environmental impact statement (EIS). The TIAR employs as a basis the *Hawaii Convention Center Transportation Impact Assessment* prepared by Wilbur Smith Associates dated May 16, 1994 (WSA/TIA). The WSA/TIA was prepared for input to the *Convention Center Environmental Assessment* (May 1994) prepared for the State Convention Center Authority by Helber Hastert & Fee, Planners (May 1994). The WSA/TIA provided a preliminary assessment of the potential transportation-related effects of the convention center project and identified key issues concerning traffic, parking, public transportation, and pedestrians in the project vicinity. The traffic analysis was based on a "generic" convention center with a convention event of 10,000 registered attendees during the three to four days of sessions. It was intended that the findings and recommendations in the WSA/TIA would be further refined when project design plans are finalized (i.e., when more information is available on location of entry and exit driveways, internal circulation system, parking facilities, passenger loading and unloading areas, delivery and service vehicle areas, pedestrian facilities, etc.).

The EIS TIAR analyzes the transportation-related impacts based on the convention center design by design/builder Nordic/PCL. The central focus of this study is the potential impacts of the convention center upon traffic conditions on streets adjacent to the site.

The analysis year is 1998, the first full year of operations for the convention center. An analysis has been made of traffic conditions at nearby key intersections to include:

- Existing conditions;
- Future (1998) conditions without the convention center as a baseline from which to measure project impacts; and
- Future (1998) conditions with the convention center.

The traffic analysis reflects the existing street system and circulation pattern. The City and County of Honolulu has proposed several alternative patterns, including converting sections of Kalakaua Avenue and Ala Moana Boulevard in the vicinity of the project to one-way operations. In January 1995, the City and County of Honolulu Planning Department issued the draft of the Waikiki People Mover and Peripheral Parking Study. The study, which was commissioned by the City and County of Honolulu to evaluate several issues associated with the development of the Waikiki Master Plan, includes an analysis of alternative circulation plans for the Waikiki study area. Furthermore, the City is currently undertaking the Waikiki Regional Traffic Impact Plan to analyze traffic impacts of existing and future (year 2005) conditions in the region, including the convention center project, and to recommend mitigation measures for overall traffic impacts in the area. The regional study will also include reevaluating the change in traffic circulation and patterns of the major streets in the area. The results of the regional traffic study are anticipated by August 1995. Therefore, the general effects of such changes are discussed in the EIS TIAR, but no quantitative analysis is provided with these potential one-way street couplets.

This study also addresses the potential impacts on other elements of the transportation system, which include:

- Parking
- Trucks and deliveries
- TheBus
- Private charter shuttle bus system
- Pedestrian facilities

A discussion of operational-period transportation management plan procedures, which will be the responsibility of the Hawai'i Convention Center operator, is also included in this TIAR.

For the purpose of this TIAR, analyses have been conducted for five (5) different scenarios relative to events at the convention center:

- Analysis of the weekday morning and afternoon peak hour traffic based on a national or international convention, or combination of conventions, with 10,000 attendees. This is a level that may be reached or exceeded approximately 15 to 20 days per year.
- Analysis of the weekday morning and afternoon peak hour traffic based on a national or international convention, or combination of conventions, with 14,000 attendees. This level may be reached or exceeded once every three years, and is used to represent a "worst case" scenario for analysis of traffic impacts.
- Analysis of the mid-day (weekday) peak hour of traffic for a 14,000-person convention. The period of analysis occurs between 1:00 PM to 2:00 PM.
- Analysis based on a 3,000-person function hosted by a national convention on a Friday evening following the afternoon commuter peak period. The period of analysis occurs between 6:30 PM to 7:30 PM.
- Analysis based on an all-local event with 1,800 attendees held on a Friday evening following the afternoon commuter peak period. The period of traffic analysis occurs between 6:30 PM to 7:30 PM.

The TIAR also discusses several transportation proposals which may affect, or be affected by the convention center. These include:

- Conversion of portions of Kalakaua Avenue and Ala Moana Boulevard to one-way street couplets;
- Peripheral parking facilities for the Waikiki area;
- A Waikiki people mover system;
- A regional rapid transit system;
- A water transport system.

## C. STUDY AREA

A variation of study areas has been identified for analyses of potential transportation impacts for the five (5) scenarios relative to events at the convention center.

<u>10,000-Person and 14,000-Person Convention</u>

An analysis of traffic generated by a 10,000-person and a 14,000-person convention during the weekday morning and afternoon peak hours is conducted for the following intersections:

- Kapiolani Boulevard and Kalakaua Avenue
- Kapiolani Boulevard and Atkinson Drive
- Atkinson Drive and Kahakai Drive/Kona Street
- Ala Moana Boulevard and Atkinson Drive
- Kalakaua Avenue and Ala Wai Boulevard

These intersections were analyzed in the WSA/TIA for the 10,000-person convention.

Based on comments received on the Draft EIS, a traffic impact analysis was conducted of the T-intersection of Kahakai Drive and the Kahakai Drive internal loop street. The intent is to analyze the potential impacts on resident traffic egressing the internal loop street onto Kahakai Drive resulting from convention center operations. The analysis was conducted for the morning and afternoon peak hours during a 14,000-person convention since this scenario is expected to have the most significant impact on the intersection.

The WSA/TIA also included an analysis of traffic conditions during the weekday morning and afternoon peak hours at the intersection of Ala Moana Boulevard and Kalia/Ena Roads since it would be affected by travel to and from the convention center. According to the WSA/TIA, this intersection was not significantly impacted by convention center traffic. Based on this finding, the intersection of Ala Moana Boulevard and Kalia/Ena Road was not analyzed for this TIAR.

Further, the WSA/TIA included an analysis of the intersection of Kapiolani Boulevard and McCully Street during the weekday morning and afternoon peak hours. The analysis indicated that traffic conditions would remain at acceptable levels with the small amount of convention center traffic through this intersection and, therefore, was not significantly impacted by the Center traffic. Also, traffic to and from the convention center is expected to be predominantly from Waikiki, travelling via Ala Moana Boulevard and Kalakaua Avenue. Therefore, this TIAR does not include an analysis of the Kapiolani Boulevard and McCully Street intersection.

Mid-day (Weekday) Peak Hour

An analysis of the mid-day (week-day) peak traffic hour based on a 14,000-person convention is conducted for the following intersections:

- Kapiolani Boulevard and Kalakaua Avenue
- Kapiolani Boulevard and Atkinson Drive
- Atkinson Drive and Kahakai Drive/Kona Street

The study area for this scenario was developed based upon consultation with the City and County of Honolulu Department of Transportation Services (DTS) during development of the scope for the EIS TIAR. The mid-day (weekday) analysis was determined to examine the effects of the absence of the AM and PM peak period contra-flow coning operations on Kapiolani Boulevard, and the turn restrictions at the Kapiolani Boulevard/Atkinson Drive and Kapiolani Boulevard/Kalakaua Avenue intersections. An analysis of the Atkinson Drive and Kahakai Drive intersection is conducted during this period due to the convention center's parking garage and truck loading dock primary access being located on Kahakai Drive.

Friday Evening Post-Commuter Peak Hour

The following intersections are analyzed for the 3,000-person event and the all-local 1,800-person event held on a Friday evening following the afternoon commuter peak traffic period:

- Kapiolani Boulevard and Kalakaua Avenue
- Kapiolani Boulevard and Atkinson Drive
- Atkinson Drive and Kahakai Drive/Kona Street
- Ala Moana Boulevard and Atkinson Drive

The study area for these scenarios were developed based upon concerns raised by the City DTS with respect to convention center traffic impacts at the "gateways to Waikiki" (i.e., Kalakaua Avenue at Kapiolani Boulevard and Ala Moana Boulevard at Atkinson Drive). Traffic is predominantly heavy during the early evening hours, with Friday evenings experiencing the residual afternoon commuter peak traffic overlapping visitor and resident traffic entering Waikiki. The intersections of Kapiolani Boulevard and Atkinson Drive, and Atkinson Drive and Kahakai Drive/Kona Street would be affected by convention center traffic entering and exiting the facility.

## 2. EXISTING CONDITIONS

The 9.65-acre Hawaii Convention Center project site is bounded by three major streets (Kapiolani Boulevard, Kalakaua Avenue and Atkinson Drive), a local street (Kahakai Drive), and by the Ala Wai Canal and Promenade. At present, the project site is vacant with small portions used for parking of vehicles or equipment. Access to the project site is provided by a locked gate on Kahakai Drive.

The surrounding area includes a mixture of offices, commercial retail uses, residential uses, and service businesses. Notably, a mixture of low-rise and high-rise residential buildings are located along Kahakai Drive adjacent to the project site. The Ala Moana Center and Ala Moana Hotel are located along Atkinson Drive and Kona Street across from the project site. The Kapiolani Boulevard business area is located west of the project site, with a mix of commercial and residential uses located adjacent to the site. Waikiki is located to the east of the project site, across of the Ala Wai Canal.

### A. EXISTING ROADWAYS

**Kapiolani Boulevard**

This major street is a principal urban arterial street serving the east side of the Central Honolulu area. It provides east-west access to the Downtown Honolulu business and civic center areas, Ala Moana Center, the Kapiolani business area, Neal Blaisdell Center, the H-1 Freeway, and to the many major mauka-makai streets it intersects.

In the project vicinity, Kapiolani Boulevard generally provides six through lanes, with three lanes in each direction, within a 100-foot wide right-of-way. Within the six-lane section, left-turns are permitted from the through lane adjacent to the centerline at most locations. The street serves a large amount of resident commuter traffic, with the majority of vehicles travelling ewabound towards Downtown Honolulu during the morning peak traffic period and Koko Head-bound towards Kaimuki-Kapahulu during the afternoon peak period. As a result, the City places traffic cones along Kapiolani Boulevard during the weekday peak traffic periods. The coning provides an additional (fourth) reversed traffic lane to serve the peak travel direction, with only two lanes remaining to serve the off-peak travel direction (contra-flow operation). Left-turns are prohibited from the off-peak travel direction when the traffic cones are in place.

In the vicinity of the project site, traffic signals are provided at the intersections of Atkinson Drive and Kalakaua Avenue. At the Atkinson Drive intersection, left turns are permitted from ewa direction Kapiolani Boulevard onto makaibound Atkinson Drive, except during the afternoon peak period (3:30 PM to 6:30 PM). During the morning peak period, this left-turn movement can be made from the normal (centerline) lane shared with through traffic, plus the additional reversed lane, which functions as a left-turn only lane. The left-turn movement is prohibited from Atkinson Drive throughout the day.

Left turns are prohibited from Kapiolani Boulevard at Kalakaua Avenue through the day due to the heavy volume of through traffic at this intersection. Only two normal through lanes are provided for Koko Head-bound travel through this intersection, since the curb lane is restricted to use by the high volume of right-turn vehicles travelling into Waikiki. A third Koko Head-bound through lane is provided during the weekday afternoon by the reversible lane operation. The City has a dedication requirement for one additional Koko Head direction lane (10-foot width) along the makai side of Kapiolani Boulevard between Atkinson Drive and Kalakaua Avenue (the project site frontage).

On-street parking along both sides of Kapiolani Boulevard between Atkinson Drive and Kaheka Street is restricted between 6:00 AM and 6:30 PM every day, except Sundays and holidays. Parking along both sides of Kapiolani Boulevard east of Atkinson Drive is prohibited.

**Kalakaua Avenue**

This major street connects the Waikiki area to the Kapiolani Boulevard and King Street-Beretania Street corridors, and provides an access route to/from the H-1 Freeway. In the vicinity of the project site, Kalakaua Avenue is currently a two-way street, varying between four and five through lanes, plus turn lanes, within a 70-, to 90-foot wide right-of-way mauka of Ala Wai Boulevard. From Ala Wai Boulevard to Ena Road, Kalakaua Avenue provides three lanes into Waikiki and two lanes outbound. Koko Head of Ena Road, Kalakaua Avenue provides one-way movement into Waikiki, with the exception of one outbound bus-only lane. The City has a dedication requirement for one additional lane on each side of Kalakaua Avenue from Kapiolani Boulevard to or beyond Ala Moana Boulevard, which includes the convention center project frontage.

At its intersection with Kapiolani Boulevard, Kalakaua Avenue has three Waikiki-bound lanes. Outbound from Waikiki, the street approach is striped for a left-turn only lane, a combination through/left-turn lane, a through lane, and a recently added right-turn only lane. There are few right-turning vehicles using the special lane. Its primary benefit is its use as a bus pull-out, so as to prevent City buses from stopping in the through lane while servicing passengers.

Left turns are prohibited from the Koko Head direction of Kalakaua Avenue at the Kapiolani Boulevard intersection. Also, left turns are prohibited from the ewabound direction during the afternoon peak traffic period.

The intersection of Kalakaua Avenue and Ala Wai Boulevard is controlled by a traffic signal. The ewa direction of Kalakaua Avenue is restricted to the through movement, while through and right-turn movements are permitted in the Koko Head direction.

**Atkinson Drive**

This five-to seven-lane major street connects Kapiolani Boulevard to Ala Moana Boulevard.

At the signalized Kapiolani Boulevard intersection, the right curb lane of maukabound Atkinson Drive feeds into the Kapiolani Boulevard right-turn-only lane to Waikiki. The other two maukabound lanes of Atkinson Drive feed into the two Koko Head-bound through lanes on Kapiolani Boulevard. During the morning peak period, the left maukabound lane is blocked off by traffic cones since the Kapiolani Boulevard lane it feeds into has been reversed in direction. Left-turns are prohibited from maukabound Atkinson Drive onto Kapiolani Boulevard at all times.

The intersection of Atkinson Drive at Kahakai Drive and Kona Street is unsignalized. An exclusive left-turn lane is provided Koko Head-bound on Atkinson Drive onto Kona Street. The left-turn movement from makaibound Atkinson Drive onto Kahakai Drive is permitted from the median through lane.

The intersections of Atkinson Drive with Ala Moana Boulevard and Mahukona Street are signal-controlled. At its intersection with Ala Moana Boulevard, Atkinson Drive has two Waikiki-bound left-turn lanes, a through lane makaibound to Ala Moana Park Drive, and two ewabound right-turn lanes.

Parking is permitted along the ewa side of Atkinson Drive (opposite the project site) between Kapiolani Boulevard and Kona Street, and along the Koko Head side (project side) between Kahakai Drive and Mahukona Street.

**Kahakai Drive**

This two-lane local street provides access to the project site and to condominiums and apartment buildings located along the street. The loop portion of the street operates in a one-way clockwise direction and forms a STOP sign-controlled T-intersection at Kahakai Drive. The Kahakai Drive approach to Atkinson Drive is STOP sign-controlled. Parking is permitted along the makai side of the street across from the project site.

**Kona Street**

Kona Street, a private street under the ownership, maintenance and control of Ala Moana Center, is a two-lane street which provides east-west circulation along the mauka side of the Ala Moana Hotel and Ala Moana Center, between Atkinson Drive and Piikoi Street. All of its intersections are stop sign-controlled, except for the signalized intersection with Piikoi Street. Multi-way stop controls are located at the Mahukona Street and Keeaumoku Street intersections, with most left-turn movements being prohibited at Keeaumoku Street. Eastbound traffic on the Kona Street approach to Atkinson Drive is restricted to right-turn-only, yielding the right-of-way to ewabound traffic on Atkinson Drive. A number of parking entrances and exits are located along Kona Street, including ramps to/from the upper parking levels of Ala Moana Center.

**Ala Moana Boulevard**

Ala Moana Boulevard is a primary arterial providing access to the Downtown Honolulu and Honolulu Harbor areas and to the Waikiki area. Ala Moana Boulevard is a six-lane divided highway, with three ewabound lanes and three Diamond Head-bound lanes.

The intersection of Ala Moana Boulevard and Atkinson Drive is controlled by a traffic signal. In the Diamond Head-bound direction, there are two left-turn lanes providing access onto Atkinson Drive, two through lanes, and a combination through/right-turn lane onto Ala Moana Park Drive. Ewabound, Ala Moana Boulevard provides a left-turn lane onto Ala Moana Park Drive, two through lanes, and a combination through/right-turn lane onto Atkinson Drive.

**Ala Wai Boulevard**

Koko Head of Kalakaua Avenue, Ala Wai Boulevard is a major street which operates one-way ewabound as part of a one-way street couplet serving the Waikiki area, with Kalakaua Avenue providing Koko Head-bound movement. Within Ala Wai Boulevard, there are four lanes from Kapahulu Avenue to McCully Street, with an additional right-turn lane at McCully Street. Parking is permitted in the mauka lane during off-peak periods. Between McCully Street and Kalakaua Avenue, Ala Wai Boulevard provides three lanes in the ewa direction. At its intersection with Kalakaua Avenue, Ala Wai Boulevard provides a right-turn lane, a shared right-turn/through lane, and a left-turn lane. Ewa of Kalakaua Avenue, Ala Wai Boulevard is a secondary street serving the Hobron Lane residential area. In this area, Ala Wai Boulevard is a two-lane, east-west roadway, terminating near the Ala Moana Boulevard bridge.

## B. EXISTING TRAFFIC VOLUMES

Traffic volumes for the morning and afternoon peak traffic periods were derived from the WSA/TIA and further validated for the EIS TIAR. In the WSA/TIA, traffic volumes were obtained from special counts made by Kaku Associates and Cambridge Systematics, Inc. in 1992 for the rapid transit project and for the Waikiki Master Plan study. These counts were updated and supplemented by counts made by WSA in March 1994 for key intersections. The traffic volumes were further validated for the EIS TIAR analysis, using the most recent available traffic data obtained from the State of Hawaii Department of Transportation (DOT) and the City and County of Honolulu Department of Transportation Services (DTS)[1]. Furthermore, manual counts were conducted by The Traffic Management Consultant at specific intersections to verify critical turning volumes in the study area. The traffic count data for the mid-day (weekday) peak and Friday evening post-commuter peak period analyses were obtained by manual traffic count surveys conducted by The Traffic Management Consultant. Also, the traffic volumes used in the EIS TIAR were verified with and are consistent with the traffic data collected by Kaku Associates in February 1995 for the City's Waikiki Regional Impact Plan.

[1] Traffic volumes at Kapiolani Boulevard/McCully Street intersection were not validated.

Typical weekday traffic volumes on major streets in the vicinity of the project site are as follows:

- Kapiolani Boulevard ...................... 50,000 vehicles per day
- Kalakaua Avenue ........................ 41,000 vehicles per day
- Atkinson Drive 25,000 vehicles per day
- Ala Wai Boulevard
  (Kokohead of Kalakaua Avenue) ......... 21,000 vehicles per day
- Ala Wai Boulevard
  (ewa of Kalakaua Avenue) ............. 8,000 vehicles per day
- Ala Moana Boulevard ..................... 48,000 vehicles per day

The weekday peak one-hour traffic periods typically extend from about 7:15 AM to 8:15 AM, while the afternoon peak one-hour volumes occur from about 4:00 PM to 5:00 PM. The peak one-hour periods may vary by 15 to 30 minutes between different streets and on different days. The present peak one-hour traffic volumes for the morning and afternoon peak hour periods are depicted in Figures 2-1 and 2-2, respectively. The volumes represent the number of through, left-turn, and right-turn vehicles on each approach to the key intersections in the project vicinity. Key features include the following:

1. Kapiolani Boulevard experiences a very large directional split in peak hour traffic, with the peak direction volume about two to five times that of the off-peak direction volume.

2. Kalakaua Avenue traffic is nearly evenly split in each direction during the peak traffic hours.

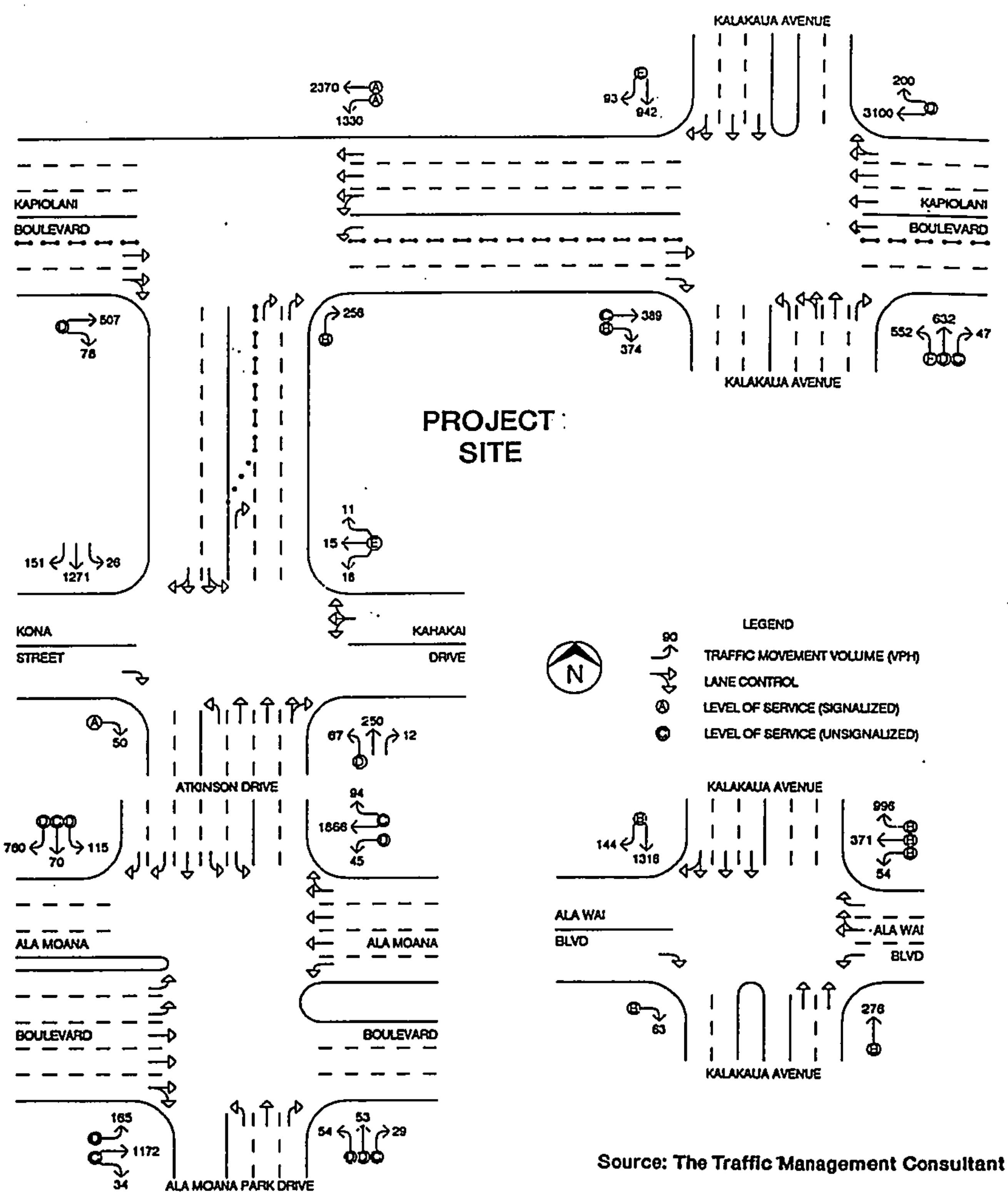
3. The highest traffic volume intersection during both the morning and afternoon peak traffic hours is the Kapiolani Boulevard/Kalakaua Avenue intersection, with about 6,330 and 6,400 vehicles travelling through this intersection in the morning and afternoon peak hours, respectively.

4. The other "high volume" intersections in the area, and their peak hour traffic volumes (as a percentage of the Kapiolani Boulevard/Kalakaua Avenue intersection volume) are:

   - Ala Moana/Atkinson ............. 75-80 percent
   - Kapiolani/Atkinson .............. 65-70 percent
   - Kalakaua/Ala Wai .............. 50-55 percent

A manual count of mid-day (weekday) traffic volumes was conducted by The Traffic Management Consultant in December 1994, between 12:00 noon and 2:00 PM. During the mid-day, Kapiolani Boulevard carries about 80 percent of the AM and PM peak hour traffic, without the benefit of the contra-flow operation. The mid-day peak hour volumes occur from about 1:00 PM to 2:00 PM. The present mid-day peak hour traffic volumes are depicted in Figure 2-3. Mid-day (weekday) traffic volumes at the key Kapiolani Boulevard/Kalakaua Avenue intersection average about 5,300 vehicles per hour, or about 83 percent of the peak commute hour volumes.

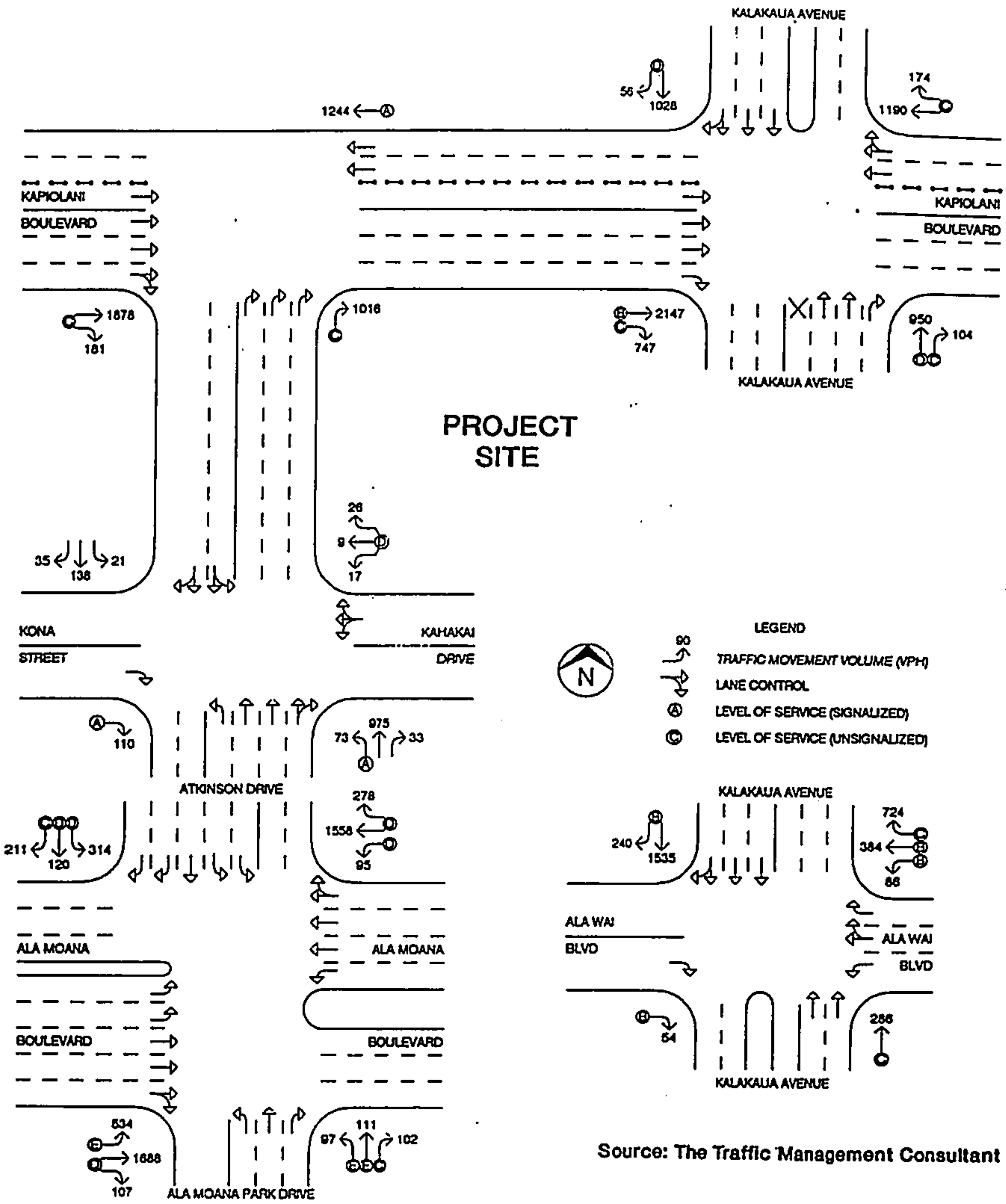
According to the WSA/TIA, midweek evening hourly traffic volumes at the intersection of Kapiolani Boulevard/Kalakaua Avenue range between 3,800 to 4,200 vehicles during the 7:00 PM to 11:00 PM period, or 60 to 65 percent of the peak commute hour volumes.




Source: The Traffic Management Consultant

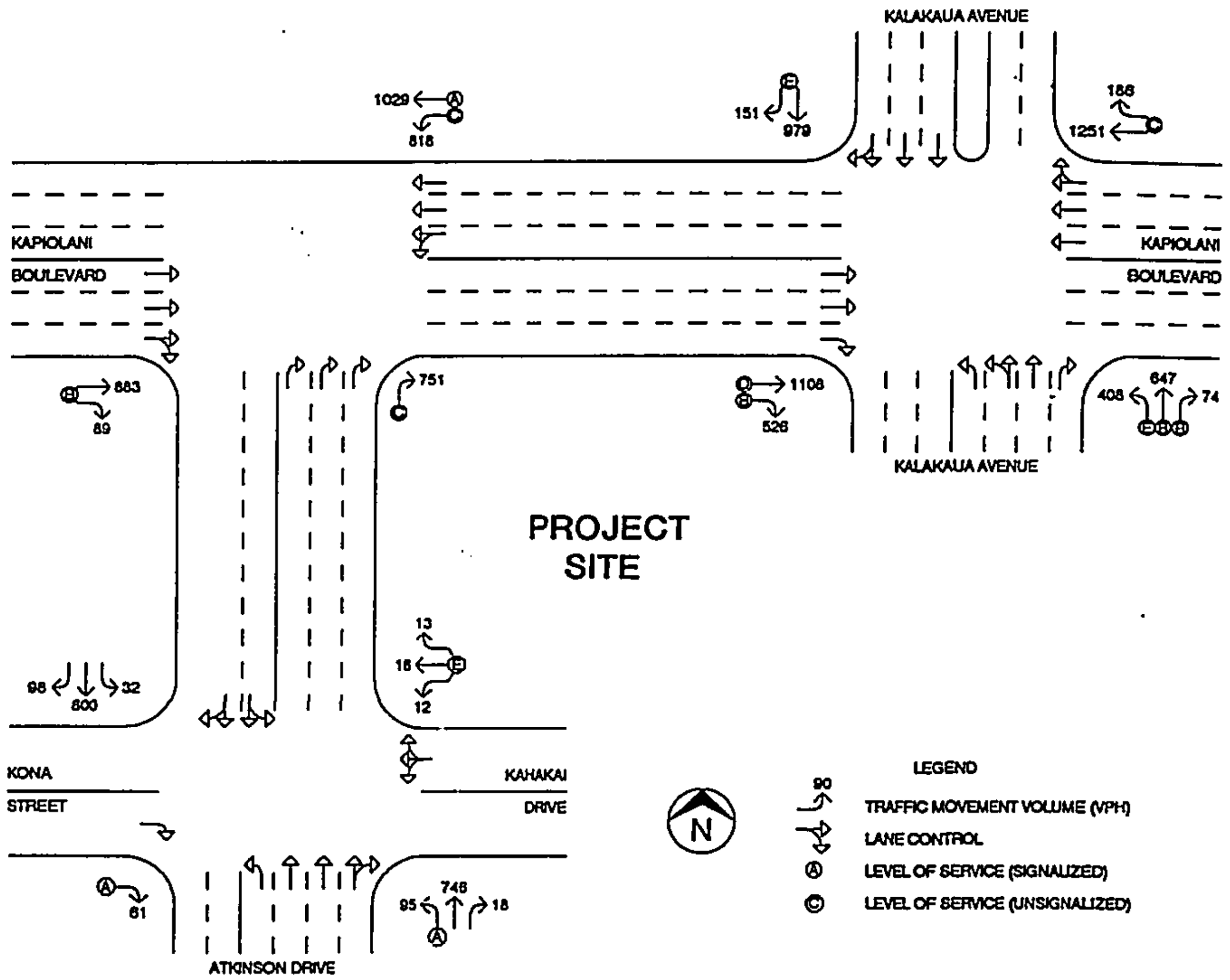
**Fig. 2-1**
**EXISTING AM PEAK HOUR TRAFFIC**

| | |
|---|---|
| TRAFFIC IMPACT ANALYSIS REPORT | WILSON OKAMOTO & ASSOCIATES, INC. and |
| HAWAI'I CONVENTION CENTER | THE TRAFFIC MANAGEMENT CONSULTANT |




Source: The Traffic Management Consultant

Fig. 2-2
EXISTING PM PEAK HOUR TRAFFIC




Source: The Traffic Management Consultant

Fig. 2-3
EXISTING MID-DAY (WEEKDAY) PEAK HOUR TRAFFIC

As indicated in the WSA/TIA, the highest nighttime traffic volumes in the project area usually occur on Friday or Saturday evenings, with Friday evening traffic volumes generally slightly higher than Saturdays. This is primarily due to the residual PM commuter peak traffic period overlapping with the visitor and resident traffic entering Waikiki. In October 1994, traffic counts were conducted by The Traffic Management Consultant for a Friday evening between 6:30 PM and 11:00 PM at the following four key intersections: Kapiolani Boulevard and Kalakaua Avenue, Kapiolani Boulevard and Atkinson Drive, Atkinson Drive and Kahakai Drive/Kona Street, and Ala Moana Boulevard and Atkinson Drive. The Friday evening peak traffic hour typically occurs between 6:30 PM and 7:30 PM. The present Friday evening peak hour traffic volumes are depicted in Figure 2-4. Traffic volumes entering the intersection of Kapiolani Boulevard/Kalakaua Avenue total about 5,400 vehicles per hour, or 84 percent of the peak commute hour volumes.

## C. EXISTING TRAFFIC CONDITIONS

Existing traffic conditions in the vicinity of the project site are characterized by trip generators in the region and along the arterial roadways in the vicinity of the project site. Kapiolani Boulevard is a major commuter route to and from Downtown Honolulu during the morning and afternoon peak traffic periods. Commercial and business establishments along this roadway generate traffic throughout the day and into the early evenings. Ala Moana Boulevard and Kalakaua Avenue are primary access routes to and from Waikiki, a major destination for visitors as well as a social destination for residents. The recreational opportunities afforded by nearby Ala Moana Park also attract residents and visitors alike.

Congested traffic conditions regularly occur along some portions of Kapiolani Boulevard, Kalakaua Avenue, Atkinson Drive, and Ala Moana Boulevard near the project site during peak commute hours. Congested conditions also occur along Kalakaua Avenue and Ala Moana Boulevard within Waikiki during evening hours on Fridays, Saturdays, and special events (Halloween, prom nights, political events, etc.). The evening congestion within Waikiki sometimes results in stacking of traffic back to and the disruption of traffic flow near the project site. During weekend days, congestion also occurs along Kapiolani Boulevard and Atkinson Drive during the Christmas shopping season and special sales events at the Ala Moana Center.

### 1. Capacity Analysis Methodology

The roadway and intersection capacity analyses conducted for this EIS TIAR is based upon procedures set forth in the *Highway Capacity Manual, Special Report 209*, Transportation Research Board, 1985, as amended, and the *Highway Capacity Software*, Federal Highways Administration. The Transportation Research Board (TRB) has developed standard procedures to provide qualitative descriptors of traffic operating conditions. The TRB evaluation method uses a concept known as level-of-service (LOS), which is defined as "a qualitative measure describing operational conditions within a traffic stream". Several factors are included in determining LOS, such as speed, delay, vehicle density, freedom to maneuver, traffic interruptions, driver comfort, and safety. The LOS concept involves assigning a letter designation (from LOS A to LOS F) to indicate operational conditions of an intersection, or for the various street approaches or lanes at an intersection. The level-of-service concept and methodology are described in Appendix A. LOS A, B and C are considered satisfactory levels of service. LOS D represents a "desirable minimum" operating level of service. LOS E is an undesirable condition, while LOS F represents an unacceptable condition. LOS D is considered acceptable as a design basis for peak hour conditions. Each level of service category corresponds to a range of anticipated delay encountered by the average driver passing through the intersection.

For traffic signal-controlled intersections, the level-of-service is based on average delay time per vehicle. Long signal cycle lengths at intersections of two high-volume streets will tend to result in comparatively poorer service levels, since large volumes of traffic are being kept waiting through the red signal phase on both streets.

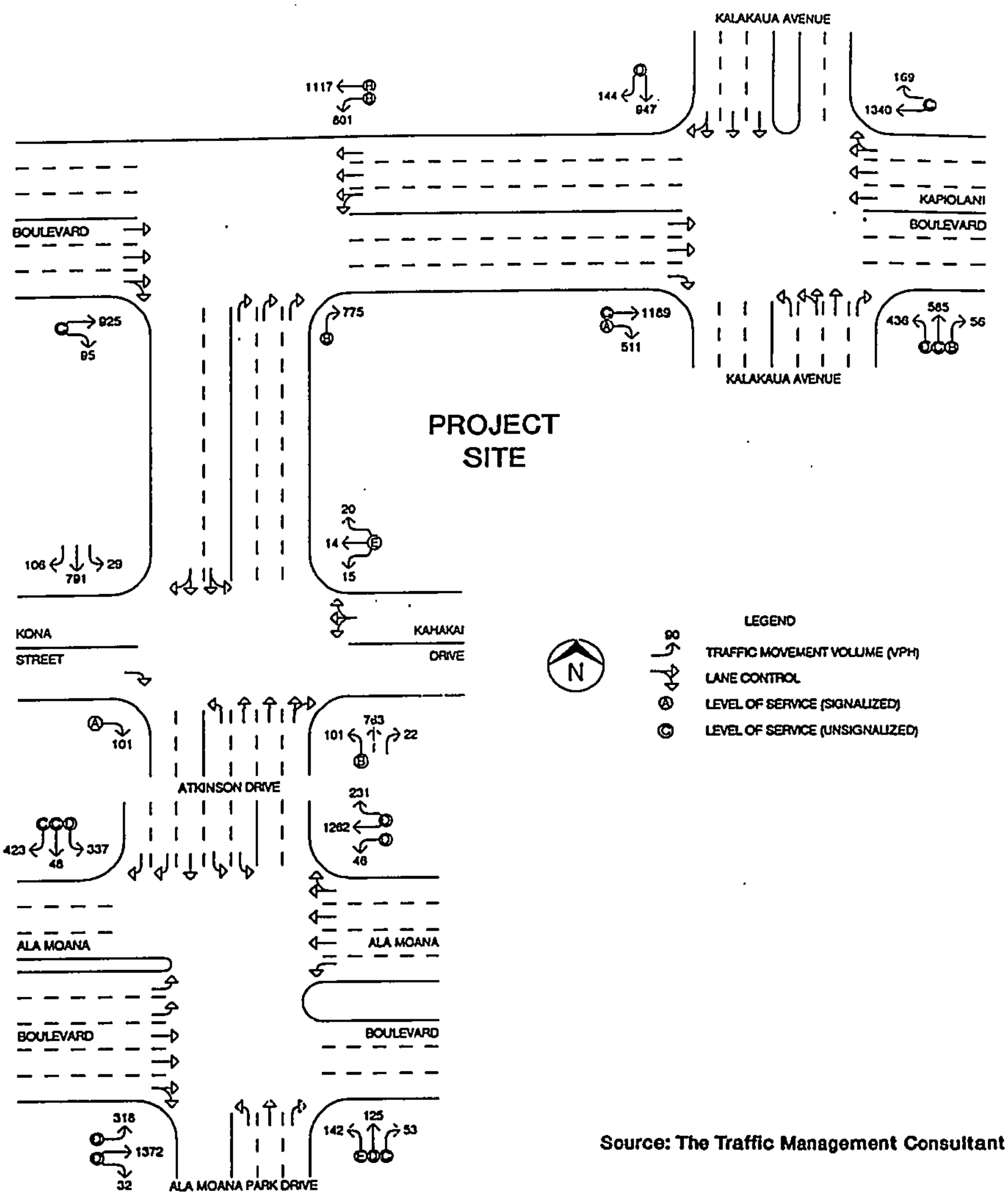



Fig. 2-4

EXISTING FRIDAY EVENING POST-COMMUTER PEAK HOUR TRAFFIC

Another measure encountered in these calculations is the volume-to-capacity (v/c) ratio. This ratio is a measure of the relative traffic demand to the roadway's traffic carrying ability. For example, a v/c ratio of 0.50 indicates that the traffic demand is utilizing 50 percent of the capacity of the roadway.

## 2. Existing Capacity Analysis

Based on analysis of the existing traffic volumes, four peak traffic periods have been determined to most likely be frequently affected by convention center traffic. These periods include the AM peak hour of weekday traffic, the PM peak hour of weekday traffic, the mid-day peak hour of weekday traffic, and the Friday evening peak hour following the PM peak commuter period. This study analyzes conditions at those key intersections for each of the four peak traffic periods that are likely to be most directly affected by travel to/from the convention center. The intersections analyzed for each of the peak traffic periods are listed in Table 2-1.

**Table 2-1. Intersections Analyzed in the Study Area**

| Intersection | AM Peak Hour (Weekday) | PM Peak Hour (Weekday) | Mid-day Peak Hour (Weekday) | Friday Evening Post-Commuter Peak Hour |
|---|---|---|---|---|
| Kapiolani Boulevard and Kalakaua Avenue | • | • | • | • |
| Kapiolani Boulevard and Atkinson Drive | • | • | • | • |
| Kalakaua Avenue and Ala Wai Boulevard | • | • | — | — |
| Ala Moana Boulevard and Atkinson Drive | • | • | — | • |
| Atkinson Drive and Kahakai Drive/Kona St. | • | • | • | • |
| Kahakai Loop and Kahakai Drive | • | • | — | — |

Ref.: The Traffic Management Consultant

Principal findings of the intersection analyses are indicated below.

### a. AM Peak Hour

Traffic in the study area predominantly flows in the westbound direction during the AM peak hour. Kapiolani Boulevard operates at acceptable levels during the westbound contra-flow operations. Table 2-2 shows the LOS, critical v/c ratios, and average vehicle delay during the existing AM peak hour.

The intersection of Kapiolani Boulevard and Kalakaua Avenue is the busiest intersection in the study area, with over 6,300 vehicles per hour (vph) entering the intersection during the AM peak hour. Traffic on Atkinson Drive flows primarily in the makaibound direction to the Ala Moana Center or continuing westbound to Ala Moana Boulevard. Traffic exiting Kahakai Drive onto Atkinson Drive experiences LOS E conditions under unsignalized conditions. Traffic operates at LOS A conditions at the STOP sign-controlled T-intersection of the Kahakai Drive loop at Kahakai Drive.

| Table 2-2. Existing AM Peak Hour Capacity Analysis | | | |
|---|---|---|---|
| **Intersection** | **Level-of-Service** | **Volume-to-Capacity Ratio** | **Average Vehicle Delay (seconds)** |
| Kapiolani Boulevard and Kalakaua Avenue | D | 1.000 | 34.4 |
| Kapiolani Boulevard and Atkinson Drive | B | 0.785 | 5.2 |
| Atkinson Drive and Kahakai Drive/Kona Street | E* | — | — |
| Kahakai Loop and Kahakai Drive | A* | — | — |
| Kalakaua Avenue and Ala Wai Boulevard | B | 0.729 | 12.8 |
| Ala Moana Boulevard and Atkinson Drive | C | 0.817 | 22.6 |

*Note: Kahakai Drive and Kahakai Loop LOS under unsignalized conditions.
Ref.: The Traffic Management Consultant

**b. PM Peak Hour**

Traffic in the study area generally flows in the eastbound direction during the PM peak hour. Kapiolani Boulevard again operates well under the eastbound contra-flow operations with restricted turning movements. Table 2-3 summarizes the existing PM peak hour LOS, critical v/c ratios, and average vehicle delay for intersections in the study area.

The intersection of Kapiolani Boulevard and Kalakaua Avenue is again the busiest intersection in the study area, with almost 6,400 vph entering the intersection during the PM peak hour. During brief periods, eastbound traffic on Kapiolani Boulevard queues back across the Atkinson Drive intersection. Traffic on Atkinson Drive flows primarily in the maukabound direction, queuing back across Kahakai Drive during brief periods. Traffic exiting Kahakai Drive makaibound onto Atkinson Drive experiences LOS E under unsignalized conditions. Traffic operates at LOS A conditions at the STOP sign-controlled T-intersection of the Kahakai Drive loop at Kahakai Drive. The traffic signal green time on Atkinson Drive at its intersection with Ala Moana Boulevard is extended to accommodate the heavy pedestrian crossing at Ala Moana Boulevard, resulting in additional delays to the other approaches of the intersection.

**c. Mid-day (Weekday) Peak Hour**

Traffic on Kapiolani Boulevard is evenly distributed in the eastbound and westbound directions during the mid-day (weekday) peak hour. Table 2-4 shows the levels of service, critical v/c ratios, and average vehicle delays during the existing mid-day (weekday) peak hour.

Traffic entering the intersection of Kapiolani Boulevard and Kalakaua Avenue totals over 5,300 vph, or about 83 percent of the commuter peak hour volumes. Eastbound traffic on Kapiolani Boulevard queues back across the Atkinson Drive intersection during brief periods. Traffic on Atkinson Drive is also evenly distributed in the maukabound and makaibound directions. Traffic exiting Kahakai Drive experiences LOS E under unsignalized conditions.

| Table 2-3. Existing PM Peak Hour Capacity Analysis | | | |
|---|---|---|---|
| **Intersection** | **Level-of-Service** | **Volume-to-Capacity Ratio** | **Average Vehicle Delay (seconds)** |
| Kapiolani Boulevard and Kalakaua Avenue | C | 0.881 | 19.6 |
| Kapiolani Boulevard and Atkinson Drive | B | 0.702 | 14.6 |
| Atkinson Drive and Kahakai Drive/Kona Street | D* | — | — |
| Kahakai Loop and Kahakai Drive | A* | — | — |
| Kalakaua Avenue and Ala Wai Boulevard | B | 0.825 | 14.3 |
| Ala Moana Boulevard and Atkinson Drive | D | 0.821 | 36.7 |

*Note: Kahakai Drive and Kahakai Loop LOS under unsignalized conditions.
Ref.: The Traffic Management Consultant

| Table 2-4. Existing Mid-day (Weekday) Peak Hour Capacity Analysis | | | |
|---|---|---|---|
| **Intersection** | **Level-of- Service** | **Volume-to-Capacity Ratio** | **Average Vehicle Delay (seconds)** |
| Kapiolani Boulevard and Kalakaua Avenue | D | 0.962 | 28.8 |
| Kapiolani Boulevard and Atkinson Drive | B | 0.726 | 14.3 |
| Atkinson Drive and Kahakai Drive/Kona Street | E* | — | — |

*Note: Kahakai Drive LOS under unsignalized conditions.
Ref.: The Traffic Management Consultant

### d. Friday Evening Post-Commuter Peak Hour

Table 2-5 summarizes the existing Friday evening post-commuter peak hour levels of service, critical v/c ratios, and average vehicle delays for intersections in the study area.

Traffic entering the intersection of Kapiolani Boulevard and Kalakaua Avenue totals almost 5,400 vph, or about 84 percent of the commuter peak hour volumes. During brief periods, eastbound traffic on Kapiolani Boulevard queues back across the Atkinson Drive intersection. Traffic exiting Kahakai Drive experiences LOS E under unsignalized conditions.

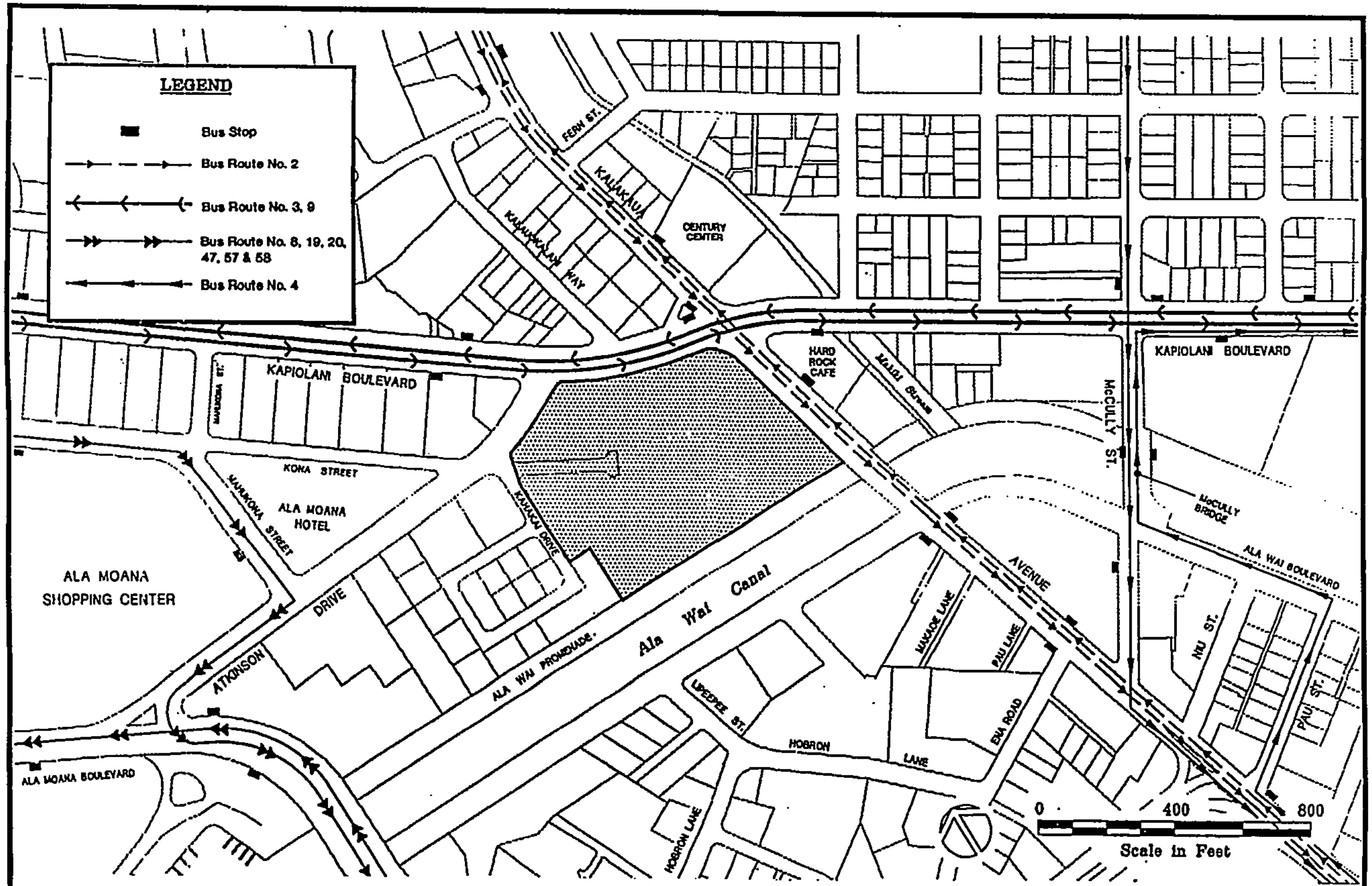
| Table 2-5. Existing Friday Evening Post-Commuter Peak Hour Capacity Analysis | | | |
|---|---|---|---|
| **Intersection** | **Level-of- Service** | **Volume-to-Capacity Ratio** | **Average Vehicle Delay (seconds)** |
| Kapiolani Boulevard and Kalakaua Avenue | C | 0.862 | 23.5 |
| Kapiolani Boulevard and Atkinson Drive | B | 0.807 | 14.2 |
| Atkinson Drive and Kahakai Drive/Kona Street | E* | — | — |
| Ala Moana Boulevard and Atkinson Drive | D | 0.768 | 33.8 |
| *Note: Kahakai Drive LOS under unsignalized conditions.<br>Ref.: The Traffic Management Consultant | | | |

## D. PUBLIC TRANSIT ACCESS

A number of TheBus trunk routes provide public transit access to the project site for use by future convention center employees and visitors (see Figure 2-5). TheBus service along Kalakaua Avenue is provided by Route 2, and along Kapiolani Boulevard by Routes 3 and 9. Also, TheBus urban trunk routes 8, 19, and 20, and many suburban trunk routes, provide service along Kona Street on the mauka side of Ala Moana Center, with the closest bus stop located on Mahukona Street at Atkinson Drive, one block makai of the project site. Further, TheBus route 4 provides service along McCully Street with the closest bus stops located on the McCully Street bridge Koko Head of the project site. Key features of the routes directly serving the site are as follows:

**Route 2 Waikiki-Liliha and Waikiki-School:** Route 2 provides service from Waikiki to Downtown Honolulu and to the Kalihi area, with service hours extending from 5:00 AM until 1:00 AM. Service frequency approximates 4 to 5 minutes between buses during weekday peak commute periods, 6 minutes mid-day and on weekends, and 10 to 15 minutes during late evening hours. During the weekday, there are a total of 28 buses on this route during the 7:00 AM to 9:00 AM peak period from Waikiki to the convention center area, and a total of 30 buses during the 3:00 PM to 5:00 PM peak period from the area of the convention center to Waikiki. In the Waikiki-bound direction, Route 2 travels through Waikiki via Kalakaua Avenue, Kuhio Avenue and to Kapahulu Avenue. The Downtown Honolulu-bound buses travel along Kuhio Avenue, continuing onto Kalakaua Avenue. The closest bus stops along Kalakaua Avenue are located on the mauka side of Kapiolani Boulevard and on the makai side of Ala Wai Boulevard for Waikiki-bound buses, and on the makai side of Ala Wai Boulevard and next to the Hard Rock Cafe opposite the project site for the Downtown Honolulu-bound buses.

**Route 3 Kaimuki-Pearl Harbor:** This trunk route provides service from Pearl Harbor through Kalihi and Downtown, along Kapiolani Boulevard and Date Street and then through the Kaimuki area, in both the eastbound and westbound directions. Service frequencies approximates 15 minutes between buses during the weekday commute hours, 20 minutes mid-day, and 30 minutes during the evening and weekends. Service hours are from 5:00 AM to 1:00 AM. During the weekday, there are eight Route 3 buses during the 7:00 AM to 9:00 AM peak traffic period in both directions, and nine buses travelling in the eastbound direction and eight buses in the westbound direction during the 3:00 PM to 5:00 PM peak period. The closest bus stops are located on Kapiolani Boulevard on the ewa side of Kalakaua Avenue opposite the project site for ewabound buses, and on the ewa side of Atkinson Drive for Koko Head-bound buses.




TRAFFIC IMPACT ANALYSIS REPORT

HAWAI'I CONVENTION CENTER

Fig. 2-5
THEBUS ROUTES

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**Route 4 Nuuanu/Punahou:** Route 4 provides service from Nuuanu Valley to the University area and continues toward Waikiki via Kapiolani Boulevard, McCully Street, Ala Wai Boulevard, Kalakaua Avenue, and Kuhio Avenue. Service is provided from 5:00 AM until 12:00 AM. Service frequency is about 10 minutes between buses. During the weekday, a total of 12 Route 4 buses operate during the 7:00 AM to 9:00 AM peak period from Waikiki to the convention center area, and a total of eight buses during the 3:00 PM to 5:00 PM peak period from the convention center area to Waikiki. The closest bus stops are on Kalakaua Avenue makai of Ala Wai Boulevard for Waikiki-bound buses, and on McCully Street between Kapiolani and Ala Wai Boulevards for Nuuanu-bound buses.

**Route 8 Waikiki/Ala Moana:** Route 8 provides service between Waikiki and Ala Moana Center. The Waikiki-bound route begins at Ala Moana Center on Mahukona Street, continuing along Atkinson Drive, Ala Moana Boulevard, Kalia Road, Saratoga Road, and onto Kuhio Avenue to Kapahulu Avenue. Route 8 returns to Ala Moana Center in the opposite direction, except it travels on Ala Moana Boulevard, Atkinson Drive, Piikoi Street, and onto Kona Street. Service hours are from 7:00 AM to 10:30 PM, with service frequency approximately 10 minutes between buses. During the weekday, 11 buses (including four articulated buses) operate during the 7:00 AM to 9:00 AM peak period from Waikiki to the convention center area, and 12 buses (including four articulated buses) operate during the 3:00 PM to 5:00 PM peak period from the convention center area to Waikiki. The bus stop closest to the convention center is located makai on Mahukona Street near Atkinson Drive.

**Route 9 Palolo Valley:** Route 9 provides service between the Palolo Valley area and Downtown Honolulu via Waialae Avenue and Kapiolani Boulevard. Service frequencies are approximately 15 to 25 minutes between buses during weekday commute hours, 30 minutes mid-day, and 40 minutes in evenings and on weekends. Service is provided from about 5:30 AM until 11:00 PM. During the 7:00 AM to 9:00 AM weekday peak period, a total of eight buses travel in the westbound direction and five buses in the eastbound direction. During the 3:00 PM to 5:00 PM weekday peak period, six buses travel in the eastbound direction and seven buses in the westbound direction. Route 9 stops at the same bus stops as Route 3.

**Route 19 Waikiki/Airport and Hickam:** This trunk route provides service between Hickam and Waikiki. Waikiki-bound, Route 19 follows the same route as Route 8. In the Airport-bound direction, Route 19 also follows Route 8, except it bypasses Ala Moana Center and continues toward Downtown Honolulu via Ala Moana Boulevard. Service hours are from 5:00 AM to 1:00 AM. A total of five buses operate during the 7:00 AM to 9:00 AM weekday peak period from Waikiki to the convention center area, with service frequency about 24 minutes between buses. During the 3:00 PM to 5:00 PM weekday peak period, a total of three buses operate from the convention center area to Waikiki, with service frequency about 40 minutes between buses. The closest bus stops are located on Ala Moana Boulevard near Atkinson Drive for Airport-bound buses, and on Mahukona Street near Atkinson Drive for Waikiki-bound buses.

**Route 20 Waikiki/Pearlridge:** Route 20 provides service between Pearlridge (Aiea) and Waikiki, basically following the same route as Route 19, except it does not enter Ala Moana Center in the Waikiki-bound direction. Service hours are from 5:00 AM to 7:00 PM. During the 7:00 AM to 9:00 AM weekday peak period, service frequency is about 30 minutes between buses with a total of four buses operating from Waikiki to the convention center area. During the 3:00 PM to 5:00 PM weekday peak period, service frequency is about 40 minutes between buses, with a total of three buses operating from the convention center area to Waikiki. The closest bus stops are located on both sides of Ala Moana Boulevard near Atkinson Drive.

**Route 47 Waikiki/Honolulu and Waipahu:** Route 47 provides service between Waikiki and Waipahu, with service hours from 5:00 AM to 1:00 PM. In the vicinity of the convention center site, Route 47 follows Route 20 to and from Waikiki. During the 7:00 AM to 9:00 AM weekday peak period, service frequency is about 24 minutes between buses, with a total of five buses operating from Waikiki to the convention center area. During the 3:00 PM to 5:00 PM weekday peak period, service frequency is about 30 minutes between buses, with a total of four buses operating between the convention center area and Waikiki. The bus stops closest to the convention center are located along both sides of Ala Moana Boulevard near Atkinson Drive.

**Route 57/58 Kailua-Waimanalo-Sea Life Park-Waikiki-Honolulu:** Route 57/58 provides service between Waikiki and Ala Moana Center, following Route 8. Service hours are 6:30 AM to 8:00 PM. Service frequency is about 30 minutes between buses, with a total of four buses operating during the 7:00 AM to 9:00 AM weekday peak period from Waikiki to the convention center area. A total of eight buses operate during the 3:00 PM to 5:00 PM weekday peak period. The bus stop closest to the convention center is located on Mahukona Street at Atkinson Drive.

**Other TheBus Commuter Routes:** A number of other commuter routes stop at Ala Moana Center, with service frequencies ranging between 15 to 30 minutes. These routes include the following: Route 5 Ala Moana/Manoa; Route 6 Pauoa/Woodlawn, Route 11 Honolulu/Aiea Heights; Route 12 Honolulu/Salt Lake; Route 17 Makiki/Ala Moana Center; Route 18 University/Ala Moana Center; Route 49 Honolulu/Ewa Beach; Route 50 Makakilo/Village Park and Honolulu; Route 51 Honolulu/Makaha; Route 52/55 Honolulu/Wahiawa Heights, Kaneohe and Kaneohe/Kahaluu; Route 52/55/88A Wahiawa/Circle Island, Kaneohe/Circle Island, North Shore Express; Route 53 Honolulu/Pacific Palisades; Route 54 Honolulu/Pearl City; and Route 56 Honolulu/Kailua/Kaneohe/Kalihi.

**Existing Transit Capacity:** The Kalakaua Avenue/Kapiolani Boulevard intersection is a major transfer point between Routes 2, 3 and 9, particularly for persons working in Waikiki and for Washington Intermediate School students. Route 2 is heavily patronized with standing loads common both into and out of Waikiki during the morning and afternoon commute hours. Routes 3 and 9 are also heavily used with seated loads and some standees typical during the morning and afternoon commute periods.

Table 2-6 summarizes the existing transit capacity on TheBus routes between Waikiki and the convention center site.

**Table 2-6. The Bus Existing Transit Capacity**

| Rte No. | Description | AM Peak Period: No. of Vehicles | AM Peak Period: Avg. Crush Load | AM Peak Period: Avg. Hrly. Capacity | PM Peak Period: No. of Vehicles | PM Peak Period: Avg. Crush Load | PM Peak Period: Avg. Hrly. Capacity |
|---|---|---|---|---|---|---|---|
| 2 | Waikiki | 28 | 80 | 1,120 | 30 | 80 | 1,200 |
| 4 | Nuuanu | 12 | 80 | 480 | 8 | 80 | 320 |
| 8 | Ala Moana | 11 | 90 | 495 | 12 | 90 | 540 |
| 19 | Airport | 5 | 80 | 200 | 3 | 80 | 120 |
| 20 | Pearlridge | 4 | 80 | 160 | 3 | 80 | 120 |
| 47 | Waipahu | 5 | 80 | 200 | 4 | 80 | 160 |
| 57/58 | Kailua | 4 | 80 | 160 | 5 | 80 | 400 |
| Totals | | 69 | | 2,815 | 65 | | 2,660 |

## E. PEDESTRIAN ACTIVITY

Present sidewalks in the project area are typically four feet in width with some sections up to 10 feet in width. Pedestrian activity in the area is very light with the most activity related to bus patrons transferring between bus routes at the Kalakaua Avenue/Kapiolani Boulevard intersection. Pedestrian traffic at the intersection of Ala Moana Boulevard and Atkinson Drive results from visitors walking between Waikiki and Ala Moana Center, and beach-goers walking to and from Ala Moana Park. Other sources of pedestrian activity are recreational/exercise walkers/runners and Hard Rock Cafe patrons. Current activity levels on sidewalks and crosswalks in the area typically range between 30 and 100 pedestrians per hour.

## 3. 1998 TRAFFIC CONDITIONS WITHOUT THE CONVENTION CENTER

Future traffic volumes were estimated for 1998 without development of the convention center project at the former Aloha Motors site. The year 1998 is used for this analysis since the convention center is anticipated to be completed and available for convention usage by early that year. The 1998 traffic volumes and conditions without the project provide a "baseline" condition from which to identify the location and magnitude of traffic impacts which are likely to result from the development of the convention center.

The analysis of the baseline conditions without the convention center project assumes that the former Aloha Motors site remains undeveloped (vacant) in 1998.

### A. ASSUMPTIONS REGARDING TRAFFIC GROWTH

The basis of forecasted growth in peak hour traffic without the convention center project is set forth in the WSA/TIA.

The *Waikiki Regional Traffic Study*[1] prepared a subarea model to forecast traffic increases for Waikiki and the surrounding area as part of the Waikiki Master Plan Study. The traffic model addressed travel increases within an area generally bounded by Pensacola Street, the H-1 Freeway, and Kapahulu Avenue. Based on City land use data and socio-economic projections for the year 2010, the model estimated traffic growth of about 17 percent within the area by 2010. On an annualized basis, the Waikiki study anticipated traffic growth of 1.0 to 1.5 percent each year.

For the purposes of the EIS TIAR, an annual traffic growth rate of 1.5 percent per year has been assumed through 1998 for peak traffic hours, mid-day and Friday evening traffic. This increase has been uniformly factored against all existing traffic volumes within the project vicinity.

Also, future traffic for the Waikiki Landmark project has been added to the background traffic growth area roadways. Construction of this development has been completed, but the condominium units have not yet been occupied. This project has been added on an individual basis since its traffic would utilize the section of Kalakaua Avenue adjacent to the convention center project. (The number and distributions of vehicle trips outlined in the *Waikiki Landmark Draft Environmental Impact Statement*[2] were used to assign that project's traffic to the area roadways.)

A number of other development projects could potentially occur within the adjacent area within the same general time frame as the convention center project. The potential project which could most directly affect traffic conditions near the convention center would be the development of the former Veterans of Foreign Wars (VFW) site opposite Kalakaua Avenue from the project site, and the former Unocal service station site and City impound lot for towed vehicles on the mauka side of Kapiolani Boulevard in the block Koko Head of the project site. Development of these parcels assuming specific land uses is not included in the 1998 forecasts since the composition and timing of the project is not known at the time of this study, although the timing will most likely be after 1998. The 1.5 percent annual traffic growth rate factored into the TIAR analysis accounts for this.

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[1] *Waikiki Regional Traffic Study*, prepared for City and County of Honolulu by Cambridge Systematics, Inc., October 1993.

[2] *Waikiki Landmark Draft Environmental Impact Statement*, prepared for Bel-Landmark, Inc. by DHM Planners, Inc., March 1989.

## B. ROADWAY PROJECTS

No roadway modifications are included in the analysis of 1998 conditions without the convention center project. The Waikiki Master Plan proposes that sections of Kalakaua Avenue and Ala Moana Boulevard across the Ala Wai Canal be converted to a one-way street couplet, which would have a major effect upon traffic patterns and conditions in the convention center area. The general effects of the one-way couplet are discussed in Chapter 5.

## C. 1998 TRAFFIC CONDITIONS

### 1. AM Peak Hour

Under existing roadway conditions, the 1998 AM peak hour traffic without project results in an overall increase in congestion and travel delays. The intersection of Kapiolani Boulevard and Kalakaua Avenue operates at LOS E and at a v/c of 1.074; i.e., the projected traffic demands exceed the intersection's carrying capacity. Figure 3-1 shows the 1998 AM peak hour traffic without project. Table 3-1 summarizes the levels of service, critical v/c ratios, and average delays during the 1998 AM peak hour without project.

### b. PM Peak Hour

Similarly, the 1998 PM peak hour traffic without project also results in an overall increase in congestion and travel delays. Figure 3-2 shows the 1998 PM peak hour traffic without project. Table 3-2 summarizes the 1998 PM peak hour levels of service, critical v/c ratios, and average vehicle delays.

### c. Mid-day (Weekday) Peak Hour

During the 1998 mid-day (weekday) peak hour without project, the intersection of Kapiolani Boulevard and Kalakaua Avenue operates at LOS D and at a v/c of 1.02; i.e., the projected traffic demands exceed the theoretical capacity by 2 percent. Figure 3-3 shows the 1998 mid-day (weekday) traffic without project. Table 3-3 summarizes the levels of service, critical v/c ratios, and average vehicle delays during the 1998 mid-day (weekday) peak hour without project.

### d. Friday Evening Post-Commuter Peak Hour

The 1998 Friday evening post-commuter peak hour traffic without project results in an overall increase in congestion and travel delays. Figure 3-4 shows the 1998 Friday evening post-commuter peak hour traffic without project. Table 3-4 summarizes the levels of service, critical v/c ratios, and average vehicle delays.

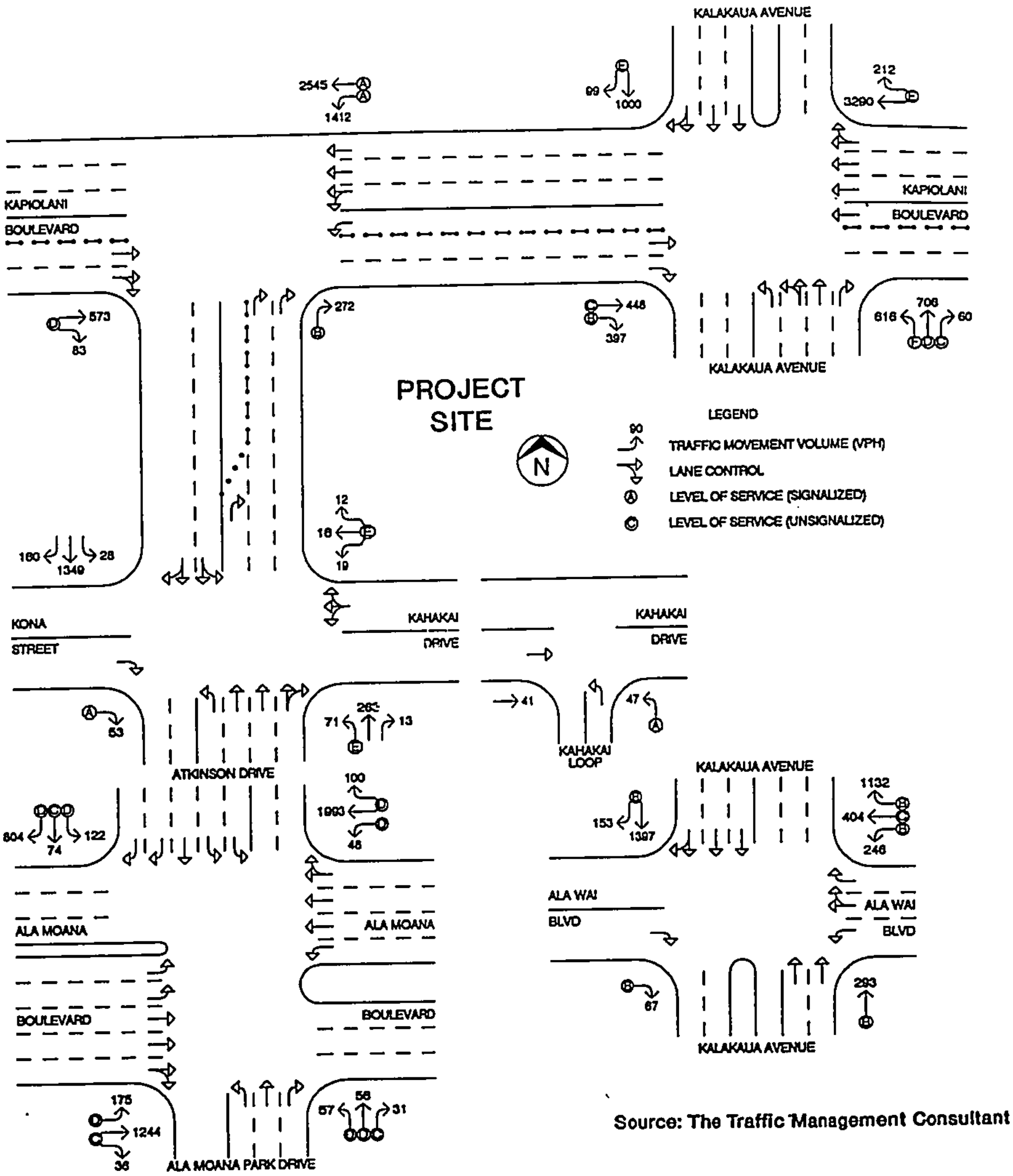


Fig. 3-1
1998 AM PEAK HOUR TRAFFIC WITHOUT PROJECT

| | |
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| Table 3-1. 1998 AM Peak Hour Capacity Analysis Without Project | | | |
|---|---|---|---|
| **Intersection** | **Level-of- Service** | **Volume-to-Capacity Ratio** | **Average Vehicle Delay (seconds)** |
| Kapiolani Boulevard and Kalakaua Avenue | E | 1.074 | 53.8 |
| Kapiolani Boulevard and Atkinson Drive | B | 0.843 | 6.0 |
| Atkinson Drive and Kahakai Drive/Kona Street | E* | --- | --- |
| Kahakai Loop and Kahakai Drive | A* | --- | --- |
| Kalakaua Avenue and Ala Wai Boulevard | B | 0.801 | 14.0 |
| Ala Moana Boulevard and Atkinson Drive | C | 0.869 | 24.8 |
| *Note: Kahakai Drive and Kahakai Loop LOS under unsignalized conditions.<br>Ref.: The Traffic Management Consultant | | | |

| Table 3-2. 1998 PM Peak Hour Capacity Analysis Without Project | | | |
|---|---|---|---|
| **Intersection** | **Level-of- Service** | **Volume-to-Capacity Ratio** | **Average Vehicle Delay (seconds)** |
| Kapiolani Boulevard and Kalakaua Avenue | C | 0.952 | 22.5 |
| Kapiolani Boulevard and Atkinson Drive | C | 0.759 | 15.7 |
| Atkinson Drive and Kahakai Drive/Kona Street | E* | --- | --- |
| Kahakai Loop and Kahakai Drive | A* | --- | --- |
| Kalakaua Avenue and Ala Wai Boulevard | C | 0.897 | 16.3 |
| Ala Moana Boulevard and Atkinson Drive | D | 0.873 | 38.0 |
| *Note: Kahakai Drive and Kahakai Loop LOS under unsignalized conditions.<br>Ref.: The Traffic Management Consultant | | | |

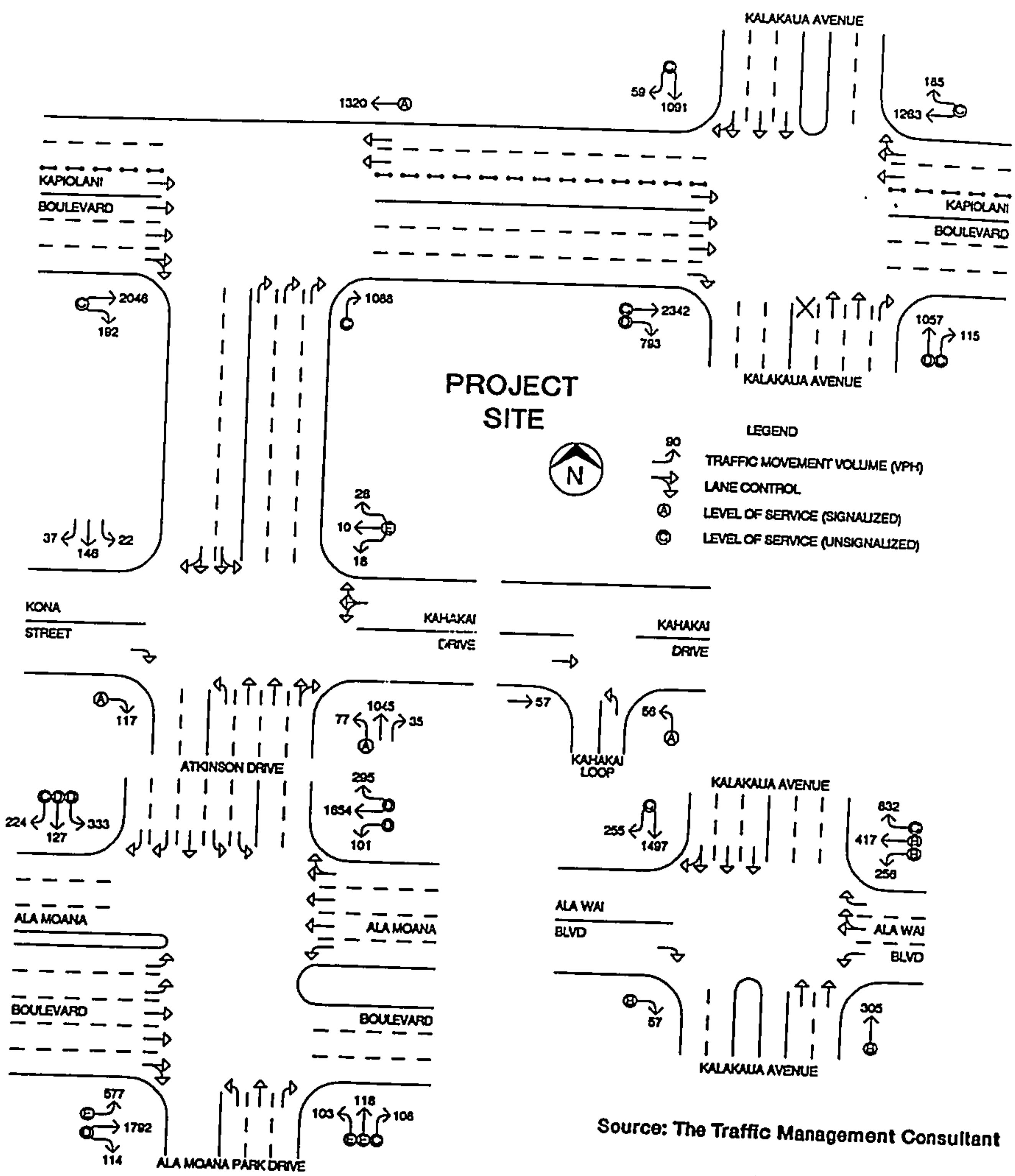
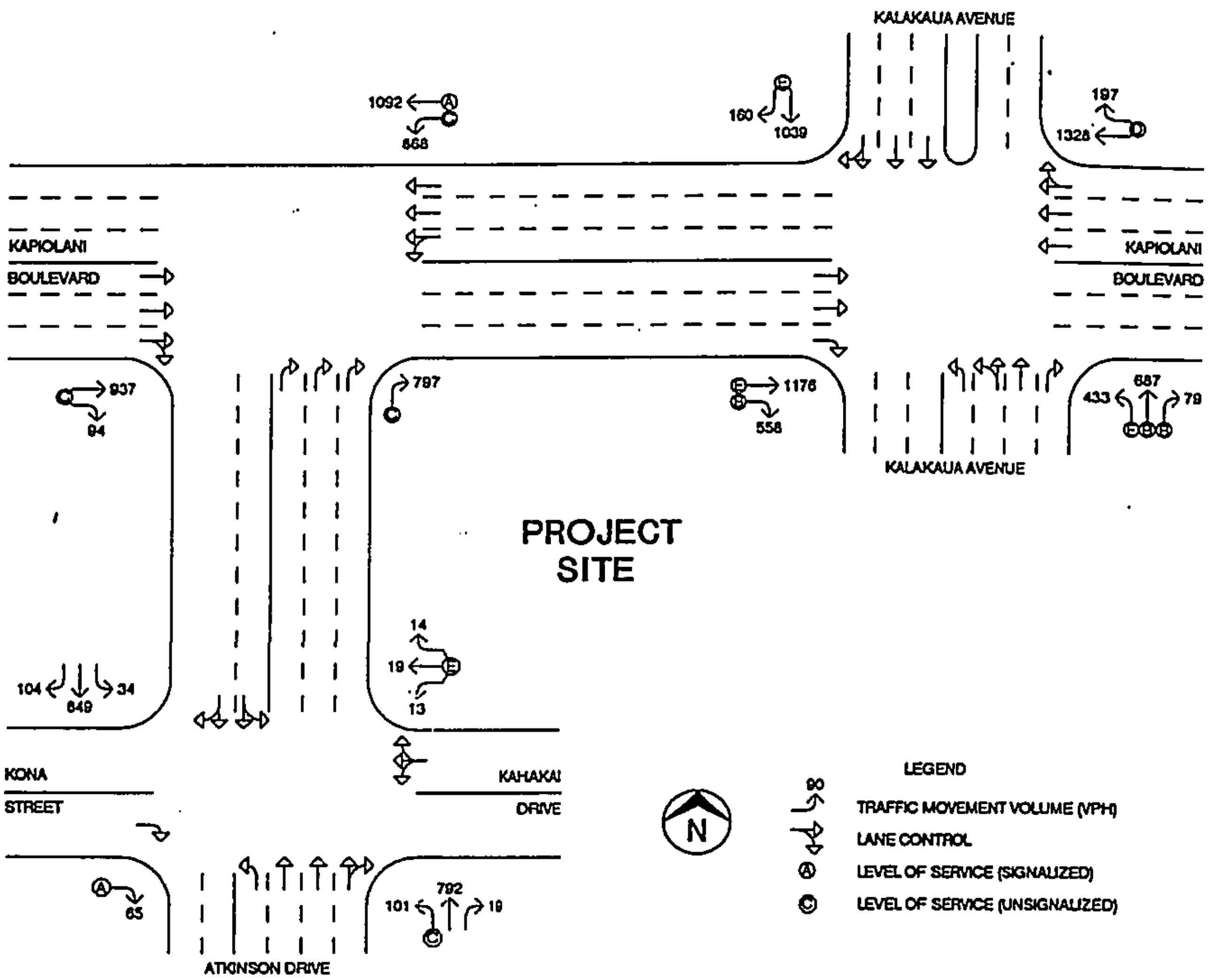



Fig. 3-2
1998 PM PEAK HOUR TRAFFIC WITHOUT PROJECT

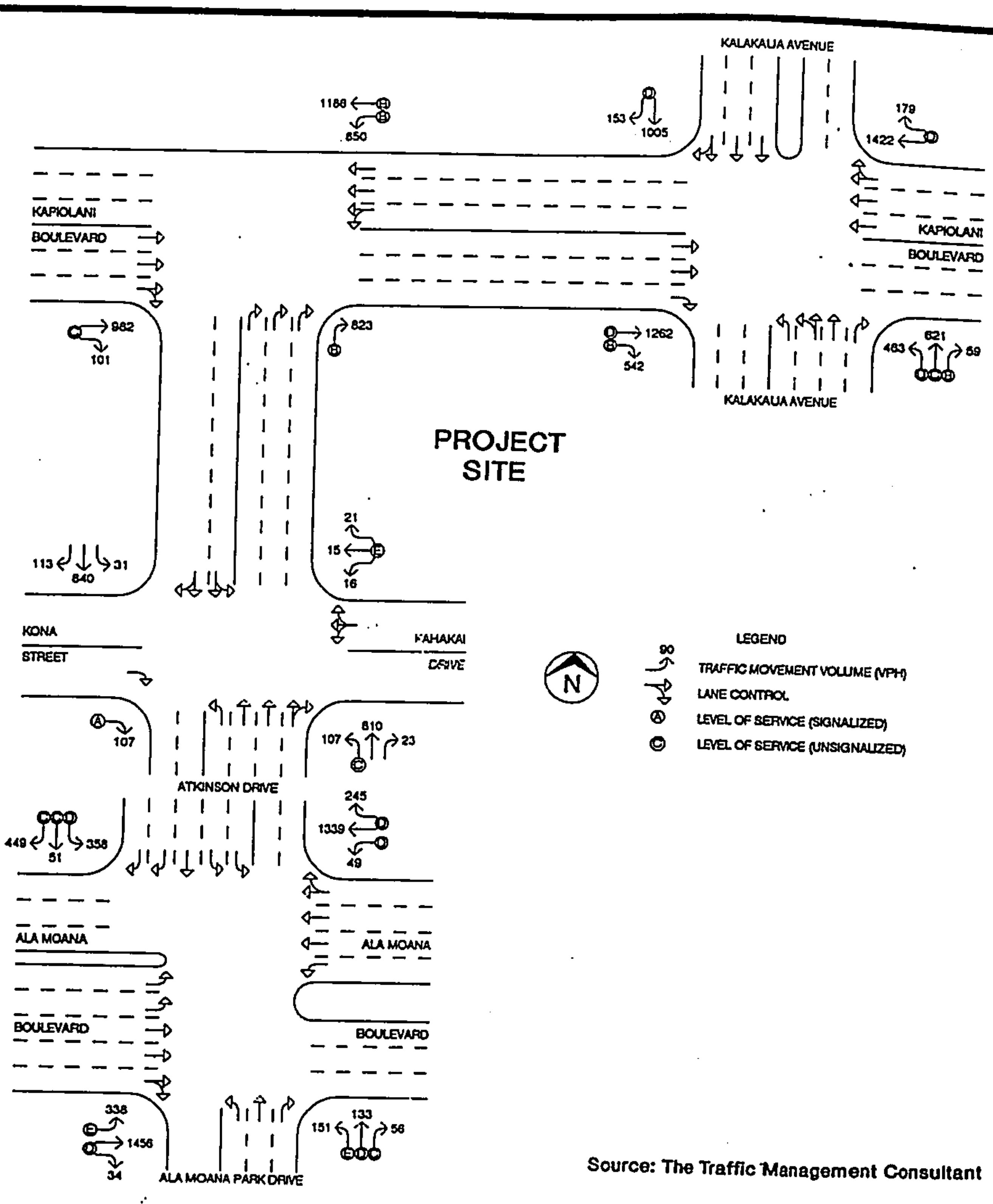



Source: The Traffic Management Consultant

Fig. 3-3
1998 MID-DAY (WEEKDAY) PEAK HOUR TRAFFIC WITHOUT PROJECT

| Table 3-3. 1998 Mid-day (Weekday) Peak Hour Capacity Analysis Without Project | | | |
|---|---|---|---|
| **Intersection** | **Level-of- Service** | **Volume-to-Capacity Ratio** | **Average Vehicle Delay (seconds)** |
| Kapiolani Boulevard and Kalakaua Avenue | D | 1.02 | 37.9 |
| Kapiolani Boulevard and Atkinson Drive | B | 0.806 | 14.7 |
| Atkinson Drive and Kahakai Drive/Kona Street | E* | — | — |
| *Note: Kahakai Drive LOS under unsignalized conditions.<br>Ref.: The Traffic Management Consultant | | | |

| Table 3-4. 1998 Friday Evening Post-Commuter Peak Hour Capacity Analysis Without Project | | | |
|---|---|---|---|
| **Intersection** | **Level-of- Service** | **Volume-to-Capacity Ratio** | **Average Vehicle Delay (seconds)** |
| Kapiolani Boulevard and Kalakaua Avenue | D | 0.935 | 27.2 |
| Kapiolani Boulevard and Atkinson Drive | B | 0.890 | 14.2 |
| Atkinson Drive and Kahakai Drive/Kona Street | E* | — | — |
| Ala Moana Boulevard and Atkinson Drive | D | 0.816 | 34.6 |
| *Note: Kahakai Drive LOS under unsignalized conditions.<br>Ref.: The Traffic Management Consultant | | | |




Source: The Traffic Management Consultant

Fig. 3-4

1998 FRIDAY EVENING POST-COMMUTER TRAFFIC WITHOUT PROJECT

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## 4. ANALYSIS OF PROJECT IMPACTS ON 1998 TRAVEL CONDITIONS

The analysis of the convention center impacts upon the transportation system is focused on the area which is within the immediate vicinity of the Center and which will be most directly affected by the facility. The analysis encompasses roadway traffic conditions, private shuttle bus transportation, trucks and deliveries, project and off-site parking, public transportation, and pedestrian access. The analysis reflects the following principal assumptions:

- The analysis year is 1998, the first full year of operations for the convention center. To obtain a conservative basis for the purpose of analyzing transportation impacts, the TIAR assumes the convention center to hold the same size events as would be in its stabilized years.

- The analysis is based on the existing transportation system street patterns, roadway widths, pedestrian facilities, etc., and with proposed mitigating actions.

- The analysis is conducted for five (5) different event scenarios relative to events at the convention center:

  1. Analysis of the weekday morning and afternoon peak traffic hour based on a national or international convention, or combination of conventions, with 10,000 attendees. Single or combined conventions of this size are likely to occur no more than 20 days per year, and thus this size represents a reasonable "typical large recurring event" to use as a basis for identifying potential transportation impacts and mitigative actions.

  2. Analysis of the weekday morning and afternoon peak traffic hour based on a national or international convention, or combination of conventions, with 14,000 attendees. This analysis is used to represent a "worst-case" traffic situation as a basis for identifying potential transportation impacts and mitigative measures. *This attendance level may be reached or exceeded once every three years.*

  3. Analysis of the mid-day (weekday) peak traffic hour for a 14,000-person convention. The period of traffic analysis occurs between 1:00 PM to 2:00 PM. This analysis is used to examine the effects of the absence of the contra-flow lane coning operations along Kapiolani Boulevard, and the turn restrictions at the Kapiolani Boulevard intersections with Kalakaua Avenue and Atkinson Drive.

  4. Analysis based on a 3,000-person function hosted by a national convention on a Friday evening following the afternoon commuter peak period. The period of traffic analysis occurs between 6:30 PM to 7:30 PM. The analysis examines the affects of an early Friday evening, when the residual afternoon commuter peak period traffic overlaps visitor and resident traffic entering Waikiki.

  5. Analysis based on an all-local event with 1,800 attendees held on a Friday evening following the afternoon commuter peak period. The period of traffic analysis occurs between 6:30 PM to 7:30 PM. The intent is to analyze the maximum size event at the convention center that could be accommodated by the number of on-site parking stalls. Larger events would require use of existing off-site parking and require that attendees be shuttled by buses to and from the convention center.

### A. PROJECT DESCRIPTION

The proposed convention center project will consist of approximately 1,106,670 square feet (SF) of facility areas, of which the main areas include approximately 200,000 SF of exhibition hall, 100,000 SF of meeting rooms, a 35,000-SF ballroom, a lobby and adjacent entry drive area, an approximately 800-stall parking garage, a loading dock area, and various support and administrative facilities. A site plan of the proposed convention center is depicted on Figure 4-1, showing key features of the facility.

**Project Site Access**

Site access for the proposed convention center is separated into four components. The site access effectively separates different types of traffic to minimize conflicts between vehicle types and modes of transportation. Furthermore, it distributes the convention center traffic onto all three of the major roadways surrounding the site.

The main entrance to the convention center is located on the corner of Kapiolani Boulevard and Atkinson Drive and accommodates vehicular passenger drop-off/pick-up and general pedestrian access leading to the lobby. Vehicular access to the parking garage is provided by two ramps on Kahakai Street and a reversible ramp on Kalakaua Avenue. Access to the loading dock is located on Kahakai Street at an access separate from the parking garage ramps. A major pedestrian access to the convention center is located along the Ala Wai Promenade.

<u>Main Entrance Access</u>

The main entrance to the convention center is located on the corner of Kapiolani Boulevard and Atkinson Drive and is intended for use as a vehicular drop-off/pick-up area for passengers and general pedestrian access leading to the lobby. The three-lane entry drive in front of the lobby is the primary arrival and departure point for delegates using shuttle buses and taxis. All vehicles would enter via right-turn from Atkinson Drive and exit onto Kapiolani Boulevard as traffic conditions permit. The left-turn movement from makaibound Atkinson Drive into the main entry drive would not be permitted. The three lanes within the main entry drive include an approximately 150-foot long left lane which could accommodate approximately six (6) taxis or vehicles for passenger drop-off/pick-up lanes within the main entry drive for passenger drop-off/pick-up; an approximately 335-foot long lane curbside of the lobby to accommodate up to six (6) full-size shuttle buses; and a middle lane for passing and maneuvering into and out of the two curb lanes. The portion of Atkinson Drive fronting the project site will be widened by 10 feet to accommodate two (2) full-size shuttle bus berths for larger events. Another passenger drop-off/pick-up area for taxis and private and rental vehicles will be provided within the parking garage of the convention center.

<u>Parking Garage</u>

The primary parking garage access is located on Kahakai Drive and a secondary access is located on Kalakaua Avenue (see Figure 4-2). The traffic flow to and from the convention center parking garage would generally be inbound during the AM peak traffic hour and outbound during the PM peak traffic hour. Taxi and private vehicle drop-off/pick-ups can be accommodated within the approximately 800-stall parking garage.

The entry and exit ramps on Kahakai Drive are one-way, single-lane spiral ramps. The entry ramp is located further in Kahakai Drive than the exit ramp to maximize the distance available for queue storage within the facility. Furthermore, the gate control/parking attendant stations are located at the top of the entry ramp, providing about 225 feet of queue storage without blocking Atkinson Drive. If necessary for large events, the flow of traffic on the entry ramp can be reversed to accommodate exiting traffic after a major event.

The Kalakaua Avenue ramp is a single-lane, reversible direction ramp which would operate as an entrance ramp most times and can be used as an exit ramp during peak exiting periods. The ramp could be restricted to right-turn in during the entry operation and right-turn out during the exit operation. The entry ramp operation provides easy access from the H-1 Freeway by way of Punahou Street and Kalakaua Avenue. The exit ramp operation facilitates quick egress toward Waikiki.

<u>Truck Loading Dock Access</u>

Truck access to the loading dock facility is provided on Kahakai Drive, with a right-turn in and right-turn out driveway on Kalakaua Avenue (see Figure 4-3). The loading dock includes provisions for a turnaround area, thus minimizing potential queuing of service vehicles back onto the streets. To adequately accommodate

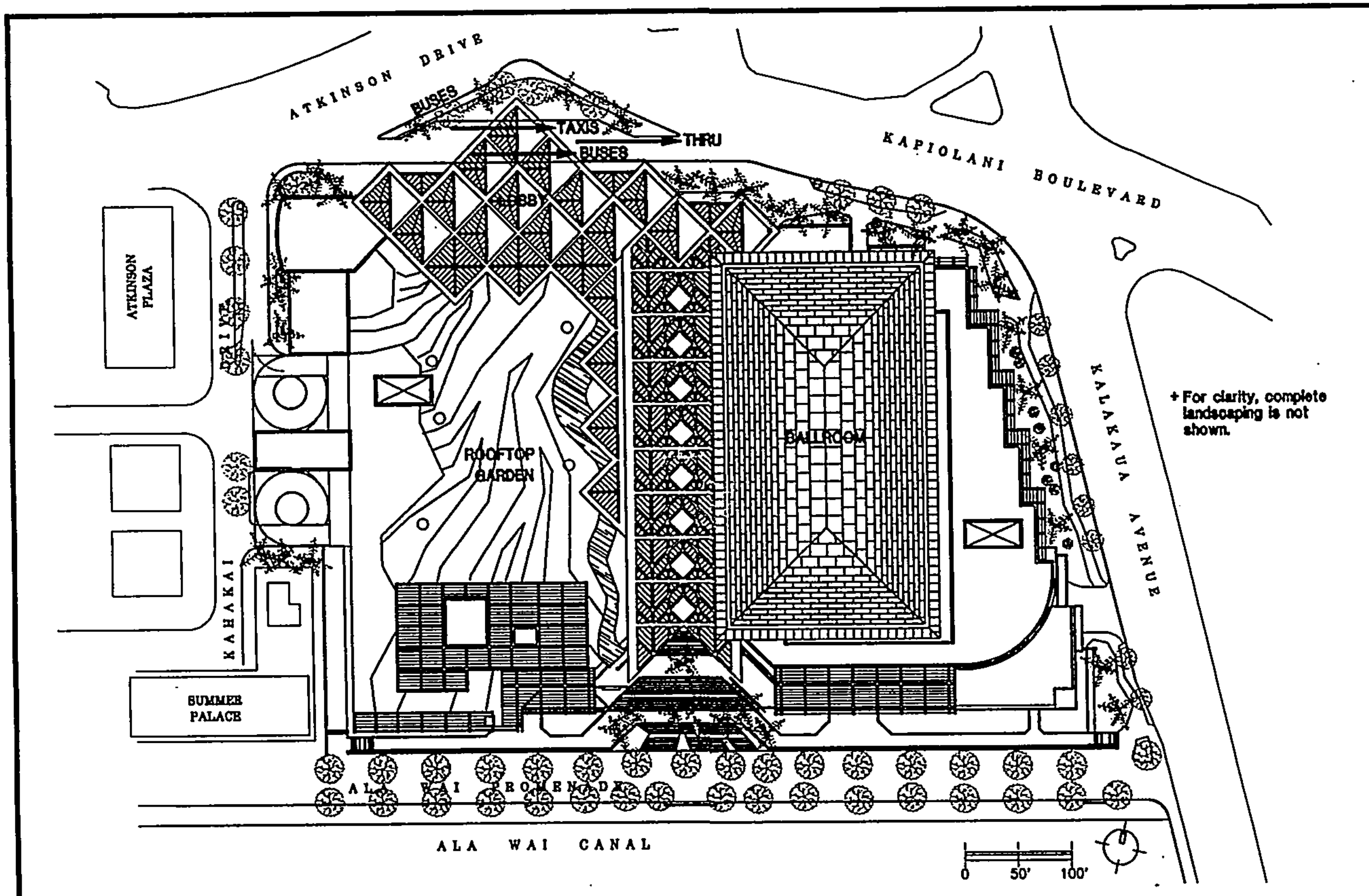


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Fig. 4-1

SITE PLAN

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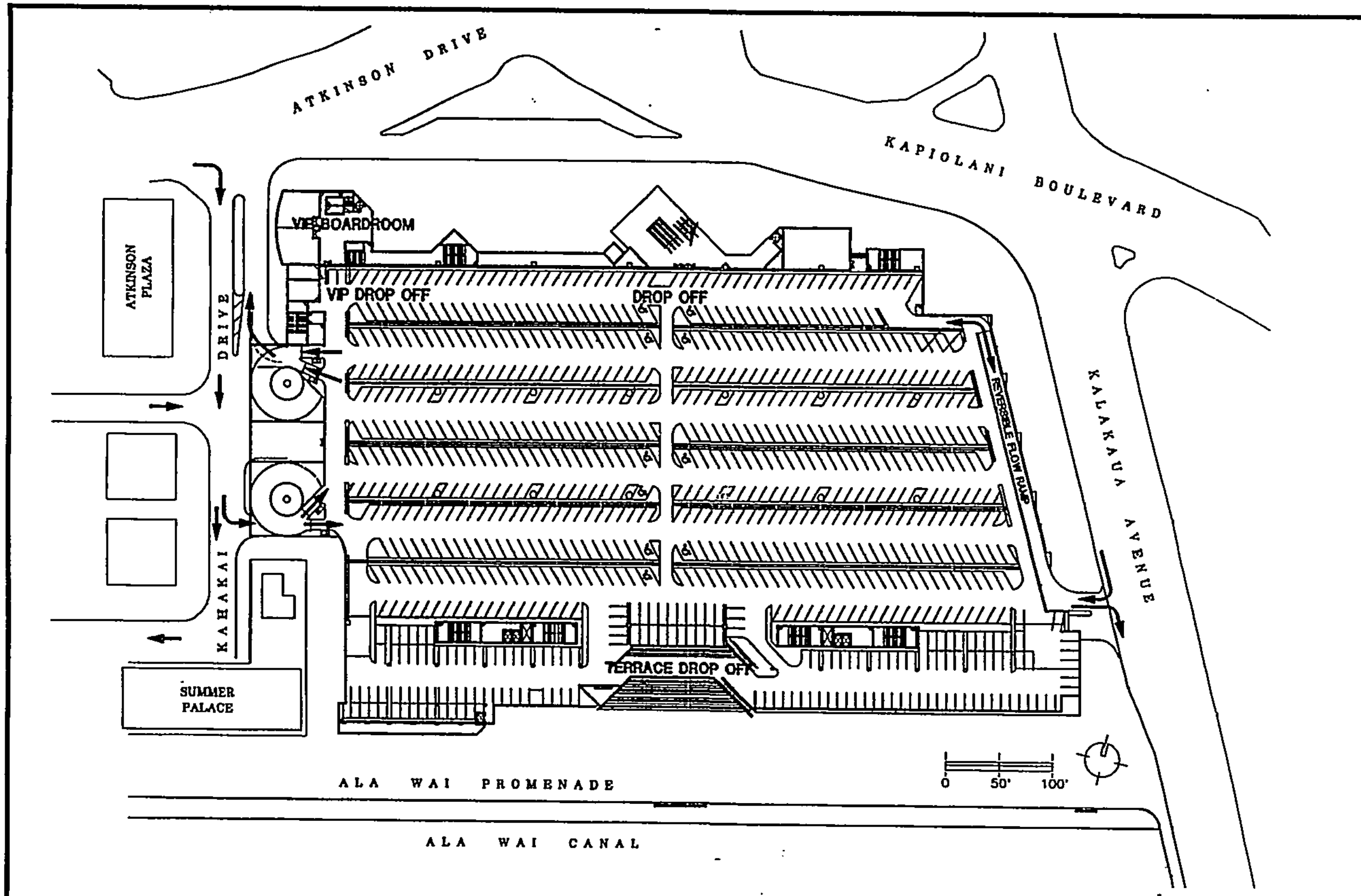


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Fig. 4-2
PARKING GARAGE
ACCESS SITE PLAN

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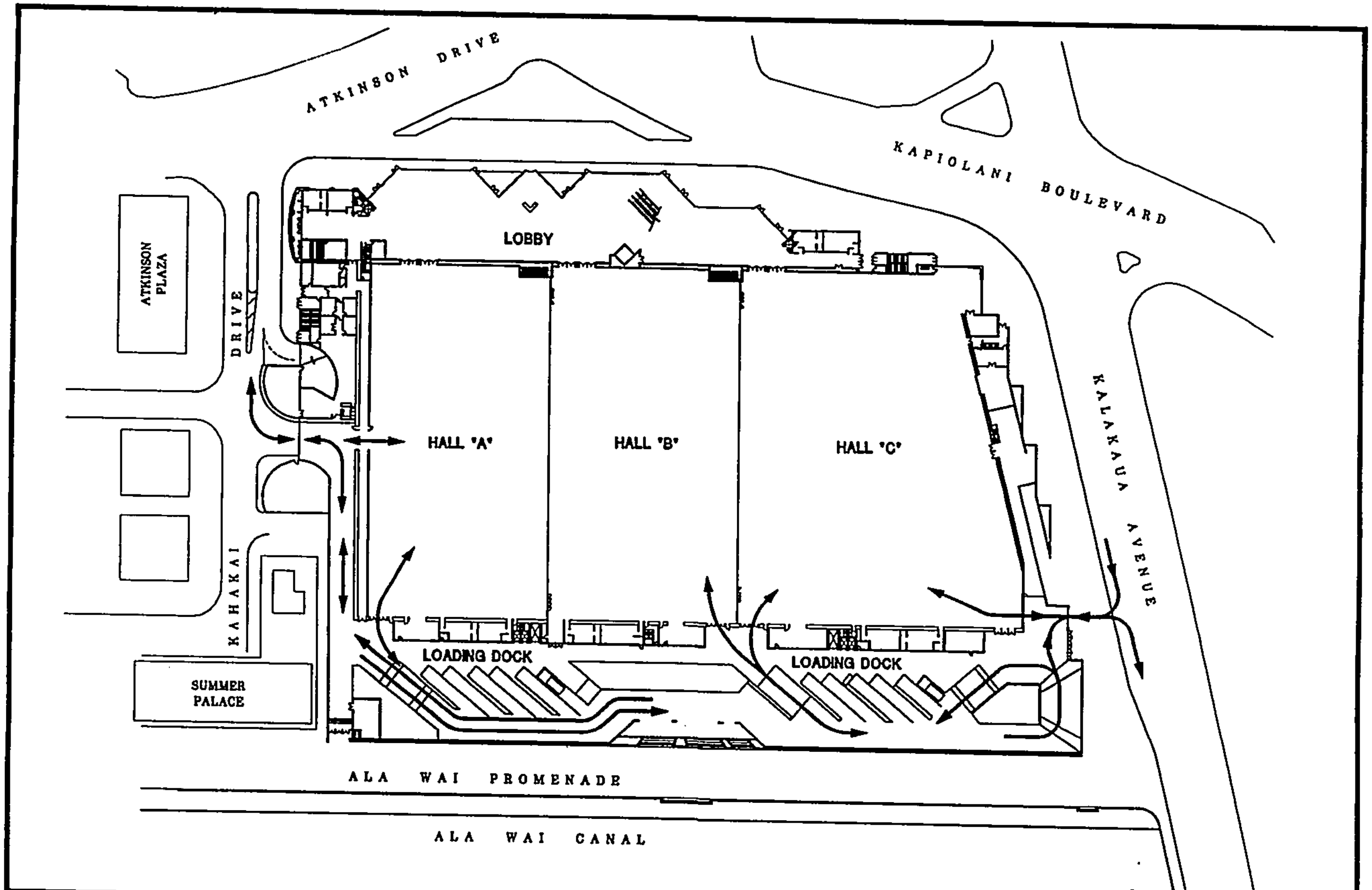



| | | |
|---|---|---|
| TRAFFIC IMPACT ANALYSIS REPORT<br><br>HAWAI'I CONVENTION CENTER | Fig. 4-3<br>TRUCK LOADING DOCK<br>ACCESS SITE PLAN | WILSON OKAMOTO & ASSOCIATES, INC.<br>and<br>THE TRAFFIC MANAGEMENT CONSULTANT |

required servicing, approximately twelve (12) loading docks are distributed along the exhibit hall for easy access to the hall.

The Kahakai Drive truck access is located between the parking garage entry and exit ramps. The truck access driveway on Kahakai Drive, the intersection of Atkinson Drive and Kahakai Drive, and the truck access on Kalakaua Avenue will be designed for semi-trailer truck turning movements to ensure accommodation of larger vehicles. The Kahakai Drive truck access also provides direct vehicle ingress to the exhibit hall. The Kalakaua Avenue driveway services the vehicle exit from the hall.

For larger conventions or events, the truck loading dock may also be used as a staging area for up to approximately 20 shuttle buses awaiting passenger pick-up to minimize queuing in the main entry driveway area.

Pedestrian Access

Pedestrian access is provided at the lobby entrance on the corner of Kapiolani Boulevard and Atkinson Drive, with a pedestrian-only access along the Ala Wai Promenade. The Promenade access reduces the Waikiki pedestrian traffic walking to and from the convention center along Kalakaua Avenue to Kapiolani Boulevard. Waikiki pedestrian traffic is expected to cross the Ala Wai Canal via the Ala Moana Boulevard bridge and the Kalakaua Avenue bridge and walk to the convention center along the Ala Wai Promenade.

**Proposed Roadway Improvements With the Project**

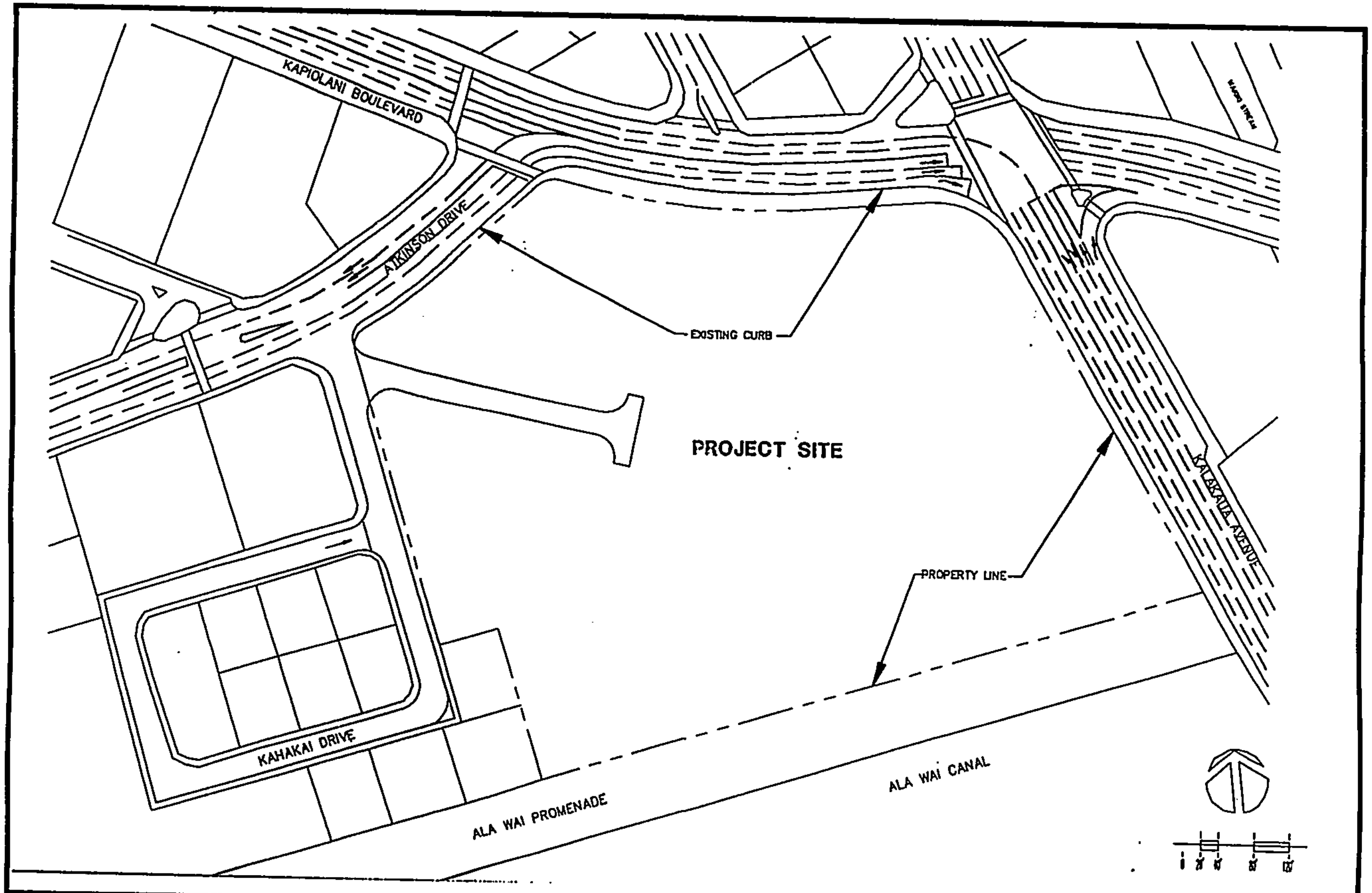
A number of roadway improvements to the existing street system will be constructed as part of this project (see Figures 4-4 and 4-5). These improvements include the following:

1. Kapiolani Boulevard will be widened by 10 feet along the project frontage to provide an additional right-turn only lane in the eastbound direction. The existing eastbound curb lane will be converted to an optional through/right-turn lane.

2. Kalakaua Avenue will be widened by 12 feet along the project frontage from Kapiolani Boulevard to the Ala Wai Canal bridge to provide an additional 10-foot wide makaibound lane for use as a bus stop and a right-turn lane into the Center's Kalakaua Avenue parking ramp. Also, the maukabound lanes on Kalakaua Avenue at Kapiolani Boulevard will be restriped to provide double left-turn lanes, one through lane, and a shared through/right-turn lane. The widening of Kalakaua Avenue provides the opportunity to increase the present sub-standard left-turn traffic lane widths on maukabound Kalakaua Avenue to 10 feet.

3. The makaibound lanes on Kalakaua Avenue at Kapiolani Boulevard will be widened from 10-foot to 11-foot wide lanes by reducing or eliminating the existing striped median on the Kalakaua Avenue approach.

4. Kahakai Drive will be widened on the project side to add two traffic lanes. With this widening, Kahakai Drive will be improved to provide two (2) 10-foot wide outbound lanes, a 10-foot wide landscaped median, and two (2) 10-foot wide inbound lanes. The outbound lanes provide separate left- and right-turn lanes onto Atkinson Drive. The inbound lanes separate convention center traffic from the residential traffic on Kahakai Drive. The left inbound lane provides access to the parking garage and loading dock areas of the convention center facility, and the right inbound lane provides access to the Kahakai Drive residential area. On-street parking on the makai side of Kahakai Drive would be restricted during large convention events, involving about five (5) parking spaces.




TRAFFIC IMPACT ANALYSIS REPORT

HAWAI'I CONVENTION CENTER

Fig. 4-4
EXISTING ROADWAY SYSTEM

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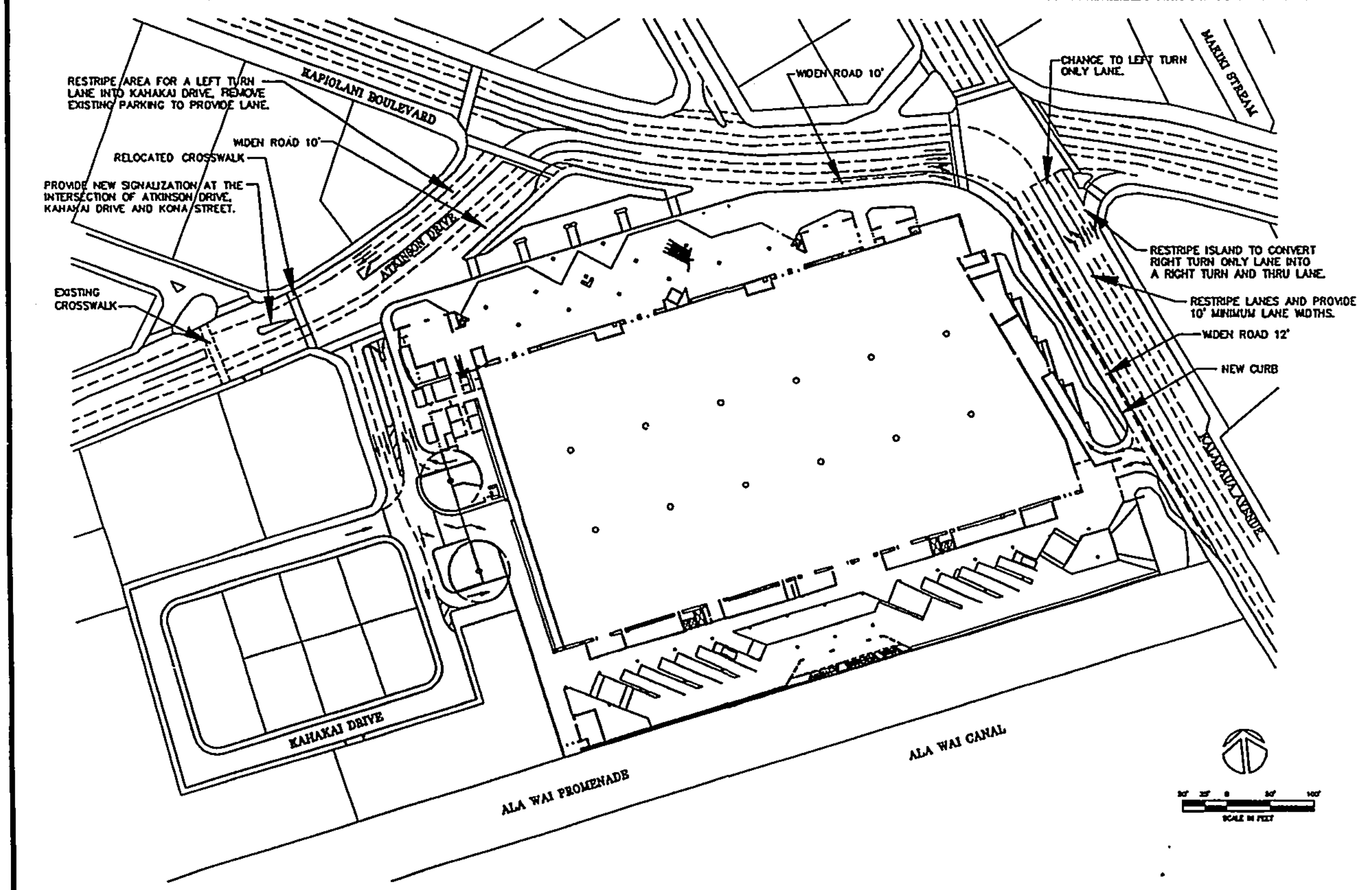



TRAFFIC IMPACT ANALYSIS REPORT

HAWAI'I CONVENTION CENTER

Fig. 4-5
PROPOSED ROADWAY SYSTEM

WILSON OKAMOTO & ASSOCIATES, INC.
and
THE TRAFFIC MANAGEMENT CONSULTANT

5. Traffic signals will be installed at the intersection of Atkinson Drive and Kahakai Drive/Kona Street, which would also include signalizing the left-turn movement from maukabound Atkinson Drive to Kona Street. The traffic signal would provide a signal controlled crossing point for pedestrians walking between the convention center and the Ala Moana Hotel and Ala Moana Center. The existing pedestrian crossing on Atkinson Drive at that intersection will be relocated to the mauka side of Kona Street. The traffic signals would be coordinated with the traffic signals at the intersection of Kapiolani Boulevard and Atkinson Drive to minimize queuing on Atkinson Drive back to Kapiolani Boulevard.

6. An exclusive left-turn lane will be provided on makaibound Atkinson Drive at Kahakai Drive, extending back to Kapiolani Boulevard. Provision of this approximately 210-foot long lane will be accomplished within the existing roadway width by prohibiting on-street parking on the ewa side of Atkinson Drive between Kapiolani Boulevard and Kona Street, eliminating about five (5) existing parking spaces, and restriping the existing through lanes. The exclusive left-turn lane would separate left-turn traffic from through traffic, thereby reducing delay to makaibound through traffic on Atkinson Drive.

7. The portion of Atkinson Drive along the project frontage between Kahakai Drive and Kapiolani Boulevard will be widened by 10 feet to provide additional curbside shuttle bus loading/unloading space along Atkinson Drive if needed for the larger events.

## B. ANALYSIS OF 10,000-PERSON CONVENTION

The convention center is intended to serve national and international conventions in order to maintain a high level of use of Waikiki visitor facilities and attractions in future years. It will primarily serve those visitor conventions, exhibits and trade shows that cannot be adequately served by existing individual hotel facilities due to size or support requirements.

The convention center will typically serve conventions and related events with between 2,000 and 10,000 attendees. The design of the convention center will allow several smaller conventions to be held simultaneously, although the combined number of attendees would not exceed those for a single large convention. Single or combination of conventions with more than 10,000 attendees may occur occasionally.

An analysis of key transportation impacts was prepared in the WSA/TIA based on a single large or a combination of several smaller national conventions at the convention center, with a total of 10,000 persons registered to attend the functions. The analysis was based on a "generic" convention center. For the purpose of the EIS TIAR, the travel forecast assumptions used in the WSA/TIA have been adapted to the proposed convention center design to analyze the traffic impacts of a 10,000-person convention event.

### Travel Forecast Assumptions

A convention event with 10,000 registered attendees is used as the basis for this traffic analyses. Single or combined conventions of this size, or larger, are likely to occur on no more than 20 days per year, and thus this size represents a reasonable "typical recurring event" to use as a basis for identifying potential impacts and mitigative actions. Most such conventions will last for three to four days, with only a portion of the registered attendees visiting the convention center on any given day.

The principal assumptions used in estimating travel on a typical weekday with a 10,000-person convention are outlined in the following sections. The travel forecast assumptions and modal shares used in the WSA/TIA and the EIS TIAR were developed pursuant to discussions with persons with extensive experience in convention center operations across the nations and those associated with major Waikiki hotels which host convention events. Specifically, information was obtained through discussions held with managers and others associated with the Los Angeles, San Diego, Miami, Moscone Center (San Francisco), Portland, and Sacramento convention centers. The information obtained was further supplemented and verified in consultation with the State CCA's technical evaluation board member on convention center operations and with the CCA's Marketing Director.

Convention Attendance Characteristics

- The travel forecasts and analysis reflects a major national or international convention, or combination of two or three conventions at the project site with a total of 10,000 participants during the three to four days of convention sessions.

- On a typical high-usage day, 80 percent of the registered conventioneers (8,000 persons) are assumed to attend events at the convention center. According to the Manager of the Hyatt Regency Waikiki, 80 percent of conventioneers attending a national convention at the hotel typically attend the morning sessions on a peak day.

- On a typical day, there will be a large peak inflow of attendees coinciding with the peak traffic hour on the adjacent streets, and a gradual exodus of attendees through the mid-day, afternoon, and evening periods with the largest numbers exiting during the midday period. The analysis reflects:

- 80 percent of the daily attendees (6,400) arriving during the 7:15 to 8:15 AM peak hour; and

- 25 percent of the daily attendees (2,000) exiting during the 4:30 to 5:30 PM peak hour.

- Local residents typically comprise 5 percent or less of attendees of national conventions held in Honolulu. According to the Hyatt Regency Waikiki Manager, local residents typically comprise 5 percent or less of the total convention attendees for a national convention at the hotel. The Manager further indicates that 10 percent local resident attendance at the hotel's national conventions is a very high proportion. For a 10,000-person convention, 5 percent of attendees as local residents results in the following origin for attendees:

| | Convention Attendees | Morning Peak Hour Arrivals |
|---|---|---|
| Oahu Residents | 500 | 320 |
| Oahu Visitors | 9,500 | 6,080 |
| Ref.: Wilbur Smith Associates; May 1994. | | |

- Although the larger conventions may likely have a smaller proportion of attendees from Oahu, the travel analyses are based on 5 percent of attendees as local residents.

Visitor Location and Number Walking

- The inventory of existing hotels and short-term rental condominium units, grouped by walking distance to the site, is based on a 1989 survey modified to include the Hawaii Prince Hotel:

| | Number of Units Within | | |
|---|---|---|---|
| | 5 Minute Walk | 6-10 Minute Walk | 11-15 Minute Walk |
| Hotel Rooms | 1,193 | 1,623 | 4,779 |
| Condo Units | -0- | 1,394 | 1,398 |
| Ref.: Wilbur Smith Associates; May 1994. | | | |

- As an overall average for a major convention, approximately 50 percent of the hotel rooms and 10 percent of visitor condo units within a 15-minute walk are assumed to be occupied by convention attendees.

- An average of 1.1 convention attendees is assumed for each room occupied by conventioneers.

- The proportion of convention attendees walking between their hotel/condo and the project site is assumed as follows for the various distances:

    - Within a 5 minute walk: ........................ 100%
    - Between 6 to 10 minute walk: .................... 75%
    - Between 11 to 15 minute walk: .................. 50%
    - More than 15 minute walk: ...................... 10%

Visitor Travel Mode

- A system of charter bus routes will be used to provide convenient shuttle service between Waikiki hotels and the convention center to augment the regularly scheduled public transportation services in the area. Approximately 45 percent of visitor attendees will be shuttled by charter bus to and from the convention center.

- Approximately 5 percent of visitors to Oahu will use rental cars to reach the convention center since they may want to keep materials or equipment in their car at the session, or otherwise need a vehicle at the site. An average of 2.3 attendees per vehicle is assumed, which is a typical occupancy rate for social events. The 2.3 persons per vehicle is the approximate midway range of the 1.7 to 2.8 persons per vehicle which is typical for conventions, trade shows and exhibitions at other facilities. Also, surveys taken at the Portland, Los Angeles and Sacramento convention centers indicate that 2.1 to 2.5 persons per vehicle auto occupancy rates are achieved.

- Approximately 5 percent of Oahu visitors will use a taxi to travel to the site, with an average of 2.3 attendees per vehicle. These visitor attendees would likely be those who are staying at outlying hotels within Waikiki which are not served by shuttle buses or are not located within close proximity to hotels that provide shuttle bus service, or those who would be carrying material or other items to the convention center. Since it is likely that hotels would accommodate groups of conventioneers, it is reasonable to assume that these conventioneers would share taxi rides to and from the convention center.

    The percentage of Oahu visitor attendees assumed to use taxis is comparable with the results of a travel mode analysis study conducted at the Honolulu International Airport, wherein about 6 percent of Oahu visitors from overseas domestic destinations use a taxi. The study was conducted to determine the modal split and vehicle occupancies of domestic arrivals for the Honolulu International Airport Master Plan.

- Approximately 10 percent of Oahu visitors will use TheBus and future Waikiki people mover services to travel to/from the convention center.

Resident Travel Mode

- Most local residents attending a convention are expected to travel via personal auto. The analysis reflects 90 percent using automobiles, with an average of 2.3 attendees per vehicle which is an occupancy rate typical for social events.

- Given the excellent TheBus service at the convention center project site, 10 percent of local attendees are estimated to use public transit to travel from their homes or workplace.

Employee Travel

- Approximately 150 full-time and part-time employees will work at the convention center facility each day during a major convention, with 80 percent arriving/departing during the peak traffic hours.
- Employees commuting via personal auto will be discouraged through market-rate parking fees and limits on parking available to employees.
- Thirty (30) percent of regular employees are assumed to use public transit, a proportion comparable to the Financial District. The convention center employees would likely share characteristics similar to the downtown Financial District (i.e., to be in the administrative capacity). Also, the convention center would likely charge market rates for on-site parking, rather than the low parking rates in Waikiki.
- For the 70 percent of regular employees commuting by automobile, an average of 1.2 employees per vehicle is assumed which is comparable to the work commute mode occupancy.
- The large numbers of food service or other workers needed for special events are assumed to arrive and depart during the off-peak hours of traffic.

Trucks and Deliveries

- During a major convention(s) using the entire facility, there will likely be no truck activity related to move-out of the previous convention or move-in of the next convention. The truck activity will likely occur on the one or two set-up days prior to and one or two move-out days following the event.
- Vendor deliveries and other service vehicles will typically average 5 to 10 vehicles per hour, which is consistent with the results of a truck use survey conducted at the Moscone Center in San Francisco.

### Travel Forecasts

For a large single convention or combination of several smaller conventions, the visiting conventioneers will likely be dispersed among a large number of hotels throughout Waikiki, not just one or two convention "headquarter" hotels or those closest to the convention center. Although a large portion of these convention attendees will walk to/from the facility, an even larger number will likely require vehicular transportation. In most cities where the convention center is not located adjacent to large numbers of hotel rooms, such as Los Angeles and Miami Beach, this transportation linkage is largely provided by a special shuttle bus system operated between the major hotel areas and the convention site.

For the forecast of travel mode to/from the convention center for visitors to Oahu, the number of those walking was first estimated. After allowance for usage of rental cars, taxis, and the public bus system, the remainder of the Oahu visitors are assumed to use a special system of charter buses providing shuttle service along several routes between the Waikiki hotels and the convention center facility.

The travel modes for Oahu resident convention attendees and employees were estimated using the forecast assumptions outlined in the proceeding sections.

Walk Trips To/From Convention Center

Although the attendees of a major convention will be staying at a large number of hotels throughout Waikiki, a sizeable portion are likely to stay within convenient walking distance of the convention center. Many of the hotels near the ewa end of Waikiki will likely market their units for convention usage. This analysis assumes that for a major convention, 50 percent of the hotel rooms within a 15-minute walk of the convention center would be occupied by convention attendees. Examples of hotels within various walking distances from the convention center are:

| | |
|---|---|
| 5-minute walk | Ala Moana Hotel |
| 6 to 10-minute walk | Hawaii Prince<br>Outrigger Hobron<br>Inn on the Park |
| 11 to 15-minute walk | Ilikai Hotel<br>Hilton Hawaiian Village<br>Maile Court<br>Waikiki Gateway |

The major hotel concentration from the Sheraton Waikiki to the Hyatt Regency to Outrigger West is located approximately a 20 to 25-minute walk to the convention center site.

Based on these walking distances, and the assumptions listed in the preceding section, an estimated 2,130 attendees would walk to the convention center in the morning peak hour, or about 35 percent of the 6,080 visitors to Oahu arriving during that period. In the afternoon peak hour, a similar percentage would walk back to the hotels. Table 4-1 summarizes these estimates.

The adjacent Ala Moana Hotel contributes approximately 20 percent of those walking. The largest portion originates within the 11 to 15-minute time band, which includes the Hilton Hawaiian Village Hotel and Ilikai facilities.

If an additional hotel(s) is constructed near the convention center, the number walking would likely increase. For example, construction of a 500-room hotel as part of a Hobron Superblock development project would increase those walking to/from the site in the morning peak hour by 200 to 275 attendees, based on the assumptions used in this analysis.

**Trip Generation**

Based on the study assumptions, a 10,000-person convention could generate an estimated 533 inbound and 217 outbound vehicle trips during the morning peak hour. This number represents the initial day of a 3 to 4-day convention, and the ensuing days could be slightly lower. The composition of the morning peak hour vehicle trips is summarized in Table 4-2. Key features include:

- Approximately 70 percent of the total 750 vehicle trips to or from the project site are related to Oahu visitor attendees.
- Approximately 18 percent of the total vehicle trips during the AM peak hour are by Oahu residents attending the convention.
- Approximately 12 percent are employee, delivery, and service vehicles.
- Approximately 61 shuttle bus trips would be needed if standard size charter coaches are used.

Vehicle trips would be substantially lower in the peak afternoon exiting hour. As summarized in Table 4-3, a total of 317 vehicle trips is estimated for the afternoon peak hour, with 233 exiting and 84 entering the site. Employee and vendor vehicles would comprise about 28 percent of the much lower volumes in the afternoon period.

**Table 4-1. Visitors Walking to Convention Center 10,000-Person Convention**

| Item | Walking Distance | | | | |
|---|---|---|---|---|---|
| | Less Than 5 Minutes | 6 to 10 Minutes | 11 - 15 Minutes | More Than 15 Minutes | Total |
| **Visitor Units** | | | | | |
| • Hotel | 1,193 | 1,623 | 4,779 | — | — |
| • Condo | — | 1,394 | 1,398 | | |
| **Percent of Units Occupied by Conventioneers** | | | | | |
| • Hotel | 50 | 50 | 50 | — | — |
| • Condo | — | 10 | 10 | — | — |
| **Number of Units Occupied by Conventioneers** | | | | | |
| • Hotel | 597 | 812 | 2,390 | — | — |
| • Condo | — | 139 | 140 | — | — |
| **Total** | **597** | **951** | **2,530** | **4,559** | **8,637** |
| **Number of Conventioneers** | | | | | |
| • Hotel | 657 | 894 | 2,629 | — | — |
| • Condo | — | 153 | 154 | — | — |
| **Total** | **657** | **1,047** | **2,783** | **5,013** | **9,500** |
| **Percent Walking** | | | | | |
| | 100% | 75% | 50% | 10% | — |
| **Number Walking To/From Center** | | | | | |
| • Total Attendees | 657 | 785 | 1,392 | 501 | 3,335 |
| • AM Peak Hour | 420 | 500 | 890 | 320 | 2,130 |
| • PM Peak Hour | 132 | 157 | 280 | 101 | 670 |

Total Attendees = Number walking during the 3-4 days of convention functions.
AM Peak Hour = 7:15 - 8:15 AM on a typical day
PM Peak Hour = 4:30 - 5:30 PM on a typical day

Source: Wilbur Smith Associates; May 1994

The actual numbers of vehicle trips could vary from these estimates depending upon convention characteristics and future conditions. The following are key variables that could effect the number of vehicle trips:

- The proportion of local residents versus visitors attending the convention, since a much higher proportion of local residents are likely to travel via automobile. Few or no local residents would reduce the vehicle trips, while more than 5 percent local residents would increase vehicle trips.

- The average number of persons per vehicle arriving by automobile, with the 2.3 persons per vehicle being approximately midway in a range of 1.7 to 2.8 for conventions, trade shows and exhibitions at other facilities. To attain this average, it would likely require market rate pay parking and/or public perceptions of a constrained parking supply.

- The proportion of visitors to Oahu arriving by rental car and taxi, with a very convenient alternative (the shuttle bus system) needed to keep usage levels of rental cars and taxis at the rates used in this analysis.

**Table 4-2. AM Peak Hour Trip Generation Summary 10,000-Person Convention**

| Travel Mode | Mode Split | Person Trips | Persons per Vehicle | Vehicle Trips | | |
|---|---|---|---|---|---|---|
| | | | | Enter | Exit | Total |
| **Visitor Trips** | | | | | | |
| Walk | 35% | 2,130 | --- | --- | --- | --- |
| Taxi | 5% | 305 | 2.3 | 133 | 133 | 266 |
| Auto | 5% | 305 | 2.3 | 133 | 7 | 140 |
| Public Bus | 10% | 610 | --- | --- | --- | --- |
| Shuttle Bus | 45% | 2,730 | 45.0 | 61 | 61 | 122 |
| **Subtotal** | **100%** | **6,080** | --- | **327** | **201** | **528** |
| **Resident Trips** | | | | | | |
| Auto | 90% | 288 | 2.3 | 126 | 7 | 133 |
| Public Bus | 10% | 32 | --- | --- | --- | --- |
| **Employee Trips** | | | | | | |
| Auto | 70% | 84 | 1.2 | 70 | 4 | 74 |
| Public Bus | 30% | 36 | --- | --- | --- | --- |
| **Vendor and Delivery Trips** | 100% | --- | --- | 10 | 5 | 15 |
| **Total Vehicle Trips** | | | | **533** | **217** | **750** |

Ref: Wilbur Smith Associates, May 1994

**Traffic Assignment**

The traffic assignment and access considerations set forth in the WSA/TIAR for a 10,000-person convention is adapted to the selected convention center design. Vehicular access to the three-lane entry drive fronting the convention center lobby at the corner of Kapiolani Boulevard and Atkinson Drive would be via right-turn in from maukabound Atkinson Drive and right-turn out onto eastbound Kapiolani Boulevard. Shuttle buses, taxis and vehicles from Waikiki travelling to the lobby entrance drop-off/pick-up area will be directed to approach the convention center from westbound Ala Moana Boulevard, turn right on maukabound Atkinson Drive, and turn right to the lobby entrance. The left-turn movement makaibound on Atkinson Drive into the main entry drive of the convention center will be prohibited. Vehicles exiting the lobby entry drive onto Kapiolani Boulevard will either proceed eastbound on Kapiolani Boulevard or turn right at Kalakaua Avenue.

Vehicles traveling to the convention center's parking garage entrance at Kahakai Drive will approach either from Ala Moana Boulevard (eastbound or westbound), turn right onto Atkinson Drive, and right onto Kahakai Drive; or from Kapiolani Boulevard (eastbound or westbound), turn onto Atkinson Drive, and left onto Kahakai Drive. Vehicles approaching the secondary access along Kalakaua Avenue would approach makaibound.

Container trucks will be directed to approach the convention center by way of Nimitz Highway/Ala Moana Boulevard/Atkinson Drive to provide the most convenient route with the least impacts to traffic. Trucks exiting the convention center will use this same route. Some of the trucks unloading/loading within the exhibit hall may exit through the Kalakaua Avenue driveway and proceed makaibound along Kalakaua Avenue.

**Table 4-3. PM Peak Hour Trip Generation Summary**
**10,000-Person Convention**

| Travel Mode | Mode Split | Person Trips | Persons per Vehicle | Vehicle Trips | | |
|---|---|---|---|---|---|---|
| | | | | Enter | Exit | Total |
| **Visitor Trips** | | | | | | |
| Walk | 35.3% | 670 | — | — | — | — |
| Taxi | 5% | 95 | 2.3 | 42 | 42 | 84 |
| Auto | 5% | 95 | 2.3 | 2 | 42 | 46 |
| Public Bus | 10% | 190 | — | — | — | — |
| Shuttle Bus | 44.7% | 850 | 35.0 | 29 | 29 | 58 |
| **Subtotal** | **100%** | **1,900** | — | **73** | **113** | **186** |
| **Resident Trips** | | | | | | |
| Auto | 90% | 90 | 2.3 | 2 | 40 | 42 |
| Public Bus | 10% | 10 | — | — | — | — |
| **Employee Trips** | | | | | | |
| Auto | 70% | 84 | 1.2 | 4 | 70 | 74 |
| Public Bus | 30% | 36 | — | — | — | — |
| **Vendor and Delivery Trips** | 100% | — | — | 5 | 10 | 15 |
| **Total Vehicle Trips** | | | | 84 | 233 | 317 |

Ref: Wilbur Smith Associates, May 1994

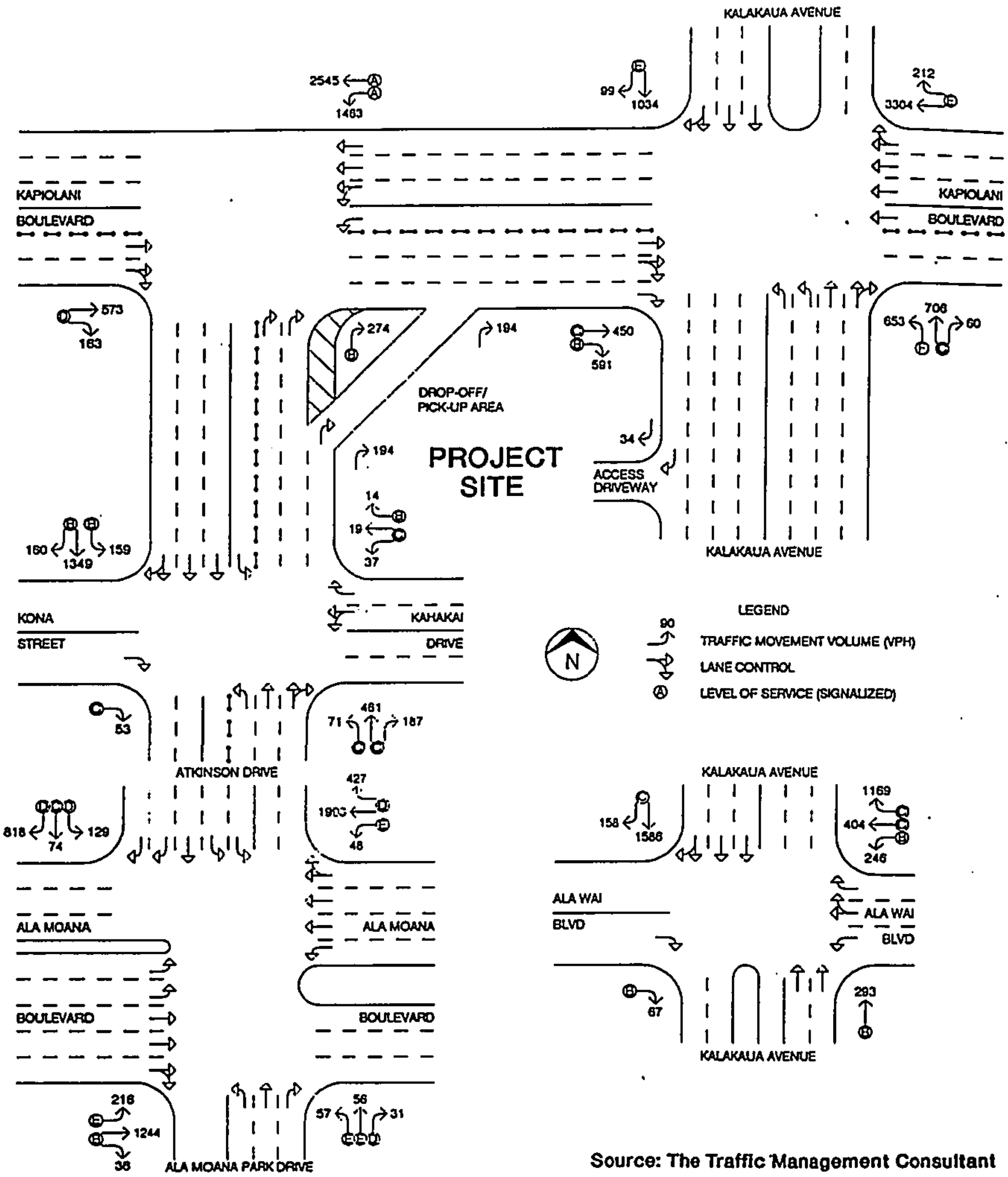
Due in part to the PM peak traffic period turn restrictions on maukabound Kalakaua Avenue at Kapiolani Boulevard and on westbound Kapiolani Boulevard at Atkinson Drive, all visitor conventioneers arriving via automobiles will be instructed to approach the convention center from westbound Ala Moana Boulevard and right onto Atkinson Drive. Also, by recommending that all visitor conventioneers follow this travel route to and from the convention center at other times, traffic would be distributed so as to further reduce the increase at the busy intersection of Kapiolani Boulevard and Kalakaua Avenue during the AM peak period.

**1998 AM and PM Peak Hour Traffic Impacts**

The AM and PM peak hour traffic for a 10,000-person convention are depicted in Figures 4-6 and 4-7, respectively, wherein the LOS analysis is performed under the proposed traffic mitigation measures described herein. The capacity analysis is performed using existing traffic signal cycle lengths; however, phase timings have been adjusted to accommodate the relative increase in traffic demands. Table 4-4 shows the LOS, v/c ratios, and average vehicle delays without mitigation (i.e., with existing roadway facilities) and with the proposed traffic mitigation measures.

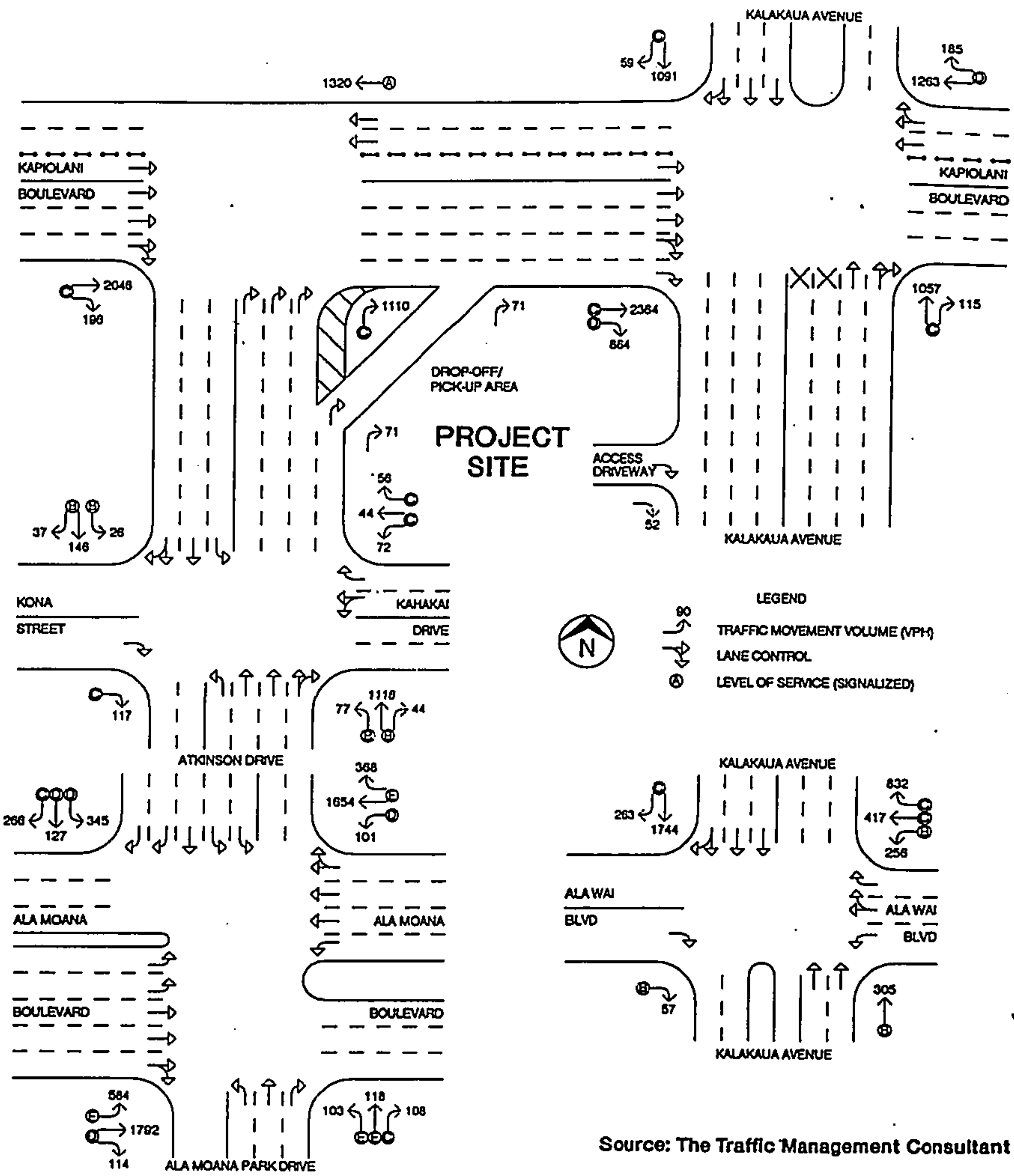
**a. Kapiolani Boulevard and Kalakaua Avenue**

The intersection of Kapiolani Boulevard and Kalakaua Avenue is expected to experience a 4.1 percent traffic increase in the AM peak hour. Traffic conditions would continue to operate at LOS E, increasing the v/c ratio from 1.074 to 1.099 during the AM peak hour without mitigation. The westbound approach would deteriorate from LOS E to LOS F with a 10,000-person convention. The other critical movements would continue to operate at LOS F, including the makaibound approach on Kalakaua Avenue and the left-turn movement from




Source: The Traffic Management Consultant

Fig. 4-6
1998 AM PEAK HOUR TRAFFIC WITH 10,000-PERSON CONVENTION




Source: The Traffic Management Consultant

Fig. 4-7
1998 PM PEAK HOUR TRAFFIC WITH 10,000-PERSON CONVENTION

| Table 4-4. 1998 Peak Hour Capacity Analysis 10,000-Person Convention | | | | | |
|---|---|---|---|---|---|
| **Intersection** | **Peak Hr** | **Action** | **LOS** | **V/C Ratio** | **Delay (seconds)** |
| Kapiolani Boulevard and Kalakaua Avenue | AM | Without Mitigation | E | 1.099 | 56.7 |
| | | With Mitigation | E | 1.079 | 51.0 |
| | PM | Without Mitigation | D | 1.014 | 25.8 |
| | | With Mitigation | C | 0.879 | 21.8 |
| Kapiolani Boulevard and Atkinson Drive | AM | Without Mitigation | B | 0.843 | 6.8 |
| | PM | Without Mitigation | C | 0.759 | 15.8 |
| Atkinson Drive and Kahakai Drive/Kona Street | AM | Without Mitigation | F* | --- | --- |
| | | With Mitigation | C | 0.442 | 17.2 |
| | PM | Without Mitigation | F* | --- | --- |
| | | With Mitigation | B | 0.369 | 13.1 |
| Kalakaua Avenue and Ala Wai Boulevard | AM | Without Mitigation | C | 0.909 | 17.0 |
| | PM | Without Mitigation | C | 0.926 | 19.3 |
| Ala Moana Boulevard and Atkinson Drive | AM | Without Mitigation | D | 0.973 | 28.4 |
| | PM | Without Mitigation | E | 0.903 | 43.1 |

*Note: Kahakai Drive LOS under unsignalized conditions.
"Without Mitigation" = with existing roadway facilities.
Ref.: The Traffic Management Consultant

maukabound Kalakaua Avenue. The traffic impacts during the AM peak hour are marginal, yet significant enough to require appropriate mitigation.

During the PM Peak hour, the intersection is expected to deteriorate to LOS D. The maukabound, makaibound and westbound approaches are not affected by convention center traffic. However, by impacting only the peak direction of traffic (i.e., right-turn movement on eastbound Kapiolani Boulevard to Waikiki-bound Kalakaua Avenue), the intersection capacity is exceeded by 1.4 percent. The relatively small increase in overall intersection demand (1.3 percent) causes significant impacts to the right-turn movement on eastbound Kapiolani Boulevard, resulting in LOS F without mitigation.

Traffic Impacts With Mitigating Actions

Several roadway improvements are proposed at the intersection of Kapiolani Boulevard and Kalakaua Avenue and along the property frontage of these two roadways that would mitigate the traffic impacts resulting from the convention center:

1. Kapiolani Boulevard will be widened by 10 feet along the project frontage to provide an additional right-turn only lane in the eastbound direction. The existing eastbound curb lane would be converted to an optional through/right-turn lane. The net result would increase the capacity of eastbound Kapiolani Boulevard, improving the LOS F conditions on the right-turn movement to LOS D.

2. Kalakaua Avenue will be widened by 12 feet along the project frontage from Kapiolani Boulevard to the Ala Wai Canal bridge to provide an additional 10-foot wide makaibound lane for use as a bus stop and a right-turn lane into the Center's Kalakaua Avenue parking ramp. Also, the maukabound lanes on Kalakaua Avenue at Kapiolani Boulevard will be restriped to provide double left-turn lanes, one through

lane, and a shared through/right-turn lane. The widening of Kalakaua Avenue provides the opportunity to increase the left-turn traffic lane widths on maukabound Kalakaua Avenue to 10 feet. The restriping of the maukabound left-turn lanes on Kalakaua Avenue improves the present sub-standard left-turn movement to LOS E.

3. The makaibound lanes on Kalakaua Avenue at Kapiolani Boulevard will be widened from 10-foot to 11-foot wide lanes by reducing or eliminating the existing striped median on the Kalakaua Avenue approach. This mitigation measure improves the makaibound approach to LOS E.

With these traffic mitigation measures, the intersection of Kapiolani Boulevard and Kalakaua Avenue would continue to operate at LOS E, and the v/c ratio improves to 1.079 during the AM peak hour. During the PM peak hour, the intersection improves to LOS C and a v/c ratio of 0.879. No additional measures are needed to mitigate project impacts.

**b. Kapiolani Boulevard and Atkinson Drive**

The intersection of Kapiolani Boulevard and Atkinson Drive is not significantly impacted by the proposed convention center during the AM and PM peak hours of traffic. The critical movement during the AM peak hour is the eastbound through movement which is unaffected by convention center traffic. During the PM peak hour, intersection traffic demand is increased by less than 1 percent by convention center traffic.

This intersection may be affected by the proposed signalization at the intersection of Atkinson Drive and Kahakai Drive/Kona Street which may cause queuing back to Kapiolani Boulevard. This condition is further discussed in the Atkinson Drive and Kahakai Drive/Kona Street intersection analysis below.

**c. Atkinson Drive and Kahakai Drive/Kona Street**

Kahakai Drive is expected to be significantly impacted by convention center traffic. The primary entrances to the parking garage and loading dock access are located on Kahakai Drive. Kahakai Drive at Atkinson Drive is expected to operate at LOS F conditions during both the AM and PM peak hours of traffic under unsignalized conditions. The left-turn movement from makaibound Atkinson Drive to Kahakai Drive may occasionally block through traffic in the shared through lane, especially during the AM peak hour.

<u>Traffic Impacts With Mitigating Actions</u>

In order to mitigate the traffic impacts resulting from the proposed convention center at the intersection of Atkinson Drive and Kahakai Drive/Kona Street, several traffic improvements are proposed:

1. Kahakai Drive will be widened on the project side to provide two traffic lanes. With this widening, Kahakai Drive will be improved to provide two (2) 10-foot wide outbound lanes, a 10-foot wide landscaped median, and two (2) 10-foot wide inbound lanes. The outbound lanes provide separate left- and right-turn lanes onto Atkinson Drive. The inbound lanes separate convention center traffic from the residential traffic on Kahakai Drive. The left inbound lane provides access to the parking garage and loading dock areas of the convention center facility, and the right inbound lane provides access to the Kahakai Drive residential area. On-street parking on the makai side of Kahakai Drive would be restricted during large convention events, involving about five (5) parking spaces.

2. Traffic signals will be installed at this intersection, which would also include signalizing the left-turn movement from maukabound Atkinson Drive to Kona Street. The traffic signal would provide a signal controlled crossing point for pedestrians walking between the convention center and Ala Moana Hotel and Ala Moana Center. The existing pedestrian crossing on Atkinson Drive at that intersection will be relocated to the mauka side of Kona Street. The traffic signals would be coordinated with the traffic

signals at the intersection of Kapiolani Boulevard and Atkinson Drive to minimize queuing on Atkinson Drive back to Kapiolani Boulevard.

3. An exclusive left-turn lane will be provided on makaibound Atkinson Drive at Kahakai Drive, extending back to Kapiolani Boulevard. Provision of this approximately 210-foot long lane will be accomplished within the existing roadway width by prohibiting on-street parking on the ewa side of Atkinson Drive between Kapiolani Boulevard and Kona Street, eliminating about five (5) existing parking spaces, and restriping the existing through lanes. The exclusive left-turn lane would separate left-turn traffic from through traffic, thereby reducing delay to makaibound through traffic on Atkinson Drive.

During large conventions, to further mitigate potential queuing on makaibound Atkinson Drive at Kahakai Drive during large conventions in the AM peak period, a contra-flow operation should be implemented on Atkinson Drive between Kapiolani Boulevard and Mahukona Street to provide three (3) through lanes in the makaibound direction. This can be accomplished by coning the median left-turn lane to convert it to an additional through makaibound direction lane. To provide two through maukabound lanes on Atkinson Drive, on-street parking would be restricted on the east side of Atkinson Drive between Mahukona Street and Kahakai Drive, involving about nine (9) parking stalls. The left maukabound lane on Atkinson Drive also would be coned between Kapiolani Boulevard and Kahakai Drive to reverse the travel direction, and would be signed as an exclusive left-turn from makaibound Atkinson Drive to Kahakai Drive.

Under signalized conditions, the intersection of Atkinson Drive and Kahakai Drive operates at LOS C and LOS B during the AM and PM peak hours of traffic, respectively.

During the AM peak period, the curb lane on maukabound Atkinson Drive at Kahakai Drive would be used primarily by convention center traffic either turning right to Kahakai Drive or to the lobby entrance drop-off/pick-up area. Temporary informational signs should be installed on maukabound Atkinson Drive, directing convention center traffic to the curb lane (and left-turn traffic to Kona Street into the left lane.

### d. Kalakaua Avenue and Ala Wai Boulevard

The intersection of Kalakaua Avenue and Ala Wai Boulevard is expected to continue to operate at acceptable LOS during the AM and PM peak hours of traffic; however the traffic demands during both peak hours are expected to approach capacity conditions. The intersection is impacted primarily by the shuttle buses and taxis returning to Waikiki from the convention center. Traffic mitigation is not recommended at this intersection.

### e. Ala Moana Boulevard and Atkinson Drive

The intersection of Ala Moana Boulevard and Atkinson Drive is expected to operate at the desirable minimum LOS D during the AM peak hour of traffic. The convention center traffic would use 10.4 percent of the existing intersection capacity. The primary traffic impact would occur on the right-turn movement on westbound Ala Moana Boulevard resulting from visitor traffic approaching the convention center.

During the PM peak hour, increase in traffic would only utilize 3 percent of intersection capacity; however, the overall intersection operation would worsen from LOS D to LOS E. The relatively small increase (2.4 percent) in PM peak hour traffic resulting from the convention center is sufficient to lower the LOS to undesirable conditions.

<u>Mitigating Actions</u>

1. With the large volume of vehicles turning right onto Atkinson Drive, which would be increased with the convention center, it would be desirable to add a right-turn lane along the mauka side of Ala Moana Boulevard. The right-turn lane would primarily be of benefit during the more critical afternoon peak period when congested conditions are expected to occur along ewabound Ala Moana Boulevard, although

there would be relatively few vehicles travelling from Waikiki to the convention center during the peak period. However, the Yacht Harbor Towers extends very close to the sidewalk at the corner and limits any widening along this side.

The Draft EIS TIAR indicated that provision of a right-turn lane would likely require one of two approaches. Based on comments received on the Draft EIS, the following is a discussion and cost factors of each plan, and the benefits and impacts of providing this right-turn lane.

Approach A

To provide an exclusive 12-foot wide right-turn lane, Approach A would reduce the existing lanes of Ala Moana Boulevard between Atkinson Drive and the Ala Wai Canal Bridge to substandard widths, reduce the mauka sidewalk along Yacht Harbor Towers, and relocate the median divider.

Lane width reductions would narrow the Waikiki-bound left and center lanes of Ala Moana Boulevard (east of Atkinson Drive) from 12 feet to 11 feet. The Waikiki-bound curb lane would be reduced from 14 feet to 12 feet. In ewabound direction, the curb lane of Ala Moana Boulevard east of Atkinson Drive would be reduced from 14 feet to 11 feet. The remaining three ewabound lanes would each be reduced from 12 feet to 11 feet. With these lane width reductions, the median divider would be relocated 4 feet makai of its existing location. Also, the mauka sidewalk along Ala Moana Boulevard would need to be reduced from 10 to 8 feet in width.

The major cost that this plan would incur is to relocate the median divider, primarily due to the difference in grade elevation between the ewabound and Waikiki-bound lanes of Ala Moana Boulevard. The remaining costs would be associated with improvements such as lane re-striping and installation of a new curb along the mauka side of Ala Moana Boulevard.

Approach B

This approach would involve acquiring a strip of land from Ala Moana Park, widening Ala Moana Boulevard on that side, and shifting the median divider to provide the additional exclusive ewabound right-turn lane.

The 12-foot wide strip of land to be acquired from Ala Moana Park would extend from Ala Moana Park Drive to the Ala Wai Canal Bridge. The median divider would then be relocated 12 feet makai. With the relocated median divider, the left-turn lane on ewabound Ala Moana Boulevard onto Ala Moana Park Drive would need to be re-striped, and the existing left-turn lane would be modified to become a through lane. The existing shared through/right-turn curb lane on ewabound Ala Moana Boulevard would be modified to become an exclusive right-turn lane onto Atkinson Drive.

As in the case of Approach A, a major cost for this plan would be for the relocation of the median divider, primarily due to the difference in grade elevation between the ewabound and Waikiki-bound lanes of Ala Moana Boulevard. Other costs associated with this plan would include installing a curb lane along Waikiki-bound Ala Moana Boulevard, and re-striping the remaining lanes.

State DOT Suggested Plan

In recent discussions between the State CCA and the State DOT, the DOT has indicated that they will further evaluate the right-turn lane on westbound Ala Moana Boulevard at Atkinson Drive as part of its Ala Moana Boulevard improvement project. The decision by the State DOT to implement this improvement, however, is subject to the results of the City's Waikiki Regional Traffic Impact Plan which is anticipated for completion in August 1995.

In comments submitted in response to the Draft EIS TIAR, the State DOT suggests that a right-turn lane could be provided by relocating the median divider, reducing lane widths to 11 feet, and relocating the mauka sidewalk onto landscaping makai of Yacht Harbor Towers. The improvements associated with this plan would be similar to those of the aforementioned Approach A, except that all lanes of Ala Moana Boulevard between Atkinson Drive/Ala Moana Park Drive and the Ala Wai Canal Bridge would be reduced from 12 feet to 11 feet, and a strip of land along the mauka side of Ala Moana Boulevard would need to be acquired from the Yacht Harbor Towers parcel to retain the existing sidewalk width.

Benefits and Impacts of Providing the Right-Turn Lane

The primary benefit of providing the exclusive right-turn lane is to improve the overall capacity and level-of-service of the Ala Moana Boulevard/Atkinson Drive intersection.

Among the three plans discussed above, major long-term impacts associated with providing the right-turn lane would potentially include the following: the taking of public park land (Ala Moana Park as proposed in Approach B), acquisition of privately-owned land (Yacht Harbor Towers parcel as proposed in the State DOT proposal), traffic safety implications resulting from reduced lane widths, and a reduction in sidewalk width.

Because development of an exclusive right-turn lane along Ala Moana Boulevard would involve public lands and funds, any construction proposal would be subject to the provisions of Chapter 343, Hawaii Revised Statutes (Hawaii EIS law) and would be reviewed as a separate action from the convention center proposal. Also, since Ala Moana Boulevard is classified as a Federal Aid Primary route, such road improvements may be eligible for federal funding. If federal funding is involved, the project proposal would be subject to compliance with the appropriate Federal permits and regulations.

Other Considerations

A plan entitled *Ala Moana Regional Master Plan Design Plan Summary Report* was prepared by the City and County of Honolulu Department of Parks and Recreation in May 1992 which discussed proposed revisions to the traffic/circulation system within the park. The Plan recommends that approximately one-half (1/2) mile of the scenic roadway between the Magic Island entrance and McCoy Pavilion be converted to one-way traffic flow in the ewa direction. Vehicles entering the park from the Waikiki direction can either park at Magic Island, reverse direction within the Magic Island parking lot, or continue through the one-way zone. Vehicles entering the park from the ewa direction will not be permitted to enter the one-way zone and will have to reverse direction via the turnaround at McCoy Pavilion.

This proposed conversion of traffic flow to one-way operation may reduce traffic exiting Ala Moana Park Drive at Ala Moana Boulevard, resulting in overall improvement in traffic operations at the intersection.

## C. ANALYSIS OF 14,000-PERSON CONVENTION

A 14,000-person convention is analyzed to identify key transportation impacts and potential mitigative actions. The analysis is used to represent a "worst-case" traffic situation, that which may be reached once every three years. This analysis of a larger size event is conducted in response to comments received on the Environmental Assessment for the Convention Center, including the City and County of Honolulu Department of Transportation Services. This quantitative analysis is based on travel forecast assumptions used for the 10,000-person convention, which have been revised to achieve a more conservative basis for transportation impact analysis. The following analysis is based on a national or international convention, or combination of conventions, with 14,000 attendees.

**Travel Forecast Assumptions**

The principal assumptions used in estimating travel on a typical weekday with a 10,000-person convention have been adapted for a 14,000-attendee convention and are outlined in the following sections.

Convention Attendance Characteristics

- The travel forecasts and analysis reflect a major national or international convention, or combination of two or three conventions at the project site with a total of 14,000 participants during the three to four days of convention sessions.

- On a typical high-usage day, 80 percent of the registered conventioneers (11,200 persons) are assumed to attend events at the convention center. This assumption is maintained from the 10,000-person convention.

- On a typical day, there will be a large peak inflow of attendees coinciding with the peak traffic hour on the adjacent streets and a gradual exodus of attendees through the mid-day, afternoon, and evening periods with the largest numbers exiting during the mid-day period. The analysis reflects:

- Eighty (80) percent of the daily attendees (8,960 persons) arriving during the 7:15 to 8:15 AM peak hour; and

- Twenty-five (25) percent of the daily attendees (2,800 persons) exiting during the 4:30 to 5:30 PM peak hour.

- Local residents typically comprise 5 percent or less of attendees of national conventions held in Honolulu. The travel analyses are based on 5 percent of attendees as local residents. This assumption is maintained from the 10,000-person convention. For a 14,000-person convention, 5 percent of attendees as local residents results in the following origin for attendees:

| | Convention Attendees | Morning Peak Hour Arrivals |
|---|---|---|
| Oahu Residents | 700 | 448 |
| Oahu Visitors | 13,300 | 8,512 |
| Ref. The Traffic Management Consultant | | |

Visitor Location and Number Walking

- The inventory of existing hotels and short-term rental condominium units used as a basis for the 10,000-attendee convention is employed for the 14,000-attendee convention.

- As an overall average, hotels and short-term rental condominium units within the 10-minute walk are assumed to accommodate about 12.8 percent of the visitor attendees, of which 80 percent would walk to the convention center. In general, conventioneers would most likely walk to destinations located within a 10-minute range. According to personnel associated with the Hilton Hawaiian Village Hotel and the Hyatt Regency Waikiki, people would likely walk to destinations within a four- to five-block range or within a 10-minute range.

- An average of 1.1 convention attendees is assumed for each room occupied by conventioneers.

- The walk trip assumptions for Oahu visitor conventioneers have been reduced from the 10,000-person convention. This reflects reductions in walk trip assumptions for each of the walking distance zones from the convention center to Waikiki as later described. The proportion of convention attendees walking between their hotel/condo and the convention center are assumed as follows for the various distances:

- Within a 5-minute walk: ........................ 95%
- Between 6 to 10-minute walk: .................... 70%
- More than 11 minute walk: ...................... 0%

Visitor Travel Mode

- A system of charter bus routes will be used to provide convenient shuttle service between the area hotels and the convention center to augment the regularly scheduled public transportation services in the area. Seventy (70) percent of visitor attendees will be shuttled by charter bus to and from the convention center. This is greater than the 45 percent assumed to travel by shuttle bus for a 10,000-person convention. The 70 percent of Oahu visitor attendees assumed to ride shuttle buses is similar to the ratio achieved by mainland convention centers without adjacent hotel complexes. For example, according to the manager of the Miami Convention Center (where the concentration of Miami Beach hotels is located 3 to 4 miles from the site), 80 to 90 percent of attendees at a national convention typically use the continuous all-day shuttle bus system which operates between the Center and the hotels.

  The average seating capacity of the shuttle buses is assumed to be achieved. Based upon the current private bus fleets, the large tour coaches can accommodate a capacity of 49 or more seated passengers. For this TIAR, the capacity is based on an average passenger load of 49 persons per bus, which approximates the lowest seated capacity of the large charter coaches, which range in size from 49 to 65 seats, with 54 seats being the most common size. This 49-passenger capacity is higher than the assumed average shuttle bus load of 45 persons used for the 10,000-person convention.

- Approximately 5 percent of visitors to Oahu will use rental cars to reach the convention center since they may want to keep materials or equipment in their car at the session, or otherwise need a vehicle at the site. An average of 1.2 attendees per vehicle is assumed, which is comparable to the work commute mode. This conservative vehicle occupancy is in comparison to the 2.3 persons per vehicle used in the 10,000-person scenario.

- Approximately 5 percent of Oahu visitors will use a taxi to travel to the site, with an average of 2.3 attendees per vehicle. This assumption is maintained from the 10,000-person convention.

- Like the 10,000-person convention, approximately 10 percent of Oahu visitors will use TheBus and future Waikiki people mover services to travel to/from the convention center.

Local Resident Travel Mode

- Most local residents attending a convention are expected to travel via personal auto. The analysis reflects 90 percent using automobiles, with an average of 1.2 attendees per vehicle. This auto occupancy rate does not account for any number of active car-pooling programs which could be enacted to reduce the overall traffic or increase available parking stalls. The conservative 1.2 auto occupancy is comparable to the work commute mode, as opposed to that for a social function which is reflected in the higher number (2.3) for the 10,000-attendee event.

  The use of cars based on the assumed modal split for both local residents and Oahu visitor attendees utilizes the parking capacity of the convention center, and is thereby used to represent a "worst-case" condition for traffic impacts.

- Similar to the 10,000-person convention, 10 percent of local attendees are estimated to use public transit to travel from their homes or workplace.

<u>Employee Travel</u>

The employee travel forecast assumptions for the 10,000-person convention are maintained for the 14,000-person convention.

- Approximately 150 full-time and part-time employees will work at the convention center facility each day during a major convention, with 80 percent arriving/departing during the peak traffic hours.
- Employees commuting via personal auto will be discouraged through market-rate parking fees and limits on parking available to employees.
- Thirty (30) percent of regular employees are assumed to use public transit, a proportion comparable to the Financial District. This assumption is maintained from the 10,000-person convention.
- For the 70 percent of regular employees commuting by automobile, an average of 1.2 employees per vehicle is assumed.
- The large numbers of food service or other workers needed for special events are assumed to arrive and depart during the off-peak hours of traffic.

<u>Trucks and Deliveries</u>

The trucks and deliveries travel forecast assumptions for the 10,000-attendee convention are maintained.

- During a major convention(s) using the entire facility, there will likely be no truck activity related to move out of previous convention or move-in of next convention.
- Vendor deliveries and other service vehicles will typically average 5 to 10 vehicles per hour. This assumption is maintained from the 10,000-person convention.

### Travel Forecasts

The basis for the travel forecasts for the 14,000-attendee convention is the same as for the 10,000-attendee convention, with the exception of walk trips to and from the convention center as discussed below, and vehicle occupancies. The travel modes for Oahu resident convention attendees and employees were estimated using the forecast assumptions outlined in the proceeding sections.

<u>Walk Trips To/From Convention Center</u>

The cumulative percentage of walk trips by Oahu visitors from hotels to and from the convention center for the 14,000-attendee convention is decreased from that of the 10,000-attendee convention. The cumulative reduction in walk trips reflect reductions in walk trip assumptions for each of the walking distance zones from the convention center to Waikiki hotels.

The walk mode split for a 14,000-person convention is based upon a maximum walk time of 10 minutes which is consistent with acceptable travel time for work-to-home walk trips. As previously indicated, in general, conventioneers would most likely walk to destinations located within a 10-minute range. According to personnel associated with the Hilton Hawaiian Village Hotel and the Hyatt Regency Waikiki, people would likely walk to destinations within a four- to five-block range or within a 10-minute range. The walk times between the convention center and various hotels and short-term rental condominium units in the project vicinity are taken from the 1989 survey, modified to include the Hawaii Prince Hotel, which was employed in the WSA/TIA. Only a few large hotels are located within a 10-minute walking distance, including the Ala Moana Hotel, Hawaii Prince Hotel, Outrigger Hobron, and Inn on the Park. Hotels and rental condominiums within the 10-minute walk perimeter are assumed to accommodate about 12.8 percent of Oahu visitor attendees, 80 percent of which would opt to walk to the convention center. This figure appears reasonable since the 4,200 hotel rooms and visitor condominium units within this walk perimeter represent about 12.4 percent of the 34,000 visitor accommodations located in Waikiki.

Examples of hotels within various walking distances from the convention center are:

5-minute walk ........................ Ala Moana Hotel

6 to 10-minute walk ........................ Hawaii Prince
........................ Outrigger Hobron
........................ Inn on the Park

Based on these walking distances and the assumptions listed in the preceding section, about 10 percent of the Oahu visitor attendees would walk to the convention center during the AM peak hour. In the afternoon peak hour, a similar percentage would walk back to the hotels. Table 4-5 summarizes these estimates.

**Table 4-5. Attendees Walking to the Convention Center 14,000-Person Convention**

| Walking Distance (minutes) | | Less than 5 minutes | 6-10 minutes | 11-15 minutes | Total |
|---|---|---|---|---|---|
| No. of Units Within Walking Distance | Hotels | 1,193 | 1,623 | 4,779 | 7,595 |
| | Condos | 0 | 1,394 | 1,398 | 2,792 |
| No. of Attendees (50% Hotel and 10% Condos Occupied by Attendees) | | | | | |
| Hotels (@ 1.1 attendees/room) | | 657 | 893 | 2,628 | 4,178 |
| Condos (@ 1.1 attendees/room) | | 0 | 153 | 154 | 307 |
| Total | | 657 | 1,046 | 2,782 | 4,485 |
| Percent Walking | | 95% | 70% | 0% | — |
| No. of Attendees Walking | AM Peak Hour | 399 | 468 | 0 | 867 |
| | PM Peak Hour | 125 | 146 | 0 | 271 |
| Walk Mode Split | Total | Walking | | % Split | Use |
| AM Peak Hour | 8,960 | 867 | | 9.7% | 10% |
| PM Peak Hour | 2,800 | 271 | | 9.7% | 10% |
| Ref.: The Traffic Management Consultant | | | | | |

The number of attendees who choose to walk to any event can vary significantly based on weather, average age of attendees, frequency of shuttle bus service, etc. The analysis for the 14,000-person event utilizes a conservative 10 percent of total attendees in order to evaluate a "worst case" condition from the perspective of vehicular traffic impact, for this once every three year event. A similar analysis could be conducted using the same number of walkers as was used for the 10,000-person event. This would reduce the vehicular traffic impacts and raise the pedestrian traffic flows to the same level as the 10,000-person event. Although the 14,000-person event is significantly larger, it is assumed that the same number of hotel rooms would be available to attendees of both size conventions within walking distance to the Center, and that the additional 4,000 persons would be farther away and choose to utilize the shuttle bus operations.

**Trip Generation**

Based on the study assumptions, a 14,000-person convention could generate an estimated 1,251 vehicles per hour (vph) during the morning peak hour, 908 inbound and 343 outbound vehicle trips. This number represents the initial day of a 3 to 4-day convention, and the ensuing days could be slightly lower. The composition of the morning peak hour vehicle trips is summarized in Table 4-6.

**Table 4-6. AM Peak Hour Trip Generation Summary 14,000-Person Convention**

| Travel Mode | Mode Split | Person Trips | Persons per Vehicle | Vehicle Trips | | |
|---|---|---|---|---|---|---|
| | | | | Enter | Exit | Total |
| **Oahu Visitor Trips** | | | | | | |
| Walk | 10% | 851 | — | — | — | — |
| Taxi | 5% | 426 | 2.3 | 185 | 185 | 370 |
| Auto | 5% | 426 | 2.3 | 185 | 10 | 195 |
| Public Bus | 10% | 851 | — | — | — | — |
| Shuttle Bus | 70% | 5,958 | 49.0 | 122 | 122 | 244 |
| Subtotal | 100% | 8,512 | — | 492 | 317 | 809 |
| **Oahu Resident Trips** | | | | | | |
| Auto | 90% | 403 | 1.2 | 336 | 17 | 353 |
| Public Bus | 10% | 45 | — | — | — | — |
| **Employee Trips** | | | | | | |
| Auto | 70% | 84 | 1.2 | 70 | 4 | 74 |
| Public Bus | 30% | 36 | — | — | — | — |
| **Vendor and Delivery Trips** | 100% | — | — | 10 | 5 | 15 |
| **Total Vehicle Trips** | | | | 908 | 343 | 1,251 |

Ref.: The Traffic Management Consultant

Vehicle trips would be substantially lower in the peak afternoon exiting hour. As summarized in Table 4-7, a total of 566 vehicle trips is estimated for the afternoon peak hour, with 396 exiting and 170 entering the site.

**Traffic Assignment**

The basis of the traffic assignment for the 14,000-attendee convention is the same as that of the 10,000-attendee convention discussed previously.

| Table 4-7. PM Peak Hour Trip Generation Summary 14,000-Person Convention | | | | | | |
|---|---|---|---|---|---|---|
| **Travel Mode** | **Mode Split** | **Person Trips** | **Persons per Vehicle** | **Vehicle Trips** | | |
| | | | | **Enter** | **Exit** | **Total** |
| **Oahu Visitor Trips** | | | | | | |
| Walk | 10% | 266 | — | — | — | — |
| Taxi | 5% | 133 | 2.3 | 58 | 58 | 116 |
| Auto | 5% | 133 | 2.3 | 3 | 58 | 61 |
| Public Bus | 10% | 266 | — | — | — | — |
| Shuttle Bus | 70% | 1,862 | 20.0 | 94 | 94 | 188 |
| **Subtotal** | **100%** | **2,660** | — | **155** | **210** | **365** |
| **Oahu Resident Trips** | | | | | | |
| Auto | 90% | 126 | 1.2 | 6 | 106 | 112 |
| Public Bus | 10% | 14 | — | — | — | — |
| **Employee Trips** | | | | | | |
| Auto | 70% | 84 | 1.2 | 4 | 70 | 74 |
| Public Bus | 30% | 36 | — | — | — | — |
| **Vendor and Delivery Trips** | 100% | — | — | 5 | 10 | 15 |
| **Total Vehicle Trips** | | | | 170 | 396 | 566 |
| Ref.: The Traffic Management Consultant | | | | | | |

**1998 AM and PM Peak Hour Traffic Impacts**

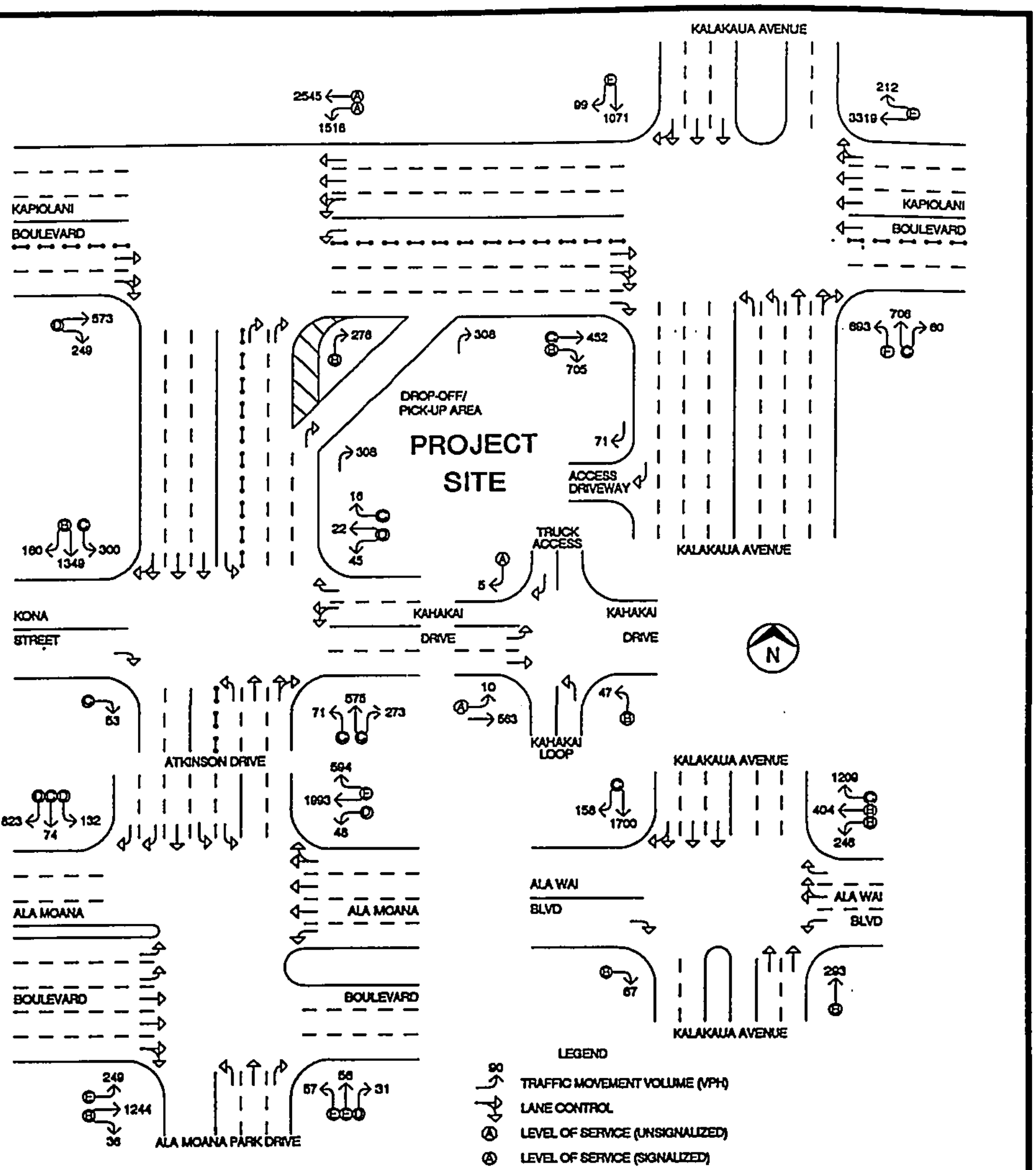
Figures 4-8 and 4-9 show the respective AM and PM peak hour traffic with a 14,000-person convention. The LOS analysis for the 14,000-person convention is performed with the proposed traffic mitigation measures described in the traffic impact analysis for the 10,000-person convention. Table 4-8 shows the LOS, v/c ratios, and average vehicle delays without mitigation (i.e., with existing roadway facilities) and with the proposed traffic mitigation.

**a. Kapiolani Boulevard and Kalakaua Avenue**

During the AM peak hour, the intersection of Kapiolani Boulevard and Kalakaua Avenue would operate at LOS F without mitigation. The increase in AM peak hour traffic demand, resulting from the 14,000-person convention, would also exceed the intersection's capacity; however, the LOS would be unaffected during the 1998 AM peak hour without project. The increase in PM peak hour traffic demand resulting from the 14,000-person convention also exceeds the intersection's existing capacity (without mitigation).

<u>Traffic Impacts With Mitigating Actions</u>

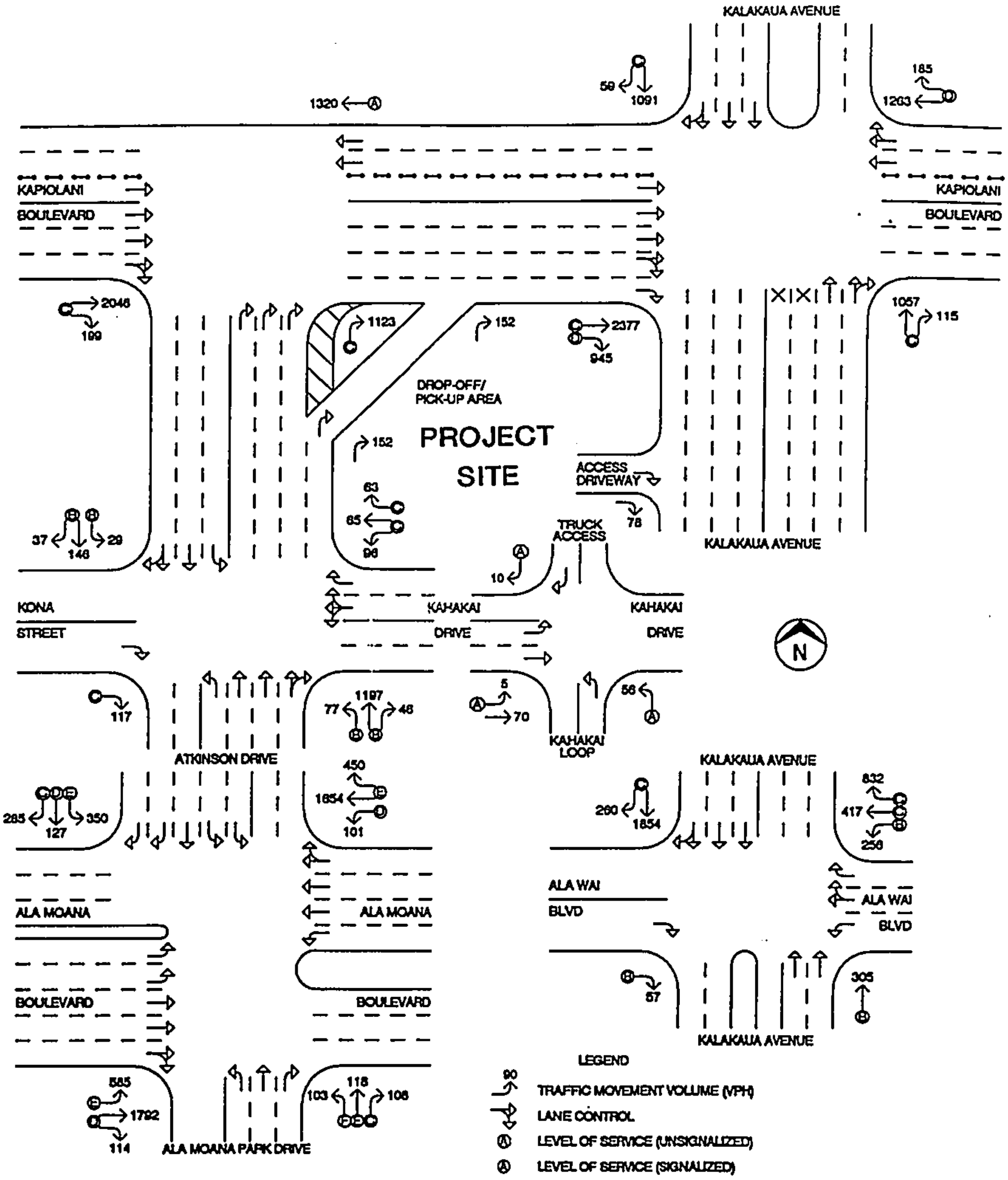
The proposed mitigation actions described under the 10,000-person traffic impact analysis increase the overall intersection capacity to accommodate the AM and PM peak traffic hours under the 14,000-person scenario.




Source: The Traffic Management Consultant

Fig. 4-8

1998 AM PEAK HOUR TRAFFIC WITH 14,000-PERSON CONVENTION




Source: The Traffic Management Consultant

Fig. 4-9
1998 PM PEAK HOUR TRAFFIC WITH 14,000-PERSON CONVENTION

**Table 4-8. 1998 AM and PM Peak Hour Capacity Analysis 14,000-Person Convention**

| Intersection | Peak Hr | Action | LOS | V/C Ratio | Delay (seconds) |
|---|---|---|---|---|---|
| Kapiolani Boulevard and Kalakaua Avenue | AM | Without Mitigation | F | 1.125 | 62.9 |
| | | With Mitigation | E | 1.096 | 54.1 |
| | PM | Without Mitigation | D | 1.036 | 27.5 |
| | | With Mitigation | C | 0.919 | 23.0 |
| Kapiolani Boulevard and Atkinson Drive | AM | Without Mitigation | B | 0.843 | 7.3 |
| | PM | Without Mitigation | C | 0.763 | 15.8 |
| Atkinson Drive and Kahakai Drive/ Kona Street | AM | Without Mitigation | F* | — | — |
| | | With Mitigation | C | 0.538 | 17.6 |
| | PM | Without Mitigation | F* | — | — |
| | | With Mitigation | B | 0.430 | 13.7 |
| Kahakai Loop and Kahakai Drive | AM | Without Mitigation | B** | — | — |
| | PM | Without Mitigation | A** | — | — |
| Kalakaua Avenue and Ala Wai Boulevard | AM | Without Mitigation | C | 0.962 | 23.3 |
| | PM | Without Mitigation | C | 0.945 | 21.5 |
| Ala Moana Boulevard and Atkinson Drive | AM | Without Mitigation | E | 1.024 | 42.8 |
| | PM | Without Mitigation | E | 0.929 | 45.2 |

*Note: Kahakai Drive LOS unsignalized conditions.
"Without Mitigation" = with existing roadway facilities.
**Note: Side street LOS under unsignalized conditions.
Ref.: The Traffic Management Consultant

The most significant impact on the intersection during the AM peak hour occurs on the eastbound right-turn movement from Kapiolani Boulevard to Kalakaua Avenue, resulting from the increase in shuttle buses and taxis returning to Waikiki. However, the increase in AM peak hour traffic occurs in the off-peak direction and is accommodated by the proposed right-turn lane on eastbound Kapiolani Boulevard.

The additional right-turn only lane significantly improves the eastbound capacity on Kapiolani Boulevard, which is the critical direction of traffic during the PM peak hour. The existing eastbound curb lane, which would be converted to an optional through/right-turn lane, provides three eastbound lanes at Kalakaua Avenue. It further provides double right-turn lanes toward Waikiki, which facilitates the shuttle bus and taxi circulation between the convention center and Waikiki.

With the proposed mitigation, PM peak hour traffic conditions are improved slightly over the 1998 PM peak hour conditions without project. No further mitigating actions are recommended at the intersection of Kapiolani Boulevard and Kalakaua Avenue during the AM and PM peak hours for the 14,000-person convention.

**b. Kapiolani Boulevard and Atkinson Drive**

The intersection of Kapiolani Boulevard and Atkinson Drive continues to operate at satisfactory LOS during the AM and PM peak traffic hours. The westbound through movement on Kapiolani Boulevard continues to be the critical intersection movement during the AM peak hour and is unaffected by convention center traffic. Without the added right-turn lane in front of the project, the increase in right-turn traffic from Kapiolani Boulevard to Kalakaua Avenue would worsen queuing in the eastbound lanes of Kapiolani Boulevard beyond Atkinson Drive during the PM peak hour. The proposed improvement at the Kalakaua Avenue and Kapiolani Boulevard intersection as discussed under the 10,000-person convention is expected to mitigate this situation. No further mitigation is recommended at this intersection.

**c. Atkinson Drive and Kahakai Drive/Kona Street**

Under this scenario, traffic on Kahakai Drive is expected to be significantly increased by convention center traffic, particularly during the AM peak hour. Kahakai Drive would again operate at LOS F during both AM and PM peak hours under unsignalized conditions as a result of heavier traffic demands on Atkinson Drive.

Traffic Impacts With Mitigating Actions

The mitigating actions discussed under the 10,000-person scenario for this intersection should accommodate the 14,000-person convention event. Under signalized conditions, Atkinson Drive and Kahakai Drive are expected to continue to operate at LOS C and LOS B during the AM and PM peak hours of traffic, respectively.

The signal coordination between the proposed traffic signals and the existing traffic signals at the intersection of Kapiolani Boulevard and Atkinson Drive becomes more critical in order to minimize the queuing resulting from the increase in left-turn traffic from makaibound Atkinson Drive to Kahakai Drive.

As under the 10,000-person scenario, the existing median left-turn lane should be coned to provide an additional makaibound lane from Kahakai Drive to Mahukona Street during the AM peak hour. This mitigating measure increases makaibound capacity on Atkinson Drive and reduces the potential of queuing from Kahakai Drive back to Kapiolani Boulevard.

**d. Kahakai Loop and Kahakai Drive**

Traffic exiting Kahakai Loop would experience a minor increase in delay due to the increase in inbound traffic to the convention center's parking garage entrance ramp on Kahakai Drive. During the AM peak hour of the 14,000-person convention, the LOS on Kahakai Loop at Kahakai Drive would deteriorate from LOS A to LOS B, which is still considered a satisfactory LOS.

During the PM peak hour of the 14,000-person convention, the LOS on Kahakai Loop at Kahakai Drive would remain unchanged at LOS A since the inbound traffic volumes on Kahakai Drive are minimal. Furthermore, traffic exiting the loop street would not conflict with the vehicles egressing the convention center parking garage since the Center's exit ramp is located closer to Atkinson Drive.

**e. Kalakaua Avenue and Ala Wai Boulevard**

The circulating shuttle bus and taxi traffic increases the demand levels at this intersection to near capacity conditions during both the AM and PM peak hours. However, the intersection is expected to continue to operate at acceptable LOS during the peak hours of traffic. No mitigating actions are recommended.

**f. Ala Moana Boulevard and Atkinson Drive**

The traffic operations at the intersection of Ala Moana Boulevard and Atkinson Drive are expected to worsen from LOS D without project to LOS E during the AM peak hour under the 14,000-attendee scenario. The convention center traffic demand is expected to add 12.5 percent traffic to the 1998 AM peak hour traffic without project. The cumulative traffic demand is expected to exceed the existing intersection capacity during the AM peak hour. The 14,000-person convention scenario significantly increases the shuttle bus volumes and visitor attendee traffic, impacting the right-turn movement from westbound Ala Moana Boulevard to maukabound Atkinson Drive. The heavy right-turn movement from the shared right-turn/through lane on Ala Moana Boulevard further impacts the westbound through movement.

Mitigating Actions

1. As indicated under the 10,000-person convention scenario, it would be desirable to add a right-turn lane along the mauka side of Ala Moana Boulevard with the large volume of vehicles turning right onto Atkinson Drive, which would be increased by the convention center. The right-turn lane would primarily be of benefit during the morning and afternoon peak periods when congested conditions are expected to occur along ewabound Ala Moana Boulevard. Widening constraints imposed by the Yacht Harbor Towers would limit any widening along this side of the roadway.

   As indicated in the 10,000-person scenario, the Draft EIS TIAR indicated that provision of a right-turn lane would likely require one of two approaches. Based on comments received on the Draft EIS, the following is a discussion and cost factors of each plan, and the benefits and impacts of providing this right-turn lane.

   Approach A

   To provide an exclusive 12-foot wide right-turn lane, Approach A would reduce the existing lanes of Ala Moana Boulevard between Atkinson Drive and the Ala Wai Canal Bridge to substandard widths, reduce the mauka sidewalk along Yacht Harbor Towers, and relocate the median divider.

   Lane width reductions would narrow the Waikiki-bound left and center lanes of Ala Moana Boulevard (east of Atkinson Drive) from 12 feet to 11 feet. The Waikiki-bound curb lane would be reduced from 14 feet to 12 feet. In ewabound direction, the curb lane of Ala Moana Boulevard east of Atkinson Drive would be reduced from 14 feet to 11 feet. The remaining three ewabound lanes would each be reduced from 12 feet to 11 feet. With these lane width reductions, the median divider would be relocated 4 feet makai of its existing location. Also, the mauka sidewalk along Ala Moana Boulevard would need to be reduced from 10 to 8 feet in width.

   The major cost that this plan would incur is to relocate the median divider, primarily due to the difference in grade elevation between the ewabound and Waikiki-bound lanes of Ala Moana Boulevard. The remaining costs would be associated with improvements such as lane re-striping and installation of a new curb along the mauka side of Ala Moana Boulevard.

   Approach B

   This approach would involve acquiring a strip of land from Ala Moana Park, widening Ala Moana Boulevard on that side, and shifting the median divider to provide the additional exclusive ewabound right-turn lane.

   The 12-foot wide strip of land to be acquired from Ala Moana Park would extend from Ala Moana Park Drive to the Ala Wai Canal Bridge. The median divider would then be relocated 12 feet makai. With the relocated median divider, the left-turn lane on ewabound Ala Moana Boulevard onto Ala Moana Park Drive would need to be re-striped, and the existing left-turn lane would be modified to become a through lane. The existing shared through/right-turn curb lane on ewabound Ala Moana Boulevard would be modified to become an exclusive right-turn lane onto Atkinson Drive.

As in the case of Approach A, a major cost for this plan would be for the relocation of the median divider, primarily due to the difference in grade elevation between the ewabound and Waikiki-bound lanes of Ala Moana Boulevard. Other costs associated with this plan would include installing a curb lane along Waikiki-bound Ala Moana Boulevard, and re-striping the remaining lanes.

State DOT Suggested Plan

In recent discussions between the State CCA and the State DOT, the DOT has indicated that they will further evaluate the right-turn lane on westbound Ala Moana Boulevard at Atkinson Drive as part of its Ala Moana Boulevard improvement project. The decision by the State DOT to implement this improvement, however, is subject to the results of the City's Waikiki Regional Traffic Impact Plan which is anticipated for completion in August 1995.

In comments submitted in response to the Draft EIS TIAR, the State DOT suggests that a right-turn lane could be provided by relocating the median divider, reducing lane widths to 11 feet, and relocating the mauka sidewalk onto landscaping makai of Yacht Harbor Towers. The improvements associated with this plan would be similar to those of the aforementioned Approach A, except that all lanes of Ala Moana Boulevard between Atkinson Drive/Ala Moana Park Drive and the Ala Wai Canal Bridge would be reduced from 12 feet to 11 feet, and a strip of land along the mauka side of Ala Moana Boulevard would need to be acquired from the Yacht Harbor Towers parcel to retain the existing sidewalk width.

Benefits and Impacts of Providing the Right-Turn Lane

The primary benefit of providing the exclusive right-turn lane is to improve the overall capacity and level-of-service of the Ala Moana Boulevard/Atkinson Drive intersection.

Among the three plans discussed above, major long-term impacts associated with providing the right-turn lane would potentially include the following: the taking of public park land (Ala Moana Park as proposed in Approach B), acquisition of privately-owned land (Yacht Harbor Towers parcel as proposed in the State DOT proposal), traffic safety implications resulting from reduced lane widths, and a reduction in sidewalk width.

Because development of an exclusive right-turn lane along Ala Moana Boulevard would involve public lands and funds, any construction proposal would be subject to the provisions of Chapter 343, Hawaii Revised Statutes (Hawaii EIS law) and would be reviewed as a separate action from the convention center proposal. Also, since Ala Moana Boulevard is classified as a Federal Aid Primary route, such road improvements may be eligible for federal funding. If federal funding is involved, the project proposal would be subject to compliance with the appropriate Federal permits and regulations.

Other Considerations

A plan entitled *Ala Moana Regional Master Plan Design Plan Summary Report* was prepared by the City and County of Honolulu Department of Parks and Recreation in May 1992 which discussed proposed revisions to the traffic/circulation system within the park. The Plan recommends that approximately one-half (1/2) mile of the scenic roadway between the Magic Island entrance and McCoy Pavilion be converted to one-way traffic flow in the ewa direction. Vehicles entering the park from the Waikiki direction can either park at Magic Island, reverse direction within the Magic Island parking lot, or continue through the one-way zone. Vehicles entering the park from the ewa direction will not be permitted to enter the one-way zone and will have to reverse direction via the turnaround at McCoy Pavilion.

This proposed conversion of traffic flow to one-way operation may reduce traffic exiting Ala Moana Park Drive at Ala Moana Boulevard, resulting in overall improvement in traffic operations at the intersection.

## D. ANALYSIS OF MID-DAY (WEEKDAY) PEAK HOUR TRAFFIC

During the mid-day (weekday) peak traffic period, Kapiolani Boulevard carries about 75 percent of the peak hour traffic volume. The analysis of the mid-day (weekday) peak hour traffic was conducted in response to concerns expressed by the City Department of Transportation Services. Traffic impacts are a concern since the contra-flow coning operation and turn restrictions are not in effect during this period. With the absence of the contra-flow coning operations, traffic along Kapiolani Boulevard remains at an elevated traffic level (although considerably below the AM and PM peak traffic hours). The traffic impacts of the convention center on the mid-day (weekday) peak traffic period are analyzed under the following assumptions for a 14,000-person convention.

### Travel Forecast Assumptions

- The travel forecasts and analysis reflects a national or international convention with 14,000 attendees. The travel assumptions employed for the PM peak traffic hour analysis for the 14,000-person convention are applied to this mid-day (weekday) peak hour analysis. The analysis of the mid-day (weekday) peak hour occurs between 1:00 PM to 2:00 PM.
- According to the State CCA, conventions generate very little traffic during the off-peak hours. The Manager of the Hyatt Regency Waikiki indicates that about 40 to 50 percent of the conventioneers attend the afternoon sessions on a peak day. The other half tend to leave the session mid-day, either before, during, or soon after lunch. Throughout the afternoon, conventioneers tend to "trickle-out", in contrast to the "rush" characterizing the morning arrival. Therefore, it is assumed that 25 percent of the attendees would leave the convention center facility during any given off-peak hour, many of whom would opt to walk to an intermediate destination such as the Ala Moana Center or other retail/restaurant outlets in Waikiki before returning to their hotels or the convention center. It is also assumed that 12.5 percent of the attendees would enter or re-enter the facility during the off-peak hour.
- Seventy (70) percent of Oahu visitor attendees leaving the convention center facility during the mid-day peak hour (1,862 persons) are assumed to leave by shuttle bus.
- Of the local resident attendees leaving the convention center during the mid-day peak hour, 90 percent are assumed to leave by private vehicles with a 1.2 person occupancy factor.

### Trip Generation

During the mid-day (weekday) peak traffic hour, the convention center is expected to generate a total of 613 vph, with 271 vph arriving at the site and 342 vph departing the site. The trip generation characteristics for the mid-day (weekday) peak hour are shown on Table 4-9.

### Traffic Assignment

The basis of the traffic assignment for the mid-day (weekday) peak traffic hour is the same for that of the 14,000-attendee convention AM and PM peak traffic hour previously discussed.

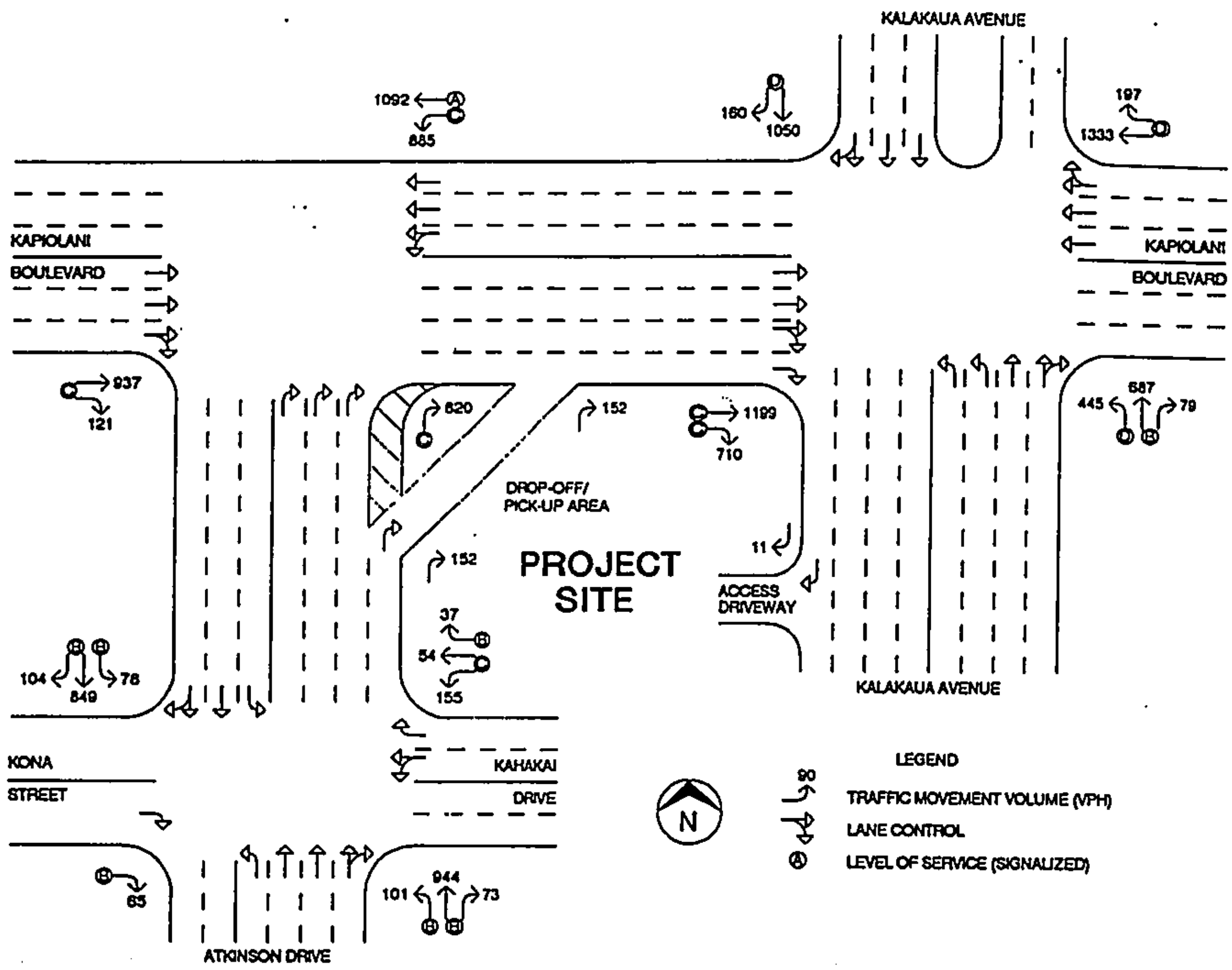
| Table 4-9. Mid-day (Weekday) Peak Hour Trip Generation Summary 14,000-Person Convention | | | | | | |
|---|---|---|---|---|---|---|
| **Travel Mode** | **Mode Split** | **Person Trips** | **Persons per Vehicle** | **Vehicle Trips** | | |
| | | | | **Enter** | **Exit** | **Total** |
| **Oahu Visitor Trips** | | | | | | |
| Walk | 10% | 266 | — | — | — | — |
| Taxi | 5% | 133 | 2.3 | 58 | 58 | 116 |
| Auto | 5% | 133 | 2.3 | 29 | 58 | 87 |
| Public Bus | 10% | 266 | — | — | — | — |
| Shuttle Bus | 70% | 1,862 | 20.0 | 94 | 94 | 188 |
| **Subtotal** | **100%** | **2,660** | — | **181** | **210** | **391** |
| **Oahu Resident Trips** | | | | | | |
| Auto | 90% | 403 | 1.2 | 54 | 106 | 160 |
| Public Bus | 10% | 45 | — | — | — | — |
| **Employee Trips** | | | | | | |
| Auto | 70% | 24 | 1.2 | 21 | 11 | 32 |
| Public Bus | 30% | — | — | — | — | — |
| **Vendor and Delivery Trips** | **100%** | — | — | 15 | 15 | 30 |
| ***Total Vehicle Trips*** | | | | ***271*** | ***342*** | ***613*** |
| Ref.: The Traffic Management Consultant | | | | | | |

**1998 Mid-day (Weekday) Peak Hour Traffic Impacts**

The mid-day (weekday) peak hour traffic volumes are shown on Figure 4-10. As previously indicated, the travel assumptions for the 14,000-person convention PM peak traffic hour analysis are applied to the mid-day (weekday) peak hour analysis. The LOS analysis for the mid-day (weekday) peak period is performed under the proposed traffic mitigation for the 14,000-person convention described in the previous section for the respective analyzed intersections. Table 4-10 shows the LOS, v/c ratios, and average vehicle delays both without mitigation (i.e., with existing roadway facilities) and with the proposed traffic mitigation.

**a. Kapiolani Boulevard and Kalakaua Avenue**

During the mid-day (weekday) peak hour, convention center traffic is expected to increase intersection traffic demand by 3.6 percent; however, the increase in traffic delays are sufficient to result in LOS E conditions with the existing street lanes. The mid-day convention center traffic is similar to the PM peak hour traffic; i.e., the primary impact is caused by the circulating shuttle bus traffic travelling back to Waikiki. However, the eastbound contra-flow operation and left-turn movement restriction on maukabound Kalakaua Avenue are not in effect during the mid-day. Therefore, traffic impacts without mitigation are more significant.




Source: The Traffic Management Consultant

Fig. 4-10
1998 MID-DAY (WEEKDAY) PEAK HOUR
TRAFFIC WITH 14,000-PERSON CONVENTION

**Table 4-10. 1998 Mid-day (Weekday) Peak Hour Capacity Analysis
14,000-Person Convention**

| Intersection | | LOS | V/C Ratio | Delay (seconds) |
|---|---|---|---|---|
| Kapiolani Boulevard and Kalakaua Avenue | Without Mitigation | E | 1.040 | 40.2 |
| | With Mitigation | C | 0.849 | 22.0 |
| Kapiolani Boulevard and Atkinson Drive | Without Mitigation | C | 0.85 | 15.6 |
| Atkinson Drive and Kahakai Drive/ Kona Street | Without Mitigation | F* | --- | --- |
| | With Mitigation | B | 0.54 | 14.7 |

*Note: Kahakai Drive LOS under unsignalized conditions
"Without Mitigation" = with existing roadway facilities.
Ref.: The Traffic Management Consultant

<u>Traffic Impacts With Mitigating Actions</u>

With the mitigating actions described under the 10,000-person convention traffic impact analysis, traffic operations at this intersection significantly improves to LOS C, reduces vehicle delay, and increases intersection capacity. The additional right-turn lane on eastbound Kapiolani Boulevard mitigates the impacts of the shuttle bus traffic. No further mitigating actions are recommended.

**b. Kapiolani Boulevard and Atkinson Drive**

The intersection of Kapiolani Boulevard and Atkinson Drive is not significantly impacted by the proposed project during the mid-day (weekday) peak hour of traffic. The convention center traffic adds only 1.8 percent to the intersection demand. The intersection continues to operate at acceptable LOS. No further mitigating actions are recommended.

**c. Atkinson Drive and Kahakai Drive/Kona Street**

Under unsignalized conditions, Kahakai Drive is expected to operate at LOS F during the mid-day (weekday) peak hour. Through traffic on Atkinson Drive is heavy in both directions during the mid-day peak hour, making it difficult for the increased number of vehicles to exit Kahakai Drive.

<u>Traffic Impacts With Mitigating Actions</u>

Traffic conditions on Kahakai Drive are expected to be significantly improved under the proposed traffic signalization. The left-turn movement from Kahakai Drive to makaibound Atkinson Drive is expected to improve from LOS F under unsignalized conditions without project to LOS B under signalized conditions with project. Traffic signal coordination with the Kapiolani Boulevard signal should minimize queuing on makaibound Atkinson Drive.

## E. ANALYSIS OF FRIDAY EVENING POST-COMMUTER 3,000-PERSON EVENT

As perceived by the general public, traffic entering Waikiki is predominantly heavy during the early evening hours on Friday and Saturday. Friday evening was selected to represent a "worst-case" situation, when the residual afternoon commuter peak period traffic overlaps visitor and resident traffic entering Waikiki. The assumed event is a 3,000-attendee function hosted by a national convention. The analysis of the Friday evening post-commuter peak hour occurs between 6:30 PM to 7:30 PM.

The 3,000-person event is based on the estimated banquet seating capacity of the 35,000-SF ballroom, where according to the Hawaii Convention Center Authority, recurring evening food function events could be held. The seating capacity is based on a SF per person factor comparable to that used by the Hilton Hawaiian Village Hotel for their Coral and Tapa Ballrooms. While it is anticipated that banquets would more realistically average 2,400 persons or less, the capacity figure was assumed in order to provide a conservative analysis. The Friday evening post-commuter peak hour traffic impact analysis is based upon the following assumptions:

**Travel Forecast Assumptions**

<u>Event Attendance Characteristics</u>

- The travel forecasts and analysis reflects a sit-down dining event hosted by a national convention in the convention center ballroom with a total of 3,000 attendees on a Friday evening following the peak commuter traffic period.
- A higher percentage (40 percent) of local resident participation is assumed, since local attendees would likely be accompanied by a spouse or guest to an evening event. Also, local attendees may be more likely to attend an evening function, rather than the daily convention sessions due to potential conflicts with work schedules.
- The remaining 60 percent of attendees will be comprised of Oahu visitor attendees and spouses.

<u>Oahu Visitors Walking</u>

- Since this would be a more formal event, it is assumed that only 5 percent of the visitor attendees would walk to the event, with the majority coming from the Ala Moana Hotel due to its close proximity to the convention center.

<u>Visitor Travel Mode</u>

- Sixty (60) percent of Oahu visitor attendees would be shuttled by charter bus to the event.
- Approximately 25 percent of Oahu visitors will use rental cars to travel to the event. Rental car usage is expected to be more significant for an evening event as Oahu visitor conventioneers are more likely to bring their spouses along, and assuming those spouses have rented cars for vacation-type activities during the convention.
- Since this would be an evening event, no Oahu visitors are assumed to travel by public transit (TheBus) to and from the event.
- Approximately 10 percent of Oahu visitors will use a taxi to travel to the site, with an average of 2.3 attendees per vehicle.

<u>Local Resident Travel Mode</u>

- Most local residents attending the evening event are expected to travel via personal auto. The analysis reflects 90 percent using automobiles, with an average of 2.3 attendees per vehicle, which is a typical auto occupancy rate for social events. The 2.3 persons per vehicle is the approximate midway range of the 1.7 to 2.8 persons per vehicle which is typical for conventions, trade shows and exhibitions at other facilities. High automobile usage is assumed to represent a "worst-case" analysis which would involve significant local participation, along with use of rental cars by visitor attendees as indicated above.

- Approximately 10 percent of local residents will use a taxi to travel to the site, with an average of 2.3 attendees per vehicle.

**Trip Generation**

Based on the study assumptions, a 3,000-person event held on a Friday evening after the peak commuter period could generate an estimated 1,006 vph, 819 vph arriving at the site and 187 vph departing the site. Table 4-11 shows the trip generation characteristics for a 3,000-person Friday evening event.

**Table 4-11. Friday Evening Post-Commuter Peak Hour Trip Generation Summary 3,000-Person Event**

| Travel Mode | Mode Split | Person Trips | Vehicle Occupancy | Vehicle Trips | | |
|---|---|---|---|---|---|---|
| | | | | Enter | Exit | Total |
| **Oahu Visitor Trips** | | | | | | |
| Walk | 5% | 90 | — | — | — | — |
| Taxi | 10% | 180 | 2.3 | 78 | 78 | 156 |
| Auto | 25% | 450 | 2.3 | 196 | 10 | 206 |
| Public Bus | 0% | 0 | — | — | — | — |
| Shuttle Bus | 60% | 1,080 | 49.0 | 23 | 23 | 46 |
| **Subtotal** | **100%** | **1,800** | — | **297** | **111** | **408** |
| **Oahu Resident Trips** | | | | | | |
| Auto | 90% | 403 | 2.3 | 470 | 24 | 494 |
| Taxi | 10% | 120 | 2.3 | 52 | 52 | 104 |
| **Total Vehicle Trips** | | | | **819** | **187** | **1,006** |

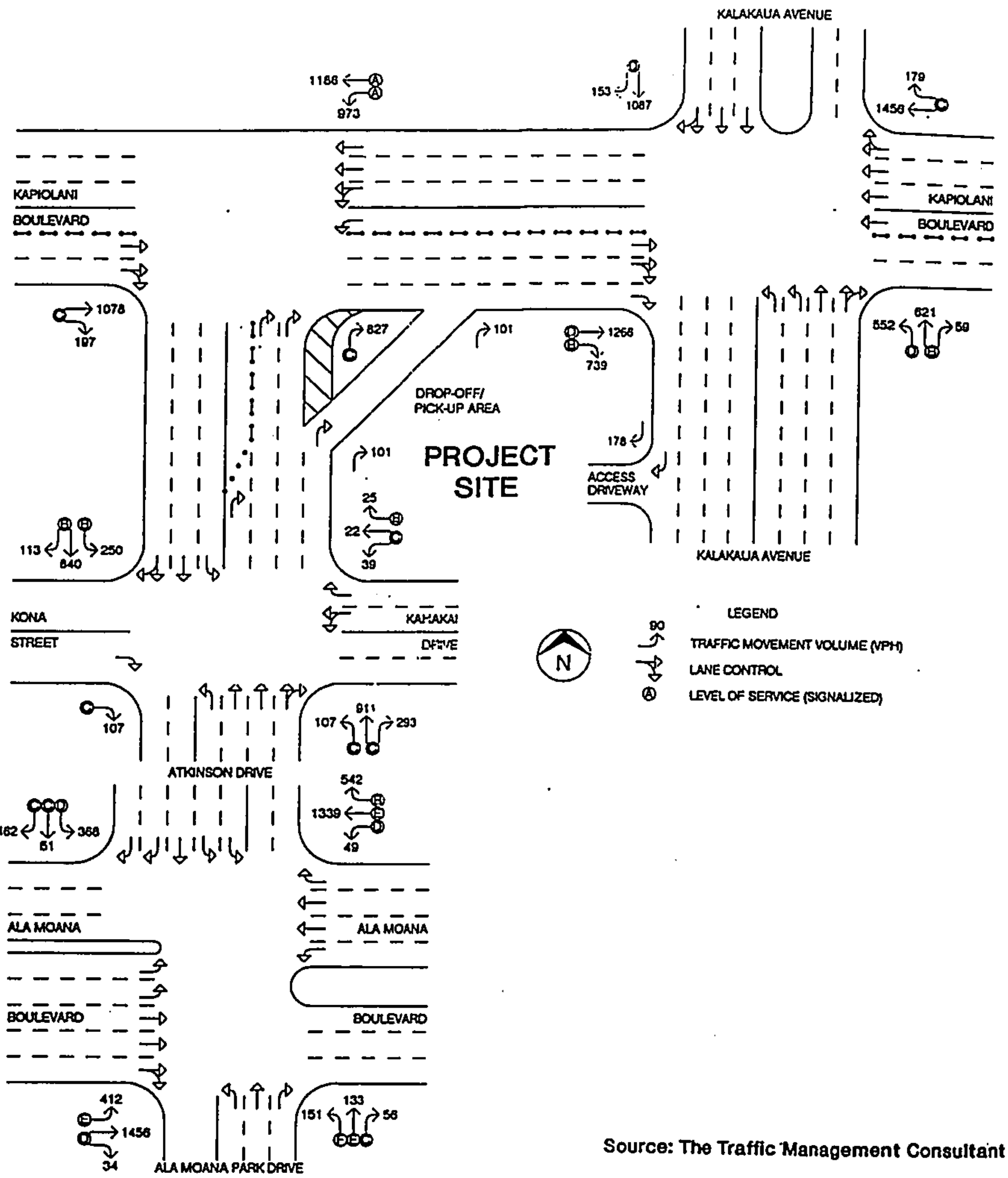
Ref.: The Traffic Management Consultant

**Traffic Assignment**

The basis of the traffic assignment for the 3,000-person Friday evening post-commuter event is the same for that of the 10,000-person and 14,000-person conventions as previously discussed.

**1998 Friday Evening Post-Commuter Peak Hour Traffic Impacts**

The Friday evening post-commuter peak hour traffic is shown in Figure 4-11. The LOS analysis for the Friday evening post-commuter peak period is performed under the proposed traffic mitigation for the 10,000-person and 14,000-person conventions described in the previous sections. Table 4-12 shows the LOS, v/c ratios, and average vehicle delays without mitigation (i.e., with existing roadway facilities) and with the proposed traffic mitigation.




Source: The Traffic Management Consultant

Fig. 4-11
1998 FRIDAY EVENING POST-COMMUTER
PEAK HOUR TRAFFIC WITH 3,000-PERSON EVENT

**Table 4-12. 1998 Friday Evening Post-Commuter Peak Hour Capacity Analysis 3,000-Person Event**

| Intersection | | LOS | V/C Ratio | Delay (seconds) |
|---|---|---|---|---|
| Kapiolani Boulevard and Kalakaua Avenue | Without Mitigation | D | 0.992 | 32.6 |
| | With Mitigation | D | 0.952 | 26.6 |
| Kapiolani Boulevard and Atkinson Drive | Without Mitigation | F | 1.174 | 65.8 |
| | With Mitigation | B | 0.838 | 10.9 |
| Atkinson Drive and Kahakai Drive/ Kona Street | Without Mitigation | F* | --- | --- |
| | With Mitigation | B | 0.516 | 14.8 |
| Ala Moana Boulevard and Atkinson Drive | Without Mitigation | E | 0.895 | 56.4 |
| | With Mitigation | D | 0.870 | 36.2 |

*Note: Kahakai Drive LOS under unsignalized conditions
"Without Mitigation" = with existing roadway facilities.
Ref.: The Traffic Management Consultant

**a. Kapiolani Boulevard and Kalakaua Avenue**

With the existing street lanes, the intersection of Kapiolani Boulevard and Kalakaua Avenue is expected to operate at capacity. The intersection traffic demand would increase by 7.1 percent prior to the beginning of the Friday evening post-commuter event. All approaches are affected by convention center traffic approaching the site, as well as shuttle bus and taxi traffic returning to Waikiki.

Traffic Impacts With Mitigating Actions

In addition to the mitigation proposed under the 10,000-person convention scenario, further traffic mitigation may be needed to accommodate the expected increase in traffic on Kapiolani Boulevard for large size evening events. A westbound contra-flow coning operation, similar to that now used by the City during the AM peak hour, may be needed on Kapiolani Boulevard between the Makiki Drainage Canal crossing (east of Kalakaua Avenue) and Kaheka Street prior to the start of a Friday evening event at the convention center. This westbound contra-flow coning operation would be implemented shortly after the end of the City's PM eastbound contra-flow operation, continuing into the early evening as necessary. As under the AM peak hour contra-flow operation, four (4) through lanes would be provided on westbound Kapiolani Boulevard. Together with the mitigating actions described under the 10,000-person convention scenario, the capacity conditions at the intersection of Kapiolani Boulevard and Kalakaua Avenue would be mitigated, resulting in a v/c ratio of 0.952.

**b. Kapiolani Boulevard and Atkinson Drive**

The increase in convention center traffic on Kapiolani Boulevard at Atkinson Drive would exceed the existing intersection capacity, resulting in LOS F conditions. The increase in left-turn traffic demand on westbound Kapiolani Boulevard to Atkinson Drive could queue back to Kalakaua Avenue. The increase in eastbound Kapiolani Boulevard traffic headed for the convention center further adds to the PM post-commuter peak traffic heading into Waikiki.

Traffic Impacts With Mitigating Actions

The westbound contra-flow operation on Kapiolani Boulevard would extend through the Atkinson Drive intersection as far as Kaheka Street. The existing daytime parking restrictions on both sides of Kapiolani Boulevard between Atkinson Drive and Kaheka Street would be extended into the period of the contra-flow operation. The existing eastbound capacity on Kapiolani Boulevard is maintained by the restricting of on-street parking. The westbound contra-flow operation would provide dual left-turn lanes from westbound Kapiolani Boulevard to makaibound Atkinson Drive. The proposed contra-flow operation significantly improves the traffic operation to LOS B and a v/c ratio of 0.838.

**c. Atkinson Drive and Kahakai Drive/Kona Street**

Under the present stop sign controls, the intersection of Atkinson Drive and Kahakai Drive is expected to operate at LOS F during the Friday evening post-commuter peak hour of traffic as a result of the increase in convention center traffic and the heavy through traffic on Atkinson Drive in both directions. The increase in left-turn demand on the shared left-turn/through lane on makaibound Atkinson Drive to Kahakai Drive would queue traffic back to Kapiolani Boulevard. The makaibound through traffic would use the remaining lane on Atkinson Drive.

Traffic Impacts With Mitigating Actions

The installation of traffic signals at the intersection of Atkinson Drive and Kahakai Drive/Kona Street as described under the 10,000-person convention scenario would improve LOS F conditions of the Kahakai Drive approach to LOS C. The exclusive left-turn lane on makaibound Atkinson Drive at Kahakai Drive described under the 10,000-person convention scenario reduces delays to through traffic by separating left-turn traffic. The signal coordination between the proposed traffic signals and the existing traffic signals at the intersection of Kapiolani Boulevard and Atkinson Drive is required to minimize queuing on Atkinson Drive between Kahakai Drive and Kapiolani Boulevard.

Traffic in the right-lane on maukabound Atkinson Drive at Kahakai Drive would primarily be comprised of convention center traffic, either turning right to Kahakai Drive or to the lobby entrance drop-off/pick-up area. Temporary traffic control signs should be installed to direct convention center traffic to the curb lane and Kapiolani Boulevard-bound traffic to the remaining two through lanes. The three (3) maukabound lanes would be reduced to two right-turn lanes at Kapiolani Boulevard due to the proposed westbound contra-flow operation. The makaibound contra-flow operation on Atkinson Drive proposed for the AM peak period would not be required during the early Friday evening post-commuter traffic operations.

**d. Ala Moana Boulevard and Atkinson Drive**

The traffic operation at the intersection of Ala Moana Boulevard and Atkinson Drive is expected to operate at LOS E during the Friday evening post-commuter peak hour without mitigation. The critical traffic movements (i.e., eastbound left-turn and the westbound through/right-turn movements) would operate at LOS F without traffic mitigation.

Traffic Impacts With Mitigating Action

Assuming the current roadway lanes, designation of the curb lane on westbound Ala Moana Boulevard to a right-turn only (except for City buses) onto Atkinson Drive would improve the intersection traffic operations to LOS D. This could be accomplished by signing and coning the right-lane to redirect through traffic to the remaining through lanes on westbound Ala Moana Boulevard. With this mitigating action, critical traffic movements (i.e., eastbound left-turn and the westbound through/right-turn movements) would improve to LOS E.

## F. ANALYSIS OF ALL-LOCAL 1,800-PERSON EVENING EVENT

In general, the convention center will not be a primary venue for local events. Large indoor local events will continue to be staged at the Blaisdell Center or at the various hotel ballrooms in Waikiki and elsewhere. Nevertheless, the convention center could supplement the existing venues.

The all-local event is assumed to occur on a Friday or Saturday evening in the 35,000-SF convention center ballroom. The Friday evening post-commuter peak period, between 6:30 PM to 7:30 PM, is used as the period of analysis. The intent is to analyze the maximum size event at the convention center that could be accommodated by the number of on-site parking stalls. Assuming that the event organizers do not require carpooling or provide off-site parking, such an event will be limited to approximately 1,800 persons, based on an average vehicle occupancy rate of 2.3 persons for attending social functions. Larger events would require use of existing off-site parking and require that attendees be shuttled by buses to and from the convention center. The analysis of the all-local event is based upon the following assumptions:

### Travel Forecast Assumptions

- The travel forecasts and analysis reflects an all-local 1,800-person event at the convention center ballroom during a Friday evening following the peak traffic commuter period.
- Ninety (90) percent of the attendees will arrive in private vehicles at an occupancy rate of 2.3 persons per vehicle which is typical for a social event.
- The remaining 10 percent of local residents will use a taxi to travel to the site, with an average of 2.3 attendees per vehicle.

### Trip Generation

The convention center is expected to generate a total 899 vph during an all-local event held on a Friday evening; 784 vph arriving at the site and 115 vph departing the site. Table 4-13 shows the trip generation characteristics for an 1,800 person all-local event.

**Table 4-13. Friday Evening Post-Commuter Peak Hour Trip Generation Summary 1,800-Person All-Local Event**

| Travel Mode | Mode Split | Person Trips | Persons per Vehicle | Vehicle Trips | | |
|---|---|---|---|---|---|---|
| | | | | Enter | Exit | Total |
| Oahu Resident Trips | | | | | | |
| Auto | 90% | 1,620 | 2.3 | 705 | 36 | 741 |
| Taxi | 10% | 180 | 2.3 | 79 | 79 | 158 |
| Total Vehicle Trips | | | | 784 | 115 | 899 |

Ref.: The Traffic Management Consultant

### Traffic Assignment

The basis of the traffic assignment for the all-local 1,800-person event on a Friday evening following the peak commuter period is the same as that of the 10,000-person and 14,000-person conventions as previously discussed.

**1998 1,800-Person All-Local Event Traffic Impacts**

Traffic for an all-local 1,800-person event during a Friday evening post-commuter peak hour is shown in Figure 4-12. The LOS analysis for this scenario is performed under the proposed traffic mitigation measures for the 10,000-person and 14,000-person conventions described in the previous sections. Table 4-14 shows the LOS, v/c ratios, and average vehicle delays without mitigation (i.e., with existing roadway facilities) and with the proposed traffic mitigation measures.

**a. Kapiolani Boulevard and Kalakaua Avenue**

With the present street lanes, the intersection of Kapiolani Boulevard and Kalakaua Avenue is expected to operate at capacity during the Friday evening post-commuter all-local 1,800-person event. Traffic on Kapiolani Boulevard is heavier than under the 3,000-person Friday evening post-commuter event hosted by a national convention.

Traffic Impacts With Mitigating Actions

The westbound contra-flow coning operation is also recommended on Kapiolani Boulevard prior to the start of a Friday evening post-commuter large all-local event at the convention center. Together with the mitigating actions described under the 10,000-person scenario, the capacity conditions at this intersection would be eased. Informational signs should be installed on makaibound Kalakaua Avenue to direct convention center traffic to the Kalakaua Avenue parking garage entrance.

**b. Kapiolani Boulevard and Atkinson Drive**

During a national convention, the primary movement of traffic is between Waikiki and the convention center, approaching the site on maukabound Atkinson Drive. The all-local 1,800-person event impacts Kapiolani Boulevard since the primary movement of traffic is makaibound from the H-1 Freeway turning onto Kapiolani Boulevard to approach the convention center. The traffic turning from Kapiolani Boulevard on to Atkinson Drive results in LOS F and over-capacity conditions.

Traffic Impacts With Mitigating Actions

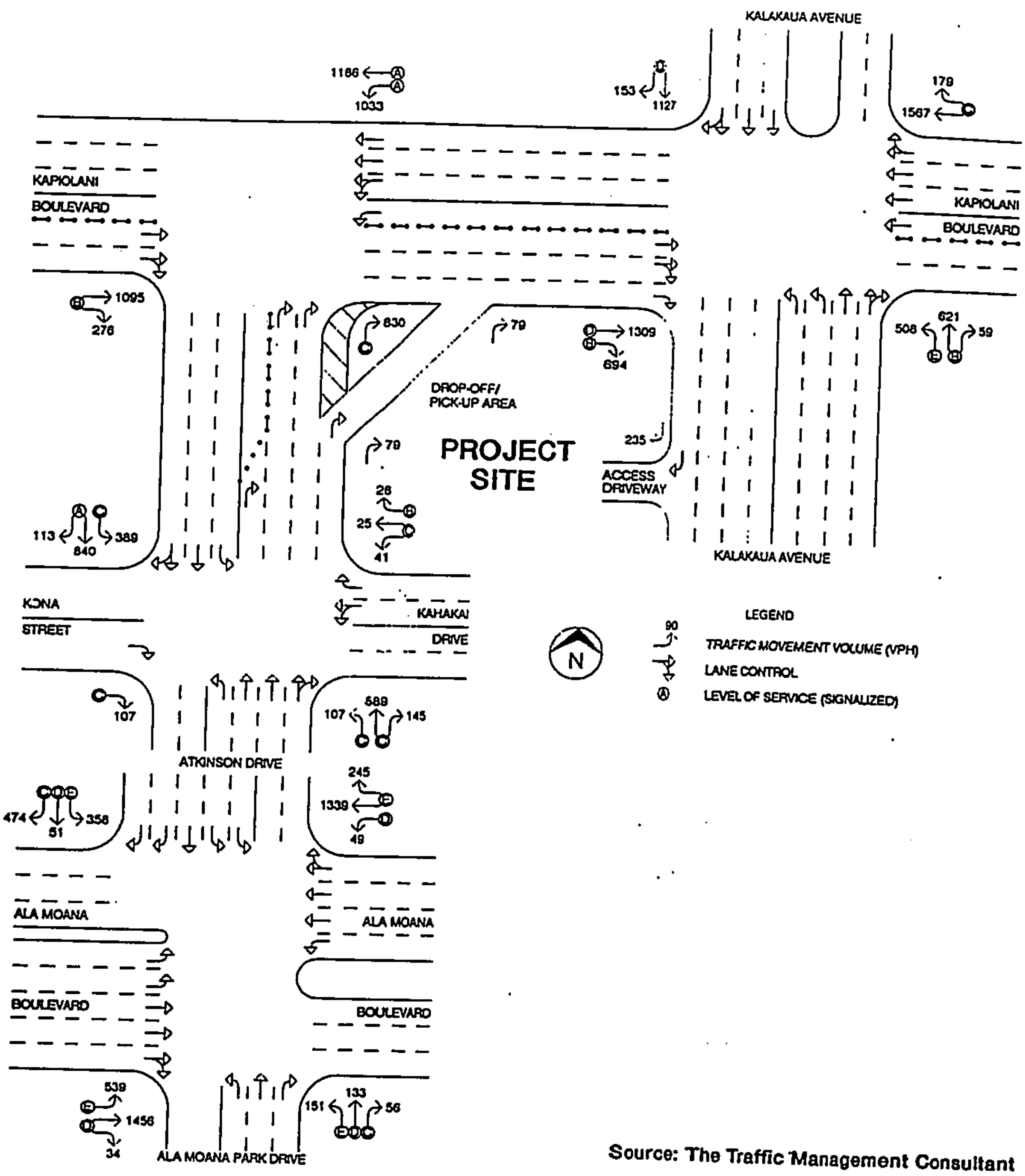
Under the proposed contra-flow coning operations described in the Friday evening 3,000-person event scenario, the intersection of Kapiolani Boulevard and Atkinson Drive improves to satisfactory LOS. Informational signs should be installed on eastbound Kapiolani Boulevard to direct convention center traffic to the Kalakaua Avenue parking garage entrance, as well as the Kahakai Drive entrance.

**c. Atkinson Drive and Kahakai Drive/Kona Street**

As under the previously analyzed Friday evening post-commuter 3,000-person event scenario, the intersection of Atkinson Drive and Kahakai Drive is expected to operate at LOS F during the Friday evening peak hour of traffic with the existing roadway lanes. The maukabound convention center traffic on Atkinson Drive is lower than the previous scenario, with a corresponding increase in makaibound traffic. The increased makaibound traffic demand from Kapiolani Boulevard to Atkinson Drive would also increase the potential queuing problem on Atkinson Drive, where the vehicles waiting to turn left into Kahakai Drive may stack back to Kapiolani Boulevard.

Traffic Impacts With Mitigating Actions

The installation of traffic signals at the intersection of Atkinson Drive and Kahakai Drive/Kona Street as described under the 10,000-person convention scenario would improve the LOS F conditions on the Kahakai Drive approach to LOS C. The exclusive left-turn lane on makaibound Atkinson Drive at Kahakai Drive




Source: The Traffic Management Consultant

**Fig. 4-12**
**1998 FRIDAY EVENING POST-COMMUTER PEAK HOUR TRAFFIC WITH 1,800-PERSON ALL-LOCAL EVENT**

**Table 4-14. 1998 Friday Evening Post-Commuter Peak Hour Capacity Analysis 1,800-Person All-Local Event**

| Intersection | | LOS | V/C Ratio | Delay (seconds) |
|---|---|---|---|---|
| Kapiolani Boulevard and Kalakaua Avenue | Without Mitigation | D | 1.001 | 37.4 |
| | With Mitigation | D | 0.981 | 28.4 |
| Kapiolani Boulevard and Atkinson Drive | Without Mitigation | F | 1.181 | 67.4 |
| | With Mitigation | B | 0.868 | 11.5 |
| Atkinson Drive and Kahakai Drive/ Kona Street | Without Mitigation | F* | — | — |
| | With Mitigation | B | 0.573 | 11.5 |
| Ala Moana Boulevard and Atkinson Drive | Without Mitigation | D | 0.838 | 37.2 |

*Note: Kahakai Drive LOS under unsignalized conditions
"Without Mitigation" = with existing roadway facilities.
Ref.: The Traffic Management Consultant

described under the 10,000-person scenario reduces delays to through traffic by separating left-turn traffic. The signal coordination between the proposed traffic signals and the existing traffic signals at the intersection of Kapiolani Boulevard and Atkinson Drive is required to minimize the queuing on Atkinson Drive between Kahakai Drive and Kapiolani Boulevard.

### d. Ala Moana Boulevard and Atkinson Drive

The intersection of Ala Moana Boulevard and Atkinson Drive is not expected to be significantly impacted by an all-local 1,800-person Friday evening post-commuter event. Convention center traffic would increase traffic demand at the intersection by 4.5 percent; however, only 2.2 percent of the existing capacity would be utilized. The intersection would operate at LOS D and a v/c ratio of 0.838. No mitigation action is recommended.

## G. PARKING

The convention center will provide approximately 800 parking stalls on-site. For the purpose of this study, it is assumed that the parking will be made available to facility employees and visitors at pay parking rates comparable to market rates within the Waikiki area.

### 1. Adequacy of On-Site Parking

The WSA/TIA assessed the convention center parking needs based on a 10,000-person national convention and the assumptions listed under "Forecast Assumptions" for the 10,000-person convention scenario. The estimated peak parking demand would occur during the mid-morning period. The parking requirements for convention center employees, Oahu visitor attendees, and local resident attendees are estimated at 390 stalls. The remaining 410 unused stalls would be available to accommodate any functions when the actual levels of automobile use exceed the study assumptions. These available stalls could be used to accommodate events that have a higher proportion of Oahu residents, a lower average number of occupants per vehicle, or a higher proportion of Oahu visitors driving to the site (rainy days).

The three other convention/event scenarios analyzed in this study would virtually maximize use of the on-site parking. The parking allocation for each of these scenarios is summarized in Table 4-15.

**Table 4-15. Parking Allocation**

| | 10,000-Person Convention | 14,000-Person Convention | 3,000-Person Friday Evening Post-Commuter Event | 1,800-Person All-Local Event |
|---|---|---|---|---|
| Visitor Attendees | 158 | 220 | 196 | 0 |
| Resident Attendees | 149 | 397 | 470 | 704 |
| Employees | 83 | 83 | 83 | 83 |
| Unused Stalls | 410 | 100 | 51 | 13 |
| Total Stalls | 800 | 800 | 800 | 800 |

Ref.: The Traffic Management Consultant

The parking stalls appear sufficient to accommodate most national and international events at the center, assuming that market rates are charged for parking. There may be some such events, as well as local events, that may exceed the parking supply. Also, some employees and attendees may try to find free on-street parking to avoid the parking charges for the convention center garage.

**2. Effects Upon On-Street Parking**

Development of the convention center and its associated roadway improvements will require removal or use restriction of on-street parking near the project site. Temporary restrictions along some streets would be needed during certain large conventions during daytime hours or for special evening events. The on-street parking that would be affected includes:

a. **Atkinson Drive:**

- Parking on the ewa side of Atkinson Drive between Kapiolani Boulevard and Kona Street (about 5 stalls) will be eliminated to provide an exclusive left-turn lane on makaibound Atkinson Drive at Kahakai Drive.
- Parking on the east side of Atkinson Drive between Kahakai Drive to Mahukona Street (9 stalls) would be restricted during the AM peak period; to permit provision of a proposed contra-flow operation to mitigate traffic impacts.

b. **Kapiolani Boulevard:**

- Parking on both sides of Kapiolani Boulevard between Atkinson Drive and Kaheka Street (approximately 40 stalls) may be restricted during the Friday evening post-commuter peak period for traffic flow. The existing daytime parking restriction would be extended through the proposed contra-flow operation period.

c. **Kahakai Drive:**

- Parking on the makai side of Kahakai Drive (5 stalls) would be restricted during large convention events to provide for two (2) inbound lanes.

In the Draft EIS TIAR, it was indicated that parking along the project frontage on Kahakai Drive (7 stalls) will be removed to provide for two (2) outbound lanes on Kahakai Drive. However, on-street parking along the project frontage of Kahakai Drive is currently prohibited due to emergency access. The EIS TIAR referenced these stalls in recognition that Kahakai Drive residents presently park along this side of the roadway.

On-street parking along most streets near the convention center is intensely used throughout the daytime and evening hours. Most of this parking has no meters or parking time limits. The current parking users include area residents, employees in the area, and visitors to the area.

Areas particularly sensitive to any parking "overflow" from the convention center include the Kahakai Drive loop, the section of Ala Wai Boulevard across from the project site, and Kalauokalani Drive mauka of Kapiolani Boulevard. Any effort to control parking use in these areas would require City and County of Honolulu participation. Most such efforts, such as removal of parking, posted time limits, parking meters, or establishment of resident parking permit programs, would provide some degree of inconvenience to area residents and their visitors.

### 3. Parking Alternatives

There may be events that would have a higher proportion of local residents driving to the convention center, or would require additional temporary and part-time employees, or trade show exhibitors who may require special parking needs. To accommodate those events which would require more parking than the approximately 800 on-site stalls, a parking management plan should be established. Several alternatives are offered that could become part of an overall transportation management plan which would increase the number of available stalls or provide alternatives to parking at the convention center.

a. To the extent that off-site parking may be required for certain events (i.e., predominantly local attendance or all-local-attendee events), arrangements could be made to use existing outlying parking facilities that may be available during the event. The attendees would be required to park at the off-site facility and be transported by shuttle buses to and from the convention center. As it is uncertain at this time as to which facilities would be used and the number of available parking stalls, potential traffic impacts which may result from use of these facilities cannot be assessed.

b. The provision of parking at host hotels for local event attendees when negotiating accommodations for Oahu visitor attendees could be arranged. The local attendees would park at the hotel(s) and be transported by shuttle bus to and from the convention center along with the Oahu visitor attendees.

c. Arrangements to relocate employee parking to nearby hotels, commercial offices, and possibly residential condominiums that may have available parking, thereby freeing up employee stalls for attendees.

d. Preferential on-site parking could be provided to employees and local attendees who carpool/vanpool to a convention center event (with an auto occupancy of two (2) or more persons per vehicle), thereby freeing up more available parking stalls.

e. Passes for on-site parking could be issued to pre-registered conventioneers as a means to prevent "turn-aways" from driving up to a full parking garage, thereby adding to traffic in the area. All other convention attendees would be notified prior to the event that no on-site parking would be provided without a pass.

f. Provision of market-rate parking fees (no free parking) for on-site parking to encourage attendees and employees to use public transit and ridesharing.

g. A program to issue temporary public bus passes to convention center employees could be implemented to discourage employees from travelling to and from the center by private vehicles.

h. During special events, the truck dock loading area could be used for valet service tandem parking when truck unloading/loading activities are not occurring.

## H. TRUCKS AND DELIVERIES

Varying levels of truck, delivery vehicle, and service vehicle activity will occur during the one or two set-up days before a convention or trade show event, during the event itself, and on the one or two move-out days following the event.

### 1. Truck Activity

Large trucks will be needed for movement of exhibit materials and equipment to and from the convention center, and for regular activities such as refuse collection trucks. Key features and impacts of truck activity are listed below:

- About 50 container truckloads of freight may be needed to set up a major trade show/convention that uses the entire exhibition hall floor with the actual amount depending on the type of conventions, number of exhibitors, and the bulkiness of the displays and equipment.
- The truck activity will occur on the one or two set-up days prior to and one or two move-out days following the event. For set-up, most trucks will likely arrive and depart in the morning; for move-out, trucks may arrive and leave throughout the day and possibly during the early evening hours. Very few trucks are anticipated to arrive or depart from the convention center during the morning and afternoon peak traffic hours.
- For smaller overlapping conventions, move-in and/or move-out may occur for one part of the facility while another convention/exhibition is underway in another area of the facility. This situation would most likely require fewer trucks due to the smaller convention space.
- The container trucks will likely be arriving from and returning to convention freight consolidation/storage contractor facilities in the Mapunapuna-Kalihi Kai area.
- The Nimitz Highway-Ala Moana Boulevard-Atkinson Drive route will likely provide the most convenient route with the least impacts.
- The H-1 Freeway with exit onto Kinau Street-Piikoi Street and continuing via Kapiolani Boulevard or Ala Moana Boulevard-Atkinson Drive is a less desirable routing. The H-1 Freeway with exit at Punahou Street and use of Kalakaua Avenue or McCully Street is the least desirable routing due to restrictive turn radii, and to the increased number of residential areas that would be affected by truck movement.
- The convention center's truck entry/exit is located along Kahakai Drive which would facilitate a routing to/from the site using Atkinson Drive. A secondary right-turn in/right-turn out entry/exit is provided on Kalakaua Avenue which would route exiting trucks through Waikiki.

The truck activity for convention move-in and move-out should not have any significant impact on area traffic conditions since this would occur primarily on days with no conventions at the site. The truck movements could occasionally affect traffic flow along Kahakai Drive as vehicles enter/exit via this street, although such inconveniences would be of short duration. To alleviate such occurrences to the extent possible, the scheduling of the arrival of trucks at the site should minimize the number of truck arrivals and departures during the morning and afternoon peak hours. Also, the truck drivers should be instructed to use the Nimitz Highway-Ala Moana Boulevard-Atkinson Drive route so as to minimize impacts.

The truck access driveways on Kahakai Drive and Kalakaua Avenue will be designed for semitrailer truck turning movements to ensure accommodation of larger vehicles. The loading dock is contained entirely within the convention center site at ground level, with provisions for a turnaround area, thus minimizing potential queuing of service vehicles back onto the streets. To adequately accommodate required servicing, approximately 12 docks will be distributed along the exhibit hall for easy access to the halls.

**2. Vendor Delivery Trucks**

A variety of smaller delivery and service vehicles will be travelling to and from the convention center site throughout the day, both during move-in/move-out days and during convention events. These will mostly consist of vans and small trucks related to florists, electricians, carpenters, telecommunication installers, parcel deliveries, food/beverage deliveries, and similar activities.

As previously indicated in the traffic impact analysis section, volume levels will likely approximate 5 to 10 vehicles per hour, which should not affect area traffic conditions. Most of these vehicles will likely use the truck loading dock, with the smaller service and delivery vehicles using the parking garage. The transportation coordinator of the convention center should monitor the affect of the arrival and departures of these vehicles on traffic conditions in the immediate area. Should traffic conditions be adversely affected, the transportation coordinator should limit the arrival and departure of these smaller delivery and service vehicles during the peak traffic hours.

## I. PUBLIC TRANSPORTATION

### TheBus Services

The convention center site is well serviced by the City's TheBus transit system. Visitor attendees using TheBus to and from the convention center would likely be those staying at the smaller hotels which are not serviced by the private shuttle bus system provided by the convention. As discussed in the following section entitled Private Shuttle Bus Service, convention planners will provide a pre-paid private shuttle bus service between the major host hotels in Waikiki and the convention center.

Analysis of TheBus services is based on a 14,000-person convention since this scenario is anticipated to have the most significant affect on public transit of the five convention scenarios previously analyzed.

Based on the study assumptions for a 14,000-person convention, an estimated 851 visitors to Oahu and 81 Oahu residents would travel to the convention center via TheBus during the morning peak hour. In the afternoon peak hour, an estimated 266 visitors to Oahu and 54 residents would use TheBus to leave the facility. The Oahu residents would be dispersed among buses on Routes 2, 4, 8, 19, 20, 47, 57, and 58, as well as the routes operating from the Ala Moana Center. However, most visitors to Oahu will use Route 2, with some using the routes operating along Ala Moana Boulevard.

<u>AM Peak Hour</u>

During the morning peak hour, the total transit capacity of Route 2 (from Kuhio Avenue onto Kalakaua Avenue) and Route 4 (from Kuhio Avenue, Kalakaua Avenue, Ala Wai Boulevard, and onto McCully Street) is 1,440 passengers. For City buses operating ewabound using Ala Moana Boulevard (Routes 8, 19, 20, 47, and 57), the transit capacity totals 1,215 passengers during the morning peak hour.

An average "crush load" capacity (seated and standing passengers) of 80 passengers per bus is used to estimate the transit capacity of the Waikiki bus routes, with the exception of Route 8 which has an average crush load of 90 passengers per bus due to the use of articulated buses on that route. Therefore, the total transit capacity of buses operating from Waikiki to the convention center during the AM peak hour is 2,815 passengers. Thus, the convention visitor attendees would use about 30 percent of the overall transit capacity between Waikiki and the convention center if spread throughout this one-hour period.

PM Peak Hour

During the afternoon peak hour, the total transit capacity from the convention center to Waikiki (Routes 2, 3, 8, 19, 20, 47, and 58) is 2,660 passengers. The projected PM peak hour transit demand generated by convention visitor attendees represents about 10 percent of the overall transit capacity between the convention center and Waikiki.

TheBus Impacts and Mitigating Actions

During large conventions, transit capacity of TheBus would be significantly impacted by visitor attendees using public transit during the AM peak hour. Convention center employees and local resident attendees using TheBus would not significantly impact the commuter transit routes during the weekday peak hours.

Under existing transit conditions, significant numbers of visitor attendees boarding TheBus at the east end of Kuhio Avenue could fully load the buses and result in increased pass-ups, resulting in delays to local residents and visitors waiting to board buses at the west end of Kuhio Avenue. Given the present crowded conditions on the Waikiki transit routes, TheBus could not accommodate the additional convention visitor attendee ridership during a large convention event without adding more bus capacity, either more City bus vehicles or use of higher-capacity articulated buses, which would be costly, or more shuttle buses. The decision to use more public bus vehicles would be determined by the City, while use of higher-capacity articulated buses would incur high costs. Therefore, the following measure is recommended to mitigate the transit impacts resulting from increased ridership attributed to the convention center:

- Mid-size and large conventions should provide and encourage the use of special convention shuttle services by visitor attendees to minimize their use and impact of public transit during the peak commuter hours. Convention literature should promote use of such systems and a convenient system of shuttle buses should be provided between the hotels and the convention center. Visitor attendees not staying at the major host hotels should be instructed to walk to the nearest convenient shuttle bus pick-up point for transport to the convention center.

Other Consideration

The City is proposing the Waikiki people mover system toward implementing some of the transportation goals of the Waikiki Master Plan. The people mover system, which is proposed as a supplement to the City's bus system, would provide a local circulator within Waikiki and connect to major hotels and shopping centers. The convention center vicinity is among one of the key transit stops by the people mover system. The system's projected capacity is 480 passengers per hour. The people mover system could increase the transit capacity in Waikiki and augment transit access between Waikiki and the convention center.

As indicated in the WSA/TIA, bus stops in the convention center area introduce several concerns:

1. The bus stop at the Hard Rock Cafe is closest for visitors using Route 2 (maukabound on Kalakaua Avenue). However, the closest crosswalks are located makai of Ala Wai Boulevard or mauka of Kapiolani Boulevard, which may increase jaywalking and the attendant safety concerns. Visitor conventioneers travelling to the convention center should be instructed to disembark at the bus stop mauka of Kapiolani Boulevard (near the Century Center building) to encourage safe crossing. However, some visitor conventioneers may opt to disembark at the bus stop at Ala Wai Boulevard (near the Waikiki Landmark), which would increase pedestrian traffic across the Kalakaua Avenue bridge. This could worsen pedestrian conditions on the bridge sidewalks (see "Pedestrians" section).

2. As indicated in the WSA/TIA, all but one bus stop in the project vicinity have no weather protection. Shelters should be added, although this is provided for informational purposes and should not be viewed as mitigation for the convention center project.

## J. PRIVATE SHUTTLE BUS SERVICE

### Shuttle Bus Operations

A private charter shuttle bus system will be used to provide transportation between Waikiki hotels and the convention center for most visitor attendees. Convention transportation consultant S.E.A.T. Planners, Incorporated (S.E.A.T.) of San Diego, California, which has extensive experience in planning and coordinating transportation management plans for special events throughout the nation, was consulted to provide guidelines for this shuttle bus operation and capacity analysis for the convention center.

All large conventions will require a shuttle bus operator to plan and coordinate a shuttle bus transportation system for conventioneers. A shuttle bus operator is typically hired by the convention planner to provide transportation services for event attendees. The shuttle bus operator is responsible for chartering the bus vehicles and developing routes and schedules. The bus operator would work closely with the convention planner to coordinate the shuttle bus schedules in accordance with convention activities.

In order to provide the most cost-effective operation, the shuttle bus operator will typically minimize the number of bus vehicles and drivers required to accommodate the projected ridership. The required number of bus vehicles is also dependent on the location and number of attendees staying at the convention-arranged hotels, and the estimated travel times between the hotels and the convention center during the peak traffic periods. The cost of the shuttle bus service is typically included in the convention attendance fee.

An efficient shuttle bus system is dependent upon convention attendees staying at the fewest number of hotels, located within easy vehicular access of the convention center. A convention planner will usually secure large blocks of rooms from nearby hotels which can easily be serviced by shuttle bus routes. Several shuttle bus routes would be developed, each providing service to a large block of hotel rooms. Each route may service a single large hotel or several smaller hotels. Shuttle buses would not service small or non-host hotels since these facilities usually lack off-street loading areas, thereby requiring shuttle buses to stop on the street. Frequent stops increase the transportation costs and reduce the efficiency of the shuttle bus service. Visitor attendees choosing not to stay at the convention-arranged accommodations will be directed to walk to the nearest host hotel to use the shuttle bus service.

In planning the shuttle bus operation for an event at the convention center, the operator will take into account the expected daily attendance and the number of attendees that are expected to be transported by shuttle bus during the peak hour. The shuttle bus operator will also seek to charter the largest available bus vehicle (passenger capacity). Based upon the current private bus fleets, the large tour coaches can accommodate a capacity of 49 or more seated passengers. The shuttle bus operator is expected to maximize use of the buses during the peak arrival/departure hours. In general, shuttle bus loads can vary from trip to trip, with some buses containing empty seats, while others are carrying standing passengers. Overall, however, the average bus load is expected to be equivalent to the seated capacity of the bus. The shuttle bus operator could also use the standing capacity to accommodate an unexpected surge in ridership demand (i.e., during inclement weather conditions). If the standing passenger capacity cannot accommodate a higher than expected ridership demand, or if the average bus load is less than expected, the shuttle bus operator would have to make additional bus trips over an extended period of time to transport the total number of passengers.

The most critical period for the shuttle bus operation is during the AM peak hour, when a large number of attendees need to be transported from the hotels to the convention center. The shuttle bus operator should coordinate the scheduling of shuttle buses with the convention planner and the convention center transportation coordinator to minimize congestion at the hotels, on the public streets, and at the convention center, respectively. In general, shuttle bus drivers have prescribed schedules for leaving the hotels and arriving at the convention center. Also, the convention planner should assign event attendees a specific departure time to minimize confusion at the hotel pick-up point. At the convention center, route schedules should result in reasonably uniform arrival times so bus unloading activities do not overwhelm the Center's lobby driveway area. Also, the shuttle bus operator should have personnel stationed at the lobby entry driveway to direct shuttle buses into and out of the passenger loading/unloading area so as to prevent queuing back onto the streets.

During the remainder of the day, attendees are expected to gradually depart the convention center facility to return to their hotels or go to other destinations. During this time, the shuttle bus service would run as a regularly scheduled operation between the convention center and host hotels, and at a reduced service rate and vehicle occupancy.

Events that conclude with large numbers of attendees returning to the hotels would likely require a shuttle bus staging area prior to the end of the event. The shuttle bus operator should coordinate with the convention center's transportation coordinator for use of the facility's loading dock area for bus staging so as to eliminate the potential of buses queuing on the streets.

**Shuttle Bus Capacity Analysis**

An analysis of the shuttle bus loading and unloading operations for an event at the convention center is presented below. The 14,000-person convention is used as a basis for this analysis since the forecast assumptions previously presented assumes a greater number of Oahu visitor conventioneers (70 percent) using the shuttle bus to/from the convention center.

Methodology

The methodology for this analysis is presented in Chapter 12, Transit Capacity, of the *Highway Capacity Manual Special Report 209* (HCM), published by the Transportation Research Board, 1985, as amended. The HCM procedures estimate an average of 2.0 seconds per alighting (disembarking) passenger and 3.0 seconds per boarding passenger. The procedures further estimate the clearance interval between successive buses at 20 seconds. The total dwell time (total time that a bus is stopped to service passengers) plus clearance interval is increased by 20 percent to account for variations in dwell time, clearance interval, and arrival rate.

This capacity analysis is based on an average passenger load of 49 persons per bus, which approximates the lowest seated capacity of the large charter coaches, which range in size from 49 to 65 seats, with 54 seats being the most common size.

According to S.E.A.T., the number of shuttle buses required for a convention event is dependent upon the number of round trips between the hotels and the convention center that can be made within a peak traffic hour. The number of shuttle bus round trips is dependent upon the number of stops, traffic delays along the bus routes, and distances between the hotels and the convention center.

AM Peak Hour

Based on the previous forecast assumptions for a 14,000-person convention, 70 percent of the Oahu visitor attendees would use the shuttle bus to travel to the convention center during the AM peak hour. The shuttle buses would operate with an average load approximating the seated capacity. A fleet of approximately 60 to 70 charter buses would be required to transport the estimated 5,958 Oahu visitor attendees to the convention center during the AM peak hour. This would result in about 122 bus trips during this peak hour period. The average headway (time between the arrival of successive vehicles) between shuttle buses would be about 30 seconds during the AM peak hour.

Based on methodology in the HCM, five (5) bus berths at the convention center would be required to accommodate the shuttle bus operations during the morning peak hour. Inefficiencies in the bus unloading operation at the convention center may potentially occur as a result of variation in the arrival rate due to heavier AM peak hour traffic between the hotels and the center. The shuttle bus operator would be responsible for the planning of bus schedules to maintain bus arrivals at constant headways and to avoid too many buses arriving at the same time. An additional bus berth would be required to account for inefficiencies resulting from friction between arriving and departing buses, typically experienced in multiple "in-line" bus berths. These frictional effects are anticipated to be minimal since the dwell time of each vehicle should be relatively constant.

Additional delays may occur for buses exiting the convention center main entry drive area onto Kapiolani Boulevard. However, the right-turn movement from eastbound Kapiolani Boulevard to Waikiki-bound Kalakaua Avenue operates at LOS B during the AM peak hour, indicating little delay. Shuttle buses exiting the convention center would enter the proposed additional right-turn-only on Kapiolani Boulevard which will be provided as part of the convention center project.

The six (6) off-street bus berths provided at the main entry drive fronting the convention center lobby should be adequate to accommodate the shuttle bus operations and number of bus trips during the AM peak hour under normal conditions. Two (2) additional on-street bus berths can be provided on the proposed widened portion of Atkinson Drive fronting the project site. These two bus berths would be able to accommodate up to 50 bus trips per hour, equal to an additional 2,450 passengers during the AM peak hour.

<u>PM Peak Hour</u>

The shuttle bus operation during the afternoon peak period is oriented more toward service than efficiency as visitor attendees are expected to leave the convention center throughout the afternoon. According to S.E.A.T., the afternoon shuttle bus service would be provided at about 75 percent of its AM peak hour operation. Shuttle buses will leave on time, whether they are carrying only one passenger or the capacity 49 passengers. Since the shuttle bus service would be more schedule-oriented during the afternoon period, the buses would operate at a much lower average occupancy rate of 20 passengers per bus. This is in comparison to the 35 persons per bus applied in the 10,000-person convention scenario.

Based on the forecast assumptions for a 14,000-person convention, about 94 shuttle bus trips would be required to transport the approximately 1,862 visitor attendees back to Waikiki hotels during the PM peak hour. During the afternoon peak traffic period, queuing on eastbound Kapiolani Boulevard is expected to extend from Kalakaua Avenue to the exit point of the main entry driveway. The traffic signal operation at the intersection of Kapiolani Boulevard and Kalakaua Avenue would potentially affect the clearance times for shuttle buses exiting the convention center.

Based on methodology in the HCM, a minimum of three (3) bus berths would be required during the PM peak hour shuttle bus operation for a 14,000-person convention. All six (6) bus berths in the main entry drive of the convention center would be available during the PM peak hour.

For events which may have most attendees or participants leaving at its conclusion (as opposed to "trickling-out" during the afternoon), up to 20 shuttle buses can be staged within the loading dock prior to the end of the event. The shuttle buses would enter the loading dock via Kalakaua Avenue. As shuttle buses loaded with passengers depart the main entry area, the buses in the staging area will be directed to arrive at the main entry for passenger pick-up in succession.

## K. PEDESTRIAN ACCESS TO SITE

Existing pedestrian facilities in the area of the convention center site are generally adequate for existing conditions. On Kapiolani Boulevard, crosswalks are located immediately west of Atkinson Drive and on the west side of Kalakaua Avenue. Crosswalks on Kalakaua Avenue are located on the mauka side of Kapiolani Boulevard and the makai side of Ala Wai Boulevard. On Atkinson Drive, crosswalks are located immediately makai of Kapiolani Boulevard and at Kona Street. An unmarked crosswalk is provided on Kahakai Drive at Atkinson Drive. All pedestrian crossings are signalized, with the exception of the Kona street and Kahakai Drive crosswalks. Pedestrian crossing on Kalakaua Avenue is prohibited on the makai side of Kapiolani Boulevard.

Except for the Ala Moana Hotel, most hotel and condominium rental accommodations which would be used by conventioneers are located in Waikiki across the Ala Wai Canal. Pedestrian access between the Waikiki hotels and the convention center involves crossing either the Kalakaua Avenue bridge or the Ala Moana Boulevard bridge.

### Pedestrian Impacts and Mitigating Actions

The analysis of pedestrian impacts to the convention center site is based on the 10,000-person convention due to its higher walk mode (35 percent) in comparison to the 14,000-person convention (10 percent). While a high walk mode scenario reduces the traffic impacts of the convention center, it identifies potential pedestrian impacts on existing facilities in the area of the project site.

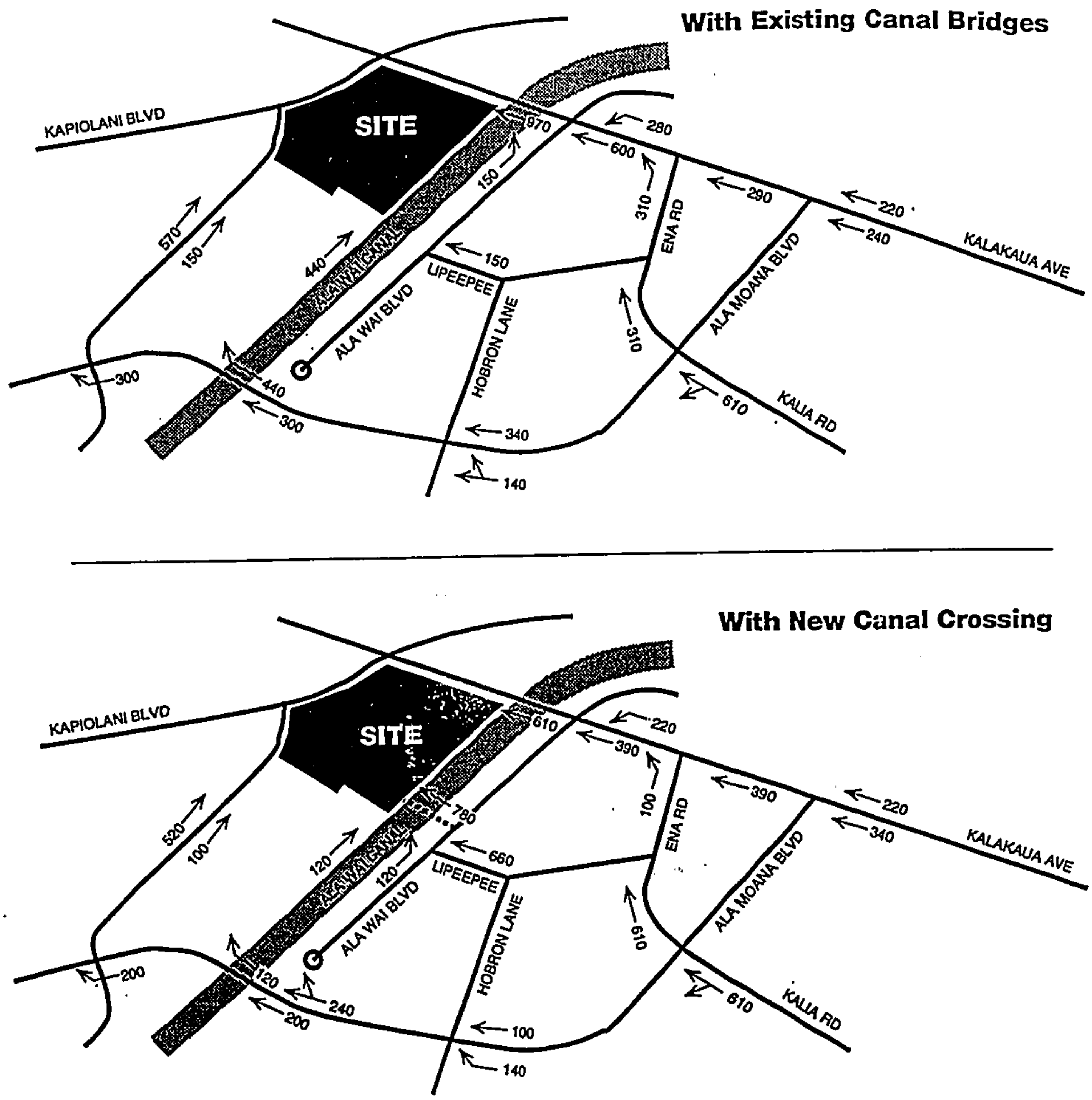
Given the favorable climate and the existing availability of hotel rooms within convenient walking distance of the convention center, a large portion of attendees will likely walk to/from the convention center. For the 10,000-person convention used in this assessment, an estimated 2,130 attendees would walk to the facility. This number could be larger for the limited number of very large conventions, for those smaller conventions with attendees concentrated in the hotels closest to the facility, and/or if additional hotels are constructed within convenient walking distance.

The morning peak hour pedestrian trips were estimated for the principal routes between the hotels and the convention center. The estimated volumes are depicted in the top portion of Figure 4-13, which include only attendees and do not reflect existing pedestrian volumes. The largest volumes occur on the Kalakaua bridge, with 970 pedestrians. Other high-volume corridor segments include 820 along Kalakaua Avenue mauka of Ena Road, 740 across the Ala Moana Boulevard bridge, and 720 along Atkinson Drive.

A key concern is the adequacy and safety of pedestrian traffic across the makai sidewalk of the Kalakaua Avenue bridge. A preliminary assessment was made of the makai sidewalk across the bridge using the procedures outlined in the *1985 Highway Capacity Manual*. These procedures use a level-of-service concept similar to that for roadways, with conditions denoted by letters ranging from excellent (LOS A) to undesirable (LOS F). Each level of service is associated with a certain average space per pedestrian and/or flow rate expressed in the average number of pedestrians passing a point per minute per foot of width. The six levels of service are described in Appendix B, Figure B-1.

The pedestrian service level was evaluated at four locations on or near the Kalakaua bridge: at the center of the bridge crossing where there are no impediments to pedestrian flow; at each end of the bridge where there are utility poles within the walkway; and at

the crosswalk across Ala Wai Boulevard. The analysis assumes that 50 percent of the peak hour pedestrians cross in a single 15-minute time period. Table 4-16 summarizes the results for average conditions, and for conditions within platoons crossing the bridge (due to traffic signal effects or slow walkers).




Source: Wilbur Smith Associates, May 1994

Fig. 4-13
ESTIMATED CONVENTION CENTER
PEDESTRIAN TRIPS MORNING PEAK HOUR

**Table 4-16. Kalakaua Bridge Crossing Pedestrian Service Levels**

| Location | Average Condition | | Platoon Condition | |
|---|---|---|---|---|
| | PMF | LOS | PMF | LOS |
| Center of Crossing | 8.9 | C | 12.9 | D |
| Pole at End near Site | 17.0 | E | 21.0 | E |
| Pole at End near Waikiki | 10.3 | D | 14.3 | D |
| At Ala Wai Crosswalk | 47.0* | B | 15.4* | D |

PMF = Pedestrians per Minute per Foot of Width.
LOS = Level-of-Service.
* = Average square feet of area per pedestrian during crossing
Source: Wilbur Smith Associates.

Relocation of the utility poles at each end of the Kalakaua bridge could improve conditions to the levels indicated for the center of the bridge crossing where there are no impediments within the walkway. The traffic signal located on the utility pole on the Waikiki side of the Kalakaua Avenue bridge may be required to be relocated to a new mast arm to maintain visibility to motorists.

With the pole relocations, pedestrian conditions (LOS C/D) appear acceptable for a large 10,000-person convention, given the assumptions used in this analysis. Future increases in pedestrian use above these levels, due to factors such as those cited earlier, could worsen conditions to LOS E and increase concerns for pedestrian safety.

Previous studies indicated that further analysis may be required for the sidewalk area along the Diamond Head side of Atkinson Drive between the Kona Street crosswalk and Kahakai Drive. The visitor conventioneers staying at the Ala Moana Hotel would likely walk along the ewa side of Atkinson Drive, cross Kona Street, and use the proposed relocated crosswalk across Atkinson Drive to access the convention center. Also, convention attendees arriving by TheBus and disembarking at either Ala Moana Center or Ala Moana Boulevard would walk to the convention center using both sides of Atkinson Drive.

The pedestrian analysis indicates that the existing sidewalks on both sides of Atkinson Drive are adequate to accommodate the cumulative pedestrian volume of convention attendees walking to the convention center during the AM peak hour of a large convention. The crosswalks at the intersection of Atkinson Drive and Kahakai Drive are also expected to operate at satisfactory levels of service. The area of concern is on the southeast corner of the intersection of Atkinson Drive and Kahakai Drive. Pedestrians on the ewa side of Atkinson Drive would cross over to the southeast corner of the intersection, converging with the pedestrians walking along the Diamond Head side of Atkinson Drive. Up to about 1,000 pedestrians can be expected to cross Kahakai Drive during the AM peak hour of a large convention from the southeast corner of the intersection. Under existing curb return geometrics, the projected pedestrian volume would result in LOS F conditions. This corner sidewalk area is inadequate to accommodate the projected volume of pedestrians waiting for the proposed pedestrian signal to cross Kahakai Drive, and will cause pedestrians to queue up along the Atkinson and Kahakai sidewalks waiting for the light to change.

To improve pedestrian conditions at the southeast corner of the intersection of Atkinson Drive and Kahakai Drive, the sidewalk area at this corner should be expanded to accommodate pedestrian queues. During a large convention in the AM peak hour, a traffic control officer should also be stationed at the Kahakai Drive crosswalk to maintain pedestrian safety.

Other options to further improve pedestrian access would include the following:

1. Widen the existing Kalakaua Avenue bridge to increase the makai sidewalk width by 2 feet or more. This can be accomplished by reducing the road width of Kalakaua Avenue and relocating the makai curbline into the existing travel way. The lane markings would need to be realigned, thereby reducing the maukabound curb lane from the existing 16 feet to about 14 feet. The vehicle turning radii on the dual right-turn lanes from westbound Ala Wai Boulevard to maukabound Kalakaua Avenue may need to be adjusted to accommodate the design truck vehicle.

2. Construct a new pedestrian-only bridge paralleling and adjacent to the makai side of the bridge. (The existing bridge sidewalk area could continue in use, or could be reconstructed as a bicycle lane or to widen the traffic lanes.)

3. Construct a new pedestrian bridge across the canal near the makai end of the project site, near Lipeepee Street.

All options would improve sidewalk conditions to LOS C for the identified pedestrian volume levels. Figure 4-13 also indicates the reassignment of the pedestrian volumes if a new pedestrian crossing location is constructed (Option 3). The new crossing may also increase walk trips since it would reduce the walk time to the convention center from several hotels, in particular, from the Hilton Hawaiian Village Hotel.

To provide safer pedestrian movement across the Kalakaua Avenue bridge, a divider or barrier could be considered along the curb lane to physically separate the vehicular and pedestrian traffic. Although this is technically feasible, the historic nature of the bridge would require approvals to be subject to additional review, a process which has yet to be initiated. This option is not necessary to meet capacity requirements, but would increase pedestrian safety.

Previous studies identified other pedestrian locations that would require improvements. These include the following:

- The completion of a surfaced walkway along the ewa-side of the Ala Wai Promenade between Ala Moana Boulevard and Kalakaua Avenue.

  A walkway on the Ala Wai Promenade will extend from Kalakaua Avenue to the Kahakai Drive edge of the convention center property between the two rows of Banyan trees. The configuration and finish of the walkway, additional landscaping, and whether or not any street furniture or lighting will also be provided will be determined in consultation with the State Historic Preservation Division. In the future, the City Department of Parks and Recreation proposes to replicate this walkway along the Ala Wai Promenade from the Kahakai Drive edge of the convention center to Ala Moana Boulevard.

- The possible relocation of the Atkinson Drive crosswalk at Kona Street, relative to installation of the traffic signal at Kahakai Drive.

  In conjunction with the proposed installation of the traffic signal at the Atkinson Drive/Kahakai Drive/Kona Street intersection, the existing pedestrian crossing on Atkinson Drive near Kona Street will be relocated to the mauka side of this intersection.

- The narrow 4-foot wide sidewalks along portions of Ala Moana Boulevard between Kalia Road and the Ala Wai Canal. Based on a field investigation, an approximate 250-foot section of the paved mauka sidewalk along Ala Moana Boulevard west of Hobron Lane is about 6 feet wide, with a 4-foot wide planter strip. The remainder of the sidewalk between Kalia Road and the Ala Wai Canal consists of a

10-foot wide paved sidewalk. The existing sidewalk meets or exceeds the City and County of Honolulu standards for sidewalk widths.

## L. TRANSPORTATION MANAGEMENT PLAN

Prior to the opening of the Hawai'i Convention Center, the State CCA will engage the services of an operator to manage the operations of the Center. Among the primary duties entailed in operating a convention center is the management of transportation-related activities associated with events held at the Center. Transportation management is essential in efficiently transporting the large number of delegates associated with national or international conventions, with minimal traffic-related impacts to the surrounding roadways. In addition, it is in the economic interest of the convention center operator and convention planners to assure that inconvenience and delays to conventioneers is minimized in any transportation plan.

The procedures outlined in this section are intended to serve as a framework for the development of a transportation management plan to be employed by the convention center operator for specific events. It will be the responsibility of the State CCA to ensure that these transportation management plan guidelines and procedures are provided to the convention center operator for use in developing and implementing such plans for events. These guidelines are intended to identify principal operational measures which should be considered by the convention center operator on an event-related basis. It will be the responsibility of the convention center operator to develop detailed transportation management plans for implementation. Once the convention center is operational, judgement and experience will determine which specific operational mitigation measures would be implemented for a particular event.

Establishment of a transportation management plan will require close coordination among the various personnel involved in organizing a convention event. The key personnel most likely to be involved in the development and implementation of a transportation management plan include the following:

- A Special Event Manager designated by the convention center operator, who will be responsible for all aspects of specific convention events, including overseeing the transportation coordinator.
- A Transportation Coordinator designated by the convention center operator, who will be responsible for the transportation-related operations of the convention center. The transportation coordinator's primary function would be the development of a series of master transportation management plans for different types and sizes of convention center events, and the overseeing of plan refinements/modifications for each event at the convention center, as deemed necessary. The transportation coordinator will also be responsible in overseeing the transportation operations which occur during the event.
- A Convention Planner who is affiliated with and organizes a specific convention group.

<u>Role of the Transportation Coordinator</u>

The convention center transportation coordinator will be the key person in the development of the master transportation management plan and the refinements for specific events, as well as implementation of key elements of the plans. The responsibilities of the transportation coordinator may include the following:

- Design a traffic operational plan which describes the implementation of operational traffic control measures, including indicating the times that the reversible parking ramps would flow in each direction, coning operations, temporary parking restrictions, and temporary lane assignments for review by the City DTS and the State DOT, as deemed appropriate.

- Obtain the necessary permits and approvals for operational traffic measures which may affect or occur on public streets from the City and County of Honolulu Department of Transportation Services (DTS) and the State Department of Transportation (DOT), as appropriate.

- Work with the convention planners to schedule the starting and ending times of convention events to avoid the peak traffic hours, if deemed necessary.

- Develop and notify the appropriate parties (i.e., convention planners, shuttle bus operators, etc.) of recommended travel routes to and from the convention center that would least impact traffic conditions in the area.

- Ensure that the traffic control personnel necessary to direct event-related traffic in and around the convention center site are provided.

- Assist convention planners in assessing and providing for the parking needs for their event.

- Monitor and coordinate the shuttle bus and taxi/limousine passenger loading and unloading operations at the convention center.

- Monitor and coordinate the scheduling of truck deliveries to the convention center.

- Coordinate with the news and broadcast media to relay advisories of convention center events that may affect traffic conditions.

- Refine the transportation *management plan as appropriate* based on operations experience at the convention center.

**Transportation Management Plan Guidelines**

The transportation management plan would provide a description and diagrams (as appropriate) of operational traffic improvements or measures intended to ensure maximum efficiency of transportation-related activities for an event at the convention center. Prior to the opening of the convention center, a master transportation management plan would be developed by the transportation coordinator which would include operational procedures and guidelines which would be necessary to meet the traffic and transportation-related needs of the Center's events. The master transportation management plan will be submitted to the City Department of Transportation Services for review and approval prior to the opening of the Center.

Prior to each event at the convention center, the transportation coordinator and the respective convention planner will review the master transportation plan and implement only those elements which would be necessary to meet the needs of the particular event. The type and size of the event would be the determining factor in selecting the necessary transportation operational measures for an event. Should the transportation procedures or measures deemed necessary for a particular event deviate from those in the master transportation plan, the transportation coordinator would then submit the event-related plan to the City DTS for review and approval.

The management plan would provide for the following transportation operations:

<u>Traffic Access Controls</u>

Traffic control personnel would be stationed at key access points or intersections in and around the convention center site to facilitate the movement of traffic during large events. In general, traffic control personnel would be responsible to minimize traffic delays on public streets resulting from the convention center, maintaining the flow of traffic into and out of the convention center site and adjacent streets, and ensuring safe pedestrian crossings at the Center's driveways. Security personnel trained in traffic control procedures would be used to direct traffic within the Center's site and off-duty police officers could be employed to direct traffic on the public streets in the vicinity of the convention center.

The key access points in the immediate vicinity of the convention center where the stationing of traffic control personnel may be necessary include the following:

- The convention center's parking garage entrance and exit ramp driveways on Kahakai Drive. During large events at the convention center, traffic control personnel may also be used to direct the movement of all vehicles which pass through the T-intersection of Kahakai Drive and the Kahakai internal loop street, as deemed necessary.

- The convention center's parking garage entrance/exit ramp driveway on Kalakaua Avenue.

- The convention center's entrance and exit driveways fronting the lobby area, and within the passenger loading/unloading area of the main entry drive.

- The pedestrian crossing on Kahakai Drive at Atkinson Drive.

The transportation coordinator would also be responsible for determining operational procedures to expedite the entry of vehicles into the convention center's parking garage to minimize any queuing back onto the streets. One such measure could involve issuing on-site parking passes to attendees on a pre-registration basis in order to expedite vehicles past the control gates planned at the top of the parking entrance ramps (i.e., in lieu of vehicles having to stop to take a ticket from the entry gate located at the top of the ramp). All other convention attendees would be notified prior to the event that no on-site parking would be provided without a pass.

Temporary On-Street Parking Restrictions

As discussed under section G. Parking, temporary parking restrictions along certain streets would be necessary during large conventions during daytime hours, or for evening events at the convention center. Such on-street parking restrictions will require a street usage permit from the City DTS. The on-street parking restrictions would be implemented prior to the start of the specific event at the convention center. Temporary "No Parking" signs would be installed several days in advance of the event to notify area residents and businesses. The signs would specify the day and time that on-street parking would be restricted. The transportation coordinator will be responsible to coordinate the installation and removal of the signs.

Contra-Flow Coning Operations

As discussed earlier, the implementing of the westbound contra-flow coning operation on Kapiolani Boulevard, similar to the City's AM peak period operations, may be required to mitigate traffic conditions for a large Friday evening post-commuter event at the convention center. Implementation of the contra-flow coning operation will require a street usage permit from the City DTS. The transportation coordinator would be responsible for preparing a coning plan, including the affected day, affected times, and the limits of coning, and submitting the plan to the City DTS for review and approval. The transportation coordinator would also be responsible for the implementation of the contra-flow coning operations.

Furthermore, the transportation coordinator would be responsible for coordinating the coning operation with the City DTS' PM peak period contra-flow coning operations on Kapiolani Boulevard. Installation and removal of the convention center coning could be performed by the City DTS on a special contract basis, or by a private contractor. The costs associated with implementation of the special contra-flow coning operations would be the responsibility of the convention center operator.

Signing and Coning Operations

As previously discussed, it may be necessary for the transportation coordinator to install temporary informational or regulatory signs and to implement coning operations to accommodate certain events at the convention center. The transportation coordinator would be responsible to prepare a signing and coning plan for submittal to either the City DTS and the State DOT for review, as appropriate. Installation and removal of the signs and cones could also be performed by the City DTS on a special contract basis, or by a private contractor. The costs associated with the coning operations would be the responsibility of the convention center operator.

Traffic Signal Operations

The transportation coordinator could work with the City DTS to develop special traffic signal timing and coordination on the major roadways in the vicinity of the convention center prior to or following a large event. This would enable traffic to more efficiently flow according to actual traffic demand in the affected areas. The special traffic signal timing and coordination plan would be implemented from the City DTS' traffic signal control center.

Delivery Truck Operations

The transportation coordinator would be responsible to monitor and coordinate the scheduling of arrivals and departures of container/freight trucks delivering exhibit materials to and from the convention center. Such scheduling should minimize the number of trucks arriving and departing the convention center site during the morning and afternoon peak traffic periods. Also, the transportation coordinator should instruct the truck drivers to use the Nimitz Highway-Ala Moana Boulevard-Atkinson Drive route since it would likely result in the least traffic impacts.

For the smaller delivery and service vehicles travelling to and from the convention center site throughout the day, the transportation coordinator should monitor the affect of the arrival and departures of these vehicles on traffic conditions in the immediate area. Should traffic conditions be adversely affected, the transportation coordinator should limit the arrival and departure of these smaller delivery and service vehicles from the convention center during the peak traffic hours.

On-Site Parking

The transportation coordinator will be responsible to coordinate with the convention planner on the specific parking needs of the convention attendees/exhibitors, and with the special event manager on the parking requirements for convention center employees. As previously discussed under Parking Alternatives, the following measures may be implemented to meet on-site parking needs:

- Preferential on-site parking could be provided to employees and local resident attendees who carpool/vanpool to the convention center (with an auto occupancy of two (2) or more persons per vehicle), thereby freeing up more available parking stalls.

- Passes for on-site parking could be issued to pre-registered conventioneers as a means to prevent "turn-aways" from driving up to a full parking garage, thereby adding to traffic in the area. All other convention attendees would be notified prior to the event that no on-site parking would be provided without a pass.

- During special events, the convention center's loading dock area could be used for valet service tandem parking when truck delivery activities are not occurring.

- A program to issue temporary public bus passes to convention center employees could be implemented by the transportation coordinator to free up parking stalls for use for convention events.

Off-Site Parking

As previously discussed, in the event that parking in excess of the number of on-site stalls is needed, the following alternatives may be pursued by the transportation coordinator:

- The transportation coordinator will identify candidate sites for off-site convention center parking and will be responsible to develop a standing agreement for use of these facilities.

- To the extent that event planners may require off-site parking for certain events (i.e., predominantly local attendance or all-local-attendee events), arrangements would be made to use existing outlying parking facilities that may be available during the event. Attendees not holding on-site parking passes would be instructed to park at the off-site facility and be transported by shuttle buses to and from the convention center. The transportation coordinator will work with the convention planner in securing the use of an off-site parking facility from the list of pre-arranged candidate sites.

- The transportation coordinator could work with the convention planner to include the provision of parking at host hotels for convention workers or local event attendees when negotiating accommodations for Oahu visitor attendees. The employees and local attendees would park at the hotel(s) and be transported by shuttle bus to and from the convention center along with the Oahu visitor attendees.

- Arrangements for temporary replacement or additional employee parking could be made by the transportation coordinator with nearby hotels, commercial offices, and possibly residential condominiums to provide available parking for a fee during large convention events.

Shuttle Bus Operations

The transportation coordinator would be responsible to monitor and coordinate the shuttle bus operations at the convention center with the shuttle bus operator to minimize congestion at the Center. In coordination with the shuttle bus operator, personnel should be stationed at the lobby entry driveway to direct shuttle buses into and out of the passenger loading/unloading area so as to prevent queuing back onto the streets and to ensure pedestrian safety.

Transportation Demand Management

The transportation coordinator should coordinate with the State DOT Highway Division's Transportation Demand Management Office in developing and implementing transportation management techniques for the convention center operations.

## M. FUTURE CONVENTION CENTER EXPANSION

As the Hawai'i Convention Center develops its market, future expansion of the facility may become economically feasible and desirable. To accommodate this expansion, structural requirements for supporting the expansion have been incorporated in the current design. The expansion includes about 50,000 square feet of meeting rooms plus supporting facilities and 100,000 square feet of leasable exhibit space. The increase would better accommodate the infrequent larger conventions and provide more space to better serve the mid-size conventions. The requirement to accommodate 200 additional parking spaces was abandoned by the State CCA after it was determined that the cost would be economically prohibitive.

Group 2+ International, Inc., the convention center consultant to the Convention Center Authority, estimates that the future expansion, if implemented, would result in a 20 percent increase in the size of the typical large convention, or combination of simultaneous small conventions, using the center. This would increase the large convention size, used as the basis for the 14,000-person convention analysis, to 16,700 attendees.

The time frame for future expansion of the convention center remains undetermined. Therefore, a quantitative analysis of the impacts on traffic resulting from the expansion would not be possible at this time. A supplemental EIS would need to be prepared when the decision is made to pursue such expansion. It is anticipated that a traffic impact analysis would need to be conducted for the supplemental EIS. Such analysis could consider the findings of the Waikiki Regional Traffic Impact Plan being conducted by the City and any resulting traffic improvements that may have been implemented.

## 5. RELATIONSHIP TO OTHER PROPOSED TRANSPORTATION PROJECTS IN THE AREA

The City and County of Honolulu has developed a Waikiki Master Plan to guide development and design features within the area. The 1992 Master Plan analyzed a variety of land use scenarios and transportation circulation alternatives as a means of enhancing an urban design concept for the area. The ultimate improvement program was designed to improve traffic conditions and enhance traffic operations in the Waikiki area through a combination of transportation improvements, land use reductions, increased transit usage with the aid of a people mover system, and peripheral parking policies. The three key transportation elements of the Waikiki Master Plan that may affect, or be affected by the convention center include: 1) conversion of the section of Kalakaua Avenue and Ala Moana Boulevard at the ewa end of Waikiki to one-way operation; 2) development of a network of several parking facilities at the periphery of the Waikiki area; and 3) operation of a people mover system providing circulation within Waikiki.

The City Planning Department is currently preparing the Waikiki People Mover and Peripheral Parking Study which is the next step towards implementing some of the transportation and circulation goals of the Waikiki Master Plan. A draft of the study was completed and issued in January 1995. This study examines three separate but connected systems: traffic circulation within Waikiki; the people mover system; and peripheral parking.

Furthermore, the City is currently undertaking the Waikiki Regional Traffic Impact Plan to analyze traffic impacts of existing and future (year 2005) conditions in the region, including the convention center project, and to recommend mitigation measures for overall traffic impacts in the area. The State CCA is a member of the regional study's task force committee. The results of the regional traffic study are anticipated to be available by August 1995.

Also, the City and County of Honolulu has long planned to develop a regional rapid transit system, with the alignment passing across or adjacent to the former Aloha Motors site and with a station located at the intersection of Kapiolani Boulevard and Kalakaua Avenue. Although the development work on the rapid transit project has largely ceased due to the lack of a dedicated local funding source, it is possible that continuing increases in traffic congestion may result in the eventual future development of a transit guideway through this area.

There has also been recurring suggestions for the development of a water transport system on the Ala Wai Canal, primarily in an effort to provide a unique visitor attraction and to alleviate traffic congestion on surface streets.

This chapter discusses the effects of these potential projects upon the convention center.

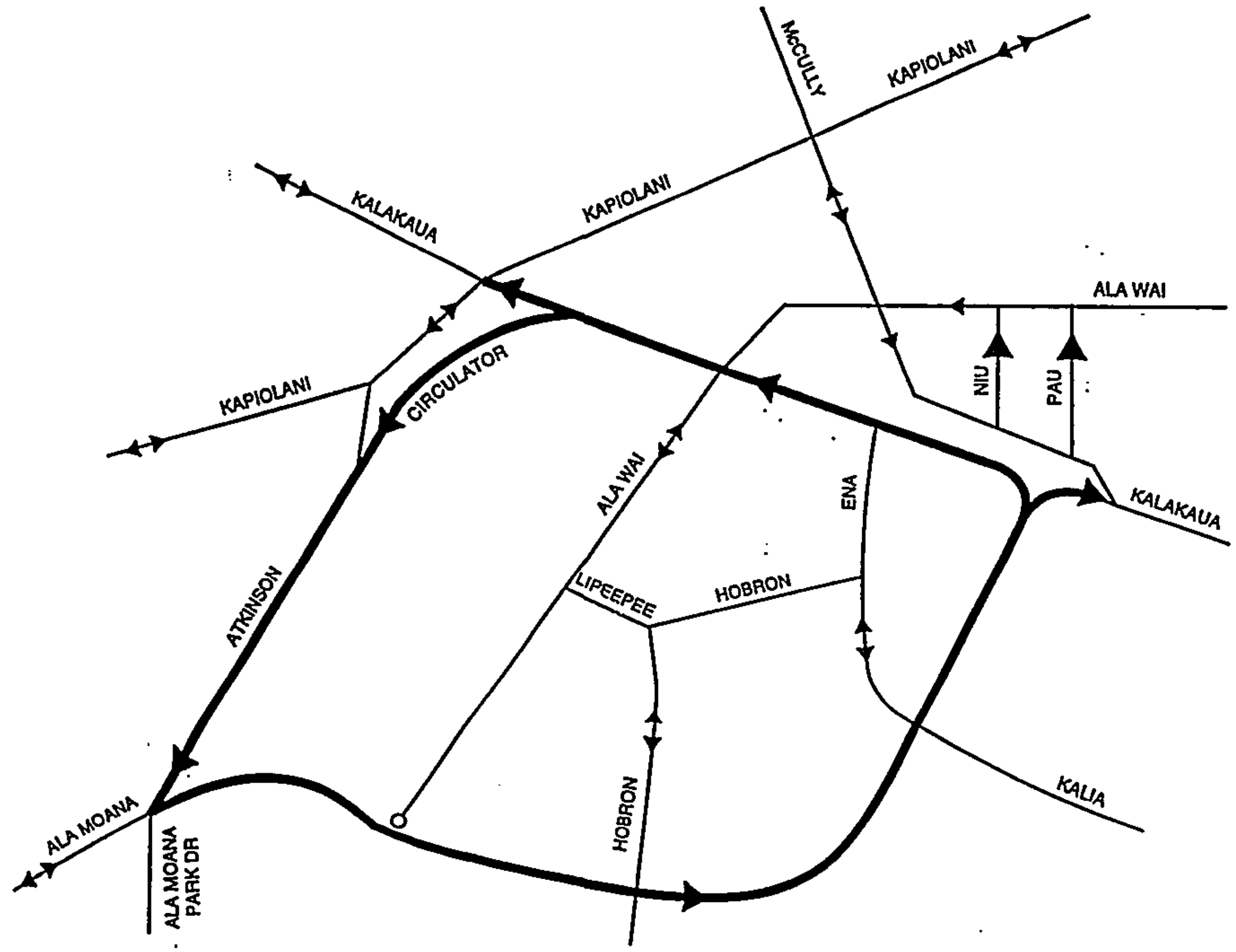
### A. ONE-WAY STREET COUPLET

The Waikiki Master Plan seeks to provide a more attractive landscaped entry to Waikiki along Ala Moana Boulevard, as well as added pedestrian amenities along this and other Waikiki streets. To accomplish this, the City proposes to convert the portions of Ala Moana Boulevard and Kalakaua Avenue at the ewa end of Waikiki to one-way operation. The two one-way streets would require fewer traffic lanes, with these "excess" lanes then used to provide widened landscape and pedestrian areas.

Given this objective, the City has been studying three circulation alternatives within this area:

i. Continue with the existing two-way circulation patterns. This current circulation includes two-way operation of Ala Moana Boulevard and Kalakaua Avenue, and the existing roadway configurations on Kapiolani Boulevard, McCully Street, Atkinson Drive, and Ala Wai Boulevard.

ii. Convert Ala Moana Boulevard, Kalakaua Avenue, and Atkinson Drive to a one-way counter-clockwise circulation system (See Figure 5-1). This alternative consists of one-way counter-clockwise roadway circulation on Ala Moana Boulevard from Atkinson Drive to Kalakaua Avenue, and on Kalakaua Avenue from




SOURCE: *Waikiki Regional Traffic Study-Final Report*, Cambridge Systematics, Inc., October 1993.

Fig. 5-1
**PROPOSED ONE-WAY COUNTER-CLOCKWISE ROADWAY CIRCULATION WITH CIRCULATOR ROAD**

Reference: Wilbur Smith Associates

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Ala Moana Boulevard to Kapiolani Boulevard. Kalakaua Avenue, Diamond Head of Ala Moana Boulevard, remains one-way in the Diamond Head direction. Also, Atkinson Drive is one-way in the makai direction from Kapiolani Boulevard to Ala Moana Boulevard.

iii. Convert Ala Moana Boulevard and Kalakaua Avenue to one-way operations to form a clockwise circulation system (See Figure 5-2). This alternative consists of one-way clockwise roadway circulation on Ala Moana Boulevard from Kalakaua Avenue to Atkinson Drive, and on Kalakaua Avenue from Kapiolani Boulevard continuing through Waikiki.

Both of the one-way systems include a new circulator roadway across the former Aloha Motors site to permit the one-way traffic flow to circulate between Kalakaua Avenue and Atkinson Drive without having to use Kapiolani Boulevard. This two-lane circulator roadway would require the use of an approximately 34-foot-wide strip of property along the Kapiolani Boulevard project frontage. This would include an 11-foot-wide divider strip, with landscaping, between the circulator road and Kapiolani Boulevard.

Due to the uncertainty as to the nature and timing of the proposed regional traffic improvements, directive was given by the State CCA during the Request for Proposals (RFP) process for development of the convention center to proceed with design on the basis of existing traffic patterns in the project vicinity. The WSA/TIA evaluated both of the one-way systems with the respective circulator roadways and its effect with respect to a "generic" convention center project. During preparation of the WSA/TIA, the City had a consultant study underway to examine the traffic impacts and future roadway requirements with the three circulation alternatives. As indicated in the WSA/TIA, the results of that study were not available during preparation of the environmental assessment. As such, the WSA/TIA included observations to the counter-clockwise and clockwise alternatives based upon review of the earlier Cambridge Systematics, Inc. study.[1]

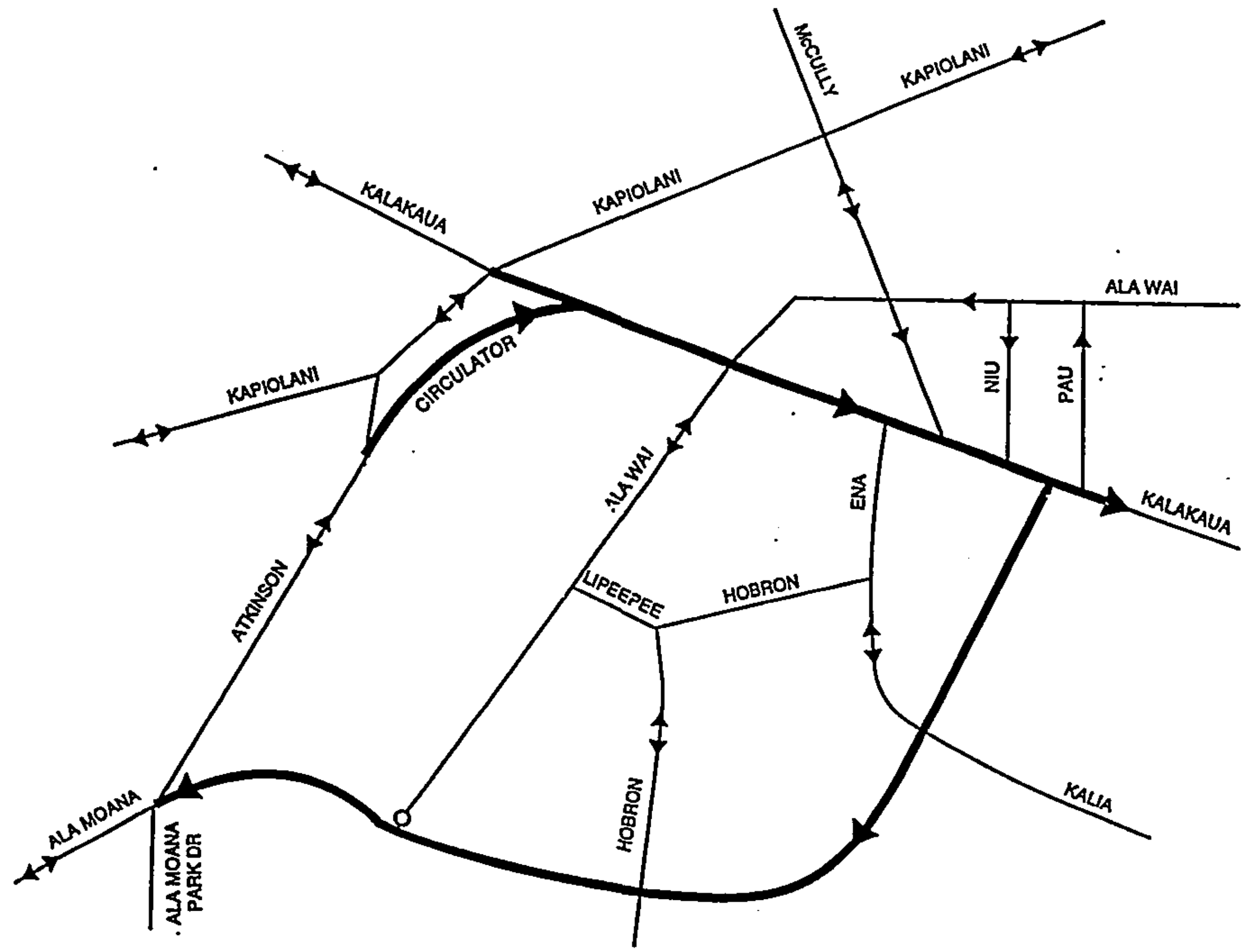
The City's draft Waikiki People Mover and Peripheral Parking Study re-assesses the three circulation alternatives on the Waikiki study area. Furthermore, the City's Waikiki Regional Traffic Impact Plan will also include reevaluating the change in traffic circulation and patterns of the major streets in the area. Due to the impending completion of these two studies, the following effects are based on the current convention center design:

**Counter-Clockwise One-Way System**

1. Given the design requirements for the proposed convention center and the site constraints, construction of the Center precludes future construction of the circulator road within the project site. The circulator road would require taking about 20 feet or more additional right-of-way along the Kapiolani Boulevard frontage, as well as an area at the corner of Kapiolani Boulevard and Kalakaua Avenue. This taking of additional right-of-way would be precluded given the proposed convention center's on-site circulation along the Kapiolani Boulevard frontage and its building layout.

2. Conversion of the streets to the counter-clockwise operation would adversely affect the passenger drop-off/pick-up operations at the lobby entry drive of the convention center since the entry drive is designed for right-turn in from Atkinson Drive and right-turn out onto Kapiolani Boulevard. The one-way operation would make it operationally infeasible for buses and taxis makaibound on Kapiolani Boulevard to enter the main entry drop-off/pick-up area of the convention center without requiring a potential major change. To allow for vehicular access to the convention center main entry drive area, this would require major modification, such as:

[1] Op cit.




SOURCE: *Waikiki Regional Traffic Study-Final Report*, Cambridge Systematics, Inc., October 1993.

Fig. 5-2
PROPOSED ONE-WAY CLOCKWISE
ROADWAY CIRCULATION WITH CIRCULATOR ROAD

Reference: Wilbur Smith Associates

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- Install a traffic signal on Kapiolani Boulevard near the convention center to allow buses and taxis to turn left into the main entry drive of the convention center from Kapiolani Boulevard.

- Provide a counter-flow lane on maukabound Atkinson Drive between Ala Moana Boulevard and the convention center. This would allow provision of a right-turn into the main entry drive of the convention center by taxis and other vehicles.

- Convert Kapiolani Boulevard to a one-way westbound operation. This would allow provision of vehicles to safely access the main entry drive of the convention center.

Each of these potential modifications will have significant impacts on traffic circulation in the area.

3. The change in directional traffic flow would require the loading and unloading of shuttle bus passengers on the street side of the entry drive. Since the larger numbers of bus passengers would be required to cross the entry drive to access the lobby, this would result in increased conflicts with vehicular movements in the driveway area and potential safety concerns. Under the current design, the only passengers required to cross the entry driveway are those arriving by taxis or private vehicles.

4. If the streets are converted to the counter-clockwise operation, this one-way pattern would simplify access to the convention center for visitors to Oahu since all Waikiki traffic could reach the center via Kalakaua Avenue. All Waikiki-bound traffic would exit the center via Atkinson Drive and Ala Moana Boulevard.

5. For most local residents who work or attend functions at the convention center, this one-way pattern would primarily limit residents to access the center via Kahakai Drive. Most local residents are anticipated to approach the convention center from the H-1 Freeway makaibound, Ala Moana Boulevard eastbound, or Kapiolani Boulevard westbound. To reach the convention center via Kalakaua Avenue, local residents would have to enter Waikiki on Ala Moana Boulevard or McCully Street.

6. The one-way makaibound traffic flow on Atkinson Drive would likely result in trucks travelling to the site either via Ala Moana Boulevard/Piikoi Street/Kapiolani Boulevard/Atkinson Drive; the H-1 Freeway via McCully Street; or Ala Moana Boulevard through Waikiki.

**Clockwise One-Way System**

1. Given the design requirements and site constraints for the convention center, construction of the Center precludes future construction of the circulator road or any additional widening within the site. The clockwise system could require taking 10 feet more in width along the Kapiolani Boulevard project frontage than the counter-clockwise system, if an added right-turn lane is needed from Kapiolani Boulevard onto Kalakaua Avenue. This taking of additional right-of-way would be precluded given the proposed convention center's on-site circulation along the Kapiolani Boulevard frontage and its building layout.

2. Development of the convention center could potentially restrict conversion of the streets to one-way operation depending on the adequacy of right-of-way within the existing streets.

3. Conversion of the streets to the clockwise operation would not significantly affect vehicular traffic operations at the convention center main entry drive area since the planned vehicular approach and circulation to this area would be maintained.

4. If the streets are converted to the clockwise operation, this one-way pattern matches the circulation pattern proposed for most Waikiki visitor traffic with the existing two-way system, with travel to the convention center site via Ala Moana Boulevard and Atkinson Drive, and return via Kalakaua Avenue.

The one-way operation on Ala Moana Boulevard would allow provision of right-turn lanes to Atkinson Drive for convention center traffic.

5. Conversion of the streets to clockwise operation would allow resident traffic to leave the convention center similar to the existing two-way street system.

**Existing Circulation System**

This system is the most conducive to the convention center as it maintains the existing traffic circulation pattern and improves traffic operations by widening existing roadways. Also, this circulation system allows for the most options in terms of vehicular approaches to the convention center.

## B. PERIPHERAL PARKING

The Waikiki Master Plan includes provision for two peripheral parking structures to be built outside of Waikiki. One, to be built ewa of Waikiki, would accommodate 3,000 parking stalls. The other structure would be located at the Diamond Head end of Waikiki to accommodate 500 stalls. The peripheral parking structures would provide long-term parking for Waikiki employees and make more parking within hotel parking garages available for non-workers. The parking facilities are provided outside Waikiki to reduce traffic congestion and the other adverse effects (land consumption, visual effects, emissions) of providing additional parking within Waikiki. However, since the two peripheral parking structures were intended to be developed in consideration of the previously proposed rapid transit system, the sites for the peripheral parking facilities have been reassessed. The City's draft Waikiki People Mover and Peripheral Parking Study reviews various potential peripheral parking sites around Waikiki, and provides an assessment of the constraints, impacts, capacity, and accessibility of each.

The peripheral parking system would be integrated into a new traffic/circulation plan for Waikiki, and served by a shuttle van service. Four publicly-held sites were selected by the City Planning Department for evaluation of peripheral parking sites. The study scope did not include the evaluation of privately-held lands. The four sites, along with the proposed number of stalls, are:

1. Ala Moana Beach Park
   A. Middle play field (900 stalls)
   B. Magic Island parking lot (1,440 stalls)

2. Ala Wai Play Fields
   A. Southeast corner of McCully Street and Kapiolani Boulevard (880 stalls)
   B. Main play fields (1,600 stalls)
   C. At the southern end of University Avenue (900 stalls)

3. Ala Wai Golf Course
   A. Along the Ala Wai Canal (770 stalls)
   B. Along the Manoa-Palolo Stream (1,200 stalls)
   C. Along Date Street (400 stalls)
   D. Along Kapahulu Avenue, north of the Base Yard (165 stalls)

4. Kapahulu Base Yard
   A. Within the site boundaries (400 stalls)
   B. Beyond the site boundaries (650 stalls)

The study findings of the evaluation conclude that in general, none of the sites appear to be well-suited for the development of peripheral parking. Each site has a number of significant land-use constraints, particularly since they are publicly-held lands primarily utilized for recreation/park usage. It further indicates that sites beyond those covered in the study will need to be considered for peripheral parking facilities. Furthermore, the study indicates that Ala Moana Center and the convention center have been mentioned as possible sites for peripheral parking facilities, and suggests that these sites should be explored further.

The following are general effects with respect to the convention center regarding the peripheral parking facilities.

- The future convention center operator could designate the Center's facility to serve as a parking function during the non-convention or "dark" days. However, because the parking will not be available on a regular basis, it would be infeasible to consider it as a permanent parking site.

- Use of the planned parking (800 stalls) on the convention center site during non-convention days as peripheral parking for Waikiki would potentially increase the traffic volumes forecast for site driveways and adjacent street sections, and could potentially result in the need for additional roadway improvements. In assessing the adequacy of on-site parking based on a 10,000-person national convention, the WSA/TIA estimated that about 410 "unused" stalls (of the 800 stalls) would have been available. The EIS TIAR analyzes traffic impacts based on a "worst-case" 14,000-person event, which assumes that the entire convention center parking garage would be fully utilized by event participants and employees.

  Also, the requirement set forth in the Request for Proposals (RFP) process to accommodate an additional 200 on-site parking spaces for future expansion of the facility was abandoned by the State CCA after it was determined that the cost of adding the parking spaces would be economically prohibitive.

- In the WSA/TIA, a general observation was that the design of the convention center would have to accommodate on-site circulation for the peripheral parking that minimizes any disruption to center circulation, passenger loading, and parking activities by vehicles using the on-site peripheral parking. As indicated above, the requirement set forth in the project's RFP process to accommodate an additional 200 on-site parking spaces for future expansion of the facility was abandoned by the State CCA after it was determined that the cost of adding the parking spaces would be economically prohibitive.

- Development of peripheral parking facilities near the convention center could provide some additional parking needed to accommodate large local events at the center in the evenings, or for the large number of food service workers needed for large banquets. Special shuttle service would be needed if the peripheral parking is farther away than convenient walking distance. Since the City has not yet selected the specific locations of these parking sites due to significant land-use constraints, the potential traffic and pedestrian impacts which could result if such peripheral parking is used in association with events at the convention center cannot be determined at this time.

## C. PEOPLE MOVER SYSTEM

The proposed people mover system would travel a route of approximately five miles, and would be targeted to serve tourists by providing a local circulator within Waikiki and connecting to major hotels and shopping center. The people mover system is proposed as a supplement to the City's bus system. The City's draft Waikiki People Mover and Peripheral Parking Study reviews available options for the people mover system and offers a recommendation for system vehicle type and technology, identifies a recommended system route and potential stops, and describes operational and facility requirements for the system. The draft study also provides estimates of visitor market demand for and potential revenues of a people mover system, estimates of start-up and maintenance costs, and an analysis of the financial results of system operations.

Since the people mover system is mainly targeted at tourists, the study recommends that the transit stops be located at major attractions such as hotels and shopping centers. Key transit stops would include the convention center, the convention center/Hard Rock Cafe, Ala Moana Center, the Waikiki Trade Center, the Honolulu Zoo, the International Market Place, and the Hilton Hawaiian Village.

A rubber-tired on-street system is considered to be the preferred option for the Waikiki people mover. Based upon an evaluation of different performance criteria applied to different vehicle types in the City's study, a diesel-powered trolley replica style vehicle is recommended. The people mover vehicle would have a seating capacity of 22 to 35 passengers and a standing capacity of 14 to 19 passengers, resulting in a total capacity of 41 to 45 passengers. The system's projected capacity along the route is 480 passengers per hour.

The study recommends that the people mover system operate from 7:00 AM to until 10:00 PM, with its primary emphasis directed at visitors and convention center attendees rather than at local residents. According to the study, the recommended operation plan would be to accommodate the early morning and evening transportation requirements of the convention center attendees. The system would operate with 5 minute headways from 7:00 AM until 6:00 PM, and with 10 minute headways between 6:00 PM to 10:00 PM. This translates to a daily capacity of 6,240 passengers, assuming full utilization of all buses.

The following are general effects with respect to the convention center regarding the people mover system.

- The people-mover system could increase the transit capacity in Waikiki and enhance transit access between Waikiki and the convention center, depending upon the routing and scheduling of the service. The projected capacity of 480 passengers per hour may accommodate a major portion of the small to average convention size, but would not meet the needs of the larger conventions during the AM peak hour (i.e., 10,000- and 14,000-person conventions), unless more vehicles or higher capacity vehicles are added to the route. Also, virtually all conventions will include shuttle transportation as part of the convention package. It would be likely that most conventioneers would opt to use the shuttle bus transportation system in lieu of paying fares to take the people mover between the hotel and the convention center. Therefore, the people mover could serve as a supporting system for the convention center.

- Except during peak hours of the large conventions, the two bus berths on Atkinson Drive fronting the convention center could be available as people mover stops. Also, there is the planned City bus stop on Kalakaua Avenue that may be used by the people mover.

## D. RAPID TRANSIT GUIDEWAY AND STATION

The concept of a fixed-guideway transit corridor through Central Honolulu dates back to 1967 with the first Oahu Transportation Study. Since then, the transit plan has evolved through various alignments, types of vehicles, and termini. The most recent rapid transit development project plans included an elevated transit guideway extending along Kona Street, crossing Atkinson Drive, continuing along the Atkinson and Kapiolani edges within the project site, and then crossing Kalakaua Avenue and continuing in a new median section along Kapiolani Boulevard. Earlier transit plans included alignments extending straight through the project site. A transit station would have been included within the segment crossing the project site.

Based on the most recent rapid transit project, the transit guideway structure would be 30 to 35 feet above ground level, with a guideway width of about 30 feet. Support columns about 10 feet wide would be needed at approximately 90-foot intervals along the guideway. The elevated guideway structure would widen to 50 feet or more in the station area, and vertical movement systems (elevators, escalators, stairways) would be needed for passenger access. Curvature of the guideway adjacent to the site would affect transit operating needs.

The design plan for the convention center would affect the physical feasibility of future construction of a rapid transit guideway through the project area, the location of a transit station within the area, and the visual appearance and costs of the guideway. Construction of the guideway along the periphery of the site would affect the visual appearance and operations of the convention center. Key considerations are:

- The current convention center design precludes any alignment straight across the site, and would require that any future alignment be located along the periphery of the site. This could require the taking of right-of-way from other properties and may affect operation speeds.
- A future elevated guideway along the periphery would adversely affect the aesthetic appearance of the convention center from Atkinson Drive and Kapiolani Boulevard, especially since the center's main lobby entrance is located along this frontage. The visual impact would be increased in the station area due to the vertical transport system and other requirements. A future guideway along this frontage would also likely affect vehicular access to the passenger drop-off/pick-up area adjacent to the main lobby of the convention center.
- The proposed design of the convention center would preclude future the location of a transit station on the project site. Furthermore, location of a transit station at the convention center would increase feeder bus and automobile traffic to the area for passenger drop-off/pick-up and potentially interfere with convention center traffic operations. Pedestrian activity would increase at the convention center site.
- Location of a transit station near the project site would improve resident and employee access to the convention center. However, visitor access would not be directly affected unless a transit main line or feeder line is extended into Waikiki.
- The rapid transit line should result in a 2 to 5 percent reduction in future traffic along Kapiolani Boulevard and a small improvement in intersection conditions.[2]
- The convention center operations could be adversely impacted during transit construction.

## E. WATER TRANSPORT SYSTEM

Discussion on the concept of a water transport system on the Ala Wai Canal has recurred over the years, most recently with the proposed development of the convention center adjacent to the Canal. The bases in support of such a concept have consistently been to provide an alternative mode of transportation to vehicular travel and to provide a uniquely appealing means of transport for conventioneers.

Current plans for the convention center do not include any improvements associated with using the Ala Wai Canal as a waterborne avenue of approach by conventioneers. Several concerns need to be resolved before pursuing such a concept, including potential navigational and recreational conflicts with other groups and individuals who use the canal for boating and canoeing. Furthermore, such a system would likely require that portions of the Ala Wai Canal be dredged and docking facilities installed. The proposed convention design, however, would not preclude such a use of the Ala Wai Canal in the future.

As it is envisioned that potential boating vessels associated with this concept would likely be of the low passenger volume mode, such water transport is not likely to have a significant impact on peak hour vehicle use and should not be viewed as a significant traffic mitigation measure for the convention center.

[2] *Transportation Impacts Results Report, Appendices Volume 2,* Honolulu Rapid Transit Program, July 1992.

# APPENDIX A

## *METHODOLOGY FOR ANALYZING TRAFFIC CONDITIONS*

# APPENDIX A

## METHODOLOGY FOR ANALYZING TRAFFIC CONDITIONS

The Transportation Research Board (TRB), a division of the National Science Foundation, has developed standardized methods for use in evaluating the effectiveness and quality of service for roadways and streets. Different methodologies are available for analyzing traffic signal-controlled intersections and unsignalized intersections, both of which were used in evaluating present and future conditions for this study.

The TRB evaluation methods use a concept known as level-of-service (LOS). This concept describes facility operations on a letter basis from A to F, which signify excellent to unacceptable conditions, respectively. The methods generally compare traffic volumes on a facility to the facility's theoretical capacity. Capacity is estimated based on the facility's physical characteristics (e.g. number of lanes), traffic conditions (e.g. types of vehicles), and type of traffic controls. The comparisons are frequently referred to as the volume-to-capacity (V/C) ratio. The methodologies are described in the *1985 Highway Capacity Manual* (1985 HCM).[1]

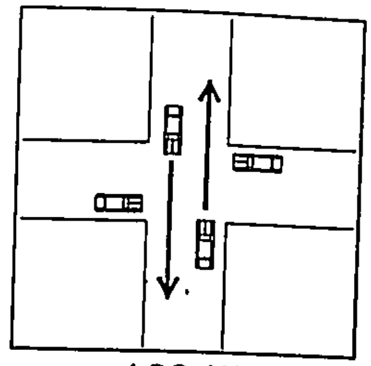
### Traffic Signal-Controlled Intersections

Traffic conditions at traffic signal-controlled intersections were evaluated using the *Operations Analysis* methodology described in the 1985 HCM. Using this method, the level-of-service is based on the average delay time per vehicle passing through the intersection. The delay time, calculated in seconds, is the result of the phasing and timing of the traffic signal as well as the intersection's physical layout and the composition of the traffic. Average delay time and level-of-service are determined for the entire intersection, for each roadway approach, and for each traffic movement or lane group. A description of the characteristics and criteria associated with LOS A through LOS F is provided in Figure A-1.

The methodology also calculates a ratio of actual or estimated peak hour traffic volumes to the theoretical capacity of the intersection. This indicates the proportion of available capacity being used by traffic volumes and where there is unused capacity available for future traffic increases. This volume-to-capacity ratio (V/C) reflects the physical characteristics of the intersection and the traffic characteristics, and is somewhat independent of the efficiency of the traffic signal phasing/timing.

[1] Highway Capacity Manual, Special Report 209, Transportation Research Board, 1985.

The **OPERATIONS LEVEL METHODOLOGY**, which is described in the Transportation Research Board's Highway Capacity Manual, defines Level of Service (LOS) for signalized intersections in terms of delay. Technically, delay is the amount of time an average vehicle must wait at an intersection before being able to pass through the intersection. For signalized intersections, the relationship between LOS and delay is based on the average stopped delay per vehicle for a fifteen minute period.



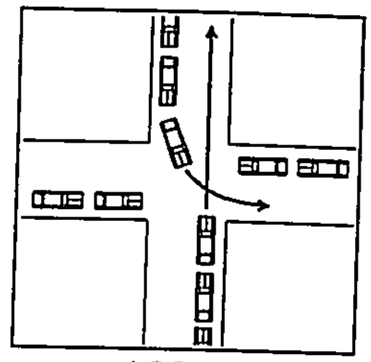
LOS 'A'

**LEVEL OF SERVICE 'A' - Delay 0.0 to 5.0 seconds**
Describes operations with very low delay, i.e., less than 5 seconds per vehicle. This occurs when signal progression is extremely favorable. Most vehicles arrive during the green phase and are not required to stop at all.

*Corresponding V/C ratios usually range from 0.00 to 0.60.*

**LEVEL OF SERVICE 'B' - Delay 5.1 to 15.0 seconds**
Describes operations with delay in the range of 5 to 15 seconds per vehicle generally characterized by good signal progression and/or short cycle lengths. More vehicles are required to stop than for LOS 'A' causing higher levels of average delay.

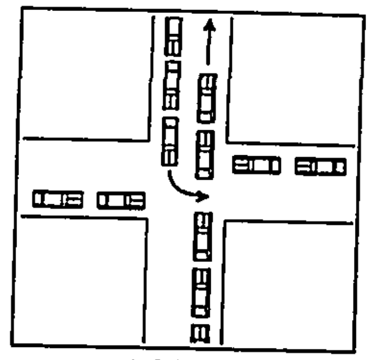
*Corresponding V/C ratios usually range from 0.61 to 0.70.*



LOS 'C'

**LEVEL OF SERVICE 'C' - Delay 15.1 to 25.0 seconds**
Describes operations with delay in the range of 15 to 25 seconds per vehicle. Occasionally, vehicles may be required to wait more than one red signal phase. The number of vehicles stopping at this level is significant although many still pass through the intersection without stopping.

*Corresponding V/C ratios usually range from 0.71 to 0.80.*



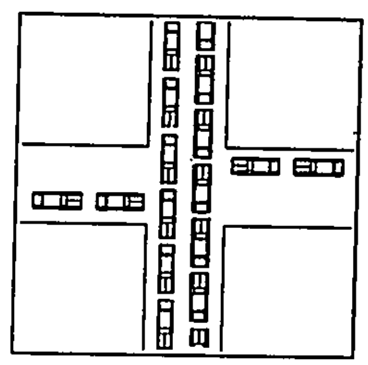
LOS 'D'

**LEVEL OF SERVICE 'D' - Delay 25.1 to 40.0 seconds**
Describes operations with delay in the range of 25 of 40 seconds per vehicle. At LOS 'D', the influence of congestion becomes more noticeable. Many vehicles stop, and the proportion of vehicles not stopping declines. The number of vehicles failing to clear the signal during the first green phase is noticeable.

*Corresponding V/C ratios usually range from 0.81 to 0.90.*

**LEVEL OF SERVICE 'E' - Delay 40.1 to 60.0 seconds**
Describes operations with delay in the range of 40 to 60 seconds per vehicle. These high delay values generally indicate poor signal progression, long cycle lengths and high V/C ratios. Vehicles frequently fail to clear the intersection during the first green phase.

*Corresponding V/C ratios usually range from 0.91 to 1.00.*



LOS 'F'

**LEVEL OF SERVICE 'F' - Delay 60.1 seconds plus**
Describes operations with delay in excess of 60 seconds per vehicle. This condition often occurs with oversaturation, i.e., when arrival flow rates exceed the capacity of the intersection.

*Corresponding V/C ratios of over 1.00 are usually associated.*

SOURCE: Transportation Research Board, "Operations Level Methodology-Signalized Intersections", Highway Capacity Manual, Special Report 209, 1985.

Fig. A-1

LEVEL OF SERVICE DIAGRAM

## Unsignalized Intersections

At intersections with STOP sign controls, the level-of-service was calculated using the 1985 HCM procedures for intersections with two-way STOP sign control (STOP or YIELD signs on minor streets) and the *1991 Circular 373*[2] procedures for those intersections with STOP signs on all approaches (three- or four-way STOP sign control). In both methodologies, six levels-of-service, A through F, are used to describe traffic conditions.

For three-leg ("T") and four-leg intersections with STOP or YIELD controls on the minor street approaches, the standard procedure provides a comparative measure of delay for those movements which must yield to conflicting movements at the intersection. The movements which must yield include:

- Left-turn out of the side street;
- Right-turn out of the side street; and
- Left-turn into the side street.

Through vehicles on the major streets are not required to yield to other movements at T- and two-way controlled intersections. The general indicator of intersection delay is determined by calculating the one-hour capacity for each key movement, based on conflicting traffic volumes, and then comparing the number of vehicles making that maneuver to the calculated capacity. The unused or "reserve" capacity for the movement is then used to identify a level-of-service for that movement. Unlike signalized analysis, an overall intersection level-of-service is not calculated but rather a level-of-service is calculated for each lane group.

The level-of-service criteria for unsignalized intersections with minor street STOP controls is defined in Table A-1.

For intersections with STOP or YIELD controls on all approaches, the *Circular 373* methodology was used to assess level-of-service. This methodology is also based on analyzing each intersection approach independently, but then provides an average overall level-of-service for each intersection. Flow rates and approach capacities are calculated for each approach and volume-to-capacity ratios and delays are determined. Individual approach levels-of-service are based on volume-to-capacity ratios. A weighted average of approach delays is used in arriving at an overall intersection delay and level-of-service. Table A-2 shows the level-of-service criteria for four-way STOP controlled intersections.

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2 *Interim Materials on Unsignalized Intersection Capacity*, Circular 373, Transportation Research Board, July 1991.

Table A-1

**LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS**
**Hawai'i Convention Center - Transportation Impact Assessment**

| LOS | Reserve Capacity (pcph) | Expected Delay |
|---|---|---|
| A | 400 or more | Little or no delays |
| B | 300 - 399 | Short traffic delays |
| C | 200 - 299 | Average traffic delays |
| D | 100 - 199 | Long traffic delays |
| E | -0- - 99 | Very long traffic delays |
| F | Negative Value | Exceeds capacity with extreme traffic delays |

LOS = Level of Service
pcph = passenger cars per hour
Source: *Highway Capacity Manual*, Chapter 10
Ref.: Wilbur Smith Associates, May 1994

Table A-2

**LEVELS-OF-SERVICE CRITERIA FOR UNSIGNALIZED ALL-WAY STOP INTERSECTIONS**
**Hawai'i Convention Center - Traffic Impact Assessment**

| LOS | Average Stopped Delays (seconds/vehicle) |
|---|---|
| A | <5 |
| B | 5 - 10 |
| C | 10 - 20 |
| D | 20 - 30 |
| E | 30 - 45 |
| F | >45 |

Source: Transportation Research Board, Circular 373: Interim Materials on Unsignalized Intersection Capacity, July 1991, Page 19.
Ref.: Wilbur Smith Associates, May 1994

# APPENDIX B

## *PEDESTRIAN WALKWAY LEVELS OF SERVICE*

**LEVEL OF SERVICE A**

Pedestrian Space: ≥ 130 sq ft/ped    Flow Rate: ≤ 2 ped/min/ft

At walkway LOS A, pedestrians basically move in desired paths without altering their movements in response to other pedestrians. Walking speeds are freely selected, and conflicts between pedestrians are unlikely.

**LEVEL OF SERVICE B**

Pedestrian Space: ≥ 40 sq ft/ped    Flow Rate: ≤ 7 ped/min/ft

At LOS B, sufficient area is provided to allow pedestrians to freely select walking speed, to bypass other pedestrians, and to avoid crossing conflicts with others. At this level, pedestrians begin to be aware of other pedestrians, and to respond to their presence in the selection of walking path.

**LEVEL OF SERVICE C**

Pedestrian Space: ≥ 24 sq ft/ped    Flow Rate: ≤ 10 ped/min/ft

At LOS C, sufficient space is available to select normal walking speeds, and to bypass other pedestrians in primarily unidirectional streams. Where direction or crossing movements exist, minor conflicts will occur, and speeds and volume will be somewhat lower.

**LEVEL OF SERVICE D**

Pedestrian Space: ≥ 15 sq ft/ped    Flow Rate: ≤ 15 ped/min/ft

At LOS D, freedom to select individual walking speed and to bypass other pedestrians is restricted. Where crossing or reverse-flow movements exist, the probability of conflict is high, and its avoidance requires frequent changes in speed and position. The LOS provides reasonably fluid flow; however, considerable friction and interaction between pedestrians is likely to occur.

**LEVEL OF SERVICE E**

Pedestrian Space: ≥ 6 sq ft/ped    Flow Rate: ≤ 25 ped/min/ft

At LOS E, virtually all pedestrians would have their normal walking speed restricted, requiring frequent adjustment of gait. At the lower range of this LOS, forward movement is possible only by "shuffling." Insufficient space is provided for passing of slower pedestrians. Cross- or reverse-flow movements are possible only with extreme difficulties. Design volumes approach the limit of walkway capacity, with resulting stoppages and interruption to flow.

**LEVEL OF SERVICE F**

Pedestrian Space: ≥ 6 sq ft/ped    Flow Rate: ≤ variable

At LOS F, all walking speeds are severely restricted and forward progress is made only by "shuffling". There is frequent, unavoidable contact with other pedestrians. Cross- and reverse-flow movements are virtually impossible. Flow is sporadic and unstable Space is more characteristic of queued pedestrians than of moving pedestrian streams.

SOURCE: *Highway Capacity Manual, Special Report 209*, Transportation Research Board, 1985.

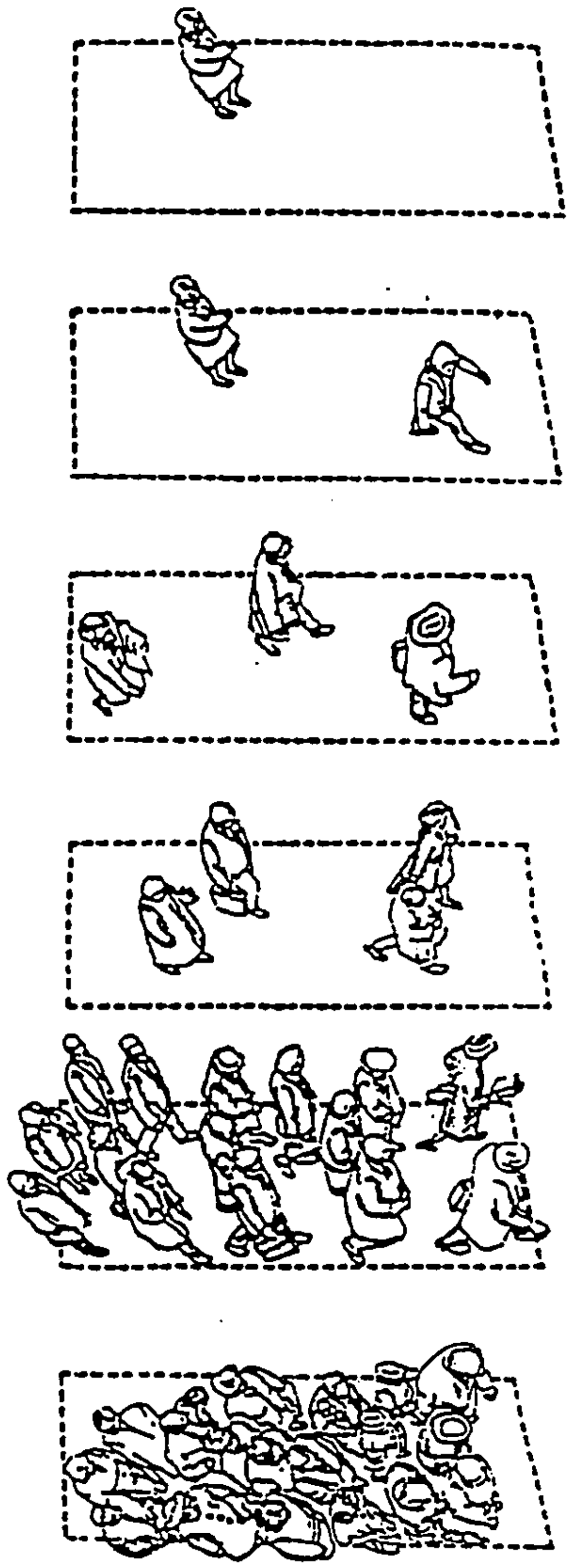

Fig. B-1

PEDESTRIAN WALKWAY LEVELS OF SERVICE

## APPENDIX J

## TRAFFIC ASSESSMENT
## ADDITIONAL INTERSECTIONS

**Parsons Engineering Science, Inc.**

Hawai'i Convention Center

**PARSONS ENGINEERING SCIENCE, INC.**

1357 Kapiolani Boulevard, Suite 1120 • Honolulu, Hawaii 96814 • (808) 944-8009 • Fax: (808) 944-1618



June 22, 1995

Mr. Earl Matsukawa
Wilson Okamoto & Associates, Inc.
1907 S. Beretania Street
Honolulu, Hawaii 96826

Re: Traffic Assessment of Intersections in the Vicinity of the Proposed Hawai'i Convention Center

Dear Earl:

The following is a summary of our assessment of additional intersections in the vicinity of the Hawai'i Convention Center.

A. SCOPE OF WORK AND PURPOSE

This Traffic Impact Assessment (TIA) report provides an analysis of potential traffic impacts to intersections located beyond the study area defined in the Transportation Impact Analysis Report (January 1995) prepared for the Hawai'i Convention Center Environmental Impact Statement (EIS TIAR). The EIS TIAR study area includes five (5) intersections surrounding the project site which were determined to be most significantly impacted by convention center traffic. The intersection analyses for this TIA has been conducted in response to comments received on the Draft EIS that additional intersections in the project vicinity should be analyzed for potential convention center traffic impacts.

This TIA assesses ten (10) intersections in the vicinity of the convention center project site. These intersections, which were selected on the basis of approach and departure routes to and from the convention center site, are identified as follows and are shown in Exhibit A:

1. Atkinson Drive at Mahukona Street
2. Ena Road at Kalakaua Avenue
3. McCully Street at Kalakaua Avenue
4. McCully Street at Ala Wai Boulevard
5. McCully Street at Kapiolani Boulevard
6. Hobron Lane at Ala Moana Boulevard
7. Ala Moana Boulevard at Ena Road/Kalia Road
8. Ala Moana Boulevard at Kalakaua Avenue
9. Makaloa Street at Kalakaua Avenue
10. Mahukona Street/Kaheka St. at Kapiolani Boulevard

This analysis is based on the existing street patterns and roadway widths. This analysis is conducted using the same trip generation, travel forecasts assumptions, modal splits, traffic assignments, and 1998 analysis year used in the EIS TIAR. Development of new trip generation rates, modal splits or vehicle occupancy factors was not part of this assessment.

B. ASSUMPTIONS AND METHODOLOGY

The assumptions relative to modal splits and vehicle occupancy as outlined in the EIS TIAR were also used in this study as it was not the purpose to define new parameters as previously stated. The following tasks were performed:

1. If existing traffic counts were not available, new counts were performed. These new counts were performed on the dates shown in Exhibit A. Old counts were then adjusted to match the most recent counts.
2. Projected the traffic counts to the analysis year (1998) using the growth factor of 1.5 per cent per year used in the EIS TIAR.
3. Calculated the trips generated for the HCC for the six scenarios listed below using the modal splits and vehicle occupancies used in the EIS TIAR:
    - Scenario 1 1998 AM Peak Hour without the Project
    - Scenario 2 1998 PM Peak Hour without the Project
    - Scenario 3 1998 AM Peak Hour for a 10,000-Person Event
    - Scenario 4 1998 PM Peak Hour for a 10,000-Person Event
    - Scenario 5 1998 AM Peak Hour for a 14,000-Person Event
    - Scenario 6 1998 PM Peak Hour for a 14,000-Person Event

C. TRIP GENERATION

Trips generated by the HCC were estimated for the various scenarios using the modal splits and vehicle occupancies used in the EIS TIAR.

D. TRIP DISTRIBUTION AND ASSIGNMENT

Trip distributions and assignments were based on the distributions indicated in the EIS TIAR. The distributions calculated were then applied to the additional intersections assessed.

E. CONCLUSIONS AND RECOMMENDATIONS

The level-of-service (LoS) analysis was conducted using the Planning Method as described in the 1985 Highway Capacity Manual. This methodology looks at isolated intersections and assumes that the traffic signal phasing and synchronization is optimized.

The results of the LoS analysis is summarized in Exhibit C. The conclusions of the analysis for the 10,000 person scenario are as follows:

1. All intersections operate at LoS D or better during the morning peak hour.

2. The intersection of Kapiolani Boulevard at McCully Street is expected to operated at LoS E during the afternoon peak hour. The remaining intersections operate at LoS D or better.

3. The intersection of Kapiolani Boulevard at McCully Street operates at LoS E during the afternoon peak hour under under 1998 without project conditions. The volume-to-capacity ratio and therefore the LoS did not change with the addition of convention center traffic. Convention center traffic had no impact on afternoon peak hour conditions at this intersection.

4. The calculated LoS for existing conditions is not indicative of the observed levels-of-service at the intersections of Atkinson Drive at Kapiolani Boulevard and Ala Moana Boulevard at Kalakaua Avenue. At these locations, the observed conditions appear worse than would be expected based on the level-of-service calculations.

In summary, the conclusion of the analysis is that there is sufficient existing lane capacity at the additional intersections that were analyzed to accommodate traffic generated by a 10,000 person event at the convention center. However, the full capacity of the intersections appears not to be effectively used due to backups from adjacent intersections and/or imbalances in the distribution of traffic among the travel lanes,

The analysis also indicates that traffic conditions could be improved with optimization of traffic signal phasing and coordination. The traffic signal phasing and timings should be examined to determine if the backups can be reduced or eliminated by optimizing the traffic signal timings

Respectfully submitted,
PARSONS ENGINEERING SCIENCE, INC.

Phillip J. Rowell, P.E.
Principal Traffic Engineer

PJR:kmb
ADMIN\REPORT1.HCC

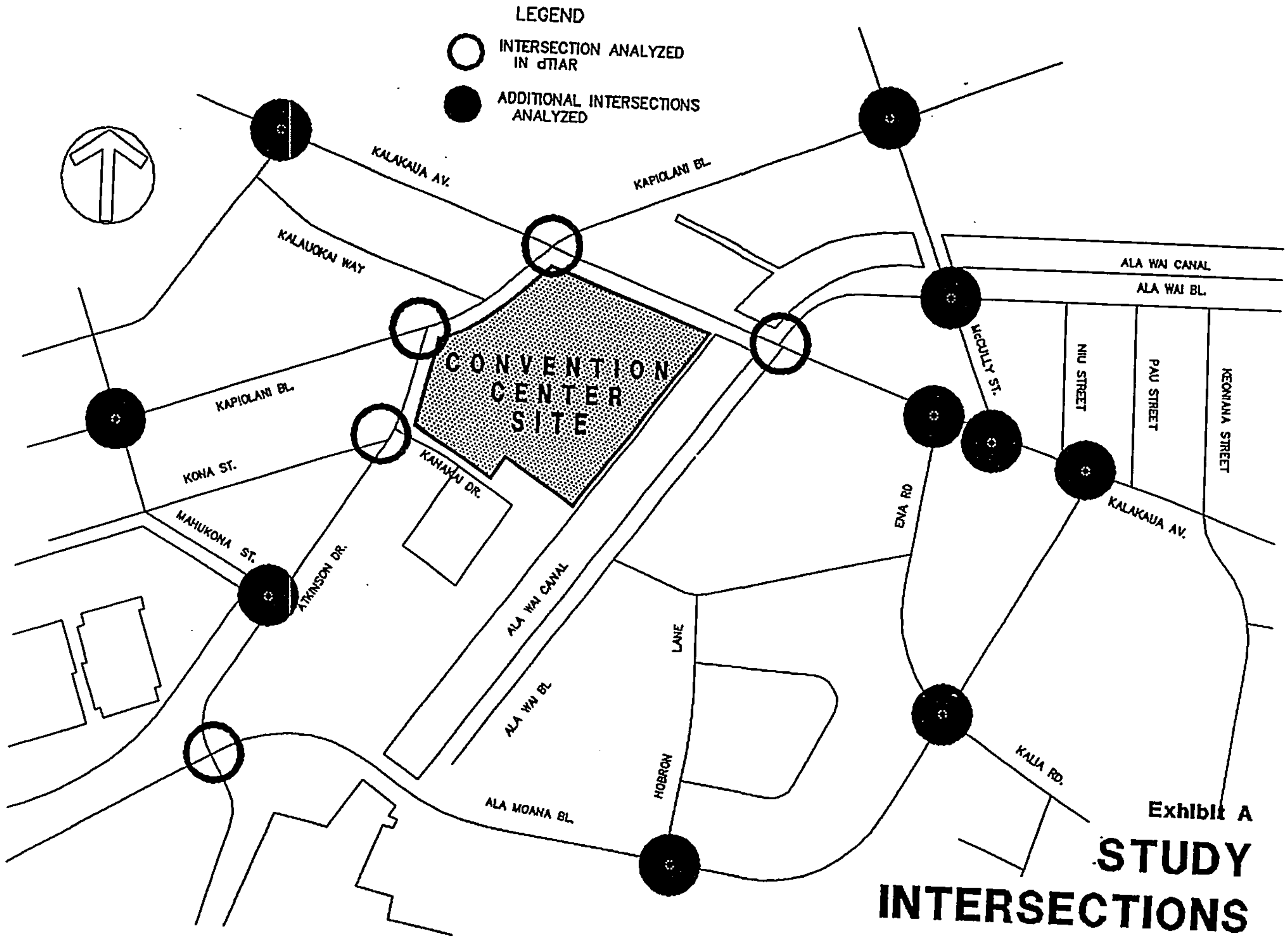


Exhibit A
# STUDY INTERSECTIONS

*Parsons Engineering Science, Inc.*

**Exhibit B** **Sources of Existing Traffic Counts**

| No. | Intersection | Source | Comments |
|---|---|---|---|
| 2 | Atkinson Dr. at Mahukona St. | PES | Counted April 1995 |
| 9 | Ena Rd. at Kalakaua Av. | PES | Counted April 1995 |
| 10 | McCully St. at Kalakaua Av. | DTS | |
| 11 | McCully St. at Ala Wai Bl. | DTS | |
| 12 | McCully St. at Kapiolani Bl. | DTS | |
| 13 | Hobron Lane at Ala Moana Bl. | DTS | |
| 14 | Ala Moana Bl. at Ena Rd./Kalia Rd. | DTS | |
| 15 | Ala Moana Bl. at Kalakaua Av. | DTS | |
| 16 | Makaloa St. at Kalakaua Av. | PES | Counted April 1995 |
| 17 | Mahukona St/Kaheka St.. at Kapiolani Bl. | PES | Counted June 1995 |

LEGEND:

TIAR/TMC = Transportation Impact Analysis Report for the Environmental Impact Statement Prepared By The Traffic Management Consultant.

DTS = Waikiki Regional Traffic Impact Study Prepared For the City and County Department of Transportation Services.

PES = Parsons Engineering Science, Inc.

22-Jun-95

Exhibit C

# LEVEL-OF-SERVICE SUMMARY ANALYSIS

Additional Intersections
Hawaii Convention Center Traffic Study

| | | 1998 Without Project | | | | 10,000 Person Event | | | | | | 14,000 Person Event | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AM Peak Hour (Scenario 1) | | PM Peak Hour (Scenario 2) | | AM Peak Hour (Scenario 3) | | | PM Peak Hour (Scenario 4) | | | AM Peak Hour (Scenario 5) | | | PM Peak Hour (Scenario 6) | |
| No | INTERSECTION | V/C | LoS | V/C | LoS | V/C | LoS | Chg | V/C | LoS | Chg | V/C | LoS | Chg | V/C | LoS |
| 2 | Atkinson Dr. at Mahukona St. | 0.551 | A | 0.497 | A | 0.562 | A | 0.011 | 0.519 | A | 0.022 | 0.565 | A | 0.014 | 0.528 | A |
| 9 | Ena Rd. at Kalakaua Av. | 0.553 | A | 0.808 | D | 0.598 | A | 0.045 | 0.841 | D | 0.033 | 0.616 | B | 0.063 | 0.857 | D |
| 10 | McCully St. at Kalakaua Av. | 0.323 | A | 0.432 | A | 0.367 | A | 0.044 | 0.465 | A | 0.033 | 0.385 | A | 0.062 | 0.480 | A |
| 11 | McCully St. at Ala Wai Bl. | 0.756 | C | 0.783 | C | 0.770 | C | 0.014 | 0.784 | C | 0.001 | 0.775 | C | 0.019 | 0.784 | C |
| 12 | McCully St. at Kapiolani Bl. | 0.770 | C | 0.974 | E | 0.773 | C | 0.003 | 0.974 | E | 0.000 | 0.774 | C | 0.004 | 0.974 | E |
| 13 | Hobron Lane at Ala Moana Bl. | 0.614 | B | 0.819 | D | 0.695 | B | 0.081 | 0.834 | D | 0.015 | 0.724 | C | 0.110 | 0.840 | D |
| 14 | Ala Moana Bl. at Ena Rd./Kalia Rd. | 0.607 | B | 0.759 | C | 0.837 | D | 0.230 | 0.783 | C | 0.024 | 0.945 | E | 0.338 | 0.793 | C |
| 15 | Ala Moana Bl. at Kalakaua Av. | 0.707 | C | 0.844 | D | 0.742 | C | 0.035 | 0.875 | D | 0.031 | 0.756 | C | 0.049 | 0.890 | D |
| 16 | Makaloa St. at Kalakaua Av. | 0.649 | B | 0.742 | C | 0.659 | B | 0.010 | 0.744 | C | 0.002 | 0.662 | B | 0.013 | 0.745 | C |
| 17 | Mahukona St./Kaheka St. at Kapiolani | 0.488 | A | 0.892 | D | 0.488 | A | 0.000 | 0.894 | D | 0.002 | 0.488 | A | 0.000 | 0.895 | D |

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*APPENDIX K*

***TRAFFIC IMPACT ANALYSIS REPORT***
***2005 TRAFFIC CONDITIONS***

***Parsons Engineering Science, Inc.***

*Hawai'i Convention Center*

TRAFFIC IMPACT ANALYSIS REPORT
2005 TRAFFIC CONDITIONS

# HAWAI'I CONVENTION CENTER

Prepared For
WILSON OKAMOTO AND ASSOCIATES, INC.

Prepared By
PARSONS ENGINEERING SCIENCE, INC.
Honolulu, Hawaii

June 1995

TRAFFIC IMPACT ANALYSIS REPORT

# HAWAI'I CONVENTION CENTER 2005 TRAFFIC CONDITIONS

IN HONOLULU, HAWAII

Prepared For
**WILSON OKAMOTO & ASSOCIATES, INC.**

Prepared By

**PARSONS ENGINEERING SCIENCE, INC.**
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Fax: (808) 944-1618
July 10, 1995

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# 1. INTRODUCTION

Parsons Engineering Science, Inc. has been retained to conduct this Traffic Impact Analysis Report (TIAR/PSE) of anticipated 2005 conditions for the proposed Hawai'i Convention Center in Honolulu. The following report has been prepared to describe the traffic characteristics of the project and likely impacts to the adjacent roadway network. This introductory chapter discusses the location of the project, the proposed development, and the study methodology.

**Project Location and Description**

The project is located at the major entrance to Waikiki. The site is bounded by the Ala Wai Canal, Kahakai Drive, Atkinson Drive, Kapiolani Boulevard and Kalakaua Avenue. The location of the project is shown in Figure 1.

The uses and the floor area of each use is summarized in Table 1.

Access and egress to the parking structure will be located along Kahakai Drive. There are two spiral ramps, one for inbound and one for outbound traffic. Access for trucks is provided via a driveway between the two spiral ramps. A secondary reversible ramp that will provide access from Kalakaua Avenue in the morning and an exit during the evening is located along the Kalakaua Avenue frontage of the project. The parking structure will provide 800 spaces.

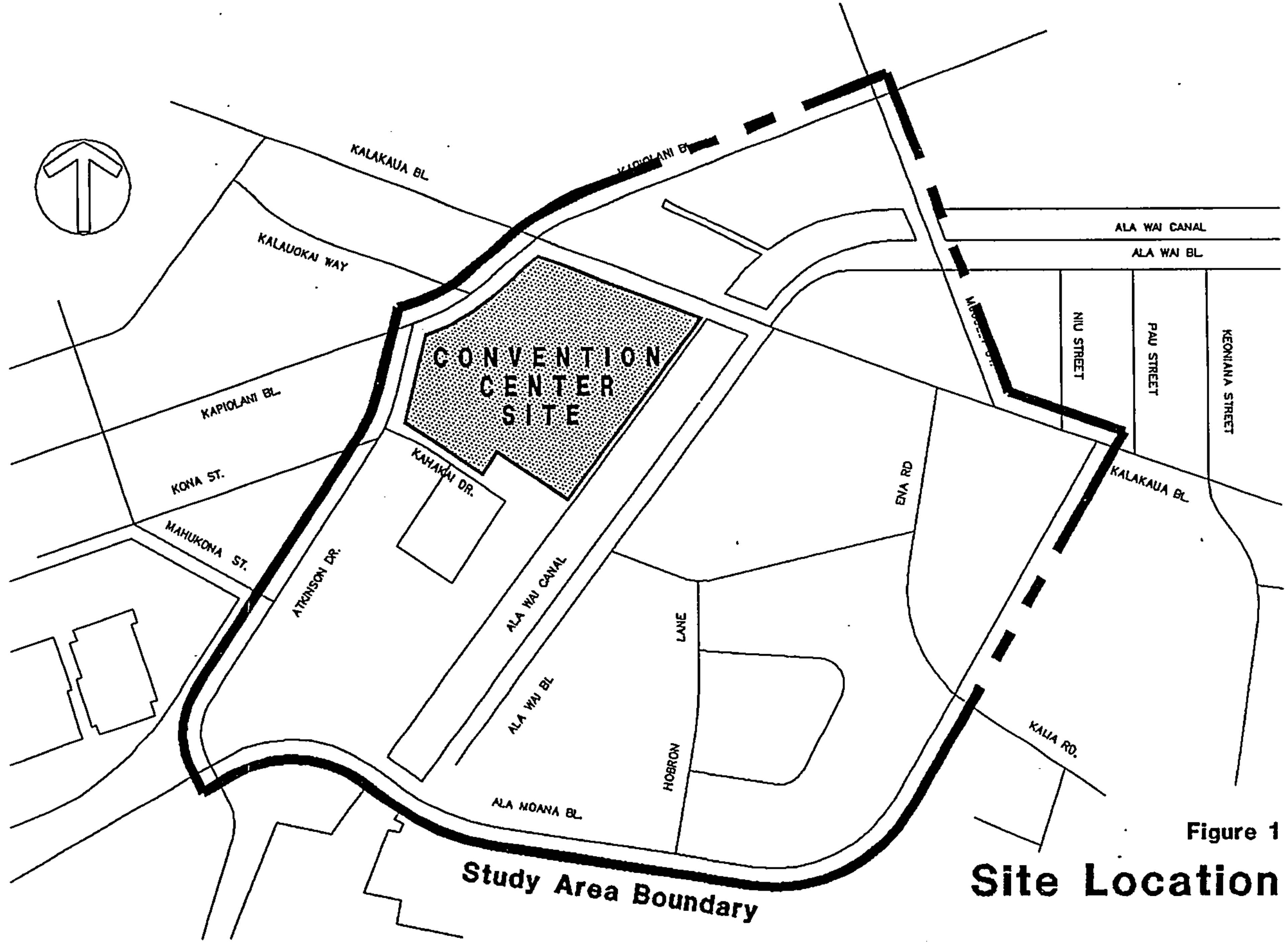


**Figure 1**

# Site Location

Shuttle buses, taxis and limos will use a passenger loading and unloading area at the front of the center. This area is a diagonal driveway between Atkinson Drive and Kapiolani Boulevard. The diagonal driveway is approximately 600 feet long.

**Table 1 Summary of Project Floor Area[(1)]**

| Description/Use | Floor Area (Square Feet) |
|---|---|
| Exhibit Halls | 200,000 |
| Meeting Rooms | 100,000 |
| Ballroom | 35,000 |
| Lobby/Prefunction | 240,665 |
| Administrative Area | 13,500 |
| VIP/Boardroom | 4,600 |
| Support Areas | 252,915 |
| Landscaped Terrace | 105,000 |
| Subtotal | 951,680 |
| Future Expansion | 150,000 |
| TOTAL | 1,101,680 |

NOTES:
(1) Source: TIAR/TMC

## Background

In May 1994, the Hawaii Convention Center Transportation Impact Assessment (TIA/WSA) was prepared by Wilbur Smith Associates as input into the Convention Center Environmental Assessment. The TIA/WSA examined the anticipated 1998 transportation related impacts of a 10,000 person event for a "generic" convention center at the proposed site since there was no specific design upon which to base the assessment. The study presented a project based upon certain assumptions relative to the size of events, mode splits and vehicle occupancies and concluded that roadway improvements would be required. However, it also implied that roadway improvements may be required depending upon the specific convention center design selected.

In January 1995, the Hawaii Convention Center Transportation Impact Analysis Report (TIAR/TMC) was prepared by The Traffic Management Consultant as part of the Environmental Impact Statement (EIS) for the selected convention center design. The TIAR/TMC based its analyses on the traffic data and assumptions of the TIA/WSA. The study analyzed the 1998 traffic impacts at five intersections anticipated to be most impacted by convention center traffic based on the conclusions of the TIA/WSA. In addition to examining the impacts of the 10,000 person event on morning and afternoon peak hour traffic conditions, the TIAR/TMC studied the impacts of a 14,000 person event on morning and afternoon peak hour conditions, a 14,000 person event on midday traffic conditions, a 3,000 person event on a Friday evening post afternoon peak hour conditions, and a 1,800 person all local resident event on a Friday evening post afternoon peak hour conditions.

The conclusions of the TIAR/TMC were consistent with the TIA/WSA since both were based on the same assumptions, design year, study area, etc.

During the public comment period of the draft EIS, substantial comments regarding the TIAR/TMC were received. The major comments were:

1. The study area should include intersections other than those immediately adjacent to the site.

2. The design year should be 2005, rather than 1998, to be consistent with the stabilized operational year indicated in the economic impact study for the convention center.

3. The basis for the assumptions relative to mode split, vehicle occupancy, load factors, etc., used to estimate the number of trips generated by the proposed Convention Center should be substantiated.

4. The traffic volumes used for existing conditions, and as the basis for estimating future traffic, should be confirmed.

**Purpose and Scope of Study**

This TIAR has been prepared in response to the concerns of the above comments. The scope of work is limited to the following tasks:

1. Expand the study area as indicated in Figure 1.

2. Update the peak hour traffic volume data to reflect current (1995) traffic conditions.

3. Verify the assumptions relative to mode of travel and vehicle occupancies.

4. Estimate 2005 background traffic volumes without the convention center project.

5. Estimate traffic generated for the proposed convention center for a 10,000 Person Event, a 14,000 person event and a 10,000 person event to reflect a reduction in the percentage of persons walking to the center such as during inclement weather. It is not the intent of this TIAR to analyze the midday peak hour, Friday evening post afternoon peak for a 3,000 person event, or the 1,800 all-local Friday evening post afternoon peak event.

6. Identify any additional mitigation measures that may be required to accommodate convention center traffic in the year 2005.

**Study Methodology**

In order to conduct this study, the following tasks were performed:

1. Data Collection

Traffic data used for this TIAR were obtained from the TIAR/TMC, traffic counts conducted for the City's Waikiki Regional Traffic Impact Study, and from field counts conducted during March and April, 1995. The sources of the traffic data for each study intersection is presented in Chapter 2 of this report.

The study was expanded to include a total of 15 intersections, plus the convention center's shuttle bus entrance and exit on Atkinson Drive and Kapiolani Boulevard, respectively.

In addition, traffic studies for several Mainland convention centers were obtained and reviewed to establish parameters for the assumptions used in the trip generation analysis.

2. Analysis of Existing Traffic Conditions

Using the data collected, existing traffic conditions in the vicinity of the project site were determined. Traffic conditions can be described by the level-of-service (LOS) at each study intersection.
The planning method described in the 1985 Highway Capacity Manual (HCM) was used to determine the level-of-service at the intersections. This method was selected based on discussions with the City's consultant for the Waikiki Regional Traffic Impact Study. A more detailed explanation of the methodology, the level-of-service concept, and the results are presented in Chapter 2.

3. Determination of 2005 Cumulative Traffic Projections

The year 2005 was used as the design year. Traffic projections for 2005 were estimated by expanding 1995 traffic counts by a growth factor of 8 per cent, or 0.7% per year, and superimposing traffic generated by several development projects that would impact the study intersections. A detailed description of this process and the resulting cumulative traffic projections are presented in Chapter 3.

4. Analysis of Project-Related Traffic Impacts

The next step in the traffic analysis was to estimate peak-hour (morning and afternoon) traffic that would be generated by the project. This was done using a number of assumptions relative to event size, mode split, vehicle occupancies, and attendance ratios.

These trips were distributed based on the origin of the visitors and employees and the available approach and departure routes. The project-related traffic was then superimposed on 2005 cumulative traffic volumes at the study intersections. A level-of-service analysis was then conducted for this condition and compared to 2005 cumulative conditions without the project to determine the impacts of this project. The 2005 cumulative traffic projections are presented in Chapter 4. The analysis of the project-related impacts and the conclusions of the analyses are presented in Chapter 5.

# 2. ANALYSIS OF EXISTING CONDITIONS

This chapter presents the existing traffic conditions and volumes on the roadways adjacent to the proposed project. The level-of-service concept and the results of the level-of-service analysis for existing conditions are also presented. The purpose of this analysis is to establish the base conditions for the determination of the impacts of the project which are described in a subsequent chapter.

**Existing Intersection Controls and Lane Configurations**

The study intersections were selected based upon the access routes to and from the project. The intersections analyzed, and existing lane configurations on the adjacent street network, are shown on Figure 2.

Figure 2 also indicates the type of right-of-way controls and lane configurations at the study intersections. All of the intersections, except the intersection of Atkinson Drive at Kahakai Drive, are controlled by traffic signals.

Pedestrian crossing signals are provided at crosswalks.

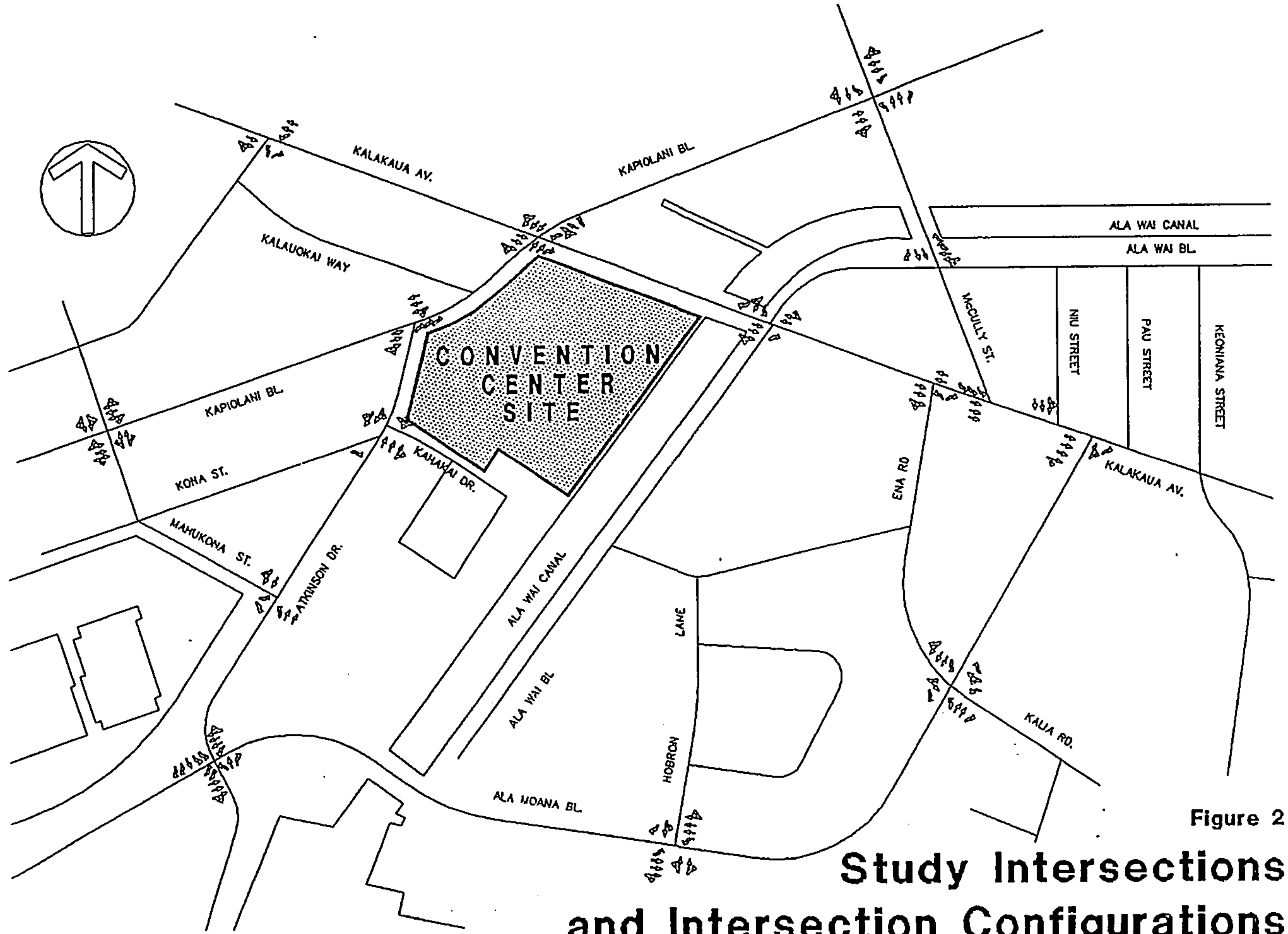


Figure 2
**Study Intersections and Intersection Configurations**

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**Existing Peak Hour Traffic Volumes**

The AM and PM peak hour traffic volumes used in the following analyses are shown in Figures 3 and 4, respectively. Traffic volumes were taken from three sources. Traffic volumes for key intersections were taken from counts conducted for the City and County of Honolulu Department of Transportation Services as part of the Waikiki Regional Traffic Impact Study. For the intersections studied as part of the TIAR/TMC, but were not included in the Waikiki Study, volumes were expanded to reflect the approach and departure volumes for the intersections at which current traffic counts were available. For the remainder of the intersections, field counts were performed by PES. A summary of the source of the traffic data is presented in Table 2.

**Level-of-Service Concept**

Signalized Intersections

The planning method described in the 1985 Highway Capacity Manual (HCM) was used to analyze the operating efficiency of the signalized intersections adjacent to the study site. This method involves the calculation of a volume-to-capacity (V/C) ratio which is related to a level-of-service. A maximum intersection capacity based on the number of phases was used for the V/C calculations.

"Level-of-Service" is a term which denotes any of an infinite number of combinations of traffic operating conditions that may occur on a given lane or roadway when it is subjected to various traffic volumes. Level-of-service (LOS) is a qualitative measure of the effect of a number of factors which include:

- ◇ Space,
- ◇ Speed,
- ◇ Travel Time,
- ◇ Traffic Interruptions,
- ◇ Freedom to Maneuver,
- ◇ Safety
- ◇ Driving Comfort, and
- ◇ Convenience

There are six levels-of-service, A through F, which relate to the driving conditions from best to worst, respectively. The characteristics of traffic operations for each level-of-service are summarized in Table 3. In general, LOS A represents free-flow conditions with no congestion. LOS F, on the other hand, represents severe congestion with stop-and-go conditions. Level-of-service D is typically considered acceptable for peak hour conditions in urban areas.

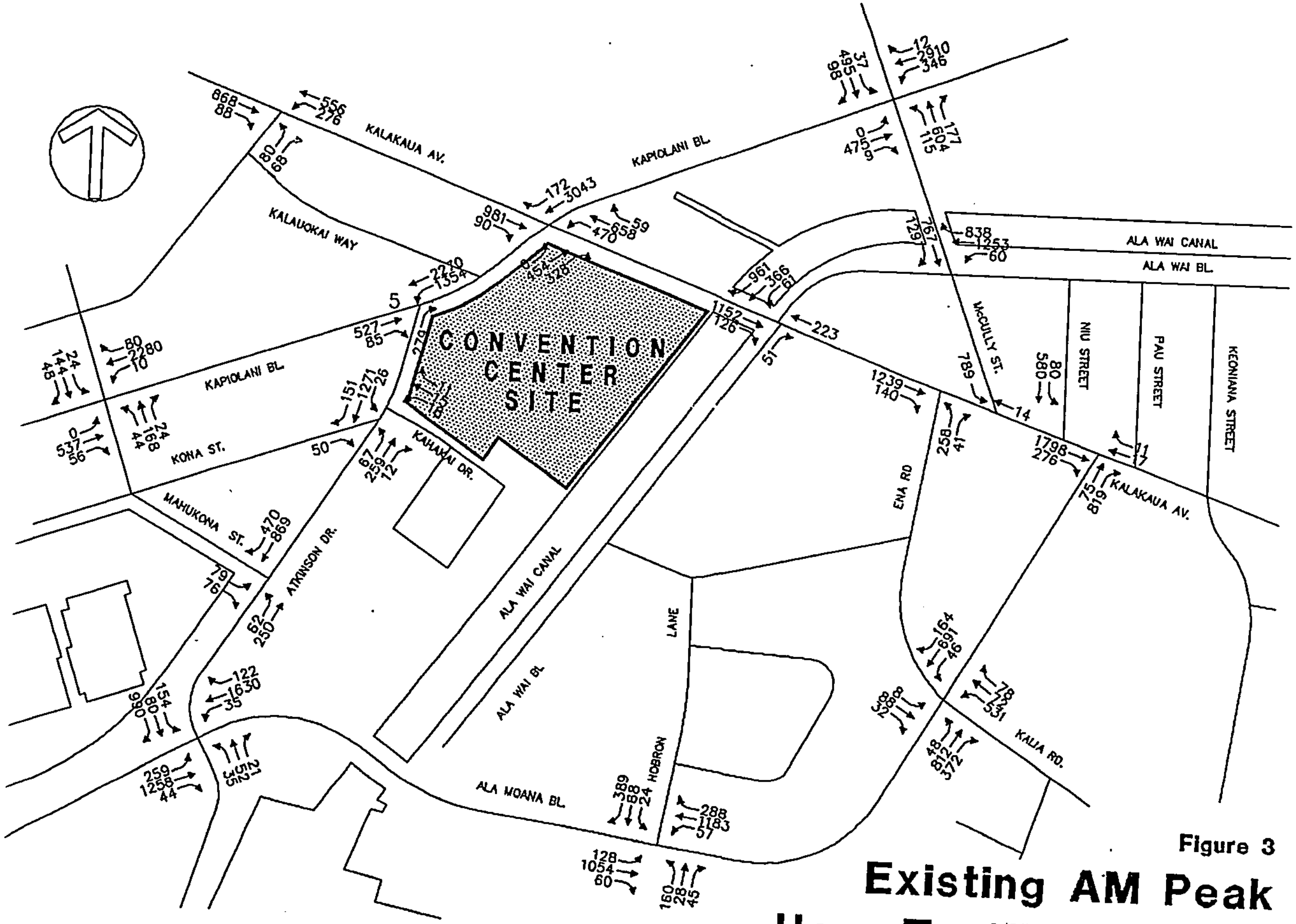


**Figure 3**

# Existing AM Peak Hour Traffic Volumes

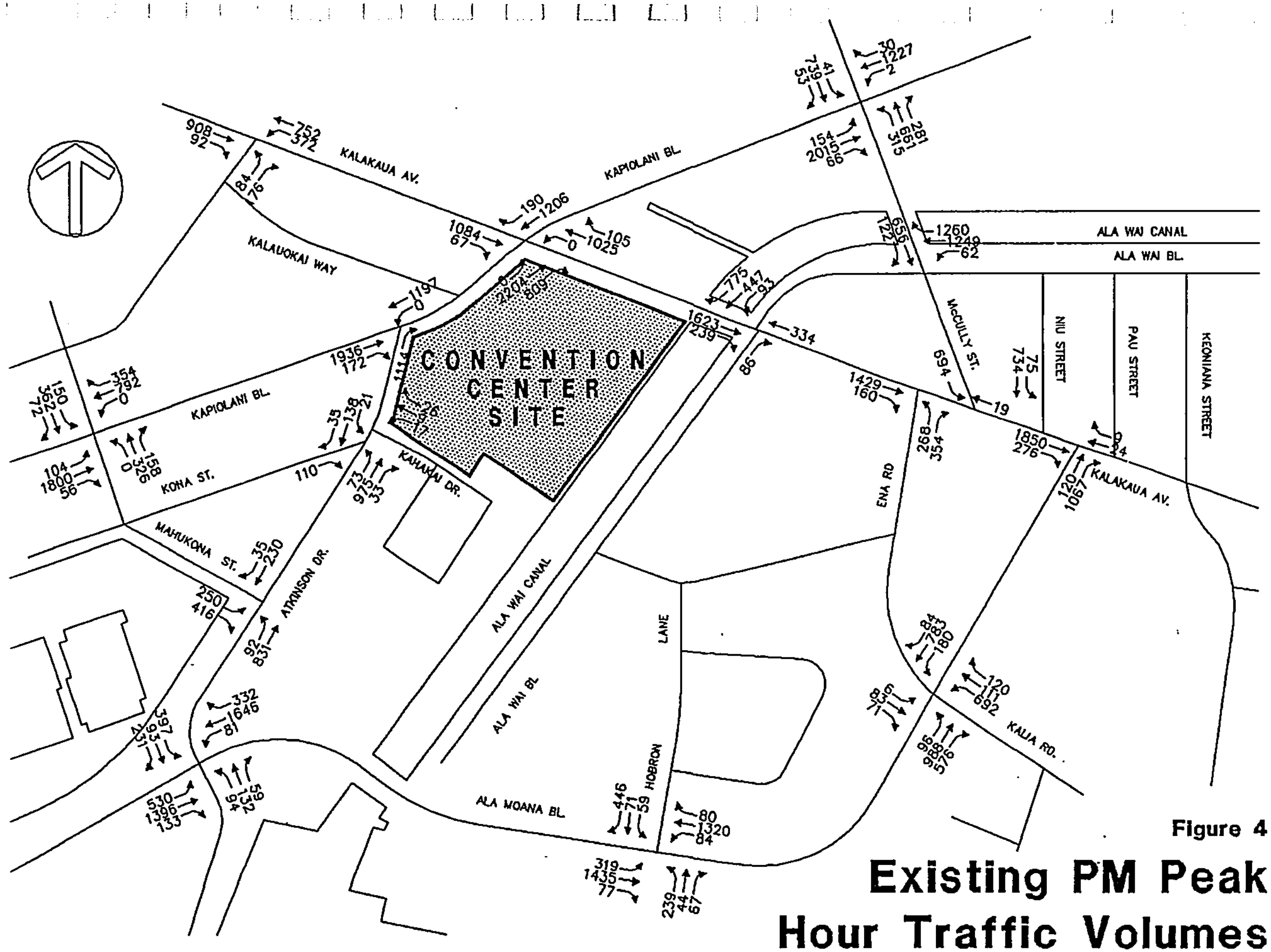


**Figure 4**

# Existing PM Peak Hour Traffic Volumes

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**Table 2 Sources of Existing Traffic Counts**

| No. | Intersection | Source | Comments |
|---|---|---|---|
| 1 | Atkinson Dr. at Ala Moana Bl. | DTS | |
| 2 | Atkinson Dr. at Mahukona St. | PES | Counted April 1995 |
| 3 | Atkinson Dr. at Kahakai Dr/Kona St. | TIAR/TMC | |
| 4 | Atkinson Dr. at Convention Center Bus Bay Entrance | NA | Calculated from Adjacent Intersections |
| 5 | Atkinson Dr. at Kapiolani Dr. | DTS | |
| 6 | Kapiolani Bl. at Convention Center Bus Bay Exit | NA | Calculated from Adjacent Intersections |
| 7 | Kapiolani Bl. at Kalakaua Av. | DTS | |
| 8 | Ala Wai Bl. at Kalakaua Av. | DTS | |
| 9 | Ena Rd. at Kalakaua Av. | PES | Counted April 1995 |
| 10 | McCully St. at Kalakaua Av. | DTS | |
| 11 | McCully St. at Ala Wai Bl. | DTS | |
| 12 | McCully St. at Kapiolani Bl. | DTS | |
| 13 | Hobron Lane at Ala Moana Bl. | DTS | |
| 14 | Ala Moana Bl. at Ena Rd./Kalia Rd. | DTS | |
| 15 | Ala Moana Bl. at Kalakaua Av. | DTS | |
| 16 | Makaloa St. at Kalakaua Av. | PES | Counted April 1995 |
| 17 | Mahukona St/Kaheka St.. at Kapiolani Bl. | PES | Counted June 1995 |

LEGEND:
TIAR/TMC = Transportation Impact Analysis Report for the Environmental Impact Statement Prepared By The Traffic Management Consultant.
DTS = Waikiki Regional Traffic Impact Study Prepared For the City and County Department of Transportation Services.
PES = Parsons Engineering Science, Inc.

**Table 3 Level-of-Service Definitions for Signalized Intersections**

| Level of Service | Interpretation | Volume-to-Capacity Ratio | Stopped Delay (Seconds) |
|---|---|---|---|
| A,B | Uncongested operations; all vehicles clear in a single cycle. | 0.000-0.700 | <15.0 |
| C | Light congestion; occasional backups on critical approaches | 0.701-0.800 | 15.1-25.0 |
| D | Congestion of critical approaches but intersection functional Vehicles must wait through more than one cycle during short periods. No long standing lines formed. | 0.801-0.900 | 25.1-40.0 |
| E | Severe congestion with some standing lines on critical approaches. Blockage of intersection may occur if signal does not provide protected turning movements. | 0.901-1.000 | 40.1-60.0 |
| F | Total breakdown with stop-and-go operation | >1.001 | >60.0 |

Notes:
(1) Source: Highway Capacity Manual, 1985.
(2) This is the ratio of the calculated critical volume to Level-of-Service E Capacity.

Corresponding to each level-of-service shown in Table 3 is a volume-to-capacity ratio. This is the ratio of either existing or projected traffic volumes to the capacity of the intersection. Capacity is defined as the maximum number of vehicles that can be accommodated by the roadway during a specified period of time. The capacity of a particular roadway is dependent upon its physical characteristics such as the number of lanes, the operational characteristics of the roadway (one-way, two-way, turn prohibitions, bus stops, etc.), the type of traffic using the roadway (trucks, buses, etc.) and turning movements.

## Unsignalized Intersections

Like signalized intersections, the operating conditions of intersections controlled by stop signs can be classified by a level-of-service from A to F. However, the method for determining level-of-service for unsignalized intersections is based on the use of gaps in traffic on the major street by vehicles crossing or turning through that stream. Specifically, the capacity of the controlled legs of an intersection is based on two factors: 1) the distribution of gaps in the major street traffic stream, and 2) driver judgment in selecting gaps through which to execute a desired maneuver. The criteria for level-of-service at an unsignalized intersection is therefore based on delay and the potential, or reserve capacity, of each turning movement. Table 4 summarizes the definitions for level-of-service and the corresponding reserve capacity.

**Table 4 Level-of-Service Definitions for Unsignalized Intersections(1)**

| Level-of-Service | Expected Delay to Minor Street Traffic | Reserve Capacity(3) |
|---|---|---|
| A | Little of no delay | >400 |
| B | Short traffic delays | 300-399 |
| C | Average traffic delays | 200-299 |
| D | Long traffic delays | 100-199 |
| E | Very long traffic delays | 0-99 |
| F | See note (2) below | |

Notes:
(1) Source: Highway Capacity Manual, 1985.
(2) When demand volume exceeds the capacity of the lane, extreme delays will be encountered with queuing which may cause severe congestion affecting other traffic movements in the intersection. This condition usually warrants improvement of the intersection.
(3) Reserve capacity is defined as "the capacity of a lane at an unsignalized intersection minus the demand for that lane."

**Results of Existing Level-of-Service Analysis**

Results of these analyses are shown in tabular form in Table 5 and graphically in Figure 5.

The signalized intersections were analyzed using the signalized level-of-service (LOS) planning method. The intersection of Atkinson Drive at Kahakai Drive/Kona Street was analyzed using the methodolgy for unsignalized intersections previously discussed. The calculated levels-of-service were confirmed by field observations.

All of the subject intersections operate at Level-of-Service D or better, except Kapiolani Boulevard at Kalakaua Avenue, which operates at LoS "E" during the morning peak hour. The V/C ratio is 0.921, indicating that the intersection is operating at or near capacity.

The remaining intersections operate at levels-of-service acceptable for urban peak hour conditions.

As shown, the intersections are expected to operate at LoS E or better. However, the calculated LoS for existing conditions is not indicative of the observed levels of service at the study intersections. In general, the observed conditions are worse than would be expected based on the level-of-service calculations. The conclusion of the calculations and the observations is that there is sufficient lane capacity at these intersections, but the full capacity of the intersections appears not to be effectively used due to backups from adjacent intersections and/or imbalances in the distribution of traffic among the travel lanes.

The analysis also indicates that traffic conditions could be improved with optimization of traffic signal phasing and coordination. The traffic signal phasing and timing should be examined to determine if the backups can be reduced or eliminated by optimizing the traffic signal timings.

**Table 5 Results of Level-of-Service Analysis for Existing Conditions**

| Intersection | AM Peak Hour V/C(1) | AM Peak Hour LoS(2) | PM Peak Hour V/C(1) | PM Peak Hour LoS(2) |
|---|---|---|---|---|
| Atkinson Dr. at Ala Moana Bl. | 0.746 | C | 0.889 | D |
| Atkinson Dr. at Mahukona St. | 0.506 | A | 0.468 | A |
| Atkinson Dr. at Kahakai Dr./Kona St. | Not Signalized | | | |
| Atkinson Dr. at Kapiolani Bl. | 0.842 | D | 0.606 | B |
| Kapiolani Bl. at Kalakaua Av. | 0.921 | E | 0.779 | C |
| Ala Wai Bl. at Kalakaua Av. | 0.724 | C | 0.787 | C |
| Ena Rd. at Kalakaua Av. | 0.474 | A | 0.720 | C |
| McCully St. at Kalakaua Av. | 0.267 | A | 0.372 | A |
| McCully St. at Ala Wai Bl. | 0.644 | B | 0.615 | B |
| McCully St. at Kapiolani Bl. | 0.714 | C | 0.879 | D |
| Hobron Ln. at Ala Moana Bl, | 0.551 | A | 0.742 | C |
| Ala Moana Bl. at Ena Rd./Kalia Rd. | 0.471 | A | 0.688 | B |
| Ala Moana Bl. at Kalakaua Av. | 0.610 | B | 0.726 | C |
| Makaloa St. at Kalakaua Av. | 0.567 | A | 0.656 | B |
| Mahukona St./Kaheka St. at Kapiolani Bl. | 0.444 | A | 0.824 | D |

LEGEND:
V/C = Volume-to-Capacity Ratio
LoS = Level-of-Service

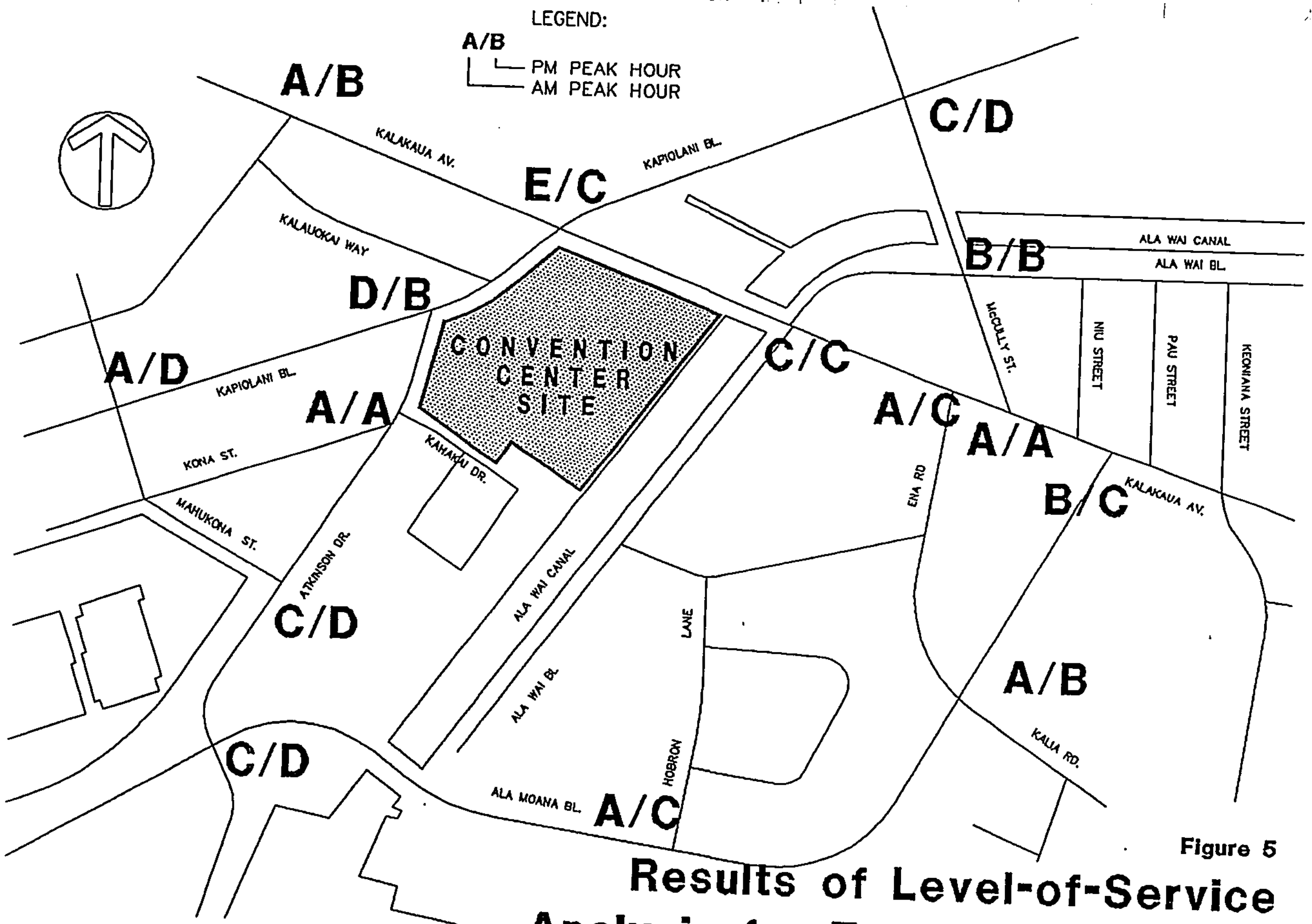


Figure 5
**Results of Level-of-Service Analysis for Existing Conditions**

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# 3. 2005 CUMULATIVE TRAFFIC CONDITIONS

The purpose of this chapter is to discuss the assumptions and data used to estimate 2005 cumulative traffic conditions. Cumulative traffic conditions are defined as the traffic conditions resulting from background growth and related projects.

Future traffic growth consist of two components. The first is ambient background growth that is a result of regional growth and cannot be attributed to a specific project. This growth rate is typically estimated by analyzing historical counts taken over a period of several years. The second component is estimated traffic that will be generated by other development projects in the vicinity of the proposed project.

**Background Traffic Growth Rate**

The background growth rate represents the ambient growth in traffic resulting from regional growth not associated with a specific project, known projects which do not have a project description from which to quantify trips generated, and from projects for which no traffic study is required. The growth rate is typically based on historical traffic data or anticipated growth in population, employment, housing, etc.

For this study, it was decided that the average background growth between 1995 and 2005 would be approximately 8 per cent, or 0.7 per cent per year. This is the average increase in several socio-economic parameters in and adjacent to Waikiki.

**Related Project Generated Traffic**

The second component in estimating cumulative traffic volumes is the traffic generated by other proposed projects in the vicinity. Related projects are defined as those projects that are under construction or have been approved for construction by the City and would significantly impact traffic at the study intersections.

A total of thirteen projects were identified. These projects are shown in Figure 6 and are summarized in Table 6.

**2005 Cumulative Traffic Volumes**

Estimated 2005 cumulative traffic volumes are calculated by applying the background growth rate to existing traffic volumes and adding trips generated by related projects. The resulting 2005 cumulative peak hour traffic projections are shown in Figures 7 and 8 for the morning and afternoon peak hours, respectively.

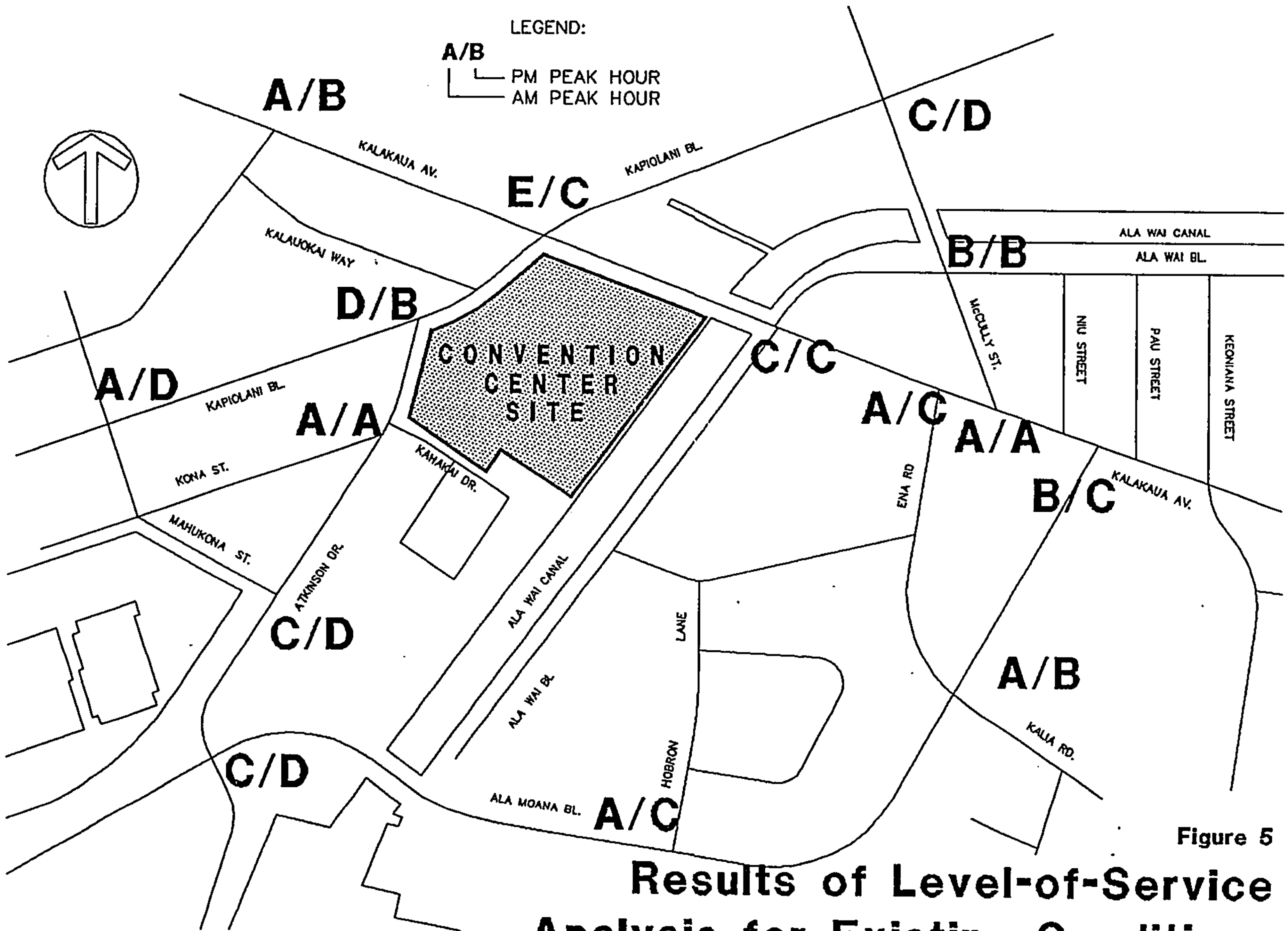


Figure 5

**Results of Level-of-Service Analysis for Existing Conditions**

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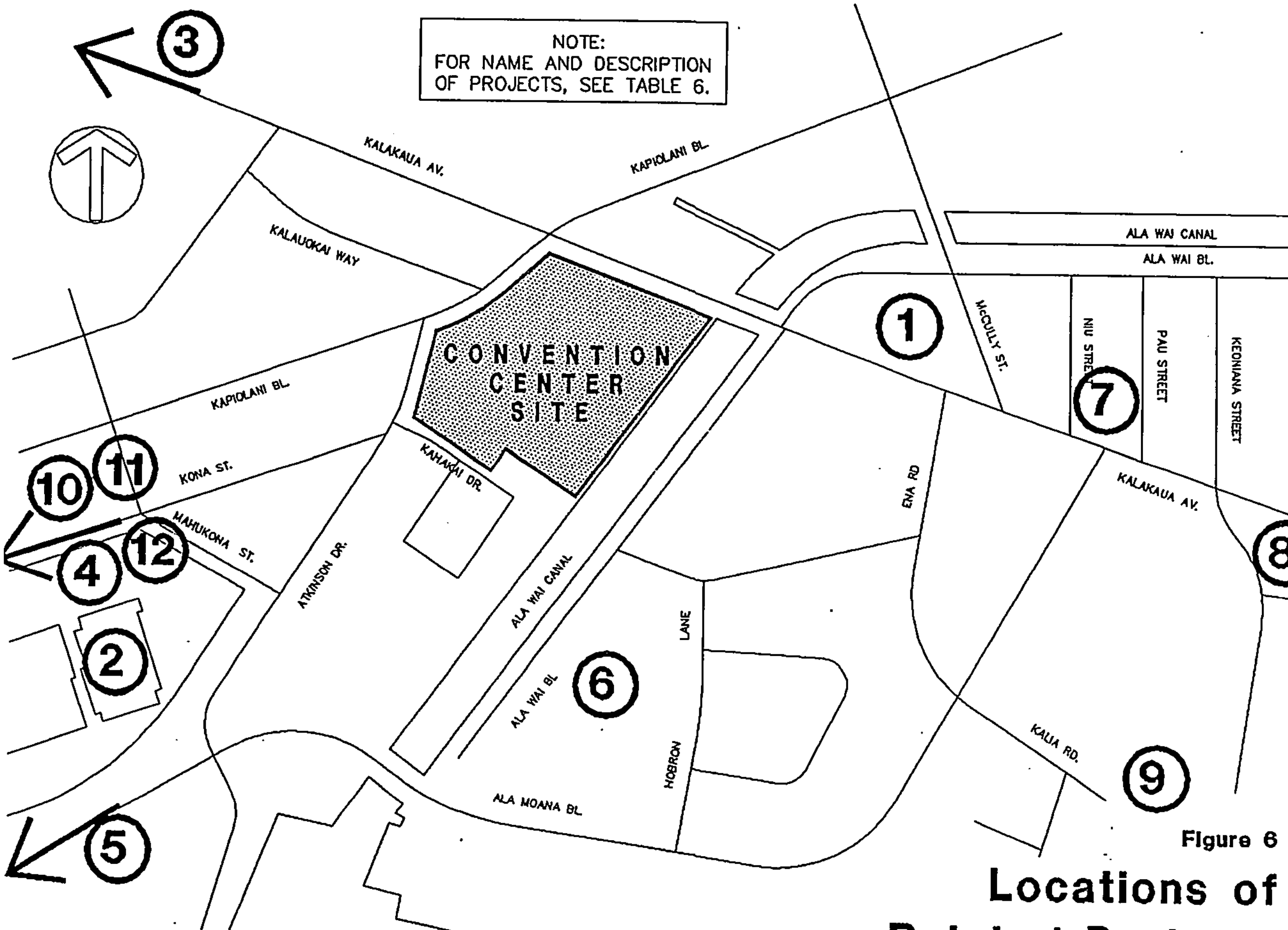


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Figure 6
**Locations of Related Projects**

**Table 6 Summary of Related Projects**

| No | Project Name/Description | Status | Source of Traffic Data |
|---|---|---|---|
| 1 | Waikiki Landmark | Completed but unoccupied. | Traffic study by Pacific Planning and Engineering |
| 2 | Ala Moana Shopping Center Expansion | No Project Description | Considered part of background traffic growth. |
| 3 | Paawa Superblock | | Traffic Study By Wilbur Smith & Associates |
| 4 | Symphony Park | | No traffic study required(1). Traffic assumed to be part of background growth. |
| 5 | Ward Center Expansion | | "Expansion" was accomplished by reconfiguring existing floor space. Increased traffic considered part of background growth. |
| 6 | Waikiki Gateway | No project desciption available. Project will have to prepare an EIS(1). | No traffic study available(1). |
| 7 | Kalakaua Between Niu and Pau Streets | | No traffic study submitted to date.(2) |
| 8 | Nike Town | | No traffic study submitted to date.(2) |
| 9 | Hale Koa Expansion | | Traffic study provided by DTS. |
| 10 | Haseko Project (Keeaumoku Superblock) | | Traffic Study by Wilbur Smith & Associates.. |
| 11 | Asahi Jukyan | No Project Description Available. | Trafic considered part of background growth. |
| 12 | KCCC Faculty Housing (Hale Kewalo Project) | Project is officially closed(1). | |

NOTES:
(1) Source: Wilson Okamoto & Associates.
(2) Source: Department of Transportation Service, City and County of Honolulu

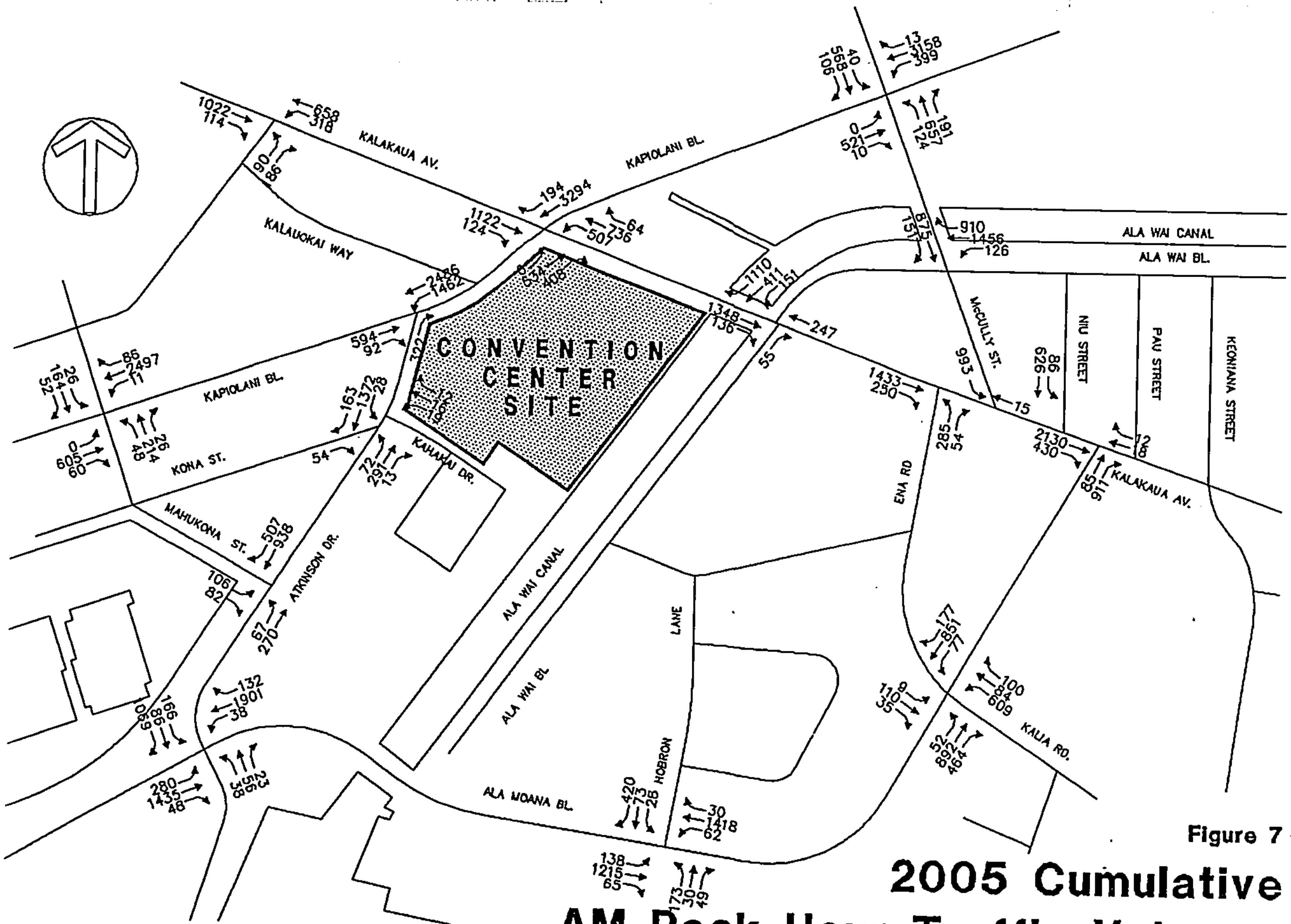


Figure 7
# 2005 Cumulative AM Peak Hour Traffic Volumes

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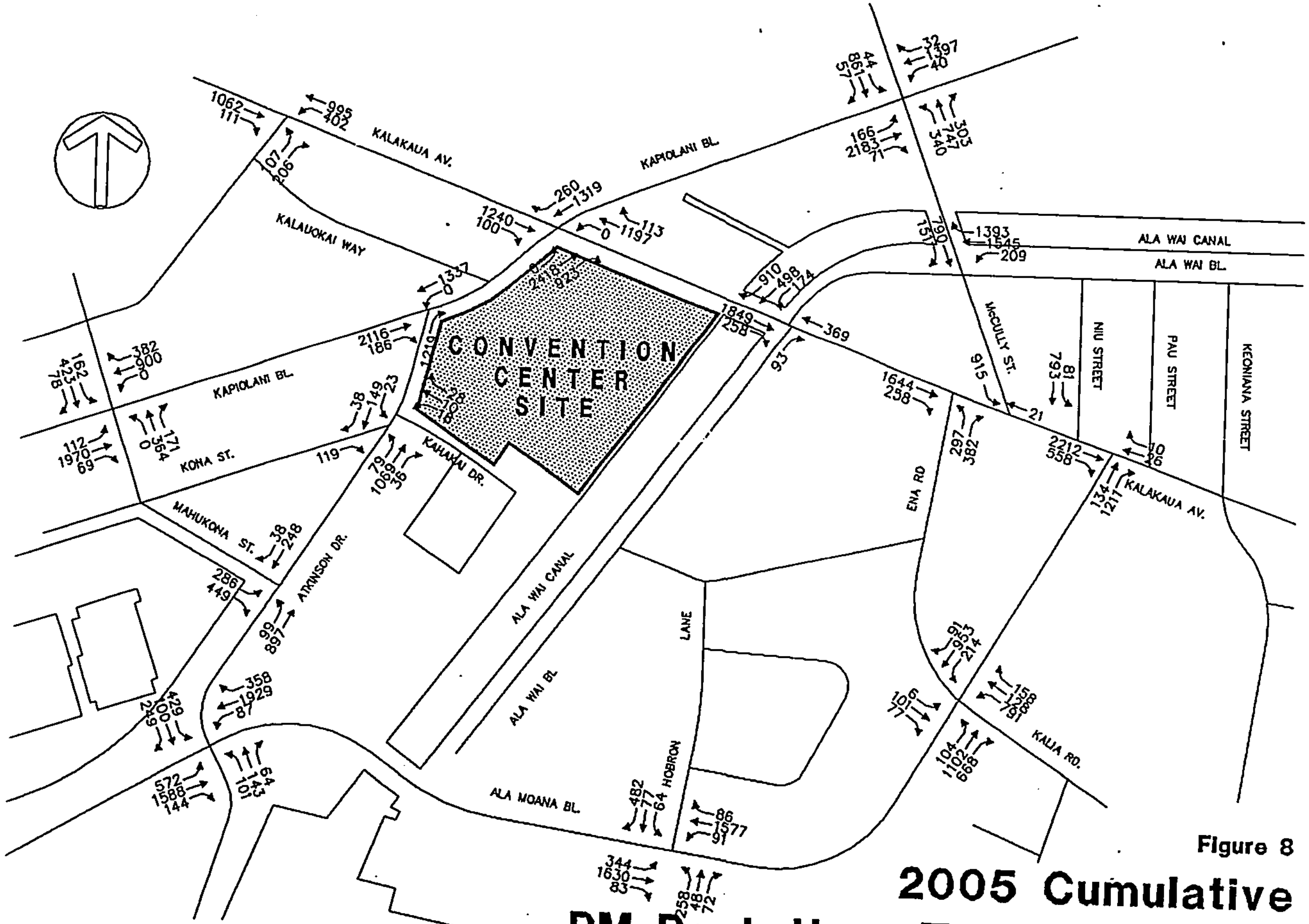


**Figure 8**

# 2005 Cumulative PM Peak Hour Traffic Volumes

*Parsons Engineering Science, Inc.*

# 4. PROJECT RELATED TRAFFIC CONDITIONS

This chapter discusses the methodology used to identify the traffic-related impacts of the proposed project. Generally, the process involves estimating the number of peak-hour trips that would be generated by the proposed project, distribution and assignment of these trips on the approach and departure routes, and finally, determination of the levels-of-service at affected intersections subsequent to implementation of the project. The resulting levels-of-service and the traffic impacts are discussed in the following chapter.

**Trip Generation**

Future traffic volumes generated by a project are typically estimated using trip generation equations contained in Trip Generation, Fifth Edition, prepared by the Institute of Transportation Engineers. This is the standard reference for trip generation data.

There is no source of trip generation rates for convention centers. Since each center is unique, the trips to be generated are estimated using assumptions relative to event size, mode split, vehicle occupancies, and attendance ratios.

The TIAR/TMC and the TIA/WSA studies used assumptions for the above parameters to estimate the morning and afternoon peak hour trips. There was an extensive discussion providing the basis for estimating the percentage of convention attendees that would walk to the center from adjacent hotels which will not be repeated in this report. For the study, we have adjusted several of the traffic-related assumptions. A summary of the assumptions used to estimate the peak hour trips are presented in Table 7 and each parameter is discussed in the following paragraphs.

**Table 7 Summary of Traffic Related Assumption Used for Trip Generation Analysis**

| Assumption | TIAR/TMC | | | | TIAR/PES | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM |
| Event Size | 10,000 | 10,000 | 14,000 | 14,000 | 10,000 | 10,000 | 14,000 | 14,000 | 10,000 | 10,000 |
| Per Cent Non-Residents | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 |
| Per Cent Residents | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Number of Employees | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| Per Cent Attending | 64 | 20 | 64 | 20 | 64 | 20 | 64 | 20 | 64 | 20 |
| Per Cent Visitors By Mode | | | | | | | | | | |
| Public Transit | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Shuttle Bus | 45 | 45 | 70 | 70 | 45 | 45 | 45 | 45 | 50 | 50 |
| Taxi/Limo | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 15 | 15 |
| Passenger/Rental Auto | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 15 | 15 |
| Walk | 35 | 35 | 10 | 10 | 35 | 35 | 35 | 35 | 10 | 10 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Vehicle Occupancy By Mode (Visitors) | | | | | | | | | | |
| Shuttle Bus | 45.0 | 35.0 | 49.0 | 20.0 | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 |
| Taxi/Limo | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 |
| Passenger/Rental Auto | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 |
| Per Cent Residents By Mode | | | | | | | | | | |
| Public Transit | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Taxi/Limo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Passenger Auto | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Vehicle Occupancy By Mode (Residents) | | | | | | | | | | |
| Public Transit | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Taxi/Limo | 0 | 0 | 0 | 0 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 |
| Passenger Auto | 2.3 | 2.3 | 1.2 | 1.2 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 |
| Per Cent Employees By Mode | | | | | | | | | | |
| Public Transit | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| Passenger Auto | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Vehicle Occupancy By Mode (Employees) | | | | | | | | | | |
| Public Transit | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Passenger Auto | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |

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Event Size

The design event size is 10,000 persons. It is possible that on rare occasions, an event exceeding 10,000 persons may be scheduled. An event of 14,000 persons has been examined to determine the traffic demand management measures that will be required in such an event. It is anticipated that this size event would occur approximately once every three years. Therefore, it is not a case for which major roadway improvement should be planned.

Mode Splits and Vehicle Occupancies

The TIAR/TMC used the same mode splits as was used in the TIA/WSA. The convention center project was planned using these data. Both studies assumed that convention visitors would travel via shuttle bus, public transit, taxi/limousines and walking. There were no surveys upon which to base the mode splits.

The TIAR/TMC varied the vehicle occupancies and mode splits between the 10,000 and 14,000 person events to examine a "worse case" scenario relative to vehicles and pedestrians. For this study, the mode splits and vehicle occupancies used for the 10,000 person scenario have also been used for the 14,000 person event.

The impacts of reducing the percentage of visitors walking to and from the center have been reduced from 35 to 10 percent to examine the impacts of a scenario for which the number of walkers would be significantly reduced, such as during inclement weather, with increased traffic impacts. The remaining 25 percent of the walkers have been distributed among the shuttle buses, taxis, limos, and passenger/rental automobiles.

The vehicle occupancies were also varied between the 10,000 and 14,000 person scenarios. In the study, the same vehicle occupancies have been used for all three scenarios. However, the occupancy for the shuttle bus has been reduced from 45 persons per vehicle to 35, or approximately 80 per cent of capacity. This is because the convention center shuttle buses will probably not operate at 100% capacity for the entire peak hours.

Using the assumptions and the event sizes discussed, the trips that will be generated by the Convention Center was estimated. The trip generation calculations for three scenarios have been summarized in Table 8. The spreadsheets for these calculations are presented as Appendix A.

# Table 8 Summary of Trip Generation Analysis

*10,000 Person Event*

| Travel Mode | AM Peak Hour In | Out | Total | PM Peak Hour In | Out | Total |
|---|---|---|---|---|---|---|
| Non-Residents | | | | | | |
| Shuttle Bus | 78 | 78 | 156 | 24 | 24 | 48 |
| Taxi/limo | 132 | 132 | 264 | 41 | 41 | 82 |
| Passenger auto | 132 | 7 | 139 | 2 | 41 | 43 |
| Subtotal | 342 | 217 | 559 | 67 | 106 | 173 |
| Residents | | | | | | |
| Passenger auto | 125 | 7 | 132 | 2 | 39 | 41 |
| Employees | | | | | | |
| Passenger auto | 70 | 4 | 74 | 4 | 70 | 74 |
| TOTAL | 537 | 228 | 765 | 73 | 215 | 288 |

*14,000 Person Event*

| Travel Mode | AM Peak Hour In | Out | Total | PM Peak Hour In | Out | Total |
|---|---|---|---|---|---|---|
| Non-Residents | | | | | | |
| Shuttle Bus | 109 | 109 | 218 | 34 | 34 | 68 |
| Taxi/limo | 185 | 185 | 370 | 58 | 58 | 116 |
| Passenger auto | 185 | 10 | 195 | 3 | 58 | 61 |
| Subtotal | 479 | 304 | 783 | 95 | 150 | 245 |
| Residents | | | | | | |
| Passenger auto | 175 | 9 | 184 | 6 | 105 | 111 |
| Employees | | | | | | |
| Passenger auto | 70 | 4 | 74 | 4 | 70 | 74 |
| TOTAL | 724 | 317 | 1,041 | 105 | 325 | 430 |

*10,000 Person Event (Inclement Weather Scenario)*

| Travel Mode | AM Peak Hour In | Out | Total | PM Peak Hour In | Out | Total |
|---|---|---|---|---|---|---|
| Non-Residents | | | | | | |
| Shuttle Bus | 87 | 87 | 174 | 27 | 27 | 54 |
| Taxi/limo | 397 | 397 | 794 | 124 | 124 | 248 |
| Passenger auto | 397 | 21 | 418 | 7 | 124 | 131 |
| Subtotal | 881 | 505 | 1,386 | 158 | 275 | 433 |
| Residents | | | | | | |
| Passenger auto | 125 | 7 | 132 | 2 | 39 | 41 |
| Employees | | | | | | |
| Passenger auto | 70 | 4 | 74 | 4 | 70 | 74 |
| TOTAL | 1,076 | 516 | 1,592 | 164 | 384 | 548 |

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**Verification of Trip Generation Calculation**

The resulting number of trips per square feet of exhibit hall and meeting rooms were compared to generation rates for two other convention center projects for which comparable data were available. This comparison is summarized in Table 9.

**Table 9 Comparison of Trip Generation Rates**

| Facility & Location | Trips per 1,000 Square Feet[1] In | Out | Total | Remarks |
|---|---|---|---|---|
| LA Convention Center Los Angeles, CA | 0.38 | 0.22 | 0.60 | PM Peak Hour for Consumer Show |
| " | 0.10 | 0.64 | 0.74 | PM Peak Hour for Trade Show |
| Navy Pier, Chicago. IL | 0.50 | 0.42 | 0.92 | Design Peak Hour |
| Hawaii Convention Center | 1.73 | 0.76 | 2.49 | AM Peak Hour, 10,000 Person Event |
| | 0.24 | 0.72 | 0.96 | PM Peak Hour, 10,000 Person Event |
| | 2.41 | 1.06 | 3.47 | AM Peak Hour, 14,000 Person Event |
| | 0.35 | 1.08 | 1.43 | PM Peak Hour, 14,000 Person Event |

NOTE:
(1) Trips are calculated per 1,000 square feet of exhibition hall and meeting room area.

The total trip generation rates for the Hawaii Convention Center are higher than for the total trip generation rates for the other convention centers. The PM peak hour inbound rates are slightly less. The AM peak hour rates are higher. The conclusion of this analysis is that the total number of peak hour trip rates and the AM inbound trip rates are conservative compared to the facilities compared.

**Trip Distribution**

The project-related trips were distributed based on the future distribution of population as shown in the HALI 2010 socio-economic data and the anticipated approach routes to the project site. This information was obtained from previously conducted traffic studies in the area, which have been generally accepted by the reviewing agencies.

Two distributions were developed. The first was for the convention shuttle buses, limos and taxis. Since all of these vehicles would load and unload in the bus bay area, these vehicles would approach the site via Ala Moana Boulevard and depart the site via Atkinson Drive, Kapiolani Boulevard, and Kalakaua Avenue.

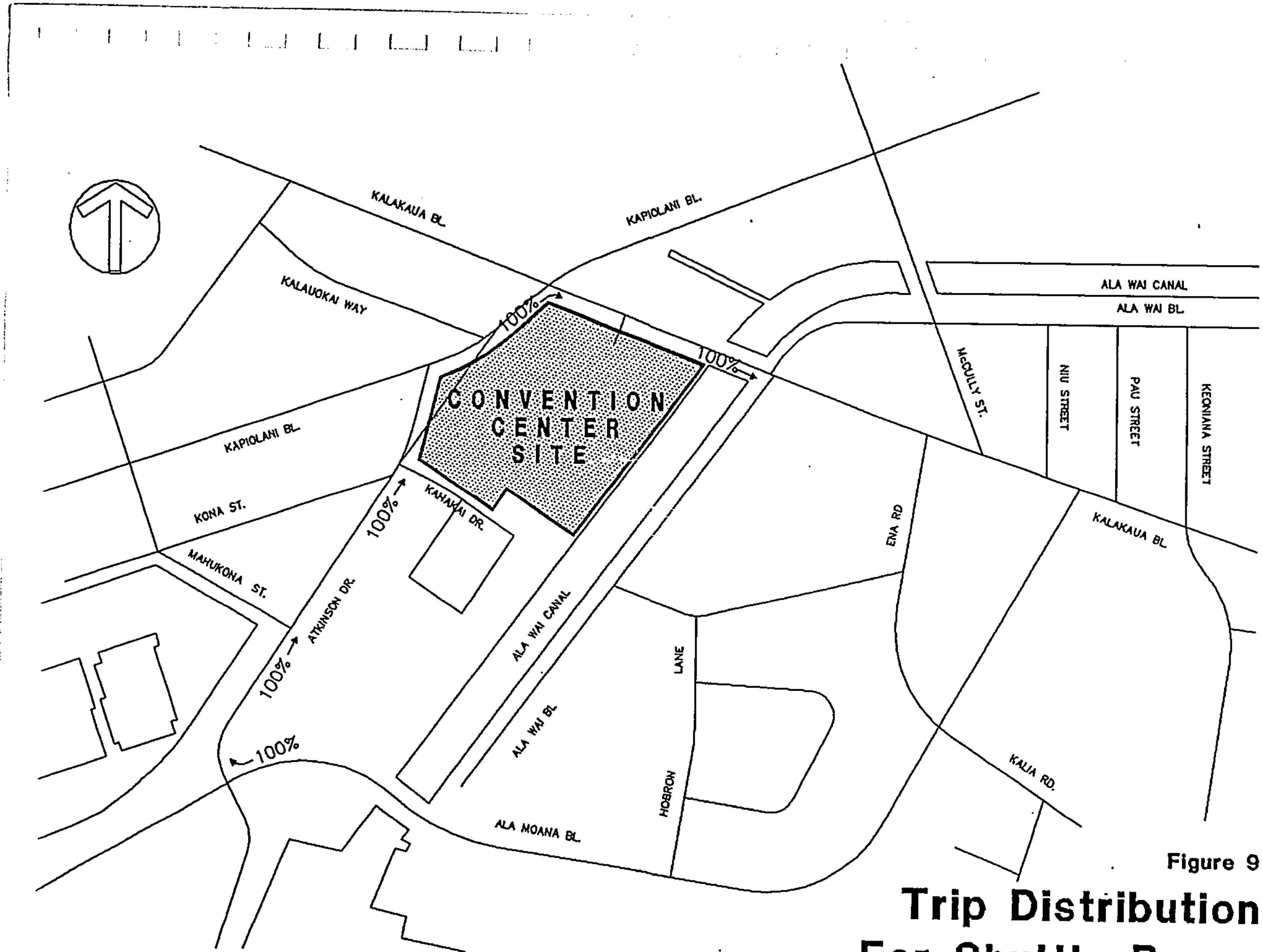
Autos would approach and depart the site to and from all directions. The approach and departure distributions for buses and autos are shown in Figures 9 and 10, respectively.

**Trip Assignment**

Using the trip generation assumption and trip distribution previously discussed, project-related traffic was assigned to the various traffic movements at the intersections studied. The trip assignments for the 10,000 and 14,000 person events are presented in Figures 11 and 12, respectively.

**2005 Cumulative Plus Project Peak Hour Traffic Volumes**

Future traffic volumes with the project were determined by superimposing the project-generated traffic on the 2005 cumulative traffic volumes presented in Chapter 3. Figures 13, 14, 15 and 16 indicate the peak hour traffic volumes for the 10,000 and 14,000 person event scenarios.




Parsons Engineering Science, Inc.

Figure 9

## Trip Distribution For Shuttle Buses

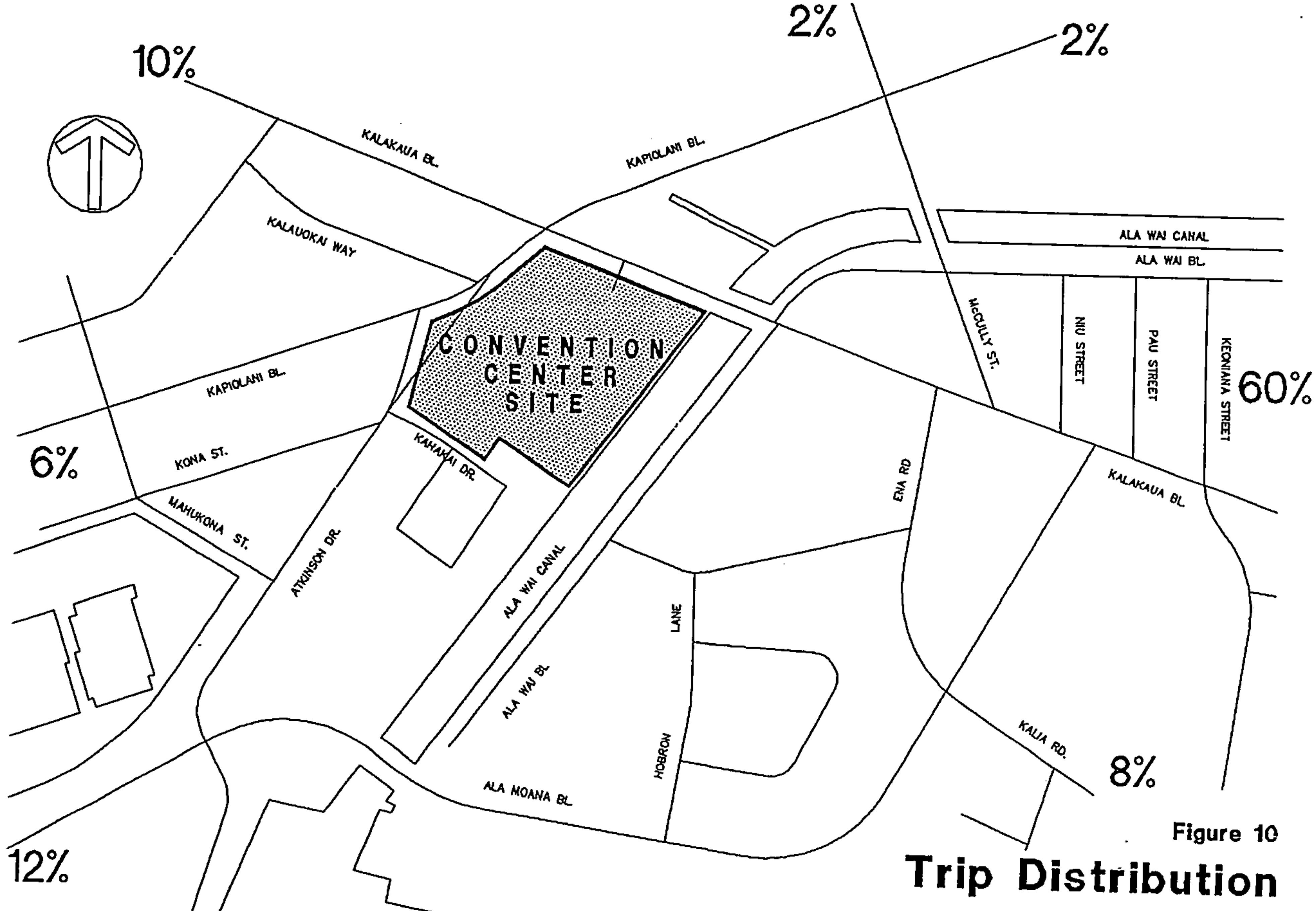



Figure 10

**Trip Distribution For Autos**

Parsons Engineering Science, Inc.

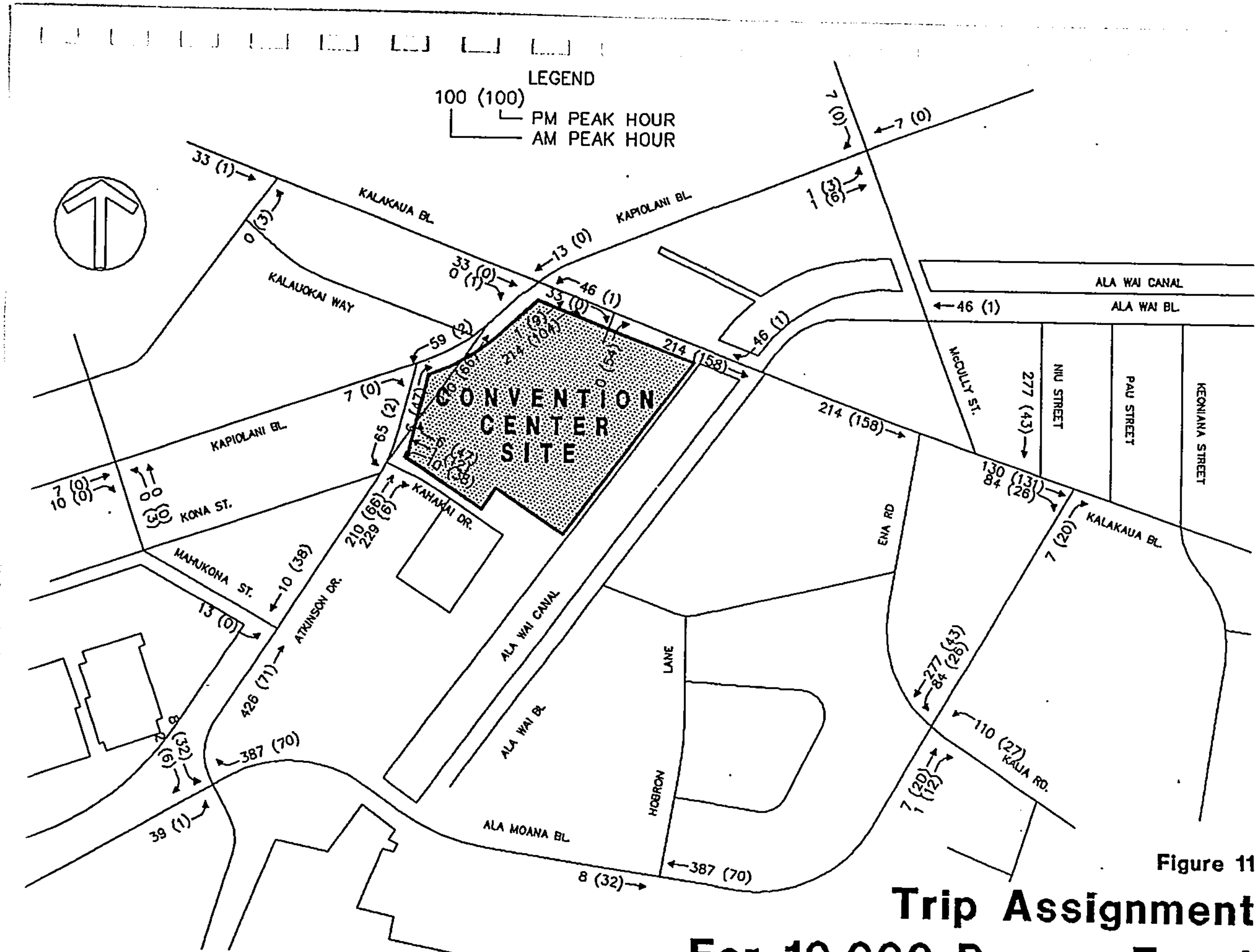
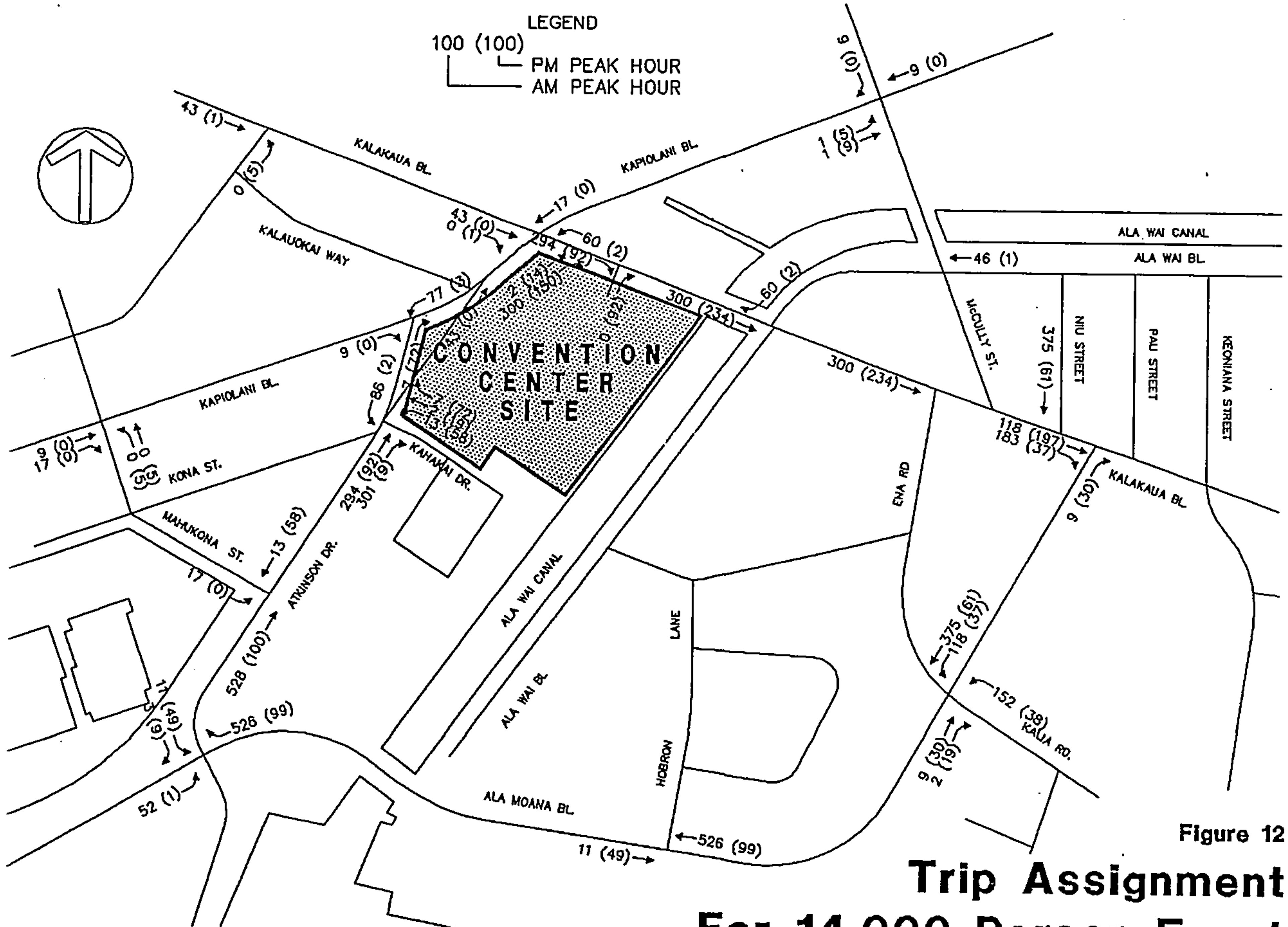


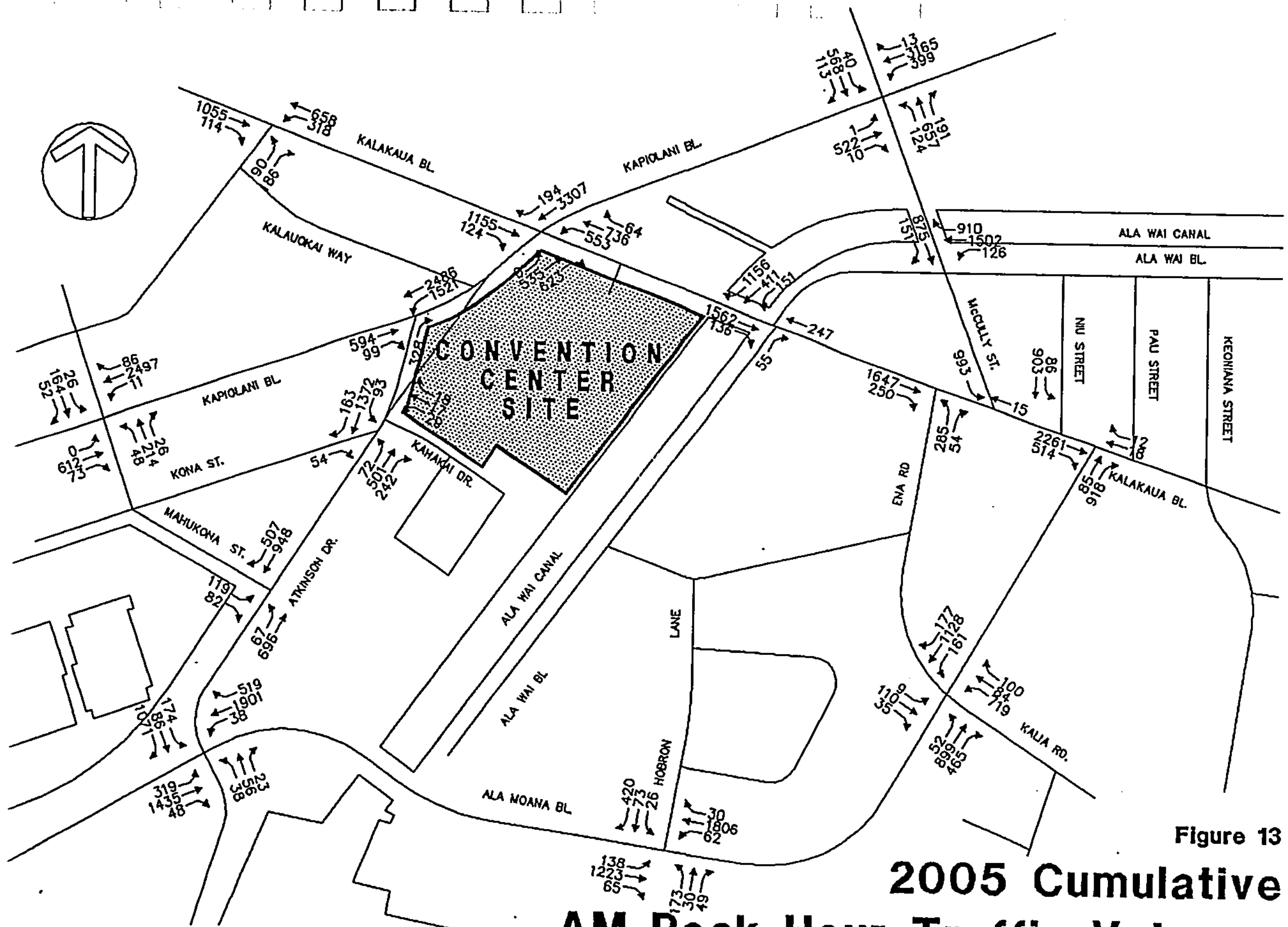

Figure 11
# Trip Assignment For 10,000 Person Event

*Parsons Engineering Science, Inc.*




Parsons Engineering Science, Inc.

Figure 12
**Trip Assignment For 14,000 Person Event**




Parsons Engineering Science, Inc.

Figure 13

# 2005 Cumulative AM Peak Hour Traffic Volumes

**[10,000 Person Event]**

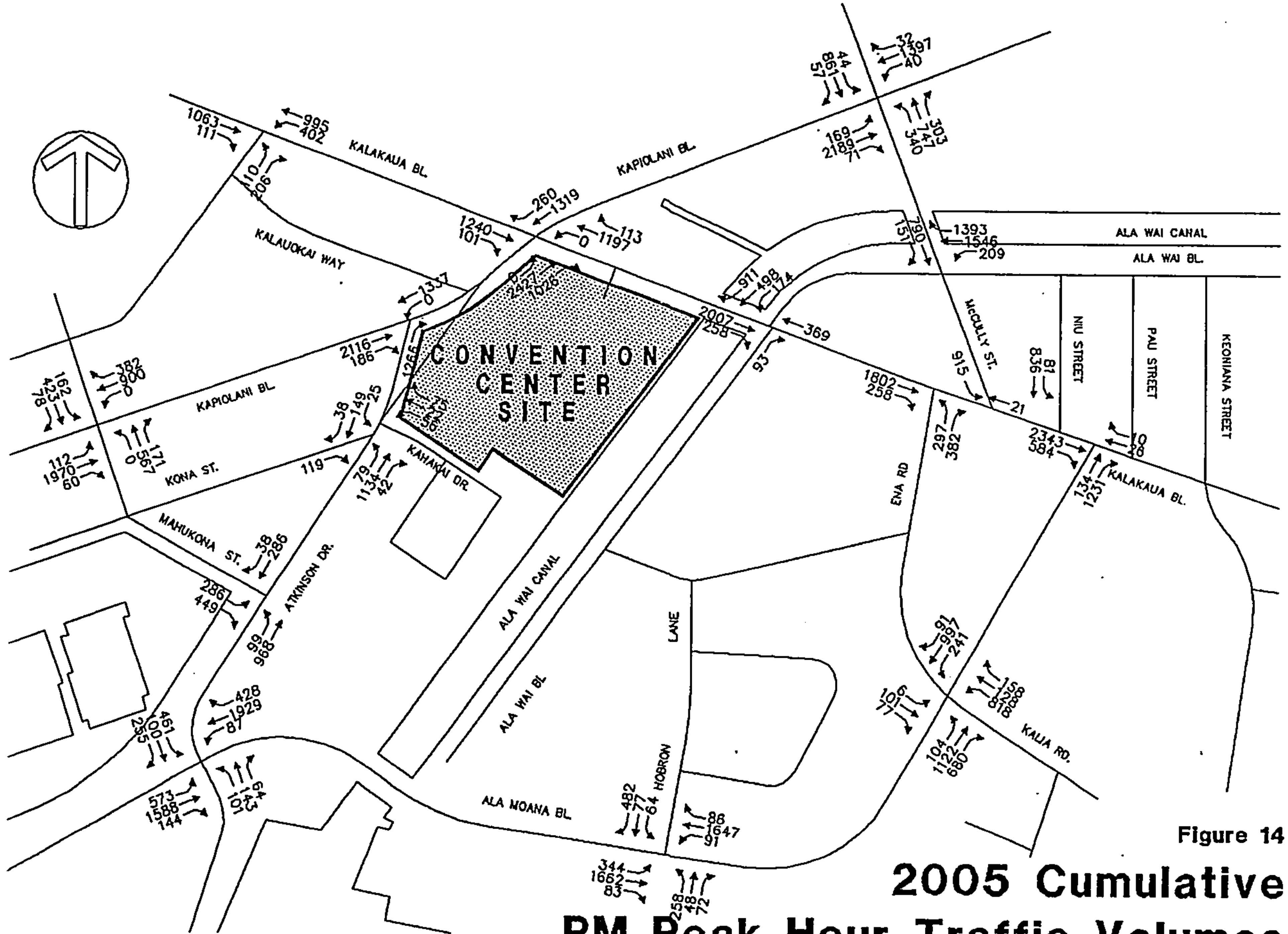



Figure 14
# 2005 Cumulative PM Peak Hour Traffic Volumes
## (10,000 Person Event)

Parsons Engineering Science, Inc.

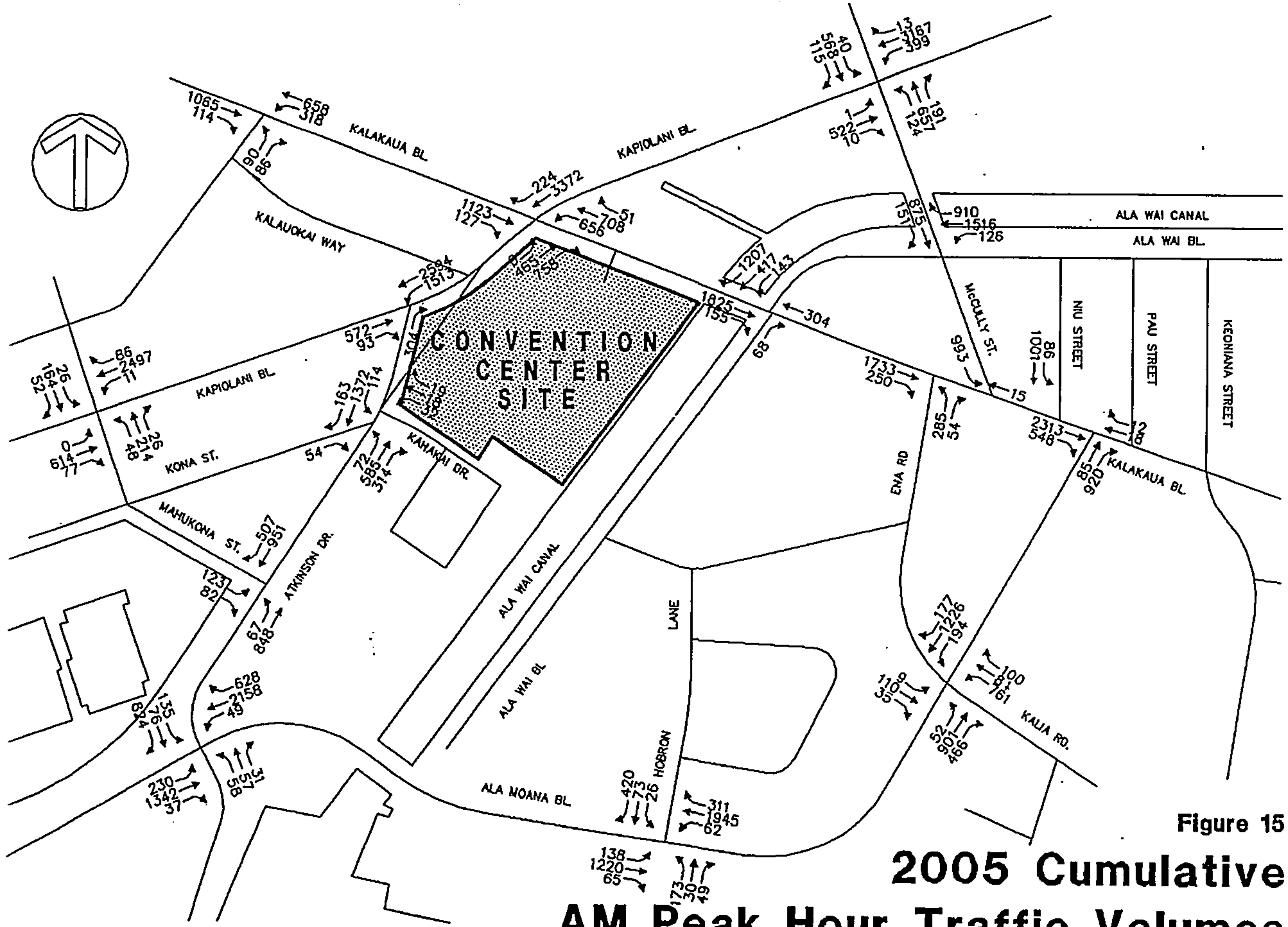



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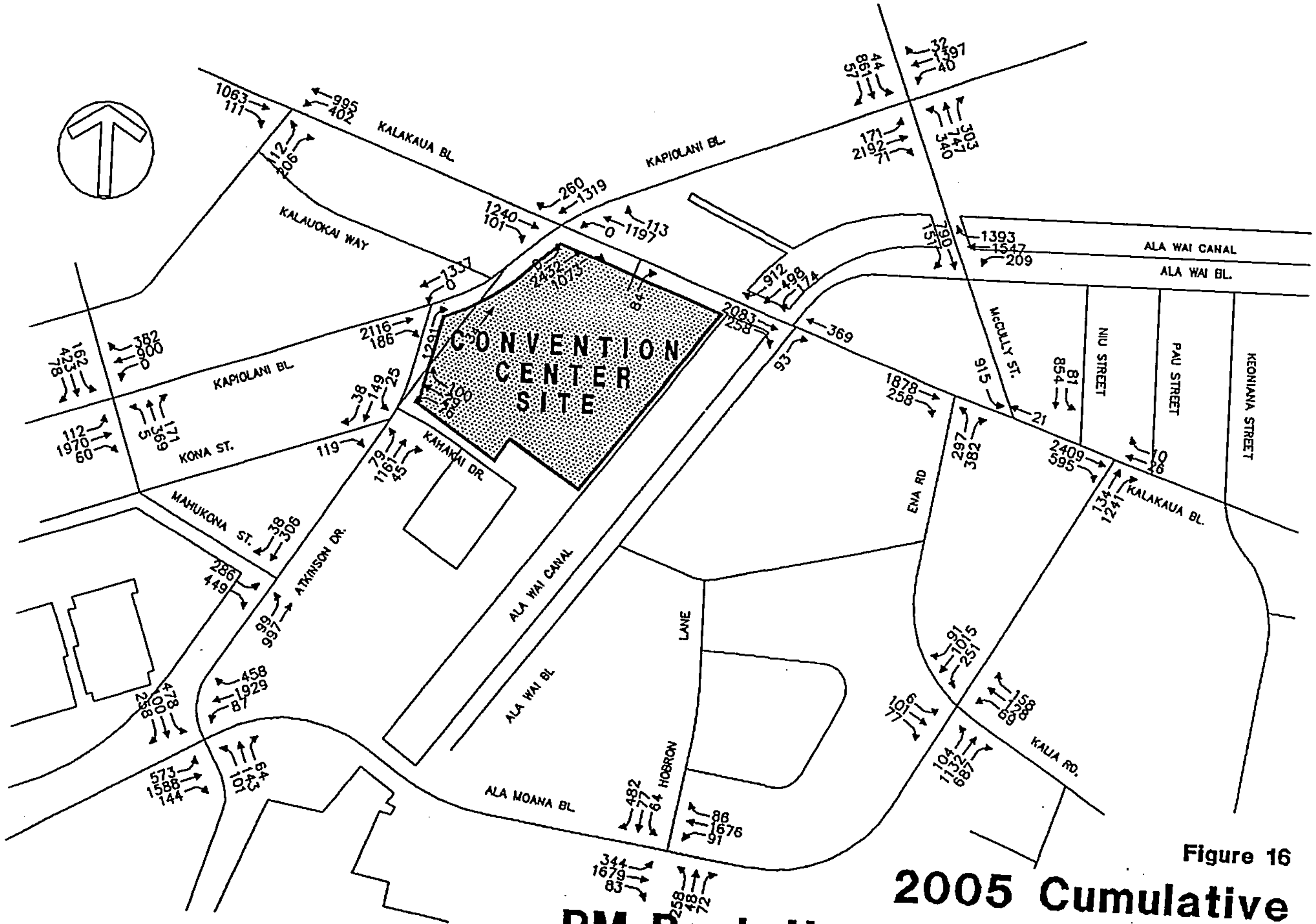
Figure 15
**2005 Cumulative**
**AM Peak Hour Traffic Volumes**
**[14,000 Person Event]**




Parsons Engineering Science, Inc.

Figure 16
## 2005 Cumulative PM Peak Hour Traffic Volumes (14,000 Person Event)

# 5. CONCLUSIONS AND RECOMMENDATIONS

The purpose of this chapter is to present the results of the level-of-service analysis, which identifies the project-related impacts. In addition, any mitigation measures necessary and feasible are identified and other access, egress and circulation issues are discussed.

**Definition of Significant Impacts**

Criteria for determining if a project has a significant traffic impact for which mitigation measures must be investigated have been established based on traffic impact study guidelines used in various other cities. Generally, the criteria are as follows: if the level-of-service (LOS) without the project is E or F and the volume/capacity (V/C) ratio changes less than 0.020, the project's traffic impacts are considered insignificant. However, if the V/C ratio change is greater than 0.020, then mitigation measures which will reduce the V/C ratio change to less than 0.020 must be identified. If the LOS with the project is D or better, then no mitigation measures need to be identified.

**Project-Related Traffic Improvements**

The analysis was performed for conditions that included the following roadway improvements that are part of the proposed convention center project:

1. Atkinson Drive

   Provide an additional lane along makaibound Atkinson Drive between Kahakai Drive and Kapiolani Boulevard to provide a left turn lane into Kahakai Drive, and install a traffic signal at the intersection of Atkinson Drive at Kahakai Drive. The left turn storage lane should be approximately 150 feet long. This would provide storage capacity to accommodate 215 vehicles per hour for a 120 second cycle and 240 vehicles per hour for a 90 second cycle.

   It is also recommended that the signal provide protected-permissive left turn phasing for traffic to turn left from Atkinson Drive into Kahakai Drive. This type of operation would provide a protected left turn phase when there are three of more vehicles in the left trun storage lane. When there are less than three vehicles, left turns would be made during the amber signal phase.

2. Kapiolani Boulevard

   Widen Kapiolani Boulevard Drive fronting the project site from Atkinson Drive to Kalakaua Avenue to provide an additional lane for Diamond Head bound traffic. The additional lane would be for right turning traffic only. The existing right turn only lane would become an optional right turn or through lane.

3. Kalakaua Avenue

   Widen Kalakaua Avenue along the project frontage from Kapiolani Boulevard to the Ala Wai Promenade to provide an additional lane in the Diamond Head direction. The section between the center's parking garage entrance/exit and the Ala Wai Promenade would be used for a City bus stop.

4. Kahakai Drive

   Widen Kahakai Drive from the existing two lanes to provide two lanes in each direction and a median.

In addition, it was assumed that the City would continue using the current morning and afternoon coning plans along Kapiolani Boulevard.

**Project-Related Traffic Impacts and Mitigation Measures**

The level-of-service analysis for 2005 for a 10,000-person event is summarized in Table 10. Even with the roadway improvements implemented as part of the project, four intersections will operate at level-of-service E or F and have a volume-to-capacity ratio change of 0.020 or greater.

These intersections are discussed below:

1. Atkinson Drive at Ala Moana Boulevard

   During the morning peak hour, the volume-to-capacity ratio is expected to increase from 0.835 without the project to 0.929 with the project. This impact is the result of the heavy right turns from westbound Ala Moana Boulevard to Atkinson Drive associated with the Center. A right turn only lane would reduce the morning peak hour volume-to-capacity ratio to 0.821, which is an improvement compared to the 2005 without project condition.

   During the afternoon peak hour, the volume-to-capacity ratio is expected to increase from 0.991 without the project to 1.037 with the project. The right turn only lane would improve the volume-to-capacity ratio to 0.814.

2. Atkinson Drive at Kapiolani Boulevard

   During the morning peak hour, the volume-to-capacity ratio is expected to increase from 0.924 without the project to 0.954 with the project. A right turn only lane for traffic turning from Kapiolani Boulevard to Atkinson Drive would reduce the morning peak hour volume-to-capacity ratio to 0.922, which also is an improvement compared to the 2005 without project condition.

3. Kapiolani Boulevard at Kalakaua Avenue

   During the afternoon peak hour, the volume-to-capacity ratio is expected to increase from 0.878 without the project to 0.904 with the project. A right turn only lane for traffic turning from Ewa-bound Kapiolani Boulevard to mauka-bound Kalakaua Avenue would reduce the peak hour volume-to-capacity ratio to 0.843, which is a significant improvement compared to the 2005 without project condition.

Table 10

## LEVEL-OF-SERVICE SUMMARY ANALYSIS FOR 10,000 PERSON EVENT

Hawaii Convention Center Traffic Study

| | | 2005 Cumulative (Without Project) | | | | 2005 10,000 Person Event | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AM Peak Hour (Case 1) | | PM Peak Hour (Case 2) | | AM Peak Hour (Case 3) | | | PM Peak Hour (Case 4) | | |
| No | INTERSECTION | V/C | LoS | V/C | LoS | V/C | LoS | Change | V/C | LoS | Change |
| 1 | Atkinson Dr. at Ala Moana Blvd. | 0.835 | D | 0.991 | E | 0.929 | E | 0.094 | 1.037 | F | 0.046 |
| 2 | Atkinson Dr. at Mahukona St. | 0.560 | A | 0.505 | A | 0.572 | A | 0.012 | 0.528 | A | 0.023 |
| 3 | Atkinson Dr. at Kahakai Dr./Kona St. | 0.568 | A | 0.304 | A | 0.399 | A | -0.169 | 0.334 | A | 0.030 |
| 4 | Atkinson Dr. at Bus Bay Entrance | 0.489 | A | 0.348 | A | 0.509 | A | 0.020 | 0.363 | A | 0.015 |
| 5 | Atkinson Dr. at Kapiolani Bl. | 0.924 | E | 0.672 | B | 0.954 | E | 0.030 | 0.683 | B | 0.011 |
| 6 | Kapiolani Blvd. at Bus Bay Exit | 0.630 | B | 0.495 | A | 0.770 | C | 0.140 | 0.543 | A | 0.048 |
| 7 | Kapiolani Bl at Kalakaua Av. | 1.016 | F | 0.878 | D | 0.987 | E | -0.029 | 0.904 | E | 0.026 |
| 8 | Ala Wai Bl. at Kalakaua Av. | 0.823 | D | 0.883 | D | 0.868 | D | 0.045 | 0.916 | E | 0.033 |
| 9 | Ena Rd. at Kalakaua Av. | 0.563 | A | 0.821 | D | 0.607 | B | 0.044 | 0.854 | D | 0.033 |
| 10 | McCully St. at Kalakaua Av. | 0.328 | A | 0.439 | A | 0.372 | A | 0.044 | 0.471 | A | 0.032 |
| 11 | McCully St. at Ala Wai Bl. | 0.767 | C | 0.795 | C | 0.782 | C | 0.015 | 0.795 | C | 0.000 |
| 12 | McCully St. at Kapiolani Bl. | 0.784 | C | 0.991 | E | 0.788 | C | 0.004 | 0.991 | E | 0.000 |
| 13 | Hobron Lane at Ala Moana Bl. | 0.624 | B | 0.833 | D | 0.704 | C | 0.080 | 0.847 | D | 0.014 |
| 14 | Ala Moana Bl. at Ena Rd./Kalia Rd. | 0.544 | A | 0.797 | C | 0.633 | B | 0.089 | 0.828 | D | 0.031 |
| 15 | Ala Moana Bl. at Kalakaua Av. | 0.718 | C | 0.858 | D | 0.753 | C | 0.035 | 0.888 | D | 0.030 |
| 16 | Makaloa St. at Kalakaua Av. | 0.659 | B | 0.754 | C | 0.669 | B | 0.010 | 0.756 | C | 0.002 |
| 17 | Mahukona St./Kaheka St. at Kapiolani | 0.495 | A | 0.908 | E | 0.495 | A | 0.000 | 0.910 | E | 0.002 |

NOTE: Level-of-service analysis assumes that City will continue to use morning and afternoon coning along Kapiolani Boulevard through 2005.

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4. Ala Wai Boulevard at Kalakaua Avenue

   During the afternoon peak hour, the volume-to-capacity ratio is expected to increase from 0.883 without the project to 0.916 with the project, an increase of 0.033. To mitigate the project impacts, the westbound approach of Ala Wai Boulevard at Kalakaua Avenue, along with traffic signals, should be modified to provide two exclusive right-tum lanes onto maukabound Kalakaua Avenue from westbound Ala Wai Boulevard, and an optional through/left turn lane. This can be accomplished by reconfiguring the existing lanes within the existing roadway width. This would allow more green time to the Waikikibound Kalakaua Avenue traffic and therefore increase the capacity in that direction. This modification would decrease the afternoon peak hour volume-to-capacity ratio at the Kalakaua Avenue/Ala Wai Boulevard intersection from 0.916 to 0.892 and improve the level-of-service from LoS E to LoS D. The morning peak hour level-of-service would also improve from LoS D to LoS C, with a decrease in the volume-to-capacity ratio from 0.868 to 0.715.

**Traffic Demand Management**

The convention center management should designate a Transportation Coordinator whose responsibilities may include the operation of the parking facilities and implementation of traffic demand management programs.

The transportation coordinator would also develop a plan to accommodate the traffic expected from a large event or during inclement weather. Using the traffic generation calculation presented previously in the report, an estimate of the programs required for each of these events has been developed.

For a !4,000-person event, the plan would involve the following:

1. Temporary relocation of employees to a satellite lot and transporting them to the center via a shuttle bus.

2. Designation of an existing satellite parking lot for resident visitors and provision of shuttle buses to accommodate approximately 50 percent of the anticipated resident visitors to the center.

3. Reallocation of the mode splits and the number of vehicles avialable for non-resident visitors as shown in Table 11. Vehicle occupancies would have to be higher for convention center shuttle buses and a larger percentage would be encouraged to walk.

The inclement weather scenario is a worse-case condition for traffic related impacts associated with a 10,000 person event. This is a condition for which the percentage of visitors walking to the convention center would be significantly less than for the design scenario. Those visitors would change travel modes from walking to shuttle buses, taxis, limos,or automobiles with a resulting increase in traffic volumes in the study area

To reduce the traffic generated to levels comparable to the design scenario, the traffic management plan should be designed for the following:

a. The proportion of non-resident attendees walking to the convention center would decrease to 5 percent or less,

b. The percentage of non-resident attendees using the shuttle buses would increase to 75 percent, and

c. Taxi use by non-resident attendees would also be expected to increase.

To accommodate these, the transportation management plan should address the following :

a. The need for more passenger loading/unloading area for additional shuttle buses. The transportation coordinator should coordinate with the shuttle bus operator for use of the Center's loading dock area for bus staging so as to eliminate the potential of buses queuing on the streets.

b. The need for more taxi loading/unloading area for passengers. An area within the convention center parking garage could be designated for this purpose. The placement of directional signing would be required to route taxis to the designated loading/unloading areas, and to direct passengers to the Center's lobby from the drop-off area.

Table 11

# Mode Split Analysis for 14,000 Person Event

AM Peak Hour

| Travel Mode | Non-Resident Visitors Mode Split | Non-Resident Visitors Persons /Vehicle | Non-Resident Visitors Total Vehicle | Resident Visitors Mode Split | Resident Visitors Persons /Vehicle | Resident Visitors Total Vehicle | Employees Mode Split | Employees Persons /Vehicle | Employees Total Vehicle | Vehicle Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Public Transit | 10 | NA | | 10 | NA | | 30 | NA | | 0 |
| Shuttle Bus | 45 | 42.0 | 182 | 50 | 40.0 | 11 | 70 | 45.0 | 4 | 197 |
| Taxi/Limo | 5 | 2.3 | 370 | 0 | 2.3 | 0 | 0 | 2.3 | 0 | 370 |
| Pass Auto | 5 | 2.3 | 195 | 40 | 2.3 | 82 | 0 | 1.2 | 0 | 277 |
| Walk | 35 | NA | | 0 | NA | | 0 | NA | | 0 |
| Totals | 100 | | 747 | 100 | | 93 | 100 | | 4 | 844 |

PM Peak Hour Trip

| Travel Mode | Non-Resident Visitors Mode Split | Non-Resident Visitors Persons /Vehicle | Non-Resident Visitors Total Vehicle | Resident Visitors Mode Split | Resident Visitors Persons /Vehicle | Resident Visitors Total Vehicle | Employees Mode Split | Employees Persons /Vehicle | Employees Total Vehicle | Vehicle Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Public Transit | 10 | NA | | 10 | NA | | 30 | NA | | 0 |
| Shuttle Bus | 45 | 42.0 | 57 | 50 | 40.0 | 4 | 70 | 45.0 | 4 | 64 |
| Taxi/Limo | 5 | 2.3 | 116 | 0 | 2.3 | 0 | 0 | 2.5 | 0 | 116 |
| Pass Auto | 5 | 2.3 | 61 | 40 | 1.2 | 49 | 0 | 1.2 | 0 | 110 |
| Walk | 35 | NA | | 0 | NA | | 0 | NA | | 0 |
| Totals | 100 | | 234 | 100 | | 53 | 100 | | 4 | 290 |

# APPENDIX A
# TRIP GENERATION CALCULATIONS

Table A-1

# Trip Generation Analysis

Hawaii Convention Center Traffic Study For 10,000 Visitors

| | | |
|---|---|---|
| 10,000 | Total Visitors | |
| 95 | % Non-Resident | 9,500 |
| 5 | % Resident | 500 |
| 120 | Total Employees | |
| 64 | AM k Factor | |
| 20 | PM k Factor | |

## AM Peak Hour Trip Generation Analysis

| | | Non-Resident Visitors | | | | | | Resident Visitors | | | | | | Employees | | | | | | Vehicles | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Travel Mode | Vehicle Capacity | Mode Split | Persons | Persons /Vehicle | Total Vehicl | In 95 | Out 5 | Mode Split | Persons | Persons /Vehicle | Total Vehicl | In 95 | Out 5 | Mode Split | Persons | Persons /Vehicle | Total Vehicl | In 95 | Out 5 | Total | In | Out |
| Public Transit | NA | 10 | 608 | NA | | | | 10 | 32 | NA | | | | 30 | 36 | NA | | | | 0 | 0 | 0 |
| Shuttle Bus | 40 | 45 | 2,736 | 35.0 | 156 | 78 | 78 | 0 | 0 | 45.0 | 0 | 0 | 0 | 0 | 0 | 45.0 | 0 | 0 | 0 | 156 | 78 | 78 |
| | 0 | 0 | 0 | 16.0 | 0 | 0 | 0 | 0 | 0 | 16.0 | 0 | 0 | 0 | 0 | 0 | 16.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0 | 0 | 0 | 12.0 | 0 | 0 | 0 | 0 | 0 | 12.0 | 0 | 0 | 0 | 0 | 0 | 12.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Taxi/Limo | 5 | 5 | 304 | 2.3 | 264 | 132 | 132 | 0 | 0 | 2.3 | 0 | 0 | 0 | 0 | 0 | 2.3 | 0 | 0 | 0 | 264 | 132 | 132 |
| Pass Auto | 5 | 5 | 304 | 2.3 | 139 | 132 | 7 | 90 | 288 | 2.3 | 132 | 125 | 7 | 70 | 84 | 1.2 | 74 | 70 | 4 | 345 | 327 | 17 |
| Walk | NA | 35 | 2,128 | NA | | | | 0 | 0 | NA | | | | 0 | 0 | NA | | | | 0 | 0 | 0 |
| Totals | | 100 | 6,080 | | 560 | 343 | 217 | 100 | 320 | | 132 | 125 | 7 | 100 | 120 | | 74 | 70 | 4 | 765 | 538 | 228 |

## PM Peak Hour Trip Generation Analysis

| | | Non-Resident Visitors | | | | | | Resident Visitors | | | | | | Employees | | | | | | Vehicles | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Travel Mode | Vehicle Capacity | Mode Split | Persons | Persons /Vehicle | Total Vehicl | In 5 | Out 95 | Mode Split | Persons | Persons /Vehicle | Total Vehicl | In 5 | Out 95 | Mode Split | Persons | Persons /Vehicle | Total Vehicl | In 5 | Out 95 | Total | In | Out |
| Public Transit | NA | 10 | 180 | NA | | | | 10 | 10 | NA | | | | 30 | 36 | NA | | | | 0 | 0 | 0 |
| Shuttle Bus | 40 | 45 | 855 | 35.0 | 49 | 24 | 24 | 0 | 0 | 35.0 | 0 | 0 | 0 | 0 | 0 | 35.0 | 0 | 0 | 0 | 49 | 24 | 24 |
| | 0 | 0 | 0 | 16.0 | 0 | 0 | 0 | 0 | 0 | 16.0 | 0 | 0 | 0 | 0 | 0 | 16.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0 | 0 | 0 | 12.0 | 0 | 0 | 0 | 0 | 0 | 12.0 | 0 | 0 | 0 | 0 | 0 | 12.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Taxi/Limo | 5 | 5 | 95 | 2.3 | 83 | 41 | 41 | 0 | 0 | 2.3 | 0 | 0 | 0 | 0 | 0 | 2.5 | 0 | 0 | 0 | 83 | 41 | 41 |
| Pass Auto | 5 | 5 | 95 | 2.3 | 43 | 2 | 41 | 90 | 90 | 2.3 | 41 | 2 | 39 | 70 | 84 | 1.2 | 74 | 4 | 70 | 158 | 8 | 150 |
| Walk | NA | 35 | 665 | NA | | | | 0 | 0 | NA | | | | 0 | 0 | NA | | | | 0 | 0 | 0 |
| Totals | | 100 | 1,900 | | 175 | 68 | 107 | 100 | 100 | | 41 | 2 | 39 | 100 | 120 | | 74 | 4 | 70 | 290 | 74 | 216 |

2/18/95

Table A-2

# Trip Generation Analysis

**Hawaii Convention Center Traffic Study For 14,000 Visit(REVISED MOCE SPLITS AND VEHICLE OCCUPANCIES)**

| | | |
|---|---|---|
| 14,000 | Total Visitors | |
| 95 | % Non-Resident | 13,300 |
| 5 | % Resident | 700 |
| 120 | Total Employees | |
| 64 | AM k Factor | |
| 20 | PM k Factor | |

## AM Peak Hour Trip Generation Analysis

| | | Non-Resident Visitors | | | | | | Resident Visitors | | | | | | Employees | | | | | | Vehicles | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Travel Mode | Vehicle Capacity | Mode Split | Persons | Persons /Vehicle | Total Vehicl | In 95 | Out 5 | Mode Split | Persons | Persons /Vehicle | Total Vehicl | In 95 | Out 5 | Mode Split | Persons | Persons /Vehicle | Total Vehicl | In 95 | Out 5 | Total | In | Out |
| Public Transit | NA | 10 | 851 | NA | | | | 10 | 45 | NA | | | | 30 | 36 | NA | | | | 0 | 0 | 0 |
| Shuttle Bus | 40 | 45 | 3,830 | 35.0 | 219 | 109 | 109 | 0 | 0 | 45.0 | 0 | 0 | 0 | 0 | 0 | 45.0 | 0 | 0 | 0 | 219 | 109 | 109 |
| Courtesy Vehicle | 25 | 0 | 0 | 16.0 | 0 | 0 | 0 | 0 | 0 | 16.0 | 0 | 0 | 0 | 0 | 0 | 16.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vans | 16 | 0 | 0 | 12.0 | 0 | 0 | 0 | 0 | 0 | 12.0 | 0 | 0 | 0 | 0 | 0 | 12.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Taxi/Limo | 5 | 5 | 426 | 2.3 | 370 | 185 | 185 | 0 | 0 | 2.3 | 0 | 0 | 0 | 0 | 0 | 2.3 | 0 | 0 | 0 | 370 | 185 | 185 |
| Pass Auto | 5 | 5 | 426 | 2.3 | 195 | 185 | 10 | 90 | 403 | 2.3 | 185 | 175 | 9 | 70 | 84 | 1.2 | 74 | 70 | 4 | 453 | 430 | 23 |
| Walk | NA | 35 | 2,979 | NA | | | | 0 | 0 | NA | | | | 0 | 0 | NA | | | | 0 | 0 | 0 |
| Totals | | 100 | 8,512 | | 784 | 480 | 304 | 100 | 448 | | 185 | 175 | 9 | 100 | 120 | | 74 | 70 | 4 | 1,042 | 725 | 317 |

## PM Peak Hour Trip Generation Analysis

| | | Non-Resident Visitors | | | | | | Resident Visitors | | | | | | Employees | | | | | | Vehicles | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Travel Mode | Vehicle Capacity | Mode Split | Persons | Persons /Vehicle | Total Vehicl | In 5 | Out 95 | Mode Split | Persons | Persons /Vehicle | Total Vehicl | In 5 | Out 95 | Mode Split | Persons | Persons /Vehicle | Total Vehicl | In 5 | Out 95 | Total | In | Out |
| Public Transit | NA | 10 | 266 | NA | | | | 10 | 14 | NA | | | | 30 | 36 | NA | | | | 0 | 0 | 0 |
| Shuttle Bus | 40 | 45 | 1,197 | 35.0 | 68 | 34 | 34 | 0 | 0 | 35.0 | 0 | 0 | 0 | 0 | 0 | 35.0 | 0 | 0 | 0 | 68 | 34 | 34 |
| Courtesy Vehicle | 25 | 0 | 0 | 16.0 | 0 | 0 | 0 | 0 | 0 | 16.0 | 0 | 0 | 0 | 0 | 0 | 16.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vans | 16 | 0 | 0 | 12.0 | 0 | 0 | 0 | 0 | 0 | 12.0 | 0 | 0 | 0 | 0 | 0 | 12.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Taxi/Limo | 5 | 5 | 133 | 2.3 | 116 | 58 | 58 | 0 | 0 | 2.3 | 0 | 0 | 0 | 0 | 0 | 2.5 | 0 | 0 | 0 | 116 | 58 | 58 |
| Pass Auto | 5 | 5 | 133 | 2.3 | 61 | 3 | 58 | 90 | 126 | 1.2 | 111 | 6 | 105 | 70 | 84 | 1.2 | 74 | 4 | 70 | 245 | 12 | 233 |
| Walk | NA | 35 | 931 | NA | | | | 0 | 0 | NA | | | | 0 | 0 | NA | | | | 0 | 0 | 0 |
| Totals | | 100 | 2,660 | | 245 | 95 | 150 | 100 | 140 | | 111 | 6 | 105 | 100 | 120 | | 74 | 4 | 70 | 429 | 104 | 325 |

File: TRIPGEN5.WK5

Table A-3

# Trip Generation Analysis

Hawaii Convention Center Traffic Study For 10,000 Visitors-Inclement Weather Scenario

| | | |
|---|---|---|
| 10,000 | Total Visitors | |
| 95 | % Non-Resident | 9,500 |
| 5 | % Resident | 500 |
| 120 | Total Employees | |
| 64 | AM k Factor | |
| 20 | PM k Factor | |

AM Peak Hour Trip Generation Analysis

| | | Non-Resident Visitors | | | | | | Resident Visitors | | | | | | Employees | | | | | | Vehicles | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Travel Mode | Vehicle Capacity | Mode Split | Persons | Persons /Vehicle | Total Vehicles | In 95 | Out 5 | Mode Split | Persons | Persons /Vehicle | Total Vehicl | In 95 | Out 5 | Mode Split | Persons | Persons /Vehicle | Total Vehicl | In 95 | Out 5 | Total | In | Out |
| Public Transit | NA | 10 | 608 | NA | | | | 10 | 32 | NA | | | | 30 | 36 | NA | | | | 0 | 0 | 0 |
| Shuttle Bus | 40 | 50 | 3,040 | 35.0 | 174 | 87 | 87 | 0 | 0 | 45.0 | 0 | 0 | 0 | 0 | 0 | 45.0 | 0 | 0 | 0 | 174 | 87 | 87 |
| | 0 | 0 | 0 | 1.0 | 0 | 0 | 0 | 0 | 0 | 16.0 | 0 | 0 | 0 | 0 | 0 | 16.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0 | 0 | 0 | 1.0 | 0 | 0 | 0 | 0 | 0 | 12.0 | 0 | 0 | 0 | 0 | 0 | 12.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Taxi/Limo | 5 | 15 | 912 | 2.3 | 793 | 397 | 397 | 0 | 0 | 2.3 | 0 | 0 | 0 | 0 | 0 | 2.3 | 0 | 0 | 0 | 793 | 397 | 397 |
| Pass Auto | 5 | 15 | 912 | 2.3 | 417 | 397 | 21 | 90 | 288 | 2.3 | 132 | 125 | 7 | 70 | 84 | 1.2 | 74 | 70 | 4 | 623 | 592 | 31 |
| Walk | NA | 10 | 608 | NA | | | | 0 | 0 | NA | | | | 0 | 0 | NA | | | | 0 | 0 | 0 |
| Totals | | 100 | 6,080 | | 1,384 | 880 | 504 | 100 | 320 | | 132 | 125 | 7 | 100 | 120 | | 74 | 70 | 4 | 1,590 | 1,075 | 515 |

PM Peak Hour Trip Generation Analysis

| | | Non-Resident Visitors | | | | | | Resident Visitors | | | | | | Employees | | | | | | Vehicles | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Travel Mode | Vehicle Capacity | Mode Split | Persons | Persons /Vehicle | Total Vehicles | In 5 | Out 95 | Mode Split | Persons | Persons /Vehicle | Total Vehicl | In 5 | Out 95 | Mode Split | Persons | Persons /Vehicle | Total Vehicl | In 5 | Out 95 | Total | In | Out |
| Public Transit | NA | 10 | 190 | NA | | | | 10 | 10 | NA | | | | 30 | 36 | NA | | | | 0 | 0 | 0 |
| Shuttle Bus | 40 | 50 | 950 | 35.0 | 54 | 27 | 27 | 0 | 0 | 35.0 | 0 | 0 | 0 | 0 | 0 | 35.0 | 0 | 0 | 0 | 54 | 27 | 27 |
| | 0 | 0 | 0 | 16.0 | 0 | 0 | 0 | 0 | 0 | 16.0 | 0 | 0 | 0 | 0 | 0 | 16.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0 | 0 | 0 | 12.0 | 0 | 0 | 0 | 0 | 0 | 12.0 | 0 | 0 | 0 | 0 | 0 | 12.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Taxi/Limo | 5 | 15 | 285 | 2.3 | 248 | 124 | 124 | 0 | 0 | 2.3 | 0 | 0 | 0 | 0 | 0 | 2.5 | 0 | 0 | 0 | 248 | 124 | 124 |
| Pass Auto | 5 | 15 | 285 | 2.3 | 130 | 7 | 124 | 90 | 90 | 2.3 | 41 | 2 | 39 | 70 | 84 | 1.2 | 74 | 4 | 70 | 245 | 12 | 233 |
| Walk | NA | 10 | 190 | NA | | | | 0 | 0 | NA | | | | 0 | 0 | NA | | | | 0 | 0 | 0 |
| Totals | | 100 | 1,900 | | 433 | 158 | 275 | 100 | 100 | | 41 | 2 | 39 | 100 | 120 | | 74 | 4 | 70 | 547 | 163 | 384 |

File: TRIPGENA.WK3

6/18/95

## *APPENDIX L*

## *TRANSPORTATION IMPACT ASSESSMENT*

*Wilbur Smith Associates*

Hawai'i Convention Center

# HAWAII CONVENTION CENTER

# TRANSPORTATION IMPACT ASSESSMENT

Prepared for

Helber Hastert & Fee

by

WSA

May 16, 1994

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**CHAPTER**

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# EXECUTIVE SUMMARY

The State of Hawaii Convention Center Authority (State CCA) plans to construct the Convention Center on the former Aloha Motors site, which is located at the corner of Kapiolani Boulevard and Kalakaua Avenue adjacent to the ewa end of the Waikiki area. The Convention Center will have a minimum of 675,000 sq. ft. of floor area, and will include an exhibit hall, meeting rooms, and ballroom. A minimum of 800 parking stalls will be provided on-site. The Convention Center will not include any commercial or residential development on the project site. The first full year of operation is anticipated in 1998.

This report provides a preliminary assessment of the potential transportation-related effects of the Convention Center. The report identifies those key issues concerning traffic, parking, public transportation, and pedestrians in the project vicinity.

## TRIP GENERATION

The convention center is primarily intended to serve national and international conventions, trade shows, exhibitions, and meetings. These are expected to attract 2,000 to 14,000 attendees during the two- to four-day duration typical for such events.

For the purpose of this assessment of key transportation impacts, the analyses have been based on a single large or a combination of several smaller national conventions at the Center, with a total of 10,000 persons registered to attend the functions. Events of this size or larger are likely to occur on no more than 15 to 20 days per year, and thus represent a reasonable event size for identifying potential impacts and mitigative actions.

The following are the resultant levels of travel for a 10,000-person convention, based on the factors and assumptions presented in Chapter 4.

- About 6,400 attendees would arrive during the morning peak hour, which would coincide with the commute peak hour.
- There would be a gradual exodus of attendees throughout the midday and afternoon period, with about 2,000 expected to exit during the afternoon peak commute hour.
- For a large national convention, 95 percent or more of the attendees would be visitors to Oahu, and 5 percent or less would be local residents.
- During a large convention, there would be about 150 permanent workers at the Center, exclusive of exhibitors and the additional food service workers needed for any special large banquets.

- In the morning peak hour, an estimated 533 vehicles would enter and 217 vehicles would exit the Center. The source of these vehicle trips to/from the Center would be:
  - 70% to serve visitor attendees;
  - 18% to serve resident attendees; and
  - 12% employee and service vehicles.
- In the afternoon peak hour, an estimated 84 vehicles would enter and 233 vehicles would exit the Center, with employee and service vehicles accounting for 28 percent.

## EFFECTS WITH EXISTING TRANSPORTATION SYSTEM

The following sections summarize the key project travel demands and impacts anticipated with the Convention Center, based on the analyses of a 10,000-person event outlined in Chapter 4.

### Roadway Access

- The Center would require two or more driveways for access, with one possible combination being a right-turn-in/right-turn-out driveway along Kalakaua Avenue, and one or more driveway(s) along Kahakai Drive. Kahakai Drive is unique in that it provides convenient access from the site towards areas ewa of the site.
- Use of Kahakai Drive as a major entry/exit would likely require widening of the street to four lanes, installation of a traffic signal at the Atkinson Drive intersection, and provision of a left-turn lane on Atkinson Drive at the intersection.
- The potential use of a left-turn lane on Atkinson Drive at Kahakai Drive would be limited by the short distance to Kapiolani Boulevard, which would limit the length of the left-turn lane to that sufficient for a queue of 8 to 9 waiting vehicles. Left-turn volumes above about 150 vehicles per hour could result in occasional blockage of the Kapiolani Boulevard Kokohead-bound lanes.

  To minimize the potential for blockage, a traffic management plan would likely be needed to encourage those shuttle buses, taxis and rental cars travelling from Waikiki to the Center to use routes that avoid this left-turn lane.
- The largest traffic increases would occur during the morning peak hour on those street sections nearest the site. If used as a major entry/exit, Kahakai Drive would likely experience the largest numerical (+476 vehicles) and proportional (more than five-fold) traffic increases. The other large increases would occur on Atkinson Drive (+26%), Ala Moana Boulevard (+9%), Kalakaua Avenue (+7%), and Kapiolani Boulevard (+5%). Afternoon increases would amount to one-quarter to one-half of the morning increases.
- The Kapiolani Boulevard-Kalakaua Avenue intersection would be significantly affected by the Center traffic, with the project worsening the congested conditions in the morning peak hour, and increasing traffic to the intersection capacity during the afternoon peak hour. Intersection modifications appropriate to mitigate project impacts could include:

i. Widen the two substandard 9-foot-wide left-turn lanes on Kalakaua Avenue to 12-foot widths;

ii. Convert the mauka-direction right-turn-only lane to a combination through/right-turn lane;

iii. Provide an additional through/right-turn lane along the project frontage for Kokohead-bound Kapiolani Boulevard traffic; and

iv. Provide a right-turn lane for ewa-bound traffic on Kapiolani to turn mauka onto Kalakaua Avenue.

- Conditions at the Ala Moana Boulevard-Atkinson Drive intersection could be adversely affected by the ewabound traffic from Waikiki to the site. The larger volumes of Center traffic would use this intersection during the morning peak period, a time when this intersection operates at acceptable levels of service. Congested conditions occur on the ewa-bound Ala Moana Boulevard approach during the afternoon peak period when there would be few vehicles travelling from Waikiki to the Center. Therefore, the project's impacts could largely be mitigated by modifying the amount of traffic signal green time allocated to each traffic movement.

- Location of driveways along Atkinson Drive and/or Kapiolani Boulevard could lessen traffic use of Kahakai Drive, though not substantially.

- Construction of a bridge from Ala Wai Boulevard across the canal to the Center could substantially lessen traffic use of Kahakai Drive, as well as the Kapiolani-Kalakaua intersection. However, such a bridge crossing would have adverse impacts upon the adjacent area along Ala Wai Boulevard and the canal.

## Trucks and Deliveries

- About 50 large truck loads of freight may be needed for a large convention/exhibition. This would result in 50 truck trips to and from the Center on move-in and move-out days. The trucks would likely use Ala Moana Boulevard and Atkinson Drive to travel to/from the Convention Center.

- Smaller delivery and service vehicles would travel to/from the Center both during move-in/move-out days and during convention events, with volumes likely to approximate 5 to 10 vehicles per hour.

- The trucks and deliveries should not significantly disrupt traffic flow unless the trucks arriving on-site exceed the available off-street loading bays. To minimize such occurrences:

  - One freight manager or consolidator should be responsible for scheduling truck traffic for an event; and

- On-street parking along the Diamondhead side of Atkinson Drive, makai of Kahakai Drive, could be reserved for truck parking on move-in/move-out days.

## On-Site and Off-Site Parking

- The 800 on-site parking stalls appear adequate for most national and international events at the Center, assuming that market rates are charged for parking.

- On-street parking along several adjacent street sections may be removed or restricted:

  - Ewa side of Atkinson Drive across from site (8 stalls)
  - Diamondhead side of Atkinson Drive makai of site (9 stalls)
  - Kahakai Drive adjacent to site (16 stalls, both sides).

- Some Center employees or attendees may use on-street parking to avoid using Center pay parking. Given the present intensive use of on-street parking, City and County of Honolulu actions may be needed to control parking use on nearby residential streets.

## Public Transportation

- Medium to large size conventions may overload ewabound TheBus service in Waikiki during the morning peak period and result in increased "pass ups" of waiting bus riders in the ewa portion of Waikiki, even if a very small proportion of attendees use TheBus.

- The special shuttle bus system providing service between the hotels and Convention Center must be convenient to use and well publicized to minimize the number of conventioneers using TheBus, taxis, and rental cars.

- For a 10,000-person convention, the special shuttle would need to provide about 75 trips to the Center during the morning peak hour, which may require use of 50 to 60 charter/tour coaches.

## Pedestrians

- For a 10,000-person convention with attendees dispersed among many Waikiki hotels, approximately 35 percent, or 2,130 of the Waikiki visitors arriving in the morning peak hour are estimated to walk to the Center.

- For a 10,000-person event, the peak 15-minute "surge" of convention attendees crossing the Kalakaua Bridge would likely result in unacceptable pedestrian conditions where utility poles are located at each end of the bridge. Relocation of the poles would provide adequate conditions.

- To greatly improve pedestrian conditions on the Kalakaua Bridge, one of the following actions may be appropriate:

i. Widen the Kalakaua Bridge sidewalk by about 2 feet;
ii. Build a new pedestrian bridge adjacent to the Kalakaua Bridge; or
iii. Build a new pedestrian bridge across the canal at the makai end of the site (near Lipeepee Street).

- Relocation of the Atkinson Drive crosswalk at Kona Street and sidewalk modifications along the Diamondhead side of Atkinson makai of Kahakai Drive may be needed to improve pedestrian safety and convenience.

### Local Events

- The 800 on-site parking stalls could support a local event of about 1,500 to 1,800 attendees.

- A local resident convention of about 1,600 attendees would generate a number of peak hour vehicle trips similar to that of the 10,000-person national convention, although the routing to the Center would differ.

- Access to additional parking would be needed to accommodate larger local luncheon or evening events.

## RELATIONSHIP TO PROPOSED AREA TRANSPORTATION PROJECTS

Several elements of the Waikiki Master Plan and the plans for a future rapid transit system could either affect the Convention Center project, or be affected by the Center. The element of the Master Plan having the greatest potential effect on the Center would be the conversion of Ala Moana Boulevard, Kalakaua Avenue, and Atkinson Drive to a one-way street couplet between their junction near Ala Moana Center and Fort DeRussy.

### One-Way Couplet

- Either a clockwise or counter-clockwise one-way couplet project would include a new circulator roadway across the Convention Center site between Kalakaua Avenue and Atkinson Drive, which would likely reduce the developable area for the Center.

- The one-way street couplet could improve traffic access between Waikiki and the Convention Center.

- The one-way couplet and circulator roadway would likely require a more circuitous routing for most resident and service vehicle trips to and from the Center.

- The counter-clockwise one-way couplet plan would require trucks to either travel into Waikiki to reach the Center, or to use Kinau-Piikoi or McCully Streets from the Freeway.

- The area needed for the Convention Center would likely preclude construction of the circulator road within the site, although the Center would not preclude development of a one-way couplet.

## Waikiki Peripheral Parking - People-Mover System

- Any use of planned or additional on-site parking at the Center as peripheral parking for Waikiki would likely increase peak hour traffic and potential mitigation needs above those identified for the Center.

- A nearby peripheral parking facility could be used to accommodate larger local events at the Convention Center.

- A future Waikiki people-mover system may provide additional public transportation capacity for visitor attendees travelling to the Center during the morning peak period since general tourist travel is lighter during this time.

## Honolulu Rapid Transit Project

- Previous plans for a regional rapid transit project have routed the guideway across the Aloha Motors site, or along the Atkinson Drive and Kapiolani Boulevard edges of the site. The Convention Center would preclude an alignment bisecting the site. Depending upon the Convention Center site plan, sufficient building setbacks may be possible to allow future development of the transit guideway along the boundary of the site.

- A rapid transit station near the project site could improve resident access to the Convention Center and reduce resident vehicle trips. However, Waikiki visitor vehicle trips would not likely be reduced without construction of a Waikiki line.

- The rapid transit line could reduce regional vehicle traffic on the surrounding streets. However, location of a station at the Convention Center would add to feeder bus, vehicle drop-offs, and pedestrian traffic to/from the station.

# 1. INTRODUCTION

The State of Hawaii Convention Center Authority (State CCA) has selected the former Aloha Motors site as the location for the new Hawaii Convention Center. The approximately 9.7-acre site is located at the Ewa end of the 1.5-mile long Waikiki area, with the site separated from Waikiki by the Ala Wai Canal. The site is located adjacent to the Kalakaua Avenue gateway and bridge crossing into the Waikiki area (see Figure 1-1).

This report provides a preliminary assessment of the potential transportation-related effects of the Convention Center project. The report identifies those key issues concerning traffic, parking, public transportation, and pedestrians in the project vicinity. A detailed assessment of transportation-related impacts will be prepared as part of the environmental impact statement (EIS) for the project, once a design plan has been developed for the project.

## PROJECT DESCRIPTION

The State CCA intends that the primary users of the Convention Center will be national and international conventions, trade shows, exhibitions, and meetings. Such events are expected to produce from 2,000 to 14,000 in total attendance. Trade shows and exhibitions directed towards Oahu residents are expected to continue using the City and County of Honolulu's Blaisdell facilities, or facilities at the major Waikiki hotels.

The design program outlined by the State CCA for the Convention Center requires that the project provide a minimum total of 675,000 gross square feet (GSF) of floor area. The following are the minimum space allocations for the principal elements of the facility:

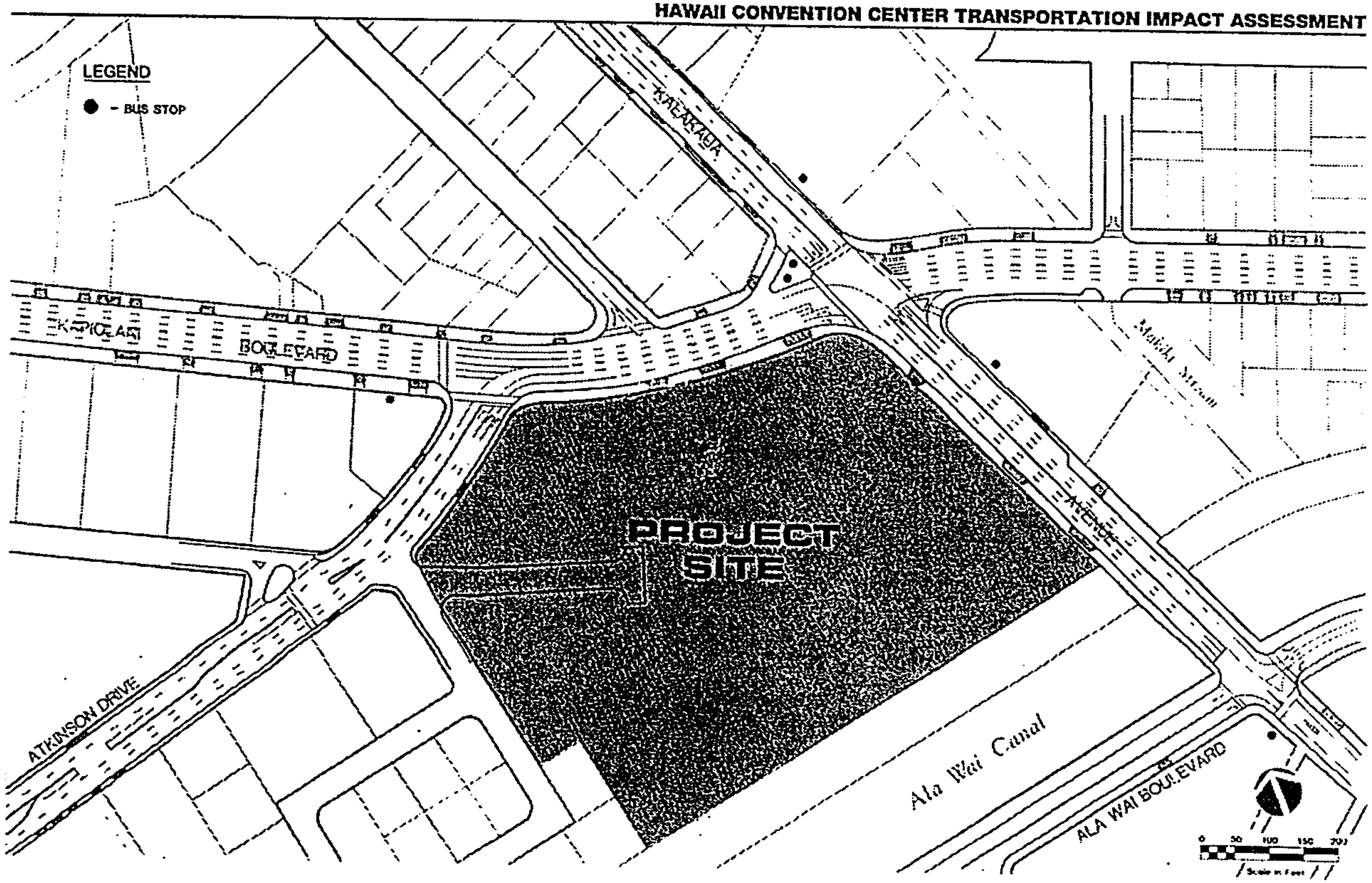
- 200,000 sq. ft. leasable area for the Exhibit Hall
- 100,000 sq. ft. leasable area for meeting rooms
- 35,000 sq. ft. leasable area for the ballroom

The project will provide a minimum of 800 parking stalls on-site to serve Convention Center activities.

Unlike the previous Convention Center mixed-use development plans proposed for the site by First Development, Inc. and by Sukamto Holding Corporation, the State's project will not include any private commercial development on the site.

The general time frame for the development of the Convention Center project is anticipated as follows:

- Project Design: ........................ 1994 - 1995
- EIS Development and Review Process: ..... 1994 - 1995
- Construction: .......................... 1995 - 1997
- First Year at Full Operation: ............. 1998




SOURCE: Wilson Okamoto & Associates, Inc.
WILBUR SMITH ASSOCIATES

Figure 1-1
**PROJECT LOCATION**

## STUDY PURPOSE AND SCOPE

This preliminary assessment of the transportation-related impacts of the Convention Center is prepared for input to an Environmental Assessment for the project. This preliminary assessment is intended to identify those potential impacts that need to be considered during the planning and design of the facility, and which may need to be further addressed in the Draft EIS for the project.

The central focus of this study is the potential impacts of the Convention Center upon traffic conditions on streets adjacent to the site. A preliminary analysis has been made of traffic conditions at nearby key intersections, to include:

- Existing conditions;
- Future (1998) conditions without the Convention Center as a baseline from which to measure project impacts;
- Estimation of traffic increases with Convention Center; and
- Future (1998) conditions with the Convention Center.

The traffic analysis reflects the existing street circulation pattern. The City and County of Honolulu proposes to convert the sections of Kalakaua Avenue and Ala Moana Boulevard in the vicinity of the project to one-way operation, with Ala Moana Boulevard inbound to and Kalakaua Avenue outbound from Waikiki. However, at the time of this study, no specific details were available regarding the proposed modifications nor the anticipated changes to traffic volumes on area streets. Therefore, the general effects of such a change are discussed, but no quantitative analysis is provided with this potential one-way street couplet.

This study also addresses the potential effects on other elements of the transportation system, which includes:

- Parking
- TheBus
- Pedestrian facilities

This assessment also identifies several transportation proposals which may affect, or be affected by the Convention Center. These include:

- Conversion of portions of Kalakaua Avenue and Ala Moana Boulevard to a one-way street couplet;
- Peripheral parking facilities for the Waikiki area;
- A Waikiki people-mover system; and
- A regional rapid transit system.

# 2. EXISTING CONDITIONS

The 9.7-acre Hawaii Convention Center site is bounded by three major streets (Kapiolani Boulevard, Kalakaua Avenue, and Atkinson Drive), a local residential street (Kahakai Drive), and by the Ala Wai Canal/Promenade. At present, the site is vacant with small portions used for parking of vehicles or equipment. Access to the site is via a locked gate on Kahakai Drive.

The surrounding area includes a mix of offices, commercial retail uses, residential uses, and service businesses. Notably, a mix of low-rise and high-rise residential buildings are located along Kahakai Drive adjacent to the project site. The Ala Moana Center regional shopping complex and Ala Moana Hotel are located along Atkinson Drive and Kona Street across from the site. The center of the Kapiolani Boulevard business area is located just ewa of the project, with a mix of low-density commercial and residential uses located adjacent to the site.

## EXISTING ROADWAYS

The site is bordered by three major streets and one local street. The three major streets connect the site to the Downtown, Waikiki, and Kapiolani business areas and to other elements of the regional roadway system. The project site and adjacent street system are depicted in Figure 1-1.

### Kapiolani Boulevard

This major street is a principal arterial serving the east side of the Central Honolulu area. It provides access to the Downtown Honolulu business and Civic Center areas, the Ala Moana Center, the Kapiolani business area, Neil Blaisdell Center, the H-1 Freeway, and to the many major mauka-makai streets it intersects.

Kapiolani Boulevard generally provides six through lanes within a 100-foot wide right-of-way in the project vicinity. Within the six-lane section, left-turns are permitted from the through lane adjacent to the centerline at most locations. The street serves a large amount of resident commuter traffic with the large majority of vehicles travelling ewa-bound towards Downtown Honolulu during the morning peak traffic period and Kokohead-bound towards Kaimuki-Kapahulu during the afternoon peak traffic period. As a result, the City places traffic cones during the weekday peak traffic periods to provide an additional (fourth) reversed traffic lane to serve the peak travel direction traffic, with only two lanes remaining to serve the off-peak travel direction. Left-turns are prohibited from the off-peak travel direction when the traffic cones are in place.

In the vicinity of the site, traffic signals are provided at the intersections of Atkinson Drive, Kalakaua Avenue, and McCully Street. At the Atkinson Drive intersection, left turns are permitted from ewa direction Kapiolani Boulevard onto Atkinson Drive except during the afternoon peak period (3:30 PM to 6:30 PM). During the morning peak period, this left-turn movement can be made from the normal (centerline) lane shared with through traffic plus the additional reversed lane, which functions as a left-turn only lane. The left-turn movement is prohibited from Atkinson Drive throughout the day.

Left turns are prohibited from Kapiolani Boulevard at Kalakaua Avenue throughout the day due to the heavy volume of through traffic at this intersection. Only two normal through lanes are provided for Kokohead-bound travel through this intersection, since the curb lane is restricted to use by the high volume of right-turn vehicles travelling into Waikiki. A third Kokohead-bound through lane is provided during the weekday afternoon by the reversible lane operation. The City has a dedication requirement for one additional Kokohead direction lane (10-foot width) along the makai side of Kapiolani Boulevard between Atkinson Drive and Kalakaua Avenue (the project site frontage).

Left-turn lanes are provided on each Kapiolani Boulevard approach at McCully Street. Left turns are restricted from the off-peak direction during the period when the reversible lane is in operation.

### Kalakaua Avenue

This major street connects the Waikiki area to the Kapiolani Boulevard and King-Beretania Street corridors, and provides an access route to/from the H-1 Freeway. In the vicinity of the project site, Kalakaua Avenue is currently a two-direction street which varies between four and five through lanes, plus turn lanes, within a 70- to 90-foot wide right-of-way mauka of Ala Wai Boulevard. From Ala Wai Boulevard to Ena Road, the street provides three lanes into Waikiki and two lanes outbound. Kokohead of Ena Road, the street provides one-way movement into Waikiki with the exception of one outbound bus-only lane. The City has a dedication requirement for one additional lane on each side of the street from Kapiolani Boulevard to or beyond Ala Moana Boulevard, which includes the project frontage.

At its intersection with Kapiolani Boulevard, Kalakaua Avenue has three lanes towards Waikiki. Outbound from Waikiki, the street approach is striped for a left-turn-only lane, a combination through/left-turn lane, a through lane, and a recently added right-turn-only lane. There are few right-turning vehicles to use the special lane; its primary benefit is its use as a bus pull-out to remove stopped public buses from the through lane.

Left-turns are prohibited from the Kokohead direction of Kalakaua Avenue at the Kapiolani Boulevard intersection. Left turns are prohibited from the ewa-bound direction during the afternoon peak traffic period.

The intersection with Ala Wai Boulevard is controlled by a traffic signal. The ewa direction of Kalakaua Avenue is restricted to the through movement, while through and right-turn movements are permitted in the Kokohead direction.

### Atkinson Drive

This four-to-five lane major street connects Kapiolani Boulevard to the Ala Moana Center and to Ala Moana Boulevard. Parking is permitted along the ewa side opposite the site, and along the Kokohead side makai of Kahakai Drive.

At the Kapiolani Boulevard intersection, the right-side lane feeds into the Kapiolani right-turn-only lane to Waikiki, while the other two lanes feed into the two normal Kokohead-bound through lanes. During the morning peak period, the left-side lane is blocked off by traffic cones since the lane it feeds into has been reversed in direction. Left-turns are prohibited from Atkinson Drive onto Kapiolani Boulevard at all times.

The Atkinson Drive intersections with Ala Moana Boulevard and Mahukona Street are signal-controlled.

### Kahakai Drive

This two-lane local street provides access to the site and to condominiums and apartment buildings located along the street. The loop portion of the street operates in a one-way clockwise direction. The Kahakai Drive approach to Atkinson Drive is STOP sign-controlled. Parking is permitted along both sides of the street adjacent to the project site.

### Kona Street

Kona Street is a two-lane street which provides east-west circulation along the mauka side of the Ala Moana Hotel and Ala Moana Center, between Atkinson Drive and Piikoi Street. All intersections are stop sign-controlled except for the signalized intersection with Piikoi Street. Multi-way stop controls are used at the Mahukona Street and Keeaumoku Street intersections, with most left-turn movements being prohibited at Keeaumoku Street. A number of parking entrances and exits are located along the street, including ramps to/from the upper parking levels at Ala Moana Center.

### Ala Wai Boulevard

Kokohead of Kalakaua Avenue, Ala Wai Boulevard is a major street which operates one-way ewa-bound as part of a one-way street couple serving the Waikiki area with Kalakaua Avenue providing Kokohead-bound movement. There are four lanes from Kapahulu Avenue to McCully Street, with an additional right-turn lane at McCully Street. Parking is permitted in the mauka lane, during off-peak periods. Between McCully Street and Kalakaua Avenue, Ala Wai Boulevard provides three ewa-direction lanes. Ewa of Kalakaua Avenue, Ala Wai Boulevard is a secondary street serving the Hobron Lane residential area. In this area, the street provides one lane in each direction with parking permitted along both sides.

### McCully Street

McCully Street provides a mauka-makai connection between the Waikiki area, the major Kokohead-ewa direction streets, the H-1 Freeway, and the residential areas mauka of the freeway. The street generally provides two through lanes in each direction, with parking permitted to serve the small businesses and residences along certain sections between the Ala Wai Canal and King Street.

## EXISTING TRAFFIC VOLUMES

Recent traffic volumes were obtained from special counts made by Kaku Associates and Cambridge Systematics, Inc. in 1992 for the rapid transit project and for the Waikiki Master Plan Study. These counts were updated and supplemented by turning movement counts made by Wilbur Smith Associates in March 1994.

Typical weekday traffic volumes on major streets in the vicinity of the project site are as follows:

- Kapiolani Boulevard .................... 45,000 vehicles per day
- Kalakaua Avenue .................... 35,000 vehicles per day
- Atkinson Drive .................... 25,000 vehicles per day
- Ala Wai Boulevard
  (Kokohead of Kalakaua Avenue) ....... 35,000 vehicles per day
- Ala Wai Boulevard
  (ewa of Kalakaua Avenue) ............ 8,000 vehicles per day
- McCully Street .................... 33,000 vehicles per day
- Ala Moana Boulevard .................. 50,000 vehicles per day

The weekday peak one-hour traffic periods typically extend from about 7:15 AM to 8:15 AM, while the afternoon peak one-hour volumes occur from about 4:00 PM to 5:00 PM. The peak one-hour periods may vary by 15 to 30 minutes between different streets and on different days. The present peak one-hour traffic volumes for the morning and afternoon peak hour periods are depicted in Figures 2-1 and 2-2, respectively. The volumes represent the number of through, left turn, and right turn vehicles on each approach to the key intersections in the project vicinity. Key features include the following:

1. Kapiolani Boulevard experiences a very large directional split in peak hour traffic, with the peak direction volume some two to five times the off-peak direction volume.

2. Kalakaua Avenue traffic is nearly evenly split in each direction during the peak traffic hours.

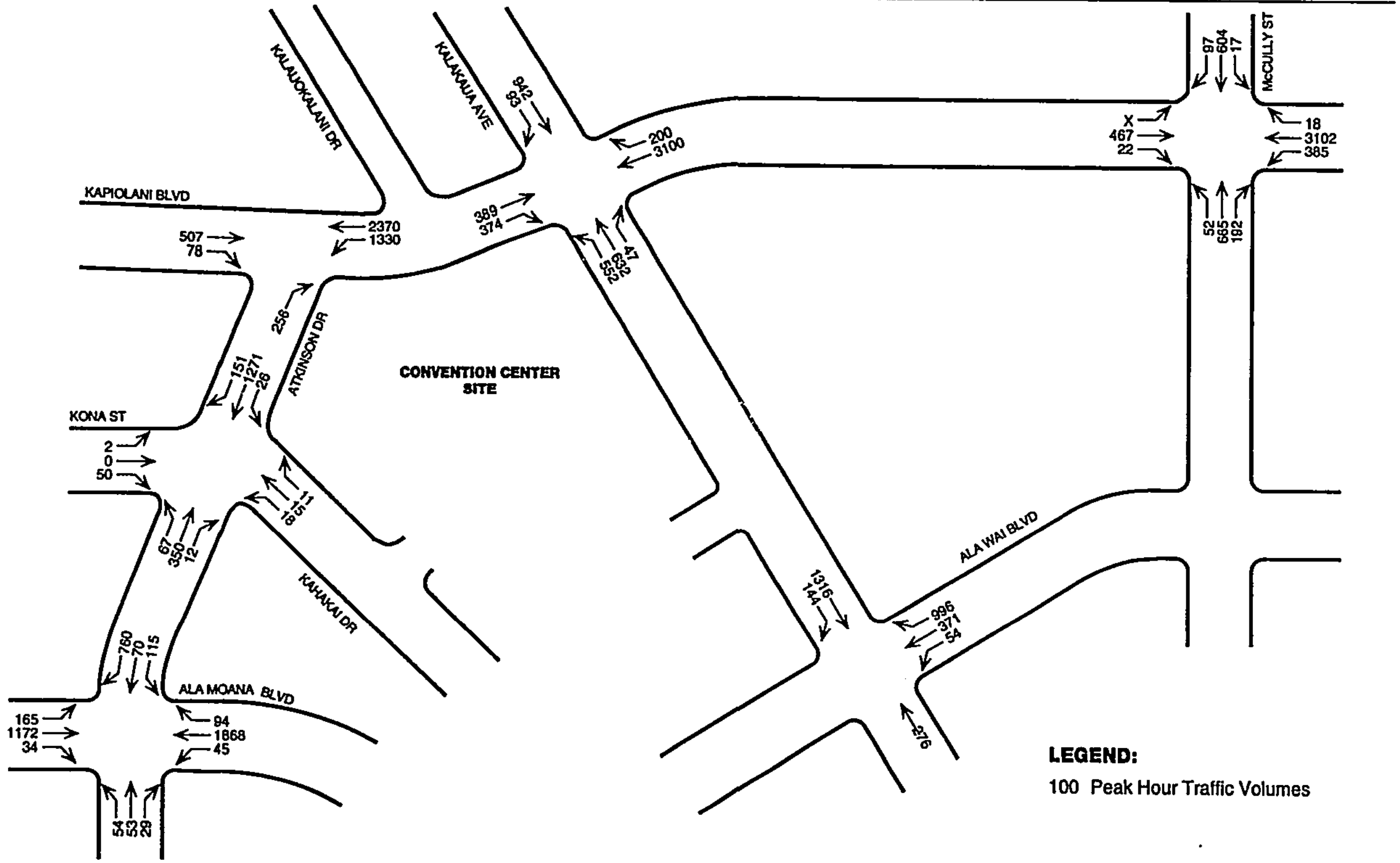
3. The highest volume intersection during both the morning and afternoon peak traffic hours is the Kapiolani Boulevard-Kalakaua Avenue intersection with about 6,330 and 6,400 vehicles travelling through this intersection in the morning and afternoon peak hours, respectively.

4. The other "high volume" intersections in the area, and their peak hour traffic volumes as a percentage of the Kapiolani Boulevard-Kalakaua Avenue intersection volume are:

   - Kapiolani - McCully ....... 85-90 percent
   - Ala Moana - Atkinson ..... 75-80 percent
   - Kapiolani - Atkinson ...... 65-70 percent
   - Kalakaua - Ala Wai ....... 50-55 percent

Midday traffic volumes on weekdays at the key Kapiolani Boulevard-Kalakaua Avenue intersection average about 4,800 vehicles per hour, or about 75 percent of the peak commute hour volumes.

Midweek evening hourly traffic volumes at this intersection range between 3,800 to 4,200 vehicles during the 7:00 PM to 11:00 PM period or 60 to 65 percent of the peak commute hour volumes.




WILBUR SMITH ASSOCIATES

Figure 2-1
**EXISTING MORNING PEAK HOUR TRAFFIC VOLUMES**

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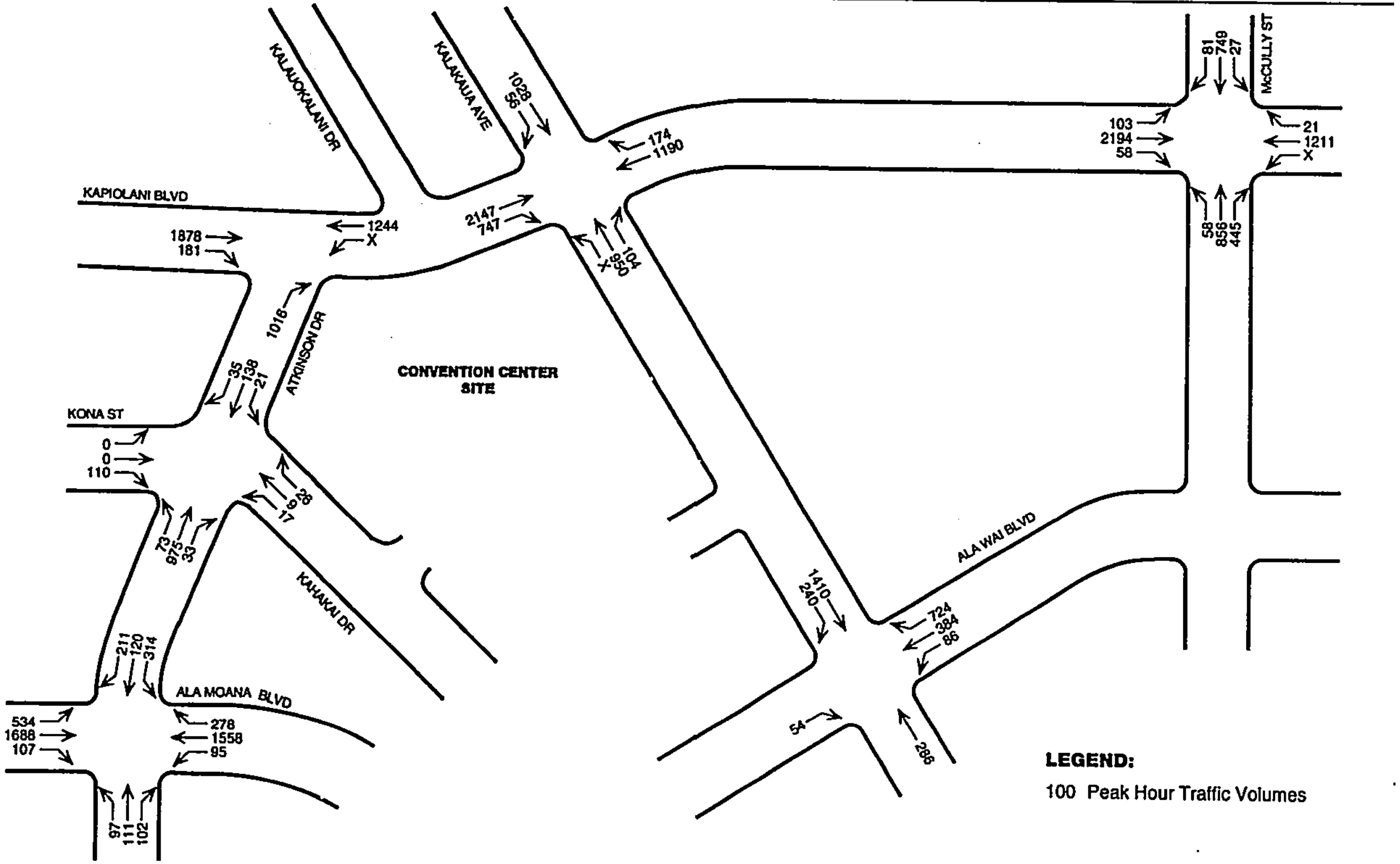


WILBUR SMITH ASSOCIATES

Figure 2-2
**EXISTING AFTERNOON PEAK HOUR TRAFFIC VOLUMES**

CONVCTR2.HWNBASE-4/29/94C

The highest nighttime traffic volumes in the site area usually occur on Friday or Saturday evenings, with Friday evening traffic volumes generally slightly higher than Saturdays. In 1989, Wilbur Smith Associates conducted turning movement counts for a Friday evening for the 7:00 PM to 8:00 PM and 10:00 PM to 11:00 PM periods since these two periods represent the likely peak one hour periods for traffic arriving at and departing from any evening events at the Convention Center. The total number of vehicles passing through the Kapiolani Boulevard - Kalakaua Avenue intersection is about 5,100 between 7:00 PM and 8:00 PM, and 4,200 between 10:00 PM and 11:00 PM. This approximates 65 to 80 percent of the vehicles during the morning and afternoon peak commute hours.

## TRAFFIC CONDITIONS

Congested traffic conditions regularly occur along some portions of Kapiolani Boulevard, Kalakaua Avenue, Atkinson Drive, and Ala Moana Boulevard near the project site during peak commute hours. Congested conditions also occur along Kalakaua Avenue and Ala Moana Boulevard within Waikiki during evening hours on Fridays, Saturdays, and special events (Halloween, prom nights, political events). The evening congestion within Waikiki sometimes results in stacking of traffic back to and the disruption of traffic flow near the project site. Congestion also occurs along Kapiolani Boulevard and Atkinson Drive during the daytime on weekends during the Christmas shopping season and special sales events at the Ala Moana Center.

This analysis focuses on the traffic conditions during the weekday peak commute hours since these would be most frequently affected by Convention Center traffic. The study analyzes conditions at those key intersections near the project site that are likely to be most directly affected by travel to/from the Convention Center which include:

- Kapiolani Boulevard at Kalakaua Avenue, at Atkinson Drive, and at McCully Street
- Atkinson Drive at Kahakai Drive and at Ala Moana Boulevard
- Ala Moana Boulevard at Kalia/Ena Road

The intersection analyses were performed using procedures outlined in the 1985 HCM,[1] which are based on a concept referred to as Level-of-Service. The level-of-service concept and methodology are described in Appendix A. In general, this method describes traffic conditions in a letter basis from A to F, which signify excellent to unacceptable conditions. Level-of-Service (LOS) D is considered acceptable as a design basis for peak hour conditions. For traffic signal-controlled intersections, the level-of-service is based on average delay time per vehicle, and for long signal cycle lengths at intersections of two high-volume streets will tend to result in comparatively poorer service levels, since large volumes of traffic are being kept waiting through the red signal phase on both streets. The volume-to-capacity (V/C) ratio is also provided to indicate the portions of the theoretical capacity of the intersections being used by the existing or estimated traffic volumes.

The results of the intersection analyses are summarized in Table 2-1. Principal findings indicated by the analyses and/or field observations are listed in the following items.

[1] *Highway Capacity Manual, Special Report 209,* Transportation Research Board, 1985.

Table 2-1

**EXISTING LEVELS-OF-SERVICE AT KEY INTERSECTIONS**
**Hawaii Convention Center - Transportation Impact Assessment**

| Intersection | Morning Peak Hour | | | Afternoon Peak Hour | | |
|---|---|---|---|---|---|---|
| | Delay | V/C | LOS | Delay | V/C | LOS |
| Kapiolani Blvd./McCully St. | 20.6 | 0.73 | C | 28.9 | 0.86 | D |
| Kapiolani Blvd./Kalakaua Ave. | 47.6 | 1.03 | E | 21.2 | 0.86 | C |
| Kapiolani Blvd./Atkinson Dr. | 7.0 | 0.65 | B | 13.3 | 0.58 | B |
| Atkinson Dr./Ala Moana Blvd. | 25.8 | 0.58 | D | 42.2 | 0.80 | D |
| Atkinson Dr./Kahakai Dr. | — | 28* | E | — | 115* | D |
| Atkinson Dr./Kona St. | — | 49* | E | — | 920* | A |
| Ala Moana Blvd/Kalia Rd. | 31.9 | 0.65 | D | 35.1 | 0.80 | D |

Delay = Average Delay per Vehicle (in seconds).
V/C = Volume-to-Capacity Ratio.
LOS = Level-of-Service
* = STOP-sign controlled intersection; Reserve Capacity is presented instead of V/C ratio.

Wilbur Smith Associates; May 1994

**Kapiolani Boulevard - Kalakaua Avenue Intersection** — The Kapiolani Boulevard - Kalakaua Avenue intersection currently operates at a poor service level (LOS E) with current traffic volumes slightly exceeding the theoretical capacity of the intersection (103 percent) during the morning peak hour. The ewa-bound through traffic on Kapiolani Boulevard, and the Diamondhead-bound through and ewa-bound left-turn traffic on Kalakaua Avenue operate at LOS E or F.

During the afternoon peak hour, traffic conditions at the intersection are an acceptable LOS C, with present traffic using 86 percent of the calculated existing capacity. The principal delays occur to the Kokohead-bound traffic on Kapiolani Boulevard.

**Kapiolani Boulevard - Atkinson Drive Intersection** — At the Kapiolani Boulevard - Atkinson Drive intersection, the analysis indicates acceptable conditions during both peak periods. However, during the afternoon peak period the combination of the short distances between Kalakaua Avenue and Atkinson Drive, the large volume of Kokohead-bound traffic, and limitations on the synchronizing of the two traffic signals, results in queuing of Kapiolani Boulevard traffic from the Kalakaua intersection through the Atkinson intersection. Additionally, vehicles turning right from Atkinson Drive are limited to two through lanes with little storage capacity on Kapiolani Boulevard. In the afternoon, these vehicles frequently stack through the intersection and block the right-turn lane access to Waikiki.

**Kapiolani Boulevard - McCully Street Intersection** — Overall conditions at the Kapiolani Boulevard - McCully Street intersection are acceptable during both peak periods. However, LOS E conditions are experienced by the left-turn movement from ewa-bound Kapiolani Boulevard and the makai-bound traffic on McCully Street during the morning peak hour, and by traffic in both directions on McCully Street during the afternoon peak hour.

**Ala Moana Boulevard - Atkinson Drive Intersection** — Overall conditions at the Ala Moana Boulevard - Atkinson Drive intersection are acceptable during the morning peak period. During the afternoon, the overall intersection operates at LOS E, although the traffic uses only 80 percent of the theoretical capacity. Because of the traffic signal allocation of green time, the traffic delays primarily occur for the ewa-bound through traffic exiting Waikiki, and the Diamondhead-bound through and left-turn traffic. Traffic on the Atkinson and Ala Moana approaches use less than one-half of the allocated capacity and experience few delays.

**Kahakai Drive - Atkinson Drive Intersection** — Vehicles turning left from Kahakai Drive onto Atkinson Drive during the morning experience some delays (LOS E) due to the almost continuous flow of makai-bound through traffic along Atkinson Drive. During the afternoon peak period, the mauka-bound traffic queue stopped on Atkinson Drive for the Kapiolani Boulevard traffic signal usually extends beyond the Kahakai Drive intersection, with the vehicles frequently stopping in the intersection and blocking both left-turns into and out of Kahakai Drive.

**Atkinson Drive - Kona Street Intersection** — Traffic turning left from Atkinson Drive into Kona Street experiences LOS E conditions during the morning peak hour. No left-turns are permitted from Kona Street, so this intersection does not experience problems similar to the adjacent Kahakai Drive intersection.

## PUBLIC TRANSIT ACCESS

Several TheBus trunk routes provide public transit access to the project site for use by Convention Center employees and visitors. TheBus service along Kalakaua Avenue is provided by Route 2, and along Kapiolani Boulevard by Routes 3 and 9. Also, TheBus urban trunk routes 8, 19 and 20, and many suburban trunk routes provide service along Kona Street on the mauka side of Ala Moana Center, with the closest bus stop located on Mahukona Street at Atkinson Drive, one block makai of the project site. Key features of the routes directly serving the site are as follows:

**Route 2 Waikiki-Liliha** — Route 2 provides service from Waikiki to Downtown Honolulu and to the Kalihi area, with service hours extending from about 5:00 AM until 1:00 AM. Service frequency approximates 4 to 5 minutes between buses during weekday peak commute periods, 6 minutes midday and on weekends, and 10 to 15 minutes during late evening hours. The closest bus stops along Kalakaua Avenue are located on the mauka side of Kapiolani Boulevard and on the makai side of Ala Wai Boulevard for Waikiki-bound buses, and on the makai side of Ala Wai Boulevard and next to the Hard Rock Cafe opposite the site for the Downtown Honolulu-bound buses.

**Route 3 Kaimuki-Pearl Harbor** — This trunk route provides service from Pearl Harbor through Kalihi and Downtown, along Kapiolani Boulevard and Date Street and then through the Kaimuki area. Service frequency approximates 6 to 10 minutes between buses during the weekday commute hours, 20 minutes midday, and 30 minutes during the evening and weekends. Service hours are from 4:00 AM to 1:00 AM. The closest bus stops are located on Kapiolani Boulevard on the ewa side of Kalakaua Avenue opposite the site for ewa-bound buses, and on the ewa side of Atkinson Drive for Kokohead-bound buses.

**Route 9 Palolo Valley** — Route 9 provides service between the Palolo Valley area and Downtown Honolulu via Waialae Avenue and Kapiolani Boulevard. Service frequencies are approximately 10 to 15 minutes between buses during weekday commute hours, 30 minutes midday, and 40 minutes in evenings and on weekends. Service is provided from about 5:30 AM until 11:00 PM. Route 9 stops at the same bus stops as Route 3.

The Kalakaua Avenue - Kapiolani Boulevard intersection is a major transfer point between routes 2, 3 and 9, particularly for persons working in Waikiki and for Washington Intermediate School students. Route 2 is heavily patronized with standing loads common both into and out of Waikiki during the morning and afternoon commute hours. Routes 3 and 9 are also heavily used with seated loads and some standees typical during the morning and afternoon commute periods.

## PEDESTRIAN ACTIVITY

Present sidewalks in the project area are typically four feet in width with some sections up to ten feet in width. Pedestrian activity in the area is very light with the most activity related to bus patrons transferring between bus routes at the Kalakaua Avenue-Kapiolani Boulevard intersection. Other sources of pedestrian activity are recreational/exercise walkers/runners and Hard Rock Cafe patrons. Current activity levels on sidewalks and crosswalks in the area typically range between 30 and 100 pedestrians per hour.

## 3. 1998 TRAFFIC CONDITIONS WITHOUT THE CONVENTION CENTER

Future traffic volumes were estimated for 1998 without development of the Convention Center project at the former Aloha Motors site. The year 1998 is used for this analysis since the Convention Center should be completed and should be available for convention usage by early in that year. The 1998 traffic volumes and conditions without the project provide a "baseline" condition from which to identify the location and magnitude of traffic impacts which are likely to result from the development of the planned Convention Center.

### ASSUMPTIONS REGARDING TRAFFIC GROWTH

The *Waikiki Regional Traffic Study*[1] prepared a subarea model to forecast traffic increases for Waikiki and the surrounding area as part of the Waikiki Master Plan Study. The traffic model addressed travel increases within an area generally bounded by Pensacola Street, the H-1 Freeway, and Kapahulu Avenue. Based on City land use data and socio-economic projections for the year 2010, the model estimated traffic growth of about 17 percent within the area by 2010. On an annualized basis, the Waikiki study anticipated traffic growth of 1.0 to 1.5 percent each year.

For the purposes of the Convention Center impact assessment, an annual traffic growth rate of 1.5 percent per year has been assumed through 1998. This increase has been uniformly factored against all existing traffic volumes within the project vicinity.

Also, future traffic for the Waikiki Landmark project has been added to the background traffic growth area roadways. Construction of this development has been completed, but the condominium units have not yet been occupied. This project has been added on an individual basis since its traffic would utilize the section of Kalakaua Avenue adjacent to the Convention Center project. The number and distributions of vehicle trips outlined in the *Waikiki Landmark Draft Environmental Impact Statement*[2] were used to assign that project's traffic to the area roadways.

A number of other development projects could potentially occur within the adjacent area within the same general time frame as the Convention Center project. The potential project which could most directly affect traffic conditions near the Convention Center would be the development of the former Veterans of Foreign Wars (VFW) site opposite Kalakaua Avenue from the project site, and the former Unocal service station site and City impound lot for towed vehicles on the mauka side of Kapiolani Boulevard in the block kokohead of the project site. Development of these parcels is not included in the 1998 forecasts since the composition and timing of the project is not known at the time of this study, although the timing will most likely be after 1998.

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1 *Waikiki Regional Traffic Study*, prepared for City and County of Honolulu by Cambridge Systematics, Inc., October 1993.

2 *Waikiki Landmark Draft Environmental Impact Statement*, prepared for Bel-Landmark, Inc. by DHM Planners, Inc., March 1989.

## ROADWAY PROJECTS

No roadway modifications are included in the analysis of 1998 conditions without the project. The Waikiki Master Plan proposes that the sections of Kalakaua Avenue and Ala Moana Boulevard across the Ala Wai Canal be converted to a one-way street couplet, which would have a major effect upon traffic patterns and conditions in the Convention Center area. The general effects of the one-way couplet are discussed in Chapter 5.

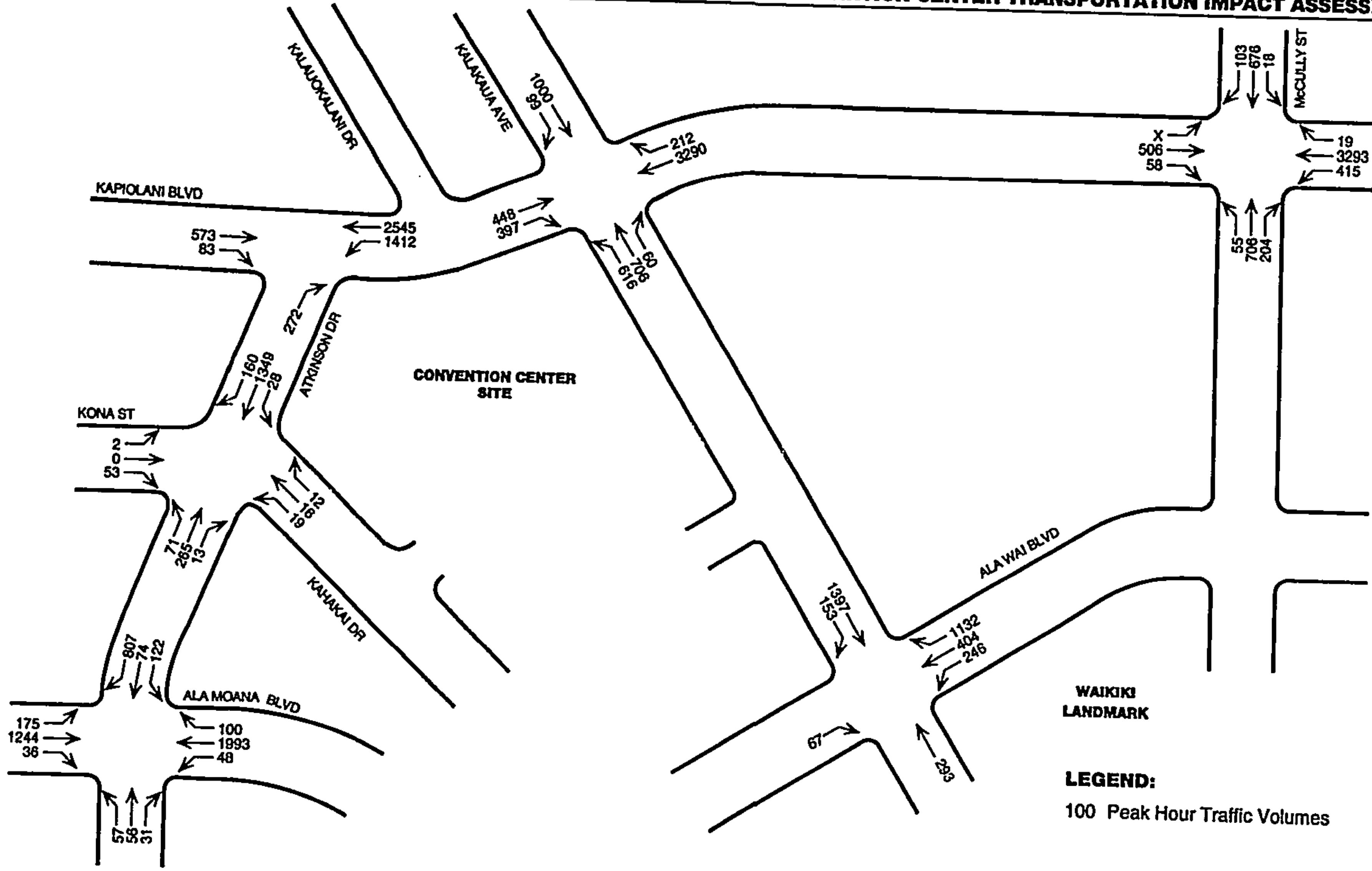
## 1998 TRAFFIC VOLUMES

Without development of the Convention Center, traffic volumes are estimated to increase by about six to eight percent on the streets near the project site. Estimated 1998 traffic volumes for the morning and afternoon commute peak hours, with the existing two-way traffic operations on Kalakaua Avenue and Ala Moana Boulevard, are depicted in Figures 3-1 and 3-2, respectively.

## 1998 TRAFFIC CONDITIONS

Traffic conditions without the Convention Center are summarized in Table 3-1 for the key intersections in the project vicinity. The six to eight percent traffic increase would generally result in similar increases to the volume-to-capacity ratio and average vehicle delay times. The principal change would occur at the Kapiolani-Kalakaua intersection in the morning peak hour, which would worsen to LOS F from the existing LOS E.

## HAWAII CONVENTION CENTER TRANSPORTATION IMPACT ASSESSMENT




LEGEND:

100 Peak Hour Traffic Volumes

WILBUR SMITH ASSOCIATES

Figure 3-1

**YEAR 1998 WITHOUT PROJECT - MORNING PEAK HOUR TRAFFIC VOLUMES**

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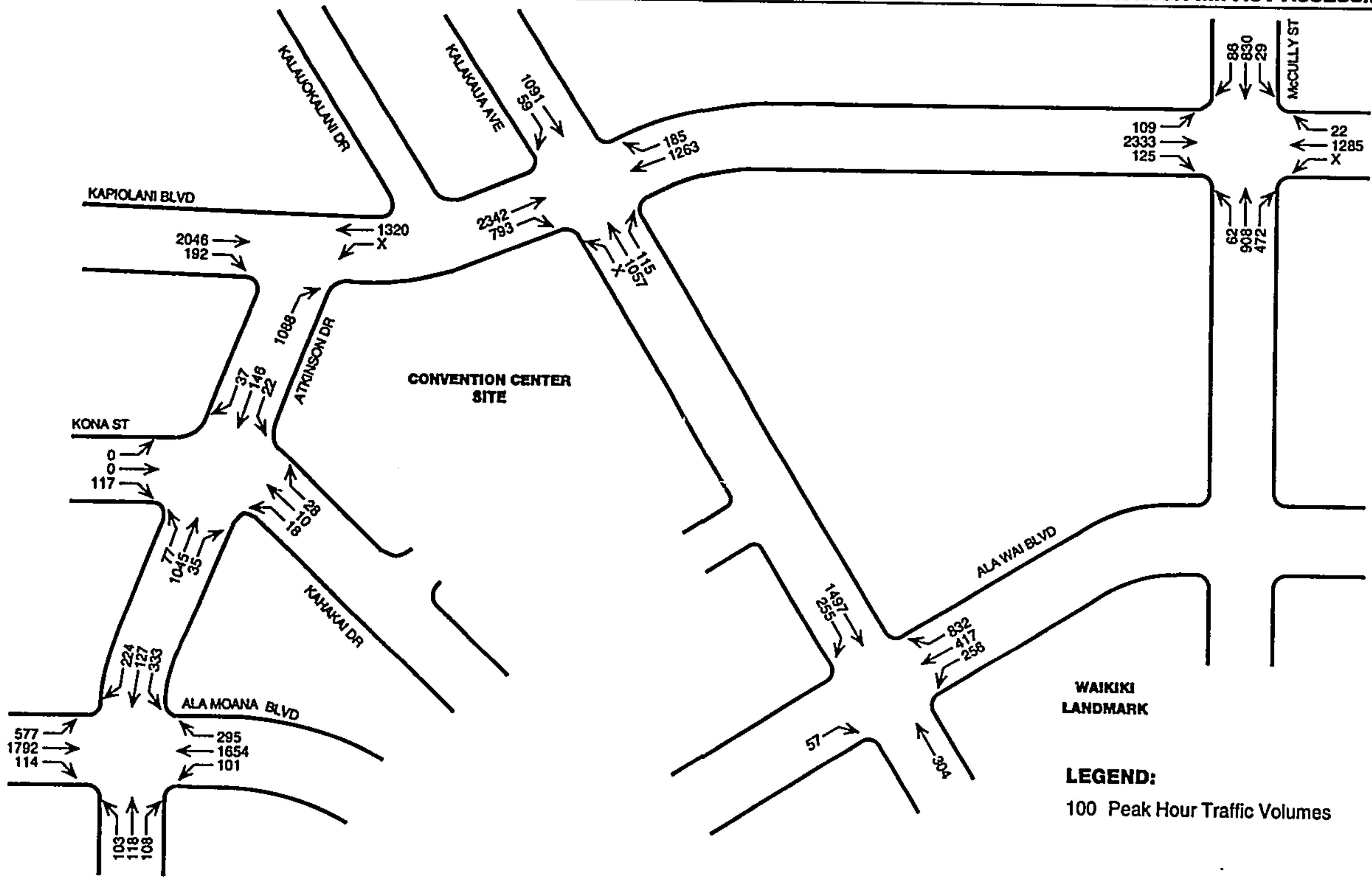


WILBUR SMITH ASSOCIATES

Figure 3-2
**YEAR 1998 WITHOUT PROJECT AFTERNOON PEAK HOUR TRAFFIC VOLUMES**

CONVCTR2.HWIBASE-4/29/94C

Table 3-1

**1998 WITHOUT PROJECT LEVELS-OF-SERVICE AT KEY INTERSECTIONS**
**Hawaii Convention Center - Transportation Impact Assessment**

| Intersection | Morning Peak Hour | | | Afternoon Peak Hour | | |
|---|---|---|---|---|---|---|
| | AD | V/C | LOS | AD | V/C | LOS |
| Kapiolani Blvd./McCully St. | 22.8 | 0.78 | C | 30.5 | 0.93 | D |
| Kapiolani Blvd./Kalakaua Ave. | 72.0 | 1.11 | F | 24.7 | 0.93 | C |
| Kapiolani Blvd./Atkinson Dr. | 9.8 | 0.71 | B | 13.3 | 0.62 | B |
| Atkinson Dr./Ala Moana Blvd. | 29.0 | 0.62 | E | 56.5 | 0.85 | E |
| Atkinson Dr./Kahakai Dr. | --- | 26* | E | --- | 94* | E |
| Atkinson Dr./Kona St. | --- | 46* | E | --- | 895* | A |
| Ala Moana Blvd./Kalia Rd. | 33.2 | 0.68 | D | 38.3 | 0.85 | D |

AD = Average Delay per Vehicle (in seconds).
V/C = Volume-to-Capacity Ratio.
LOS = Level-of-Service.
* = STOP-sign controlled intersection; Reserve Capacity is presented instead of V/C ratio.

Wilbur Smith Associates; May 1994

T-12/450

# 4. ASSESSMENT OF PROJECT IMPACTS ON 1998 TRAVEL CONDITIONS

The preliminary assessment of the Convention Center impacts upon the transportation system is focused on the area which is within the immediate vicinity of the facility and which will be most directly affected by the facility. The assessment encompasses roadway traffic conditions, trucks and deliveries, project and off-site parking, public transportation, and pedestrian access. The analyses reflect the following principal assumptions:

- The analysis year is 1998, the first full year of operations for the Convention Center.
- The analysis is based on the existing transportation system street patterns, roadway widths, pedestrian facilities, etc.
- The analysis is based on a national convention, or combination of conventions, with 10,000 attendees. This is a level that may be reached or exceeded for approximately 15 to 20 days per year.
- Since there is no project design layout at this time, this assessment discusses potential site ingress-egress locations, with the analysis of adjacent intersections based on assumed driveway locations.

This chapter addresses the Convention Center impacts with the existing transportation system. Several potential modifications proposed by the City and County of Honolulu for the transportation system in the vicinity of the Center, and the potential impacts of these changes, are discussed in Chapter 5.

## TRAVEL FORECAST ASSUMPTIONS

The Convention Center project is intended to serve national and international conventions in order to maintain a high level of use of Waikiki visitor facilities and attractions in future years. It will primarily serve those visitor conventions, exhibits and trade shows that cannot be adequately served by existing individual hotel facilities due to size or support requirements.

The Convention Center will typically serve conventions and related events with between 2,000 and 10,000 attendees. The design of the facilities will allow several smaller conventions to be held simultaneously, although the combined number of attendees would not exceed those for a single large convention. Single or combinations of conventions with more than 10,000 attendees may occur occasionally.

A convention event with 10,000 registered attendees is used as the basis for these travel analyses. Single or combined conventions of this size, or larger, are likely to occur on no more than 20 or so days per year, and thus this size represents a reasonable "maximum event" to use as a basis for identifying potential impacts and mitigative actions. Most such conventions will last for three to four days, with only a portion of the registered attendees visiting the Convention Center on any given day.

The principal assumptions used in estimating travel on a typical weekday with a 10,000-person convention are outlined in the following sections.

## Convention Attendance Characteristics

- The travel forecasts and analysis reflects a major national convention or combination of two or three conventions at the site with a total of 10,000 participants during the three to four days of convention sessions.

- On a typical high-usage day, 80 percent of the registered conventioneers (8,000 persons) are assumed to attend events at the Convention Center.

- On a typical day, there will be a large peak inflow of attendees coinciding with the peak traffic hour on the adjacent streets and a gradual exodus of attendees through the midday, afternoon, and evening periods with the largest numbers exiting during the midday period. The analysis reflects:

  - Eighty percent of the daily attendees (6,400) arriving during the 7:15 to 8:15 AM peak hour; and
  - Twenty-five percent of the daily attendees (2,000) exiting during the 4:30 to 5:30 PM peak hour.

- Local residents typically comprise 5 percent or less of attendees of national conventions held in Honolulu. For a 10,000-person convention, 5 percent of attendees as local residents results in the following origin for attendees:

| | Convention Attendees | Morning Peak Hour Arrivals |
|---|---|---|
| Oahu Residents | 500 | 320 |
| Oahu Visitors | 9,500 | 6,080 |

- Although the larger conventions may likely have a smaller proportion of attendees from Oahu, the travel analyses are based on 5 percent of attendees as local residents.

## Visitor Location and Number Walking

- The inventory of existing hotels and short-term rental condominium units, grouped by walking distance to the site, is based on a 1989 survey, modified to include the Hawaii Prince Hotel:

| | Number of Units Within | | |
|---|---|---|---|
| | 5 Minute Walk | 6-10 Minute Walk | 11-15 Minute Walk |
| Hotels Rooms | 1,193 | 1,623 | 4,779 |
| Condo Units | -0- | 1,394 | 1,398 |

- As an overall average for a major convention, approximately 50 percent of the hotel rooms and 10 percent of visitor condo units within a 15-minute walk are assumed to be occupied by convention attendees.

- An average of 1.1 convention attendees is assumed for each room occupied by conventioneers.

- The proportion of convention attendees walking between their hotel/condo and the site are assumed as follows for the various distances:

  - Within a 5 minute walk: ........... 100%
  - Between 6 to 10 minute walk: ...... 75
  - Between 11 to 15 minute walk: ..... 50
  - More than 15 minute walk: ........ 10

## Visitor Travel Mode

- A system of charter bus routes will be used to provide convenient shuttle service between the area hotels and the Convention Center to augment the regularly scheduled public transportation services in the area.

- Approximately 5 percent of visitors to Oahu will use rental cars to reach the Convention Center since they may want to keep materials or equipment in their car at the session, or otherwise need a vehicle at the site. An average of 2.3 attendees per vehicle is assumed.

- Approximately 5 percent of Oahu visitors will use a taxi to travel to the site, with an average of 2.3 attendees per vehicle.

- Approximately 10 percent of Oahu visitors will use *TheBus* and future Waikiki people-mover services to travel to/from the site.

### Resident Travel Mode

- Most residents attending a convention are expected to travel via personal auto. The analysis reflects 90 percent using automobiles, with an average of 2.3 attendees per vehicle.
- Given the excellent TheBus service at the Convention Center site, 10 percent of local attendees are estimated to use public transit to travel from their homes or workplace.

### Employee Travel

- Approximately 150 full-time and part-time employees will work at the facility each day during a major convention, with 80 percent arriving/departing during the peak traffic hours.
- Employee commuting via personal auto will be discouraged through market-rate parking fees and limits on parking available to employees.
- Thirty percent of regular employees are assumed to use public transit, a proportion comparable to the Financial District.
- For the 70 percent of regular employees commuting by automobile, an average of 1.2 employees per vehicle is assumed.
- The large numbers of food service or other workers needed for special events will use public transit or be bused to the site from outside staging areas.

### Trucks and Deliveries

- During a major convention(s) using the entire facility, there will likely be no truck activity related to move out of previous convention or move-in of next convention.
- Vendor deliveries and other service vehicles will typically average 5 to 10 vehicles per hour.

## TRAVEL FORECASTS

For a large single convention or combination of several smaller conventions, the visiting conventioneers will likely be dispersed among a large number of hotels throughout Waikiki, not just one or two convention "headquarters" hotels or those closest to the Convention Center. Although a large portion of these convention attendees will walk to/from the facility, an even larger number will likely require vehicular transportation. In most cities where the convention center is not located adjacent to large numbers of hotel rooms, such as Los Angeles and Miami Beach, this transportation linkage is largely provided by a special shuttle bus system operated between the major hotel areas and the convention site.

For the forecast of travel mode to/from the Convention Center for visitors to Oahu, the number of those walking was first estimated. After allowance for usage of rental cars, taxis, and the public bus system, the remainder of the Oahu visitors are assumed to use a special system of charter buses providing shuttle service along several routes between the Waikiki hotels and the convention facility.

The travel modes for Oahu resident convention attendees and employees was estimated using the forecast assumptions outlined in the proceeding sections.

## Walk Trips To/From Convention Center

Although the attendees of a major convention will be staying at a large number of hotels throughout Waikiki, a sizeable portion are likely to stay within convenient walking distance of the Convention Center. Many of the hotels near the ewa end of Waikiki will likely market their units for convention usage. This analysis assumes that for a major convention, 50 percent of the hotel rooms within a 15-minute walk of the Convention Center would be occupied by convention attendees. Examples of hotels within various walking distances from the Convention Center are:

| | |
|---|---|
| 5-minute walk | Ala Moana Hotel |
| 6 to 10-minute walk | Hawaii Prince<br>Outrigger Hobron<br>Inn on the Park |
| 11 to 15-minute walk | Ilikai Hotel<br>Hilton Hawaiian Village<br>Maile Court<br>Waikiki Gateway |

The major hotel concentration from the Sheraton Waikiki to the Hyatt Regency to Outrigger West is located approximately a 20 to 25 minute walk to the site.

Based on these walking distances, and the assumptions listed in the preceding section, an estimated 2,130 attendees would walk to the Convention Center in the morning peak hour, or about 35 percent of the 6,080 visitors to Oahu arriving during that period. In the afternoon peak hour, a similar percentage would walk back to the hotels. Table 4-1 summarizes these estimates.

The adjacent Ala Moana Hotel contributes approximately 20 percent of those walking. The largest portion originates within the 11-15 minute time band, which includes the Hilton and Ilikai facilities.

If an additional hotel(s) is constructed near the Convention Center, the number walking would likely increase. For example, construction of a 500-room hotel as part of a Hobron Superblock development project would increase those walking to/from the site in the morning peak hour by 200 to 275 attendees, based on the assumptions used in this analysis.

Table 4-1

VISITORS WALKING TO CONVENTION CENTER
Hawaii Convention Center - Transportation Assessment

| Item | Walking Distance: Less Than 5 Minutes | 6 to 10 Minutes | 11 - 15 Minutes | More Than 15 Minutes | Total |
|---|---|---|---|---|---|
| **Visitor Units** | | | | | |
| ▸ Hotel | 1,193 | 1,623 | 4,779 | — | — |
| ▸ Condo | — | 1,394 | 1,398 | — | — |
| **Percent of Units Occupied by Conventioneers** | | | | | |
| ▸ Hotel | 50 | 50 | 50 | — | — |
| ▸ Condo | — | 10 | 10 | — | — |
| **Number of Units Occupied by Conventioneers** | | | | | |
| ▸ Hotel | 597 | 812 | 2,390 | — | — |
| ▸ Condo | — | 139 | 140 | — | — |
| **Total** | 597 | 951 | 2,530 | 4,559 | 8,637 |
| **Number of Conventioneers** | | | | | |
| ▸ Hotel | 657 | 894 | 2,629 | — | — |
| ▸ Condo | — | 153 | 154 | — | — |
| **Total** | 657 | 1,047 | 2,783 | 5,013 | 9,500 |
| **Percent Walking** | | | | | |
| | 100% | 75% | 50% | 10% | — |
| **Number Walking To/From Center** | | | | | |
| ▸ Total Attendees | 657 | 785 | 1,392 | 501 | 3,335 |
| ▸ AM Peak Hour | 420 | 500 | 890 | 320 | 2,130 |
| ▸ PM Peak Hour | 132 | 157 | 280 | 101 | 670 |

Total Attendees = Number walking during the 3-4 days of convention functions.
AM Peak Hour = 7:15 - 8:15 AM on a typical day
PM Peak Hour = 4:30 - 5:30 PM on a typical day

Wilbur Smith Associates; April 1994

## Vehicle Trips

Based on the study assumptions, a 10,000-person convention could generate an estimated 533 inbound and 217 outbound vehicle trips during the morning peak hour. This number represents the initial day of a 3 to 4 day convention, and the ensuing days could be slightly lower. The composition of the morning peak hour vehicle trips is summarized in Table 4-2. Key features include:

- Approximately 70 percent of the total 750 vehicle trips to or from the site are related to Oahu visitor attendees.
- Approximately 18 percent of the vehicle trips are by Oahu residents attending the convention.
- Approximately 12 percent are employee, delivery, and service vehicles.
- Approximately 61 shuttle bus trips would be needed if standard size charter coaches are used.

Vehicle trips would be substantially lower in the peak afternoon exiting hour. As summarized in Table 4-3, a total of 317 vehicle trips is estimated for the afternoon peak hour, with 233 exiting and 84 entering the site. Employee and vendor vehicles would comprise about 28 percent of the much lower volumes in the afternoon period.

The actual numbers of vehicle trips could vary from these estimates depending upon convention characteristics and future conditions. The following are key variables that could effect the number of vehicle trips.

- The proportion of local residents versus visitors attending the convention, since a much higher proportion of local residents are likely to travel via automobile. Few or no local residents would reduce the vehicle trips, while more than 5 percent local residents would increase vehicle trips.
- The average number of persons per vehicle arriving by automobile, with the 2.3 persons per vehicle approximately midway in a range of 1.7 to 2.8 for conventions, trade shows and exhibitions at other facilities. To attain this average, it would likely require market rate pay parking and/or public perceptions of a constrained parking supply.
- The proportion of visitors to Oahu arriving by rental car and taxi, with a very convenient alternative (the shuttle bus system) needed to keep usage levels of rental cars and taxis at the rates used in this analysis.

## DESCRIPTION OF PROJECT INGRESS-EGRESS

The layout of the project, including driveway locations and the on-site circulation plan, will not be known until a project development team and design concept have been selected later this year. This section provides a brief overview of the potential locations for project driveways, and other traffic considerations that would affect site access plans.

Table 4-2

**ESTIMATED CONVENTION CENTER TRAFFIC**
**MORNING PEAK HOUR 7:15 - 8:15 AM**
**Hawaii Convention Center - Transportation Assessment**

| Travel Mode | Percent Using Mode | Persons per Vehicle | Person Trips To | Vehicle Trips | |
|---|---|---|---|---|---|
| | | | | To | From |
| **Oahu Visitor Trips** | | | | | |
| ▸ Walk | 35.0% | -- | 2,130 | -- | -- |
| ▸ Taxi | 5.0 | 2.3 | 305 | 133 | 133 |
| ▸ Auto | 5.0 | 2.3 | 305 | 133 | 7 |
| ▸ Public Bus | 10.0 | -- | 610 | -- | -- |
| ▸ Shuttle/Charter Bus | 45.0 | 45.0 | 2,730 | 61 | 61 |
| **Subtotal Visitors** | **100.0%** | -- | **6,080** | **327** | **201** |
| **Oahu Resident Trips** | | | | | |
| ▸ Public Bus | 10.0 | -- | 32 | -- | -- |
| ▸ Auto | 90.0 | 2.3 | 288 | 126 | 7 |
| **Subtotal Residents** | **100.0%** | -- | **320** | **126** | **7** |
| **Employee Trips** | | | | | |
| ▸ Public Bus | 30.0 | -- | 36 | -- | -- |
| ▸ Auto | 70.0 | 1.2 | 84 | 70 | 4 |
| **Subtotal Employees** | **100.0%** | -- | **120** | **70** | **4** |
| **Vendor and Delivery Trips** | | | | | |
| ▸ Vehicles | 100% | -- | -- | 10 | 5 |
| | | | **Total Vehicle Trips** | **533** | **217** |

Wilbur Smith Associates; April 1994

Table 4-3

ESTIMATED CONVENTION CENTER TRAFFIC
AFTERNOON PEAK HOUR 4:30 - 5:30 PM
Hawaii Convention Center - Transportation Assessment

| Travel Mode | Percent Using Mode | Persons per Vehicle | Person Trips To | Vehicle Trips | |
|---|---|---|---|---|---|
| | | | | To | From |
| **Oahu Visitor Trips** | | | | | |
| ▸ Walk | 35.3% | -- | 670 | --- | --- |
| ▸ Taxi | 5.0 | 2.3 | 95 | 42 | 42 |
| ▸ Auto | 5.0 | 2.3 | 95 | 2 | 42 |
| ▸ Public Bus | 10.0 | --- | 190 | --- | --- |
| ▸ Shuttle/Charter Bus | 44.7 | 35.0 | 850 | 29 | 29 |
| **Subtotal Visitors** | **100.0%** | --- | **1,900** | **73** | **113** |
| **Oahu Resident Trips** | | | | | |
| ▸ Public Bus | 10.0 | --- | 10 | --- | --- |
| ▸ Auto | 90.0 | 2.3 | 90 | 2 | 40 |
| **Subtotal Residents** | **100.0%** | --- | **100** | **2** | **40** |
| **Employee Trips** | | | | | |
| ▸ Public Bus | 30.0 | --- | 36 | --- | --- |
| ▸ Auto | 70.0 | 1.2 | 84 | 4 | 70 |
| **Subtotal Employees** | **100.0%** | --- | **120** | **4** | **70** |
| Vendor and Delivery Trips | | | | | |
| ▸ Vehicles | 100% | --- | --- | 5 | 10 |
| | | | **Total Vehicle Trips** | **84** | **233** |

Wilbur Smith Associates; April 1994

This discussion reflects a continuation of the present street pattern in the area. Access implications of a possible Kalakaua Avenue - Ala Moana Boulevard one-way street couplet are discussed in Chapter 5.

## Potential Project Driveway Locations

The project will likely have a minimum of two driveways, and possibly a third or fourth. To the extent feasible, it will be desirable to provide separate driveways for access to parking, access to passenger loading/unloading areas (shuttle buses, taxis, and personal automobiles), and for truck deliveries/services.

**Kalakaua Avenue** — Kalakaua Avenue may likely provide the street identity of the Convention Center and, as such, provide for both vehicular and pedestrian access to the Center. With the present two-way traffic operation on this section of Kalakaua Avenue, driveways along this frontage will likely be limited to right-turn-in/right-turn-out. The existing bridge and street widths could accommodate a short left-turn lane for Waikiki vehicles entering the site, but the short stacking distance would be sufficient for approximately four automobiles or two buses and would likely be insufficient to accommodate left-turns without frequent blockage of one of the two mauka-bound lanes across the Ala Wai Canal Bridge. Both left-turns into and out of the Kalakaua driveway would experience frequent blockage and delays by the queues of vehicles stacked along this section from the adjacent traffic signals at Ala Wai Boulevard and at Kapiolani Boulevard. Also, because of the right-turn from Kapiolani Boulevard, there is a near constant flow of Waikiki-bound traffic in this section.

Desirably, any driveway for right-turns should be located approximately mid-block or slightly closer to the Ala Wai Canal. If the location of pedestrian access to the Center creates major pedestrian flows across the driveway or if any entry controls are located close to the street, a short stacking lane may be needed to minimize blockage of the curb through lane.

**Kapiolani Boulevard** — Any driveway along this frontage would likely be limited to right-turns into the site. Right-turns out of the site are possible toward Waikiki, but any vehicles desiring to continue Kokohead-bound on Kapiolani Boulevard would have to weave through the right-turn traffic into Waikiki. At-grade left-turns into or out of this frontage are not feasible.

**Atkinson Drive** — The situation along this frontage is similar to that along Kapiolani Boulevard. Any traffic desiring to turn-right and continue Kokohead-bound on Kapiolani Boulevard would have to cross the curb lane, since the curb lane feeds into the right-turn-only lane into Waikiki. The main purpose for providing a driveway along this frontage would likely be to lessen traffic increases to/from a driveway(s) along Kahakai Drive.

**Kahakai Drive** — This street provides the only likely location to provide left-turns out from the project site, primarily to serve traffic exiting towards the Kakaako and Downtown Honolulu areas. Otherwise, traffic towards these areas must travel to McCully Street or circulate through Waikiki to turn and travel towards the ewa direction.

Kahakai Drive serves a residential area, with residential buildings located along the street adjacent to the project site. The location of driveways, the level of usage, and any modifications to the street should consider mitigative actions to minimize any disruptive effects on area residents.

Provision of a driveway(s) along this street would likely require street modifications. Installation of a traffic signal would be needed to accommodate left-turns from the street onto Atkinson Drive. The traffic signal timing would have to be synchronized with the Kapiolani-Atkinson signal to minimize any stacking of makai-bound traffic onto Kapiolani Boulevard, given the short distance (250 feet) between these two intersections. The street would likely require widening and the present on-street parking may have to be restricted, at least during daytime hours and for special evening events.

**Ala Wai Boulevard** — Potentially, a vehicular bridge could be constructed from Ala Wai Boulevard across the canal to the site. This bridge connection would provide a convenient route for Waikiki traffic into and out of the Convention Center. However, such a bridge would have several potentially negative impacts:

- Increase traffic along this less-travelled and lower capacity segment of Ala Wai Boulevard;
- Disrupt pedestrian movement along both sides of the Ala Wai Canal;
- Affect the visual features along the canal;
- Place additional piers in the canal; and
- Require major expenditures for construction.

## Other Access Considerations

Several other roadway and traffic operations features affect access for the Convention Center.

**Atkinson Left-Turn Lane to Kahakai Drive** — At present, left-turns from makai-bound Atkinson Drive onto Kahakai Drive are made from the through lane adjacent to the center line. With project access via a Kahakai Drive driveway, a left-turn lane may likely be necessary on Atkinson Drive. Such a left-turn lane may be provided by eliminating the parking along the ewa side of Atkinson Drive between Kapiolani and Kahakai, and restriping this section to provide the left-turn lane. A minor widening along the project side of the street may also be desirable to provide sufficient makai-bound through lane widths to receive the double left-turn movement from Kapiolani during the morning peak hour.

Because of the short distance between Kapiolani and Kahakai, about 250 feet, only 8 to 9 automobiles (or fewer with buses or trucks in the waiting queue) could be accommodated in the stacking lane before the traffic queue would extend into the Kapiolani Boulevard lanes. Blockage of Kapiolani could become a problem if the left-turn volume exceeds about 150 vehicles per hour. This would be most likely to occur during the morning peak period.

One approach to this potential problem is to provide a second (double) left-turn lane from Atkinson to Kahakai Drive, which would approximately double the number of vehicles that could be stacked without blocking Kapiolani through traffic. However, this would require street widening along this block of Atkinson Drive, may require additional widening of Kahakai Drive to receive the double left-turn lanes, would likely introduce a merging problem on Kahakai Drive, and would result in offset through lanes on Atkinson Drive. Given these disadvantages, provision of a double left-turn lane appears undesirable at this location.

A second, preferred approach would be to establish a traffic management plan that encourages use of vehicle routings which minimize use of an Atkinson Drive left-turn lane into Kahakai Drive. The traffic most needing use of this left-turn lane would be vehicles approaching the site from the Moiliili area traveling ewa-bound on Kapiolani Boulevard. Vehicles from other areas could be routed to this or other driveways so as to avoid increasing use of the left-turn lane.

- Vehicles traveling Kokohead-bound on Kapiolani could be provided Convention Center routing signs that direct them to a driveway along Kapiolani or Kalakaua, which should then provide convenient access to parking areas or passenger drop-off areas.
- Commercial vehicles (shuttle buses and taxis) approaching from Waikiki could be directed to use Ala Moana Boulevard and Atkinson Drive during the peak traffic periods to reach the site and enter via Kahakai or another driveway.
- Convention Center routing signs and convention information packets could direct vehicles approaching from Waikiki to use the Ala Moana-Atkinson route to reach the Convention Center.

**Afternoon Peak Period Restrictions** — The afternoon reversible lane operation and related left-turn restrictions on Kalakaua at Kapiolani and on Kapiolani at Atkinson are assumed to continue in the future.

- The routing instructions in the preceding paragraph would apply to traffic approaching the site from Waikiki.
- Traffic approaching from the Moiliili-Kaimuki-East Honolulu areas would have to travel via H-1 Freeway or Beretania Street and use Keeaumoku Street or Kalakaua Avenue. Traffic approaching on ewa-bound Kapiolani Boulevard would have to circle a block to loop back to the site via Kalakaua, Kokohead-bound Kapiolani, or Mahukona Street.

## TRAFFIC CONDITIONS WITH EXISTING STREET SYSTEM

The Convention Center/mixed-use developments previously approved for the project site included a number of street modifications to mitigate traffic impacts on the nearby streets. However, these private development projects included a mix of hotel, retail or office uses which contributed much of the total project traffic.

Accordingly, this assessment of the Convention Center effects on the area traffic conditions, and potential mitigative needs, begins with an analysis of the incremental impact of the project on traffic conditions with the existing street network. This analysis is then used to identify those actions appropriate to mitigate the incremental effects of the project.

## 1998 Peak Hour Traffic Volumes

The number of vehicle trips generated by the Convention Center were assigned to the surrounding street system based on the following assumptions.

- The project was assumed to have two driveways, a right-turn in/out along Kalakaua Avenue and a driveway on Kahakai Drive. Additional driveways along Atkinson or Kapiolani would primarily reduce traffic use of the Kahakai and Kalakaua driveways and would have little effect on traffic conditions at the adjacent intersections.

- All Waikiki shuttle buses and 75 percent of taxis and visitor rental cars were assumed to use Ala Moana Boulevard and Atkinson Drive to approach the site, with the remaining visitor vehicles using Kalakaua Avenue.

- Distribution of resident trips to/from the site was based on Hali 2005 trip distribution forecast data for the Ala Moana area.

The resultant forecast of traffic volumes on the adjacent street network, with the Convention Center trips, are depicted in Figures 4-1 and 4-2 for the morning and afternoon peak hours, respectively. The traffic volumes reflect general area traffic growth as well as occupancy of the completed Waikiki Landmark.

The largest numerical and proportional increase in traffic would occur during the morning peak hour. As summarized in Table 4-4, the largest increases would occur along the Ala Moana Boulevard-Atkinson Drive-Kahakai Drive route from Waikiki to the Convention Center. The section of Kalakaua Avenue between Ala Wai and Kapiolani Boulevards and the section of Kapiolani Boulevard between Atkinson Drive and Kalakaua Avenue would also increase by more than 5 percent.

In the afternoon peak hour, the project would result in nominal proportional increases on most area streets. The major increases, of more than 5 percent each, would occur along Kahakai Drive, Atkinson Drive and the segment of Kalakaua Avenue between Ala Wai Boulevard and McCully Street.

## Traffic Conditions at Key Intersections

The morning and afternoon peak hour traffic conditions are summarized in Table 4-5 for the key intersections in the project vicinity. These conditions represent a weekday during a 10,000-person convention at the facility. The 1998 conditions reflect the present roadway facilities and traffic controls, with the exception of the Kahakai Drive intersection with Atkinson Drive. The analyses assumes that Kahakai Drive is widened to four lanes, a left-turn lane is provided on Atkinson Drive, and a traffic signal is installed. Existing conditions and 1998 conditions without the project are provided in Table 4-5 for comparison purposes. The key findings are summarized below.

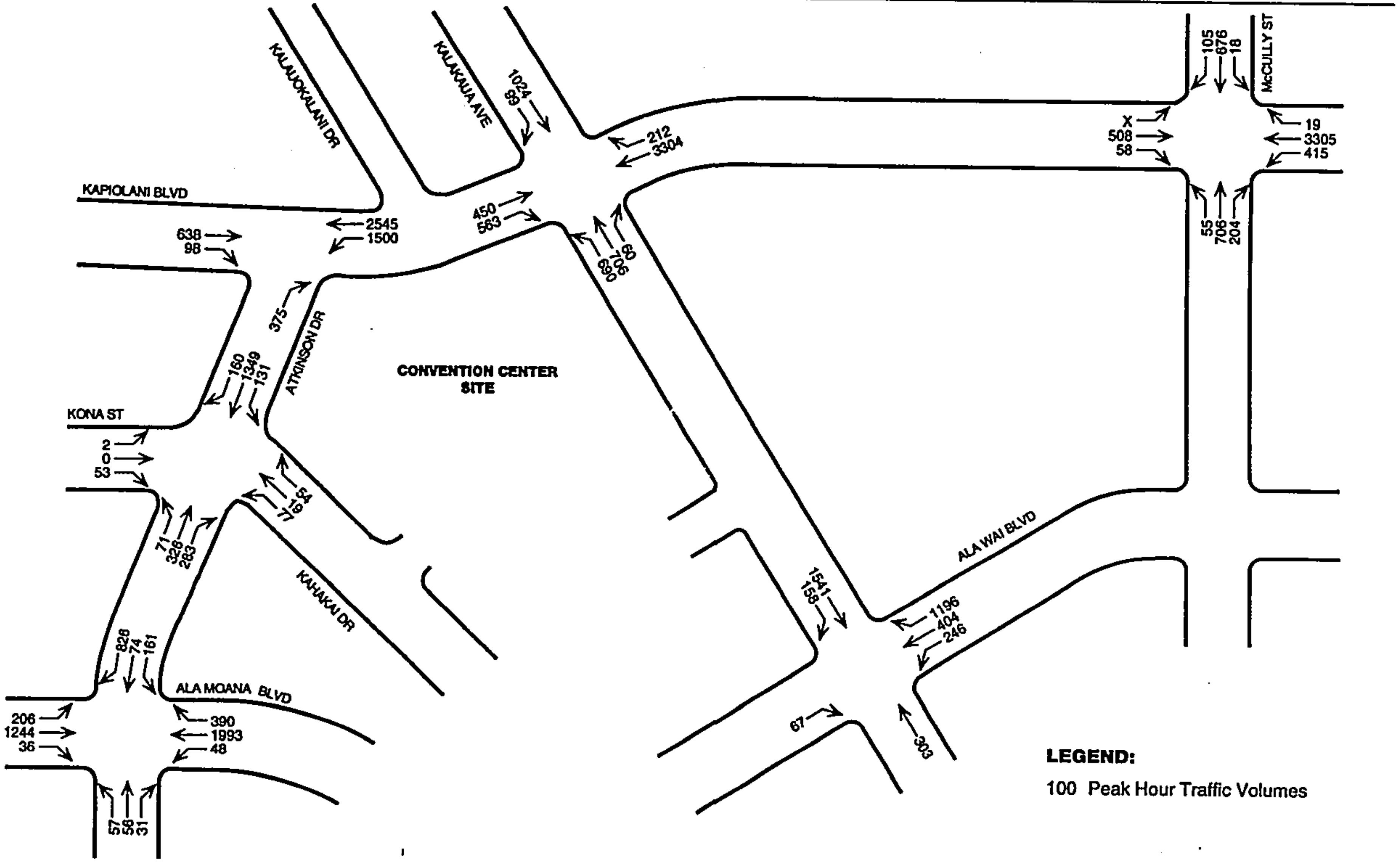


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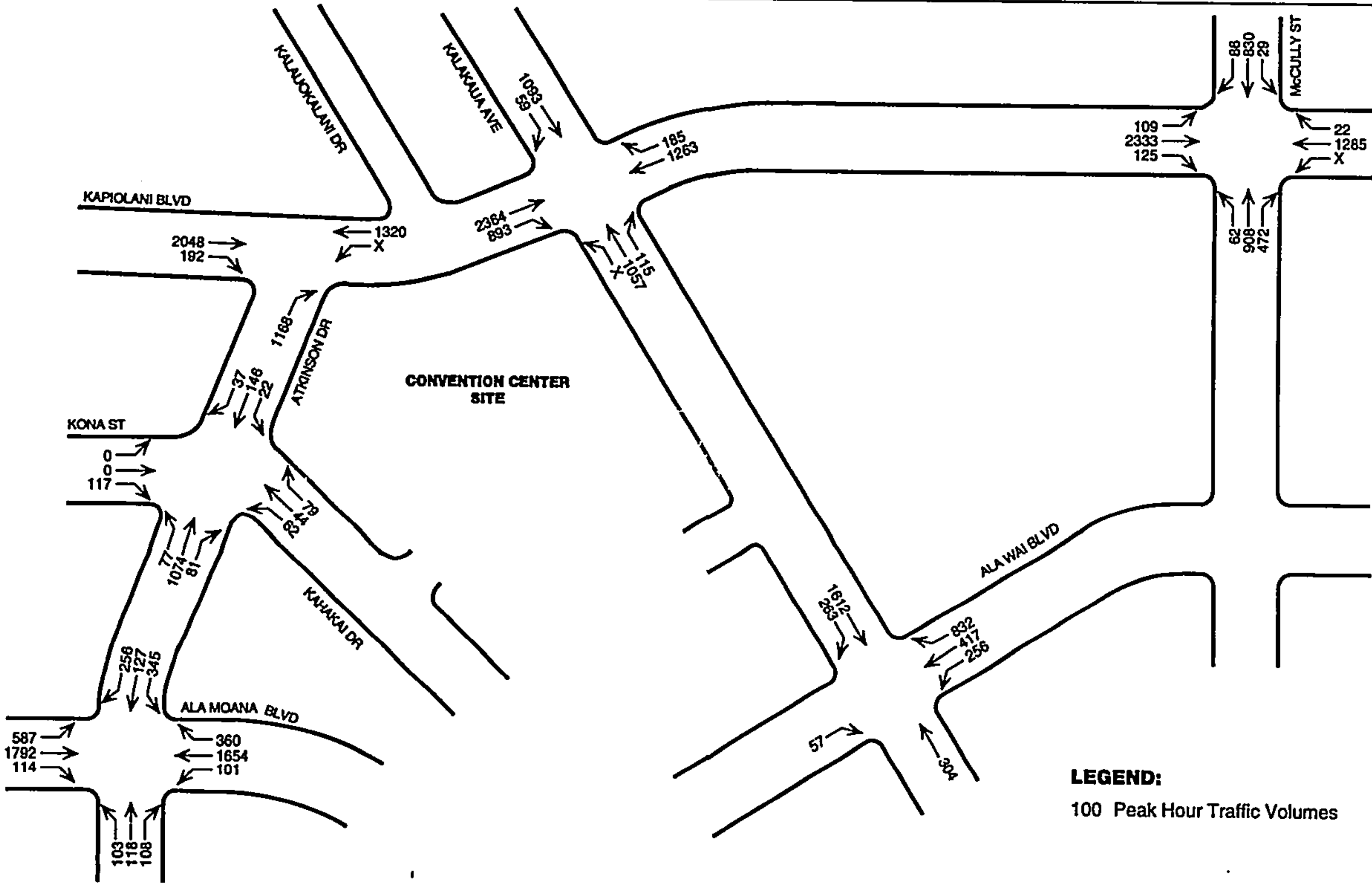
Figure 4-1

**YEAR 1998 WITH PROJECT MORNING PEAK HOUR TRAFFIC VOLUMES**

CONVCTR2.HWIBASE-5/3/94C

## HAWAII CONVENTION CENTER TRANSPORTATION IMPACT ASSESSMENT




**LEGEND:**

100 Peak Hour Traffic Volumes

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Figure 4-2

**YEAR 1998 WITH PROJECT AFTERNOON PEAK HOUR TRAFFIC VOLUMES**

CONVCTR2.HW\BASE-5/3/94C

Table 4-4
(Page 1 of 2)

CONVENTION CENTER TRAFFIC INCREASES ON AREA STREETS[1]
Hawaii Convention Center - Transportation Assessment

| Location | Morning Peak Hour | | | Afternoon Peak Hour | | |
|---|---|---|---|---|---|---|
| | Non-Project Traffic | Project Traffic | Percent Increase | Non-Project Traffic | Project Traffic | Percent Increase |
| **Kapiolani Boulevard** | | | | | | |
| ▸ West of Atkinson Drive | 3,201 | 80 | 2.5% | 3,558 | 2 | 0.1% |
| ▸ West of Kalakaua Ave. | 4,802 | 256 | 5.3% | 4,455 | 82 | 1.8% |
| ▸ East of Kalakaua Ave. | 4,010 | 16 | 0.4% | 3,905 | 22 | 0.6% |
| ▸ East of McCully St. | 4,455 | 14 | 0.3% | 4,141 | 13 | 0.3% |
| **Kalakaua Avenue** | | | | | | |
| ▸ North of Kapiolani Blvd. | 2,017 | 24 | 1.2% | 2,392 | 2 | 0.1% |
| ▸ North of Ala Wai Blvd. | 2,975 | 223 | 7.5% | 2,888 | 123 | 4.3% |
| ▸ South of Ala Wai Blvd. | 2,003 | 159 | 7.9 | 2,114 | 115 | 5.4% |
| **McCully Street** | | | | | | |
| ▸ North of Kapiolani Blvd. | 1,523 | 2 | 0.1% | 1,984 | 9 | 0.5% |

Table 4-4
(Page 2 of 2)

**CONVENTION CENTER TRAFFIC INCREASES ON AREA STREETS[1]**
Hawaii Convention Center - Transportation Assessment

| Location | Morning Peak Hour | | | Afternoon Peak Hour | | |
|---|---|---|---|---|---|---|
| | Non-Project Traffic | Project Traffic | Percent Increase | Non-Project Traffic | Project Traffic | Percent Increase |
| **Ala Moana Boulevard** | | | | | | |
| ▸ North of Kalia Rd. | 1,984 | 213 | 10.7 | 2,299 | 47 | 2.0 |
| ▸ East of Atkinson Dr. | 3,538 | 329 | 9.3% | 4,283 | 77 | 1.8% |
| ▸ West of Atkinson Dr. | 4,312 | 50 | 1.2% | 4,464 | 42 | 0.9% |
| **Atkinson Drive** | | | | | | |
| ▸ South of Kapiolani Blvd. | 1,767 | 206 | 11.7% | 1,280 | 80 | 6.3% |
| ▸ North of Ala Moana Blvd. | 1,334 | 348 | 26.1% | 1,674 | 109 | 6.5% |
| Kahakai Dr. | 88 | 476 | 540.9% | 113 | 175 | 154.9% |

(1) 1998 traffic volumes with a 10,000-person convention. Traffic numbers reflect both travel directions on two-way streets.

Wilbur Smith Associates; April 1994

T-10/450

Table 4-5

**1998 LEVELS-OF-SERVICE AT KEY INTERSECTIONS WITH THE CONVENTION CENTER WITHOUT MITIGATION**
**Honolulu Convention Center - Transportation Assessment**

| Intersection | Scenario | Morning Peak Hour | | | Afternoon Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | AD | V/C | LOS | AD | V/C | LOS |
| Kapiolani Blvd. at McCully St. | Existing | 20.6 | 0.73 | C | 28.9 | 0.86 | D |
| | 1998 Without Project | 22.8 | 0.78 | C | 30.5 | 0.93 | D |
| | 1998 With Project | 22.9 | 0.79 | C | 30.6 | 0.94 | D |
| Kapiolani Blvd. at Kalakaua Ave. | Existing | 47.6 | 1.03 | E | 21.2 | 0.86 | C |
| | 1998 Without Project | 72.0 | 1.11 | F | 24.7 | 0.93 | C |
| | 1998 With Project | 98.3 | 1.14 | F | 27.2 | 1.00 | D |
| Kapiolani Blvd. at Atkinson Drive | Existing | 7.0 | 0.65 | B | 13.3 | 0.58 | B |
| | 1998 Without Project | 9.8 | 0.71 | B | 13.3 | 0.62 | B |
| | 1998 With Project | 10.4 | 0.75 | B | 13.9 | 0.64 | B |
| Atkinson Dr. at Ala Moana Blvd. | Existing | 25.8 | 0.58 | D | 42.2 | 0.80 | E |
| | 1998 Without Project | 29.0 | 0.62 | D | 56.5 | 0.85 | E |
| | 1998 With Project | 53.2 | 0.70 | E | 63.4 | 0.87 | F |
| Atkinson Dr. at Kahakai Dr. | Existing | — | 28* | E | — | 115* | D |
| | 1998 Without Project | — | 26* | E | — | 94* | E |
| | 1998 With Project | 11.6 | 0.58 | B | 10.6 | 0.34 | B |
| Ala Moana Blvd. at Kalia/Ena Rds. | Existing | 31.9 | 0.65 | D | 35.1 | 0.80 | D |
| | 1998 Without Project | 33.2 | 0.68 | D | 38.3 | 0.85 | D |
| | 1998 With Project | 33.6 | 0.70 | D | 38.6 | 0.86 | D |

**Legend:**

AD = Average Delay per Vehicle (in seconds).
V/C = Volume-to-Capacity Ratio.
LOS = Level-of-Service.
* = STOP-sign controlled intersection; Reserve Capacity is presented instead of V/C ratio.

Wilbur Smith Associates; May 1994

### Kapiolani Boulevard at McCully Street

- The small amount of Convention Center traffic traveling through this intersection would have minimal effect on traffic conditions. Traffic conditions would remain at acceptable levels.

### Kapiolani Boulevard at Kalakaua Avenue

- During the morning peak hour, forecast traffic volumes would exceed the theoretical intersection capacity of this intersection with resultant intersection conditions at LOS F both without and with the project. The project traffic added to the left-turn from Kalakaua onto Kapiolani, and to the makai-bound through traffic on Kalakaua, would result in a slight increase in the intersection volume-to-capacity ratio (by 0.03) and a significant increase in average vehicle delay time.
- During the afternoon peak hour, the project would add traffic to the right-turn movement from Kapiolani towards Waikiki and to the makai-bound through movement on Kalakaua Avenue. With the addition of the project traffic, total traffic would approximate the theoretical capacity of the intersection. Average vehicle delay would remain at acceptable levels.
- Project impacts would warrant mitigative actions for this intersection.

### Kapiolani Boulevard at Atkinson Drive

- Computed conditions at this intersection would remain at acceptable levels.
- Addition of project traffic to Kokohead-bound traffic along Kapiolani and to mauka-bound Atkinson, coupled with increased average delays at the Kapiolani-Kalakaua intersection, would likely exacerbate the vehicle queuing and blockage at this intersection.

### Atkinson Drive at Kahakai Drive

- The assumed four-lane Kahakai Drive, with a left-turn lane added to Atkinson Drive, would result in very acceptable service level and level of capacity utilization at this intersection with installation of traffic signal controls. The modifications may likely improve traffic conditions for Kahakai residents turning onto or off of Atkinson Drive.

### Atkinson Drive at Ala Moana Boulevard

- In the morning peak hour, the project would increase the number of vehicles turning onto Atkinson, primarily from Waikiki. This increase would significantly affect conditions for traffic on the ewa-bound approach of Ala Moana Boulevard, with this approach worsening from LOS D to F and the overall intersection worsening from LOS D to E, based on the continuation of the existing traffic signal timing. Future traffic with the project would use only 70 percent of the available capacity, based on optimum signal timing.

- In the afternoon peak hour, the smaller increases in project traffic would increase use of intersection capacity by two percent. The small traffic increase would increase the average delay time by 7 seconds, but this would change the overall level-of-service from LOS E to LOS F, based on a continuation of existing allocation of traffic signal green time to each approach.

  The present traffic signal allocation of green time to the various traffic movements could be modified to more efficiently utilize the existing intersection capacity. The present signal operations result in longer delays for the ewa-bound approach as compared to the other movements. Modifications to signal timing could maintain overall intersection conditions at LOS D and E in the morning and afternoon peak hours, respectively. However, the modifications would increase delays to traffic turning left onto Atkinson Boulevard and to traffic exiting Ala Moana Park Road.

- With the large volume of vehicles turning right onto Atkinson Drive, which would be increased with the Center, it would be desirable to add a right-turn lane along the mauka side of Ala Moana Boulevard. The right-turn lane would primarily be of benefit during the afternoon peak period when congested conditions now occur along ewa-bound Ala Moana Boulevard, although there would be few vehicles travelling from Waikiki to the Center during the peak period. However, the Yacht Harbor Towers extends very close to the sidewalk at the corner and limits any widening along this side.

  Therefore, the provision of a right-turn lane would likely require one of two approaches:

  1. Reduce the existing ewa-bound lanes to substandard 10-foot widths and reduce the mauka sidewalk from 10 to 8 feet in width to provide the lane; or

  2. Acquire a strip of land from Ala Moana Park, widen Ala Moana Boulevard along that side, and shift the median divider to provide the additional ewa-bound lane, which would require substantial construction costs.

  Due to the potential safety, park land and cost impacts, either of these two approaches may be impractical. Given the small amount of Center traffic affected in the congested afternoon period, it appears appropriate to address the ewa-bound congested conditions through reallocation of the traffic signal timing.

## Ala Moana Boulevard at Kalia and Ena Roads

- During the morning peak hour, the project would primarily increase traffic on the Ala Moana Boulevard ewa-bound approach to this intersection. The through lanes on this approach are greatly underutilized with 46 percent of available capacity used without the project; the project would increase use to 58 percent of capacity and increase average delay by 1.6 seconds per vehicle. The small increases of project traffic on the other approaches would not significantly affect conditions on those streets.

- During the afternoon peak hour, the project would add much smaller increases than in the morning. Most of the project traffic would be added to the ewa-bound traffic on Ala Moana Boulevard, with the project traffic increasing this approach to 44 percent of capacity, as compared to 41 percent without the project. The small amount of project traffic added to the congested left-turn movement from Kalia Road would increase average delay for this movement from 66.0 seconds without the project to 67.6 seconds with the project.

## Roadway Mitigation Actions

The initial assessment of Convention Center access and traffic impacts has been based on continuation of the present street circulation pattern, and the peak period coning/turn restrictions along Kapiolani Boulevard. The following actions appear appropriate to mitigate the Convention Center's traffic impacts:

1. To mitigate conditions at the Kapiolani-Kalakaua intersection in the morning peak period, the two mauka-direction left-turn lanes from Kalakaua onto Kapiolani could be widened from present 9-foot width to 12 feet each. Also, the existing right-turn-only lane on this leg of Kalakaua Avenue could be designated as a combination through or right-turn lane. This would result in the mauka direction of Kalakaua having two left-turn only lanes (12 feet each), one through lane, and one combination through/right-turn lane. This would require street widening of about 6 feet, as well as a minor modification to the channelization on the southeast corner and minor widening on the northeast corner to provide transition for the lane offset.

   Morning traffic conditions of the Kapiolani-Kalakaua intersection could be further improved if a short right-turn lane is provided on Kapiolani Boulevard for ewa-direction traffic turning right onto Kalakaua Avenue. This widening could be accomplished within the existing street right-of-way.

2. To mitigate conditions at the Kapiolani-Kalakaua intersection in the afternoon peak period, an additional 10-foot-wide traffic lane could be provided along the Kapiolani Boulevard frontage of the project site. The new lane would be for right-turns into Waikiki. The present right-turn-only lane would be redesignated as a combination through- or right-turn lane. There is an existing "extra" through lane along Kapiolani Kokohead of Kalakaua to receive traffic from the additional through lane.

3. If Kahakai Drive is to be used as a major entry/exit to the site, or to accommodate truck deliveries, the street would likely require widening, possibly to four lanes. The street width must also reflect the turning radius of large trucks and buses if it is to be used by such vehicles, and on-street parking, if a continuation of on-street parking is to be allowed at all times.

4. Stacking lanes may be needed for driveways along Atkinson Drive, Kapiolani Boulevard and Kalakaua Avenue, dependent upon the level of usage and the features of the driveway (pedestrian conflicts, type and position of any entry controls, etc.).

5. Reallocation of traffic signal green time appears most appropriate to mitigate any effects at the intersection of Ala Moana Boulevard and Atkinson Drive.

The proposed modifications at the Kapiolani-Kalakaua intersection would be sufficient to offset project impacts at this intersection, and would provide conditions similar to existing (see Table 4-6).

Table 4-6
1998 LEVELS-OF-SERVICE AT KAPIOLANI-KALAKAUA INTERSECTION
WITH CONVENTION CENTER AND MITIGATION
Hawaii Convention Center - Transportation Impact Assessment

| Scenario | Morning Peak Hour | | | Afternoon Peak Hour | | |
|---|---|---|---|---|---|---|
| | AD | V/C | LOS | AD | V/C | LOS |
| Existing | 47.6 | 1.03 | E | 21.2 | 0.86 | C |
| 1998 Without Project | 72.0 | 1.11 | F | 24.7 | 0.93 | C |
| 1998 With Project | | | | | | |
| ▸ Without Mitigation | 98.3 | 1.14 | F | 27.2 | 1.00 | D |
| ▸ With Mitigation | 50.2 | 1.06 | E | 20.7 | 0.82 | C |

AD = Average Delay per Vehicle (in seconds).
V/C = Volumes-to-Capacity Ratio.
LOS = Level-of-Service

Wilbur Smith Associates; May 1994

## TRUCKS AND DELIVERIES

Varying levels of truck, delivery vehicle, and service vehicle activity will occur during the one or two set-up days before a convention or trade show event, during the event itself, and on the one or two move-out days following the event.

## Truck Activity

Large trucks will be needed for movement of exhibit materials to and from the Convention Center, and for regular activities such as refuse collection trucks. Key features and impacts of truck activity are listed below.

- About 50 container truckloads of freight may be needed to set up a major trade show/convention that uses the entire convention center with the actual amount depending on the type of convention, number of exhibitors, and the bulkiness of the displays and equipment.

- The truck activity will occur on the one or two set-up days prior to and one or two move-out days following the event. For set-up, most trucks will likely arrive and depart in the morning; for move-out, trucks may arrive and leave throughout the day.

- For smaller overlapping conventions, move-in and/or move-out may occur for one part of the facility while another convention/exhibition is underway in another area of the facility.

- The container trucks will likely be arriving from and returning to convention freight consolidation/storage contractor facilities in the Mapunapuna-Kalihi Kai area.

  - The Nimitz Highway-Ala Moana Boulevard-Atkinson Drive route will likely provide the most convenient route with the least impacts.

  - The H-1 Freeway with exit onto Kinau Street-Piikoi Street and continuing via Kapiolani Boulevard or Ala Moana Boulevard-Atkinson Drive is a less desirable routing, and H-1 Freeway with exit at Punahou Street and use of Kalakaua Avenue or McCully Street is the least desirable routing, due to restrictive turn radii, and to increased number of residential areas that would be affected by truck movement.

- Truck entry/exit will most likely be located along Kahakai Drive, which would facilitate a routing to/from the site using Atkinson Drive. Entry/exit could be provided along the Atkinson, Kapiolani or Kalakaua frontages if an acceptable on-site circulation plan could be developed, although this may result in a more circuitous routing off-site, probably through Waikiki.

The truck activity for convention move-in and move-out should not have any significant impact on area traffic conditions since this would occur primarily on days with no conventions at the site. The truck movements could occasionally affect traffic flow along Kahakai Drive as vehicles enter/exit via this street. Such inconveniences would be of short duration, unless the cause is that more trucks have arrived than there are off-street loading bays. The potential for truck blockage of Kahakai Drive can be addressed through the following:

- Each convention should designate one freight manager/consolidator to be responsible for scheduling the arrival of trucks at the site.

- On-street parking along the Diamondhead side of Atkinson Drive, and possibly the makai side of Kahakai Drive, could be designated as a truck holding area if and when the trucks on-site or arriving exceed loading bays on major move-in/move-out days.

### Delivery and Service Vehicles

A variety of smaller delivery and service vehicles will be travelling to and from the site throughout the day, both during move-in/move-out days and during convention events. These will mostly consist of vans and small trucks related to florists, electricians, carpenters, telecommunication installators, parcel deliveries, food/beverage deliveries, and similar activities.

Volume levels will likely approximate 5 to 10 vehicles per hour, which should not affect area traffic conditions. Although many of these vehicles will use the loading dock, many will also use the parking areas and reserved spaces should be identified for use by delivery and service vehicles.

## PARKING

The Convention Center is to provide a minimum if 800 parking stalls on-site. For the purpose of *this study, it is* assumed that the parking will be available to facility employees and visitors at pay parking rates comparable to market rates within the Waikiki area.

### Adequacy of On-Site Parking

The Convention Center parking needs were assessed based on a 10,000-person national convention and the assumptions listed under "Forecast Assumptions" in this chapter. The estimated peak parking demand would occur during the mid-morning period. The estimated parking requirements, including a 10 percent reserve, are as follows:

| | |
|---|---|
| Center Employees: .................... | 83 stalls |
| Oahu Visitor Attendees: ................ | 158 |
| Oahu Resident Attendees: .............. | 149 |
| **Subtotal:** ...................... | **390 stalls** |
| 10% Reserve for Parking Turnover: ....... | 40 |
| Reserved Stalls for Media, Deliveries, etc.: .. | 30 |
| **Total:** ........................ | **460 stalls** |

The estimated 460-space requirement indicates that 340 "unused" stalls would be available to accommodate any functions where the actual levels of automobile use exceed the study assumptions. This would allow a doubling of the level of attendee vehicle use (307 stalls). These available stalls could be used to accommodate events that have a higher proportion of Oahu residents, a lower average number of occupants per vehicle, or a higher proportion of Oahu visitors driving to the site (rainy days).

### Effects on Off-Site Parking

The Convention Center may require removal or use restriction of parking near the project site. Temporary restrictions could be needed daily during daytime hours or for special evening events. The parking that could potentially be affected includes:

**1 - Atkinson Drive** — Ewa side between Kapiolani and Kona Street, unmarked one-hour parking area (about 8 stalls) may be removed to provide a makai-direction left-turn lane.

**2 - Atkinson Drive** — Diamondhead side between Mahukona Street and Kahakai Drive, unmarked parking and passenger loading area (about 9 stalls) could be restricted during morning and mid-day hours for traffic flow or for temporary truck parking. This section now has "*No Parking*" restriction during the afternoon peak period.

**3 - Kahakai Drive** — Both sides adjacent to project site (about 16 stalls) could be removed, or could be restricted during convention center activities, or a combination of part removal and part temporary restriction.

On-street parking along most streets near the Convention Center is intensely used throughout the daytime and evening hours. Most of this parking has no meters or parking time limits. The current parking users include area residents, employees in the area, and visitors to the area.

Although the Convention Center parking appears sufficient to accommodate most national and international events, there may be some such events, as well as local events, that may exceed the parking supply. Also, some employees and attendees may try to find free on-street parking to avoid the parking charges for the Convention Center garage.

Areas particularly sensitive to any parking "overflow" from the Convention Center include the Kahakai Drive loop, the section of Ala Wai Boulevard across from the project site, and Kalauokalani Drive mauka of Kapiolani Boulevard. Any effort to control parking use in these areas would require City and County of Honolulu participation. Most such efforts, such as posted time limits, parking meters, or establishment of a resident parking permit program, would provide some degree of inconvenience to area residents and their visitors.

## PUBLIC TRANSPORTATION

Convention attendees and employees will affect levels of usage on the City TheBus routes near the site. The private charter/tour bus providers will likely be used to provide special transportation between the hotels and Convention Center for most visitor conventions.

### TheBus Services

Based on the study assumptions for a 10,000-person convention, an estimated 610 visitors to Oahu and 68 Oahu residents would travel to the Convention Center via TheBus during the morning peak hour. In the afternoon peak hour, an estimated 190 visitors to Oahu and 46 residents would use TheBus to leave the facility. The Oahu residents would be dispersed among buses on Routes 2, 8, 19, 20 and 47, as well as the routes operating from the Ala Moana Center. However, most visitors to Oahu will use Route 2, with some using the routes operating along Ala Moana Boulevard.

During the morning peak hour, based on the present schedules, about 16 Route 2 buses operate through Waikiki past the Convention Center, while 10 City buses operate ewa-bound using Ala Moana Boulevard. Using an average "crush load" capacity of 75 to 80 passengers per bus, the Route 2 buses can accommodate about 1,200 passengers out of Waikiki, while the Ala Moana Boulevard buses can accommodate 800 riders. Thus, the convention attendees would use 50 percent of Route 2 capacity, or 30 percent of combined Route 2/Ala Moana Boulevard capacity if spread throughout this one-hour period.

Given the present crowded conditions on these routes, TheBus could not accommodate the additional riders without adding more bus capacity, either more vehicles or use of higher-capacity articulated buses. It would likely be impractical to schedule additional TheBus service for those days with large convention events. Therefore, large numbers of visitors, boarding the regularly scheduled buses in the eastern and central sections of Waikiki, could fully load the buses and result in increased pass-ups and delays to residents and visitors waiting to board buses in the western portion of Waikiki.

Accordingly, mid-size and large conventions should stress the use of special convention shuttle services. Convention literature should promote use of such systems, and a convenient system of shuttle buses must be provided between the hotels and the Convention Center.

Bus stops in the Convention Center area introduce several concerns:

1. The bus stop at the Hard Rock Cafe is closest for visitors using Route 2. However, the closest crosswalks are located makai of Ala Wai Boulevard or mauka of Kapiolani Boulevard, which may increase jaywalking and the attendant safety concerns.

2. Use of the bus stops at Ala Wai Boulevard would increase pedestrian traffic across the Kalakaua bridge, which could worsen pedestrian conditions on the bridge sidewalks (see "Pedestrians" section).

3. All but one bus stop in the vicinity have no weather protection. Shelters should be added.

### Private Shuttle Service

It is anticipated that the special Convention Center shuttle service will be operated by private bus operators, with the number of buses and number of transportation companies varying with the size of the convention, and the locations of hotels housing concentrations of attendees. Some smaller conventions may utilize only hotels within convenient walking distance and require no shuttle service.

For the 10,000-person convention used as the basis for this assessment, approximately 60-65 bus trips would be needed. This would increase to about 75 to accommodate those attendees included as public bus riders (see "TheBus Services"). A fleet of about 50 to 60 buses would be needed to provide this shuttle service during the peak arrival hour. Much lower numbers would be needed during the other times of the day.

Arrangements will be needed with individual hotels and City and County of Honolulu to establish loading/unloading areas for the shuttle service.

## PEDESTRIAN ACCESS TO SITE

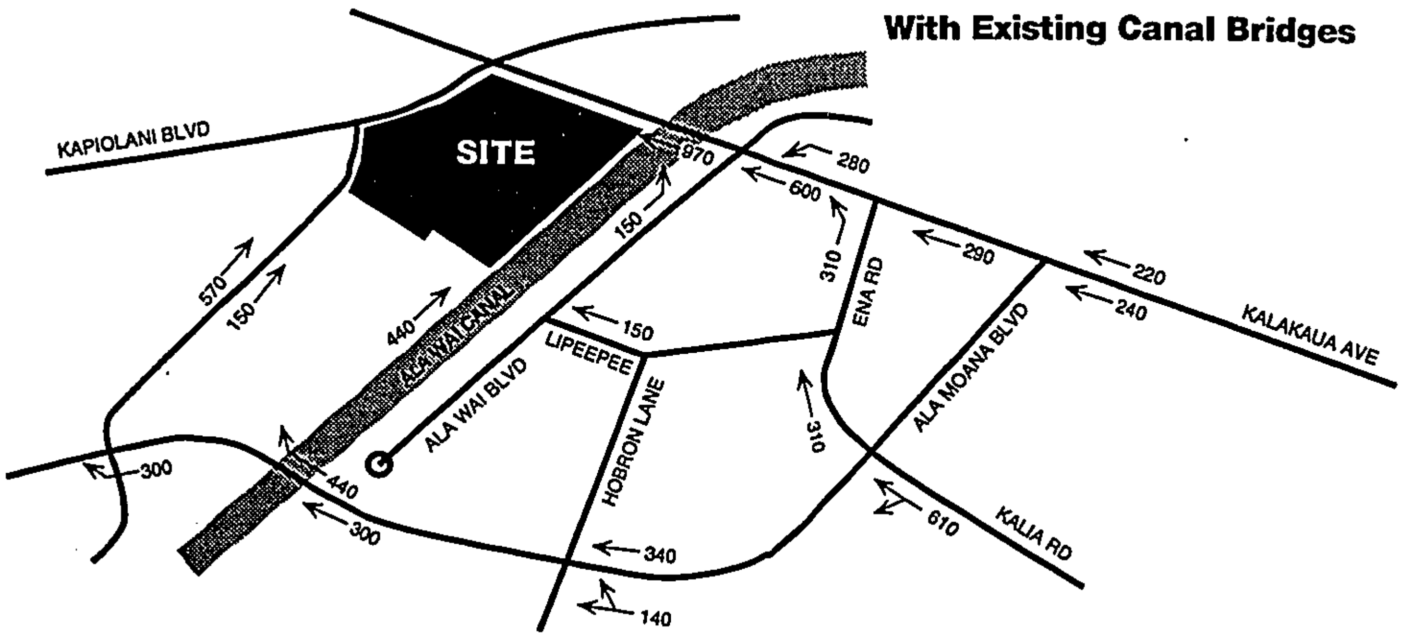
Given the favorable climate and the existing availability of hotel rooms within convenient walking distance of the Convention Center, a large portion of attendees will likely walk to/from the site. For the 10,000-person convention used in this assessment, an estimated 2,130 attendees would walk to the facility. This number could be larger for the limited number of very large conventions, for those smaller conventions with attendees concentrated in the hotels closest to the facility, and/or if additional hotels are constructed within convenient walking distance.

The morning peak hour pedestrian trips were estimated for the principal routes between the hotels and the Center. The estimated volumes are depicted in the top portion of Figure 4-3, which include only attendees and do not reflect existing pedestrian volumes. The largest volumes occur on the Kalakaua bridge,with 970 pedestrians. Other high-volumes corridor segments include 820 along Kalakaua mauka of Ena Road, 740 across the Ala Moana bridge, and 720 along Atkinson Drive.

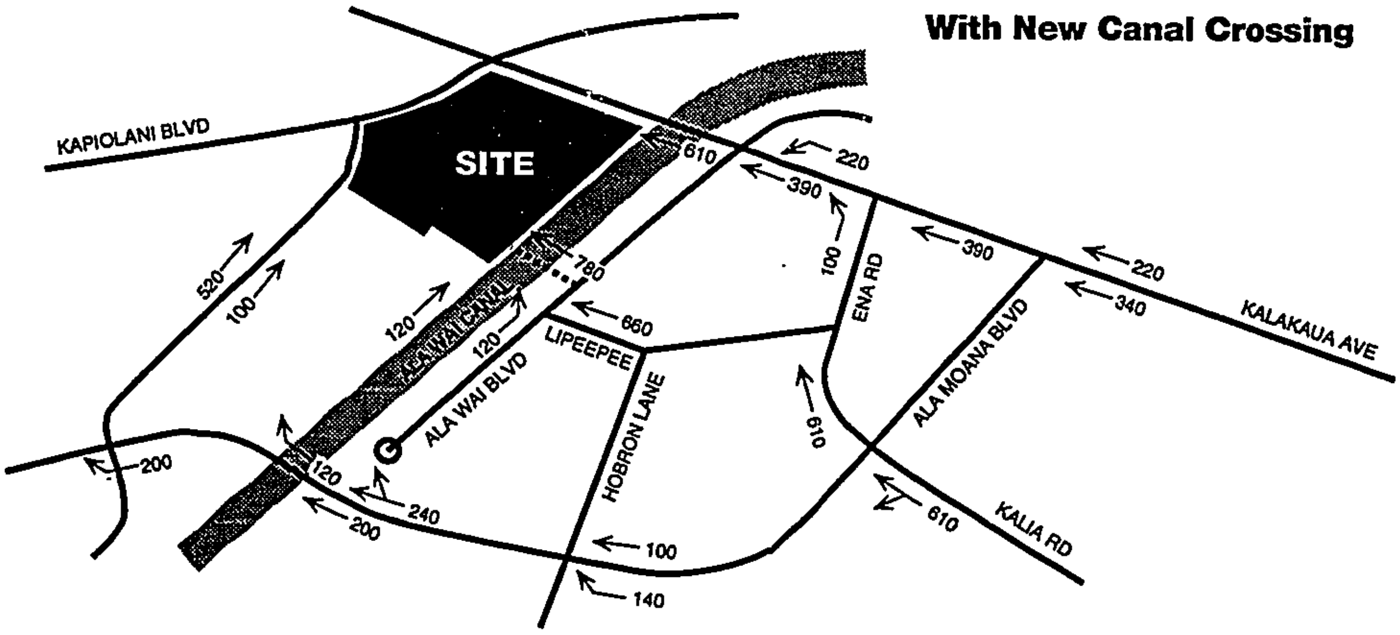
A key concern is the adequacy and safety of pedestrian traffic across the makai sidewalk (closest to the ocean) of the Kalakaua bridge. A preliminary assessment was made of the makai sidewalk across the bridge using the procedures outlined in the *1985 Highway Capacity Manual*. These procedures use a level-of-service concept similar to that for roadways, with conditions denoted by letters ranging from excellent (LOS A) to undesirable (LOS F). Each level of service is associated with a certain average space per pedestrian and/or flow rate expressed in the average number of pedestrians passing a point per minute per foot of width. The six levels of service are described in Appendix B, Figure B-1.

The pedestrian service level was evaluated at four locations on or near the Kalakaua Bridge: at the center of the bridge crossing where there are no impediments to pedestrian flow; at each end of the bridge where there are utility poles within the walkway, and at the crosswalk across Ala Wai Boulevard. The analysis assumes that 50 percent of the peak hour pedestrians cross in a single 15-minute time period. Table 4-7 summarizes the results for average conditions, and for conditions within platoons crossing the bridge (due to traffic signal effects or slow walkers).

**With Existing Canal Bridges**




**With New Canal Crossing**




WILBUR SMITH ASSOCIATES

Figure 4-3
**ESTIMATED CONVENTION CENTER PEDESTRIAN TRIPS**
**MORNING PEAK HOUR**

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Table 4-7

**KALAKAUA BRIDGE CROSSING PEDESTRIAN SERVICE LEVELS**
**Hawaii Convention Center - Transportation Impact Assessment**

| Location | Average Condition | | Platoon Condition | |
|---|---|---|---|---|
| | PMF | LOS | PMF | LOS |
| Center of Crossing | 8.9 | C | 12.9 | D |
| Pole at End near Site | 17.0 | E | 21.0 | E |
| Pole at End near Waikiki | 10.3 | D | 14.3 | D |
| At Ala Wai Crosswalk | 47.0* | B | 15.4* | D |

PMF = Pedestrians per Minute per Foot of Width.
LOS = Level-of-Service.
* = Average square feet of area per pedestrian during crossing.
Wilbur Smith Associates; May 1994

Relocation of the utility poles at each end of the bridge could improve conditions to the levels indicated for the center of the bridge crossing where there are no impediments within the walkway. However, relocation of the traffic signal pole at the Waikiki end may be restricted by the need for visibility to motorists and by the canopy tree on that corner.

With the pole relocations, pedestrian conditions (LOS C/D) appear acceptable for a large 10,000-person convention, given the assumptions used in this analysis. Future increases in pedestrian use above these levels, due to factors as such those cited earlier, could worsen conditions to LOS E and increase concerns for pedestrian safety.

Options for physical modifications to further improve pedestrian access would include the following:

1. Widen the existing Kalakaua bridge to increase the makai sidewalk width by 2 feet or more.

2. Construct a new pedestrian-only bridge paralleling and adjacent to the makai side of the bridge. (The existing bridge sidewalk area could continue in use, or could be reconstructed as a bicycle lane or to widen the traffic lanes.)

3. Construct a new pedestrian bridge across the canal near the makai end of the project site, near Lipeepee Street.

All options would improve sidewalk conditions to LOS C for the identified pedestrian volume levels. Figure 4-3 also indicates the reassignment of the pedestrian volumes if a new pedestrian crossing location is constructed (Option 3). The new crossing may also increase walk trips since it would reduce the walk time to the Center from several hotels, in particular, from the Hilton Hawaiian Village.

Based on pedestrian studies conducted during the First Development, Inc. project, other locations that may require improvements or further analysis include the following:

- The sidewalk area along the Diamondhead side of Atkinson Drive between the Kona Street crosswalk and Kahakai Drive.
- The completion of a surfaced walkway along the ewa-side Ala Wai Promenade between Ala Moana Boulevard and Kalakaua Avenue.
- The possible relocation of the Atkinson Drive crosswalk at Kona Street, relative to installation of the traffic signal at Kahakai Drive.
- The narrow 4-foot wide sidewalks along portions of Ala Moana Boulevard between Kalia Road and the canal.

## LOCAL EVENT AT THE CENTER

The Convention Center could be used for occasional local resident events. These may include locally-oriented regional or district conventions, receptions, political or charity fundraiser events, public ceremonies, or other functions that may use the ballroom, meeting rooms, or exhibit hall. Based upon the assessment of the visitor-oriented event, the following observations are offered:

- Given that about 700 of the Center parking stalls could be available for attendees to a local event, the on-site parking could accommodate a local event with 1,500 to 1,800 attendees.
- A local convention of about 1,600 attendees would result in an overall level of peak hour increases in site traffic similar to that for the 10,000-person national convention, although the routing on the adjacent streets would be more oriented towards Honolulu than Waikiki.
- Traffic for larger local events could be accommodated during the mid-day or evening, although such events would likely require use of off-site parking.

## EFFECTS OF EXPANSION

The Convention Center Authority design program calls for provisions to be made in the initial facility design to accommodate the potential future addition of 100,000 more sq. ft. of exhibit hall, 50,000 sq. ft. of meeting rooms, and 200 more parking stalls. The increase should not directly result in a proportional increase in typical Convention Center activity levels. The increase would better accommodate the infrequent larger conventions and provide more space to better serve the midsize conventions.

Group 2+ International, Inc., the convention center consultant to the Convention Center Authority, estimates that the future expansion, if implemented, would result in a 20 percent increase in the size of the typical large convention, or combination of simultaneous small conventions, using the Center. This would increase the large convention size, used as the basis for the assessment, to 12,000 persons.

This 20 percent increase in the convention size would also result in a similar level of increase to the estimates of traffic, pedestrian, transit, and parking activities presented in the preceding sections of this chapter. Key features would include:

- Vehicle trips generated in the morning peak hour would increase to 900 from 750, and in the afternoon peak hour, to 380 from 317.

- The expansion would result in a further traffic increase on the adjacent street sections as follows:

| Street | Morning | Afternoon |
|---|---|---|
| Kapiolani Boulevard | +1.0% | +0.4% |
| Kalakaua Avenue | +1.5% | +0.9% |
| Atkinson Drive | +5.0% | +1.3% |
| Ala Moana Boulevard | +1.8% | +0.4% |

- Morning peak hour pedestrian trips increase to about 2,550 for the typical large convention, with the number crossing the Kalakaua bridge increasing to 1,150.

- Shuttle bus trips to the Center in the morning peak hour would increase to approximately 90, versus about 75 with the initial facility. This would require about 60 to 70 vehicles.

- The increase in on-site parking could accommodate local events with about 2,100 to 2,300 attendees.

# 5. RELATIONSHIP TO OTHER PROPOSED TRANSPORTATION PROJECTS IN THE AREA

The City and County of Honolulu has developed a Waikiki Master Plan to guide development and design features within the area. The Master Plan includes two key transportation elements that could affect the Convention Center: 1) conversion of the section of Kalakaua Avenue and Ala Moana Boulevard at the ewa end of Waikiki to one-way operation; and 2) development of a network of several parking facilities at the periphery of the Waikiki area, with a people-mover system providing circulation within Waikiki and access to these peripheral parking areas.

Also, the City and County of Honolulu has long planned to develop a regional rapid transit system, with the alignment passing across or adjacent to the former Aloha Motors site and with a station located at the intersection of Kapiolani Boulevard and Kalakaua Avenue. Although the development work on the rapid transit project has largely ceased due to the lack of a dedicated local funding source, it is possible that continuing increases in traffic congestion may result in the eventual future development of a transit guideway through this area.

This chapter discusses the effects of these potential projects upon the Convention Center.

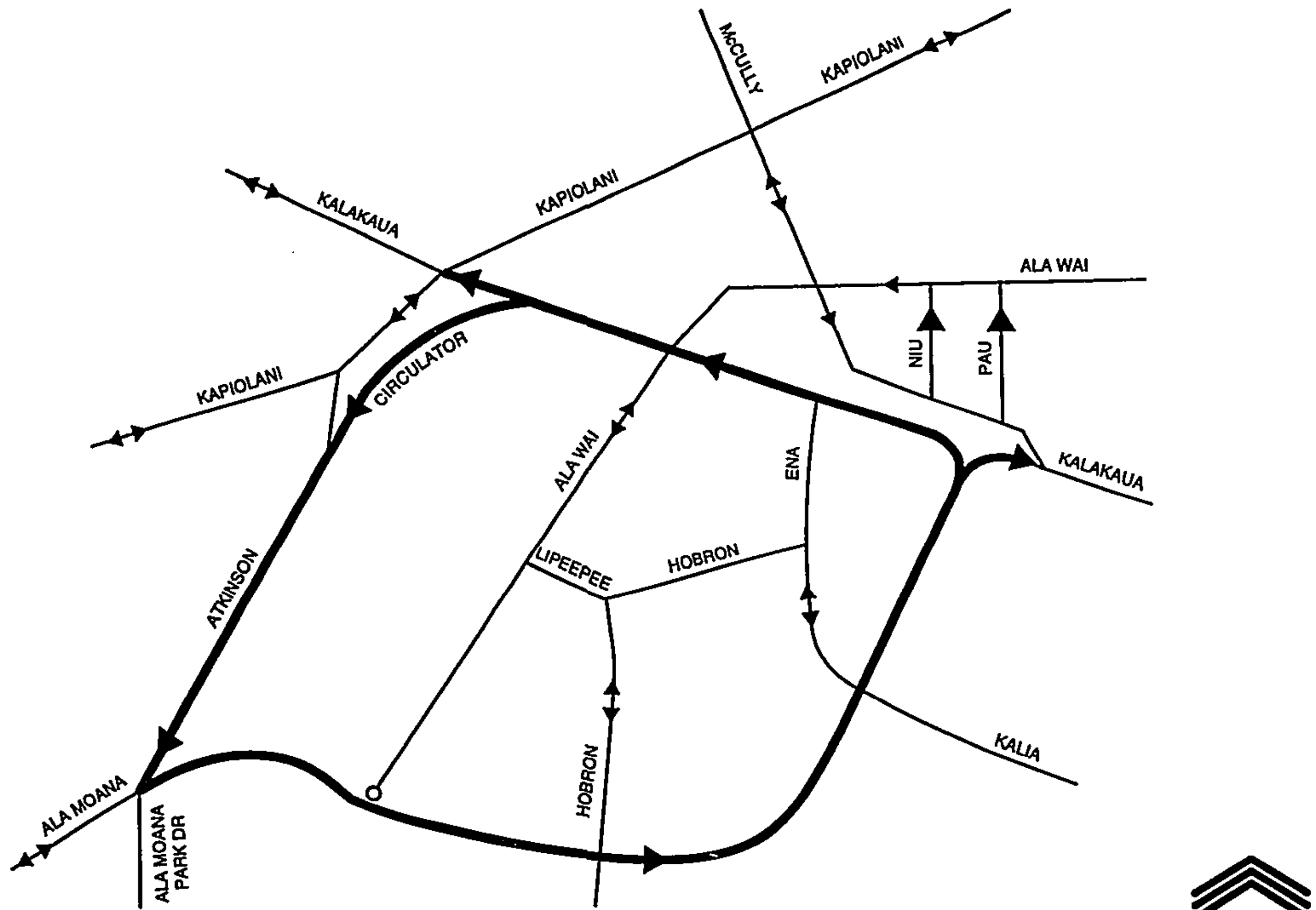
## ONE-WAY STREET COUPLET

The Waikiki Master Plan seeks to provide a more attractive landscaped entry to Waikiki along Ala Moana Boulevard, as well as added pedestrian amenities along this and other Waikiki streets. To accomplish this the City proposes to convert the portions of Ala Moana Boulevard and Kalakaua Avenue at the ewa end of Waikiki to one-way operation. The two one-way streets would require fewer traffic lanes, with these "excess" lanes then used to provide widened landscape and pedestrian areas.

Given this objective, the City is currently studying three circulation alternatives within this area:

i. Continue with the existing circulation patterns;
ii. Convert Ala Moana, Kalakaua, and Atkinson to a one-way counter-clockwise circulation system (Figure 5-1); and
iii. Convert Ala Moana and Kalakaua to one-way operations to form a clockwise circulation system (Figure 5-2).

Both of the one-way systems include construction of a new circulator roadway across the Aloha Motors site to permit the one-way traffic flow to circulate between Kalakaua Avenue and Atkinson Drive without having to use Kapiolani Boulevard. This two-lane circulator roadway would require the use of an approximately 34-foot-wide strip of property along the Kapiolani frontage. This would include an 11-foot-wide divider strip, with landscaping, between the circulator road and Kapiolani Boulevard.



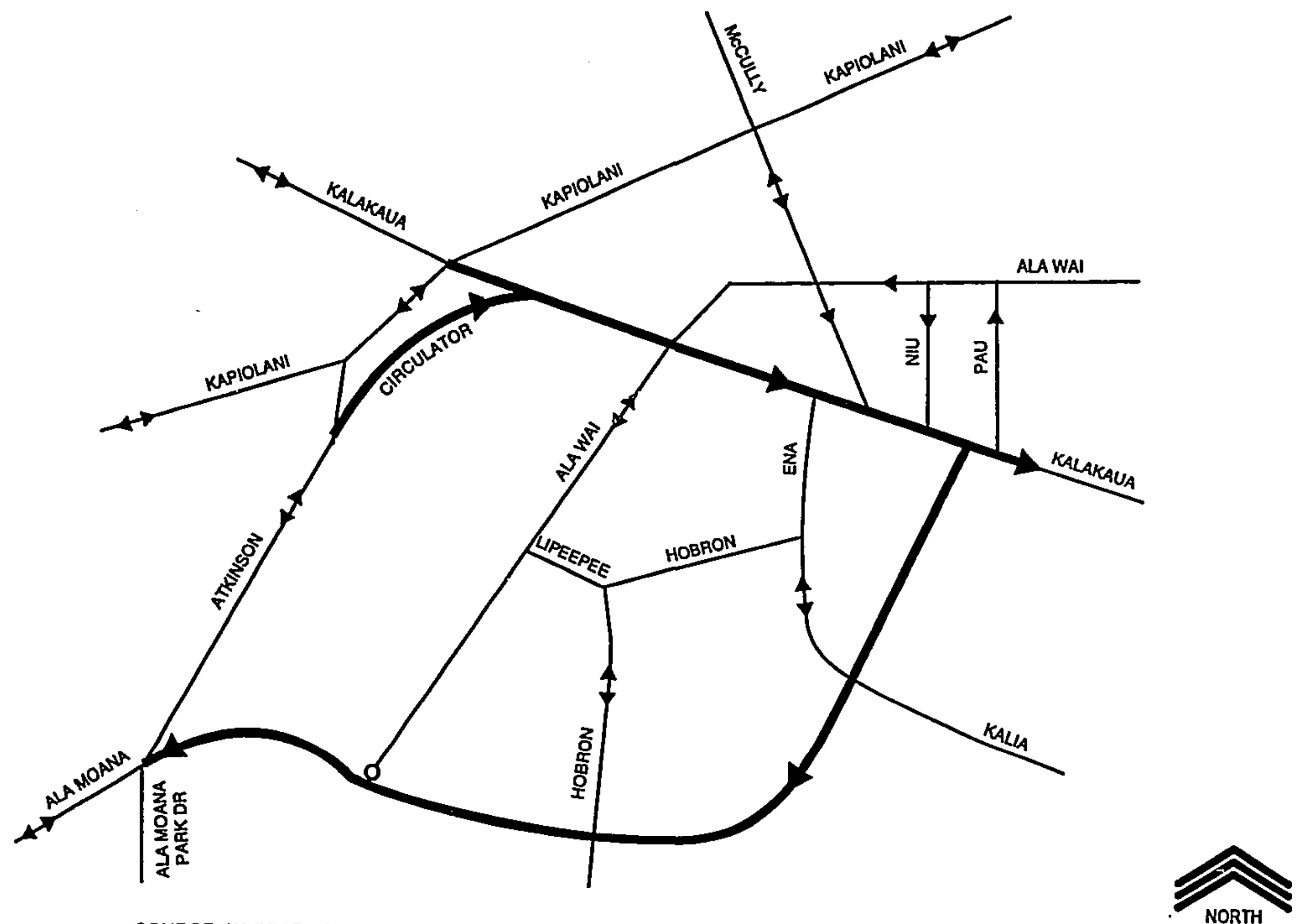

SOURCE: *Waikiki Regional Traffic Study-Final Report*, Cambridge Systematics, Inc., October 1993.

Figure 5-1

**PROPOSED ONE-WAY COUNTER CLOCKWISE ROADWAY CIRCULATION WITH CIRCULATOR ROAD**

WSA WILBUR SMITH ASSOCIATES

CONVCTR2\CIRCULAT-5/5/94C




SOURCE: *Waikiki Regional Traffic Study-Final Report*, Cambridge Systematics, Inc., October 1993.

WSA WILBUR SMITH ASSOCIATES

Figure 5-2
**PROPOSED ONE-WAY CLOCKWISE ROADWAY CIRCULATION WITH CIRCULATOR ROAD**

CONVCTR2\CIRCULAT-5/5/94C

The City currently has a consultant study underway to examine the traffic impacts and future roadway requirements with the existing two-way system and with the two one-way systems. The results of that study were not available during preparation of this environmental assessment. The following observations have been based upon review of the earlier Cambridge Systematics, Inc., study.[1]

## Counter-Clockwise One-Way System

1. This one-way pattern (Figure 5-1) would simplify access to the Convention Center for visitors to Oahu since all Waikiki traffic could reach the Center via Kalakaua Avenue. All Waikiki traffic would exit via Atkinson Drive and Ala Moana Boulevard.

2. The circulator roadway would make access to the Center difficult for most Honolulu residents who work or attend functions at the site. Access to the site would be limited to the two ends of the circulator near the Kalakaua Bridge and at Kahakai Drive. The number of residents entering via Kahakai Drive would be limited by either the one-way pattern or the short stacking distance for the left-turn lane on Atkinson Drive (the left-turn would be across same-direction traffic in the circulator makai-bound lanes). Most residents would have to enter Waikiki on Ala Moana Boulevard or McCully Street to reach the Center via Kalakaua Avenue.

3. The design and traffic operations of the circulator road would likely preclude any residents from exiting onto Kalakaua Avenue and travelling mauka on Kalakaua or turning onto Kapiolani, unless a traffic signal is installed at the Kalakaua exit. This new signal would adversely affect traffic flow along Kalakaua Avenue. Otherwise all residents would have to exit the area via Atkinson Drive and Ala Moana Boulevard.

4. The one-way makai-bound traffic flow on Atkinson Drive would likely result in trucks travelling to the site either via Ala Moana Boulevard through Waikiki, or from the freeway via McCully Street.

5. The circulator road would require taking about 20 feet or more additional right-of-way along the Kapiolani frontage, as well as an area at the corner of Kapiolani Boulevard and Kalakaua Avenue. These would reduce the available site area at critical points and would likely constrain the site options regarding the building layout and the on-site circulation.

6. Given the design requirements for the Convention Center and the site constraints, construction of the Center would likely preclude future construction of the circulator road within the site. Development of the Center would not preclude conversion of the streets to one-way operation.

[1] Op.cit.

## Clockwise One-Way System

1. This one-way pattern (Figure 5-2) matches the circulation pattern proposed for most Waikiki/visitor traffic with the existing two-way system, with travel to the site via Ala Moana and Atkinson, and return via Kalakaua Avenue. The one-way operation on Ala Moana Boulevard would allow provision of right-turn lanes to Atkinson Drive for Convention Center traffic.

2. Resident access to the site would be good if makai-bound traffic on Kalakaua Avenue is allowed to turn right into the Center. This would require installation of a traffic signal on the circulator road at its junction with Kalakaua Avenue to permit the Kalakaua traffic to turn right into the site across the circulator road traffic. The driveway and signal would have to be located closer to the canal end of the site to avoid the stacking of Convention Center traffic into Kapiolani Boulevard.

3. Resident traffic would leave the Center similar to the two-way street system.

4. Truck traffic could enter and exit the area via Atkinson Drive.

5. The clockwise system could require taking 10 feet more in width along the Kapiolani Boulevard frontage than the counter-clockwise system if an added right-turn lane is needed from Kapiolani Boulevard onto Kalakaua Avenue.

6. Given the design requirements for the Convention Center and the site constraints, construction of the Center would likely preclude future construction of the circulator road within the site. Development of the Center would not preclude conversion of the streets to one-way operation.

## Peripheral Parking/People-Mover System

The Waikiki Master Plan includes provision of up to 3,000 parking stalls in parking facilities at the ewa periphery of the Waikiki area for use by Waikiki employees and other long-term parkers. The parking spaces are to be provided outside Waikiki to reduce traffic circulation and the other adverse effects (land consumption, visual effects, emissions) of providing additional parking within Waikiki.

A Waikiki people-mover system would provide circulation between the peripheral parking and Waikiki, and circulation within Waikiki. The people-movers would be special rubber-tired buses with low floors and wide doors to facilitate entry and exit. The people-movers would provide service along designated routes at frequent headways, and may be used to replace a portion of TheBus service within Waikiki.

The City has recently retained consultants to initiate the planning of these systems. Since no specific location or design information is available, the following are general observations regarding these systems.

- Provision of additional parking or use of a portion of the planned parking (800 stalls) on the Convention Center site as peripheral parking for Waikiki would increase the traffic volumes forecast for site driveways and adjacent street sections, and could result in the need for additional roadway improvements.

- The design of the Convention Center would have to accommodate on-site circulation for the peripheral parking that minimizes any disruption to Center circulation, passenger loading, and parking activities by vehicles using the on-site peripheral parking.

- Development of peripheral parking facilities near the Convention Center could provide the additional parking needed to accommodate large local events at the Center in the evenings, or for the large number of food service workers needed for large banquets. Special shuttle bus service would be needed if the peripheral parking is farther away than convenient walking distance.

- The people-mover system could enhance transit access between Waikiki and the Center, depending upon the routing and scheduling of the service.

## RAPID TRANSIT GUIDEWAY AND STATION

The recent rapid transit development project plans included an elevated transit guideway extending along Kona Street, crossing Atkinson Drive, continuing along the Atkinson and Kapiolani edges within the project site, and then crossing Kalakaua Boulevard and continuing in a new median section along Kapiolani Boulevard. Earlier transit plans included alignments extending straight through the project site. A transit station would be included within the segment crossing the project site.

Based on the most recent rapid transit project, the transit guideway structure would be 30 to 35 feet above ground level, with a guideway width of about 30 feet. Support columns, about 10 feet wide would be needed at approximately 90-foot intervals along the guideway. The elevated guideway structure would widen to 50 feet or more in the station area, and vertical movement systems (elevators, escalators, stairways) would be needed for passenger access. Curvature of the guideway adjacent to the site would affect transit operating speeds.

The design plan for the Convention Center would affect the physical feasibility of future construction of a rapid transit guideway through the project area, the location of a transit station within the area, and the visual appearance and costs of the guideway. Construction of the guideway across the site would affect the visual appearance and operations of the Center. Key considerations are:

- The requirements for a large exhibition hall would be incompatible with any alignment straight across the site, and would require that any future alignment be located along the periphery of the site.

- A future guideway along the periphery would likely affect the appearance of the Convention Center from Atkinson Drive and Kapiolani Boulevard sides of the site. The visual impact may be increased in the station area due to the vertical transport system and other requirements.

- Location of a station in the proximity of the site would improve resident access to the Center. However, visitor access would not be directly affected unless a transit main line or feeder line is extended into Waikiki.

- Location of a station at the site would increase feeder bus and automobile traffic to the area for passenger drop-off/pick-ups. Pedestrian activity would increase at the site.

- The rapid transit line should result in a 2 to 5 percent reduction in future traffic along Kapiolani Boulevard and a small improvement in intersection conditions.[2]

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2 *Transportation Impacts Results Report, Appendices Volume 2*, Honolulu Rapid Transit Program, July 1992.

# APPENDIX A

## *METHODOLOGY FOR ANALYZING TRAFFIC CONDITIONS*

# APPENDIX A

## METHODOLOGY FOR ANALYZING TRAFFIC CONDITIONS

The Transportation Research Board (TRB), a division of the National Science Foundation, has developed standardized methods for use in evaluating the effectiveness and quality of service for roadways and streets. Different methodologies are available for analyzing traffic signal-controlled intersections and unsignalized intersections, both of which were used in evaluating present and future conditions for this study.

The TRB evaluation methods use a concept known as level-of-service (LOS). This concept describes facility operations on a letter basis from A to F, which signify excellent to unacceptable conditions, respectively. The methods generally compare traffic volumes on a facility to the facility's theoretical capacity. Capacity is estimated based on the facility's physical characteristics (e.g. number of lanes), traffic conditions (e.g. types of vehicles), and type of traffic controls. The comparisons are frequently referred to as the volume-to-capacity (V/C) ratio. The methodologies are described in the *1985 Highway Capacity Manual* (1985 HCM).[1]

### Traffic Signal-Controlled Intersections

Traffic conditions at traffic signal-controlled intersections were evaluated using the *Operations Analysis* methodology described in the 1985 HCM. Using this method, the level-of-service is based on the average delay time per vehicle passing through the intersection. The delay time, calculated in seconds, is the result of the phasing and timing of the traffic signal as well as the intersection's physical layout and the composition of the traffic. Average delay time and level-of-service are determined for the entire intersection, for each roadway approach, and for each traffic movement or lane group. A description of the characteristics and criteria associated with LOS A through LOS F is provided in Figure A-1.

The methodology also calculates a ratio of actual or estimated peak hour traffic volumes to the theoretical capacity of the intersection. This indicates the proportion of available capacity being used by traffic volumes and where there is unused capacity available for future traffic increases. This volume-to-capacity ratio (V/C) reflects the physical characteristics of the intersection and the traffic characteristics, and is somewhat independent of the efficiency of the traffic signal phasing/timing.

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1 Highway Capacity Manual, Special Report 209, Transportation Research Board, 1985.

The **OPERATIONS LEVEL METHODOLOGY**, which is described in the Transportation Research Board's Highway Capacity Manual, defines Level of Service (LOS) for signalized intersections in terms of delay. Technically, delay is the amount of time an average vehicle must wait at an intersection before being able to pass through the intersection. For signalized intersections, the relationship between LOS and delay is based on the average stopped delay per vehicle for a fifteen minute period.

**LEVEL OF SERVICE 'A' - Delay 0.0 to 5.0 seconds**
Describes operations with very low delay, i.e., less than 5 seconds per vehicle. This occurs when signal progression is extremely favorable. Most vehicles arrive during the green phase and are not required to stop at all.
***Corresponding V/C ratios usually range from 0.00 to 0.60.***

**LEVEL OF SERVICE 'B' - Delay 5.1 to 15.0 seconds**
Describes operations with delay in the range of 5 to 15 seconds per vehicle generally characterized by good signal progression and/or short cycle lengths. More vehicles are required to stop than for LOS 'A' causing higher levels of average delay.
***Corresponding V/C ratios usually range from 0.61 to 0.70.***

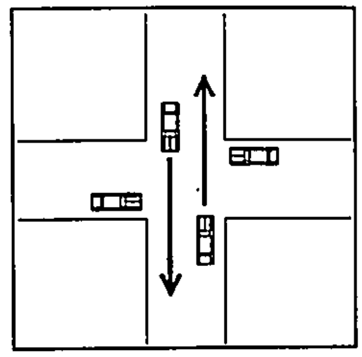
**LEVEL OF SERVICE 'C' - Delay 15.1 to 25.0 seconds**
Describes operations with delay in the range of 15 to 25 seconds per vehicle. Occasionally, vehicles may be required to wait more than one red signal phase. The number of vehicles stopping at this level is significant although many still pass through the intersection without stopping.
***Corresponding V/C ratios usually range from 0.71 to 0.80.***

**LEVEL OF SERVICE 'D' - Delay 25.1 to 40.0 seconds**
Describes operations with delay in the range of 25 of 40 seconds per vehicle. At LOS 'D', the influence of congestion becomes more noticeable. Many vehicles stop, and the proportion of vehicles not stopping declines. The number of vehicles failing to clear the signal during the first green phase is noticeable.
***Corresponding V/C ratios usually range from 0.81 to 0.90.***

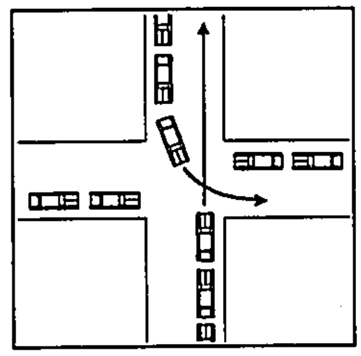
**LEVEL OF SERVICE 'E' - Delay 40.1 to 60.0 seconds**
Describes operations with delay in the range of 40 to 60 seconds per vehicle. These high delay values generally indicate poor signal progression, long cycle lengths and high V/C ratios. Vehicles frequently fail to clear the intersection during the first green phase.
***Corresponding V/C ratios usually range from 0.91 to 1.00.***

**LEVEL OF SERVICE 'F' - Delay 60.1 seconds plus**
Describes operations with delay in excess of 60 seconds per vehicle. This condition often occurs with oversaturation, i.e., when arrival flow rates exceed the capacity of the intersection.
***Corresponding V/C ratios of over 1.00 are usually associated.***

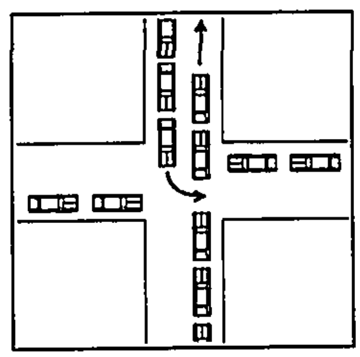
SOURCE: Transportation Research Board, "Operations Level Methodology-Signalized Intersections", Highway Capacity Manual, Special Report 209, 1985.



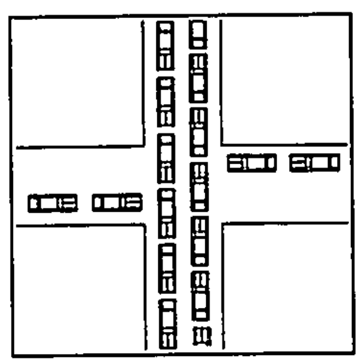
LOS 'A'



LOS 'C'



LOS 'D'



LOS 'F'

Figure A-1
**LEVEL OF SERVICE DIAGRAM**

## Unsignalized Intersections

At intersections with STOP sign controls, the level-of-service was calculated using the 1985 HCM procedures for intersections with two-way STOP sign control (STOP or YIELD signs on minor streets) and the *1991 Circular 373*[2] procedures for those intersections with STOP signs on all approaches (three- or four-way STOP sign control). In both methodologies, six levels-of-service, A through F, are used to describe traffic conditions.

For three-leg ("T") and four-leg intersections with STOP or YIELD controls on the minor street approaches, the standard procedure provides a comparative measure of delay for those movements which must yield to conflicting movements at the intersection. The movements which must yield include:

- Left-turn out of the side street;
- Right-turn out of the side street; and
- Left-turn into the side street.

Through vehicles on the major streets are not required to yield to other movements at T- and two-way controlled intersections. The general indicator of intersection delay is determined by calculating the one-hour capacity for each key movement, based on conflicting traffic volumes, and then comparing the number of vehicles making that maneuver to the calculated capacity. The unused or "reserve" capacity for the movement is then used to identify a level-of-service for that movement. Unlike signalized analysis, an overall intersection level-of-service is not calculated but rather a level-of-service is calculated for each lane group.

The level-of-service criteria for unsignalized intersections with minor street STOP controls is defined in Table A-1.

For intersections with STOP or YIELD controls on all approaches, the *Circular 373* methodology was used to assess level-of-service. This methodology is also based on analyzing each intersection approach independently, but then provides an average overall level-of-service for each intersection. Flow rates and approach capacities are calculated for each approach and volume-to-capacity ratios and delays are determined. Individual approach levels-of-service are based on volume-to-capacity ratios. A weighted average of approach delays is used in arriving at an overall intersection delay and level-of-service. Table A-2 shows the level-of-service criteria for four-way STOP controlled intersections.

[2] *Interim Materials on Unsignalized Intersection Capacity*, Circular 373, Transportation Research Board, July 1991.

**Table A-1**

**LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS**
**Hawaii Convention Center - Transportation Impact Assessment**

| LOS | Reserve Capacity (pcph) | Expected Delay |
|---|---|---|
| A | 400 or More | Little or no delays |
| B | 300 - 399 | Short traffic delays |
| C | 200 - 299 | Average traffic delays |
| D | 100 - 199 | Long traffic delays |
| E | -0- - 99 | Very long traffic delays |
| F | Negative Value | Exceeds capacity with extreme traffic delays |

LOS = Level-of-Service
pcph = passenger cars per hour
Source: *Highway Capacity Manual*, Chapter 10

**Table A-2**

**LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED ALL-WAY STOP INTERSECTIONS**
**Hawaii Convention Center - Transportation Impact Assessment**

| LOS | Average Stopped Delays (seconds/vehicle) |
|---|---|
| A | <5 |
| B | 5 - 10 |
| C | 10 - 20 |
| D | 20 - 30 |
| E | 30 - 45 |
| F | >45 |

Source: Transportation Research Board, *Circular 373: Interim Materials on Unsignalized Intersection Capacity*, July, 1991, Page 19.

# APPENDIX B

## PEDESTRIAN WALKWAY LEVELS OF SERVICE

**LEVEL OF SERVICE A**

Pedestrian Space: ≥ 130 sq ft/ped    Flow Rate: ≤ 2 ped/min/ft

At walkway LOS A, pedestrians basically move in desired paths without altering their movements in response to other pedestrians. Walking speeds are freely selected, and conflicts between pedestrians are unlikely.

**LEVEL OF SERVICE B**

Pedestrian Space: ≥ 40 sq ft/ped    Flow Rate: ≤ 7 ped/min/ft

At LOS B, sufficient area is provided to allow pedestrians to freely select waking speed, to bypass other pedestrians, and to avoid crossing conflicts with others. At this level, pedestrians begin to be aware of other pedestrians, and to respond to their presence in the selection of walking path.

**LEVEL OF SERVICE C**

Pedestrian Space: ≥ 24 sq ft/ped    Flow Rate: ≤ 10 ped/min/ft

At LOS C, sufficient space is available to select normal walking speeds, and to bypass other pedestrians in primarily unidirectional streams. Where direction or crossing movements exist, minor conflicts will occur, and speeds and volume will be somewhat lower.

**LEVEL OF SERVICE D**

Pedestrian Space: ≥ 15 sq ft/ped    Flow Rate: ≤ 15 ped/min/ft

At LOS D, freedom to select individual walking speed and to bypass other pedestrians is restricted. Where crossing or reverse-flow movements exist, the probability of conflict is high, and its avoidance requires frequent changes in speed and position. The LOS provides reasonably fluid flow; however, considerable friction and interaction between pedestrians is likely to occur.

**LEVEL OF SERVICE E**

Pedestrian Space: ≥ 6 sq ft/ped    Flow Rate: ≤ 25 ped/min/ft

At LOS E, virtually all pedestrians would have their normal walking speed restricted, requiring frequent adjustment of gait. At the lower range of this LOS, forward movement is possible only by "shuffling." Insufficient space is provided for passing of slower pedestrians. Cross- or reverse-flow movements are possible only with extreme difficulties. Design volumes approach the limit of walkway capacity, with resulting stoppages and interruption to flow.

**LEVEL OF SERVICE F**

Pedestrian Space: ≥ 6 sq ft/ped    Flow Rate: ≤ variable

At LOS F, all walking speeds are severely restricted and forward progress is made only by "shuffling". There is frequent, unavoidable contact with other pedestrians. Cross- and reverse-flow movements are virtually impossible. Flow is sporadic and unstable Space is more characteristic of queued pedestrians than of moving pedestrian streams.

SOURCE: *Highway Capacity Manual, Special Report 209*, Transportation Research Board, 1985.

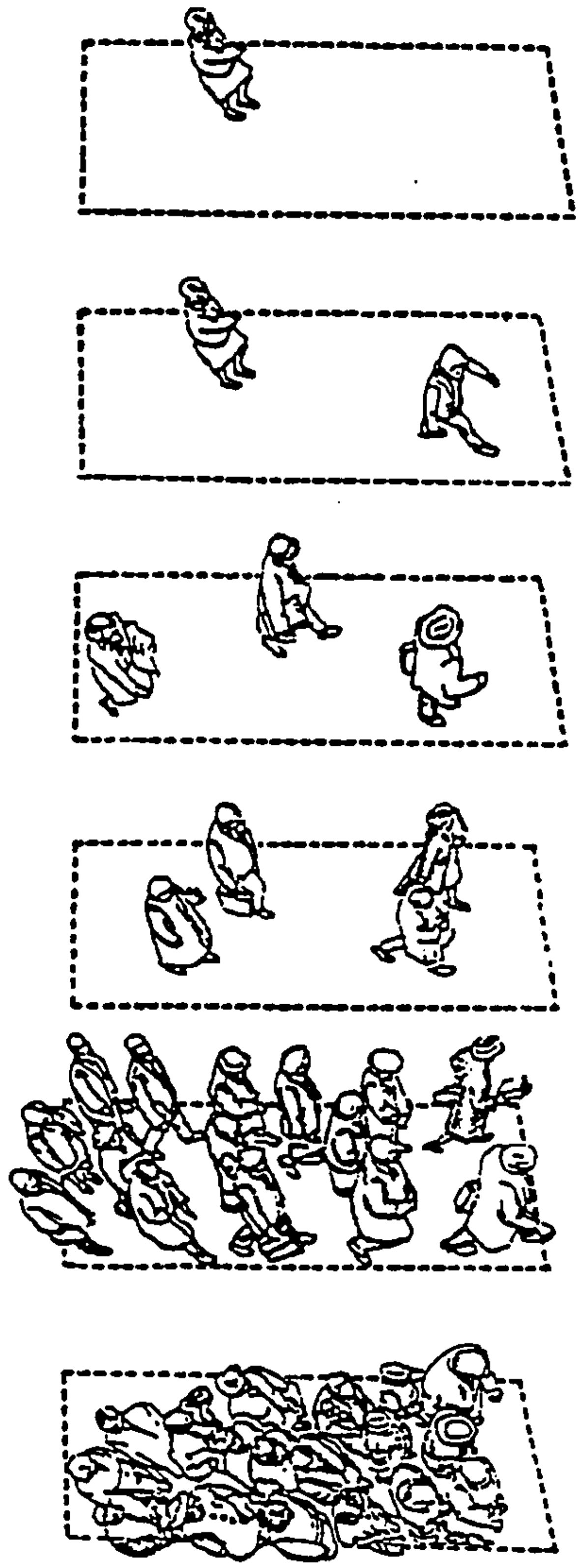


Figure B-1
**PEDESTRIAN WALKWAY LEVELS OF SERVICE**

**Wilson Okamoto & Associates, Inc.** Planners • Engineers • Architects Honolulu, Hawaii