A03-738 GENTRY INVESTMENT PROPERTIES
PETITION FOR DISTRICT BOUNDARY
AMENDMENT (Oahu)

ORIGINAL

BEFORE THE LAND USE COMMISSION

OF THE STATE OF HAWAII

In the Matter of the Petition of	)	DOCKET NO. A03-738
GENTRY INVESTMENT PROPERTIES	)	STIPULATED PETITIONER'S PROPOSED FINDINGS OF FACT, CONCLUSIONS OF LAW, AND DECISION & ORDER; EXHIBIT "A"; CERTIFICATE OF SERVICE
Petition For District Boundary Amendment	)	

LAND USE COMMISSION
STATE OF HAWAII
2003 OCT 30 A 8:41

STIPULATED PETITIONER'S PROPOSED FINDINGS OF FACT, CONCLUSIONS OF LAW, AND DECISION & ORDER

EXHIBIT "A";

CERTIFICATE OF SERVICE

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GENTRY INVESTMENT PROPERTIES

ORIGINAL

BEFORE THE LAND USE COMMISSION

OF THE STATE OF HAWAII

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STATE OF HAWAII
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STPULATED PETITIONER'S PROPOSED FINDINGS OF FACT, CONCLUSIONS OF LAW, AND DECISION AND ORDER

The parties hereto have agreed and stipulated to the attached Petitioner's Proposed Findings of Fact, Conclusions of Law, and Decision and Order.

The parties hereto may execute this stipulation by counterpart and said executed counterparts shall constitute a whole and complete stipulation.

Dated: Honolulu, Hawaii, _____, 2003.

GENTRY INVESTMENT PROPERTIES

By _____

Matsubara, Lee & Kotake
Benjamin M. Matsubara
Curtis T. Tabata
Its Attorneys

ORIGINAL

HASEKO (EWA), INC.

By _____
Oshima Chun Fong & Chung
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Randall K. Ishikawa
Its Attorneys

LAND USE COMMISSION
STATE OF HAWAII
2003 OCT 30 A 8:41

HAWAII PRINCE HOTEL WAIKIKI CORP.

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STATE OF HAWAII
OFFICE OF PLANNING

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Mary Lou Kobayashi
Its Planning Program Administrator

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF PLANNING AND PERMITTING

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Its Director

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LAND USE COMMISSION
STATE OF HAWAII
2003 OCT 30 A 8:21

HAWAII PRINCE HOTEL WAIKIKI CORP.

By Jerry Kondo

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STATE OF HAWAII
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CITY AND COUNTY OF HONOLULU
DEPARTMENT OF PLANNING AND PERMITTING

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Its Director

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LAND USE COMMISSION
STATE OF HAWAII
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STATE OF HAWAII
OFFICE OF PLANNING

By Mary Lou Kobayashi
Mary Lou Kobayashi
Its Planning Program Administrator

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF PLANNING AND PERMITTING

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ORIGINAL

HASEKO (EWA), INC.

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Oshima Chun Fong & Chung
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LAND USE COMMISSION
STATE OF HAWAII
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ORIGINAL

BEFORE THE LAND USE COMMISSION

OF THE STATE OF HAWAII

In the Matter of the Petition of	)	DOCKET NO. A03-738
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LAND USE COMMISSION
STATE OF HAWAII
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PETITIONER'S PROPOSED FINDINGS OF FACT, CONCLUSIONS OF LAW, AND DECISION AND ORDER

EXHIBIT "A"

BEFORE THE LAND USE COMMISSION

OF THE STATE OF HAWAII

In the Matter of the Petition of	)	DOCKET NO. A03-738
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Petition For District Boundary Amendment	)	

PETITIONER'S PROPOSED
FINDINGS OF FACT, CONCLUSIONS OF LAW,
AND DECISION AND ORDER

GENTRY INVESTMENT PROPERTIES, a Hawaii limited partnership ("Petitioner"), filed a Petition For District Boundary Amendment on March 21, 2003, pursuant to chapter 205, Hawaii Revised Statutes ("HRS"), and chapter 15-15, Hawaii Administrative Rules ("HAR"), to amend the State land use district boundary to reclassify approximately 282.614 acres of land at Ewa, Oahu, Hawaii, identified as Tax Map Key Nos. 1-9-1-10:7 and 1-9-1-69:5 (collectively the "Property"), from the State Land Use Agricultural District to the State Land Use Urban District for a residential and an industrial and commercial complex ("Project").

The Land Use Commission of the State of Hawaii ("Commission"), having heard and examined the testimony, evidence and arguments of counsel presented during the hearing and the proposed findings of fact, conclusions of law, and decision and order filed by the Petitioner and the responses of the State Office of Planning

("OP"), the City and County of Honolulu ("County"), Intervenor Haseko (Ewa), Inc. ("Haseko") and Intervenor Hawaii Prince Hotel Waikiki Corp. ("Hawaii Prince"), hereby makes the following findings of fact, conclusions of law, and decision and order:

FINDINGS OF FACT

PROCEDURAL MATTERS

1. On March 21, 2003, Petitioner filed a Petition for District Boundary Amendment and Exhibits "1"-"3" ("Petition").

2. On April 21, 2003, Haseko filed its Notice of Intent to Intervene.

3. On April 25, 2003, Petitioner filed its Amended Certificate of Service of Petition for District Boundary Amendment.

4. On April 28, 2003, Petitioner filed its Amended Affidavit of Service of Petition for District Boundary Amendment.

5. By letter dated May 2, 2003, the Executive Officer deemed the Petition a proper filing as of April 28, 2003.

6. On May 20, 2003, Petitioner filed its Errata to Petition for District Boundary Amendment filed March 21, 2003.

7. On May 29, 2003, OP filed its Statement of Position of the Office of Planning in Support of Petition.

8. On June 2, 2003, County filed its Statement of Position of the Office of the Department of Planning and Permitting to the Land Use Commission.

9. On June 6, 2003, Haseko filed Haseko (Ewa), Inc.'s Submission of Witness and Exhibit Lists.

10. On June 6, 2003, Petitioner filed Petitioner's List of Exhibits and List of Witnesses and Attachments "1" and "2".

11. On June 12, 2003, a prehearing conference was conducted in Conference Room 405 of the Leiopapa A Kamehameha Building, 235 South Beretania Street, 4th Floor, in Honolulu, Hawaii, with representatives of Petitioner, OP, County and Haseko present.

12. On June 12, 2003, Haseko filed Haseko (Ewa), Inc.'s Application to Intervene.

13. On June 19, 2003, Petitioner filed Gentry Investment Properties Statement of No-Objection and Non-Appearance of Counsel as to Haseko (Ewa), Inc.'s Application to Intervene filed June 12, 2003.

14. On June 19, 2003, the Commission filed its Prehearing Order.

15. On June 23, 2003, Hawaii Prince filed Intervenor-Applicant Hawaii Prince Hotel Waikiki Corp.'s Petition to Intervene.

16. On July 3, 2003, County filed Department of Planning and Permitting's Amended List of Witnesses and List of Exhibits.

17. On July 3, 2003, Petitioner filed Petitioner's First Amended List of Exhibits and First Amended List of Witnesses, Attachment "A", Exhibits "1"-"8" and Attachment "B".

18. On July 7, 2003, the Commission filed its Order Granting Haseko (Ewa), Inc.'s Application to Intervene.

19. On July 8, 2003, OP filed Office of Planning's List of Exhibits and List of Witnesses.

20. On July 8, 2003, the Commission received correspondence from Department of Land and Natural Resources, Historic Preservation Division, indicating that "We believe that no historic properties will be affected by this undertaking."

21. On July 9, 2003, County filed its Second Amended List of Witnesses and Exhibits.

22. On July 10, 2003, the Commission considered the Petition at its meeting in Honolulu, Hawaii. Entering appearances were Benjamin M. Matsubara, Esq. and Curtis T. Tabata, Esq. for Petitioner, David K. Tanoue, Deputy Corporation Counsel for the County, John W.K. Chang, Deputy Attorney General, Judith Henry and Abe Mitsuda for OP, Linnel T. Nishioka, Esq. for Haseko and J. Douglas Ing, Esq. and Teri Y. Kondo, Esq. for Hawaii Prince.

23. After the appearances of the parties, the Commission heard Hawaii Prince's application for intervention at which time no opposition was presented and no

written opposition had been filed, and a vote was taken on this motion. There being a vote tally of 6 ayes, 0 nays, and 3 absent, the motion carried.

24. The following individuals provided public testimony: Norman Pang, Tesha Malama and Suzanne Alawa.

25. Following the public testimony, the Commission conducted a hearing on the Petition pursuant to a public notice published on June 6, 2003, in the Honolulu Star-Bulletin.

26. On July 11, 2003, the Commission continued the hearing on the Petition, Petitioner Gentry Investment Properties' and Intervenor Haseko (Ewa), Inc.'s Stipulation was filed and entered into evidence and the hearing on the Petition was closed on July 11, 2003, subject to additional evidence that may be submitted by Hawaii Prince.

27. On July 18, 2003, the Commission received correspondence from Hawaii Prince indicating that they would not be calling any witnesses or presenting any testimony with respect to this docket.

28. On July 30, 2003, the Commission served upon the parties the Order Granting Hawaii Prince's Petition to Intervene.

29. On August 7, 2003, the Commission, by its own motion, re-opened the hearing for the limited purpose of receiving additional and clarifying testimony from the State Department of Transportation Highway Division Chief. The Letter

Agreement between the Petitioner and Hawaii Prince, which sets forth the agreement between the two parties regarding drainage, was admitted into evidence, written public testimony was received from Tesha Malama, and the hearing on the Petition was closed.

30. A draft Environmental Impact Statement has been submitted, the comments have been received, and the responses to those comments are nearly complete. It is anticipated that by the end of 2003, Petitioner will have a final approved Environmental Impact Statement through the Office of Environmental Quality Control. [TR 7/10/03, p. 160-161]

DESCRIPTION OF PETITION AREA

31. The Petition Area is located in Ewa, Oahu, Hawaii, consisting of approximately 282.614 acres, and is identified by: 1) Tax Map Key No. 1-9-1-10:7, consisting of 114.617 acres; and 2) Tax Map Key No. 1-9-1-69:5, consisting of 167.997 acres. [Petitioner's Exhibit ("PET Ex.") 1, p. 1]

32. The Ewa Makai-East portion of the Petition Area (Tax Map Key No. 1-9-1-10:7) lies between proposed single family homes in Ewa by Gentry and the Hawaii Prince Golf Course, and extends east of Fort Weaver Road to the U. S. Navy property boundary. The Ewa Makai-West portion of the Petition Area (Tax Map Key No. 1-9-1-69:5) lies west of Fort Weaver Road, between Ewa by Gentry's Sun Terra residential community and the Coral Creek Golf Course (to the north) and Haseko's planned

Ocean Pointe community (to the south). The Barbers Point Naval Air Station Golf Course lies to the West of the Petition Area. [PET Ex. 1, p. 3, 4 and 13]

33. Ewa Makai-West is contiguous to Urban Districts to the north, west and south. Ewa Makai-East is contiguous to the Urban District to the north and Agricultural Districts to the south and east. [PET Ex. 1, p. 5]

34. The Petition Area consists of fallow agricultural lands which were previously leased for many years by Oahu Sugar Company, Ltd. for the production of sugar cane. These leases expired a number of years ago, and for the past several years, nearly all of the Petition Area was leased to Ralph's Ranch on a month-to-month lease. However, Ralph's Ranch, which also leases lands in Kunia and Kahuku, recently vacated the Petition Area, so the Petition Area is no longer in any productive use. [PET Ex. 1, p. 14; PET Ex. 3, p. 2; Hearing Transcript of July 10, 2003 ("TR 7/10/03"), p. 130]

35. Fee simple ownership of the Petition Area is vested in The Estate of James Campbell, whose principal place of business is 1001 Kamokila Boulevard, Kapolei, Hawaii, 96707. [PET Ex. 1, Appendix B and D]

36. The Estate of James Campbell has authorized Petitioner to submit the Petition and to develop the Petition Area as set forth in its written Authorization dated December 4, 2002. [PET Ex. 1, Appendix B and D]

37. The Petition Area contains soil types as determined by the Soil Conservation Service, now known as the Natural Resource Conservation Service (NRCS):

		Acres
EmA	'Ewa silty clay loam, moderately shallow, 0 to 2 percent slopes.	65.1
EmB	'Ewa silty clay loam, moderately shallow, 2 to 6 percent slopes.	21.4
MnC	Mamala stony silty clay loam, 0 to 12 percent slopes.	196.1
	TOTAL	282.6

[PET Ex. 1, Exhibit BB, p. 2]

38. Approximately 30.6% of the Subject Property is rated "Prime" (soil types EmA and EmB), and 69.4% is rated "Other" (soil type MnC) under the "Agricultural Lands of Importance in the State of Hawaii" (ALISH) classification system. [PET Ex. 1, Exhibit BB, p. 3]

39. Approximately 23.2% of the Petition Area is rated "A" and the remaining 76.8% is rated "C" under the UH Land Study Bureau's (LSB) Overall Productivity Rating. [PET Ex. 1, Exhibit BB, p. 3-4]

40. The elevation of the Petition Area ranges from about 20 to 35 feet above mean sea level. [PET Ex. 1, Exhibit BB, p. 4]

41. Except for two pronounced sumps near the eastern boundary of Ewa Makai-East, slopes are approximately 1% in the Petition Area. [PET Ex. 1, Exhibit BB, p. 4]

42. Average annual rainfall in the Petition Area is slightly more than 20 inches. [PET Ex. 1, Exhibit BB, p. 5]

43. The Petition Area receives considerable sunshine, with an average daily insolation exceeding 500 calories per square centimeter. The average low temperature range from about 60°F in the winter to about 70°F in the summer, while average high temperature ranges from just under 80°F in the winter to just under 90°F in the summer. [PET Ex. 1, Exhibit BB, p. 4]

44. The Petition Area is not in an area designated as a flood zone in the Federal Flood Insurance Rate maps. [PET Ex. 3, p. 2; TR 7/10/03, p. 130]

PROPOSAL FOR RECLASSIFICATION

45. The 282.614 acre Ewa Makai development is being proposed as a continuation of the existing Ewa by Gentry. This existing community, situated immediately north of the Ewa Makai parcels, is a 1,000 acre planned development of approximately 7,000 homes, of which 5,383 had been completed and closed as of January 31, 2003. [PET Ex. 3, p. 2]

46. The Conceptual Master Plan for the Ewa Makai property includes approximately 550 single family detached units on approximately 93 acres, 675 cluster

units on approximately 64 acres and 640 multi-family units on approximately 32 acres. It also includes community facilities (a middle school, a community recreation center complex, and two church/daycare sites) on approximately 24 acres, an industrial/commercial complex on approximately 30 acres, parks on approximately 11.5 acres, open space for infrastructure/drainage on approximately 14 acres and roadways on approximately 14.5 acres. [PET Ex. 1, p. 21; PET Ex. 3, p. 2-3]

47. Single family homes will average 5,000 square feet with an estimated density of 7.5 units per acre and average in price between approximately $300,000.00 to $435,000.00 (2003 dollars), cluster homes will have an estimated density of 12.5 units per acre and range in price between approximately $200,000.00 to $300,000.00 (2003 dollars) and multi-family residential homes will have an estimated density of 20 units per acre and will range in price between approximately $150,000.00 to $200,000.00 (2003 dollars). [PET Ex. 1, p. 20, 21-22; PET Ex. 3, p. 3]

48. Two public parks are planned for the Petition Area. The 8 acre park in Ewa Makai-West will be centrally located and within walking or biking distance for many area residents. The 3.5 acre park is an extension of a 6.8 acre park which is planned for the existing Ewa by Gentry development along Keaunui Drive. A 2 acre private community recreation center complex is also planned in Ewa Makai-West. [PET Ex. 1. p. 22; PET Ex. 3, p. 3-4; TR 7/10/03, p. 135]

49. A 30 acre industrial-commercial complex is intended as an adjunct to the proposed 20 acre Laulani Commercial Center which is on land not included in the Petition Area and retained by Campbell Estate and already zoned for urban uses. The industrial-commercial complex is intended to provide supplemental services to meet the needs of the Ewa community and to also provide a major source of employment for an estimated 1,500 people at build-out. Lots would range in size from 15,000 square feet to 3 acres with a total of 35 to 40 expected lots to be used for warehousing, light assembly operations, wholesaling, commercial and other permitted uses. Buildings are not expected to exceed 40 feet in height, and a 30-foot wide landscape and drainage easement will be provided between the buildings and the Ocean Pointe boundary. [PET Ex. 1, p. 22-23; PET Ex. 3, p.4; TR 7/10/03, p. 136]

50. Petitioner plans to convey to the Department of Education, State of Hawaii, an 18 acre site on Kapolei Parkway for the construction of a new middle school for grades 6 through 8. Two 2 acre church sites are planned for Ewa Makai-West and Ewa Makai-East. It is envisioned that the church sites will also serve as centers for day care and/or other community services during the weekdays. [PET Ex. 1, p. 23; PET Ex. 3, p. 4; TR 7/10/03, p. 136]

51. Petitioner plans on dedicating a 2 acre site to the Ewa by Gentry Community Association for the construction of a recreation facility for use by its residents. [PET Ex. 1, p. 23]

52. Petitioner has agreed to comply with the following affordable housing requirements that the County will probably recommend in satisfaction of Revised Ordinances of Honolulu ("ROH") Section 99-51 and 01-33: (1) at least 10% of the total number of units to be developed in the project area must be affordable to households earning up to and including 80% of the area median income as determined by the U.S. Department of Housing and Urban Development ("HUD"), and (2) at least an additional 20% of the total number of units to be developed in the project area shall be affordable to households earning up to and including 120% of the area median income as determined by HUD. [PET Ex. 1, Appendices E, F and G]

53. It is projected that it will take one to one and a half years to obtain the necessary Federal, State and County entitlements and approvals for the first phase, and that the Project is intended to be substantially completed within ten (10) years from the date of LUC approval. [PET Ex. 1, p. 26-27]

54. Petitioner projects that the 1865 total residential units for the Project will be developed according to the following schedule: 1) 2005/90 units; 2) 2006/192 units; 3) 2007/227 units; 4) 2008/270 units; 5) 2009/246 units; 6) 2010/240 units; 7) 2011/123 units; 8) 2012/90 units; 9) 2013/87 units; 10) 2014/60 units; 11) 2015/90 units; 12) 2016/70 units; and 13) 2017/80 units. [PET Ex. 1, p. 27]

55. The proposed development will produce design and construction employment opportunities during the construction phases. Approximately $84.9

million is estimated to be spent on the design and construction of the project infrastructure, approximately $260.7 million is estimated to be spent on the construction of the residences, approximately $85.6 million is estimated to be spent on the construction of the industrial-commercial complex, and approximately $1.38 million is estimated to be spent on the construction of park improvements. [PET Ex. 1, Exhibit KK, p. VI-3, Exhibit VI-G]

PETITIONER'S FINANCIAL CAPABILITY TO UNDERTAKE THE PROPOSED DEVEOPMENT

56. Petitioner's unaudited financial statements as of December 31, 2002, reflect total assets of $85,615,597, total liabilities of $34,684,735, and partners' capital of $50,930,862. [PET Ex. 1, Exhibit AA]

57. Petitioner intends to use a combination of cash reserves and financing to acquire the two parcels for the development. After Petitioner obtains its land entitlements, it will sell the land in smaller increments to Gentry Homes, Ltd., and Gentry Homes, Ltd. will finance the infrastructure and development costs with its current $34 million revolving line of credit and the Petition Area will serve as additional collateral for the line of credit. It is anticipated that this line of credit will have sufficient capacity to finance all site and building improvements for the project. [PET Ex. 1, Exhibit AA]

STATE AND COUNTY PLANS AND PROGRAMS

58. The Petition Area is currently designated in the State Land Use Agricultural District. [PET Ex. 1, p. 5]

59. County's Ewa Development Plan, adopted in 1997, designates the Petition Area as being within the Urban Growth Boundary, and a part of the network of master planned residential communities. [PET Ex. 66 and 67; PET Ex. 3, p. 9 and 10; TR 7/10/03, p. 145]

60. Ewa Makai-West is zoned AG-2 General Agriculture District and Ewa Makai-East is zoned AG-1 Restricted Agriculture District. [PET Ex. 1, p. 6]

61. The Petition Area is not located along the shoreline or next to any beaches and is not within the Special Management Area, and should not have an impact on the Coastal Zone Management Area, and is consistent with the various objectives and policies of the Coastal Zone Management Program, as set forth in Section 205A, HRS. [PET Ex. 1, p. 58]

NEED FOR THE PROPOSED DEVELOPMENT

62. John Child & Company prepared a Market Assessments and Fiscal Economic Impacts analysis in September of 2001 and updated in February of 2003. The Market Assessment concluded that the 1865 residential units proposed for the Project are projected to be sold between 2006 and 2013. It is estimated that Petitioner will sell an average of 287 residential units each year from 2001 to 2009, an average of 276 units

from 2010 to 2013, and an average of 265 units from 2014 to 2016. [PET Ex. 1, Exhibit KK, p. 4-5; PET Ex. 4, p. 2-3]

63. Petitioner proposes to develop the 30 acre industrial-commercial site in 2007, and the demand for industrial-commercial uses supports development of the 30 acre site in the Petition Area. [PET Ex. 1, Exhibit KK, p. 5-6; PET Ex. 4, p. 3-4]

ECONOMIC IMPACTS

64. The projected new construction related jobs created annually on the Project is estimated to average about 310 direct jobs and 547 indirect and induced jobs for a total of about 857 new jobs over the Project's construction period from 2005 to 2013. [PET Ex. 1, Exhibit KK, p. VII-3 - VII-4; PET Ex. 4, p. 4]

65. In addition to the construction related jobs, the development of the 30 acre industrial-commercial complex will create approximately 1,500 permanent long-term operational employment, including light and/or service industrial and retail uses compatible with the residential character of the surrounding neighborhood. [PET Ex. 1, Exhibit KK, p. VII-4; PET Ex. 4, p. 5]

66. The Project is anticipated to have a net fiscal impact on real property taxes of $8.3 million during the construction period of 2005 through 2013, and the annual net fiscal impact is anticipated to be $1.81 million beginning at 2014 (2001 dollars). [PET Ex. 1, Exhibit KK, p. VIII-4 - VII-9; PET Ex. 4, p. 5]

67. The net fiscal impact on State of Hawaii general excise tax revenues and State of Hawaii income tax revenues are anticipated to be $45.2 million during the construction period of 2005 through 2013, and the annual net fiscal impact is anticipated to be $3.65 million beginning at 2014 (2001 dollars). [PET Ex. 1, Exhibit KK, p. VIII-1 - VIII-4; PET Ex. 4, p. 5]

SOCIAL IMPACTS

IMPACTS UPON RESOURCES OF THE AREA

Agricultural Resources

68. Decision Analysts Hawaii, Inc. prepared an Impact on Agriculture study in February 2002. The impact study has concluded that no existing sugarcane or pineapple plantations will be impacted by the Project, and the Project will not limit the potential growth of diversified agriculture due to the vast amount of land that has been released from plantation agriculture since the late 1960s. [PET Ex. 1, Exhibit BB, p. 7 and 8]

Flora and Fauna

69. Char & Associates prepared a Botanical Survey in June of 2001. The Botanical Study concluded that the vegetation on the site consists largely of introduced or alien plant species, and that no threatened or endangered species were found in the Petition Area, and therefore the proposed Project is not expected to have a significant negative impact on the botanical resources. [PET Ex. 1, Exhibit DD, p. 4-5]

70. Mr. Phil Bruner, Environmental Consultant, prepared an Avifaunal and Feral Mammal Survey on May 9, 2001. The Avifaunal and Feral Mammal Survey concluded that no native birds were recorded on the field survey and no unique resources important to native birds were discovered on the Petition Area. The only species of mammal observed on the survey was the Small Indian Mongoose. [PET Ex. 1, Exhibit EE, p. 2-4]

Archaeological/Historical Resources

71. Pacific Legacy, Inc. prepared an Archaeological Survey in January of 2003. The Archaeological Survey concluded that no archaeological sites are present within the Petition Area, and no cultural resources were found within the Petition Area.

While there are no surface archaeological sites, there is the possibility of encountering subsurface resources, and it is recommended that an archaeologist be retained on an on-call basis to assist the contractor in the event that subsurface archaeological resources are encountered. [PET Ex. 1, Exhibit CC, p. 15]

Ground Water Resources

72. Mr. Tom Nance, President of Tom Nance Water Resource Engineering, performed an analysis of the water needs for the Project. Mr. Nance concluded that potable water for the Project will be supplied by the Board of Water Supply ("BWS"). At the present time, the sustainable yield of the aquifer that will

provide the Project's potable water is 102 million gallons a day ("MGD") and the present pumpage is 52 MGD.

Secondly, the BWS recently acquired what is called the Ewa Shaft (or EP15 and 16) which is located at Honouliuli Gulch. The Ewa Shaft currently has an allocation form the Commission on Water Resource Management of 12.154 MGD, and based upon the terms of the shaft's acquisition, its water must be used to serve projects in the Ewa Development Plan area, which includes Petitioner's Project. Based upon the Ewa Shaft and other BWS sources, there will be adequate potable water for the Project's need of approximately 1.0 MGD. [PET Ex. 6, p. 1; TR 7/10/03, p. 173-176]

73. There are two possible sources for the Project's non-potable water needs, the underlying brackish groundwater from the caprock aquifer or reclaimed R-1 quality effluent from the Honouliuli Waste Water Treatment Plant. Due to the expense of connecting to the R-1 effluent system, the non-potable irrigation source will likely come from small, modest capacity existing caprock wells that will be sufficient to meet the Project's non-potable water needs of 0.135 MGD. [PET Ex. 6, p. 1; TR 7/10/03, p. 173-176]

Cultural Resources

74. Pacific Legacy, Inc. prepared a Cultural Assessment in April of 2002. The Cultural Assessment concluded that the Petition Area is located within an area traditionally referred to as the plain of Kaupe`a - the barren place for mischievous

wandering spirits called *ao kuewa*, and further distinction places the Project in an area named Kelea.

Although the traditional surface of the Petition Area have long been destroyed, with in-fill during the cattle grazing years and plowing during clearing for sugarcane agriculture, the area is documented as having been a main thoroughfare for travelers to the settlements on the western coastline and a trail having passed between Pu`u o Kapolei and Pu`u o Palailai.

The Petition Area lies in the path of the traditional viewing direction for the *Māhina`ona* Crown. When the sun moved north it would at one point in the year, May 1 on the western calendar, align in the west and set directly behind Pu`u o Kapolei and Pu`u o Pālailai (two hills northwest of the Petition Area). When the sun would set behind these two hills at the particular alignment, a glowing crown was the result when viewed from the ancient altar site on the present Waikiki Aquarium grounds.

The only archaeological sites documented in the Petition Area are coral sinkholes, which were used for agriculture, and it does not appear that the Project will have any adverse effect to traditional cultural activities in the area. [PET Ex. 1, Exhibit FF, p. 3-16]

ENVIRONMENTAL QUALITY

Noise

75. Y. Ebisu & Associates prepared an Acoustic Study in November of 2001. The Acoustic Study concluded that along the existing roadways which are expected to service the Project traffic, noise levels are expected to increase by 0.8 to 1.6 Ldn between 1998 and 2010 as a result of Project traffic. By 2010, essentially all locations which front Fort Weaver Road, Geiger Road, Kapolei Parkway, Iroquois Road, and Street A will experience relatively high noise levels above 65 Ldn, and will require traffic noise mitigation measures. Those receptor locations which are removed from the major roadways as well as shielded by existing and new buildings should experience traffic noise levels less than 65 Ldn.

Based on 2000/2001 and 2020 aircraft noise contours developed over the project site, only the commercial and industrial portions of the Project site are located inside the 60 Ldn noise contour. Special aircraft noise attenuation measures should not be required for this project. The State Office of Planning recommends that no residential construction be allowed in areas greater than 60 Ldn aircraft noise contours, and that an avigation easement be granted to the State in areas of the Project falling in areas greater than 55 Ldn aircraft noise counters.

Temporary noise impacts may occur during the construction of the proposed Project. Because construction activities are predicted to be audible at

adjoining properties, the quality of the acoustic environment may be degraded to unacceptable levels during periods of construction. Mitigation measures to reduce construction noise will not be practical in all cases. For this reason, the use of quiet equipment and construction curfew periods as required under the State Department of Health noise regulations are recommended to minimize construction noise impacts. [PET Ex. 1, Exhibit II, p. 1; TR 7/11/03, p.166]

Air Quality

76. B.D. Neal & Associates prepared an Air Quality Study in January of 2003. The Air Quality Study concluded that the major potential short-term air quality impact of the project will occur from the emission of fugitive dust during construction. Mitigation measures that should be implemented include watering active work areas and unpaved roads twice daily on days without rainfall, and covering dirt hauling trucks when traveling on roadways. Mitigation measures that will also help to reduce fugitive dust impacts include the use of windscreens and/or limiting the area that is disturbed at any given time, the use of mulch or chemical soil stabilizers, road cleaning and tire washing programs, the paving of parking areas and early landscaping and the monitoring of dust to evaluate the effectiveness of the Project's dust control program and to adjust the program if necessary.

During construction phases, emissions from engine exhausts will also occur both from on-site construction and from vehicles used by construction workers

and trucks traveling to and from the construction site. Increased vehicular emissions can be reduced by moving equipment and personnel to the site during off-peak traffic hours. After the proposed Project is completed, long term impacts on air quality should be small, and worst case concentrations of carbon monoxide should remain within both the State and Federal ambient air quality standards. Implementing any air quality mitigation measures for long term traffic related impacts is probably unnecessary and unwarranted. [PET Ex. 1, Exhibit HH, p. 29-30]

Water Quality

77. Groundwater exists beneath the Petition Area as a thin, brackish basal lens in hydraulic contact with saline water at depth and seawater at shoreline, and is commonly referred to as the Ewa Caprock Aquifer. At present, the use of the aquifer on the eastern side of the Ewa Plain consists of 0.7 million gallons per day by the New Ewa Beach Golf Course and a far lesser amount by a number of small capacity wells on existing Ewa by Gentry developed areas. Development of the Subject Property site should have no significant impact on the aquifer. [PET Ex. 1, p. 47]

ADEQUACY OF PUBLIC SERVICES AND FACILITIES

Highways and Roadway Facilities

78. Parsons Brinckerhoff Quade & Douglas, Inc. performed a Traffic Impact Analysis in December 2002. The Traffic Impact Analysis concluded that with the recommended roadway and traffic improvements, the roadway system can

accommodate the traffic generated by the proposed Project. The two categories of roadway improvements are local and regional. The local roadway improvements will be implemented and paid for by the Petitioner. The State or the County will implement the regional roadway improvements. [PET Ex. 1, Exhibit GG, p. 36; PET Ex. 5, p. 2]

79. Local roadway improvements include extending Keanui Drive south and west from Iroquois Road to Kapolei Parkway, the addition of three full-movement accesses for Keanui Drive between Kapolei Parkway and Fort Weaver Road, widening Geiger Road west of Kapolei Parkway to a three-lane cross section, widen Iroquois Point Road from Keanui Drive to the eastern boundary of the Petition Area, re-stripe Kapolei Parkway north of Geiger Road as a six-lane arterial roadway once Kapolei Parkway is connected to North-South Road, and additional intersections on Kapolei Parkway south of Geiger Road. [PET Ex. 1, Exhibit GG, p. 30-36]

80. The regional roadway improvements include widening Fort Weaver Road from four to six lanes between Geiger Road and Farrington Highway, completion of Kapolei Parkway between Ocean Pointe Development and North-South Road, and implementation of North-South Road and a half-diamond interchange between Kapolei Parkway and H-1 Freeway. [PET Ex. 5, page 2]

81. The Fort Weaver Road expansion project falls under the State Department of Transportation's jurisdiction as a State roadway, and has been divided into two phases: 1) Farrington Highway to Lualaunui Street; and 2) A`awa Drive to the

Geiger Road-Iroquois Point Road intersection. The first phase will be started approximately March 2004 with a tentative completion date of March 2005. [TR 8/7/03, p. 50-51]

82. The second phase of the Fort Weaver Road expansion project, A`awa Drive to the Geiger Road-Iroquois Point Road intersection, will be procured as a design-build project which entails a contractor bidding on both the design and construction phases together to be completed within a set calendar date as a lump sum contract. The cost of the second phase is approximately $1.8 million for design and $18 million for construction.

It is hoped that the Notice to Proceed will be issued by late 2004 with completion of the second phase in early 2007. The completion could be accelerated if an incentive/disincentive type provision is implemented, where the bids are reduced for the sole purpose of determining the low bidder by reducing the bid by the product of a to-be-determined dollar value and the number of applicable days. The actual bid amount does not change, and the State benefits in a shorter construction period and earlier delivery of the project. [TR 8/7/03, p. 51-53]

83. Petitioner has completed Kapolei Parkway to its ultimate cross-section between a point south of Geiger Road to the OR&L right of way. The County has awarded a construction contract for the segment of Kapolei Parkway between the

OR&L right of way and Renton Road and construction should be complete by the summer of 2004. [PET Ex. 5, p. 2-3]

84. The segment of Kapolei Parkway between Renton Road and North-South Road falls under the jurisdiction of the State Department of Land and Natural Resources and Department of Hawaiian Home Lands. [TR 7/11/03, p. 178]

85. The North-South Road project is from H-1 Freeway to Kapolei Parkway. The project will be divided into two phases of $30 million each. The first phase will be from Farrington Highway to Kapolei Parkway for three lanes. The second phase is from Farrington Highway to H-1 including a temporary interchange at the existing Palailai undercrossing. The Notice to Proceed for the first phase is expected to issue by late 2004 with completion by late 2006 or early 2007. The Notice to Proceed for the second phase is expected to issue by late 2005 with completion by early 2007. [TR 8/7/03, p. 53-55]

86. The North-South Road project will initially be built with three lanes instead of the full six lanes for the project. One lane will be used in each direction and the middle lane could be used as a reversible lane with two lanes headed mauka in the morning and two lanes headed makai in the afternoon. [TR 7/11/03, p. 174-175]

87. The funding of the North-South Road project will be through State appropriations and what is intended as a "soft-match" where the Federal government allows the State to use the value of the State owned land for the North-South Road

right-of-way as a local match. The total cost of the project from the H-1 Freeway to Kapolei Parkway is approximately $60 million, which will include $12 million from the State and $48 million from the Federal government. To obtain the Federal funding, the State Department of Transportation will proceed with the Oahu Metropolitan Planning Organization ("OMPO") process. The State Department of Transportation's schedule is subject to OMPO's acceptance of the State Department of Transportation's recommendation, however, the North-South Road project is very high on the State's list of priorities. [TR 7/11/03, p. 175-176; TR 8/7/03, p. 55-56]

88. It is possible to implement the incentive/disincentive provision for the North-South project which could accelerate the completion date . [TR 8/7/03, p. 60]

89. Petitioner is required to comply with Chapter 33A, Revised Ordinances of Honolulu ("Ordinance 02-52"), related to a traffic impact fee program for Ewa and Petitioner will contribute their "fair share" to future roadway improvements in the Ewa region as provided in Ordinance 02-52. [County Ex. 9 and 10]

90. "The County currently has a mechanism that collects and transfers the impact fees collected by the County to a State account. However, the State does not have a mechanism to receive and expend those fees from the State account. The State is currently working on legislation that will enable the State to receive and expend those funds." [TR 8/7/03, p. 62-63]

Water Service

91. The BWS currently has water system improvement projects in the construction and design stages which will provide adequate source capacity to accommodate the Project. As with Ewa by Gentry, a dual water system will be developed for the Project to conserve the supply of potable water, and non-potable water will be used where feasible for purposes such as landscape irrigation. [PET Ex. 1, p. 79-80; PET Ex. 1, Appendix J]

Wastewater Disposal

92. The Project is located in the tributary area of the Honouliuli wastewater treatment plant. Wastewater generated will be discharged from the site into an existing 84-inch interceptor sewer on Geiger Road which has sufficient capacity to accommodate the proposed flows. All wastewater to the Honouliuli wastewater treatment plant receives at least primary treatment, with a portion of the flow, 13 million gallons per day (mgd), going to secondary and tertiary treatment to produce recycled water. The overall liquid treatment capacity of the plant is 38 mgd. The current solids handling capacity is about 27 to 29 mgd, slightly higher than current flows, but will be expanded to at least 38 mgd under a City project now being designed, and expected to be completed in 2006. The proposed project by Gentry will discharge an estimated one mgd leaving approximately 11 mgd for other future development. [TR 7/10/03, p. 142]

Drainage

Ewa Makai-West

93. On the west side of Fort Weaver Road, lies the Kaloi Gulch Watershed that extends from Palehua on the ridge of the Waianae Mountain to the shoreline of the project formerly known as Ewa Marina and now called Ocean Pointe. The total tributary watershed is approximately 11 square miles. Due to the area's arid character, significant stormwater runoff in the lower part of the watershed where development is currently taking place is infrequent. In the last 10 years, for example, there has been only one such event. It occurred in November of 1996. [PET Ex. 6, p. 7; TR 7/11/03, p. 7-9]

94. Recognizing the need to coordinate drainage improvements among landowners and developers in the Kaloi watershed, the County formed a Technical Committee in 1992 to formulate design guidelines and recommend appropriate drainage improvements. The committee was comprised of engineers representing the City (Public Works), the State (for development planned by HFDC), Campbell Estate (landowner of the upper watershed and the Laulani project, now known as Gentry Makai West), the Ewa Village re-development project, Ewa by Gentry, Coral Creek Golf Course, and Ewa Marina (now Ocean Pointe). Following a series of meetings, the 7-member Kaloi Gulch Technical Committee issued an Interim Report in June 1993. Its most important recommendations were: 1) require all projects to incorporate runoff retention and detention features to reduce peak flowrates and sediment loading to the

Ewa Marina property; 2) open the flow restrictions between Mango Tree Road and the railroad ROW to relieve flooding in the Ewa Villages; and 3) construct an interim drainage channel makai of the Gentry project to allow stormwater passing through the railroad ROW to pass through the Coral Creek golf course and be directed back into the then-existing Kaloi channel makai of the golf course. [PET Ex. 6, p. 7-8]

95. Earlier versions of the Committee's reports listed specific retention/detention volumes for each project and also specified channel inverts and hydraulic grades at the property boundaries between projects. The Ewa Villages re-development, Ewa by Gentry, and Coral Creek Golf Course were all designed, approved by the County, and constructed in compliance with all of the specific requirements contained in earlier drafts of the Technical Committee's report. As a result, stormwater retention/detention volumes of unprecedented sizes have been incorporated in the Ewa Village and Coral Creek golf courses. [PET Ex. 6, p. 8]

96. When the flood in November of 1996 occurred, two key aspects of the Technical Committee's recommendations had not yet been implemented: (1) removal of the restriction of stormwater flow to pass through the railroad ROW to alleviate potential flooding in the Ewa Villages; and (2) construction of the channel makai of Ewa by Gentry. The restriction at the railroad ROW resulted in extensive flooding of Ewa Villages during the November 1996 storm. This event provided the impetus for developing the "Technical Solution" for the interim drainage improvements

which are in place today. As signed off by the engineering representatives of landowners and developers in September 1997, the following interim improvements were required to be installed by each of the affected landowner/developers: 1) channel conveyance capacity from the railroad ROW through Ocean Pointe equivalent to 2500 CFS with no freeboard capacity; 2) invert elevations at each of the property boundaries between projects were to be as specified; 3) discharge from the interim channel was to be directed into a retention/detention basin to be constructed in Ocean Pointe; and 4) overflow from this basin was to be directed through Oneula Beach Park to the ocean. [PET Ex. 6, p. 8]

97. The interim 2500 CFS conveyance capacity from the Ewa Villages to Oneula Beach Park has been in place since January 2000. What remains to be installed for complete floodwater protection is sufficient channel conveyance capacity to meet the County Drainage Standards requirement of 11,000 CFS. As originally conceived as far back as the 1970s and as still incorporated in Ocean Pointe's currently approved drainage master plan, the channel with the full 11,000 CFS capacity was to discharge into the project's marina. However, accomplishing this would require lowering the County's Honouliuli WWTP ocean outfall, an undertaking of substantial cost and considerable risk. Recently, Haseko has been assessing alternatives that would utilize discharge through Oneula Beach Park rather than into the marina. Until this process is completed and the ultimate drainage improvements in Ocean Pointe are installed, all of

the upstream projects are limited to passing 2500 CFS through their respective interim channels and retaining their project-generated stormwater onsite. [PET Ex. 6, p. 8]

98. The onsite project drainage will consist of catchbasins/inlets, manholes and drain pipes located in dedicated roadways. A box culvert or open channel is planned to run parallel to the makai boundary of the site, intercepting and diverting runoff to the Kaloi Channel. Runoff is not expected to flow into the areas makai of the project site. Onsite drainage systems will be designed in accordance with the County's Storm Drainage Standards. [PET Ex. 7, p. 2]

99. The lack of adequate conveyance capacity makai of the project site may require phasing of the development and drainage improvements. Excavation of temporary retention/detention basins could be done to allow initial development of the Project to proceed. Interim improvements will be designed in accordance with the requirements of the Storm Drainage Standards and with the approval of all concerned government agencies. Also, the Coral Creek and Ewa Villages golf courses provide large amounts of retention and detention storage. In addition to dampening of the peak runoff, the storage also has the beneficial effect of settling out sediment in the runoff. The amount of storage within the Coral Creek golf course will satisfy the water quality requirements for the Ewa By Gentry and Ewa Makai-West projects. [PET Ex. 7, p. 2]

100. The proposed drainage improvements for the Ewa Makai-West portion of the Project will be consistent with the drainage plans identified in approved

drainage master plans for the area and will not have adverse impacts on drainage in the area. All improvements will be in accordance with the standards of the County, and all other applicable rules and regulations. [PET Ex. 7, p. 2]

Ewa Makai-East

101. The Petition Area east of Fort Weaver Road known as Ewa Makai-East encompasses drainage issues that are local in nature as opposed to regional issues that are present in the Kaloi Gulch watershed. Being local in nature, the drainage issues relating to Ewa Makai-East affect only the adjoining landowners. [TR 7/11/03, p. 56-57]

102. Under the terms of the Seibu Acquisition Agreement dated May 1987 between the Estate of James Campbell and Seibu Hawaii, Inc., the Hawaii Prince golf course (located makai of Ewa Makai-East) was to accommodate runoff from 255 acres of mauka land when those mauka lands are put into residential use. [PET Ex. 8, p. 1]

103. The current approved drainage master plan for Ewa Makai-East is entitled "Drainage Master Plan for Ewa by Gentry-East, Phase II and Ewa Makai-East, Tax Map Key: 9-1-10:7 and 20" and was accepted by the County on July 18, 1997. The approved 1997 drainage master plan, which encompasses the same 255 acres referenced in the Seibu Acquisition Agreement, reduces the area of runoff from 255 acres to 70 acres of land adjacent to Fort Weaver Road plus areas immediately adjacent to the Hawaii Prince golf course to drain into the Hawaii Prince golf course. The remaining

areas are to drain into drainage sumps located within the Ewa Makai-East development and the existing sump straddling the eastern property line. [PET Ex. 8, p. 1]

104. The 1997 drainage master plan is currently pending revision before the County, and the revision proposed by the Petitioner, if approved by the County, will reduce the aforementioned 70 acres to approximately 10 acres, and the remaining areas would drain into sumps as described in the 1997 drainage master plan. [PET Ex. 8, p. 1-2]

105. If the revised 1997 drainage master plan is approved by the County, there will not be any increase in the storm water runoff to the downstream adjoining properties and/or in comparison to the Seibu Acquisition Agreement. [PET Ex. 8, p. 2; TR 7/11/03, p. 55]

Solid Waste Disposal

106. Solid waste handling and disposal will be coordinated with the County Department of Environmental Services, Refuse Division, with written notification submitted in advance of when the refuse service is expected to begin. The design of residential communities within the Project will comply with the Division's requirements in order to enable refuse pick-up. [PET Ex. 1, p. 81]

107. The project is estimated to produce 3728 tons of solid waste based upon a population of approximately 6,000 persons at final buildout, however, the

existing Waimanalo Gulch landfill is expected to reach its capacity in 2008. [TR 7/10/03, p. 157-158]

108. In response to the projected 2008 closure date for the existing landfill, the County's Refuse Division is planning to expand the existing H-Power plant, identify the County's next land fill and submitting the Refuse Division's recommendation to the City Council by December 1, 2003, develop an alternative disposal technologies park on land that has been acquired by the County for the purpose of exploring waste disposal technologies, propose a curbside recycling collection pilot, and implement a bioconversion project for sewage sludge that will be located on the grounds of the Sand Island Treatment Plant. [TR 7/11/03, p. 152-154]

109. It is the intent of the County's Refuse Division to have the new land fill on line by 2008. [TR 7/11/03, p. 155]

Schools

110. The Ewa Development Plan states that the State Department of Education ("DOE") has projected a need by 2020 for two new intermediate schools, one of which has already been built in the Villages of Kapolei. Although the Ewa Development Plan list East Kapolei Intermediate as the second school site, the development of East Kapolei Intermediate is uncertain at this time. The Petition and the DOE have agreed to enter into a written agreement whereby the Petitioner will be

conveying to the DOE an 18 acre site on Kapolei Parkway for the construction of a new middle school for grades 6 through 8. [PET Ex. 1, p. 80-81]

Police and Fire Protection

111. The Project is serviced by the Kapolei Police Station, which is located at 1100 Kamokila Boulevard in Kapolei. There is also a storefront office next to the 7-Eleven store at 91-1669 Fort Weaver Road. According to the Honolulu Police Department, the additional residential units added by the Project will create an increase in the need for police service. It is anticipated that the increase in net economic benefits to the County will address the increased cost of police services needed. [PET Ex. 1, p. 81]

112. The Project will be serviced by the Waipahu Fire Station for single alarm fires. For a multiple alarm such as a structure fire, three engine companies and one ladder company would be sent from the Ewa Beach, Waipahu and Kapolei Fire Stations, with the ladder company originating from the Waipahu Fire Station. [PET Ex. 1, p. 81]

Electricity and Telephone Service

113. The Project will be serviced by Hawaiian Electric Co. ("HECO") for electric power and Verizon for telephone service. HECO indicated that it will be able to serve the Project from the Fort Weaver Substation which was installed in an earlier phase of the Ewa by Gentry project. Therefore, the installation of additional substation

transformer capacity and extension cables, ducts and associated electrical facilities should encounter no significant obstacles to providing timely and reliable service. [PET Ex. 1, p. 81-82]

COMMITMENT OF STATE FUNDS AND RESOURCES

114. Government costs incurred as a result of the Project are not expected to exceed the revenues derived. The government costs associated with development of the Project consists primarily of school development and roadway improvements. Petitioner is expected to contribute a fair-share of the costs of such school development and roadway improvements. [PET Ex. 1, p. 80-81; PET Ex. 1, Exhibit KK, p. VIII-1 - VIII-4; PET Ex. 4, p. 5; County Ex. 9 and 10]

CONFORMANCE TO URBAN DISTRICT STANDARDS

115. The Petition Area is adjacent to lands characterized by "city-like" concentrations of people, structures, streets, urban levels of service and other related land uses. The Petition Area will be an extension of the Ewa by Gentry community, considered a part of Oahu's growing Kapolei region where more than 450 businesses provide over 16,000 jobs and the number of jobs is expected to double by 2010. Schools, parks, medical services, shopping and entertainment centers, restaurants and recreation facilities service a growing population. [PET Ex. 1, p. 48]

116. Ewa by Gentry in itself is a growing community consisting of over 5,300 existing homes in a planned development that will consist of an estimated 9,100

homes at build-out (including the Petition Area). Parks, walkways and bike paths, landscaped roadways, an elementary school, an 18-hole championship golf course, a neighborhood shopping center, and a planned light industrial park are elements that contribute to Ewa by Gentry's "city-like" characteristics. [PET Ex. 1, p. 48]

117. The Petition Area is in close proximity to various centers of trading and employment (Kapolei, Waipahu, Ewa by Gentry, Ewa Beach, Barbers Point, Campbell Industrial Park, and military installations). Furthermore, the Petition Area will generate new centers of employments including a 30 acre industrial-commercial center, a middle school, and two church/day care center sites. [PET Ex. 1, p. 48]

118. The Petition Area is, or upon completion of necessary offsite and onsite infrastructure will be, adequately serviced by schools, parks, wastewater, solid waste disposal, drainage, water and transportation systems, public utilities, and police and fire protection. [PET Ex. 1, p. 49]

119. The Petition Area is located in an area with sufficient reserve for foreseeable urban growth. [PET Ex. 1, p. 49]

120. The Petition Area consists of satisfactory topography, drainage and soil conditions, is free from the danger of flood, tsunami and unstable soil conditions, and is not affected by any other adverse environmental conditions that would render it unsuitable or inappropriate for the proposed development. [PET Ex. 1, p. 49]

121. The Petition Area is contiguous with or in close proximity to existing urban areas, and is consistent with the Ewa Development Plan, by the Planning Department, City & County of Honolulu, adopted August 1997. [PET Ex. 1, p. 49]

122. The Petition Area is in an appropriate area for new urban concentration, as it represents an expansion of an existing residential community (Ewa by Gentry), and, as mentioned above, is consistent with the Ewa Development Plan. [PET Ex. 1, p. 49]

123. The Petition Area is adjacent or in close proximity to existing urban development. [PET Ex. 1, p. 49]

124. The Petition Area is adjacent to an existing residential community and will not contribute toward scattered spot urban development. The Petitioner will develop or arrange for all additional infrastructure required to service the proposed development, and public infrastructure and support services will not be unreasonably burdened by or require any unreasonable investment as a result of the proposed development. [PET Ex. 1, p. 49]

125. The Petition Area does not consist of lands having a slope of twenty percent or more. [PET Ex. 1, p. 49]

CONFORMANCE WITH THE GOALS, OBJECTIVES, AND POLICIES OF THE HAWAI`I STATE PLAN; RELATIONSHIP WITH APPLICABLE PRIORITY GUIDELINES AND FUNCTIONAL PLANS

126. The reclassification of the Petition Area and the proposed development of the Project are in conformity with the numerous goals, objectives, policies and priority guidelines of the Hawaii State Plan, including the following:

State Goals: All of the State goals set forth in Section 226-4, HRS.

State Objectives: The State objectives set forth in Sections 226-5, 226-6, 226-11, 226-12, 226-13, and 226-19, HRS.

State Policies: Numerous State policies set forth in Chapter 226, HRS, including the following:

Section 226-5(b)(1): "Manage population growth statewide in a manner that provides increased opportunities for Hawaii's people to pursue their physical, social, and economic aspirations while recognizing the unique needs of each county."

Section 226-5(b)(3): "Promote increased opportunities for Hawaii's people to pursue their socio-economic aspirations throughout the islands."

Section 226-5(b)(7): "Plan the development and availability of land and water resources in a coordinated manner so as to provide for the desired levels of growth in each geographic area."

By providing for a variety of land uses, including residential, commercial-industrial, parks, open space, and a public school facility, the Project will provide increased opportunities for Hawaii's people to pursue their physical, social and economic aspirations. The proposed industrial-commercial center will provide

permanent jobs, as well as short-term construction related jobs for residents of Ewa and the island of Oahu. With greater economic opportunities and the increased availability of new homes, overall living standards and lifestyles will be enhanced by living and working in the "new city" planned for the greater Kapolei region. The development and availability of land and water resources is being planned in a coordinated manner with public agencies and other developers in the region.

Section 226-6(a)(1): "Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawaii's people."

Section 226-6(a)(2): "A steadily growing and diversified economic base that is not overly dependent on a few industries."

Section 226-6(b)(3): "Seek broader outlets for new or expanded Hawaii business investments."

Section 226-6(b)(6): "Strive to achieve a level of construction activity responsive to, and consistent with, state growth objectives."

Section 226-6(b)(7): "Foster a business climate in Hawaii - including attitudes, tax and regulatory policies, and financial and technical assistance programs - that is conducive to the expansion of existing enterprises and the creation and attraction of new business and industry."

The industrial-commercial center will provide an outlet for new or expanded business investments, thereby helping to foster a positive business climate in Hawaii. It will provide an opportunity for the expansion of existing enterprises, as well as the creation and attraction of new businesses and industries. The development of Ewa Makai will also help the State to achieve a level of construction activity that is consistent with its growth objectives throughout the build-out period.

Section 226-11(a)(1): "Prudent use of Hawaii's land-based, shoreline, and marine resources."

Section 226-11(a)(2): "Effective protection of Hawaii unique and fragile environmental resources."

Section 226-11(b)(1): "Exercise an overall conservation ethic in the use of Hawaii's natural resources."

Section 226-11(b)(2): "Ensure compatibility between land-based and water-based activities and natural resources and ecological systems."

Section 226-11(b)(3): "Take into account the physical attributes of areas when planning and designing activities and facilities."

Section 226-11(b)(6): "Encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii."

Section 226-11(b)(7): "Pursue compatible relationships among activities, facilities, and natural resources."

Prior to preparation of the proposed Ewa Gentry Makai Master Plan, physical, environmental, and cultural aspects of the property were studied. Site features, including slope, existing sump areas, soil stability, and drainage needs were incorporated into the design. There was no rare or endangered plant or animal species found on the Petition Area, and 90% of the plant species inventoried are introduced. The native plant species are not threatened or endangered and the proposed development of the Petition Area is not expected to have a significant negative impact on the botanical resources.

With respect to conserving the use of Hawai`i's natural resources, the Petitioner has been a leader in waste management. From site design and development to waste disposal and recycling, the Petitioner has successfully incorporated waste saving products, methods and techniques into all phases of housing development.

Section 226-12(b)(1): "Promote the preservation and restoration of significant natural and historic resources."

Section 226-12(b)(3): "Promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features."

Section 226-12(b)(4): "Protect those special areas, structures and elements that are an integral and functional part of Hawaii's ethnic and cultural heritage."

Section 226-12(b)(5): "Encourage the design of developments and activities that complement the natural beauty of the islands."

Because the Petition Area was formerly cultivated in sugar, it does not contain any scenic assets, places of natural beauty, or multi-cultural or historical resources. Plans for the Project will promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of the mountains and Honolulu city vistas to the extent possible. There are no ocean views from the Petition Area.

The archaeological survey determined that no archaeological sites are present within the Petition Area. If subsurface cultural resources are encountered during the course of development, the Historic Preservation Division of the Department of Land and Natural Resources will be notified in accordance with State requirements.

Section 226-13(b)(2): "Promote the proper management of Hawaii's land and water resources."

Section 226-13(b)(3): "Promote effective measures to achieve desired quality in Hawaii's surface, ground and coastal waters."

Section 226-13(b)(4): "Encourage actions to maintain or improve aural and air quality levels to enhance the health and well-being of Hawaii's people"

Section 226-13(b)(5): "Reduce the threat of life and property from erosion, flooding, tsunamis, hurricanes, earthquakes, volcanic eruptions, and other natural or man-induced hazards and disasters."

Section 226-13(b)(6): "Encourage design and construction practices that enhance the physical qualities of Hawaii's communities."

Section 226-13(b)(7): "Encourage urban developments in close proximity to existing services and facilities."

The Petitioner will continue to promote the proper management of land and water resources in the development of the Project. From incorporating efficient waste management and waste reduction strategies, to managing stormwater on site and utilizing non-potable water for irrigation purposes, the Petitioner continues to work towards minimizing any negative impacts to Hawai`i's natural resources. The homes and community are designed and constructed to reduce the threat to life and property from erosion, flooding, hurricanes, and other natural or man-induced hazards and disasters, as well as to enhance the physical qualities of Ewa. The Project is proposed to be an urban development in close proximity to existing services and facilities.

Section 226-16(b)(1): "Coordinate the development of land use activities with existing and potential water supply."

Section 226-16(b)(3): "Reclaim and encourage the productive use of runoff water and wastewater discharges."

Section 226-16(b)(6): "Promote water conservation programs and practices in government, private industry, and the general public to help ensure adequate water to meet long-term needs.

All necessary on-site water facilities will be provided in consultation with the BWS and will be built in accordance with an approved Water Master Plan. It is expected that the Project will have sufficient potable water based upon the presently available aquifer and the recently acquired Ewa Shaft.

The Petitioner has incorporated the use of non-potable brackish water in its Ewa by Gentry development, and it is also studying the possible use of reclaimed water as an alternative to potable water when non-potable water systems are inoperable or are no longer available.

Section 226-17(b)(2): "Coordinate state, county, federal, and private transportation activities and programs toward the achievement of statewide objectives."

Section 226-17(b)(3): "Encourage a reasonable distribution of financial responsibilities for transportation among participating governmental and private parties."

Section 226-17(b)6): "Encourage transportation systems that serve to accommodate present and future development needs of communities.

Section 226-17(b)(10): "Encourage the design and development of transportation systems sensitive to the needs of affected communities and the quality of Hawai`i's natural environment."

Section 226-17(b)(11): "Encourage safe and convenient use of low-cost, energy-efficient, non-polluting means of transportation."

The Petitioner has participated in the coordinated effort among state, county, federal and other private entities which objective is to provide a transportation system that is consistent with and will accommodate planned growth objectives throughout the State.

Section 226-19(a)(1): "Greater opportunities for Hawaii's people to secure reasonably priced, safe, sanitary, and livable homes, located in suitable environments that satisfactorily accommodate the needs and desires of families and individuals, through collaboration and cooperation between government and nonprofit and for-profit developers to ensure that more affordable housing is made available to very low-, low- and moderate-income segments of Hawaii's population."

Section 226-19(a)(2): "The orderly development of residential area sensitive to community needs and other land uses."

As a residential developer in Hawai`i for 35 years, the Petitoner has gained a reputation for providing quality homes at prices affordable to Hawai`i's consumers. The Petitioner's buyers, many of whom are first time homebuyers, represent a socio-economic cross section of Hawai`i's population, including very low-, low- and moderate income families and individuals.

Section 226-19(b)(1): "Effectively accommodate the housing needs of Hawaii's people."

Section 226-19(b)(2): "Stimulate and promote feasible approaches that increase housing choices for low-income, moderate-income, and gap-group households."

Section 226-19(b)(3): "Increase home ownership and rental opportunities and choices in terms of quality, location, cost, densities, style, and size of housing."

Section 226-19(b)(5): "Promote design and location of housing developments taking into account the physical setting, accessibility to public facilities and services, and other concerns of existing communities and surrounding areas."

The Project is proposed as a master planned residential community designed to accommodate the housing needs of Hawai`i's people. As a continuation of the existing Ewa by Gentry community, it will increase homeownership opportunities by providing a mix of housing types that are affordable to low-income, moderate-income, and gap-group families. The design of the Project will take into account the physical setting of the Ewa plain, accessibility to public facilities and services, and other concerns of existing communities. Transportation improvements, a major employment center, parks and recreational sites, places of worship/day care centers, and an 18 acre middle school will be incorporated into the design of the community.

Section 226-21(b)(3): "Ensure the provision of adequate and accessible educational services and facilities that are designed to meet individual and community needs."

The Petitioner has agreed with the DOE to enter into an agreement for the conveyance of 18 acres for the construction of a middle school within the Petition Area.

State Priority Guidelines: The following State priority guidelines:

Section 226-103(e)(1): "Maintain and improve water conservation programs to reduce the overall water consumption rate."

The Project, like the rest of Ewa by Gentry, will incorporate a dual water system. Brackish water from non-potable wells will be used where feasible to irrigate landscaping in common areas.

Section 226-103(f)(3): "Provide incentives to encourage the use of energy conserving technology in residential, industrial, and other buildings."

The Petitioner continues to incorporate energy conserving technology in its homes, including optional solar heating, energy efficient appliances, insulation in walls and ceilings, and energy-efficient designs that take advantage of the tradewinds to the extent possible.

Section 226-104(b)(1): "Encourage urban growth primarily to existing urban areas where adequate public facilities are already available or can be provided with reasonable public expenditures, and away from areas where other important benefits are present, such as protection of important agricultural land or preservation of lifestyles."

Section 226-104(b)(2): "Make available marginal or nonessential agricultural lands for appropriate urban uses while maintaining agricultural lands of importance in the agricultural district."

Section 226-104(b)(6): "Seek participation from the private sector for the cost of building infrastructure and utilities, and maintaining open spaces."

The Project is surrounded by urban development, and is located on nonessential agricultural land that is located in an urban fringe area adjacent to the "Second City". City policy is to encourage development of this urban fringe area in order to provide housing choices not readily available in urban Honolulu and to relieve pressures for development of rural areas, Windward Oahu, and East Honolulu. The Petitioner will contribute its fair-share impact fees in building necessary roadways, as well as utilities needed for the development. Open spaces will be maintained within the project.

Section 226-104(b)(9): "Direct future urban development away from critical environmental areas or impose mitigating measures so that negative impacts on the environment would be minimized."

Section 226-104(b)(10): "Identify critical environmental areas in Hawaii to include but not be limited to the following: watershed and recharge areas; wildlife habitats (on land and in the ocean); areas with endangered species of plants and wildlife; natural streams and water bodies; scenic and recreational shoreline resources;

open space and natural areas; historic and cultural sites; area particularly sensitive to reduction in water and air quality; and scenic resources."

The Project will not affect any critical environmental areas.

Section 226-106(1): "Seek to use marginal or nonessential agricultural land and public land to meet housing needs for low- and moderate-income and gap-group households."

"The Project intends to provide homes for low- and moderate-income and gap-group households on nonessential agricultural land."

Section 226-106(2): "Encourage the use of alternative construction and development methods as a means of reducing production costs."

As a developer, the Petitioner has consistently been on the cutting edge of technology, utilizing alternative construction materials and methods in order to reduce production costs, while improving the quality of homes that are built. For example, long-lasting, durable products such as fiber-cement siding and vinyl fencing are utilized, eliminating waste and providing value to homeowners.

Section 226-106(5): "Encourage continued support for government or private housing programs that provide low interest mortgages to Hawaii's people for the purchase of initial owner-occupied housing."

The Petitioner supports and has been a user of the State's Hula Mae Single Family Mortgage Purchase Program, as well as other government programs which

provide low-interest loans to first time homebuyers. These include the USDA-RD Section 502 Single Family Home Ownership program; the Federal Housing Administration Loan Program; and the Veterans Administration Loan Program.

Section 226-106(8): "Give higher priority to the provision of quality housing that is affordable for Hawaii's residents and less priority to development of housing intended primarily for individuals outside of Hawaii."

As with the rest of the Ewa by Gentry development, the Project is intended to provide quality homes that are affordable to Hawai`i's residents. [PET Ex. 1, p. 48-58]

CONFORMANCE WITH COASTAL ZONE MANAGEMENT OBJECTIVES AND POLICIES

127. The Petition Area does not lie within the Coastal Zone Management Area established pursuant to Chapter 205A, HRS, and is therefore not subject to the Coastal Zone Management Area requirements.

RULING ON PROPOSED FINDINGS OF FACT

Any of the proposed findings of fact submitted by the Petitioner or the other parties to this proceeding not already ruled upon by the Commission by adoption herein, or rejected by clearly contrary findings of fact herein, are hereby denied and rejected.

Any conclusion of law improperly designated as a finding of fact should be deemed or construed as a conclusion of law; any finding of fact herein improperly designated as a conclusion of law should be deemed or construed as a finding of fact.

CONCLUSION OF LAW

Pursuant to Chapter 205, HRS, and the State Land Use Commission Rules under Chapter 15-15, HAR, the Commission finds upon a preponderance of the evidence that the reclassification of the Petition Area, consisting of approximately 282.614 acres of land in the Agricultural District, situate at Ewa, Oahu, Hawaii, Tax Map Key Nos. 1-9-1-10:7 and 1-9-1-69:5, to the Urban District, for the development of the Project, and subject to the conditions in the Order below, is reasonable, non-violative of Section 205-2, HRS, and is consistent with the Hawai`i State Plan as set forth in Chapter 226, HRS, and the Coastal Zone Management Program as set forth in Chapter 205A, HRS.

ORDER

IT IS HEREBY ORDERED that the Petition Area, consisting of approximately 282.614 acres of land in the State Land Use Agricultural District situate at Ewa, Oahu, Hawaii, Tax Map Key Nos. 1-9-1-10:7 and 1-9-1-69:5, as approximately shown in Exhibit "1" attached hereto and incorporated herein by reference herein, shall be and is hereby reclassified to the State Land Use District and the State Land Use District Boundaries shall be amended accordingly.

IT IS FURTHER ORDERED that the reclassification of the Petition from the Agricultural District to the Urban District shall be subject to the following conditions:

1. Petitioner shall provide affordable housing opportunities for low, low-moderate, and gap group income residents of the State of Hawaii to the satisfaction of the City and County of Honolulu. The location and distribution of the affordable housing or other provisions for affordable housing shall be under such terms as may be mutually agreeable between the Petitioner and the County.

2. Petitioner shall contribute to the development, funding, and/or construction of school facilities, on a fair-share basis, as determined by and to the mutual satisfaction of the Petitioner and the Department of Education. Terms of the contribution shall be agreed upon in writing by the Petitioner and the Department of Education prior to obtaining County rezoning.

3. Petitioner shall fund and construct adequate wastewater transmission and disposal facilities, as determined by the City and County of Honolulu Department of Environmental Services (ENV) and the State Department of Health (DOH).

4. Petitioner shall participate in the pro-rata funding and construction of local and regional transportation improvements and programs necessitated by the proposed development according to the regulatory scheme and factors covered by the

City and County of Honolulu's impact fee ordinance - Chapter 33A, Revised Ordinances of Honolulu and as determined by the State Department of Transportation.

5. The Petitioner shall provide a landscaped building setback (approximately 12 feet) along the subject project's Fort Weaver Road frontage to provide flexibility in accommodating future transportation needs along the route and to buffer roadway noise.

6. Should any previously unidentified burials, archaeological or historic sites such as artifacts, marine shell concentrations, charcoal deposits, or stone platforms, pavings or walls be found, the Petitioner, developers and/or landowners of the affected properties shall comply with all applicable statutory provisions of Chapter 6E Hawaii Revised Statutes and administrative rules of the Department of Land and Natural Resources (DLNR).

7. Petitioner shall coordinate and discuss with the Office of Hawaiian Affairs the incorporation of Hawaiian cultural elements such as trail alignments, if deemed appropriate, and the use of proper place names for the proposed development.

8. Petitioner shall develop a Solid Waste Management Plan in conformance with the Integrated Solid Waste Management Act, Chapter 342G, Hawaii Revised Statutes. Petitioner's Solid Waste Management Plan shall be approved by the City and County of Honolulu Department of Environmental Services. The Plan shall

address and encourage an awareness of the need to divert the maximum amount of waste material caused by developments away from the County's landfills.

9. Petitioner shall participate in an air quality monitoring program as specified by the State Department of Health.

10. Petitioner, its successors, and assigns shall coordinate the design and construction of drainage improvements on the Property required as a result of the development of the Property to the satisfaction of Federal, State and City agencies with the goal of executing an agreement on the interim and ultimate regional drainage plan as soon as possible. Petitioner, its successors, and assigns shall participate in the planning and coordination of off-site improvements with all landowners and developers in the Kaloi drainage basin, and other Federal, State, and City agencies.

11. Petitioner, its successors, and assigns, agrees to work with the City to implement interim and long-term regional drainage solutions as follows:

a. Petitioner shall submit an updated drainage master plan if required for the Property to the City for its review and approval prior to any subdivision approvals other than for minor matters, such as easements.

b. Drainage solutions for the Property shall be compatible with the drainage designs for other developments in the Kalo`i Gulch drainage basin and shall conform to applicable Federal, State, and City laws, rules, regulations, and standards.

c. Drainage improvements for the Property shall be consistent with the policies and principles in the `Ewa Development Plan.

d. Petitioner shall be responsible for maintaining previously constructed drainage improvements which limit channelized runoff to 2,500 cubic feet per second (cfs) at the Property's southern boundary (specifically at the property boundary between Petitioner's property and Haseko's property) for events up to a 100-year storm. Petitioner shall also take reasonable measures to minimize non-channelized flows from the Property by construction of berms, detention basins, or other appropriate methods. These requirements shall remain in force until long-range regional drainage improvements are in place in accordance with the approved drainage master plan for the Project.

e. The Petitioner has or shall enter into a Letter Agreement with Hawaii Prince to mutually address the drainage issues as it pertains to the Hawaii Prince golf course.

12. Petitioner shall participate in the funding and construction of adequate water source, storage, and transmission facilities and improvements to accommodate the proposed project. Water transmission facilities and improvements shall be coordinated and approved by appropriate State and County agencies.

13. Petitioner shall grant to the State of Hawaii an avigation (right of flight) and noise easement in a form prescribed by the State Department of

Transportation on any portion of the Property subject to aircraft noise contours exceeding 55 Ldn.

14. Petitioner shall not construct residential units within areas exposed to Honolulu International Airport and Naval Station Barbers Point noise levels of 65 Ldn or greater.

15. Petitioner, developers and/or landowners of the Subject Property shall fund and construct adequate solar powered civil defense systems as determined by the County and State Civil Defense agencies.

16. Petitioner where feasible shall implement energy conservation measures such as the use of solar energy and solar heating and incorporate such measures to the proposed development.

Dated: Honolulu, Hawaii _____

OF COUNSEL:
MATSUBARA, LEE & KOTAKE
A Law Corporation

_____
BENJAMIN M. MATSUBARA
CURTIS T. TABATA
Attorney for Petitioner
GENTRY INVESTMENT PROPERTIES

ORIGINAL

BEFORE THE LAND USE COMMISSION

OF THE STATE OF HAWAII

In the Matter of the Petition of	)	DOCKET NO. A03-738
	)	
GENTRY INVESTMENT PROPERTIES	)	GENTRY INVESTMENT PROPERTIES
	)	
Petition For District Boundary Amendment	)	
	)	

LAND USE COMMISSION
STATE OF HAWAII
2003 OCT 30 A 8:41

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing document in this matter was duly served upon the parties listed below via U.S. certified mail, postage prepaid on October 30, 2003

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Dated: Honolulu, Hawaii, October 30, 2003.

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GENTRY INVESTMENT PROPERTIES

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Hand Delivery

TO: Mr. Anthony Ching
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State of Hawaii
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Diskette Enclosed

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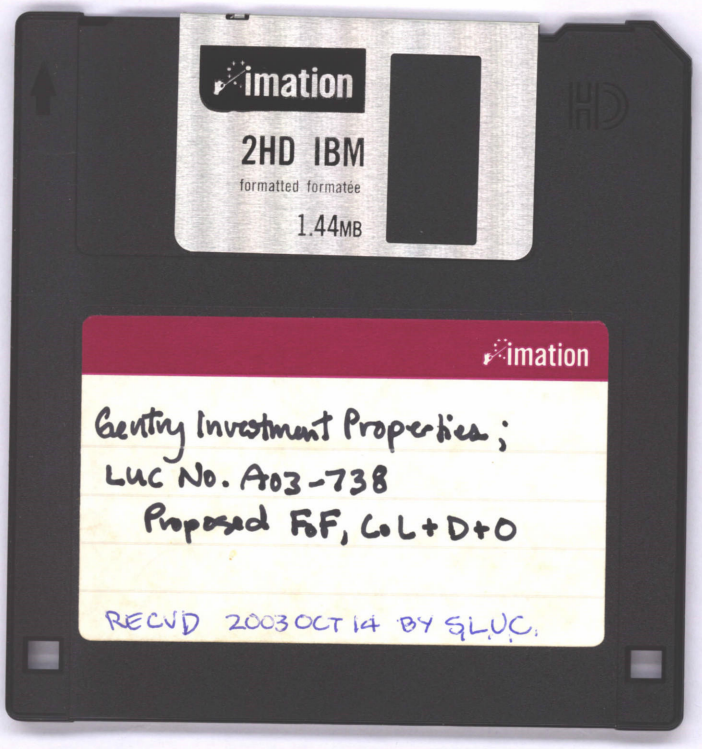
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Gentry Investment Properties;
LUC No. A03-738
Proposed FoF, CoL+D+O
RECVD 2003 OCT 14 BY SLUC.

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TRANSMITTAL

TO: Mr. Anthony Ching
Land Use Commission
State of Hawaii
235 South Beretania Street, Room 406
Honolulu, Hawaii 96813

DATED: October 14, 2003

LAND USE COMMISSION
STATE OF HAWAII
2003 OCT 14 P 2:13

Re: Gentry Investment Properties; LUC Docket No. A03-738

[ ] MAIL [X] HAND DELIVERY [ ] DHL [ ] PICKUP [ ] OTHER

COPIES	DATE	DESCRIPTION OF DOCUMENT
2	Draft	Stipulated Petitioner's Proposed Findings of Fact, Conclusions of Law, and Decision and Order; Exhibit "A"; Certificate of Service
1	Draft	Diskette - Petitioner's Proposed Findings of Fact, Conclusions of Law, and Decision & Order

TRANSMITTED FOR:

[ ]	YOUR INFORMATION AND RECORDS	[X]	YOUR REVIEW AND COMMENTS
[ ]	YOUR SIGNATURE AND RETURN	[ ]	FOR FURTHER ACTION
[ ]	YOUR SIGNATURE AND FORWARDING	[ ]	YOUR APPROVAL
	NOTED BELOW	[ ]	PER YOUR REQUEST
[ ]	PER OUR CONVERSATION	[ ]	SEE REMARKS BELOW

REMARKS:

By _____
Tran D. Livingston
Paralegal to Benjamin M. Matsubara

BEFORE THE LAND USE COMMISSION

OF THE STATE OF HAWAII

DRAFT

In the Matter of the Petition of GENTRY INVESTMENT PROPERTIES Petition For District Boundary Amendment	DOCKET NO. A03-738 STIPULATED PETITIONER'S PROPOSED FINDINGS OF FACT, CONCLUSIONS OF LAW, AND DECISION & ORDER; EXHIBIT "A"; CERTIFICATE OF SERVICE

LAND USE COMMISSION
STATE OF HAWAII
2003 OCT 14 P 2:13

STIPULATED PETITIONER'S PROPOSED FINDINGS OF FACT, CONCLUSIONS OF LAW, AND DECISION & ORDER

EXHIBIT "A";

CERTIFICATE OF SERVICE

OF COUNSEL:
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Attorneys for Petitioner
GENTRY INVESTMENT PROPERTIES

BEFORE THE LAND USE COMMISSION

OF THE STATE OF HAWAII

In the Matter of the Petition of	)	DOCKET NO. A03-738
GENTRY INVESTMENT PROPERTIES	)	STIPULATED PETITIONER'S PROPOSED FINDINGS OF FACT, CONCLUSIONS OF LAW, AND DECISION & ORDER
Petition For District Boundary Amendment	)	

STPULATED PETITIONER'S PROPOSED FINDINGS OF FACT, CONCLUSIONS OF LAW, AND DECISION AND ORDER

The parties hereto have agreed and stipulated to the attached Petitioner's Proposed Findings of Fact, Conclusions of Law, and Decision and Order.

The parties hereto may execute this stipulation by counterpart and said executed counterparts shall constitute a whole and complete stipulation.

Dated: Honolulu, Hawaii, _____, 2003.

GENTRY INVESTMENT PROPERTIES

By _____

Matsubara, Lee & Kotake
Benjamin M. Matsubara
Curtis T. Tabata
Its Attorneys

HASEKO (EWA), INC.

By _____
Oshima Chun Fong & Chung
Linnel T. Nishioka
Randall K. Ishikawa
Its Attorneys

HAWAII PRINCE HOTEL WAIKIKI CORP.

By _____
Watanabe Ing Kawashima & Komeiji, LLP
J. Douglas Ing
Teri Y. Kondo
Brian A. Kang
Its Attorneys

STATE OF HAWAII
OFFICE OF PLANNING

By _____
Mary Lou Kobayashi
Its Planning Program Administrator

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF PLANNING AND PERMITTING

By _____
Eric G. Crispin
Its Director

BEFORE THE LAND USE COMMISSION

OF THE STATE OF HAWAII

In the Matter of the Petition of	)	DOCKET NO. A03-738
GENTRY INVESTMENT PROPERTIES	)	PETITIONER'S PROPOSED FINDINGS OF FACT, CONCLUSIONS OF LAW, AND DECISION & ORDER
Petition For District Boundary Amendment	)	

PETITIONER'S PROPOSED FINDINGS OF FACT, CONCLUSIONS OF LAW, AND DECISION AND ORDER

EXHIBIT

BEFORE THE LAND USE COMMISSION

OF THE STATE OF HAWAII

In the Matter of the Petition of	)	DOCKET NO. A03-738
GENTRY INVESTMENT PROPERTIES	)	PETITIONER'S PROPOSED FINDINGS OF FACT, CONCLUSIONS OF LAW, AND DECISION & ORDER
Petition For District Boundary Amendment	)	

PETITIONER'S PROPOSED
FINDINGS OF FACT, CONCLUSIONS OF LAW,
AND DECISION AND ORDER

GENTRY INVESTMENT PROPERTIES, a Hawaii limited partnership ("Petitioner"), filed a Petition For District Boundary Amendment on March 21, 2003, pursuant to chapter 205, Hawaii Revised Statutes ("HRS"), and chapter 15-15, Hawaii Administrative Rules ("HAR"), to amend the State land use district boundary to reclassify approximately 282.614 acres of land at Ewa, Oahu, Hawaii, identified as Tax Map Key Nos. 1-9-1-10:7 and 1-9-1-69:5 (collectively the "Property"), from the State Land Use Agricultural District to the State Land Use Urban District for a residential and an industrial and commercial complex ("Project").

The Land Use Commission of the State of Hawaii ("Commission"), having heard and examined the testimony, evidence and arguments of counsel presented during the hearing and the proposed findings of fact, conclusions of law, and decision and order filed by the Petitioner and the responses of the State Office of Planning

("OP"), the City and County of Honolulu ("County"), Intervenor Haseko (Ewa), Inc. ("Haseko") and Intervenor Hawaii Prince Hotel Waikiki Corp. ("Hawaii Prince"), hereby makes the following findings of fact, conclusions of law, and decision and order:

FINDINGS OF FACT

PROCEDURAL MATTERS

1. On March 21, 2003, Petitioner filed a Petition for District Boundary Amendment and Exhibits "1"-"3" ("Petition").

2. On April 21, 2003, Haseko filed its Notice of Intent to Intervene.

3. On April 25, 2003, Petitioner filed its Amended Certificate of Service of Petition for District Boundary Amendment.

4. On April 28, 2003, Petitioner filed its Amended Affidavit of Service of Petition for District Boundary Amendment.

5. By letter dated May 2, 2003, the Executive Officer deemed the Petition a proper filing as of April 28, 2003.

6. On May 20, 2003, Petitioner filed its Errata to Petition for District Boundary Amendment filed March 21, 2003.

7. On May 29, 2003, OP filed its Statement of Position of the Office of Planning in Support of Petition.

8. On June 2, 2003, County filed its Statement of Position of the Office of the Department of Planning and Permitting to the Land Use Commission.

9. On June 6, 2003, Haseko filed Haseko (Ewa), Inc.'s Submission of Witness and Exhibit Lists.

10. On June 6, 2003, Petitioner filed Petitioner's List of Exhibits and List of Witnesses and Attachments "1" and "2".

11. On June 12, 2003, a prehearing conference was conducted in Conference Room 405 of the Leiopapa A Kamehameha Building, 235 South Beretania Street, 4th Floor, in Honolulu, Hawaii, with representatives of Petitioner, OP, County and Haseko present.

12. On June 12, 2003, Haseko filed Haseko (Ewa), Inc.'s Application to Intervene.

13. On June 19, 2003, Petitioner filed Gentry Investment Properties Statement of No-Objection and Non-Appearance of Counsel as to Haseko (Ewa), Inc.'s Application to Intervene filed June 12, 2003.

14. On June 19, 2003, the Commission filed its Prehearing Order.

15. On June 23, 2003, Hawaii Prince filed Intervenor-Applicant Hawaii Prince Hotel Waikiki Corp.'s Petition to Intervene.

16. On July 3, 2003, County filed Department of Planning and Permitting's Amended List of Witnesses and List of Exhibits.

17. On July 3, 2003, Petitioner filed Petitioner's First Amended List of Exhibits and First Amended List of Witnesses, Attachment "A", Exhibits "1"-"8" and Attachment "B".

18. On July 7, 2003, the Commission filed its Order Granting Haseko (Ewa), Inc.'s Application to Intervene.

19. On July 8, 2003, OP filed Office of Planning's List of Exhibits and List of Witnesses.

20. On July 8, 2003, the Commission received correspondence from Department of Land and Natural Resources, Historic Preservation Division, indicating that "We believe that no historic properties will be affected by this undertaking."

21. On July 9, 2003, County filed its Second Amended List of Witnesses and Exhibits.

22. On July 10, 2003, the Commission considered the Petition at its meeting in Honolulu, Hawaii. Entering appearances were Benjamin M. Matsubara, Esq. and Curtis T. Tabata, Esq. for Petitioner, David K. Tanoue, Deputy Corporation Counsel for the County, John W.K. Chang, Deputy Attorney General, Judith Henry and Abe Mitsuda for OP, Linnel T. Nishioka, Esq. for Haseko and J. Douglas Ing, Esq. and Teri Y. Kondo, Esq. for Hawaii Prince.

23. After the appearances of the parties, the Commission heard Hawaii Prince's application for intervention at which time no opposition was presented and no

written opposition had been filed, and a vote was taken on this motion. There being a vote tally of 6 ayes, 0 nays, and 3 absent, the motion carried.

24. The following individuals provided public testimony: Norman Pang, Tesha Malama and Suzanne Alawa.

25. Following the public testimony, the Commission conducted a hearing on the Petition pursuant to a public notice published on June 6, 2003, in the Honolulu Star-Bulletin.

26. On July 11, 2003, the Commission continued the hearing on the Petition, Petitioner Gentry Investment Properties' and Intervenor Haseko (Ewa), Inc.'s Stipulation was filed and entered into evidence and the hearing on the Petition was closed on July 11, 2003, subject to additional evidence that may be submitted by Hawaii Prince.

27. On July 18, 2003, the Commission received correspondence from Hawaii Prince indicating that they would not be calling any witnesses or presenting any testimony with respect to this docket.

28. On July 30, 2003, the Commission served upon the parties the Order Granting Hawaii Prince's Petition to Intervene.

29. On August 7, 2003, the Commission, by its own motion, re-opened the hearing for the limited purpose of receiving additional and clarifying testimony from the State Department of Transportation Highway Division Chief. The Letter

Agreement between the Petitioner and Hawaii Prince, which sets forth the agreement between the two parties regarding drainage, was admitted into evidence, written public testimony was received from Tesha Malama, and the hearing on the Petition was closed.

30. A draft Environmental Impact Statement has been submitted, the comments have been received, and the responses to those comments are nearly complete. It is anticipated that by the end of 2003, Petitioner will have a final approved Environmental Impact Statement through the Office of Environmental Quality Control. [TR 7/10/03, p. 160-161]

DESCRIPTION OF PETITION AREA

31. The Petition Area is located in Ewa, Oahu, Hawaii, consisting of approximately 282.614 acres, and is identified by: 1) Tax Map Key No. 1-9-1-10:7, consisting of 114.617 acres; and 2) Tax Map Key No. 1-9-1-69:5, consisting of 167.997 acres. [Petitioner's Exhibit ("PET Ex.") 1, p. 1]

32. The Ewa Makai-East portion of the Petition Area (Tax Map Key No. 1-9-1-10:7) lies between proposed single family homes in Ewa by Gentry and the Hawaii Prince Golf Course, and extends east of Fort Weaver Road to the U. S. Navy property boundary. The Ewa Makai-West portion of the Petition Area (Tax Map Key No. 1-9-1-69:5) lies west of Fort Weaver Road, between Ewa by Gentry's Sun Terra residential community and the Coral Creek Golf Course (to the north) and Haseko's planned

Ocean Pointe community (to the south). The Barbers Point Naval Air Station Golf Course lies to the West of the Petition Area. [PET Ex. 1, p. 3, 4 and 13]

33. Ewa Makai-West is contiguous to Urban Districts to the north, west and south. Ewa Makai-East is contiguous to the Urban District to the north and Agricultural Districts to the south and east. [PET Ex. 1, p. 5]

34. The Petition Area consists of fallow agricultural lands which were previously leased for many years by Oahu Sugar Company, Ltd. for the production of sugar cane. These leases expired a number of years ago, and for the past several years, nearly all of the Petition Area was leased to Ralph's Ranch on a month-to-month lease. However, Ralph's Ranch, which also leases lands in Kunia and Kahuku, recently vacated the Petition Area, so the Petition Area is no longer in any productive use. [PET Ex. 1, p. 14; PET Ex. 3, p. 2; Hearing Transcript of July 10, 2003 ("TR 7/10/03"), p. 130]

35. Fee simple ownership of the Petition Area is vested in The Estate of James Campbell, whose principal place of business is 1001 Kamokila Boulevard, Kapolei, Hawaii, 96707. [PET Ex. 1, Appendix B and D]

36. The Estate of James Campbell has authorized Petitioner to submit the Petition and to develop the Petition Area as set forth in its written Authorization dated December 4, 2002. [PET Ex. 1, Appendix B and D]

37. The Petition Area contains soil types as determined by the Soil Conservation Service, now known as the Natural Resource Conservation Service (NRCS):

		Acres
EmA	'Ewa silty clay loam, moderately shallow, 0 to 2 percent slopes.	65.1
EmB	'Ewa silty clay loam, moderately shallow, 2 to 6 percent slopes.	21.4
MnC	Mamala stony silty clay loam, 0 to 12 percent slopes.	196.1
	TOTAL	282.6

[PET Ex. 1, Exhibit BB, p. 2]

38. Approximately 30.6% of the Subject Property is rated "Prime" (soil types EmA and EmB), and 69.4% is rated "Other" (soil type MnC) under the "Agricultural Lands of Importance in the State of Hawaii" (ALISH) classification system. [PET Ex. 1, Exhibit BB, p. 3]

39. Approximately 23.2% of the Petition Area is rated "A" and the remaining 76.8% is rated "C" under the UH Land Study Bureau's (LSB) Overall Productivity Rating. [PET Ex. 1, Exhibit BB, p. 3-4]

40. The elevation of the Petition Area ranges from about 20 to 35 feet above mean sea level. [PET Ex. 1, Exhibit BB, p. 4]

41. Except for two pronounced sumps near the eastern boundary of Ewa Makai-East, slopes are approximately 1% in the Petition Area. [PET Ex. 1, Exhibit BB, p. 4]

42. Average annual rainfall in the Petition Area is slightly more than 20 inches. [PET Ex. 1, Exhibit BB, p. 5]

43. The Petition Area receives considerable sunshine, with an average daily insolation exceeding 500 calories per square centimeter. The average low temperature range from about 60°F in the winter to about 70°F in the summer, while average high temperature ranges from just under 80°F in the winter to just under 90°F in the summer. [PET Ex. 1, Exhibit BB, p. 4]

44. The Petition Area is not in an area designated as a flood zone in the Federal Flood Insurance Rate maps. [PET Ex. 3, p. 2; TR 7/10/03, p. 130]

PROPOSAL FOR RECLASSIFICATION

45. The 282.614 acre Ewa Makai development is being proposed as a continuation of the existing Ewa by Gentry. This existing community, situated immediately north of the Ewa Makai parcels, is a 1,000 acre planned development of approximately 7,000 homes, of which 5,383 had been completed and closed as of January 31, 2003. [PET Ex. 3, p. 2]

46. The Conceptual Master Plan for the Ewa Makai property includes approximately 550 single family detached units on approximately 93 acres, 675 cluster

units on approximately 64 acres and 640 multi-family units on approximately 32 acres. It also includes community facilities (a middle school, a community recreation center complex, and two church/daycare sites) on approximately 24 acres, an industrial/commercial complex on approximately 30 acres, parks on approximately 11.5 acres, open space for infrastructure/drainage on approximately 14 acres and roadways on approximately 14.5 acres. [PET Ex. 1, p. 21; PET Ex. 3, p. 2-3]

47. Single family homes will average 5,000 square feet with an estimated density of 7.5 units per acre and average in price between approximately $300,000.00 to $435,000.00 (2003 dollars), cluster homes will have an estimated density of 12.5 units per acre and range in price between approximately $200,000.00 to $300,000.00 (2003 dollars) and multi-family residential homes will have an estimated density of 20 units per acre and will range in price between approximately $150,000.00 to $200,000.00 (2003 dollars). [PET Ex. 1, p. 20, 21-22; PET Ex. 3, p. 3]

48. Two public parks are planned for the Petition Area. The 8 acre park in Ewa Makai-West will be centrally located and within walking or biking distance for many area residents. The 3.5 acre park is an extension of a 6.8 acre park which is planned for the existing Ewa by Gentry development along Keaunui Drive. A 2 acre private community recreation center complex is also planned in Ewa Makai-West. [PET Ex. 1. p. 22; PET Ex. 3, p. 3-4; TR 7/10/03, p. 135]

49. A 30 acre industrial-commercial complex is intended as an adjunct to the proposed 20 acre Laulani Commercial Center which is on land not included in the Petition Area and retained by Campbell Estate and already zoned for urban uses. The industrial-commercial complex is intended to provide supplemental services to meet the needs of the Ewa community and to also provide a major source of employment for an estimated 1,500 people at build-out. Lots would range in size from 15,000 square feet to 3 acres with a total of 35 to 40 expected lots to be used for warehousing, light assembly operations, wholesaling, commercial and other permitted uses. Buildings are not expected to exceed 40 feet in height, and a 30-foot wide landscape and drainage easement will be provided between the buildings and the Ocean Pointe boundary. [PET Ex. 1, p. 22-23; PET Ex. 3, p.4; TR 7/10/03, p. 136]

50. Petitioner plans to convey to the Department of Education, State of Hawaii, an 18 acre site on Kapolei Parkway for the construction of a new middle school for grades 6 through 8. Two 2 acre church sites are planned for Ewa Makai-West and Ewa Makai-East. It is envisioned that the church sites will also serve as centers for day care and/or other community services during the weekdays. [PET Ex. 1, p. 23; PET Ex. 3, p. 4; TR 7/10/03, p. 136]

51. Petitioner plans on dedicating a 2 acre site to the Ewa by Gentry Community Association for the construction of a recreation facility for use by its residents. [PET Ex. 1, p. 23]

52. Petitioner has agreed to comply with the following affordable housing requirements that the County will probably recommend in satisfaction of Revised Ordinances of Honolulu ("ROH") Section 99-51 and 01-33: (1) at least 10% of the total number of units to be developed in the project area must be affordable to households earning up to and including 80% of the area median income as determined by the U.S. Department of Housing and Urban Development ("HUD"), and (2) at least an additional 20% of the total number of units to be developed in the project area shall be affordable to households earning up to and including 120% of the area median income as determined by HUD. [PET Ex. 1, Appendices E, F and G]

53. It is projected that it will take one to one and a half years to obtain the necessary Federal, State and County entitlements and approvals for the first phase, and that the Project is intended to be substantially completed within ten (10) years from the date of LUC approval. [PET Ex. 1, p. 26-27]

54. Petitioner projects that the 1865 total residential units for the Project will be developed according to the following schedule: 1) 2005/90 units; 2) 2006/192 units; 3) 2007/227 units; 4) 2008/270 units; 5) 2009/246 units; 6) 2010/240 units; 7) 2011/123 units; 8) 2012/90 units; 9) 2013/87 units; 10) 2014/60 units; 11) 2015/90 units; 12) 2016/70 units; and 13) 2017/80 units. [PET Ex. 1, p. 27]

55. The proposed development will produce design and construction employment opportunities during the construction phases. Approximately $84.9

million is estimated to be spent on the design and construction of the project infrastructure, approximately $260.7 million is estimated to be spent on the construction of the residences, approximately $85.6 million is estimated to be spent on the construction of the industrial-commercial complex, and approximately $1.38 million is estimated to be spent on the construction of park improvements. [PET Ex. 1, Exhibit KK, p. VI-3, Exhibit VI-G]

PETITIONER'S FINANCIAL CAPABILITY TO UNDERTAKE THE PROPOSED DEVEOPMENT

56. Petitioner's unaudited financial statements as of December 31, 2002, reflect total assets of $85,615,597, total liabilities of $34,684,735, and partners' capital of $50,930,862. [PET Ex. 1, Exhibit AA]

57. Petitioner intends to use a combination of cash reserves and financing to acquire the two parcels for the development. After Petitioner obtains its land entitlements, it will sell the land in smaller increments to Gentry Homes, Ltd., and Gentry Homes, Ltd. will finance the infrastructure and development costs with its current $34 million revolving line of credit and the Petition Area will serve as additional collateral for the line of credit. It is anticipated that this line of credit will have sufficient capacity to finance all site and building improvements for the project. [PET Ex. 1, Exhibit AA]

STATE AND COUNTY PLANS AND PROGRAMS

58. The Petition Area is currently designated in the State Land Use Agricultural District. [PET Ex. 1, p. 5]

59. County's Ewa Development Plan, adopted in 1997, designates the Petition Area as being within the Urban Growth Boundary, and a part of the network of master planned residential communities. [PET Ex. 66 and 67; PET Ex. 3, p. 9 and 10; TR 7/10/03, p. 145]

60. Ewa Makai-West is zoned AG-2 General Agriculture District and Ewa Makai-East is zoned AG-1 Restricted Agriculture District. [PET Ex. 1, p. 6]

61. The Petition Area is not located along the shoreline or next to any beaches and is not within the Special Management Area, and should not have an impact on the Coastal Zone Management Area, and is consistent with the various objectives and policies of the Coastal Zone Management Program, as set forth in Section 205A, HRS. [PET Ex. 1, p. 58]

NEED FOR THE PROPOSED DEVELOPMENT

62. John Child & Company prepared a Market Assessments and Fiscal Economic Impacts analysis in September of 2001 and updated in February of 2003. The Market Assessment concluded that the 1865 residential units proposed for the Project are projected to be sold between 2006 and 2013. It is estimated that Petitioner will sell an average of 287 residential units each year from 2001 to 2009, an average of 276 units

from 2010 to 2013, and an average of 265 units from 2014 to 2016. [PET Ex. 1, Exhibit KK, p. 4-5; PET Ex. 4, p. 2-3]

63. Petitioner proposes to develop the 30 acre industrial-commercial site in 2007, and the demand for industrial-commercial uses supports development of the 30 acre site in the Petition Area. [PET Ex. 1, Exhibit KK, p. 5-6; PET Ex. 4, p. 3-4]

ECONOMIC IMPACTS

64. The projected new construction related jobs created annually on the Project is estimated to average about 310 direct jobs and 547 indirect and induced jobs for a total of about 857 new jobs over the Project's construction period from 2005 to 2013. [PET Ex. 1, Exhibit KK, p. VII-3 - VII-4; PET Ex. 4, p. 4]

65. In addition to the construction related jobs, the development of the 30 acre industrial-commercial complex will create approximately 1,500 permanent long-term operational employment, including light and/or service industrial and retail uses compatible with the residential character of the surrounding neighborhood. [PET Ex. 1, Exhibit KK, p. VII-4; PET Ex. 4, p. 5]

66. The Project is anticipated to have a net fiscal impact on real property taxes of $8.3 million during the construction period of 2005 through 2013, and the annual net fiscal impact is anticipated to be $1.81 million beginning at 2014 (2001 dollars). [PET Ex. 1, Exhibit KK, p. VIII-4 - VII-9; PET Ex. 4, p. 5]

67. The net fiscal impact on State of Hawaii general excise tax revenues and State of Hawaii income tax revenues are anticipated to be $45.2 million during the construction period of 2005 through 2013, and the annual net fiscal impact is anticipated to be $3.65 million beginning at 2014 (2001 dollars). [PET Ex. 1, Exhibit KK, p. VIII-1 - VIII-4; PET Ex. 4, p. 5]

SOCIAL IMPACTS

IMPACTS UPON RESOURCES OF THE AREA

Agricultural Resources

68. Decision Analysts Hawaii, Inc. prepared an Impact on Agriculture study in February 2002. The impact study has concluded that no existing sugarcane or pineapple plantations will be impacted by the Project, and the Project will not limit the potential growth of diversified agriculture due to the vast amount of land that has been released from plantation agriculture since the late 1960s. [PET Ex. 1, Exhibit BB, p. 7 and 8]

Flora and Fauna

69. Char & Associates prepared a Botanical Survey in June of 2001. The Botanical Study concluded that the vegetation on the site consists largely of introduced or alien plant species, and that no threatened or endangered species were found in the Petition Area, and therefore the proposed Project is not expected to have a significant negative impact on the botanical resources. [PET Ex. 1, Exhibit DD, p. 4-5]

70. Mr. Phil Bruner, Environmental Consultant, prepared an Avifaunal and Feral Mammal Survey on May 9, 2001. The Avifaunal and Feral Mammal Survey concluded that no native birds were recorded on the field survey and no unique resources important to native birds were discovered on the Petition Area. The only species of mammal observed on the survey was the Small Indian Mongoose. [PET Ex. 1, Exhibit EE, p. 2-4]

Archaeological/Historical Resources

71. Pacific Legacy, Inc. prepared an Archaeological Survey in January of 2003. The Archaeological Survey concluded that no archaeological sites are present within the Petition Area, and no cultural resources were found within the Petition Area.

While there are no surface archaeological sites, there is the possibility of encountering subsurface resources, and it is recommended that an archaeologist be retained on an on-call basis to assist the contractor in the event that subsurface archaeological resources are encountered. [PET Ex. 1, Exhibit CC, p. 15]

Ground Water Resources

72. Mr. Tom Nance, President of Tom Nance Water Resource Engineering, performed an analysis of the water needs for the Project. Mr. Nance concluded that potable water for the Project will be supplied by the Board of Water Supply ("BWS"). At the present time, the sustainable yield of the aquifer that will

provide the Project's potable water is 102 million gallons a day ("MGD") and the present pumpage is 52 MGD.

Secondly, the BWS recently acquired what is called the Ewa Shaft (or EP15 and 16) which is located at Honouliuli Gulch. The Ewa Shaft currently has an allocation form the Commission on Water Resource Management of 12.154 MGD, and based upon the terms of the shaft's acquisition, its water must be used to serve projects in the Ewa Development Plan area, which includes Petitioner's Project. Based upon the Ewa Shaft and other BWS sources, there will be adequate potable water for the Project's need of approximately 1.0 MGD. [PET Ex. 6, p. 1; TR 7/10/03, p. 173-176]

73. There are two possible sources for the Project's non-potable water needs, the underlying brackish groundwater from the caprock aquifer or reclaimed R-1 quality effluent from the Honouliuli Waste Water Treatment Plant. Due to the expense of connecting to the R-1 effluent system, the non-potable irrigation source will likely come from small, modest capacity existing caprock wells that will be sufficient to meet the Project's non-potable water needs of 0.135 MGD. [PET Ex. 6, p. 1; TR 7/10/03, p. 173-176]

Cultural Resources

74. Pacific Legacy, Inc. prepared a Cultural Assessment in April of 2002. The Cultural Assessment concluded that the Petition Area is located within an area traditionally referred to as the plain of Kaupe`a - the barren place for mischievous

wandering spirits called *ao kuewa*, and further distinction places the Project in an area named Kelea.

Although the traditional surface of the Petition Area have long been destroyed, with in-fill during the cattle grazing years and plowing during clearing for sugarcane agriculture, the area is documented as having been a main thoroughfare for travelers to the settlements on the western coastline and a trail having passed between Pu`u o Kapolei and Pu`u o Palailai.

The Petition Area lies in the path of the traditional viewing direction for the *Māhina`ona* Crown. When the sun moved north it would at one point in the year, May 1 on the western calendar, align in the west and set directly behind Pu`u o Kapolei and Pu`u o Pālailai (two hills northwest of the Petition Area). When the sun would set behind these two hills at the particular alignment, a glowing crown was the result when viewed from the ancient altar site on the present Waikiki Aquarium grounds.

The only archaeological sites documented in the Petition Area are coral sinkholes, which were used for agriculture, and it does not appear that the Project will have any adverse effect to traditional cultural activities in the area. [PET Ex. 1, Exhibit FF, p. 3-16]

ENVIRONMENTAL QUALITY

Noise

75. Y. Ebisu & Associates prepared an Acoustic Study in November of 2001. The Acoustic Study concluded that along the existing roadways which are expected to service the Project traffic, noise levels are expected to increase by 0.8 to 1.6 Ldn between 1998 and 2010 as a result of Project traffic. By 2010, essentially all locations which front Fort Weaver Road, Geiger Road, Kapolei Parkway, Iroquois Road, and Street A will experience relatively high noise levels above 65 Ldn, and will require traffic noise mitigation measures. Those receptor locations which are removed from the major roadways as well as shielded by existing and new buildings should experience traffic noise levels less than 65 Ldn.

Based on 2000/2001 and 2020 aircraft noise contours developed over the project site, only the commercial and industrial portions of the Project site are located inside the 60 Ldn noise contour. Special aircraft noise attenuation measures should not be required for this project. The State Office of Planning recommends that no residential construction be allowed in areas greater than 60 Ldn aircraft noise contours, and that an avigation easement be granted to the State in areas of the Project falling in areas greater than 55 Ldn aircraft noise counters.

Temporary noise impacts may occur during the construction of the proposed Project. Because construction activities are predicted to be audible at

adjoining properties, the quality of the acoustic environment may be degraded to unacceptable levels during periods of construction. Mitigation measures to reduce construction noise will not be practical in all cases. For this reason, the use of quiet equipment and construction curfew periods as required under the State Department of Health noise regulations are recommended to minimize construction noise impacts. [PET Ex. 1, Exhibit II, p. 1; TR 7/11/03, p.166]

Air Quality

76. B.D. Neal & Associates prepared an Air Quality Study in January of 2003. The Air Quality Study concluded that the major potential short-term air quality impact of the project will occur from the emission of fugitive dust during construction. Mitigation measures that should be implemented include watering active work areas and unpaved roads twice daily on days without rainfall, and covering dirt hauling trucks when traveling on roadways. Mitigation measures that will also help to reduce fugitive dust impacts include the use of windscreens and/or limiting the area that is disturbed at any given time, the use of mulch or chemical soil stabilizers, road cleaning and tire washing programs, the paving of parking areas and early landscaping and the monitoring of dust to evaluate the effectiveness of the Project's dust control program and to adjust the program if necessary.

During construction phases, emissions from engine exhausts will also occur both from on-site construction and from vehicles used by construction workers

and trucks traveling to and from the construction site. Increased vehicular emissions can be reduced by moving equipment and personnel to the site during off-peak traffic hours. After the proposed Project is completed, long term impacts on air quality should be small, and worst case concentrations of carbon monoxide should remain within both the State and Federal ambient air quality standards. Implementing any air quality mitigation measures for long term traffic related impacts is probably unnecessary and unwarranted. [PET Ex. 1, Exhibit HH, p. 29-30]

Water Quality

77. Groundwater exists beneath the Petition Area as a thin, brackish basal lens in hydraulic contact with saline water at depth and seawater at shoreline, and is commonly referred to as the Ewa Caprock Aquifer. At present, the use of the aquifer on the eastern side of the Ewa Plain consists of 0.7 million gallons per day by the New Ewa Beach Golf Course and a far lesser amount by a number of small capacity wells on existing Ewa by Gentry developed areas. Development of the Subject Property site should have no significant impact on the aquifer. [PET Ex. 1, p. 47]

ADEQUACY OF PUBLIC SERVICES AND FACILITIES

Highways and Roadway Facilities

78. Parsons Brinckerhoff Quade & Douglas, Inc. performed a Traffic Impact Analysis in December 2002. The Traffic Impact Analysis concluded that with the recommended roadway and traffic improvements, the roadway system can

accommodate the traffic generated by the proposed Project. The two categories of roadway improvements are local and regional. The local roadway improvements will be implemented and paid for by the Petitioner. The State or the County will implement the regional roadway improvements. [PET Ex. 1, Exhibit GG, p. 36; PET Ex. 5, p. 2]

79. Local roadway improvements include extending Keanui Drive south and west from Iroquois Road to Kapolei Parkway, the addition of three full-movement accesses for Keanui Drive between Kapolei Parkway and Fort Weaver Road, widening Geiger Road west of Kapolei Parkway to a three-lane cross section, widen Iroquois Point Road from Keanui Drive to the eastern boundary of the Petition Area, re-stripe Kapolei Parkway north of Geiger Road as a six-lane arterial roadway once Kapolei Parkway is connected to North-South Road, and additional intersections on Kapolei Parkway south of Geiger Road. [PET Ex. 1, Exhibit GG, p. 30-36]

80. The regional roadway improvements include widening Fort Weaver Road from four to six lanes between Geiger Road and Farrington Highway, completion of Kapolei Parkway between Ocean Pointe Development and North-South Road, and implementation of North-South Road and a half-diamond interchange between Kapolei Parkway and H-1 Freeway. [PET Ex. 5, page 2]

81. The Fort Weaver Road expansion project falls under the State Department of Transportation's jurisdiction as a State roadway, and has been divided into two phases: 1) Farrington Highway to Lualaunui Street; and 2) A`awa Drive to the

Geiger Road-Iroquois Point Road intersection. The first phase will be started approximately March 2004 with a tentative completion date of March 2005. [TR 8/7/03, p. 50-51]

82. The second phase of the Fort Weaver Road expansion project, A`awa Drive to the Geiger Road-Iroquois Point Road intersection, will be procured as a design-build project which entails a contractor bidding on both the design and construction phases together to be completed within a set calendar date as a lump sum contract. The cost of the second phase is approximately $1.8 million for design and $18 million for construction.

It is hoped that the Notice to Proceed will be issued by late 2004 with completion of the second phase in early 2007. The completion could be accelerated if an incentive/disincentive type provision is implemented, where the bids are reduced for the sole purpose of determining the low bidder by reducing the bid by the product of a to-be-determined dollar value and the number of applicable days. The actual bid amount does not change, and the State benefits in a shorter construction period and earlier delivery of the project. [TR 8/7/03, p. 51-53]

83. Petitioner has completed Kapolei Parkway to its ultimate cross-section between a point south of Geiger Road to the OR&L right of way. The County has awarded a construction contract for the segment of Kapolei Parkway between the

OR&L right of way and Renton Road and construction should be complete by the summer of 2004. [PET Ex. 5, p. 2-3]

84. The segment of Kapolei Parkway between Renton Road and North-South Road falls under the jurisdiction of the State Department of Land and Natural Resources and Department of Hawaiian Home Lands. [TR 7/11/03, p. 178]

85. The North-South Road project is from H-1 Freeway to Kapolei Parkway. The project will be divided into two phases of $30 million each. The first phase will be from Farrington Highway to Kapolei Parkway for three lanes. The second phase is from Farrington Highway to H-1 including a temporary interchange at the existing Palailai undercrossing. The Notice to Proceed for the first phase is expected to issue by late 2004 with completion by late 2006 or early 2007. The Notice to Proceed for the second phase is expected to issue by late 2005 with completion by early 2007. [TR 8/7/03, p. 53-55]

86. The North-South Road project will initially be built with three lanes instead of the full six lanes for the project. One lane will be used in each direction and the middle lane could be used as a reversible lane with two lanes headed mauka in the morning and two lanes headed makai in the afternoon. [TR 7/11/03, p. 174-175]

87. The funding of the North-South Road project will be through State appropriations and what is intended as a "soft-match" where the Federal government allows the State to use the value of the State owned land for the North-South Road

right-of-way as a local match. The total cost of the project from the H-1 Freeway to Kapolei Parkway is approximately $60 million, which will include $12 million from the State and $48 million from the Federal government. To obtain the Federal funding, the State Department of Transportation will proceed with the Oahu Metropolitan Planning Organization ("OMPO") process. The State Department of Transportation's schedule is subject to OMPO's acceptance of the State Department of Transportation's recommendation, however, the North-South Road project is very high on the State's list of priorities. [TR 7/11/03, p. 175-176; TR 8/7/03, p. 55-56]

88. It is possible to implement the incentive/disincentive provision for the North-South project which could accelerate the completion date . [TR 8/7/03, p. 60]

89. Petitioner is required to comply with Chapter 33A, Revised Ordinances of Honolulu ("Ordinance 02-52"), related to a traffic impact fee program for Ewa and Petitioner will contribute their "fair share" to future roadway improvements in the Ewa region as provided in Ordinance 02-52. [County Ex. 9 and 10]

90. There is currently a mechanism that transfers the impact fees collected by the County to a State account. The State is currently working on legislation that will enable the State to expend those funds, and there is no opposition or controversy surrounding that proposed legislation. [TR 8/7/03, p. 62-63]

Water Service

91. The BWS currently has water system improvement projects in the construction and design stages which will provide adequate source capacity to accommodate the Project. As with Ewa by Gentry, a dual water system will be developed for the Project to conserve the supply of potable water, and non-potable water will be used where feasible for purposes such as landscape irrigation. [PET Ex. 1, p. 79-80; PET Ex. 1, Appendix J]

Wastewater Disposal

92. The Project is located in the tributary area of the Honouliuli wastewater treatment plant. Wastewater generated will be discharged from the site into an existing 84-inch interceptor sewer on Geiger Road which has sufficient capacity to accommodate the proposed flows. All wastewater to the Honouliuli wastewater treatment plant receives at least primary treatment, with a portion of the flow, 13 million gallons per day (mgd), going to secondary and tertiary treatment to produce recycled water. The overall liquid treatment capacity of the plant is 38 mgd. The current solids handling capacity is about 27 to 29 mgd, slightly higher than current flows, but will be expanded to at least 38 mgd under a City project now being designed, and expected to be completed in 2006. The proposed project by Gentry will discharge an estimated one mgd leaving approximately 11 mgd for other future development. [TR 7/10/03, p. 142]

Drainage

Ewa Makai-West

93. On the west side of Fort Weaver Road, lies the Kaloi Gulch Watershed that extends from Palehua on the ridge of the Waianae Mountain to the shoreline of the project formerly known as Ewa Marina and now called Ocean Pointe. The total tributary watershed is approximately 11 square miles. Due to the area's arid character, significant stormwater runoff in the lower part of the watershed where development is currently taking place is infrequent. In the last 10 years, for example, there has been only one such event. It occurred in November of 1996. [PET Ex. 6, p. 7; TR 7/11/03, p. 7-9]

94. Recognizing the need to coordinate drainage improvements among landowners and developers in the Kaloi watershed, the County formed a Technical Committee in 1992 to formulate design guidelines and recommend appropriate drainage improvements. The committee was comprised of engineers representing the City (Public Works), the State (for development planned by HFDC), Campbell Estate (landowner of the upper watershed and the Laulani project, now known as Gentry Makai West), the Ewa Village re-development project, Ewa by Gentry, Coral Creek Golf Course, and Ewa Marina (now Ocean Pointe). Following a series of meetings, the 7-member Kaloi Gulch Technical Committee issued an Interim Report in June 1993. Its most important recommendations were: 1) require all projects to incorporate runoff retention and detention features to reduce peak flowrates and sediment loading to the

Ewa Marina property; 2) open the flow restrictions between Mango Tree Road and the railroad ROW to relieve flooding in the Ewa Villages; and 3) construct an interim drainage channel makai of the Gentry project to allow stormwater passing through the railroad ROW to pass through the Coral Creek golf course and be directed back into the then-existing Kaloi channel makai of the golf course. [PET Ex. 6, p. 7-8]

95. Earlier versions of the Committee's reports listed specific retention/detention volumes for each project and also specified channel inverts and hydraulic grades at the property boundaries between projects. The Ewa Villages re-development, Ewa by Gentry, and Coral Creek Golf Course were all designed, approved by the County, and constructed in compliance with all of the specific requirements contained in earlier drafts of the Technical Committee's report. As a result, stormwater retention/detention volumes of unprecedented sizes have been incorporated in the Ewa Village and Coral Creek golf courses. [PET Ex. 6, p. 8]

96. When the flood in November of 1996 occurred, two key aspects of the Technical Committee's recommendations had not yet been implemented: (1) removal of the restriction of stormwater flow to pass through the railroad ROW to alleviate potential flooding in the Ewa Villages; and (2) construction of the channel makai of Ewa by Gentry. The restriction at the railroad ROW resulted in extensive flooding of Ewa Villages during the November 1996 storm. This event provided the impetus for developing the "Technical Solution" for the interim drainage improvements

which are in place today. As signed off by the engineering representatives of landowners and developers in September 1997, the following interim improvements were required to be installed by each of the affected landowner/developers: 1) channel conveyance capacity from the railroad ROW through Ocean Pointe equivalent to 2500 CFS with no freeboard capacity; 2) invert elevations at each of the property boundaries between projects were to be as specified; 3) discharge from the interim channel was to be directed into a retention/detention basin to be constructed in Ocean Pointe; and 4) overflow from this basin was to be directed through Oneula Beach Park to the ocean. [PET Ex. 6, p. 8]

97. The interim 2500 CFS conveyance capacity from the Ewa Villages to Oneula Beach Park has been in place since January 2000. What remains to be installed for complete floodwater protection is sufficient channel conveyance capacity to meet the County Drainage Standards requirement of 11,000 CFS. As originally conceived as far back as the 1970s and as still incorporated in Ocean Pointe's currently approved drainage master plan, the channel with the full 11,000 CFS capacity was to discharge into the project's marina. However, accomplishing this would require lowering the County's Honouliuli WWTP ocean outfall, an undertaking of substantial cost and considerable risk. Recently, Haseko has been assessing alternatives that would utilize discharge through Oneula Beach Park rather than into the marina. Until this process is completed and the ultimate drainage improvements in Ocean Pointe are installed, all of

the upstream projects are limited to passing 2500 CFS through their respective interim channels and retaining their project-generated stormwater onsite. [PET Ex. 6, p. 8]

98. The onsite project drainage will consist of catchbasins/inlets, manholes and drain pipes located in dedicated roadways. A box culvert or open channel is planned to run parallel to the makai boundary of the site, intercepting and diverting runoff to the Kaloi Channel. Runoff is not expected to flow into the areas makai of the project site. Onsite drainage systems will be designed in accordance with the County's Storm Drainage Standards. [PET Ex. 7, p. 2]

99. The lack of adequate conveyance capacity makai of the project site may require phasing of the development and drainage improvements. Excavation of temporary retention/detention basins could be done to allow initial development of the Project to proceed. Interim improvements will be designed in accordance with the requirements of the Storm Drainage Standards and with the approval of all concerned government agencies. Also, the Coral Creek and Ewa Villages golf courses provide large amounts of retention and detention storage. In addition to dampening of the peak runoff, the storage also has the beneficial effect of settling out sediment in the runoff. The amount of storage within the Coral Creek golf course will satisfy the water quality requirements for the Ewa By Gentry and Ewa Makai-West projects. [PET Ex. 7, p. 2]

100. The proposed drainage improvements for the Ewa Makai-West portion of the Project will be consistent with the drainage plans identified in approved

drainage master plans for the area and will not have adverse impacts on drainage in the area. All improvements will be in accordance with the standards of the County, and all other applicable rules and regulations. [PET Ex. 7, p. 2]

Ewa Makai-East

101. The Petition Area east of Fort Weaver Road known as Ewa Makai-East encompasses drainage issues that are local in nature as opposed to regional issues that are present in the Kaloi Gulch watershed. Being local in nature, the drainage issues relating to Ewa Makai-East affect only the adjoining landowners. [TR 7/11/03, p. 56-57]

102. Under the terms of the Seibu Acquisition Agreement dated May 1987 between the Estate of James Campbell and Seibu Hawaii, Inc., the Hawaii Prince golf course (located makai of Ewa Makai-East) was to accommodate runoff from 255 acres of mauka land when those mauka lands are put into residential use. [PET Ex. 8, p. 1]

103. The current approved drainage master plan for Ewa Makai-East is entitled "Drainage Master Plan for Ewa by Gentry-East, Phase II and Ewa Makai-East, Tax Map Key: 9-1-10:7 and 20" and was accepted by the County on July 18, 1997. The approved 1997 drainage master plan, which encompasses the same 255 acres referenced in the Seibu Acquisition Agreement, reduces the area of runoff from 255 acres to 70 acres of land adjacent to Fort Weaver Road plus areas immediately adjacent to the Hawaii Prince golf course to drain into the Hawaii Prince golf course. The remaining

areas are to drain into drainage sumps located within the Ewa Makai-East development and the existing sump straddling the eastern property line. [PET Ex. 8, p. 1]

104. The 1997 drainage master plan is currently pending revision before the County, and the revision proposed by the Petitioner, if approved by the County, will reduce the aforementioned 70 acres to approximately 10 acres, and the remaining areas would drain into sumps as described in the 1997 drainage master plan. [PET Ex. 8, p. 1-2]

105. If the revised 1997 drainage master plan is approved by the County, there will not be any increase in the storm water runoff to the downstream adjoining properties and/or in comparison to the Seibu Acquisition Agreement. [PET Ex. 8, p. 2; TR 7/11/03, p. 55]

Solid Waste Disposal

106. Solid waste handling and disposal will be coordinated with the County Department of Environmental Services, Refuse Division, with written notification submitted in advance of when the refuse service is expected to begin. The design of residential communities within the Project will comply with the Division's requirements in order to enable refuse pick-up. [PET Ex. 1, p. 81]

107. The project is estimated to produce 3728 tons of solid waste based upon a population of approximately 6,000 persons at final buildout, however, the

existing Waimanalo Gulch landfill is expected to reach its capacity in 2008. [TR 7/10/03, p. 157-158]

108. In response to the projected 2008 closure date for the existing landfill, the County's Refuse Division is planning to expand the existing H-Power plant, identify the County's next land fill and submitting the Refuse Division's recommendation to the City Council by December 1, 2003, develop an alternative disposal technologies park on land that has been acquired by the County for the purpose of exploring waste disposal technologies, propose a curbside recycling collection pilot, and implement a bioconversion project for sewage sludge that will be located on the grounds of the Sand Island Treatment Plant. [TR 7/11/03, p. 152-154]

109. It is the intent of the County's Refuse Division to have the new land fill on line by 2008. [TR 7/11/03, p. 155]

Schools

110. The Ewa Development Plan states that the State Department of Education ("DOE") has projected a need by 2020 for two new intermediate schools, one of which has already been built in the Villages of Kapolei. Although the Ewa Development Plan list East Kapolei Intermediate as the second school site, the development of East Kapolei Intermediate is uncertain at this time. The Petition and the DOE have agreed to enter into a written agreement whereby the Petitioner will be

conveying to the DOE an 18 acre site on Kapolei Parkway for the construction of a new middle school for grades 6 through 8. [PET Ex. 1, p. 80-81]

Police and Fire Protection

111. The Project is serviced by the Kapolei Police Station, which is located at 1100 Kamokila Boulevard in Kapolei. There is also a storefront office next to the 7-Eleven store at 91-1669 Fort Weaver Road. According to the Honolulu Police Department, the additional residential units added by the Project will create an increase in the need for police service. It is anticipated that the increase in net economic benefits to the County will address the increased cost of police services needed. [PET Ex. 1, p. 81]

112. The Project will be serviced by the Waipahu Fire Station for single alarm fires. For a multiple alarm such as a structure fire, three engine companies and one ladder company would be sent from the Ewa Beach, Waipahu and Kapolei Fire Stations, with the ladder company originating from the Waipahu Fire Station. [PET Ex. 1, p. 81]

Electricity and Telephone Service

113. The Project will be serviced by Hawaiian Electric Co. ("HECO") for electric power and Verizon for telephone service. HECO indicated that it will be able to serve the Project from the Fort Weaver Substation which was installed in an earlier phase of the Ewa by Gentry project. Therefore, the installation of additional substation

transformer capacity and extension cables, ducts and associated electrical facilities should encounter no significant obstacles to providing timely and reliable service. [PET Ex. 1, p. 81-82]

COMMITMENT OF STATE FUNDS AND RESOURCES

114. Government costs incurred as a result of the Project are not expected to exceed the revenues derived. The government costs associated with development of the Project consists primarily of school development and roadway improvements. Petitioner is expected to contribute a fair-share of the costs of such school development and roadway improvements. [PET Ex. 1, p. 80-81; PET Ex. 1, Exhibit KK, p. VIII-1 - VIII-4; PET Ex. 4, p. 5; County Ex. 9 and 10]

CONFORMANCE TO URBAN DISTRICT STANDARDS

115. The Petition Area is adjacent to lands characterized by "city-like" concentrations of people, structures, streets, urban levels of service and other related land uses. The Petition Area will be an extension of the Ewa by Gentry community, considered a part of Oahu's growing Kapolei region where more than 450 businesses provide over 16,000 jobs and the number of jobs is expected to double by 2010. Schools, parks, medical services, shopping and entertainment centers, restaurants and recreation facilities service a growing population. [PET Ex. 1, p. 48]

116. Ewa by Gentry in itself is a growing community consisting of over 5,300 existing homes in a planned development that will consist of an estimated 9,100

homes at build-out (including the Petition Area). Parks, walkways and bike paths, landscaped roadways, an elementary school, an 18-hole championship golf course, a neighborhood shopping center, and a planned light industrial park are elements that contribute to Ewa by Gentry's "city-like" characteristics. [PET Ex. 1, p. 48]

117. The Petition Area is in close proximity to various centers of trading and employment (Kapolei, Waipahu, Ewa by Gentry, Ewa Beach, Barbers Point, Campbell Industrial Park, and military installations). Furthermore, the Petition Area will generate new centers of employments including a 30 acre industrial-commercial center, a middle school, and two church/day care center sites. [PET Ex. 1, p. 48]

118. The Petition Area is, or upon completion of necessary offsite and onsite infrastructure will be, adequately serviced by schools, parks, wastewater, solid waste disposal, drainage, water and transportation systems, public utilities, and police and fire protection. [PET Ex. 1, p. 49]

119. The Petition Area is located in an area with sufficient reserve for foreseeable urban growth. [PET Ex. 1, p. 49]

120. The Petition Area consists of satisfactory topography, drainage and soil conditions, is free from the danger of flood, tsunami and unstable soil conditions, and is not affected by any other adverse environmental conditions that would render it unsuitable or inappropriate for the proposed development. [PET Ex. 1, p. 49]

121. The Petition Area is contiguous with or in close proximity to existing urban areas, and is consistent with the Ewa Development Plan, by the Planning Department, City & County of Honolulu, adopted August 1997. [PET Ex. 1, p. 49]

122. The Petition Area is in an appropriate area for new urban concentration, as it represents an expansion of an existing residential community (Ewa by Gentry), and, as mentioned above, is consistent with the Ewa Development Plan. [PET Ex. 1, p. 49]

123. The Petition Area is adjacent or in close proximity to existing urban development. [PET Ex. 1, p. 49]

124. The Petition Area is adjacent to an existing residential community and will not contribute toward scattered spot urban development. The Petitioner will develop or arrange for all additional infrastructure required to service the proposed development, and public infrastructure and support services will not be unreasonably burdened by or require any unreasonable investment as a result of the proposed development. [PET Ex. 1, p. 49]

125. The Petition Area does not consist of lands having a slope of twenty percent or more. [PET Ex. 1, p. 49]

CONFORMANCE WITH THE GOALS, OBJECTIVES, AND POLICIES OF THE HAWAI`I STATE PLAN; RELATIONSHIP WITH APPLICABLE PRIORITY GUIDELINES AND FUNCTIONAL PLANS

126. The reclassification of the Petition Area and the proposed development of the Project are in conformity with the numerous goals, objectives, policies and priority guidelines of the Hawaii State Plan, including the following:

State Goals: All of the State goals set forth in Section 226-4, HRS.

State Objectives: The State objectives set forth in Sections 226-5, 226-6, 226-11, 226-12, 226-13, and 226-19, HRS.

State Policies: Numerous State policies set forth in Chapter 226, HRS, including the following:

Section 226-5(b)(1): "Manage population growth statewide in a manner that provides increased opportunities for Hawaii's people to pursue their physical, social, and economic aspirations while recognizing the unique needs of each county."

Section 226-5(b)(3): "Promote increased opportunities for Hawaii's people to pursue their socio-economic aspirations throughout the islands."

Section 226-5(b)(7): "Plan the development and availability of land and water resources in a coordinated manner so as to provide for the desired levels of growth in each geographic area."

By providing for a variety of land uses, including residential, commercial-industrial, parks, open space, and a public school facility, the Project will provide increased opportunities for Hawaii's people to pursue their physical, social and economic aspirations. The proposed industrial-commercial center will provide

permanent jobs, as well as short-term construction related jobs for residents of Ewa and the island of Oahu. With greater economic opportunities and the increased availability of new homes, overall living standards and lifestyles will be enhanced by living and working in the "new city" planned for the greater Kapolei region. The development and availability of land and water resources is being planned in a coordinated manner with public agencies and other developers in the region.

Section 226-6(a)(1): "Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawaii's people."

Section 226-6(a)(2): "A steadily growing and diversified economic base that is not overly dependent on a few industries."

Section 226-6(b)(3): "Seek broader outlets for new or expanded Hawaii business investments."

Section 226-6(b)(6): "Strive to achieve a level of construction activity responsive to, and consistent with, state growth objectives."

Section 226-6(b)(7): "Foster a business climate in Hawaii - including attitudes, tax and regulatory policies, and financial and technical assistance programs - that is conducive to the expansion of existing enterprises and the creation and attraction of new business and industry."

The industrial-commercial center will provide an outlet for new or expanded business investments, thereby helping to foster a positive business climate in Hawaii. It will provide an opportunity for the expansion of existing enterprises, as well as the creation and attraction of new businesses and industries. The development of Ewa Makai will also help the State to achieve a level of construction activity that is consistent with its growth objectives throughout the build-out period.

Section 226-11(a)(1): "Prudent use of Hawaii's land-based, shoreline, and marine resources."

Section 226-11(a)(2): "Effective protection of Hawaii unique and fragile environmental resources."

Section 226-11(b)(1): "Exercise an overall conservation ethic in the use of Hawaii's natural resources."

Section 226-11(b)(2): "Ensure compatibility between land-based and water-based activities and natural resources and ecological systems."

Section 226-11(b)(3): "Take into account the physical attributes of areas when planning and designing activities and facilities."

Section 226-11(b)(6): "Encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii."

Section 226-11(b)(7): "Pursue compatible relationships among activities, facilities, and natural resources."

Prior to preparation of the proposed Ewa Gentry Makai Master Plan, physical, environmental, and cultural aspects of the property were studied. Site features, including slope, existing sump areas, soil stability, and drainage needs were incorporated into the design. There was no rare or endangered plant or animal species found on the Petition Area, and 90% of the plant species inventoried are introduced. The native plant species are not threatened or endangered and the proposed development of the Petition Area is not expected to have a significant negative impact on the botanical resources.

With respect to conserving the use of Hawai`i's natural resources, the Petitioner has been a leader in waste management. From site design and development to waste disposal and recycling, the Petitioner has successfully incorporated waste saving products, methods and techniques into all phases of housing development.

Section 226-12(b)(1): "Promote the preservation and restoration of significant natural and historic resources."

Section 226-12(b)(3): "Promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features."

Section 226-12(b)(4): "Protect those special areas, structures and elements that are an integral and functional part of Hawaii's ethnic and cultural heritage."

Section 226-12(b)(5): "Encourage the design of developments and activities that complement the natural beauty of the islands."

Because the Petition Area was formerly cultivated in sugar, it does not contain any scenic assets, places of natural beauty, or multi-cultural or historical resources. Plans for the Project will promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of the mountains and Honolulu city vistas to the extent possible. There are no ocean views from the Petition Area.

The archaeological survey determined that no archaeological sites are present within the Petition Area. If subsurface cultural resources are encountered during the course of development, the Historic Preservation Division of the Department of Land and Natural Resources will be notified in accordance with State requirements.

Section 226-13(b)(2): "Promote the proper management of Hawaii's land and water resources."

Section 226-13(b)(3): "Promote effective measures to achieve desired quality in Hawaii's surface, ground and coastal waters."

Section 226-13(b)(4): "Encourage actions to maintain or improve aural and air quality levels to enhance the health and well-being of Hawaii's people"

Section 226-13(b)(5): "Reduce the threat of life and property from erosion, flooding, tsunamis, hurricanes, earthquakes, volcanic eruptions, and other natural or man-induced hazards and disasters."

Section 226-13(b)(6): "Encourage design and construction practices that enhance the physical qualities of Hawaii's communities."

Section 226-13(b)(7): "Encourage urban developments in close proximity to existing services and facilities."

The Petitioner will continue to promote the proper management of land and water resources in the development of the Project. From incorporating efficient waste management and waste reduction strategies, to managing stormwater on site and utilizing non-potable water for irrigation purposes, the Petitioner continues to work towards minimizing any negative impacts to Hawai`i's natural resources. The homes and community are designed and constructed to reduce the threat to life and property from erosion, flooding, hurricanes, and other natural or man-induced hazards and disasters, as well as to enhance the physical qualities of Ewa. The Project is proposed to be an urban development in close proximity to existing services and facilities.

Section 226-16(b)(1): "Coordinate the development of land use activities with existing and potential water supply."

Section 226-16(b)(3): "Reclaim and encourage the productive use of runoff water and wastewater discharges."

Section 226-16(b)(6): "Promote water conservation programs and practices in government, private industry, and the general public to help ensure adequate water to meet long-term needs.

All necessary on-site water facilities will be provided in consultation with the BWS and will be built in accordance with an approved Water Master Plan. It is expected that the Project will have sufficient potable water based upon the presently available aquifer and the recently acquired Ewa Shaft.

The Petitioner has incorporated the use of non-potable brackish water in its Ewa by Gentry development, and it is also studying the possible use of reclaimed water as an alternative to potable water when non-potable water systems are inoperable or are no longer available.

Section 226-17(b)(2): "Coordinate state, county, federal, and private transportation activities and programs toward the achievement of statewide objectives."

Section 226-17(b)(3): "Encourage a reasonable distribution of financial responsibilities for transportation among participating governmental and private parties."

Section 226-17(b)6): "Encourage transportation systems that serve to accommodate present and future development needs of communities.

Section 226-17(b)(10): "Encourage the design and development of transportation systems sensitive to the needs of affected communities and the quality of Hawai`i's natural environment."

Section 226-17(b)(11): "Encourage safe and convenient use of low-cost, energy-efficient, non-polluting means of transportation."

The Petitioner has participated in the coordinated effort among state, county, federal and other private entities which objective is to provide a transportation system that is consistent with and will accommodate planned growth objectives throughout the State.

Section 226-19(a)(1): "Greater opportunities for Hawaii's people to secure reasonably priced, safe, sanitary, and livable homes, located in suitable environments that satisfactorily accommodate the needs and desires of families and individuals, through collaboration and cooperation between government and nonprofit and for-profit developers to ensure that more affordable housing is made available to very low-, low- and moderate-income segments of Hawaii's population."

Section 226-19(a)(2): "The orderly development of residential area sensitive to community needs and other land uses."

As a residential developer in Hawai`i for 35 years, the Petitoner has gained a reputation for providing quality homes at prices affordable to Hawai`i's consumers. The Petitioner's buyers, many of whom are first time homebuyers, represent a socio-economic cross section of Hawai`i's population, including very low-, low- and moderate income families and individuals.

Section 226-19(b)(1): "Effectively accommodate the housing needs of Hawaii's people."

Section 226-19(b)(2): "Stimulate and promote feasible approaches that increase housing choices for low-income, moderate-income, and gap-group households."

Section 226-19(b)(3): "Increase home ownership and rental opportunities and choices in terms of quality, location, cost, densities, style, and size of housing."

Section 226-19(b)(5): "Promote design and location of housing developments taking into account the physical setting, accessibility to public facilities and services, and other concerns of existing communities and surrounding areas."

The Project is proposed as a master planned residential community designed to accommodate the housing needs of Hawai`i's people. As a continuation of the existing Ewa by Gentry community, it will increase homeownership opportunities by providing a mix of housing types that are affordable to low-income, moderate-income, and gap-group families. The design of the Project will take into account the physical setting of the Ewa plain, accessibility to public facilities and services, and other concerns of existing communities. Transportation improvements, a major employment center, parks and recreational sites, places of worship/day care centers, and an 18 acre middle school will be incorporated into the design of the community.

Section 226-21(b)(3): "Ensure the provision of adequate and accessible educational services and facilities that are designed to meet individual and community needs."

The Petitioner has agreed with the DOE to enter into an agreement for the conveyance of 18 acres for the construction of a middle school within the Petition Area.

State Priority Guidelines: The following State priority guidelines:

Section 226-103(e)(1): "Maintain and improve water conservation programs to reduce the overall water consumption rate."

The Project, like the rest of Ewa by Gentry, will incorporate a dual water system. Brackish water from non-potable wells will be used where feasible to irrigate landscaping in common areas.

Section 226-103(f)(3): "Provide incentives to encourage the use of energy conserving technology in residential, industrial, and other buildings."

The Petitioner continues to incorporate energy conserving technology in its homes, including optional solar heating, energy efficient appliances, insulation in walls and ceilings, and energy-efficient designs that take advantage of the tradewinds to the extent possible.

Section 226-104(b)(1): "Encourage urban growth primarily to existing urban areas where adequate public facilities are already available or can be provided with reasonable public expenditures, and away from areas where other important benefits are present, such as protection of important agricultural land or preservation of lifestyles."

Section 226-104(b)(2): "Make available marginal or nonessential agricultural lands for appropriate urban uses while maintaining agricultural lands of importance in the agricultural district."

Section 226-104(b)(6): "Seek participation from the private sector for the cost of building infrastructure and utilities, and maintaining open spaces."

The Project is surrounded by urban development, and is located on nonessential agricultural land that is located in an urban fringe area adjacent to the "Second City". City policy is to encourage development of this urban fringe area in order to provide housing choices not readily available in urban Honolulu and to relieve pressures for development of rural areas, Windward Oahu, and East Honolulu. The Petitioner will contribute its fair-share impact fees in building necessary roadways, as well as utilities needed for the development. Open spaces will be maintained within the project.

Section 226-104(b)(9): "Direct future urban development away from critical environmental areas or impose mitigating measures so that negative impacts on the environment would be minimized."

Section 226-104(b)(10): "Identify critical environmental areas in Hawaii to include but not be limited to the following: watershed and recharge areas; wildlife habitats (on land and in the ocean); areas with endangered species of plants and wildlife; natural streams and water bodies; scenic and recreational shoreline resources;

open space and natural areas; historic and cultural sites; area particularly sensitive to reduction in water and air quality; and scenic resources."

The Project will not affect any critical environmental areas.

Section 226-106(1): "Seek to use marginal or nonessential agricultural land and public land to meet housing needs for low- and moderate-income and gap-group households."

The Project will provide homes for low- and moderate-income and gap-group households on nonessential agricultural land.

Section 226-106(2): "Encourage the use of alternative construction and development methods as a means of reducing production costs."

As a developer, the Petitioner has consistently been on the cutting edge of technology, utilizing alternative construction materials and methods in order to reduce production costs, while improving the quality of homes that are built. For example, long-lasting, durable products such as fiber-cement siding and vinyl fencing are utilized, eliminating waste and providing value to homeowners.

Section 226-106(5): "Encourage continued support for government or private housing programs that provide low interest mortgages to Hawaii's people for the purchase of initial owner-occupied housing."

The Petitioner supports and has been a user of the State's Hula Mae Single Family Mortgage Purchase Program, as well as other government programs which

provide low-interest loans to first time homebuyers. These include the USDA-RD Section 502 Single Family Home Ownership program; the Federal Housing Administration Loan Program; and the Veterans Administration Loan Program.

Section 226-106(8): "Give higher priority to the provision of quality housing that is affordable for Hawaii's residents and less priority to development of housing intended primarily for individuals outside of Hawaii."

As with the rest of the Ewa by Gentry development, the Project is intended to provide quality homes that are affordable to Hawai`i's residents. [PET Ex. 1, p. 48-58]

CONFORMANCE WITH COASTAL ZONE MANAGEMENT OBJECTIVES AND POLICIES

127. The Petition Area does not lie within the Coastal Zone Management Area established pursuant to Chapter 205A, HRS, and is therefore not subject to the Coastal Zone Management Area requirements.

RULING ON PROPOSED FINDINGS OF FACT

Any of the proposed findings of fact submitted by the Petitioner or the other parties to this proceeding not already ruled upon by the Commission by adoption herein, or rejected by clearly contrary findings of fact herein, are hereby denied and rejected.

Any conclusion of law improperly designated as a finding of fact should be deemed or construed as a conclusion of law; any finding of fact herein improperly designated as a conclusion of law should be deemed or construed as a finding of fact.

CONCLUSION OF LAW

Pursuant to Chapter 205, HRS, and the State Land Use Commission Rules under Chapter 15-15, HAR, the Commission finds upon a preponderance of the evidence that the reclassification of the Petition Area, consisting of approximately 282.614 acres of land in the Agricultural District, situate at Ewa, Oahu, Hawaii, Tax Map Key Nos. 1-9-1-10:7 and 1-9-1-69:5, to the Urban District, for the development of the Project, and subject to the conditions in the Order below, is reasonable, non-violative of Section 205-2, HRS, and is consistent with the Hawai`i State Plan as set forth in Chapter 226, HRS, and the Coastal Zone Management Program as set forth in Chapter 205A, HRS.

ORDER

IT IS HEREBY ORDERED that the Petition Area, consisting of approximately 282.614 acres of land in the State Land Use Agricultural District situate at Ewa, Oahu, Hawaii, Tax Map Key Nos. 1-9-1-10:7 and 1-9-1-69:5, as approximately shown in Exhibit "1" attached hereto and incorporated herein by reference herein, shall be and is hereby reclassified to the State Land Use District and the State Land Use District Boundaries shall be amended accordingly.

IT IS FURTHER ORDERED that the reclassification of the Petition from the Agricultural District to the Urban District shall be subject to the following conditions:

1. Petitioner shall provide affordable housing opportunities for low, low-moderate, and gap group income residents of the State of Hawaii to the satisfaction of the City and County of Honolulu. The location and distribution of the affordable housing or other provisions for affordable housing shall be under such terms as may be mutually agreeable between the Petitioner and the County.

2. Petitioner shall contribute to the development, funding, and/or construction of school facilities, on a fair-share basis, as determined by and to the mutual satisfaction of the Petitioner and the Department of Education. Terms of the contribution shall be agreed upon in writing by the Petitioner and the Department of Education prior to obtaining County rezoning.

3. Petitioner shall fund and construct adequate wastewater transmission and disposal facilities, as determined by the City and County of Honolulu Department of Environmental Services (ENV) and the State Department of Health (DOH).

4. Petitioner shall participate in the pro-rata funding and construction of local and regional transportation improvements and programs necessitated by the proposed development according to the regulatory scheme and factors covered by the

City and County of Honolulu's impact fee ordinance - Chapter 33A, Revised Ordinances of Honolulu and as determined by the State Department of Transportation.

5. The Petitioner shall provide a landscaped building setback (approximately 12 feet) along the subject project's Fort Weaver Road frontage to provide flexibility in accommodating future transportation needs along the route and to buffer roadway noise.

6. Should any previously unidentified burials, archaeological or historic sites such as artifacts, marine shell concentrations, charcoal deposits, or stone platforms, pavings or walls be found, the Petitioner, developers and/or landowners of the affected properties shall comply with all applicable statutory provisions of Chapter 6E Hawaii Revised Statutes and administrative rules of the Department of Land and Natural Resources (DLNR).

7. Petitioner shall coordinate and discuss with the Office of Hawaiian Affairs the incorporation of Hawaiian cultural elements such as trail alignments, if deemed appropriate, and the use of proper place names for the proposed development.

8. Petitioner shall develop a Solid Waste Management Plan in conformance with the Integrated Solid Waste Management Act, Chapter 342G, Hawaii Revised Statutes. Petitioner's Solid Waste Management Plan shall be approved by the City and County of Honolulu Department of Environmental Services. The Plan shall

address and encourage an awareness of the need to divert the maximum amount of waste material caused by developments away from the County's landfills.

9. Petitioner shall participate in an air quality monitoring program as specified by the State Department of Health.

10. Petitioner, its successors, and assigns shall coordinate the design and construction of drainage improvements on the Property required as a result of the development of the Property to the satisfaction of Federal, State and City agencies with the goal of executing an agreement on the interim and ultimate regional drainage plan as soon as possible. Petitioner, its successors, and assigns shall participate in the planning and coordination of off-site improvements with all landowners and developers in the Kaloi drainage basin, and other Federal, State, and City agencies.

11. Petitioner, its successors, and assigns, agrees to work with the City to implement interim and long-term regional drainage solutions as follows:

a. Petitioner shall submit an updated drainage master plan if required for the Property to the City for its review and approval prior to any subdivision approvals other than for minor matters, such as easements.

b. Drainage solutions for the Property shall be compatible with the drainage designs for other developments in the Kalo`i Gulch drainage basin and shall conform to applicable Federal, State, and City laws, rules, regulations, and standards.

c. Drainage improvements for the Property shall be consistent with the policies and principles in the `Ewa Development Plan.

d. Petitioner shall be responsible for maintaining previously constructed drainage improvements which limit channelized runoff to 2,500 cubic feet per second (cfs) at the Property's southern boundary (specifically at the property boundary between Petitioner's property and Haseko's property) for events up to a 100-year storm. Petitioner shall also take reasonable measures to minimize non-channelized flows from the Property by construction of berms, detention basins, or other appropriate methods. These requirements shall remain in force until long-range regional drainage improvements are in place in accordance with the approved drainage master plan for the Project.

e. The Petitioner has or shall enter into a Letter Agreement with Hawaii Prince to mutually address the drainage issues as it pertains to the Hawaii Prince golf course.

12. Petitioner shall participate in the funding and construction of adequate water source, storage, and transmission facilities and improvements to accommodate the proposed project. Water transmission facilities and improvements shall be coordinated and approved by appropriate State and County agencies.

13. Petitioner shall grant to the State of Hawaii an avigation (right of flight) and noise easement in a form prescribed by the State Department of

Transportation on any portion of the Property subject to aircraft noise contours exceeding 55 Ldn.

14. Petitioner shall not construct residential units within areas exposed to Honolulu International Airport and Naval Station Barbers Point noise levels of 65 Ldn or greater.

15. Petitioner, developers and/or landowners of the Subject Property shall fund and construct adequate solar powered civil defense systems as determined by the County and State Civil Defense agencies.

16. Petitioner where feasible shall implement energy conservation measures such as the use of solar energy and solar heating and incorporate such measures to the proposed development.

Dated: Honolulu, Hawaii _____

OF COUNSEL:
MATSUBARA, LEE & KOTAKE
A Law Corporation

_____
BENJAMIN M. MATSUBARA
CURTIS T. TABATA
Attorney for Petitioner
GENTRY INVESTMENT PROPERTIES

BEFORE THE LAND USE COMMISSION

OF THE STATE OF HAWAII

In the Matter of the Petition of GENTRY INVESTMENT PROPERTIES Petition For District Boundary Amendment	)	DOCKET NO. A03-738 GENTRY INVESTMENT PROPERTIES

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing document in this matter was duly served upon the parties listed below via U.S. certified mail, postage prepaid on _____, 2003

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GENTRY INVESTMENT PROPERTIES

BEFORE THE LAND USE COMMISSION

ORIGINAL

OF THE STATE OF HAWAII

In the Matter of the Petition of GENTRY INVESTMENT PROPERTIES Petition For District Boundary Amendment	DOCKET NO. A03-738 GENTRY INVESTMENT PROPERTIES

PETITION FOR DISTRICT BOUNDARY AMENDMENT

VERIFICATION

EXHIBITS "1" TO "3"

AND

CERTIFICATE OF SERVICE

LAND USE COMMISSION
STATE OF HAWAII
2003 MAR 21 A 9:10

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BEFORE THE LAND USE COMMISSION

OF THE STATE OF HAWAII

In the Matter of the Petition of GENTRY INVESTMENT PROPERTIES Petition For District Boundary Amendment	DOCKET NO. A03-738 GENTRY INVESTMENT PROPERTIES

PETITION FOR DISTRICT BOUNDARY AMENDMENT

TO: THE HONORABLE LAND USE COMMISSION OF THE STATE OF HAWAII:

COMES NOW, GENTRY INVESTMENT PROPERTIES, for an amendment to the land use district boundary to effect district reclassification of approximately 283 acres (the "Subject Property") at Ewa, Island of Oahu, State of Hawaii, from the Agricultural district to the Urban district. The authority for the relief sought by the Petition is Section 205-4 of the Hawaii Revised Statutes, as amended ("HRS") and Title 15, Subtitle 3, Chapter 15 of the Hawaii Administrative Rules ("HAR").

The Petitioner hereby alleges and shows as follows:

(1)

NAME AND ADDRESS OF PETITIONER

The Petitioner is Gentry Investment Properties, a Hawaii limited partnership, whose principal place of business is 560 North Nimitz Highway, Suite 300, Honolulu, Hawaii, 96817, and

whose mailing address is P.O. Box 295, Honolulu, Hawaii, 96809-0295.

(2)

COMMUNICATIONS TO PETITIONER

All correspondence or communications in this matter should be addressed to and served upon Toshimasa Hosoda, of Gentry Homes, Ltd., Senior Vice President, whose mailing address is P.O. Box 295, Honolulu, Hawaii, 96809-0295.

(3)

DESCRIPTION OF SUBJECT PROPERTY

The Subject Property is located in Ewa, Oahu, Hawaii, consisting of approximately 283 acres, and is identified by: 1) Tax Map Key No. 1-9-1-10:7, consisting of 114.617 acres; and 2) Tax Map Key No. 1-9-1-69:5, consisting of 167.997 acres. A map showing the location of the Subject Property on the Island of Oahu is attached to this Petition as Figure 1 of Exhibit 1 entitled Planning Report For A State Land Use District Boundary Amendment And Zone Change Application, Ewa Makai, Ewa, Oahu, March 2003 ("Exhibit 1") and incorporated herein by reference. The tax map for the Subject Property is attached to this Petition as Figures 2a. and 2b. of Exhibit 1 and incorporated herein by reference. A metes and bounds description of the Subject Property is attached to this Petition as Appendix A of Exhibit 1 and incorporated herein by reference.

(4)

RECLASSIFICATION SOUGHT; PRESENT USE OF PROPERTY

This Petition seeks to reclassify the Subject Property from the Agricultural district to the Urban district. The Subject Property is presently located entirely in the Agricultural district. Sugar cultivation in Ewa ended when Oahu Sugar Company ceased operations in 1994.

The proposed reclassification conforms to the standards for determining Urban district boundaries:

a) The Subject Property is in close proximity to various centers of trading and employment (Kapolei, Waipahu, Ewa by Gentry, Ewa Beach, Barbers Point, Campbell Industrial Park, and military installations).

b) The Subject Property is, or upon completion of necessary offsite and onsite infrastructure will be, adequately serviced by schools, parks, wastewater, solid waste disposal, drainage, water and transportation systems, public utilities, and police and fire protection.

c) The Subject Property is located in an area with sufficient reserve for foreseeable urban growth.

d) The Subject Property consists of satisfactory topography, drainage and soil conditions, is free from the danger of flood, tsunami and unstable soil conditions, and is not affected by any other adverse environmental conditions that

would render it unsuitable or inappropriate for the proposed development.

e) The Subject Property is contiguous with or in close proximity to existing urban areas, and is consistent with the Ewa Development Plan, by the Planning Department, City & County of Honolulu, adopted August 1997.

f) The Subject Property is in an appropriate area for new urban concentration, as it represents an expansion of an existing residential community (Ewa by Gentry), and, as mentioned above, is consistent with the Ewa Development Plan.

g) The Subject Property is adjacent or in close proximity to existing urban development.

h) The Subject Property is adjacent to an existing residential community and will not contribute toward scattered spot urban development. The Petitioner will develop or arrange for all additional infrastructure required to service the proposed development, and public infrastructure and support services will not be unreasonably burdened by or require any unreasonable investment as a result of the proposed development.

i) The Subject Property does not consist of lands having a slope of twenty percent or more.

(5)

PETITIONER'S PROPERTY INTEREST IN THE PROPERTY

Fee simple ownership of the Subject Property is vested in The Estate of James Campbell, whose principal place of business is 1001 Kamokila Boulevard, Kapolei, Hawaii, 96707.

A. Attached to this Petition as Appendix B of Exhibit 1 and incorporated herein by reference, is a true and correct copy of the Amended And Restated Short Form Memorandum Of Agreement; Partial Release (Fourth Amended and Rested Development Agreement) dated June 15, 2000, by and between C.R. Churchill, D.A. Heenan and Richard W. Gushman, II, the duly appointed, qualified and acting Trustees Under The Will And Of The Estate Of James Campbell, Deceased, acting in their fiduciary and not in their individual capacities and Gentry Investment Properties.

B. Attached to this Petition as Appendix D of Exhibit 1 and incorporated herein by reference, is the written authorization of The Estate of James Campbell to file this Petition.

C. Attached hereto as Exhibit 2 and incorporated herein by reference, is the affidavit of the Petitioner attesting to its compliance with Section 15-15-48, HAR.

(6)

TYPE OF DEVELOPMENT PROPOSED

The development of the 283 acre Subject Property, referred to as the Ewa Makai development, is being proposed as a continuation of the existing Ewa by Gentry community. In 1988, the State Land Use Commission reclassified approximately 685 acres of land within Ewa by Gentry to the Urban district. These 685 acres were developed together with an adjoining 331 acre parcel already classified as Urban district. The existing Ewa by Gentry community, situated to the north of the Subject Property, is a 1,000 acre planned development of approximately 7,200 homes, of which 5,383 homes have been completed and closed as of January 31, 2003.

The proposed Ewa Makai development upon the Subject Property will include a single family residential subdivision on approximately 93 acres, multi-family residential subdivision on approximately 96 acres, and an industrial and commercial complex on approximately 30 acres. Additional lands are intended to be used for neighborhood parks and open space on approximately 25.5 acres, community facilities (including a middle school, 2 church sites, and a community recreation center) on 24 acres, and roadways on 14.5 acres. The total project will therefore consist of approximately 283 acres. Further details concerning the proposed development are set forth in (7) below and in the

Planning Report For A State Land Use District Boundary Amendment And Zoning Change Application, Ewa Makai, Ewa, Oahu, March 2003 for the Subject Property attached hereto to this Petition as Exhibit 1 and incorporated herein by reference. Exhibit 1 also contains an Archaeological Survey, Botanical Survey, Avifaunal and Feral Mammal Survey, Cultural Impact Assessment, Traffic Impact Analysis, Updated Traffic Impact Analysis, Air Quality Survey, Acoustic Study, Social Impact Assessment, Market Assessments and Fiscal and Economic Impacts, Ewa Makai's Impact on Agriculture, and a Project Master Plan.

(7)

PROJECT DATA

A. Projected Number of Lots, Lot Sizes, Number of Units, Densities, Selling Prices and Intended Market. The residential development of the Subject Property will consist of: 1) approximately 550 single family detached units, comprising of approximately 93 acres; 2) approximately 675 single family cluster units, comprising of approximately 64 acres; and 3) approximately 640 multi-family units, comprising of approximately 32 acres. Single family densities are estimated to average 7.5 units per acre, based on lot sizes averaging 5,000 square feet, and intended to be zoned "R-5" Residential under the City and County Ordinances. Single family cluster units will have a density of approximately 12.5 units per acre

and is intended to be zoned "A-1" Apartment. In 2003 dollars, single family homes will average between $300,000.00 to $435,000.00, cluster homes will range from approximately $200,000.00 to $300,000.00 and multi-family residential homes will range from approximately $150,000.00 to $200,000.00. The residential units are intended to meet the needs of a spectrum of income and age groups, and will include affordable homes as may be required by the State of Hawaii and the City and County of Honolulu.

B. Development Timetable. It is projected that it will take one to one and a half years to obtain the necessary Federal, State and County entitlements and approvals for the first phase, and that the Project is intended to be substantially completed within ten (10) years from the date of LUC approval. An estimated timetable for the development of Ewa Makai is attached to this Petition as Figure 10 of Exhibit 1 and incorporated herein by reference. Figure 10 shows a conservative timetable for the development of Ewa Makai. The timetable is based on the assumption that State and City land use entitlements for Ewa Makai will be obtained by the first quarter of 2004, and that the first homes will be delivered in late 2005 approximately 18 months later. The first phases to be developed will be Areas 34, 34A, and 33 in Ewa Makai-East.

(8)

PETITIONER'S FINANCIAL CONDITION

Attached to this Petition as Exhibit AA of Exhibit 1 and incorporated herein by reference are the Petitioner's Balance Sheet as of December 31, 2002, Statement of Income as of December 31, 2002, Financing Strategy for Ewa Makai and a letter from Mr. Ralph M. Mesick, Senior Vice President, Bank of Hawaii, Commercial Real Estate Loan Division, addressed to the Land Use Commission, State of Hawaii, confirming Bank of Hawaii's financing of Gentry Homes, Ltd.'s development work in Ewa, Oahu. The Petitioner intends to use a combination of cash reserves and financing to acquire the two parcels for the development. After the Petitioner obtains its land entitlements, Gentry Homes, Ltd. will acquire the land in smaller increments and will finance the infrastructure and development costs with its current $34 million revolving line of credit. The Subject Property will serve as additional collateral for the line of credit. It is anticipated that this line of credit will have sufficient capacity to finance all site and building improvements for the project.

(9)

DESCRIPTION OF PROPERTY

A. Description of Surrounding Areas. The uses of the areas surrounding the Subject Property are shown on Figure 9 of

Exhibit 1 and incorporated herein by reference. The Ewa Makai-East portion of the project lies between proposed single family homes in Ewa by Gentry and the Hawaii Prince Golf Course, and extends east of Fort Weaver Road to the U. S. Navy property boundary. The Ewa Makai-West portion of the project lies west of Fort Weaver Road, between Ewa by Gentry's Sun Terra residential community and the Coral Creek Golf Course (to the north) and Haseko's planned Ocean Pointe community (to the south). The Barbers Point Naval Air Station Golf Course lies to the West of the project area.

B. Uses of Subject Property. The Property was used for sugar cane cultivation for approximately one hundred (100) years until 1994 when Oahu Sugar Company's operations in Ewa ceased.

C. Description of Soils. The Subject Property area contains soil types as determined by the Soil Conservation Service, now known as the Natural Resource Conservation Service (NRCS):

		Acres
EmA	'Ewa silty clay loam, moderately shallow, 0 to 2 percent slopes.	65.1
EmB	'Ewa silty clay loam, moderately shallow, 2 to 6 percent slopes.	21.4
MnC	Mamala stony silty clay loam, 0 to 12 percent slopes.	196.1
	TOTAL	282.6

Approximately 30.6% of the Subject Property is rated "Prime" (soil types EmA and EmB), and 69.4% is rated "Other" (soil type MnC) under the "Agricultural Lands of Importance in the State of Hawaii" (ALISH) classification system.

Approximately 23.2% of the Subject Property is rated "A" and the remaining 76.8% is rated "C" under the UH Land Study Bureau's (LSB) Overall Productivity Rating.

D. Flood Conditions. The Subject Property falls within "Zone D" (area in which flood hazards are undetermined), as determined by the Federal Emergency Management Association Federal Insurance Rate Flood Map.

E. Drainage Conditions. Drainage improvements will be planned to provide coordinated drainage systems benefiting both the Ewa by Gentry and Ewa Makai developments.

F. Topography. The Subject Property has slopes that are approximately 1%. The elevation of the Subject Property ranges from about 20 to 35 feet above mean sea level.

In summary, the Subject Property is comprised of lands with satisfactory topography and will possess satisfactory drainage for the proposed development, is reasonably free from danger of floods, tsunami, unstable soil conditions and other adverse environmental effects, is contiguous with or in close proximity to existing urban areas and in an appropriate location for new urban concentrations, and will not contribute toward scattered

spot urban development. A more detailed description of the Subject Property and surrounding uses is set forth in the attached Planning Report (Exhibit 1).

(10)

ASSESSMENT OF IMPACTS ON ENVIRONMENT, AGRICULTURE, RECREATIONAL, CULTURAL, HISTORIC, SCENIC, FLORA AND FAUNA, GROUNDWATER OR OTHER RESOURCES

The Subject Property contains no recreational, cultural, historic, scenic or other resources.

A. Flora and Fauna. Attached to the Petition as Exhibit 1, Exhibit DD, and incorporated herein by reference, is a Botanical Survey covering the Subject Property. The Botanical Study concluded, among other things, that the vegetation on the site consists largely of introduced or alien plant species, and that no threatened or endangered species were found on the Subject Property.

Attached to the Petition as Exhibit 1, Exhibit EE, and incorporated herein by reference, is an Avifaunal and Feral Mammal Survey covering the Subject Property. The Avifaunal and Feral Mammal Survey concluded, among other things, that no native birds were recorded on the field survey and no unique resources important to native birds were discovered on the Subject Property. The only species of mammal observed on the survey was the Small Indian Mongoose.

B. Archaeology. Attached to this Petition as Exhibit 1, Exhibit CC, and incorporated herein by reference, is an Archaeological Survey covering the Subject Property. The Archaeological Survey concluded, among other things, that no archaeological resources were present within the Subject Property.

C. Cultural. Attached to this Petition as Exhibit 1, Exhibit FF, and incorporated herein by reference, is A Cultural Impact Assessment For The Proposed Ewa Gentry Makai Development Project, Ewa, Oahu, covering the Subject Property. The assessment has concluded, among other things, that it does not appear that the proposed development will have any adverse effect to traditional cultural activities in the area.

D. Agriculture. Attached to this Petition as Exhibit 1, Exhibit BB, and incorporated herein by reference, is Ewa Makai: Impact on Agriculture covering the Subject Property. The impact study has concluded, among other things, that no existing sugarcane or pineapple plantation will be impacted by the project, and the project will not limit the potential growth of diversified agriculture due to the vast amount of land that has been released from plantation agriculture since the late 1960s.

E. Groundwater. The Subject Property lies above what is known as the Ewa Caprock Aquifer, a thin, brackish basal lens in hydraulic contact with saline water at depth and seawater at the

shoreline. At present, the use of the aquifer on the eastern side of the Ewa Plain consists of 0.7 million gallons per day by the New Ewa Beach Golf Course and a far lesser amount by a number of small capacity wells on existing Ewa by Gentry developed areas. Development of the Subject Property site should have no significant impact on the aquifer.

F. Environment. No materially adverse environmental impacts are anticipated by the development of the Subject Property, and all short-term impacts generated primarily during the construction phase of the project relating to air quality and acoustic impacts can be adequately mitigated. The Air Quality Survey and Acoustic Study, attached to this Petition as Exhibit 1, Exhibits HH and II, respectively, are incorporated herein by reference.

In summary, the proposed use and development of the Subject Property are not anticipated to have any negative effect on the environment, or on any agricultural, recreational, cultural, historic, scenic, flora, fauna, groundwater or other resources of the area. The proposed reclassification of the Subject Property will not have any adverse impact on the preservation or maintenance of any valued cultural, historical, or natural resources or on the maintenance of any other natural resources relevant to Hawaii's economy including, but not limited to, agricultural resources.

(11)

AVAILABILITY OR ADEQUACY OF PUBLIC SERVICES AND FACILITIES

The Planning Report attached to this Petition as Exhibit 1 contains a discussion of the availability or adequacy of schools, parks, wastewater systems, solid waste disposal, drainage, water, transportation systems, public utilities, and police and fire protection, and the impact, if any, to any public agency for the Subject Property. Public services and facilities, together with improvements to be constructed, are adequate to support, and are not anticipated to be unreasonably burdened or impacted by, the proposed development or reclassification of the Subject Property.

Generally, the proposed development's impact on the area's public schools fall within the projected enrollment for 2007, however, the region is targeted for significant residential population growth, such that it is likely that the cumulative growth will exceed projected 2007 enrollment, with or without the proposed development. The Petitioner and Gentry Homes, Ltd. have been working with the State Department of Education, and the parties have agreed that dedicating 18 acres for a new middle school meets the developer's fair share requirement; however, the Department of Education has reserved the right to amend the fair share requirements for this project if State and County land use approvals are not obtained in a timely manner.

Two neighborhood parks are planned for the proposed development: an 8-acre park in Ewa Makai-West and a 3.5-acre park in Ewa Makai-East. The 3.5-acre park will be a part of a larger 10.3-acre park in the existing Ewa by Gentry community. In addition, a 2-acre community recreation center complex is planned, and additional recreational areas may be developed in conjunction with individual residential developments.

The Traffic Impact Analysis, attached to the Petition as Exhibit 1, Exhibit GG, and incorporated herein by reference, contains an assessment of the impact the proposed development will have on the traffic in the area. The report concludes, among other things, that with the roadway and traffic improvements recommended, the roadway system will accommodate the traffic generated by the proposed development.

In summary, based upon existing facilities and improvements to be constructed by the State, County and/or the Petitioner, all public services and facilities, such as schools, parks, wastewater systems, solid waste disposal, drainage, water, transportation systems, public utilities, and police and fire protection, are or will be available or adequate for the proposed development and no public agency is expected to be unreasonably impacted by the proposed development.

(12)

LOCATION OF PROPOSED DEVELOPMENT IN RELATION TO ADJACENT DISTRICTS AND CENTERS OF TRADING AND EMPLOYMENT

The adjacent areas north and south of the Subject Property are urban. The existing Ewa by Gentry community lies to the north, and the Hawaii Prince Golf Course and Ocean Pointe Master Planned Community lies to the south.

The Subject Property is in close proximity to various centers of trading and employment. The Laulani Commercial Center, a 20-acre commercial area zoned "B-2" owned by The Estate of James Campbell, will be adjacent to the Petitioner's proposed 30-acre industrial-commercial complex on the Subject Property. In addition, the urban centers of Kapolei, Waipahu, the Ewa Beach Shopping Center, Kalaeloa, Waikele, Royal Kunia, Campbell Industrial Park, Hawaiian Waters Adventure Park, Ko Olina and military bases are in proximity to the Subject Property.

(13)

ECONOMIC IMPACTS OF THE PROPOSED DEVELOPMENT

The Market Assessment and Fiscal and Economic Impacts Report, attached as Exhibit 1, Exhibit KK, and incorporated herein by reference, provides the analysis of the economic impacts of the proposed development.

The proposed development will produce design and construction employment opportunities during the construction phases. Approximately $84.9 million is estimated to be spent on the design and construction of the project infrastructure, approximately $260.7 million is estimated to be spent on the construction of the residences, approximately $85.6 million is estimated to be spent on the construction of the industrial-commercial complex, and approximately $1.38 million is estimated to be spent on the construction of park improvements.

The proposed development is anticipated, at full development, to have a net fiscal impact on real property taxes of $8.3 million during the construction period of 2005 through 2013, and the annual net fiscal impact is anticipated to be $1.81 million beginning at 2014. The net fiscal impact on State of Hawaii general excise tax revenues and State of Hawaii income tax revenues are anticipated to be $45.2 million during the construction period of 2005 through 2013, and the annual net fiscal impact is anticipated to be $3.65 million beginning at 2014 (all projections are in 2001 dollars).

The proposed development would generate significant direct construction employment and indirect and induced employment during the development period. It is anticipated that the proposed development will generate an average of 857 new jobs annually during the construction period of 2005 through 2013.

In addition to the construction related jobs, the development of the 30 acre industrial-commercial complex will create permanent long-term operational employment. The projected permanent employment assumes that the tenants of the industrial-commercial complex would include light and/or service industrial and retail uses compatible with the residential character of the surrounding neighborhood. It is anticipated that 1,500 full-time, part-time, and self-employment jobs would be created at full development.

Due to the vast amount of land that has been released from plantation agriculture since the late 1960s, the proposed reclassification will not limit the potential growth of diversified agriculture and no existing sugarcane or pineapple plantation will be impacted.

In summary, the proposed reclassification of the Subject Property is anticipated to have a favorable impact on the economies of the City and County of Honolulu and the State of Hawaii, and will not have a material impact on agricultural production in the vicinity of the Subject Property or in the City and County of Honolulu or the State of Hawaii.

(14)

HOUSING NEEDS OF LOW, LOW-MODERATE AND GAP GROUPS

Based upon discussions with the City & County of Honolulu, it is anticipated that the City will probably recommend (1) at

least 10% of the total number of units to be developed in the project area must be affordable to households earning up to and including 80% of the area median income as determined by the U.S. Department of Housing and Urban Development ("HUD"), and (2) at least an additional 20% of the total number of units to be developed in the project area shall be affordable to households earning up to and including 120% of the area median income as determined by HUD. The Petitioner would not be opposed to meeting these requirements. A copy of the letter memorializing this discussion is attached to this Petition as Appendix G of Exhibit 1 and incorporated herein by reference.

(15)

ASSESSMENT OF NEED FOR THE RECLASSIFICATION

The Market Assessment and Fiscal and Economic Impacts Report, attached as Exhibit 1, Exhibit KK, and incorporated herein by reference, concludes that there will be a market demand for the residential units to be developed on the Subject Property. The Market Assessment projects that the 1,865 units proposed by the proposed development will be sold between 2006 and 2013. This projection is based upon the projected population growth in the area of the Subject Property and the Petitioner's estimated market share of future new housing demand.

This assessment of market demand and need for the proposed development is based on the relationship between the proposed development and other projects existing or proposed for the island of Oahu, and takes into consideration other similarly designated land for the island of Oahu.

Given the Subject Property's contiguity with existing urban uses, and the anticipated market demand and absorption period for residential units, the Subject Property is an appropriate location for new urban concentration, and the proposed development represents an appropriate and reasonable use of the Subject Property. Given the proximity of the Subject Property to undeveloped lands appropriate for further residential expansion, the Subject Property is located in an area with sufficient reserves for foreseeable urban growth.

(16)

ASSESSMENT OF CONFORMITY

TO GOALS, OBJECTIVES AND POLICIES OF HAWAII STATE

PLAN AND PRIORITY GUIDELINES AND FUNCTIONAL PLAN POLICIES

The reclassification of the Subject Property and the proposed development of the Subject Property are in conformity with the numerous goals, objectives, policies and priority guidelines of the Hawaii State Plan, including the following:

State Goals: All of the State goals set forth in Section 226-4, HRS.

State Objectives: The State objectives set forth in Sections 226-5, 226-6, 226-11, 226-12, 226-13, and 226-19, HRS.

State Policies: Numerous State policies set forth in Chapter 226, HRS, including the following:

Section 226-5(b)(1): "Manage population growth statewide in a manner that provides increased opportunities for Hawaii's people to pursue their physical, social, and economic aspirations while recognizing the unique needs of each county."

Section 226-5(b)(3): "Promote increased opportunities for Hawaii's people to pursue their socio-economic aspirations throughout the islands."

Section 226-6(a)(1): "Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawaii's people."

Section 226-6(a)(2): "A steadily growing and diversified economic base that is not overly dependent on a few industries."

Section 226-11(a)(2): "Effective protection of Hawaii unique and fragile environmental resources."

Section 226-11(b)(3): "Take into account the physical attributes of areas when planning and designing activities and facilities."

Section 226-11(b)(8): "Pursue compatible relationships among activities, facilities and natural resources."

Section 226-12(b)(1): "Promote the preservation and restoration of significant natural and historic resources."

Section 226-12(b)(4): "Protect those special areas, structures and elements that are an integral and functional part of Hawaii's ethnic and cultural heritage."

Section 226-12(b)(5): "Encourage the design of developments and activities that complement the natural beauty of the islands."

Section 226-13(b)(2): "Promote the proper management of Hawaii's land and water resources."

Section 226-13(b)(3): "Promote effective measures to achieve desired quality in Hawaii's surface, ground and coastal waters."

Section 226-13(b)(6): "Encourage design and construction practices that enhance the physical qualities of Hawaii's communities."

Section 226-13(b)(7): "Encourage urban developments in close proximity to existing services and facilities."

Section 226-19(a)(1): "Greater opportunities for Hawaii's people to secure reasonably priced, safe, sanitary, and livable homes, located in suitable environments that satisfactorily accommodate the needs and desires of families and individuals, through collaboration and cooperation between government and nonprofit and for-profit developers to ensure that more affordable housing is made available to very low-, low- and moderate-income segments of Hawaii's population."

Section 226-19(a)(2): "The orderly development of residential area sensitive to community needs and other land uses."

Section 226-19(b)(1): "Effectively accommodate the housing needs of Hawaii's people."

Section 226-19(b)(2): "Stimulate and promote feasible approaches that increase housing choices for low-income, moderate-income, and gap-group households."

Section 226-19(b)(3): "Increase home ownership and rental opportunities and choices in terms of quality, location, cost, densities, style, and size of housing."

Section 226-19(b)(5): "Promote design and location of housing developments taking into account the physical setting, accessibility to public facilities and services, and other concerns of existing communities and surrounding areas."

State Priority Guidelines: The following State priority guidelines:

Section 226-103(a): "Priority guidelines to stimulate economic growth and encourage business expansion and development to provide needed jobs for Hawaii's people and achieve a stable and diversified economy:

(1) Seek a variety of means to increase the availability of investment capital for new and expanding enterprises.

(A) Encourage investments which:

(i) Reflect long term commitments to the State;

(ii) Rely on economic linkages with the local community;

(iii) Diversify the economy;

(iv) Reinvest in the local economy;

(v) Are sensitive to community needs and priorities; and

(vi) Demonstrate a commitment to provide management opportunities to Hawaii residents."

Section 226-104(a)(1): "Encourage planning and resource management to insure that population growth rates throughout the State are consistent with available and planned resource capacities and reflect the needs and desires of Hawaii's people."

Section 226-104(b): "Priority guidelines for regional growth distribution and land resource utilization:

(1) Encourage urban growth primarily to existing urban areas where adequate public facilities are already available or can be provided with reasonable public expenditures, and away from areas where other important benefits are present, such as protection of important agricultural land or preservation of lifestyles.

* * *

(2) Make available marginal or nonessential agricultural lands for appropriate urban uses while maintaining agricultural lands of importance in the agricultural district.

* * *

(6) Seek participation from the private sector for the cost of building infrastructure and utilities, and maintaining open spaces."

Section 226-106(1): "Seek to use marginal or nonessential agricultural land and public land to meet housing needs for low- and moderate-income and gap-group households."

Section 226-106(2): "Encourage the use of alternative construction and development methods as a means of reducing production costs."

Section 226-106(5): "Encourage continued support for government or private housing programs that provide low interest mortgages to Hawaii's people for the purchase of initial owner-occupied housing."

Section 226-106(8): "Give higher priority to the provision of quality housing that is affordable for Hawaii's

residents and less priority to development of housing intended primarily for individuals outside of Hawaii."

The requested reclassification of Subject Property is reasonable and appropriate given the location of the Subject Property in relation to immediately adjacent lands which are in the Urban district, the proximity of the Subject Property to existing urban, commercial, industrial and residential uses and employment centers, the market demand for the residences to be developed on the Subject Property, and the minimal impact the reclassification will have upon existing agricultural activities and the availability of agricultural lands.

(17)

ASSESSMENT OF CONFORMITY TO OBJECTIVES AND POLICIES OF COASTAL ZONE MANAGEMENT PROGRAM

The Subject Property is located outside of the Special Management Area. Based on the nature and scope of the proposed development, the project should have no impact on the Coastal Zone Management Area, and is consistent with the various objectives and policies of the Coastal Zone Management Program, as set forth in Section 205A, HRS.

The Subject Property is not located along the shoreline or next to any beaches. Drainage facilities within the Subject Property will be adequately planned and constructed, and wastewater generated by the project will be collected, treated

and disposed of by the City and County of Honolulu's wastewater treatment system. The project will not block or impair any views or vistas from or to the shoreline, and contains no important archaeological, cultural, historic, or biological resources. The Subject Property is located within flood "Zone D" (area in which flood hazards are undetermined), and its development will require no extraordinary grading or cutting of the land.

For the foregoing reasons, the proposed development is not expected to be subject to any coastal ecosystems, beaches or marine resources, in accordance with the objectives and policies described in Section 205A-2(b)(1), (2), (3), (4), (6), (9), and (10), HRS, and Sections 205A-2(c)(1), (2), (3), (4), (6), (9), and (10), HRS.

(18)

ASSESSMENT OF CONFORMITY

TO COUNTY GENERAL PLANS, COMMUNITY PLANS, ZONING DESIGNATIONS

AND POLICIES, AND PROPOSED AMENDMENTS REQUIRED

The proposed development will be located in the Ewa urban-fringe areas of the General Plan of the City and County of Honolulu where development is encouraged. The Petitioner's proposed development, to date, has received the support of the Ewa Neighborhood Board based on recommendations made by the

Planning and Zoning Committee, as well as the Ewa by Gentry Community Association.

Upon obtaining reclassification of the Subject Property from Agricultural district to the Urban district, the Petitioner will need to obtain City and County of Honolulu approval for the rezoning of the Subject Property to "R-5" Residential, "A-1" Apartment, "P-2" General Preservation, and "IMX-1" Industrial-Commercial Mixed Use.

(19)

DEVELOPMENT OF THE PROPERTY

WITHIN 10 YEARS OF COMMISSION APPROVAL

It is projected that it will take one and one-half (1½) to two (2) years to obtain the necessary Federal, State and County entitlements and approvals, and the Project is anticipated to be substantially completed within ten (10) years from the date of LUC approval. An estimated timetable for the development of Ewa Makai is attached to this Petition as Figure 10 of Exhibit 1 and incorporated herein by reference. Figure 10 shows a conservative timetable for the development of Ewa Makai. The timetable is based on the assumption that State and City land use entitlements for Ewa Makai will be obtained by the first quarter of 2004, and that the first homes will be delivered in late 2005 approximately 18 months later. The first phases to be developed will be Areas 34, 34A, and 33 in Ewa Makai-East.

(20)

HAWAIIAN CUSTOMARY AND TRADITIONAL RIGHTS

Pursuant to Act 50, the Petitioner obtained A Cultural Impact Assessment For The Proposed Ewa Gentry Makai Development Project, Ewa, Oahu, attached to this Petition as Exhibit 1, Exhibit FF, and incorporated herein by reference, which concludes that it does not appear that the proposed development will have any adverse effect to traditional cultural activities on the Subject Property, and that the only archaeological sites documented in the Subject Property thus far are the coral sinkholes, which were used for agriculture. Accordingly, it does not appear that the Subject Property requires protection or regulation under Article XII, Section 7 of the Hawaii State Constitution.

(21)

WRITTEN COMMENTS RECEIVED FROM THIRD PARTIES

The Petitioner has received a letter dated January 9, 2002, from the State Department of Education ("DOE"), attached to this Petition as Exhibit 1, Appendix H, and a letter dated January 24, 2003, from the Board of Water Supply ("BWS"), City and County of Honolulu, attached to this Petition as Exhibit 1, Appendix J(2).

The January 9, 2002 letter received from the DOE memorialized the Petitioner's understanding that the dedication

of the 18-acre middle school site will satisfy the DOE's fair share requirements as long as Gentry obtains State and County land use approvals in a timely manner.

The January 24, 2003 letter received from the BWS confirms that the BWS expects adequate source capacity for the Ewa Makai project.

(22)

NOTIFICATION OF PETITION FILING

Attached as Exhibit 3 and incorporated herein by reference, is a true and correct copy of the notification of the filing of this Petition and the Affidavit of Sending of Notification of Petition Filing required by Subsection 15-15-50(d), HAR.

(23)

CONCLUSION

Based upon the evidence contained in the Exhibits to this Petition and by the evidence adduced or to be adduced herein, the Subject Property meets the standards applicable in establishing boundaries for the Urban District, and the requested reclassification is reasonable, is not in violation of Section 205-2, HRS, and is consistent with the standards, goals, criteria and policies of Chapters 205, 205A and 226, HRS, the Rules of the Hawaii Land Use Commission, and the criteria established pursuant to Sections 205-16 and 206-17, HRS.

Dated: Honolulu, Hawaii March 18, 2003.

OF COUNSEL:
MATSUBARA, LEE & KOTAKE
A Law Corporation

BENJAMIN M. MATSUBARA
CURTIS T. TABATA
Attorney for Petitioner
GENTRY INVESTMENT PROPERTIES

VERIFICATION

Toshimasa Hosoda, being duly sworn, on oath, deposes and says that he is the Senior Vice President of Gentry Homes, Ltd., a Hawaii corporation, and as such is authorized to make this verification on behalf of said corporation; that he has read the foregoing Petition and knows the contents thereof; and that the same are true to the best knowledge, information and belief.

Toshimasa Hosoda

Subscribed and sworn to me
this 18th day of March 2003

Name SYLVIA T. HAYASHI
Notary Public, State of Hawaii
My commission expires: 10.26.03

ORIGINAL

PLANNING REPORT FOR A STATE LAND USE DISTRICT BOUNDARY AMENDMENT

AND

ZONE CHANGE APPLICATION

2003 MAR 21 A 9:11
LAND USE COMMISSION
STATE OF HAWAII



EWA MAKAI
Ewa, Oahu

March 2003

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APPENDICES

A. Legal Description of Property

B. Development Agreement Between Gentry Investment Properties and The Estate of James Campbell

C. Status Title Report

D. Letter of Authorization from The Estate of James Campbell

E. Letter from DPP dated 12/16/02 regarding Gentry's compliance with City's affordable housing requirements

F. Ordinances 99-51 and 01-33 Relating to Affordable Housing Conditions in Unilateral Agreements

G. Letter from Tosh Hosoda to Kathy Sokugawa dated 2/5/02 regarding anticipated affordable housing requirements for Ewa Makai

H. Letter from DOE dated January 9, 2002, regarding satisfaction of DOE's fair-share requirements

I. "Leaders in Waste Management" article written by Clean Hawaii Center, State Department of Business, Economic Development & Tourism

J. (1) Letter from Tom Nance dated 1/31/03 regarding validity of approved water master plan for Ewa by Gentry; and (2) Letter from BWS dated 1/24/03 regarding the availability of potable water for Ewa Makai Development

K. Letters from engineering consultants regarding status of approved sewer and drainage master plans for Ewa Makai

L. Documents pertaining to pubic input including:

- Affidavit confirming that adjoining property owners were sent written notification letters about the Ewa Neighborhood Board presentation on Ewa Makai;
- Relevant sections of the minutes of the March 14, 2002 Meeting of the Ewa Neighborhood Board No. 23 in which the Board voted to support the Ewa Makai project subject to certain conditions;
- Minutes of the Ewa Neighborhood Board's Planning and Zoning Committee meetings of 1/15/02 and 2/28/02;
- A letter from a Sun Terra resident opposing the zone change request
- A letter from Hawaiiana Management Company, Ltd. relating to the Ewa by Gentry Community Association Board's unanimous support for the development of Ewa Makai.

M. Photos of Ewa Makai

EXHIBITS

AA. Letter from Bank of Hawaii regarding Gentry's financial capability to develop property

BB. Ewa Makai's Impact on Agriculture

CC. Archaeological Survey

DD. Botanical Survey

EE. Avifaunal and Feral Mammal Survey

FF. Cultural Impact Assessment

GG. Traffic Impact Analysis

HH. Air Quality Survey

II. Acoustic Study

JJ. Social Impact Assessment

KK. Market Assessments and Fiscal and Economic Impacts

LL. Ewa Makai Project Master Plan

INTRODUCTION

Two-fold Purpose of the Report

Gentry Investment Properties is seeking land use entitlement approvals for its proposed Ewa Makai residential development. An infill project, Ewa Makai will be surrounded by existing and future urban uses, and will serve to complete the Ewa by Gentry master planned community.

This document is being prepared for Gentry Investment Properties to serve as: (1) a Planning Report for a petition to the State Land Use Commission (SLUC) for a State Land Use District Boundary Amendment; and (2) a Zone Change Application to the City and County of Honolulu, Department of Planning and Permitting (DPP). This document has been prepared to allow for the partial concurrent processing of both the petition and the zone change application.

The name and address of the petitioner/applicant* are as follows:

Gentry Investment Properties
P.O. Box 295
Honolulu, HI 96809-0295

The following pages provide a summary of the project

* For the purpose of this report, the term "petitioner", "applicant", and "Gentry" are used interchangeably.

PROJECT SUMMARY

Project Name:	Ewa Makai
Name and Address of Petitioner/Applicant:	Gentry Investment Properties P.O. Box 295 Honolulu, Hawaii 96809-0295
Agent for SLUC Redesignation:	Benjamin M. Matsubara, Esq. Matsubara, Lee & Kotake 888 Mililani Street, 8th Floor Honolulu, HI 96813 phone: 526-9566 fax: 538-3840 email: mlkalc@lava.net
Agent for Rezoning:	Tosh Hosoda Senior Vice President - Planning Gentry Homes, Ltd. 560 North Nimitz Hwy., Suite 300 Honolulu, HI 96817 phone: 599-8360 fax: 599-8380 email: toshh@gentryhawaii.com
Landowner:	The Estate of James Campbell
TMK Numbers:	Ewa Makai-East 9-1-10:7 (AG-1) Ewa Makai-West 9-1-69:5 (AG-2)
Land Area:	283 acres Ewa Makai-East – 115 ac.; Ewa Makai-West - 168 ac.
Existing Uses:	Fallow agricultural land previously used for sugar cane production and appurtenant infrastructure (e.g. cane haul roads); currently leased to Ralph's Ranch for grazing of horse and cattle.
Proposed Uses:	1,865 single family and multi-family residential units, industrial/commercial mixed uses, public facilities (including a middle school, parks, churches/day care centers, and a community center), and open space.
Current Land Use District:	Agricultural
Redesignation Requested:	Urban
Ewa Development Plan Land Uses:	• Low and Medium Density Residential • Industrial • Parks and Golf Courses • Agricultural and Preservation

PROJECT SUMMARY, Cont'd

City and County of Honolulu Zoning:

- Ewa Makai-East — AG-1 Restricted Agriculture
- Ewa Makai-West — AG-2 General Agriculture

SMA District:

Not within SMA District.

Actions Requested:

- Redesignation of approximately 283 acres of land in the State Agricultural District to Urban District
- Rezoning of approximately 283 acres of land from AG-1 Restricted Agriculture and AG-2 General Agriculture to the following:

R-5 Residential	93 acres
A-1 Apartment	146 acres
P-2 General Preservation	14 acres
IMX-1 Industrial-Commercial Mixed Use	30 acres
	283 acres

Approving Agencies:

- State Land Use Commission for State Land Use Redesignation
- Department of Planning and Permitting, City and County of Honolulu, for Rezoning Request

Agencies and Individuals Consulted:

Federal Agencies:

- U.S. Army Corps of Engineers
- U.S. Environmental Protection Agency, Region IX
- U.S. Department of Agriculture, Natural Resources Conservation Service
- U.S. Department of the Interior, U.S. Fish and Wildlife Service

State of Hawaii Agencies

- Department of Accounting and General Services
- Department of Agriculture
- Department of Business, Economic Development and Tourism, Land Use Commission
- Department of Business, Economic Development and Tourism, Office of Planning
- Department of Defense
- Department of Health
  - Clean Air Branch
  - Clean Water Branch
  - Environmental Planning Office
  - Noise and Radiatin Branch
  - Safe Drinking Water Branch
  - Sanitatin Branch
  - Solid & Hazardous Waste Branch
  - Wastewater Branch
- Department of Land and Natural Resources, Engineering Division

- Department of Land and Natural Resources, Historic Preservation Division
- Department of Transportation
- Housing and Community Development Corporation of Hawaii
- Oahu Metropolitan Planning Organization
- Office of Hawaiian Affairs
- University of Hawaii, Environmental Center

City and County of Honolulu Agencies

- Board of Water Supply
- Department of Community Services
- Department of Design and Construction
- Department of Environmental Services
- Department of Facilities Maintenance
- Department of Parks and Recreation
- Department of Planning and Permitting
- Department of Transportation Services
- Honolulu Emergency Services Department
- Honolulu Fire Department
- Honolulu Police Department

Community Organizations and Private Agencies

- Hawaiian Electric Company
- Ewa Neighborhood Board No. 23
- Ewa by Gentry Community Association
- Oceanic Cable
- The Outdoor Circle
- Verizon

Individuals and Elected Officials

- Van Diamond, Oahu Burial Council
- Shad Kane, Chair, Committee of Historic Sites & Cultural Properties, Hawaiian Civic Club
- Arline Wainaha Pu'ulei Brede-Eaton, member of first family to into Ewa area in the early post-contact years
- Kumu Hula John Kaimikaua
- Pat Namaka Bacon, Cultural Resource Specialist, Bishop Museum
- Dr. Bruce Carlson, Director, Waikiki Aquarium
- Thelma G. Parish, Member of early resident family
- (Former) Councilmember John DeSoto
- Councilmember Mike Gabbard
- Senator Willie Espero
- Senator Brian Kanno
- Representative Romy Mindo
- Representative Tulsi Tamayo

Area Landowners

- Coral Creek Golf, Inc.
- HASEKO (Hawaii), Inc.
- Hawaii Prince Hotel Waikiki
- The Estate of James Campbell
- U.S. Navy
- Adjacent Sun Terra property owners

I. BASIC INFORMATION ON THE PROPERTY TO BE REDESIGNATED/REZONED

A. Description of the Property. The Subject Property to be rezoned is comprised of two parcels located in Ewa, Oahu, Hawaii, that are identified as Ewa Makai-East (Tax Map Key 1-9-1-10:7, consisting of 114.617 acres) and Ewa Makai-West (Tax Map Key 1-9-1-69:5, consisting of 167.997 acres). Together these parcels represent a total of 282.614 acres.

A map showing the location of the Subject Property on the Island of Oahu is included as Figure 1. The tax maps for the Subject Property are included as Figures 2a and 2b.

The following land use changes are being sought for the Subject Property:

1. State Land Use Redesignation

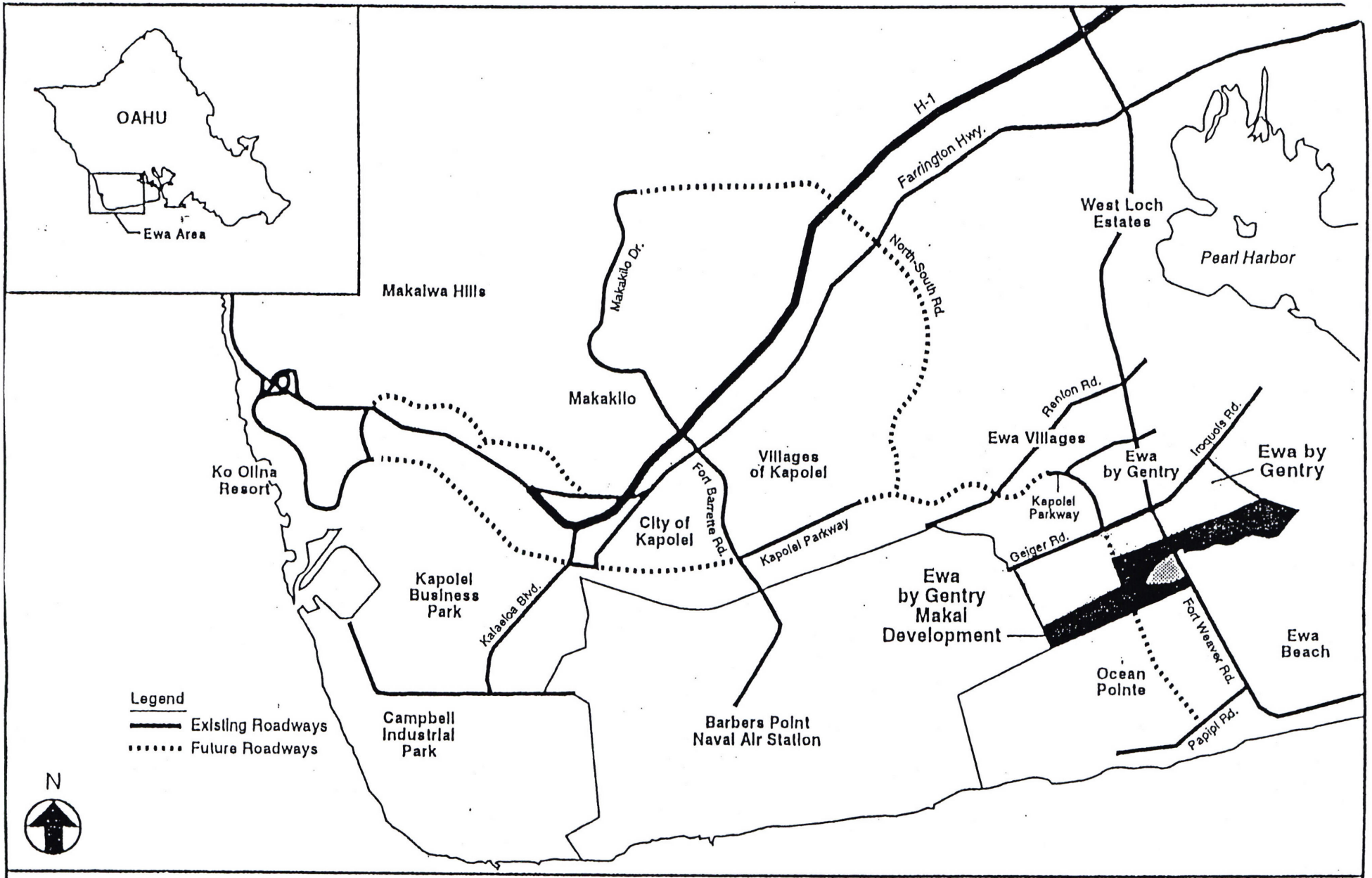
A change in land use designation from "Agricultural" to "Urban" by the State Land Use Commission is being sought. A map of current State Land Use designations of the subject property is included as Figure 3.

2. Rezoning by City

It is proposed that approximately 283 acres of AG-1 Restricted Agriculture and AG-2 General Agriculture lands be rezoned as follows:

R-5 Residential	93 acres
A-1 Apartment	146 acres
P-2 General Preservation	14 acres
IMX-1 Industrial-Commercial Mixed Use	30 acres
	283 acres

I. A map of the current zoning of the Subject Property and surrounding areas is included as Figure 4. A map of the proposed zoning is included as Figure 5.



VICINITY MAP

Figure 1

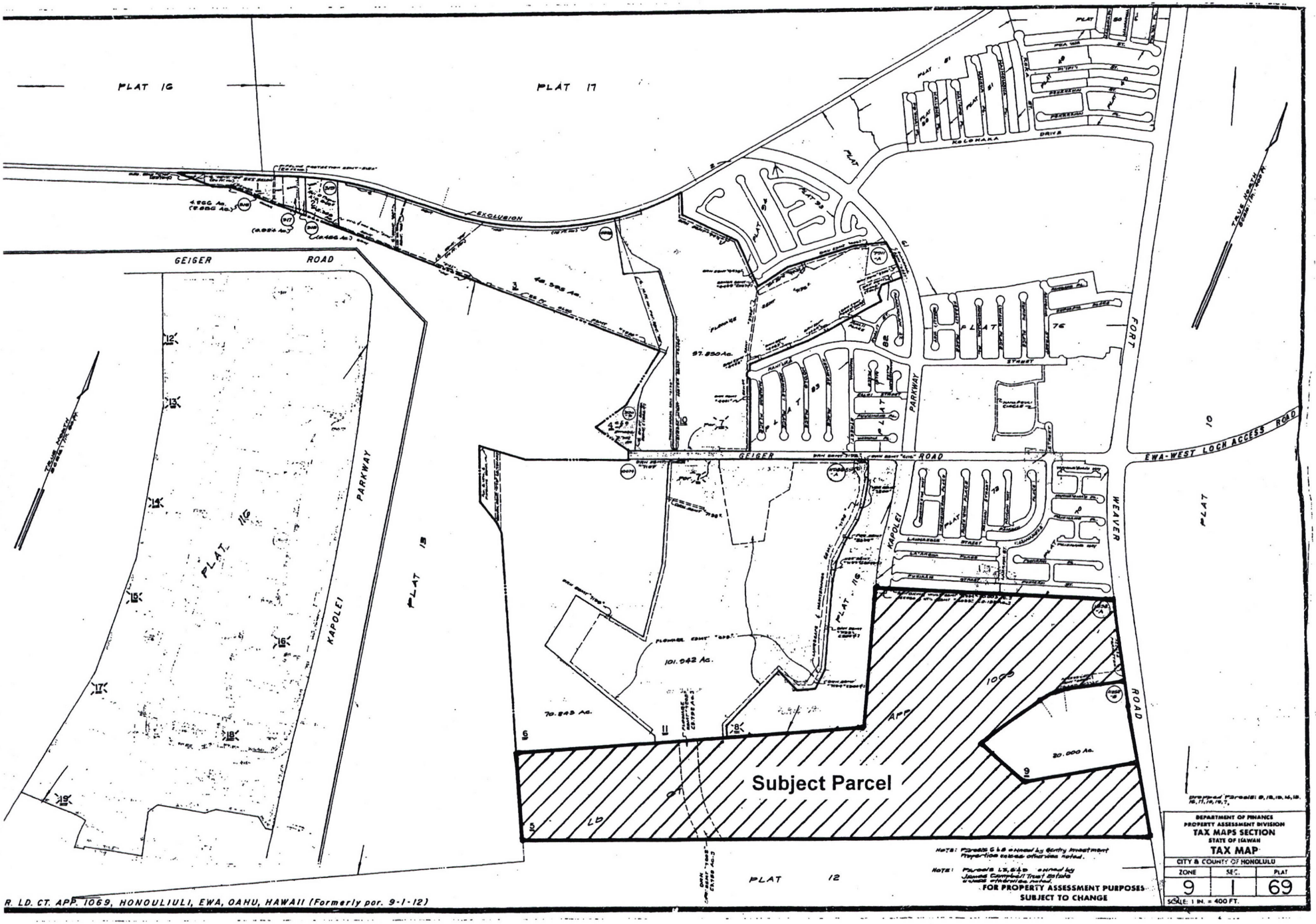
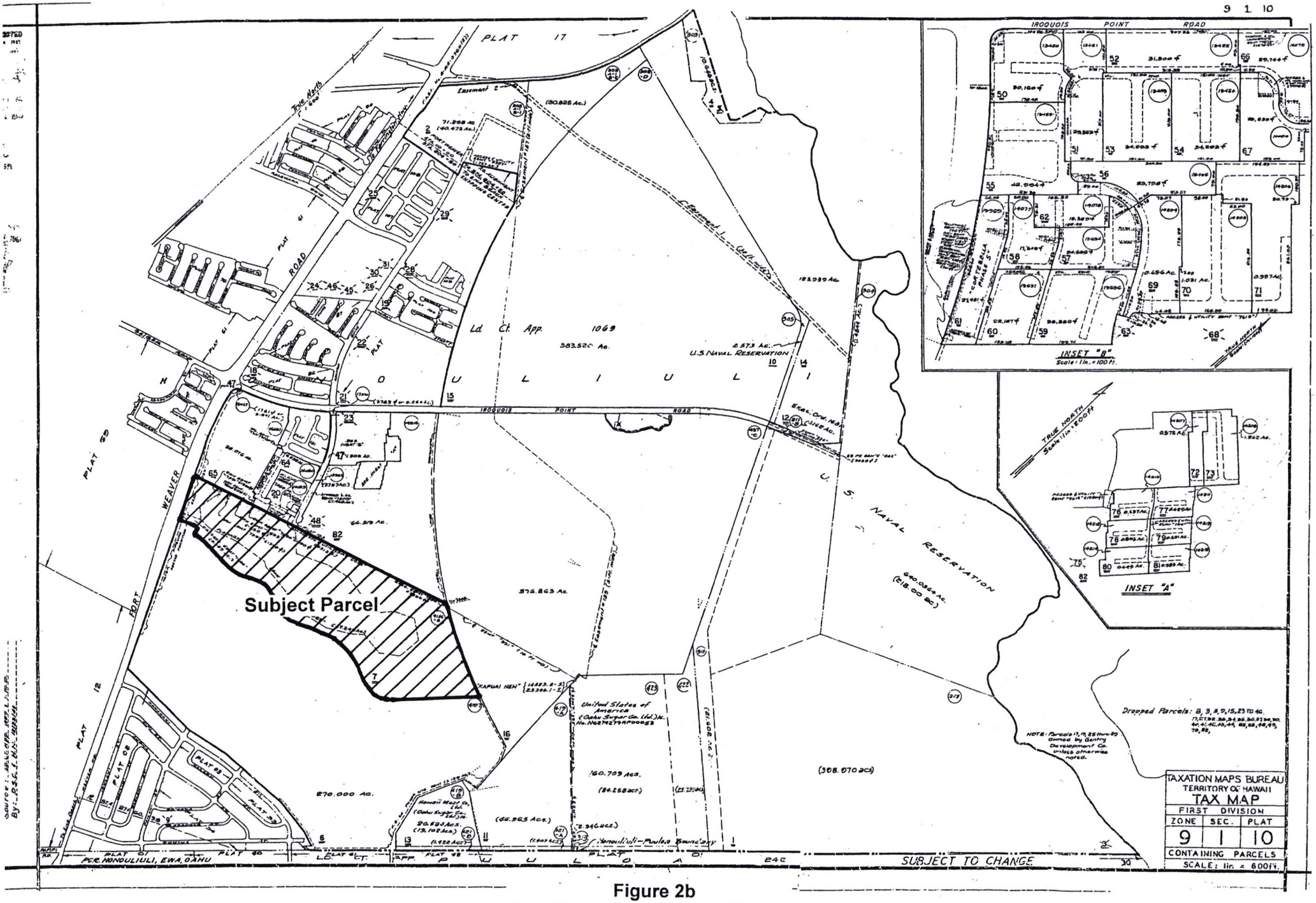


Figure 2a
Tax Map of Ewa Makai – West

NOTICE: Owner's lessee's and vendee's names recorded on this tax map print may not be current.

AUG 15 2002


9 1 10
PLAT 17
IROQUOIS POINT ROAD
INSET "B"
Scale: 1in. = 100 ft.
INSET "A"
Subject Parcel
U.S. NAVAL RESERVATION
Ld. Ct. App. 1069
HONOULIULI
WEAVER ROAD
FORT WEAVER ROAD
United States of America (Oahu Sugar Co. (Ltd.)lic. No. NGS 2789 R00003
Dropped Parcels: 8, 3, 4, 7, 15, 23 to 40, 77, 82, 84, 85, 86, 87, 88, 90, 91, 40, 41, 42, 43, 44, 45, 46, 48, 49, 75, 88,
NOTE: Parcels 11, 12, 85 thru 89 Owned by Gentry Development Co. Unless otherwise noted.
TAXATION MAPS BUREAU
TERRITORY OF HAWAII
TAX MAP
FIRST DIVISION
ZONE 9 | SEC. 1 | PLAT 10
CONTAINING PARCELS
SCALE: 1in. = 600ft.
SUBJECT TO CHANGE
PLAT 01
PLAT 40
PLAT 08
PLAT 12
PLAT 59
PLAT 98
PLAT 99
PLAT 100
PLAT 101
PLAT 102
PLAT 103
PLAT 104
PLAT 105
PLAT 106
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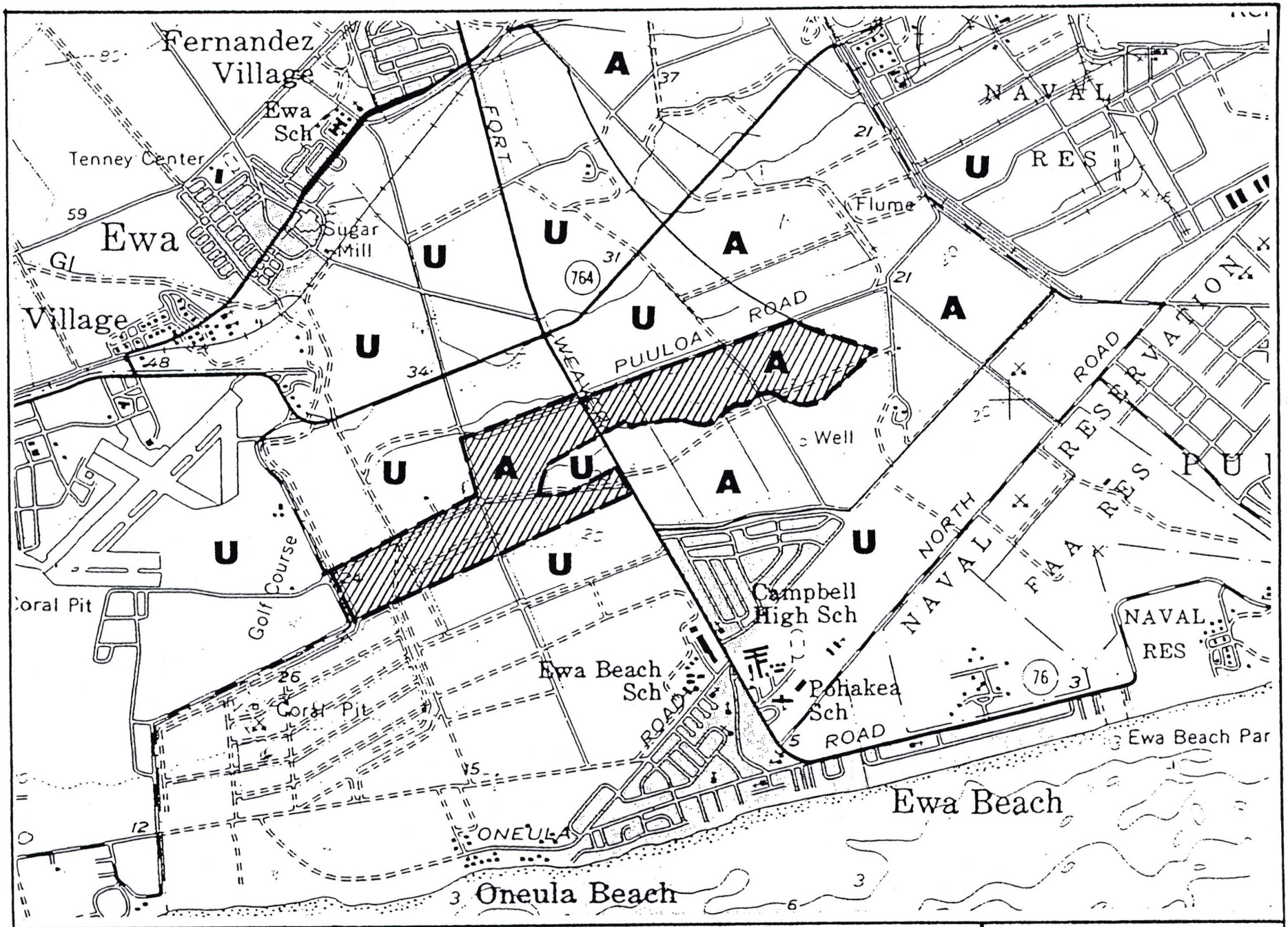
PLAT 115
PLAT 116
PLAT 117
PLAT



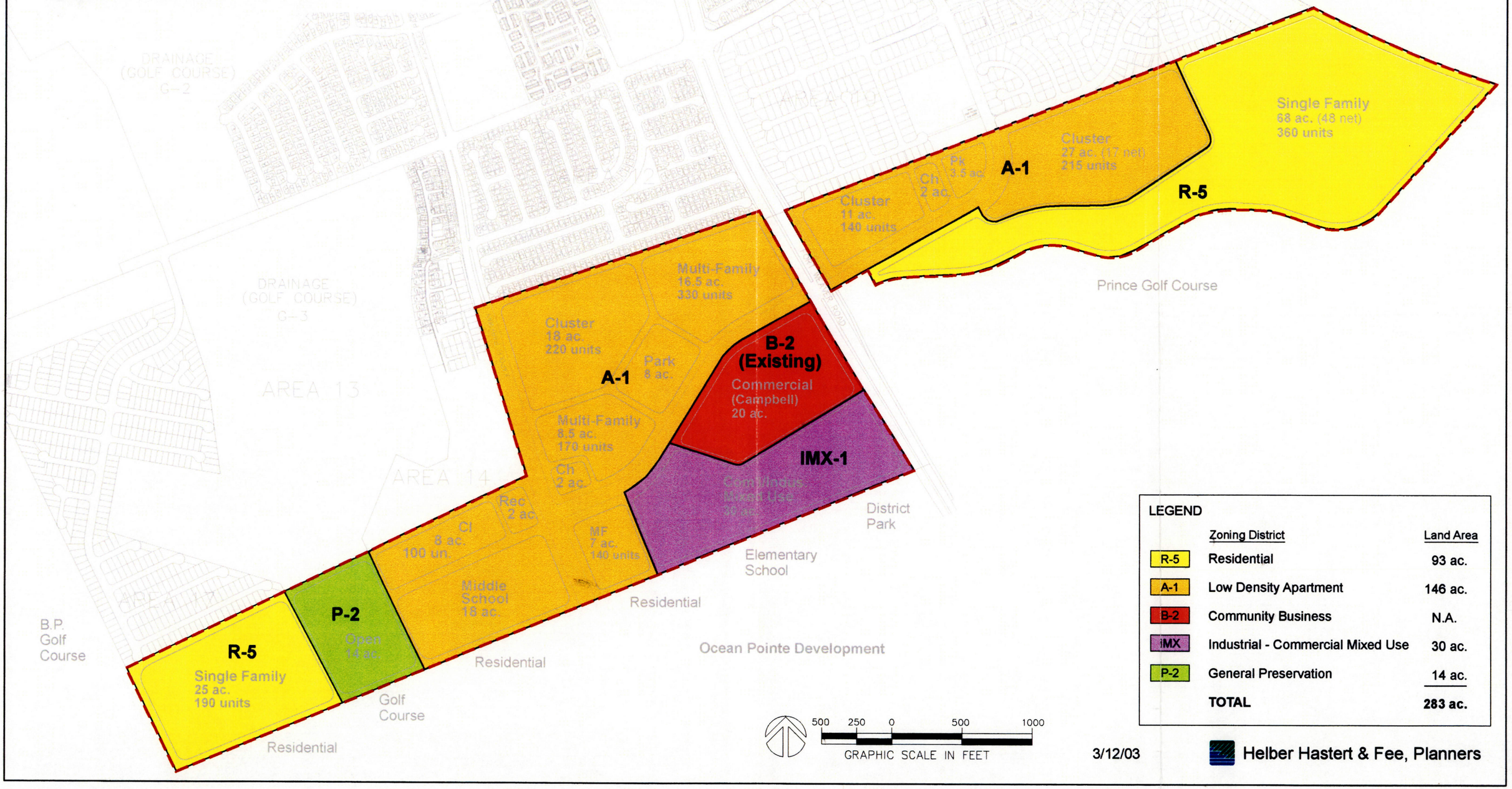
Existing State Land Use District Boundary Map
Ewa Area

Figure 3

Figure 4.
Current Zoning Map of Subject Area

EWA MAKAI PROPOSED ZONING

Gentry Homes, Ltd.



LEGEND

	Zoning District	Land Area
R-5	Residential	93 ac.
A-1	Low Density Apartment	146 ac.
B-2	Community Business	N.A.
IMX	Industrial - Commercial Mixed Use	30 ac.
P-2	General Preservation	14 ac.
	TOTAL	**283 ac.**

3/12/03

Helber Hastert & Fee, Planners

Figure 5

B. Description of Topography and Soil Types. The topographic contours of the project site are generally level. Elevations within the two parcels vary from 20 feet above mean sea level (msl) to approximately 35 feet above msl. Except for two pronounced sumps near the east boundary of Ewa Makai-East, the ground slopes are approximately 1 percent. A topographic map of the Subject Parcels are included as Figures 6a and 6b.

The Ewa coastal plains were formed initially by ponded lava of the Koolau Volcano (Sterns, 1985). As the sea level rose, coral formation and marine sediment were deposited on the lava. Lowering of the sea level caused erosion and valley cutting of the Waianae Range and Schofield Plateau. This, in turn, deposited silt over the coral formations.

Soil survey maps prepared in 1972 by the U.S. Department of Agriculture, Soil Conservation Service (now known as the Natural Resource Conservation Service), indicate that the predominant soil series types in the Ewa Makai area are as follows: Ewa silty clay loam (EmA and EmB) and Mamala stony silty clay loam (MnC).

Ewa silty clay loam, moderately shallow, 0 to 2 percent slopes (EmA) comprises about 65.1 acres of land on the subject property, while Ewa silty clay loam, moderately shallow, 2 to 6 percent slopes (EmB) comprises about 21.4 acres of land. Both of these soil types have profiles like that of Ewa silty clay loam, 3 to 6 percent slopes, except that the depth to coral limestone is 20 to 50 inches. Ewa silty clay loam, 3 to 6 percent slopes, is more than 60 inches deep. The surface layer is generally dark reddish-brown silty clay loam. The subsoil is dark reddish-brown and dark-red silty clay loam that has subangular blocky structure. The substratum is coral limestone, sand, or gravelly alluvium. The soil is neutral in the surface layer and subsoil. Runoff is very slow, and the erosion hazard is no more than slight.

Mamala stony silty clay loam (MnC), which comprises approximately 196.1 acres of the subject property, consists of slope ranges of 0 to 12 percent, although in most places the slope does not exceed 6 percent. Stones, mostly coral rock fragments, are common in the surface layer and in the profile. The surface layer is dark reddish-brown, stony silty clay loam about 11 inches thick. The soil is underlain by coral limestone and consolidated calcareous sand at depths of 8 to 20 inches. This soil is neutral to mildly alkaline. Permeability is moderate. Runoff is very slow to medium, and the erosion hazard is slight to moderate. **Figure 7** depicts the soil types found on the Subject Property.

C. Soils Ratings

Three classification systems are commonly used to rate soils in Hawaii: (1) Land Capability Grouping; (2) Agricultural Lands of Importance to the State of Hawaii; and (3) Overall Productivity Rating.

Figure 6a
TOPOGRAPHY OF EWA MAKAI – EAST

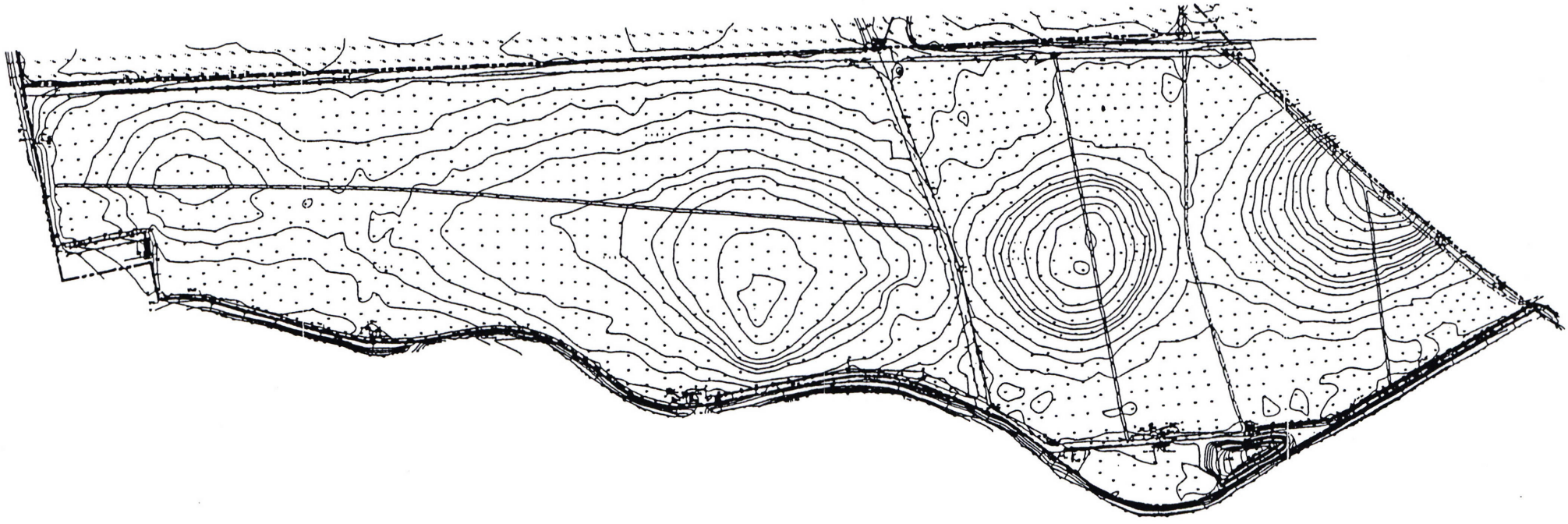
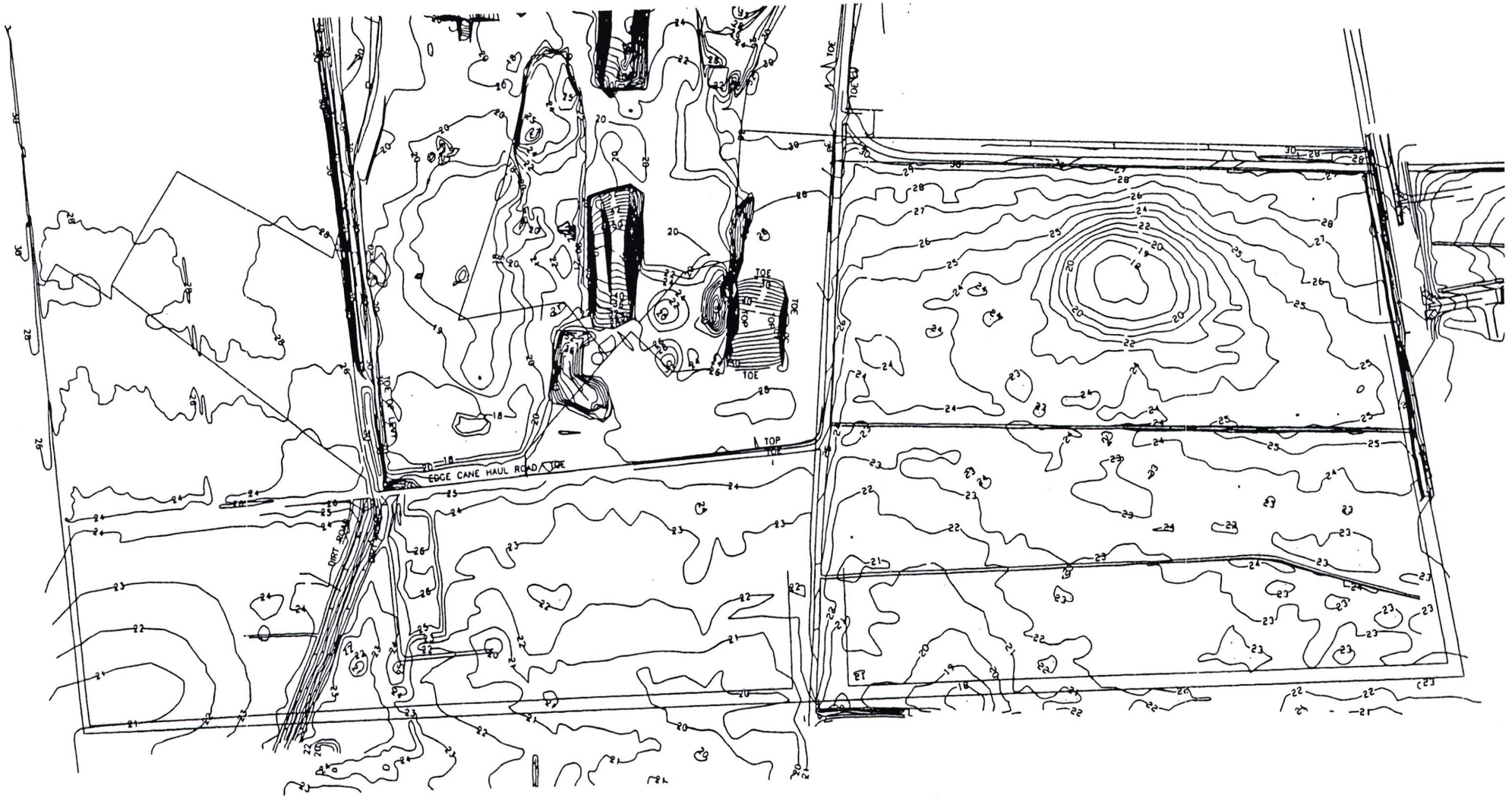


Figure 6b
TOPOGRAPHY OF EWA MAKAI - WEST



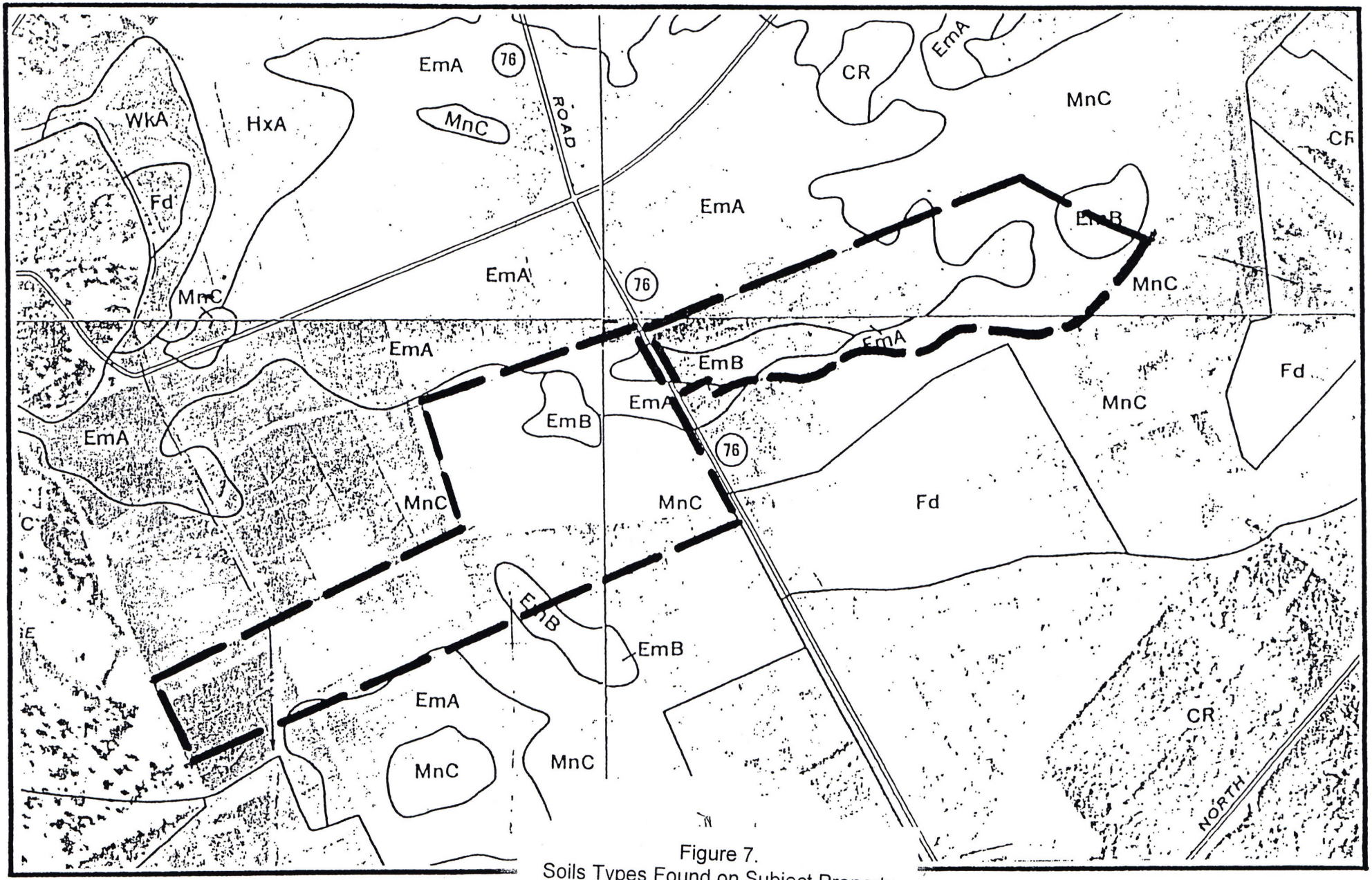


Figure 7.
Soils Types Found on Subject Property

1. Land Capability Grouping (NRCS Rating)

The 1972 Land Capability Grouping by the U.S. Department of Agriculture NRCS rates soils according to eight levels, ranging from the highest classification level, I, to the lowest level, VIII.

Assuming that the land is irrigated, soil types EmA and EmB, which cover about 30.6% of the project area, have land capability ratings of IIs and IIe, respectively. The II indicates that the soils have moderate limitations that reduce the choice of crops that can be grown successfully, or indicates that moderate conservation practices are required. The subclassification of "s" indicates that the limitation is due to stoniness, unfavorable texture, shallowness, or low water-holding capacity; the subclassfication of "e" indicates a risk of erosion.

Soil MnC, which covers 69.4% of the project area, has a land capability rating of IIIs, which indicates that the soils have severe limitations that reduce the options on plants, require special conservation practices, or both.

2. Agricultural Lands of Importance in the State of Hawaii (ALISH)

The Agricultural Lands of Importance to the State of Hawaii (ALISH) ratings were developed in 1977 by the NRCS, the University of Hawaii College of Tropical Agriculture and Human Resources, and the State of Hawaii, Department of Agriculture. This system classifies agricultural land into three categories: (1) "Prime", which is best suited for the production of crops because of its ability to sustain high yields with relatively little input and with the least damage to the environment; (2) "Unique", which is non-Prime agricultural land currently being used for the production of specific high-value crops; and (c) "Other", which is non-Prime and non-Unique agricultural land that is important to the production of crops.

Approximately 30% of the project area is rated Prime (soil types EmA and EmB) and 69.4% is rated Other (soil type MnC).

3. Overall Productivity Rating

In 1972, the UH Land Study Bureau (LSB) developed the Overall Productivity Rating, which classifies soils according to five levels, with "A" representing the class of highest productivity and "E" the lowest.

About 23% of the project area is rated A, and the remaining 76.8% is rated C.

D. Flood and Drainage Conditions

Because the topography of Ewa by Gentry and Ewa Makai are generally level, major permanent and interim drainage systems are required to prevent flooding of the project areas. Consequently, ultimate drainage improvements will be planned to provide coordinated drainage systems benefiting both the Ewa by Gentry and Ewa Makai developments.

Ewa Makai is not located in an area designated as a flood zone. According to Panel 150001-0110 of the Federal Flood Insurance Rate map of 1990, the Subject Property is located in Zone D, an area in which flood hazards are undetermined.

E. Climatic Conditions

The project area receives considerable sunshine, with an average daily insolation exceeding 500 calories per square centimeter. The average low temperatures range from about 60°F in the winter to about 70° in the summer, while the average high temperature ranges from just under 80° in the winter to just under 90° in the summer. Average rainfall in the project area is slightly more than 20 inches.

F. Surrounding Land Uses and Structures

The Ewa Makai-East portion of the project lies between proposed single family homes in Ewa by Gentry and the Hawaii Prince Golf Course, and extends east of Fort Weaver Road to the U.S. Navy Explosive Safety Quantity Distance (ESQD-) Boundary. The Ewa Makai-West portion of the project lies west from Fort Weaver Road, between Ewa by Gentry's Sun Terra residential community and the Coral Creek Golf Course (to the north) and Haseko's planned Ocean Pointe community (to the south). The Barbers Point Naval Air Station Golf Course lies to the west of the project area.

G. Chronological Land Use History

According to historic documents, the entire ahupua'a of Honouliuli (Land Commission Award 11216, Apana 8; approximately 43,250 acres) was awarded to a granddaughter of King Kamehameha I, Mikahela Kekau'onohi. Kekau'onohi was awarded land on all of the Hawaiian Islands including the ahupua'a of Honouliuli and Waimalu on Oahu. Upon her death, portions of the land, which include the project area, were sold to James Campbell. Fee ownership of the project site has since been held by the Estate of James Campbell.

By the 1850s, cattle ranching was firmly established at Ewa with an estimated 12,000 head of cattle. By 1877, James Campbell had acquired approximately 41,000 acres of arid ranch lands on the Ewa Plain and was said to have some 32,000 head of wild cattle. With the need for water apparent, Campbell arranged for the drilling of Hawaii's first artesian wells, an effort that proved successful and made available water reserves for the area.

In 1889, the Honouliuli lands were leased to B.F. Dillingham, who later subleased a portion of those lands to W.R. Castle who, with Castle and Cooke, organized the Ewa Plantation Company. A merger of Ewa Plantation with Oahu Sugar occurred in 1970.

In the 1890s, the sugar industry in Hawaii began to rapidly expand. Construction of the Oahu Railway & Land (OR&L) railroad, which carried both passengers and freight, began in 1889 and eventually went around the island. The railroad was instrumental in the development of several sugar plantations (Ewa Plantation Company, Kahuku Plantation Company, Oahu Sugar Company, and the Waialua Agricultural Company), as well as James Dole's pineapple efforts in Central Oahu.

By the 1920s, Honouliuli was used almost exclusively for sugar cultivation and ranching. The Ewa Plantation Company controlled approximately 12,000 acres which

included sugar cane, a sisal plantation, residential areas for several thousand people, and a limestone quarry. The Oahu Sugar Company controlled 3,000 acres, although not all of it was planted in sugar. Honouliuli Ranch, the largest landholder, controlled approximately 20,000 acres with much of it considered waste because it contained gullies and rocks. Six thousand acres were reportedly planted in pineapple or were forest or wetlands. (Archaeological Inventory Report for Ewa Gentry Makai Project, Prepared for Environmental Communications by Pacific Legacy, Inc., June 2001; Zone Change Application and Planning Report for a State Land Use District Boundary Amendment for Laulani Commercial Center, Prepared for The Estate of James Campbell by William E. Wanket, Inc., May 1998); Ewa Makai Social Impact Assessment, Prepared by Earthplan, July 2002).

The Subject Property consists of fallow agricultural lands that were previously leased for many years by Oahu Sugar Company, Ltd. (OSCo) for the production of sugar cane. These leases with OSCo have since expired and there are no plans to convert the subject properties to other types of agricultural uses other than grazing activities on a short-term lease. (See H. below.)

In 1991, the City Department of Housing and Community Development (DHCD) had proposed the development of master planned residential communities called Laulani and Fairways on the Subject Property (since renamed Ewa Makai-West and Ewa Makai-East, respectively). The developments did not materialize and in 1996, Gentry acquired the development rights for these parcels from Campbell Estate.

H. Present Use of Subject Property

For the past several years, nearly all of the property has been leased to Ralph's Ranch month-to-month, which also leases lands in Kunia and Kahuku. The subject property provides sufficient grass to graze about 20 head of livestock, more or less, depending on rainfall and supplemental feed. The ranch is operated as a hobby by a father and son, and has no employees.

I. Legal Description. A legal description of the subject parcels, including land court maps and metes and bounds description, is included as Appendix A.

J. Ownership. The subject properties are currently owned in fee by the Estate of James Campbell, and are recorded under the Land Court System. A short form of the development agreement between Gentry Investment Properties and Campbell Estate verifying Gentry's proprietary interest in the Subject Property is included as Appendix B. A current status title report for both Ewa Makai-East and Ewa Makai-West are included as Appendix C.

A Development Agreement between Gentry Investment Properties and Campbell Estate provides that Gentry is authorized to obtain the appropriate governmental land use approvals for the subject properties and to prepare the project master plan. A Letter of Authorization from the landowner is included as Appendix D.

II. HISTORY OF THE DEVELOPMENT OF EWA BY GENTRY

In June 1987, The Gentry Companies concluded an agreement to acquire approximately 75 acres of fee simple land from Aloha State Corporation, a subsidiary of Hirano Brothers, Ltd. The agreement with Hirano Brothers, Ltd., and concurrent negotiations with the Estate of James Campbell, provided the Gentry Companies with the rights to acquire and develop 857 acres of additional contiguous lands from the Estate of James Campbell in future years. In 1987, Gentry began the development of the master planned community of Ewa by Gentry by breaking ground on its Soda Creek development project, the first residential neighborhood in what would be eventually be a 1,000-acre community.

In 1988, the State Land Use Commission reclassified approximately 685 acres of land within the Ewa by Gentry to the Urban Land Use District. These lands were to be developed together with an adjoining 331-acre parcel of land already in the Urban Land Use District. (A portion of the 331 acres is located in Ewa Villages.)

Over the past 15 years, Gentry has continued to build and sell homes in various communities within Ewa by Gentry. More than 5,300 homes have been completed of the 7,200 homes anticipated at build-out. The chart in Figure 8 shows the status of homes that have been or will be developed in Ewa by Gentry.

In 1998, Gentry sought and received on August 3, 1998, approval from the State Land Use Commission to amend Condition No. 4 of the SLUC's Decision and Order for Ewa by Gentry regarding the provision of affordable housing. The revised Condition 4 now provides that the Petitioner shall contribute to affordable housing opportunities for low, low-moderate, and moderate-income residents of the State of Hawaii to the satisfaction of the City and County of Honolulu. This action on the part of the SLUC was consistent with the spirit and intent of the Governor's Blueprint for Affordable Housing, which proposed to establish a new streamlined affordable housing policy for private sector developments requesting State land use reclassifications by assigning implementation requirements and enforcement to the counties.

The affordable units within the project area (also shown in Figure 8) have been developed and sold in compliance with the terms and conditions of a comprehensive affordable housing agreement executed between the Petitioner and the City and County of Honolulu. The current agreement dated June 18, 1997, sets forth terms and conditions for carrying out the Petitioner's affordable housing program in the Ewa by Gentry project. Included as Appendix E is a letter from the City and County of Honolulu dated December 16, 2002, which confirms that Ewa by Gentry is progressing satisfactorily toward compliance of the affordable housing requirements.

In addition, since August 5, 1999, the Petitioner has been in compliance with Ordinance 99-51, which temporarily amends the affordable housing conditions in existing unilateral agreements. The provisions of Ordinance 99-51 were extended until August 5, 2005 in 2001 with the enactment of Ordinance 01-33. The provisions of Ordinances 99-51 and 01-33 will apply to homes in Ewa Makai for which sales contracts are executed prior to August 5, 2005 and which are closed within ninety days after the repeal date. The repeal date may be extended or shortened as the City Council deems appropriate.

Based on discussions with staff of the City Department of Planning and Permitting, it has been the recent policy of the City Administration to recommend that developers seeking zoning be required to provide affordable homes. Its general policy has been as follows: (1) At least 10% of the total number of units to be developed in the project area must be affordable to households earning up to and including 80% of the area median income as determined by the U.S. Department of Housing and Urban Development; and (2) at least an additional 20% of the total number of units to be developed in the project area shall be affordable to households earning up to and including 120% of the area median income as determined by the U.S. Department of Housing and Urban Development. (See Appendix G.) Gentry does not object to such a requirement.

Figure 8
EWA BY GENTRY – SUMMARY OF HOUSING UNITS DEVELOPED/PLANNED AS OF 1-31-03

Area	Type	Project or Increment	Status	Est'd # of Affordable Units			Total Units
				80% of median	120% of median	140% of median	
1A (por)	MF	Palm Villas (R)	Completed	112	0	0	112
1A (por)	MF	Palm Villas (S)	Completed	1	6	5	240
1B & 1C	MF	Palm Court I, II, III	Completed	0	5	5	400
2A & 2B	SF	Soda Creek	Completed	0	0	0	459
3	MF	Arbors	Completed	0	3	7	289
4	MF	Palm Villas 2	Completed	0	18	37	384
5	SF	Kula Lei (Schuler Homes)	Completed	0	0	0	193
5F	SF	Prescott on the Green	Ongoing	0	*6*	0	6
6	SF	Sun Terra on the Park	Completed	0	4	2	182
7	SF	Sun Terra South/Fiesta	Completed	0	17	129	250
7	SF	Del Verde	Completed	0	18	0	39
8 & 8A	MF	Coronado*	Completed	130	109	0	256
10	MF	Sunrise	Completed	0	107	38	408
12	SF	Sun Terra	Completed	0	7	8	451
13	SF Condo	Hu'elani	Ongoing	0	*70*	*10*	101
18	SF	Summer Hill/Trovare (Carr Dev.)	Completed	0	18	0	305
24	MF	Suncrest	Completed	0	56	1	64
19A	SF	Sonoma	Ongoing	*0*	*120*	*0*	130
19B	SF	Prescott	Ongoing	*0*	*158*	*0*	153
21 (por)	SF Condo	CorteBella	Completed	*130*	*0*	*0*	130
21 (por)	SF Condo	Terrazza	Completed	*150*	*17*	*0*	167
21 (por)	SF Condo	Las Brisas	Ongoing	*150*	*31*	*0*	181
21 (por)	SF Condo	Tiburon	Ongoing	*5*	*128*	*0*	134
23/24 (por)	SF Condo	Lombard Way	Completed	91	45	3	143
(por)	SF Condo	Avalon	Completed	45	0	0	46
24 (por)	MF	The Shores at Suncrest	Completed	4	27	2	36
26 (por)	SF Condo	The Lofts	Completed	0	30	3	45
26 (por)	SF Condo	Alii Cove	Completed	0	114	29	157
26 (por)	SF Condo	Alii Court	Completed	35	44	7	114
27A	SF	Fiesta Seabreeze	Completed	0	17	14	86
27A & B	SF	Meridian	Completed	0	33	4	57
27B	SF	The Breakers	Completed	0	78	0	79
28A&D	SF	The Carriages	Completed	0	0	0	70
28B&C	SF	WoodBridge	Ongoing	0	0	0	89
N/A	Credits transferred from Campbell Estate		N/A	265	0	0	N/A
14	SF Condo	To be named	Future	*25*	*100*	*0*	125
17	SF	To be named	Future	*0*	*418*	*0*	420
20	SF	To be named	Future	*0*	*213*	*0*	215
27C	SF	To be named	Future	*0*	*60*	*0*	60
30	SF Condo	To be named	Future	*70*	*111*	*0*	181
31	SF	To be named	Future	*0*	*284*	*0*	284
			Totals	**1213**	**2,472**	**304**	**7241**

Numbers are tentative and are subject to change. Italicized numbers are estimates only.

III. DESCRIPTION OF THE PROPOSED DEVELOPMENT

A. Overall description. The 283-acre Ewa Makai development is being proposed as a continuation of the existing Ewa by Gentry community. The existing Ewa by Gentry community, situated to the north of the Ewa Makai parcels, is a 1,000-acre planned development of approximately 7,200 homes, of which 5,383 had been completed and closed as of January 31, 2003.

The existing Ewa by Gentry community was initially planned to accommodate primarily "entry level" homebuyers, and indeed, this has been Gentry's strongest market. On Oahu, Gentry has historically been the leading developer of quality homes that are competitively priced, and that tradition has continued in Ewa by Gentry. For the past several years, nearly 100 percent of Gentry's homes have been priced at levels that would be considered "affordable" under the City and County of Honolulu's affordable housing program, with homes priced at levels affordable to those earning from ≤80% to 140% of median income. Ewa by Gentry has provided the opportunity for thousands of residents to be able to enjoy living in a nice environment that they can call home.

Although first time homebuyers continue to constitute the largest segment of Gentry's home buying population, recent projects have also included more spacious homes because of changing demographics and market conditions. These larger, more upscale units have done very well on the market and provide an opportunity for those who enjoy living in Ewa to "move-up" to a larger home that meets the needs of their growing families. At build-out, Ewa by Gentry will contain a mix of single family and multi-family homes, an 18-hole championship daily fee golf course, four community parks, expansion of Ewa Mahiko District Park, Holomua Elementary School (which opened in August 1996), a seven-acre neighborhood commercial center (which opened in the summer of 1999), and a 12-acre light industrial area.

As a continuation of the Ewa by Gentry community, Ewa Makai would offer a range of housing types, as well as other non-residential uses. The complementary phasing of the Ewa Makai and the Ewa by Gentry areas would facilitate more effective overall planning and provision of required infrastructure for the entire master planned community.

The Conceptual Master Plan for the Subject Property includes approximately 550 single family detached units (93 acres), 675 cluster units (64 acres), 640 multi-family units (32 acres), community facilities (24 acres) (including a middle school, a community recreation center complex, and two church sites), an industrial/commercial complex (30 acres), parks (11.5 acres), open space for infrastructure/drainage (14 acres), and roadways (14.5 acres). The total proposed development on the Subject Property will therefore consist of approximately 283 acres. A Conceptual Master Plan for Ewa Makai is included as Figure 9.

The existing Kapolei Parkway that runs from the railroad tracks bordering Ewa Villages to the southern end of Gentry's Sun Terra subdivision will be extended to accommodate the development of Ewa Makai-West. Keaunui Drive, which will run from the railroad tracks bordering West Loch Estates through Gentry's developments

south of Iroquois Point Road will be extended to accommodate the development of Ewa Makai-East. New water, sewer, drainage, underground electric and telephone cable systems conforming to City and County standards will be installed. The public roadway system will also conform to City standards for 60-foot, 44-foot, and 32-foot rights-of-way having curbs, gutters, and sidewalks.

The following is a brief description of the major land use elements of the Ewa Makai Conceptual Development Plan:

B. Residential. Approximately 550 single family homes, 675 single family cluster homes, and 640 multi-family units are planned for development on the Subject Property. These units are intended to meet the housing needs of a spectrum of income and age groups, and will include affordable homes as may be required by the State and City.

1. Single Family Residential

360 single family homes are planned for Ewa Makai-East, while 190 homes are planned for Ewa Makai-West. Most of the single family units will be sold in fee as house and lot packages, although a few custom built homes on larger lots may also be a possibility.

For Ewa Makai-East, Gentry proposes to continue its single family residential development from the mauka direction into the petition/zone change area. Single family residences in Ewa East would take advantage of the frontage along the existing Hawaii Prince Golf Course.

The proposed Ewa Makai residential subdivisions will be designed for consistency with the existing Ewa by Gentry community. Presently, single family densities are estimated to average 7.5 units per acre, based on lot sizes averaging 5,000 square feet. Average prices will range from $300,000 to $435,000 in 2003 dollars.

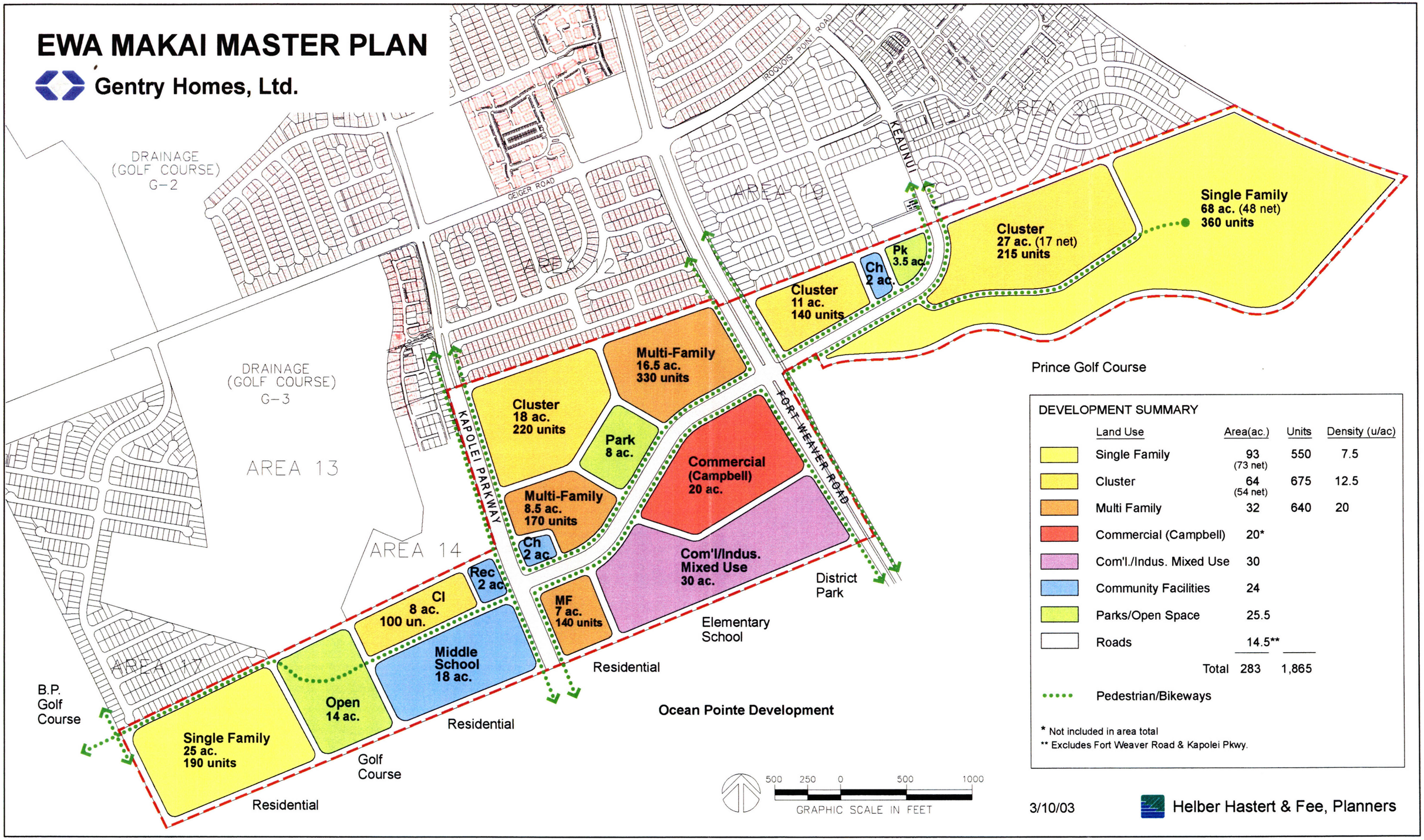
2. Cluster Homes

355 single family condominium homes are planned for Ewa Makai-East, while 320 such homes are planned for Ewa Makai-West. These single family condominiums will be sold in fee simple on lands that are zoned A-1 Low Density Apartment.

Single family condos have been popular choices among Gentry's new homebuyers for several reasons. They are less dense than multi-family apartments; they offer more privacy; they offer individual lots that are easy to maintain; and they are more affordable than single family homes on standard R-5 houselots. Smaller houselots and reduced infrastructure costs have enabled Gentry to sell these types of units at very competitive prices. It is anticipated that sales prices for cluster homes will range from approximately $200,000 to $300,000 in 2003 dollars.

EWA MAKAI MASTER PLAN

Gentry Homes, Ltd.



DEVELOPMENT SUMMARY

Land Use	Area(ac.)	Units	Density (u/ac)
Single Family	93 (73 net)	550	7.5
Cluster	64 (54 net)	675	12.5
Multi Family	32	640	20
Commercial (Campbell)	20*		
Com'l./Indus. Mixed Use	30		
Community Facilities	24		
Parks/Open Space	25.5		
Roads	14.5**		
Total	283	1,865	
Pedestrian/Bikeways			

* Not included in area total

** Excludes Fort Weaver Road & Kapolei Pkwy.

500 250 0 500 1000

GRAPHIC SCALE IN FEET

3/10/03

Helber Hastert & Fee, Planners

Figure 9

3. Multi-Family Residential

Approximately 640 multi-family homes are planned for Ewa Makai-West. Multi-family residences may include single family condominiums, duplexes, townhomes, or stacked flats, with product types being largely dependent upon market conditions at the time of sale. It is estimated that these units will sell for approximately $150,000 to $200,000 in 2003 dollars.

To minimize the need for vehicular transportation, the multi-family units will be located in areas proximate to public transportation facilities, commercial facilities, school sites, and parks. Pedestrian walkways and bike paths will be incorporated to enhance internal circulation between major trip generation centers and residential areas.

C. Parks/Open Space Corridor

The conceptual plan incorporates two neighborhood parks: an 8-acre park in Ewa Makai-West and a 3.5 acre park in Ewa Makai-East. The 8-acre park in Ewa Makai-West will be centrally located and within walking or biking distance for many area residents. The 3.5 acre park in Ewa Makai-East will be an extension of a planned 6.8 acre park in the existing Ewa by Gentry community, thereby increasing the overall park size to 10.3 acres. In addition, a 2-acre private community recreation center complex is planned in Ewa Makai-West for use by Ewa by Gentry residents, and additional private recreational areas may be developed in conjunction with individual residential developments.

The open space/drainage corridor will function as a collector for surface runoff and an aesthetic amenity extending from the makai end of the Coral Creek Golf Course in Ewa by Gentry to the mauka boundary of Haseko's planned golf course in Ocean Pointe. The channel through the project is planned to be a wide, grass-lined drainage way that will have a bottom width ranging from about 450 feet near the Gentry golf course boundary to about 330 feet at the Ocean Pointe boundary with 4:1 side slopes. The major drainage channel will be designed in accordance with City and County Storm Drainage Standards in anticipation of dedicating the channel to the City. It is envisioned that the 14-acre drainage way will be an attractive, landscaped open space that could also provide for recreational activities.

Tentative site plans also call for the development of open space areas in Ewa East that will incorporate needed drainageways and retention/detention basins into attractive greenways and open space areas within the community.

Master planning and development of new parks will be provided in accordance with the requirements of the City's Park Dedication Ordinance.

D. Industrial-Commercial Area

A 30-acre industrial-commercial complex is intended as an adjunct to the future 20-acre Laulani Commercial Center. *(Note: The Laulani Commercial Center, which is not a part of the current land use petition and zone change, was processed separately by the landowner, Campbell Estate, and has already received its land entitlements.)* The 30-acre industrial-commercial complex is envisioned to provide services supplemental

to the needs of the area and would also provide a source of employment for an estimated 1,500 full-time, part-time, and self-employment jobs at build-out.

The industrial-commercial development is expected to contain 35 to 40 lots ranging in size from approximately 15,000 square feet up to 3 acres. Uses are anticipated to be similar to those found in the existing industrial-commercial developments in Kaneohe, Kalihi, Waipio, Kakaako, Mapunapuna, and Hawaii Kai. It would include warehousing, light assembly operations, wholesaling, commercial, and other permitted uses. The IMX-1 district is intended to promote and maintain a viable mix of light industrial and commercial uses to serve the surrounding community without exposing non-industrial uses to unsafe and unhealthy environments.

Based on the number of lots, the lot sizes, and the anticipated operations, it is expected there will be approximately 40 major buildings within the complex. Although the proposed IMX-1 zoning allows floor area ratio (FAR) maximums of 1.5 to 2.5 (depending on the mix of industrial and non-industrial uses), it is anticipated that the average FAR for this development will be approximately 0.60. Assuming approximately 4 acres of the 30-acre site is taken up by roadways, the remaining 26 acres of developable land would generate approximately 680,000 square feet of total building floor area.

Although off-street parking requirements will vary significantly depending on the specific types of uses on each lot, most will require between 1 stall per 300 square feet and 1 stall per 1,500 square feet of floor area. Assuming an average of 1 stall per 900 square feet, approximately 756 parking stalls will be needed within the complex.

Although the zoning map for the area will establish the maximum height of buildings in the complex, it is anticipated that structures will not exceed 40 feet. Many are expected to be single-story facilities. Some may have mezzanines or second story spaces for administrative or light storage uses, and others may be "high cube" facilities.

E. Church/School/Day Care Sites

To address the spiritual needs of the community, two 2-acre church sites are planned, one in Ewa Makai-West and the other in Ewa Makai-East. It is envisioned that the church sites will also serve as centers for day care and/or other community services during the weekdays.

F. Community Recreation Center

Plans call for a 2-acre site to be dedicated to the Ewa by Gentry Community Association on which it will build a recreational facility for use by its residents. It is anticipated that such a community center will provide a meeting facility in which various functions and activities could take place, including parties, group meetings, and classes. The actual planned uses would be largely contingent on the community's needs and desires, and could also include such recreational amenities as a swimming pool, play courts, playground areas, etc.

G. Middle School

An 18-acre site will be dedicated to the State Department of Education for the development of a public school . The DOE currently plans to build a middle school (grades 6 to 8) on the site. Plans for the school have not been drafted as yet.

H. Circulation and Drainage Infrastructure

1. Transportation Systems

Roadway Network

Interstate H-1, Farrington Highway, and Fort Weaver Road/Kunia Road provide regional and sub-regional access to the Ewa Makai development study area. Within Ewa Makai, Geiger Road/Iroquois Point Road will provide the primary east-west circulation. Fort Weaver Road, Kapolei Parkway, and Keaunui Street will provide north-south circulation. Launahele Street, located between Fort Weaver Road and Kapolei Parkway, will provide north-south access to existing development.

One of the major elements of the future Ewa roadway network is Kapolei Parkway which is planned as a major corridor. The portion of Kapolei Parkway through Ewa by Gentry has already been completed. When remaining portions of the roadway are completed, including those portions through HASEKO's Ocean Pointe community, the Ewa Makai community, and State and City properties, Kapolei Parkway will serve as a major link from Ewa Beach to the city of Kapolei. Eventually, it will serve as a link from Ewa Beach to the resort area of Ko Olina.

Bikeway System

Major bike paths will run along the OR&L right-of-way and Kapolei Parkway and along the North-South Road and Fort Weaver Road. Bike paths currently exist throughout the Ewa by Gentry community and along Fort Weaver Road and Kapolei Parkway, and will be included in the Ewa Makai development, as well.

Transit-Oriented Streets

Circulation systems within the Ewa Makai community will be designed to allow for increased transit use and reduced dependence on automobile travel. Bus routes will be planned to accommodate the "hub and spoke" system recently implemented by the City, and as the population grows, the bus system is assumed to grow to handle the transit demand placed on the bus system. Where feasible, the rights-of-way along transit routes in Ewa Makai will make provisions for bus shelters and bus pull-outs.

2. Drainage Systems

Proposed drainage systems for Ewa Makai-East and Ewa Makai-West include the following:

Ewa Makai-East

Plans currently call for the development of two retention/detention basins in the Ewa Makai-East project site to handle stormwater runoff from the mauka project areas, with grass-lined drainageways connecting these sumps. Overflow would be discharged into the Navy lands east of the project site. These landscaped drainage features will serve to meet NPDES requirements, and could also serve as a visual and recreational amenity for the community, with bikepaths or jogging paths being constructed as part of the drainage system.

Ewa Makai–West

Ewa Makai–West, like Ewa by Gentry–West, falls within the 11 square mile Kaloi watershed that extends from the crest of the Waianae Mountain Range to the ocean.

Regional drainage improvements will be handled by the continuation of the Kaloi Channel through Ewa Makai-West. It is envisioned that the channel will be a wide, landscaped, grass-lined open space area connecting the makai end of the Coral Creek Golf Course to the mauka boundary of the Ocean Pointe development. It will have a bottom width ranging from about 450 feet near the Coral Creek Golf Course boundary to about 330 feet at the Ocean Pointe boundary with 4:1 side slopes. The channel is designed to provide conveyance capacity for the peak flow from the City's Ewa Villages development. As with the use of the golf course for runoff conveyance, the unlined drainageway through Ewa Makai-West will facilitate infiltration and dampen peak runoff rates, helping to improve the quality of runoff leaving the site.
The Ewa Makai-West project area is included in the drainage master plan entitled "Drainage Master Plan for the Gentry-Ewa Project", revised February 1991, that has been approved by the City and County of Honolulu Department of Public Works on April 8, 1991
(Ref. No. 91120146). Major elements of the approved drainage plan will be maintained in the drainage plan for Ewa Makai-West.

The drainage systems for both the Ewa Makai–East and Ewa Makai-West projects will be designed in accordance with the "Storm Drainage Standards" of the City and County of Honolulu. Implementation of site specific Best Management Practices will be considered during development of the detailed site design of the systems. Status update letters from the engineering consultants who are developing the drainage master plans for Ewa Makai-East and Ewa Makai-West are included as part of Appendix K.

I. Development Timetables

Figure 10 shows a conservative timetable for the development of Ewa Makai. The timetable is based on the assumption that State and City land use entitlements for Ewa Makai will be obtained by the first quarter of 2004, and that the first homes will be delivered in late 2005 approximately 18 months later. The first phases to be developed will be Areas 34, 34A, and 33 in Ewa Makai-East.

The timely development of Ewa Makai is necessary to enable the continued development of Gentry's projects in Ewa. Although there are a few remaining zoned parcels in Ewa by Gentry, drainage issues need to be addressed prior to the development of a portion of Ewa by Gentry-East. A permanent drainage facility will be required by the City to facilitate additional subdivision approvals for the development of homes in the northeast corner of the property.

Plans for a permanent regional drainage facility to accommodate portions of land in Ewa by Gentry-East have been drafted and an EIS for the drainage facility was accepted in late 1995. However, a Federal Environmental Assessment and Findings of No Significant Impact (FONSI) are still being reviewed by the federal government. Because Pearl Harbor is considered a critical reef habitat, the project is being reviewed by the National Marine Fisheries Service. There are additional Federal, State and City permits that need to be obtained or renewed, including but not limited to, a U.S. Army Corps of Engineers Section 404 permit; Coastal Zone Management Act (CZMA) permit; Special Management Area (SMA) permit, State Conservation District Use (CDUA) permit, and various other permits. In addition, an agreement with U.S. Navy to purchase an easement on their property will need to be executed.

Based upon the various agencies involved in the review process to obtain all necessary approvals for the regional drainage system, as well as the need to acquire the land from the federal government, three to four years may be required before construction on the drainage facility can commence. Construction of the facility is estimated to take another eighteen months. Because of the length of time it will take before the drainage facility is completed, it makes sense from a development standpoint to pursue the continuous and timely delivery of homes in Ewa Makai-East where infrastructure is or can be made readily available to support the development.

Figure 10.
Estimated Development Timetable for Ewa Makai

IV. PETITIONER'S FINANCIAL CONDITION

Exhibit AA includes the financial statements of the petitioner including a balance sheet and income statement, a summary of Gentry's financing strategy, and a statement from the Petitioner's lender that attests to the Petitioner's financial capability to develop the subject property.

V. ASSESSMENT OF THE IMPACTS OF THE PROPOSED USE OR DEVELOPMENT

A. Agriculture

A study on Ewa Makai's impact on agriculture was done by Decision Analysts Hawaii, Inc. (DAHI) in February 2002. (See Exhibit BB.) In its study, DAHI concludes that the loss of agricultural land will not adversely affect the growth of diversified agriculture in Hawaii.

The property is currently fallow sugarcane land, of which about 86 acres are well-suited for growing low-elevation crops. This is based on the favorable soil conditions and ratings over 31% of the site, the gently-sloping terrain, the very sunny climate, good access, and the short trucking distance to the Honolulu markets and to shipping terminals. However, crop farming could be limited by a lack of access to a large volume of low-cost irrigation water and by nuisance problems with neighboring residential communities.

Currently, nearly all of the property is leased to Ralph's Ranch, which also leases about 500 acres in Kunia and Kahuku. The Subject Property provides sufficient grass to graze about 20 head, more or less, depending on rainfall and supplemental fee. The ranch is operated as a hobby by a father and son and has no employees. Development of the Project is expected to have a modest impact on ranch operations, possibly reducing the size of the herd by a dozen or more head.

The proposed development will also have a minimal impact on agriculture in Hawaii for the following reasons.

Ample land is available for diversified agriculture. A vast amount of land has been released from plantation agriculture (about 236,200 acres since 1968), and this release of land has far outpaced the demand for land for diversified crops (an increase of about 38,500 acres over the same period). The net decrease in crop land amounted to 197,700 acres. While some of the released land has been converted or is scheduled to be converted to non-agricultural uses, most of it remains available for diversified crops. Thus, ample land is available in Hawaii to accommodate the growth of diversified agriculture.

Land is not the limiting factor to the growth of diversified agriculture. Consistent with the above, the limiting factor to the growth of diversified agriculture is *not* the *land supply*, but rather the size of the market for crops that can be grown *profitably* in Hawaii.

These findings also apply to Oahu. In particular, most of the 22,500 acres released from sugar production during the 1990s remains available. Fields in Kunia and Ewa have been leased, but markets for crops grown on the land are being developed. On the North Shore, various crops are being explored, but most of the former sugarcane land remains fallow. Development of the Project will involve the loss of far too little good agricultural land to adversely affect the availability of land to farmers on Oahu or in other parts of Hawaii, or to adversely affect the growth of diversified agriculture in Hawaii.

In addition, while the Project will result in urban development on some good agricultural land, this loss to agriculture will be offset by the following benefits: new homes for about 1,865 families, about 1,500 jobs at the industrial-commercial center, 24 acres of community facilities, and 25 acres of new parks and open space.

B. Recreation

Area residents will benefit from increased recreational amenities that will be provided under the proposed Project. Two public park areas will be developed, including an 8-acre park in Ewa Makai-West and a 3.5-acre park that will be part of a larger 10.3-acre park in Ewa Makai-East. Additionally, a 2-acre site will be dedicated to the Ewa by Gentry community for the development of a private community/recreation center for use by Ewa by Gentry and Ewa Makai residents. A 14-acre drainageway in Ewa Makai-West is envisioned to be a landscaped, grassed open space area that can double as a recreational amenity for the community. The drainage sumps and channels in Ewa Makai-East will also serve as landscaped visual amenities, and will also likely double as recreational amenities, with walkways and bikepaths built alongside them. Bikepaths will be built throughout the community, linking the Ewa by Gentry and Ewa Makai communities with other surrounding communities, including Westloch, Ewa Villages, Ocean Pointe, Ewa Beach, Kalaeloa, and eventually the second city of Kapolei. The bikepaths will also connect to the Pearl Harbor Historic Trail that is being planned.

C. Historic and Scenic

Because the Subject Property was formerly cultivated in sugar, it does not contain any scenic assets, places of natural beauty, or multi-cultural or historical resources. However, plans for the project will promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of the mountains and Honolulu city vistas to the extent possible. There are no ocean views from the Subject Property.

D. Environment

An Environmental Impact Statement is being prepared by Environmental Communications and will be submitted as part of the Petitioner's application for rezoning to the City Department of Planning and Permitting. It is anticipated that there will be no major impacts on the environment resulting from the development of the project. The following are summaries of the EIS components relating to archaeological impacts, flora and fauna, Hawaiian customary and traditional rights, traffic, air quality, noise, and social impacts:

1. Archaeological Impacts

An archaeological survey for the proposed Ewa Makai development was conducted by Pacific Legacy, Inc. in January 2003. (See Exhibit CC.) The archival research and a review of previous archaeological studies in the area indicated that the Ewa Plain has undergone dramatic and extensive alterations over its long land use history. A review of the previous archaeology for the area determined the current project area was previously surveyed by Jayatilaka et al. (1992) and Goodman and Cleghorn (1991) and Goodman (1993). None of these surveys identified any cultural resources within the project area. This

was confirmed when the current survey conducted by Pacific Legacy also failed to locate any cultural resources within the project area.

Given that the project area was under sugar cane cultivation for approximately 100 years, it is unlikely that any subsurface cultural materials area still present within the project area. The proposed project area is completely devoid of any natural features and contours.

While there are no surface archaeological sites, there is a possibility of encountering subsurface resources in the form of sinkholes containing cultural materials and possibly human burials. Should subsurface resources be encountered during the course of development, the Historic Preservation Division of the Department of Land and Natural Resources will be notified in accordance with State requirements.

2. Flora

A Botanical Survey of 'Ewa Gentry Makai, 'Ewa District, O'ahu was performed by botanical consultant Winona Char of Char & Associates in June 2001. (See Exhibit DD.) Prior to 1995, the Project Site was under active sugar cane cultivation. A botanical survey of the Site by Char in 1991 described dense fields of sugar cane on the cultivated portions of the Site, and weedy vegetation on the uncultivated areas, such as along cane haul roads, irrigation ditches, and the Kaloi drainage channel. Today, the 283-acre Project Site is covered by scattered weedy patches and large areas with barren soil. Both the Ewa Makai-East and Ewa Makai-West parcels have been used for grazing horses; as a result, the vegetation on both parcels is sparse with about 50 to 60% plant cover.

The vegetation on the site consists largely of introduced or alien plant species such as sourbush, Indian pluchea, golden crown-beard, buffelgrass, kiawe, etc. Of a total of 62 species inventoried on the site, 56 (90%) are introduced. A few native species occur on the site, some of them in fairly large numbers. These are: 'uhaloa, 'ilima, pa'uohi'iaka, kipukai (Heliotopium curassavicam), hoary abutilon, and popolo (Solaum americanum). Only the pa'uohiaka is endemic, that is, it is native only to the Hawaiian Islands. The other species are indigenous, that is, they are native to the Hawaiian Islands and elsewhere.

An intensive search was made for Abutilon menziesii, a listed endangered species belonging to the mallow family that has occurred in some abandoned sugar cane fields on the Ewa plain. No Abutilon menziesii plants were found, nor were any other threatened and endangered species or species of concern encountered on the project site. Given these findings, Char concludes that the proposed development of the site is not expected to have a significant negative impact on the botanical resources.

3. Fauna

A survey of the site, conducted by Environmental Consultant Phil Bruner, found no native birds and the typical array of introduced birds that normally occur in the lowlands in this region of the island. None of the introduced species are endangered or threatened. Also present on the site were two migratory

species, the Pacific Golden-Plover (*Pluvialis fulva*) and Ruddy turnstone (*Arenaria interpres*), which was likewise expected. These birds utilize open habitats such as fields and lawns to forage for insects. They are the two most common migrants to Hawaii and are not endangered or threatened. No unique resources important to native birds were discovered on the Property. Weed-covered fields are not uncommon in West Oahu. The development of the property will likely result in the decrease of some species and an increase in the population of other introduced birds.

The only species of mammal observed on the survey was the Small Indian Mongoose (*Herpestes auropunctatus*), which is common in dry lowland habitats.

A copy of the Avifaunal and Feral Mammal Survey of the Ewa by Gentry Makai Development Project, Oahu (May 9, 2001), prepared by Phil Bruner, is included as Exhibit EE.

4. Hawaiian Cultural and Traditional Rights

Cultural impact assessment investigations were conducted by Pacific Legacy, Inc. in order to satisfy the requirements of Act 50, SLH 2000. This Act requires that information concerning traditional cultural practices and features that might be affected by the proposed development be identified, and that any potential impact be assessed.

According to the cultural impact study, it does not appear that the proposed development will have any adverse effect on traditional cultural activities in the area. The area has been subjected to extensive major land alterations associated with cattle and sugar cane cultivation.

Ewa inter-coastal plains likely remained fairly desolate during the pre- and early post-contact years due to two factors: the marginal environment and ancient-traditional oral histories that identify the area as the plain of Kaupe'a – the barren place for mischievous wandering spirits called *ao kuewa*.

Research shows that the overall Ewa/Kapolei region has a long and rich cultural and legendary history. The overall area was an important thoroughfare for travelers to settlements on the western coastline. Importance is also ascribed to certain landmarks in the region, in particular Pu'u o Kapolei which was a sighting point for the summer solstace. A copy of the cultural impact study, A Cultural Impact Assessment for the Proposed Ewa Gentry Makai Development Project conducted by Pacific Legacy, Inc. (April 2002) is included as Exhibit FF.

5. Traffic

A Traffic Impact Analysis for the Ewa by Gentry Makai Development was prepared by Parsons Brinckerhoff Quade & Douglas, Inc. ("Parsons") in December 2002 and is included as Exhibit GG.

Existing Roadway System

Interstate H-1, Farrington Highway, and Fort Weaver Road/Kunia Road provide regional and sub-regional access to the Ewa Makai development study area. Within the study area, Geiger Road/Iroquois Point Road provides the primary east-west circulation. Fort Weaver Road, Kapolei Parkway, and Keaunui Street provide north-south circulation. Launahele Street, located between Fort Weaver Road and Kapolei Parkway, provides north-south access to existing development.

Public Transit

The City and County of Honolulu Department of Transportation Services, Public Transit Division, currently provides an island-wide public bus transit system called TheBus. The Handi-Van provides para-transit service for semi-ambulatory and non-ambulatory persons with disabilities. Both systems are operated by Oahu Transit Services (OTS), and carries over 80 million passengers annually. The following bus routes serve the Ewa area: Routes 42, 431, 421, 41, 91 and 101. Additionally, the CityExpress! Route A and other express buses operate out of the Waipahu Transit Center, accessible to Ewa and Ewa Beach riders through Route 431.

Existing Traffic Conditions

Existing traffic conditions were observed and documented and operations of signalized and unsignalized intersections in the study area were analyzed. The existing intersection operational characteristics established based conditions for comparison to future operations with and without the project. Traffic-related data was collected for each of the five study intersections. Traffic turning movement volumes, field observations of intersection operations, and general intersection characteristics were noted. Geometric lane configurations, intersection traffic control, and traffic signal phasing and timing data were collected. Intersection geometry inventory (number of lane and lane widths, crosswalk locations, unsignalized inventory control, signalized intersection locations, entrance and driveway locations, and posted speed limits) were used as inputs into the intersection analyses.

Turning movement counts were conducted at the following intersections: Geiger Road and Kapolei Parkway, Geiger Road and Launahele Street, Fort Weaver Road and Geiger Road, and Iroquois Road and Keaunui Road. The AM and PM peak hours were found to occur from 7:00 to 8:00 AM and from 4:00 to 5:00 PM, respectively.

Existing intersections were analyzed using the methodologies for unsignalized and signalized intersections outlined in the *2000 Highway Capacity Manual.* Operating conditions at an intersection by approach are expressed as a qualitative measure known as Level of Service (LOS) ranging from A to F. LOS A represents free-flow operations with low delay, while LOS F represents congested conditions with relatively high delay. The overall intersection LOS is a weighted average of the LOS of individual traffic movement groups. Most movements operate at an acceptable LOS.

The Traffic Impact Analysis concludes that currently most traffic movements at the intersections along Geiger Road and Iroquois Road operate acceptably during both peak hours. There were selected movements at the intersections of Geiger Road/Kapolei Parkway, Fort Weaver Road/Geiger Road/Iroquois Pint Road, and Keaunui Drive that experience delays.

Field observations during the morning peak hour confirmed an average six to seven vehicles queued for the southbound left-turn movement and one to two vehicles for the northbound through movement at the intersection of Kapolei Parkway/Geiger Road. This delay is caused by the existing through volumes on Geiger Road. The northbound through volume performing this movement is less than ten vehicles per hour during peak hours. As a result, the delay affects only a few vehicles. The queued vehicles were also allowed time to discharge onto Geiger Road from the adjacent signal at Launahele Street/Geiger Road which create s gaps in the westbound flow, allowing time for vehicles to execute their moves.

Vehicles queued in the southbound and northbound left-turn movements on Fort Weaver Road and through movements on Iroquois Point Road during AM peak hour. This delay is caused by the magnitude of the left-turning volume from eastbound Geiger Road onto northbound Fort Weaver Road.

The westbound left turns from the Hawaii Prince Golf Course Entrance to southbound Fort Weaver Road experience delays in both peak hours due to the high volume of traffic on Fort Weaver Road. However, the volume of traffic performing this left-turn movement is less than five vehicles per hour during the peak hours and therefore, this delay affects only a few vehicles. This left-turn movement is also helped by traffic signals at the adjacent intersections on Fort Weaver Road, which create gaps in the Fort Weaver Road traffic flow, allowing merging the left-turns to execute.

Year 2010 Traffic Conditions

The Year 2010 was used as the basis for future traffic analysis. This time frame was used because it is the time frame used to develop the Ewa Impact Fee Ordinance (Chapter 33A, Revised Ordinances of Honolulu). This chapter sets forth a regulatory scheme for the assessment and collection of impact fees to be borne on a pro-rata share basis by landowners, developers, home builders, and others who directly contribute to expanding the population and increasing economic activity in the Ewa region through new land development activities.

The proposed Ewa Makai project is estimated to take 15 to 20 years to be completed; thus, assuming that the entire development is completed by 2010 would be conservative in that its impacts would be concentrated within a relatively short period of time.

Future Roadways and Public Transit

Future roadway improvements assumed for the year 2010 time frame were based on a judgment of which roadway improvements described in the *Oahu*

Regional Transportation Plan (ORTP) that was approved on April 6, 2001, would be implemented. The ORTP describes future roadway improvements for a year 2025 horizon. The *Ewa Highway Master Plan* and the *North-South Road Corridor Study* were also consulted.

The following improvements are assumed to have been completed by the analysis year: a new North-South Road Interchange on the H-1 Freeway; the widening of Fort Weaver Road to six lanes between Geiger Road and Farrington Highway; a new north-south arterial roadway between H-1 Freeway and Kapolei Parkway (within the year 2010 time frame, it may be implemented as a 2-lane roadway with the ultimate cross-section being 4-6 lanes); Kapolei Parkway from Papipi Road to Fort Barrette Road in Kapolei; the widening of Farrington Highway to four lanes from Kapolei Golf Course Access Road to Fort Weaver Road.

The current bus routes reflect a "hub and spoke" system implemented recently. As population grows, the bus fleet is assumed to grow to handle the transit demand placed on the bus system. Through the *Primary Corridor Transportation Project*, the City is planning improvements that would increase the transit carrying capacity between the Ewa region and urban Honolulu.

The *Institute of Transportation Engineers Trip Generation (6th edition)* to estimate the number of trips to be generated by the Ewa Makai development. Adjustments were made to account for trips that are projected to occur between land uses located within Ewa Makai. The Year 2010 background traffic volumes were derived from the computerized travel demand model being used to update the *Ewa Highway Master Plan*. This model is also being used for the *North-South Road Corridor Study* currently completing the planning phase for a new arterial roadway in the Ewa plain. The travel demand model accounts for projected regional traffic patterns. The future year 2010 background traffic assumes significant completion of both the Ewa by Gentry and the Ocean Pointe developments currently under construction. These two developments account for the majority of future background traffic generated in the study area. Additionally, it was assumed that the commercial retail parcel proposed by the Estate of James Campbell at the Keaunui/Fort Weaver Road intersection would be fully developed. The traffic generated by the Ewa Makai development was added to the projected background traffic to obtain the total peak hour traffic volumes.

Key intersections were also analyzed using the methodologies for unsignalized and signalized intersections outlined in the *2000 Highway Capacity Manual (HCM)*.

Based on the year 2010 projections, the study found that intersections analyzed are projected to operate acceptably for peak hour conditions with or without the Ewa by Gentry-Makai development. Implicit in these analysis results are specific roadway and intersection improvements that are planned for the area.

Recommended Roadway Improvements

Gentry Homes has already implemented major roadway improvements as part of the Ewa by Gentry development, such as Kapolei Parkway between the OR&L right-of-way and a point south of Geiger Road, widening Geiger Road/Iroquois Point Road between Kapolei Parkway and Keaunui Drive, construction of Kolowaka Drive, construction of part of Keaunui Drive, signalization of the Geiger Road/Fort Weaver Road intersection, and signalization of Kaahupahau Street/Geiger Road intersection.

As they progress into the Ewa by Gentry – Makai development, Gentry will continue internal roadway and intersection improvements. Additionally, the City Council has passed and the Mayor of Honolulu recently signed into law Ordinance 02-52 that establishes a mechanism for collecting roadway impact fees in the Ewa region for major roadway improvements. Improvements covered by the impact fee ordinance include widening of Fort Weaver Road between Farrington Highway and North Road, completion of Kapolei Parkway between Papipi Road and Ko Olina, and the proposed North-South Road and interchange. The Ewa by Gentry-Makai property is included within the influence area of the impact fee ordinance and will, therefore, contribute to the improvement fund.

In addition to the regional roadway improvements that will be covered under the impact fee ordinance, the traffic study identifies roadway improvements that will be the responsibility of the developer. The study concludes that with the recommended roadway and traffic improvements, the roadway system can accommodate the traffic generated by the proposed land uses.

The study also concludes that the analyses contained in the report are very conservative in that both the "without" and "with" Ewa by Gentry-Makai scenarios include new roadways such as the Keaunui Drive extension between Kapolei Parkway and Fort Weaver Road and between Fort Weaver Road and Iroquois Road. Both also include the connection of Kapolei Parkway south to the Ocean Pointe development. With these new roadways that will be constructed as part of the Ewa by Gentry Makai development, traffic conditions on Fort Weaver Road are projected to be better than conditions without these roadway improvements. It is therefore possible to say that the Ewa by Gentry-Makai development enables the completion of a supporting roadway system that helps to distribute traffic demand in a way that increases mobility in the Ewa area.

Also included as part of Exhibit GG is a letter from Parsons dated February 11, 2003, which addresses some of the concerns raised in response to the Environmental Impact Statement Preparation Notice (EISPN) for Ewa Makai.

With respect to long-term traffic conditions of the Ewa region, there have been several iterations of long-range transportation studies conducted for this region. The most recent is the Ewa Highway Master Plan/Year 2010 Highway Plan (EHMP) by Kaku Associates dated August 28, 2001, and an amendment to this study dated May 31, 2002. These studies were used as the basis of Chapter 33A of the Revised Ordinances of Honolulu that identified and assigned transportation impact fees to future development within the Ewa plain (Ordinance 02-52). A longer-range evaluation is part of the Transportation for Oahu Plan – TOP 2025 (Top 2025) approved by the Oahu Metropolitan

Planning Organization (OMPO) Policy Committee on April 6, 2001. The proposed Gentry Ewa Makai development was included in both plans.

Parsons' Traffic Impact Analysis dated December 2002 is consistent with the traffic volume projections developed as part of the EHMP. The traffic impact analysis focuses on the localized needs surrounding the Ewa Makai development. The regional issues are handled through the EHMP and the TOP 2025. This was judged the most appropriate way to maintain consistency with previously conducted long-range studies while providing specific details adjacent to the proposed Ewa Makai development.

With regard to the impact of the proposed location of the University of Hawaii-West Oahu Campus, the change in location is judged to have minimal impacts on traffic in the Ewa Makai area. Previous plans had the UH West Oahu Campus located mauka of the H-1 Freeway in the vicinity of the future H-1 North-South Road Interchange. Current concepts now locate it makai of H-1 Freeway, still in the vicinity of the future H-1 North-South Road Interchange. The change would be beneficial in helping to accelerate the schedule for the North-South Road between Kapolei Parkway and Farrington Highway. This would benefit the Ewa and Ewa Beach areas by providing an alternative access to the H-1 Freeway.

6. Air Quality

An Air Quality Study for the Proposed Ewa by Gentry Makai Development was prepared by B.D. Neal & Associates in November 2002. (See Exhibit HH.) The study examines the potential short- and long-term air quality impacts that could occur as a result of the construction and use of the proposed facilities and suggests mitigative measures to reduce any potential air quality impacts where possible and appropriate. Potential impacts on the project from nearby industrial sources were also examined.

According to the study, the present air quality of the project area appears to be reasonably good based on nearby air quality monitoring data. Air quality data from the nearest monitoring stations operated by the State Department of Health suggest that all national air quality standards are currently being met.

If the proposed project is given the necessary approvals to proceed, it may be inevitable that some short- and/or long-term impacts on air quality will occur either directly or indirectly as a consequence of project construction and use. Short-term impacts from fugitive dust will likely occur during the project construction phase. To a lesser extent, exhaust emissions from stationary and mobile construction equipment, from the disruption of traffic, and from workers' vehicles may also affect air quality during the period of construction. State air pollution control regulations require that there be no visible fugitive dust emissions at the property line. Hence, an effective dust control plan must be implemented to ensure compliance with state regulations. Fugitive dust emissions can be controlled to a large extent by watering of active work areas, using wind screens, keeping adjacent paved roads clean, and by covering of open-bodied trucks. Other dust control measures could include limiting the area that can be disturbed at any given time and/or mulching or chemically stabilizing inactive areas that have been worked. Paving and landscaping of

project areas early in the construction schedule will help to reduce dust emissions. Monitoring dust at the project boundary during construction could be considered as a means to evaluate the effectiveness of the project dust control program. Gentry has implemented such a program in its Ewa by Gentry project.

Following construction of Ewa Makai, motor vehicles coming to and from the proposed development will result in a long-term increase in air pollution emissions in the project area. During worst-case conditions, modeling study results indicated that present 1-hour and 8-hour carbon monoxide concentrations are within both the state and the national ambient air quality standards. At project build-out, carbon monoxide concentrations were estimated to either remain unchanged or increase slightly at some locations compared to the without-project case; worst-case concentrations should remain within both national and state standards. Due to the small impact the project is expected to have, implementing mitigation measures for traffic-related air quality impacts was deemed to be unnecessary and unwarranted.

Although the specific tenants of the industrial/commercial area associated with the project have not been identified, the types of facilities that are expected to locate there are not significant sources of air pollution.

7. Noise

The existing and future traffic noise levels in the vicinity of the proposed Ewa Makai development were evaluated for their potential impact on present and future noise sensitive areas in a study by Y. Ebisu & Associates dated November 2001, entitled, "Acoustic Study for the Ewa by Gentry – Makai Development, Ewa, Oahu." (Included as Exhibit II) The future traffic noise levels along the primary access roadways to the project were calculated for the Calendar Year (CY) 2010.

The noise descriptor currently used by federal agencies to assess environmental noise is the Day-Night Average Sound Level (DNL or Ldn). Along the existing roadways which are expected to service the project traffic, noise levels are expected to increase by 0.8 to 1.6 DNL between CY 1998 and CY 2010 as a result of project traffic. These increases in traffic noise levels associated with project traffic are not considered to be significant, and should not be discernible during the 12-year forecast interval.

By CY 2010, the dominant traffic noise sources in the project area will continue to be traffic noise from Fort Weaver Road. Traffic noise along the new sections of Kapolei Parkway south of Geiger Road and the new Street A will also be dominant noise sources within the project boundaries, particularly at those receptor locations that are removed from Fort Weaver Road. Essentially all locations which front Fort Weaver Road, Geiger Road, Kapolei Parkway, Iroquois Road, and Street A will experience relatively high noise levels above 65 DNL, and will require traffic noise mitigation measures. Those receptor locations that are removed from the major roadways, as well as shielded by existing and new buildings, should experience traffic noise levels less than 65 DNL.

Based on Year 2000/2001 and 2020 aircraft noise contours developed over the project site, only the commercial and industrial portions of the project site are located inside the 60 DNL noise contour. The aircraft noise contours indicate that planned residential or other noise sensitive uses within the Project area are located outside the airport's existing and forecasted 60 DNL contours, and are in conformance with local planning guidelines for the siting of noise sensitive land uses in the vicinity of airports. Special aircraft noise attenuation measures should not be required for this project. However, implementation of airport noise disclosure provisions in Chapter 508D, Hawaii Revised Statutes, will be necessary for certain areas of the Project that are contained within the FAR Part 150 noise contours.

Unavoidable, but temporary, noise impacts may occur during the construction of the proposed project. Because mitigation measures to reduce construction noise to inaudible levels will not be practical in all cases, the use of quiet equipment and construction curfew periods as required under the State Department of Health noise regulations are recommended to minimize construction noise impacts.

8. Social Impacts

The potential social impacts of Ewa Makai were assessed in a study by Earthplan, Inc. dated July 2002, entitled "Ewa Makai Social Impact Assessment." (Included as Exhibit ~~II~~ JJ) The Ewa Makai Social Impact Assessment studied two different geographical areas as they relate to the Ewa Makai project: (1) the larger "Overall Study Area"; and (2) the "Primary Study Area".

The Overall Study Area coincides with the Ewa Development Plan (Ewa DP) region and covers the entire Ewa plain, including the coastline between West Loch and Kahe Point, and extending to the mauka areas. It consists of two Neighborhood Boards: the Makakilo/Kapolei/Honokai Hale/Nanakai Gardens Neighborhood Board No. 24, which encompasses the western portion of the Ewa DP area; and the Ewa Neighborhood Board No. 23.

The Primary Study Area coincides with the Ewa Neighborhood Board No. 23 area, which includes the existing communities of Ewa Beach, Ewa Villages, West Loch Estates, Ewa by Gentry, and Ocean Pointe.

a. **Population Trends.** In the Overall Study Area, the average annual growth rate between 1980 and 1990 was 1.2 percent. This rate of growth increased significantly as development activity increased, as indicated by the 5.9 percent average annual growth rate from 1990 to 2000. In 2000, the Ewa Development Plan area accounted for 7.8 percent of the total Oahu population. By 2010, it is projected to comprise nine percent of Oahu's population; by 2020, ten percent.

b. **Age.** The Overall and Primary Study Areas tend to be younger than the Oahu population. When compared to the island-wide community, both had relatively higher proportions of people 17 years old and younger, and lower proportions of people 65 years and older.

The Overall and Primary Study Areas also had consistently lower median ages than the island-wide community. The 1990 median ages for the Overall and Primary Study Areas were 27.5 and 27.8 years respectively; in 2000, they were 31.2 and 30.8 years, respectively. This compares with the 1990 and 2000 Oahu median ages of 32.2 years and 35.7 years, respectively.

c. **Ethnicity.** When compared to the 2000 island-wide ethnic profile, the Overall Study Area tended to have lower proportions of Caucasians (Oahu 21 percent; Overall Study Area 18 percent) and Hawaiians (Oahu nine percent; Overall Study Area eight percent). The Primary Study Area had proportionately fewer Caucasians (17 percent), and other/mixed (27 percent), and more Asians (50%) when compared with the Overall Study Area. Both Oahu and the Overall Study Area Asian population amounted to 46 percent of the total population. The proportion of those of other and mixed races was higher in the Overall Study Area (28 percent) than on Oahu (24 percent).

d. **Households and Families.** Both the Overall and Primary Study Areas had significantly high proportions of family households when compared with the island-wide community. In 1990 and 2000, about 74 and 72 percent, respectively, were family households out of the total household count. In the Total Study area, almost all (99.8%) of the households were family households in 1990, and 84 percent were family households in 2000. In the Primary Study Area, 89 percent of the households were families in 1990, and 85 percent in 2000.

Household and family sizes were higher in the Overall and Primary Study Areas than in the Oahu-wide community. In 1990 and 2000, the Oahu-wide average household size was three persons. The average household size for the Overall Study Area was 3.7 persons in 1990 and 2000. In the Primary Study Area, the average household size was four persons in 1990 and decreased to 3.7 persons in 2000.

The Oahu-wide average family size was 3.5 persons and 3.6 persons in 1990 and 2000, respectively. For the Overall Study Area, family sizes averaged 3.6 and 4.2 persons in 1990 and 2000, respectively, and for the Primary Study Area, the average was 4.1 persons in 1990 and 2000.

e. **Housing Units.** The Overall Study Area experienced a 77 percent increase in housing units from 11,721 to 20,804 units from 1990 to 2000. The Primary Study Area housing units more than doubled from 1990 to 2000, from 6,972 to 15,845 units. Both increases were significantly higher than the twelve percent increase experienced on Oahu from 1990 to 2000.

In terms of housing unit occupancy, the Overall and Primary Study Areas experienced an increase in owner-occupied units from 1990 to 2000, and had significantly higher proportions when compared to Oahu. The owner-occupancy rate for the Overall Study Area was 64 percent; for the Primary Study Area, 63 percent. On Oahu, there was an owner-

occupancy rate of 49.5 percent in 2000, with 41 percent of the units being occupied by renters, and approximately 5.8 percent of the housing units were vacant. Housing vacancy rates were high in the Overall and Primary Study Areas due to the ongoing construction activity. The Overall Study Area had a nine percent housing vacancy rate; the Primary Study Area, ten percent.

f. **Private Development Efforts.** Ewa is a region in transition and there are major changes that are being undertaken as part of the effort to establish the region as the island's secondary urban core. Kapolei is envisioned as providing an urban center with facilities for commerce, finance, government services, and industrial activities. The major components include several commercial and office complexes, the existing James Campbell Industrial Park, the new 800-acre Kapolei Business Park, Barbers Point Harbor, Ko'Olina Resort, and the City of Kapolei's numerous residential neighborhoods.

Specific projects underway in the Primary Study Area include the following:

Ocean Pointe
Adjacent to Ewa town and south of the project site, Ocean Pointe is a planned 1,100-acre community that includes a full-service 1,400-slip marina with a maritime commercial complex. This complex includes light industrial, commercial and retail facilities, as well as ancillary visitor accommodations. The project also includes 4,850 residential units, a golf course and a 20-acre district park.

Developer HASEKO (Ewa) recently submitted a request to rezone a portion of the project to accommodate drainage system modifications. The proposed changes included reduction of the marina size from 120 to 70 acres, converting the eastern basin to a portion of the golf course, reducing the golf course from 27 to 18 holes, reduction and reconfiguration of the commercial and industrial support area, and incorporating a neighborhood business area. The rezoning request for reconfiguration was recently approved by the Honolulu City Council.

Ewa by Gentry
As of January 31, 2003, 5,383 housing units had been built and sold in Ewa by Gentry, which is located just north of the project site. When development is completed in 2010, there will be approximately 7,200 housing units. Ewa Makai will be an extension of Ewa by Gentry.

Ewa Villages
The City and County of Honolulu acquired 600 acres northwest of the project site. This area surrounds and includes the former plantation villages, including Tenney, Renton and Varona Villages. Existing structures in Ewa Villages are being rehabilitated for reuse, and related affordable and market housing is being developed. A total of 1,900 residential units will be available at full build out.

g. **Population Impacts.** The Ewa Makai development will result in an increase in the residential population due to the increase in residential units. Based on a mid-range projection, Ewa Makai may add 6,000 persons to the region. This estimate is based on the 2000 average household size in Ewa Gentry of 3.25 multiplied by the projected number of units (1,865).

The projected Ewa Development Plan population for 2010 is 88,400 persons. The proposed Ewa Makai project would comprise approximately seven percent of this projected population.

h. **Project in Relation to Public Policies and Community Expectations.** The proposed Ewa Makai development is consistent with public policies as set forth in the Ewa Development Plan.

Overall growth and residential policy
The project is consistent with public policy to promote residential development in the urban fringe of the Ewa Development Plan area. Ewa Makai is included in Phase 1 of the Development Plan phase of Ewa development. It is referred to as Laulani Residential, with 1,100 units, and Fairways Residential, with 900 units.

Ewa Makai will also offer a variety of housing types, including single family homes, townhomes, and residential cluster neighborhoods, which will provide for a wide range of affordability for a mixture of household types and sizes.

Residential Component
The project is well below the residential density called for in the Ewa Development Plan. The residential density for single-family units is 7.5 units per acre, which is within the Development Plan range of five to twelve units per acre. The combined project density for cluster and multi-family units is 15 units per acre, which is within the Development Plan range of ten to 30 units per acre.

The project includes 24 acres for community facilities, consistent with the Ewa Development Plan residential provision for community facilities including churches, community centers and elderly and child care centers. Further, the developer intends to comply with design and land use guidelines related to building height and form, compatibility and architectural character.

Community-Based Parks
The proposed project may result in a resident population between 5,500 and 6,900 persons. Based on the parks standards set forth by the Ewa Development Plan, these population levels would require community park acreage between eleven and 13.8 acres. The proposed project includes 13.5 acres designated for park space, plus 14 acres designated for open space. The Ewa Makai project is consistent with the policies related to community-based parks in that the 13.5 acres generally meet the standard that would apply to the high end of the population estimate.

Industrial and Commercial Areas

The industrial/commercial component of Ewa Makai is included as part of "Laulani Commercial" in Table 2.2 of the Ewa Development Plan relating to Phasing of Ewa Developments. Thirty acres are designated for Industrial use.

i. **Community Reaction.** The Social Impact Assessment reviewed the actions of the Ewa Neighborhood Board No. 23 to assess possible community issues on the Ewa Makai project. Board minutes of meetings held from June 2000 to May 2002 were reviewed.

The Ewa Neighborhood Board deals with issues related to a stable residential community. In terms of proposed community changes, the Board generally tends to support the improvement of existing facilities, such as sidewalks, bus stops, and actions such as a Conditional Use Permit to convert a church office space into classrooms.

In October 2001, the Board voted to support a moratorium on further construction in Ewa until proper highway improvements were in place. In February 2002, the Board, after working with the City, State, and private developers (namely Gentry Homes, Ltd. and HASEKO), unanimously voted to withdraw its request for a construction moratorium, noting that the private developers have historically completed their share of improvements in a timely manner.

The Ewa Makai project was discussed in the Planning and Zoning Committee in January 2002. Key issues included the following: (1) A request was made to redesign the plans such that the middle school would be adjacent to the planned 14-acre open space area; (2) Concerns were expressed about the adequacy of school facilities in light of the cumulative growth planned for the region; and (3) Other infrastructure concerns relating to roads and drainage were also expressed.

In March 2002, the Ewa Neighborhood Board voted to support the following actions, based on recommendations of the Planning and Zoning Committee:

1. *Support the development of the Ewa Makai project, which incorporates the infrastructure development for roads/ technology, sewage and the intermediate school site development.*
2. *The Department of Education should actively encourage parents of students in overcrowded area schools to apply for geographic exemptions to attend Iroquois Point Elementary.*
3. *Do not support any future request for increasing density in the project.*
4. *Future legislators need to ensure CIP funding for the development of the new intermediate school.*

j. Public Services and Facilities.

Police Protection

The project site is served by the Kapolei Police Station, which is located at 1100 Kamokila Boulevard in Kapolei. There is also a storefront office next to the 7-eleven store at 91-1669 Fort Weaver Road.

The Primary Area, which is the Ewa Neighborhood Board area, is divided into Police Beats 874, 875, 876, 877, and 879. The project site is located in Police Beats 875 and 876. At any given time, there is a minimum of 14 officers assigned to this region. Potential project impacts on current services would be a likely increase in calls for police services.

It is recommended that the Ewa Makai project could mitigate impacts on police protection services through security measures such as on-site security, design measures such as well-lit public areas and walkways, and the establishment of neighborhood watch programs. As an extension of the Ewa by Gentry community, Ewa Makai will have on-site security and will be part of an established community watch program.

Fire Protection

In the event of a single alarm fire, the project site would be served by the Waipahu Fire Station. For a multiple alarm such as a structure fire, three engine companies and one ladder company would be sent from the Ewa Beach, Waipahu, and Kapolei Fire Stations. The ladder company would originate from the Waipahu Fire Station.

Five firefighters are assigned to the Waipahu Fire Station, with a minimum of four people on call at all times. A minimum of four people would respond in the event of a single alarm incident. In the event of a multiple alarm incident, there would be a minimum of 18 firefighters responding from the three engine and one ladder companies, as well as a fire chief and the assigned driver. The response time to the project site depends on traffic, but is usually from four to six minutes.

If a backup company is needed, the backup company can come from the Waipahu, Ewa Beach, and Kapolei Fire Stations. In the event of a second alarm in a multiple incident, two additional engine companies from the Waikele and Pearl City Fire Stations would respond, as well as a ladder company coming from the Kapolei Fire Stations.

The project will increase the demand for fire protection services by adding new structures and approximately 6,000 people to the area.

Emergency Medical Services

The Honolulu Emergency Services Department, hereafter referred to as EMS, is responsible for providing the following:

- an efficient, effective and economical operation of the pre-hospital emergency medical care and emergency ambulance service,

- a comprehensive aquatic safety program at 19 City beach parks, including lifeguard services,
- injury prevention, public education and public health programs, and
- coordination with other agencies and jurisdictions

In an emergency response, either EMS personnel or the nearest fire station is notified. EMS uses a global tracking system that places each vehicle within 30 feet of its current location.

The Ewa area is primarily serviced by two ambulances from St. Francis West and the Waipahu Fire Station. There is also a single Rapid Response Unit based at Kalaeloa. The Rapid Response Unit does not transport patients, however.

Ambulances are staffed by two paramedics, and the Rapid Response Unit is staffed by a single paramedic. If needed, additional EMS vehicles respond from Waianae and Aiea. The average response time to the project site is approximately six to nine minutes.

Public Education

Based on current DOE district boundaries, residents of the Ewa Makai community will be served by the Pohakea and Ewa Beach Elementary Schools, Ilima Intermediate, and Campbell High School. The current and projected enrollments of these schools are presented in the following table.

Current and Future Enrollment for Schools Servicing Ewa Makai Area

School	Current Student Enrollment	Projected Student Enrollment for 2007
Ewa Beach Elementary	581	831
Pohakea Elementary School	562	649
Ilima Intermediate School	1,012	1,243
Campbell High School	2,033	2,289

The proposed project will impact these facilities by increasing the school-aged population. The following table presents the long-term projection for Ewa Makai students at full build-out, and as the on-site population stabilizes.

Long-Term Projected School Population for Ewa Makai

Grade Level	Projected Population Estimate
Kindergarten through sixth grade	466
Seventh and eighth grade	205
Ninth through twelfth grade	224
Total	895

In general, the project's impact on the area's schools falls within the projected 2007 enrollment. The region is targeted for significant residential population growth with or without Ewa Makai, so it is likely that cumulative growth will exceed projected 2007 enrollment if the project is implemented.

The Gentry Companies has been working with the State Department of Education to determine the developer's contribution to the public education system. The parties have agreed that dedicating 18 acres for a new middle school meets the developer's fair share requirement. DOE has, however, reserved the right to amend the fair share requirements for this project should State and County land use approvals not be obtained in a timely manner. Included as Appendix H is a copy of a DOE letter dated January 9, 2002, setting forth this agreement.

9. Groundwater

Groundwater exists beneath the Ewa Makai area as a thin, brackish basal lens in hydraulic contact with saline water at depth and seawater at the shoreline. It is typically referred to as the Ewa Caprock Aquifer. Use of this resource for irrigation was begun by the Ewa Plantation in the 1930s and continued until Oahu Sugar ceased cultivation of sugarcane on the Ewa Plain in late 1994. During that 60-year period of use, a number of skimming type wells were used to extract 15 to 20 million gallons per day (MGD), most of which was drawn from the eastern (Pu'uloa) side of the Ewa Plain. The rate of pumpage was actually far in excess of the aquifer's natural rate of recharge. However, it was sustained by the plantation's excess irrigation of mauka fields by better quality water and the direct import of this water to the largest of the pumping centers on the caprock.

In late 1994, use of caprock groundwater abruptly dropped, from more than 15 MGD to about 3 MGD. Most of the remaining use was by three golf courses around the Ewa Makai area: Hawaii Prince, New Ewa Beach, and Coral Creek. In the year 2001, BWS began selling treated wastewater effluent of R-1 quality to two of the three courses, further reducing the draft from the aquifer. At present, use of the caprock aquifer on the eastern side of the Ewa Plain consists of 0.7 MGD by the New Ewa Beach golf course and a far lesser amount by a number of small capacity wells throughout the existing Ewa by Gentry developed area.

The caprock aquifer is still in the process of adjusting to the major changes in its use described above. However, development of the Ewa Makai site should have no significant impact on this naturally shrinking resource. (Source: Discussion with Tom Nance, Tom Nance Water Resource Engineering, January 2003.)

VI. CONSISTENCY WITH APPLICABLE PUBLIC PLANS AND LAND USE POLICIES

A. State Plans and Policies

1. **State Land Use Law.** A reclassification of the subject property from "Agricultural" to "Urban" District is being sought.

   Pursuant to §15-15-24, Hawaii Administrative Rules (HAR), any and all uses permitted by the counties, either by ordinance or rules may be allowed within the Urban District. Because the Ewa Makai project has already been designated within the Urban Growth Boundary on the Ewa Development Plan Map, and because its planned uses have been approved under City Ordinance 96-06, the proposed uses within the Ewa Makai project would be considered "allowable uses" under the proposed reclassification to the Urban District. The project would also be in conformance with the standards for determining Urban District boundaries under §15-15-18, HAR, as discussed below.

   a. *Lands characterized by "city-like" concentrations of people, structures, streets, urban level of services, and other related land uses.*

      Ewa Makai will be an extension of the Ewa by Gentry community, considered a part of Oahu's growing Kapolei region where more than 450 businesses provide over 16,000 jobs – a number that is expected to more than double by 2010. Schools, parks, medical services, shopping and entertainment centers, restaurants and recreation facilities service a growing population of nearly 68,000 people, a number that is expected to reach more than 89,000 in 2010.

      Ewa by Gentry in itself is a growing community consisting of over 5,300 existing homes in a planned development that will consist of an estimated 9,100 homes at build-out (including Ewa Makai). Parks, walkways and bike paths, landscaped roadways, an elementary school, an 18-hole championship golf course, a neighborhood shopping center, and a planned light industrial park are elements that contribute to Ewa by Gentry's "city-like" characteristics. With similar types of amenities as those offered in the existing Ewa by Gentry, Ewa Makai would also have "city-like" characteristics.

   b. *Takes into consideration the following specific factors:*

      1) *Proximity to centers of trading and employment except where the development would generate new centers of trading and employment.*

         Ewa Makai would not only be in proximity to centers of trading and employment (Kapolei, Waipahu, Ewa by Gentry, Ewa Beach, Barbers Point, Campbell Industrial Park, military installations), it would also generate new centers of employment. A 30-acre industrial-commercial center, a middle school, and two church/day care center sites are being proposed for development in Ewa Makai.

2) *Availability of basic services.*

The Subject Property is, or upon the completion of necessary offsite and onsite infrastructure will be, adequately serviced by schools, parks, wastewater systems, solid waste disposal, drainage, water, transportation systems, public utilities, and police and fire protection.

3) *Sufficient reserve areas for foreseeable urban growth.*

The Subject Property is located in an area with sufficient reserves for foreseeable urban growth.

c. *Satisfactory topography, drainage, and reasonably free from the danger of any flood, tsunami, unstable soil condition, and other adverse environmental effects.*

The topographic contours of the Subject Property are generally level. Except for two pronounced sumps near the east boundary of Ewa Makai-East, elevations with the two parcels vary from 20 feet above mean sea level ("msl") to approximately 35 feet msl. The ground slope is approximately one percent. According to Panel 150001-0110 of the Federal Flood Insurance Rate map of 1990, the Subject Property is located in Zone D, an area in which flood hazards are undetermined.

d. *Contiguity with existing urban areas*

The Subject Property is contiguous with or in proximity to existing urban areas, and is designated on the City's General Plan and Development Plan for urban use.

e. *Appropriateness of location for new urban concentrations, especially areas of urban growth as shown on the state and county general plans.*

As stated previously, the Subject Property is located in the Kapolei region, designated for future urban growth by both the State and the City, and therefore is appropriate for new urban concentrations.

f. *Inclusion of lands which do not conform to the standards in paragraphs (1) to (5) under certain circumstances.*

Not applicable.

g. *Will not contribute toward scattered spot urban development, necessitating unreasonable investment in public infrastructure or support services.*

The Subject Property will not contribute toward scattered spot urban development as it will be an extension of the existing master planned community of Ewa by Gentry, over half of which has already been developed. Gentry will develop additional infrastructure required to service the proposed development. Public infrastructure and support services will not be unreasonably burdened, nor will any unreasonable investment be required as a result of the proposed development.

h. General slope of the land.

The Subject Property does not consist of lands having a slope of twenty percent or more.

2. **Hawaii State Plan.** The purpose of the Hawaii State Plan as set forth in Chapter 226, Hawaii Revised Statutes, is to serve as a guide for the future long-range development of the State; identify the goals, objectives, policies, and priorities for the State; provide a basis for determining priorities and allocating limited resources, such as public funds, services, human resources, land, energy, water, and other resources; improve coordination of federal, state, and county plans, policies, programs, projects, and regulatory activities; and to establish a system for plan formulation and program coordination to provide for an integration of all major state and county activities.

Objectives, policies, and priority guidelines that are relevant to the Ewa Makai development are as follows.

Section 226-5 – Objectives and policies for population.

It shall be the objective in planning for the State's population to guide population growth to be consistent with the achievement of physical, economic, and social objectives contained in this chapter.

(b) To achieve the population objective, it shall be the policy of this State to:

(1) Manage population growth statewide in a manner that provides increased opportunities for Hawaii's people to pursue their physical, social, and economic aspirations while recognizing the unique needs of each county.

(3) Promote increased opportunities for Hawaii's people to pursue their socio-economic aspirations throughout the islands.

(7) Plan the development and availability of land and water resources in a coordinated manner so as to provide for the desired levels of growth in each geographic area.

By providing for a variety of land uses, including residential, commercial-industrial, parks, open space, and a public school facility, Ewa Makai will provide increased opportunities for Hawaii's people to pursue their physical, social and economic aspirations. The proposed industrial-commercial center will provide permanent jobs, as well as short-term construction-related jobs for residents of Ewa and the island of Oahu. With greater economic opportunities and the increased availability of new homes, overall living standards and lifestyles will be enhanced by living and working in the "new city" planned for the greater Kapolei region. The development and availability of land and water resources is being planned in a coordinated manner with public agencies and other developers in the region.

Section 226-06 – Objectives and policies for the economy – in general.

(a) Planning for the State's economy in general shall be directed toward achievement of the following objectives:

Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawaii's people. A steadily growing and diversified economic base that is not overly dependent on a few industries.

(b) To achieve the general economic objectives, it shall be the policy of this State to:
(3) Seek broader outlets for new or expanded Hawaii business investments.
(6) Strive to achieve a level of construction activity responsive to, and consistent with, state growth objectives.
(7) Foster a business climate in Hawaii – including attitudes, tax and regulatory policies, and financial and technical assistance programs – that is conducive to the expansion of existing enterprises and the creation and attraction of new business and industry.

The industrial-commercial center will provide an outlet for new or expanded business investments, thereby helping to foster a positive business climate in Hawaii. It will provide an opportunity for the expansion of existing enterprises, as well as the creation and attraction of new businesses and industries. The development of Ewa Makai will also help the State to achieve a level of construction activity that is consistent with its growth objectives throughout the build-out period.

Section 226-11 Objectives and policies for the physical environment – land-based, shoreline, and marine resources.

(a) Planning for the State's physical environment with regard to land-based, shoreline, and marine resources shall be directed towards achievement of the following objectives:
(1) Prudent use of Hawaii's land-based, shoreline, and marine resources.
(2) Effective protection of Hawaii's unique and fragile environmental resources.
(b) To achieve the land-based, shoreline, and marine resources objectives, it shall be the policy of this State to:
(1) Exercise an overall conservation ethic in the use of Hawaii's natural resources.
(2) Ensure compatibility between land-based and water-based activities and natural resources and ecological systems.
(3) Take into account the physical attributes of areas when planning and designing activities and facilities.
(6) Encourage the protection of rare or endangered plant and animal species and habitats native to Hawaii.
(7) Pursue compatible relationships among activities, facilities, and natural resources.

Prior to preparation of the proposed Ewa Gentry Makai Master Plan, physical, environmental, and cultural aspects of the property were studied. Site features, including slope, existing sump areas, soil stability, and drainage needs were incorporated into the design. There were no rare or endangered plant and animal species found on the Project Site, and 90% of the plant species inventoried are introduced.. A few native species occur on the site (*'uhaloa, 'ilima, pa'uohi'iaka, kipukai, hoary abutilon*, and *popolo*). Only the *pa'uohi'iaka* is endemic (native only to the Hawaiian Islands); the other species are

indigenous (i.e. native to the Hawaiian Islands and elsewhere). However, these native species are not threatened or endangered and the proposed development of the site is not expected to have a significant negative impact on the botanical resources.

With respect to conserving the use of Hawaii's natural resources, Gentry has been a leader in waste management. From site design and development to waste disposal and recycling, Gentry has successfully incorporated waste saving products, methods, and techniques into all phases of housing development. Included as Appendix I is an article written by the Clean Hawaii Center of the State Department of Business, Economic Development & Tourism that espouses how Gentry has committed to incorporating waste reduction and water saving strategies into its homebuilding business.

Section 226-12 Objective and policies for the physical environment – scenic, natural beauty, and historic resources.

(a) Planning for the State's physical environment shall be directed towards achievement of the objective of enhancement of Hawaii's scenic assets, natural beauty, and multi-cultural/historical resources.

(b) To achieve the scenic, natural beauty and historical resources objective, it shall be the policy of this State to:

(1) Promote the preservation and restoration of significant natural and historic resources.

(3) Promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

(4) Protect those special areas, structures, and elements that are an integral and functional part of Hawaii's ethnic and cultural heritage.

(5) Encourage the design of developments and activities that complement the natural beauty of the islands.

Because the Subject Property was formerly cultivated in sugar, it does not contain any scenic assets, places of natural beauty, or multi-cultural or historical resources. However, plans for the project will promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of the mountains and Honolulu city vistas to the extent possible. There are no ocean views from the Subject Property.

The archaeological survey determined that no archaeological sites are present within the project area. Further, given that the project area was under sugar cane cultivation for approximately 100 years, it was determined to be unlikely that any subsurface cultural materials are still present within the project area. However, should subsurface resources be encountered during the course of development, the Historic Preservation Division of the Department of Land and Natural Resources will be notified in accordance with State requirements.

Section 226-13 Objectives and policies for the physical environment – land, air, and water quality.

(b) To achieve the land, air, and water quality objectives, it shall be the policy of this State to:

(2) Promote the proper management of Hawaii's land and water resources.

(3) Promote effective measures to achieve desired quality in Hawaii's surface, ground, and coastal waters.
(4) Encourage actions to maintain or improve aural and air quality levels to enhance the health and well-being of Hawaii's people.
(5) Reduce the threat to life and property from erosion, flooding, tsunamis, hurricanes, earthquakes, volcanic eruptions, and other natural or man-induced hazards and disasters.
(6) Encourage design and construction practices that enhance the physical qualities of Hawaii's communities.
(7) Encourage urban developments in close proximity to existing services and facilities.

Gentry will continue to promote the proper management of land and water resources in the development of Ewa Makai. From incorporating efficient waste management and waste reduction strategies, to managing stormwater on site and utilizing non-potable water for irrigation purposes, Gentry continues to work toward minimizing any negative impacts to Hawaii's natural resources. The homes and community are designed and constructed to reduce the threat to life and property from erosion, flooding, hurricanes, and other natural or man-induced hazards and disasters, as well as to enhance the physical qualities of Ewa. Ewa Makai will be an urban development in close proximity to existing services and facilities.

Section 226-16 Objectives and policies for facility systems – water.

(b) To achieve the facility systems water objective, it shall be the policy of the State to:
(1) Coordinate the development of land use activities with existing and potential water supply.
(3) Reclaim and encourage the productive use of runoff water and wastewater discharges.
(6) Promote water conservation programs and practices in government, private industry, and the general public to help ensure adequate water to meet long-term needs.

All necessary on-site water facilities will be provided in consultation with the Board of Water Supply (BWS) and will be built in accordance with an approved Water Master Plan. (The latest approved potable water master plan for the Ewa by Gentry project, which included Ewa Makai-East and West, was prepared by Tom Nance Water Resource Engineering in September 2000, and was approved by the BWS on November 3, 2000. Included as part of Appendix J is a letter from Tom Nance dated January 31, 2003, which states that based on the current Ewa Makai Land Use Plan, the approved water master plan should still be valid.)

In addition, Gentry is a member of the Ewa Plain Water Development Corporation (EPWDC), a non-profit corporation responsible for planning, financing, and implementing the construction of regional source development, storage reservoirs, and distribution systems. Major portions of EPWDC's water program (including dedicated source and well facilities, storage and transmission for a water system of 6.72 million gallons per day) have already been implemented and were dedicated to BWS in 1991. Although the BWS

does not provide advance water allocations or water reservations for projects such as Ewa Makai, BWS expects to have sufficient water for the Ewa Region. According to a BWS letter to Gentry dated January 24, 2003, (also included as part of Appendix J), BWS currently has water system improvement projects in the construction and design stages, which will provide adequate source capacity to accommodate Gentry's proposed development. The Ewa Shaft's estimated yield is 15 million gallons per day (mgd). In addition, the proposed Desalination Facility in Kalaeloa is being designed for 5 mgd with a potential to expand to 35 mgd in the future. The installation of wells at the Waipahu Wells II Station and completion of the Waipahu Wells IV will add 4.21 mgd to BWS's capacity to deliver water. These two projects should be completed this year.

With respect to water conservation practices, Gentry has incorporated the use of non-potable brackish water in its Ewa by Gentry development. It is also studying the possible use of reclaimed water as an alternative to potable water when the non-potable systems are inoperable or are no longer available.

Section 226-17 Objectives and policies for facility systems – transportation.

(b) To achieve the transportation objectives, it shall be the policy of the State to:
- *(2) Coordinate state, county, federal, and private transportation activities and programs toward the achievement of statewide objectives.*
- *(3) Encourage a reasonable distribution of financial responsibilities for transportation among participating governmental and private parties.*
- *(6) Encourage transportation systems that serve to accommodate present and future development needs of communities.*
- *(10) Encourage the design and development of transportation systems sensitive to the needs of affected communities and the quality of Hawaii's natural environment.*
- *(11) Encourage safe and convenient use of low-cost, energy-efficient, non-polluting means of transportation.*

Gentry has participated in the coordinated effort among state, county, federal and other private entities which objective is to provide a transportation system that is consistent with and will accommodate planned growth objectives throughout the State. As a designated growth area, transportation improvements must be made to the greater Kapolei region to accommodate the current and future growth patterns. Gentry, along with all regional developers and major landowners are continuing to study the transportation requirements, cost estimates, and timing for transportation improvements throughout the Ewa region. Some of those improvements have already been put in place; others are yet to be built. Using as its basis the recently-completed Ewa Region Highway Transportation Master Plan, the City recently established a new program for the assessment and collection of impact fees to finance a portion of anticipated costs of improving or expanding the capacity of Ewa roadway and traffic facilities necessitated by new land development activity within the Ewa region.

Section 226-19 Objectives and policies for socio-cultural advancement – housing.

(a) Planning for the State's socio-cultural advancement with regard to housing shall be directed toward the achievement of the following objectives:

(1) Greater opportunities for Hawaii's people to secure reasonably priced, safe, sanitary, and livable homes, located in suitable environments that satisfactorily accommodate the needs and desires of families and individuals, through collaboration and cooperation between government and nonprofit and for-profit developers to ensure that more affordable housing is made available to very low-, low- and moderate-income segments of Hawaii's population.

(2) The orderly development of residential areas sensitive to community needs and other land uses.

As a residential developer in Hawaii for 35 years, Gentry has gained a reputation for providing quality homes at prices affordable to Hawaii's consumers. Gentry's buyers, many of whom are first time homeowners, represent a socio-economic cross section of Hawaii's population, including very low-, low- and moderate income families and individuals. These families and individuals are being afforded the opportunity to secure reasonably priced, safe, sanitary, and livable homes in a master planned community setting. Sensitive to community needs and other land uses, Gentry is the only area developer that has completed its pro rata portion of Kapolei Parkway through the Ewa by Gentry community. Gentry is also working with other area developers to ensure that regional transportation improvements get funded and built.

(b) To achieve the housing objectives, it shall be the policy of this State to:

(1) Effectively accommodate the housing needs of Hawaii's people;

(2) Stimulate and promote feasible approaches that increase housing choices for low-income, moderate-income, and gap-group households.

(3) Increase homeownership and rental opportunities and choices in terms of quality, location, cost, densities, style, and size of housing.

(5) Promote design and location of housing developments taking into account the physical setting, accessibility to public facilities and services, and other concerns of existing communities and surrounding areas.

Ewa Makai will be a master planned residential community designed to accommodate the housing needs of Hawaii's people. As a continuation of the existing Ewa by Gentry community, it will increase homeownership opportunities by providing a mix of housing types that are affordable to low-income, moderate-income, and gap-group families. The design of Ewa Makai will take into account the physical setting of the Ewa plain, accessibility to public facilities and services, and other concerns of existing communities. Transportation improvements, a major employment center, parks and recreational sites, places of worship/day care centers, and an 18-acre middle school will be incorporated into the design of the community.

Section 226-21 Objective and policies for socio-cultural advancement – education.

(b) To achieve the education objective, it shall be the policy of this State to:

(3) Ensure the provision of adequate and accessible educational services and facilities that are designed to meet individual and community needs.

Gentry will be dedicating an 18-acre middle school site in Ewa Makai to the State Department of Education to meet the community's needs. A middle school will help to relieve pressure in the neighboring Campbell complex elementary schools by opening up classes to sixth graders. The school may also be designed as a multi-track school to stretch limited resources.

Section 226-103 Economic priority guidelines.

(e) Priority guidelines for water use and development:
(1) Maintain and improve water conservation programs to reduce the overall water consumption rate.

Ewa Makai, like the rest of the Ewa by Gentry community, will incorporate a dual water system. Brackish water from non-potable wells will be used where feasible to irrigate landscaping in the common areas, thus reducing the overall potable water consumption rate. Use of reclaimed water from the Honouliuli Wastewater Treatment Plant (HWWTP)is also being examined. The Ewa by Gentry Community Association is also examining the feasibility of using reclaimed water from the HWWTP (instead of potable water) as a back-up system when the non-potable wells are inoperable due to broken pumps or other reasons.

(f) Priority guidelines for energy use and development.
(3) Provide incentives to encourage the use of energy conserving technology in residential, industrial, and other buildings.

Gentry continues to incorporate energy conserving technology in its homes, including optional solar heating, energy efficient appliances, insulation in walls and ceilings, and energy-efficient designs that take advantage of the tradewinds to the extent possible.

Section 226-104 Population growth and land resources priority guidelines

(b) Priority guidelines for regional growth distribution and land resource utilization:
(1) Encourage urban growth primarily to existing urban areas where adequate public facilities are already available or can be provided with reasonable public expenditures, and away from areas where other important benefits are present, such as protection of important agricultural land or preservation of lifestyles.
(2) Make available marginal or nonessential agricultural lands for appropriate urban uses while maintaining agricultural lands of importance in the agricultural district.
(6) Seek participation from the private sector for the cost of building infrastructure and utilities, and maintaining open spaces.

Inasmuch as it is surrounded by urban development, the Ewa Makai community can be considered an urban "infill" project. It will be located on nonessential agricultural land in an area that is targeted as the "Second City." Preservation of lifestyles is not an issue. Ewa Makai will be built by a private sector developer that will pay its fair share of the cost of building necessary

roads, as well as utilities needed for the development. Open spaces will be maintained within the project.

(9) Direct future urban development away from critical environmental areas or impose mitigating measures so that negative impacts on the environment would be minimized.

(10) Identify critical environmental areas in Hawaii to include but not be limited to the following: watershed and recharge areas; wildlife habitats (on land and in the ocean); areas with endangered species of plants and wildlife; natural streams and water bodies; scenic and recreational shoreline resources; open space and natural areas; historic and cultural sites; areas particularly sensitive to reduction in water and air quality; and scenic resources.

Ewa Makai will not affect any critical environmental areas.

Section 226-106 Affordable housing.

Priority guidelines for the provision of affordable housing:

(1) Seek to use marginal or nonessential agricultural land and public land to meet housing needs of low- and moderate-income and gap-group households.

Ewa Makai will provide homes for low- and moderate-income and gap-group households on nonessential agricultural land.

(2) Encourage the use of alternative construction and development methods as a means of reducing production costs.

As a developer, Gentry has consistently been on the cutting edge of technology, utilizing alternative construction materials and methods in order to reduce production costs, while improving the quality of homes that are built. For example, long-lasting, durable products such as fiber-cement siding and vinyl fencing are utilized, eliminating waste and providing value to homeowners.

(5) Encourage continued support for government or private housing programs that provide low interest mortgages to Hawaii's people for the purchase of initial owner-occupied housing.

Gentry has been an ardent supporter and user of the State's Hula Mae Single Family Mortgage Purchase Program, as well as other government programs which provide low-interest loans to first time homebuyers. These include the USDA-RD Section 502 Single Family Home Ownership program; the Federal Housing Administration Loan Program; and the Veterans Administration Loan Program.

(8) Give higher priority to the provision of quality housing that is affordable for Hawaii's residents and less priority to the development of housing intended primarily for individuals outside of Hawaii.

As with the rest of the Ewa by Gentry development, Ewa Makai is intended to provide quality homes that are affordable to Hawaii's residents.

3. Coastal Zone Management

The Ewa Makai development does not lie within the Coastal Zone Management (CZM) Area established pursuant to Chapter 205A, Hawaii Revised Statutes, and is therefore not subject to the CZM requirements.

4. Chapter 343, Hawaii Revised Statutes

An Environmental Impact Statement is being prepared and will need to be accepted prior to submittal of an application for rezoning of the Ewa Makai lands. The Department of Planning and Permitting of the City and County of Honolulu will be the accepting agency.

5. Five-Year Boundary Review

The five-year boundary review is a comprehensive, statewide, policy-oriented examination of the State land use district classifications that is performed by the Office of State Planning. It provides the State Land Use Commission with an opportunity to review urbanization proposals from a broad, comprehensive and long-range viewpoint.

During the last five-year boundary review conducted in 1992, 1,823 acres of land in the Ewa region were recommended for reclassification from the Agricultural District to the Urban District to help met Oahu's projected demand for urban land. The Ewa Makai parcel was included in the acreage recommended for reclassification from agricultural to urban. See Figure 11.

Figure 11
State Land Use District 10-Year Boundary Review
Recommendations for Ewa

B. City and County of Honolulu Plans and Policies

1. City and County of Honolulu General Plan.

The General Plan of the City and County of Honolulu is a comprehensive statement of objectives and policies which sets forth the long-range aspirations of Oahu's residents and the strategies of actions to achieve them. The Ewa Makai development will be consistent with the following applicable objectives and policies of the General Plan:

Population

Objective C. *To establish a pattern of population distribution that will allow the people of Oahu to live and work in harmony.*

Policy 2. Encourage development within the secondary urban center at Kapolei and the Ewa and Central Oahu urban-fringe areas to relieve developmental pressures in the remaining urban-fringe and rural areas and to meet housing needs not readily provided in the primary urban center.

Policy 3. Manage physical growth and development in the urban-fringe and rural areas so that:

a. An undesirable spreading of development is prevented; and
b. Their population densities are consistent with the character of development and environmental qualities desired for such areas.

The Ewa Makai community, which will help to meet the housing needs of Oahu's residents, will be located in the Ewa urban-fringe area where development is encouraged. A residential development in the Ewa urban-fringe area will help to prevent an undesirable spreading of development throughout the rest of Oahu that is not targeted for further development. Ewa Makai's population densities will be consistent with the character of development and environmental qualities as set forth in the Ewa Development Plan.

Economic Activity

Objective A. *To promote employment opportunities that will enable all the people of Oahu to attain a decent standard of living.*

Policy 1. Encourage the growth and diversification of Oahu's economic base.

Policy 2. Encourage the development of small businesses and larger industries which will contribute to the economic and social well-being of Oahu residents.

Policy 3. Encourage the development in appropriate locations on Oahu of trade, communications, and other industries of a nonpolluting nature.

The 30-acre industrial-commercial site proposed for Ewa Makai-West will provide opportunities for diversified businesses that are safe and

nonpolluting in nature and convenient to residents in the Ewa area. The property will be primarily used for light and/or service industrial purposes with ancillary retail uses that would support the industrial tenants. Long-term operational employment opportunities will be created, generating an estimated annual income of $24.4 million at build-out. Estimated retail sales and service revenues from the industrial-commercial development will be roughly $60 million annually.

Objective G. *To bring about orderly economic growth on Oahu.*

Policy 1. Permit the moderate growth of businesses in the urban-fringe areas.

The industrial-commercial site in Ewa Makai-West will be located in the Ewa urban-fringe area.

Natural Environment

Objective A. *To protect and preserve the natural environment.*

Policy 4. Require development projects to give due consideration to natural features such as slope, flood and erosion hazards, water-recharge areas, distinctive land forms, and existing vegetation.

Policy 6. Design surface drainage and flood-control systems in a manner which will help preserve their natural settings.

Due consideration will be given to the topography and other natural features when designing Ewa Makai. Drainage and flood control systems in Ewa Makai-East, for example, will incorporate a grass-lined drainage way and open retention/detention basins; in Ewa Makai-West, a natural drainageway will be incorporated as part of the Kaloi Gulch drainage system.

Housing

Objective A. *To provide decent housing for all the people of Oahu at prices they can afford.*

Policy 3. Encourage innovative residential development which will result in lower costs, added convenience and privacy, and the more efficient use of streets and utilities.

Gentry has been a leader in innovative residential development that has resulted in lower costs and efficient site developments without sacrificing quality.

Policy 5. Make full use of State and Federal programs that provide financial assistance for low- and moderate-income homebuyers.

Gentry's low- and moderate-income homebuyers have taken advantage of numerous government programs that provide financial assistance, including the State's Hula Mae Single Family Mortgage Purchase Program; the

State's Mortgage Credit Certificate Program; the USDA-RD Section 502 Single Family Home Ownership Program; the Federal Housing Administration Loan Program; and the Veterans Administration Loan Program.

Policy 10. Promote the construction of affordable dwellings which take advantage of Oahu's year-round moderate climate.

Ewa Makai will offer affordable, energy-efficient homes that take advantage of Ewa's year-round moderate climate.

Objective B. *To reduce speculation in land and housing.*

Policy 2. Discourage private developers from acquiring and assembling land outside of areas planned for urban use.

Ewa Makai is located in an area planned for urban use.

Objective C. *To provide the people of Oahu with a choice of living environments which are reasonably close to employment, recreation, and commercial centers and which are adequately served by public utilities.*

Policy 1. Encourage residential developments that offer a variety of homes to people of different income levels and families of various sizes.

Ewa Makai will offer a variety of residential types to suit buyers of different income levels and families of various sizes.

Policy 3. Encourage residential development near employment centers.

The Ewa Makai master plan calls for the development of not only residential units, but also a significant employment center consisting of a 30-acre industrial-commercial area that is adjacent to a 20-acre commercial area. In addition, the secondary urban center of Kapolei, the city of Waipahu, military bases, and other nearby employment centers will offer jobs that are in proximity to the planned Ewa Makai development.

Policy 5. Discourage residential development where roads, utilities, and community facilities cannot be provided at a reasonable cost.

Roads, utilities and community facilities can be provided at a reasonable cost.

Transportation & Utilities

Objective A. *To create a transportation system which will enable people and goods to move safely, efficiently, and at a reasonable cost; serve all people, including the poor, the elderly, and the physically handicapped; and offer a variety of attractive and convenient modes of travel.*

Policy 1. Develop and maintain an integrated ground-transportation system consisting of the following elements and their primary purposes:

b. *Roads and highways -- for commercial traffic and travel in non-urban areas;*
c. *Bikeways -- for recreational activities and trips to work, schools, shopping centers, and community facilities; and*
d. *Pedestrian walkways – for ... trips to schools, parks, and shopping centers.*

Ewa Makai will consist of an integrated ground transportation system of roads, parkways, bikeways, and pedestrian walkways, offering residents a variety of attractive and convenient modes of travel. It will also be designed to accommodate easy access to transit stops.

Objective D. *To maintain transportation and utility systems which will help Oahu continue to be a desirable place of live and visit.*

Policy 2. Use the transportation and utility systems as a means of guiding growth and the pattern of land use on Oahu.

Millions of dollars in public and private sector resources have been expended in order to encourage the development within Oahu's secondary urban center, as well as in Ewa and Central Oahu. The development of improved transportation and utility systems will continue to be a priority in the Kapolei and Ewa regions in order to continue guiding growth and land use patterns on Oahu to these areas.

Policy 5. Require the installation of underground utility lines wherever feasible.

Underground utility lines will be installed wherever feasible in Ewa Makai.

Physical Development and Urban Design

Objective A. *To coordinate changes in the physical environment of Oahu to ensure that all new developments are timely, well-designed, and appropriate for the areas in which they will be located.*

Policy 2. Coordinate the location and timing of new development with the availability of adequate water supply, sewage treatment, drainage, transportation, and public safety facilities.

Policy 3. Phase the construction of new developments so that they do not require more regional supporting services than are available.

Implementation of the Ewa Development Plan will be accomplished in part through the phasing of development to support the vision for Ewa and to maximize the effect of infrastructure investments. It provides the opportunity to focus the impact of scarce public funds for infrastructure development, supports the directed growth strategy of the General Plan, and provides a clear signal to private landowners and developers as to where and when development will be supported. (Ewa DP, pp 5-1, 5-2) Both Ewa Makai East and Ewa Makai West have been included as "high

priority areas" that are supported for zoning changes and infrastructure investments between the years 1997-2005.

Policy 5. Provide for more compact development and intensive use of urban lands where compatible with the physical and social character of existing communities.

Policy 6. Encourage the clustering of developments to reduce the cost of providing utilities and other public services.

Compact residential developments have been one of the key factors in Gentry's ability to provide quality, affordable homes for Hawaii's residents. These types of developments, consisting of clustered single family condominiums, multi-family townhomes, and zero lot-line homes, have resulted in reduced infrastructure costs in Ewa by Gentry. Similar types of units will be built in Ewa Makai, making the physical and social characters of the communities compatible.

Policy 7. Locate new industries and new commercial areas so that they will be well related to their markets and suppliers, and to residential areas and transportation facilities.

The industrial-commercial area proposed for Ewa Makai will be conveniently located and well-related to its markets and suppliers. It will be in a residential community and will be accessible via various modes of transportation.

Policy 8. Locate community facilities on sites that will be convenient to the people they are intended to serve.

There are several community facilities planned for Ewa Makai: two church/day care centers; an 18-acre middle school; a community center, and two parks. Additional smaller recreation centers and facilities may be provided in some of the larger single family and multi-family neighborhoods. All are located on sites that will be convenient to the people they are intended to serve. The middle school site has met with the approval of the Department of Education.

Policy 9. Exclude from residential areas, uses which are major sources of noise and pollution.

The industrial-commercial site planned for Ewa Makai will contain businesses that are compatible with residential living and which will not be major sources of noise and pollution.

Policy 10. Establish danger zones to exclude incompatible uses from hazardous areas surrounding airfields, electromagnetic-radiation sources, and storage places for fuel and explosives.

An Explosives Safety Zone has been established in the Naval Magazine Lualualei West Loch Branch and is adjacent to the easternmost boundary of Ewa Makai-East. To minimize residents' inadvertent entrance into the

Explosives Safety Zone, Gentry has constructed a 6' high PVC-coated chainlink fence along the eastern boundary of existing Ewa by Gentry developments. Additional fencing will be installed as development occurs along the eastern boundary of the Ewa by Gentry and Ewa Makai properties. Gentry will also comply with the Navy requirement banning the construction of any road entering Ewa Makai from Iroquois Point Road within 200' of any Navy installation boundary.

Objective C. *To develop a secondary urban center in Ewa with its nucleus in the Kapolei area.*

Policy 2. Encourage the development of a major residential, commercial, and employment center within the secondary urban center at Kapolei.

The proposed Ewa Makai community will provide residences, industrial-commercial businesses, and an employment center within the secondary urban center, consistent with this policy.

Objective D. *To maintain those development characteristics in the urban-fringe and rural areas which make them desirable places to live.*

Policy 1. Develop and maintain urban-fringe areas as predominantly residential areas characterized by generally low-rise, low density development which may include significant levels of retail and service commercial uses as well as satellite institutional and public uses geared to serving the needs of households.

Ewa Makai will be a predominantly residential community characterized by low-rise, low-density development. It will also include industrial and commercial uses to serve the needs of the community.

Policy 3. Establish a green belt in the Ewa and Central Oahu areas of Oahu in the Development Plans.

The proposed Ewa Makai community will be consistent with the Ewa Open Space and Greenways Network set forth in the Ewa Development Plan. As an extension of the Ewa by Gentry master planned community, Ewa Makai will incorporate an open space network within the community. Significant acreage of open space will be retained in parks and landscaped drainageways. The community is also adjacent to agricultural lands in the West Loch Naval Magazine Blast Zone, as well as the Coral Creek, Barbers Point, and Hawaii Prince golf courses, all of which are designated as part of the regional open space system. Greenway corridors include the Kapolei Parkway and Fort Weaver Road.

Objective E. *To create and maintain attractive, meaningful, and stimulating environments throughout Oahu.*

Policy 4. Require the consideration of urban-design principles in all development projects.

The Ewa Makai development will be consistent with land use principles set forth in the Ewa Development Plan. (See below.)

Culture and Recreation

Objective D. *To provide a wide range of recreational facilities and services that are readily available to all residents of Oahu.*

Policy 1. Develop and maintain community-based parks to meet the needs of the different communities on Oahu.

Policy 9. Require all new developments to provide their residents with adequate recreation space.

Policy 10. Encourage the private provision of recreation and leisure-time facilities and services.

To meet the recreational needs of Ewa Makai residents, two community-based parks are planned, as well as a private community recreational facility.

2. Ewa Development Plan.

The Ewa Development Plan, adopted in 1997, provides conceptual, long-range visions and policies to guide land use and infrastructure decisions affecting the Ewa region. The Ewa Makai community will be consistent with the Ewa Development Plan in the following respects:

a. Vision

Ewa Makai is consistent with the following key elements of the vision:

Urban Growth Boundary – *"The Urban Growth Boundary for Ewa was drawn to give long-range protection from urbanization for over 3,000 acres of prime agricultural land and for preservation of open space while providing adequate land for urban development in Ewa for the foreseeable future."*

"...almost 8,400 acres are available for residential development; almost 800 acres for retail and office development; and nearly 1,250 acres for industrial development. Providing this capacity allows for competition and promotes more affordable residential, commercial, and industrial development."

"It should be noted that a portion of the lands indicated for development are in the State Agricultural Land Use District and will have to be approved for transfer to the State Urban District by the State Land Use Commission before they can be developed."

The Ewa Makai development lies within the Urban Growth Boundary for Ewa. (Figure 12.) These lands are currently in the State Agricultural Land Use District; approval for transfer to the State Urban District will be sought.

Open Space and Greenways – *"A network of Open Space and Greenways will link the Secondary Urban Center and associated employment centers, new master planned residential developments and revitalized established communities, an Ewa shoreline park, and a major regional park and recreation complex at Kalaeloa."*

The proposed development will be an extension of the Ewa by Gentry master planned community, which incorporates an open space network within the community. Significant acreages of open space will be retained in parks, as well as in the landscaped drainageways and retention areas that will ~~be~~ provide visual greenbelts in the Ewa Makai development. The community is also adjacent to agricultural lands in the West Loch Naval Magazine Blast Zone and the Coral Creek, Barbers Point and Hawaii Prince golf courses, all of which are designated as part of the regional open space system. Greenway corridors include the Kapolei Parkway and Fort Weaver Road.

Kalaeloa Regional Park and Recreation Complex – *"A major Regional Park and Recreation Complex at Kalaeloa will provide needed open space, recreation opportunities, and access to the beaches and ocean."*

A bikepath through Ewa Makai will serve to link the community with the proposed regional park.

Master Planned Residential Communities – *"A network of master planned residential communities will provide a wide variety of housing and accommodate the need for affordable housing."*

Laulani and Fairways (aka Ewa Makai-West and Ewa Makai-East, respectively) are among the planned residential communities slated for development in the Ewa Development Plan area. These units are intended to meet the needs of a spectrum of income and

Figure 12
Urban Growth Boundary for Ewa

age groups, and will include entry-level, move-up, and other types of housing units.

Communities Designed to Support Non-Automotive Travel – *"The master planned residential communities will be designed or redeveloped to support pedestrian and bike use within the community and transit use for trips outside the community."*

As an extension of the Ewa by Gentry master planned community, the project will support pedestrian and bicycle use through the development of sidewalks and bikepaths within the community and along Fort Weaver Road. Ewa Makai will also be designed to accommodate City bus service along its main streets, and will be located in proximity to a ferry service that is currently in the planning stages.

Conservation of Natural Resources – *"Ewa Natural Resources, including potable water, coastal water quality, and wetlands and other wildlife habitat, will be conserved by:*

- *Developing a dual water distribution system with potable water for drinking and other clean water uses, and non-potable water for irrigation and industrial use.*
- *Designing the regional drainage and wastewater treatment system to minimize non-point source pollution of the ocean and Pearl Harbor.*
- *Protecting valuable habitats for endangered waterbirds located in Batis Salt Marsh in Ewa Marina and in the West Loch of Pearl Harbor and for endangered plants located within Barbers Point Naval Air Station and elsewhere."*

A dual water distribution system is currently being used in Ewa by Gentry, and will continue to be used in Ewa Makai where feasible. Additionally, the drainage and wastewater treatment systems in Ewa Makai will be designed as part of a regional system to minimize non-point source pollution of the ocean. Ewa Makai does not contain any endangered flora or fauna and is not sited on the Ewa DP map of key natural resources.

Preservation and Enhancement of Historic and Cultural Resources – There are no known historic or cultural sites in Ewa Makai.

Phased Development – Ewa Makai will be consistent with the phased development component of the Ewa Development Plan in the following respects:

- It will provide **increased land supply** to support economic development and job creation and to accommodate residential growth with an emphasis on providing affordable housing and a diversity of housing types.

- It will provide for **moderate growth of an industrial-commercial center in an Urban Fringe Area** to primarily serve the needs of the surrounding residential communities.

- It is **consistent with the phasing plan** to support residential and commercial development. The Fairways and Laulani Residential projects (Ewa Makai-East and Ewa Makai-West) and the 30-acre Laulani Industrial project are listed in the Phase I development timetable (1997-2005)

- There will be **adequate facilities** to ensure that development does not outpace infrastructure development.

- There will be **public and private sector coordination on infrastructure needs** to support the directed growth strategy of the General Plan.

b. Land Use Policies, Principles, and Guidelines

The vision for the development of Ewa will be implemented through the application of land use general policies, principles, and guidelines. The Ewa Makai development will be consistent with these policies, principles, and guidelines, as follows:

1) <u>Open Space Preservation and Development</u>

Planning Principles – Planning principles that will guide the development of Ewa Makai include the following:

<u>*Visual and Physical Definition of Urban Areas.*</u> *"Within the Urban Growth Boundary, the open space system should visually distinguish and physically separate individual communities, neighborhoods, and land use areas in Ewa."*

The Ewa by Gentry community, of which Ewa Makai will be an extension, will be visually distinguished by the open space system. It is bordered on the east by the agricultural areas of the U.S. Navy Blast Zone, to the south by the Hawaii Prince Golf Course, and to the west by the Kalaeloa Golf Course. Portions of the southern boundary will be bordered by the future Ocean Pointe golf course and a 20-acre district park and portions of the northern boundary will be bordered by the Coral Creek Golf Course.

<u>*Passive and Active Open Spaces.*</u> *"The open space system shall consist of areas in active use, as well as passive areas. Active areas include parks, golf courses, and agricultural fields. Passive areas include the State Conservation District, fallow land in the State Agriculture District, drainage and utility corridors."*

Creation of Open Space Network. *"The various types of open space should be linked as an open space network, with major open space areas connected by open space corridors along transportation routes, utility corridors, and drainageways."*

Open space areas, in and around the Ewa Makai development, will be connected by greenways along major transportation corridors, as well as the open space drainageway that will be part of the Kaloi Gulch drainage system.

Dual Use of Drainageways and Utility Corridors. *"To create the regional open space network, drainageways and utility corridors should be viewed as opportunities to link major open spaces with pedestrian and bike paths along open space corridors. To accommodate such uses, where possible, drainageways should be retained as natural or man-made vegetated channels rather than be replaced by concrete channels."*

An open space area in Ewa Makai-West will extend from the Coral Creek Golf Course to the Ocean Pointe golf course, providing a natural drainage channel. A pedestrian/bike path will traverse through this open space and will connect parks within the community with the proposed Kalaeloa Regional Park and the shoreline.

Ewa Makai-East will have a vegetated drainageway to a retention/detention basin. This open space greenway will contain a pedestrian/bike path and other recreational features where appropriate.

Relation to Open Space Map

Appendix A of the Ewa DP shows components of the regional open space system. The Kaloi Gulch drainage channel in Ewa Makai-West, as well as the greenways along Kapolei Parkway and the Fort Weaver Road corridor are included as part of the open space system. Although there will be smaller community and neighborhood parks in Ewa Makai, these are not shown on the map because only island-wide, regional, and district parks are shown.

Guidelines

The following guidelines are relevant to Ewa Makai:

Natural Gulches and Drainageways. *"Planned improvements to the Ewa drainage systems should be integrated into the regional open space network by emphasizing the use of retention basins and recreational access in the design approach."*

As noted above, the drainage channel in Ewa Makai-West will form an open space link between the Coral Creek and Ocean Pointe golf courses.

The drainage system in Ewa Makai-East will consist of a dual use recreational vegetated drainageway leading to a retention/detention basin at the eastern corner.

Greenways and Open Space Corridors. *"The rights-of-way for major arterials and collector streets should be designed as landscaped parkways or greenways, complete with a landscaped median strip, landscaped sidewalk, and bikeways. Major arterials should have separate bike paths, and major collectors should have bike lanes. Suggested width for major arterials, including right-of-way and planting strips, is 120 feet wide and for major collectors is 100 feet wide."*

The rights-of-way for major arterials and collector streets in Ewa Makai will conform to the above to the extent possible. Landscaped bike paths, sidewalks, and median strips (as applicable), are an integral part of the existing Ewa by Gentry community and will continue to play an important role in providing greenways and open space corridors in Ewa Makai.

2) **Regional Parks and Recreation Complexes** – There are no regional parks or recreation complexes planned for Ewa Makai.

3) **Community-Based Parks**

General Policies – General policies that will guide the development of parks in Gentry Makai include the following:

"Adequate parks to meet residents' recreational needs should be provided."

"New residential development should strive to provide land for open space and recreation purposes at a minimum of two acres of park per 1,000 residents."

Based on an estimated population of 6,000 residents (1,865 units x 3.25 persons per household (based on the 2000 average household size)), 12 acres of land should be provided for open space and recreation purposes in Ewa Makai. The Ewa Makai Master Plan far exceeds this requirement: 25.5 acres of land are being set aside for public parks and open space, and another 2 acres are being set aside for a private community recreation center. Mini parks may also be developed within neighborhoods. Additionally, a district park that is adjacent to Ewa Makai-West is being developed by HASEKO.

Guidelines – The following guidelines are relevant to the development of community-based parks in Ewa Makai.

"Where feasible, Community and Neighborhood Parks should be sited at the center of neighborhoods, in order to maximize accessibility."

"Development master plans should provide accessible pathways from surrounding streets to facilitate pedestrian and bicycle access to all features in parks."

Both park areas that are planned for Ewa Makai will be centrally located and will be accessible to both pedestrians and bicyclists via pathways from surrounding streets.

4) **Historic and Cultural Resources** – Because the Ewa Makai area was formerly cultivated in sugar, it does not contain any historic features or native Hawaiian cultural and archaeological sites. Plans for the project will promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of the makai mountain views, as well as views of central Honolulu and Diamond Head to the extent possible. There are no ocean views from the Subject Property.

5) **Existing and Planned Residential Development** – Section 3.6.3 of the Ewa DP provides general policies and guidelines for the development of new communities and the expansion or renovation of existing communities.

General Policies – The development of Ewa Makai will be consistent with the following general policies.

Overall density – "To achieve the desired compactness and character of development in planned residential communities, the housing density of the aggregate area zoned for residential use (including the streets) should be in the range of 10 to 15 units per acre."

Densities in the Ewa Makai community will range from 7.5 units/acre to 20 units/acre. The overall density will average 10 to 11 units per acre. These units will be in conformance with the height guidelines for planned residential developments (i.e., low density units will not exceed two stories, and medium density developments will not exceed three stories).

Physical Definition of Neighborhoods – "The boundaries of neighborhoods should be made evident through the use of street patterns, landscape or natural features, and building form and siting. The focus of neighborhood activity should be on the local street or a common pedestrian right-of-way or recreation area."

Ewa Makai is divided into three distinct neighborhoods: (1) the area west of Kapolei Parkway; (2) the area between Kapolei Parkway and Fort Weaver Road; and (3) the area

east of Fort Weaver Road. Each neighborhood has a central park or open space feature which is linked to the surrounding residential areas by a network of pedestrian and bike paths. The two major highways, along with the Barbers Point and Hawaii Prince golf courses, and the Navy open space provide distinct boundaries for the three neighborhoods.

Compatible Mix of Building Forms – *"There should be a variety of housing types and densities to avoid visual monotony and accommodate a variety of housing needs, but without sharp contrasts between the exterior appearance of adjacent housing areas."*

The proposed rezoning will provide a mixture of housing types and densities, consistent with the above policy. The homes will be compatible with the exterior appearance of adjacent housing areas.

Transit-Oriented Streets. *"Street patterns and rights-of-way should be designed to accommodate mass transit service and make it convenient to access for as many households as possible."*

Major streets and rights-of-way will be designed to accommodate mass transit service that is convenient to as many of Ewa Makai's households as possible.

Pedestrian and Bicycle Travel. *"Pedestrian and bicycle travel should be encouraged, particularly to reach neighborhood designations such as schools, parks, and convenience stores."*

Ewa Makai will provide both sidewalks and bikepaths throughout the community, making it convenient and easy for residents to access neighborhood destinations.

Integration of Linear Corridors. *"Physical and visual connections between communities should be encouraged through the creative design of transportation and utility corridors and drainage systems."*

The Ewa Makai community will be connected to the communities on the north (Ewa by Gentry) and the south (Ocean Pointe) by Kapolei Parkway and Fort Weaver Road. In addition, the Kaloi Gulch drainage system passes through the west side of the community as a proposed 14-acre landscaped open area linking the Coral Creek and Ocean Pointe golf courses.

Provision of Community Facilities. *"Land should be provided for community facilities, including churches, community centers, and elderly and child care centers."*

Land has been set aside in Ewa Makai for two church/day care center sites, a community recreation center, and a middle school.

Guidelines: Low Density Residential – The following are guidelines for the development of low density residential areas consisting of one and two-story single family attached and/or detached dwellings with individual entries.

Density – "Density should be 5 to 12 units per acre, typical of residential zoning districts and allowing the application of optional design standards for Clusters and Planned Unit Developments."

The proposed density for the single family and cluster developments will range from 7.5 to 12.5 units per acre. The overall average will be 9.6 units per acre.

Building Height – "In general, buildings should not exceed two stories, although the height may vary according to required flood elevation, slope, and roof form."

Single family and cluster homes in Ewa Makai will not exceed two stories.

Site Design – "The site design for small-lot developments should avoid monotonous rows of garages and driveways along neighborhood street frontages by employing features such as varied building setbacks and shared driveways."

Where feasible, the site design will strive to employ features such as varied building setbacks and shared driveways to avoid monotony.

Building Form – "Buildings should provide visual interest and individual identity by using varied roof forms, exterior colors and finishes, building orientation, floor plans and architectural details."

The above elements will be incorporated to the extent possible in order to provide visual interest and individual identity.

Guidelines: Medium Density Residential – The following are guidelines for the development of medium density residential areas consisting of two- and three-story townhouse or low-rise apartment buildings.

Density – "Density should be 10 to 30 units per acre."

The average density for the multi-family developments in Ewa Makai will be approximately 20 units per acre.

Building Height – *"In general, buildings should not exceed three stories above grade. Maximum building heights should allow for pitched roof forms."*

Multi-family buildings will not exceed three stories.

Building Form – *"Building form, orientation, location of entries and landscape screening should be employed to maintain a sense of residential scale and provide greater privacy and individual identity for housing units."*

The above elements will be incorporated to the extent possible in order to maintain residential scale and provide greater privacy and individual identity for housing units.

Compatibility – *"Building scale, roof form and the quality of materials should be compatible with those of adjacent low-density residential areas."*

Compatibility with adjacent low-density residential areas will be taken into consideration when designing multi-family buildings.

Guidelines: High Density Residential – Not applicable. There will be no high density residential buildings in Ewa Makai.

Circulation System – The Ewa Development Plan states: *"Master-planned projects should each have a circulation plan, or 'circulation element' in their Project Master Plan."*

A circulation plan for Ewa Makai will be included as part of the Project Master Plan.

Transit Routes and Facilities -- *"The circulation plan should define the hierarchy of streets within the project and its relationship to the surrounding transportation network. The circulation plan should also indicate existing and proposed bus routes and specific measures to accommodate efficient transit service for as many households as possible. Most residences should be within a five-minute (or one-quarter mile) walking distance of a proposed bus route. The rights-of-way along transit routes should make provisions for bus shelters, bus pull-outs, and, if applicable, park-and-ride facilities and/or future transit stations."*

A hierarchy of streets is planned throughout the Ewa Makai development area. Two major arterials, Fort Weaver Road and the extension of the Kapolei Parkway, run through the area providing the primary access to the Ewa Beach, Ocean

Pointe and Iroquois Point communities. The only major collector road within the project is a proposed continuation of Keaunui Drive extending from the east side of the Ewa by Gentry development across Fort Weaver Road to the Kapolei Parkway.

Currently two regional City bus lines (#41 & #42) pass through the Ewa Makai project area, both on Fort Weaver Road. In addition, a local circulator bus (#431) provides hourly service from the Waipahu Transit Center through the Ewa Villages and existing Ewa by Gentry development mauka of Geiger/Iroquois Point Road.

In order to serve the Ewa Makai area, it would be relatively easy to move the current circulator route (#431) from Geiger/Iroquois Point Road down to the proposed extension of Keaunui Drive where it crosses Fort Weaver Road and connects to the Kapolei Parkway as shown on the Ewa Makai Circulation Plan. A circulator bus along this route would place approximately 80% of the residential units and all of the non-residential uses in Ewa Makai within a quarter mile of a public transportation route.

If a secondary loop were added to the expanded circulator route along a proposed collector road within the residential area at the east end of the project (as shown on the Circulation Plan), 90% of the units would then be within a quarter mile of the route.

Where feasible, the rights-of-way along transit routes in Ewa Makai will make provisions for bus shelters and bus pull-outs.

<u>Pedestrian and Bicycle Routes and Facilities</u> -- *"The circulation plan should indicate any pedestrian and bicycle paths that are physically separated from roadways. Street intersections along these separated paths should have a narrow curb radius and include special signage and paving to encourage safe and convenient pedestrian and bicycle crossings. Interior pedestrian/bicycle routes may be provided as an alternative to paved sidewalks along local streets."*

The Ewa Makai area is designed to be a pedestrian and bicycle-friendly environment. Arterial, collector and local access streets will be designed in accordance with new City standards with sidewalks and bike lanes or bike paths where appropriate.

A separate pedestrian and bicycle path will be provided across the open area makai of the Coral Creek golf course. This path will provide an important link for residents in the Ewa Makai area to the Barbers Point golf course and the

beach and future recreation facilities at Kalaeloa. Other portions of this pathway between the Kapolei Parkway and the Barbers Point/Kalaeloa boundary will be integrated into the local roadway network and will be designed to encourage safe and convenient travel for all users.

Landscape Treatment -- *"Conceptual street tree plans should be indicated in the circulation plan. Entries to the community should be identified with special landscape treatment. The rights-of-way for major arterials and major collector streets should be designed as landscaped parkways, complete with a landscaped median strip, landscaped sidewalk, and bikeways. Canopy trees should be planted to shade the sidewalk/bikepath areas. Landscaped treatment along the edges of the project should be appropriate for the natural setting and designed to provide continuity and transition from adjacent development areas."*

Landscaping of public streets, pedestrian/bike paths, community entries and development buffers in the Ewa Makai area will be based on the use of plant materials appropriate to the Ewa climate and environment. The typical locations of these landscaped elements and features are indicated in the Ewa Makai Project Master Plan. Also include in the Plan are photographs of typical roadways showing the locations of street trees and landscaped areas within the public rights-of-ways, as well as landscaped entryways in Ewa by Gentry.

Relation to Urban Land Use Map – The planned low- and medium-density areas in the Ewa Makai Master Plan will be consistent with the Ewa Urban Land Use Map shown as Exhibit A in the Ewa Development Plan.

Relation to Zoning – The planned residential areas in Ewa Makai will be consistent with the Guidelines for Appropriate Zoning set forth in Table 3.3 of the Ewa Development Plan.

Non-Residential Development: Industrial Centers – The industrial-commercial and employment center in Ewa Makai-West is proposed for service-oriented light industrial use and is included for development in Phase I of the Phasing Plan for the Ewa DP area. (See Table 2.2.) It will be consistent with the planning principles set forth in Section 3.7.3.2 that refer to appropriateness of scale and environmental compatibility.

c. Public Facilities and Infrastructure Policies and Principles

Chapter 4 of the Ewa DP sets forth policies and principles to guide the planning and construction of proposed public and private public facility projects and infrastructure systems to carry out the vision for future

development of Ewa. The Ewa Makai development will be consistent with these policies and principles as follows:

1) **Transportation Systems**

Roadway Network – Two major arterials, Fort Weaver Road and the extension of the Kapolei Parkway, run through the area providing the primary access to the Ewa Beach, Ocean Pointe and Iroquois Point communities. The only major collector road within the project is a proposed continuation of Keaunui Drive extending from the east side of the Ewa by Gentry development across Fort Weaver Road to the Kapolei Parkway.

One of the major elements of the future Ewa roadway network is Kapolei Parkway which is planned as a major corridor. The portion of Kapolei Parkway through Ewa by Gentry has already been completed. When remaining portions of the roadway are completed, including those portions through HASEKO's Ocean Pointe community, the Ewa Makai community, and State and City properties, Kapolei Parkway will serve as a major link from Ewa Beach to the city of Kapolei. Eventually, it will serve as a link from Ewa Beach to the resort area of Ko Olina.

Bikeway System – The Ewa DP states that major bike paths should run along the OR&L right-of-way and Kapolei Parkway and along the North-South Road and Fort Weaver Road. Bike paths currently exist throughout the Ewa by Gentry community and along Fort Weaver Road and Kapolei Parkway, and will be included in the Ewa Makai development, as well.

Transit-Oriented Community Street Systems - Circulation systems within the Ewa Makai community will be designed to facilitate bicycle and pedestrian travel, allow for increased transit use, and reduce dependence on automobile travel.

2) **Water Allocation and System Development**

Adequacy of Water Supply – BWS expects to have sufficient water for the Ewa Region. According to a BWS letter to Gentry dated January 24, 2003, (included as Appendix I), BWS currently has water system improvement projects in the construction and design stages, which will provide adequate source capacity to accommodate Gentry's proposed development. The Ewa Shaft's estimated yield is 15 million gallons per day (mgd). In addition, the proposed Desalination Facility in Kalaeloa is being designed for 5 mgd with a potential to expand to 35 mgd in the future. The installation of wells at the Waipahu Wells II Station and completion of the Waipahu Wells IV will add 4.21 mgd to BWS's capacity to deliver water. These two projects should be completed this year. It is anticipated that potable supply for Ewa Makai will be provided from the Ewa Shaft, with Gentry paying the appropriate facilities charge.

The BWS does not provide advance water allocations or water reservations for projects such as Ewa Makai. Water commitments are made at the building permit or construction drawing stage on a first come, first served basis. When water is made available, the developer will be required to pay BWS' Water System Facilities Charge.

Dual Transmission Lines/Use of Nonpotable Water – As with Ewa by Gentry, a dual water system will be developed in Ewa Makai to conserve the supply of potable water. Nonpotable water will be used where feasible for purposes such as landscape irrigation.

3) **Wastewater Treatment**

Wastewater produced by the Ewa Makai development will be connected to the Honouliuli Wastewater Treatment Plant, a municipal sewer service system, in accordance with approved master plans.

4) **Drainage Systems**

The Ewa DP states that drainage system designs should emphasize control and minimization of non-point source pollution and the retention and/or detention of storm water on-site and in appropriate open space and wetland areas. Natural and man-made vegetated drainageways and retention basins are currently proposed for Ewa Makai. A drainageway that is part of the Kaloi Gulch Drainage Basin is proposed for Ewa Makai-West, connecting the Coral Creek Golf Course with Ocean Pointe's planned golf course.

In Ewa Makai-East, a landscaped drainageway, recreation area, and large retention basin will be built as part of the residential subdivision. These drainage facilities will be used to detain or retain storm water flows to reduce their volume and runoff rates and the amounts of sediments and pollutants transported offsite. The retention/detention basins may be developed as part of a landscaped walkway that will double as a visual amenity, though final plans are undetermined at this time.

5) **School Facilities**

The Ewa DP states that the State Department of Education (DOE) has projected a need by 2020 for two new intermediate schools, one of which has already been built in the Villages of Kapolei. Although the Ewa DP lists East Kapolei Intermediate as the second intermediate school site, the development of East Kapolei is uncertain at this time. In cooperation with the DOE, Gentry has agreed to dedicate an 18-acre middle school site in Ewa Makai-West to service the educational needs of this

growing area and to address its fair share contribution for the provision of adequate school facilities.

6) Public Safety

Police Protection

The project site is served by the Kapolei Police Station, which is located at 1100 Kamokila Boulevard in Kapolei. There is also a storefront office next to the 7-eleven store at 91-1669 Fort Weaver Road.

According to the Honolulu Police Department, because of the number of residential units planned, and with the corresponding addition of pedestrian and vehicular traffic in and around the area, there will be an increase in the need for police service. It is anticipated that the revenues collected from real property taxes of the new residences and industrial-commercial centers will finance the increased cost of police services needed. No additional requirements are anticipated for the Honolulu Fire Department.

Fire Protection

In the event of a single alarm fire, the project site would be served by the Waipahu Fire Station. For a multiple alarm such as a structure fire, three engine companies and one ladder company would be sent from the Ewa Beach, Waipahu, and Kapolei Fire Stations, with the ladder company originating from the Waipahu Fire Station. The project would increase the demand for fire protection services by adding new structures and an increased population.

Availability or Adequacy of Other Public Services and Facilities

In addition to the public services and facilities that are noted above, the following public services and facilities will also be available and adequate.

7) Solid Waste Handling and Disposal

Solid waste handling and disposal will be coordinated with the City Department of Environmental Services, Refuse Division, with written notification submitted in advance of when the refuse service is expected to begin. The design of residential communities within Ewa Makai will comply with the Division's requirements in order to enable refuse pick-up.

8) Public Utilities

The project will be serviced by a number of public utilities including the Hawaiian Electric Co. (HECO) for electric power,

Verizon (telephone), Board of Water Supply (water and sewer), and various cable television providers including Oceanic Cable and Americast. There is also a possibility of using The Gas Company for gas service.

HECO indicated that it will be able to serve this new development from the Fort Weaver Substation which was installed in an earlier phase of the Ewa by Gentry project. Therefore, the installation of additional substation transformer capacity and extension of cables, ducts, and associated electrical facilities should encounter no significant obstacles to providing timely and reliable service.

9) Parks

The conceptual plan incorporates two neighborhood parks: an 8-acre park in Ewa Makai-West and a 3.5 acre park in Ewa Makai-East. The 8-acre park in Ewa Makai-West will be centrally located and within walking or biking distance for many area residents. The 3.5 acre park in Ewa Makai-East will be an extension of a planned 6.8 acre park in the existing Ewa by Gentry community, thereby increasing the overall park size to 10.3 acres. In addition, a 2-acre private community recreation center complex is planned in Ewa Makai-West for use by Ewa by Gentry residents, and additional private recreational areas may be developed in conjunction with individual residential developments. Master planning and development of new parks will be provided in accordance with the requirements of the City's Park Dedication Ordinance.

10) Public Agency Impact

There should be no direct impact on any public agency as a result of the development of Ewa Makai.

VII. LOCATION OF THE PROPOSED USE OR DEVELOPMENT IN RELATION TO ADJACENT LAND USE DISTRICTS AND ANY CENTERS OF TRADING AND EMPLOYMENT

Ewa Makai will be an infill project bordered on the north and south by urban uses. To the north is the existing Ewa by Gentry community; to the south are the Hawaii Prince Golf Course and the Ocean Pointe master planned community. Also nearby are the existing residential communities of Ewa Beach, Ewa Villages, and West Loch. Ewa Makai is in an area designated for urban growth in the City's Ewa Development Plan.

The Ewa Makai development will be located adjacent to or in proximity to a number of centers of trading and employment. A 20-acre commercial area owned by Campbell Estate and zoned B-2 will be essentially located within the Ewa Makai community and will be adjacent to the proposed 30-acre IMX site in Ewa Makai. In addition, the secondary urban center of Kapolei, the city of Waipahu, the Ewa Beach Shopping Center, Kalaeloa and other military bases are in proximity. Waikele and Royal Kunia, are also nearby, as well as other current and future places of employment, including the many area golf courses, Campbell Industrial Park, the Hawaiian Waters Adventure Park, the resort area of Ko Olina, and the planned University of Hawaii West Oahu Campus.

In June 2001, 75 companies in the City of Kapolei provided nearly 3,000 jobs. In the greater Kapolei region, there are more than 450 companies generating more than 16,000 jobs. This number is expected to more than double by 2010.

Government's presence in Kapolei has also continued to grow over the years. The Kapolei Regional Police Station, the City and County of Honolulu's new civic center, the Kapolei High School and Kapolei Middle School, the State Office Building, and the almost-completed Kapolei Regional Library are evidence of government's commitment to the Kapolei region.

VIII. ECONOMIC IMPACTS OF THE PROPOSED DEVELOPMENT

A. Impact on Employment Opportunities

According to a fiscal and economic impact study on the subject property conducted by John Child & Company (September 2001), the residential and industrial-commercial developments will generate short-term employment during the construction of the new residential units and industrial-commercial pad sites and buildings. Additionally, industrial-commercial jobs at businesses that would locate at the industrial-commercial site will create permanent, or long-term, employment for the residents in the Ewa area. Both short-term and long-term employment impacts are projected as follows:

1. New Jobs During the Construction Period

Direct Construction Employment

Direct construction employment includes onsite laborers, operatives and craftsmen, as well as professional, managerial, sales and clerical workers who may be employed elsewhere in the State.

Based on the relative values of the construction expenditures estimated for the residential, industrial-commercial, and infrastructure improvements, about 7.5 to 9.5 construction related jobs are estimated for every $1.0 million in construction expenditures associated with the Ewa Makai developments.

Based on Gentry's development schedule, construction sequencing could begin as early as 2005 and proceed through 2013. Based on the projected construction expenditures for Ewa Makai (adjusted to reflect 1992 dollars), about 705 full-time and part-time jobs in the construction industry are estimated at peak construction in 2008. The average annual direct construction employment is estimated to be about 310 full-time and part-time jobs, or about 2% of the statewide total.

Indirect and Induced Employment

According to a study conducted by the Department of Business, Economic Development and Tourism (The Hawaii Input-Output Study 1992 Benchmark Report, December 1998 ("I-O study")), another 15 full-time, part-time, and self-employment jobs would be created in other industries as a result of every $1.0 million in construction. Based on these indirect and induced multiplier effects, an average of 136 and 411 jobs, respectively, would be created annually during the construction period.

Total Employment Impacts During Construction

Based on the projected construction expenditures and multiplier effects applicable to the construction industry, an average of about 857 new jobs would be created annually in the State during the Ewa Makai construction period.

2. Long-Term Operational Employment Impacts

Development of the industrial-commercial site would create permanent or long-term operational employment opportunities in the Ewa Gentry neighborhood. The projected employment at establishments in the Ewa Makai industrial-commercial development assumes the tenants would include light and/or service industrial and retail uses compatible with the residential character of the surrounding neighborhood.

Average absorption rates are measured as the ratio of employees to one acre of land for various industrial-commercial sectors. These rates range from one acre of land for every 5.9 employees in the transportation and warehousing sector to about 251.0 employees for labor-intensive retail establishments such as eating and drinking establishments.

Based on the anticipated uses at the 30-acre Ewa Makai industrial-commercial site and a conservative projected average absorption rate of 50 employees/acre, an additional 1,500 full-time, part-time, and self-employment jobs would be created at full development in 2009. Indirect and induced employment effects were not projected because of the anticipated variation in the types of business establishments. As a result, the employment impact is understated.

Included as Exhibit KK. is a Report Covering Market Assessments and Fiscal and Economic Impacts for the Proposed Ewa by Gentry Makai Development prepared by John Child and Company (September 2001).). Also included as Attachment KK is a letter from John Child and Company which addresses the impacts of the events of September 11, 2001 and the State Land Use Commission approval of the proposed Koa Ridge development by Castle & Cooke, Inc. on the proposed Ewa Makai development.

B. Impact to Agricultural Production in the Vicinity of Subject Property, and in the County and State

As previously mentioned, a study on Ewa Makai's impact on agriculture was done by Decision Analysts Hawaii, Inc. (DAHI) in February 2002. (See Exhibit BB.) In its study, DAHI concludes that the loss of agricultural land will not adversely affect the growth of diversified agriculture in Hawaii.

The property is currently fallow sugarcane land, of which about 86 acres are well-suited for growing low-elevation crops. This is based on the favorable soil conditions and ratings over 31% of the site, the gently-sloping terrain, the very sunny climate, good access, and the short trucking distance to the Honolulu markets and to shipping terminals. However, crop farming could be limited by a lack of access to a large volume of low-cost irrigation water and by nuisance problems with neighboring residential communities.

Currently, nearly all of the property is leased to Ralph's Ranch on a month-to-month basis, which also leases about 500 acres in Kunia and Kahuku. The Subject Property provides sufficient grass to graze about 20 head of livestock, more or less, depending on rainfall and supplemental fee. The ranch is operated as a hobby by a father and son and has no employees.

Although the subject property will commit about 283 acres of land to non-agricultural use, the commitment will not adversely affect the growth of diversified agriculture. This conclusion is based on the following findings.

Ample land is available for diversified agriculture. A vast amount of land has been released from plantation agriculture (about 236,200 acres since 1968), and this release of land has far outpaced the demand for land for diversified crops (an increase of about 38,500 acres over the same period). The net decrease in crop land amounted to 197,700 acres. While some of the released land has been converted or is scheduled to be converted to non-agricultural uses, most of it remains available for diversified crops. Thus, ample land is available in Hawaii to accommodate the growth of diversified agriculture.

Land is not the limiting factor to the growth of diversified agriculture. Consistent with the above, the limiting factor to the growth of diversified agriculture is *not* the *land supply*, but rather the size of the market for crops that can be grown *profitably* in Hawaii.

These findings also apply to Oahu. In particular, most of the 22,500 acres released from sugar production during the 1990s remains available. Fields in Kunia and Ewa have been leased, but markets for crops grown on the land are being developed. On the North Shore, various crops are being explored, but most of the former sugarcane land remains fallow. Development of the Project, DAHI concludes, will involve the loss of far too little good agricultural land to adversely affect the availability of land to farmers on Oahu or in other parts of Hawaii, or to adversely affect the growth of diversified agriculture in Hawaii.

IX. PROJECT MASTER PLAN

The Ewa Development Plan requires that a Project Master Plan be prepared for any significant zone change involving 25 acres or more. Included as Exhibit LL is a copy of the Project Master Plan for Ewa Makai.

X. PUBLIC INPUT

Presentations to Ewa Neighborhood Board's Planning and Zoning Committee

Meeting of January 15, 2002

The Ewa Makai project was discussed at the Ewa Neighborhood Board's Planning and Zoning Committee meeting on January 15, 2002. Key issues and concerns raised included the following:

- It was recommended that the plans be redesigned such that the middle school would be adjacent to the planned 14-acre open area.
- It was questioned whether the school facilities would be adequate, considering the cumulative growth planned for the area.
- Concerns were expressed regarding the adequacy of other infrastructure, including roads and drainage.

The Committee agreed to contact DOE about its plans for schools in the area and to share concerns that two new schools for the rapidly growing area appear to be insufficient. It was suggested by one of the attendees that the Committee contact the surrounding schools to get a pulse of the student population and administration's thoughts. The Committee asked the Gentry representative to reconvene with the Committee in February to iron out the details.

The Committee expressed appreciation that Gentry has reduced the number of homes in the Ewa by Gentry community by 1,100 units, from 8,300 units down to 7,200 units. The Committee also liked the fact that the plans include the completion of Keaunui Drive and Kapolei Parkway. The Committee agreed that if infrastructure is inadequate, it was not necessarily Gentry's fault because Gentry plans its developments in accordance with what the State and City recommends.

Meeting of February 28, 2002

At the Planning and Zoning Committee meeting on February 28, 2002, the Gentry representative again reviewed the proposed project, including the roadway connections. Keaunui Road and Kapolei Parkway are planned to be the major roadways through the project. Conduits will be installed at the intersection of Fort Weaver Road and Keaunui Drive in the event that signalization is deemed necessary. The signals at that intersection should be properly synchronized.

There was also a discussion about what had transpired during meetings with the DOE. Subsequent to the January meeting, members of the Planning and Zoning Committee, along with the Gentry representative, met with officials from the Facilities Branch and the Statistical Research Branch of the State Department of Education (DOE). The DOE officials explained the methodologies that they use to plan for schools and to forecast enrollments.

Insofar as the Campbell Complex (which includes schools from Ewa Beach to Ewa Villages) is concerned, there appears to be adequate classroom space because an elementary school at Iroquois Point is currently underutilized. Some redistricting may be required in the near future so that more students will be able to attend this school. It was suggested that a possible immediate solution would be to offer parents who live in the Ewa area the option of sending their children to Iroquois Point Elementary.

With respect to future plans for the Campbell Complex, a new permanent building of six classrooms will be built at Ewa Beach Elementary School. A new elementary school is being planned for the Ocean Pointe development. Also, Ewa Elementary School could be expanded to include four more portable buildings. A new intermediate school in Ewa Makai will most likely be developed for multi-track since that is the trend today. The DOE may consider building it as a middle school that would include grades six to eight, so as to relieve the pressure of surrounding elementary schools.

The Committee still had concerns about DOE's projections for the Ewa plain, but was satisfied that Gentry has made all efforts to meet DOE's expectations for school development. The Committee was also satisfied with roadways planned for the project.

The Committee agreed to recommend that the Ewa Neighborhood Board support the development of Ewa Makai subject to certain conditions. The Committee also recommended that Gentry work closely with future legislators to ensure that moneys are budgeted through the CIP process for the funding of the school projects.

Ewa Neighborhood Board

The applicant made a presentation on the Ewa Makai project to the Ewa Neighborhood Board No. 23 at its regular meeting of March 14, 2002. Written notice of the presentation was sent to the adjoining property owners. (Included as part of Appendix L is a copy of an affidavit confirming that adjoining property owners were sent written notification of the required neighborhood board presentation, a list of adjoining property owners to whom notification letters were sent, and a copy of the letter that was sent. Also included is a copy of a letter from one of the residents of Sun Terra expressing his views on the proposed development.)

A copy of relevant sections of the minutes of the Neighborhood Board Meeting are included as part of Appendix L.

The Planning and Zoning Committee made the following recommendations to the Ewa Neighborhood Board:

"1) We support the development of the Ewa Makai project, which incorporates the infrastructure development for roads/technology, sewage, and the intermediate school site development.
2) The Department of Education should actively encourage parents of students in overcrowded area schools to apply for geographical exemptions to attend Iroquois Point Elementary.
3) We do not support any future requests for increasing density in the project.
4) We need future legislators to ensure CIP funding for the development of the new intermediate school."

The Ewa Neighborhood Board voted 5-2 in favor of the project, with one member abstaining.

Ewa by Gentry Community Association

The Applicant also made a presentation to the Ewa by Gentry Community Association at a Regular Board of Directors Meeting held on October 24, 2001. The Board voted unanimously to support Gentry's land use entitlement requests. A copy of a letter from Hawaiiana Management, the managing agent for the EbGCA, is also included as part of Appendix L.

Agencies, Organizations and Individuals Consulted

In addition to the Ewa Neighborhood Board and the Ewa by Gentry Community Association, a large number of agencies, organizations, and individuals have been consulted on the Ewa Makai project. The following is a list of consulted parties.

Federal Agencies:
U.S. Army Corps of Engineers
U.S. Environmental Protection Agency, Region IX
U.S. Department of Agriculture, Natural Resources Conversation Service
U.S. Department of the Interior, U.S. Fish and Wildlife Service

State of Hawaii Agencies
Department of Accounting and General Services
Department of Agriculture
Department of Business, Economic Development and Tourism, Land Use Commission
Department of Business, Economic Development and Tourism, Office of Planning
Department of Defense
Department of Health
- Clean Air Branch
- Clean Water Branch
- Environmental Planning Office
- Noise and Radiation Branch
- Safe Drinking Water Branch
- Sanitation Branch
- Solid & Hazardous Waste Branch
- Wastewater Branch

Department of Land and Natural Resources, Engineering Division
Department of Land and Natural Resources, Historic Preservation Division
Department of Transportation
Housing and Community Development Corporation of Hawaii
Oahu Metropolitan Planning Organization
Office of Hawaiian Affairs
University of Hawaii, Environmental Center

City and County of Honolulu Agencies
Board of Water Supply
Department of Community Services
Department of Design and Construction
Department of Environmental Services
Department of Facilities Maintenance
Department of Parks and Recreation
Department of Planning and Permitting
Department of Transportation Services
Honolulu Emergency Services Department
Honolulu Fire Department
Honolulu Police Department

Community Organizations and Private Agencies
Ewa Beach Community Association
Ewa by Gentry Community Association
Ewa Neighborhood Board No. 23
The Gas Company
Hawaiian Electric Company
Makakilo/Kapolei/Honokai Hale Neighborhood Board No. 34
Oceanic Cable
The Outdoor Circle
Verizon Hawaii, Inc.
West Loch Estates Fairways Homeowners Association
West Loch Estates Fairways Townhouses Association

Individuals and Elected Officials
Van Diamond, Oahu Burial Council
Shad Kane, Chair, Committee of Historic Sites & Cultural Properties, Hawn. Civic Club
Arline Wainaha Pu'ulei Brede-Eaton, member of first family to move into Ewa area in the early post-contact years
Kumu Hula John Kaimikaua
Pat Namaka Bacon, Cultural Resource Specialist, Bishop Museum
Dr. Bruce Carlson, Director, Waikiki Aquarium
Thelma G. Parish, Member of early resident family
(Former) Councilmember John DeSoto
Councilmember Mike Gabbard
Senator Willie Espero
Senator Brian Kanno
Representative Romy Mindo
Representative Tulsi Tamayo

Area Landowners
Coral Creek Golf, Inc.
HASEKO (Hawaii), Inc.
Hawaii Prince Hotel Waikiki
The Estate of James Campbell
U.S. Navy
Adjacent Sun Terra property owners

XI. PHOTOS OF SUBJECT PROPERTY

Photographs of the subject property are included as Appendix M.

APPENDICES

DESCRIPTION OF

LOT 4196-B, LAND COURT APPLICATION 1069

ALL that certain piece or parcel of land being Lot 4196-B as shown on Map 626 of Land Court Application 1069 filed in the Office of the Assistant Registrar of the Land Court of the State of Hawaii and being a portion of the land covered by Transfer Certificate of Title No. 312,214 issued to the Trustees Under the Will and of the Estate of James Campbell, deceased.

Situate at Honouliuli, Ewa, Oahu, Hawaii.

Beginning at the southwest corner of this parcel of land, the same being the north corner of Lot 4197 as shown on Map 432 of Land Court Application 1069 and on the easterly side of Fort Weaver Road, FASP No. S-RS-0760 (2), the coordinates of said point of beginning referred to Government Survey Triangulation Station "KAPUAI NEW" being 17,304.85 feet South and 17,782.01 feet East and thence running by azimuths measured clockwise from true South:

1.	150°	20'		661.35 feet along the easterly side of Fort Weaver Road;
2.	248°	45'		4051.84 feet along Lots 12028 and 12030, Ld. Ct. App.1069;
				Thence along Lot 437-C, Ld. Ct. App. 1069 on a curve to the left with a radius of 7405.00 feet, the chord azimuth and distance being
3.	292°	42'	38.6"	1413.51 feet;
4.	41°	38'	40"	1211.73 feet along Lot 4197, Ld. Ct. App. 1069;

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LAND USE COMMISSION
STATE OF HAWAII

				Thence along Lot 4197, Ld. Ct.App. 1069 on a curve to the right with a radius of 430.00 feet, the chord azimuth and distance being
5.	74°	44'	20"	469.58 feet;
6.	107°	50'		360.00 feet along Lot 4197, Ld. Ct. App. 1069;
7.	93°	20'		250.00 feet along Lot 4197, Ld. Ct. App. 1069;
				Thence along Lot 4197, Ld. Ct. App. 1069 on a curve to the left with a radius of 620.00 feet, the chord azimuth and distance being
8.	76°	50'		352.18 feet;
9.	60°	20'		440.00 feet along Lot 4197, Ld. Ct. App.1069;
				Thence along Lot 4197, Ld. Ct. App. 1069 on a curve to the right with a radius of 380.00 feet, the chord azimuth and distance being
10.	83°	47'	30"	302.54 feet;
11.	107°	15'		170.00 feet along Lot 4197, Ld. Ct. App. 1069;
				Thence along Lot 4197, Ld. Ct. App. 1069 on a curve to the left with a radius of 450.00 feet, the chord azimuth and distance being
12.	84°	42'	30"	345.02 feet;
13.	62°	10'		175.00 feet along Lot 4197, Ld. Ct. App. 1069;
				Thence along Lot 4197, Ld. Ct. App. 1069 on a curve to the right with a radius of 710.00 feet, the chord azimuth and distance being

ORIGINAL

14.	74°	25'	301.29 feet;
15.	86°	40'	430.00 feet along Lot 4197, Ld. Ct. App. 1069;
			Thence along 4197, Ld. Ct. App. 1069 on a curve to the left with a radius of 400.00 feet, the chord azimuth and distance being
16.	73°	30'	182.23 feet;
17.	150°	20'	123.00 feet along Lot 4197, Ld. Ct. App. 1069;
18.	60°	20'	300.00 feet along Lot 4197, Ld. Ct. App. 1069 to the point of beginning and containing an area of 114.617 acres.

SUBJECT, HOWEVER, TO Easement 1500 for Access and Utility Purposes as shown on Map 432 of Land Court Application 1069.

SUBJECT, ALSO, HOWEVER, TO a portion of Easement 1989 for Waterline Purposes as shown on Map 453 of Land Court Application 1069.

SUBJECT, ALSO, HOWEVER, TO a portion of Easement 391 as shown on Map 143 of Land Court Application 1069.

SUBJECT, ALSO, HOWEVER, TO the restriction of Access Rights along Fort Weaver Road as shown on Map 422 of Land Court Application 1069.

WALTER P. THOMPSON, INC.

Honolulu, Hawaii
November 9, 1998

98-228a.doc

JAMES R. THOMPSON
LICENSED PROFESSIONAL LAND SURVEYOR
No. 3627
HAWAII, U.S.A.

By _____
Licensed Professional
Land Surveyor 3627

DESCRIPTION OF

LOT 11252-A, LAND COURT APPLICATION 1069

ALL that certain piece or parcel of land being Lot 11252-A as shown on Map 861 of Land Court Application 1069 filed in the Office of the Assistant Registrar of the Land Court of the State of Hawaii and being a portion of the land covered by Transfer Certificate of Title No. 477,507 issued to the Trustees Under the Will and of the Estate of James Campbell, deceased.

Situate at Honouliuli, Ewa, Oahu, Hawaii.

Beginning at the southeast corner of this parcel of land, the same being the north corner of Lot 3425-B-2 as shown on Map 457 of Land Court Application 1069 and on the westerly side of Fort Weaver Road, FASP No. S-RS-0760 (2), the coordinates of said point of beginning referred to Government Survey Triangulation Station "KAPUAI NEW" being 18,604.08 feet South and 18,383.16 feet East and thence running by azimuths measured clockwise from true South:

1.	67°	30'	20"	5719.67 feet along Lot 3425-B-2, Ld. Ct. App. 1069;
2.	154°	02'		824.97 feet along Lot 204-A-2-A-1, Ld. Ct. App. 1069;
3.	244°	02'		3198.34 feet along Lots 10074, 11985-A and 11986, Ld. Ct. App. 1069;
4.	163°	00'		1270.00 feet along Lot 11986, Ld. Ct. App. 1069;
5.	250°	50'		2150.00 feet along Lots 7695, 7621 through 7599 (inclusive), 7455 through 7432 (inclusive) and Lot 7458, Ld. Ct. App. 1069;

6.	330°	20'		751.35 feet along the westerly side of Fort Weaver Road;
7.	60°	20'		563.37 feet along Lot 11252-B, Ld. Ct. App. 1069;
				Thence along Lot 11252-B, Ld. Ct. App. 1069 on a curve to the left with a radius of 500.00 feet, the chord azimuth and distance being
8.	45°	41'	30"	252.77 feet;
9.	31°	03'		669.83 feet along Lot 11252-B, Ld. Ct. App.1069;
10.	288°	28'		531.20 feet along Lot 11252-B, Ld. Ct. App. 1069;
11.	238°	16'		1053.18 feet along Lot 11252-B, Ld. Ct. App. 1069;
12.	328°	16'		677.78 feet along the westerly side of Fort Weaver Road to the point of beginning and containing an area of 167.997 acres.

SUBJECT, HOWEVER, TO Easement 6099 for Access and Utility Purposes as shown on Map 861 of Land Court Application 1069.

SUBJECT, ALSO, HOWEVER, TO the restriction of Access Rights along Fort Weaver Road as shown on Map 365 of Land Court Application 1069.

WALTER P. THOMPSON, INC.

Honolulu, Hawaii
November 9, 1998

98-228.doc

JAMES R. THOMPSON
LICENSED PROFESSIONAL LAND SURVEYOR
No. 3627
HAWAII, U.S.A.

By James R. Thompson
Licensed Professional
Land Surveyor 3627

720 IWILEI ROAD
WALTER P. THOMPSON, INC.
SURVEYING & MAPPING
HONOLULU, HI

(amendment)

I hereby certify that this is a true copy from the records of the Bureau of Conveyances, as 2634843 + 2634844. (Partial Release)

M. Kekua-Kaluniak

For Registrar of Conveyances
Assistant Registrar, Land Court
State of Hawaii

JUN 29 2000

LAND COURT SYSTEM | REGULAR SYSTEM

Return by Mail ☐ Pickup ☐ To:

Carlsmith Ball
1001 Bishop Street
Suite 2200, Pacific Tower
Honolulu, Hawaii 96813
Attention: Eric A. James, Esq. (808) 523-2500

TITLE OF DOCUMENT:

AMENDED AND RESTATED SHORT FORM MEMORANDUM OF AGREEMENT; PARTIAL RELEASE (Fourth Amended and Restated Development Agreement)

PARTIES TO DOCUMENT:

FIRST PARTY:	**C.R. CHURCHILL, D.A. HEENAN and RICHARD W. GUSHMAN, II,** the duly appointed, qualified and acting **TRUSTEES UNDER THE WILL AND OF THE ESTATE OF JAMES CAMPBELL, DECEASED,** acting in their fiduciary and not in their individual capacities
SECOND PARTY:	**GENTRY INVESTMENT PROPERTIES,** a Hawaii limited partnership 560 N. Nimitz Highway, Honolulu, Hawaii 96817
TAX MAP KEY(S):	(Oahu) 9-2-01-11 (por.) **Certificate of Title No. 487,358 (as to Lot 12004);** (Oahu) 9-1-69-05 (por.) **Certificate of Title No. 477,507 (as to Lot 11252-A)** (Oahu) 9-1-69-09 **Certificate of Title No. 477,507 (as to Lot 11252-B);** (Oahu) 9-1-10-02 (por.) **Certificate of Title No. 410,912 (as to Lot 302-A-1-B-1); and** (Oahu) 9-1-10-07 **Certificate of Title No.410,914 (as to Lot 4196-B)** (This document consists of 9 pages.)

2003 MAR 21 A 9:11

STATE OF HAWAII
LAND USE COMMISSION

AMENDED AND RESTATED SHORT FORM MEMORANDUM OF AGREEMENT; PARTIAL RELEASE
(Fourth Amended and Restated Development Agreement)

THIS INSTRUMENT is made as of June 15, 2000, by and between **C.R. CHURCHILL, D.A. HEENAN and RICHARD W. GUSHMAN, II,** the duly appointed, qualified and acting **TRUSTEES UNDER THE WILL AND OF THE ESTATE OF JAMES CAMPBELL, DECEASED,** acting in their fiduciary and not in their individual capacities, (the "Estate"), and **GENTRY INVESTMENT PROPERTIES,** a Hawaii limited partnership (formerly known as Gentry Development Company), having its principal place of business and post office address at 560 N. Nimitz Highway, Honolulu, Hawaii 96817 ("Gentry").

WITNESSETH:

WHEREAS, the Estate and Gentry entered into that certain unrecorded Third Amended and Restated Development Agreement dated November 14, 1995, a short form memorandum (the "Original Memorandum of Agreement") of which is filed in the Office of the Assistant Registrar of the Land Court of the State of Hawaii as Document No. 2273812, and noted on **Certificate of Title No. 477,507 (as to Lot 11252-A and Lot 11252-B), Certificate of Title No. 410,912 (as to 302-A-1-B-1), Certificate of Title No. 410,914 (as to Lot 4196-B) and Certificate of Title No. 487,358 (as to Lot 12004),** affecting that certain real property situate at Honouliuli, District of Ewa, City and County of Honolulu, Island of Oahu, State of Hawaii more fully described therein.

WHEREAS, the parties desire to release Lot 12004 and Lot 11252-B from the above referenced unrecorded Third Amended and Restated Development Agreement.

WHEREAS, the parties desire to amend and restate the Original Memorandum of Agreement in its entirety to reflect the parties' execution of that certain unrecorded Fourth Amended and Restated Development Agreement.

NOW, THEREFORE, in consideration of the foregoing, and subject to the condition set forth below, the undersigned do hereby declare as follows:

A. Partial Release of Short Form Memorandum of Agreement.

That certain unrecorded Third Amended and Restated Development Agreement dated November 14, 1995, by and between the Trustees under the Will and of the Estate of James

ORIGINAL

Campbell, Deceased and Gentry Investment Properties, a Hawaii limited partnership (formerly known as Gentry Development Company), a short form memorandum of which is filed in the Office of the Assistant Registrar of the Land Court of the State of Hawaii as Document No. 2273812, is hereby released from: (a) **Lot 12004**, as shown on Map 884 of Land Court Application No. 1069, being all of the land covered by **Certificate of Title No. 487,358**; and (b) **Lot 11252-B**, as shown on Map 861 of Land Court Application No. 1069, being a portion of the land covered by **Certificate of Title No. 477,507**, and such agreement shall hereafter be of no further force and effect as to such land. It is the intent of the undersigned parties, the only parties in interest with respect to the Original Memorandum of Agreement, that both the underlying unrecorded Third Amended and Restated Development Agreement and the Original Memorandum of Agreement of the same shall no longer affect Lot 12004 and Lot 11252-B.

B. Amendment and Restatement of Original Memorandum of Agreement.

The Original Memorandum of Agreement, being that certain instrument filed in the Office of the Assistant Registrar of the Land Court of the State of Hawaii as Document No. 2273812, shall be and is hereby amended and restated in its entirety as follows:

WHEREAS, the Trustees under the Will and of the Estate of James Campbell, Deceased and Gentry Investment Properties, a Hawaii limited partnership, have concurrently entered into that certain unrecorded Fourth Amended and Restated Development Agreement dated June 15, 2000 (the "Fourth Amended and Restated Development Agreement");

WHEREAS, the Estate and Gentry desire to give formal notice of the existence of the Fourth Amended and Restated Development Agreement by amending and restating the Original Memorandum of Agreement in its entirety;

NOW THEREFORE, the parties agree and acknowledge that, pursuant to the terms, covenants, and conditions of the Fourth Amended and Restated Development Agreement and the Exhibits thereto, the Estate has granted Gentry the right to require the Estate to convey the properties defined in the Fourth Amended and Restated Development Agreement and the Exhibits thereto as the "Laulani Property" and the "Fairway Properties" (collectively the "Estate Properties") more particularly described in **Exhibit 1** attached hereto and incorporated herein by this reference, and that Gentry has granted the Estate certain rights to require Gentry to acquire the "Laulani Property" and the "Fairway Properties".

The parties agree that upon conveyance to Gentry of any of the Estate Properties, the parties will execute and file a partial release of this Amended and Restated Short Form Memorandum of Agreement as to the property conveyed.

The parties further agree that upon termination of the Fourth Amended and Restated Development Agreement pursuant to the terms, conditions and covenants of the Fourth Amended and Restated Development Agreement and the Exhibits thereto, this Amended and Restated Short Form Memorandum of Agreement shall be of no further force or effect and will be removed from record. The parties will execute and file such agreements as are necessary to effect such cancellation.

In the event of a conflict between the terms of this Amended and Restated Short Form Memorandum of Agreement and the terms of the Fourth Amended and Restated Development Agreement, the terms of the Fourth Amended and Restated Development Agreement shall prevail.

This Amended and Restated Short Form Memorandum of Agreement may be executed in counterparts, each of which so executed shall, irrespective of the date of its execution and delivery, be deemed an original, and the counterparts together shall constitute one and the same instrument.

This Amended and Restated Memorandum of Agreement shall have the same priority as to the above referenced land as the Original Short Form Memorandum of Agreement.

Any liability which may arise as a consequence of the execution of this instrument by or on behalf of the Trustees under the Will and of the Estate of James Campbell, Deceased, shall be a liability of the Estate of James Campbell, and not the personal liability of any trustee or employee of the Estate of James Campbell.

IN WITNESS WHEREOF, the parties have executed these presents as of the date first above written.

GENTRY INVESTMENT PROPERTIES, a Hawaii limited partnership

By GENTRY-PACIFIC, LTD.,
a Hawaii corporation
Its General Partner

By _____
Its President, Norman Gentry

By _____
Its Secretary, Dawn Suyenaga

TRUSTEES UNDER THE WILL AND OF THE ESTATE OF JAMES CAMPBELL, DECEASED, acting in their individual capacities

_____
C.R. Churchill

_____
D.A. Heenan

_____
Richard W. Gushman, II

IN WITNESS WHEREOF, the parties have executed these presents as of the date first above written.

GENTRY INVESTMENT PROPERTIES, a Hawaii limited partnership

By GENTRY-PACIFIC, LTD.,
a Hawaii corporation
Its General Partner

By _____
Its

By _____
Its

TRUSTEES UNDER THE WILL AND OF THE ESTATE OF JAMES CAMPBELL, DECEASED, acting in their individual capacities

_____
C.R. Churchill

_____
D.A. Heenan

_____
Richard W. Gushman, II

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6/14/00 Execution Copy

STATE OF HAWAII)
) ss.
CITY AND COUNTY OF HONOLULU)

On this 15th day of June, 2000 before me personally appeared Norman Gentry, and Dawn Sugenaga, to me personally known/proved to me on the basis of satisfactory evidence, who, being by me duly sworn or affirmed, did say that such persons executed foregoing instrument as the free act and deed of such persons, and if applicable in the capacity shown, having been duly authorized to execute such instrument in such capacity.

COLETTE L. ANDRADE-FUJII NOTARY PUBLIC STATE OF HAWAII

Colette Andrade-Fujii
Name: Colette L. Andrade-Fujii
Notary Public, State of Hawaii

My Commission expires: 7/17/2000

1368849.2.doc
6/14/00 Execution Copy

STATE OF HAWAII }
} SS.
CITY AND COUNTY OF HONOLULU }

On this 15th day of June, 2000, before me personally appeared C. R. Churchill, D. A. Heenan, and Richard W. Gushman, II, Trustees Under the Will and of The Estate of James Campbell, Deceased, to me known to be the persons described in and who severally executed the foregoing instrument, and severally acknowledged that they executed the same as their free act and deed as such Trustees.

Lydia L. Hannemann
Printed Name: Lydia L. Hannemann
Notary Public, State of Hawaii
My commission expires: Feb. 11, 2004

EXHIBIT 1

All of those certain parcels of land situate at Honouliuli, District of Ewa, City and County of Honolulu, Island of Oahu, State of Hawaii, described as follows:

LAULANI PROPERTY:

LOT 11252-A, area 167.997 acres, as shown on Map 861, filed in the Office of the Assistant Registrar of the Land Court of the State of Hawaii with Land Court Application No. 1069 of the Trustees under the Will and of the Estate of James Campbell, Deceased.

BEING a portion of the land described in **Certificate of Title No. 477,507** issued of the Trustees under the Will and of the Estate of James Campbell, Deceased.

FAIRWAY PROPERTIES:

LOT 302-A-1-B-1, area 40.473 acres, as shown on Map 790, filed in the Office of the Assistant Registrar of the Land Court of the State of Hawaii with Land Court Application No. 1069 of the Trustees under the Will and of the Estate of James Campbell, Deceased.

BEING a portion of the land described in **Certificate of Title No. 410,912** issued of the Trustees under the Will and of the Estate of James Campbell, Deceased.

LOT 4196-B, area 114.617 acres, as shown on Map 626, filed in the Office of the Assistant Registrar of the Land Court of the State of Hawaii with Land Court Application No. 1069 of the Trustees under the Will and of the Estate of James Campbell, Deceased.

BEING a portion of the land described in **Certificate of Title No. 410,914** issued of the Trustees under the Will and of the Estate of James Campbell, Deceased.

(Oahu) 9-2-01-11 (por.): **Certificate of Title No. 487,358 (as to Lot 12004);**
(Oahu) 9-1-69-05 (por.): **Certificate of Title No. 477,507 (as to Lot 11252-A)**
(Oahu) 9-1-69-09: **Certificate of Title No. 477,507 (as to Lot 11252-B);**
(Oahu) 9-1-10-02 (por.): **Certificate of Title No. 410,912 (as to Lot 302-A-1-B-1); and**
(Oahu) 9-1-10-07: **Certificate of Title No.410,914 (as to Lot 4196-B)**

End of Exhibit 1

Island Title
CORPORATION

Title Division, 1132 Bishop Street, Suite 400
Honolulu, Hawaii 96813
Telephone: (808) 531-0261
Facsimile: (808) 524-1251
Website: www.itchawaii.com

INFORMATION

Commitment No.: **00217045**
Your Reference: **The Gentry Companies**

The Title Insurance Commitment is a legal contract between you and the Company. It is issued to show the basis on which we will issue a Title Insurance Policy to you. The Policy will insure you against certain risks to the land title, subject to the limitations shown on the Policy.

The Company will give you a sample of the Policy form, if you ask.

The Commitment is based on the land title as of the Commitment Date. Any changes in the land title or the transaction may affect the Commitment and the Policy.

The Commitment is subject to its Requirements, Exceptions and Conditions.

THIS INFORMATION AND THE ATTACHED PRIVACY NOTICES ARE NOT A PART OF THE TITLE INSURANCE COMMITMENT. YOU SHOULD READ THE COMMITMENT VERY CAREFULLY.

If you have any questions about this Commitment, contact **Sean Matsumura** by telephone at **(808) 531-0261**, by facsimile at **(808) 524-1251**, or by E-Mail at **smatsumura@itchawaii.com**.

TABLE OF CONTENTS

AGREEMENT TO ISSUE POLICY	
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EXCEPTIONS	Schedule B-II
DESCRIPTION OF THE LAND	Schedule C

2003 MAR 21 A 9:12
LAND USE COMMISSION
STATE OF HAWAII

TITLE INSURANCE COMMITMENT
BY
First American Title Insurance Company

AGREEMENT TO ISSUE POLICY

We agree to issue a policy to you according to the terms of the Commitment. When we show the policy amount and your name as the proposed insured in Schedule A, this Commitment becomes effective as of the Commitment Date shown in Schedule A.

If the Requirements shown in this Commitment have not been met within six months after the Commitment Date, our obligation under this Commitment will end. Also, our obligation under this Commitment will end when the Policy is issued and then our obligation to you will be under the Policy.

Our obligations under this Commitment is limited by the following:

The Provisions in Schedule A.

The Requirements in Schedule B-I.

The Exceptions in Schedule B-II.

The Conditions on Page 2.

This Commitment is not valid without SCHEDULE A and Sections I and II of SCHEDULE B.

IN WITNESS WHEREOF, **First American Title Insurance Company** has caused its corporate name to be hereunto affixed by its duly authorized agents on the date shown in Schedule A.

First American Title Insurance Company

By its authorized issuing agent

Island Title Corporation
Title Division, 1132 Bishop Street, Suite 400
Honolulu,HI 96813

_____
Title Officer

ORIGINAL

CONDITIONS

1. DEFINITIONS

(a) "Mortgage" means mortgage, deed of trust or other security instrument. (b) "Public Records" means title records that give constructive notice of matters affecting your title according to the state statutes where your land is located.

2. LATER DEFECTS

The Exceptions in Schedule B - Section II may be amended to show any defects, liens or encumbrances that appear for the first time in the public records or are created or attached between the Commitment Date and the date on which all of the Requirements (1) and (3) of Schedule B - Section I are met. We shall have no liability to you because of this amendment.

3. EXISTING DEFECTS

If any defects, liens or encumbrances existing at Commitment Date are not shown in Schedule B, we may amend Schedule B to show them. If we do amend Schedule B to show these defects, liens or encumbrances, we shall be liable to you according to Paragraph 4 below unless you knew of this information and did not tell us about it in writing.

4. LIMITATION OF OUR LIABILITY

Our only obligation is to issue to you the policy referred to in this Commitment when you have met its Requirements. If we have any liability to you for any loss you incur because of an error in this Commitment, our liability will be limited to your actual loss caused by your relying on this Commitment when you acted in good faith to:

Comply with the Requirements shown in Schedule B - Section I
or
Eliminate with our written consent any Exceptions shown in Schedule B - Section II.

We shall not be liable for more than the Policy Amount shown in Schedule A of this Commitment and our liability is subject to the terms of the Policy form to be issued to you.

5. CLAIMS MUST BE BASED ON THIS COMMITMENT

Any claim, whether or not based on negligence, which you may have against us concerning the title to the land must be based on this Commitment and is subject to its terms.

Island Title Corporation
Commitment No.: 00217045

SCHEDULE A

1. Commitment Date: **December 30, 2002** at **8:00 a.m.**

2. Policy (or policies) to be issued:

(a) **None** Policy Amount $
Proposed Insured:
[ ]

(b) **None** Policy Amount $
Proposed Insured:
[ ]

(c) **None** Policy Amount $
Proposed Insured:
[ ]

3. The estate or interest in the land which is covered by this Commitment is **[Fee Simple]** and is owned, at the Commitment Date by:

C.R. CHURCHILL, D.A. HEENAN, RICHARD W. GUSHMAN, II, and RONALD J. ZLATOPER, jointly as Trustees under the Will and of the Estate of James Campbell, Deceased

4. The land referred to in this Commitment is described as follows: **See Schedule C attached**

SCHEDULE B - SECTION I

REQUIREMENTS

The following requirements must be met:

1. Pay the agreed amounts for the interest in the land and/or the mortgage to be insured.
2. Pay us the premiums, fees and charges for the policy.
3. Documents satisfactory to us creating the interest in the land and/or mortgage to be insured must be signed, delivered and recorded.
4. You must tell us in writing the name of anyone not referred to in this Commitment who will get an interest in the land or who will make a loan on the land. We may then make additional requirements or exceptions.
5. You must tell us in writing if the funds from any loan to be insured will be used for construction and/or home improvement purposes. We may then make additional requirements or exceptions.
6. You must tell us in writing of any changes in the marital status of anyone with a recorded interest in the land. We may then make additional requirements or exceptions.
7. You must tell us in writing if you will be submitting Releases for any of the exceptions noted in Schedule B, Section II, Part II after the recordation of the documents creating the interest to be insured.
8. **This Commitment for Title Insurance has been issued as a status report only and no liability is assumed hereunder. In the event that this order is amended in the future to include the purchase of title insurance, we reserve the right to update this Commitment to include additional requirements and/or exceptions.**

SCHEDULE B - SECTION II

EXCEPTIONS

Any policy we issue will have the following exceptions unless they are taken care of to our satisfaction.

PART I:

NOTE: Items 2 through 6 will not appear on an ALTA Extended Coverage Loan Policy provided that the requirements appearing under Schedule B - Section I of this commitment have been complied with.

1. Taxes or assessments which are not shown at Date of Policy, as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records. Proceedings by a public agency which may result in taxes or assessments, reassessments, or notices of such proceedings, whether or not shown by the records of such agency or by the public records.
2. Any facts, rights, interests, or claims which are not shown by the public records but which could be ascertained by an inspection of said land or by making inquiry of persons in possession thereof.
3. Easements, claims of easement or encumbrances which are not shown by the public records.
4. Unpatented mining claims; reservations or exceptions in patents or in acts authorizing the issuance thereof; water rights, claims or title to water.
5. Any lien, or right to a lien for services, labor or material theretofore or hereafter furnished, imposed by law and not shown by the public records.
6. Discrepancies, conflicts in boundary lines, shortage in area, encroachments, or any other facts which a correct survey would disclose, and which are not shown by public records.

PART II:

1. Tax Map Key: 9-1-69-5, County of Honolulu. Area Assessed: 168.052 acres, more or less. Real Property Taxes for the Fiscal Year 2002-2003:

1st Installment:	$209.67	Paid
2nd Installment:	$209.67	Open (Due February 20, 2003)
Assessed Values:	(2002)	
Improvements:	$ ----	
Exemption:	$ ----	
Land:	$42,400.00	
Exemption:	$ ----	
Total Value:	$42,400.00	
Net Value:	$42,400.00	
(Class 5)		

2. Title to all minerals and metallic mines reserved to the State of Hawaii.

3. Covenants, conditions, restrictions, reservations, agreements, obligations, easements and other provisions set forth in the Ewa By Gentry Community Area Declaration of Covenants, Conditions and Restrictions:

Dated: July 21, 1998
Filed: Document No. 1568352
to which reference is hereby made, but deleting any covenant, condition or restriction indicating a preference, limitation or discrimination based on race, color, religion, sex, handicap, familial status, or national origin to the extent such covenants, conditions or restrictions violate 42 USC 3604(c) or Section 515-6, HRS

AMENDMENTS TO DECLARATION

DATED:	DOCUMENT NO.
May 30, 1989	1652869
June 21, 1991	1888053

AMENDMENT BY ADDITION OF REAL PROPERTY

Dated: July 20, 2000
Filed: Document No. 2639394

SCHEDULE B-II - Continued

4. Abutters right of access acquired by the State of Hawaii in Civil No. 62550 in the Circuit Court of the First Circuit, State of Hawaii, by Amended Final Order of Condemnation:

Dated: April 1, 1987
Filed: Document No. 1455569

AND AS SET FORTH BY:

Land Court Order No.: 70754, Map 366
Land Court Application No. 1069
Filed: August 9, 1984

5. Restriction of access rights as set forth by

Land Court Order No. 93896, Map 473
Land Court Application No. 1069
Filed: June 5, 1989

6. Covenants, conditions, restrictions, reservations, agreements, obligations, easements and other provisions set forth in the Declaration of Covenant Regarding Non-Potable Water Wells:

Dated: May 19, 1993
Filed: Document No. 2032652
to which reference is hereby made, but deleting any covenant, condition or restriction indicating a preference, limitation or discrimination based on race, color, religion, sex, handicap, familial status, or national origin to the extent such covenants, conditions or restrictions violate 42 USC 3604(c) or Section 515-6, HRS

7. SHORT FORM MEMORANDUM OF AGREEMENT (Third Amended and Restated Development Agreement):

Dated: November 15, 1995
Filed: Document No. 2273812
By and between: P.R. Cassiday, C.D. Pratt, Jr., C.R. Churchill, D.A. Heenan, the duly appointed, qualified and acting Trustees under the Will and of the Estate of James Campbell, Deceased, acting in the fiduciary and not in their individual capacities, "Estate", and Gentry Development Company, a Hawaii limited partnership, "Gentry"

SCHEDULE B-II - Continued

AMENDED AND RESTATED SHORT FORM MEMORANDUM OF AGREEMENT; PARTIAL RELEASE (Fourth Amended and Restated Development Agreement):

Dated: June 15, 2000
Filed: Document Nos. 2634843 and 2634844
(Also affects other property)

8. EASEMENT 6933, as set forth by:

Land Court Order No.: 137787, Map 1005
Land Court Application No. 1069
Filed: March 6, 2000
Purpose: Temporary Access and utility purposes

9. EASEMENT 6934, as set forth by:

Land Court Order No.: 137787, Map 1005
Land Court Application No. 1069
Filed: March 6, 2000
Purpose: Transformer Vault

10. SHORT FORM MEMORANDUM OF INFRASTRUCTURE PLAN (Fourth Amended and Restated Development Agreement):

Dated: June 15, 2000
Filed: Document No. 2634847
By and between: C.R. Churchill, D.A. Heenan, and Richard W. Gushman II, the duly appointed, qualified and acting Trustees under the Will and of the Estate of James Campbell, Deceased, acting in their fiduciary and not their individual capacities "Estate" and Gentry Investment Properties, a Hawaii limited partnership

11. EASEMENT 7202, as set forth by:

Land Court Order No.: 139836, Map 1048
Land Court Application No. 1069
Filed: October 17, 2000
Purpose: Drainage

12. EASEMENT 7203, as set forth by:

SCHEDULE B-II - Continued

Land Court Order No.: 139836, Map 1048
Land Court Application No. 1069
Filed: October 17, 2000
Purpose: Flowage and Switching Vault

NOTE:

The name of Gentry Development Company, a Hawaii limited partnership, has been legally changed to Gentry Investment Properties, a Hawaii limited partnership, as set forth by Land Court Order No. 123770, filed March 25, 1996.

SCHEDULE C

That certain parcel of land situate at Honouliuli, Ewa, Island of Oahu, State of Hawaii, described as follows:

Lot 11252-A, area 168.052 acres, more or less, as shown on Map 861, filed in the Office of the Assistant Registrar of the Land Court of the State of Hawaii with Land Court Application No. 1069 of the Trustees under the Will and of the Estate of James Campbell, deceased.

Being a portion of the land described in Transfer Certificate of Title No. 477,507 issued to the Trustees under the Will and of the Estate of James Campbell, deceased.

NOTE: Lot 11252-A will have access to and from Fort Weaver Road via Easement 6099, as shown on map 861, filed in the Office of the Assistant Registrar of the Land Court of the State of Hawaii with Land Court Application No. 1069.

Island Title Corporation Privacy Notice

Island Title Corporation, its Island Contract Collections division, and its affiliated companies, Island Title Exchange and Real Estate/Title Solutions, LLC ("Island Title") respect your right to privacy. We believe it is important that you know how we use personal identifiable information, also called nonpublic personal information, which we collect from you. The purpose of this notice is to advise you how we meet federal regulations to guard your nonpublic personal information in real estate transactions that we handle for personal, family, or household purposes. We are required by law to give you this privacy notice if you have a customer relationship with us

Information We Collect

If you are a seller, buyer, or borrower in a real estate transaction for which a title order, an escrow, or collection account has been set up at Island Title, nonpublic personal information we collect usually comes from several sources such as:

- Information provided by you on any applications, supporting documents, or other forms, such as your name, address, and Social Security number.
- Information provided by your lender, real estate sales agent, or others, including those provided online through our Web site, such as your loan number, account balance, and where you work.
- Information from your transactions with our company or affiliates and kept by us such as the number and type of transactions we have handled in the past for you.

Our Information Disclosure Practices

- We may disclose all of the information we collect above as permitted by law.
- We do not disclose any nonpublic personal information about you, even when you are a former customer, with anyone, except as permitted by law.
    1. For example, the law permits us to disclose nonpublic personal information with non-affiliated third parties such as title insurance underwriters or real estate attorneys to process your request for our products or services.
    2. The law also permits us to disclose nonpublic personal information about you to our own auditors or to state and federal regulatory agencies such as state bank examiners or the Internal Revenue Service.
    3. If we are requested to disclose nonpublic personal information about you because of a subpoena or similar legal process, we attempt to notify you that your escrow records containing confidential information have been requested unless we are prohibited by law or by court order.
    4. Your right to opt out from disclosing information in the above examples would not apply. They are disclosures permitted by law. "Opt out" means a choice you can make to tell us not to disclose information about you.
- We do not disclose or sell nonpublic personal information about you to direct marketers, retailers, or to for-profit or non-profit organizations.

How We Guard Your Information

It is our company policy to handle your nonpublic personal information with utmost confidentiality.

- To keep your information safe and secure, we maintain physical, electronic, and procedural safeguards that comply with federal regulations.
- We restrict access to nonpublic personal information about you to those Island Title employees who need the information in order to provide you with our products or services.
- We train our employees to make sure that your nonpublic personal information will be handled responsibly according to this privacy notice.

Changes to Our Privacy Notice

- We may amend this privacy notice if our policies or practices change and we will inform you of those changes as required by law.
- You will receive a privacy notice from us annually so long as you maintain an ongoing customer relationship with Island Title.

The First American Corporation

FIRST AMERICAN TITLE INSURANCE COMPANY

Privacy Policy

We Are Committed to Safeguarding Customer Information

In order to better serve your needs now and in the future, we may ask you to provide us with certain information. We understand that you may be concerned about what we will do with such information – particularly any personal or financial information. We agree that you have a right to know how we will utilize the personal information you provide to us. Therefore, together with our parent company, The First American Corporation, we have adopted this Privacy Policy to govern the use and handling of your personal information.

Applicability

This Privacy Policy governs our use of the information which you provide to us. It does not govern the manner in which we may use information we have obtained from any other source, such as information obtained from a public record or from another person or entity. First American has also adopted broader guidelines that govern our use of personal information regardless of its source. First American calls these guidelines its *Fair Information Values*, a copy of which can be found on our website at www.firstam.com.

Types of Information

Depending upon which of our services you are utilizing, the types of nonpublic personal information that we may collect include:

- Information we receive from you on applications, forms and in other communications to us, whether in writing, in person, by telephone or any other means;
- Information about your transactions with us, our affiliated companies, or others; and
- Information we receive from a consumer reporting agency.

Use of Information

We request information from you for our own legitimate business purposes and not for the benefit of any nonaffiliated party. Therefore, we will not release your information to nonaffiliated parties except: (1) as necessary for us to provide the product or service you have requested of us; or (2) as permitted by law. We may, however, store such information indefinitely, including the period after which any customer relationship has ceased. Such information may be used for any internal purpose, such as quality control efforts or customer analysis. We may also provide all of the types of nonpublic personal information listed above to one or more of our affiliated companies. Such affiliated companies include financial service providers, such as title insurers, property and casualty insurers, and trust and investment advisory companies, or companies involved in real estate services, such as appraisal companies, home warranty companies, and escrow companies. Furthermore, we may also provide all the information we collect, as described above, to companies that perform marketing services on our behalf, on behalf of our affiliated companies, or to other financial institutions with whom we or our affiliated companies have joint marketing agreements.

Former Customers

Even if you are no longer our customer, our Privacy Policy will continue to apply to you.

Confidentiality and Security

We will use our best efforts to ensure that no unauthorized parties have access to any of your information. We restrict access to nonpublic personal information about you to those individuals and entities who need to know that information to provide products or services to you. We will use our best efforts to train and oversee our employees and agents to ensure that your information will be handled responsibly and in accordance with this Privacy Policy and First American's *Fair Information Values*. We currently maintain physical, electronic, and procedural safeguards that comply with federal regulations to guard your nonpublic personal information.

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Island Title
CORPORATION

Title Division, 1132 Bishop Street, Suite 400
Honolulu, Hawaii 96813
Telephone: (808) 531-0261
Facsimile: (808) 524-1251
Website: www.itchawaii.com

INFORMATION

Commitment No.: **00217046**
Your Reference: **The Gentry Companies**

The Title Insurance Commitment is a legal contract between you and the Company. It is issued to show the basis on which we will issue a Title Insurance Policy to you. The Policy will insure you against certain risks to the land title, subject to the limitations shown on the Policy.

The Company will give you a sample of the Policy form, if you ask.

The Commitment is based on the land title as of the Commitment Date. Any changes in the land title or the transaction may affect the Commitment and the Policy.

The Commitment is subject to its Requirements, Exceptions and Conditions.

THIS INFORMATION AND THE ATTACHED PRIVACY NOTICES ARE NOT A PART OF THE TITLE INSURANCE COMMITMENT. YOU SHOULD READ THE COMMITMENT VERY CAREFULLY.

If you have any questions about this Commitment, contact **Sose Sauvao** by telephone at **(808) 531-0261**, by facsimile at **(808) 524-1251**, or by E-Mail at **ssauvao@itchawaii.com**.

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Island Title Corporation Privacy Notice

Island Title Corporation, its Island Contract Collections division, and its affiliated companies, Island Title Exchange and Real Estate/Title Solutions, LLC ("Island Title") respect your right to privacy. We believe it is important that you know how we use personal identifiable information, also called nonpublic personal information, which we collect from you. The purpose of this notice is to advise you how we meet federal regulations to guard your nonpublic personal information in real estate transactions that we handle for personal, family, or household purposes. We are required by law to give you this privacy notice if you have a customer relationship with us

Information We Collect

If you are a seller, buyer, or borrower in a real estate transaction for which a title order, an escrow, or collection account has been set up at Island Title, nonpublic personal information we collect usually comes from several sources such as:

- Information provided by you on any applications, supporting documents, or other forms, such as your name, address, and Social Security number.
- Information provided by your lender, real estate sales agent, or others, including those provided online through our Web site, such as your loan number, account balance, and where you work.
- Information from your transactions with our company or affiliates and kept by us such as the number and type of transactions we have handled in the past for you.

Our Information Disclosure Practices

- We may disclose all of the information we collect above as permitted by law.
- We do not disclose any nonpublic personal information about you, even when you are a former customer, with anyone, except as permitted by law.
    1. For example, the law permits us to disclose nonpublic personal information with non-affiliated third parties such as title insurance underwriters or real estate attorneys to process your request for our products or services.
    2. The law also permits us to disclose nonpublic personal information about you to our own auditors or to state and federal regulatory agencies such as state bank examiners or the Internal Revenue Service.
    3. If we are requested to disclose nonpublic personal information about you because of a subpoena or similar legal process, we attempt to notify you that your escrow records containing confidential information have been requested unless we are prohibited by law or by court order.
    4. Your right to opt out from disclosing information in the above examples would not apply. They are disclosures permitted by law. "Opt out" means a choice you can make to tell us not to disclose information about you.
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How We Guard Your Information

It is our company policy to handle your nonpublic personal information with utmost confidentiality.

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The First American Corporation

FIRST AMERICAN TITLE INSURANCE COMPANY

Privacy Policy

We Are Committed to Safeguarding Customer Information

In order to better serve your needs now and in the future, we may ask you to provide us with certain information. We understand that you may be concerned about what we will do with such information – particularly any personal or financial information. We agree that you have a right to know how we will utilize the personal information you provide to us. Therefore, together with our parent company, The First American Corporation, we have adopted this Privacy Policy to govern the use and handling of your personal information.

Applicability

This Privacy Policy governs our use of the information which you provide to us. It does not govern the manner in which we may use information we have obtained from any other source, such as information obtained from a public record or from another person or entity. First American has also adopted broader guidelines that govern our use of personal information regardless of its source. First American calls these guidelines its *Fair Information Values*, a copy of which can be found on our website at www.firstam.com.

Types of Information

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- Information we receive from you on applications, forms and in other communications to us, whether in writing, in person, by telephone or any other means;
- Information about your transactions with us, our affiliated companies, or others; and
- Information we receive from a consumer reporting agency.

Use of Information

We request information from you for our own legitimate business purposes and not for the benefit of any nonaffiliated party. Therefore, we will not release your information to nonaffiliated parties except: (1) as necessary for us to provide the product or service you have requested of us; or (2) as permitted by law. We may, however, store such information indefinitely, including the period after which any customer relationship has ceased. Such information may be used for any internal purpose, such as quality control efforts or customer analysis. We may also provide all of the types of nonpublic personal information listed above to one or more of our affiliated companies. Such affiliated companies include financial service providers, such as title insurers, property and casualty insurers, and trust and investment advisory companies, or companies involved in real estate services, such as appraisal companies, home warranty companies, and escrow companies. Furthermore, we may also provide all the information we collect, as described above, to companies that perform marketing services on our behalf, on behalf of our affiliated companies, or to other financial institutions with whom we or our affiliated companies have joint marketing agreements.

Former Customers

Even if you are no longer our customer, our Privacy Policy will continue to apply to you.

Confidentiality and Security

We will use our best efforts to ensure that no unauthorized parties have access to any of your information. We restrict access to nonpublic personal information about you to those individuals and entities who need to know that information to provide products or services to you. We will use our best efforts to train and oversee our employees and agents to ensure that your information will be handled responsibly and in accordance with this Privacy Policy and First American's *Fair Information Values*. We currently maintain physical, electronic, and procedural safeguards that comply with federal regulations to guard your nonpublic personal information.

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American Land Title Association Commitment - 1982

TITLE INSURANCE COMMITMENT
BY
First American Title Insurance Company

AGREEMENT TO ISSUE POLICY

We agree to issue a policy to you according to the terms of the Commitment. When we show the policy amount and your name as the proposed insured in Schedule A, this Commitment becomes effective as of the Commitment Date shown in Schedule A.

If the Requirements shown in this Commitment have not been met within six months after the Commitment Date, our obligation under this Commitment will end. Also, our obligation under this Commitment will end when the Policy is issued and then our obligation to you will be under the Policy.

Our obligations under this Commitment is limited by the following:

The Provisions in Schedule A.

The Requirements in Schedule B-I.

The Exceptions in Schedule B-II.

The Conditions on Page 2.

This Commitment is not valid without SCHEDULE A and Sections I and II of SCHEDULE B.

IN WITNESS WHEREOF, **First American Title Insurance Company** has caused its corporate name to be hereunto affixed by its duly authorized agents on the date shown in Schedule A.

First American Title Insurance Company

By its authorized issuing agent

Island Title Corporation
Title Division, 1132 Bishop Street, Suite 400
Honolulu,HI 96813

Title Officer

Commitment No. **00217046**

Island Title Corporation
Commitment No.: **00217046**

CONDITIONS

1. DEFINITIONS

(a) "Mortgage" means mortgage, deed of trust or other security instrument. (b) "Public Records" means title records that give constructive notice of matters affecting your title according to the state statutes where your land is located.

2. LATER DEFECTS

The Exceptions in Schedule B - Section II may be amended to show any defects, liens or encumbrances that appear for the first time in the public records or are created or attached between the Commitment Date and the date on which all of the Requirements (1) and (3) of Schedule B - Section I are met. We shall have no liability to you because of this amendment.

3. EXISTING DEFECTS

If any defects, liens or encumbrances existing at Commitment Date are not shown in Schedule B, we may amend Schedule B to show them. If we do amend Schedule B to show these defects, liens or encumbrances, we shall be liable to you according to Paragraph 4 below unless you knew of this information and did not tell us about it in writing.

4. LIMITATION OF OUR LIABILITY

Our only obligation is to issue to you the policy referred to in this Commitment when you have met its Requirements. If we have any liability to you for any loss you incur because of an error in this Commitment, our liability will be limited to your actual loss caused by your relying on this Commitment when you acted in good faith to:

Comply with the Requirements shown in Schedule B - Section I
or
Eliminate with our written consent any Exceptions shown in Schedule B - Section II.

We shall not be liable for more than the Policy Amount shown in Schedule A of this Commitment and our liability is subject to the terms of the Policy form to be issued to you.

5. CLAIMS MUST BE BASED ON THIS COMMITMENT

Any claim, whether or not based on negligence, which you may have against us concerning the title to the land must be based on this Commitment and is subject to its terms.

SCHEDULE A

1. Commitment Date: **January 9, 2003** at **8:00 a.m.**

2. Policy (or policies) to be issued:

   (a) **None** Policy Amount $
   Proposed Insured:

   (b) **None** Policy Amount $
   Proposed Insured:

   (c) **None** Policy Amount $
   Proposed Insured:

3. The estate or interest in the land which is covered by this Commitment is **Fee Simple** and is owned, at the Commitment Date by:

   C.R. CHURCHILL, D.A. HEENAN, RICHARD W. GUSHMAN, II, and RONALD J. ZLATOPER, jointly as Trustees under the Will and of the Estate of James Campbell, Deceased

4. The land referred to in this Commitment is described as follows: **See Schedule C attached**

Island Title Corporation
Commitment No.: 00217046

SCHEDULE B - SECTION I

REQUIREMENTS

The following requirements must be met:

1. Pay the agreed amounts for the interest in the land and/or the mortgage to be insured.

2. Pay us the premiums, fees and charges for the policy.

3. Documents satisfactory to us creating the interest in the land and/or mortgage to be insured must be signed, delivered and recorded.

4. You must tell us in writing the name of anyone not referred to in this Commitment who will get an interest in the land or who will make a loan on the land. We may then make additional requirements or exceptions.

5. You must tell us in writing if the funds from any loan to be insured will be used for construction and/or home improvement purposes. We may then make additional requirements or exceptions.

6. You must tell us in writing of any changes in the marital status of anyone with a recorded interest in the land. We may then make additional requirements or exceptions.

7. You must tell us in writing if you will be submitting Releases for any of the exceptions noted in Schedule B, Section II, Part II after the recordation of the documents creating the interest to be insured.

8. **This Commitment for Title Insurance has been issued as a status report only and no liability is assumed hereunder. In the event that this order is amended in the future to include the purchase of title insurance, we reserve the right to update this Commitment to include additional requirements and/or exceptions.**

SCHEDULE B - SECTION II

EXCEPTIONS

Any policy we issue will have the following exceptions unless they are taken care of to our satisfaction.

PART I:

NOTE: Items 2 through 6 will not appear on an ALTA Extended Coverage Loan Policy provided that the requirements appearing under Schedule B - Section I of this commitment have been complied with.

1. Taxes or assessments which are not shown at Date of Policy, as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records. Proceedings by a public agency which may result in taxes or assessments, reassessments, or notices of such proceedings, whether or not shown by the records of such agency or by the public records.

2. Any facts, rights, interests, or claims which are not shown by the public records but which could be ascertained by an inspection of said land or by making inquiry of persons in possession thereof.

3. Easements, claims of easement or encumbrances which are not shown by the public records.

4. Unpatented mining claims; reservations or exceptions in patents or in acts authorizing the issuance thereof; water rights, claims or title to water.

5. Any lien, or right to a lien for services, labor or material theretofore or hereafter furnished, imposed by law and not shown by the public records.

6. Discrepancies, conflicts in boundary lines, shortage in area, encroachments, or any other facts which a correct survey would disclose, and which are not shown by public records.

SCHEDULE B-II - Continued

PART II:

1. Tax Map Key: 9-1-10-7, County of Honolulu. Area Assessed: 114.617 acres, more or less. Real Property Taxes for the Fiscal Year 2002-2003:

1st Installment:	$145.39	Paid
2nd Installment:	$145.38	Open (Due February 20, 2003)
Assessed Values:	(2002)	
Improvements:	$ ----	
Exemption:	$ ----	
Land:	$29,400.00	
Exemption:	$ ----	
Total Value:	$29,400.00	
Net Value:	$29,400.00	
(Class 5)		

2. Taxes (including rollback taxes) assessments or obligations levied or created for any public purpose or improvement, unless the tax, assessment or obligation is payable and recorded as an existing lien in the public records.

3. Title to all minerals and metallic mines reserved to the State of Hawaii.

4. Rights or claims of persons or entities other than the insured involving or arising out of: Mineral or metallic mines; geothermal resources; water; fishing; navigation; wetlands; creation or loss of the land or any portion thereof by accretion, avulsion or artificial means; persons residing on or otherwise in possession of the land or any portion thereof; trails, roadways, or other rights of way, including without limitation any rights or claims under Chapter 264, Hawaii Revised Statutes; claims arising out of customary or traditional Hawaiian rights including but not limited to those for access or gathering purposes protected by the Constitution of the State of Hawaii or the laws of Hawaii.

SCHEDULE B-II - Continued

5. LEASE OF RIGHT OF WAY

Dated:	September 23, 1963
Filed:	Document No. 318179
Lessor:	Alan Sanford Davis, M. L. Randolph and George Miles Collins, Trustees under the Will and of the Estate of James Campbell, deceased
Lessee:	The Hawaiian Electric Company, Limited
Purpose:	a right of way and easement for electrical purposes, along, across, over, under and within Lot 437 (Map 89), between points C and D, being 25 feet wide, extending 12 1/2 feet on each side of the center line and between points D and E, being 25 feet wide, extending one (1) foot south and 24 feet north of the center line, all as shown on Map 63-31 of Lessee
Term:	until the termination of the Trust created by the Will of said James Campbell and thereafter from month to month

6. Covenants, conditions, restrictions, reservations, agreements, obligations, easements and other provisions set forth in the Declaration of Restrictions:

Dated:	August 22, 1989
Filed:	Document No. 1661671
	to which reference is hereby made, but deleting any covenant, condition or restriction indicating a preference, limitation or discrimination based on race, color, religion, sex, handicap, familial status, or national origin to the extent such covenants, conditions or restrictions violate 42 USC 3604(c) or Section 515-6, HRS

7. Covenants, conditions, restrictions, reservations, agreements, obligations, easements and other provisions set forth in the Ewa By Gentry Community Area Declaration of Covenants, Conditions and Restrictions:

Dated:	July 21, 1998
Filed:	Document No. 1568352
	to which reference is hereby made, but deleting any covenant, condition or restriction indicating a preference, limitation or discrimination based on race, color, religion, sex, handicap, familial status, or national origin to the extent such covenants, conditions or restrictions violate 42 USC 3604(c) or Section 515-6, HRS

SCHEDULE B-II - Continued

AMENDMENTS TO DECLARATION

DATED:	DOCUMENT NO.
May 30, 1989	1652869
June 21, 1991	1888053

AND FURTHER AMENDED BY

DECLARATION OF ADDITION OF REAL PROPERTY

Dated:	July 20, 2000
Filed:	Document No. 2639394

8. Abutters right of access acquired by the State of Hawaii in Civil No. 62550 in the Circuit Court of the First Circuit, State of Hawaii, by Amended Final Order of Condemnation:

Dated:	April 1, 1987
Filed:	Document No. 1455569

AND AS SET FORTH BY:

Land Court Order No.:	70754, Map 366 Land Court Application No. 1069
Filed:	August 9, 1984

9. Restriction of access rights as set forth by

Land Court Order No.	86200, Map 422 Land Court Application No. 1069
Filed:	September 11, 1987

10. EASEMENT 1500, as set forth by:

Land Court Order No.:	89384, Map 432 Land Court Application No. 1069
Filed:	April 25, 1988
Purpose:	Access

11. Access in favor of Lot 4197 over Easement 1500 as set forth by:

Land Court Order No.	89384, Map Land Court Application No. 1069
Filed:	April 25, 1988

SCHEDULE B-II - Continued

12. GRANT OF NONEXCLUSIVE EASEMENT (ACCESS)

Dated:	December 29, 1988
Filed:	Document No. 1604419
Purpose:	Access to Fort Weaver Road appurtenant to Lot 4197 over Easement "1500"
In favor of:	Seibu Hawaii

13. GRANT OF NON-EXCLUSIVE EASEMENT

Dated:	February 20, 1992
Filed:	Document No. 1918380
Purpose:	Water and water facilities over and across Easement "1500"
In favor of:	City and County of Honolulu and the Board of Water Supply

14. EASEMENT 1989, as set forth by:

Land Court Order No.:	92212, Map 453 Land Court Application No. 1069
Filed:	December 30, 1988
Purpose:	Waterline

15. GRANT OF NON-EXCLUSIVE EASEMENT

Dated:	March 3, 1994
Filed:	Document No. 2237817
Purpose:	Water and waterlines over and through a portion Easement "1989"
In favor of:	City and County of Honolulu, and the Board of Water Supply

16. Terms, provisions, covenants and conditions of that certain unrecorded Ewa Water Facilities Dedication Agreement, dated effective May 1, 1991 as disclosed in Instrument:

Dated:	May 1, 1991
Filed:	Document No. 2237817

SCHEDULE B-II - Continued

17. Covenants, conditions, restrictions, reservations, agreements, obligations, easements and other provisions set forth in the Declaration of Covenant Regarding Non-Potable Water Wells:

Dated:	May 19, 1993
Filed:	Document No. 2032652 to which reference is hereby made, but deleting any covenant, condition or restriction indicating a preference, limitation or discrimination based on race, color, religion, sex, handicap, familial status, or national origin to the extent such covenants, conditions or restrictions violate 42 USC 3604(c) or Section 515-6, HRS

18. GRANT OF EASEMENT

Dated:	December 15, 1993
Filed:	Document No. 2125164
Purpose:	electrical Easement E00965400, 20 feet and 25 feet wide, containing 1.206 acres
In favor of:	Hawaiian Electric Company, Inc.

19. Terms, provisions, covenants and conditions of that certain unrecorded Third Amended and Restated Development Agreement, as disclosed in:

SHORT FORM MEMORANDUM OF AGREEMENT (Third Amended and Restated Development Agreement):

Dated/Effective	November 14, 1995
Filed:	Document No. 2273812
By and between:	P.R. Cassiday, C.D. Pratt, Jr., C.R. Churchill, D.A. Heenan, the duly appointed, qualified and acting Trustees under the Will and of the Estate of James Campbell, Deceased, acting in the fiduciary and not in their individual capacities, "Estate", and Gentry Development Company, a Hawaii limited partnership, "Gentry"

SCHEDULE B-II - Continued

AMENDED AND RESTATED SHORT FORM MEMORANDUM OF AGREEMENT; PARTIAL RELEASE (Fourth Amended and Restated Development Agreement):

Dated: June 15, 2000
Filed: Document Nos. 2634843 and 2634844
(Also affects other property)

SHORT FORM MEMORANDUM OF INFRASTRUCTURE PLAN (Fourth Amended and Restated Development Agreement):

Dated: June 15, 2000
Filed: Document No. 2634847

20. EASEMENT 7589, as set forth by:

Land Court Order No.: 143691, Map 1098
Land Court Application No. 1069
Filed: October 23, 2001
Purpose: Flowage

21. EASEMENT 7590, as set forth by:

Land Court Order No.: 143691, Map 1098
Land Court Application No. 1069
Filed: October 23,2001
Purpose: Electrical

22. EASEMENT 7591, as set forth by:

Land Court Order No.: 143691, Map 1098
Land Court Application No. 1069
Filed: October 23,2001
Purpose: Drainage

23. EASEMENT 7592, as set forth by:

Land Court Order No.: 143691, Map 1098
Land Court Application No. 1069
Filed: October 23,2001
Purpose: Drainage

SCHEDULE B-II - Continued

24. EASEMENT 7593, as set forth by:

Land Court Order No.: 143691, Map 1098
Land Court Application No. 1069
Filed: October 23, 2001
Purpose: Drainage

25. EASEMENT 7594, as set forth by:

Land Court Order No.: 143691, Map 1098
Land Court Application No. 1069
Filed: October 23, 2001
Purpose: Drainage

NOTE:

The name of Gentry Development Company, a Hawaii limited partnership, has been legally changed to Gentry Investment Properties, a Hawaii limited partnership, as set forth by Land Court Order No. 123770, filed March 25, 1996.

SCHEDULE C

That certain parcel of land situate at Honouliuli, Ewa, Island of Oahu, State of Hawaii, described as follows:

Lot 4196-B, area 114.617 acres, more or less, as shown on Map 626, filed in the Office of the Assistant Registrar of the Land Court of the State of Hawaii with Land Court Application No. 1069 of the Trustees under the Will and of the Estate of James Campbell, deceased.

Being a portion of the land described in Transfer Certificate of Title No. 410,914 issued to the Trustees under the Will and of the Estate of James Campbell, deceased.

NOTE: Lot 4196-B has direct access to a government road, to wit: Fort Weaver Road, as shown on Map 626, and is filed in the Office of the Assistant Registrar of the Land Court of the State of Hawaii with Land Court Application No. 1069, as set forth by Land Court Order 110714 filed February 24, 1993.

ORIGINAL

THE ESTATE OF JAMES CAMPBELL

RECEIVED
DEC 6 2002

AUTHORIZATION

Gentry Investment Properties, a Hawaii limited partnership ("Gentry") and the Trustees under the Will and of the Estate of James Campbell, Deceased, acting in their fiduciary and not in their individual capacities (the "Estate") entered into that certain unrecorded Fourth Amended and Restated Development Agreement dated June 15, 2000, a short form of which is recorded in the Land Court of the State of Hawaii as Document No. 2634843 ("Development Agreement"), by which Agreement Gentry holds an option to purchase the following parcels of land situate in Ewa, Honouliuli, Island of Oahu, State of Hawaii:

1. Lot 4196-B, area 114.617 acres, as shown on Map 626 of Land Court Application 1069 filed in the Office of the Assistant Registrar of the Land Court of the State of Hawaii, as described in Land Court Certificate of Title No. 410,914 issued to the Estate, being also identified on the tax maps of the State of Hawaii as TMK No. 1-9-1-10:07 ("Ewa Makai East"); and

2. Lot 11252-A, area 167.997 acres, as shown on Map 861 of said Land Court Application 1069, as described in Land Court Certificate of Title No. 447,507 issued to the Estate, being also identified on the tax maps of the State of Hawaii as TMK No. 1-9-1-69:05 ("Ewa Makai West").

In consideration of the terms and provisions of the Development Agreement, the Estate does hereby authorize Gentry, and its authorized representatives, to take any and all actions and do all things necessary and proper to obtain any governmental approvals required by the United states of America, the State of Hawaii and the City and County of Honolulu for the development of Ewa Makai East and Ewa Makai West properties (collectively "Ewa Makai"). The Estate hereby further authorizes Gentry to prepare the project master plan and any amendments thereto for Ewa Makai.

Nothing in this authorization, however, shall be deemed to obligate the Estate to incur or pay any expenses in connection with such governmental approvals or to agree to any conditions of such governmental approvals. The Development Agreement shall continue to determine the terms and conditions of the agreement between Gentry and the Estate.

Dated this 4th day of December, 2002.

THE ESTATE OF JAMES CAMPBELL

By: Howard Schwiebert
Name: Howard Schwiebert
Its: Development Manager

LAND USE COMMISSION
STATE OF HAWAII
2003 MAR 21 A 8:12

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DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET • HONOLULU, HAWAII 96813
TELEPHONE: (808) 523-4414 • FAX: (808) 527-6743 • INTERNET: www.co.honolulu.hi.us

ORIGINAL

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GENTRY COMPANIES
GPC

JEREMY HARRIS
MAYOR

ERIC G. CRISPIN, AIA
Acting DIRECTOR

LORETTA K.C. CHEE
DEPUTY DIRECTOR

89/Z-009

December 16, 2002

Ms. Debra M. A. Luning
Director of Governmental Relations
and Community Affairs
Gentry Homes, Limited
P.O. Box 295
Honolulu, Hawaii 96809

LAND USE COMMISSION
STATE OF HAWAII
2003 MAR 21 A 9:12

Dear Ms. Luning:

Ewa by Gentry Affordable Housing Credits

Pursuant to your telephone request, we confirm that your project is progressing satisfactorily toward the compliance of the affordable housing requirements.

If you have questions, please call Dave Matsushima of our Development Plans and Zone Change Branch at 527-5872.

Sincerely yours,

for ERIC G. CRISPIN, AIA
Acting Director of Planning and Permitting

EGC:mo

Gentry23.DOC

F

A BILL FOR AN ORDINANCE

RECEIVED
AUG 10 1999

RELATING TO AFFORDABLE HOUSING CONDITIONS IN UNILATERAL AGREEMENTS.

BE IT ORDAINED by the People of the City and County of Honolulu:

SECTION 1. **Council Findings and Purpose.**

The Council finds that zone changes approved by the Council to permit large residential developments typically are subject to a number of conditions established pursuant to Section 21-2.80, Revised Ordinances of Honolulu 1990, as amended (formerly Section 21-8.40). These conditions are set forth in a Unilateral Agreement ("U/A") which is executed and recorded by the developer/landowner so as to run with the rezoned land and which also is attached to and made a part of the zone change ordinance. These conditions typically include a condition requiring the developer to provide affordable housing units in addition to market-priced units.

Many, if not most, of the U/As currently in effect for large residential developments on Oahu contain affordable housing conditions with the following basic elements:

1) Required percentage of affordable units. A specified percentage of the overall unit count of the residential project must be comprised of affordable housing units. These affordable units must be affordable to households in specified income categories established by reference to the median income for the City, as determined by the U.S. Department of Housing and Urban Development.

2) Restrictions on transfer. The affordable housing units must be subject to the following restrictions on transfer and sale by the purchaser:

2003 MAR 21 A 9:12
LAND USE COMMISSION
STATE OF HAWAII

CITY COUNCIL
CITY AND COUNTY OF HONOLULU
HONOLULU, HAWAII

ORDINANCE 99-51
BILL 50 (1999), CD1, FD1

a) Ten-year buy-back. If the purchaser wishes to transfer the unit, the City has the first option to purchase the unit at a price slightly above that paid by the purchaser. This restriction typically is in effect for ten years from the date of the initial purchase.

b) Shared appreciation. Following the expiration of the buy-back period, the unit may be sold at market price, but the seller must pay to the City a share of any appreciation in the value of the unit, as determined by a specified formula. This latter restriction has no expiration date, but is released upon payment of the shared appreciation amount.

These restrictions are required by the U/A to be incorporated in any deed, lease, or other instrument of conveyance of the affordable housing unit.

The U/A also typically requires the developer to execute an agreement with the City which sets forth the affordable housing program for the subject property and which includes the elements discussed above. This agreement typically contains additional details of the program such as the specific eligibility requirements for qualified buyers, presale and marketing requirements, application and eligibility certification procedures, and monitoring and reporting requirements.

The Council finds that the real estate market on Oahu has in recent years undergone a substantial change. In connection with the general downturn in the State's economy, the market has declined and real estate prices have fallen significantly, such that market prices are now at or below the prices established for affordable housing units. As a result, developers cannot sell the affordable units they are required to build because buyers choose to buy market units that are not subject to the restrictions on transfer of affordable units described above. Restricting affordable home sales to buyers in specific income categories also greatly reduces the potential number of buyers for the affordable units.

ORIGINAL

An additional consequence of this inability to sell affordable units is that developers who are required to deliver affordable units at the same time as market units are deterred from constructing market units, thereby further dampening construction activity in an already depressed housing industry.

The Council thus finds that due to the current depressed real estate market, the affordable housing conditions established by U/As in prior zone change ordinances are not providing affordable housing units that are saleable and therefore are adversely impacting the housing and construction industries without any corresponding benefit to the public.

The current depressed real estate market also has imposed hardships on current owner-occupants of affordable housing units who have attempted to sell their units during the ten-year buy-back period. Many buy-back restrictions imposed by U/As provide that if the City waives its first option to purchase the unit, the owner-occupant must sell the unit to a "qualified resident" in the same income category, and subject to the same restrictions on transfer. As a result, the owner-occupants have been unable to find buyers for their units.

Accordingly, the purpose of this ordinance is to temporarily amend--for a period of two years, subject to an extension--the affordable housing conditions in existing U/As to permit the sale of affordable housing units free from any conditions related to buyer eligibility and restrictions on transfer. Under this amendment, developers will remain obligated to deliver the numbers and types of affordable housing units at the affordable prices required by the U/As, but they will be able to offer them for sale to the general public without any buy-back or shared appreciation conditions. Further, during the effective period of this amendment, an owner of an affordable housing unit who purchased the unit subject to a buy-back restriction imposed pursuant to a U/A affordable housing condition will be allowed to transfer the unit to any purchaser without regard to any buyer eligibility requirements imposed by buy-back restriction, and free from any restrictions on further transfer by the purchaser,

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if the owner has owned the unit for more than three years and the City waives its first option to purchase the unit pursuant to the buy-back restriction.

The Council acknowledges that the developers' affordable housing obligations--including the restrictions on buyer eligibility and transfer--are not only set forth in the zone change ordinances amended by this ordinance. The U/As also are recorded on the title of the rezoned land and, pursuant to the U/As, the developers have entered into binding agreements with the City detailing their affordable housing programs.

Accordingly, this ordinance also authorizes the mayor or the mayor's designee to execute and, if appropriate, record such documents, including but not limited to waivers, releases, and amendment documents, as may be necessary to conform existing documents to the provisions of this ordinance.

SECTION 2. **Definitions.**

For the purposes of this ordinance:

"Affordable housing agreement" means an agreement between the declarant and the City setting forth the affordable housing program to be provided by the declarant pursuant to an affordable housing condition in a unilateral agreement.

"Affordable housing condition" means a condition in a unilateral agreement which requires the declarant to provide a specified number or percentage of housing units for sale or rent to households in a specified income category or categories.

"Buy-back restriction" means a restriction on the sale or transfer of an affordable housing unit imposed pursuant to an affordable housing condition, including but not limited to buyer eligibility requirements and first options by the City to purchase the unit at a price based on the original cost to the purchaser. This restriction is referred to in many unilateral agreements as the "Ten-Year Buy Back" provision. "Buy-back

restriction" shall not include obligations to pay to the City a share of any appreciation in the value of the unit on resale and first options by the City to purchase the unit at a price based on the fair market value of the unit. This latter restriction is referred to in many unilateral agreements as the "First Option and Shared Appreciation in Value" provision.

"Declarant" means a person who executes and records a unilateral agreement, and any valid successor in interest to such person.

"Department" means the department of planning and permitting.

"Unilateral agreement" means a document establishing conditions on the development or use of land, recorded in the Bureau of Conveyances or the Land Court of the State of Hawaii, or both, as appropriate, so that the conditions shall run with the land, and attached to and made a part of a zone change ordinance, pursuant to Section 21-2.80, Revised Ordinances of Honolulu 1990, as amended (formerly Section 21-8.40).

SECTION 3. **Amendment of Unilateral Agreements.**

(a) All affordable housing conditions in effect on the effective date of this ordinance are hereby amended as follows:

(1) Notwithstanding any other provision in the affordable housing condition, affordable housing units subject to the condition may be sold by the declarant to the general public free from any conditions relating to (i) buyer eligibility, including but not limited to household income limits (but subject to the owner-occupancy requirement of subdivision (3)(C) below); or (ii) restrictions on transfer of the units, including but not limited to first options by the City to purchase the units or obligations to pay to the City a share of any appreciation in the value of the unit on resale.

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(2) The declarant shall receive full credit for any affordable housing units sold under this amendment, toward the number of affordable housing units required by the unilateral agreement.

(3) A housing unit shall not qualify as an affordable housing unit under paragraphs (1) and (2) unless the following conditions are met:

(A) The housing unit shall be designated to the City as an affordable housing unit pursuant to an affordable housing agreement, provided that housing units previously designated to the City as market-priced units or as part of a market-priced increment in a residential project may be redesignated as affordable housing units if sold at the prices required for designated affordable housing units;

(B) The housing unit shall be delivered and offered for sale simultaneously with market-priced units; and

(C) The housing unit shall be sold to an owner-occupant.

(4) During the effective period of this ordinance, the declarant shall submit to the department, every six months, a report describing the declarant's housing sales under the provisions of this ordinance. The report shall at a minimum include the following information:

(A) Total number of affordable and market-priced housing units sold;

(B) Information on each housing unit sold, including:

(1) Location;

(2) Sales price;

(3) Buyers' names;

(4) Buyers' intent to reside in the unit;

(5) Income level of each buyer; and

(6) Date the sale of the unit was closed.

(b) All other provisions of the affordable housing conditions not amended herein shall remain in full force and effect, including but not limited to any provisions relating to:

(1) The required number of affordable housing units;

(2) The determination of the prices of the affordable housing units; and

(3) Affordable rental housing.

SECTION 4. **Transfer Notwithstanding Buy-back Restriction.**

(a) While this ordinance is in effect, an owner of an affordable housing unit who purchased the unit subject to a buy-back restriction imposed pursuant to an affordable housing condition may transfer the unit to any purchaser without regard to any buyer eligibility requirements imposed by the buy-back restriction, and free from any restrictions on further transfer by the purchaser, if the following conditions are met at the time of the transfer:

(1) The owner has owned the unit for more than three years;

(2) The owner has given the City the opportunity to exercise any first option to purchase the unit pursuant to the buy-back restriction; and

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(3) The City has elected not to exercise its first option to purchase the unit pursuant to the buy-back restriction.

Any transfers made pursuant to this section shall be valid notwithstanding the subsequent repeal of this ordinance.

(b) All buy-back restrictions in affordable housing conditions in effect on the effective date of this ordinance are hereby amended to conform with subsection (a).

(c) This section shall not apply to transfer restrictions which require an owner of an affordable housing unit to pay to the City a share of any appreciation in the value of the affordable housing unit on resale, or which grant to the City the first option to purchase the affordable housing unit at a price based on the fair market value of the unit.

SECTION 5. **Authority to Conform Related Documents.**

The mayor or the mayor's designee, in consultation with the corporation counsel, is authorized to execute and, if appropriate, record such documents, including but not limited to waivers, releases, and amendment documents, as may be necessary to conform existing documents to the provisions of this ordinance, including the temporary nature of the amendment set forth herein. The declarant or, with respect to amendments made pursuant to Section 4, the owner of the affordable housing unit, as applicable, shall bear the costs of preparation and recordation of such documents.

SECTION 6. **Effective Date; Repeal; Extension of Repeal Date.**

This ordinance shall take effect upon its approval and shall be repealed two years after the date of its approval, provided that the repeal date may be extended as provided herein. Upon the repeal of this ordinance, all affordable housing conditions

amended herein shall return to the form in which they existed immediately prior to the effective date of this ordinance; provided, however, that the provisions of this ordinance shall continue to apply to the following affordable housing units owned by declarants:

(1) Multi-family affordable housing units for which individual sales contracts have been executed prior to the repeal date of this ordinance, provided that the unit must be completed and the sale must close within 90 days after the repeal date; and

(2) Single-family affordable housing units for which individual sales contracts have been executed prior to the repeal date of this ordinance, provided that the unit must be completed and the sale must close within 90 days after the repeal date.

The department shall submit to the Council, not less than six months prior to the initial repeal date of this ordinance, a report setting forth information that shall include, but shall not be limited to, the number and locations of the affordable housing units sold under the provisions of this ordinance, and the income levels of buyers who acquired the affordable housing units. The report shall include a recommendation, based on an evaluation of this information, on whether the repeal date should be extended for an additional period of time and the recommended period of the extension. If the recommendation of the department is to extend the repeal date, the department shall initiate a bill to amend this ordinance to extend the repeal date.

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CITY AND COUNTY OF HONOLULU
HONOLULU, HAWAII

ORDINANCE 99-51
BILL 50 (1999), CD1, FD1

The Council may, in its discretion, and pursuant to a bill initiated by the administration or the Council, amend this ordinance to extend the repeal date as recommended, or for a shorter or longer period as the Council deems appropriate.

INTRODUCED BY:

Donna Mercado Kim

DATE OF INTRODUCTION:

April 22, 1999

Honolulu, Hawaii

Councilmembers

APPROVED AS TO FORM AND LEGALITY:

Deputy Corporation Counsel

APPROVED this 5th day of August, 1999.

JEREMY HARRIS, Mayor
City and County of Honolulu

(OCS/072299/mg)

CITY COUNCIL
CITY AND COUNTY OF HONOLULU
HONOLULU, HAWAII
CERTIFICATE

ORDINANCE 99-51

BILL 50 (1999)

INTRODUCTION DATE: APRIL 22, 1999
INTRODUCED BY: DONNA MERCADO KIM

		AYE	NO	A/E
1ST READING DATE: 4/28/99 REMARKS: Felix/Mansho - Bill passed 1st reading and referred to Zoning. - 9.	BAINUM	X		
	DeSOTO	X		
	FELIX	X		
	HOLMES	X		
	KIM	X		
	MANSHO	X		
	MIRIKITANI	X		
	YOSHIMURA	X		
	HANNEMANN	X		
	TOTAL	9	0	0
2ND READING DATE: 5/18/99 PUBLICATION DATE: 5/31/99 DRAFT: COMMITTEE REPORT: ZCR-215 PUBLIC HEARING DATE: 5/18/99 PUBLICATION DATE: 5/8/99 REMARKS: Kim/DeSoto - Bill passed 2nd reading. - 6. Excused: Bainum, Holmes, Mirikitani. - 3. Public hearing held concurrently, closed and referred to Committee on Zoning.	BAINUM			E
	DeSOTO	X		
	FELIX	X		
	HANNEMANN	X		
	HOLMES			E
	KIM	X		
	MANSHO	X		
	MIRIKITANI			E
	YOSHIMURA	X		
	TOTAL	6	0	3
3RD READING DATE: 7/22/99 DRAFT: CD1, FD1 COMMITTEE REPORT: ZCR-363 REMARKS: DeSoto/Mirikitani - CR 363 be adopted and Bill pass 3rd reading, as amended (CD1). Kim/Holmes - Bill amended to FD1. - 6. Excused: Bainum, DeSoto, Mirikitani. - 3. There being no objections from the 6 members present (Excused: Bainum, DeSoto Mirikitani), Council Rule relating to the 48-hour notice waived. CR-363 adopted and Bill passed 3rd reading, as amended (CD1, FD1). - 6. Noes: Holmes, Mirikitani. - 2. Excused: DeSoto. - 1.	BAINUM	X		
	DeSOTO			E
	FELIX	X		
	HANNEMANN	X		
	HOLMES		X	
	KIM	X		
	MANSHO	X		
	MIRIKITANI		X	
	YOSHIMURA	X		
	TOTAL	6	2	1

ORDINANCE PUBLICATION DATE: 8/16/99

Referred to: ZONING
Reference:

I hereby certify that the above is a true record of action by the Council of the City and County of Honolulu on this BILL.

Genevieve G. Wong
GENEVIEVE G. WONG, CITY CLERK

JON C. YOSHIMURA, CHAIR AND PRESIDING OFFICER

99-51

CITY COUNCIL
CITY AND COUNTY OF HONOLULU
HONOLULU, HAWAII

ORDINANCE 01-33

BILL 27 (2001), CD1

A BILL FOR AN ORDINANCE

RELATING TO THE EXTENSION OF ORDINANCE 99-51 CONCERNING THE AFFORDABLE HOUSING CONDITIONS IN UNILATERAL AGREEMENTS.

BE IT ORDAINED by the People of the City and County of Honolulu:

SECTION 1. Council Findings and Purpose.

The Council finds that Ordinance 99-51, relating to affordable housing conditions in Unilateral Agreements, took effect on August 5, 1999, and, by its terms, will be repealed on August 5, 2001, unless the repeal date is extended.

The Council further finds that Ordinance 99-51 has been effective in stimulating sales of affordable housing units, primarily to families in the target income groups.

The Council further finds that Ordinance 99-51 should be extended because Oahu market conditions for production of new housing are still depressed, and national economic conditions are worsening.

Accordingly, the purpose of this ordinance is to extend the repeal date of Ordinance 99-51 and to make clarifying amendments thereto.

SECTION 2. Ordinance 99-51 is amended by amending Section 2 to add a new definition of "Owner-occupant" to read as follows:

""Owner-occupant" means an owner who intends to occupy the unit for at least one (1) year."

SECTION 3. Ordinance 99-51 is amended by amending Section 6 to read as follows:

"SECTION 6. **Effective Date; Repeal; Extension of Repeal Date.**

This ordinance shall take effect upon its approval and shall be repealed [two years after the date of its approval,] on

OCS00377.B01

01-33

August 5, 2005, provided that the repeal date may be extended as provided herein. Upon the repeal of this ordinance, all affordable housing conditions amended herein shall return to the form in which they existed immediately prior to [the effective date of this ordinance;] August 5, 1999; provided, however, that the provisions of this ordinance shall continue to apply to the following affordable housing units owned by declarants:

(1) Multi-family affordable housing units for which individual sales contracts have been executed prior to the repeal date of this ordinance, provided that the unit must be completed and the sale must close within 90 days after the repeal date; and

(2) Single-family affordable housing units for which individual sales contracts have been executed prior to the repeal date of this ordinance, provided that the unit must be completed and the sale must close within 90 days after the repeal date.

The department shall submit to the Council, not less than six months prior to [the initial repeal date of this ordinance,] August 5, 2005, a report setting forth information that shall include, but shall not be limited to, the number and locations of the affordable housing units sold under the provisions of this ordinance, and the income levels of buyers who acquired the affordable housing units. The report shall include a recommendation, based on an evaluation of this information, on whether the repeal date should be extended for an additional period of time and the recommended period of the extension. In preparing the report, the department may request proponents of an extension to submit to the director of planning and permitting, not less than one (1) year prior to the repeal date, a marketing study of Oahu's need for and ability to sustain new housing units, prepared by a person or firm with statewide reputation and at least 10 years of experience in analyzing real estate markets. The marketing study shall include a statement of assumptions and methodology sufficient to permit independent review of the study by the department and the Council. If the recommendation of the department is to extend the repeal date, the department shall

CITY COUNCIL
CITY AND COUNTY OF HONOLULU
HONOLULU, HAWAII

ORDINANCE 01-33
BILL 27 (2001), CD1

initiate a bill to amend this ordinance to extend the repeal date.

The Council may, in its discretion, and pursuant to a bill initiated by the administration or the Council, amend this ordinance to extend the repeal date as recommended, or for a shorter or longer period as the Council deems appropriate."

SECTION 4. Ordinance material to be repealed is bracketed. New material is underscored.

initiate a bill to amend this ordinance to extend the repeal date.

The Council may, in its discretion, and pursuant to a bill initiated by the administration or the Council, amend this ordinance to extend the repeal date as recommended, or for a shorter or longer period as the Council deems appropriate."

SECTION 4. Ordinance material to be repealed is bracketed. New material is underscored.

CITY COUNCIL
CITY AND COUNTY OF HONOLULU
HONOLULU, HAWAII
CERTIFICATE

ORDINANCE 01-33 BILL 27 (2001)

INTRODUCTION DATE: MARCH 28, 2001
INTRODUCED BY: CHAIR JON YOSHIMURA (BY REQUEST)

		AYE	NO	A/E
1ST READING DATE: 4/4/01 REMARKS: Holmes/DeSoto - Bill passed 1st reading and referred to Zoning. - 9.	BAINUM	X		
	CACHOLA	X		
	DeSOTO	X		
	FELIX	X		
	HOLMES	X		
	MANSHO	X		
	MIRIKITANI	X		
	OKINO	X		
	YOSHIMURA	X		
	TOTAL	9	0	0
2ND READING DATE: 5/30/01 DRAFT: COMMITTEE REPORT: ZCR-220 PUBLIC HEARING DATE: 5/30/01 REMARKS: DeSoto/Felix - Bill passed 2nd reading. - 7. Excused: Cachola, Holmes. - 2. Public hearing held concurrently, closed and referred to Zoning.	BAINUM	X		
	CACHOLA			E
	DeSOTO	X		
	FELIX	X		
	HOLMES			E
	MANSHO	X		
	MIRIKITANI	X		
	OKINO	X		
	YOSHIMURA	X		
	TOTAL	7	0	2
3RD READING DATE: 6/20/01 DRAFT: CD1 COMMITTEE REPORT: ZCR-274 REMARKS: DeSoto/Felix - Bill passed 3rd reading, as amended. - 7. Excused: Holmes, Mirikitani. - 2.	BAINUM	X		
	CACHOLA	X		
	DeSOTO	X		
	FELIX	X		
	HOLMES			E
	MANSHO	X		
	MIRIKITANI			E
	OKINO	X		
	YOSHIMURA	X		
	TOTAL	7	0	2

Referred to: ZONING
Reference: D-251-01

I hereby certify that the above is a true record of action by the Council of the City and County of Honolulu on this BILL.

GENEVIEVE G. WONG, CITY CLERK

JON O. YOSHIMURA, CHAIR AND PRESIDING OFFICER

THE GENTRY COMPANIES

ORIGINAL

February 4, 2003

Ms. Kathy Sokugawa
Planning Division Chief
Department of Planning and Permitting
City and County of Honolulu
650 South King Street
7th Floor
Honolulu, HI 96813

LAND USE COMMISSION
STATE OF HAWAII
2003 MAR 21 A 9:12

Dear Kathy:

RE: AFFORDABLE HOUSING REQUIREMENTS FOR EWA MAKAI

Thank you for meeting with me last week. This is to confirm my understanding of what we had discussed regarding anticipated affordable housing requirements for Ewa Makai. It is my understanding that the City administration will probably recommend the following: (1) At least 10% of the total number of units to be developed in the project area must be affordable to households earning up to and including 80% of the area median income as determined by the U.S. Department of Housing and Urban Development; and (2) at least an additional 20% of the total number of units to be developed in the project area shall be affordable to households earning up to and including 120% of the area median income as determined by the U.S. Department of Housing and Urban Development. Gentry would not be opposed to meeting this requirement.

Please let me know if my understanding is incorrect. Thank you.

Sincerely,

GENTRY HOMES, LTD.

Tosh Hosoda

Tosh Hosoda
Senior Vice President - Planning

Gentry Homes, Ltd. P.O. Box 295 Honolulu, Hawaii 96809 (808) 599-5558 FAX (808) 599-5398

H

BENJAMIN J. CAYETANO
GOVERNOR

Patricia Hamamoto
[redacted]
Interim Superintendent

STATE OF HAWAII
DEPARTMENT OF EDUCATION
P.O. BOX 2360
HONOLULU, HAWAII 96804

DIVISION OF ADMINISTRATIVE SERVICES
[redacted]

ORIGINAL

RECEIVED
JAN 11 2002

January 9, 2002

Ms. Debra M. A. Luning
Gentry Homes, Ltd.
P.O. Box 295
Honolulu, Hawai`i 96809

LAND USE COMMISSION
STATE OF HAWAII
2003 MAR 21 A 9:12

Dear Ms. Luning:

Subject: Ewa Makai Development

We offer the following comments in regards to the subject development:

1. The site of the planned Commercial/Industrial Mixed Use zone on the southern edge of the development is satisfactory to the Department of Education (DOE) provided that an adequate buffer is placed between this zone and the future Oceanpointe Elementary School.

2. Based on a maximum unit count of 1,875, dedication of the 18-acre school site shown on the "Ewa Makai Master Plan" dated September 4, 2001 will satisfy DOE's fair-share requirements. Note that DOE reserves the right to amend the fair-share requirement for this project should state and county land use approval not be obtained in a timely manner.

If you have any questions, please call Mr. Sanford Beppu at 733-4862.

Thank you.

Sincerely,

Raynor M. Minami, Director
Facilities and Support Services Branch

RMM:hy

Clean Hawaii Center

STATE OF HAWAII
Department of Business, Economic Development & Tourism
Energy, Resources & Technology Division
URL: http://www.hawaii.gov/dbedt/ert/chc/

P.O. Box 2359, Honolulu, HI 96804
Phone: +1.808.587.3802 / 2778
Fax: +1.808.587.3820

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Leaders in Waste Management

Gentry Homes
Ewa by Gentry
Ewa, HI

Spring 2001

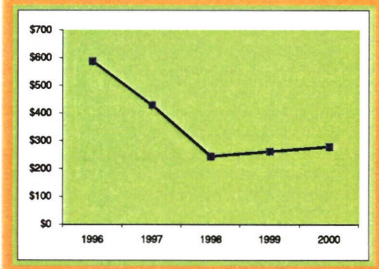
Reducing Waste Disposal Costs at Gentry Homes

Ewa by Gentry

Green waste is separated for composting at Hawaiian Earth Products.

- *Rock, concrete, and coral excavated from the golf course is stockpiled and reused as subbase slab for homes.*
- *Topsoil is collected and reused in landscaping and on the golfcourse.*
- *Recycling program updates are a regular item at weekly safety meetings.*
- *Reusable items are donated to University of Hawaii, Hawaii Homeless, and other charities.*

The Results



Using efficient waste management practices such as these, Gentry Homes has reduced the average waste disposal cost from $589 per single-family home in 1996, to $280 in 2000, saving the company an estimated $64,000 each year.



Bob Kayser surveys the existing fill material to be reused in the development.

Gentry Homes—Efficient Waste Management is Just a Part of an Efficient Development

From site design and development to waste disposal and recycling, this production builder has successfully incorporated waste saving products, methods, and techniques into every phase of housing development.

The key to efficient waste management is knowing what you're throwing away, so a good waste management plan starts with a dumpster dive. Bob Kayser, Vice President and Director of Construction for **Gentry Builders** readily admits that he has "climbed into a container a few times."

Since 1996 when Gentry committed to reducing waste disposal costs, the company's efforts have been highly successful. Estimated savings for 2000 exceed $60,000 (see sidebar).

Mr. Kayser attributes Gentry's success to thorough planning and a comprehensive approach, which focuses on reducing waste by:

1. Evaluating material selection and purchasing procedures,
2. Identifying specific waste reduction strategies to incorporate into standard practice, and
3. Instituting a recycling program to capture remaining waste.

Waste Reduction Strategies

- A central cutting area prepares "cut-packs" for framing and drywall, reducing overall waste and consolidating scrap for recycling.
- Coral excavated from the golf course is reused as subbase for 3,800 homes.

Department of Business, Economic Development & Tourism
Energy, Resources & Technology Division

P.O. Box 2359, Honolulu, HI 96804
www.hawaii.gov/dbedt/ert/chc

Phone: +1.808.587.3802 / 2778
Fax: +1.808.587.3820

Clean Hawai'i Center

For more information

A Contractor's Waste Management Guide: Best Management Practices and Tools for Job-Site Recycling and Waste Reduction in Hawaii. 1999. DBEDT. www.state.hi.us/dbedt/ert/cwmg/index.html.

Guide to Resource-Efficient Building in Hawaii. 1999. DBEDT and the Hawaii Advanced Building Technologies Training (HABiT) Program.

"We recycle because it translates into savings."
Bob Kayser, Gentry Homes

Efficient Development (cont.)



Gentry homes uses cut packs to save time, material, and money.



Dedicated drywall container.

- Protecting stored materials from the weather not only helps to eliminate waste, but also helps avoid moisture problems down the road.
- Limiting the use of hazardous materials to the central cutting area provides for collection and safe disposal.

Job Site Recycling Program

- Drywall is recycled, and all green wastes are composted.

Material Selection & Purchase Procedures

- To minimize hazardous materials, Gentry uses ACZA treated wood for most framing wood, which is a least toxic alternative to CCA treated wood.
- Gentry continues to experiment with steel trusses, framing, and roofing material to evaluate their effectiveness as alternatives to wood products. (Since 1977, the company has built more than 300 homes using steel).
- Long-lasting, durable products and materials are specified such as fiber-cement siding and vinyl fencing, eliminating waste and providing value for homeowners.

Gentry Builders Also Saves Water!

As part of the overall efficiency program, Gentry Builders uses innovative design to manage stormwater on site.

- The entire golf course serves as a flood alleviation zone for the community at Ewa and other uphill on the mountain.
- The stormwater detention pond serves as a water hazard for the community golf course.
- Stormwater retention is captured by a grass field located next to the detention pond.



All common areas at the Ewa housing development are irrigated with brackish water fed from wells and detention ponds, such as this one, not with potable water.

J

TNWRE
Tom Nance Water
Resource Engineering

ORIGINAL

January 31, 2003
03/041 (03-09)

LAND USE COMMISSION
STATE OF HAWAII
2003 MAR 21 A 9:13

Mr. Tosh Hosoda
Senior Vice President
Gentry Homes, Ltd.
P. O. Box 295
Honolulu, Hawaii 96809

Dear Mr. Hosoda:

Inclusion of Ewa Makai in the
Potable Water Master Plan for Ewa by Gentry

The latest approved potable water master plan for the Ewa by Gentry project was prepared by our firm in September 2000 and approved by the Board of Water Supply on November 3, 2000. It included all of the Ewa Makai project areas on both sides of Fort Weaver Road (the areas formerly known as Laulani and Fairways).

I have compared Gentry's current (January 30, 2003) land use plan for all of its Ewa project areas with the land use plan which was the basis of the September 2000 potable water master plan our firm prepared. There are only nominal changes to the areas of the School, Park, and Commercial parcels. The number of residential units is 47 higher than in the approved water master plan. However, because there is a shift from less single family to more multi-family units in the current land use plan, the project's water requirements have actually been reduced (refer to the tally below). As a result, size requirements for well supply, reservoir storage, and pipeline hydraulic capacity for the Gentry Ewa project have actually been reduced.

Changes from the September 2002 BWS-Approved Potable Water Master Plan for Ewa by Gentry

Residential Unit Type	Unit Use Rate (GPD)	Change in Required Supply (GPD)
Addition of 309 Multi-Family Units Reduction of 262 Single Family Units	276 500	+85,284 -131,000
Net Change for 47 More Units	- -	-45,716

680 Ala Moana Boulevard, Suite 406 • Honolulu, Hawaii 96813-5411 • Phone: (808) 537-1141 • Fax: (808) 538-7757 • E-mail: office@tnwre.com

The only other change of significance since the September 2000 water master plan was prepared is BWS' conversion of its 16-inch potable main in Fort Weaver Road for use by its non-potable system. That conversion was completed in late 2001. However, the BWS-approved Gentry water master plan anticipated that this conversion would take place and incorporated hydraulic analyses with the 16-inch Fort Weaver main no longer available for potable use.

Based on the foregoing, it is my opinion that the water master plan approved by BWS in November 2000 is still valid for Gentry's current land use plan.

Sincerely,

Tom Nance

Tom Nance

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843

JEREMY HARRIS, Mayor

EDDIE FLORES, JR., Chairman
CHARLES A. STED, Vice-Chairman
JAN M.L.Y. AMII
HERBERT S.K. KAOPUA, SR.
DAROLYN H. LENDIO

LARRY J. LEOPARDI, Ex-Officio

CLIFFORD S. JAMILE
Manager and Chief Engineer

DONNA FAY K. KIYOSAKI
Deputy Manager and Chief Engineer

January 24, 2003

Ms. Debra M. A. Luning
The Gentry Companies
Gentry Homes, Ltd.
P. O. Box 295
Honolulu, Hawaii 96809

Dear Ms. Luning:

Subject: Your Letter Dated January 9, 2003 Regarding the Availability of Potable Water for Ewa Makai Development, Ewa Oahu

Thank you for your letter regarding water service to the proposed Ewa Makai Development.

The Board of Water Supply (BWS) does not provide advance water allocations or water reservations. Water commitments are made at the building permit or construction drawing stage on a first come, first serve basis. When water is made available, the developer will be required to pay our Water System Facilities Charges.

We expect to have sufficient water for the Ewa Region. The BWS currently has water system improvement projects in the construction and design stages, which will provide adequate source capacity to accommodate your proposed development. The Ewa Shaft's estimated yield is 15 million gallons per day (mgd). In addition, the proposed Desalination Facility in Kalaeloa is being designed for 5 mgd with a potential to expand to 35 mgd in the future. The installation of wells at the Waipahu Wells II Station and completion of the Waipahu Wells IV will add 4.21 mgd to our capacity to deliver water. These two well projects should be completed this year.

If you have any questions, please contact Joseph Kaakua at 527-6123.

Very truly yours,

K. Sumida

for CLIFFORD S. JAMILE
Manager and Chief Engineer

ORIGINAL

KN CONSULTING SERVICES, INC.
Civil Engineers

January 27, 2003

Mr. Tosh Hosoda, Senior Vice President
Gentry Homes, Ltd
PO Box 295
Honolulu, HI 96809

LAND USE COMMISSION
STATE OF HAWAII
2003 MAR 21 A 9:13

Ewa Makai-East
Drainage and Sewer Master Plans

Dear Mr. Hosoda:

This is to update you on the status of drainage and sewer master plans for Ewa Makai-East that we are currently developing for Gentry

As you know, there are existing drainage and sewer master plans for Ewa by Gentry-East that have been approved by the City and County of Honolulu.[1] These master plans account for the drainage and sewer needs of Ewa Makai-East. However, because the drainage concept for Ewa Makai-East has been subsequently amended, our company has been tasked with revising and supplementing the approved plans.

We have been working closely with City and County engineers, and will continue to do so in order to ensure that the revised plans meet with their approval. We also understand that these master plans are subject to applicable standards established by the Federal, State, and City governments and will design the plans to meet these standards.

The approved master plans will the basis for the design of the drainage and sewer improvements for Ewa Makai-East development.

Sincerely,
KN Consulting Services, Inc.

Kenneth O. Nagai
President and Principal Civil Engineer

[1] Revised Drainage Master Plan for Ewa by Gentry-East, Phase II & Ewa Makai-East, Engineering Concepts Inc., February 1997. Approved July 8, 1997 by the City and County of Honolulu; and Revised Ewa by Gentry Sewer Master Plan, Park Engineering, August 2001. Approved January 18, 2002 by the City and County of Honolulu.

1451 South King Street, Suite 412 ▪ Honolulu, Hawaii 96814 ▪ Phone 808 941-8882 ▪ Fax 808 941-8828

ENGINEERING CONCEPTS, INC.
Consulting Engineers

February 6, 2003

Ms. Debra M.A. Luning
Director of Government Affairs and Community Relations
Gentry Homes, Ltd.
P.O. Box 295
Honolulu, Hawaii 96809

Subject: Ewa Makai Master Plan (August 23, 2002)

We have reviewed the Ewa Makai Master Plan dated August 23, 2002 which you furnished. With respect to this master plan, no significant changes are anticipated to the following documents:

1. Sewer Master Plan for Ewa Makai-West (approved November 1999)

2. Wastewater Pump Station and Force Main for Ewa Makai-West (approved April 3, 2002); and

3. Drainage Master Plan for Ewa Makai-West (approved October 21, 1996).

Should you have any questions, please call me at 591-8820.

Very truly yours,

Kenneth Ishizaki, P.E.
Executive Vice President

1150 South King Street, Suite 700 • Honolulu, Hawaii 96814
Tel (808) 591-8820 • Fax (808) 591-9010 • E-Mail: eci@ecihawaii.com

Appendix L

ORIGINAL

AFFIDAVIT

LAND USE COMMISSION
STATE OF HAWAII
2003 MAR 21 A 9:53

STATE OF HAWAII)
)
CITY AND COUNTY OF HONOLULU)

THE UNDERSIGNED, being first duly sworn on oath, deposes and says as follows:

1. That the undersigned is the Senior Vice President-Planning for Gentry Homes, Ltd., the agent for Gentry Investment Properties, a Hawaii limited partnership ("Gentry Investment") in connection with this proposed rezoning;

2. That C. R. CHURCHILL, D. A. HEENAN, RICHARD W. GUSHMAN, II, and RONALD J. ZLATOPER, the duly appointed, qualified, and acting TRUSTEES UNDER THE WILL AND OF THE ESTATE OF JAMES CAMPBELL, DECEASED ("Estate") are the owners of the land situated in Honouliuli, Ewa, Oahu, Hawaii, being Lot 4196-B, Map 626, Land Court Application 1069, and Lot 11252-A, as shown on Map 861, Land Court Application 1069, being also property identified on the tax maps of the State of Hawaii as (1) 9-1-10:7 and (1)9-1-69:5, respectively;

3. That Gentry Investment is the Developer under that certain unrecorded Development Agreement made between the Estate and Gentry Investment; and

4. That, as required in connection with the application by Gentry Investment to the City and County of Honolulu, Department of Planning and Permitting, to rezone the Property from AG-1 Restricted Agriculture and AG-2 General Agriculture to R-5 Residential, A-1 Apartment, P-2 General Preservation and IMX-1 Industrial-Commercial Mixed Use, Gentry Investment presented the project to the Ewa Neighborhood Board No. 23 on Thursday, March 14, 2002, and sent written notification of the neighborhood board presentation to adjoining property owners.

FURTHER, AFFIANT SAYETH NAUGHT.

TOSH HOSODA

SUBSCRIBED AND SWORN to before
me this 17 day of March, 2003, by Tosh Hosoda

Notary Public, State of Hawaii
Printed Name of Notary: Colette L. Andrade-Fujii
My Commission Expires: July 17, 2004

COLETTE L. ANDRADE-FUJII
NOTARY
PUBLIC
STATE OF HAWAII

Academy. P. Smith also recognized Chase Meritt, an eighth grade student at Messiah Lutheran School who is a finalist in this years State Spelling Bee.

COMMITTEE REPORTS:

Parks & Recreation Committee – Chair Alexander stated they were unable to hold a meeting but will check with Pam Witty-Oakland, Council Chair DeSoto's Office, to see if comments may still be submitted regarding the bill to close the park.

Questions, comments, and answers: (1) P. Smith noted that the previous Parks & Recreation Committee Chair has never had problems with the submitting the committee agenda in on time. (2) Miyashiro noted that she sent in her Parks & Recreation Committee agenda to the Neighborhood Commission Office on February 20. She added that she is unaware of what happened to the agenda. Chair Alexander will follow-up on the issue.

Planning & Zoning Committee – There was no report at this time.

NEW BUSINESS:

North South Road Update – Vickie Caraway, Department of Land and Natural Resources, Forestry Division and Wildlife updated the Board and guests on the status of the habitat conservation of the Abutilon Menziesii plant on North South Road. She added that DLNR is introducing an amendment to change the definition of "land owner" that will require government agencies to follow the same regulations as private landowners.

Gambling – P. Smith moved seconded by Bautista that the Neighborhood Board not support gambling in the State of Hawaii in any form. The motion carried. 5-1-2 Aye: Beamer, Makini, Miyashiro, G. Smith, P. Smith Nay: Alexander Abstain: Bautista, Malama

Questions, comments, and concerns: (1) P. Smith noted that she has previously lived in a small town that was torn apart by gambling which is why she is opposed to legalizing gambling in Hawaii.

Gentry request for zoning – Debra Luning of Gentry Homes, Ltd. presented a summary of Gentry's proposed Ewa Makai development for which it will be seeking land use changes at the State Land Use Commission and the City. The Estate of James Campbell, with Gentry having development rights, currently owns the land. The 283-acre development, which is basically an "infill" project, is being proposed as a continuation of the existing Ewa by Gentry community to enable more effective overall planning for the entire master planned community. The Conceptual Master Plan for Ewa Makai, which Luning reviewed, includes approximately 1,865 residential homes (single family detached units, cluster units, and multi-family units), community facilities (including an 18-acre intermediate or middle school, a community recreation center complex, and two church/day care center sites), a commercial/industrial complex, parks, open space for drainage, and roadways. An important feature of Ewa Makai will be the development of Kapolei Parkway, which when completed by all parties (Haseko, Gentry, City and State), will provide an alternative access out of Ewa Beach. Bike paths will be provided throughout the Ewa Makai community and will serve as a link to other communities and to the regional park at Kalaeloa. Luning stated that the existing Ewa by Gentry community was originally planned for 8,300 units, but has since been scaled back to approximately 7,200 units, a decrease of about 1,100 units. Thus, Ewa Makai will result in a net increase of only 750 units. The project has gained the support of the Ewa by Gentry Community Association and the Ewa Neighborhood Board's Committee on Planning and Zoning.

Questions, comments, and answers: (1) Gentry Homes was commended for setting aside two plots of the Ewa Makai project for churches. (2) Question was raised if noise buffers were considered to decrease noise coming from proposed parks in the plan. Luning stated that the noise concerns from the parks would be addressed. (3) Opposition to the project was noted because the project would lessen the

Property value of surrounding homes and enhances the current traffic and dust problems. (3) A suggestion was made that construction of new homes in the Ewa area be suspended until traffic problems are corrected.

Malama made the following recommendations to the Board from the Planning and Zoning Committee for the Ewa Makai Project.

1. **Support the development of the Ewa Makai project, which incorporates the infrastructure development for roads/technology, sewage, and the intermediate school site development.**
2. **The Department of Education should actively encourage parents of students in overcrowded area schools to apply for geographical exemptions to attend Iroquois Point Elementary.**
3. **Do not support any future requests for increasing density in the project.**
4. **Future legislators need to ensure CIP funding for the development of the new intermediate school.**

The motion carried. 5-2-1 Aye: Beamer, Makini, Malama, G. Smith, P. Smith Nay: Alexander, Miyashiro Abstain: Bautista.

Malama added that due to private land ownership, the Planning and Zoning Committee does not recommend to pursue beach access at Aekai Place.

UNFINISHED BUSINESS: None.

REPORTS:

Military – There was no representative present.

Board of Water Supply – Cal Sueoka distributed the BWS report and highlighted the following: (1) There were no water main breaks and six ongoing water projects in Ewa. (2) General Water Announcement: In January 2000, the Board of Water Supply began the AKAMAIRead project which will allow the automatic reading of meters by electronic rather than manual means. Approximately 150,000 water meters were scheduled for replacement or retrofitting, starting in the Makaha-Waianae area and moving eastward around the island. We estimated that this project would take three years to complete and would make it easier for the BWS to obtain timely and accurate meter reading and to detect leaks in our distribution system and at the customer's home or business. The installation of the electronic device would allow the transmission of consumption information from the meter to a computer set inside a BWS vehicle as it is driven past. As our contractor approaches the final year of this project, work has been completed for most of Oahu. We are now in the Heeia-Kahaluu area and will move towards the North Shore and finish up neighborhoods before the project ends in March 2003. Questions about the AKAMAIRead project can e directed to our Customer Service unit at 532-6530 or AMR Project Office at 527-5109.

P. Smith moved seconded by G. Smith to add Hale Kipa to the agenda. The motion carried unanimously.

The agenda was taken out of order.

Hale Kipa Emergency Shelter Program – Dori Tyau reported that Hale Kipa is a short-term placement shelter for teens currently involved in the "system", needing temporary shelter while they wait they await next placement. An 8-bed coed shelter is located in Manoa and in the process is a proposal for a 5-bed female shelter in Ewa. Funding and referral sources for the program are provided by the Department of Human Services (Child and Welfare Services), Family Court, Offices of Youth Services, and the Hawaii Youth Services Network.

Ewa Neighborhood Board Planning & Zoning Committee

Committee Chair: Tesha H. Malama
Meeting Held On: 2/28/02 Thursday 6:00 p.m. Haseko Room
Attendees: Lyle Halverson, Tony Becker, Pam Smith, Garry Smith, Roby Correa, Debbie Luning, Gary Bautista, and Tesha Malama
Called to order at 6:00pm

Agenda: Ewa by Gentry Makai Project – Debbie Luning
Discussion about appropriate amount of schools in the new area.
Aekai Pl. beach access.

The Planning and Zoning (P&Z) committee had concerns about projections involving schools and roadways, and asked Debbie Luning to present the project again this month. This allowed the P&Z Committee to meet with DOE.

Debbie Luning pointed out on the display board the roadway connections. The roads throughout the development will be built as the project is built ensuring through access between the Oceanpointe and the Gentry project. The Keaunui Road will intersect Kapolei Parkway, and those roads will be fully developed through the project. If traffic lights are deemed necessary, the intersection at Ft. Weaver and the Hawaii Prince Golf Course will also be developed and equipped with proper technology for synchronized traffic lights.

Pam Smith reported the research findings from the meeting with DOE representatives.

School	Capacity	Current	Projected 02	Projected 06
Ewa Elementary	764	851	831	867
Ewa Beach Elementary*	549	621	613	824
Holomua	1147	1230	1194	1250
Kaimiloa	745	758	757	764
Pohakea	672	583	541	565
Iriquois Point	1060	654	724	704
Ilima Intermediate	1311	1030	1081	1129
Jame Campbell HS	2188	2043	1821	1866
* 04 addition of 6 classrooms	120			
Totals for Elem. Schools	**5057**	**4697**	**4660**	**4974**

By reviewing the numbers, it was found that Iroqouis Pt. Elementary is currently under-utilized, therefore DOE expressed they may need to do some redistricting in the near future. Pam Smith suggested that a possible immediate solution would be to offer parents who live in the Ewa area the option of sending their children to Iroquois Point Elementary. Many parents may opt to do so, especially because it is an air-conditioned school with nice facilities. Although being located on a military base may cause some hindrance, there are several schools on military bases near Wahiawa that accept (or used to accept) non-military children.

DOE meetings with Sanford Beppu and Keith Kameoka provided us with information and plans for the current schools. New schools are planned with buildings and portables in mind. A new permanent building of 6 classrooms will be built at Ewa Beach Elementary. A new Elementary school is being planned for the Oceanpointe development. Also Ewa Elementary could be expanded to include 4 more portable buildings. The new intermediate school in Ewa Makai will most likely be developed for multi-track since that is the trend today. The DOE may consider building it as a middle school that would include 6th to 8th grades so as to relieve the pressure of surrounding elementary schools.

As a committee we still have concerns about DOE's projections for the Ewa plain, but we are satisfied that Gentry has made all efforts to meet DOE expectations for school development. We are also satisfied with roadway development planned for the project.

Ewa Neighborhood Board Planning & Zoning Committee

Committee Chair: Tesha H. Malama
Meeting Held On: 1/15/02 (Tuesday) 6:00 p.m. Haseko Room
Attendees: Gordon Sing, Diane Sing, Lyle Halverson, Tony Becker, Pam Smith, Garry Smith and Tesha Malama
Called to order at 6:00pm

Agenda: Ewa by Gentry Makai Project – Debbie Luning
Aekai Beach Access – Gordon Sing
Ewa Mill Parcel of land Community Center/Football Field
(William Gonsalves and Bill Mclaughlin)

Attendees introduced themselves and the discussion on Aekai Beach access began. Gordon Sing restated the necessity to pursue restoring beach access at Aekai Place. To restore safety and allow the public to enjoy the area like the community had done for over 30 years. Tesha explained there were 2 basic ways to accomplish this. First negotiate with the property owner and utilize CIP or Vision Team funding to purchase the land, or secondly have the city pursue condemnation of the land and pay fair market value to the owner.

As a committee it was decided that we would work with John DeSoto's office on pursuing the possibility and feasibility of condemnation. Gordon Sing did explain that he thinks the immediate area homeowners may not support the reopening, but he could get over 1,000 signatures from the Ewa Beach community who supports the opening for beach access. The property has been up for sale, but the owner has not been successful in getting it sold.

Debbie Luning presented the Ewa by Gentry Makai proposed project. There were 2 concerns identified. First housing units that surround the parks area be set back away from the park to prevent the necessity for park closure requests, specifically the 14 acre open parcel designated drainage area should be adjacent to the proposed middle school instead of the residential cluster. The second concern was about appropriate development of schools for the project and ultimately the Ewa Beach/Ewa plain. Debbie explained that the DOE suggested Gentry designate 18 acres for a Middle School and Haseko's plan for another elementary school would be sufficient for 1800 more residential units by Gentry and estimated 4,500 units planned by Haseko. The committee raised the same concerns about infrastructure such as roads, drainage, schools, etc. We agree with Gentry they can only plan for what the State, City, and DOE dictates, and we appreciate that Gentry has reduced their overall project plans by 1,200 units from 8,300 to 7,100. We like the fact that plans include roadway completion of Keaunue drive and Kapolei Parkway.

The committee agreed to contact DOE about their plans for schools and share the concerns that 2 new schools to the area with all the housing developments are not sufficient. Tony also suggested that we contact the surrounding schools to get a pulse of the student population and administration's thoughts. The committee asked Debbie to reconvene with committee in February to iron out the details.

Ewa Parcel of land for a community center or football field. The parties concerned did not attend therefore there was no discussion on this agenda item.

Meeting ended approximately 7:45 pm

The P&Z committee has made recommendations to do small modifications to the plan, but we propose to the board that we support Ewa Makai project. Furthermore we recommend to Gentry that they work closely with future legislators to budget through CIP funding the school projects.

Recommendations to the Board:

Ewa Makai Project

1. We support the development of the Ewa Makai project, which incorporates the infrastructure development for roads/technology, sewage, and the intermediate school site development.
2. The Department of Education should Actively Encourage parents of students in overcrowded area schools to apply for geographical exemptions to attend Iriquois Point Elementary."
3. We do not support any future requests for increasing density in the project.
4. We need future legislators to ensure CIP funding for the development of the new intermediate school.

Aekai Pl.

1. Due to private land ownership, we do not recommend to pursue beach access at Aekai Pl.

Meeting ended at 7:10 p.m.

Ewa Neighborhood Board #23
c/o Neighborhood commission office
530 South King Street
Honolulu Hale Room 400
Honolulu, Hi.

3-12-02

Dear Sirs :

Last Friday, March 8,2002, I received notice in the mail (See attached) a letter to notify adjacent land owners of The Gentry Companies intent to gain approval of zoning changes for the parcel of land directly "makai" (South) of my home at 91-933 Puhikani Street. I called Ms. Luning and stated I had lots of questions, but the one question I really needed answers for is how do I opose these Zoning changes ?

I oppose this zoning change for three reasons. First, Existing transportation/Traffic problems continue. Second, the continuing problem of fugitive dust from construction projects, including Gentry. The third reason to oppose this zone change is the reduction in land value due to adjacent high rise/ multi level, view reducing structures.

I urge this Board to oppose this zoning change at this time for these, as well as other reasons.

Very Truly Yours

Thomas H. Hoxie
91-933 Puhikani St.
Ewa Beach, Hi. 96706

HAWAIIANA

Hawaiiana Management Company, Ltd.
Pacific Park Plaza, Suite 700
711 Kapiolani Boulevard
Honolulu, Hawaii 96813
Tel: (808) 593-9100
Fax: (808) 593-6333
Internet: www.hmcmgt.com

November 19, 2001

Mr. Anthony J. H. Ching
Executive Officer
State Land Use Commission
State Office Tower
235 South Beretania Street, 4th Floor
Honolulu, Hawaii 96813

Re: Gentry Homes, Ltd., Ewa Makai Master Plan

Dear Mr. Ching:

This letter is to inform you that the Board of Directors of Ewa by Gentry Community Association reviewed the proposed Ewa Makai Master Plan prepared for Gentry Homes, Ltd. at their regular meeting held on October 24, 2001.

After studying the plan and discussing the potential effects on Ewa by Gentry Community Association, the Board of Directors was unanimous in their approval of the Master Plan and voices their support for the development of Ewa Makai.

Sincerely,

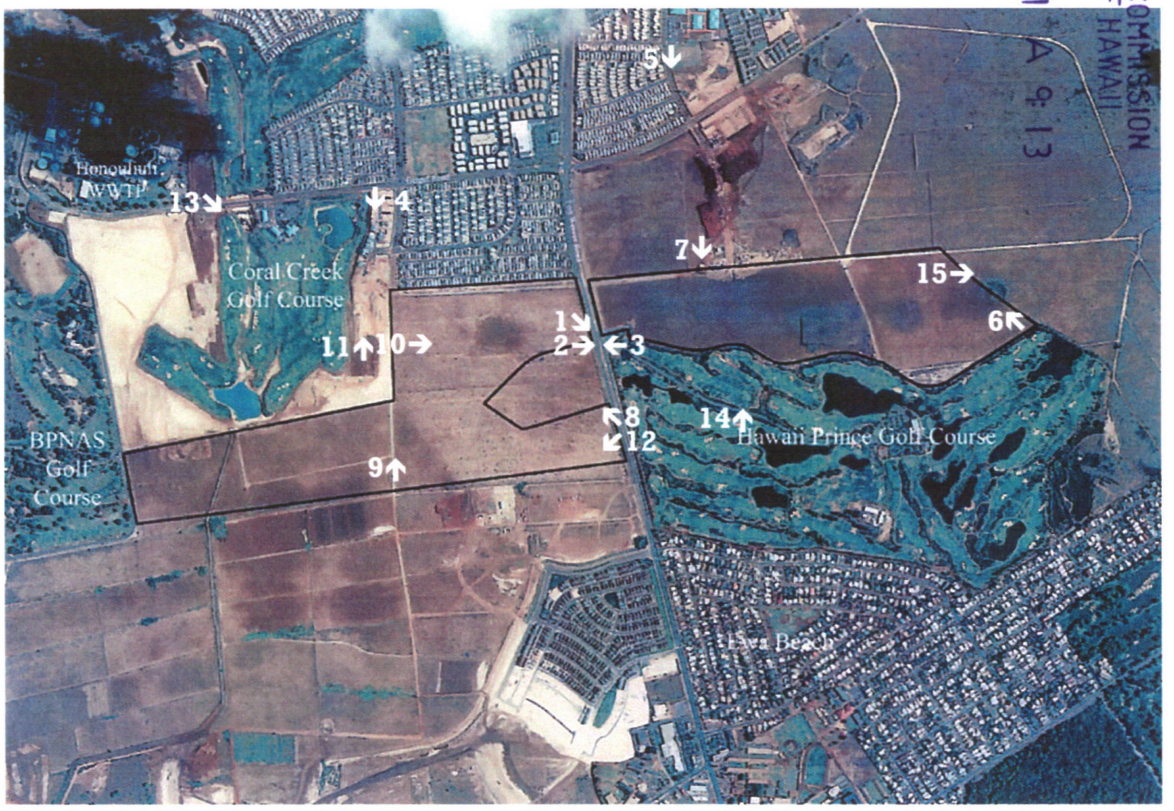
FOR THE BOARD OF DIRECTORS OF
EWA BY GENTRY COMMUNITY ASSOCIATION

Ed Robinson, PCAM®
Management Executive

ORIGINAL

LAND USE COMMISSION
STATE OF HAWAII
2003 MAR 21 A 9:13

PHOTOGRAPHS OF PROJECT AREA



Number keys to photographs found on the following pages are noted on the above aerial shot of Ewa Makai.

Ingress and Egress to Property



Future main entrance to Ewa Makai–West off of Fort Weaver Road (Keaunui Drive Extension) next to Hawaii Prince Golf Course entrance.
←[1]
[2] ↓





[3] Location of future main entrance to Ewa Makai-West off of Fort Weaver Road (opposite from entrance to Ewa Makai-East).



[4] A regional highway improvement, Kapolei Parkway in Ewa by Gentry will be extended to serve the transportation needs of Ewa Makai-West, as well as other area residents.



[5] Keaunui Drive in Ewa by Gentry will be extended through Ewa Makai-East.

Photos of Ewa Makai-East and West



6 A view of Ewa Makai-East. The green area is a sump.



7 A view of Ewa Makai-East facing South. The Hawaii Prince Golf Course can be seen in the background.



8 A view of Ewa Makai-West looking Northwest, with a partial view of the Waianae Mountain Range.



9 Livestock is raised by Ralph's Ranch on a portion Ewa Makai-West.



10 A view of the Ewa Makai-West facing toward the East. Ft. Weaver Road and the Koolaus can be seen in the background.

Photos of Neighboring Properties



[11] The subdivisions of Sun Terra and Hu'elani in Ewa by Gentry lie to the north of Ewa Makai-West.



[12] The planned community of HASEKO'S Ocean Pointe lies to the south of Ewa Makai-West.



[13] Ewa Makai will be bordered by three golf courses. The Barbers Point NAS Golf Course forms the western boundary of Ewa Makai-West, while the Coral Creek Golf Course (shown here) borders a portion of Ewa Makai-West to the north.



[14] The Hawaii Prince Golf Course lies to the South of Ewa Makai-East. In the background can be seen homes in the communities of Sonoma and Prescott in Ewa by Gentry which will border Ewa Makai-East to the north.



[15] An open area that is part of the existing Explosives Safety Zone at West Loch forms the eastern boundary of the project

EXHIBITS

BLUEBIRDonline.com (888) 477-0700

ORIGINAL

LAND USE COMMISSION
STATE OF HAWAII
2003 MAR 21 A 9:13

EXHIBIT AA

Current Balance Sheet and Income Statement
Financing Strategy
Letter from BOH Regarding Gentry's Capability to Develop Ewa Makai

CONFIDENTIAL

Gentry Investment Properties
Balance Sheet
As of December 31, 2002

Unaudited

	2002 Historical Cost Basis
Cash	404,430
Accounts Receivable	572,519
Real estate properties held for investment	82,831,931
Other Assets	1,806,717
Total Assets	85,615,597
Accounts Payable	38,233
Notes Payable	25,708,424
Due to partners and affiliates	8,938,078
Total Liabilities	34,684,735
Partners' Capital	50,930,862
Total Liabilities and Partner's Capital	85,615,597

CONFIDENTIAL

Gentry Investment Properties
Statement of Income
As of December 31, 2002

Unaudited

	2002
Revenues:	
Gain on Sales of Real Estate Properties	4,731,751
Interest Income	23,051
Rental and Other Income	174,507
Total Revenues	4,929,309
Expenses:	
General and Administrative Expenses	465,518
Financing Expenses	479,663
Rental and Other Expenses	1,319,309
Total Expenses	2,264,490
Net Income (Loss)	2,664,819

THE GENTRY COMPANIES

INTER-OFFICE CORRESPONDENCE

To: Debbie Luning

FROM: Quentin Machida

DATE: February 12, 2003

RE: Financing for Ewa Makai

PETITIONER'S FINANCIAL CONDITION

Attached to this Petition as Exhibit AA of Exhibit 1 and incorporated herein by reference are the Petitioner's Balance Sheet as of December 31, 2002, Statement of Income as of December 31, 2002, Financing Strategy for Ewa Makai and a letter from Mr. Ralph Mesick, Vice President, Construction and Income Property Loan Department, Bank of Hawaii, addressed to the Land Use Commission, State of Hawaii, confirming Bank of Hawaii's financing of Gentry Homes, Ltd.'s development work in Ewa, Oahu. The Petitioner intends to use a combination of cash reserves and financing to acquire the two parcels for the development. After the Petitioner obtains its land entitlements, Gentry Homes, Ltd. will acquire the land in smaller increments, and will finance the infrastructure and development costs with its current $34 million revolving line of credit. The Subject Property will serve as additional collateral for the line of credit. It is anticipated that this line of credit will have sufficient capacity to finance all site and building improvements for the project.

Bank of Hawaii

January 17, 2003

Land Use Commission
State of Hawaii
335 Merchant Street, Room 104
Honolulu, HI 96813

Re: Gentry companies applications for land use redistricting and zoning entitlements

Gentlemen:

Bank of Hawaii has financed many real estate projects developed by The Gentry Companies over the past 30 years. We are currently providing financing to Gentry Homes, Ltd. for the development of its Ewa by Gentry community.

Based on its track record of successfully completed projects, we believe that Gentry has the management capability and expertise to develop the Ewa Makai-East and Ewa Makai-West parcels for which it is currently seeking State land use redistricting and City zoning entitlements. These entitlements are a necessary first step in order for Gentry to secure the financing needed for the development of Ewa Makai from lending institutions such as Bank of Hawaii.

Sincerely,

Ralph M. Mesick
Senior Vice President
Bank of Hawaii
Commercial Real Estate Loan Division

ORIGINAL

LAND USE COMMISSION
STATE OF HAWAII
2003 MAR 21 A 9:13

'EWA MAKAI:
IMPACT ON AGRICULTURE

PREPARED FOR:

Gentry Investment Properties

PREPARED BY:

Decision Analysts Hawaii, Inc.

February 2002

LAND USE COMMISSION
STATE OF HAWAII

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EXECUTIVE SUMMARY

1. PROJECT PROPOSAL

Located in the 'Ewa District of O'ahu and straddling Fort Weaver Road, the 'Ewa Makai project (the Project) is a 283-acre residential community being proposed by Gentry Investment Properties as a southern continuation of the existing 'Ewa by Gentry community. It will be an infill project sandwiched between two existing urban areas: (1) on the north, the Project will abut the 'Ewa by Gentry residential community and Coral Creek Golf Course; (2) on the south, the Project will abut the Ocean Pointe residential community and golf course and the Hawai'i Prince Golf Course.

2. AGRICULTURAL CONDITIONS

The property is fallow sugarcane land, about 86 acres of which are well-suited for growing low-elevation crops. This evaluation is based on the favorable soil conditions and ratings over 31% of the site, the gently-sloping terrain, the very sunny climate, good access, and the short trucking distance to the Honolulu markets and to shipping terminals.

However, crop farming could be limited by a lack of access to a large volume of low-cost irrigation water and by nuisance problems with neighboring residential communities.

3. IMPACT ON EXISTING RANCHING OPERATIONS

Currently, nearly all of the property is leased to Ralph's Ranch, which also leases about 500 acres in Kunia and Kahuku. About 75 head of cattle and a half dozen horses graze on the total acreage, and another 10 or so horses are penned. The 'Ewa acreage provides sufficient grass to graze about 20 head, more or less, depending on rainfall and supplemental feed. The ranch is operated as a hobby by a father and son and has no employees.

Development of the Project is expected to have a modest impact on ranch operations, possibly reducing the size of the herd by a dozen or more head.

4. IMPACT ON THE GROWTH OF DIVERSIFIED AGRICULTURE

The Project will commit about 283 acres of agricultural land to a non-agricultural use. However, this commitment will not adversely affect the growth of diversified agriculture. This conclusion is based on the following findings:

— Ample land is available for diversified agriculture

A vast amount of land has been released from plantation agriculture (about 236,200 acres since 1968), and this release of land has far outpaced the demand for land for diversified crops (an increase of about 38,500 acres over this same period). The net decrease in crop land amounted to 197,700 acres. While some of the released land has been converted or is scheduled to be converted to non-agricultural uses, most of it remains available for diversified crops. Thus, ample land is available in Hawai'i to accommodate the growth of diversified agriculture.

— Land is not the limiting factor to the growth of diversified agriculture

Consistent with the above, the limiting factor to the growth of diversified agriculture is *not* the *land supply*, but rather the *size of the market* for crops that can be grown *profitably* in Hawai'i.

These findings also apply to O'ahu. In particular, most of the 22,500 acres released from sugar production during the 1990s remains available. Fields in Kunia and 'Ewa have been leased, but markets for crops grown on the land are still being developed. On the North Shore, various crops are being explored, but most of the former sugarcane land remains fallow.

With regard to the Project, it will involve the loss of far too little good agricultural land to adversely affect the availability of land to farmers on O'ahu or in other parts of Hawai'i, or to adversely affect the growth of diversified agriculture in Hawai'i.

5. OFFSETTING AND COMPARATIVE BENEFITS

While the Project will result in urban development on some good agricultural land, this loss to agriculture will be offset by the following benefits: new homes for about 1,865 families, about 1,500 jobs at the industrial-commercial center, 30 acres of community facilities, and 11.5 acres of new parks.

For comparison, the current grazing operation supports a fraction of one job, while 283 acres planted in crops could support about 35 jobs.

6. CONSISTENCY WITH STATE AND COUNTY POLICIES

State and County plans call for preserving the economic viability of plantation agriculture and promoting the growth of diversified agriculture. To accomplish this, an adequate supply of agriculturally suitable lands and water must be assured.

With regard to diversified agriculture, the Project will reduce the availability of agricultural land by a small amount. However, because of the vast amount of land that has been released from plantation agriculture, ample agricultural land is available on O'ahu and other islands to accommodate the growth of diversified agriculture. Thus, the Project will *not* limit the potential growth of diversified agriculture.

Thus, the Project will not conflict with the major thrust of the agriculture portions of State and County policies.

'Ewa Makai:
Impact on Agriculture

1. Introduction

The 'Ewa Makai project (the Project) is a residential community being proposed by Gentry Investment Properties on approximately 283 acres of agricultural land. The impact of the Project on agriculture is analyzed in this report.

The material covers the location of the Project and neighboring land uses, a general description of the Project, State and County land classifications, the agricultural conditions of the site, potential crops, recent agricultural uses of the land, the impact of the Project on existing ranch operations and on the growth of diversified agriculture, offsetting and comparative benefits of the Project, and consistency of the Project with State and County agricultural policies.

Appendix A provides information on Hawaii's agricultural land market, while Appendix B provides information on State and County objectives, policies, and guidelines related to agricultural lands.

2. Project Location and Neighboring Land Uses

Located in the 'Ewa District of O'ahu below 'Ewa by Gentry, the property is comprised of two parcels, one on each side of Fort Weaver Road: [1]

- TMK: 9-1-10:7: 'Ewa Makai-West (114.617 acres)
- TMK: 9-1-68:5: 'Ewa Makai-East (167.997 acres)

'Ewa Makai will be an infill project sandwiched between two existing urban areas. On the north, the Project will abut the 'Ewa by Gentry residential community and Coral Creek Golf Course. On the south, the Project will abut the Ocean Pointe residential community and golf course and the Hawai'i Prince Golf Course. The west end of the Project abuts the Barbers Point Golf Course, while the east end abuts the U.S. Navy Explosive Safety Zone for the West Loch Naval Magazine. This safety zone is agricultural land which could be planted in crops.

3. Project Description

The Project will be a 283-acre southern continuation of the existing 'Ewa by Gentry community. The Conceptual Master Plan for the Project includes the following components:[1]

- 1,865 homes on 189 acres (550 single-family detached homes, 675 single-family detached homes, and 640 multi-family homes).
- 24 acres of community facilities (a middle school, a recreation center, and two church sites).
- 30 acres for a commercial/industrial complex that will provide an estimated 1,500 full-time and part-time jobs at full development.
- 11.5 acres of parks.
- 14 acres for infrastructure and drainage.
- 14.5 acres of roadways.

4. Land Classifications

Currently, all of the Project area is in the State Agricultural District. At the County level, 'Ewa Makai-West is zoned AG-2 (General Ag) and Makai-East is zoned AG-1 (Restricted Ag).[1]

Project implementation will require redistricting all 283 acres to the State Urban District.[1] At the County level, Project implementation will require rezoning to: R-5 Residential (104 acres), A-1 Apartment (124 acres), P-2 General Preservation (25 acres), and IMX-1 Industrial-Commercial Mixed Use (30 acres).

5. Agricultural Conditions

5.a. Soil Types

The Project area contains three soil types as determined by the Soil Conservation Service, now known as the Natural Resources Conservation Service (NRCS):[2]

		Acres
EmA	'Ewa silty clay loam, moderately shallow, 0 to 2 percent slopes.	65.1
EmB	'Ewa silty clay loam, moderately shallow, 2 to 6 percent slopes.	21.4
MnC	Mamala stony silty clay loam, 0 to 12 percent slopes.	196.1

5.b. Soil Ratings

Three classification systems are commonly used to rate soils in Hawai'i: (1) Land Capability Grouping, (2) Agricultural Lands of Importance to the State of Hawai'i, and (3) Overall Productivity Rating.

5.b.(1) Land Capability Grouping (NRCS Rating)

The 1972 Land Capability Grouping by the United States Department of Agriculture NRCS, rates soils according to eight levels, ranging from the highest classification level, **I**, to the lowest level, **VIII**.[2]

Assuming that the land is irrigated, soil types EmA and EmB—which cover about 30.6% of the Project area—have land capability ratings of IIs and IIe, respectively. The II indicates that the soils have moderate limitations that reduce the choice of crops that can be grown successfully, or indicates that moderate conservation practices are required. The subclassification "s" indicates that the limitation is due to stoniness, unfavorable texture, shallowness, or low water-holding capacity; the subclassification "e" indicates a risk of erosion.

Soil MnC, which covers 69.4% of the Project area, has a land capability rating of IIIs, which indicates that the soils have severe limitations that reduce the options on plants, require special conservation practices, or both.

5.b.(2) Agricultural Lands of Importance in the State of Hawai'i (ALISH)

The ALISH ratings were developed in 1977 by the NRCS, the University of Hawai'i (UH) College of Tropical Agriculture and Human Resources, and the State of Hawai'i, Department of Agriculture.[3] This system classifies agricultural land into three categories: (a) **Prime**, which is best suited for the production of crops because of its ability to sustain high yields with relatively little input and with the least damage to the environment; (b) **Unique**, which is non-Prime agricultural land currently being used for the production of specific high-value crops; and (c) **Other**, which is non-Prime and non-Unique agricultural land that is important to the production of crops.

Approximately 30.6% of the Project area is rated **Prime** (soil types EmA and EmB), and 69.4% is rated **Other** (soil type MnC).

5.b.(3) Overall Productivity Rating (LSB Rating)

In 1972, the UH Land Study Bureau (LSB) developed the Overall Productivity Rating, which classifies soils according to five levels with **A** representing the class of highest productivity and **E** the lowest.[4]

About 23.2% of the Project area is rated **A** and the remaining 76.8% is rated **C**.

5.b.(4) Summary Evaluation of Soil Quality

About 23% to 31% of the Project area is comprised of higher quality soils. The remaining lands have lower quality (stony) soils, but they are still suitable for crop farming.

5.c. Soil Characteristics

Consistent with the above soil ratings, the better agricultural lands exhibit a number of favorable characteristics: they are good for machine tilling; slopes are gentle (see below); and the soils are moderately fine in texture, not stony, more than 30 inches deep, and well-drained.[4]

Most of the lower-quality lands have characteristics quite similar to the more highly rated soils in the Project area, except that the soils are moderately good for machine tilling, stony, and less than 30 inches deep.

5.d. Elevation

The elevation of the Project area ranges from about 20 to 35 feet above mean sea level.[1] At this elevation, the land is suitable for crops that are generally referred to as "low-elevation crops," as opposed to "high-elevation crops"(such as those being grown in Kula, Maui or Waimea on the Big Island).

5.e. Slopes

Except for two pronounced sumps near the eastern boundary of 'Ewa Makai-East, slopes are approximately 1%.[1]

5.f. Climatic Conditions

5.f.(1) Solar Radiation

The Project area receives considerable sunshine, with an average daily insolation exceeding 500 calories per square centimeter.[5]

5.f.(2) Temperatures

The average low temperatures range from about 60°F in the winter to about 70° in the summer, while the average high temperature ranges from just under 80° in the winter to just under 90° in the summer.[6]

5.f.(3) Rainfall

Average annual rainfall in the Project area is slightly more than 20 inches.[7]

5.g. Irrigation Water

Access to a large volume of low-cost irrigation water may no longer be available to irrigate crops in the Project area because groundwater recharge from diversified crops in 'Ewa is far less than it was when the surrounding land was planted in sugarcane.

5.h. Road Access

The fields are reached via Fort Weaver Road and former canehaul roads.

5.i. Locational Advantages

The Project area is well located for serving the Honolulu consumer market and export markets. This is due to the short trucking distance to Honolulu markets, Honolulu Airport, and Honolulu Harbor.

5.j. Nuisance Issues

Given the nearby homes at 'Ewa Gentry and Ocean Pointe, nuisances arising from farm operations could become an issue for both residents and farm operators if the land were to be farmed. Some residents close to farming operations would be likely to complain about occasional noise, dust, chemical spraying, etc. In turn, addressing the complaints could adversely affect farming operations.

5.k. Summary

As much as 86 acres of the Project area are well-suited for growing low-elevation crops. This evaluation is based on the favorable soil conditions and ratings over 31% of the site, the gently-sloping terrain, the very sunny climate, good access, and the short trucking distance to the Honolulu markets and to shipping terminals.

However, crop farming could be limited by a lack of access to a large volume of low-cost irrigation water and by nuisance problems with neighboring residential communities.

6. POTENTIAL CROPS

Based on the above agronomic conditions, the Project area is suitable for low-elevation crops commercially grown in Hawai'i, including but not limited to: asparagus, beans (green, bush, and snap), bell peppers, bittermelon, cantaloupe, Chinese peas, cucumbers, daikon, dry onions, eggplant, flowers/nursery products, ginger root, green onions, green peppers, head and semi-head lettuces, herbs, honeydew melons, limes, lotus root, lychee, Manoa lettuce, mango, mustard cabbage, Oriental squash, parsley, pumpkins, seed crops, sweet corn, sweet potatoes, tangerines, andwatermelons.[8]

7. RECENT AGRICULTURAL USES

For approximately 100 years ending in the early 1990s, the land was used for cultivating sugarcane. Since the closure of O'ahu Sugar Co., Ltd., limited grazing has occurred on the property (see below).

8. IMPACT ON EXISTING RANCH OPERATIONS

Currently, nearly all of the property is leased to Ralph's Ranch, which also leases about 500 acres in Kunia and Kahuku.[9] About 75 head of cattle and a half dozen horses graze on the total acreage, and another 10 or so horses are penned. The 'Ewa acreage provides sufficient grass to graze about 20 head, more or less, depending on rainfall and supplemental feed. The ranch is operated as a hobby by a father and son and has no employees.

Development of the Project is expected to have a modest impact on ranch operations, possibly reducing the size of the herd by a dozen or more head.

9. IMPACT ON THE GROWTH OF DIVERSIFIED AGRICULTURE

The Project will commit about 283 acres of agricultural land to a non-agricultural use. However, this commitment will not adversely affect the growth of diversified agriculture. This conclusion is based on the following findings from Appendix A:

— Ample land is available for diversified agriculture

A vast amount of land has been released from plantation agriculture (about 236,200 acres since 1968), and this release of land has far outpaced the demand for land for diversified crops (an increase of about 38,500 acres over this same period). The net decrease in crop land

amounted to 197,700 acres. While some of the released land has been converted or is scheduled to be converted to non-agricultural uses, most of it remains available for diversified crops. Thus, ample land is available in Hawai'i to accommodate the growth of diversified agriculture.

— Land is not the limiting factor to the growth of diversified agriculture

Consistent with the above, the limiting factor to the growth of diversified agriculture is *not* the *land supply*, but rather the *size of the market* for crops that can be grown *profitably* in Hawai'i.

These findings also apply to O'ahu. Since 1968, the contraction and eventual closure of Kahuku Planation Co. O'ahu Sugar Co., Ltd., and Waialua Sugar Co., Inc. released about 37,860 acres. Also, most of the 22,500 acres released from sugar production during the 1990s remain available. Fields in Kunia and 'Ewa are regarded as among the best farmland in Hawai'i. These lands have been leased, but markets for crops grown on the land are still being developed. On the North Shore, various crops are being explored, but most of the former sugarcane land remains fallow.

With regard to the Project, it will involve the loss of far too little good agricultural land to adversely affect the availability of land to farmers on O'ahu or in other parts of Hawai'i, or to adversely affect the growth of diversified agriculture in Hawai'i.

10. OFFSETTING AND COMPARATIVE BENEFITS

While the Project will result in urban development on some good agricultural land, this loss to agriculture will be offset by the following benefits: new homes for about 1,865 families, about 1,500 jobs at the industrial-commercial center, 30 acres of community facilities, and 11.5 acres of new parks.[1]

For comparison, the current grazing operation supports a fraction of one job, while 283 acres planted in crops could support about 35 jobs (based on 12.5 farm jobs per 100 acres).[10]

11. CONSISTENCY WITH STATE AND COUNTY AGRICULTURAL POLICIES

The *Hawaii State Constitution*, the *Hawaii State Plan*, the *State Agriculture Functional Plan*, and the *General Plan of the City and County of Honolulu* call for preserving the economic viability of plantation agriculture and promoting the growth of diversified agriculture (see Appendix B). To accomplish this, an adequate supply of agriculturally suitable lands and water must be assured.

With regard to plantation agriculture, no existing sugarcane or pineapple plantation will be impacted by the Project.

With regard to diversified agriculture, the Project will reduce the availability of agricultural land. However, because of the vast amount of land that has been released from plantation agriculture since the late 1960s, ample agricultural land is available on O'ahu and on other islands to accommodate the growth of diversified agriculture. Thus, the Project will *not* limit the potential growth of diversified agriculture.

Regarding policies "...to preserve and protect agricultural lands," discussions in the "Agriculture" portion of the *State Functional Plan* recognize that redesignation of lands from Agriculture to Urban should be allowed "... upon a demonstrated change in economic or social conditions, and where the requested redesignation will provide greater benefits to the general public than its retention in ..." agriculture; that is, when an "overriding public interest exists." The enormous contraction in plantation agriculture—resulting in the supply of agricultural land far exceeding demand—constitutes a major change in economic and social conditions. Furthermore, the proposed Project will provide benefits (about 1,865 homes, about 1,500 jobs, etc.) that far exceed those provided by current grazing operations (less than 1 job) or could be provided by diversified agriculture (about 35 jobs). Even with the Project, there will be no loss in existing or potential agricultural employment in view of the availability of agricultural land on O'ahu and throughout the State.

In summary, the Project will not conflict with the major thrust of the plantation-agriculture portions or the diversified-agriculture portions of State and County policies.

12. REFERENCES

[1] Gentry Investment Properties.

[2] U.S. Department of Agriculture, Soil Conservation Service in cooperation with The University of Hawai'i Agricultural Experiment Station. *Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawai'i.* Washington, D.C. August 1972.

[3] Harold L. Baker. *Agricultural Lands of Importance in the State of Hawai'i.* University of Hawai'i College of Tropical Agriculture and Human Resources, Honolulu, Hawai'i. 1977.

[4] Land Study Bureau. *Detailed Land Classification – Island of Oahu.* Honolulu, Hawai'i. December 1972.

[5] State of Hawai'i, Department of Business and Economic Development. *Oahu Sunshine Map.*

[6] Department of Geography, University of Hawai'i. *Atlas of Hawai'i, Second Edition.* University of Hawai'i Press. Honolulu, Hawai'i. 1983.

[7] Department of Geography, University of Hawai'i. *Atlas of Hawai'i, Third Edition.* University of Hawai'i Press. Honolulu, Hawai'i. 1998.

[8] Hawai'i Agricultural Statistics Service. *Statistics of Hawaiian Agriculture.* Honolulu, Hawai'i. Annual.

[9] Ralph's Ranch.

[10] Estimated by Decision Analysts Hawai'i, Inc.

APPENDIX A: HAWAI'I'S AGRICULTURAL LAND MARKET

INTRODUCTION

Presented below and in Figure A-1 is an overview of the agricultural land market in Hawai'i. The discussion includes the release of land from plantation agriculture (i.e., sugarcane and pineapple), the growth in land requirements for diversified crops (i.e., all crops other than sugarcane and pineapple), and the availability of land for diversified crops.

RELEASE OF LAND FROM PLANTATION AGRICULTURE

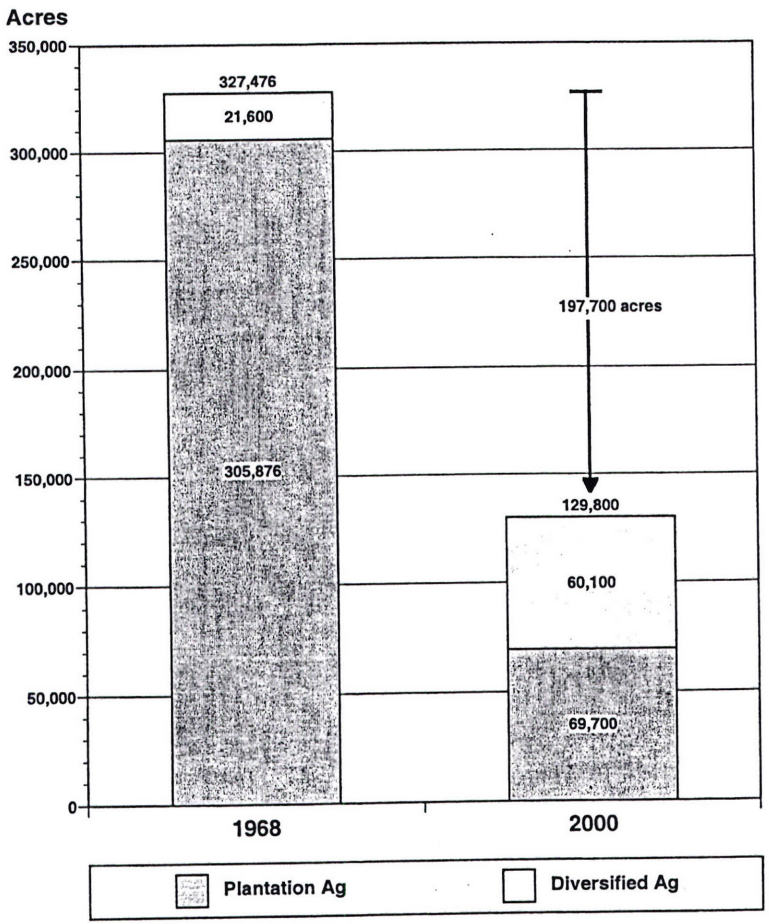
Because Hawai'i's sugar and pineapple industries have contracted substantially over the past three decades, an enormous and growing supply of farmland is available for diversified agriculture and other land uses. As shown in Figure A-1, land in plantation agriculture has declined from about 305,900 acres in 1968 to about 68,700 acres in 2000, for a 32-year decrease of about 236,200 acres (an average decrease of about 7,400 acres per year).[1,2]

On Oahu, the contraction and eventual closure of Kahuku Plantation Co., O'ahu Sugar Co., Ltd. and Waialua Sugar Co., Inc. released about 37,860 acres since 1968.[3]

GROWTH IN LAND REQUIREMENTS FOR DIVERSIFIED CROPS

Land requirements to accommodate the growth of diversified crops are modest compared to the available supply. As plantation agriculture was contracting, Statewide land requirements for diversified crops grew from 21,600 acres in 1968 to 60,100 acres in 2000, for a 32-year increase of 38,500 acres (an average increase of 1,200 acres per year).[1,2] Even this increase in diversified-crop acreage is high in that it includes many fields planted in grasses that are mowed for cattle feed rather than placing cattle on the fields and including the land in the inventory of grazing land.

Figure A-1. Acres in Crop: 1968 and 2000



Although a great many crops can be grown in Hawai'i's year-round subtropical climate, the modest growth in land requirements for diversified crops reflects the fact that few of them can be grown profitably on a large scale. The primary reasons for this are given below.[4]

—Hawai'i's subtropical climate is not well-suited to the commercial production of major crops that grow better in the temperate mainland climates.

—For certain crops, special hybrids adapted to Hawai'i's subtropical climate are yet to be developed.

—Crop pests are more prevalent and more expensive to control in Hawai'i than they are on the mainland where the cold winters kill many pests.

—Fruit-fly infestations prevent exports of many crops, or require expensive treatment.

—Most soils in Hawai'i have low nutrient levels and therefore require high expenditures for fertilizer.

—Hawai'i suffers from high farm-labor costs, largely because the agriculture industry must compete against the visitor industry and related industries for its labor.

—High overseas transportation costs increase the cost of importing agricultural supplies and equipment and, for export crops, shipping produce to market.

—For a number of crops, consumption volumes in Hawai'i are too small to support large, efficient farms (i.e., the volumes are too small to realize economies of scale).

—Trends towards crops that are certified as safe and towards a single supplier of many food items favor large farms.

—Hawai'i farmers must compete against highly efficient mainland and foreign farms which, in a number of cases, can deliver produce to Hawai'i more cheaply than it can be produced locally. This is due to economies of scale and, in comparison to Hawai'i, low costs for land, labor, supplies, fertilizer, pest control, equipment, etc.

AVAILABILITY OF LAND FOR DIVERSIFIED AGRICULTURE

As indicated in Figure A-1, a vast amount of land has been released from plantation agriculture, and this release of land has far outpaced the demand for land for diversified crops. As a result, the amount of land in crops has declined from about 327,500 acres in 1968 to an estimated 129,800 acres in 2000, for a net release of about 197,700 acres (an average decrease of about 6,200 acres per year).[1,2]

Some of this land has been converted or is scheduled to be converted to urban, forestry or other uses. But, the majority of the 197,700 acres remains available for diversified crops. Much of this land is fallow, is used for grazing, or is in some other low-value land-holding operation. A major issue Statewide is how to use productively the vast amount of high-quality agricultural land that has become available.

On O'ahu, most of the 22,500 acres released from sugar production during the 1990s remain available. Fields in Kunia and 'Ewa are regarded as among the best farmland in the State, based on the high solar radiation, high quality soils, and the short trucking distance to the large Honolulu market and, for export markets, to the Honolulu International Airport and Honolulu Harbor.[5] These lands have been leased, but markets for crops grown on the land are still being developed.[6] On the North Shore, various crops are being explored, but most of the former sugarcane land remains fallow.[7]

SUMMARY

In summary, ample land is available on all islands to accommodate the growth of diversified agriculture. Furthermore, the limiting factor to the growth of diversified agriculture is *not* the *land supply*, but rather the *size of the market* for crops that can be grown *profitably* in Hawai'i.

REFERENCES

[1] Schmitt, Robert C. *Historical Statistics of Hawai'i.* The University Press of Hawai'i, Honolulu, Hawai'i. 1977.

[2] Hawai'i Agricultural Statistics Service. *Statistics of Hawaiian Agriculture.* Honolulu, Hawai'i. Annual.

[3] Decision Analysts Hawai'i, Inc. *Hawai'i's Sugar Industry: Problems, Outlook and Urban Growth Issues.* State of Hawai'i, Department of Planning and Economic Development. Honolulu, Hawai'i. April 1981.

[4] Decision Analysts Hawai'i, Inc. *Hawai'i's Sugar Industry and Sugarcane Lands: Outlook, Issues and Options.* April 1989.

[5] Decision Analysts Hawai'i, Inc. *Agricultural Lands of Kunia and Central 'Ewa: Agronomic and Locational Advantages, Potential Crops, Crop Budgets.* December 1993.

[6] Discussions with farmers.

[7] Decision Analysts Hawai'i, Inc. "North Shore Planning District, O'ahu: Agricultural Resources, Situation and Outlook." July 1997.

APPENDIX B:
STATE AND COUNTY OBJECTIVES, POLICIES AND GUIDELINES RELATED TO AGRICULTURAL LANDS

HAWAII STATE CONSTITUTION (Article XI, Section 3):

The State shall conserve and protect agricultural lands, promote diversified agriculture, increase agricultural self-sufficiency and assure the availability of agriculturally suitable lands. The legislature shall provide standards and criteria to accomplish the foregoing.

Lands identified by the State as important agricultural lands needed to fulfill the purposes above shall not be reclassified by the State or rezoned by its political subdivisions without meeting the standards and criteria established by the legislature and approved by a two-thirds vote of the body responsible for the reclassification or rezoning action.

HAWAII STATE PLAN (Chapter 226, Hawaii Revised Statutes, as amended):[1,2]

Section 226-7 Objectives and policies for the economy--agriculture.

(a) Planning for the State's economy with regard to agriculture shall be directed towards achievement of the following objectives:

(1) Viability in Hawaii's sugar and pineapple industries.

(2) Growth and development of diversified agriculture throughout the State.

(3) An agriculture industry that continues to constitute a dynamic and essential component of Hawaii's strategic, economic, and social well-being.

(b) To achieve the agricultural objectives, it shall be the policy of the State to:

(2) Encourage agriculture by making best use of natural resources.

(10) Assure the availability of agriculturally suitable lands with adequate water to accommodate present and future needs.

(16) Facilitate the transition of agricultural lands in economically nonfeasible agricultural production to economically viable agricultural uses.

Section 226-103 Economic priority guidelines.

(c) Priority guidelines to promote the continued viability of the sugar and pineapple industries:

(1) Provide adequate agricultural lands to support the economic viability of the sugar and pineapple industries.

(d) Priority guidelines to promote the growth and development of diversified agriculture and aquaculture:

(1) Identify, conserve, and protect agricultural and aquacultural lands of importance and initiate affirmative and comprehensive programs to promote economically productive agricultural and aquacultural uses of such lands.

(10) Support the continuation of land currently in use for diversified agriculture.

Section 226-104 Population growth and land resources priority guidelines.

(b) Priority guidelines for regional growth distribution and land resource utilization:

(2) Make available marginal or non-essential agricultural lands for appropriate urban uses while maintaining agricultural lands of importance in the agricultural district.

Section 226-106 Affordable Housing

Priority guidelines for the provision of affordable housing:

(1) Seek to use marginal or nonessential agricultural land and public land to meet housing needs of low- and moderate-income and gap-group households.

AGRICULTURE STATE FUNCTIONAL PLAN (1991)[3]

(Functional plans are guidelines for implementing the State Plan. They are approved by the Governor, but not adopted by the State Legislature.)

Objective H: Achievement of Productive Agricultural Use of Lands Most Suitable and Needed for Agriculture.

Policy H(2): Conserve and protect important agricultural lands in accordance with the Hawaii State Constitution.

Action H(2)(a): Propose enactment of standards and criteria to identify, conserve, and protect important agricultural lands and lands in agricultural use.

Action H(2)(c): Administer land use district boundary amendments, permitted land uses, infrastructure standards, and other planning and regulatory functions on important agricultural lands and lands in agricultural use, so as to ensure the availability of agriculturally suitable lands and promote diversified agriculture.

CITY AND COUNTY OF HONOLULU

GENERAL PLAN, Objectives and Policies (Resolution No. 87-211)[4]

Economic Activity

Objective C. To maintain the viability of agriculture on Oahu.

Policy 1. Assist the agricultural industry to ensure the continuation of agriculture as an important source of income and employment.

Policy 2. Support agricultural diversification in all agricultural areas on Oahu.

Policy 3. Support the development of markets for local products, particularly those with the potential for economic growth.

Policy 4. Provide sufficient agricultural land in Ewa, Central Oahu, and the North Shore to encourage the continuation of sugar and pineapple as viable industries.

Policy 5. Maintain agricultural land along the Windward, North Shore, and Waianae coasts for truck farming, flower growing, aquaculture, livestock production, and other types of diversified agriculture.

Policy 6. Encourage the more intensive use of productive agricultural land.

Policy 7. Encourage the use of more efficient production practices by agriculture, including the efficient use of water.

Policy 8. Encourage the more efficient use of nonpotable water for agricultural use.

REFERENCES

[1] State of Hawaii, Office of State Planning, Office of the Governor. *The Hawaii State Plan, 1991.* Honolulu, Hawaii. 1991.

[2] Act 25, S.B. No. 1158, April 15, 1993.

[3] Hawaii Department of Agriculture. *The Hawaii State Plan: Agriculture, State Functional Plan.* Honolulu, Hawaii. 1991.

[4] City and County of Honolulu, Department of General Planning. *General Plan Objectives and Policies.* Honolulu, Hawaii. 1992.

ORIGINAL

LAND USE COMMISSION
STATE OF HAWAII
2003 MAR 21 A 9:13

FINAL REPORT

ARCHAEOLOGICAL SURVEY FOR THE PROPOSED `EWA GENTRY MAKAI DEVELOPMENT `EWA DISTRICT, AHUPUA`A OF HONOULIULI, ISLAND OF O`AHU

(TMK 9-1-10:7 AND 9-1-69:5)

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ABSTRACT

Pacific Legacy, Inc., at the request Environmental Communications, conducted an archaeological survey for the proposed `Ewa Gentry Makai residential housing, commercial and industrial mixed uses, community facilities and open spaces development at a 283-acre parcel in `Ewa (TMK 9-1-10:7 and 9-1-69:5), *ahupua`a* of Honouliuli, island of O`ahu. The proposed project area is currently zoned for agriculture and presently consists of fallow agricultural land formerly used for sugar cane production and limited grazing activities.

Archival research and a review of previous archaeological studies in the area indicates that the `Ewa Plain has undergone dramatic and extensive alterations over its long land use history. The review of the previous archaeology for the area determined the current project area has been previously surveyed by Davis (1988), Goodman and Cleghorn (1991), Jayatilaka et al. (1992), and Goodman et al. (1993). None of these surveys identified any cultural resources within the project area. Based on this information, it seemed extremely unlikely that any surface archaeological sites would be present within the project area. Further, given that the project area was under sugar cane cultivation for approximately 100 years, it seems unlikely that any subsurface cultural material is present in the area.

Indeed, the current survey failed to identify any surface cultural remains. The proposed project area is completely devoid of any natural features and contours. No cultural resources are present in the proposed project area.

While there are no surface archaeological sites in the project area, there is the possibility of encountering subsurface resources in the form of sinkholes containing cultural materials and possibly human burials. These features could be as deep as 3 feet below ground surface. It is recommended that an archaeologist be retained on an on-call basis to assist the contractor in the event that subsurface archaeological resources are encountered.

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1.0 INTRODUCTION

Pacific Legacy, Inc., at the request Environmental Communications, conducted an archaeological survey for the proposed `Ewa Gentry Makai residential housing, commercial and industrial mixed uses, community facilities and open spaces development at a 283-acre parcel in `Ewa (TMK 9-1-10:7 and 9-1-69:5), *ahupua`a* of Honouliuli, island of O`ahu (Figure 1). The proposed project area is currently zoned for agriculture and presently consists of fallow agricultural land formerly used for sugar cane production and limited grazing activities.

1.1 SCOPE OF WORK

Tasks for the current project were performed as follows:

(1) a review of the relevant previous archaeological research conducted in the immediate area;

(2) review of historic documents and literature pertaining to the area;

(3) a survey of the proposed project area; and

(4) the preparation of a final report summarizing results of the survey and recommendations for future work.

1.2 PROJECT LOCATION AND ENVIRONMENTAL SETTING

The district of `Ewa (or The `Ewa Plain, as it is often referred) located on the southwest side of O`ahu, was formed by "a broad elevated coral reef partly covered by alluvium carried out from the mountains" (Macdonald et al. 1983: 420). The district of `Ewa has undergone numerous changes in modern times.

The project area is located along both the east and west sides of Fort Weaver Road. The project area is bounded by residential housing and the Coral Creek Golf Course to the north, the Hawaii Prince Golf Course and residential housing to the south, undeveloped land to the east and the former Barbers Point Naval Air Station to the west. Fort Weaver Road bisects the project area.

Elevation of the `Ewa Plain ranges from sea level to over 200 feet (60.96 m) above mean sea level (AMSL). Approximately 20 inches (50.80 cm) of rain falls annually (with the majority occurring between November and February) with temperatures ranging between 60° and 90°F with the highest temperatures occurring in August and September (Armstrong 1983).

The only permanent running water at Honouliuli is located in Honouliuli Gulch, located on the northeast side of the *ahupua`a*, adjacent to the *ahupua`a* of Hō`ae`ae.

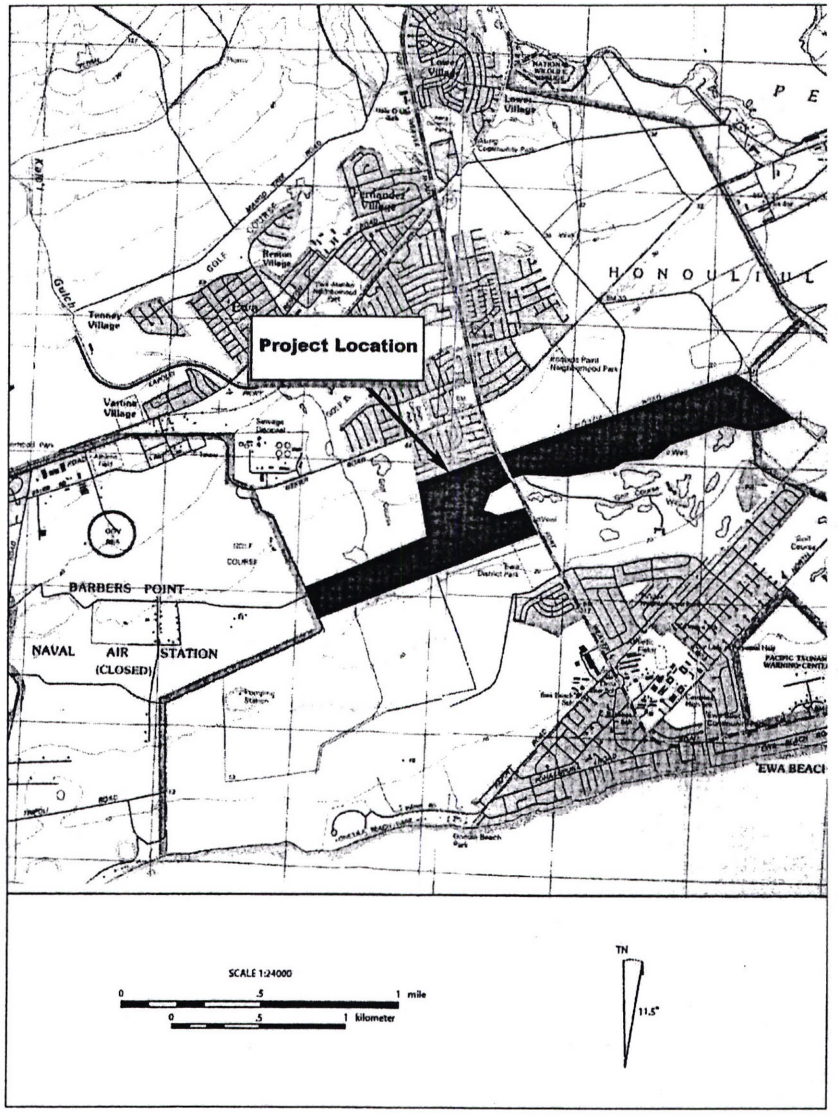

Figure 1. Approximate Location of Project Area depicted on USGS Ewa and Pearl Harbor Quadrangular Map, 1998 and 1999.

1.2.1 Vegetation

Vegetation throughout the `Ewa Plain consists of a variety of alien plants including: lantana (*Lantana camara*), *koa haole* (*Leucaena glauca*), *klu* (*Acacia farnesiana*), *kiawe* (*Prosopis pallida*), finger grass (*Chloris* sp.), natal grass (*Tricholaena rosea*), and various ornamental trees and bushes.

1.2.2 Soils

Soils in the region of `Ewa include: the Waipahu Series, Honouliuli Series, Pearl Harbor Series, Kaloko series, Ewa Series, Mamala series, Filled Land, and Coral Outcrop (Foote et al. 1972). Each of these soils is briefly discussed below.

Coral Outcrop consists of coral or cemented calcareous sand on the island of Oahu. The coral reefs formed in shallow ocean water during the time the ocean stand was at a higher level. Small areas of coral outcrop are exposed on the ocean shore, on the coastal plains, and at the foot of the uplands. Elevations range from sea level to approximately 100 feet. . .This land type is used for military installations, quarries, and urban development. Vegetation is sparse. It consists of *kiawe*, *koa haole*, and fingergrass (Foote et al. 1972:29).

Fill Land consists mostly of areas filled with bagasse and slurry from sugar mills. A few areas are filled with material from dredging and from soil excavation. Generally, these materials are dumped and spread over marshes, low-lying areas along the coastal flats, coral sand, coral limestone, or areas shallow to bedrock. . .This land type is used mostly for the production of sugarcane (Foote et al. 1972:31).

Honouliuli Series consists of well-drained soils on coastal plains on the island of Oahu in the Ewa area. These soils developed in alluvium derived from basic igneous material. They are nearly level and gently sloping. Elevation ranges from 15 to 125 feet. . .These soils are used for sugarcane, truck crops, orchards and pasture. The natural vegetation consists of *kiawe*, *koa haole*, fingergrass, bristly foxtail, and bermudagrass (Foote et al. 1972:43).

Kaloko Series consists of poorly drained soils on coastal plains on the islands of Kauai and Oahu. These soils developed in alluvium derived from basic igneous rock; the alluvium has been deposited over marly lagoon deposits. The soils are nearly level. Elevations range from sea level to 20 feet. . .These soils are used for irrigated sugarcane and pasture. The natural vegetation consists of *kiawe*, klu, bermuda grass, and annuals (Foote et al. 1972:58).

Mamala Series consists of shallow, well-drained soils along the coastal plains on the islands of Oahu and Kauai. These soils formed in alluvium deposited over coral limestone and consolidated calcareous sand. They are nearly level to moderately sloping. Elevations range from nearly sea level to 100 feet on Oahu but extend to 850 feet on Kauai. . .These soils are used for sugarcane, truck crops, orchards, and pasture. The natural vegetation consists of *kiawe*, *koa haole*, bristly foxtail, and swollen fingergrass (Foote et al. 1972:93).

Waipahu Series consists of well-drained soils on the marine terraces on the island of Oahu. These soils developed in old alluvium derived from basic igneous rock. They are nearly level to

moderately sloping. Elevations range from nearly sea level to 125 feet . . .These soils are used for sugarcane and homesites. The natural vegetation is fingergrass, bermuda grass, bristly foxtail and *kiawe* (Foote et al. 1972:134).

Pearl Harbor Series consists of very poorly drained soils on nearly level coastal plains on the island of Oahu. These soils developed in alluvium overlying organic material. Elevations range from nearly sea level to 5 feet. . .These soils are used for taro, sugarcane, and pasture. The natural vegetation consists of cattails, mangrove trees, California grass, and sedges (Foote et al. 1972:112).

2.0 ARCHIVAL RESEARCH

The information discussed below was obtained from a document and literature search conducted at the State Historic Preservation Division, Department of Land and Natural Resources Library at Kapolei, The State of Hawai`i Library and The State Bureau of Conveyances. Materials obtained from this search are used in the current document to assess possible impact to cultural resources. Based on these results, recommendations will be presented for further archaeological work.

2.1 TRADITIONAL HISTORY

Several works have summarized the traditions of `Ewa. Among these are Sterling and Summers (1978), Kelly (1991), and Charvet-Pond and Davis (1992). The reader is referred to these for more detailed information. Presented below is a brief discussion, highlighting the themes of the `Ewa Plain.

Sterling and Summers (1978) relates an interesting legend regarding the creation and name of the `Ewa Plain:

> When Kane and Kanaloa were surveying the islands they came to Oahu and when they reached Red Hill saw below them the broad plains of what is now Ewa. To mark the boundaries of land they would throw a stone and where the stone fell would be the boundary line. When they saw the beautiful land lying below them, it was their thought to include as much of the flat level land as possible. They hurled the stone as far as the Waianae range and it landed somewhere in the Waimanalo section. When they went to find it, they could not locate the spot where it fell. So Ewa (strayed) became known by that name. The stone that strayed (Sterling and Summers 1978:1).

The stone was eventually found at Pili o Kahe. The spot marks the boundary between Honouliuli and Waianae. It is said that the hill on the `Ewa side is the male and the hill on the Waianae side is the female (Sterling and Summer 1978: 1).

Traditionally, Pu`u o Kapolei may have been the most important cultural place on `Ewa. Pu`u o Kapolei is a volcanic cone that in ancient times had several uses (the residence of *kamapua`a*, a landmark, and a point for solar observation). The *pu`u* was said to have a *heiau* (possibly dedicated to the sun) which was destroyed prior to McAllister`s O`ahu survey (1933). Tuggle and Tuggle (1997:28) claim that Pu`u o Kapolei may have been the term for the whole region of `Ewa and not just the hill. This is based on the fact that Pu`u o Kapolei was the primary landmark for travelers between Pearl Harbor and west O`ahu with the trail passing inland of it. The *ahupua`a* of `Ewa was known for its taro (*kalo*). In fact, `Ewa was said to have its own taro that was favored by the inhabitants of the region. This particular type of taro was known as *Kaikoi* and was the famous type of taro grown in `Ewa (Handy and Handy 1972). Sterling and Summers (1978) also discuss this type of taro. In a newspaper article taken from *Na Wahi Pana o Ewa*, by Ka Loea Kalaiaina, dated June 3, 1899, the merits of the `Ewa taro are discussed:

> The native of Ewa, whether man or woman, will know just how to do it (pound *poi*) until your palate is pleased. This is one thing on the ka-i koi taro of Ewa. That is the taro that visitors gnaw on and find it so good that they want to live until they die in Ewa. The poi of ka-i koi is so delicious (Sterling and Summers 1978: 8).

Of the lands used to cultivate taro, Handy (1940) writes:

> Large terrace areas are shown on the U.S. Geological Survey map of Oahu (1917) bordering West Loch of Pearl Harbor, the indication being that these are still under cultivation. I am told taro is still grown here. This is evidently what is referred to as "Ewa taro lands" (Handy 1940: 82).

Traditionally, the `Ewa district was an *ali`i* stronghold. This is attributed to the fact that Pearl Harbor was abundant with marine resources.

> The primary reason for `Ewa's prominence in history and as an *ali`i* stronghold was undoubtedly the existence of the great number of fishponds at different points around Pearl Harbor, which was `Ewa territory. . .The Pearl Harbor ponds were stocked with various kinds of fish, but especially mullet, because these inland waters were the summer home of the mullet of Oahu (Handy and Handy 1972:470).

2.2 HISTORIC LAND USE

Kamehameha gave the entire *ahupua`a* of Honouliuli to Kalanimoku, after he conquered O`ahu, with the right that he could pass it on to his heirs. Later, Kalanimoku passed on the land to his sister Wahinepi`o.

The entire *ahupua`a* of Honouliuli (Land Commission Award 11216, Apana 8; approximately 43,250 acres) was awarded to a granddaughter of Kamehameha I, Mikahela Kekau`onohi, one of the wives of Kamehameha II and daughter of Wahinepi`o (who she likely claimed the land through). Kekau`onohi was awarded land on all of the Hawaiian Islands including the *ahupua`a* of Honouliuli and Waimalu on O`ahu (LCA records on file at the State of Hawai`i, Bureau of Conveyances; Vol. 9, pg. 659). "About 150 acres of the *ahupua`a* (Honouliuli) were excluded as part of *kuleana* awards to commoners" (Tuggle and Tuggle 1997:34). A total of 72 awards were made all of which appear to be in or adjacent to Honouliuli Gulch (Tuggle and Tuggle 1997:34), which is not within or near the project area.

By the 1850's cattle ranching was firmly established at `Ewa with an estimated 12,000 head of cattle. By 1877, James Campbell was said to have some 32,000 head of wild cattle (Briggs 1926, quoted in Kelly 1991: 162). The sugar industry in Hawaii began to rapidly expand in the 1890's and severely altered the appearance of the `Ewa Plain and the rest of the islands. Construction for the Oahu Railway & Land (OR&L) railroad began in 1889 and eventually went around the island. This opened up `Ewa and the rest of O`ahu for sugar, pineapple, and eventually military use.

In 1888, Benjamin F. Dillingham's company Oahu Railway and Land Company began construction of the OR&L railroad that was to extend westward from Honolulu. By 1890 it extended to Pearl City, by 1895 it extended to Waianae, and by 1899 it extended to Kahuku, the farthest point form Honolulu (National Register of Historic Places Nomination Forn; see Appendix A). The railroad carried both passengers and freight. The railroad was instrumental in the development of several sugar plantations (Ewa Plantation Company, Kahuku Plantation Company, Oahu Sugar Company, and the Wailua Agricultural Company) as well as James Dole's pineapple efforts in central Oahu. During World War II, the Oahu Railway, as it became to be known, transported supplies, munitions, troops, and defense workers. At its height, the Oahu Railway consisted of 175 miles of track. After World War II, railroad business declined dramatically - in 1947 all operations outside of Honolulu were abandoned, a pineapple shuttle from Pier 34 to the cannery ceased operation in 1972. A portion of the railroad right-of-way between Nanakuli and Honouliuli was placed on the National Register of Historic Places.

In 1893 the first sisal or *malina* (*Agave sisalana*) plants were imported from Florida (approximately 20,000 plants) and experimentally planted in an area southeast of Pu`u o Kapolei. The Hawaiian name, *malina,* means marine, indicating that the plant was used in the manufacturing of marine ropes (Neal 1965: 225). The Hawaiian Fibre Company was established in 1898 to utilize the sisal grown on the 300 acre plantation in `Ewa (Tuggle and Tuggle 1997: 37). The production of sisal in `Ewa continued into the 1920's.

By the 1920s, Honouliuli was used almost exclusively for sugar cultivation and ranching. The `Ewa Plantation Company controlled approximately 12,000 acres which included sugar cane, a sisal plantation, residential areas for several thousand people, and a limestone quarry. The O`ahu Sugar Company controlled 3,000 acres although not all of it was planted in sugar. Honouliuli Ranch, the largest landholder, controlled approximately 20,000 acres with much of it considered waste because it contained gullies and rocks. Six thousand acres were reportedly planted in pineapple, or forest and wetland.

Frierson (1973) indicates that the Ewa Plantation Company drastically altered the landscape in an attempt to increase the amount of fertile agricultural land. Prior to the rainy season, the plantation excavated drainage ditches from the lower slopes of the Wai`anae range down to the lowlands. Vertical channels were cut into the adjacent slopes to encourage erosion. Frierson writes that "enough soil was washed down the ditches and deposited on the plain to reclaim 373 acres in a few years" (Frierson 1973:17). "By 1931, `Ewa Plantation had seventy artesian and four surface wells with eighteen pumps (Wilcox 1996: 107).

The `Ewa Plantation was acquired by Oahu Sugar Company in 1970. The Oahu Sugar Company operated two mills in `Ewa and Waipahu. Sugar cultivation along the `Ewa Plain began a slow and steady decline in the 1970's. The Oahu Sugar Company with the demise of sugar ceased operations at `Ewa in 1994. Real estate development has flourished including the creation of Kapolei, touted as O`ahu's "second city."

2.3 ARCHAEOLOGICAL BACKGROUND

The first archaeological sites identified on `Ewa were recorded by J. Gilbert McAllister (1933) in the 1930's. McAllister identified several sites on the `Ewa Plain. Among these were Site 138, Site 139, Site 141, Site 145 and Site 146.

Site 138. Puu Kapolei Heiau, on Puu Kapolei hill, Honouliuli.

> The stones from the heiau supplied the rock crusher which was located on the side of this elevation, which is about 100 feet away on the sea side. There was formerly a large rock shelter on the sea side where Kamapuaa is said to have lived with grandmother (McAllister 1933:108).

Site 139. Kalanamaihiki fishing shrine at Kapapapuhi, Honouliuli.

> Near the end of the small tongue of land that juts out opposite Laulaunui Island in the west loch of Pearl Harbor, are two large rough stones about 2.5 feet in size, with six or seven smooth stones averaging 1 foot in size in a small pile adjoining the larger stones. The entire site is covered with akulikuli and would not be noticed or considered if the Hawaiians did not know of its former sacredness (McAllister 1933:108).

Site 141. Kaihuopalaai.

> The site is named for Kaihuopalaai, said to be the daughter of Konikonia and his wife Hinaaimalama. Fornander (37, vol5, p. 270) writes ". . .on Oahu, Kaihuopalaai saw a goodly man by the name of Kapapaapuhi (site 139) who was living at Honouliuli, Ewa; she fell in love with him and they were united, so Kaihuopalaai has remained in Ewa to this day. She was changed into that fishponds in which mullet are kept and fattened, and this fish is used for that purpose to this day" (McAllister 1933:108).

Site 145. Puuloa.

> Puuloa, site where the first breadfruit in Hawaii is said to have been planted. As noted by Thrum:
>
> > Tradition credits the introduction of the breadfruit trees in these islands to Kahai, a son of Moikeha, who brought a species from Upolu, in the Samoan Group, on his return voyage from Kahiki, and planted same at Puuloa, Oahu (McAllister 1933:109).

Site 146. The Ewa Coral Plains.

> Site 146, Ewa coral plains, throughout which are remains of many sites. The great extent of old stone walls, particularly near the Puuloa Salt Works, belongs to the ranching period about 75 years ago. It is probable that the holes and pits in the coral were formerly used by the Hawaiians. Frequently the soil on the floor of the larger pits was used for cultivation, and even today one comes upon

bananas and Hawaiian sugar cane still growing in them. They afford shelter and protection, but I doubt if previous to the time of Cook there was ever a large population there (McAllister 1933:109).

2.4 PREVIOUS ARCHAEOLOGY

A vast number of archaeological studies have been conducted on the `Ewa Plain in recent years. These investigations are related to the expansive development that has taken place on the `Ewa Plain in the last 20 years. Only a limited number of investigations will be presented here. For a complete synthesis of the cultural resources recorded on the `Ewa Plain prior to 1995, the reader is directed to Tuggle and Tuggle (1997). Additional information can be obtained from Haun (1991) and Tuggle (1995).

In 1975, Clark and Connolly (1975) conducted an archaeological reconnaissance survey for the Honouliuli Sewage Treatment plant and ocean outfall. They surveyed the entire parcel proposed for the facility. No sites were identified. Clark and Connolly did not survey the corridor that extended *makai* from the plant to the ocean since it passed through sugarcane fields. However, they did survey the beach portion where the outfall would be located. No cultural features were identified. They concluded that if any significant cultural resources would be impacted, it would be located on the beach and not on the plain itself.

In 1978 A. Sinoto (1978) of the Bishop Museum conducted archaeological test excavations at Barbers Point. While excavating limestone sinkholes, Sinoto recovered the remains of numerous fossil bird bones "including the skeletal remains of many extinct species, such as large flightless geese, eagles, ibises, finches" (Kirch 1985:117). Later studies have indicated that human alteration of the environment (i.e. land clearing of the native vegetation) and direct predation may have led to the extinction of these species.

In 1979, Bert Davis (1979) conducted archaeological investigations in an area totaling approximately 1,099 acres. This area was previously surveyed by Jourdane (1979) for the proposed `Ewa Marina Community Development. The survey resulted in the identification of 18 previously unrecorded archaeological sites (State Site Numbers 3201-3218) composed of 107 features including sinkholes, mounds, platforms, and enclosures. A second survey, performed in an area previously utilized for sugar cane cultivation, did not identify any archaeological sites.

In 1983, Hommon and Ahlo (1983) conducted archaeological subsurface testing at the proposed `Ewa Marina Community Development Area (TMK 9-1-12:2-3, 5-17, 23, 28). The project area is located south of the area previously surveyed by Davis (1979) and Jourdane (1979). A total of five trenches were excavated. No cultural remains were identified.

In 1987, Paul H. Rosendahl, Inc, (Dicks et al. 1987) conducted an archaeological reconnaissance survey with subsurface testing on a 216 acre parcel for the proposed West Loch Estates Golf Course and parks. A total of seven archaeological sites were identified (State Sites 3318 to 3324). These sites consisted of prehistoric and historic burials and habitation sites located on Hō`ae`ae Point and on the slopes and uplands surrounding the Honouliuli Stream floodplain. Other sites

recorded were remnants of an agricultural system including: irrigated pondfield cropping of the floodplain, and dryland cultivation in the surrounding slopes and uplands.

Also in 1987, Rosendahl (1987), conducted an archaeological surface survey with subsurface testing immediately adjacent to area mentioned above (Dicks et al. 1987) as part of the Environmental Impact Statement. The survey resulted in the identification of four archaeological sites including a small cemetery related to the sugarcane industry, a historic surface artifact collection area that pre-dates the sugarcane industry and a probable exposed midden pit.

In 1988, The Bishop Museum (Davis 1988) conducted archaeological testing for the Ewa Gentry project at Honouliuli (the current project area). The project area was situated in an area previously utilized for sugar cane cultivation. A surface survey previously conducted by Kennedy (1988) for the same area failed to identify any archaeological sites. No archaeological sites were identified during testing.

Cultural Surveys Hawaii (Hammatt et al. 1990) conducted archaeological investigations for the proposed `Ewa Villages project site, immediately north of the Honouliuli Sewage Treatment Plant. A total of 616 acres were surveyed and a total of nine sites were identified, all associated with the sugar cane industry and the supporting plantation. Site types identified were: a historic cemetery, reservoir, a communal bathhouse, OR&L tracks, village store and saimin stand, and a roundhouse.

In 1990, Archaeological Consultants of Hawaii, Inc (Kennedy et al. 1991) conducted an archaeological inventory survey for the then proposed Puuloa Golf Course (now the New Ewa Beach Golf Club)(TMK: 9-1-01:27&6). The project area was bounded is at the south end of Fort Weaver Road and to the north of The Pacific Tsunami Warning Center. The survey resulted in the recording of 72 prehistoric, historic and modern sites. Most of the sites were sinkholes containing cultural material, C-shapes, enclosures and mounds. Kennedy and Denham (1992) conducted data recovery at sites slated to be impacted during construction of the golf course. It was concluded that initial occupation of the area occurred between A.D. 1020-1480. Three of the sites (3910, 3921 and 3770) were judged no longer significant following data recovery. All other sites slated for data recovery were considered significant and recommended for preservation.

In 1991, The Bishop Museum (Goodman and Cleghorn 1991) conducted an archaeological surface survey in conjunction with a historical documents and literature search for the Laulani Fairways Housing project at Pu`uloa (TMK 9-1-10: por. 7; 9-1-12:por.5). The project area is located to the south Honouliuli Sewage Treatment Plant and to the east of Barbers Point Naval Air Station and is approximately 300 acres in size (this is the current project area). No surface cultural remains were identified during the survey.

In 1991, the Applied Research Group (Jayatilaka et al. 1992) conducted an archaeological survey with subsurface testing on a 270-acre parcel for the then proposed Hawaii Prince Golf Course (also the current project area)(TMK 9-1-10). No surface archaeological remains were identified during the survey. Eleven backhoe trenches and four backhoe scrapes were excavated. No cultural remains were identified and no further work was recommended.

In 1993, Pantaleo and Sinoto (1993) conducted an archaeological inventory survey for a proposed offsite drainage system at the `Ewa Gentry in Honouliuli. Only one historic site was identified, a concrete drainage ditch that measured 4,600 feet long, 150 feet wide and between 20 and 25 feet deep. No other significant cultural remains were recorded.

Also in 1993, the Bishop Museum (Goodman et al. 1993) conducted an archaeological reconnaissance survey of a proposed commercial project. The project area is located south and east of the Honouliuli Sewage Treatment Plant, and to the west of Fort Weaver Road, surrounded to the north, south and west by former sugarcane fields (the current project area) (TMK 9-1-69:por. 5). No cultural remains were identified.

In 1996, Scientific Consultant Services (Spear 1996) conducted an archaeological survey for an area north of the Honouliuli Treatment Plant, and west of the Tenney and Varona plantation villages. The survey concentrated on two short, shallow gulches present in an area formerly used for sugarcane cultivation. No archaeological sites were identified during the survey.

Tuggle and Tuggle (1997) authored a synthesis of cultural resource studies conducted on the `Ewa Plain. Although the manuscript was prepared for the Barbers Point Naval Air Station, it examines the prehistory and history, the previous archaeology, and the natural resources found on the `Ewa Plain. Their manuscript was used in the preparation of this document and proved to be invaluable. It is highly recommended for anyone planning to work in the region.

Paul H. Rosendahl conducted three archaeological data recovery projects (1988, 1989, and 1990) at West Loch Estates Residential Increment I, Golf course and Shoreline Park located in Honouliuli, `Ewa District, Island of O`ahu (Wolforth et al. 1998). This "work included excavations at Sites 3319, 3320, and 3321; backhoe trenching at Sites 3322 (buried fishpond) and 3324 (extensive pondfield system); and monitoring of construction activities " (Wolforth et al. 1998:ii). The other sites identified were an artifact concentration, human skeletal remains and temporary habitations. Excavations uncovered ash lenses, midden deposits, possible postholes, rock alignments, and a segment of the OR&L railway. Radiocarbon dates obtained from test excavations indicates that the pondfields were in use between 10th and 17th A.D.

2.5 SITE PREDICTABILITY

Due to the impacts of residential and road development, ranching, sugarcane cultivation, and military activities, prehistoric surface remains were not expected within the project area. However, it is possible that excavations will expose sinkholes that have been filled in by alluvium moving downslope, numerous cultivation activities and by various residential and commercial developments. These sinkholes often contain archaeological deposits (i.e. human remains, hearths and extinct bird bones). Numerous sinkholes have been recorded on Barbers Point Naval Air Station and at other areas in `Ewa. Human burials may also be uncovered during the course of pipeline excavations. Sinkholes and human burials are the most probable site types that may be encountered during the course of the project.

3.0 METHODS

The archaeological survey was conducted on May 17, 2001. Paul L. Cleghorn, Ph.D., served as principal investigator and main point of contact while James McIntosh, B.A. and Bonnie Whitehead, B.A., conducted the field survey.

A vehicular survey was conducted around the outer edges of the project area. When areas of interest were identified the archaeologists conducted a pedestrian survey. Given the vast amount of visibility in the area, spacing between archaeologists was between 25-35 m. The project area was photo documented using a digital camera.

4.0 RESULTS

The archaeological survey determined that the entire project area had undergone significant impacts from agricultural and developmental use. In fact, evidence of irrigation lines were still present in a large portion of the project area (Figure 2). The entire project area was devoid of any natural features or contours. No archaeological resources were present within the project area.

The area south of the Coral Creek Golf Course contains a large drainage area (Figure 3). This drain apparently serves for runoff purposes of the golf course. The drainage consists of an excavated area approximately 40 m wide and 3-4 m deep. The entire face of the drain is coral and limestone. A check of the wall of the drain failed to identify any exposed subsurface features.

The survey also determined that parcels adjacent to the current project area are currently being developed for residential housing (Figure 4). This area located along the far eastern end of the project area was previously surveyed by Jayatilaka et al. (1992). See Appendix for additional photographs of the modified nature of the project area.



Figure 2. Drip irrigation lines still visible in project area.



Figure 3. Photo showing drainage extending south from Coral Creek Golf Course. View to north.

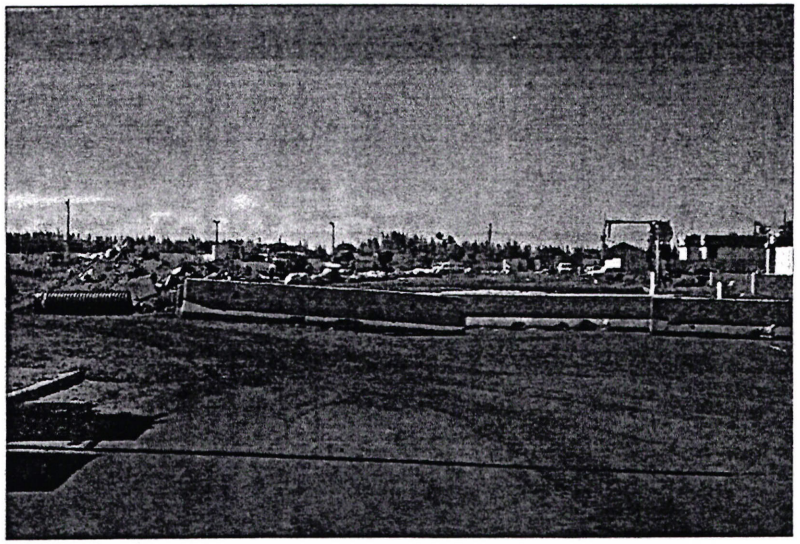

Figure 4. View of on-going development to the northeast of the project area.

5.0 SUMMARY AND DISCUSSION

The archaeological survey determined that no archaeological sites are present within the current project area. The archival research and a review of previous archaeological studies on the `Ewa Plain demonstrate that the area has undergone dramatic and extensive alterations over its long land use history. A review of the previous archaeology for the area indicated that the project area was previously surveyed by Davis (1988) Jayatilaka et al. (1992) and Goodman and Cleghorn (1991) and Goodman (1993). None of these surveys identified any cultural resources within the project area. This fact was confirmed when the current survey also failed to locate any cultural resources within the current project area (See Appendix for photographs).

Given that the project area was under sugar cane cultivation for approximately 100 years, it seems unlikely that any subsurface cultural materials are still present within the project area. While there are no surface archaeological sites, there is the possibility of encountering subsurface resources in the form of sinkholes containing cultural materials and possibly human burials. These features could be as deep as 3 feet below ground surface. It is recommended that an archaeologist be retained on an on-call basis to assist the contractor in the event that subsurface archaeological resources are encountered.

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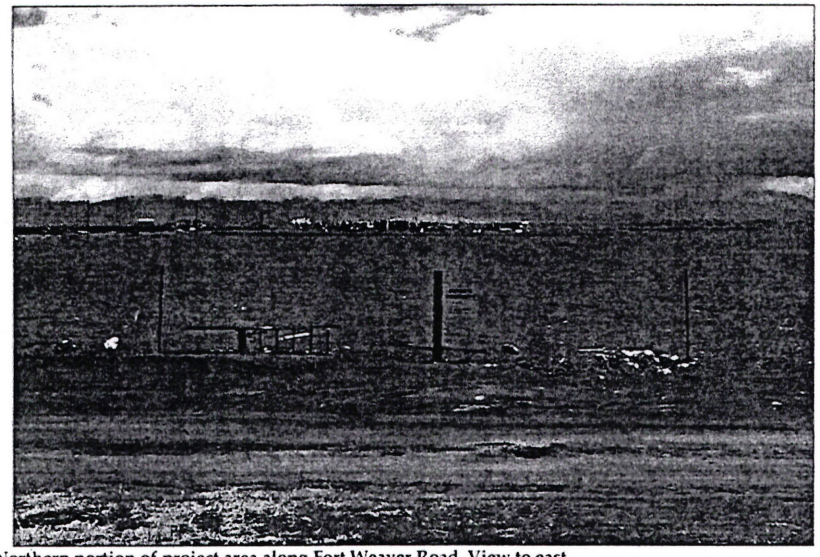
APPENDIX

PHOTOGRAPHS



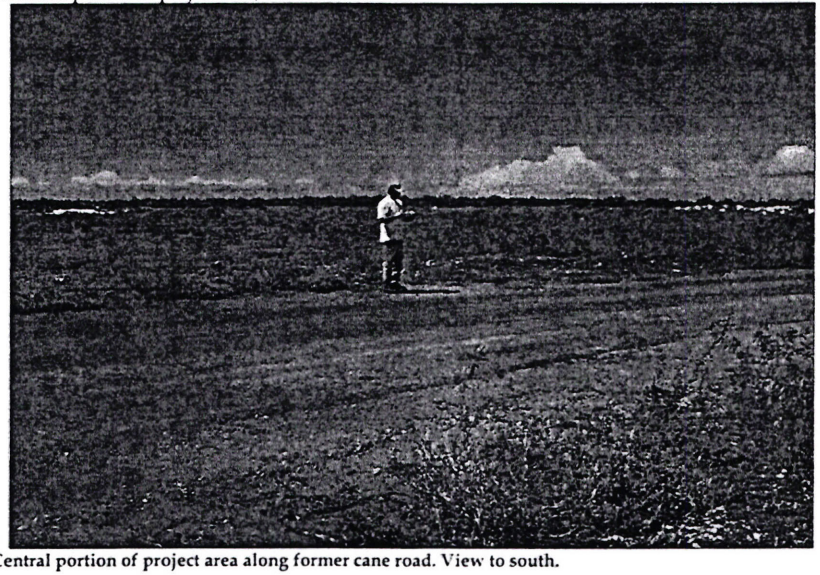
Northern portion of project area along Fort Weaver Road. View to east.



Southern portion of project area, view to northeast.



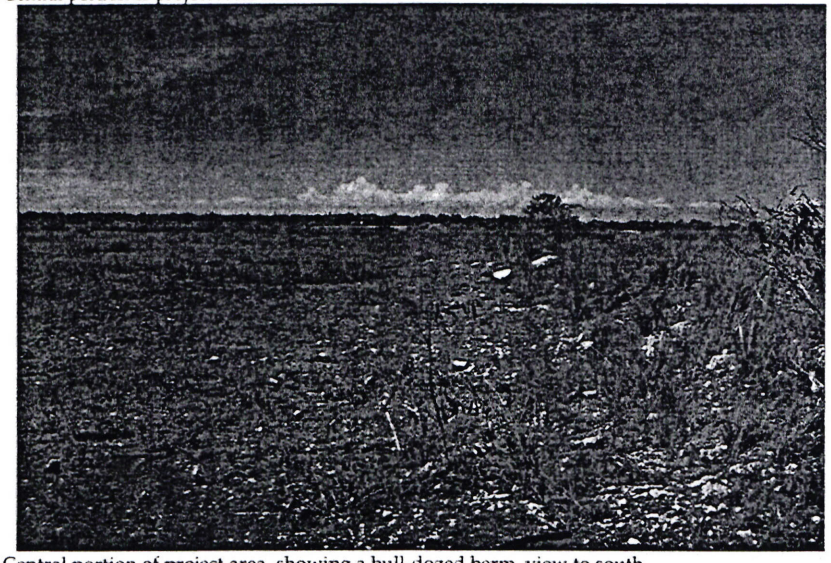
Northern portion of project area, view to northwest.



Central portion of project area along former cane road. View to south.



Central portion of project area. View to west.



Central portion of project area, showing a bull-dozed berm, view to south.

ORIGINAL

BOTANICAL SURVEY
'EWA GENTRY MAKAI
'EWA DISTRICT, O'AHU

LAND USE COMMISSION
STATE OF HAWAII
2003 MAR 21 A 9:13

by

Winona P. Char

CHAR & ASSOCIATES
Botanical Consultants
Honolulu, Hawai'i

Prepared for: ENVIRONMENTAL COMMUNICATIONS, INC.

June 2001

BOTANICAL SURVEY
'EWA GENTRY MAKAI
'EWA DISTRICT, O'AHU

INTRODUCTION

The project site consists of approximately 283 acres bounded by the former Barbers Point Naval Air Station to the west, the Coral Creek Golf Course and residential lots to the north, overgrown sugar cane fields to the east, and the Hawaii Prince Golf Course and residential lots to the south. The site is divided into two parcels by Fort Weaver Road. The 'Ewa Makai-East parcel consists of ±115 acres, while the 'Ewa Makai-West parcel is approximately 168 acres.

The project site as well as the adjacent lands were used for sugar cane cultivation until 1995 when Oahu Sugar Company, Ltd. ceased operations. Currently the site is used for limited grazing activities; a few horses were observed on the west parcel during this survey.

Field studies to assess the botanical resources on the project site were conducted on 07 and 14 June 2001 by a team of two botanists. The primary objectives of the field studies were to:

1) provide a general description of the vegetation on the site;
2) inventory the flora;
3) search for threatened and endangered species as well as species of concern; and
4) identify areas of potential environmental problems or concerns and propose appropriate mitigation measures.

SURVEY METHODS

ior to undertaking the field studies, a search was made of the rtinent literature to familiarize the principal investigator th other botanical studies conducted in the general area. pographic maps were examined to determine terrain characteristics, cess, boundaries, and reference points.

walk-through survey method was used. Notes were made on plant sociations and distribution, disturbances, substrate types, ainage, topography, etc. Plant identifications were made in the eld; plants which could not be positively identified were llected for later determination in the herbarium, and for mparison with the recent taxonomic literature.

e species are indicative of the season ("rainy" vs. "dry") and e environmental conditions at the time of the survey. A survey ken at a different time of the year and under varying environ- ıtal conditions would no doubt yield slight variations in the ecies list, especially of the weedy, annual plants.

DESCRIPTION OF THE VEGETATION

ior to 1995, the project site was under active sugar cane ltivation. A botanical survey of the site by Char in 1991 scribed dense fields of sugar cane on the cultivated portions the site, and weedy vegetation on the uncultivated areas such along cane haul roads, irrigation ditches, and the Kaloi ainage channel. A ±20-acre parcel surrounded by the 'Ewa Makai- st property and Fort Weaver Road was surveyed in 1998 by Char : the proposed Laulani Commercial Center. Weedy scrub vegetation l replaced the former sugar cane fields.

Today, the 283-acre project site is covered by scattered weedy patches and large areas with barren soil. Both the 'Ewa Makai-East and 'Ewa Makai-West parcels have been used for grazing horses; as a result the vegetation on both parcels is sparse with about 50 to 60% plant cover.

An inventory of all the plants found during the field studies is presented in the species checklist at the end of this report.

Scrub Vegetation

Due to prolonged drought conditions and grazing pressure, the vegetation on the site consists of live and dried up patches of weedy plants with scattered young trees of kiawe (Prosopis pallida), 10 to 15 ft. tall. Locally abundant are golden crown-beard (Verbesina encelioides), running pop (Passiflora foetida), and 'uhaloa (Waltheria indica). Where the substrate consists of soil and broken up coralline material, Indian pluchea (Pluchea indica) and sourbush (Pluchea carolinensis) become abundant, forming 20 to 30% of the plant cover. A few shrubs of koa haole (Leucaena leucocephala), klu (Acacia farnesiana), and Christmas berry (Schinus terebinthifolius) are found scattered here and there; these tend to be 1 to 3 ft. tall. Other plants which occur here in smaller numbers include buffelgrass (Cenchrus ciliaris), Australian saltbush (Atriplex semibaccata), virgate mimosa (Desmathus pernambucanus), Sida ciliaris, and pa'uohi'iaka (Jacquemontia ovalifolia ssp. sandwicensis). 'Ilima (Sida fallax) occurs as scattered shrubs, but may be locally abundant during the wetter months.

On the 'Ewa Makai-West parcel, the former Kaloi drainage channel supports dried clumps of Guinea grass (Panicum maximum) and koa haole shrubs. A few live castor bean plants (Ricinus communis)

are found here. Where the parcel abuts the Barbers Point Naval Air Station Golf Course, there is a strip of greener vegetation with more or less dense buffelgrass and weeds such as false mallow (Malvastrum coromandelianum), hairy spurge (Chamaesyce hirta), Boerhavia coccinea, and Calyptocarpus vialis.

On the 'Ewa Makai-East parcel, low lying swale areas which receive runoff from the adjacent mauka projects support dense, green patches of golden crown-beard, large Pluchea shrubs (7 to 8 ft. tall), 'ilima, ivy gourd (Coccinia grandis), 'uhaloa, hoary abutilon (Abutilon incanum), coat buttons (Tridax procumbens), etc. A small drainageway with standing water supports a number of weedy species including spiny amaranth (Amaranthus spinosus), slender amaranth (Amaranthus viridis), wiregrass (Eleusine indica), false daisy (Eclipta alba), castor bean, Leptochloa fusca ssp. uninervia, common purslane (Portulaca oleracea), nutgrass (Cyperus rotundus), and Bermuda grass (Cynodon dactylon).

DISCUSSION AND RECOMMENDATIONS

The project site has been disturbed for a long period of time, first by extensive sugar cane cultivation and recently by grazing activity. As a result, the vegetation on the site consists largely of introduced or alien plant species such as sourbush, Indian pluchea, golden crown-beard, buffelgrass, kiawe, etc. Of a total of 62 species inventoried on the site, 56 (90%) are introduced. A few native species occur on the site, some of them in fairly large numbers. These are: 'uhaloa, 'ilima, pa'uohi'iaka, kipukai (Heliotropium curassavicum), hoary abutilon, and popolo (Solaum americanum). Only the pa'uohi'iaka is endemic, that is, it is native only to the Hawaiian Islands. The other species are indigenous, that is, they are native to the Hawaiian Islands and elsewhere.

An intensive search was made for Abutilon menziesii, a listed endangered species belonging to the mallow family. The Abutilon is known from the abandoned sugar cane fields on the Varona Village/ 'Ewa mill area (Nagata 1996; PBR Hawaii 1998). No Abutilon menziesii plants were found nor did we encounter any other threatened and endangered species or species of concern (U.S. Fish and Wildlife Service 1999; Wagner et al. 1999) on the project site.

Given these findings, the proposed development of the site is not expected to have a significant negative impact on the botanical resources. It is recommended, however, that landscaping be installed as soon as possible to prevent dust problems and soil loss.

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PLANT SPECIES LIST -- 'Ewa Gentry Makai

he following checklist is an inventory of all the plants observed n the project site during the field studies. The plant names are rranged alphabetically by families within each of two groups: icots and Monocots. The taxonomy and nomenclature of the flowering lants follow Wagner et al. (1990). The few recent name changes or the flowering plants follow those reported in the Hawaii iological Survey series (Evenhuis and Miller 1995-1998; Evenhuis nd Eldredge 1999-2000).

or each species, the following information is provided:

- Scientific name with author citation.
- Common English and/or Hawaiian name(s), when known.
- Biogeographic status. The following symbols are used:
  - E = endemic = native only to the Hawaiian Islands.
  - I = indigenous = native to the Hawaiian Islands and also elsewhere.
  - I? = questionably indigenous = data not clear if dispersal to the islands by natural or human-related mechanisms, but weight of evidence suggests probably indigenous.
  - X = introduced or alien = all those plants brought to the Hawaiian Islands by humans, intentionally or accidentally, after Western contact, that is, Cook's arrival in the islands in 1778.
  - X? = questionably introduced = date of introduction unclear or very soon after Western contact; may possibly be indigenous or of Polynesian introduction.

Scientific name	Common name	Status
FLOWERING PLANTS		
DICOTS		
AMARANTHACEAE (Amaranth family)		
Alternanthera pungens Kunth	khaki weed	X
Amaranthus spinosus L.	spiny amaranth, pakai kuku	X
Amaranthus viridis L.	slender amaranth, pakai	X
ANACARDIACEAE (Mango family)		
Schinus terebinthifolius Raddi	Christmas berry	X
ASCLEPIADACEAE (Milkweed family)		
Calotropis gigantea (L.) W.T. Aiton	crown flower	X
ASTERACEAE (Daisy family)		
Calyptocarpus vialis Less.		X
Conyza bonariensis (L.) Cronq.	hairy horseweed, ilioha	X
Eclipta prostrata (L.) L.	false daisy	X
Flaveria trinervia (Spreng.) C. Mohr.	flaveria	X
Pluchea carolinensis (Jacq.) G. Don	sourbush, pluchea	X
Pluchea X fosbergii Cooperr. & Galang	pluchea hybrid	X
Pluchea indica (L.) Less.	Indian fleabane	X
Sonchus oleraceus L.	sowthistle, pualele	X
Spagneticola trilobata (L.) Pruski	wedelia	X
Tridax procumbens L.	coat buttons	X
Verbesina encelioides (Cav.) Benth. & Hook.	golden crown-beard	X
BORAGINACEAE (Heliotrope family)		
Heliotropium curassavicum L.	kipukai, nena	I
Heliotropium procumbens var. depressum (Cham.) Fosb.		X
CHENOPODIACEAE (Goosefoot family)		
Atriplex semibaccata R. Br.	Australian saltbush	X
Atriplex suberecta Verd.	saltbush	X
Chenopodium murale L.	'aheahea	X
CONVOLVULACEAE (Morning glory family)		
Ipomoea obscura (L.) Ker-Gawl.	field bindweed	X
Ipomoea triloba L.	little bell, pink bindweed	X
Jacquemontia ovalifolia ssp. sandwicensis (A. Gray) K. Robertson	pa'uohi'iaka	E
Merremia aegyptia (L.) Urban	hairy merremia, koali kua hulu	X?

;ientific name	Common name	Status
JCURBITACEAE (Gourd family)		
>ccinia grandis (L.) Voigt	coccinia, ivy gourd	X
ıcumis dipsaceus Ehrenb. & Spach	wild cucumber, hedgehog gourd, teasel gourd	X
JPHORBIACEAE (Spurge family)		
ıamaesyce hirta (L.) Millsp.	hairy spurge, garden spurge	X
ıamaesyce hypericifolia (L.) Millsp.	graceful spurge	X
cinus communis L.	castor bean, koli	X
ıBACEAE (Pea family)		
:acia farnesiana (L.) Willd.	klu	X
·otalaria incana L.	fuzzy rattlepod, kukaehoki	X
:smanthus pernambucanus (L.) Thellung	slender mimosa	X
digofera hendecaphylla Jacq.	creeping indigo	X
digofera suffruticosa Mill.	indigo, 'iniko	X
ucaena leucocephala (Lam.) de Wit	koa haole	X
thecellobium dulce (Roxb.) Benth.	'opiuma	X
osopis pallida (Humb. & Bonpl. ex Willd.) Kunth	kiawe	X
nna surattensis (N.L. Burm.) H. Irwin & Barneby	kolomona, kalamona	X
MIACEAE (Mint family)		
onotis nepetifolia (L.) R. Br.	lion's ear	X
LVACEAE (Mallow family)		
utilon incanum (Link) Sweet	ma'o, hoary abutilon	I?
lvastrum coromandelianum (L.) Garcke	false mallow, hauuoi	X
da ciliaris L.		X
da fallax Walp.	'ilima	I
da rhombifolia L.	Cuba jute	X
SSIFLORACEAE (Passion flower family)		
ssiflora foetida L.	running pop, pohapoha	X
RTULACACEAE (Purslane family)		
·tulaca oleracea L.	common purslane, pigweed, 'ihi	X
_ANACEAE (Nightshade family)		
:otiana glauca R.C. Graham	tree tobacco	X
lanum americanum Mill.	popolo, glossy nightshade	I?
lanum lycopersicum var. cerasiforme (Dunal) Spooner, Anderson & Jansen	currant tomato, wild tomato	X
:RCULIACEAE (Cacao family)		
theria indica L.	'uhaloa, hi'aloa, kanakaloa	I?

Scientific name	Common name	Status
ZYGOPHYLLACEAE (Creosote bush family)		
Tribulus terrestris L.	puncture vine, goat head	X
MONOCOTS		
CYPERACEAE (Sedge family)		
Cyperus rotundus L.	nutgrass, nut sedge	X
POACEAE (Grass family)		
Cenchrus ciliaris L.	buffelgrass	X
Chloris barbata (L.) Sw.	swollen fingergrass, mau'ulei	X
Cynodon dactylon (L.) Pers.	Bermuda grass, manienie	X
Eleusine indica (L.) Gaertn.	wiregrass, manienie ali'i	X
Eragrostis amabilis (L.) Wight & Arnott	lovegrass	X
Leptochloa fusca ssp. uninervia (J. Presl) N. Snow		X
Melinis repens (Willd.) Zizka	Natal redtop, Natal grass	X
Panicum maximum Jacq.	Guinea grass	X
Sporobolus pyramidatus (Lam.) Hitchc.		X

ORIGINAL

AVIFAUNAL AND FERAL MAMMAL SURVEY OF THE EWA BY GENTRY MAKAI DEVELOPMENT PROJECT, OAHU

Prepared for:

Environmental Communications, Inc.

LAND USE COMMISSION
STATE OF HAWAII
2001 MAR 21 A 9:13

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9 May 2001

INTRODUCTION

The purpose of this report is to present the findings of a field survey of a 283 acre site (Ewa by Gentry Makai) located at Ewa, Oahu (Fig. 1). Published and unpublished resources were also used to supplement the results of the field survey. The purposes of the survey were:

1- Document the species of birds and mammals currently on or near the site.

2- Investigate all habitats on the property.

3- Record any natural resources important to native and migratory birds.

GENERAL SITE DESCRIPTION

Figure One shows the location of the property. The entire area is relatively flat and is surrounded by existing residential and golf course developments. The vegetation is comprised of grasses, weeds and scattered brush. No wetland habitat was found on the property.

SURVEY METHODS

The field survey was conducted on 17, 26 April 2001. The area was surveyed on foot and from a vehicle traveling along roads at the edge of the property. Sections not visible from the roads were walked in order to search for birds and mammals. Tallies of all birds and mammals observed were kept and were used to estimate relative abundance data given in Table One. Weather during the survey days was partly cloudy with light easterly winds. These conditions did not limit the collection of data. Scientific and common names used in this report follow Pyle (1997) and Honaki et al. (1982).

RESULTS AND DISCUSSION

Native Birds:

No native birds were recorded on the field survey. The only native species that might occur in this area is the endangered Short-eared Owl (*Asio flammeus sandwichensis*). The Hawaiian name for this bird is Pueo. They are found on all the main Hawaiian Islands but are only listed as endangered on Oahu. Pueo nest on the ground and forage over open fields and forests. They are known to occur in Ewa and have been seen on the nearby HASEKO property (Bruner 1994). The available habitats and location of this site are not appropriate for other native birds. The absence of wetlands

also makes this property unattractive to native waterbirds. Earlier studies in this region have found similar results (Bruner 1991, 1993, 1994).

Migratory Birds:

Two species of migrants were seen on the survey. An average of 18 Pacific Golden-Plover (*Pluvialis fulva*) were tallied over the two survey days. Five Ruddy Turnstone (*Arenaria interpres*) were seen on 26 April. These species are not endangered or threatened. They are the two most common migrants to Hawaii (Pratt et al. 1987), Hawaii Audubon Society 1993).

Introduced Birds:

Sixteen species of introduced birds were recorded over the two survey days. Table One lists these birds and gives their relative abundance. None of these species is endangered or threatened. The array of birds recorded at this location is typical of this region of the island (Hawaiian Audubon Society 1993).

Mammals:

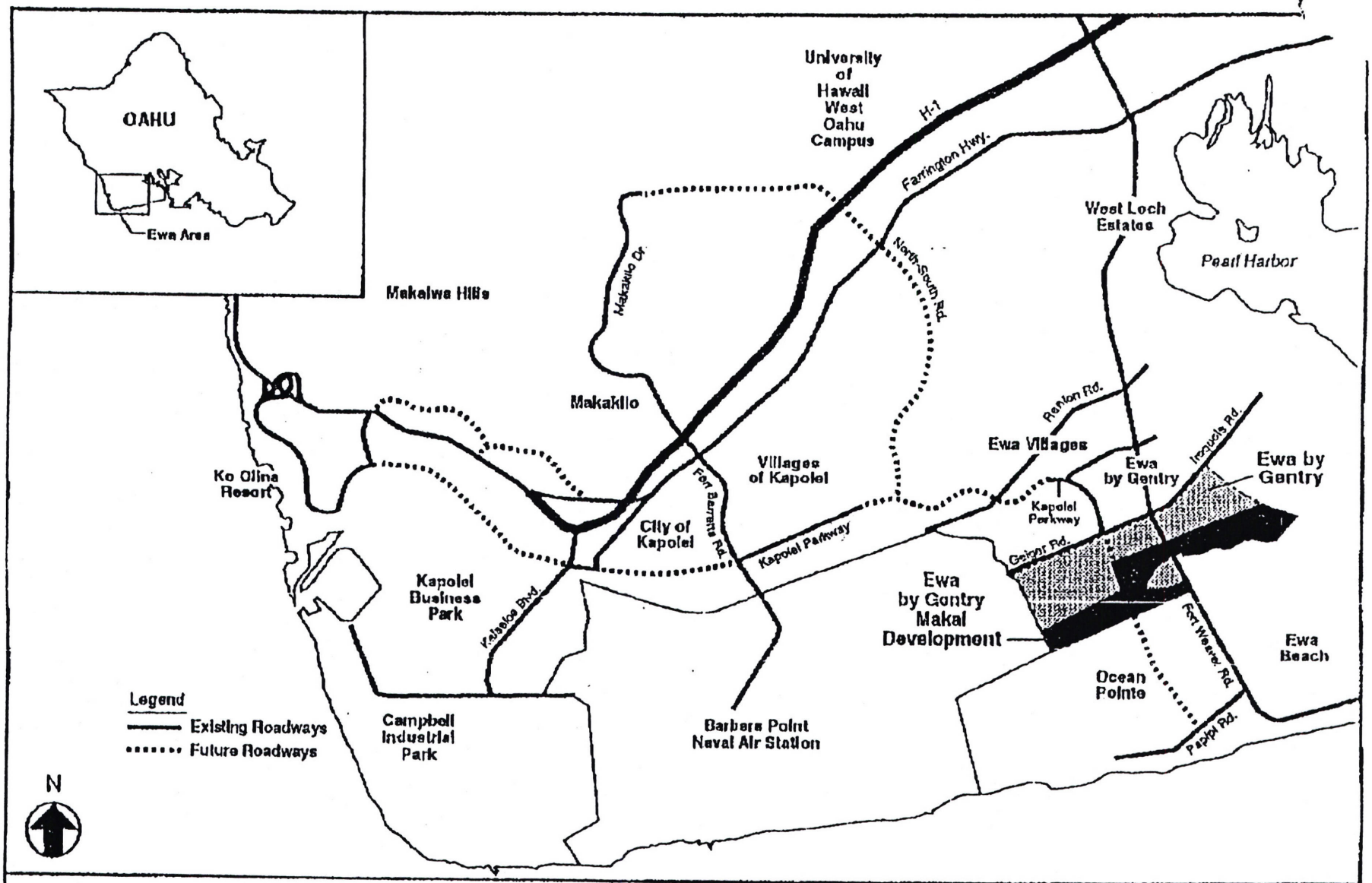
The only species of mammal observed on the survey was the Small Indian Mongoose (*Herpestes auropunctatus*). A total of three mongoose were tallied. Feral cats (*Felis catus*) and rats (*Rattus spp.*) were not recorded but likely occur on and near the

property. The endangered Hawaiian Hoary Bat (*Lasiurus cinereus semotus*) was not found. This species is rarely recorded on Oahu but is fairly common on Kauai and the Big Island (Tomich 1986, Kepler and Scott 1990). The Hawaiian Hoary Bat forages in a wide variety of native and non-native habitats including urban areas. They generally roost solitarily in trees.

CONCLUSIONS

The survey of this site found the typical array of introduced birds that normally occur in the lowlands in this region of the island. The presence of the two migratory species was likewise expected. These birds utilize open habitats such as fields and lawns to forage for insects. The Small Indian Mongoose is common in dry lowland habitats.

No unique resources important to native birds were discovered on this property. Weed covered fields are not uncommon in west Oahu. The development of this property will likely result in the decrease of some species and an increase in the populations of other introduced birds.



VICINITY MAP

Fig. 1. Location of the faunal (bird and mammal) field survey. Area shown in black.

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Introduced birds recorded at the Ewa by Gentry Makai Development Project site. Relative Abundance estimates are based on the following scale: Abundant = 25+; Common = 15-24; Uncommon = 5-14; Rare = less than 5 tallied for the entire time of the survey. Data from both days of the survey were averaged to obtain the relative abundance estimate number.

Common Name	Scientific Name	Relative Abundance
Cattle egret	*Bubulcus ibis*	R
Ring-necked Pheasant	*Phasianus colchicus*	R
Spotted Dove	*Streptopelia chinensis*	C
Zebra Dove	*Geopelia striata*	A
Sky Lark	*Alauda arvensis*	A
Red-vented Bulbul	*Pycnonotus cafer*	C
Northern Mockingbird	*Mimus polyglottos*	U
Common Myna	*Acridotheres tristis*	A
Japanese White-eye	*Zosterops japonicus*	U
Northern Cardinal	*Cardinalis cardinalis*	C
Red-crested Cardinal	*Paroaria coronata*	U
House Finch	*Carpodacus mexicanus*	A
House Sparrow	*Passer domesticus*	R
Common Waxbill	*Estrilda astrild*	A
Nutmeg Mannikin	*Lonchura punctulata*	A
Java Sparrow	*Padda oryzivora*	C

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ORIGINAL

A CULTURAL IMPACT ASSESSMENT FOR THE PROPOSED EWA GENTRY MAKAI DEVELOPMENT PROJECT EWA, OAHU

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April 2002

ABSTRACT

Gentry Properties is proposing a development project named 'Ewa Gentry Makai, located in 'Ewa on the island of O'ahu. As part of the Environmental Impact Statement process, a Cultural Impact Assessment was conducted and is reported upon in this document. This assessment consists of archival and oral historical research.

The research conducted indicates that this area has a long and rich cultural and legendary history. The area was an important thoroughfare for travelers to settlements on the western coastline. Oral history information gathered indicates that a traditional trail existed between nearby Pu'u o Kapolei and Pu'u o Palailai. The area was also noted as a place of mischievous wandering spirits or *ao kuewa*.

Importance is also ascribed to certain landmarks of the area. In particular, Pu'u o Kapolei was a sighting point for the summer solstice.

The area, however, has been subjected to extensive major land alterations associated with cattle raising and sugar cane cultivation. These agricultural activities have destroyed the material evidence of the traditional activities that took place in this area. It does not appear that the proposed development will have any adverse effect to traditional cultural activities in the area.

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1.0 INTRODUCTION

Gentry Properties is proposing a development project named 'Ewa Gentry Makai, located in 'Ewa on the island of O'ahu. As part of the Environmental Impact Statement process, Pacific Legacy, Inc., at the request of Environmental Communications, conducted a Cultural Impact Assessment for the proposed 'Ewa Gentry Makai development project.

The following cultural impact assessment investigations are intended to satisfy Act 50, required by law as of April 26, 2000. Act 50 requires that information concerning traditional cultural practices and features that might be affected by the proposed development be identified, and that any potential impact is assessed.

The development project will include residential housing, commercial and industrial use facilities. The project area is a 283-acre parcel located in the district of 'Ewa (TMK 9-1-10:7 and 9-1-69:5), on the 'Ewa Coral Plain in Honouliuli *ahupua'a*, island of O'ahu (Figure 1). The proposed project area is currently zoned for agriculture and presently consists of fallow agricultural land formerly used for sugar cane production and limited grazing activities

2.0 KUPUNA INFORMANTS

Individuals and organizations knowledgeable about the area and/or cultural practices or features relating to the area were identified and contacted. Table 1 summarizes the knowledgeable individuals and organizations that were consulted. Oral history interviews and consultations were conducted. In addition, archival research was undertaken to identify additional cultural features in the area and traditional practices that may have been conducted in the area. The following individuals were contacted:

Van Diamond is chairman of the O'ahu burial council, and was initially contacted to assist in locating knowledgeable traditional and historic informants and possible descendents of past residents of the project area. He suggested that we contact two knowledgeable *kupuna*—Shad Kane and Arline Eaton.

Shad Kane serves as chairman of the Committee of Historic Sites and Cultural Properties for the Hawaiian Civic Club. He is a retired policeman who worked in the 'Ewa District from the Kapolei to Pu'uloa area, and including much of Honouliuli. He is a long time resident of the area, and currently lives in Kapolei.

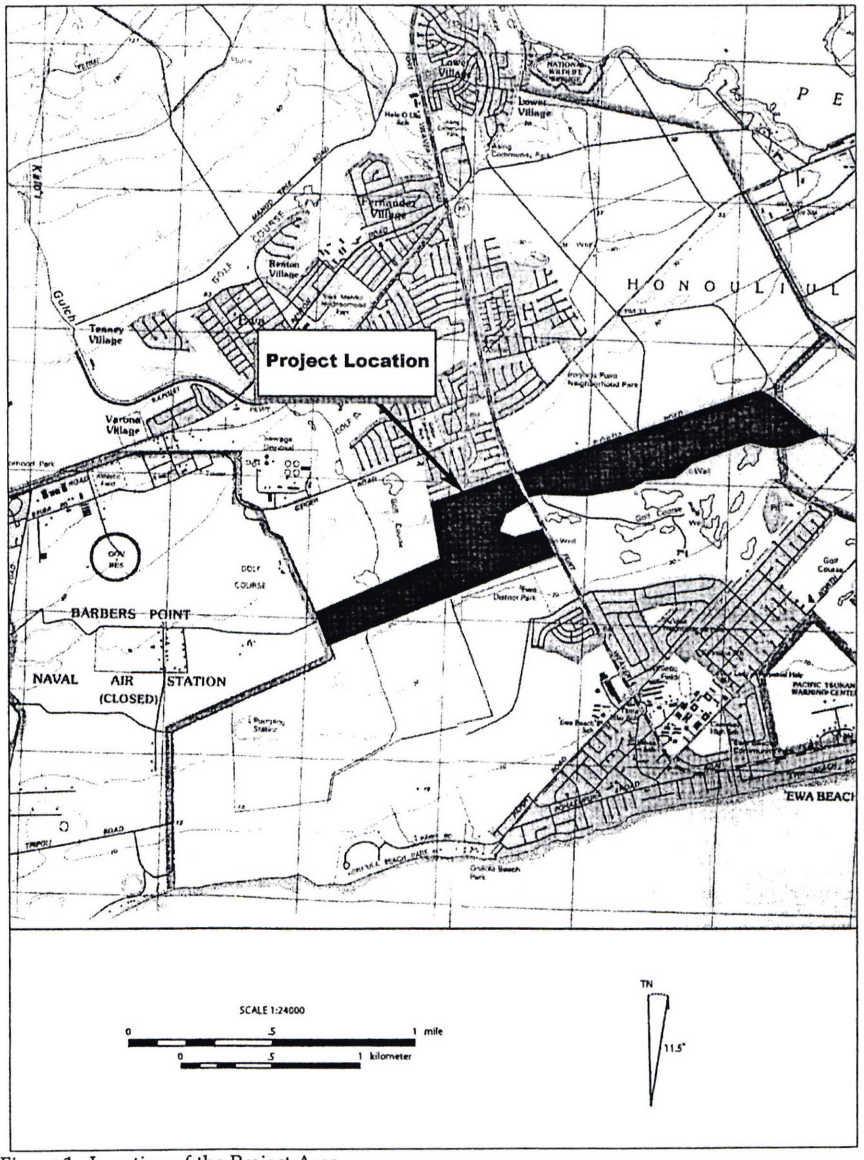

Figure 1. Location of the Project Area

Arline Wainaha Pu'ulei Brede-Eaton (born 1927) works for the Department of Education. Her family has a long history in the area, spanning four generations. She has been active in numerous cultural preservation projects.

Ms. Eaton states that to the best of her knowledge her family was the first family to move into the area in the early post contact years. She is the *hānai* (adoptive) daughter of Papa (William E.) Brede [III] and Jenny (Jane) Brede. Ms. Eaton's grandfather told her that her great grandfather, William E. Brede (I), lived on the land they were now living on since sometime after Kamehameha I. He told her that the land was not owned then, but that they had been given the right to live there. They had no amenities, and lived in a sort of lean-to house.

John Kaimikaua is a Kumu Hula active in Hawaiian cultural matters.

Pat Namaka Bacon is a noted Hawaiian Cultural Scholar who is the *hanai* (adopted) daughter of Kawena Pukui. The Bishop Museum currently employs Ms. Bacon as a Cultural Resource Specialist.

Dr. Bruce Carlson is director of the Waikiki Aquarium. He joined the staff in 1976 as a graduate student, served as Acting Director from 1986-1990, and as Director since 1990.

Table 1. Summary of Individuals and Organizations Consulted

Van Diamond	O'ahu Burial Council Chair	Referred to Shad Kane and Arline Eaton
Shad Kane	Hawaiian Civic Club: Committee of Historic Sites & Cultural Properties, Chair	Interview, referred to Arline Eaton and Kumu John Kaimikaua
Arline Eaton	Department of Education	Interview, referred to Thelma Parish
Thelma G. Parish	Member of early resident family, Retired Nun	Referred to oral history given in 1997 with K. Maly
John Kaimikaua	Kumu Hula	Telephone consultation, referred to Pat Bacon
Pat Bacon	Bishop Museum, Cultural Resource Specialist	No knowledge of area, will locate source, no response at writing
Bruce Carlson	Waikiki Aquarium, Director	Discussion of Māhina'ona

3.0 TRADITIONAL HISTORY

Pre- and early post-contact histories of the research area convey a setting that usually refers to the entire 'Ewa Coral Plain as a unit rather than the individual *ahupua'a* of Honouliuli or Pu'uloa. The 'Ewa plain is relatively flat and inclines slightly to the coastline (south, east, and

west), with topography varying little. Coral sinkholes and the volcanic cone Pu'u o Kapolei are the main topographic deviation.

Pu'u o Kapolei is a traditional landmark with a rich legendary history, noted from the time of the earliest of ancient settlements in Hawaii. Historic activities, however, have destroyed much of the area and its ancient Hawaiian cultural features. The numerous cultural coral sinkholes on the plain—which includes the project area—were filled-in and plowed over during the historic cattle-grazing and later sugarcane production.

Tuggle and Tomonari-Tuggle (1997) have provided a synthesis of the 'Ewa Plain cultural environment. This information will not be restated here, however, culturally informative themes within their synthesis include: environment, vegetation and fauna, landform subdivisions, archaeology, subsistence resources, cultivation potential, important places, traditions, resources, traditional themes and pre and post-historical documentation. The reader is directed to this report for additional information.

Fresh water on the barren coral plain has often been reported as being insufficient to support a permanent or substantial Hawaiian settlement during pre-contact years. Tuggle and Tomonari-Tuggle (1997:18-21), however, summarize their in-depth research on water availability on the 'Ewa Plain asserting that their findings may have made permanent Hawaiian settlement possible in at least a number of specific locales, if not generally across the entire area. Water was identified at various locales on the plain including: the watertable in sink holes, in the wetlands, sheet runoff, spring and creek water from now dry gulches, natural limestone water traps, a few ponds mapped and documented on the plain or along the coastline, and from the major Honouliuli Stream and various lesser Honouliuli *ahupua'a* streams. The streams provided fresh *mauka* (mountain) water at the more fertile inland and internal bay locales. Fresh water is documented at the spring Hoaka lei at Kualaka'i on the 'Ewa coastline, in oral history chant—"He Mo'olelo Ka'ao No Hi'iaka I Ka Poli O Pele"—translated by Kawena Pukui et al. (1974:119) and by Kepā Maly (1999:31).

Important locales of the 'Ewa Plain are mapped and summarized in Tuggle and Tomonari-Tuggle (1997:21-24). A few of these locations are important to the traditional history of the project area. They include: Pu'u o Kapolei (a volcanic cone or hill), the plain of Kaupe'a (barren home for wandering spirits), Hoaka lei (legendary spring), Pu'uloa salt works, residence of chiefs at Pu'uloa and Līhu'e, Honouliuli Gulch and agricultural fields, Kalaeloa (Barbers Point) and its lighthouse, Kaihuopala'ai (West Lock Bay), and Ko'olina village the later residence of James Campbell "Lanikūhonua" (Figure 2) Additional information concerning Pu'u o Kapolei and the Plain of Kaupe'a is documented below.

The extent of pre-contact settlement on the 'Ewa coral plains is debated. Early contact observations account for a marginal population on the plain, and two more populace settlements on the coastline within Kaihu o Pala'ai (West Lock Bay). Early Hawaiians in the

'Ewa Coral Plains area, as documented by oral histories and archaeological investigations, had access to various resources such as a rich variety of: marine fish, shellfish, and seaweed. These resources were found along the coastline, in cultural fishponds, and in Keawalau o Pu'uloa (Pearl Harbor). The upper stream gulches and the inland harbor coastline provided fertile grounds for irrigation and agricultural cultivation, predominately *taro*. Inland and plain sinkhole cultivation provided access to sweet potato, banana, coconut, *milo*, *noni*, sugar cane, breadfruit, ti, *koali 'ai*, *'aheahea, and pai hi 'iha* vegetation, etc. (Fornander 1916-20,II: 400; Kamakau 1991:110; Tuggle and Tomonari-Tuggle 1997:13,15).

The 'Ewa Plain was home to a variety of wild terrestrial plants and birds. In the legend—"He Mo'olelo Ka'ao No Hi'iaka I Ka Poli O Pele"—Hi'iaka travels through 'Ewa, noting important geographical locales as well as many trees, plants, and flowers. Flora mentioned include: *nēnē* grasses, *kupukupu* ferns, noni trees, *ma 'o* (*Gossypium tomentosum*, yellow Hybiscus), varieties of *lehua, koai 'a, 'ilima* (*Sida fallax*), *'ōhai (Sesbania tomentosa*), *Kukui, Kauno 'a* (*Cuscuta sandwichiana*), *'uala* (sweet potato), *pilipili- 'ula* (*Chrysopogon aciculatus* [grass]), *wiliwili* trees (*Erythrina* sp.), and *noho* (*Tribulus cistoides*). This legend was first published in Hawaiian in the Hawaiian newspaper *Ka Hōkū o Hawai'i* from September 18, 1924 -July 17, 1928. Emerson (1978:167) translated parts of this legend, and more recently Kepā Maly (1999:31) translated parts relating to 'Ewa. Maly paraphrases a portion of his translations within the Hi'iaka legend chant mentioned above:

> Descending to the flat lands of Honouliuli, Hi'iaka then turned and looked at Pu'uokapolei and Nāwahineokama'oma'o who dwelt there in the shelter of the growth of the *'ōhai* (*Sesbania tomentosa*), upon the hill...When Hi'iaka finished her chant, Pu'uoKapolei said...So it is that you pass by without visiting the two of us. Lo, we have no food with which to host you. Indeed, the eyes roll dizzily with hunger. So you do not visit us two elderly women who have cultivated the barren and desolate plain. We have planted the *'uwala* (sweet potato) shoots, that have sprouted and grown, and have been dedicated to you, our lord. Thus as you travel by, pull the potatoes and make a fire in the *imu*, so there will be relief from the hunger. For we have no food, we have no fish and no blanket to keep us warm. We have but one *Kapa* (covering)...in the time when the grasses dry, and none is left on the plain, we two are left to live without clothing. (Maly 1999:35)

The Hi'iaka chant—"He Mo'olelo Ka'ao No Hi'iaka I Ka Poli O Pele"—discussed above describes the travels of Hi'iaka through the plains of 'Ewa as she has been sent by her sister *Pele* (volcano goddess) to bring her desired lover from Kaua'i to Hawai'i Island; there are descriptions of a diverse area environment and reference to the natives of Pu'uloa, and persons living on Pu'u o Kapolei and the plains (Maly 1999:31-35). Pu'uokapolei and Nāwahineokama'oma'o may refer to mythological persons or land features; Pu'uokapolei has

long been the name of a hill on the 'Ewa Plain, however a physical association with the term Nāwahineokama'oma'o has not yet been identified. The above reference clarifies that in ancient times, the plain was indeed considered marginal in regards to flora and subsistence during the dry seasons; it also shows that the plain usually had enough water to support grasses and other plants and trees. Habitation may have been difficult at many locations on the 'Ewa Plain, but references such as the selections above and below show that the variety of resources available were, although difficult and tedious, accessible.

Emma Metcalf-Nakuina notes that:

> Kamapuaa subsequently conquered most of the island of Oahu, and, installing his grandmother as queen, took her to Puuokapolei, the lesser of the two hillocks forming the southeastern spur of the Waianae mountain range, and made her establish her court there. This was to compel the people who were to pay tribute to bring all the necessities of life from a distance, to show his absolute power over all,
>
> Puuokapolei is some little distance from Sisal, towards Waianae, and is as desolate a spot as could be picked out on the whole island. It is almost equally distant from the sea, from which came the fish supplies; from the taro and potato patches of Ewa, and from the mountain ravines containing the banana and sugar cane plantations. (Emma Metcalf-Nakuina 1904:50)

The environment in the research area is documented in numerous historic descriptions as being barren, desolate, and generally unpopulated. Ancient oral histories also refer to the area as barren, however, in considering the flora and avifauna depicted in ancient chants and oral history accounts such as those above, the references to *barren* may have much to do with the relative comparative island environments. Archaeological investigations, reported in the next section, show that sinkholes on the plain were utilized for agricultural purposes. It is likely that any ancient and pre-contact permanent habitations were close to the coastline or stream outlets, at least for those who did not rely on tribute subsistence.

Following the contact years, the area attracted a minimal number of foreign settlers. Only those that could use the area as commercial investment desired land in this area. Initially, the salt-works and cattle (grazing) industries dominated the land, and later sugar cane agriculture extended *makai* into the plain beyond the current project area.

4.0 KUPUNA TESTIMONY

4.1 *AHUPUA 'A* BOUNDARY

Ms. Eaton asserts that the current *ahupua 'a* map is inaccurate (Figure 2). The boundaries as she knew them extended Pu'uloa some distance to the west and north from its current northern-western boundary with Honouliuli , and further across Pearl Harbor to the eastern

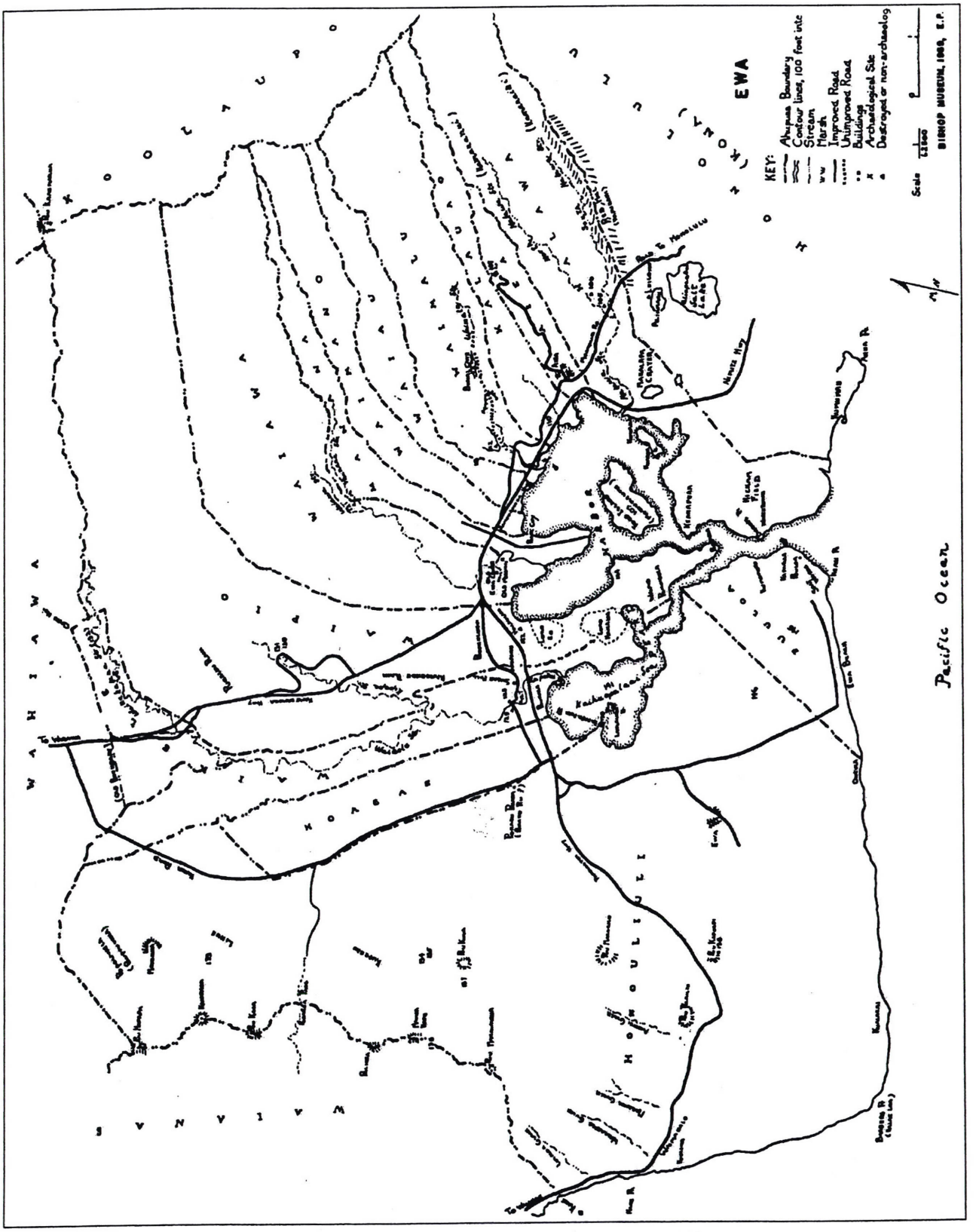

Figure 2. Traditional Areas of 'Ewa (from Sterling and Summers 1978)

shore. She believes that the current project area is actually in the Pu'uloa *ahupua'a*, not in Honouliuli *ahupua'a*. She describes the project area as being desolate and uninhabited during her childhood prior to sugarcane production, and recalls it being referred to as Kealia. Sterling and Summers (1978) indicate Pu'uloa as a separate *ahupua'a*. On the other hand, Tuggle and Tomonari-Tuggle (1997) indicate that Pu'uloa was an *'ili* within the *ahupua'a* of Honouliuli. The Hawaiian Studies Institute (1987) seems to support Tuggle and Tomonari-Tuggle.

4.2 KAUPE'A AND THE *AO KUEWA* (REALM OF THE WANDERING SPIRITS)

Mr. Shad Kane conveyed the following insights into the history of the lands of Pu'uloa and Honouliuli; he believed that the 'Ewa inter-coastal plains remained fairly desolate during the pre and early post-contact years. He attributed this to two factors: the marginal environment, and ancient-traditional oral histories that identify the area as the "barren place for mischievous wandering spirits." Hawaiians, he states, believed in a concept called *wailua* (the dream spirit) that contained two energies within the body, one good and one bad. The concept held that one's *'aumākua* (deified deceased ancestors and family or personal gods) would help the spirit of a deceased Hawaiian descendent, when it left the body, to travel to a leaping point where the new spirit could leap into the next realm. Ka'ena Point is the leaping point most often referred to near the project area (each island had its own geographical leaping points). Lanaakahuhani was the desired afterlife spirit realm where one's good *wailua* spirit energy experienced a favorable existence, as a result of the assistance received from one's *'aumākua*. If one did not conduct one's self in life to the satisfaction of their *'aumākua* they might not receive the assistance needed to reach Lanaakahuhani. This would cause the bad *wailua* spirit energy a type of banishment to a local *ao kuewa* – realm of the earthly wandering homeless and mischievous spirits. One such a*o kuewa* is on the 'Ewa plains in an area called Kaupe'a (crisscrossing, intermingled) – this area then is known as the "barren place for wandering mischievous spirits." Mr. Kane added that throughout his many years as a policeman in the area he saw many unexplainable situations that made him contemplate the undesirable *wailua* spirit in the *ao kuewa* of Kaupe'a, 'Ewa.

Martha Beckwith writes that Hawaiian teachings, according to *kahuna* pose that:

> ...death to the body (kino) does not entail death to the spirit (uhane [or wailua]) ...experiences of the soul after it leaves the body at death...follow traditional ideas...probably influenced by later development of the aumakua belief. There is a place of the dead, reached at some leaping place, with which is connected a branching tree as roadway of the soul. Elaborations enter...as a result of the part conceived to be played by the aumakua in protecting and sheltering the soul and leading it to its aumakua world. The worst fate that can befall a soul is to be abandoned by its aumakua and left to stray, a wandering spirit (kuewa) in some barren and desolate place, feeding upon spiders and night moths. Such spirits are believed to be malicious and to take delight in leading travelers astray; hence the wild places which they haunt on each island are feared and avoided. Such

> are the plains of...the rough country of Kaupea at Puuloa on Oahu...In these desolate places lost spirits wander until some friendly aumakua takes pity upon them.
>
> Other leaping places of the soul (Leina-ka-uhane) are named at different points...and Kaena on Oahu; (Beckwith 1976:154,156)

Sterling and Summers document two historical references to the wandering spirits and their O'ahu home Kaupe'a, which were spoken of by Mr. Kane. The first reference was translated from the Place Names – O'ahu stories in the Hawaiian newspaper *Ke Au Hou*, an edition dated July 12, 1911:

> The plain of Kaupea on the plain of Puuloa was where the ghosts wandered to catch night moths and spiders for food. It extended from the wiliwili trees of Kaupea to Kanehili. (Sterling and Summers 1978:44)

The second reference by Kamakau reveals that:

> On the plain of Kaupe'a, beside Puuloa, wandering souls would go to catch moths and spiders. However, wandering souls would not go far in the places mentioned earlier before they would be found...by [the] 'aumakua souls, and be helped to escape. Those souls who had no such help were indeed friendless, (Kamakau 1964:49)

There appears to be a possible discrepancy concerning the *ahupua'a* in which Kaupe'a lies. In the 1911 *Ke Au Hou* newspaper article, Kaupe'a is said to be on the plain of Pu'uloa, but extends west to Kanehili. Mr. Kane places the location of Kanehili within the boundaries of Honouliuli *ahupua'a*, to the west of the current project area. Kamakau's earlier reference (written in the mid-half of 19th century) places Kaupe'a beside Pu'uloa. It is not clear if Kamakau is referring to Pu'uloa as the *ahupua'a* or the locale area along the west coastline at the mouth of the harbor, but the *Ke Au Hou* reference clarifies that the Kaupe'a area extended west to Kanehili. Oral testimony documented above indicates that an error may exist for the current boundaries of the *ahupua'a* of Pu'uloa and Honouliuli. Nonetheless, both *ahupua'a* are relative to the history of the 'Ewa Coral Plain and the current project parcel. The location of the Kaupe'a w*ili wili* trees was not clearly established, thus Kaupe'a perimeters could not be accurately mapped. The current project parcel, however, definitely lies within the traditional area of Kaupe'a, according to these descriptions.

4.3 THE LANDS OF 'EWA

The lands of 'Ewa are described by several early historical sources, with reference to the barren lands of Pu'uloa and Honouliuli; Vancouver, while anchored at the entrance to *Kaihu o Pala'ai* (West Lock Bay) in 1793, noted that:

> The part of the island opposite to us was low...forming a level country between the mountains that compose the east and the west ends of the island." (Vancouver 1883,v3: 361, 363)

The coral plains of Pu'uloa and Honouliuli lie west of Vancouver's location. He adds that:

> This tract of land was of some extent, but did not seem to be populous, nor to possess any great degree of natural fertility; although we were told that, at a little distance from the sea, the soil is rich, and all the necessaries of life are abundantly produced. (Vancouver 1883,v3: 361, 363)

The latter more fertile lands referred to are likely those, which lie to the northwest, inland of the inner bay coastline.

McAllister in referring to the 'Ewa coral plains during his survey in 1930 (Site 146) states that there are remains of many sites throughout this area, and that

> It is probable that the holes and pits in the coral were formerly used by the Hawaiians. Frequently the soil on the floor of larger pits was used for cultivation...bananas and Hawaiian sugar cane still growing in them...I doubt if previous to the time of Cook there was ever a large population here. (McAllister 1933:109)

Mr. Shad Kane's oral testimony (above), in part, agrees with the observations of Vancouver in 1793 and McAllister in 1930, and with the historical sources of Beckwith (1940) and Sterling and Summers (1978). These sources support a similar pre-contact and early post-contact environment for the 'Ewa Coral Plains of Pu'uloa and Honouliuli *ahupua'a*; the area supported a marginal early population and agricultural environment. Much of the land to the west of the harbor was barren in pre-contact years, gaining its reputation as the "barren place for wandering spirits."

Ms. Eaton discussed a collaboration interview that she and her good friend Sister Thelma Genevieve Parish had participated in with Kepā Maly, in May of 1997 (Maly 1999:44). Sister Parish was not available at the present time, but she had shared extensive information about the 'Ewa plains with Maly in 1997. Portions of her testimony describe the early 20th century environment of the Honouliuli Pu'uloa area – the current project area – and include comments relating to historic cultural practices, place names of her childhood era, and the environmental settings of the area during her youth:

> ...the pasturage seems unlikely in our terms today, because it's not meadow-like, but it was just virgin country and the *pipi*, the cattle were turned loose. And then there were divisions (many of them were stone wall enclosures) so that you had one paddock [fattening grounds] following another paddock, following another paddock. So when we left Honouliuli, we were coming through the tail end of the cane lands, then we'd come to a gate, we'd have to stop and get out...and so we had to break or hack-hack at the branches of the *kiawe* trees that had grown over the road after our last visit. And we'd come down, and I'd have to jump out of the car again, and open the next gate, wait until he'd gone through and close that gate. I think we had to do that three or four times...There were coral stone walls and also many were wire fencing, the barbed wire...strung from one *kiawe* wood post to the next...And the gates were swung from larger posts, embedded in the coral.
>
> My grandmother's property was always...sort of located by the height of the windmill. She had the only windmill in the area and it was a landmark... Kūpaka, as I knew it then, is now Parish Drive...And so we referred to that whole area...the area we went through, before reaching my grandmother's country home, was that of Mitsuyasu...[they had] a charcoal burning establishment...Mitsuyasu must have been here before 1925. I know, I found my grandmother's records, and she built her home in '25...So they had come around that time...could have been here before that.
>
> ...The salt works were the focal point of the ownership, of my great grandfather's ownership...[he] commercialized in salt, and sold it.
>
> The only other habitation, if I can refer to it as such, was my cousin's country home, and she was the daughter of Samuel Dowsett. And [he] had an old country home down in this area. And then beyond to the west of my grandmother's holdings was, where the holdings of my grand uncle Alika, that's Alexander Cartwright Dowsett. And his old home was visible from the beach area outside my grandmother's home.
>
> Ewa Village was the last plantation area of this whole locale, and Ewa Plantation was very much in the works, and they had their extensive cane fields, through Honouliuli and all the way around, along Farrington Highway, almost to Nānākuli...The changes have been tantamount, but they've come about primarily with the closing down of sugar. (Maly 1999:44)

Maly noted that "the aunties were talking about new place names in the 'Ewa District, and how inappropriate they were, some not even of Hawaiian origins]" He asked their opinion on this and Sister Parish stated that "There's no excuse for them not to research and find names applicable to the area". Auntie Arline stated "That's what happened with that Gentry, they just...look at the names they have." Sister Parish added, "It reflects a good deal of the *po'e haole* [foreign] thinking...It's so stupid! To have to put up with these nonsensical names.".

Ms. Eaton provided the following information to us regarding the area of her childhood.

As a young child Ms. Eaton spent her weekdays at their home in Kalihi and weekends and holidays at the Pu'uloa residence, later making the Pu'uloa residence her full time home. She

states that her childhood playmates at Pu'uloa roamed the area freely, and ventured as far as Kalaeloa (Barber's Point) to the west. Ms. Eaton and her childhood friends often visited the Robins family at their home near and a little inland of the lighthouse at Kalaeloa. The Robins were the third family to move into the area, as she recalls, because Mr. Robins was to be the lighthouse keeper. She and her friends explored the coral plains and the coastline, and came to know it well. She recalls that they often came upon individuals fishing along the beaches, who sometimes shared fish they were cooking with her and her friends. She recalls the meals as being very delicious, and often including lobster. Auntie Arline shared that although they were just small children, they had no fear of persons coming to utilize the beaches. "Anyway" she states "if they had tried any mischief we had just to run, because no one knew the area as we did. We often played in the wetlands, they are of particular importance to us then and now." Ms. Eaton recalls that for along time there seemed to be just the three residence locations, those of her family the Brede's, the Dowsett-Parish families, and the Robins' family.

Papa Brede, Ms. Eaton's father, told her that sometime during the time of Kamehameha II or III, she was unsure—the king sold the Dowsett family most of Pu'uloa. Being the second permanent residents in the area, they established a home in Kupaka (the area of present day Parish Road), but their land ran from Iroquois point to Campbell high school and west through what is now called 'Ewa Beach and Pohakupuna Road to just before Oneula Beach. Ms. Eaton believes that the king, possibly being Liholiho, may have needed money at the time and thus deciding that the barren lands of Pu'uloa and Honouliuli were suitable for selling. Sometime after this land sale, the Dowsett-Parish family sold William Brede (I) the land on which they lived. The first ventures of the Dowsett's enterprises included the commercialized salt-works and the cattle business. Papa Brede began to work for the Dowsett's Ranch, overseeing operations.

4.4 *MĀHINA 'ONA*

Mr. Kane added that the term Kaupe'a also referred to the Hawaiian celebration of ancestors and their relationship and use of the Southern Cross Constellations.

Mr. Kane discussed a particular migration of very early inhabitants—sun-worshipers from Tahiti—who may have occupied or used for a time the area that includes the current project parcel. The construction of at least two *heiau*, one in Wai'anae and one in Waikiki are attributed to these early sun-worshipers. He did not recall the exact names of the two heiau, but knew that the Waikiki heiau was near Diamond Head. The *Opunaha Altar*, which stood on the grounds of the present day Waikiki Aquarium, is also attributed to these sun-worshipers; this site was the primary observation location for the traditional practice of viewing an event called the *Māhina 'ona*. The *Māhina 'ona*, he explains, refers to a vision of a bright glowing crown visible through sunset, which takes place at the beginning of *Kau* (or *Makali'i*) the warm season for the Hawaiian calendar. The date coincides with May 1 in the Western calendar. Near this date, from the area of the ancient *Opunaha Altar*, the sun sets in the west behind Pu'u o Pālailai and Pu'u o Kapolei creating the vision of the glowing crown. The current project area lies in the

direct path of the traditional viewing direction for the *Māhina 'ona* Crown.

Tuggle and Tomonari-Tuggle also note the common associations between 'Ewa and Kahiki (the traditional homeland of Hawaiians). Kahiki is most often referred to as defining Tahiti.

Emma Metcalf-Nakuina states:

> There were sun-worshippers among the original arrivals in Hawai'i, and there were two temples dedicated to the sun on O'ahu—one at Kaneloa (a part of the present Kapiolani Park), and one at Kau'o Kala, Waianae. These temples were not for the whole population, but for only a few who claimed it as a privilege...(Nakuina 1904:8)

Dr. Bruce Carlson, director of the Waikiki Aquarium, published a historical informational flyer for the Aquarium in 1985 that details the traditional *Māhina 'ona* viewing event. He stated that "Hawaiians watched the setting sun as a way of marking the seasons, and that the Wakiki Aquarium grounds near the seal pool once contained the alter mentioned above; an important site for a significant cultural event called the *Māhina 'ona*. When the sun moved north it would at one point in the year align in the west and set directly behind Pu'u o Kapolei and Pu'u o Pālailai (two hills northwest of the project area). When the sun set behind these two hills at the particular alignment, a glowing crown was the result. This crown can be seen from the ancient altar site on the Aquarium grounds, which is in direct alignment. Carlson understood that this event was suppose to occur near May 1st, forty days after the spring equinox, and has personally viewed the event a few times on May 2nd.

Mr. Carlson stated that his main source was an article by Akin, Akin, and Scudder entitled "Puu o Kapolei":

> Puu o Kapolei is a small hill at the southern foot of the Waianae mountain range, also known more recently as Fort Barrett. Puu o Kapolei is an important cultural site and at one time contained a heiau on its peak...we have found that...an observer at the stone enclosure at Queens Surf, Kapiolani Park sees the sun setting into a crown. The crown is actually Puu o Palailai, the hill directly behind Puu o Kapolei as viewed from Kapiolani Park. Thus, on Lei Day, May 1 (...the official beginning of Kau) the sun is seen to set into Puu o Palailai... (Akin, Akin, and Scudder 1985: volume IX, no.12)

Sterling and Summers cite a Kamakau reference to the *Māhina 'ona* and Pu'u o Kapolei:

> ...and the Makali'i season when the sun set (kau) from Ka-'ula to Kawaihoa was called Kau...When it set at Ka'ula and turned south the season was called Ho'oilo. In the same way the people of Oahu reckoned from the time when the sun set over Pu'uokapolei until it set in the hollow of Mahinaona and called this period Kau, and when it moved south again from Pu'uokapolei and it grew cold and the time when young sprouts started, the season was called from their germination (oilo) the season of Ho'olio. There

were therefore two seasons, the season of Makali'i [Kau] and the season of Ho'oilo. (Kamakau as cited in Sterling and Summers 1978:34)

Kamakau may be referring to the hollow of the *Māhina 'ona* vision, however, another reading would attribute *Māhina 'ona* as another name for Pu'u o Pālailai. Pukui's translation of *mahina* is moon, moonlight, or glow; and *'ona* is intoxicating, etc. (Pukui 1986:219-220;288). An intoxicating glow or moonlight translation for *Māhina 'ona* could refer to the vision of the crown itself, the frequent breathtaking moonlight views near the two hills, or a unique combination of the two.

4.5 Kelea, Surf-riding Chiefess from Hana, Maui

Ms. Eaton remembered being told by her grandmother, that at some point in traditional history the area of the project parcel was known as Kelea. The Kelea area, as Ms. Eaton states, acquired its name from an oral history about Kelea a famous female *ali'i* surfer from Hana, Maui, and Chief Lo Lale who abducted her from Maui and made her his wife at his court in Līhu'e, 'Ewa, O'ahu. Ms. Eaton distinguishes the project parcel with the geographical name Kelea. This oral history was conveyed to her by her kupuna:

> ...having heard of the famous Kelea, Chief Lo Lale of Lihue sent his men to Hana to surf with Kelea to Oahu. They enticed her into surfing with them in Hana, and they kept the ride going until they arrived on the beach in Puuloa. Kelea was confused when she saw her surroundings, but Chief Lo Lale was so kind and loving to her that she went to his home in Lihue to live with him, often coming down to the beaches of Ewa to surf. They were quite happy for a time, but eventually Kelea was homesick and the chief, although heartbroken, let her return to her home.

A different variation of this story is recorded in Thrum (1930:58-62) as translated from Kamakau's version. In this version, Kelea is a chiefess and the sister of Kawao who is the king of the Hamakuapoko and Kekaha sections of Maui. She is known for her beauty and expertise in surfing. Chief Lo Lale from Līhu'e, O'ahu sent a group of his attendants to find him a wife. After searching other islands they reached Maui and were told of the famous surfing Chiefess Kelea. They were told that they could find her "indulging in the rolling surf in the early morning," at Hamakuapoko. The bride delegation boarded their canoe and sailed for Hana. The delegation called to Kelea "O chiefess, make your landing on this canoe." Kelea agreed reluctantly, and "knew not that this was a woman-snatching canoe, into which she was enticed." The group rode the surf to shore and went out again, and again they landed successfully ashore. During the third trip the wind arose and the delegation stole away to sea, for their O'ahu home. They landed at Waialua, and Kelea was taken to Lo Lale in Līhu'e. He claimed her for his wife and they had three children "who became some of the ancestral chiefs of Hawaii nei." After close to ten years Kelea asked her husband for permission to go sightseeing down into 'Ewa, reluctantly he agreed.

The story continues with the trip through 'Ewa, and cites many place names. When Kelea

reaches "the rumbling stream of Waipahu" she delights in "the view of the lochs of Puuloa", and they travel on through Hālawa and Kawehewehe. The residents of Kawehewehe tell Kelea that "near by is the kou grove of Kahaloa from which to see the surf-riding of the chiefs, and the king, Kalamakua." Arriving at Kahaloa, Kelea secures a surfboard, and the beach crowd cheers her surfing ability and grace. At a distance King Kalamakua heard the cheers and asked what the noise was about. When told that a skilled woman chiefess caused the cheering the king guessed it was the famed Kelea of Maui. The king went to the shore and awaited Kelea. When she came in he asked if she was the Maui chiefess? "Yes," was the reply. The king then said: "Stand forth." And she did so, the king took off his kihei (mantle) and wrapped it around her as a skirt, to shield her...she became his willing spouse". They lived together as husband and wife and had a daughter, Laielohelohe.

There are several variations to this story. Most place Kelea in various 'Ewa locations. A few additional variations can be found in "Legends and Myths of Hawaii" by Kalakaua (1888:209-225,229-246), "Myths and Legends of Our New Possessions" by Skinner (1900:217-219), In The Path of The Trade Winds" by Thorpe (1924:3-12), and "More Hawaiian Folk Tales" by Thrum (1923:77-86).

Kumu Hula John Kaimikaua was contacted, and stated that he was not familiar with any cultural practices in the area in question, and that there were no chants that he knew of which referred to the area of the proposed development. He referred us to Pat Bacon.
Ms. Bacon said she was not familiar with the area, but that she would try to find someone to contact. At the time of writing, she had not yet responded.

5.0 DISCUSSION

The archival and oral historical research conducted indicates that the project parcel is located on the 'Ewa Coral Plain within an area traditionally referred to as the plain of Kaupe'a—the barren place for mischievous wandering spirits called *ao kuewa*. Further distinction places the project parcel in an area named Kelea.

This area is documented as having been a main thoroughfare for travelers to the settlements on the western coastline. A trail is documented in oral history as having passed between Pu'u o Kapolei and Pu'u o Palailai.

Any permanent Hawaiian residents of the coral plains, during both pre- and post-contact years, would have had an arduous time of acquiring subsistence resources, particularly during drought. Resources within the *ahupua'a* of Honouliuli and Pu'uloa included access to marine resources, and fertile coastline and stream gulch area agricultural lands. The abundant forest resources, mentioned above, were located north of the Honouliuli *Ahupua'a*. Avifauna was also available on the plain.

Although the project parcel and surrounding area did not support a large human settlement

area, it has a rich cultural history and legendary fame. The area is referred to in many chants and oral histories. The importance of Pu'u o Kapolei as a seasonal solstice landmark related to an ancient cultural viewing event, of which the project area lies in the direct path, is of particular cultural importance. The traditional place name Kaupe'a, and its cultural significance as the "earthly place for wandering mischievous *ao kuewa*" who did not make it to the desired afterlife realm, identifies the area as an important part of the ancient Hawaiian belief system.

The only archaeological sites documented in the project parcel area thus far are the coral sinkholes, which were used for agriculture. The traditional surface for these sites have long been destroyed, with in-fill during the cattle grazing years and plowing during clearing for sugarcane agriculture.

It does not appear that the proposed development will have any adverse effect to traditional cultural activities in the area.

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February 26, 2003

ORIGINAL

Ms. Debra M.A. Luning
Gentry Homes, Ltd.
P.O. Box 295
Honolulu, Hawaii 96809

Re: Comments to Environmental Impact Statement Preparation Notice (EISPN)
Gentry Ewa Makai, Ewa District, Oahu, Hawaii's
PBQD Reference: 16332C

LAND USE COMMISSION
STATE OF HAWAII
2003 MAR 21 P 1:

Dear Ms. Luning:

We have reviewed letters to Mr. Tim Hata of the City and County of Honolulu Department of Planning and Permitting (DPP) regarding the Gentry Ewa Makai project. One was from Ms. Mary Lou Kobayashi, Acting Director of the Office of Planning of the State of Hawaii Department of Business, Economic Development and Tourism (DBEDT) and two were from Ms. Cheryl Soon, Director of the City and County Department of Transportation Services (DTS). The letters were responses generated by review of the Environmental Impact Statement Preparation Notice (EISPN) for Gentry Ewa Makai.

The letter from DBEDT-OP requests evaluation of long-term traffic conditions in the Ewa region. There have been several iterations of long-range transportation studies conducted for this region. The most recent is the Ewa Highway Master Plan/Year 2010 Highway Plan by Kaku Associates dated August 28, 2001 and an amendment to this study dated May 31, 2002. These studies were used as the basis of Chapter 33A of the Revised Ordinances of Honolulu that identified and assigned transportation impact fees to future development within the Ewa plain. A longer-range evaluation is part of the Transportation for Oahu Plan – TOP 2025 approved by the Oahu Metropolitan Planning Organization (OMPO) Policy Committee on April 6, 2001. The proposed Gentry Ewa Makai development was included in both plans.

The Traffic Impact Analysis for Ewa by Gentry Makai Development, dated December 2002 is consistent with the traffic volumes projections developed as part of the Ewa Highway Master Plan/Year 2010 Highway Plan. The traffic impact analysis focuses on the localized needs surrounding the Ewa by Gentry Makai development. The regional issues are handled through the Ewa Highway Master Plan/Year 2010 Highway Plan and the Transportation for Oahu Plan – TOP 2025. This was judged the most appropriate way to maintain consistency with previously conducted long-range studies while providing specific details adjacent to the proposed Ewa by Gentry Makai development.

The two letters from DTS requests that the Traffic Impact Analysis for Ewa by Gentry Makai Development include a discussion of transit access to the development and a discussion regarding the Regional Bus Rapid Transit (BRT) component of the Primary Corridor Transportation Project being pursued by DTS. Page 17 of the traffic impact analysis acknowledges the recent efforts by DTS to implement "Hub and Spoke" bus improvements

and mentions the Primary Corridor Transportation Project. Although the discussion does not contain a specific reference to BRT, it is included since it is part of the Primary Corridor Transportation Project.

DTS also request that a discussion of capacity of Fort Weaver Road and the H-1 Kunia Interchange On-Ramp should be included. Both the Ewa Highway Master Plan/Year 2010 Highway Plan and the Transportation for Oahu Plan – TOP 2025 studies identify the capacity constraints of Fort Weaver Road and H-1 Kunia Interchange On-Ramp and use them as justification for improvements such as North-South Road, H-1 North-South Road Interchange, and Kapolei Parkway.

Another request in the DTS letter involves the provision of a table that projects schedules for implementation of roadway improvements and for the Ewa by Gentry Makai development. As I understand it, both are being prepared by Gentry Homes, Ltd..

Many of the major roadway improvements such as the widening of Fort Weaver Road, the completion of Kapolei Parkway, and the construction of the North-South Road and H-1 North-South Road interchange are included as a basis for the the transportation impact fee assessments documented in Chapter 33A of the Revised Ordinances of Honolulu.

During our telephone conversation, you also relayed a concern expressed verbally by the Office of Environmental Quality Control (OEQC). This concern related to the location of the proposed University of Hawaii-West Oahu Campus. Previous plans had it located mauka of H-1 Freeway in the vicinity of the future H-1 North-South Road Interchange. Current concepts now locate it makai of H-1 Freeway, still in the vicinity of the future H-1 North-South Road Interchange. This change in location is judged to have minimal impacts on traffic in the Ewa by Gentry Makai area. The change would also be beneficial in helping to accelerate the schedule for the North-South Road between Kapolei Parkway and Farrington Highway. This would benefit the Ewa and Ewa Beach areas by providing alternative access to H-1 Freeway.

Both DBEDT-OP and DTS raise valid long-range transportation issues. The development community in the Ewa region is very aware of these issues and has cooperated with the State of Hawaii and the City and County of Honolulu to address these long-range issues. The transportation impact fee ordinance is the culmination of these cooperative efforts. Doing additional long-range studies would be re-inventing the wheel on these issues and could interfere with the current impact fee mechanism. The impact fee ordinance for the Ewa region identified transportation improvements and defined a mechanism to pay for those improvements. Because the impact fees are due at the time building permits are obtained, development would necessarily precede the roadway improvements unless the City and County of Honolulu and the State of Hawaii elected to float bonds for their respective roadway improvements and used the impact fee revenue to service the bond debt.

We hope this letter clarifies the issues raised by DTS and DBEDT-OP. We stand ready to assist you in addressing further questions or comments regarding traffic impacts associated with the Ewa by Gentry Makai Development.

Very truly yours,

PARSONS BRINCKERHOFF QUADE & DOUGLAS, INC.

Wayne Y. Yoshioka
Manager of Transportation Planning/Traffic Engineering

TRAFFIC IMPACT ANALYSIS

EWA BY GENTRY - MAKAI DEVELOPMENT

Ewa, Oahu, Hawaii

December 2002

Prepared For:
Gentry Investment Properties
P.O. Box 295
Honolulu, Hawaii 96809

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PBQD Reference Number:

16332C

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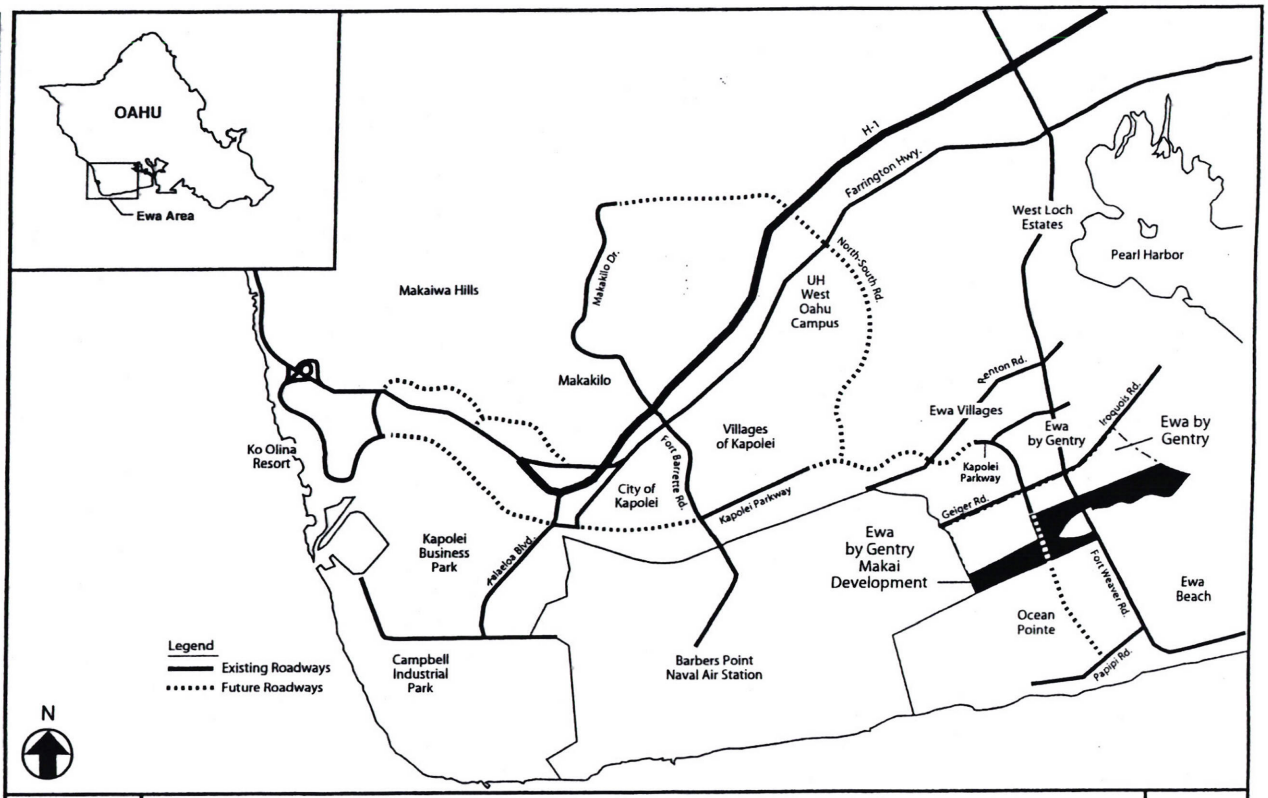
I. INTRODUCTION

This report documents the assumptions and methodology used and summarizes the findings and recommendations of a traffic impact assessment study for the proposed Ewa by Gentry - Makai development in Ewa, Oahu, Hawaii. Existing and projected Year 2010 traffic conditions at key roadway intersections located within the project study area were evaluated. Figure 1 shows the general location the proposed project, and Figure 2 illustrates a conceptual development plan for the proposed project. As shown in Figure 2, the study area is defined by the entrance to the Hawaii Prince Golf Club to the south, Geiger Road to the north, Keaunui Drive to the east, and Kalaeloa to the west.

The proposed project will include single and multi-family residential development, light industrial uses, and recreational and public facilities. The land for the project is proposed to be re-designated from agricultural to urban use through the State Land Use District Boundary Amendment (SLUDBA) process with the State Land Use Commission. After re-designation, the land will also need to be rezoned for the proposed uses. Figure 2 illustrates the boundaries of the land proposed for SLUDBA re-designation action.

Ewa by Gentry - Makai is the logical extension of the Ewa by Gentry Development currently under development in Ewa, Oahu, Hawaii. A significant proportion of the homes planned to be within Ewa by Gentry has already been constructed. Within this development, the new Holomua Elementary School and the Coral Creek Golf Course are complete. As part of the Ewa by Gentry development, the segment of Kapolei Parkway between the Oahu Railway and Land (OR&L) right-of-way and Ewa by Gentry property line, south of Geiger Road, has been constructed to its ultimate cross-section by Gentry Homes, Ltd.

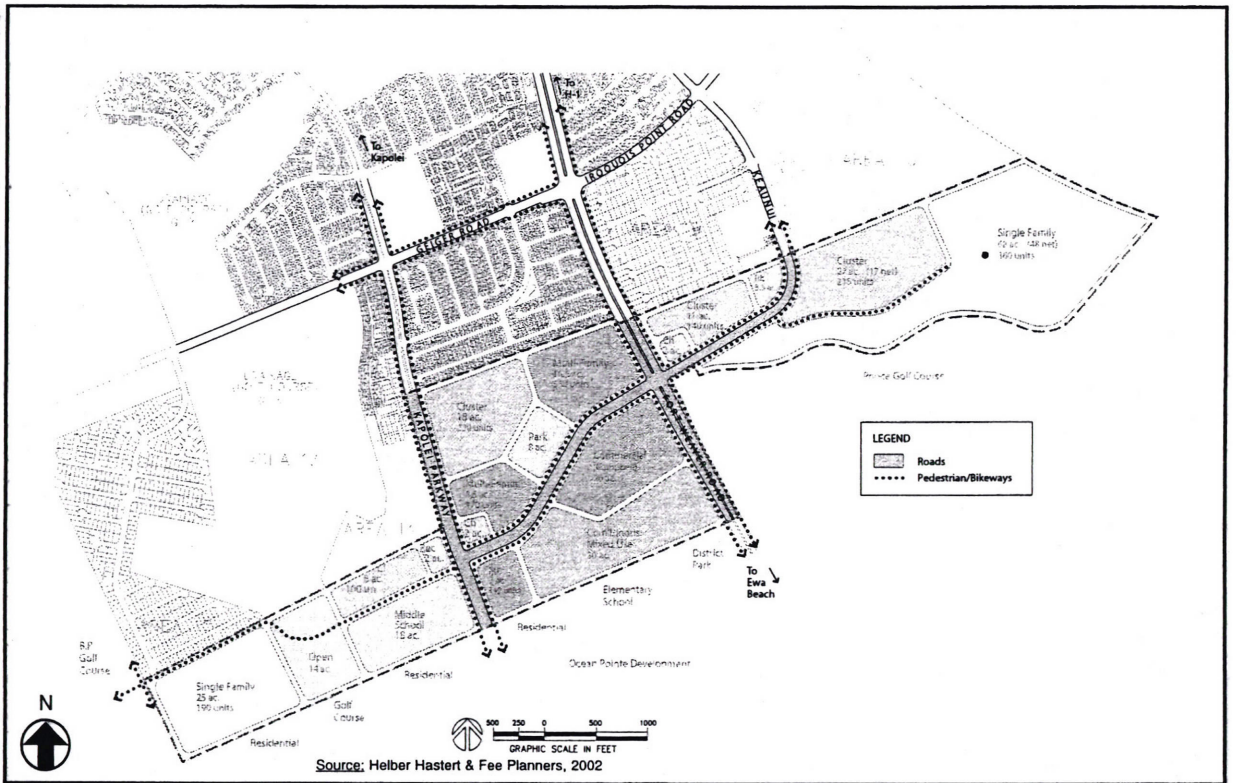
The proposed Ewa by Gentry - Makai project will add 550 singe-family and 1329 multi-family residential units, about 30 acres of light industrial uses, a community recreational center, a new middle school site, two church sites, and two neighborhood park sites. Kapolei Parkway will be extended from Geiger Road south to the Ewa by Gentry - Makai property line. The conceptual development plan is shown in Figure 2.



PB 100 YEARS

VICINITY MAP

Figure 1



Source: Helber Hastert & Fee Planners, 2002

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CONCEPTUAL DEVELOPMENT PLAN

Figure 2

II. EXISTING CONDITIONS

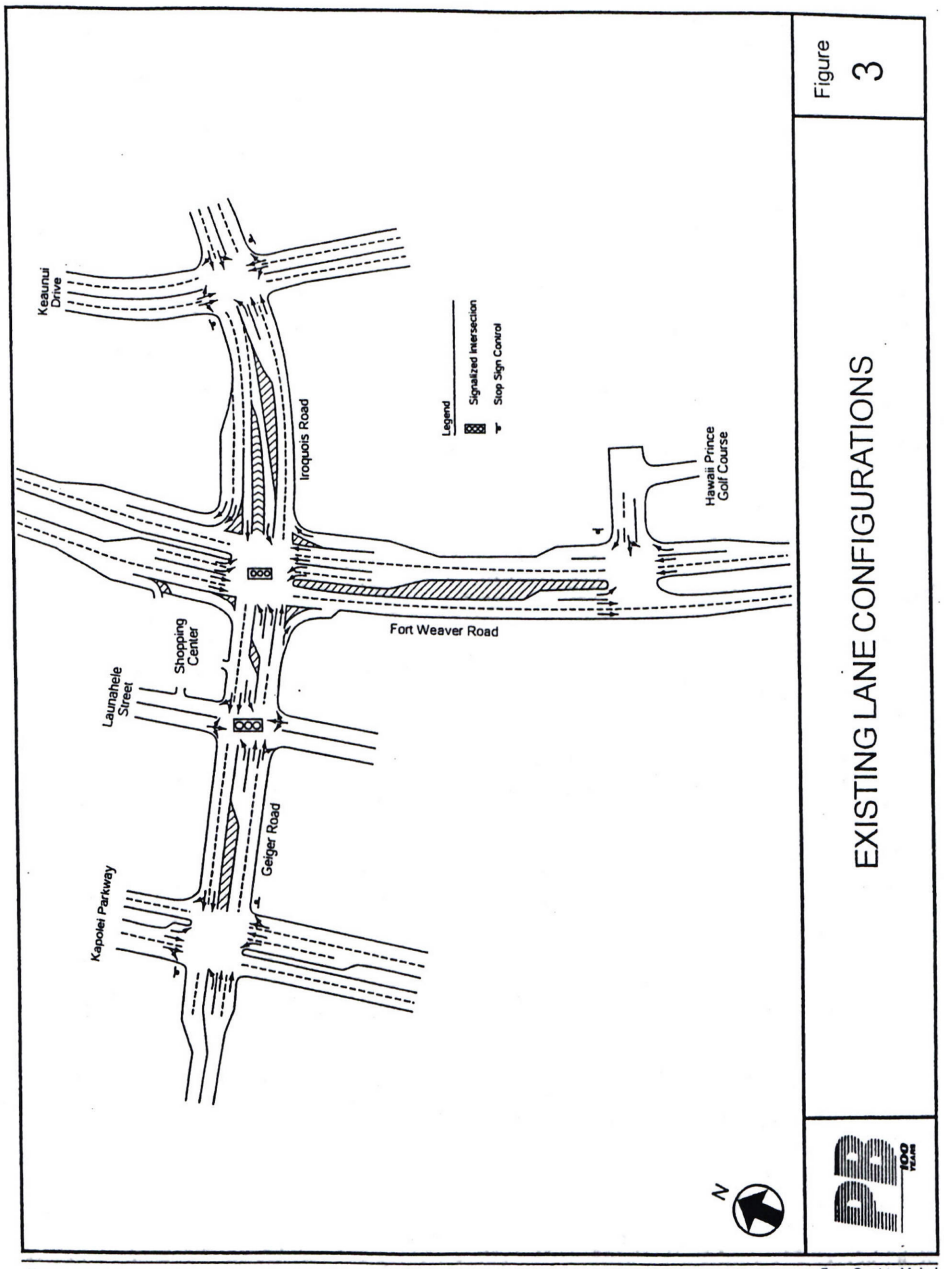
A. EXISTING ROADWAY SYSTEM

Interstate H-1, Farrington Highway, and Fort Weaver Road/Kunia Road provide regional and sub-regional access to the Ewa by Gentry - Makai Development study area. Within the study area, Geiger Road/Iroquois Point Road provides the primary east-west circulation. Fort Weaver Road, Kapolei Parkway, and Keaunui Street provide north-south circulation. Launahele Street, located between Fort Weaver Road and Kapolei Parkway, provides north-south access to existing development. Figure 3 shows the existing roadway lane configurations described in this section.

Fort Weaver Road/Kunia Road

Currently, Fort Weaver Road is the principal north-south arterial roadway serving Ewa and Ewa Beach. It provides access to Interstate H-1 and Farrington Highway. North of Farrington Highway, it becomes Kunia Road. The southern terminus is east of the Ewa Beach International Golf Club where it merges with Cormorant Avenue, leading into the Iroquois Point Naval Housing. Fort Weaver Road/Kunia Road is a six-lane expressway between Interstate H-1 and Farrington Highway with interchanges at H-1 and Farrington Highway. It is a four-lane principal arterial from Farrington Highway to North Road and a two-lane minor arterial through the rest of Ewa Beach.

Within the project study limits on Fort Weaver Road, there is a signalized intersection at Geiger Road/Iroquois Road and an unsignalized intersection with the access to the Hawaii Prince Golf Club. The posted speed limit on Fort Weaver Road is 45 mph at the intersection with Geiger/Iroquois Road and 35 mph at the Hawaii Prince Golf Club access. The Hawaii Prince Golf Club access intersection is where the proposed Keaunui Street extension would intersect Fort Weaver Road.



Kapolei Parkway

Kapolei Parkway is a divided arterial roadway, currently open to traffic between the south end of Ewa by Gentry property line and the OR&L right-of-way. Ultimately it will be a major arterial providing north-south mobility within the Ewa and Ewa Beach communities. Currently, because only a portion of Kapolei Parkway is open to traffic, it is striped as a 4-lane arterial, and parking is permitted on both sides of the roadway. Future plans call for it to be striped as a 6-lane arterial with no on-street parking. The currently posted speed limit is 30 mph.

Geiger Road/Iroquois Road

Geiger Road is a collector road providing east-west mobility and circulation within the study area. To the west of Fort Weaver Road, it crosses Kapolei Parkway and continues into Kalaeloa (formerly Barber's Point). Between Fort Weaver Road and Kapolei Parkway, Geiger Road is a four-lane roadway with left-turn lanes at intersections (see Figure 3). West of Kapolei Parkway, Geiger Road is, currently, a two-lane, undivided roadway. To the east of Fort Weaver Road, this roadway is named Iroquois Point Road and continues into the U.S. Naval Magazine - Lualualei West Loch Branch. Closer to Fort Weaver Road, this segment also provides access to Keaunui Drive and Holomua Elementary School. It is a four-lane roadway with left-turn lanes at intersections from Fort Weaver Road to a point just east of Keaunui Drive. It then transitions to a two-lane, undivided roadway. The posted speed limit is 30 mph within the Ewa by Gentry study area.

Launahele Street

Launahele Street is, primarily, a north-south collector roadway providing access to Geiger Road. It currently serves multi-family residential development located north of Geiger Road along Hanapouli Circle. South of Geiger Road, it serves a single-family, residential development, curving to the west and eventually becoming an east-west street that intersects Kapolei Parkway. Launahele Street is a signalized intersection with Geiger Road, and its posted speed limit is 25 mph.

Keaunui Drive

Keaunui Drive is a north-south residential collector roadway that provides access to Iroquois Point Road and Kolowaka Drive. Holomua Elementary School is located adjacent to and obtains its access directly from Keaunui Drive. It currently services single-family and multi-family residential development north and south of Iroquois Point Road. Keaunui Drive forms an unsignalized intersection with Iroquois Road, and its posted speed limit is 25 mph.

B. PUBLIC TRANSIT

The City and County of Honolulu Department of Transportation Services - Public Transit Division currently provides an island-wide public bus transit system called TheBus. TheHandi-Van provides para-transit service for semi-ambulatory and non-ambulatory persons with disabilities. Both systems are operated by Oahu Transit Services (OTS), and carries over 80 million passengers annually.

The following bus routes serve the Ewa area:

- Route 42 - This route travels between Ewa Beach and Waikiki via Fort Weaver Road, Farrington Highway, Kamehameha Highway, Nimitz Highway, Dillingham Boulevard, King/Beretania Streets, and Ala Moana Boulevard.
- Route 431 - This route provides circulator service between Ewa Beach and the Waipahu Transit Center. Within Ewa/Ewa Beach, it provides service to development along Geiger Road, Keaunui Drive, Kolowaka Drive, and Renton Road.
- Route 421 - This route provides circulator service within Ewa Beach. It connects Pohakupuna/Papipi with Fort Weaver/Popoi areas passing through the Ewa Beach Transit Center located near the intersection of Fort Weaver Road and North Road.
- Route 41 - This route travels between the City of Kapolei and Ewa Beach via Kamokila Boulevard, Farrington Highway, Fort Barrette Road, Roosevelt Avenue, Geiger Road, and Fort Weaver Road.

- Routes 91 and 101- These are express routes that operate only during weekdays in the morning and afternoon peak periods. The routes travel from specific residential areas within Ewa/Ewa Beach to downtown Honolulu.

Additionally, the CityExpress! Route A and other express buses operate out of the Waipahu Transit Center, accessible to Ewa and Ewa Beach riders through Route 431.

C. EXISTING INTERSECTION GEOMETRY AND CONTROL

Existing traffic conditions were observed and documented, and operations of study area signalized and unsignalized intersections were analyzed. The existing intersection operational characteristics established base conditions for comparison to future operations with and without the project.

Traffic-related data were collected for each of the five study intersections. Traffic turning movement volumes, field observations of intersection operations, and general intersection characteristics were noted. Geometric lane configurations, intersection traffic control, and traffic signal phasing and timing data were collected. Intersection geometry inventory included the following:

- Number of lanes and lane widths,
- Crosswalk locations,
- Unsignalized intersection control,
- Signalized intersection locations,
- Entrance and driveway locations,
- and Posted speed limits.

These data were used as inputs into the intersection analyses. The existing lane configurations are illustrated in Figure 3.

D. EXISTING TRAFFIC VOLUMES

Traffic turning movement counts were conducted at the following intersections on Wednesday 8 May 2002 for the PM peak hour and Thursday 9 May 2002 for the AM peak hour.

- Geiger Road and Kapolei Parkway,
- Geiger Road and Launahele Street,
- Fort Weaver Road and Geiger Road,
- Iroquois Road and Keaunui Road.

The AM and PM peak hours were found to occur from 7:00 to 8:00 AM and from 4:00 to 5:00 PM, respectively. Figure 4 shows the existing peak hour traffic volumes for each turning movement at these intersections. Existing traffic count data can be found in Appendix A.

E. EXISTING INTERSECTION OPERATIONS

The intersections were analyzed using the methodologies for unsignalized and signalized intersections outlined in the *2000 Highway Capacity Manual (HCM)*. Operating conditions at an intersection by approach are expressed as a qualitative measure known as Level of Service (LOS) ranging from A to F. LOS A represents free-flow operations with low delay, while LOS F represents congested conditions with relatively high delay. The overall intersection LOS is a weighted average of the LOS of individual traffic movement groups. Appendix B has more detailed definitions of intersection LOS.

Field observations were performed at selected intersections to verify the results of the intersection analyses.

1. Results of Unsignalized Intersections

Table 1 displays the existing conditions level of service (LOS) for each unsignalized intersection. Most movements operate at acceptable LOS.

Left turn and through movements from Kapolei Parkway experience delay during both morning and evening peak hours due to through traffic demand on Geiger Road. This through traffic is the result of the opening of Kalaeloa (Barber's Point) to non-military traffic. The southbound left-turns from Kapolei Parkway onto eastbound Geiger Road experience the highest delay during both peak hours. This condition occurs around 7:30 A.M. for a concentrated 10 to 15 minute period and a less intense situation occurs around 4:30 P.M. Mitigating this condition somewhat are gaps in the westbound traffic flow on Geiger Road created by the adjacent traffic signal at Launahele Street.

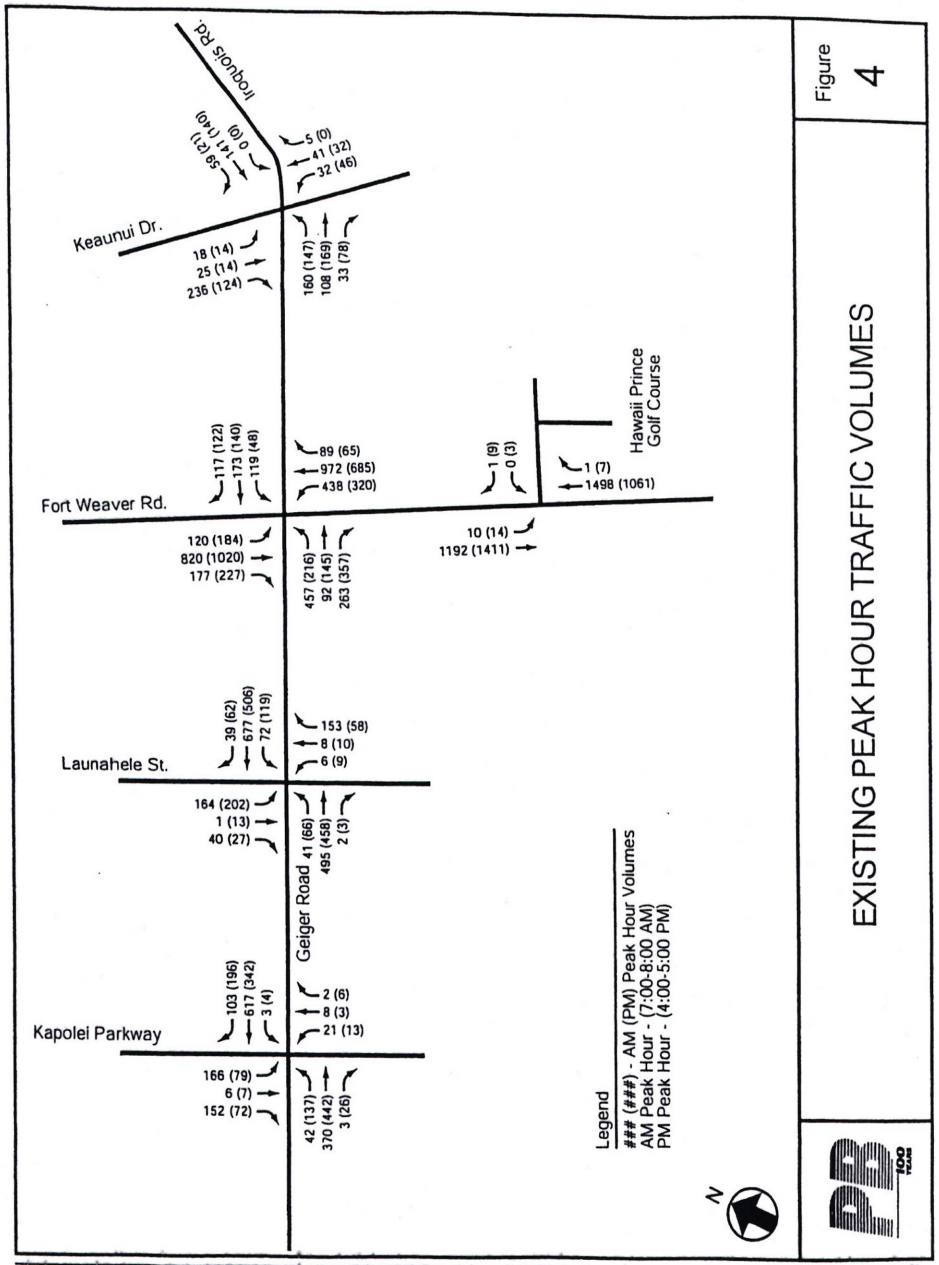


Figure 4

EXISTING PEAK HOUR TRAFFIC VOLUMES

Table 1

Existing Conditions Level of Service Summary

Unsignalized Intersections

Intersection	AM Peak Hour LOS	AM Peak Hour Delay (sec/veh)	PM Peak Hour LOS	PM Peak Hour Delay (sec/veh)
Geiger Road/Kapolei Parkway	**Unsignalized**			
Geiger EB Left	A	9.6	A	9.3
Geiger WB Left	A	8.1	A	8.4
Kapolei NB Left	D	29.3	D	31.9
Kapolei NB Thru	D	29.3	E	36.0
Kapolei NB Right	C	22.8	B	13.7
Kapolei SB Left	F	152.8	F	52.6
Kapolei SB Thru	D	27.5	D	32.7
Kapolei SB Right	B	13.8	B	11.8
Iroquois Point Road/Keaunui Drive	**Unsignalized**			
Iroquois Pt EB Left	A	8.1	A	7.9
Iroquois Pt WB Left	A	7.5	A	7.8
Keaunui NB Left	C	23.1	C	24.7
Keaunui NB Thru and Right	C	16.2	C	18.4
Keaunui SB Left	C	18.7	C	18.5
Keaunui SB Thru and Right	B	11.4	C	10.2
Fort Weaver Rd/Keaunui Drive	**Unsignalized**			
Ft Weaver SB Left	B	14.5	B	11.2
Keaunui WB Left	E	40.3	D	27.2
Keaunui WB Right	C	16.4	B	13.1

Note: NB- northbound, SB-southbound, EB- eastbound, WB- westbound

The left-turn movement from the Hawaii Prince Golf Club access road to southbound Fort Weaver Road does not have a high demand, but vehicles attempting to execute this movement during the peak hours experience delay due to high traffic volumes on Fort Weaver Road. Observations show that the left-turn movement is currently accomplished in two steps. First, a vehicle crosses the northbound lane on Fort Weaver Road and then stops in the median area. Second, the vehicle merges into the southbound traffic flow.

These steps reduce the delay because the vehicle does not have to wait for an acceptable gap in both the northbound and southbound traffic on Fort Weaver Road.

2. Results of Signalized Intersections

Two signalized intersections are located within the study area, Fort Weaver Road/Geiger Road/Iroquois Point Road intersection and Geiger Road/Launahele Street. Cycle length at Fort Weaver/Geiger varies from 120 to 150 seconds, while cycle length averages about 60 seconds at Geiger/Launahele. Table 2 displays the existing level of service for the signalized intersections.

Table 2

Existing Conditions Level of Service
Signalized Intersections

Intersection	AM Peak Hour		PM Peak Hour	
	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
Fort Weaver Rd/Geiger/Iroquois Roads	**D**	**50.9**	**D**	**47.9**
EB Left	D	50.8	D	53.2
EB Through	D	45.2	D	54.5
EB Right	C	25.7	D	38.4
WB Left	E	59.3	D	51.2
WB Through	E	65.3	D	54.3
WB Right	B	13.4	C	21.8
NB Left	D	53.5	D	54.2
NB Through	D	48.5	D	53.6
NB Right	B	19.0	C	24
SB Left	E	58.9	D	43.5
SB Through	E	71.4	D	54.3
SB Right	B	18.2	B	18.6
Geiger Rd/Launahele St.	**B**	**12.3**	**B**	**12.0**
EB Left	B	11.5	B	11.7
EB Through	B	12.1	B	11.9
WB Left	B	11.6	B	12.6
WB Through	B	13.2	B	12.4
NB Left	A	9.1	A	9.2
NB Through	B	10.3	A	9.5
SB Through	B	11.7	B	11.7

Note: NB- northbound, SB-southbound, EB- eastbound, WB- westbound

At the intersection of Fort Weaver Road and Geiger/Iroquois Point Road, the southbound approach experiences traffic delays during the A.M. peak because of the long signal cycle length and the large amount of green time allocated to traffic turning from eastbound Geiger Road onto northbound Fort Weaver Road. Significant green time is also allocated to the northbound to eastbound left-turn movement, adding to the delay for southbound traffic. Still, the overall intersection operates at an accepted LOS D for peak hour conditions.

Figure 5 summarizes the existing intersection levels of service. For detailed analysis information, Appendix C includes intersection capacity analysis worksheets.

F. SUMMARY OF RESULTS

In summary, most traffic movements at the intersections along Geiger Road and Iroquois Road operate acceptably during both peak hours. There are selected movements at the intersections of Geiger Road/Kapolei Parkway, Fort Weaver Road/Geiger Road/Iroquois Point Road, and Keaunui Drive that experience delays.

Field observations during the morning peak hour confirmed an average six to seven vehicles queued for the southbound left-turn movement and one to two vehicles for the northbound through movement on the intersection of Kapolei Parkway/Geiger Road. This delay is caused by the existing through volumes on Geiger Road. The northbound through volume performing this movement is less than ten vehicles per hour (vph) during peak hours. As a result this delay affects only a few vehicles. The queued vehicles were also allowed time to discharge onto Geiger Road from the adjacent signal at Launahele Street/Geiger Road which create gaps in the westbound flow allowing time to for vehicles to execute their movements.

Vehicles queued in the southbound and northbound left-turn movements on Fort Weaver Road and through movements on Iroquois Point Road during AM peak hour. This delay is caused by the magnitude of the left-turning volume from eastbound Geiger Road onto northbound Fort Weaver Road.

The westbound left turns from the Hawaii Prince Golf Course Entrance to southbound Fort Weaver Road experience delays in both peak hours due to the high volume of traffic on

Fort Weaver Road. However, the volume of traffic performing this left-turn movement is less than five vehicles per hour (vph) during the peak hours, and, therefore, this delay affects only a few vehicles. This left-turn movement is also helped by traffic signals at the adjacent intersections on Fort Weaver Road, which create gaps in the Fort Weaver Road traffic flow, allowing merging the left-turns to execute.

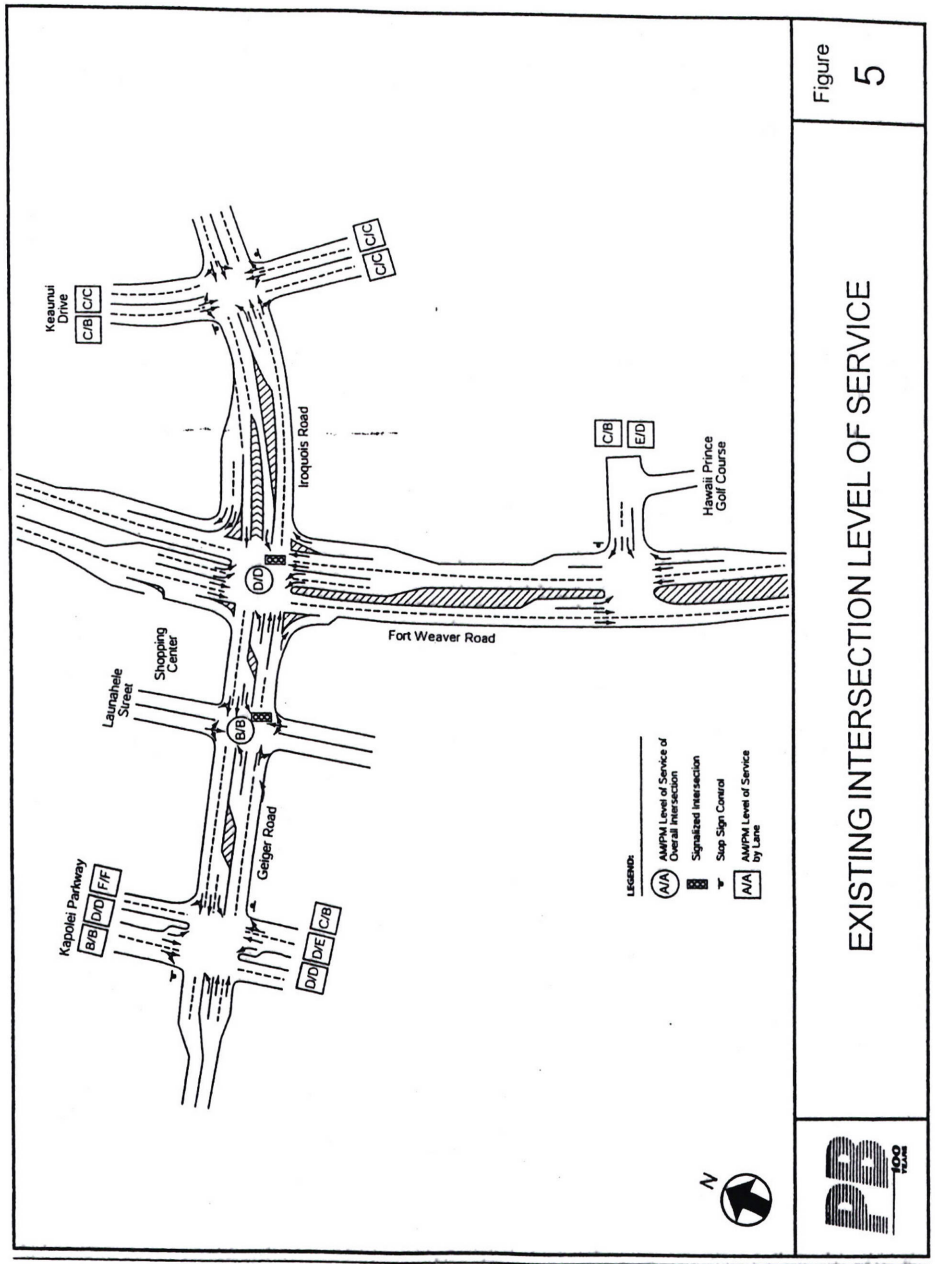


Figure 5

EXISTING INTERSECTION LEVEL OF SERVICE

III. YEAR 2010 TRAFFIC CONDITIONS

The Year 2010 was used as the basis for future traffic analysis. This time frame was used because it is the time frame used to develop the Ewa Impact Fee Ordinance. The Ewa Impact Fee Ordinance (Chapter 33A, Revised Ordinances of Honolulu). This chapter sets forth a regulatory scheme for the assessment and collection of impact fees to be borne on a pro-rata share basis by landowners, developers, home builders, and others who directly contribute to expanding the population and increasing economic activity in the Ewa region through new land development activities.

The proposed Ewa by Gentry - Makai develop is estimated to take 15 to 20 years to be completed, but assuming that the entire development is complete by 2010 would be conservative is concentrating its impacts within a relatively short time frame.

A. FUTURE ROADWAYS AND PUBLIC TRANSIT

Future roadway improvements assumed for the Year 2010 time frame were based on a judgment of which roadway improvements described in the *Oahu Regional Transportation Plan (ORTP),* approved April 6, 2001 by the Policy Committee of the Oahu Metropolitan Planning Organization (OMPO), would be implemented. The ORTP describes future roadway improvements for a Year 2025 horizon. The *Ewa Transportation Master Plan* and the *North-South Road Corridor Study* were also consulted.

1. Regional Roadways

Several improvements will be made to Interstate H-1, Farrington Highway, and Fort Weaver Road, and Kapolei Parkway and North-South Road are planned for completion by the Year 2010.

H-1 Freeway

The following Interstate H-1 improvement is assumed to occur by the analysis year:

- North-South Road Interchange - New interchange on H-1 Freeway constructed.

Fort Weaver Road

- Fort Weaver Road widened to six lanes between Geiger Road and Farrington Highway.

North-South Road

- New north-south arterial roadway constructed between H-1 Freeway and Kapolei Parkway. The new North-South Road will provide alternative access to H-1 Freeway for Ewa and Ewa Beach areas. Within the year 2010 time frame, it may be implemented as a 2-lane roadway with the ultimate cross-section being 4 to 6 lanes.

Kapolei Parkway

- Kapolei Parkway completed from Papipi Road to Fort Barrette Road in Kapolei. Much of this roadway is completed today. The City and County of Honolulu is currently moving forward on the segment between the OR&L right-of-way and Renton Road. This leaves the segment between Renton Road and the drainage bridge near Kapolei Middle School as a key link to be finished for Kapolei Parkway to fulfill its arterial function to provide enhanced mobility within the Ewa plain. Additional segments makai of the current terminus near Geiger Road are also assumed to be completed. Part of the makai segment would be constructed as part of the Ewa Gentry – Makai development, while the other makai segment would be constructed by Haseko as part of the Ocean Pointe development.

Farrington Highway

- Farrington Highway widened to four lanes from Kapolei Golf Course Access Road to Fort Weaver Road. Farrington highway is already four lanes wide from the Kapolei Golf Course Access Road to Kamokila Boulevard.

2. Transit Service

The current bus routes reflect a "hub and spoke" system implemented recently. As population grows, the bus fleet is assumed to grow to handle the transit demand placed on the bus system. A new bus maintenance facility recently opened in Pearl City and there have new transit centers and bus stop improvements implemented. Through the *Primary Corridor Transportation Project*, the City and County of Honolulu is planning improvements that would increase the transit carrying capacity between the Ewa region and urban Honolulu.

B. TRIP GENERATION

The *Institute of Transportation Engineers (ITE), Trip Generation, 6th edition* (1998) was used to estimate the number of trips generated by the Ewa by Gentry - Makai Development based on land uses identified in the conceptual development plan (Figure 2).

The conceptual development plan identifies the boundaries of the parcel proposed for re-designation from agricultural to urban. Also included in this conceptual development plan are future development parcels for the Ewa by Gentry development that have already received zoning approvals. These are treated as background traffic. The site-generated traffic acknowledges only the development contained in the area undergoing re-designation from agricultural to urban. Table 3 summarizes the trips generated by the proposed Ewa by Gentry - Makai Development. The parcel numbers correspond to the parcel numbers in the conceptual development plan shown in Figure 2 of this report.

The ITE codes and land use descriptions are shown for each parcel. Table 3 summarizes the total trips generated by the Ewa by Gentry - Makai Development. Traffic created along adjacent streets from the middle school was assumed to be negligible during PM peak hour. During the assignment phase of the travel demand estimation analysis, adjustments were made to these total trips to account for trips that are projected to occur between land uses located within the Ewa by Gentry - Makai Development. Examples are trips traveling between residential development and future middle school Parcel 6A. Appropriate adjustments were made to eliminate double counting of trips. A similar adjustment was made to trips between residential uses and future commercial retail Parcel 4A being developed by others.

Table 3

Trip Generation Summary

Parcel	Land Use	ITE Code	Intensity	Units	AM Peak Hour		PM Peak Hour	
					Enter	Exit	Enter	Exit
17 & 34 A	Single Family	210	190	Units	34	102	117	66
1A	Single Family	210	360	Units	65	194	221	124
2A	Cluster	220	100	Units	8	42	38	19
2B	Cluster	220	220	Units	18	93	84	41
2C	Cluster	220	140	Units	11	59	53	26
2D	Cluster	220	215	Units	17	91	82	40
34G	Drainage	N/A	14	Acres	0	0	0	0
3A	Multi Family	220	140	Units	11	59	52	26
3B	Multi Family	220	170	Units	14	72	63	31
3C	Multi Family	220	330	Units	26	139	123	60
5A	Light Industrial	130	30	Acres	257	53	67	251
6A	Middle School	522	700	Students	184	138	0	0
6B	Rec Center	412	2	Acres	0	0	0	0
6C	Community Facilities	412	2	Acres	0	0	0	0
6D	Community Facilities	412	2	Acres	0	0	0	0
7A	County Park	412	8	Acres	0	0	0	0
7B	County Park	412	3.5	Acres	0	0	0	0
Total					645	1042	900	684

*The PM peak hour traffic volumes are negligible

C. TRIP DISTRIBUTION AND ASSIGNMENT

The traffic generated by the proposed Ewa by Gentry-Makai Development was directionally distributed and assigned to the future roadway network.

A summary of regional travel patterns entering and exiting the Ewa area was created from the Oahu Metropolitan Planning Organization (OMPO) travel demand model. Table 4

summarizes the distribution patterns of the generated volumes entering and exiting the Ewa area.

Table 4

Trip Distribution of Ewa by Gentry Makai Trips

Direction: Exiting	Origin: Ewa Gentry	
	AM Peak	PM Peak
Mauka	45%	35%
Makai	15%	15%
Kapolei Pkwy	25%	25%
Roosevelt Ave	5%	5%
Within Gentry	10%	20%

Direction: Entering	Destination: Ewa	
	AM Peak	PM Peak
Mauka	35%	45%
Makai	15%	15%
Kapolei Pkwy	20%	25%
Roosevelt Ave	5%	5%
Within Gentry	25%	10%

Traffic within Gentry was distributed to middle school, light industrial, and commercial retail development. These trips were assigned to the roadway network and are reflected in the projected traffic turning volumes. These trips within Gentry were distributed from residential development to non-residential uses as follows: In the AM peak approximately twenty-three percent to commercial retail, thirty-eight percent to light industrial, and thirty-nine percent to the middle school development and in the PM peak approximately seventy percent to commercial retail and thirty percent light industrial development.

These distributions were applied to the trips generated, and the resulting project-generated trip assignment is shown in Figure 6.

D. YEAR 2010 BACKGROUND TRAFFIC

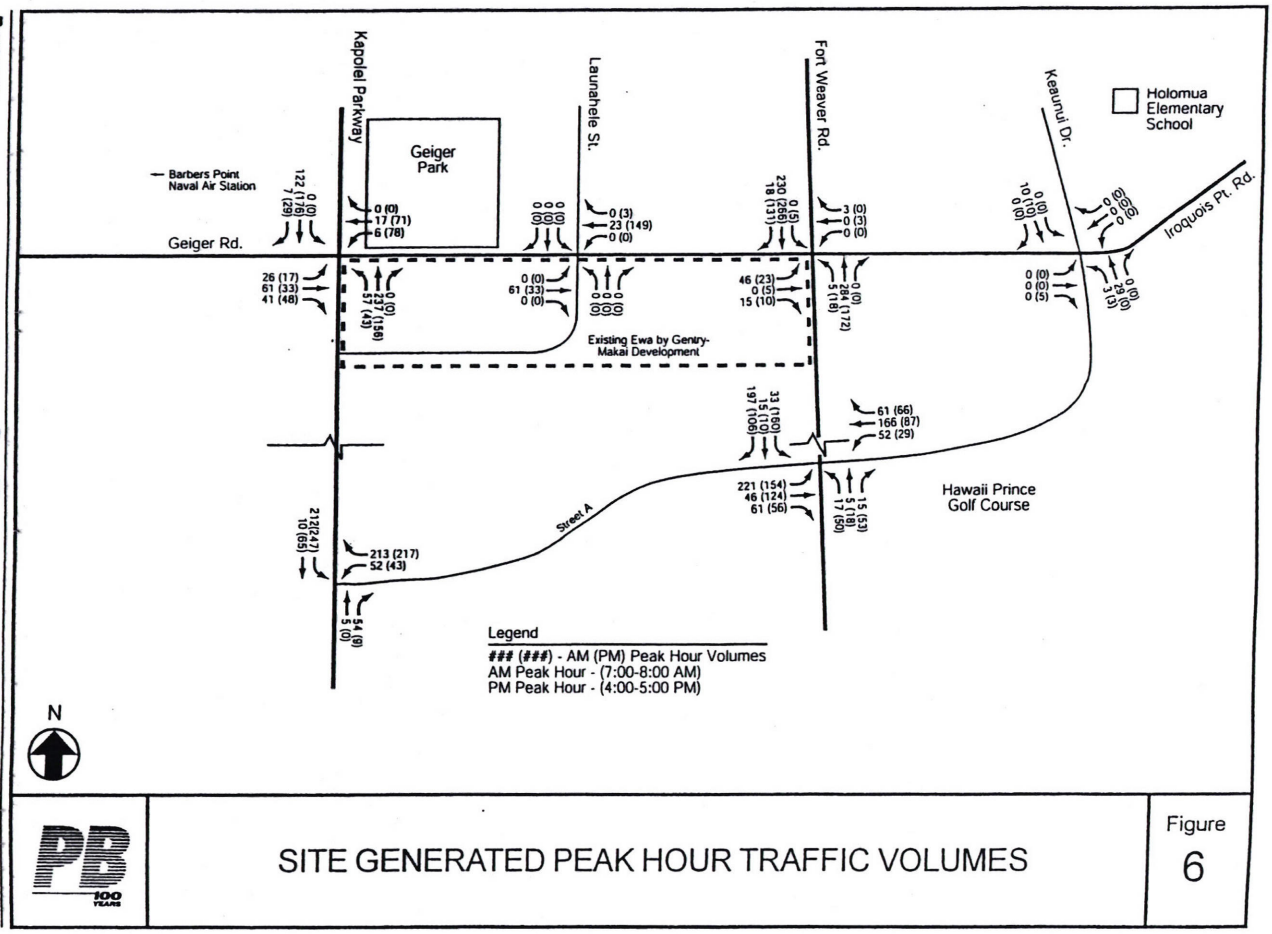
The Year 2010 background traffic volumes were derived from the computerized travel demand model being used to update the *Ewa Transportation Master Plan.* This model is also being used for the *North-South Road Corridor Study* currently completing the planning phase for a new arterial roadway in the Ewa plain. The travel demand model accounts for projected regional traffic patterns.

The future Year 2010 background traffic assumes significant completion of both the Ewa by Gentry Development and the Ocean Pointe Development (Haseko) currently under construction. These two developments account for the majority of future background traffic generated in the study area. Additionally, it was assumed that the commercial retail parcel proposed by the Estate of James Campbell at the Keaunui/Fort Weaver Road intersection was fully developed. In areas where greater detail was necessary, background traffic was estimated using rates documented in *Trip Generation, 6th Edition.* Traffic volumes forecasted by the *Ewa Transportation Master Plan Update* computerized travel demand model were used as control totals to develop a future Year 2010 peak hour assignment for the study area.

The projected Year 2010 background traffic volumes are shown in Figure 7.

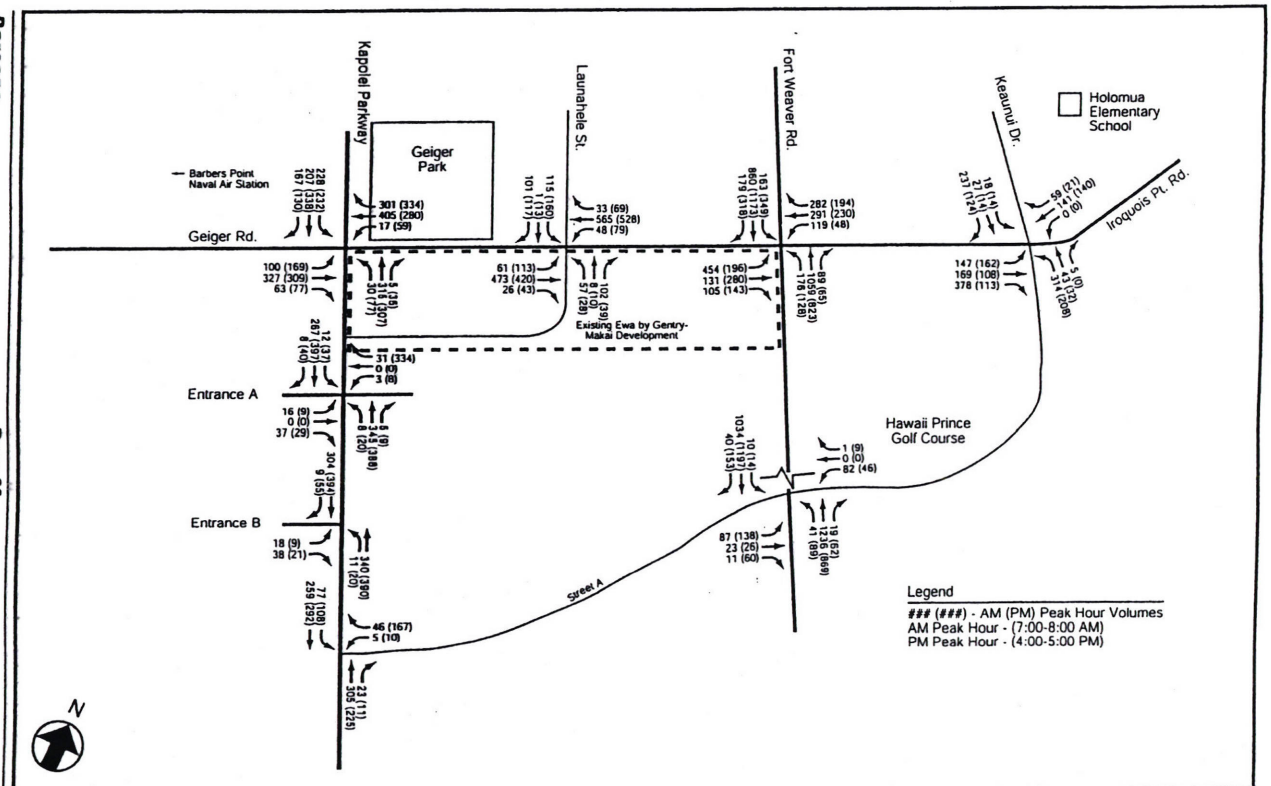
E. TOTAL TRAFFIC

The traffic generated by the Ewa by Gentry - Makai Development was added to the projected background traffic to obtain the total peak hour traffic volumes shown in Figure 8.



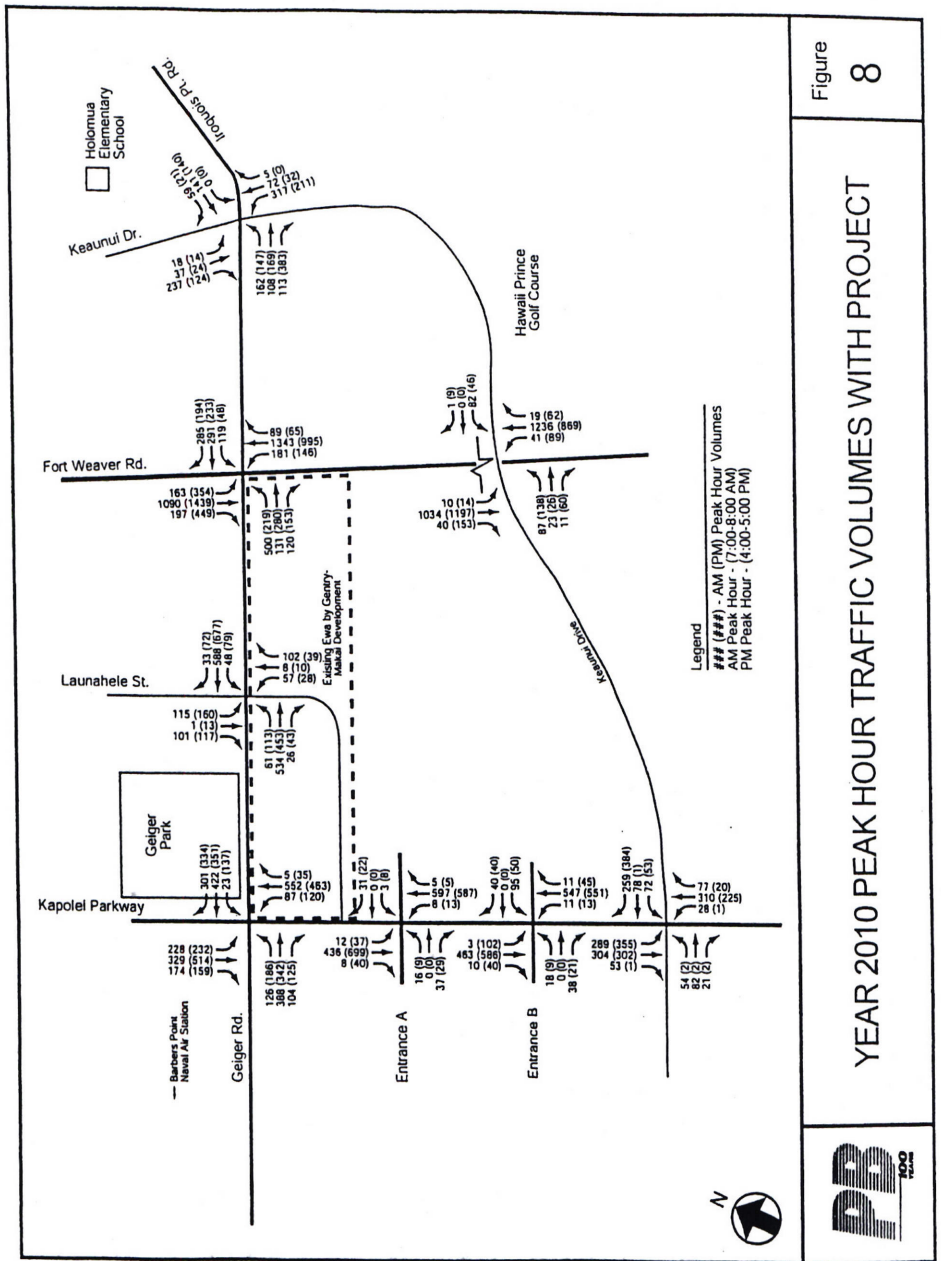
SITE GENERATED PEAK HOUR TRAFFIC VOLUMES

Figure 6



YEAR 2010 PEAK HOUR TRAFFIC VOLUMES WITHOUT PROJECT

Figure 7



F. INTERSECTION OPERATIONS ANALYSIS RESULTS

Key intersections were analyzed using the methodologies for unsignalized and signalized intersections outlined in the *2000 Highway Capacity Manual (HCM)*. Operating conditions at an intersection are expressed as qualitative measures known as Level of Service (LOS) ranging from A to F. LOS A represents free-flow operations with low delay, while LOS F represents congested conditions with relatively high delay. The approach LOS is a weighted average of the LOS of individual traffic movement groups. Appendix B has more detailed definitions of intersection LOS.

Field observations were performed at selected intersection to verify reasonableness of the analysis results.

1. Projected Operations at Unsignalized Intersections

Three intersections were analyzed as unsignalized intersections:

- Kapolei Parkway/Launahele Street/Entrance A (Access Road to Area 14 &12);
- Kapolei Parkway/Entrance B (Access Road to Parcel 34D);
- Geiger Road/Entrance C (Access to Parcels 16, 17, 34A).

Table 5 displays the projected Year 2010 peak hour unsignalized intersection level of service without and with the Ewa by Gentry - Makai Development. As shown in Table 5, the unsignalized intersections generally operate well. The left-turn movement out of the side street tends to experience some delay during the peak hours because of the magnitude of through traffic on the main road. The left-turn movements projected to experience delays occur at the following locations:

- Eastbound left turn out of Entrance A to northbound Kapolei Parkway;
- Westbound left turn out of Launahele Street (Entrance A) to southbound Kapolei Parkway;
- Eastbound left turn out of Entrance B to northbound Kapolei Parkway;
- Westbound left turn out of Entrance B to southbound Kapolei Parkway;
- Northbound left turn out of Entrance C to westbound Geiger Road.

Table 5

Year 2010 Without and With Ewa by Gentry Makai
Level of Service Summary
Unsignalized Intersections

Intersection	With Project				Without Project			
	AM		PM		AM		PM	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Kapolei Pkwy/ Entrance A	**Unsignalized**				**Unsignalized**			
Entrance A Eastbound Left	C	23.1	F	43.7	B	14.4	C	21.5
Entrance A Eastbound Right	B	10.1	B	11.8	A	9.4	B	10.1
Entrance A Westbound Left	D	25.3	E	38.0	B	14.8	C	20.9
Entrance A Westbound Right	B	11.0	B	10.8	A	9.6	A	9.8
Kapolei Pkwy Northbound Left	A	8.4	A	9.8	A	7.9	A	8.5
Kapolei Pkwy Southbound Left	A	9.1	A	9.2	A	8.1	A	8.4
Kapolei Parkway/Entrance B	**Unsignalized**				**Unsignalized**			
Entrance B Eastbound Left	C	23.1	C	23.5	B	13.3	C	16.5
Entrance B Eastbound Right	B	10.2	B	10.2	A	9.5	B	10.1
Entrance B Westbound Left	E	44.9	D	32.8	No Entrance			
Entrance B Westbound Right	B	10.8	B	11.0				
Kapolei Pkwy Northbound Left	A	8.5	A	8.6	A	8.0	A	8.5
Kapolei Pkwy Southbound Left	A	8.9	A	9.0	No Entrance			
Geiger Road/ Entrance C	**Unsignalized**				**Unsignalized**			
Geiger Road Westbound Left	A	8.3	B	10.6	A	8.2	A	9.6
Entrance C Northbound Left	C	18.3	D	29.2	C	16.7	C	20.7
Entrance C Northbound Right	C	15.5	C	15.7	B	12.9	B	13.8

The left-turn movements at entrances A and B along Kapolei Parkway are projected to experience delays during the peak hour time periods. There is significant traffic volume traveling along Kapolei Parkway, but future adjacent traffic signals at Geiger Road and at Keaunui Drive Extension would create gaps in traffic on Kapolei Parkway, providing time for vehicles turning from side streets to complete their desired movement.

At Entrance C on Geiger Road, left-turn movements out of the access would experience delays due to projected through volumes on Geiger Road. It is recommended to provide median storage in Geiger Road for the left-turn movement out of Entrance C, so that vehicles could accomplish the movement in two steps: first a turn out of the access to the median and second, a merge movement from the median into westbound Geiger Road.

2. Projected Operations at Signalized Intersections

Table 6 summarizes the projected Year 2010 peak hour intersection level of service (LOS) for the signalized intersections. As depicted in Table 6, all intersections analyzed are projected to operate at overall LOS D or better during the peak hours, without or with the Ewa by Gentry - Makai Development. The main street approaches along Kapolei Parkway and Fort Weaver Road are projected to operate at LOS D or better. There are selected movements that are projected to operate at LOS E, due primarily to the long cycle lengths used at these intersections. Observations of existing conditions indicate that during peak periods, the traffic signals on Fort Weaver Road operate with cycle lengths approaching 240 seconds. This expedites the mainline Fort Weaver traffic, but creates delays for the side streets. Side street queues were found to clear within one phase, however, and queue lengths on Geiger Road appeared reasonable, not exceeding 10 vehicles per lane. Similar conditions are projected for the future. Appendix C includes intersection capacity analysis worksheets.

In these analyses, Fort Weaver Road was assumed to be a four-lane facility. There is a project sponsored by the State of Hawaii Department of Transportation (HDOT) that will widen Fort Weaver Road to a six-lane facility between Farrington Highway and Geiger Road. It is currently in the design phase. Construction funds have not been programmed

Table 6

Year 2010 Without and With Ewa by Gentry Makai
Level of Service Summary
Signalized Intersections

Intersection/Approach	Without Ewa by Gentry Makai				With Ewa Gentry Makai			
	AM Peak		PM Peak		AM Peak		PM Peak	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Ft Weaver Rd/ Geiger Rd	**D**	**40.7**	**C**	**34.0**	**D**	**50.8**	**D**	**49.2**
Eastbound	D	42.4	D	37.9	D	48.8	D	43.3
Westbound	C	32.9	C	32.7	D	37.5	C	33.0
Northbound	D	52.3	D	38.3	E	76.7	D	46.5
Southbound	C	31.5	C	30.8	C	29.3	E	55.7
Geiger Rd/ Launahele St	**B**	**11.6**	**B**	**11.3**	**B**	**11.8**	**B**	**11.6**
Eastbound	B	11.5	B	10.7	B	11.8	B	11.0
Westbound	B	11.9	B	11.0	B	12.0	B	11.6
Northbound	B	10.4	B	10.5	B	10.4	B	10.5
Southbound	B	12.1	B	13.4	B	12.1	B	13.4
Geiger Rd/ Kapolei Pkwy	**C**	**23.5**	**C**	**21.4**	**C**	**25.3**	**C**	**22.9**
Eastbound	C	21.2	C	20.2	C	22.2	C	21.5
Westbound	C	29.0	C	24.2	C	29.6	C	24.5
Northbound	C	21.2	C	20.3	C	23.7	C	21.5
Southbound	C	20.0	C	20.3	C	24.9	C	23.4
Keaunui Drive Ext./ Kapolei Pkwy	**A**	**8.5**	**A**	**9.5**	**C**	**27.3**	**C**	**27.1**
Eastbound	No Driveway				D	35.3	C	32.8
Westbound	B	12.2	B	12.9	C	22.4	B	19.3
Northbound	A	9.0	A	8.7	C	26.9	C	25.8
Southbound	A	7.4	A	8.4	C	28.8	C	32.9
Ft Weaver Rd/ Keaunui Dr.	**D**	**38.5**	**C**	**32.3**	**D**	**37.8**	**C**	**33.0**
Eastbound	D	37.2	C	34.0	D	40.9	D	37.8
Westbound	D	35.7	D	36.0	D	38.0	C	32.9
Northbound	D	46.8	C	27.0	D	47.5	C	27.1
Southbound	C	29.0	C	35.8	C	27.1	D	35.5
Iroquois Rd/ Keaunui Dr.	**C**	**25.5**	**B**	**15.9**	**C**	**25.6**	**B**	**16.1**
Eastbound	B	19.6	B	10.4	B	19.6	B	10.4
Westbound	C	33.8	C	30.6	C	33.8	C	30.6
Northbound	C	34.8	C	25.8	C	34.5	C	25.8
Southbound	B	15.5	B	10.1	B	15.9	B	11.5

yet, but HDOT indicates that the project is expected to proceed into construction within the next five years. Assuming a four-lane facility makes the intersection analyses conservative by overestimating the impacts during the peak periods.

The Keaunui Drive/Iroquois Point Road intersection is projected to warrant signalization by the year 2010. The left-turn movements from Keaunui Drive at the Iroquois Point Road/Keaunui Drive intersection are projected to experience delay in the future due to the increase left-turning vehicles traveling towards Fort Weaver Road and Kapolei Parkway. It is recommended to monitor this intersection and, when warranted, signalize the intersection.

G. SUMMARY OF RESULTS

Intersections analyzed are projected to operate acceptably for peak hour conditions without or with the Ewa by Gentry - Makai Development. Implicit in these analysis results are specific roadway and intersection Improvements, and these are summarized in the following chapter of this report.

IV. RECOMMENDATIONS AND CONCLUSION

A. RECOMMENDED ROADWAY IMPROVEMENTS

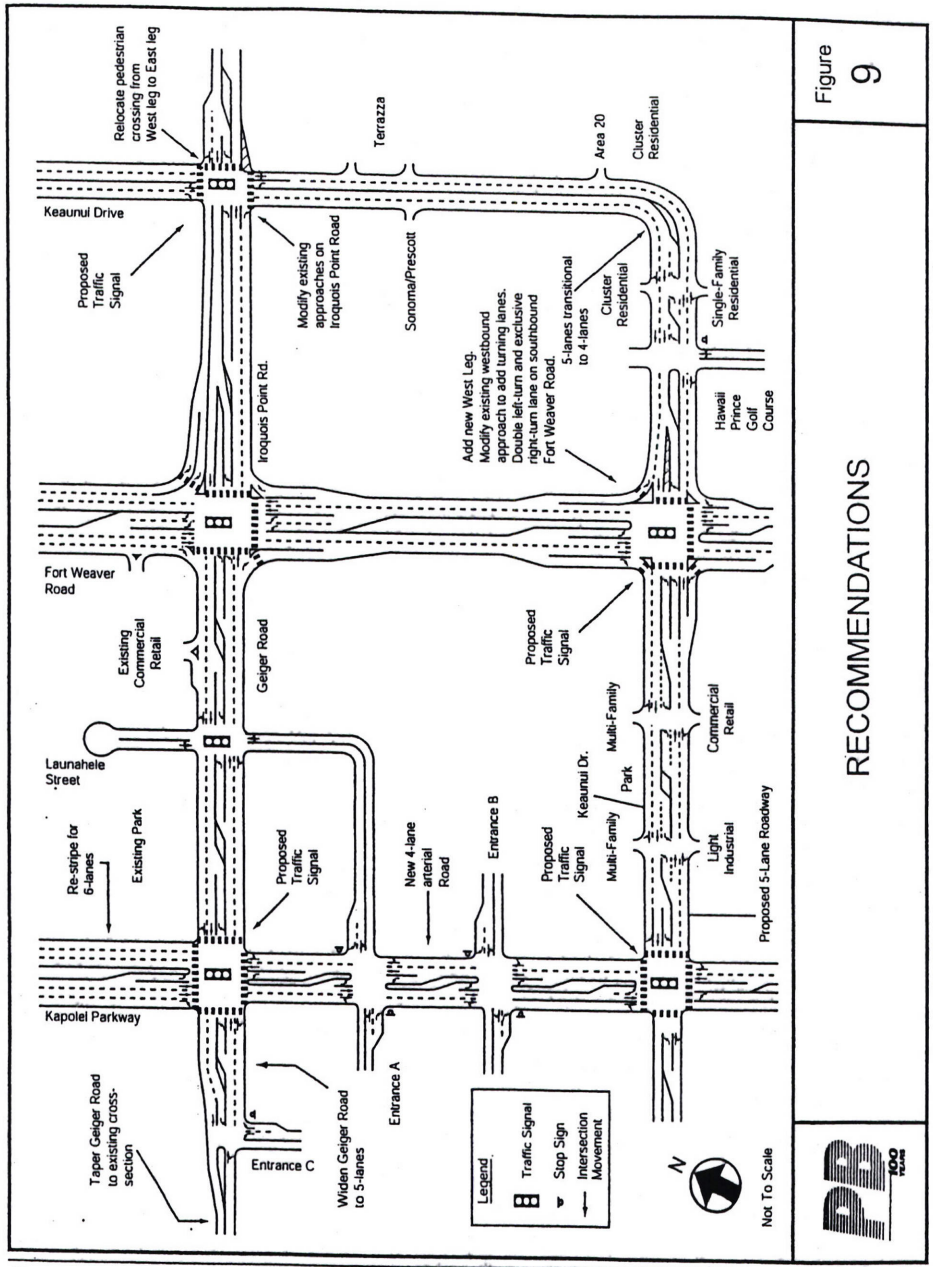
Gentry Homes, Ltd. has already implemented major roadway improvements as part of the Ewa by Gentry Development such as Kapolei Parkway between the OR&L right-of-way and a point south of Geiger Road, widening Geiger Road/Iroquois Point Road between Kapolei Parkway and Keaunui Drive, construction of Kolowaka Drive, construction of part of Keaunui Drive, signalization of the Geiger Road/Fort Weaver Road intersection, signalization of Kolowaka Drive/Fort Weaver Road intersection, and signalization of Launahele Street/Geiger Road intersection.

As they progress into the Ewa Gentry – Makai Development, Gentry Homes, Ltd. will continue internal roadway and intersection improvements. Additionally, the Honolulu City Council has passed, and the Mayor of Honolulu is expected to sign an ordinance that would establish a mechanism for collecting roadway impact fees in the Ewa region for major roadway improvements. Improvements covered by the impact fee ordinance include widening of Fort Weaver Road between Farrington Highway and North Road, completion of Kapolei Parkway between Papipi Road and Ko Olina, and the proposed North-South Road and interchange. The Ewa Gentry – Makai property is included within the influence area of the impact fee ordinance and will, therefore, contribute to the improvement fund.

This section of the report serves to identify roadway improvements that are not covered under the impact fee ordinance. These improvements would be the responsibility of Gentry Homes, Ltd. Figure 9 summarizes the improvement recommendations.

1. Keaunui Drive

As part of the Ewa by Gentry - Makai Development, the existing Keaunui Drive will be extended south and west so that it forms a continuous roadway from Iroquois Road to Kapolei Parkway. This extension will intersect Fort Weaver Road at the existing Hawaii Prince Golf Course access road location. This intersection has existing median left-turn bays and acceleration and deceleration lanes for right-turning traffic on Fort Weaver Road. It is proposed to signalize this access when warranted. The extension of Keaunui Drive will



help to distribute traffic and reduce traffic demand at the Geiger Road/Iroquois Road approaches to Fort Weaver Road.

The Keaunui Extension is recommended to have a 5-lane cross-section from Kapolei Parkway to a point just east of the Hawaii Prince Golf Course entrance. It would then transition to a 4-lane, undivided roadway and maintain this cross-section up to Iroquois Point Road. It is also recommended that the segment of the Keaunui Extension located between Fort Weaver Road and the existing Hawaii Prince access road be kept free of accesses to reduce potential conflict with traffic turning onto Keaunui Extension from Fort Weaver Road.

It is recommended that the westbound Keaunui approach to Fort Weaver Road have one through lane, an exclusive right-turn lane, and an exclusive left turn lane. The eastbound approach would be similar except two exclusive left-turn lanes would be provided. The southbound Fort Weaver Road approach already has a southbound to eastbound median left-turn lane. A southbound to westbound right-turn deceleration lane and a southbound acceleration similar to the configuration at the Geiger Road/Iroquois Point Road intersection is also recommended for eastbound to southbound right turning vehicles. The northbound Fort Weaver Road approach would be configured with an exclusive northbound to westbound median left-turn lane in addition to the existing northbound right-turn lane deceleration lane.

Pedestrian crosswalks would be provided on the west, south, and east legs, similar to the configuration used at the Fort Weaver/Geiger intersection.

2. Accesses on Keaunui Drive Extension

A painted median similar to that on Geiger Road is proposed for the Keaunui Drive Extension between Kapolei Parkway and Fort Weaver Road. At least three full-movement accesses are proposed for this segment of roadway. One would be located approximately 400 to 500 feet east of Kapolei Parkway and would serve a church parcel to the north and a multi-family residential parcel to the south. The second would be located approximately 800 to 1000 feet east of Kapolei Parkway and would serve a multi-family residential parcel to the north and a commercial/light-industrial subdivision to the south. The third would be located approximately 800 feet west of Fort Weaver Road and would serve a park, mutli-

family and single-family residential parcels to the north and a commercial/retail parcel proposed by others to the south.

The segment of Keaunui Drive located between Iroquois Point Road and Fort Weaver Road is partially constructed. Accesses exist south of Iroquois Point Road for the Terrazza and the Sonoma and Prescott subdivisions. Starting at the other end from Fort Weaver Road, accesses are proposed at a point opposite the Hawaii Prince Golf Course Driveway and at two more locations to the east.

3. Geiger Road

West of Kapolei Parkway, Geiger Road is currently a 2-lane roadway. Ewa Gentry –Makai traffic could be accommodated by a 3-lane cross-section, with the third lane providing a median turn lane. Currently, traffic pressures from traffic using Roosevelt Avenue through Kalaeloa to travel between Ewa Beach and Kapolei dominate this segment of roadway. The completion of Kapolei Parkway between Fort Barrette Road and Ewa Beach would relieve this pressure, but as Kalaeloa develops trips generated from Kalaeloa itself will restore this pressure. Because the time frame for the development of Kalaeloa is uncertain, the following recommendation for Geiger Road is provided.

Geiger road, west of Kapolei Parkway is recommended to be widened to a 3-lane cross-section between Kapolei Parkway and the Access to Entrance C, the roadway that provides access to parcels 17 and 34-A as shown in Figure 2. The median lane would provide left-turn protection at the Coral Creek Golf Course entrance and at Entrance C. West of Entrance C, Geiger Road would transition back to its existing 2-lane cross-section. Acknowledging the potential for major development of Kalaeloa, it is recommended to dedicate enough right-of-way to allow Geiger Road to be widened to a four-lane roadway with median at sometime in the future.

At the approach to Kapolei Parkway, a median left-turn lane should be created so that Geiger Road west of Kapolei Parkway matches the cross-section of Geiger Road east of Kapolei Parkway. Also, an exclusive eastbound to southbound right-turn lane is recommended. This intersection should be monitored and, when warranted, a traffic signal should be installed. It appears from the analyses that peak hour traffic signal warrants would be met by the Year 2010 time frame.

4. Iroquois Point Road

Iroquois Point Road currently is configured as a 5-lane cross-section between Fort Weaver Road and Keaunui Drive. This cross-section transitions to a 2-lane roadway just east of Keaunui Drive. The eastbound approach to the Keaunui intersection is configured with an exclusive left-turn lane, a through lane, and a through/right lane. The westbound approach to this intersection is the same, although it achieves this cross-section only about 200 feet before Keaunui Drive.

It is recommended to widen the segment of Iroquois Point Road from Keaunui to the eastern boundary of the Ewa by Gentry development. The median area would be extended to the entrance driveway into the Area 23/24 parcel (Suncrest, Shores, Lombard Way and Avalon developments), then tapered out to return to the 2-lane, undivided cross-section, east of the Ewa by Gentry development. This median area would provide left-turn lanes for traffic movements turning into the Area 23/24 driveway and for traffic movements turning from westbound Iroquois Point Road to southbound Keaunui Drive. One through lane would be provided in each direction between the entrance into Area 23/24 and Keaunui Drive. About 500 feet east of Keaunui Drive, a westbound to northbound right-turn lane would be created.

It is recommended to signalize this intersection when warranted. It appears from the projected traffic volumes that peak hour traffic signal warrants would be met by the Year 2010 time frame. The proposed signal should be coordinated with the existing signal at Fort Weaver Road/Geiger Road intersection.

The northbound approach would be reconfigured as an exclusive left-turn lane and a shared left-through-right-turn lane and the southbound approach to be reconfigured as an exclusive right-turn lane and a shared left-through lane. Signal timing is recommended to be split phase and coordinated with the signals at Fort Weaver Road and Iroquois Point Road.

In conjunction with the signalization of the intersection of Keaunui Drive and Iroquois Point Road, it is recommended to relocate the crosswalk from its existing location on the west leg to the east leg of the Keaunui Drive/Iroquois Point intersection. This would lessen the potential vehicle-pedestrian conflicts between pedestrians crossing Iroquois Point Road and traffic turning from Keaunui Drive to westbound Iroquois Point Road. Existing curb ramps associated with the existing crosswalk need to be removed. Curb ramps already exist on the east side of the intersection but need to be checked for consistency with current ADA guidelines.

The proposed geometric modifications to Iroquois Point Road, the proposed traffic signal, and the proposed pedestrian crossing improvements have been discussed with both the State of Hawaii Department of Transportation – Highways Division-Traffic Engineering Branch and the City & County of Honolulu Department of Planning and Permitting-Site Development Division-Traffic Review Branch. Both agencies have indicated that the concept is workable, subject to review of detailed design.

5. Kapolei Parkway

The existing segment of Kapolei Parkway between the OR&L right-of-way and the Ewa by Gentry property line south of Geiger Road is expected to connect to North-South Road and eventually to Interstate H-1 Freeway by the Year 2010. When the connection is made, this segment of Kapolei Parkway north of Geiger Road is recommended to be re-striped as a 6-lane arterial roadway with no on-street parking allowed. In this configuration, the outside lanes will serve as shared through/right lanes.

South of Geiger Road, Kapolei Parkway is ultimately planned to be extended to Papipi Road. As part of the Ewa by Gentry – Makai development, it will be extended to the makai Gentry property line. Kapolei Parkway could be configured as a 4-lane arterial roadway in this segment.

6. Accesses on Kapolei Parkway

South of Geiger Road, intersections on Kapolei Parkway are proposed at the existing Launahele Street, the proposed Road B, and the proposed Keaunui Drive Extension. The intersections at the existing Launahele Street and proposed Road B are proposed to be unsignalized with STOP-sign control on the side street approaches. Median left-turn lanes and separate lanes for right and left turn/through lanes are recommended at the unsignalized accesses.

The Kapolei Parkway/Keaunui Extension intersection is proposed to be signalized when warranted. It is recommended that the Middle School site (Parcel 6A) access Kapolei Parkway opposite the proposed Keaunui Drive Extension. This would minimize the number of accesses on Kapolei Parkway and eventually provide the school with a signalized access from Kapolei Parkway. The Keaunui Drive Extension approach is recommended to have exclusive left, through, and right-turn lanes. The Middle School approach is recommended to have an exclusive left-turn lane and a through/right lane.

B. CONCLUSION

Based on the analysis of the proposed Ewa by Gentry - Makai Development, it is concluded that with roadway and traffic improvements recommended in this report, the roadway system can accommodate the traffic generated by the proposed land uses.

It should be noted that the analyses contained in this report are very conservative in that both the without and with Ewa by Gentry - Makai scenarios include new roadways such as the Keaunui Drive extension between Kapolei Parkway and Fort Weaver Road and between Fort Weaver Road and Iroquois Road. Both also include the connection of Kapolei Parkway south to the Ocean Pointe development. With these new roadways, that will be constructed as part of the Ewa by Gentry Makai development, traffic conditions on Fort Weaver Road are projected to better than conditions without these roadway improvements. It is, therefore, possible to say that the Ewa by Gentry Makai development enables the completion of a supporting roadway system that helps to distribute traffic demand in a way that increases mobility in the Ewa area.

APPENDICES

Appendix A Traffic Count Data

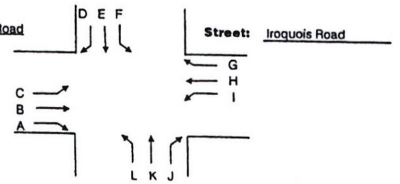
AM COUNT SHEET

Intersection: Geiger Rd-Iroquois Rd/Ft. Weaver Rd

Date: 5/9/2002 - 5/10/2002

By: Brad & Robbie

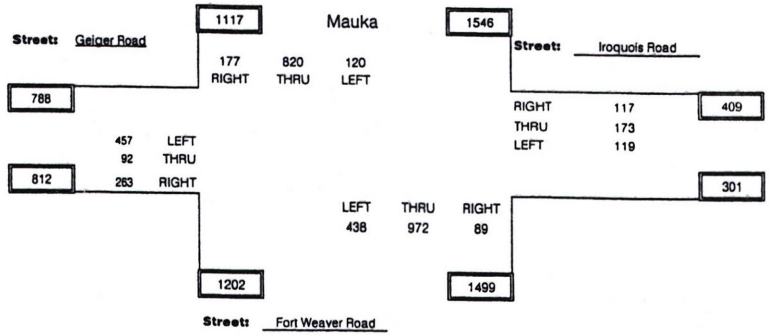
Weather: 0



TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
5:30 - 5:45	73	4	19	19	75	14	50	16	7	5	284	50	616	2544
5:45 - 6:00	60	15	28	30	84	15	32	31	8	4	229	50	586	2727
6:00 - 6:15	64	19	39	28	121	18	32	28	9	12	210	70	650	2968
6:15 - 6:30	51	16	43	53	162	21	35	24	10	4	216	57	692	3232
6:30 - 6:45	69	31	60	48	150	32	45	28	14	15	219	88	799	3478
6:45 - 7:00	69	31	63	35	212	23	40	32	11	10	229	72	827	3699
7:00 - 7:15	94	25	90	48	190	34	31	37	18	19	234	94	914	3837
7:15 - 7:30	55	30	122	42	193	32	28	44	31	26	238	97	938	
7:30 - 7:45	58	23	159	47	236	27	25	59	46	24	230	86	1020	
7:45 - 8:00	56	14	86	40	201	27	33	33	24	20	270	161	965	
PhI	0.699	0.767	0.719	0.922	0.869	0.882	0.886	0.733	0.647	0.856	0.900	0.680	Peak	PhI
7:00 - 8:00	263	92	457	177	820	120	117	173	119	89	972	438	3837	0.940

Peak Hour

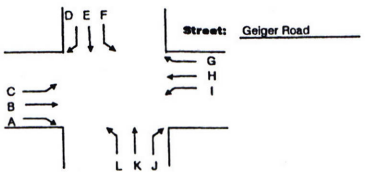
7:00 - 8:00



PARSONS BRINCKERHOFF

AM COUNT SHEET

Intersection: Geiger Rd/Launahele St.
Date: 5/8/2000 - 5/9/2000
By: Danny
Weather: Overcast



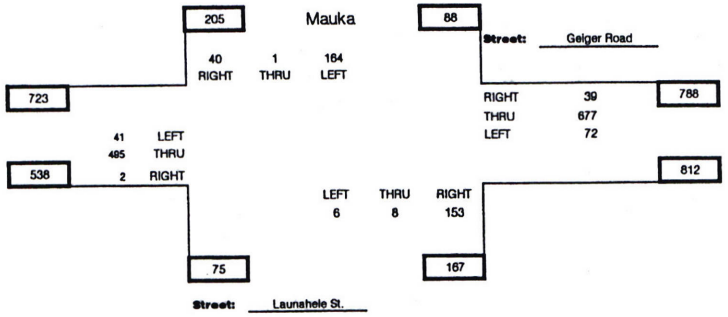
Street: Geiger Road

Street Launahele St.

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
5:30 - 5:45	0	9	3	4	0	40	8	72	5	47	0	1	189	959
5:45 - 6:00	2	32	7	6	2	34	10	93	8	37	1	4	236	1112
6:00 - 6:15	2	49	10	7	0	31	7	110	9	42	8	4	279	1214
6:15 - 6:30	0	48	3	7	0	34	4	123	7	28	0	1	255	1355
6:30 - 6:45	0	81	6	10	1	41	8	145	11	38	0	1	342	1512
6:45 - 7:00	1	74	11	17	0	43	4	130	5	46	4	3	338	1624
7:00 - 7:15	0	114	12	15	1	46	8	165	6	49	2	2	420	1698
7:15 - 7:30	1	129	10	7	0	36	9	153	21	42	2	2	412	
7:30 - 7:45	1	164	11	6	0	43	10	161	21	33	3	1	454	
7:45 - 8:00	0	88	8	12	0	39	12	198	24	29	1	1	412	
Phf	0.500	0.755	0.854	0.667	0.250	0.891	0.813	0.855	0.750	0.781	0.667	0.750	Peak	Phf
7:00 - 8:00	2	495	41	40	1	164	39	677	72	153	8	6	1698	0.935

Peak Hour

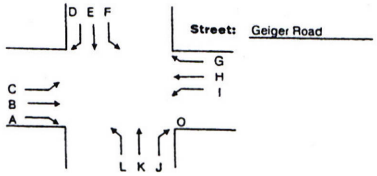
7:00 - 8:00



PARSONS BRINCKERHOFF

AM COUNT SHEET

Intersection: Geiger Rd/Kapolei Pkwy
Date: 5/9/2002 - 5/10/2002
By: Colin
Weather: 0



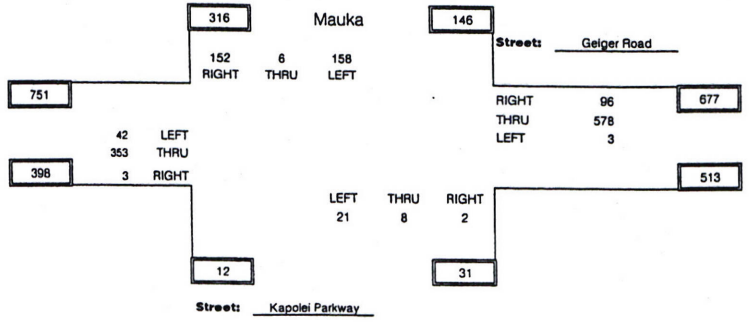
Street: Geiger Road

Street Kapolei Parkway

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
5:30 - 5:45	1	16	4	43	2	22	7	76	1	0	1	5	178	888
5:45 - 6:00	0	27	1	43	3	26	14	80	1	2	2	11	210	1015
6:00 - 6:15	2	49	6	39	0	21	13	105	1	0	0	7	243	1105
6:15 - 6:30	0	54	10	47	2	18	5	111	0	0	1	9	257	1224
6:30 - 6:45	3	72	10	43	1	18	14	136	0	0	3	5	305	1357
6:45 - 7:00	1	56	3	56	0	34	17	124	0	1	2	6	300	1405
7:00 - 7:15	0	80	11	51	2	30	12	167	0	0	2	7	362	1422
7:15 - 7:30	1	96	13	40	3	62	19	149	1	0	5	1	390	
7:30 - 7:45	1	94	7	31	1	53	21	133	0	2	1	9	353	
7:45 - 8:00	1	83	11	30	0	13	44	129	2	0	0	4	317	
Phf	0.750	0.919	0.808	0.745	0.500	0.637	0.545	0.865	0.375	0.250	0.400	0.583	Peak	Phf
7:00 - 8:00	3	353	42	152	6	158	96	578	3	2	8	21	1422	0.912

Peak Hour

7:00 - 8:00



PARSONS BRINCKERHOFF

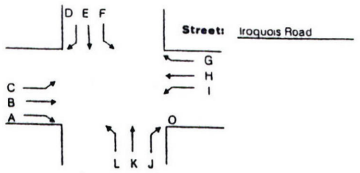
AM COUNT SHEET

Intersection: Iroquois Rd/Keaunui Rd

Date: 5/9/2002 - 5/10/2002

By: Wayne

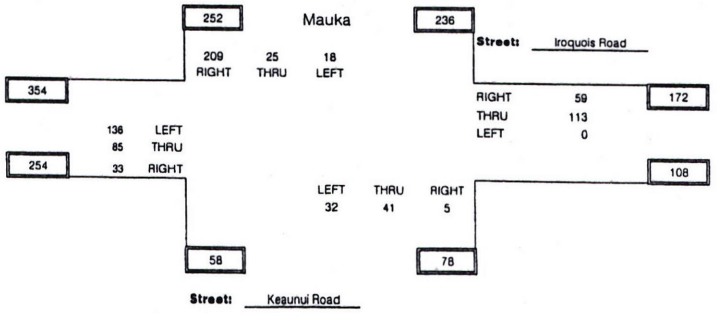
Weather: Ovecast



TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
5:30 - 5:45	2	10	9	13	3	0	7	36	0	0	5	14	99	427
5:45 - 6:00	5	17	7	18	0	0	7	28	0	0	6	14	102	508
6:00 - 6:15	6	21	15	22	0	2	8	24	0	1	5	8	112	571
6:15 - 6:30	3	25	10	17	3	2	8	26	0	1	7	12	114	620
6:30 - 6:45	14	45	22	25	0	5	7	38	0	0	12	12	180	700
6:45 - 7:00	7	30	22	28	2	1	14	38	1	0	8	14	165	736
7:00 - 7:15	7	17	33	36	5	0	16	25	0	2	12	8	161	756
7:15 - 7:30	4	25	42	59	1	5	15	23	0	0	12	8	194	
7:30 - 7:45	6	17	42	69	8	5	17	29	0	1	11	11	216	
7:45 - 8:00	16	26	19	45	11	8	11	36	0	2	6	5	185	
Phf	0.516	0.817	0.810	0.757	0.568	0.563	0.868	0.785	#DIV/0!	0.625	0.854	0.727	Peak	Phf
7:00 - 8:00	33	85	136	209	25	18	59	113	0	5	41	32	756	0.875

Peak Hour

7:00 - 8:00



PARSONS BRINCKERHOFF

Parsons Brinckerhoff
Pacific Tower, Suite 3000
1001 Bishop Street
Honolulu, HI 96813

Site Code : 00000000
Start Date: 04/07/98
File I.D. : PMPRAM
Page : 1

Movement 1

Start	From North: Fort Weaver Road				From East: Hawaii Prince Bnt				From South: Fort Weaver Road				From West				Total-	Truck
Time	Left	Thru	Rght	Trck	Left	Thru	Rght	Trck	Left	Thru	Rght	Trck	Left	Thru	Rght	Trck	18	2
5:15	0	5	0	2	1	0	0	0	9	5	0	0	0	0	0	0	18	2
5:30	1	42	0	6	0	0	0	0	290	0	5	0	0	0	0	0	344	11
5:45	5	65	0	3	0	0	1	0	235	0	3	0	0	0	0	0	312	6
Total	6	112	0	11	1	0	1	0	534	1	8	0	0	0	0	0	674	19
6:00am	3	88	0	4	2	0	0	0	251	0	0	0	0	0	0	0	348	4
6:15	0	132	0	2	0	0	0	0	237	0	4	0	0	0	0	0	375	6
6:30	0	168	0	2	0	0	0	0	319	0	4	0	0	0	0	0	493	6
6:45	0	168	0	5	0	0	0	0	289	0	2	0	0	0	0	0	464	7
Hour Total	3	556	0	13	2	0	0	0	1096	0	10	0	0	0	0	0	1680	23
7:00am	5	270	0	19	0	0	1	0	299	0	5	0	0	0	0	0	599	24
7:15	2	330	0	6	0	0	0	0	284	0	8	0	0	0	0	0	630	14
7:30	1	365	0	17	0	0	0	0	376	0	7	0	0	0	0	0	766	24
7:45	2	273	0	7	0	0	0	0	331	1	22	0	0	0	0	0	636	29
Hour Total	10	1238	0	49	0	0	1	0	1290	1	42	0	0	0	0	0	2631	91
8:00am	1	200	0	4	0	0	4	0	229	1	5	0	0	0	0	0	444	9
8:15	2	145	0	5	0	0	1	0	209	1	5	0	0	0	0	0	368	10
Total	3	345	0	9	0	0	5	0	438	2	10	0	0	0	0	0	812	19
Grand Total	22	2251	0	82	3	0	7	0	3358	4	70	0	0	0	0	0	5797	152
% Of Total	.4%	38.8%	0.0%	1.4%	.1%	0.0%	.1%	0.0%	57.9%	.1%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%		2.6%
Approch %	.4%				.2%				59.2%				0.0%	0.0%	0.0%	0.0%		97.4%
% of Approch	40.6%				30.0%				97.8%				0.0%	0.0%	0.0%	0.0%		
	.9%	95.6%	0.0%	3.5%	0.0%	70.0%	0.0%		.1%	2.0%								

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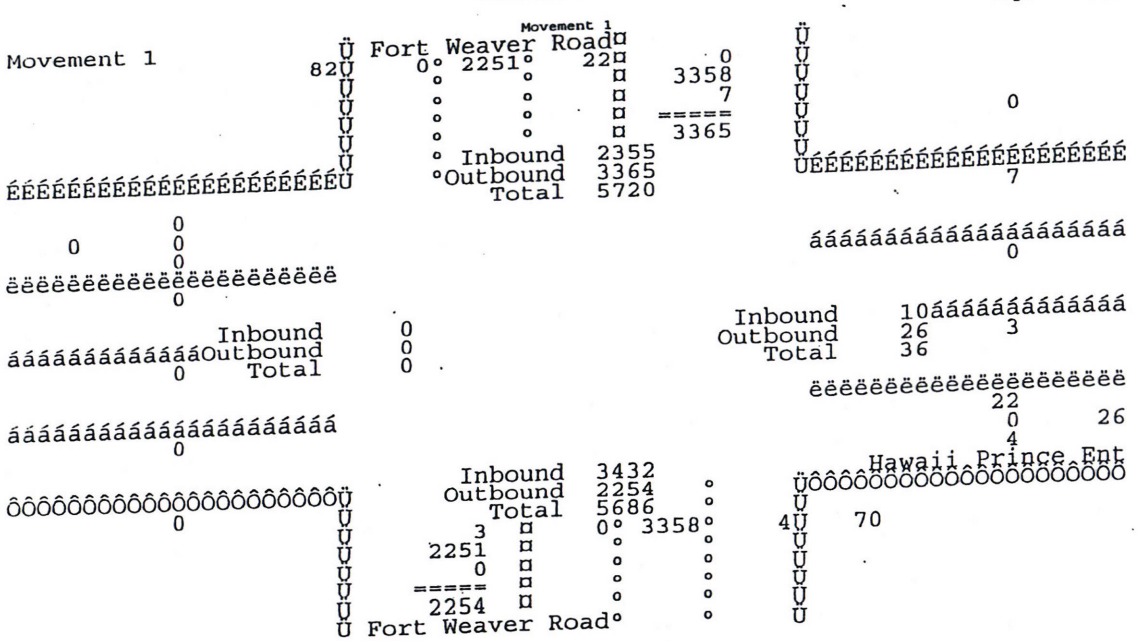

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Site Code : 00000000
Start Date: 04/07/98
File I.D. : FWRPRAM
Page : 3

Peak Hour Analysis By Entire Intersection for the Period: 05:15am to 08:15am on 04/07/98

Direction	Street Name	Start Peak Hour	Peak Hr Factor	Volumes Left	Thru	Rght	Total	Percentages Left	Thru	Rght
From North	Fort Weaver Road	07:00am	.852	10	1238	0	1248	.8	99.1	.0
From East	Hawaii Prince Ent		.250	0	0	1	1	.0	.0	100.0
From South	Fort Weaver Road		.858	0	1290	1	1291	.0	99.9	.0
From West			.0	0	0	0	0	0.0	0.0	0.0

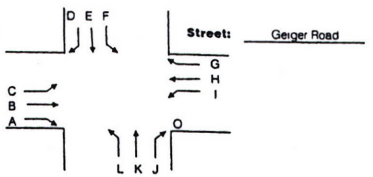
PM COUNT SHEET

Intersection: Geiger Rd/Kapolei Pkwy

Date: 5/9/2002 - 5/10/2002

By: Colin

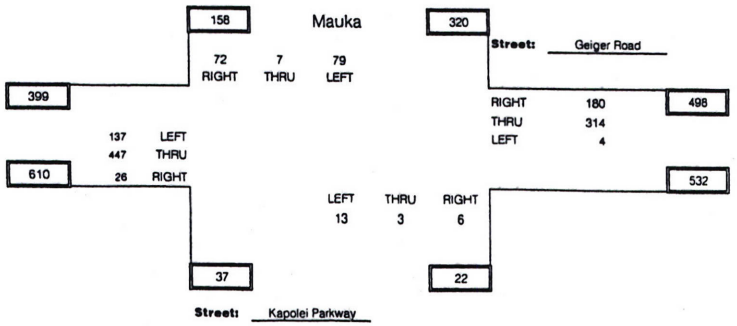
Weather: 0



TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
3:30 - 3:45	3	105	26	19	1	19	31	120	1	1	0	2	328	1262
3:45 - 4:00	4	104	33	19	2	21	34	111	2	1	2	0	333	1288
4:00 - 4:15	4	102	29	19	2	10	40	77	1	1	0	3	288	1288
4:15 - 4:30	6	102	35	14	3	17	45	87	0	2	1	1	313	1362
4:30 - 4:45	7	114	34	16	2	29	60	84	0	1	1	6	354	1360
4:45 - 5:00	9	129	39	23	0	23	35	66	3	2	1	3	333	1358
5:00 - 5:15	7	147	32	18	3	15	51	87	1	0	0	1	362	1327
5:15 - 5:30	12	111	33	17	4	17	35	69	3	4	5	1	311	
5:30 - 5:45	10	134	32	32	1	23	43	73	0	2	1	1	352	
5:45 - 6:00	5	108	32	16	1	28	39	63	3	1	2	4	302	
Phf	0.722	0.866	0.878	0.783	0.583	0.681	0.750	0.902	0.333	0.750	0.750	0.542	Peak	Phf
4:00 - 5:00	26	447	137	72	7	79	180	314	4	6	3	13	1288	0.910

Peak Hour

4:00 - 5:00



PARSONS BRINCKERHOFF

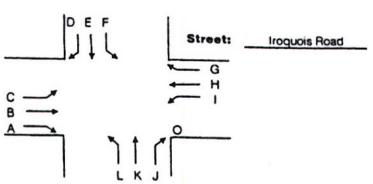
PM COUNT SHEET

Intersection: Iroquois Rd/Keaunui Rd

Date: 5/9/2002 - 5/10/2002

By: Wayne

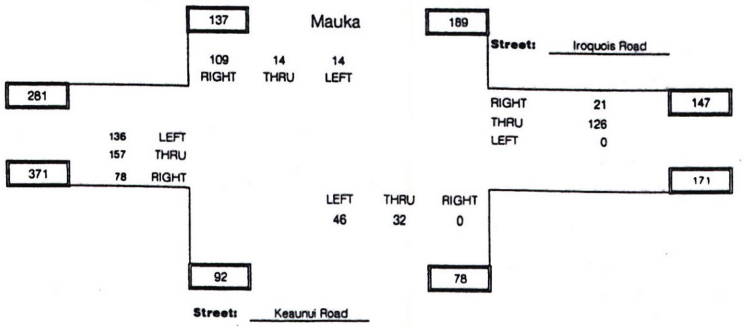
Weather: Ovecast



TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Tota Hour
3:30 - 3:45	13	38	20	17	5	1	7	36	0	1	5	14	157	650
3:45 - 4:00	14	35	32	20	3	5	4	28	2	1	6	14	164	715
4:00 - 4:15	16	42	32	34	2	4	5	24	0	0	5	8	172	733
4:15 - 4:30	15	33	34	21	3	2	4	26	0	0	7	12	157	716
4:30 - 4:45	20	52	38	32	5	5	8	38	0	0	12	12	222	735
4:45 - 5:00	27	30	32	22	4	3	4	38	0	0	8	14	182	688
5:00 - 5:15	13	33	33	22	2	4	3	25	0	0	12	8	155	732
5:15 - 5:30	18	45	34	24	5	2	5	23	0	0	12	8	176	
5:30 - 5:45	22	34	27	31	1	2	5	29	2	0	11	11	175	
5:45 - 6:00	27	58	40	26	4	17	7	36	0	0	6	5	226	
Phf	0.722	0.755	0.895	0.801	0.700	0.700	0.656	0.829	#DIV/0!	#DIV/0!	0.667	0.821	Peak	Phf
4:00 - 5:00	78	157	136	109	14	14	21	126	0	0	32	46	733	0.82

Peak Hour

4:00 - 5:00



ARSONS RINCKERHOFF

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Pacific Tower, Suite 3000
1001 Bishop Street
Honolulu, HI 96813

Site Code : 00000000
Start Date: 04/07/98
File I.D. : FWRPR
Page : 1

Movement 1

Fort Weaver Road From North				Hawaii Prince Entrance From East				Fort Weaver Road From South				From West				Total-	Trck=	
Left	Thru	Rght	Trck	Left	Thru	Rght	Trck	Left	Thru	Rght	Trck	Left	Thru	Rght	Trck			
4	257	0	1	1	0	2	0	0	250	1	2	0	0	0	0	518	3	518
0	303	0	4	1	0	0	0	0	232	0	1	0	0	0	0	541	5	541
6	360	0	1	1	0	4	0	0	315	3	7	0	0	0	0	697	8	697
1	358	0	2	0	0	0	0	0	238	0	3	0	0	0	0	602	5	602
11	1278	0	8	3	0	6	0	0	1035	4	13	0	0	0	0	2358	21	2358
3	344	0	2	0	0	1	0	0	229	2	2	0	0	0	0	583	4	583
4	378	0	5	2	0	4	0	0	297	2	0	0	0	0	0	692	5	692
1	352	0	2	0	0	1	0	0	225	0	2	0	0	0	0	583	4	583
4	330	0	4	1	0	4	0	0	218	0	2	0	0	0	0	563	6	563
12	1404	0	13	3	0	10	0	0	969	4	6	0	0	0	0	2421	19	2421
1	366	0	7	0	0	2	0	0	219	1	2	0	0	0	0	598	9	598
2	335	0	1	0	0	1	0	0	203	1	6	0	0	0	0	549	7	549
1	309	0	2	0	0	3	0	0	239	0	1	0	0	0	0	555	3	555
1	324	0	3	0	0	3	0	0	187	0	3	0	0	0	0	521	6	521
5	1334	0	13	0	0	9	0	0	848	2	12	0	0	0	0	2223	25	2223
28	4016	0	34	6	0	25	0	0	2852	10	31	0	0	0	0	7002	65	7002
.4%	57.4%	0.0%	.5%	.1%	0.0%	.4%	0.0%	0.0%	40.7%	.1%	.4%	0.0%	0.0%	0.0%	0.0%		.9%	99.1%
58.2%				.4%				41.3%										
.7%	98.5%	0.0%	.8%	19.4%	0.0%	80.6%	0.0%	0.0%	98.6%	.3%	1.1%	0.0%	0.0%	0.0%	0.0%			

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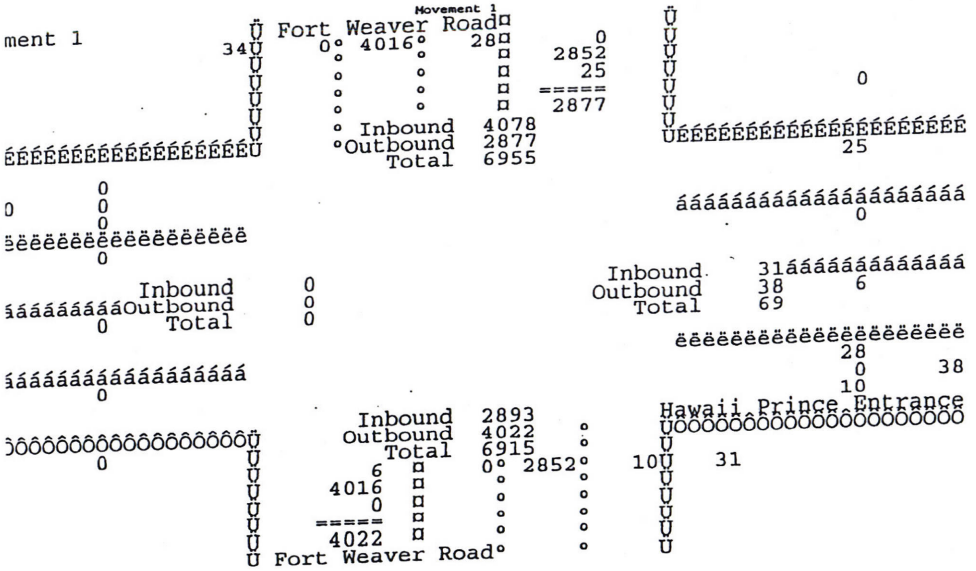


Appendix B Levels of Service Definitions

The *Highway Capacity Manual* defines six Levels of Service (LOS), labeled A through F, from best to worst conditions. Levels of Service for signalized and unsignalized intersections are defined in terms of average user delays. Delay is a measure of driver discomfort, frustration, fuel consumption, and lost travel time.

For unsignalized intersections, the *Highway Capacity Manual* evaluates gaps in the major street traffic flow and calculates available gaps for left-turns across oncoming traffic and for the left and right-turns onto the major roadway from the minor street.

LEVEL-OF-SERVICE A: Little or no delay.

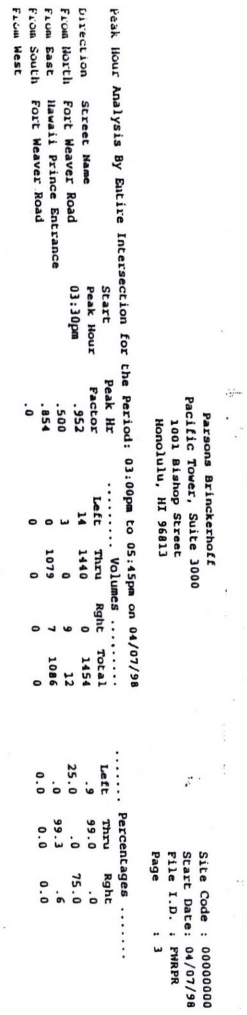
LEVEL-OF-SERVICE B: Short traffic delays.

LEVEL-OF-SERVICE C: Average traffic delays.

LEVEL-OF-SERVICE D: Long traffic delays.

LEVEL-OF-SERVICE E: Very long traffic delays.

LEVEL-OF-SERVICE F: Demand volume exceeds capacity, resulting in extreme delays with queuing that may cause severe congestion and affect other movements at the intersection.



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1001 Bishop Street
Honolulu, HI 96813

Site Code : 00000000
Start Date: 04/07/98
File I.D. : FWRPR
Page : 3

Peak Hour Analysis By Entire Intersection for the Period: 03:00pm to 05:45pm on 04/07/98

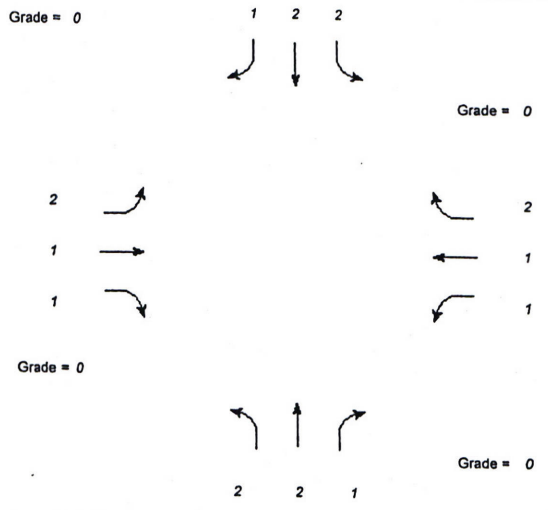
Direction	Street Name	Start Peak Hour	Peak Hr Factor	Volumes Left	Thru	Rght	Total	Percentages Left	Thru	Rght
From North	Fort Weaver Road	03:30pm	.952	14	1440	0	1454	.9	99.0	.0
From East	Hawaii Prince Entrance		.500	3	0	9	12	25.0	.0	75.0
From South	Fort Weaver Road		.854	0	1079	7	1086	.0	99.3	.6
From West			.0	0	0	0	0	0.0	0.0	0.0

Appendix C Intersection Capacity Analysis Worksheets

INPUT WORKSHEET

General Information		Site Information	
Analyst	BL	Intersection	Fort Weaver/Geiger (Iroquois)
Agency or Co.	PBQD	Area Type	All other areas
Date Performed	5/13/2002	Jurisdiction	Honolulu
Time Period	AM Peak Hour	Analysis Year	2002

Intersection Geometry



Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (vph)	457	92	263	119	173	117	438	972	89	120	820	177
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup lost time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Ext. eff. green	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Arrival type	3	3	3	3	3	3	3	3	3	3	3	3
Ped volume	0			0			0			0		
Bicycle volume	0						0			0		
Parking (Y or N)	N		N	N		N	N		N	N		N
Parking/hr												
Bus stops/hr	0	0	0	0	0	0	0	0	0	0	0	0
Ped timing	0.0			0.0			3.0			0.0		

	EW Perm	EW Perm	03	04	Excl. Left	NB Only	Thru & RT	08
Timing	G = 36.0	G = 31.0	G =	G =	G = 26.0	G = 16.0	G = 111.0	G =
	Y = 3.0	Y = 3.0	Y =	Y =	Y = 3.0	Y = 3.0	Y = 3.0	Y =

Duration of Analysis (hrs) = 1.00 Cycle Length C = 240.0

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CAPACITY AND LOS WORKSHEET

General Information

Project Description *Ewa Gentry Makai Development*

Capacity Analysis

	EB			WB			NB			SB		
Lane group	L	T	R	L	T	R	L	T	R	L	T	R
Adj. flow rate	508	102	292	132	192	130	487	1080	99	133	911	197
Satflow rate	3502	1900	1615	1805	1900	2842	3502	3610	1615	3502	3610	1615
Lost time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Green ratio	0.15	0.15	0.50	0.13	0.13	0.42	0.19	0.55	0.68	0.11	0.46	0.63
Lane group cap.	525	285	814	233	245	1196	671	1970	1090	379	1670	1016
v/c ratio	0.97	0.36	0.36	0.57	0.78	0.11	0.73	0.55	0.09	0.35	0.55	0.19
Flow ratio	0.15	0.05	0.18	0.07	0.10	0.05	0.14	0.30	0.06	0.04	0.25	0.12
Crit. lane group	Y	N	N	N	Y	N	Y	N	N	N	Y	N
Sum flow ratios	0.64											
Lost time/cycle	16.00											
Critical v/c ratio	0.68											

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Lane group	L	T	R	L	T	R	L	T	R	L	T	R
Adj. flow rate	508	102	292	132	192	130	487	1080	99	133	911	197
Lane group cap.	525	285	814	233	245	1196	671	1970	1090	379	1670	1016
v/c ratio	0.97	0.36	0.36	0.57	0.78	0.11	0.73	0.55	0.09	0.35	0.55	0.19
Green ratio	0.15	0.15	0.50	0.13	0.13	0.42	0.19	0.55	0.68	0.11	0.46	0.63
Unif. delay d1	101.4	91.6	36.0	98.2	101.3	42.2	91.1	35.3	13.5	99.2	46.4	18.8
Delay factor k	0.47	0.11	0.11	0.16	0.33	0.11	0.29	0.15	0.11	0.11	0.15	0.11
Increm. delay d2	51.6	0.8	0.3	3.3	16.9	0.0	4.0	0.3	0.0	0.6	0.4	0.1
PF factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Control delay	153.0	92.4	36.3	101.4	118.2	42.2	95.1	35.6	13.5	99.7	46.7	18.9
Lane group LOS	F	F	D	F	F	D	F	D	B	F	D	B
Apprch. delay	108.4			91.6			51.7			48.0		
Approach LOS	F			F			D			D		
Intersec. delay	66.9			Intersection LOS						E		

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INPUT WORKSHEET

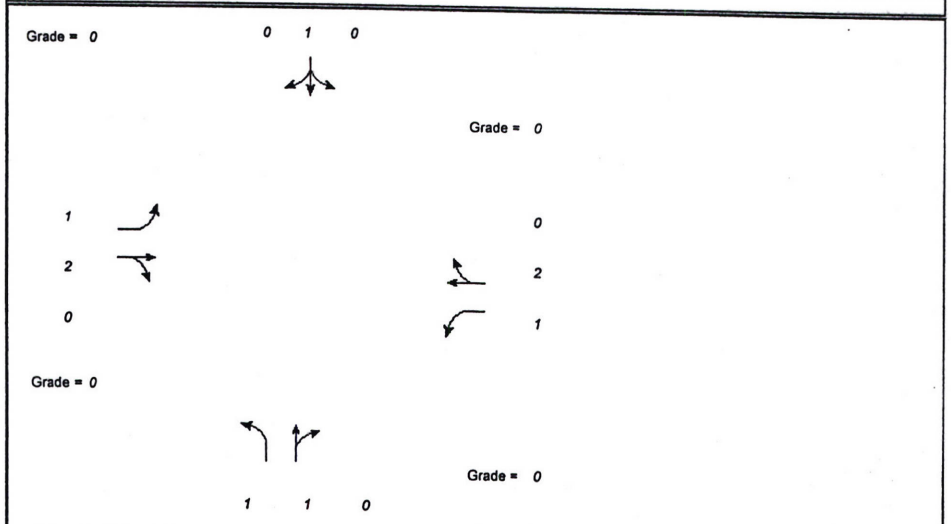
General Information

Analyst	*BL*
Agency or Co.	*PBQD*
Date Performed	*5/13/2002*
Time Period	*AM Peak Hour*

Site Information

Intersection	*Launahele/Geiger*
Area Type	*All other areas*
Jurisdiction	
Analysis Year	*2002*

Intersection Geometry



Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (vph)	41	495	2	72	677	39	6	8	153	164	1	40
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup lost time	2.0	2.0		2.0	2.0		2.0	2.0			2.0	
Ext. eff. green	2.0	2.0		2.0	2.0		2.0	2.0			2.0	
Arrival type	3	3		3	3		3	3			3	
Ped volume	0			0			0			0		
Bicycle volume	0			0			0			0		
Parking (Y or N)	N		N	N		N	N		N	N		N
Parking/hr												
Bus stops/hr	0	0		0	0		0	0			0	
Ped timing	0.0			0.0			3.0			0.0		

	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 25.0	G =	G =	G =	G = 27.0	G =	G =	G =
	Y = 3.0	Y =	Y =	Y =	Y = 3.0	Y =	Y =	Y =

Duration of Analysis (hrs) = 1.00 Cycle Length C = 60.0

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CAPACITY AND LOS WORKSHEET

General Information

Project Description *Ewa Gentry Makai Development*

Capacity Analysis

	EB		WB		NB		SB
Lane group	L	TR	L	TR	L	TR	LTR
Adj. flow rate	43	518	75	746	6	167	214
Satflow rate	539	3608	796	3580	1239	1629	1157
Lost time	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Green ratio	0.42	0.42	0.42	0.42	0.45	0.45	0.45
Lane group cap.	225	1503	332	1492	558	733	521
v/c ratio	0.19	0.34	0.23	0.50	0.01	0.23	0.41
Flow ratio	0.08	0.14	0.09	0.21	0.00	0.10	0.18
Crit. lane group	N	N	N	Y	N	N	Y
Sum flow ratios	0.39						
Lost time/cycle	8.00						
Critical v/c ratio	0.45						

Lane Group Capacity, Control Delay, and LOS Determination

	EB		WB		NB		SB
Lane group	L	TR	L	TR	L	TR	LTR
Adj. flow rate	43	518	75	746	6	167	214
Lane group cap.	225	1503	332	1492	558	733	521
v/c ratio	0.19	0.34	0.23	0.50	0.01	0.23	0.41
Green ratio	0.42	0.42	0.42	0.42	0.45	0.45	0.45
Unif. delay d1	11.1	11.9	11.3	12.9	9.1	10.1	11.1
Delay factor k	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Increm. delay d2	0.4	0.1	0.3	0.3	0.0	0.2	0.5
PF factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Control delay	11.5	12.1	11.6	13.2	9.1	10.3	11.7
Lane group LOS	B	B	B	B	A	B	B
Apprch. delay	12.0		13.0		10.2		11.7
Approach LOS	B		B		B		B
Intersec. delay	12.3		Intersection LOS				B

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	BL
Agency/Co.	PBQD
Date Performed	5/13/2002
Analysis Time Period	AM Peak Hour

Site Information

Intersection	Kapolei/Geiger
Jurisdiction	
Analysis Year	2002
Project ID	Ewa Gentry Makai AM

East/West Street: *Geiger Road* North/South Street: *Kapolei Parkway*

Intersection Orientation: *East-West* Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	42	370	3	3	617	103
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	46	411	3	3	685	114
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	2	0	1	2	0
Configuration	L	T	TR	L	T	TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	21	8	2	166	6	152
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	23	8	2	184	6	168
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		5			5	
RT Channelized			0			0
Lanes	1	2	0	1	2	0
Configuration	L	T	TR	L	T	TR

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L	L	T	TR	L	T	TR
v (vph)	46	3	23	4	6	184	3	171
C (m) (vph)	833	1156	171	152	208	168	163	578
v/c	0.06	0.00	0.13	0.03	0.03	1.10	0.02	0.30
95% queue length	0.18	0.01	0.46	0.08	0.09	21.09	0.06	1.25
Control Delay	9.6	8.1	29.3	29.3	22.8	334.8	27.5	13.8
LOS	A	A	D	D	C	F	D	B
Approach Delay	--	--	28.1			178.9		
Approach LOS	--	--	D			F		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	BL
Agency/Co.	PBQD
Date Performed	5/13/2002
Analysis Time Period	AM Peak Hour

Site Information

Intersection	Keaunui / Iroquois
Jurisdiction	
Analysis Year	2002
Project ID	Ewa Gentry Makai AM

East/West Street: *Iroquois Road*
North/South Street: *Keaunui Road*
Intersection Orientation: *East-West*
Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	160	108	33	0	141	59
Peak-Hour Factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Hourly Flow Rate, HFR	181	122	37	0	160	67
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	2	0	0	2	0
Configuration	L	T	TR	LT		TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	32	41	5	18	25	236
Peak-Hour Factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Hourly Flow Rate, HFR	36	46	5	20	28	268
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		1			1	
RT Channelized			0			0
Lanes	0	2	0	0	2	0
Configuration	LT		TR	LT		TR

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	LT	LT		TR	LT		TR
v (vph)	181	0	59		28	34		282
C (m) (vph)	1353	1433	257		348	297		841
v/c	0.13	0.00	0.23		0.08	0.11		0.34
95% queue length	0.46	0.00	0.89		0.26	0.39		1.51
Control Delay	8.1	7.5	23.2		16.2	18.7		11.4
LOS	A	A	C		C	C		B
Approach Delay	--	--	20.9			12.2		
Approach LOS	--	--	C			B		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	BL
Agency/Co.	PBQD
Date Performed	5/13/2002
Analysis Time Period	AM Peak Hour (Existing)

Site Information

Intersection	Keaunui Dr/Ft Weaver Rd
Jurisdiction	Honolulu
Analysis Year	2002
Project ID	Ewa Gentry Makai AM Peak (existing)

East/West Street: *Keaunui Drive*
North/South Street: *Fort Weaver Road*
Intersection Orientation: *North-South*
Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	21	1498	1	10	1492	152
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	0	1664	1	11	1657	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	2	1	1	2	0
Configuration		T	R	L	T	
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0	617	1	42	370	3
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	0	0	1	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	1	0	1	0	0	0
Configuration	L		R			

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L	L		R			
v (vph)		11	0		1			
C (m) (vph)		391	102		316			
v/c		0.03	0.00		0.00			
95% queue length		0.09	0.00		0.01			
Control Delay		14.5	40.3		16.4			
LOS		B	E		C			
Approach Delay	--	--	16.4					
Approach LOS	--	--	C					

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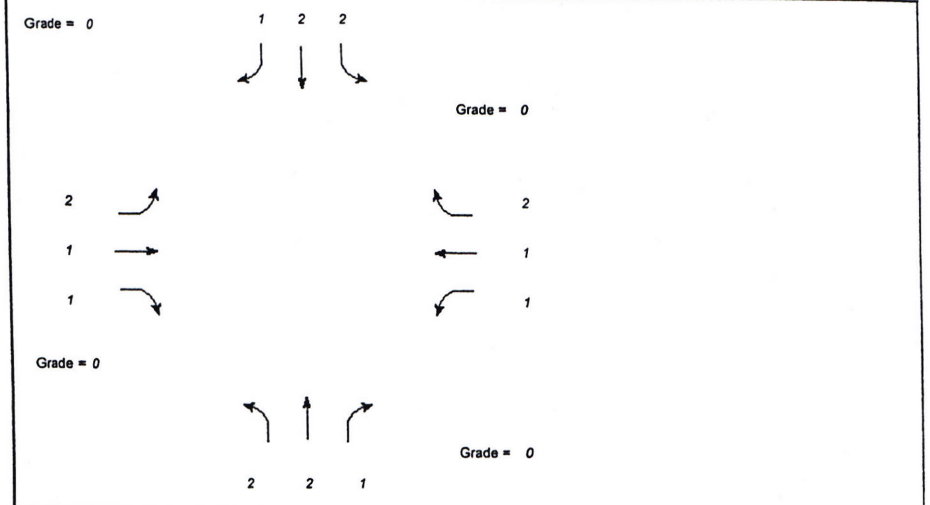
INPUT WORKSHEET

General Information		Site Information	
Analyst	BL	Intersection	Fort Weaver/Geiger (Iroquois)
Agency or Co.	PBQD	Area Type	All other areas
Date Performed	5/13/2002	Jurisdiction	
Time Period	PM Peak Hour	Analysis Year	2002

Intersection Geometry



Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (vph)	216	145	357	48	140	122	320	685	65	184	1020	227
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup lost time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Ext. eff. green	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Arrival type	3	3	3	3	3	3	3	3	3	3	3	3
Ped volume	0			0			0			0		
Bicycle volume	0						0			0		
Parking (Y or N)	N		N	N		N	N		N	N		N
Parking/hr												
Bus stops/hr	0	0	0	0	0	0	0	0	0	0	0	0
Ped timing	0.0			0.0			3.0			0.0		

	EW Perm	EW Perm	03	04	Excl. Left	SB Only	Thru & RT	08
Timing	G = 36.0	G = 36.0	G =	G =	G = 26.0	G = 16.0	G = 106.0	G =
	Y = 3.0	Y = 3.0	Y =	Y =	Y = 3.0	Y = 3.0	Y = 3.0	Y =

Duration of Analysis (hrs) = 1.00 Cycle Length C = 240.0

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CAPACITY AND LOS WORKSHEET

General Information

Project Description *Ewa Gentry Makai Development*

Capacity Analysis

	EB			WB			NB			SB		
Lane group	L	T	R	L	T	R	L	T	R	L	T	R
Adj. flow rate	216	145	357	48	140	122	320	685	65	184	1020	227
Satflow rate	3502	1900	1615	1805	1900	2842	3502	3610	1615	3502	3610	1615
Lost time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Green ratio	0.15	0.15	0.44	0.15	0.15	0.52	0.11	0.44	0.59	0.19	0.52	0.69
Lane group cap.	525	285	713	271	285	1492	379	1594	956	671	1895	1117
v/c ratio	0.41	0.51	0.50	0.18	0.49	0.08	0.84	0.43	0.07	0.27	0.54	0.20
Flow ratio	0.06	0.08	0.22	0.03	0.07	0.04	0.09	0.19	0.04	0.05	0.28	0.14
Crit. lane group	N	Y	N	N	Y	N	Y	N	N	N	Y	N
Sum flow ratios	0.52											
Lost time/cycle	16.00											
Critical v/c ratio	0.56											

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Lane group	L	T	R	L	T	R	L	T	R	L	T	R
Adj. flow rate	216	145	357	48	140	122	320	685	65	184	1020	227
Lane group cap.	525	285	713	271	285	1492	379	1594	956	671	1895	1117
v/c ratio	0.41	0.51	0.50	0.18	0.49	0.08	0.84	0.43	0.07	0.27	0.54	0.20
Green ratio	0.15	0.15	0.44	0.15	0.15	0.52	0.11	0.44	0.59	0.19	0.52	0.69
Unif. delay d1	92.4	93.9	48.0	89.1	93.6	28.3	105.0	46.2	20.8	82.8	37.7	13.3
Delay factor k	0.11	0.12	0.11	0.11	0.11	0.11	0.38	0.11	0.11	0.11	0.14	0.11
Increm. delay d2	0.5	1.5	0.6	0.3	1.3	0.0	18.3	0.2	0.0	0.2	0.3	0.1
PF factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Control delay	92.9	95.4	48.6	89.4	94.9	28.3	123.3	46.4	20.9	83.0	38.0	13.4
Lane group LOS	F	F	D	F	F	C	F	D	C	F	D	B
Apprch. delay	71.4			67.9			67.8			39.9		
Approach LOS	E			E			E			D		
Intersec. delay	57.2			Intersection LOS						E		

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INPUT WORKSHEET

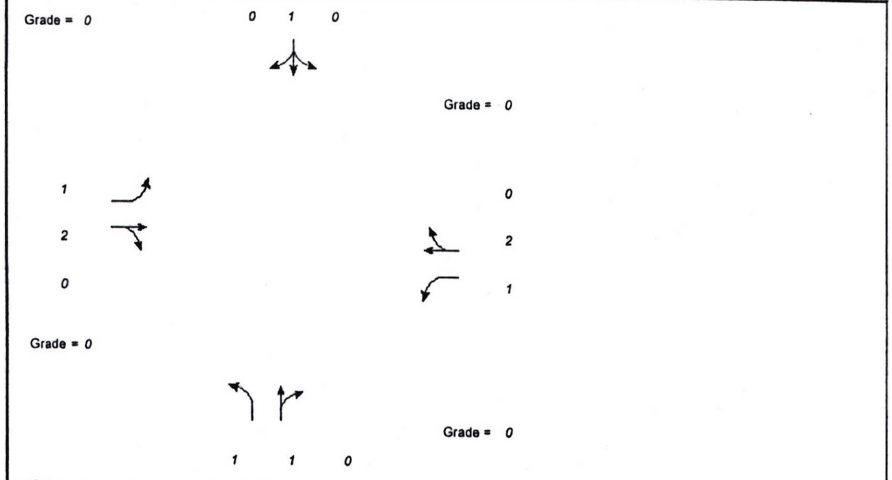
General Information

Analyst	BL
Agency or Co.	PBQD
Date Performed	5/13/2002
Time Period	PM Peak Hour

Site Information

Intersection	Launahele/Geiger
Area Type	All other areas
Jurisdiction	
Analysis Year	2002

Intersection Geometry



Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (vph)	66	458	3	119	506	62	9	10	58	202	13	27
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup lost time	2.0	2.0		2.0	2.0		2.0	2.0			2.0	
Ext. eff. green	2.0	2.0		2.0	2.0		2.0	2.0			2.0	
Arrival type	3	3		3	3		3	3			3	
Ped volume	0			0			0			0		
Bicycle volume	0			0			0			0		
Parking (Y or N)	N		N	N		N	N		N	N		N
Parking/hr												
Bus stops/hr	0	0		0	0		0	0			0	
Ped timing	0.0			0.0			3.0			0.0		

	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 25.0	G =	G =	G =	G = 27.0	G =	G =	G =
	Y = 3.0	Y =	Y =	Y =	Y = 3.0	Y =	Y =	Y =

Duration of Analysis (hrs) = 1.00 — Cycle Length C = 60.0

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CAPACITY AND LOS WORKSHEET

General Information

Project Description: Ewa Gentry Makai Development

Capacity Analysis

	EB			WB			NB			SB		
Lane group	L	TR		L	TR		L	TR			LTR	
Adj. flow rate	69	480		124	592		9	70			252	
Satflow rate	706	3607		846	3551		1215	1656			1335	
Lost time	2.0	2.0		2.0	2.0		2.0	2.0			2.0	
Green ratio	0.42	0.42		0.42	0.42		0.45	0.45			0.45	
Lane group cap.	294	1503		352	1480		547	745			601	
v/c ratio	0.23	0.32		0.35	0.40		0.02	0.09			0.42	
Flow ratio	0.10	0.13		0.15	0.17		0.01	0.04			0.19	
Crit. lane group	N	N		N	Y		N	N			Y	
Sum flow ratios	0.36											
Lost time/cycle	8.00											
Critical v/c ratio	0.41											

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Lane group	L	TR		L	TR		L	TR			LTR	
Adj. flow rate	69	480		124	592		9	70			252	
Lane group cap.	294	1503		352	1480		547	745			601	
v/c ratio	0.23	0.32		0.35	0.40		0.02	0.09			0.42	
Green ratio	0.42	0.42		0.42	0.42		0.45	0.45			0.45	
Unif. delay d1	11.3	11.8		12.0	12.3		9.1	9.5			11.2	
Delay factor k	0.11	0.11		0.11	0.11		0.11	0.11			0.11	
Increm. delay d2	0.4	0.1		0.6	0.2		0.0	0.1			0.5	
PF factor	1.000	1.000		1.000	1.000		1.000	1.000			1.000	
Control delay	11.7	11.9		12.6	12.4		9.2	9.5			11.7	
Lane group LOS	B	B		B	B		A	A			B	
Apprch. delay	11.9			12.5			9.5			11.7		
Approach LOS	B			B			A			B		
Intersec. delay	12.0			Intersection LOS						B		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	BL
Agency/Co.	PBQD
Date Performed	5/13/2002
Analysis Time Period	PM Peak Hour

Site Information

Intersection	Kapolei/Geiger
Jurisdiction	
Analysis Year	2002
Project ID	Ewa Gentry Makai PM

East/West Street: Geiger Road
North/South Street: Kapolei Parkway
Intersection Orientation: East-West
Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	137	442	26	4	342	196
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	152	491	28	4	380	217
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	2	0	1	2	0
Configuration	L	T	TR	L	T	TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	13	3	6	79	7	72
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	14	3	6	87	7	80
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		5			5	
RT Channelized			0			0
Lanes	1	2	0	1	2	0
Configuration	L	T	TR	L	T	TR

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L	L	T	TR	L	T	TR
v (vph)	152	4	14	1	7	87	3	83
C (m) (vph)	989	1057	148	117	422	158	133	609
v/c	0.15	0.00	0.09	0.01	0.02	0.55	0.02	0.14
95% queue length	0.54	0.01	0.31	0.03	0.05	3.36	0.07	0.47
Control Delay	9.3	8.4	31.9	36.0	13.7	54.8	32.7	11.8
LOS	A	A	D	E	B	F	D	B
Approach Delay	--	--	26.3			33.8		
Approach LOS	--	--	D			D		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	BL
Agency/Co.	PBQD
Date Performed	5/13/2002
Analysis Time Period	PM Peak Hour

Site Information

Intersection	Keaunui / Iroquois
Jurisdiction	
Analysis Year	2002
Project ID	Ewa Gentry Makai PM

East/West Street: Iroquois Road
North/South Street: Keaunui Road
Intersection Orientation: East-West
Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	147	169	78	0	126	21
Peak-Hour Factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83
Hourly Flow Rate, HFR	177	203	93	0	151	25
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	2	0	0	2	0
Configuration	L	T	TR	LT		TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	46	32	0	14	14	124
Peak-Hour Factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83
Hourly Flow Rate, HFR	55	38	0	16	16	149
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		1			1	
RT Channelized			0			0
Lanes	0	2	0	0	2	0
Configuration	LT		TR	LT		TR

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	LT	LT		TR	LT		TR
v (vph)	177	0	74		19	24		157
C (m) (vph)	1412	1277	256		288	290		852
v/c	0.13	0.00	0.29		0.07	0.08		0.18
95% queue length	0.43	0.00	1.20		0.21	0.27		0.68
Control Delay	7.9	7.8	24.8		18.4	18.5		10.2
LOS	A	A	C		C	C		B
Approach Delay	--	--	23.5			11.3		
Approach LOS	--	--	C			B		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	BL
Agency/Co.	PBQD
Date Performed	5/13/2002
Analysis Time Period	PM Peak Hour (Existing)

Site Information

Intersection	Keaunui Dr/Ft Weaver Rd
Jurisdiction	Honolulu
Analysis Year	2002
Project ID	Ewa Gentry Makai PM Peak (existing)

East/West Street: Keaunui Drive
North/South Street: Fort Weaver Road
Intersection Orientation: North-South
Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	21	1061	7	14	1411	152
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	0	1178	7	15	1567	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	2	1	1	2	0
Configuration		T	R	L	T	
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	3	617	9	42	370	3
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	3	0	10	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	1	0	1	0	0	0
Configuration	L		R			

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L	L		R			
v (vph)		15	3		10			
C (m) (vph)		596	165		457			
v/c		0.03	0.02		0.02			
95% queue length		0.08	0.06		0.07			
Control Delay		11.2	27.2		13.1			
LOS		B	D		B			
Approach Delay	--	--	16.3					
Approach LOS	--	--	C					

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INPUT WORKSHEET

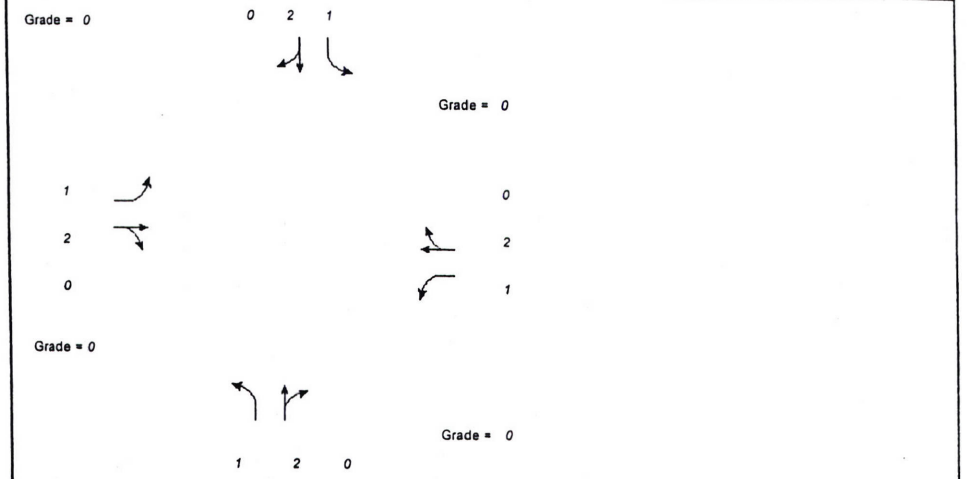
General Information

Analyst	C. Maruoka
Agency or Co.	PBQ&D
Date Performed	5/13/2002
Time Period	AM Peak Hour (2010 Base)

Site Information

Intersection	Geiger Rd/Kapolei Pkwy
Area Type	All other areas
Jurisdiction	Honolulu
Analysis Year	2002

Intersection Geometry



Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (vph)	100	327	63	17	405	301	30	315	5	228	207	167
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup lost time	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Ext. eff. green	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Arrival type	3	3		3	3		3	3		3	3	
Ped volume	0			0			0			0		
Bicycle volume							0			0		
Parking (Y or N)	N		N	N		N	N		N	N		N
Parking/hr												
Bus stops/hr	0	0		0	0		0	0		0	0	
Ped timing	0.0			0.0			3.0			0.0		

	Excl. Left	EW Perm	03	04	Excl. Left	NS Perm	07	08
Timing	G = 8.0	G = 24.0	G =	G =	G = 8.0	G = 24.0	G =	G =
	Y = 3.0	Y = 3.0	Y =	Y =	Y = 3.0	Y = 3.0	Y =	Y =

Duration of Analysis (hrs) = 1.00
Cycle Length C = 80.0

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CAPACITY AND LOS WORKSHEET

General Information

Project Description *Ewa Gentry Makai (Year 2010 Base AM Peak) Geiger/Kapolei*

Capacity Analysis

	EB		WB		NB		SB	
Lane group	L	TR	L	TR	L	TR	L	TR
Adj. flow rate	111	433	19	784	33	356	253	416
Satflow rate	1805	3522	1805	3379	1805	3601	1805	3368
Lost time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Green ratio	0.45	0.30	0.45	0.30	0.45	0.30	0.45	0.30
Lane group cap.	298	1057	427	1014	436	1080	465	1010
v/c ratio	0.37	0.41	0.04	0.77	0.08	0.33	0.54	0.41
Flow ratio		0.12		0.23		0.10		0.12
Crit. lane group	N	N	N	N	N	N	N	N
Sum flow ratios	0.53							
Lost time/cycle	16.00							
Critical v/c ratio	0.66							

Lane Group Capacity, Control Delay, and LOS Determination

	EB		WB		NB		SB	
Lane group	L	TR	L	TR	L	TR	L	TR
Adj. flow rate	111	433	19	784	33	356	253	416
Lane group cap.	298	1057	427	1014	436	1080	465	1010
v/c ratio	0.37	0.41	0.04	0.77	0.08	0.33	0.54	0.41
Green ratio	0.45	0.30	0.45	0.30	0.45	0.30	0.45	0.30
Unif. delay d1	14.9	22.3	12.6	25.5	12.7	21.8	14.4	22.4
Delay factor k	0.11	0.11	0.11	0.32	0.11	0.11	0.14	0.11
Increm. delay d2	0.8	0.3	0.0	3.9	0.1	0.2	1.3	0.3
PF factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Control delay	15.7	22.6	12.7	29.4	12.8	21.9	15.8	22.6
Lane group LOS	B	C	B	C	B	C	B	C
Apprch. delay	21.2		29.0		21.2		20.0+	
Approach LOS	C		C		C		C	
Intersec. delay	23.5		Intersection LOS				C	

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INPUT WORKSHEET

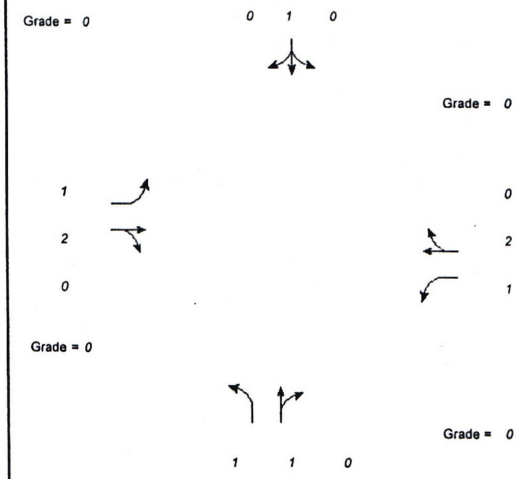
General Information

Analyst	C. Maruoka
Agency or Co.	PBQ&D
Date Performed	5/13/2002
Time Period	AM Peak Hour (2010 Base)

Site Information

Intersection	Geiger Rd/Launahele St
Area Type	All other areas
Jurisdiction	Honolulu
Analysis Year	2002

Intersection Geometry



Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (vph)	61	473	26	48	565	33	57	8	102	115	1	101
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup lost time	2.0	2.0		2.0	2.0		2.0	2.0			2.0	
Ext. eff. green	2.0	2.0		2.0	2.0		2.0	2.0			2.0	
Arrival type	3	3		3	3		3	3			3	
Ped volume		0			0			0			0	
Bicycle volume												
Parking (Y or N)	N		N	N		N	N		N	N		N
Parking/hr												
Bus stops/hr	0	0		0	0		0	0			0	
Ped timing	0.0			0.0			3.0			0.0		

	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 26.0	G =	G =	G =	G = 26.0	G =	G =	G =
	Y = 3.0	Y =	Y =	Y =	Y = 3.0	Y =	Y =	Y =

Duration of Analysis (hrs) = 1.00 Cycle Length C = 60.0

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CAPACITY AND LOS WORKSHEET

General Information

Project Description *Ewa Gentry Makai (Year 2010 Base AM Peak) Geiger/Launahele*

Capacity Analysis

	EB		WB		NB		SB
Lane group	L	TR	L	TR	L	TR	LTR
Adj. flow rate	68	555	53	665	63	122	241
Satflow rate	635	3582	760	3580	1181	1636	1396
Lost time	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Green ratio	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Lane group cap.	275	1552	329	1551	512	709	605
v/c ratio	0.25	0.36	0.16	0.43	0.12	0.17	0.40
Flow ratio	0.11	0.15	0.07	0.19	0.05	0.07	0.17
Crit. lane group	N	N	N	Y	N	N	Y
Sum flow ratios	0.36						
Lost time/cycle	8.00						
Critical v/c ratio	0.41						

Lane Group Capacity, Control Delay, and LOS Determination

	EB		WB		NB		SB
Lane group	L	TR	L	TR	L	TR	LTR
Adj. flow rate	68	555	53	665	63	122	241
Lane group cap.	275	1552	329	1551	512	709	605
v/c ratio	0.25	0.36	0.16	0.43	0.12	0.17	0.40
Green ratio	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Unif. delay d1	10.8	11.4	10.4	11.8	10.2	10.4	11.6
Delay factor k	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Increm. delay d2	0.5	0.1	0.2	0.2	0.1	0.1	0.4
PF factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Control delay	11.3	11.5	10.6	12.0	10.3	10.5	12.1
Lane group LOS	B	B	B	B	B	B	B
Apprch. delay	11.5		11.9		10.4		12.1
Approach LOS	B		B		B		B
Intersec. delay	11.6		Intersection LOS				B

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INPUT WORKSHEET

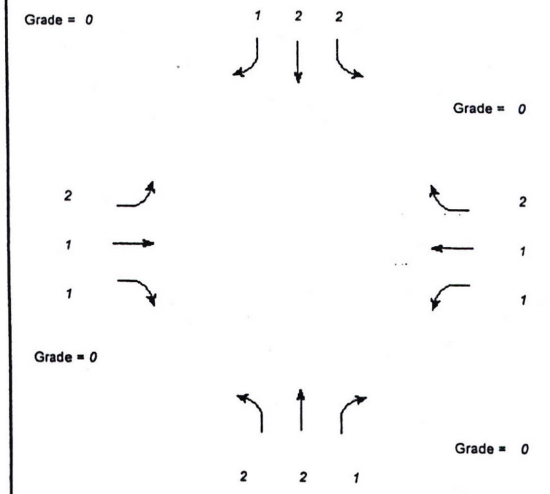
General Information

Analyst	*C. Maruoka*
Agency or Co.	*PBQ&D*
Date Performed	*9/19/2002*
Time Period	*AM Peak Hour (2010 Base)*

Site Information

Intersection	*Fort Weaver/Geiger (Iroquois)*
Area Type	*All other areas*
Jurisdiction	*Honolulu*
Analysis Year	*2002*

Intersection Geometry



Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (vph)	454	131	105	119	291	282	176	1059	89	163	860	179
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup lost time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Ext. eff. green	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Arrival type	3	3	3	3	3	3	3	3	3	3	3	3
Ped volume	0			0			0			0		
Bicycle volume							0			0		
Parking (Y or N)	N		N	N		N	N		N	N		N
Parking/hr												
Bus stops/hr	0	0	0	0	0	0	0	0	0	0	0	0
Ped timing	0.0			0.0			3.0			0.0		

	EB Only	WB Only	03	04	Excl. Left	Thru & RT	07	08
Timing	G = 18.0	G = 23.0	G =	G =	G = 9.0	G = 34.0	G =	G =
	Y = 3.0	Y = 3.0	Y =	Y =	Y = 3.0	Y = 3.0	Y =	Y =
Duration of Analysis (hrs) = 1.00						Cycle Length C = 100.0		

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CAPACITY AND LOS WORKSHEET

General Information

Project Description *Ewa Gentry Makal (Year 2010 Base AM Peak) Geiger/Ft Weaver*

Capacity Analysis

	EB			WB			NB			SB		
Lane group	L	T	R	L	T	R	L	T	R	L	T	R
Adj. flow rate	504	146	117	132	323	313	196	1177	99	181	956	199
Satflow rate	3502	1900	1615	1805	1900	2842	3502	3610	1615	3502	3610	1615
Lost time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Green ratio	0.18	0.18	0.27	0.23	0.23	0.36	0.09	0.34	0.57	0.09	0.34	0.56
Lane group cap.	630	342	436	415	437	1023	315	1227	921	315	1227	904
v/c ratio	0.80	0.43	0.27	0.32	0.74	0.31	0.62	0.96	0.11	0.57	0.78	0.22
Flow ratio	0.14	0.08	0.07	0.07	0.17	0.11	0.06	0.33	0.06	0.05	0.26	0.12
Crit. lane group	Y	N	N	N	Y	N	Y	Y	N	N	N	N
Sum flow ratios	0.70											
Lost time/cycle	16.00											
Critical v/c ratio	0.83											

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Lane group	L	T	R	L	T	R	L	T	R	L	T	R
Adj. flow rate	504	146	117	132	323	313	196	1177	99	181	956	199
Lane group cap.	630	342	436	415	437	1023	315	1227	921	315	1227	904
v/c ratio	0.80	0.43	0.27	0.32	0.74	0.31	0.62	0.96	0.11	0.57	0.78	0.22
Green ratio	0.18	0.18	0.27	0.23	0.23	0.36	0.09	0.34	0.57	0.09	0.34	0.56
Unif. delay d1	39.3	36.4	28.7	32.0	35.7	23.0	43.9	32.3	9.8	43.7	29.6	11.0
Delay factor k	0.34	0.11	0.11	0.11	0.30	0.11	0.21	0.47	0.11	0.17	0.33	0.11
Increm. delay d2	7.7	0.9	0.3	0.4	6.8	0.2	3.8	24.3	0.1	2.6	3.4	0.1
PF factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Control delay	47.0	37.3	29.1	32.4	42.5	23.2	47.7	56.6	9.9	46.3	33.0	11.2
Lane group LOS	D	D	C	C	D	C	D	E	A	D	C	B
Apprch. delay	42.4			32.9			52.3			31.5		
Approach LOS	D			C			D			C		
Intersec. delay	40.7			Intersection LOS						D		

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INPUT WORKSHEET

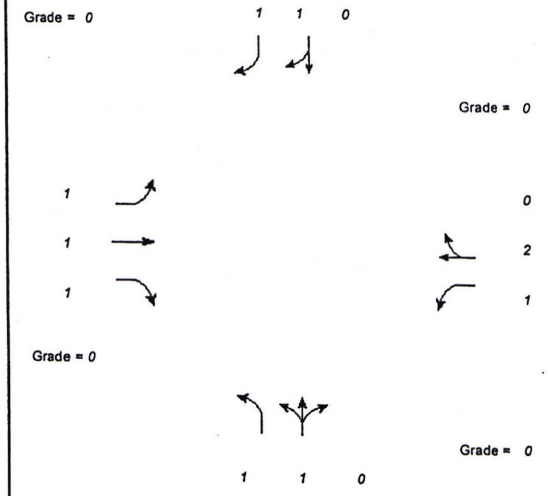
General Information

Analyst	*C. Maruoka*
Agency or Co.	*PBQ&D*
Date Performed	*9/19/2002*
Time Period	*AM Peak Hour (2010 Base)*

Site Information

Intersection	*Iroquois Pt Rd/Keaunui Rd*
Area Type	*All other areas*
Jurisdiction	*Honolulu*
Analysis Year	*2002*

Intersection Geometry



Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (vph)	162	108	113	0	141	59	314	43	5	18	27	237
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup lost time	2.0	2.0	2.0	2.0	2.0		2.0	2.0			2.0	2.0
Ext. eff. green	2.0	2.0	2.0	2.0	2.0		2.0	2.0			2.0	2.0
Arrival type	3	3	3	3	3		3	3			3	3
Ped volume	0			0			0			0		
Bicycle volume										0		
Parking (Y or N)	N		N	N		N	N		N	N		N
Parking/hr												
Bus stops/hr	0	0	0	0	0		0	0			0	0
Ped timing	0.0			0.0			3.0			0.0		

	Excl. Left	EB Only	Thru & RT	04	NB Only	SB Only	07	08
Timing	G = 8.0	G = 10.0	G = 10.0	G =	G = 20.0	G = 16.0	G =	G =
	Y = 0.0	Y = 3.0	Y = 3.0	Y =	Y = 3.0	Y = 3.0	Y =	Y =

Duration of Analysis (hrs) = 1.00 Cycle Length C = 80.0

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CAPACITY AND LOS WORKSHEET

General Information

Project Description *Ewa Gentry Makai (Year 2010 Base AM Peak) Iroquois/Keaunui*

Capacity Analysis

	EB			WB			NB			SB	
Lane group	L	T	R	L	TR		L	LTR		LT	R
Adj. flow rate	180	120	126	0	223		349	54		50	263
Satflow rate	1805	1900	1615	1805	3450		1805	1868		1863	1615
Lost time	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0
Green ratio	0.22	0.30	0.60	0.10	0.13		0.25	0.25		0.20	0.47
Lane group cap.	406	570	969	181	431		451	467		373	767
v/c ratio	0.44	0.21	0.13	0.00	0.52		0.77	0.12		0.13	0.34
Flow ratio	0.10	0.06	0.08	0.00	0.06		0.19	0.03		0.03	0.16
Crit. lane group	N	N	N	N	Y		Y	N		N	Y
Sum flow ratios	0.42										
Lost time/cycle	12.00										
Critical v/c ratio	0.50										

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB	
Lane group	L	T	R	L	TR		L	LTR		LT	R
Adj. flow rate	180	120	126	0	223		349	54		50	263
Lane group cap.	406	570	969	181	431		451	467		373	767
v/c ratio	0.44	0.21	0.13	0.00	0.52		0.77	0.12		0.13	0.34
Green ratio	0.22	0.30	0.60	0.10	0.13		0.25	0.25		0.20	0.47
Unif. delay d1	26.7	20.9	6.9	32.4	32.7		27.9	23.2		26.3	13.2
Delay factor k	0.11	0.11	0.11	0.11	0.12		0.32	0.11		0.11	0.11
Increm. delay d2	0.8	0.2	0.1	0.0	1.1		8.7	0.1		0.2	0.3
PF factor	1.000	1.000	1.000	1.000	1.000		1.000	1.000		1.000	1.000
Control delay	27.5	21.1	7.0	32.4	33.8		36.6	23.3		26.5	13.4
Lane group LOS	C	C	A	C	C		D	C		C	B
Apprch. delay	19.6			33.8			34.8			15.5	
Approach LOS	B			C			C			B	
Intersec. delay	25.5			Intersection LOS						C	

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INPUT WORKSHEET

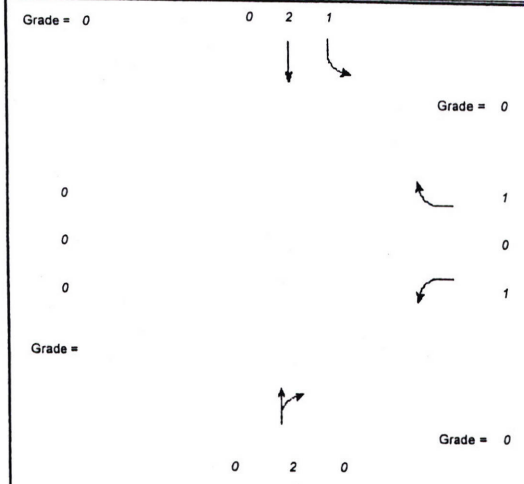
General Information

Analyst	C. Maruoka
Agency or Co.	PBQ&D
Date Performed	9/19/2002
Time Period	AM Peak Hour (2010 Base)

Site Information

Intersection	Kapolei Pkwy/Keaunui Dr
Area Type	All other areas
Jurisdiction	Honolulu
Analysis Year	2002

Intersection Geometry



Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (vph)				5		46		305	23	77	259	
% Heavy veh				0		0		0	0	0	0	
PHF				0.90		0.90		0.90	0.90	0.90	0.90	
Actuated (P/A)				A		A		A	A	A	A	
Startup lost time				2.0		2.0		2.0		2.0	2.0	
Ext. eff. green				2.0		2.0		2.0		2.0	2.0	
Arrival type				3		3		3		3	3	
Ped volume	0			0			0			·		
Bicycle volume							0					
Parking (Y or N)	N		N	N		N	N		N	N		N
Parking/hr												
Bus stops/hr				0		0		0		0	0	
Ped timing	0.0			0.0			3.0			0.0		

	WB Only	02	03	04	SB Only	Thru & RT	07	08
Timing	G = 10.0	G =	G =	G =	G = 10.0	G = 29.0	G =	G =
	Y = 3.0	Y =	Y =	Y =	Y = 3.0	Y = 3.0	Y =	Y =

Duration of Analysis (hrs) = 1.00 Cycle Length C = 60.0

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CAPACITY AND LOS WORKSHEET

General Information

Project Description *Ewa Gentry Makai (Year2010 Base AM)Kapolei Pkwy/Keaunui Dr*

Capacity Analysis

	EB	WB		NB	SB	
Lane group		L	R	TR	L	T
Adj. flow rate		6	51	365	86	288
Satflow rate		1805	1615	3571	1805	3610
Lost time		2.0	2.0	2.0	2.0	2.0
Green ratio		0.17	0.40	0.48	0.17	0.70
Lane group cap.		301	646	1726	301	2527
v/c ratio		0.02	0.08	0.21	0.29	0.11
Flow ratio		0.00	0.03	0.10	0.05	0.08
Crit. lane group		Y	N	Y	Y	N
Sum flow ratios	0.15					
Lost time/cycle	11.00					
Critical v/c ratio	0.19					

Lane Group Capacity, Control Delay, and LOS Determination

	EB	WB		NB	SB	
Lane group		L	R	TR	L	T
Adj. flow rate		6	51	365	86	288
Lane group cap.		301	646	1726	301	2527
v/c ratio		0.02	0.08	0.21	0.29	0.11
Green ratio		0.17	0.40	0.48	0.17	0.70
Unif. delay d1		20.9	11.2	8.9	21.9	2.9
Delay factor k		0.11	0.11	0.11	0.11	0.11
Increm. delay d2		0.0	0.1	0.1	0.5	0.0
PF factor		1.000	1.000	1.000	1.000	1.000
Control delay		20.9	11.2	9.0	22.4	3.0
Lane group LOS		C	B	A	C	A
Apprch. delay		12.2		9.0	7.4	
Approach LOS		B		A	A	
Intersec. delay	8.5	Intersection LOS			A	

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INPUT WORKSHEET

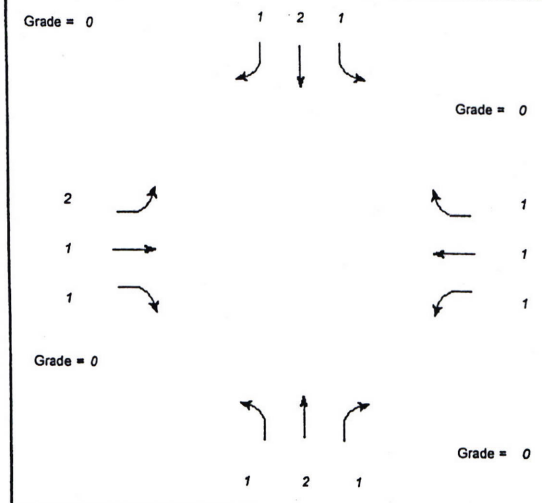
General Information

Analyst	*C. Maruoka*
Agency or Co.	*PBQ&D*
Date Performed	*9/19/2002*
Time Period	*AM Peak Hour (2010 Base)*

Site Information

Intersection	*Fort Weaver Rd/Keaunui Dr*
Area Type	*All other areas*
Jurisdiction	*Honolulu*
Analysis Year	*2002*

Intersection Geometry



Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (vph)	87	23	11	82	0	1	41	1236	19	10	1034	40
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup lost time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Ext. eff. green	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Arrival type	3	3	3	3	3	3	3	3	3	3	3	3
Ped volume	0			0			0			0		
Bicycle volume	0			0			0			0		
Parking (Y or N)	N		N	N		N	N		N	N		N
Parking/hr												
Bus stops/hr	0	0	0	0	0	0	0	0	0	0	0	0
Ped timing	0.0			0.0			3.0			0.0		

	EB Only	WB Only	03	04	Excl. Left	Thru & RT	07	08
Timing	G = 14.0	G = 18.0	G =	G =	G = 12.0	G = 40.0	G =	G =
	Y = 3.0	Y = 3.0	Y =	Y =	Y = 3.0	Y = 3.0	Y =	Y =

Duration of Analysis (hrs) = 1.00 Cycle Length C = 100.0

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CAPACITY AND LOS WORKSHEET

General Information

Project Description *Ewa Gentry Makai (Year 2010 Total AM Base) Ft Weaver/Keaunui*

Capacity Analysis

	EB			WB			NB			SB		
Lane group	L	T	R	L	T	R	L	T	R	L	T	R
Adj. flow rate	97	26	12	91	0	1	46	1373	21	11	1149	44
Satflow rate	3502	1900	1615	1805	1900	1615	1805	3610	1615	1805	3610	1615
Lost time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Green ratio	0.14	0.14	0.26	0.18	0.18	0.34	0.12	0.40	0.40	0.12	0.40	0.58
Lane group cap.	490	266	420	325	342	549	217	1444	646	217	1444	937
v/c ratio	0.20	0.10	0.03	0.28	0.00	0.00	0.21	0.95	0.03	0.05	0.80	0.05
Flow ratio	0.03	0.01	0.01	0.05	0.00	0.00	0.03	0.38	0.01	0.01	0.32	0.03
Crit. lane group	Y	N	N	Y	N	N	Y	Y	N	N	N	N
Sum flow ratios	0.48											
Lost time/cycle	16.00											
Critical v/c ratio	0.58											

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Lane group	L	T	R	L	T	R	L	T	R	L	T	R
Adj. flow rate	97	26	12	91	0	1	46	1373	21	11	1149	44
Lane group cap.	490	266	420	325	342	549	217	1444	646	217	1444	937
v/c ratio	0.20	0.10	0.03	0.28	0.00	0.00	0.21	0.95	0.03	0.05	0.80	0.05
Green ratio	0.14	0.14	0.26	0.18	0.18	0.34	0.12	0.40	0.40	0.12	0.40	0.58
Unif. delay d1	38.0	37.5	27.6	35.4	33.6	21.8	39.7	29.0	18.2	39.0	26.4	9.1
Delay factor k	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.46	0.11	0.11	0.34	0.11
Increm. delay d2	0.2	0.2	0.0	0.5	0.0	0.0	0.5	18.4	0.0	0.1	3.3	0.0
PF factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Control delay	38.2	37.7	27.6	35.9	33.6	21.8	40.2	47.5	18.3	39.1	29.7	9.1
Lane group LOS	D	D	C	D	C	C	D	D	B	D	C	A
Apprch. delay	37.2			35.7			46.8			29.0		
Approach LOS	D			D			D			C		
Intersec. delay	38.5			Intersection LOS						D		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*C. Maruoka*
Agency/Co.	*PBQ&D*
Date Performed	*9/19/2002*
Analysis Time Period	*AM Peak Hour (2010 Base)*

Site Information

Intersection	*Kapolei Pkwy/Ent. A*
Jurisdiction	*Honolulu*
Analysis Year	*2002*
Project ID	*Ewa Gentry Makai (Year 2010 Base AM Peak) Kapolei Pkwy/Ent A*

East/West Street: *Entrance A* North/South Street: *Kapolei Parkway*

Intersection Orientation: *North-South* Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	8	345	5	12	267	8
Peak-Hour Factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Hourly Flow Rate, HFR	9	392	5	13	303	9
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	2	0	1	2	0
Configuration	L	T	TR	L	T	TR
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	3	0	31	16	0	37
Peak-Hour Factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Hourly Flow Rate, HFR	3	0	35	18	0	42
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	1	0	1	1
Configuration	LT		R	LT		R

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L	LT		R	LT		R
v (vph)	9	13	3		35	18		42
C (m) (vph)	1260	1173	372		816	400		868
v/c	0.01	0.01	0.01		0.04	0.05		0.05
95% queue length	0.02	0.03	0.02		0.13	0.14		0.15
Control Delay	7.9	8.1	14.8		9.6	14.4		9.4
LOS	A	A	B		A	B		A
Approach Delay	--	--	10.0+			10.9		
Approach LOS	--	--	B			B		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	C. Maruoka
Agency/Co.	PBQ&D
Date Performed	9/19/2002
Analysis Time Period	AM Peak Hour (2010 Base)

Site Information

Intersection	Kapolei Pkwy/ Ent. B
Jurisdiction	Honolulu
Analysis Year	2002
Project ID	Ewa Gentry Makai (Year 2010 Base AM Peak) Kapolei Pkwy/Ent B

East/West Street: *Entrance B*
North/South Street: *Kapolei Parway*
Intersection Orientation: *North-South*
Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	11	340	11	3	304	9
Peak-Hour Factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Hourly Flow Rate, HFR	12	386	0	0	345	10
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	2	0	0	2	0
Configuration	L	T			T	TR
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	115	0	40	18	0	38
Peak-Hour Factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Hourly Flow Rate, HFR	0	0	0	20	0	43
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	1	0	1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L					L		R
v (vph)	12					20		43
C (m) (vph)	1215					453		841
v/c	0.01					0.04		0.05
95% queue length	0.03					0.14		0.16
Control Delay	8.0					13.3		9.5
LOS	A					B		A
Approach Delay	--	--				10.7		
Approach LOS	--	--				B		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	C. Maruoka
Agency/Co.	PBQ&D
Date Performed	9/19/2002
Analysis Time Period	AM Peak Hour (2010 Base)

Site Information

Intersection	Geiger Rd/ Ent C
Jurisdiction	Honolulu
Analysis Year	2002
Project ID	Ewa Gentry Makai (Year 201 Base AM Peak)Geiger Rd/En C

East/West Street: *Entrance C*
North/South Street: *Geiger Road*
Intersection Orientation: *East-West*
Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	15	309	4	70	581	31
Peak-Hour Factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Hourly Flow Rate, HFR	0	351	4	79	660	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Raised curb					
RT Channelized			0			0
Lanes	0	1	0	1	1	0
Configuration			TR	L	T	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	11	597	212	12	436	8
Peak-Hour Factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Hourly Flow Rate, HFR	12	0	240	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		1			1	
RT Channelized			0			0
Lanes	1	0	1	0	0	0
Configuration	L		R			

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L	L		R			
v (vph)		79	12		240			
C (m) (vph)		1215	319		695			
v/c		0.07	0.04		0.35			
95% queue length		0.21	0.12		1.57			
Control Delay		8.2	16.7		12.9			
LOS		A	C		B			
Approach Delay	--	--	13.1					
Approach LOS	--	--	B					

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INPUT WORKSHEET

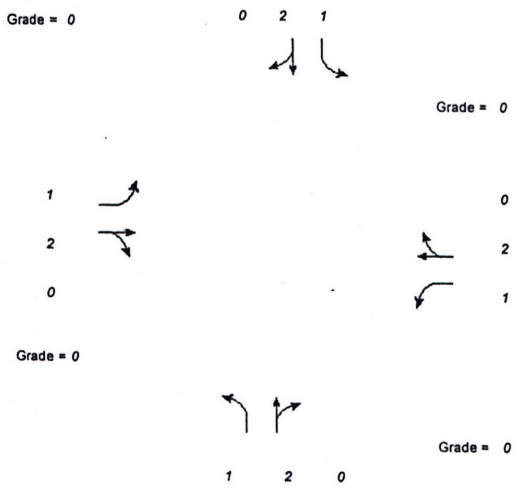
General Information

Analyst	C. Maruoka
Agency or Co.	PBQ&D
Date Performed	9/19/2002
Time Period	PM Peak Hour (2010 Base)

Site Information

Intersection	Geiger Rd/Kapolei Pkwy
Area Type	All other areas
Jurisdiction	Honolulu
Analysis Year	2002

Intersection Geometry



Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (vph)	169	309	77	59	280	334	77	307	35	232	338	130
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup lost time	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Ext. eff. green	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Arrival type	3	3		3	3		3	3		3	3	
Ped volume	0			0			0			0		
Bicycle volume	0			0			0			0		
Parking (Y or N)	N		N	N		N	N		N	N		N
Parking/hr												
Bus stops/hr	0	0		0	0		0	0		0	0	
Ped timing	0.0			0.0			3.0			0.0		

	Excl. Left	EW Perm	03	04	Excl. Left	NS Perm	07	08
Timing	G = 8.0	G = 24.0	G =	G =	G = 8.0	G = 24.0	G =	G =
	Y = 3.0	Y = 3.0	Y =	Y =	Y = 3.0	Y = 3.0	Y =	Y =
Duration of Analysis (hrs) = 1.00					Cycle Length C = 80.0			

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CAPACITY AND LOS WORKSHEET

General Information

Project Description *Ewa Gentry Makai (Year 2010 Base PM Peak) Geiger/Kapolei*

Capacity Analysis

	EB		WB		NB		SB	
Lane group	L	TR	L	TR	L	TR	L	TR
Adj. flow rate	169	386	59	614	77	342	232	468
Satflow rate	1805	3502	1805	3315	1805	3555	1805	3460
Lost time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Green ratio	0.45	0.30	0.45	0.30	0.45	0.30	0.45	0.30
Lane group cap.	350	1051	450	995	411	1067	473	1038
v/c ratio	0.48	0.37	0.13	0.62	0.19	0.32	0.49	0.45
Flow ratio		0.11		0.19		0.10		0.14
Crit. lane group	N	N	N	N	N	N	N	N
Sum flow ratios	0.53							
Lost time/cycle	16.00							
Critical v/c ratio	0.66							

Lane Group Capacity, Control Delay, and LOS Determination

	EB		WB		NB		SB	
Lane group	L	TR	L	TR	L	TR	L	TR
Adj. flow rate	169	386	59	614	77	342	232	468
Lane group cap.	350	1051	450	995	411	1067	473	1038
v/c ratio	0.48	0.37	0.13	0.62	0.19	0.32	0.49	0.45
Green ratio	0.45	0.30	0.45	0.30	0.45	0.30	0.45	0.30
Unif. delay d1	14.5	22.0	12.8	24.1	13.2	21.7	14.2	22.7
Delay factor k	0.11	0.11	0.11	0.20	0.11	0.11	0.11	0.11
Increm. delay d2	1.1	0.2	0.1	1.2	0.2	0.2	0.8	0.3
PF factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Control delay	15.6	22.2	13.0	25.2	13.4	21.9	15.0	23.0
Lane group LOS	B	C	B	C	B	C	B	C
Apprch. delay	20.2		24.2		20.3		20.3	
Approach LOS	C		C		C		C	
Intersec. delay	21.4		Intersection LOS				C	

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INPUT WORKSHEET

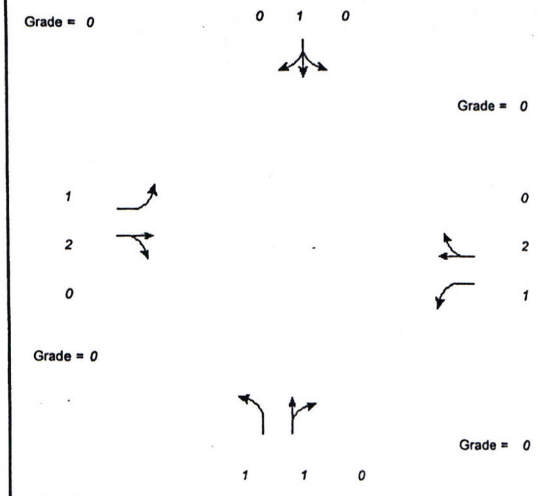
General Information

Analyst	C. Maruoka
Agency or Co.	PBQ&D
Date Performed	9/19/2002
Time Period	PM Peak Hour (2010 Base)

Site Information

Intersection	Geiger Rd/Launahele St
Area Type	All other areas
Jurisdiction	Honolulu
Analysis Year	2002

Intersection Geometry



Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (vph)	113	420	43	79	528	69	28	10	39	160	13	117
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup lost time	2.0	2.0		2.0	2.0		2.0	2.0			2.0	
Ext. eff. green	2.0	2.0		2.0	2.0		2.0	2.0			2.0	
Arrival type	3	3		3	3		3	3			3	
Ped volume		0			0			0			0	
Bicycle volume		0			0			0			0	
Parking (Y or N)	N		N	N		N	N		N	N		N
Parking/hr												
Bus stops/hr	0	0		0	0		0	0			0	
Ped timing		0.0			0.0			3.0			0.0	

	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 27.0	G =	G =	G =	G = 25.0	G =	G =	G =
	Y = 3.0	Y =	Y =	Y =	Y = 3.0	Y =	Y =	Y =

Duration of Analysis (hrs) = 1.00 Cycle Length C = 60.0

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CAPACITY AND LOS WORKSHEET

General Information

Project Description *Ewa Gentry Makai (Year 2010 Base PM Peak) Geiger/Launahele*

Capacity Analysis

	EB		WB		NB		SB
Lane group	L	TR	L	TR	L	TR	LTR
Adj. flow rate	113	463	79	597	28	49	290
Satflow rate	721	3560	883	3547	1125	1673	1443
Lost time	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Green ratio	0.45	0.45	0.45	0.45	0.42	0.42	0.42
Lane group cap.	324	1602	397	1596	469	697	601
v/c ratio	0.35	0.29	0.20	0.37	0.06	0.07	0.48
Flow ratio	0.16	0.13	0.09	0.17	0.02	0.03	0.20
Crit. lane group	N	N	N	Y	N	N	Y
Sum flow ratios	0.37						
Lost time/cycle	8.00						
Critical v/c ratio	0.43						

Lane Group Capacity, Control Delay, and LOS Determination

	EB		WB		NB		SB
Lane group	L	TR	L	TR	L	TR	LTR
Adj. flow rate	113	463	79	597	28	49	290
Lane group cap.	324	1602	397	1596	469	697	601
v/c ratio	0.35	0.29	0.20	0.37	0.06	0.07	0.48
Green ratio	0.45	0.45	0.45	0.45	0.42	0.42	0.42
Unif. delay d1	10.8	10.4	10.0	10.9	10.5	10.5	12.8
Delay factor k	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Increm. delay d2	0.7	0.1	0.2	0.1	0.1	0.0	0.6
PF factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Control delay	11.4	10.5	10.2	11.1	10.5	10.6	13.4
Lane group LOS	B	B	B	B	B	B	B
Apprch. delay	10.7		11.0		10.5		13.4
Approach LOS	B		B		B		B
Intersec. delay	11.3		Intersection LOS				B

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INPUT WORKSHEET

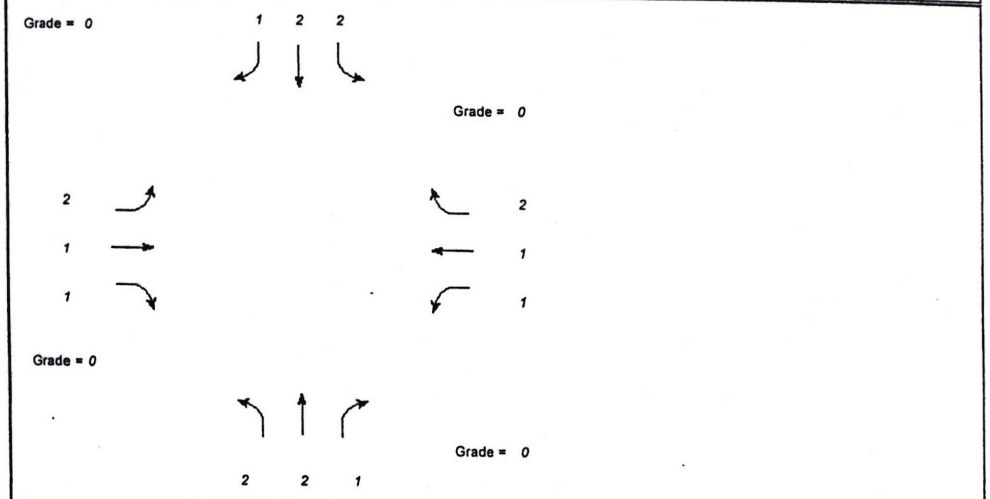
General Information

Analyst	C. Maruoka
Agency or Co.	PBQ&D
Date Performed	9/19/2002
Time Period	PM Peak Hour (2010 Base)

Site Information

Intersection	Fort Weaver/Geiger (Iroquois)
Area Type	All other areas
Jurisdiction	Honolulu
Analysis Year	2002

Intersection Geometry



Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (vph)	196	280	143	48	230	194	128	823	65	349	1173	318
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup lost time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Ext. eff. green	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Arrival type	3	3	3	3	3	3	3	3	3	3	3	3
Ped volume	0			0			0			0		
Bicycle volume	0						0			0		
Parking (Y or N)	N		N	N		N	N		N	N		N
Parking/hr												
Bus stops/hr	0	0	0	0	0	0	0	0	0	0	0	0
Ped timing	0.0			0.0			3.0			0.0		

	EB Only	WB Only	03	04	Excl. Left	SB Only	Thru & RT	08
Timing	G = 20.0	G = 18.0	G =	G =	G = 8.0	G = 6.0	G = 28.0	G =
	Y = 3.0	Y = 3.0	Y =	Y =	Y = 3.0	Y = 3.0	Y = 3.0	Y =

Duration of Analysis (hrs) = 1.00 — Cycle Length C = 100.0

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CAPACITY AND LOS WORKSHEET

General Information

Project Description Ewa Gentry Makai (Year 2010 Base PM Peak) Geiger/Ft Weaver

Capacity Analysis

	EB			WB			NB			SB		
Lane group	L	T	R	L	T	R	L	T	R	L	T	R
Adj. flow rate	196	280	143	48	230	194	128	823	65	349	1173	318
Satflow rate	3502	1900	1615	1805	1900	2842	3502	3610	1615	3502	3610	1615
Lost time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Green ratio	0.20	0.20	0.28	0.18	0.18	0.40	0.08	0.28	0.46	0.18	0.38	0.62
Lane group cap.	700	380	452	325	342	1137	280	1011	743	630	1372	1001
v/c ratio	0.28	0.74	0.32	0.15	0.67	0.17	0.46	0.81	0.09	0.55	0.85	0.32
Flow ratio	0.06	0.15	0.09	0.03	0.12	0.07	0.04	0.23	0.04	0.10	0.32	0.20
Crit. lane group	N	Y	N	N	Y	N	Y	N	N	N	Y	N
Sum flow ratios	0.63											
Lost time/cycle	16.00											
Critical v/c ratio	0.75											

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Lane group	L	T	R	L	T	R	L	T	R	L	T	R
Adj. flow rate	196	280	143	48	230	194	128	823	65	349	1173	318
Lane group cap.	700	380	452	325	342	1137	280	1011	743	630	1372	1001
v/c ratio	0.28	0.74	0.32	0.15	0.67	0.17	0.46	0.81	0.09	0.55	0.85	0.32
Green ratio	0.20	0.20	0.28	0.18	0.18	0.40	0.08	0.28	0.46	0.18	0.38	0.62
Unif. delay d1	33.9	37.5	28.4	34.5	38.3	19.3	43.9	33.6	15.2	37.3	28.5	9.0
Delay factor k	0.11	0.29	0.11	0.11	0.24	0.11	0.11	0.35	0.11	0.15	0.39	0.11
Increm. delay d2	0.2	7.7	0.4	0.2	5.2	0.1	1.2	5.4	0.1	1.1	5.9	0.2
PF factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Control delay	34.1	45.2	28.8	34.7	43.5	19.4	45.1	39.0	15.2	38.4	34.3	9.2
Lane group LOS	C	D	C	C	D	B	D	D	B	D	C	A
Apprch. delay	37.9			32.7			38.3			30.8		
Approach LOS	D			C			D			C		
Intersec. delay	34.0			Intersection LOS						C		

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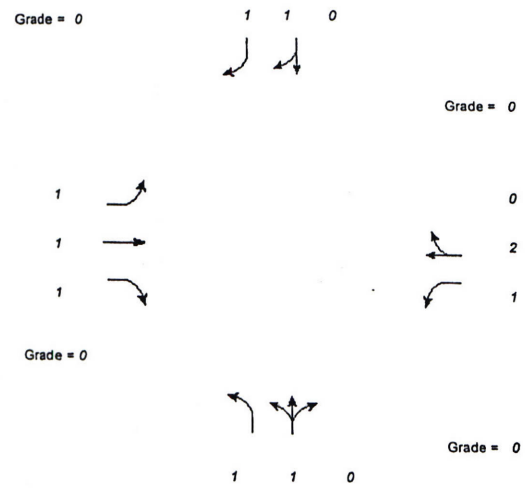
INPUT WORKSHEET

General Information		Site Information	
Analyst	C. Maruoka	Intersection	Iroquois Pt. Rd.
Agency or Co.	PBQ&D	Area Type	All other areas
Date Performed	9/19/2002	Jurisdiction	Honolulu
Time Period	PM Peak Hour (2010 Base)	Analysis Year	2002

Intersection Geometry



Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (vph)	147	169	378	0	140	21	208	32	0	14	14	124
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup lost time	2.0	2.0	2.0	2.0	2.0		2.0	2.0			2.0	2.0
Ext. eff. green	2.0	2.0	2.0	2.0	2.0		2.0	2.0			2.0	2.0
Arrival type	3	3	3	3	3		3	3			3	3
Ped volume		0			0			0			0	
Bicycle volume		0			0							
Parking (Y or N)	N		N	N		N	N		N	N		N
Parking/hr												
Bus stops/hr	0	0	0	0	0		0	0			0	0
Ped timing		0.0			0.0			3.0			0.0	

	Excl. Left	EB Only	Thru & RT	04	NB Only	SB Only	07	08
Timing	G = 10.0	G = 12.0	G = 12.0	G =	G = 20.0	G = 10.0	G =	G =
	Y = 0.0	Y = 3.0	Y = 3.0	Y =	Y = 3.0	Y = 3.0	Y =	Y =

Duration of Analysis (hrs) = 1.00 — Cycle Length C = 80.0

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CAPACITY AND LOS WORKSHEET

General Information

Project Description Ewa Gentry Makai (Year 2010 Base PM Peak) Iroquois/Keaunui

Capacity Analysis

	EB			WB			NB			SB	
Lane group	L	T	R	L	TR		L	LTR		LT	R
Adj. flow rate	147	169	378	0	161		208	32		28	124
Satflow rate	1805	1900	1615	1805	3539		1805	1900		1854	1615
Lost time	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0
Green ratio	0.28	0.35	0.82	0.13	0.15		0.25	0.25		0.13	0.65
Lane group cap.	496	665	1332	226	531		451	475		232	1050
v/c ratio	0.30	0.25	0.28	0.00	0.30		0.46	0.07		0.12	0.12
Flow ratio	0.08	0.09	0.23	0.00	0.05		0.12	0.02		0.02	0.08
Crit. lane group	Y	N	N	N	Y		Y	N		Y	N
Sum flow ratios	0.26										
Lost time/cycle	16.00										
Critical v/c ratio	0.32										

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB	
Lane group	L	T	R	L	TR		L	LTR		LT	R
Adj. flow rate	147	169	378	0	161		208	32		28	124
Lane group cap.	496	665	1332	226	531		451	475		232	1050
v/c ratio	0.30	0.25	0.28	0.00	0.30		0.46	0.07		0.12	0.12
Green ratio	0.28	0.35	0.82	0.13	0.15		0.25	0.25		0.13	0.65
Unif. delay d1	22.9	18.5	1.6	30.6	30.3		25.4	22.9		31.1	5.3
Delay factor k	0.11	0.11	0.11	0.11	0.11		0.11	0.11		0.11	0.11
Increm. delay d2	0.3	0.2	0.1	0.0	0.3		0.8	0.1		0.2	0.1
PF factor	1.000	1.000	1.000	1.000	1.000		1.000	1.000		1.000	1.000
Control delay	23.2	18.8	1.7	30.6	30.6		26.2	22.9		31.3	5.4
Lane group LOS	C	B	A	C	C		C	C		C	A
Apprch. delay	10.4			30.6			25.8			10.1	
Approach LOS	B			C			C			B	
Intersec. delay	15.9			Intersection LOS						B	

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INPUT WORKSHEET

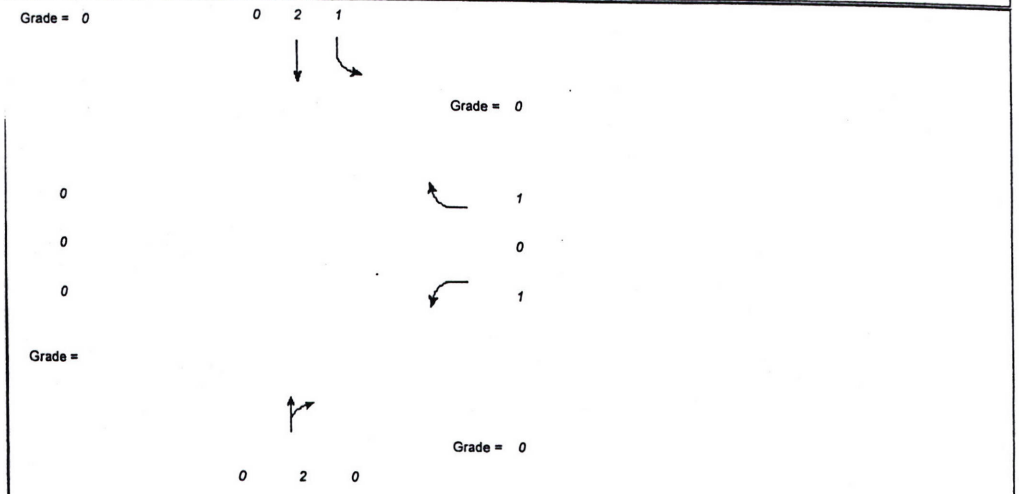
General Information

Analyst	C. Maruoka
Agency or Co.	PBQ&D
Date Performed	9/19/2002
Time Period	PM Peak Hour (2010 Base)

Site Information

Intersection	Kapolei Pkwy/Keaunui Dr
Area Type	All other areas
Jurisdiction	Honolulu
Analysis Year	2002

Intersection Geometry



Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (vph)				10		167		225	11	108	292	
% Heavy veh				0		0		0	0	0	0	
PHF				0.90		0.90		0.90	0.90	0.90	0.90	
Actuated (P/A)				A		A		A	A	A	A	
Startup lost time				2.0		2.0		2.0		2.0	2.0	
Ext. eff. green				2.0		2.0		2.0		2.0	2.0	
Arrival type				3		3		3		3	3	
Ped volume		0			0			0				
Bicycle volume								0				
Parking (Y or N)	N		N	N		N	N		N	N		N
Parking/hr												
Bus stops/hr				0		0		0		0	0	
Ped timing		0.0			0.0			3.0			0.0	

	WB Only	02	03	04	SB Only	Thru & RT	07	08
Timing	G = 10.0	G =	G =	G =	G = 10.0	G = 29.0	G =	G =
	Y = 3.0	Y =	Y =	Y =	Y = 3.0	Y = 3.0	Y =	Y =

Duration of Analysis (hrs) = 1.00 | Cycle Length C = 60.0

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CAPACITY AND LOS WORKSHEET

General Information

Project Description *Ewa Gentry Makai (Year2010 Base PM)Kapolei Pkwy/Keaunui Dr*

Capacity Analysis

	EB	WB		NB	SB	
Lane group		L	R	TR	L	T
Adj. flow rate		11	186	262	120	324
Satflow rate		1805	1615	3585	1805	3610
Lost time		2.0	2.0	2.0	2.0	2.0
Green ratio		0.17	0.40	0.48	0.17	0.70
Lane group cap.		301	646	1733	301	2527
v/c ratio		0.04	0.29	0.15	0.40	0.13
Flow ratio		0.01	0.12	0.07	0.07	0.09
Crit. lane group		N	Y	Y	N	N
Sum flow ratios	0.19					
Lost time/cycle	7.00					
Critical v/c ratio	0.21					

Lane Group Capacity, Control Delay, and LOS Determination

	EB	WB		NB	SB	
Lane group		L	R	TR	L	T
Adj. flow rate		11	186	262	120	324
Lane group cap.		301	646	1733	301	2527
v/c ratio		0.04	0.29	0.15	0.40	0.13
Green ratio		0.17	0.40	0.48	0.17	0.70
Unif. delay d1		21.0	12.2	8.6	22.3	3.0
Delay factor k		0.11	0.11	0.11	0.11	0.11
Increm. delay d2		0.0	0.2	0.0	0.9	0.0
PF factor		1.000	1.000	1.000	1.000	1.000
Control delay		21.0	12.5	8.7	23.2	3.0
Lane group LOS		C	B	A	C	A
Apprch. delay		12.9		8.7	8.4	
Approach LOS		B		A	A	
Intersec. delay	9.5	Intersection LOS			A	

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INPUT WORKSHEET

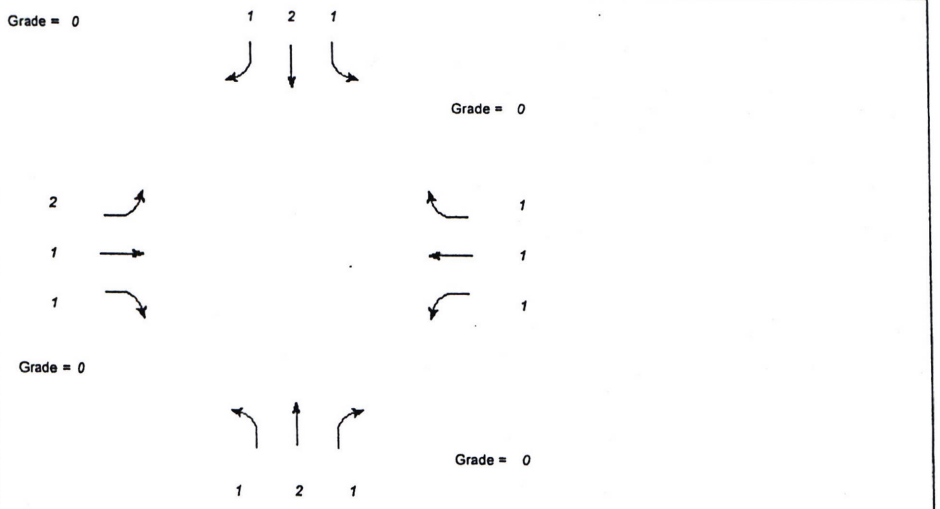
General Information

Analyst	C. Maruoka
Agency or Co.	PBQ&D
Date Performed	9/19/2002
Time Period	PM Peak Hour (2010 Base)

Site Information

Intersection	Fort Weaver Rd/Keaunui Dr
Area Type	All other areas
Jurisdiction	Honolulu
Analysis Year	2002

Intersection Geometry



Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (vph)	138	26	60	46	0	9	89	869	62	14	1197	153
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup lost time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Ext. eff. green	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Arrival type	3	3	3	3	3	3	3	3	3	3	3	3
Ped volume		0			0			0			0	
Bicycle volume		0			0			0			0	
Parking (Y or N)	N		N	N		N	N		N	N		N
Parking/hr												
Bus stops/hr	0	0	0	0	0	0	0	0	0	0	0	0
Ped timing		0.0			0.0			3.0			0.0	

	Excl. Left	Thru & RT	03	04	Excl. Left	Thru & RT	07	08
Timing	G = 13.0	G = 16.0	G =	G =	G = 18.0	G = 37.0	G =	G =
	Y = 3.0	Y = 3.0	Y =	Y =	Y = 3.0	Y = 3.0	Y =	Y =

Duration of Analysis (hrs) = 1.00 Cycle Length C = 100.0

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CAPACITY AND LOS WORKSHEET

General Information

Project Description Ewa Gentry Makai (Year 2010 Base PM Peak) Ft Weaver/Keaunui

Capacity Analysis

	EB			WB			NB			SB		
Lane group	L	T	R	L	T	R	L	T	R	L	T	R
Adj. flow rate	138	26	60	46	0	9	89	869	62	14	1197	153
Satflow rate	3502	1900	1615	1805	1900	1615	1805	3610	1615	1805	3610	1615
Lost time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Green ratio	0.13	0.16	0.38	0.13	0.16	0.38	0.18	0.37	0.54	0.18	0.37	0.54
Lane group cap.	455	304	614	235	304	614	325	1336	872	325	1336	872
v/c ratio	0.30	0.09	0.10	0.20	0.00	0.01	0.27	0.65	0.07	0.04	0.90	0.18
Flow ratio	0.04	0.01	0.04	0.03	0.00	0.01	0.05	0.24	0.04	0.01	0.33	0.09
Crit. lane group	Y	Y	N	N	N	N	Y	N	N	N	Y	N
Sum flow ratios	0.43											
Lost time/cycle	16.00											
Critical v/c ratio	0.52											

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Lane group	L	T	R	L	T	R	L	T	R	L	T	R
Adj. flow rate	138	26	60	46	0	9	89	869	62	14	1197	153
Lane group cap.	455	304	614	235	304	614	325	1336	872	325	1336	872
v/c ratio	0.30	0.09	0.10	0.20	0.00	0.01	0.27	0.65	0.07	0.04	0.90	0.18
Green ratio	0.13	0.16	0.38	0.13	0.16	0.38	0.18	0.37	0.54	0.18	0.37	0.54
Unif. delay d1	39.4	35.8	20.0	38.8	35.3	19.3	35.4	26.1	11.0	33.9	29.7	11.7
Delay factor k	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.23	0.11	0.11	0.42	0.11
Increm. delay d2	0.4	0.1	0.1	0.4	0.0	0.0	0.5	1.1	0.0	0.1	9.3	0.1
PF factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Control delay	39.8	35.9	20.0+	39.2	35.3	19.3	35.8	27.3	11.0	33.9	38.9	11.8
Lane group LOS	D	D	C	D	D	B	D	C	B	C	D	B
Apprch. delay	34.0			36.0			27.0			35.8		
Approach LOS	C			D			C			D		
Intersec. delay	32.3			Intersection LOS						C		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	C. Maruoka
Agency/Co.	PBQ&D
Date Performed	9/19/2002
Analysis Time Period	PM Peak Hour (2010 Base)

Site Information

Intersection	Kapolei Pkwy/Ent. A
Jurisdiction	Honolulu
Analysis Year	2002
Project ID	Ewa Gentry Makai (Year 2010 Base PM Peak) Kapolei Pkwy/Ent A

East/West Street: *Entrance A*
Intersection Orientation: *North-South*
North/South Street: *Kapolei Parkway*
Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	20	388	9	37	397	40
Peak-Hour Factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83
Hourly Flow Rate, HFR	24	467	10	44	478	48
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	2	0	1	2	0
Configuration	L	T	TR	L	T	TR
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	8	0	22	9	0	29
Peak-Hour Factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83
Hourly Flow Rate, HFR	9	0	26	10	0	34
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	1	0	1	1
Configuration	LT		R	LT		R

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L	LT		R	LT		R
v (vph)	24	44	9		26	10		34
C (m) (vph)	1051	1096	235		769	228		742
v/c	0.02	0.04	0.04		0.03	0.04		0.05
95% queue length	0.07	0.13	0.12		0.10	0.14		0.14
Control Delay	8.5	8.4	20.9		9.8	21.5		10.1
LOS	A	A	C		A	C		B
Approach Delay	--	--	12.7			12.7		
Approach LOS	--	--	B			B		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	C. Maruoka
Agency/Co.	PBQ&D
Date Performed	9/19/2002
Analysis Time Period	PM Peak Hour (2010 Base)

Site Information

Intersection	Kapolei/Ent. B
Jurisdiction	Honolulu
Analysis Year	2002
Project ID	Ewa Gentry Makai (Year 2010 Base PM Peak) Kapolei Pkwy/Ent B

East/West Street: *Entrance B*
Intersection Orientation: *North-South*
North/South Street: *Kapolei Parkway*
Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	20	390	45	3	394	55
Peak-Hour Factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83
Hourly Flow Rate, HFR	24	469	0	0	474	66
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	2	0	0	2	0
Configuration	L	T			T	TR
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	50	0	40	9	0	21
Peak-Hour Factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83
Hourly Flow Rate, HFR	0	0	0	10	0	25
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	1	0	1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L					L		R
v (vph)	24					10		25
C (m) (vph)	1039					324		734
v/c	0.02					0.03		0.03
95% queue length	0.07					0.10		0.11
Control Delay	8.5					16.5		10.1
LOS	A					C		B
Approach Delay	--	--				11.9		
Approach LOS	--	--				B		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	C. Maruoka
Agency/Co.	PBQ&D
Date Performed	9/19/2002
Analysis Time Period	PM Peak Hour (2010 Base)

Site Information

Intersection	Geiger Rd/ Ent C
Jurisdiction	Honolulu
Analysis Year	2002
Project ID	Ewa Gentry Makai (Year 2010 Base PM Peak)Geiger Rd/Ent C

East/West Street: *Entrance C*
North/South Street: *Geiger Road*
Intersection Orientation: *East-West*
Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	16	467	11	229	290	31
Peak-Hour Factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Hourly Flow Rate, HFR	0	530	12	260	329	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Raised curb					
RT Channelized			0			0
Lanes	0	1	0	1	1	0
Configuration			TR	L	T	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	6	597	123	12	436	8
Peak-Hour Factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Hourly Flow Rate, HFR	6	0	139	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		1			1	
RT Channelized			0			0
Lanes	1	0	1	0	0	0
Configuration	L		R			

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L	L		R			
v (vph)		260	6		139			
C (m) (vph)		1037	236		549			
v/c		0.25	0.03		0.25			
95% queue length		1.00	0.08		1.01			
Control Delay		9.6	20.7		13.8			
LOS		A	C		B			
Approach Delay	--	--	14.1					
Approach LOS	--	--	B					

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INPUT WORKSHEET

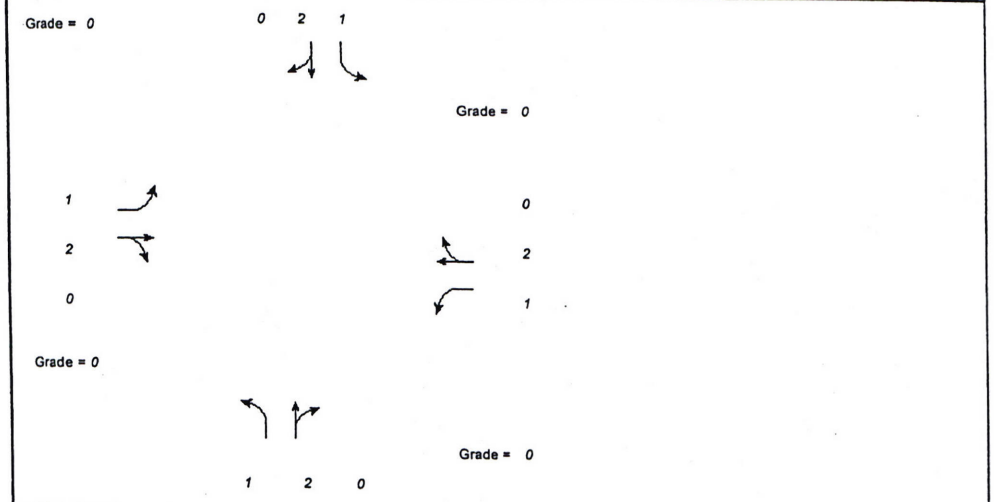
General Information

Analyst	C. Maruoka
Agency or Co.	PBQ&D
Date Performed	5/13/2002
Time Period	AM Peak Hour (2010 Total)

Site Information

Intersection	Geiger Rd/Kapolei Pkwy
Area Type	All other areas
Jurisdiction	Honolulu
Analysis Year	2002

Intersection Geometry



Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (vph)	126	388	104	23	422	301	87	594	5	228	329	174
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup lost time	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Ext. eff. green	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Arrival type	3	3		3	3		3	3		3	3	
Ped volume	0			0			0			0		
Bicycle volume							0			0		
Parking (Y or N)	N		N	N		N	N		N	N		N
Parking/hr												
Bus stops/hr	0	0		0	0		0	0		0	0	
Ped timing	0.0			0.0			3.0			0.0		

	Excl. Left	EW Perm	03	04	Excl. Left	NS Perm	07	08
Timing	G = 8.0	G = 24.0	G =	G =	G = 8.0	G = 24.0	G =	G =
	Y = 3.0	Y = 3.0	Y =	Y =	Y = 3.0	Y = 3.0	Y =	Y =

Duration of Analysis (hrs) = 1.00 Cycle Length C = 80.0

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CAPACITY AND LOS WORKSHEET

General Information

Project Description *Ewa Gentry Makai (Year 2010 Total AM Peak) Geiger/Kapolei*

Capacity Analysis

	EB		WB		NB		SB	
Lane group	L	TR	L	TR	L	TR	L	TR
Adj. flow rate	140	547	26	803	97	666	253	559
Satflow rate	1805	3495	1805	3385	1805	3605	1805	3423
Lost time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Green ratio	0.45	0.30	0.45	0.30	0.45	0.30	0.45	0.30
Lane group cap.	298	1049	377	1016	372	1082	330	1027
v/c ratio	0.47	0.52	0.07	0.79	0.26	0.62	0.77	0.54
Flow ratio		0.16		0.24		0.18		0.16
Crit. lane group	N	N	N	N	N	N	N	N
Sum flow ratios	0.61							
Lost time/cycle	16.00							
Critical v/c ratio	0.76							

Lane Group Capacity, Control Delay, and LOS Determination

	EB		WB		NB		SB	
Lane group	L	TR	L	TR	L	TR	L	TR
Adj. flow rate	140	547	26	803	97	666	253	559
Lane group cap.	298	1049	377	1016	372	1082	330	1027
v/c ratio	0.47	0.52	0.07	0.79	0.26	0.62	0.77	0.54
Green ratio	0.45	0.30	0.45	0.30	0.45	0.30	0.45	0.30
Unif. delay d1	15.4	23.2	13.0	25.7	13.6	24.0	15.8	23.4
Delay factor k	0.11	0.13	0.11	0.34	0.11	0.20	0.32	0.14
Increm. delay d2	1.2	0.5	0.1	4.4	0.4	1.1	11.1	0.6
PF factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Control delay	16.5	23.7	13.1	30.1	14.0	25.1	26.9	24.0
Lane group LOS	B	C	B	C	B	C	C	C
Apprch. delay	22.2		29.6		23.7		24.9	
Approach LOS	C		C		C		C	
Intersec. delay	25.3		Intersection LOS				C	

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INPUT WORKSHEET

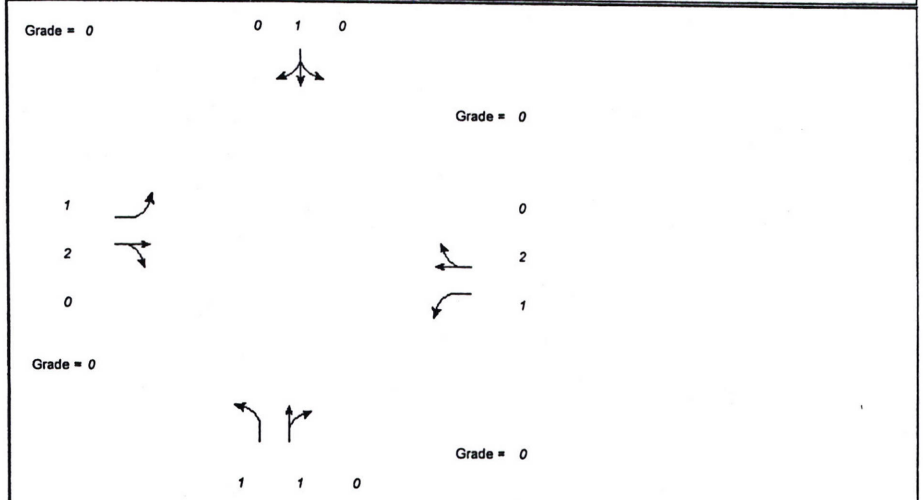
General Information

Analyst	C. Maruoka
Agency or Co.	PBQ&D
Date Performed	5/13/2002
Time Period	AM Peak Hour (2010 Total)

Site Information

Intersection	Geiger Rd/Launahele St
Area Type	All other areas
Jurisdiction	Honolulu
Analysis Year	2002

Intersection Geometry



Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (vph)	61	534	26	48	588	33	57	8	102	115	1	101
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup lost time	2.0	2.0		2.0	2.0		2.0	2.0			2.0	
Ext. eff. green	2.0	2.0		2.0	2.0		2.0	2.0			2.0	
Arrival type	3	3		3	3		3	3			3	
Ped volume		0			0			0			0	
Bicycle volume								0				
Parking (Y or N)	N		N	N		N	N		N	N		N
Parking/hr												
Bus stops/hr	0	0		0	0		0	0			0	
Ped timing	0.0			0.0			3.0			0.0		

	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 26.0	G =	G =	G =	G = 26.0	G =	G =	G =
	Y = 3.0	Y =	Y =	Y =	Y = 3.0	Y =	Y =	Y =

Duration of Analysis (hrs) = 1.00 Cycle Length C = 60.0

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CAPACITY AND LOS WORKSHEET

General Information

Project Description *Ewa Gentry Makai (Year 2010 Total AM Peak) Geiger/Launahele*

Capacity Analysis

	EB		WB		NB		SB
Lane group	L	TR	L	TR	L	TR	LTR
Adj. flow rate	68	622	53	690	63	122	241
Satflow rate	609	3585	682	3581	1181	1636	1396
Lost time	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Green ratio	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Lane group cap.	264	1554	296	1552	512	709	605
v/c ratio	0.26	0.40	0.18	0.44	0.12	0.17	0.40
Flow ratio	0.11	0.17	0.08	0.19	0.05	0.07	0.17
Crit. lane group	N	N	N	Y	N	N	Y
Sum flow ratios	0.37						
Lost time/cycle	8.00						
Critical v/c ratio	0.42						

Lane Group Capacity, Control Delay, and LOS Determination

	EB		WB		NB		SB
Lane group	L	TR	L	TR	L	TR	LTR
Adj. flow rate	68	622	53	690	63	122	241
Lane group cap.	264	1554	296	1552	512	709	605
v/c ratio	0.26	0.40	0.18	0.44	0.12	0.17	0.40
Green ratio	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Unif. delay d1	10.8	11.7	10.4	11.9	10.2	10.4	11.6
Delay factor k	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Increm. delay d2	0.5	0.2	0.3	0.2	0.1	0.1	0.4
PF factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Control delay	11.4	11.8	10.7	12.1	10.3	10.5	12.1
Lane group LOS	B	B	B	B	B	B	B
Apprch. delay	11.8		12.0		10.4		12.1
Approach LOS	B		B		B		B
Intersec. delay	11.8		Intersection LOS				B

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INPUT WORKSHEET

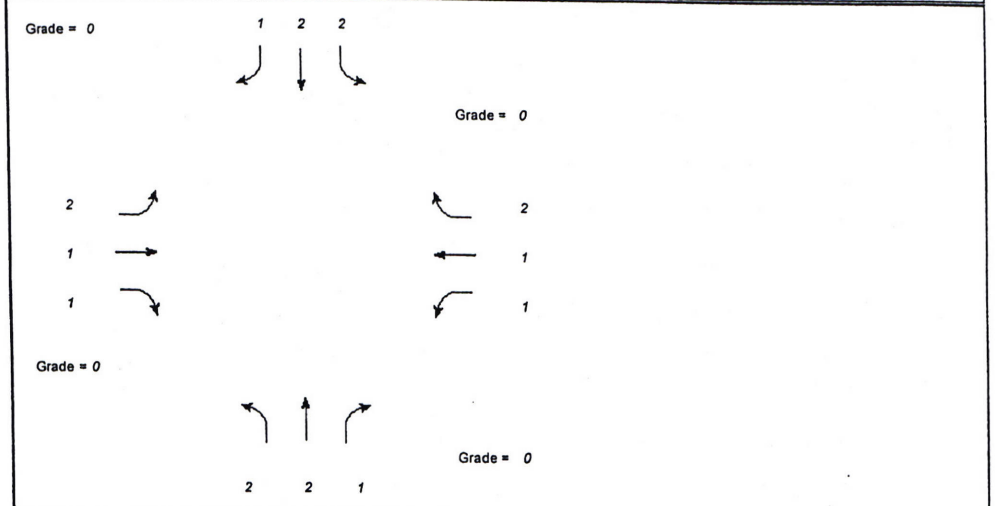
General Information

Analyst	C. Maruoka
Agency or Co.	PBQ&D
Date Performed	9/19/2002
Time Period	AM Peak Hour (2010 Total)

Site Information

Intersection	Ft Weaver Rd/Geiger (Iroquois)
Area Type	All other areas
Jurisdiction	Honolulu
Analysis Year	2002

Intersection Geometry



Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (vph)	500	131	120	119	291	285	181	1343	89	163	1090	197
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup lost time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Ext. eff. green	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Arrival type	3	3	3	3	3	3	3	3	3	3	3	3
Ped volume	0			0			0			0		
Bicycle volume							0			0		
Parking (Y or N)	N		N	N		N	N		N	N		N
Parking/hr												
Bus stops/hr	0	0	0	0	0	0	0	0	0	0	0	0
Ped timing	0.0			0.0			3.0			0.0		

	EB Only	WB Only	03	04	Excl. Left	Thru & RT	07	08
Timing	G = 18.0	G = 21.0	G =	G =	G = 8.0	G = 41.0	G =	G =
	Y = 3.0	Y = 3.0	Y =	Y =	Y = 0.0	Y = 3.0	Y =	Y =
Duration of Analysis (hrs) = 1.00						Cycle Length C = 100.0		

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CAPACITY AND LOS WORKSHEET

General Information

Project Description *Ewa Gentry Makai (Year 2010 Total AM Peak) Geiger/Ft Weaver*

Capacity Analysis

	EB			WB			NB			SB		
Lane group	L	T	R	L	T	R	L	T	R	L	T	R
Adj. flow rate	556	146	133	132	323	317	201	1492	99	181	1211	219
Satflow rate	3502	1900	1615	1805	1900	2842	3502	3610	1615	3502	3610	1615
Lost time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Green ratio	0.18	0.18	0.26	0.21	0.21	0.33	0.08	0.41	0.62	0.08	0.41	0.63
Lane group cap.	630	342	420	379	399	938	280	1480	1001	280	1480	1017
v/c ratio	0.88	0.43	0.32	0.35	0.81	0.34	0.72	1.01	0.10	0.65	0.82	0.22
Flow ratio	0.16	0.08	0.08	0.07	0.17	0.11	0.06	0.41	0.06	0.05	0.34	0.14
Crit. lane group	Y	N	N	N	Y	N	Y	Y	N	N	N	N
Sum flow ratios	0.80											
Lost time/cycle	12.00											
Critical v/c ratio	0.91											

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Lane group	L	T	R	L	T	R	L	T	R	L	T	R
Adj. flow rate	556	146	133	132	323	317	201	1492	99	181	1211	219
Lane group cap.	630	342	420	379	399	938	280	1480	1001	280	1480	1017
v/c ratio	0.88	0.43	0.32	0.35	0.81	0.34	0.72	1.01	0.10	0.65	0.82	0.22
Green ratio	0.18	0.18	0.26	0.21	0.21	0.33	0.08	0.41	0.62	0.08	0.41	0.63
Unif. delay d1	40.0	36.4	29.8	33.7	37.6	25.3	44.9	29.5	7.7	44.6	26.2	7.9
Delay factor k	0.41	0.11	0.11	0.11	0.35	0.11	0.28	0.50	0.11	0.22	0.36	0.11
Increm. delay d2	16.3	0.9	0.4	0.6	13.0	0.2	9.0	54.8	0.0	5.2	3.9	0.1
PF factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Control delay	56.2	37.3	30.3	34.2	50.6	25.5	53.9	84.3	7.7	49.9	30.1	8.0
Lane group LOS	E	D	C	C	D	C	D	F	A	D	C	A
Apprch. delay	48.8			37.5			76.7			29.3		
Approach LOS	D			D			E			C		
Intersec. delay	50.8			Intersection LOS						D		

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INPUT WORKSHEET

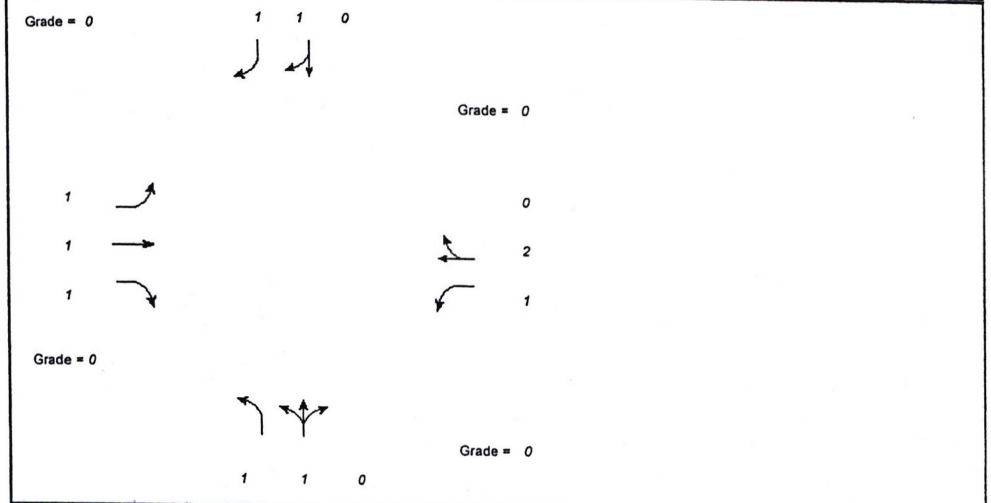
General Information

Analyst	*C. Maruoka*
Agency or Co.	*PBQ&D*
Date Performed	*9/19/2002*
Time Period	*AM Peak Hour (2010 Total)*

Site Information

Intersection	*Iroquois Pt Rd/Keaunui Rd*
Area Type	*All other areas*
Jurisdiction	*Honolulu*
Analysis Year	*2002*

Intersection Geometry



Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (vph)	162	108	113	0	141	59	317	72	5	18	37	237
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup lost time	2.0	2.0	2.0	2.0	2.0		2.0	2.0			2.0	2.0
Ext. eff. green	2.0	2.0	2.0	2.0	2.0		2.0	2.0			2.0	2.0
Arrival type	3	3	3	3	3		3	3			3	3
Ped volume	0			0			0			0		
Bicycle volume										0		
Parking (Y or N)	N		N	N		N	N		N	N		N
Parking/hr												
Bus stops/hr	0	0	0	0	0		0	0			0	0
Ped timing	0.0			0.0			3.0			0.0		

	Excl. Left	EB Only	Thru & RT	04	NB Only	SB Only	07	08
Timing	G = 8.0	G = 10.0	G = 10.0	G =	G = 20.0	G = 16.0	G =	G =
	Y = 0.0	Y = 3.0	Y = 3.0	Y =	Y = 3.0	Y = 3.0	Y =	Y =

Duration of Analysis (hrs) = 1.00 Cycle Length C = 80.0

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CAPACITY AND LOS WORKSHEET

General Information

Project Description *Ewa Gentry Makai (Year 2010 Total AM Peak) Iroquois/Keaunui*

Capacity Analysis

	EB			WB		NB		SB	
Lane group	L	T	R	L	TR	L	LTR	LT	R
Adj. flow rate	180	120	126	0	223	352	86	61	263
Satflow rate	1805	1900	1615	1805	3450	1805	1880	1869	1615
Lost time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Green ratio	0.22	0.30	0.60	0.10	0.13	0.25	0.25	0.20	0.47
Lane group cap.	406	570	969	181	431	451	470	374	767
v/c ratio	0.44	0.21	0.13	0.00	0.52	0.78	0.18	0.16	0.34
Flow ratio	0.10	0.06	0.08	0.00	0.06	0.20	0.05	0.03	0.16
Crit. lane group	N	N	N	N	Y	Y	N	N	Y
Sum flow ratios	0.42								
Lost time/cycle	12.00								
Critical v/c ratio	0.50								

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB		NB		SB	
Lane group	L	T	R	L	TR	L	LTR	LT	R
Adj. flow rate	180	120	126	0	223	352	86	61	263
Lane group cap.	406	570	969	181	431	451	470	374	767
v/c ratio	0.44	0.21	0.13	0.00	0.52	0.78	0.18	0.16	0.34
Green ratio	0.22	0.30	0.60	0.10	0.13	0.25	0.25	0.20	0.47
Unif. delay d1	26.7	20.9	6.9	32.4	32.7	28.0	23.6	26.5	13.2
Delay factor k	0.11	0.11	0.11	0.11	0.12	0.33	0.11	0.11	0.11
Increm. delay d2	0.8	0.2	0.1	0.0	1.1	9.1	0.2	0.2	0.3
PF factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Control delay	27.5	21.1	7.0	32.4	33.8	37.1	23.8	26.7	13.4
Lane group LOS	C	C	A	C	C	D	C	C	B
Apprch. delay	19.6			33.8		34.5		15.9	
Approach LOS	B			C		C		B	
Intersec. delay	25.6			Intersection LOS				C	

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INPUT WORKSHEET

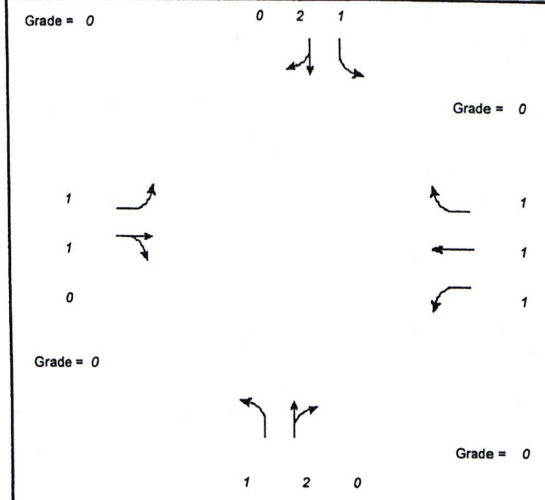
General Information

Analyst	C. Maruoka
Agency or Co.	PBQ&D
Date Performed	9/19/2002
Time Period	AM Peak Hour (2010 Total)

Site Information

Intersection	Kapolei Pkwy/Keaunui Dr
Area Type	All other areas
Jurisdiction	Honolulu
Analysis Year	2002

Intersection Geometry



Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (vph)	54	82	21	72	78	259	28	310	77	289	304	53
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup lost time	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Ext. eff. green	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Arrival type	3	3		3	3	3	3	3		3	3	
Ped volume	0			0			0			0		
Bicycle volume	0			0			0			0		
Parking (Y or N)	N		N	N		N	N		N	N		N
Parking/hr												
Bus stops/hr	0	0		0	0	0	0	0		0	0	
Ped timing	0.0			0.0			3.0			0.0		

	Excl. Left	Thru & RT	03	04	Excl. Left	Thru & RT	07	08
Timing	G = 10.0	G = 15.0	G =	G =	G = 25.0	G = 25.0	G =	G =
	Y = 3.0	Y = 3.0	Y =	Y =	Y = 3.0	Y = 3.0	Y =	Y =
Duration of Analysis (hrs) = 1.00						Cycle Length C = 90.0		

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CAPACITY AND LOS WORKSHEET

General Information

Project Description *Ewa Gentry Makai (Year2010 Total AM)Kapolei Pkwy/Keaunui Dr*

Capacity Analysis

	EB			WB			NB			SB	
Lane group	L	TR		L	T	R	L	TR		L	TR
Adj. flow rate	60	114		80	87	288	31	430		321	397
Satflow rate	1805	1842		1805	1900	1615	1805	3502		1805	3530
Lost time	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0
Green ratio	0.11	0.17		0.11	0.17	0.49	0.28	0.28		0.28	0.28
Lane group cap.	201	307		201	317	790	501	973		501	981
v/c ratio	0.30	0.37		0.40	0.27	0.36	0.06	0.44		0.64	0.40
Flow ratio	0.03	0.06		0.04	0.05	0.18	0.02	0.12		0.18	0.11
Crit. lane group	N	Y		Y	N	N	N	Y		Y	N
Sum flow ratios	0.41										
Lost time/cycle	15.00										
Critical v/c ratio	0.49										

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB	
Lane group	L	TR		L	T	R	L	TR		L	TR
Adj. flow rate	60	114		80	87	288	31	430		321	397
Lane group cap.	201	307		201	317	790	501	973		501	981
v/c ratio	0.30	0.37		0.40	0.27	0.36	0.06	0.44		0.64	0.40
Green ratio	0.11	0.17		0.11	0.17	0.49	0.28	0.28		0.28	0.28
Unif. delay d1	36.8	33.3		37.2	32.7	14.3	23.9	26.8		28.6	26.4
Delay factor k	0.11	0.11		0.11	0.11	0.11	0.11	0.11		0.22	0.11
Increm. delay d2	0.8	0.8		1.3	0.5	0.3	0.1	0.3		2.8	0.3
PF factor	1.000	1.000		1.000	1.000	1.000	1.000	1.000		1.000	1.000
Control delay	37.6	34.1		38.5	33.2	14.6	23.9	27.1		31.4	26.7
Lane group LOS	D	C		D	C	B	C	C		C	C
Apprch. delay	35.3			22.4			26.9			28.8	
Approach LOS	D			C			C			C	
Intersec. delay	27.3			Intersection LOS						C	

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INPUT WORKSHEET

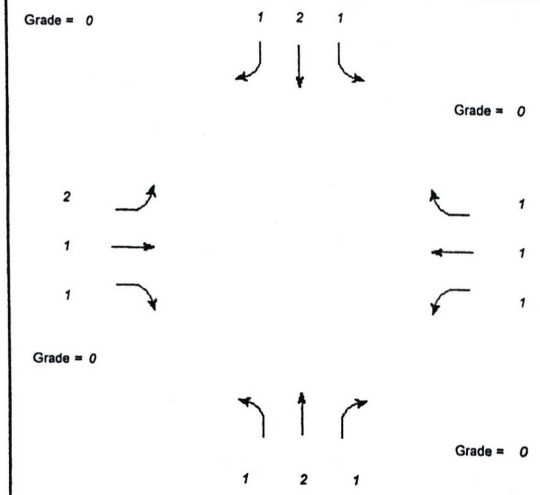
General Information

Analyst	C. Maruoka
Agency or Co.	PBQ&D
Date Performed	9/19/2002
Time Period	AM Peak Hour (2010 Total)

Site Information

Intersection	Fort Weaver Rd/Keaunui Rd
Area Type	All other areas
Jurisdiction	Honolulu
Analysis Year	2002

Intersection Geometry



Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (vph)	310	93	57	134	166	62	58	1241	34	43	1049	237
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup lost time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Ext. eff. green	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Arrival type	3	3	3	3	3	3	3	3	3	3	3	3
Ped volume	0			0			0			0		
Bicycle volume	0			0			0			0		
Parking (Y or N)	N		N	N		N	N		N	N		N
Parking/hr												
Bus stops/hr	0	0	0	0	0	0	0	0	0	0	0	0
Ped timing	0.0			0.0			3.0			0.0		

	Excl. Left	Thru & RT	03	04	Excl. Left	Thru & RT	07	08
Timing	G = 14.0	G = 18.0	G =	G =	G = 12.0	G = 40.0	G =	G =
	Y = 3.0	Y = 3.0	Y =	Y =	Y = 3.0	Y = 3.0	Y =	Y =
Duration of Analysis (hrs) = 1.00						Cycle Length C = 100.0		

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CAPACITY AND LOS WORKSHEET

General Information

Project Description *Ewa Gentry Makai (Year 2010 Total AM Peak) Ft Weaver/Keaunui*

Capacity Analysis

	EB			WB			NB			SB		
Lane group	L	T	R	L	T	R	L	T	R	L	T	R
Adj. flow rate	344	103	63	149	184	69	64	1379	38	48	1166	263
Satflow rate	3502	1900	1615	1805	1900	1615	1805	3610	1615	1805	3610	1615
Lost time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Green ratio	0.14	0.18	0.34	0.14	0.18	0.34	0.12	0.40	0.58	0.12	0.40	0.58
Lane group cap.	490	342	549	253	342	549	217	1444	937	217	1444	937
v/c ratio	0.70	0.30	0.11	0.59	0.54	0.13	0.29	0.95	0.04	0.22	0.81	0.28
Flow ratio	0.10	0.05	0.04	0.08	0.10	0.04	0.04	0.38	0.02	0.03	0.32	0.16
Crit. lane group	Y	N	N	N	Y	N	Y	Y	N	N	N	N
Sum flow ratios	0.61											
Lost time/cycle	16.00											
Critical v/c ratio	0.73											

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Lane group	L	T	R	L	T	R	L	T	R	L	T	R
Adj. flow rate	344	103	63	149	184	69	64	1379	38	48	1166	263
Lane group cap.	490	342	549	253	342	549	217	1444	937	217	1444	937
v/c ratio	0.70	0.30	0.11	0.59	0.54	0.13	0.29	0.95	0.04	0.22	0.81	0.28
Green ratio	0.14	0.18	0.34	0.14	0.18	0.34	0.12	0.40	0.58	0.12	0.40	0.58
Unif. delay d1	41.0	35.5	22.7	40.3	37.2	22.8	40.1	29.1	9.0	39.8	26.6	10.5
Delay factor k	0.27	0.11	0.11	0.18	0.14	0.11	0.11	0.46	0.11	0.11	0.35	0.11
Increm. delay d2	4.6	0.5	0.1	3.6	1.7	0.1	0.8	19.8	0.0	0.5	3.6	0.2
PF factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Control delay	45.6	36.0	22.8	43.9	38.9	22.9	40.9	48.9	9.1	40.3	30.2	10.7
Lane group LOS	D	D	C	D	D	C	D	D	A	D	C	B
Apprch. delay	40.9			38.0			47.5			27.1		
Approach LOS	D			D			D			C		
Intersec. delay	37.8			Intersection LOS						D		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*C. Maruoka*
Agency/Co.	*PBQ&D*
Date Performed	*9/19/2002*
Analysis Time Period	*AM Peak Hour (2010 Total)*

Site Information

Intersection	*Kapolei Pkwy/ Ent. A*
Jurisdiction	*Honolulu*
Analysis Year	*2002*
Project ID	*Ewa Gentry Makai (Year 2010 Total AM Peak)Kapolei Pkwy/Ent A*

East/West Street: *Entrance A* North/South Street: *Kapolei Parway*

Intersection Orientation: *North-South* Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	8	639	5	12	436	8
Peak-Hour Factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Hourly Flow Rate, HFR	9	726	5	13	495	9
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	2	0	1	2	0
Configuration	L	T	TR	L	T	TR
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	3	0	31	16	0	37
Peak-Hour Factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Hourly Flow Rate, HFR	3	0	35	18	0	42
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	1	0	1	1
Configuration	LT		R	LT		R

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L	LT		R	LT		R
v (vph)	9	13	3		35	18		42
C (m) (vph)	1071	883	180		637	217		754
v/c	0.01	0.01	0.02		0.05	0.08		0.06
95% queue length	0.03	0.04	0.05		0.17	0.27		0.18
Control Delay	8.4	9.1	25.3		11.0	23.1		10.1
LOS	A	A	D		B	C		B
Approach Delay	--	--	12.1			14.0		
Approach LOS	--	--	B			B		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	C. Maruoka
Agency/Co.	PBQ&D
Date Performed	9/19/2002
Analysis Time Period	AM Peak Hour (2010 Total)

Site Information

Intersection	Kapolei Pkwy/ Ent. B
Jurisdiction	Honolulu
Analysis Year	2002
Project ID	Ewa Gentry Makai (Year 2010 Total AM Peak)Kapolei Pkwy/Ent B

East/West Street: Entrance B
North/South Street: Kapolei Parway
Intersection Orientation: North-South
Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	11	589	11	3	463	10
Peak-Hour Factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Hourly Flow Rate, HFR	12	669	12	3	526	11
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	2	0	1	2	0
Configuration	L	T	TR	L	T	TR
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	95	0	40	18	0	38
Peak-Hour Factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Hourly Flow Rate, HFR	107	0	45	20	0	43
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	1	0	1	1
Configuration	LT		R	LT		R

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L	LT		R	LT		R
v (vph)	12	3	107		45	20		43
C (m) (vph)	1041	921	196		662	219		736
v/c	0.01	0.00	0.55		0.07	0.09		0.06
95% queue length	0.03	0.01	3.35		0.22	0.30		0.19
Control Delay	8.5	8.9	44.9		10.8	23.1		10.2
LOS	A	A	E		B	C		B
Approach Delay	--	--	34.8			14.3		
Approach LOS	--	--	D			B		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	C. Maruoka
Agency/Co.	PBQ&D
Date Performed	9/19/2002
Analysis Time Period	AM Peak Hour (2010 Total)

Site Information

Intersection	Geiger Rd/ Ent C
Jurisdiction	Honolulu
Analysis Year	2002
Project ID	Ewa Gentry Makai (Year 2010 Total AM Peak)Geiger Rd/Ent C

East/West Street: Entrance C
North/South Street: Geiger Road
Intersection Orientation: East-West
Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	16	309	6	102	581	31
Peak-Hour Factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Hourly Flow Rate, HFR	0	351	6	115	660	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Two Way Left Turn Lane					
RT Channelized			0			0
Lanes	0	1	0	1	1	0
Configuration			TR	L	T	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	16	597	309	12	436	8
Peak-Hour Factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Hourly Flow Rate, HFR	18	0	351	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		1			1	
RT Channelized			0			0
Lanes	1	0	1	0	0	0
Configuration	L		R			

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L	L		R			
v (vph)		115	18		351			
C (m) (vph)		1213	289		694			
v/c		0.09	0.06		0.51			
95% queue length		0.31	0.20		3.02			
Control Delay		8.3	18.3		15.5			
LOS		A	C		C			
Approach Delay	--	--	15.6					
Approach LOS	--	--	C					

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INPUT WORKSHEET

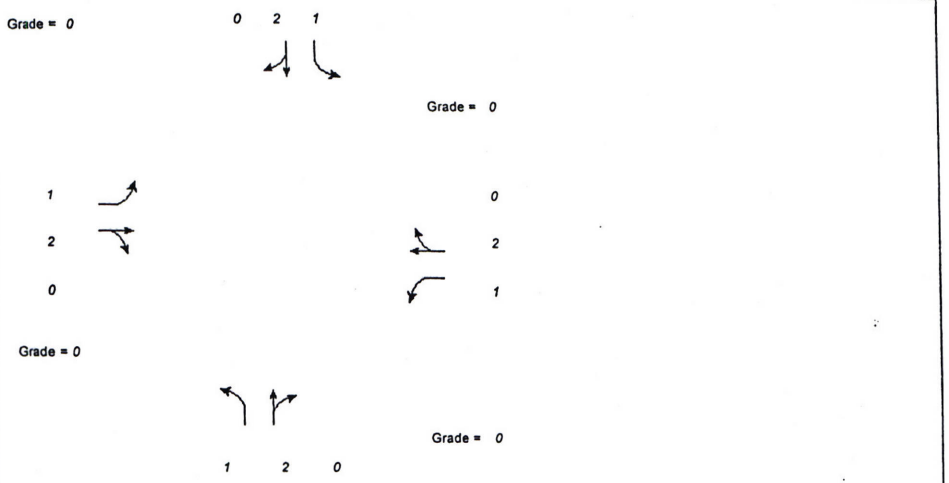
General Information

Analyst	C. Maruoka
Agency or Co.	PBQ&D
Date Performed	9/19/2002
Time Period	PM Peak Hour (2010 Total)

Site Information

Intersection	Geiger Rd/Kapolei Pkwy
Area Type	All other areas
Jurisdiction	Honolulu
Analysis Year	2002

Intersection Geometry



Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (vph)	186	342	125	137	351	334	120	463	35	232	514	159
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup lost time	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Ext. eff. green	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Arrival type	3	3		3	3		3	3		3	3	
Ped volume	0			0			0			0		
Bicycle volume	0			0			0			0		
Parking (Y or N)	N		N	N		N	N		N	N		N
Parking/hr												
Bus stops/hr	0	0		0	0		0	0		0	0	
Ped timing	0.0			0.0			3.0			0.0		

	Excl. Left	EW Perm	03	04	Excl. Left	NS Perm	07	08
Timing	G = 8.0	G = 24.0	G =	G =	G = 8.0	G = 24.0	G =	G =
	Y = 3.0	Y = 3.0	Y =	Y =	Y = 3.0	Y = 3.0	Y =	Y =

Duration of Analysis (hrs) = 1.00 — Cycle Length C = 80.0

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CAPACITY AND LOS WORKSHEET

General Information

Project Description *Ewa Gentry Makai (Year 2010 Total PM Peak) Geiger/Kapolei*

Capacity Analysis

	EB		WB		NB		SB	
Lane group	L	TR	L	TR	L	TR	L	TR
Adj. flow rate	186	467	137	685	120	498	232	673
Satflow rate	1805	3465	1805	3346	1805	3572	1805	3482
Lost time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Green ratio	0.45	0.30	0.45	0.30	0.45	0.30	0.45	0.30
Lane group cap.	323	1040	412	1004	328	1072	398	1045
v/c ratio	0.58	0.45	0.33	0.68	0.37	0.46	0.58	0.64
Flow ratio		0.13		0.20		0.14		0.19
Crit. lane group	N	N	N	N	N	N	N	N
Sum flow ratios	0.61							
Lost time/cycle	16.00							
Critical v/c ratio	0.77							

Lane Group Capacity, Control Delay, and LOS Determination

	EB		WB		NB		SB	
Lane group	L	TR	L	TR	L	TR	L	TR
Adj. flow rate	186	467	137	685	120	498	232	673
Lane group cap.	323	1040	412	1004	328	1072	398	1045
v/c ratio	0.58	0.45	0.33	0.68	0.37	0.46	0.58	0.64
Green ratio	0.45	0.30	0.45	0.30	0.45	0.30	0.45	0.30
Unif. delay d1	15.1	22.7	13.7	24.6	14.4	22.8	14.7	24.3
Delay factor k	0.17	0.11	0.11	0.25	0.11	0.11	0.17	0.22
Increm. delay d2	2.6	0.3	0.5	1.9	0.7	0.3	2.2	1.4
PF factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Control delay	17.7	23.0	14.1	26.6	15.1	23.1	16.9	25.7
Lane group LOS	B	C	B	C	B	C	B	C
Apprch. delay	21.5		24.5		21.5		23.4	
Approach LOS	C		C		C		C	
Intersec. delay	22.9		Intersection LOS				C	

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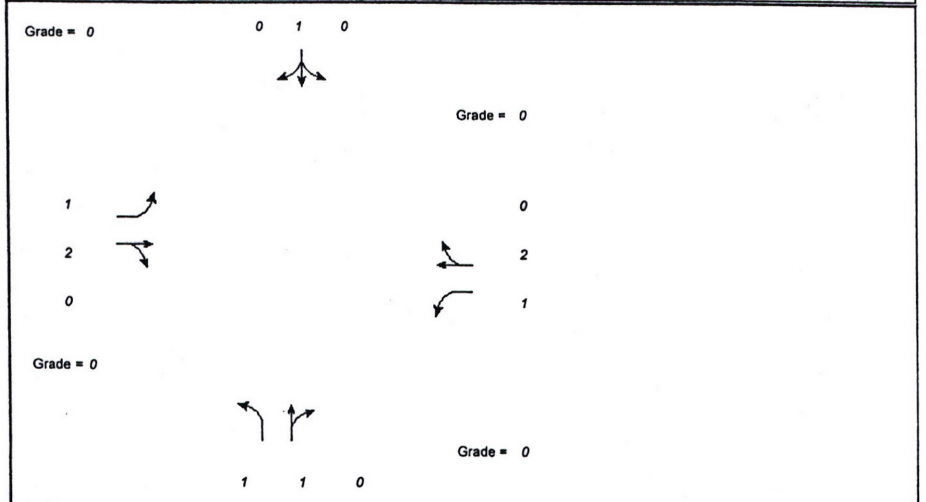
INPUT WORKSHEET

General Information		Site Information	
Analyst	C. Maruoka	Intersection	Geiger Rd/Launahele St
Agency or Co.	PBQ&D	Area Type	All other areas
Date Performed	9/19/2002	Jurisdiction	Honolulu
Time Period	PM Peak Hour (2010 Total)	Analysis Year	2002

Intersection Geometry



Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (vph)	113	453	43	79	677	72	28	10	39	160	13	117
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup lost time	2.0	2.0		2.0	2.0		2.0	2.0			2.0	
Ext. eff. green	2.0	2.0		2.0	2.0		2.0	2.0			2.0	
Arrival type	3	3		3	3		3	3			3	
Ped volume		0			0			0			0	
Bicycle volume		0			0			0			0	
Parking (Y or N)	N		N	N		N	N		N	N		N
Parking/hr												
Bus stops/hr	0	0		0	0		0	0			0	
Ped timing		0.0			0.0			3.0			0.0	

	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 27.0	G =	G =	G =	G = 25.0	G =	G =	G =
	Y = 3.0	Y =	Y =	Y =	Y = 3.0	Y =	Y =	Y =

Duration of Analysis (hrs) = 1.00 Cycle Length C = 60.0

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CAPACITY AND LOS WORKSHEET

General Information

Project Description *Ewa Gentry Makai (Year 2010 Total PM Peak) Geiger/Launahele*

Capacity Analysis

	EB		WB		NB		SB
Lane group	L	TR	L	TR	L	TR	LTR
Adj. flow rate	113	496	79	749	28	49	290
Satflow rate	562	3563	841	3558	1125	1673	1443
Lost time	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Green ratio	0.45	0.45	0.45	0.45	0.42	0.42	0.42
Lane group cap.	253	1603	378	1601	469	697	601
v/c ratio	0.45	0.31	0.21	0.47	0.06	0.07	0.48
Flow ratio	0.20	0.14	0.09	0.21	0.02	0.03	0.20
Crit. lane group	N	N	N	Y	N	N	Y
Sum flow ratios	0.41						
Lost time/cycle	8.00						
Critical v/c ratio	0.47						

Lane Group Capacity, Control Delay, and LOS Determination

	EB		WB		NB		SB
Lane group	L	TR	L	TR	L	TR	LTR
Adj. flow rate	113	496	79	749	28	49	290
Lane group cap.	253	1603	378	1601	469	697	601
v/c ratio	0.45	0.31	0.21	0.47	0.06	0.07	0.48
Green ratio	0.45	0.45	0.45	0.45	0.42	0.42	0.42
Unif. delay d1	11.4	10.5	10.0	11.5	10.5	10.5	12.8
Delay factor k	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Increm. delay d2	1.3	0.1	0.3	0.2	0.1	0.0	0.6
PF factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Control delay	12.6	10.7	10.3	11.7	10.5	10.6	13.4
Lane group LOS	B	B	B	B	B	B	B
Apprch. delay	11.0		11.6		10.5		13.4
Approach LOS	B		B		B		B
Intersec. delay	11.6		Intersection LOS				B

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INPUT WORKSHEET

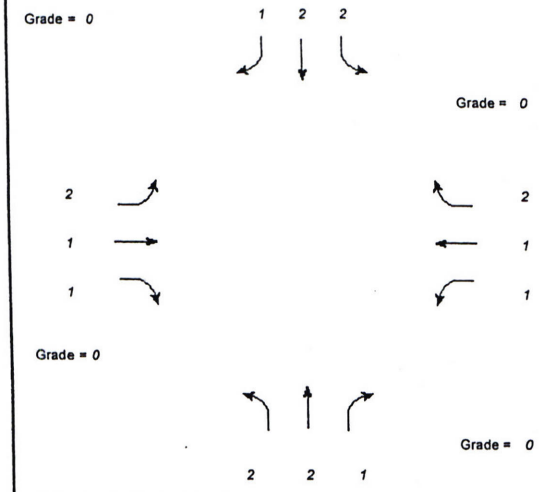
General Information

Analyst	C. Maruoka
Agency or Co.	PBQ&D
Date Performed	9/19/2002
Time Period	PM Peak Hour (2010 Total)

Site Information

Intersection	Fort Weaver/Geiger (Iroquois)
Area Type	All other areas
Jurisdiction	Honolulu
Analysis Year	2002

Intersection Geometry



Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (vph)	219	280	153	48	233	194	146	995	65	354	1439	449
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup lost time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Ext. eff. green	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Arrival type	3	3	3	3	3	3	3	3	3	3	3	3
Ped volume	0			0			0			0		
Bicycle volume	0						0			0		
Parking (Y or N)	N		N	N		N	N		N	N		N
Parking/hr												
Bus stops/hr	0	0	0	0	0	0	0	0	0	0	0	0
Ped timing	0.0			0.0			3.0			0.0		

	EB Only	WB Only	03	04	Excl. Left	SB Only	Thru & RT	08
Timing	G = 18.0	G = 18.0	G =	G =	G = 8.0	G = 6.0	G = 30.0	G =
	Y = 3.0	Y = 3.0	Y =	Y =	Y = 3.0	Y = 3.0	Y = 3.0	Y =

Duration of Analysis (hrs) = 1.00 — Cycle Length C = 100.0

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CAPACITY AND LOS WORKSHEET

General Information

Project Description Ewa Gentry Makai (Year 2010 Total PM Peak) Geiger/Ft Weaver

Capacity Analysis

	EB			WB			NB			SB		
Lane group	L	T	R	L	T	R	L	T	R	L	T	R
Adj. flow rate	219	280	153	48	233	194	146	995	65	354	1439	449
Satflow rate	3502	1900	1615	1805	1900	2842	3502	3610	1615	3502	3610	1615
Lost time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Green ratio	0.18	0.18	0.26	0.18	0.18	0.40	0.08	0.30	0.48	0.18	0.40	0.62
Lane group cap.	630	342	420	325	342	1137	280	1083	775	630	1444	1001
v/c ratio	0.35	0.82	0.36	0.15	0.68	0.17	0.52	0.92	0.08	0.56	1.00	0.45
Flow ratio	0.06	0.15	0.09	0.03	0.12	0.07	0.04	0.28	0.04	0.10	0.40	0.28
Crit. lane group	N	Y	N	N	Y	N	Y	N	N	N	Y	N
Sum flow ratios	0.71											
Lost time/cycle	16.00											
Critical v/c ratio	0.85											

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Lane group	L	T	R	L	T	R	L	T	R	L	T	R
Adj. flow rate	219	280	153	48	233	194	146	995	65	354	1439	449
Lane group cap.	630	342	420	325	342	1137	280	1083	775	630	1444	1001
v/c ratio	0.35	0.82	0.36	0.15	0.68	0.17	0.52	0.92	0.08	0.56	1.00	0.45
Green ratio	0.18	0.18	0.26	0.18	0.18	0.40	0.08	0.30	0.48	0.18	0.40	0.62
Unif. delay d1	35.9	39.4	30.2	34.5	38.3	19.3	44.2	33.8	14.1	37.4	29.9	10.0
Delay factor k	0.11	0.36	0.11	0.11	0.25	0.11	0.13	0.44	0.11	0.16	0.50	0.11
Increm. delay d2	0.3	16.2	0.5	0.2	5.6	0.1	1.8	14.9	0.0	1.2	44.1	0.3
PF factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Control delay	36.2	55.7	30.8	34.7	43.9	19.4	45.9	48.7	14.1	38.6	74.1	10.3
Lane group LOS	D	E	C	C	D	B	D	D	B	D	E	B
Apprch. delay	43.3			33.0			46.5			55.7		
Approach LOS	D			C			D			E		
Intersec. delay	49.2			Intersection LOS						D		

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INPUT WORKSHEET

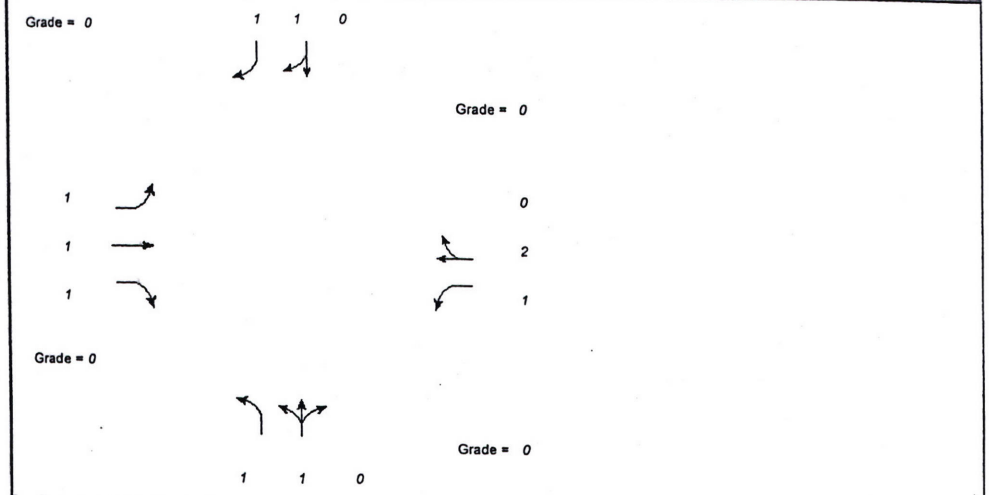
General Information

Analyst	C. Maruoka
Agency or Co.	PBQ&D
Date Performed	9/19/2002
Time Period	PM Peak Hour (2010 Total)

Site Information

Intersection	Iroquois Pt. Rd./Keaunui Rd
Area Type	All other areas
Jurisdiction	Honolulu
Analysis Year	2002

Intersection Geometry



Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (vph)	147	169	383	0	140	21	211	32	0	14	24	124
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup lost time	2.0	2.0	2.0	2.0	2.0		2.0	2.0			2.0	2.0
Ext. eff. green	2.0	2.0	2.0	2.0	2.0		2.0	2.0			2.0	2.0
Arrival type	3	3	3	3	3		3	3			3	3
Ped volume	0			0			0			0		
Bicycle volume	0			0								
Parking (Y or N)	N		N	N		N	N		N	N		N
Parking/hr												
Bus stops/hr	0	0	0	0	0		0	0			0	0
Ped timing	0.0			0.0			3.0			0.0		

	Excl. Left	EB Only	Thru & RT	04	NB Only	SB Only	07	08
Timing	G = 10.0	G = 12.0	G = 12.0	G =	G = 20.0	G = 10.0	G =	G =
	Y = 0.0	Y = 3.0	Y = 3.0	Y =	Y = 3.0	Y = 3.0	Y =	Y =

Duration of Analysis (hrs) = 1.00

Cycle Length C = 80.0

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CAPACITY AND LOS WORKSHEET

General Information

Project Description Ewa Gentry Makai (Year 2010 Total PM Peak) Iroquois/Keaunui

Capacity Analysis

	EB			WB			NB			SB	
Lane group	L	T	R	L	TR		L	LTR		LT	R
Adj. flow rate	147	169	383	0	161		211	32		38	124
Satflow rate	1805	1900	1615	1805	3539		1805	1900		1866	1615
Lost time	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0
Green ratio	0.28	0.35	0.82	0.13	0.15		0.25	0.25		0.13	0.65
Lane group cap.	496	665	1332	226	531		451	475		233	1050
v/c ratio	0.30	0.25	0.29	0.00	0.30		0.47	0.07		0.16	0.12
Flow ratio	0.08	0.09	0.24	0.00	0.05		0.12	0.02		0.02	0.08
Crit. lane group	Y	N	N	N	Y		Y	N		Y	N
Sum flow ratios	0.26										
Lost time/cycle	16.00										
Critical v/c ratio	0.33										

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB	
Lane group	L	T	R	L	TR		L	LTR		LT	R
Adj. flow rate	147	169	383	0	161		211	32		38	124
Lane group cap.	496	665	1332	226	531		451	475		233	1050
v/c ratio	0.30	0.25	0.29	0.00	0.30		0.47	0.07		0.16	0.12
Green ratio	0.28	0.35	0.82	0.13	0.15		0.25	0.25		0.13	0.65
Unif. delay d1	22.9	18.5	1.6	30.6	30.3		25.5	22.9		31.3	5.3
Delay factor k	0.11	0.11	0.11	0.11	0.11		0.11	0.11		0.11	0.11
Increm. delay d2	0.3	0.2	0.1	0.0	0.3		0.8	0.1		0.3	0.1
PF factor	1.000	1.000	1.000	1.000	1.000		1.000	1.000		1.000	1.000
Control delay	23.2	18.8	1.7	30.6	30.6		26.3	22.9		31.6	5.4
Lane group LOS	C	B	A	C	C		C	C		C	A
Apprch. delay	10.4			30.6			25.8			11.5	
Approach LOS	B			C			C			B	
Intersec. delay	16.1			Intersection LOS						B	

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INPUT WORKSHEET

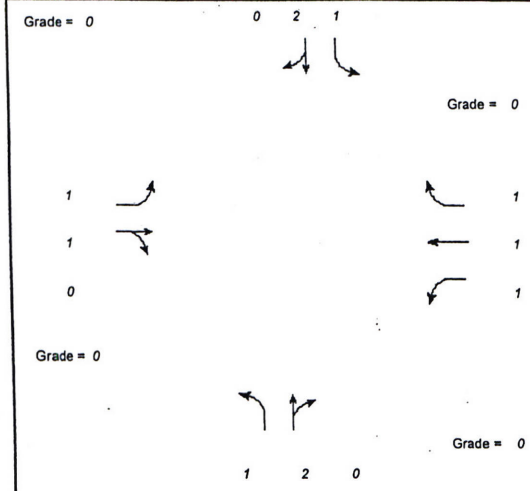
General Information

Analyst	C. Maruoka
Agency or Co.	PBQ&D
Date Performed	9/19/2002
Time Period	PM Peak Hour (2010 Total)

Site Information

Intersection	Kapolei Pkwy/Keaunui Dr
Area Type	All other areas
Jurisdiction	Honolulu
Analysis Year	2002

Intersection Geometry



Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (vph)	2	2	2	53	1	384	1	255	20	355	302	1
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup lost time	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Ext. eff. green	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Arrival type	3	3		3	3	3	3	3		3	3	
Ped volume	0			0			0			0		
Bicycle volume	0			0			0			0		
Parking (Y or N)	N		N	N		N	N		N	N		N
Parking/hr												
Bus stops/hr	0	0		0	0	0	0	0		0	0	
Ped timing	0.0			0.0			3.0			0.0		

	Excl. Left	Thru & RT	03	04	Excl. Left	Thru & RT	07	08
Timing	G = 10.0	G = 15.0	G =	G =	G = 25.0	G = 25.0	G =	G =
	Y = 3.0	Y = 3.0	Y =	Y =	Y = 3.0	Y = 3.0	Y =	Y =

Duration of Analysis (hrs) = 1.00 | Cycle Length C = 90.0

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CAPACITY AND LOS WORKSHEET

General Information

Project Description Ewa Gentry Makai (Year2010 Total PM)Kapolei Pkwy/Keaunui Dr

Capacity Analysis

	EB			WB			NB			SB		
Lane group	L	TR		L	T	R	L	TR		L	TR	
Adj. flow rate	2	4		59	1	427	1	305		394	337	
Satflow rate	1805	1758		1805	1900	1615	1805	3571		1805	3608	
Lost time	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Green ratio	0.11	0.17		0.11	0.17	0.49	0.28	0.28		0.28	0.28	
Lane group cap.	201	293		201	317	790	501	992		501	1002	
v/c ratio	0.01	0.01		0.29	0.00	0.54	0.00	0.31		0.79	0.34	
Flow ratio	0.00	0.00		0.03	0.00	0.26	0.00	0.09		0.22	0.09	
Crit. lane group	N	N		Y	N	Y	N	N		N	Y	
Sum flow ratios	0.39											
Lost time/cycle	11.00											
Critical v/c ratio	0.44											

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Lane group	L	TR		L	T	R	L	TR		L	TR	
Adj. flow rate	2	4		59	1	427	1	305		394	337	
Lane group cap.	201	293		201	317	790	501	992		501	1002	
v/c ratio	0.01	0.01		0.29	0.00	0.54	0.00	0.31		0.79	0.34	
Green ratio	0.11	0.17		0.11	0.17	0.49	0.28	0.28		0.28	0.28	
Unif. delay d1	35.6	31.3		36.8	31.3	16.0	23.5	25.7		30.0	25.9	
Delay factor k	0.11	0.11		0.11	0.11	0.14	0.11	0.11		0.33	0.11	
Increm. delay d2	0.0	0.0		0.8	0.0	0.8	0.0	0.2		8.6	0.2	
PF factor	1.000	1.000		1.000	1.000	1.000	1.000	1.000		1.000	1.000	
Control delay	35.6	31.3		37.6	31.3	16.7	23.5	25.8		38.7	26.1	
Lane group LOS	D	C		D	C	B	C	C		D	C	
Apprch. delay	32.8			19.3			25.8			32.9		
Approach LOS	C			B			C			C		
Intersec. delay	27.1			Intersection LOS						C		

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INPUT WORKSHEET

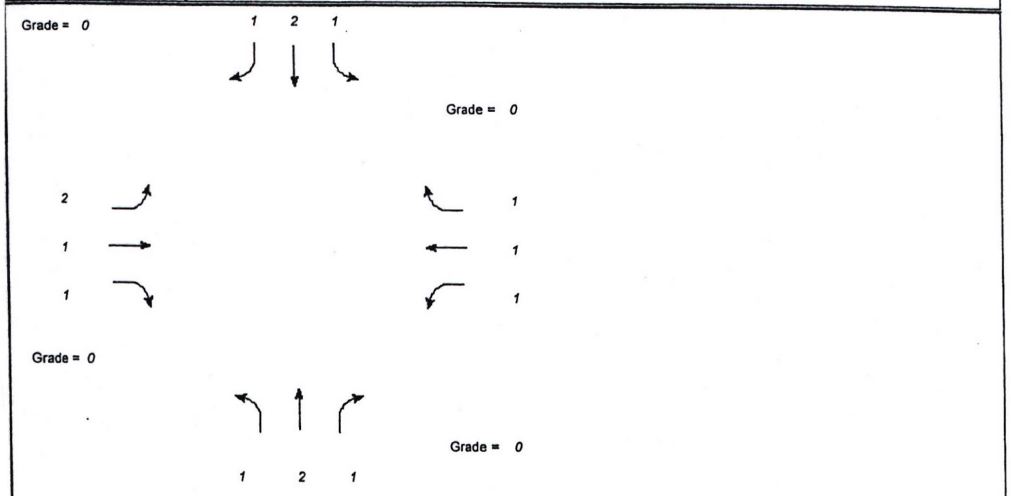
General Information

Analyst	C. Maruoka
Agency or Co.	PBQ&D
Date Performed	9/19/2002
Time Period	PM Peak Hour (2010 Total)

Site Information

Intersection	Fort Weaver Rd/Keaunui Rd
Area Type	All other areas
Jurisdiction	Honolulu
Analysis Year	2002

Intersection Geometry



Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (vph)	244	184	109	75	87	75	139	887	115	174	1207	259
% Heavy veh	0	0	0	0	0	0	0	0	0	0	0	0
PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup lost time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Ext. eff. green	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Arrival type	3	3	3	3	3	3	3	3	3	3	3	3
Ped volume	0			0			0			0		
Bicycle volume	0			0			0			0		
Parking (Y or N)	N		N	N		N	N		N	N		N
Parking/hr												
Bus stops/hr	0	0	0	0	0	0	0	0	0	0	0	0
Ped timing	0.0			0.0			3.0			0.0		

	Excl. Left	Thru & RT	03	04	Excl. Left	Thru & RT	07	08
Timing	G = 13.0	G = 16.0	G =	G =	G = 18.0	G = 37.0	G =	G =
	Y = 3.0	Y = 3.0	Y =	Y =	Y = 3.0	Y = 3.0	Y =	Y =

Duration of Analysis (hrs) = 1.00 — Cycle Length C = 100.0

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CAPACITY AND LOS WORKSHEET

General Information

Project Description Ewa Gentry Makai (Year 2010 Total PM Peak) Ft Weaver/Keaunui

Capacity Analysis

	EB			WB			NB			SB		
Lane group	L	T	R	L	T	R	L	T	R	L	T	R
Adj. flow rate	244	184	109	75	87	75	139	887	115	174	1207	259
Satflow rate	3502	1900	1615	1805	1900	1615	1805	3610	1615	1805	3610	1615
Lost time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Green ratio	0.13	0.16	0.38	0.13	0.16	0.38	0.18	0.37	0.54	0.18	0.37	0.54
Lane group cap.	455	304	614	235	304	614	325	1336	872	325	1336	872
v/c ratio	0.54	0.61	0.18	0.32	0.29	0.12	0.43	0.66	0.13	0.54	0.90	0.30
Flow ratio	0.07	0.10	0.07	0.04	0.05	0.05	0.08	0.25	0.07	0.10	0.33	0.16
Crit. lane group	Y	Y	N	N	N	N	N	N	N	Y	Y	N
Sum flow ratios	0.60											
Lost time/cycle	16.00											
Critical v/c ratio	0.71											

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Lane group	L	T	R	L	T	R	L	T	R	L	T	R
Adj. flow rate	244	184	109	75	87	75	139	887	115	174	1207	259
Lane group cap.	455	304	614	235	304	614	325	1336	872	325	1336	872
v/c ratio	0.54	0.61	0.18	0.32	0.29	0.12	0.43	0.66	0.13	0.54	0.90	0.30
Green ratio	0.13	0.16	0.38	0.13	0.16	0.38	0.18	0.37	0.54	0.18	0.37	0.54
Unif. delay d1	40.7	39.1	20.6	39.5	37.0	20.2	36.4	26.3	11.4	37.2	29.8	12.6
Delay factor k	0.14	0.19	0.11	0.11	0.11	0.11	0.11	0.24	0.11	0.14	0.42	0.11
Increm. delay d2	1.3	3.5	0.1	0.8	0.5	0.1	0.9	1.3	0.1	1.8	10.1	0.2
PF factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Control delay	41.9	42.5	20.7	40.3	37.5	20.2	37.3	27.6	11.5	39.0	39.9	12.8
Lane group LOS	D	D	C	D	D	C	D	C	B	D	D	B
Apprch. delay	37.8			32.9			27.1			35.5		
Approach LOS	D			C			C			D		
Intersec. delay	33.0			Intersection LOS						C		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	C. Maruoka
Agency/Co.	PBQ&D
Date Performed	9/19/2002
Analysis Time Period	PM Peak Hour (2010 Total)

Site Information

Intersection	Kapolei/Ent. A
Jurisdiction	Honolulu
Analysis Year	2002
Project ID	Ewa Gentry Makai (Year 2010 Total PM Peak)Kapolei Pkwy/Ent A

East/West Street: Entrance A
North/South Street: Kapolei Parkway
Intersection Orientation: North-South
Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	13	587	5	37	699	40
Peak-Hour Factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83
Hourly Flow Rate, HFR	15	707	6	44	842	48
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	2	0	1	2	0
Configuration	L	T	TR	L	T	TR
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	8	0	22	9	0	29
Peak-Hour Factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83
Hourly Flow Rate, HFR	9	0	26	10	0	34
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	1	0	1	1
Configuration	LT		R	LT		R

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L	LT		R	LT		R
v (vph)	15	44	9		26	10		34
C (m) (vph)	770	896	118		646	103		566
v/c	0.02	0.05	0.08		0.04	0.10		0.06
95% queue length	0.06	0.15	0.25		0.13	0.32		0.19
Control Delay	9.8	9.2	38.0		10.8	43.7		11.8
LOS	A	A	E		B	E		B
Approach Delay	--	--	17.8			19.0		
Approach LOS	--	--	C			C		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	C. Maruoka
Agency/Co.	PBQ&D
Date Performed	9/19/2002
Analysis Time Period	PM Peak Hour (2010 Total)

Site Information

Intersection	Kapolei/Ent. B
Jurisdiction	Honolulu
Analysis Year	2002
Project ID	Ewa Gentry Makai (Year 2010 Total PM Peak)Kapolei Pkwy/Ent B

East/West Street: Entrance B
North/South Street: Kapolei Parkway
Intersection Orientation: North-South
Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	13	551	45	3	463	10
Peak-Hour Factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83
Hourly Flow Rate, HFR	15	663	54	3	557	12
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	2	0	1	2	0
Configuration	L	T	TR	L	T	TR
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	50	0	40	9	0	21
Peak-Hour Factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83
Hourly Flow Rate, HFR	60	0	48	10	0	25
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	1	0	1	1
Configuration	LT		R	LT		R

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L	LT		R	LT		R
v (vph)	15	3	60		48	10		25
C (m) (vph)	1013	893	189		644	205		719
v/c	0.01	0.00	0.32		0.07	0.05		0.03
95% queue length	0.05	0.01	1.37		0.24	0.15		0.11
Control Delay	8.6	9.0	32.8		11.0	23.5		10.2
LOS	A	A	D		B	C		B
Approach Delay	--	--	23.2			14.0		
Approach LOS	--	--	C			B		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	C. Maruoka
Agency/Co.	PBQ&D
Date Performed	9/19/2002
Analysis Time Period	PM Peak Hour (2010 Total)

Site Information

Intersection	Geiger Rd/ Ent C
Jurisdiction	Honolulu
Analysis Year	2002
Project ID	Ewa Gentry Makai (Year 2010 Total PM Peak)Geiger Rd/Ent C

East/West Street: *Entrance C* | North/South Street: *Geiger Road*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	16	467	17	340	290	31
Peak-Hour Factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Hourly Flow Rate, HFR	0	530	19	386	329	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Raised curb					
RT Channelized			0			0
Lanes	0	1	0	1	1	0
Configuration			TR	L	T	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	9	597	186	12	436	8
Peak-Hour Factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Hourly Flow Rate, HFR	10	0	211	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		1			1	
RT Channelized			0			0
Lanes	1	0	1	0	0	0
Configuration	L		R			

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L	L		R			
v (vph)		386	10		211			
C (m) (vph)		1031	159		546			
v/c		0.37	0.06		0.39			
95% queue length		1.79	0.20		1.87			
Control Delay		10.6	29.2		15.7			
LOS		B	D		C			
Approach Delay	--	--	16.3					
Approach LOS	--	--	C					

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Appendix D

Trip Generation of Background Ewa by Gentry Traffic Volumes

Table D

Background Generated Volumes

Parcel	Land Use	ITE Code	Intensity	Unit	AM Peak Hour Trips		PM Peak Hour Trips	
					Enter	*Exit*	*Enter*	*Exit*
14	Multi Family	220	222	Units	18	94	87	43
17	Single Family	210	420	Units	74	223	229	129
19	Single Family	210	280	Units	50	149	153	86
20	Single Family	210	215	Units	17	91	84	41
21	Multi Family	220	322	Units	57	171	176	99
4A	Commercial Retail	820	20	Acres	114	73	360	389
Totals					**330**	**801**	**1089**	**787**

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ORIGINAL

AIR QUALITY STUDY

FOR THE PROPOSED

EWA BY GENTRY MAKAI DEVELOPMENT

EWA, OAHU, HAWAII

LAND USE COMMISSION
STATE OF HAWAII
2003 MAR 21 A 9:14

Prepared for:

Environmental Communications, Inc.

January 2003

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1.0 SUMMARY

Gentry Homes, Ltd. is proposing to develop the Ewa by Gentry Makai Project at Ewa, Oahu. The proposed project will consist of a total of 1865 residential units, a 30 -acre commercial/ industrial area, and associated community and support facilities. Development of the project is not expected to be completed and fully occupied until sometime after 2010. This study examines the potential short- and long-term air quality impacts that could occur as a result of construct ion and use of the proposed facilities and suggests mitigative measures to reduce any potential air quality impacts where possible and appro priate. Potential impacts on the project from nearby industrial sources are also examined.

Both federal and state standards have been established to maintain ambient air quality. At the present time, seven parameters are regulated including: particulate matter, sulfur dioxide, hydrogen sulfide, nitrogen dioxide, carbon monoxide, ozone and lead. Hawaii air quality standards are more stringent than the comparable national standards except for those pertaining to sulfur dioxide and particulate matter.

Regional and local climate together with the amount and type of human activity generally dictate the air quality of a given location. The climate of the Ewa Plain area is very much affected by its leeward and coastal situation. Winds are predominantly trade winds from the east northeast except for occasional periods when kona storms may generate strong winds from the south or when the trade winds are weak and landbreeze-seabreeze circulations may develop. Wind speeds typically vary between about 5 and 15 miles

per hour providing relatively good ventilation much of the time. Temperatures in the leeward Oahu area are generally very moderate with average daily temperatures ranging from about 65°F to 84°F. The extreme minimum temperature recorded at the nearby (former) Ewa Plantation is 47°F, while the extreme maximum tempera ture is 93°F. This area of Oahu is one of t he drier locations in the state with rainfall often highly variable from one year to the next. Monthly rainfall has been measured to vary from as little as a trace to as much as 15 inches. Average annual rainfall amounts to about 21 inches with summer months being the driest.

The present air quality of the project area appears to be reasonably good based on nearby air quality monitoring data. Air quality data from the nearest monitoring stations operated by the Hawaii Department of Health suggest that all national air quality standards are currently being met, although occasional exceedances of the more stringent state standard for ozone may occur. It is also possible that the more stringent state standards for carbon monoxide are exceeded at times ne ar congested roadway intersections.

If the proposed project is given the necessary approvals to proceed, it may be inevitable that some short - and/or long -term impacts on air quality will occur either directly or indirectly as a consequence of project construction and use. Short-term impacts from fugitive dust will likely occur during the project construction phase. To a lesser extent, exhaust emissions from stationary and mobile construction equipment, from the disruption of traffic, and from workers' vehicles may also affect air quality during the period of construction. State air pollution control regulations require that there be no visible fugitive dust emissions at the

property line. Hence, an effective dust control plan must be implemented to ensure compliance with state regulations. Fugitive dust emissions can be controlled to a large extent by watering of active work areas, using wind screens, keeping adjacent paved roads clean, and by covering of open -bodied trucks. Other dust control mea sures could include limiting the area that can be disturbed at any given time and/or mulching or chemically stabilizing inactive areas that have been worked. Paving and landscaping of project areas early in the construc tion schedule will also reduce dust emissions. Monitoring dust at the project boundary during the period of construction could be considered as a means to evaluate the effectiveness of the project dust control program. Exhaust emissions can be mitigated by moving construc - tion equipment and workers to and from the project site during off-peak traffic hours.

After construction, motor vehicles coming to and from the proposed development will result in a long -term increase in air pollution emissions in the project area. To assess the impact of emissions from these vehicles, an air quality modeling study was undertaken to esti mate current ambient concen trations of carbon monoxide at intersections in the project vicinity and to predict future levels both with and without the proposed project. During worst-case conditions, model results indicated that present 1-hour and 8 -hour carbon monoxide concentra tions are within both the state and the national ambient air quality standards. In the year 2010 without the project, carbon monoxide conce ntrations were predicted to increase at some locations and decrease at others, but concentrations would likely remain within the national and state standards at all locations studied. With the project in the year 2010, carbon monoxide concentrations were estimated to either remain unchanged or increase slightly at some

locations compared to the without -project case; worst -case concentrations should remain within both national and state standards. Due to the small impact the project is expected to have, i mplementing mitigation measures for traffic -related air quality impacts is probably unnecessary and unwarranted.

At this time, the specific tenants of the commercial/industrial area associated with the project have not been identified, but the types of f acilities that are expected to locate there are not significant sources of air pollution. Before any air pollution sources can be built anywhere in the state, an application must be submitted to the Department of Health for a permit to construct the facil ity, and detailed information concerning any air pollution emissions will need to be provided in the application.

In evaluating the proposed project, it may be appropriate to consider not only impacts created by the project but also potential impacts on the project from nearby industrial sources. Due to the relatively close proximity of industries located at Campbell Industrial Park, occasional impacts on the project from emissions emanating from these facilities may occur in conjunction with coincidenta l occurrences of industry malfunctions and westerly winds, both of which are relatively infrequent events. Increased scrutiny by the Department of Health, an air quality task force mandated by the state legislature, and the modernization by some industria l park tenants should help to mitigate future impacts on the proposed project.

2.0 INTRODUCTION

Gentry Homes, Ltd. is proposing to develop the Ewa by Gentry Makai Project on 283 acres of land at Ewa, Oahu (see Figure 1 for project location). The development will include 550 single-family residential units, 675 cluster residential units, 640 multi-family homes, a 30 -acre commercial/industrial area, and associated educational, community and support facilities. The site of the proposed development is bordered on the north by the existing Ewa by Gentry subdivision and on the south by the Ocean Pointe development and by Ewa Beach. Fort Weaver Road intersects the property. Construc tion of the project is expected to commence during 2003, and full developme nt and occupancy is planned for sometime after 2010.

The purpose of this study is to describe existing air quality in the project area and to assess the potential short- and long-term direct and indirect air quality impacts that could result from construction and use of the proposed facilities as planned. Potential impacts on the project from nearby air pollution sources are also discussed. Measures to mitigate impacts either by the project or on the project are suggested where possible and appropriate.

3.0 AMBIENT AIR QUALITY STANDARDS

Ambient concentrations of air pollution are regulated by both national and state ambient air quality standards (AAQS). National AAQS are specified in Section 40, Part 50 of the Code of Federal Regulations (CFR), while State of Hawaii AAQS are defined in Chapter 11 -59 of the Hawaii Administrative Rules. Table 1

summarizes both the national and the state AAQS that are speci - fied in the cited documents. As indicated in the table, national and state AAQS have been esta blished for particulate matter, sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone and lead. The state has also set a standard for hydrogen sulfide. National AAQS are stated in terms of both primary and secondary standards for most of the regulated air pollutants. National primary standards are designed to protect the public health with an "adequate margin of safety". National secondary standards, on the other hand, define levels of air quality necessary to protect the public welfare from "any known or anticipated adverse effects of a pollutant". Secondary public welfare impacts may include such effects as decreased visibility, diminished comfort levels, or other potential injury to the natural or man-made environment, e.g., soiling of materials, damage to vegetation or other economic damage. In contrast to the national AAQS, Hawaii State AAQS are given in terms of a single standard that is designed "to protect public health and welfare and to prevent the significant deterioration of air quality".

Each of the regulated air pollutants has the potential to create or exacerbate some form of adverse health effect or to produce environmental degrada tion when present in sufficiently high concentration for prolonged periods of time. The AAQS specify a maximum allowable concentration for a given air pollutant for one or more averaging times to prevent harmful effects. Averaging times vary from one hour to one year depending on the pollutant and type of exposure necessary to cause adverse effects. In t he case of the short -term (i.e., 1- to 24-hour) AAQS, both national and state standards allow a specified number of exceedances each year.

The Hawaii AAQS are in some cases considerably more strin gent than the comparable national AAQS. In particular, the Hawaii 1-hour AAQS for carbon monoxide is four times more stringent than the comparable national limit, and the state 1 -hour limit for ozone is more than two times as stringent as the national 1 -hour standard. The U.S. Environmental Protection Agency (EPA) is currently working on a plan to phase out the national 1 -hour ozone standard in favor of the new (and more stringent) 8 -hour standard.

The Hawaii AAQS for sulfur dioxide were relaxed in 1986 to make the state standards essentially the same as th e national limits. In 1993, the state also revised its particulate standards to follow those set by the federal government. During 1997, the federal government again revised its standards for particulate, but the new standards were challenged in federal court. A Supreme Court ruling was issued during February 2001, and at this time, it is expected that the new standards for particulate will be implemented by 2005. To date, the Hawaii Department of Health has not updated the state particulate standards.

4.0 REGIONAL AND LOCAL CLIMATOLOGY

Regional and local climatology significantly affects the air quality of a given location. Wind, temperature, atmospheric turbulence, mixing height and rainfall all influence air quality. Although the climate of Hawai i is relatively moderate throughout most of the state, significant differences in these parameters may occur from one location to another. Most differences in regional

and local climates within the state are caused by the mountainous topography.

Hawaii lies well within the belt of northeasterly trade winds generated by the semi-permanent Pacific high pressure cell to the north and east. On the island of Oahu, the Koolau and Waianae Mountain Ranges are oriented almost perpendicular to the trade winds, w hich accounts for much of the variation in the local climatology of the island. The site of the proposed project is located on the broad Ewa Plain leeward of the Koolau Mountains.

The nearest and most representative long-term wind data available for the site were collected at the Barbers Point Naval Air Station located about 3 miles to the west. Data available from the Honolulu International Airport, located about 8 miles to the east, may also be at least semi -representative. Wind frequency data given in Table 2 for Barbers Point show that the annual prevailing wind direction for this area of Oahu is east northeast (the same as at Honolulu International Airport). On an annual basis, 38.1 percent of the time the wind is from this direction, and more tha 80 percent of the time the wind is in the northeast quadrant. Winds from the south are infrequent occurring only a few days during the year and mostly in winter in association with kona storms. Wind speeds average about 10 knots (12 mph) and mostly vary between about 5 and 15 knots (6 and 17 mph). Surface winds at the project site are very similar to those recorded at Barbers Point.

Air pollution emissions from motor vehicles, the formation of photochemical smog and smoke plume rise all depend in part on air

temperature. Colder temperatures tend to result in higher emissions of contaminants from automobiles but lower concentrations of photochemical smog and ground -level concentrations of air pollution from elevated plumes. In Hawaii, the annual and daily variation of temperature depend to a large degree on elevation above sea level, distance inland and exposure to the trade winds. Average temperatures at locations near sea level generally are warmer than those at higher elevations. Areas exposed to the trade winds tend to have the least temperature variation, while inland and leeward areas often have the most. The project's near coastal, leeward location results in a relatively moderate temperature profile compared to other locations around Oahu and the state. Based on more than 50 years of data collected at Ewa Plantation, average annual daily minimum and maximum temperatures in the project area are 65°F and 84°F, respectively [1]. The extreme minimum tempera ture on record is 47°F, and the extreme maximum is 93°F.

Small scale, random motions in the atmosphere (turbulence) cause air pollutants to be dispersed as a function of distance or time from the point of emission. Turbulence is caused by both mechanical and thermal forces in the atmosph ere. It is oftentimes measured and described in terms of Pasquill -Gifford stability class. Stability class 1 is the most turbulent and class 6 the least. Thus, air pollution dissipates the best during stability class 1 conditions and the worst when stability class 6 prevails. In the Ewa area, stability class 5 or 6 is generally the highest stability class that occurs, developing during clear, calm nighttime or early morning hours when temperature inversions form due to radiational cooling. Stability cl asses 1 through 4 occur during the daytime, depending mainly on the amount of cloud cover

and incoming solar radiation and the onset and extent of the sea breeze.

Mixing height is defined as the height above the surface through which relatively vigorous vertical mixing occurs. Low mixing heights can result in high ground -level air pollution concentrations because contaminants emitted from or near the surface can become trapped within the mixing layer. In Hawaii, minimum mixing heights tend to be high because of mechanical mixing caused by the trade winds and because of the temperature moderating effect of the surrounding ocean. Low mixing heights may sometimes occur, however, at inland locations and even at times along coastal areas early in the mornin g following a clear, cool, windless night. Coastal areas also may experience low mixing levels during sea breeze conditions when cooler ocean air rushes in over warmer land. Mixing heights in Hawaii typically are above 3000 feet (1000 meters).

Rainfall can have a beneficial affect on the air quality of an area in that it helps to suppress fugitive dust emissions, and it also may "washout" gaseous contaminants that are water soluble. Rainfall in Hawaii is highly variable depending on elevation and on location with respect to the trade wind. The Ewa Plain is one of the driest areas on Oahu due to its leeward and near sea level location. Average annual rainfall amounts to about 21 inches but may vary from about 10 inches during a dry year to more than 40 inches during a wet year [1]. Most of the rainfall usually occurs during the winter months. Monthly rainfall may vary from as little as a trace to as much as 15 inches or more.

5.0 PRESENT AIR QUALITY

Present air quality in the project area is mostly affected by air pollutants from motor vehicles, industrial sources, agricultural operations and to a lesser extent by natural sources. Table 3 presents an air pollutant emission summary for the island of Oahu for calendar year 1993. The emission rates shown in the table pertain to manmade emissions only, i.e., emissions from natural sources are not included. As suggested in the table, much of the particulate emissions on Oahu originate from area sources, such as the mineral products industry and agriculture. Sulfur oxides are emitted almost exclusively by point sources, such as power plants and refineries. Nitrogen oxides emissions emanate predominantly from industrial point sources, although area sources (mostly motor vehicle traffic) also contribute a significant share. The majority of carbon monoxide emissions occur from area sources (motor vehicle traffic), while hydrocarbons are emitted mainly from point sources. Based on previous emission inventories that have been reported for Oahu, it appears that emissions of particulate and nitrogen oxides have increased during the past ten years, while emissions of sulfur oxides, carbon monoxide and hydrocarbons have declined.

Fort Weaver Road, which intersects the project site, is a major arterial roadway that presently carries moderate to heavy levels of vehicle traffic during peak traffic hours. Emissions from motor vehicles using this roadway, primarily nitrogen oxides and carbon monoxide, will tend to be carried over portions the project site by the prevailing winds.

Several sources of industrial air pollution are located in the Campbell Industrial Park, which is located about 4 miles to the west at Barbers Point. Industries currently operating there include the Chevron and BHP refineries, H -Power, Kalaeloa Partners, Applied Energy Services, Hawaiian Cement and others. Hawaiian Electric Company's Kahe Generating Station is located about 7 miles to the northwest at Kahe Point. These industries emit large amounts of sulfur dioxide, nitrogen oxides , particulate matter, carbon monoxide and other air pollutants. Prevailing winds from the east or northeast will carry these emissions away from the site most of the time.

Until recently, air pollution in the project area originating from agricultural sources could mainly be attributed to sugar cane operations near the project site. Emissions from both the mill and the canefield operations in the area have now been eliminated with the closure of the Oahu Sugar Company and much of the former sugarcane l ands are currently being used as pastureland or for diversified agriculture. Long -range uses for the land have not yet been determined.

Natural sources of air pollution emissions that also could affect the project area but cannot be quantified very accurately include the ocean (sea spray), plants (aero -allergens), wind-blown dust, and perhaps distant volcanoes on the island of Hawaii.

The State Department of Health operates a network of air quality monitoring stations at various locations on Oahu. Ea ch station, however, typically does not monitor the full complement of air quality parameters. Table 4 shows annual summaries of air

quality measurements that were made nearest to the project area for several of the regulated air pollutants for the period 1997 through 2001. These are the most recent data that are currently available.

During the 1997-2001 period, sulfur dioxide was monitored by the State Department of Health at an air quality station located at Kapolei. Concentrations monitored were consistently low compared to the standards. Annual second -highest 3-hour concentrations (which are most relevant to the air quality standards) ranged from 17 to 64 $\mu g/m^3$, while the annual second -highest 24-hour concentrations ranged from 5 to 16 $\mu g/m^3$. Annual average concentrations were only about 1 to 2 $\mu g/m^3$. There were no exceedances of the state/national 3-hour or 24-hour AAQS for sulfur dioxide during the 5-year period.

Particulate matter less than 10 microns in diameter (PM-10) is also measured at the Kapolei monitoring station. Annual second-highest 24-hour PM-10 concentrations ranged from 26 to 129 $\mu g/m^3$ between 1997 and 2001. Average annual concentrations ranged from 13 to 19 $\mu g/m^3$. All values reported were within the state and national AAQS.

Carbon monoxide measurements were also made at the Kapolei monitoring station. The annual second-highest 1-hour concentrations ranged from 1.2 to 1.9 mg/m^3. The annual second-highest 8-hour concentrations ranged from 0.6 to 1.3 mg/m^3. No exceedances of the state or national 1-hour or 8-hour AAQS were reported.

Nitrogen dioxide is also monitored by the Department of Health at the Kapolei monitoring station. Annual average concentrations of this pollutant ranged from 6 to 9 $\mu g/m^3$, safely inside the state and national AAQS.

The nearest available ozone measurements were obtained at Sand Island (about 12 miles east of the project area). The second-highest 1-hour concentrations for each year from 1997 to 2001 ranged from 96 to 110 $\mu g/m^3$. Up to 13 exceedances of the state AAQS per year were recorded during the monitoring period, but there were no exceedances during the last two years of the five-year period.

Although not shown in the table, the nearest and most recent measurements of ambient lead concentrations that have been reported were made at the downtown Honolulu monitoring station between 1996 and 1997. Average quarterly concentrations were near or below the detection limit, and no exceedances of the state AAQS were recorded. Monitoring for this parameter was discontinued during 1997.

Based on the data and discussion presented above, it appears likely that the State of Hawaii AAQS for sulfur dioxide, nitrogen dioxide, particulate matter and lead are currently being met at the project site. It is likely, however, that the state AAQS for ozone may be exceeded on occasion based on the Sand Island measurements for this parameter. While carbon monoxide

measurements at the Kapolei monitoring station suggest that concentrations are within the state and national standards, local "hot spots" may exist near traffic-congested intersections.

6.0 SHORT-TERM IMPACTS OF PROJECT

Short-term direct and indirect impacts on air quality could potentially occur due to project const ruction. For a project of this nature, there are two potential types of air pollution emissions that could directly result in short -term air quality impacts during project construction: (1) fugitive dust from vehicle movement and soil excavation; and (2) exhaust emissions from on -site construction equipment. Indirectly, there also could be short -term impacts from slow -moving construction equipment traveling to and from the project sites, from a temporary increase in local traffic caused by commuting construction workers, and from the disruption of normal traffic flow caused by lane closures of adjacent roadways.

Fugitive dust emissions may arise from the grading and dirt-moving activities associated with site clearing and preparation work. The emission rate for fugitive dust emissions from construction activities is difficult to estimate accurately. This is because of its elusive nature of emission and because the potential for its generation varies greatly depending upon the type of soil at the constru ction site, the amount and type of dirt -disturbing activity taking place, the moisture content of exposed soil in work areas, and the wind speed. The EPA [2] has provided a rough estimate for uncontrolled fugitive dust emissions from construction activity of 1.2 tons per acre per month under conditions of "medium" activity, moderate soil silt content (30%),

and precipitation/evaporation (P/E) index of 50. Uncontrolled fugitive dust emissions at the three project sites would likely be somewhere near that l evel, depending on the amount of rainfall that occurs. In any case, State of Hawaii Air Pollution Control Regulations [3] prohibit visible emissions of fugitive dust from construction activities at the property line. Thus, an effective dust control plan for the project construction phase is essential.

Adequate fugitive dust control can usually be accomplished by the establishment of a frequent watering program to keep bare -dirt surfaces in construction areas from becoming signi ficant sources of dust. In dust -prone or dust -sensitive areas, other control measures such as limiting the area that can be disturbed at any given time, applying chemical soil stabilizers, mulching and/or using wind screens may be necessary. Control regulations further stipulate that open-bodied trucks be covered at all times when in motion if they are trans porting materials that could be blown away. Haul trucks tracking dirt onto paved streets from unpaved areas is often a significant source of dust in construction areas. Some means to alleviate this problem, such as road cleaning or tire washing, may be appropriate. Paving of parking areas and/or establishment of landscaping as early in the construction schedule as possible can also lower the potential for fugitive dust emissions. Monitoring dust at the project property line could be considered to quantify and document the effectiveness of dust control measures.

On-site mobile and stationary construction equipment also will emit air pollutants from engine exhausts. Th e largest of this equipment is usually diesel -powered. Nitrogen oxides emissions from diesel engines can be relatively high compared to gasoline -

powered equipment, but the standard for nitrogen dioxide is set on an annual basis and is not likely to be vio lated by short-term construction equipment emissions. Carbon monoxide emissions from diesel engines, on the other hand, are low and should be relatively insignificant compared to vehicular emissions on nearby roadways.

Project construction activities wi ll also likely obstruct the normal flow of traffic at times to such an extent that overall vehicular emissions in the project area will temporarily increase. The only means to alleviate this problem will be to attempt to keep roadways open during peak tra ffic hours and to move heavy construction equipment and workers to and from construction areas during periods of low traffic volume. Thus, most potential short-term air quality impacts from project construction can be mitigated.

7.0 LONG-TERM IMPACTS OF PROJECT

7.1 Roadway Traffic

After construction is completed, use of the proposed facilities will result in increased motor vehicle traffic in the project area, potentially causing long -term impacts on ambient air quality. Motor vehicles with gasoline -powered engines are significant sources of carbon monoxide. They also emit nitrogen oxides and other contaminates.

Federal air pollution control regulations require that new motor vehicles be equipped with emission control devices that reduce emissions significantly compared to a few years ago. In 1990, the

President signed into law the Clean Air Act Amend ments. This legislation requires further emission reductions, which have been phased in since 1994. More recently, additional restrictions were signed into law during the Clinton administration, which will begin to take effect during the next decade. The added restrictions on emissions from new motor vehicles will lower average emissions each year as more and more older vehicles leave the state's ro adways. It is estimated that carbon monoxide emissions, for example, will go down by an average of about 30 to 40 percent per vehicle during the next 10 years due to the replacement of older vehicles with newer models.

To evaluate the potential long-term indirect ambient air quality impact of increased roadway traffic associated with a project such as this, computerized emission and atmospheric dispersion models can be used to estimate ambient carbon monoxide concentra tions along roadways leading to and from the project. Carbon monoxide is selected for modeling because it is both the most stable and the most abundant of the pollutants generated by motor vehicles. Furthermore, carbon monoxide air pollution is generally considered to be a microscale pro blem that can be addressed locally to some extent, whereas nitrogen oxides air pollution most often is a regional issue that cannot be addressed by a single new develop - ment.

For this project, three scenarios were selected for the carbon monoxide modeling study: (1) year 2002 with present conditions, (2) year 2010 without the project, and (3) year 2010 with the project. To begin the modeling study of the three scenarios, critical receptor areas in the vicinity of the project were identified for analysis. Generally speaking, roadway

intersections are the primary concern because of traffic congestion and because of the increase in vehicular emissions associated with traffic queuing. For this study, the four key intersections identified in the traffic stud y were also selected for air quality analysis. These included the following intersections:

- Fort Weaver Road at Geiger Road/Iroquois Road;
- Kapolei Parkway at Geiger Road;
- Kaahupahau Street at Geiger Road;
- Keaunui Drive at Iroquois Road.

The traffic impact assessment report for the project [4] describes the projected future traffic conditions and laneage configurations of these intersections in detail.

The main objective of the modeling study was to estimate maximum 1-hour average carbon monoxide concent rations for each of the three scenarios studied. To evaluate the significance of the estimated concentrations, a comparison of the predicted values for each scenario can be made. Comparison of the estimated values to the national and state AAQS was also used to provide another measure of significance.

Maximum carbon monoxide concentrations typically coincide with peak traffic periods. The traffic impact assessment report evaluated morning and afternoon peak traffic periods. These same periods were evaluated in the air quality impact assessment.

The EPA computer model MOBILE6 [5] was used to calculate vehicular carbon monoxide emissions for each year studied. One of the key inputs to MOBILE6 is vehicle mix. Unless very detailed information is avail able, national average values are typically assumed, which is what was used for the present study. Based on national average vehicle mix figures, the present vehicle mix in the project area was estimated to be 46.4% light -duty gasoline-powered automobiles, 40.9% light-duty gasoline-powered trucks and vans, 3.6% heavy-duty gasoline-powered vehicles, 0.2% light-duty diesel-powered vehicles, 8.3% heavy-duty diesel-powered trucks and buses, and 0.6% motorcycles. For the future scenarios studied, the vehicle mix was estimated to change slightly with fewer light-duty gasoline-powered automobiles and more light -duty gasoline-powered trucks and vans.

Ambient temperatures of 59 and 68 degrees F were used for morning and afternoon peak -hour emission computations, respectively. These are conservative assumptions since morning/afternoon ambient temperatures will generally be warmer than this, and emission estimates given by MOBILE6 generally have an inverse relationship to the ambient temperature.

After computing vehicular carbon monoxide emissions through the use of MOBILE6, these data were then input to an atmospheric dispersion model. EPA air quality modeling guidelines [6] currently recommend that the computer model CAL3QHC [7] be used to assess carbon monoxi de concentra tions at roadway intersections, or in areas where its use has previously been established, CALINE4 [8] may be used. Until a few years ago, CALINE4 was used extensively in Hawaii to assess air quality impacts at roadway intersections. In Dec ember 1997, the

California Department of Transportation recommended that the intersection mode of CALINE4 no longer be used because it was thought the model has become outdated. Studies have shown that CALINE4 may tend to over -predict maximum concentratio ns in some situations. Therefore, CAL3QHC was used for the subject analysis.

CAL3QHC was developed for the U.S. EPA to simulate vehicular movement, vehicle queuing and atmospheric dispersion of vehicular emissions near roadway intersections. It is de signed to predict 1-hour average pollutant concentrations near roadway intersections based on input traffic and emission data, roadway/receptor geometry and meteorological conditions.

Although CAL3QHC is intended primarily for use in assessing atmospheric dispersion near signalized roadway intersections, it can also be used to evaluate unsignalized intersections. This is accomplished by manually estimating queue lengths and then applying the same techniques used by the model for signalized intersections. Currently, two of the study intersections are unsignalized. These include Kapolei Parkway at Geiger Road and Keaunui Drive at Iroquois Road. In the future, in accordance with the traffic report, these two intersections were assumed to be signalized.

Input peak-hour traffic data were obtained from the traffic study cited previously. This included vehicle approach volumes, saturation capacity estimates, intersection laneage and signal timings (where applicable). All emission factors that were input to CAL3QHC for free -flow traffic on roadways were obtained from

MOBILE6 based on assumed free-flow vehicle speeds corresponding to the posted speed limits (25 to 45 mph depending on location).

Model roadways were set up to reflect roadway geometry, physic al dimensions and operating characteristics. Concentra tions predicted by air quality models generally are not considered valid within the roadway -mixing zone. The roadway -mixing zone is usually taken to include 3 meters on either side of the traveled portion of the roadway and the turbulent area within 10 meters of a cross street. Model receptor sites were thus located at the edges of the mixing zones near all intersections that were studied for all three scenarios. This implies that pedestrian sidewal ks either already exist or are assumed to exist in the future. All receptor heights were placed at 1.5 meters above ground to simulate levels within the normal human breathing zone.

Input meteorological conditions for this study were defined to provide "worst-case" results. One of the key meteorological inputs is atmospheric stability category. For these analyses, atmospheric stability category 5 was assumed for the morning cases, while atmospheric stability category 4 was assumed for the afternoon cas es. These are the most conservative stability categories that are generally used for estimating worst -case pollutant dispersion within suburban areas for these periods. A surface roughness length of 100 cm and a mixing height of 1000 meters were used in all cases. Worst -case wind conditions were defined as a wind speed of 1 meter per second with a wind direction resulting in the highest predicted concentra tion. Concentration estimates were calculated at wind directions of every 5 degrees.

Existing background concentrations of carbon monoxide in the project vicinity are believed to be at low levels. Thus, background contributions of carbon monoxide from sources or roadways not directly considered in the analysis were accounted for by adding a background concentration of 0.5 ppm to all predicted concentrations for 2002. Although increased traffic is expected to occur within the project area within the next several years with or without the project, background carbon monoxide concentrations may not change significantly since individual emissions from motor vehicles are forecast to decrease with time. Hence, a background value of 0.5 ppm was assumed to persist for the future scenarios studied.

Predicted Worst-Case 1-Hour Concentrations

Table 5 summarizes the final results of the modeling study in the form of the estimated worst-case 1-hour morning and afternoon ambient carbon monoxide concentrations. These results can be compared directly to the state and the national AAQS. Estimated worst-case carbon monoxide concentrations are presented in the table for three scenarios: year 2002 with existing traffic, year 2010 without the project and year 2010 with the project. The locations of these estimated worst-case 1-hour concentrations all occurred at or very near the indicated intersections.

As indicated in the table, the highest estimated 1-hour concentration within the project vicinity for the present (2002) case was 8.7 mg/m^3. This was projected to occur during the morning peak traffic hour near the intersection of Fort Weaver Road and Geiger Road/Iroquois Road. Concentrations at other locations and times

studied were 7.2 mg/m^3 or lower. All predicted worst-case 1-hour concentrations for the 2002 scenario were within both the national AAQS of 40 mg/m^3 and the state standard of 10 mg/m^3.

In the year 2010 without the proposed project, the highest worst-case 1-hour concentration was again predicted to occur during the morning at the intersection of Fort Weaver Road and Geiger Road/Iroquois Road. A value of 6.1 mg/m^3 was predicted to occur at this location. Peak-hour worst-case values at the other locations and times studied for the 2010 without project scenario ranged between about 3 and 5 mg/m^3. Although concentrations in the vicinity of Fort Weaver Road and Geiger Road/Iroquois Road decreased compared to the existing case, concentrations at the other locations studied remained about the same or increased somewhat due both to higher traffic volumes and to the assumed installation of traffic signals at two of the intersections. All projected worst-case concentrations for this scenario remained within the state and national standards.

Predicted 1-hour worst-case concentrations for the 2010 with project scenario were essentially unchanged compared to the 2010 without project scenario, with the project showing only a small impact in the worst-case concentrations at the intersections of Fort Weaver Road at Geiger Road/Iroquois Road and Kapolei Parkway at Geiger Road. All predicted worst-case 1-hour concentrations for the 2010 with project scenario were within both the national and the state AAQS.

Predicted Worst-Case 8-Hour Concentrations

Worst-case 8-hour carbon monoxide concentrations were estimated by multiplying the worst-case 1-hour values by a persistence factor of 0.5. This accounts for two factors: (1) traffic volumes averaged over eight hours are lower than peak 1-hour values, and (2) meteorological conditions are more variable (and hence more favorable for dispersion) over an 8-hour period than they are for a single hour. Based on monitoring data, 1-hour to 8-hour persistence factors for most locations generally vary from 0.4 to 0.8 with 0.6 being the most typical. One study based on modeling [9] concluded that 1-hour to 8-hour persistence factors could typically be expected to range from 0.4 to 0.5. EPA guidelines [10] recommend using a value of 0.7 unless a locally derived persistence factor is available. Recent monitoring data for locations on Oahu reported by the Department of Health [11] suggest that this factor may range between about 0.2 and 0.6 depending on location and traffic variability. Considering the location of the project and the traffic pattern for the area, a 1-hour to 8-hour persistence factor of 0.5 will likely yield reasonable estimates of worst-case 8-hour concentrations.

The resulting estimated worst-case 8-hour concentrations are indicated in Table 6. For the 2002 scenario, the estimated worst-case 8-hour carbon monoxide concentrations for the four locations studied ranged from 0.9 mg/m^3 at the Keaunui Drive at Iroquois Road intersection to 4.4 mg/m^3 at the Fort Weaver Road at Geiger Road/Iroquois Road intersection. The estimated worst-case concentrations were within both the state standard of 5 mg/m^3 and the national limit of 10 mg/m^3.

For the year 2010 without project scenario, worst-case concentrations ranged between 1.6 and 3.0 mg/m^3, with the highest concentration at Fort Weaver Road and Geiger Road/Iroquois Road decreasing substantially compared to the existing case. All predicted concentrations were within the standards.

For the 2010 with project scenario, worst-case concentrations remained nearly unchanged compared to the without project case, indicating minimal project impact. All predicted 8-hour concentrations for this scenario were within both the national and the state AAQS.

Conservativeness of Estimates

The results of this study reflect several assumptions that were made concerning both traffic movement and worst-case meteorological conditions. One such assumption concerning worst-case meteorological conditions is that a wind speed of 1 meter per second with a steady direction for 1 hour will occur. A steady wind of 1 meter per second blowing from a single direction for an hour is extremely unlikely and may occur only once a year or less. With wind speeds of 2 meters per second, for example, computed carbon monoxide concentrations would be only about half the values given above. The 8-hour estimates are also conservative in that it is unlikely that anyone would occupy the assumed receptor sites (within 3 m of the roadways) for a period of 8 hours.

7.2 Commercial/Industrial Mixed Uses

Air pollution emissions from industrial sources locating within the proposed commercial/industrial mixed-use area of the project could potentially result in direct impacts on air quality. While the specific industrial residents of the proposed project have not yet been identified, it is expected these will not have the potential to emit significant amounts of air pollution.

Without specific information concerning stack heights and stack gas temperatures, exit velocities and emission rates, air quality impacts from the potential industrial facilities locating within the proposed industrial park cannot be quantitatively estimated. At the present time, such detailed information is not available. However, Hawaii air pollution control rules [3] require that any activity that causes air pollution must obtain written approval from the director of th e Hawaii Department of Health. This written approval generally involves applying for both a permit to construct and a permit to operate. At the time of application, detailed information must be provided by the applicant concerning the type and nature of any air pollution emissions and the emission control technology that would be utilized. Depending on the magnitudes of the project emissions and other factors, air quality impact analyses and/or air quality monitoring may be required before the application to construct/operate is approved. Thus, even though an assessment of potential direct impacts from project air pollution emissions cannot be done at this time, state rules may require that such analyses be performed at a later date when specific busines ses apply to locate at the proposed industrial park.

8.0 IMPACTS ON PROJECT FROM CAMPBELL INDUSTRIAL PARK

In addition to assessing the air quality impacts of the project on the surrounding area, the reverse problem of impacts of air pollution sources located in the surrounding area on the residents of the project is also of concern. For the this project, the issue of primary concern is the Campbell Industrial Park (CIP) located about 4 miles west of the project site. Several large industrial sources of air pollution are located at CIP including Applied Energy Systems (AES) Generating Station, Kalaeloa Partners Cogeneration Plant, the Chevron and BHP Refineries, H -Power and Hawaiian Cement. During the past few years, several incidents of acute air pollution levels have occurred in areas within and adjacent to CIP. Some of these incidents have been caused by upset conditions at the BHP and Chevron Refineries, while the source or sources of other incidents have never been identified.

As indicated in Section 4, the prevailing winds are in the northeast quadrant, which will carry emissions from CIP away from the project site more than 80 percent of the time. Winds from the west, which could carry emissions toward the site, occur less than about 5 percent of t he time. While estimating specific air pollution levels at the project site is beyond the scope of the present study, it is unlikely that concentrations exceed air quality standards during normal operations. Emissions during normal operations are regulat ed by the Hawaii Department of Health, and industry operators are required to demonstrate compliance with state and national air quality standards. Perhaps the greatest concern is the coincidence of industry malfunctions and in conjunction with westerly-wind periods. Even if industry operators are very diligent in operating and maintaining their

facilities, occasional malfunctions that result in air pollution incidents in nearby areas are probably unavoidable.

After several incidents over the past few years, the Department of Health has increased scrutiny of industries at CIP. Also, a task force mandated by the state legislature was formed to investigate recent air pollution incidents and to reduce future occurrences. In response to plant malfunctions that have caused the excessive release of air contaminants, several industries have begun modernization programs which are intended to improve operations.

9.0 CONCLUSIONS AND RECOMMENDATIONS

The major potential short-term air quality impact of the project will occur from the emission of fugitive dust during construction. Uncontrolled fugitive dust emissions from construction activities are estimated to amount to about 1.2 tons per acre per month, depending on rainfall. To control dust, active work areas and any temporary unpaved work roads should be watered at least twice daily on days without rainfall. Use of wind screens and/or limiting the area that is disturbed at any given time will also help to contain fugitive dust emissions. Wind erosion of inactive areas of the site that have been disturbed could be controlled by mulching or by the use of chemical soil stabilizers. Dirt-hauling trucks should be covered when traveling on roadways to prevent windage. A routine road cleaning and/or tire washing program will also help to reduce fugitive dust emissions that may occur as a result of trucks tracking dirt onto paved roadways in the project area. Paving of parking areas and establishment of landscaping early in the construction schedule will also help to control dust. Monitoring dust at the project boundary during the period of

construction could be considered as a means to evaluate the effectiveness of the project dust control program and to adjust the program if necessary.

During construction phases, emissions from engine exhausts (primarily consisting of carbon monoxide and nitrogen oxides) will also occur both from on-site construction equipment and from vehicles used by construction workers and from trucks traveling to and from the project. Increased vehicular emissions due to disruption of traffic by construction equipment and/or commuting construction workers can be alleviated by moving equipment and personnel to the site during off-peak traffic hours.
After the proposed project is completed, any long-term impacts on air quality in the project area due to emissions from project-related motor vehicle traffic should be small. Worst-case concentrations of carbon monoxide should remain within both the state and the national ambient air quality standards. Implementing any air quality mitigation measures for long-term traffic-related impacts is probably unnecessary and unwarranted.

At this time, sufficient detail is not available describing the facilities that may be located within the commercial/industrial area included in the project to perform any quantitative impact assessments. However, the types of facilities currently being considered do not emit significant amounts of air pollution. In any case, before any air pollution sources can be built anywhere in the state, an application must be submitted to the Department of Health for a permit to construct the facility, and detailed information concerning any air pollution emissions will need to be provided in the application. If deemed necessary, the Department of Health may require the applicant to assess the air quality

impact of the proposed emissions.

Due to the relatively close proximity of industries located at CIP, occasional impacts on the project from emissions emanating from these facilities will probably be unavoidable. Such impacts may occur in conjunction with the coincidental occurrences of industry malfunctions and westerly winds, both of which are relatively infrequent events. Increased scrutiny by the Department of Health, a special task force mandated by the state legislature to assess and monitor emissions in the area, and the upgrade of some of the industries located at CIP, such as Chevron, should help to mitigate future impacts on areas adjacent to CIP.

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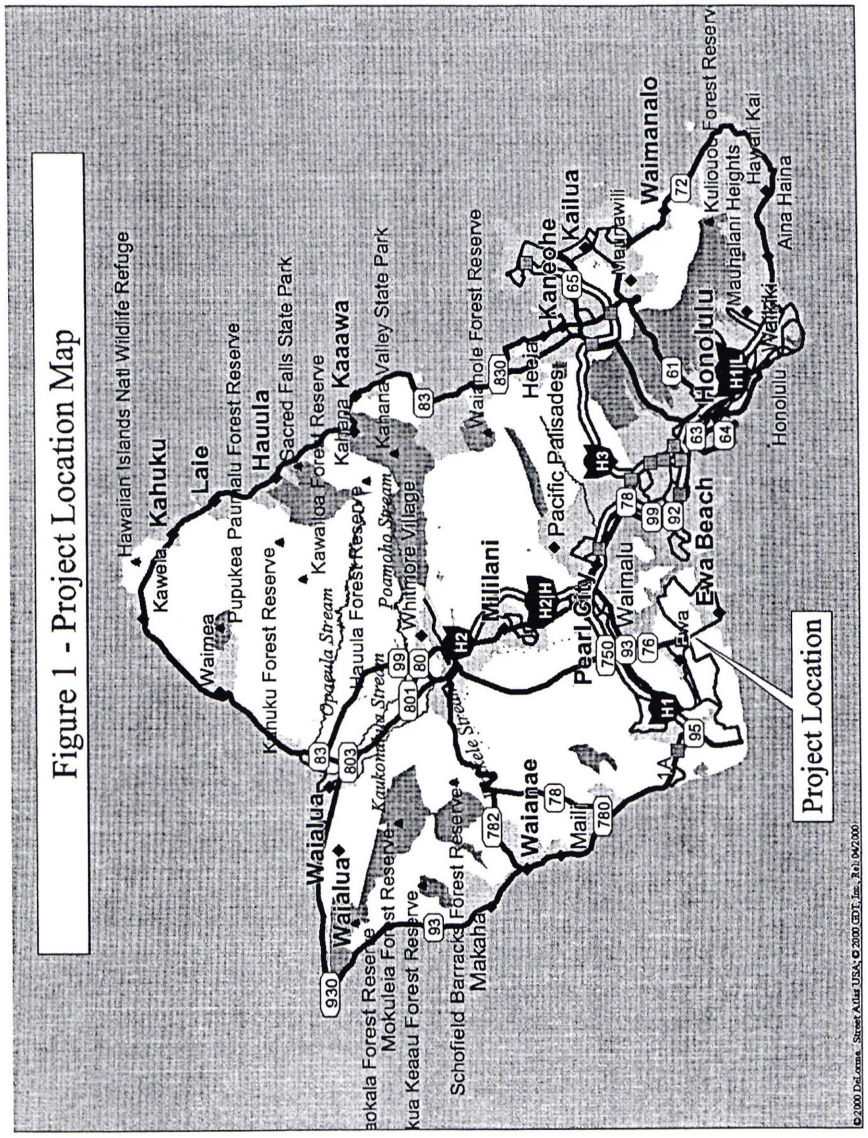

Table 1

SUMMARY OF STATE OF HAWAII AND NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Units	Averaging Time	Maximum Allowable Concentration		
			National Primary	National Secondary	State of Hawaii
Particulate Matter (<10 microns)	µg/m³	Annual 24 Hours	50[a] 150[b]	50[a] 150[b]	50 150[c]
Particulate Matter (<2.5 microns)	µg/m³	Annual 24 Hours	15[a] 65[d]	15[a] 65[d]	- -
Sulfur Dioxide	µg/m³	Annual 24 Hours 3 Hours	80 365[c] -	- - 1300[c]	80 365[c] 1300[c]
Nitrogen Dioxide	µg/m³	Annual	100	100	70
Carbon Monoxide	mg/m³	8 Hours 1 Hour	10[c] 40[c]	- -	5[c] 10[c]
Ozone	µg/m³	8 Hours 1 Hour	157[e] 235[f]	157[e] 235[f]	- 100[c]
Lead	µg/m³	Calendar Quarter	1.5	1.5	1.5
Hydrogen Sulfide	µg/m³	1 Hour	-	-	35[c]

[a] Three-year average of annual arithmetic mean.

[b] 99th percentile value averaged over three years.

[c] Not to be exceeded more than once per year.

[d] 98th percentile value averaged over three years.

[e] Three-year average of fourth-highest daily 8-hour maximum.

[f] Standard is attained when the expected number of exceedances is less than or equal to 1.

Note: Standards for particulate matter (<2.5 microns) and for 8-hour ozone have not yet been implemented.

Table 2

ANNUAL WIND FREQUENCY FOR HONOLULU INTERNATIONAL AIRPORT (%)

Wind Direction	Wind Speed (knots)									Total
	0-3	4-6	7-10	11-16	17-21	22-27	28-33	34-40	>40	
N	0.5	2.5	1.3	0.5	0.0	0.0	0.0	0.0	0.0	4.8
NNE	0.3	1.2	1.6	1.5	0.2	0.0	0.0	0.0	0.0	4.7
NE	0.3	2.1	6.1	11.0	3.2	0.3	0.0	0.0	0.0	23.0
ENE	0.2	2.5	10.9	16.6	4.1	0.3	0.0	0.0	0.0	34.7
E	0.1	1.0	2.5	2.8	0.5	0.0	0.0	0.0	0.0	7.0
ESE	0.0	0.3	0.4	0.3	0.0	0.0	0.0	0.0	0.0	1.1
SE	0.0	0.3	0.8	1.0	0.1	0.0	0.0	0.0	0.0	2.2
SSE	0.1	0.4	1.2	0.7	0.1	0.0	0.0	0.0	0.0	2.4
S	0.1	0.5	1.4	0.6	0.1	0.0	0.0	0.0	0.0	2.7
SSW	0.0	0.3	0.8	0.3	0.0	0.0	0.0	0.0	0.0	1.5
SW	0.0	0.2	0.8	0.4	0.0	0.0	0.0	0.0	0.0	1.5
WSW	0.0	0.3	0.5	0.4	0.0	0.0	0.0	0.0	0.0	1.2
W	0.1	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.1
WNW	0.2	1.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	2.0
NW	0.4	2.3	0.8	0.1	0.0	0.0	0.0	0.0	0.0	3.8
NNW	0.5	2.3	0.8	0.2	0.0	0.0	0.0	0.0	0.0	3.8
Calm	2.5									2.5
Total	5.4	18.3	30.6	36.5	8.5	0.7	0.0	0.0	0.0	100.0

Source: Climatography of the United States No. 90 (1965-1974), Airport Climatological Summary, Honolulu International Airport, Honolulu, Hawaii, U.S. Department of Commerce, National Climatic Center, Asheville, NC, August 1978.

Table 3

AIR POLLUTION EMISSIONS INVENTORY FOR ISLAND OF OAHU, 1993

Air Pollutant	Point Sources (tons/year)	Area Sources (tons/year)	Total (tons/year)
Particulate	25,891	49,374	75,265
Sulfur Oxides	39,230	nil	39,230
Nitrogen Oxides	92,436	31,141	123,577
Carbon Monoxide	28,757	121,802	150,559
Hydrocarbons	4,160	421	4,581

Source: Final Report, "Review, Revise and Update of the Hawaii Emissions Inventory Systems for the State of Hawaii", prepared for Hawaii Department of Health by J.L. Shoemaker & Associates, Inc., 1996

Table 4

ANNUAL SUMMARIES OF AIR QUALITY MEASUREMENTS FOR
MONITORING STATIONS NEAREST EWA BY GENTRY MAKAI DEVELOPMENT

Parameter / Location	1997	1998	1999	2000	2001
Sulfur Dioxide / Kapolei					
3-Hour Averaging Period:					
No. of Samples	2845	2723	2710	2505	2511
Highest Concentration ($\mu g/m^3$)	61	69	30	23	24
2nd Highest Concentration ($\mu g/m^3$)	52	64	17	18	15
No. of State AAQS Exceedances	0	0	0	0	0
24-Hour Averaging Period:					
No. of Samples	361	343	360	362	359
Highest Concentration ($\mu g/m^3$)	20	17	6	6	7
2nd Highest Concentration ($\mu g/m^3$)	16	16	6	5	6
No. of State AAQS Exceedances	0	0	0	0	0
Annual Average Concentration ($\mu g/m^3$)	2	2	2	1	2
Particulate (PM-10) / Kapolei					
24-Hour Averaging Period:					
No. of Samples	269	359	362	356	352
Highest Concentration ($\mu g/m^3$)	41	34	129	148	121
2nd Highest Concentration ($\mu g/m^3$)	26	34	39	129	104
No. of State AAQS Exceedances	0	0	0	0	0
Annual Average Concentration ($\mu g/m^3$)	13	15	15	17	19
Carbon Monoxide / Kapolei					
1-Hour Averaging Period:					
No. of Samples	8649	8044	8395	8595	8515
Highest Concentration (mg/m^3)	1.8	1.9	1.5	2.5	2.3
2nd Highest Concentration (mg/m^3)	1.7	1.5	1.2	1.6	1.9
No. of State AAQS Exceedances	0	0	0	0	0
8-Hour Averaging Period:					
No. of Samples	1085	1044	1048	1076	1073
Highest Concentration (mg/m^3)	0.7	0.6	0.6	1.0	1.6
2nd Highest Concentration (mg/m^3)	0.7	0.6	0.6	0.8	1.3
No. of State AAQS Exceedances	0	0	0	0	0
Nitrogen Dioxide / Kapolei					
Annual Average Concentration ($\mu g/m^3$)	8	8	7	9	6
Ozone / Sand Island					
1-Hour Averaging Period:					
No. of Samples	8702	8688	8566	8482	8448
Highest Concentration (mg/m^3)	106	114	110	98	104
2nd Highest Concentration (mg/m^3)	106	110	106	96	100
No. of State AAQS Exceedances	13	7	8	0	0

Source: State of Hawaii Department of Health, "Annual Summaries, Hawaii Air Quality Data, 1997- 2001"

Table 5

ESTIMATED WORST-CASE 1-HOUR CARBON MONOXIDE CONCENTRATIONS
ALONG ROADWAYS NEAR
EWA BY GENTRY MAKAI DEVELOPMENT
(milligrams per cubic meter)

Roadway Intersection	Year/Scenario					
	2002/Present		2010/Without Project		2010/With Project	
	AM	PM	AM	PM	AM	PM
Fort Weaver Road at Geiger/Iroquois Roads	8.7	7.2	6.1	5.0	6.7	5.5
Kapolei Parkway at Geiger Road	3.4	2.3	4.3	3.8	4.7	4.1
Kaahupahau Street at Geiger Road	3.9	3.2	3.7	3.1	3.7	3.2
Keaunui Drive at Iroquois Road	1.8	1.5	3.2	2.6	3.2	2.6

Hawaii State AAQS: 10
National AAQS: 40

Table 6

ESTIMATED WORST-CASE 8-HOUR CARBON MONOXIDE CONCENTRATIONS ALONG ROADWAYS NEAR EWA BY GENTRY MAKAI DEVELOPMENT (milligrams per cubic meter)

Roadway Intersection	Year/Scenario		
	2002/Present	2010/Without Project	2010/With Project
Fort Weaver Road at Geiger/Iroquois Roads	4.4	3.0	3.4
Kapolei Parkway at Geiger Road	1.7	2.2	2.4
Kaahupahau Street at Geiger Road	2.0	1.8	1.8
Keaunui Drive at Iroquois Road	0.9	1.6	1.6

Hawaii State AAQS: 5
National AAQS: 10

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ACOUSTIC STUDY FOR THE EWA BY GENTRY - MAKAI DEVELOPMENT

EWA, OAHU

LAND USE COMMISSION
STATE OF HAWAII
2003 MAR 21 A 9:14

Prepared for:

ENVIRONMENTAL COMMUNICATIONS, INC.

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NOVEMBER 2001

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CHAPTER I. SUMMARY

The existing and future traffic noise levels in the vicinity of the proposed Ewa By Gentry - Makai Development Project on the island of Oahu were evaluated for their potential impact on present and future noise sensitive areas. The future traffic noise levels along the primary access roadways to the project were calculated for the Year 2010.

Along the existing roadways which are expected to service the project traffic, noise levels are expected to increase by 0.8 to 1.6 DNL (or Ldn) between CY 1998 and CY 2010 as a result of project traffic. These increases in traffic noise levels associated with project traffic are not considered to be significant, and should not be discernible during the 12 year forecast interval.

By CY 2010, the dominant traffic noise sources in the project area will continue to be traffic noise from Fort Weaver Road. Traffic noise along the new sections of Kapolei Parkway south of Geiger Road and the new Street A will also be dominant noise sources within the project boundaries, particularly at those receptor locations which are removed from Ft. Weaver Road. Essentially all locations which front Ft. Weaver Road, Geiger Road, Kapolei Parkway, Iroquois Road, and Street A will experience relatively high noise levels above 65 DNL, and will require traffic noise mitigation measures. Those receptor locations which are removed from the major roadways as well as shielded by existing and new buildings should experience traffic noise levels less than 65 DNL.

Based on Year 2000/2001 and 2020 aircraft noise contours developed over the project site, only the commercial and industrial portions of the project site are located inside the 60 DNL noise contour. The aircraft noise contours indicate that planned residential or other noise sensitive uses within the petition area are located outside the airport's existing and forecasted 60 DNL contours, and are in conformance with local planning guidelines for the siting of noise sensitive land uses in the vicinity of airports. Special aircraft noise attenuation measures should not be required for this project. The implementation of the airport noise disclosure provisions of Chapter 508D, Hawaii Revised Statutes, 1996 will be necessary over the project areas which are contained within the FAR Part 150 noise contours, which were originally developed in 1987 for forecasted CY 1992 operations.

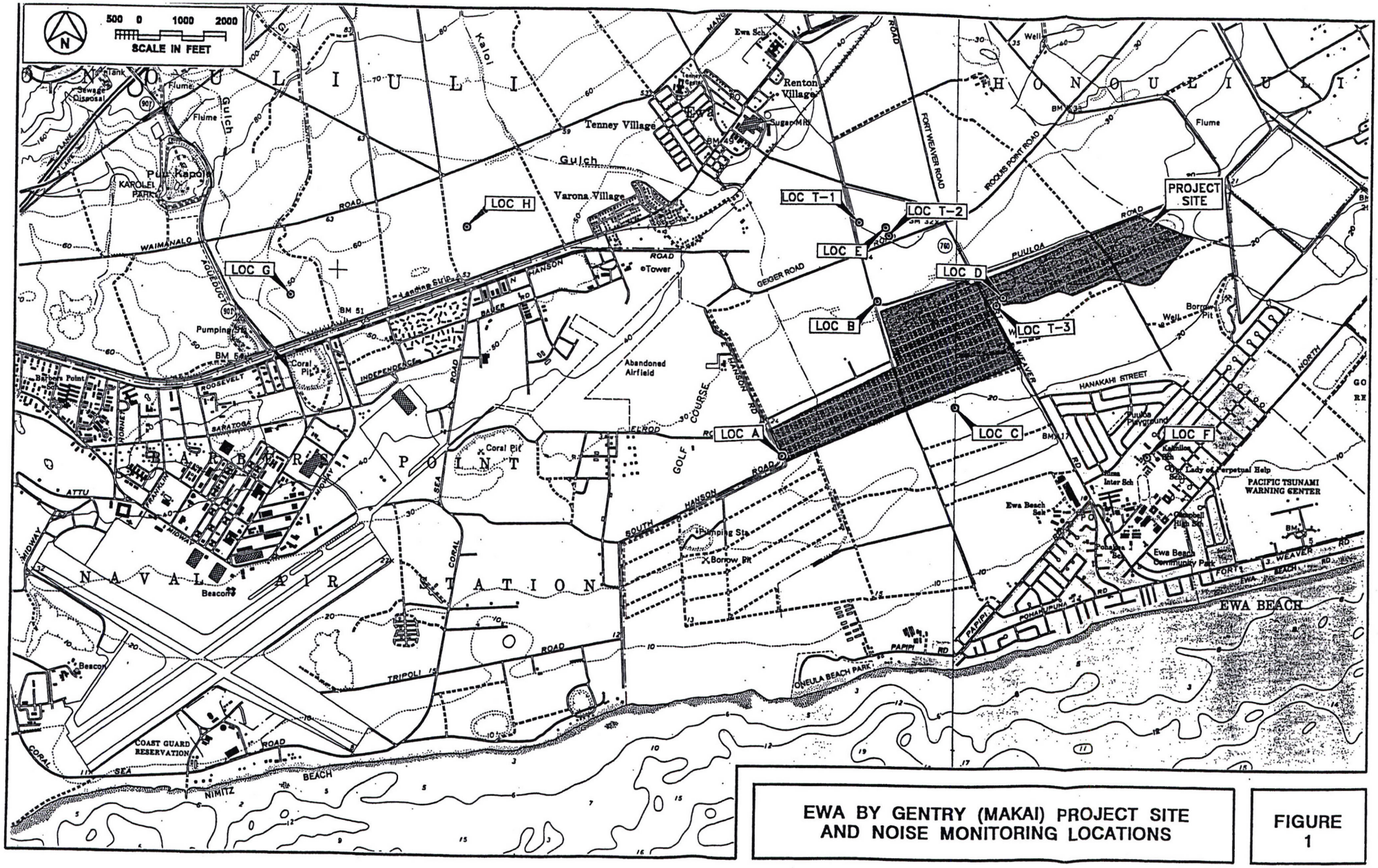
Unavoidable, but temporary, noise impacts may occur during the construction of the proposed project. Because construction activities are predicted to be audible at adjoining properties, the quality of the acoustic environment may be degraded to unacceptable levels during periods of construction. Mitigation measures to reduce construction noise to inaudible levels will not be practical in all cases. For this reason, the use of quiet equipment and construction curfew periods as required under the State Department of Health noise regulations are recommended to minimize construction noise impacts.

CHAPTER II. PURPOSE

The primary objective of this study was to describe the existing and future noise environment in the environs of the proposed Ewa By Gentry - Makai Development Project on the island of Oahu. The project site is located near the Hawaii Prince Golf Course and on both (east and west) sides of Fort Weaver Road where shown in Figure 1. It is directly under the straight-in approach flight track used by aircraft landing at Honolulu International Airport.

Roadway traffic noise level increases and impacts associated with the proposed development were to be determined within the project site as well as along the public roadways which are expected to service the project traffic. Traffic forecasts for 2010 were used. 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 traffic noise impacts were to be provided as required.

Assessments of possible noise impacts from aircraft landing at Honolulu International Airport, and from short term construction noise at the project site were also included in the noise study objectives. Recommendations for minimizing these noise impacts were also to be provided as required.



EWA BY GENTRY (MAKAI) PROJECT SITE AND NOISE MONITORING LOCATIONS

FIGURE 1

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 (DNL or Ldn). This descriptor incorporates a 24-hour average of instantaneous A-Weighted sound levels as read on a standard Sound Level Meter. The maximum A-Weighted sound level occurring while a noise source such as a heavy truck or aircraft is moving past a listener (i.e., the maximum sound level from a "single event") is referred to as the "Lmax value". The mathematical product (or integral) of the instantaneous sound level times the duration of the event is known as the "Sound Exposure Level", or Lse, which is analogous to the energy of the time-varying sound levels associated with a single event.

The DNL values represent the average noise during a typical day of the year. DNL exposure levels of 55 or less are typical of quiet rural or suburban areas. DNL exposure levels of 55 to 65 are typical of urbanized areas with medium to high levels of activity and street traffic. DNL exposure levels above 65 are representative of densely developed urban areas and areas fronting high volume roadways.

By definition, the minimum averaging period for the DNL descriptor is 24 hours. 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 DNL descriptor. Because of the averaging used, DNL values in urbanized areas typically range between 50 and 75 DNL. In comparison, the typical range of intermittent noise events may have maximum Sound Level Meter readings between 75 and 105 dBA. A more complete list of noise descriptors is provided in Appendix B to this report. In Appendix B, the Ldn descriptor symbol is used in place of the DNL descriptor symbol.

Table 1, extracted from Reference 1, categorizes the various DNL levels of outdoor noise exposure with severity classifications. Table 2, also extracted from Reference 1, presents the general effects of noise on people in residential use situations. Figure 2, extracted from Reference 2, presents suggested land use compatibility guidelines for residential and nonresidential land uses. A general consensus among federal agencies has developed whereby residential housing development is considered acceptable in areas where exterior noise does not exceed 65 DNL. This value of 65 DNL is used as a federal regulatory threshold for determining the necessity for special noise abatement measures when applications for federal funding assistance are made.

As a general rule, noise levels of 55 DNL or less occur in rural areas, or in areas which are removed from high volume roadways. In urbanized areas which are shielded from high volume streets, DNL levels generally range from 55 to 65 DNL, and are usually controlled by motor vehicle traffic noise. Residences which front major roadways are generally exposed to levels of 65 DNL, and as high as 75 DNL when the

TABLE 1

EXTERIOR NOISE EXPOSURE CLASSIFICATION (RESIDENTIAL LAND USE)

IOISE EXPOSURE CLASS	DAY–NIGHT SOUND LEVEL	EQUIVALENT SOUND LEVEL	FEDERAL (1) STANDARD
Minimal Exposure	Not Exceeding 55 DNL	Not Exceeding 55 Leq	Unconditionally Acceptable
Moderate Exposure	Above 55 DNL But Not Above 65 DNL	Above 55 Leq But Not Above 65 Leq	Acceptable(2)
Significant Exposure	Above 65 DNL But Not Above 75 DNL	Above 65 Leq But Not Above 75 Leq	Normally Unacceptable
Severe Exposure	Above 75 DNL	Above 75 Leq	Unacceptable

Notes: **(1) Federal Housing Administration, Veterans Administration, Department of Defense, and Department of Transportation.**

(2) FHWA uses the Leq instead of the Ldn 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 Leq.

TABLE 2

EFFECTS OF NOISE ON PEOPLE
(Residential Land Uses Only)

EFFECTS[1] / DAY-NIGHT AVERAGE SOUND LEVEL IN DECIBELS	Hearing Loss	Speech Interference		Annoyance[2]	Average Community Reaction[4]	General Community Attitude Towards Area
		Indoor	Outdoor			
	Qualitative Description	%Sentence Intelligibility	Distance in Meters for 95% Sentence Intelligibility	% of Population Highly Annoyed[3]		
75 and above	May Begin to Occur	98%	0.5	37%	Very Severe	Noise is likely to be the most important of all adverse aspects of the community environment.
70	Will Not Likely Occur	99%	0.9	25%	Severe	Noise is one of the most important adverse aspects of the community environment.
65	Will Not Occur	100%	1.5	15%	Significant	Noise is one of the important adverse aspects of the community environment.
60	Will Not Occur	100%	2.0	9%	Moderate to Slight	Noise may be considered an adverse aspect of the community environment.
55 and below	Will Not Occur	100%	3.5	4%		Noise considered no more important than various other environmental factors.

1. "Speech Interference" data are drawn from the following tables in EPA's "Levels Document": Table 3, Fig. D-1, Fig. D-2, Fig. D-3. All other data from National Academy of Science 1977 report "Guidelines for Preparing Environmental Impact Statements on Noise, Report of Working Group 69 on Evaluation of Environmental Impact of Noise."

2. Depends on attitudes and other factors.

3. The percentages of people reporting annoyance to lesser extents are higher in each case. An unknown small percentage of people will report being "highly annoyed" even in the quietest surroundings. One reason is the difficulty all people have in integrating annoyance over a very long time.

4. Attitudes or other non-acoustic factors can modify this. Noise at low levels can still be an important problem, particularly when it intrudes into a quiet environment.

NOTE: Research implicates noise as a factor producing stress-related health effects such as heart disease, high-blood pressure and stroke, ulcers and other digestive disorders. The relationships between noise and these effects, however, have not as yet been quantified.

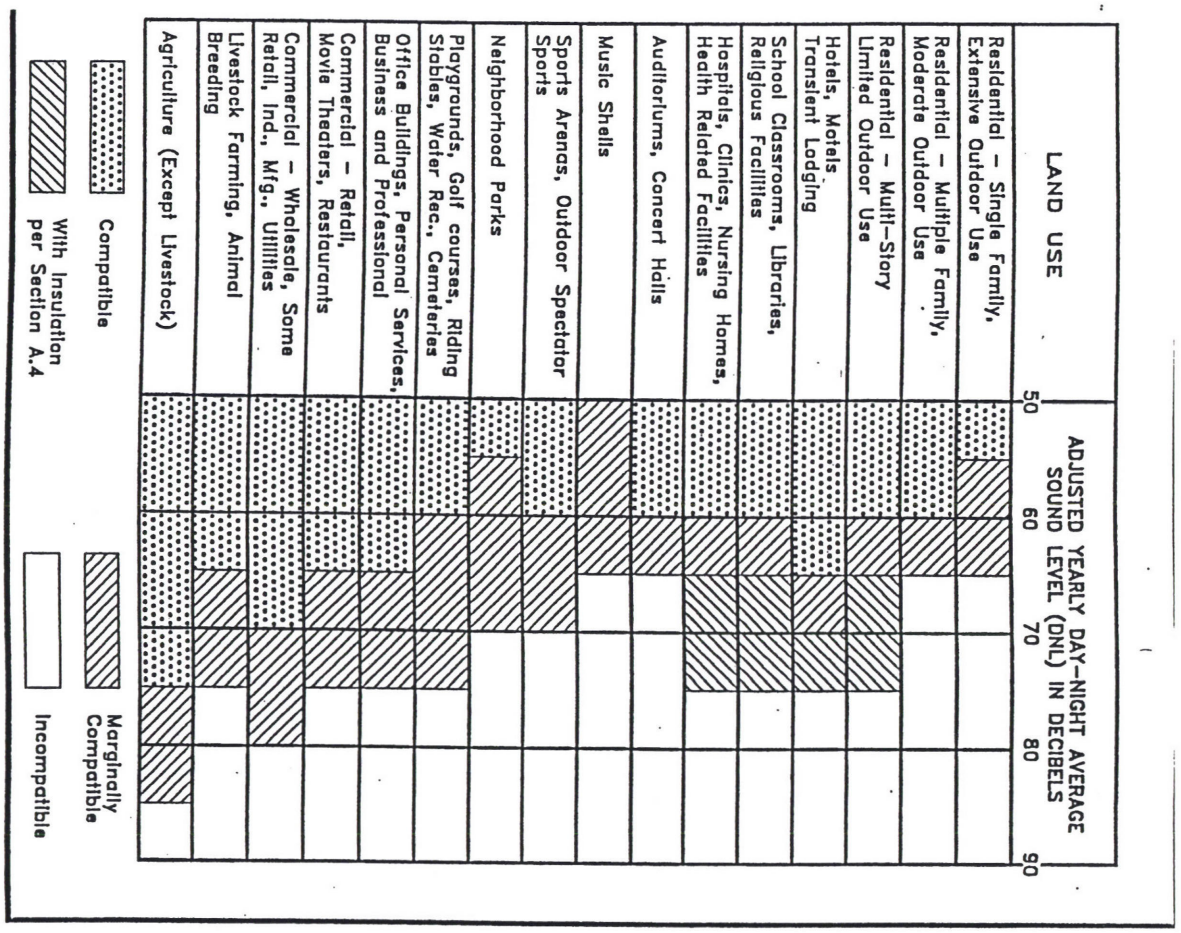


FIGURE 2

LAND USE COMPATIBILITY WITH YEARLY AVERAGE DAY-NIGHT AVERAGE SOUND LEVEL (DNL) AT A SITE FOR BUILDINGS AS COMMONLY CONSTRUCTED.
Source: American National Standards Institute S12.9-1998/Part 5)

roadway is a high speed freeway. Due to noise shielding effects from intervening structures, interior lots are usually exposed to 3 to 10 DNL lower noise levels than the front lots which are not shielded from the traffic noise.

For the purposes of determining noise acceptability for funding assistance from federal agencies, an exterior noise level of 65 DNL or lower is considered acceptable. These federal agencies include the Federal Aviation Administration (FAA), Department of Defense (DOD); Federal Housing Administration, Housing and Urban Development (FHA/HUD), and Veterans Administration (VA). This standard is applied nationally (see Reference 3), including Hawaii.

Because of our open-living conditions, the predominant use of naturally ventilated dwellings, and the relatively low exterior-to-interior sound attenuation afforded by these naturally ventilated structures, an exterior noise level of 65 DNL does not eliminate all risks of noise impacts. Because of these factors, a lower level of 55 DNL is considered as the "Unconditionally Acceptable" (or "Near-Zero Risk") level of exterior noise (see Reference 4). For typical, naturally ventilated structures in Hawaii, an exterior noise level of 55 DNL results in an interior level of approximately 45 DNL, which is considered to be the "Unconditionally Acceptable" (or "Near-Zero Risk") level of interior noise. However, after considering the cost and feasibility of applying the lower level of 55 DNL, government agencies such as FHA/HUD and VA have selected 65 DNL as a more appropriate regulatory standard.

For aircraft noise, the Hawaii State Department of Transportation, Airports Division (HDOTA), has recommended that 60 DNL be used as the common level for determining land use compatibility in respect to noise sensitive uses near its airports. Table 3 summarizes the recommendations for compatible land uses at various levels of aircraft noise. For those noise sensitive land uses which are exposed to aircraft noise greater than 55 DNL, the division recommends that disclosure of the aircraft noise levels be provided prior to any real property transactions. Reference 5 requires that such disclosure be provided prior to real property transactions concerning properties located within Air Installation Compatibility Use Zones (AICUZ) or located within airport noise maps developed under Federal Aviation Regulation (FAR) Part 150 - Airport Noise Compatibility Planning (14 CFR Part 150). The most recent FAR Part 150 noise contours for Honolulu International Airport were completed in 1987 and reflect conditions through 1992. Additional airport noise contours for 2007 were developed by the HDOTA for information purposes only during the 1987 to 1989 time frame.

For commercial, industrial, and other non-noise sensitive land uses, exterior noise levels as high as 75 DNL are generally considered acceptable. Exceptions to this occur when naturally ventilated office and other commercial establishments are exposed to exterior levels which exceed 65 DNL.

In the State of Hawaii, the State Department of Health (DOH) regulates noise from on-site activities. State DOH noise regulations are expressed in maximum

TABLE 3

HAWAII STATE DEPARTMENT OF TRANSPORTATION RECOMMENDATIONS FOR LOCAL LAND USE COMPATIBILITY WITH YEARLY DAY–NIGHT AVERAGE SOUND LEVELS (DNL)

TYPE OF LAND USE	**** Yearly Day-Night Average Sound Level ****					
	< 60	60-65	65-70	70-75	75-80	80-85
RESIDENTIAL						
Low density residential, resorts, and hotels (outdoor facil.)	Y(a)	N(b)	N	N	N	N
Low density apartment with moderate outdoor use	Y	N(b)	N	N	N	N
High density apartment with limited outdoor use	Y	N(b)	N(b)	N	N	N
Transient lodgings with limited outdoor use	Y	N(b)	N(b)	N	N	N
PUBLIC USE						
Schools, day-care centers, libraries, and churches	Y	N(c)	N(c)	N(c)	N	N
Hospitals, nursing homes, clinics, and health facilities	Y	Y(d)	Y(d)	Y(d)	N	N
Indoor auditoriums and concert halls	Y(c)	Y(c)	N	N	N	N
Government services and office buildings serving the general public	Y	Y	Y(d)	Y(d)	N	N
Transportation and Parking	Y	Y	Y(d)	Y(d)	Y(d)	Y(d)
COMMERCIAL AND GOVERNMENT USE						
Offices - government, business, and professional	Y	Y	Y(d)	Y(d)	N	N
Wholesale and retail - building materials, hardware and heavy equipment	Y	Y	Y(d)	Y(d)	Y(d)	Y(d)
Airport businesses - car rental, tours, lei stands, ticket offices, etc.	Y	Y	Y(d)	Y(d)	N	N
Retail, restaurants, shopping centers, financial institutions, etc.	Y	Y	Y(d)	Y(d)	N	N
Power plants, sewage treatment plants, and base yards	Y	Y	Y(d)	Y(d)	Y(d)	N
Studios without outdoor sets, broadcasting, production facilities, etc.	Y(c)	Y(c)	N	N	N	N
MANUFACTURING, PRODUCTION, AND STORAGE						
Manufacturing, general	Y	Y	Y(d)	Y(d)	Y(d)	N
Photographic and optical	Y	Y	Y(d)	Y(d)	N	N
Agriculture (except livestock) and forestry	Y	Y(e)	Y(e)	Y(e)	Y(e)	Y(e)
Livestock farming and breeding	Y	Y(e)	Y(e)	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
RECREATIONAL						
Outdoor sports arenas and spectator sports	Y	Y(f)	Y(f)	N	N	N
Outdoor music shells, amphitheaters	Y(f)	N	N	N	N	N
Nature exhibits and zoos, neighborhood parks	Y	Y	Y	N	N	N
Amusements, beach parks, active playgrounds, etc.	Y	Y	Y	Y	N	N
Public golf courses, riding stables, cemeteries, gardens, etc.	Y	Y	N	N	N	N
Professional/resort sport facilities, locations of media events, etc.	Y(f)	N	N	N	N	N
Extensive natural wildlife and recreation areas	Y(f)	N	N	N	N	N

Numbers in parentheses refer to notes.

KEY TO TABLE 3:

Y(Yes) = Land Use and related structures compatible without restrictions.
N(No) = Land Use and related structures are not compatible and should be prohibited.

TABLE 3 (CONTINUED)

HAWAII STATE DEPARTMENT OF TRANSPORTATION RECOMMENDATIONS FOR LOCAL LAND USE COMPATIBILITY WITH YEARLY DAY–NIGHT AVERAGE SOUND LEVELS (DNL)

NOTES FOR TABLE 3:

(a) A noise level of 60 DNL does not eliminate all risks of adverse noise impacts from aircraft noise. However, the 60 DNL planning level has been selected by the State Airports Division as an appropriate compromise between the minimal risk level of 55 DNL and the significant risk level of 65 DNL.

(b) Where the community determines that these uses must be allowed, Noise Level Reduction (NLR) measures to achieve interior levels of 45 DNL or less should be incorporated into building codes and be considered in individual approvals. Normal local construction employing natural ventilation can be expected to provide an average NLR of approximately 9 dB. Total closure plus air conditioning may be required to provide additional outdoor to indoor NLR, and will not eliminate outdoor noise problems.

(c) Because the DNL noise descriptor system represents a 24-hour average of individual aircraft noise events, each of which can be unique in respect to amplitude, duration, and tonal content, the NLR requirements should be evaluated for the specific land use, interior acoustical requirements, and properties of the aircraft noise events. NLR requirements should not be based solely upon the exterior DNL exposure level.

(d) Measures to achieve required NLR must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.

(e) Residential buildings require NLR. Residential buildings should not be located where noise is greater than 65 DNL.

(f) Impact of amplitude, duration, frequency, and tonal content of aircraft noise events should be evaluated.

allowable property line noise limits rather than DNL (see Reference 6). The noise limits apply on all islands of the State, including Oahu. Although they are not directly comparable to noise criteria expressed in DNL, State DOH noise limits for preservation/residential, apartment/commercial, and agricultural/industrial lands equate to approximately 55, 60, and 76 DNL, respectively.

Because the proposed project site is located on lands designated for single family and multifamily residential, and commercial/industrial uses, various DOH noise limits would be applicable along the lot boundary lines or receptor locations for any stationary machinery, or equipment related to commercial/industrial or construction activities. These property line limits are 70 dBA during both the daytime and nighttime periods for industrial lots or receptors. For multifamily or apartment use, the State DOH limits are 60 dBA and 50 dBA during the daytime and nighttime periods, respectively. For single family residential and public facility uses, the State DOH limits are 55 dBA and 45 dBA during the daytime and nighttime periods, respectively. These noise limits cannot be exceeded for more than 2 minutes in any 20-minute time period under the State DOH noise regulations. The State DOH noise regulations do not apply to aircraft or motor vehicles.

CHAPTER IV. GENERAL STUDY METHODOLOGY

General. Noise measurements and modeling were used to describe existing and future noise levels in the project environs. Traffic and aircraft noise were evaluated, since they were and are expected to continue to be the dominant noise sources in the area. Risks of adverse noise impacts from traffic, aircraft, and construction activities were determined, and possible noise mitigation measures were provided.

Traffic Noise. Existing traffic noise levels were measured at four locations (T-1, T-2, T-3, and T-4) in the project environs to provide a basis for developing the project's traffic noise contributions along the roadways which will service the proposed development. The locations of the measurement sites are shown in Figure 1. Location T-4 was adjacent to and approximately 100 feet east of Location T-3. Traffic noise measurements were performed during October 2001. The results of the traffic noise measurements were compared with calculations of existing traffic noise levels to validate the computer model used. The traffic noise measurement results, and their comparisons with computer model predictions of existing traffic noise levels are summarized in Table 4.

Traffic noise calculations for the existing conditions (1998 or Base Year) as well as noise predictions for 2010 were performed using the Federal Highway Administration (FHWA) Traffic Noise Model (Reference 7). Traffic data entered into the noise prediction model were: roadway and receiver locations; hourly traffic volumes, average vehicle speeds; estimates of traffic mix; and "Pavement", "Hard Soil," and "Loose Soil" propagation loss factors. The traffic data and forecasts for the project (Reference 8), plus the spot traffic counts obtained during the noise measurement periods were the primary sources of data inputs to the model. Appendix C summarizes the AM and PM peak hour traffic volumes for CY 1998 and 2010 which were used to model existing and future traffic noise along the streets surrounding the project site. For existing and future traffic along the streets surrounding the project site, it was assumed that the average noise levels, or Leq(h), during the PM peak traffic hour were approximately 1.4 to 2.0 dB less than the 24-hour DNL along those roadways.

Traffic noise calculations for both the existing and future conditions in the project environs were developed for ground level receptors without the benefit of shielding from natural or man made obstructions. Traffic noise levels were also calculated for future conditions with and without the proposed project. The forecasted changes in traffic noise levels over existing levels were calculated with and without the project, and noise impact risks evaluated. The relative contributions of non-project and project traffic to the total noise levels were also calculated, and an evaluation of possible traffic noise impacts was made.

Aircraft Noise. In addition to the traffic noise measurements, aircraft noise measurements were obtained at Locations A through H where shown in Figure 1. The

TABLE 4

TRAFFIC NOISE MEASUREMENT RESULTS

LOCATION	Time of Day (HRS)	Ave. Speed (MPH)	Hourly Traffic Volume AUTO	M.TRUCK	H.TRUCK	Measured Leq (dB)	Predicted Leq (dB)
T-1 87 FT from centerline of Kapolei Parkway (10/18/01)	1600 TO 1645	37	415	3	0	61.2	60.7
T-1 87 FT from centerline of Kapolei Parkway (10/22/01)	0630 TO 0730	37	437	9	0	60.6	61.4
T-2 57 FT from centerline of Geiger Road (10/22/01)	1600 TO 1700	37	972	14	1	67.1	67.8
T-2 57 FT from centerline of Geiger Road (10/23/01)	0630 TO 0730	37	994	34	4	68.7	68.0
T-4 200 FT from centerline of Ft. Weaver Road (10/24/01)	1507 TO 1607	38	2,256	22	22	58.6	59.1
T-3 100 FT from centerline of Ft. Weaver Road (10/24/01)	1615 TO 1715	38	2,117	29	7	66.7	68.0

TABLE 4 (CONTINUED)
TRAFFIC NOISE MEASUREMENT RESULTS

	LOCATION	Time of Day (HRS)	Ave. Speed (MPH)	Hourly Traffic Volume AUTO	M.TRUCK	H.TRUCK	Measured Leq (dB)	Predicted Leq (dB)
T-4	200 FT from centerline of Ft. Weaver Road (10/25/01)	0618 TO 0718	38	1,980	33	34	59.9	59.4
T-3	100 FT from centerline of Ft. Weaver Road (10/25/01)	0618 TO 0718	38	1,980	33	34	69.4	68.7
T-4	200 FT from centerline of Ft. Weaver Road (10/25/01)	0723 TO 0823	38	2,363	51	45	61.0	60.5
T-3	100 FT from centerline of Ft. Weaver Road (10/25/01)	0723 TO 0823	38	2,363	51	45	69.4	69.7

results of these measurements are shown in Tables 5A through 5H. These aircraft noise measurements as well as aircraft noise modeling were used to determine if the proposed housing units are in the acceptable noise zone of 60 DNL or less.

Aircraft noise contours for Honolulu International Airport (HIA) developed during the last FAR (Federal Aviation Regulations) Part 150 Noise Compatibility Program (see Reference 9) are shown in Figure 3 over the Ewa Beach and Kapolei areas. The noise contours were the result of forecasts and airport noise modeling for 1992 using an older version of the FAA INM (Federal Aviation Administration Integrated Noise Model). Figure 4 depicts the same 1992 FAR Part 150 noise contours over the project site. Using the current version (FAA INM Version 6.0) of the noise model, a rerun of the 1992 airport operational forecasts was performed during this current study to reconstruct the 1992 contours using the INM Version 6.0. These 1992 contours generated from INM Version 6.0 are shown in Figure 5. The contours shown in Figure 3 are slightly larger (or noisier) than those shown in Figure 5 due to user specified approach profiles employed in the original INM model run vs. the standard 3 degree approach profile which was employed in INM Version 6.0 model run.

Figures 3 and 4, which depict the official FAR Part 150 noise contours over the project site, are the applicable airport noise contours for disclosure purposes under Reference 5. Figure 5 was developed using the FAA INM Version 6.0 in order to determine that reasonably accurate and consistent noise contours for years beyond 1992 could be developed using the FAA INM Version 6.0.

Figure 6 depicts the 2007 noise contours which were also developed as the 20 year forecast noise contours for HIA during the last FAR Part 150 study (see Reference 9). Figure 6 was also developed using the older version of the FAA INM. Because the sizes of the noise contours in Figures 6 and 3 are similar, it could be concluded that major increases in the aircraft noise contours over the project site had not been forecast to occur between 1992 and 2007 when the last FAR Part 150 study for HIA was performed.

In order to update the published and unpublished noise contours shown in Figures 3, 5, and 6, additional airport noise contours for the 2000/2001 period and for 2020 were developed during this study using the FAA INM Version 6.0. The 2000 through 2001 period was used to model aircraft noise instead of the 12 month period ending December 2001 because of the large reductions in aircraft operations after September 11, 2001. The 2000/2001 and 2020 noise contours were used to describe existing aircraft noise levels for the 12 month period just prior to September 11, as well as predicted noise levels in the distant future. In addition, the aircraft noise contours were used to determine if sound attenuation treatment should be required at the residences within the project site, and to determine if the airport noise disclosure area would increase beyond those shown in Figures 3 and 4.

TABLE 5A

SUMMARY OF AIRCRAFT NOISE MEASUREMENTS AT LOCATION "A"

AIRCRAFT TYPE	MAXIMUM SOUND LEVELS Lmax (In dB)	SOUND EXPOSURE LEVELS Lse (In dB)
B-737(200) (RWY 8L LAND.)	68.2; 71.2; 67.3; 73.9; 73.1; 67.8; 66.2 (AVE. = 69.7)	77.5; 77.5; 75.1; 78.2; 77.5; 75.8; 73.1 (AVE. = 76.7)
B-717(200) (RWY 8L LAND.)	73.7; 71.6; 64.9; 71.2; 60.9; 71.8 (AVE. = 69.0)	79.6; 76.3; 73.2; 79.5; 68.1; 79.1 (AVE. =.77.4)
2 EACH, F-15 (RWY 8L LAND.)	78.0; 81.4 (AVE. = 79.7)	85.9; 87.1 (AVE. = 83.5)
B-747 (RWY 8L LAND.)	66.6; 75.3; 72.0 (AVE. = 71.3)	75.1; 85.4; 80.1 (AVE. = 81.9)
DC-10/L-1011 (RWY 8L LAND.)	75.0; 69.6; 77.4; 72.6; 77.6; 76.8; 75.5 (AVE. = 74.9)	84.2; 79.1; 85.8; 81.6; 81.8; 83.7; 82.7 (AVE. = 83.1)
B-757/B-767 (RWY 8L LAND.)	72.3; 74.3; 74.9; 72.3; 73.2; 78.0; 68.4; 78.8; 81.8; 75.2 (AVE. = 74.9)	82.0; 83.0; 82.5; 78.4; 82.7; 80.3; 76.7; 80.4; 84.7; 82.8 (AVE. = 81.9)
C-130 (RWY 8L LAND.)	71.5; 72.8; 74.1 (AVE. = 72.8)	78.0; 81.4; 82.5 (AVE. = 81.0)
C-141 (RWY 8L LAND.)	80.1 (AVE. = 80.1)	86.1 (AVE. = 86.1)
DC-9 (50) (RWY 8L LAND.)	70.9 (AVE. = 70.9)	75.5 (AVE.= 75.5)
GA-1 (RWY 8L LAND.)	65.6 (AVE. = 65.6)	63.2 (AVE. = 63.2)

TABLE 5B

SUMMARY OF AIRCRAFT NOISE MEASUREMENTS AT LOCATION "B"

AIRCRAFT TYPE	MAXIMUM SOUND LEVELS Lmax (In dB)	SOUND EXPOSURE LEVELS Lse (In dB)
B-737(200) (RWY 8L LAND.)	74.1; 74.6; 71.8; 70.6; 71.7; 74.6; 70.9; 76.1; 76.0; 67.8; 74.0; 69.4; 73.0 (AVE. = 72.7)	78.6; 80.6; 78.9; 79.1; 78.5; 82.9; 78.2;83.0; 82.4; 77.8; 80.5; 76.2; 81.5 (AVE. = 80.3)
B-717(200) (RWY 8L LAND.)	69.9; 74.8; 73.4; 71.2; 67.7; 71.6; 73.5; 74.2; 75.9; 73.2 (AVE. = 72.5)	78.0; 82.6; 80.8; 79.3; 76.1; 79.5; 81.0; 80.7; 83.3; 80.4 (AVE. = 80.6)
B-747 (RWY 8L LAND.)	78.0; 88.6 (AVE. = 83.3)	87.4; 93.9 (AVE. = 91.8)
DC-10/L-1011 (RWY 8L LAND.)	77.5; 79.8; 78.2; 78.2 74.7; 81.5; 77.0; 71.9 77.0; 78.5 (AVE. = 77.4)	86.8; 86.5; 85.8; 86.7 82.8; 87.7; 84.3; 79.6 85.2; 86.5 (AVE. = 85.7)
B-757/B-767 (RWY 8L LAND.)	75.4; 75.3; 76.9; 75.7; 67.0; 73.6 78.6; 76.4; 73.4; 77.4; 74.0; 76.3; 72.9; 71.4 (AVE. = 74.6)	85.7; 84.9; 86.3; 81.7; 77.4; 82.7 86.4; 83.6; 80.9; 85.7; 83.4; 85.1; 82.4; 79.7 (AVE. = 83.9)
2 EACH, F-15 (RWY 8L LAND.)	80.0; 96.1; 73.8 (AVE. = 83.3)	86.3; 94.9; 82.2 (AVE.= 89.6)
C-130 (RWY 8L LAND.)	78.5; 76.4; 75.3; 75.2 (AVE. = 76.4)	85.7; 85.2; 83.0; 84.2 (AVE. = 84.6)
C-17 (RWY 8L LAND.)	78.0	84.9
GA-2 (RWY 8L LAND.)	64.8	73.1
KC-135R (RWY 8L LAND.)	77.0; 80.7; 75.5 (AVE. = 77.7)	85.7; 87.4; 83.6 (AVE. = 85.8)

TABLE 5C

SUMMARY OF AIRCRAFT NOISE MEASUREMENTS
LOCATION "C"

AIRCRAFT TYPE	MAXIMUM SOUND LEVELS Lmax (In dB)	SOUND EXPOSURE LEVELS Lse (In dB)
B-737(200) (RWY 8L LAND.)	72.7; 70.6; 74.5; 70.1; 73.9 (AVE. =72.4)	79.6; 79.9; 82.1; 77.8; 80.9 (AVE. = 80.3)
B-717(200) (RWY 8L LAND.)	73.7; 67.5; 70.5; 72.9; 70.6; 72.0 (AVE. = 71.2)	81.1; 77.1; 77.5; 80.7; 79.6; 79.9 (AVE. = 79.6)
2 EACH, F-15 (RWY 8L LAND.)	68.2; 77.8; 82.5; 99.2 (AVE. = 81.9)	77.0; 85.5; 87.7; 107.9 (AVE. = 98.9)
B-747 (RWY 8L LAND.)	79.3; 76.3; 77.4 (AVE. = 77.7)	88.2; 85.1; 86.4 (AVE. = 86.8)
DC-10/L-1011 (RWY 8L LAND.)	76.1; 78.2; 75.3; 76.5 (AVE. = 76.5)	85.2; 86.7; 83.7; 85.2 (AVE. = 85.3)
B-757/B-767 (RWY 8L LAND.)	76.3; 79.8; 77.0; 74.4; 79.1; 78.8 (AVE. = 77.6)	84.9; 86.2; 84.7; 83.5; 85.4; 84.8 (AVE. = 85.0)
C-130 (RWY 8L LAND.)	74.6 (AVE. = 74.6)	82.4 (AVE. = 82.4)
GA-2 (RWY 8L LAND.)	72.3; 68.0 (AVE. = 70.2)	80.2; 77.4 (AVE. = 79.0)
C-141 (RWY 8L LAND.)	78.1; 80.0; 79.0 (AVE. = 79.0)	85.6; 87.2; 85.2 (AVE. = 86.1)

TABLE 5D

SUMMARY OF AIRCRAFT NOISE MEASUREMENTS
LOCATION "D"

AIRCRAFT TYPE	MAXIMUM SOUND LEVELS Lmax (In dB)	SOUND EXPOSURE LEVELS Lse (In dB)
B-737(200) (RWY 8L LAND.)	73.6; 68.8; 70.0; 70.9; 68.6; 78.0; 74.7; 71.0; 72.4; 71.9; 69.8; 70.0; 72.2; 74.5; 77.6 (AVE.= 72.3)	80.5; 78.4; 78.4; 79.6; 77.2; 78.2; 81.6; 78.5; 79.0; 80.3; 77.5; 78.5 80.3; 80.9; 84.7 (AVE.= 80.0)
B-717(200) (RWY 8L LAND.)	74.2; 80.6; 69.7; 73.2; 69.5; 75.9 68.0; 69.7; 75.1; 73.7; 69.8; 73.1 (AVE.= 72.7)	80.4; 81.8; 78.1; 77.9; 76.5; 83.5 75.7; 74.8; 82.0; 80.1; 77.8; 80.5 (AVE.= 79.8)
B-747 (RWY 8L LAND.)	81.1	88.4
DC-10/L-1011 (RWY 8L LAND.)	75.5; 77.5; 78.8; 75.8; 72.4; 75.3; 77.7; 78.8; 76.1; 77.2; 75.8; 76.6 77.2; 72.5 (AVE.= 76.2)	85.1; 84.3; 85.1; 84.9; 80.3; 84.4; 84.1; 84.5; 85.2; 85.9; 84.2; 85.8 85.2; 81.4 (AVE.= 84.5)
B-757/B-767 (RWY 8L LAND.)	77.1; 76.0; 70.1; 78.0; 78.8; 76.1; 76.1; 69.1; 74.4; 71.6; 74.5; 70.0; 75.0; 71.8; 71.8 (AVE.= 74.0)	84.1; 83.4; 79.6; 85.6; 82.7; 83.4; 85.1; 80.5; 82.0; 80.4; 83.5; 79.2; 84.7; 80.4; 80.6 (AVE.= 82.8)
2 EACH, F-15 (RWY 8L LAND.)	83.8	92.1 (AVE.= 89.1)
C-130 (RWY 8L LAND.)	75.0	82.2
C-141 (RWY 8L LAND.)	84.2; 81.6 (AVE.= 82.9)	91.5; 89.2 (AVE.= 90.4)

TABLE 5E

SUMMARY OF AIRCRAFT NOISE MEASUREMENTS
LOCATION "E"

AIRCRAFT TYPE	MAXIMUM SOUND LEVELS Lmax (In dB)	SOUND EXPOSURE LEVELS Lse (In dB)
B-737(200) (RWY 8L LAND.)	63.7; 71.9; 65.2 (AVE. = 66.9)	70.7; 80.3; 72.2 (AVE. = 76.5)
B-747 (RWY 8L LAND.)	75.2; 72.8; 73.9; 70.5; 71.4 (AVE. = 72.8)	79.3; 82.8; 81.7; 79.8; 80.4 (AVE. = 81.0)
DC-10/L-1011 (RWY 8L LAND.)	71.2; 72.8; 70.3 (AVE. = 71.4)	81.1; 81.3; 77.8 (AVE. = 80.3)
DC-9(50) (RWY 8L LAND.)	70.4; 75.8 (AVE. = 73.1)	77.1; 83.3 (AVE. = 81.2)

TABLE 5F

SUMMARY OF AIRCRAFT NOISE MEASUREMENTS
LOCATION "F"

AIRCRAFT TYPE	MAXIMUM SOUND LEVELS Lmax (In dB)	SOUND EXPOSURE LEVELS Lse (In dB)
B-737(200) (RWY 8L LAND.)	72.0; 70.9; 70.2; 70.2 (AVE. = 70.8)	80.2; 78.3; 77.3; 77.2 (AVE. = 78.4)
B-747 (RWY 8L LAND.)	78.5; 77.6; 79.4; 77.3 (AVE. = 78.2)	87.4; 85.5; 86.8; 86.0 (AVE. = 86.5)
DC-10/L-1011 (RWY 8L LAND.)	76.5; 76.5; 78.5; 73.0; 76.3; 74.5; 73.7; 75.8; 74.6; 73.6; 72.4 (AVE. = 75.0)	84.4; 84.7; 84.7; 80.4; 83.0; 82.3; 82.3; 83.2; 83.3; 82.1; 81.4 (AVE. = 83.1)
DC-9(50) (RWY 8L LAND.)	71.3; 73.0; 76.9 (AVE. = 73.7)	81.6; 79.2; 81.4 (AVE. = 80.9)
2 EACH, F-15 (RWY 8L LAND.)	77.6; 81.9 (AVE. = 79.8)	84.4; 87.0 (AVE. = 85.9)

TABLE 5G

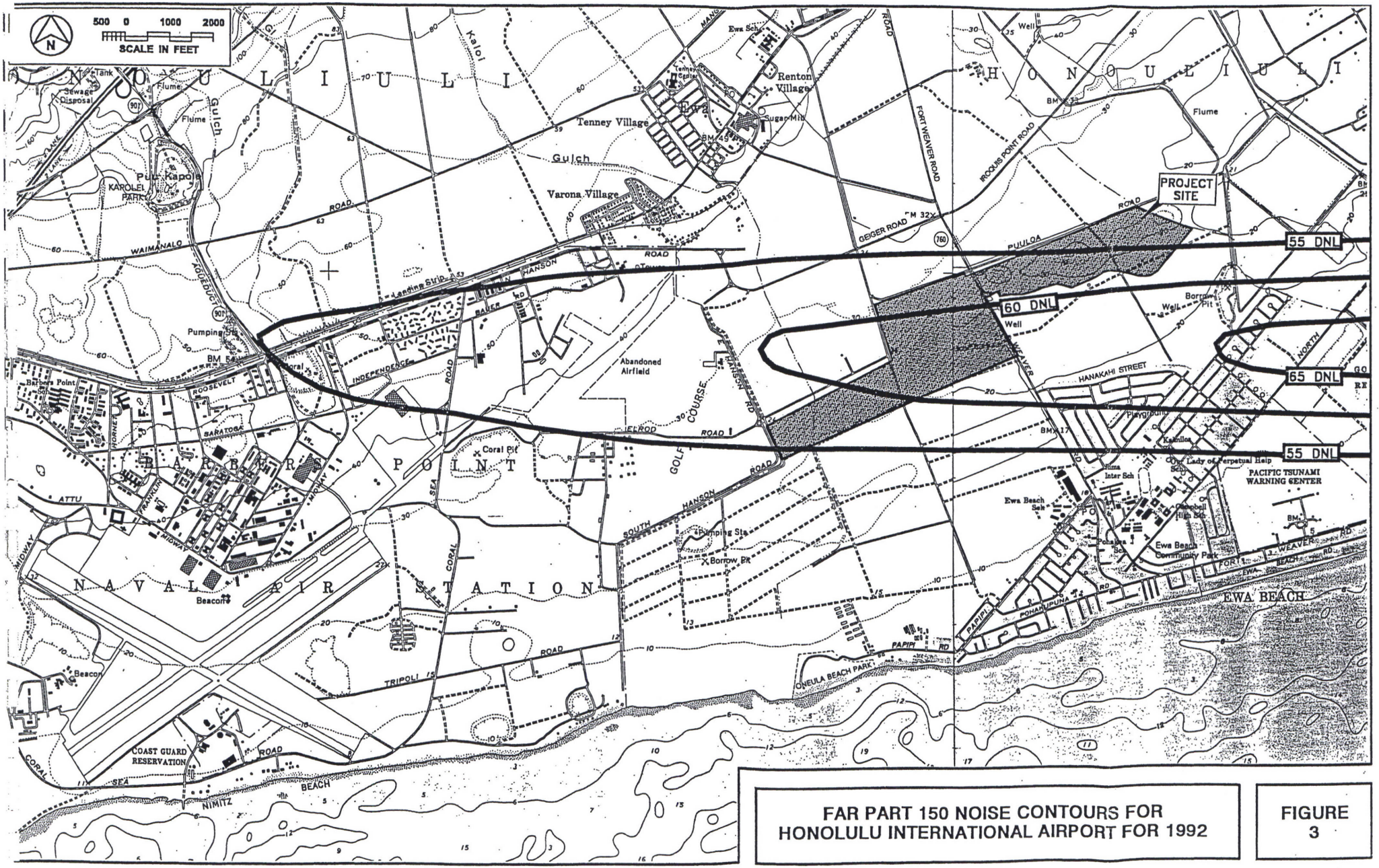
SUMMARY OF AIRCRAFT NOISE MEASUREMENTS LOCATION "G"

AIRCRAFT TYPE	MAXIMUM SOUND LEVELS Lmax (In dB)	SOUND EXPOSURE LEVELS Lse (In dB)
B-737(200) (RWY 8L LAND.)	66.7; 69.1; 70.5; 67.8 (AVE. = 68.5)	74.6; 76.7; 79.2; 74.4 (AVE. = 76.7)
B-747 (RWY 8L LAND.)	76.8; 74.8; 75.2 (AVE. = 75.6)	85.5; 84.1; 83.0 (AVE. = 84.3)
DC-10/L-1011 (RWY 8L LAND.)	65.0; 74.9; 75.6; 72.5; 60.2; 72.2; 66.7; 69.8; 69.6 (AVE. = 69.6)	71.6; 83.6; 82.4; 80.5; 68.1; 80.3; 75.1; 77.6; 79.2 (AVE. = 79.6)
DC-9(50) (RWY 8L LAND.)	67.7; 75.0; 63.6 (AVE. = 68.8)	76.8; 80.3; 70.7 (AVE. = 77.4)
2 EACH, F-15 (RWY 8L LAND.)	79.1	87.3 (AVE. = 84.3)

TABLE 5H

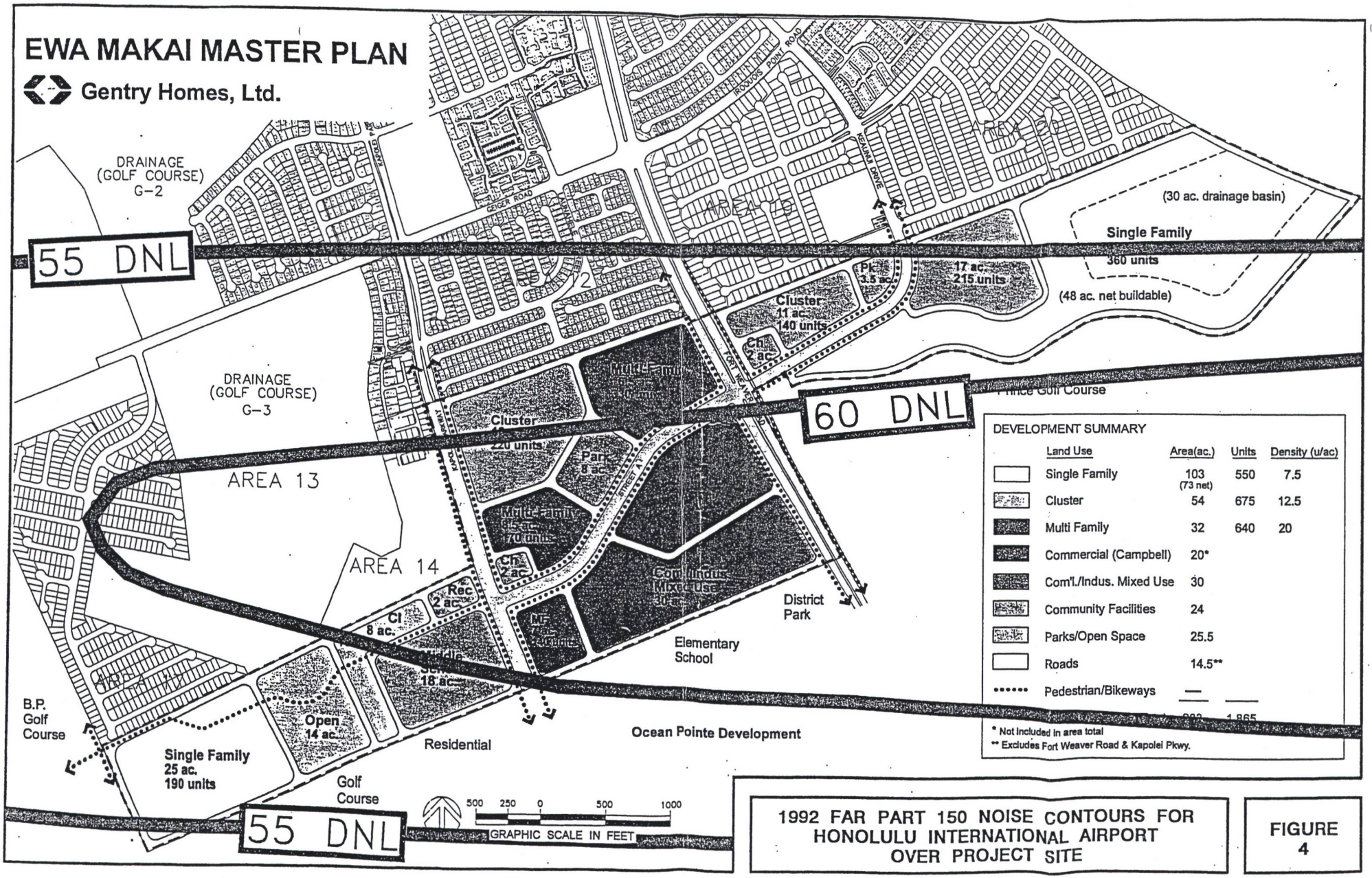
SUMMARY OF AIRCRAFT NOISE MEASUREMENTS LOCATION "H"

AIRCRAFT TYPE	MAXIMUM SOUND LEVELS Lmax (In dB)	SOUND EXPOSURE LEVELS Lse (In dB)
B-737(200) (RWY 8L LAND.)	71.9; 70.6; 71.2; 63.9; 62.0 (AVE. = 67.9)	81.5; 78.8; 81.2; 72.3; 70.4 (AVE. = 78.8)
B-747 (RWY 8L LAND.)	73.1; 71.9; 75.1; 74.6; 70.5; 73.5; 74.4; 73.4; 72.9 (AVE. = 73.3)	82.6; 82.1; 83.4; 83.8; 80.0; 83.6; 82.6; 82.3; 81.8 (AVE. = 82.6)
DC-9(50) (RWY 8L LAND.)	72.3	81.4



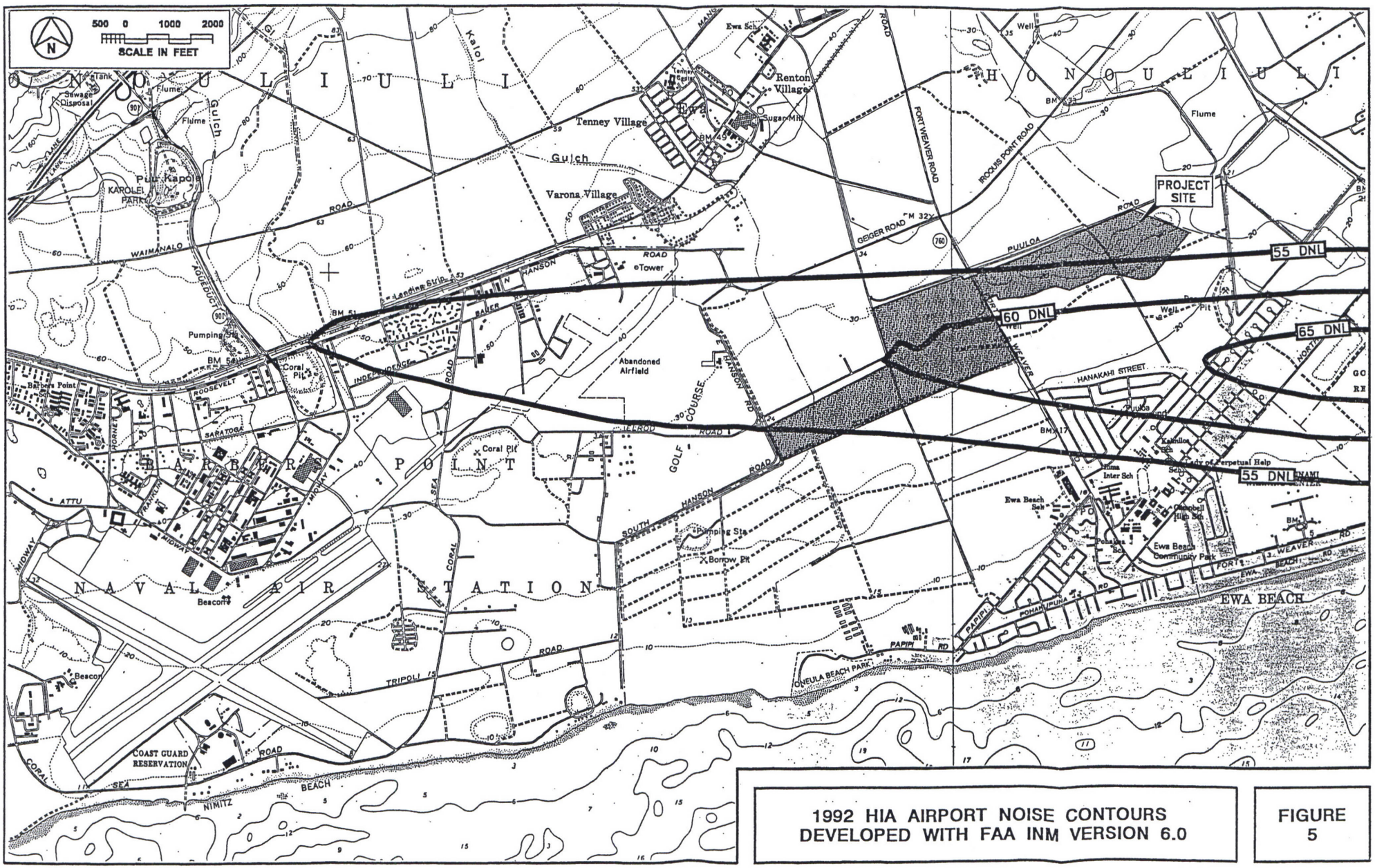
FAR PART 150 NOISE CONTOURS FOR HONOLULU INTERNATIONAL AIRPORT FOR 1992

FIGURE 3



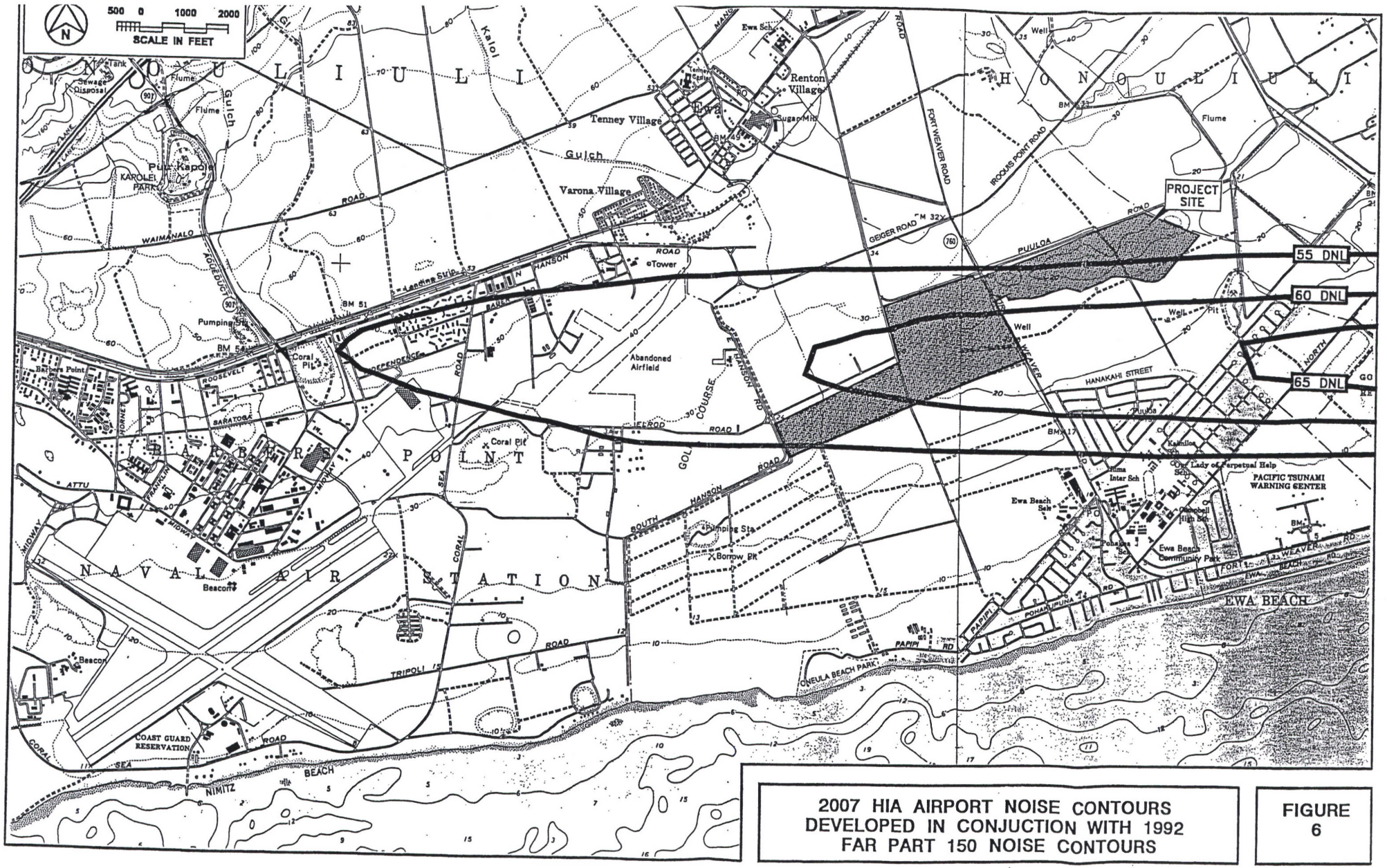
1992 FAR PART 150 NOISE CONTOURS FOR HONOLULU INTERNATIONAL AIRPORT OVER PROJECT SITE

FIGURE 4



1992 HIA AIRPORT NOISE CONTOURS DEVELOPED WITH FAA INM VERSION 6.0

FIGURE 5



2007 HIA AIRPORT NOISE CONTOURS DEVELOPED IN CONJUCTION WITH 1992 FAR PART 150 NOISE CONTOURS

FIGURE 6

CHAPTER V. EXISTING NOISE LEVELS

General. The existing background ambient noise levels in the vicinity of the proposed Ewa By Gentry - Makai Development project are controlled by motor vehicle traffic along Fort Weaver Road and fixed wing aircraft landing at Honolulu International Airport. The noise from aircraft operating at Kalaeloa Airport and the natural sounds of birds, insects, wind, and foliage are also audible. Traffic, aircraft, and background ambient noise measurements were obtained at the locations (A through H, and T-1 through T-4) shown in Figure 1. Location A was at the southeast corner of Barbers Point Golf Course; Location B was at the south end of Kapolei Parkway; Location C was at the west end of Keoneula Boulevard; Location D was at the entrance to the Hawaii Prince Golf Course; Location E was at the east end of Geiger Park; Location F was at the entrance to Kaimiloa School; Location G was at the entrance to Kapolei High School; Location H was at the entrance to Kapolei Middle School; Locations T-1 and T-2 were at Geiger Park fronting Kapolei Parkway and Geiger Road, respectively; and Locations T-3 and T-4 were near the entrance road to the Hawaii Prince Golf Course.

Typical strip chart records of traffic noise obtained at Locations T-1 and T-2 are shown in Figures 7 and 8. Typical strip chart records of aircraft noise obtained at Locations A and D are shown in Figures 9, 10, and 11. The noise events from motor vehicle traffic tend to occur more frequently, with the duration of each event generally less than 10 seconds. The noise events from aircraft tend to occur less frequently, with the duration of each event being longer than 10 seconds. Aircraft noise events tend to be as loud as the noisiest auto or heavy truck at 60 to 85 feet. While traffic noise levels diminish due to distance and shielding effects from structures, aircraft noise levels (due to the high altitude of the aircraft) are less affected by distances along the ground or shielding effects from structures.

Motor Vehicle Traffic Noise. The dominant contributors to the existing background ambient noise levels within the project area are motor vehicles traveling on Fort Weaver Road and Geiger Road. The typical hourly variations in noise levels within the project area are also influenced by motor vehicle traffic along the other roadways in the area such as Kapolei Parkway, Geiger Road, and Iroquois Road. Traffic noise levels tend to be lowest during the early morning hours between 2 and 4 AM, and tend to be highest during the AM and PM peak commuting hours. Traffic noise levels are relatively constant during the daytime period between the AM and PM peak commuting hours.

The Base Year (1998) traffic volumes and their noise contributions at 50, 100, and 200 feet setback distances from the centerlines of the roadways servicing the project are shown in Appendix C and Tables 6A and 6B. The corresponding setback distances from the roadways' centerlines to their corresponding 65 and 75 DNL traffic noise contours for ground level receptors are shown in Table 7. Based on the results shown in Tables 6A, 6B, and 7, it was concluded that existing background noise levels in the project environs currently exceed 65 DNL at essentially all buildings which front Fort Weaver Road and Geiger Road, which have unobstructed lines of sight to the

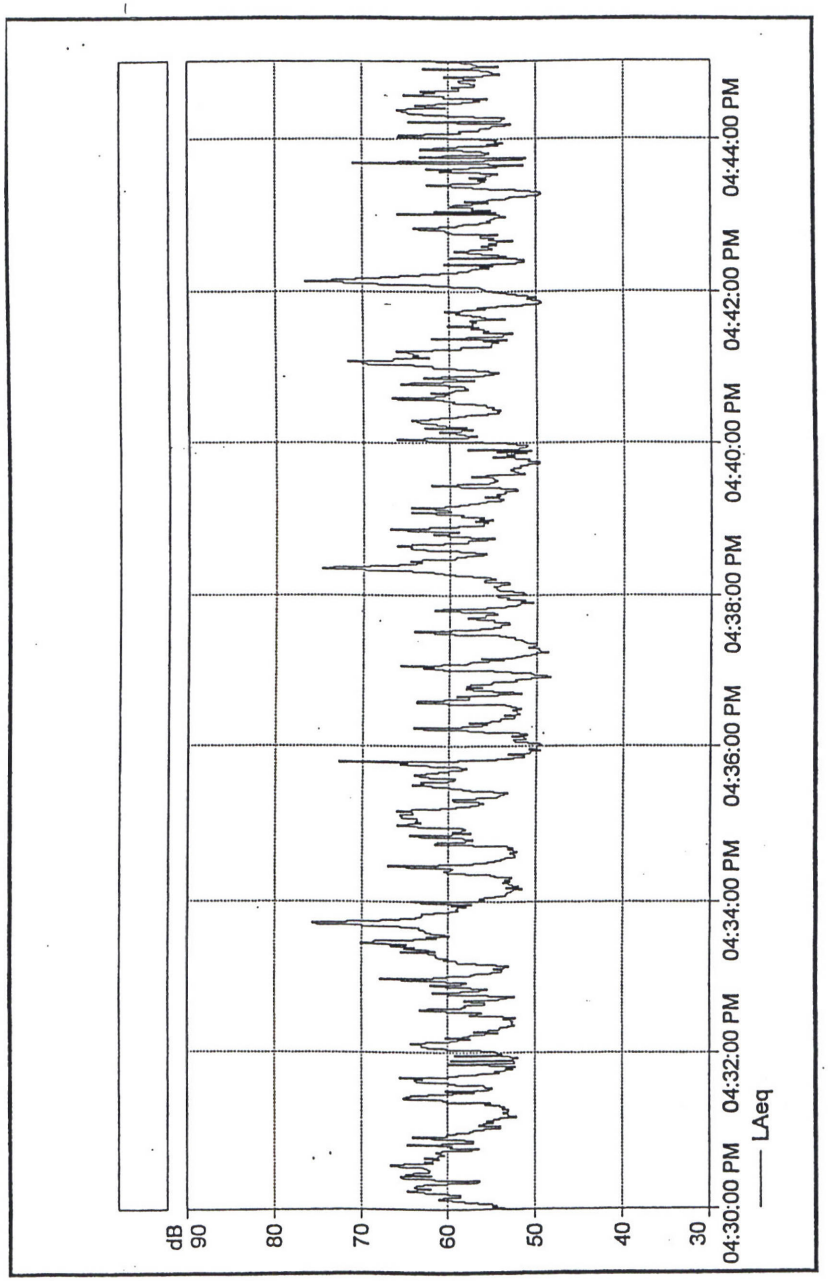
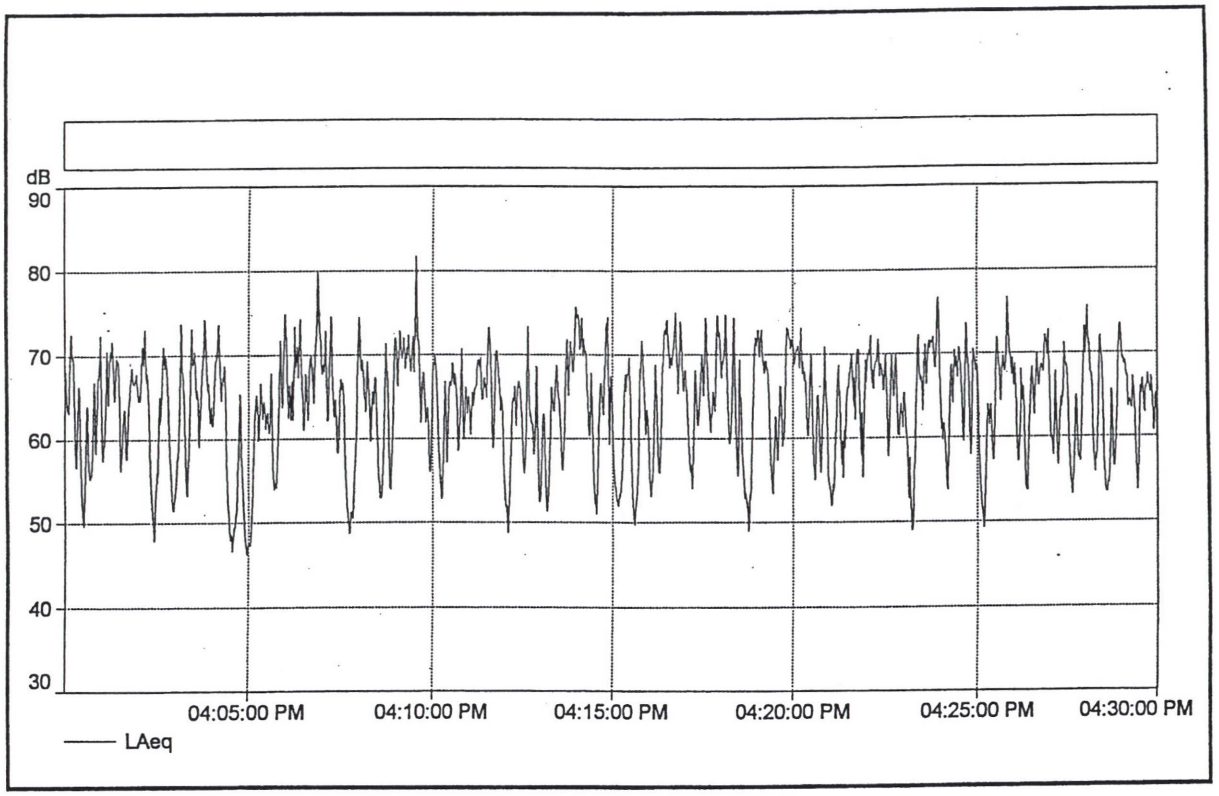


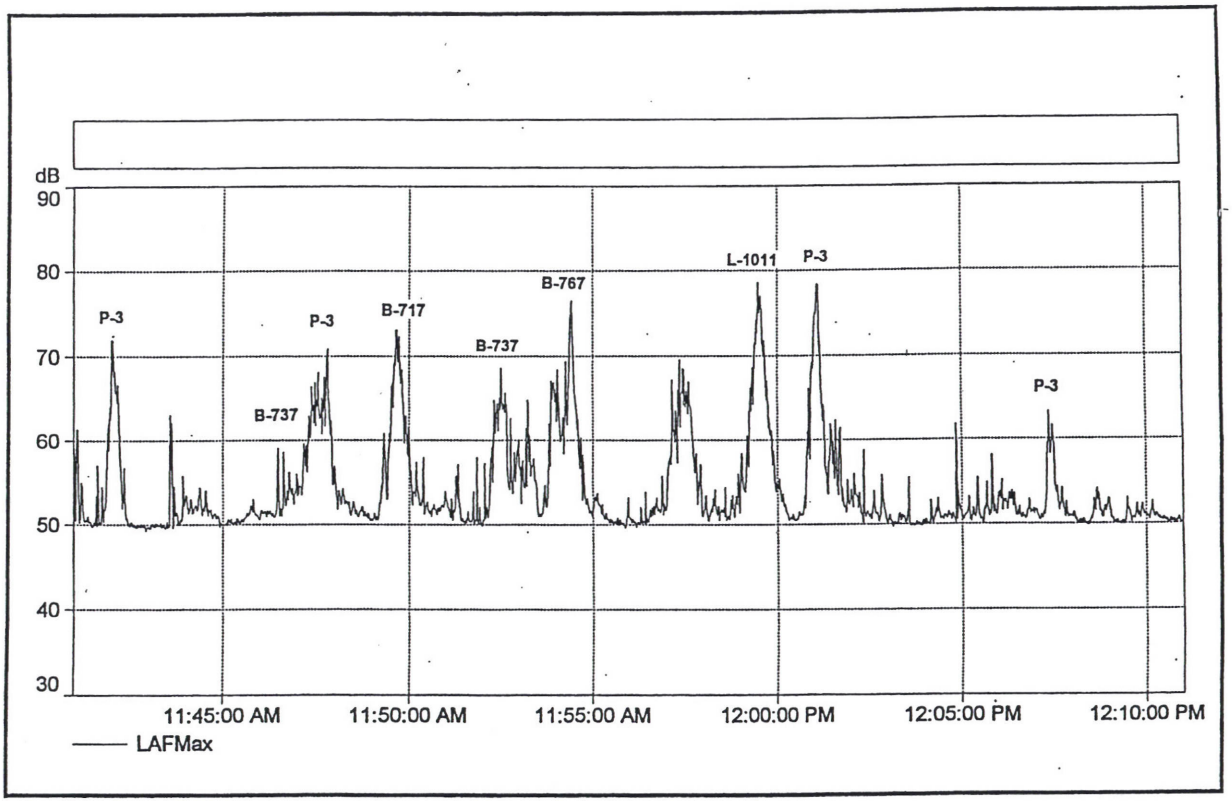
FIGURE 7

DBA VS. TIME HISTORY OF TRAFFIC NOISE LEVELS AT LOCATION T-1 (1630 TO 1645 HOURS; 10/18/01)



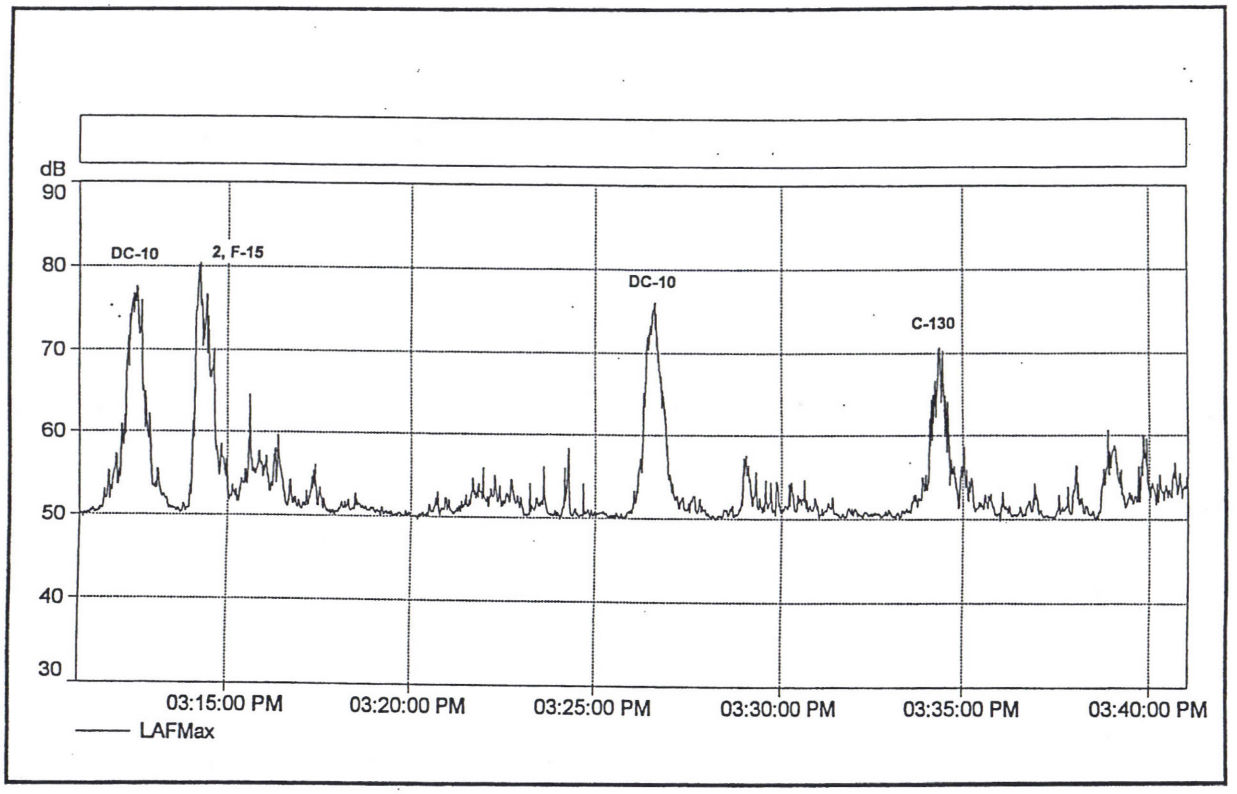
DBA VS. TIME HISTORY OF TRAFFIC NOISE LEVELS AT LOCATION T–2 (1600 TO 1630 HOURS; 10/22/01)

FIGURE 8



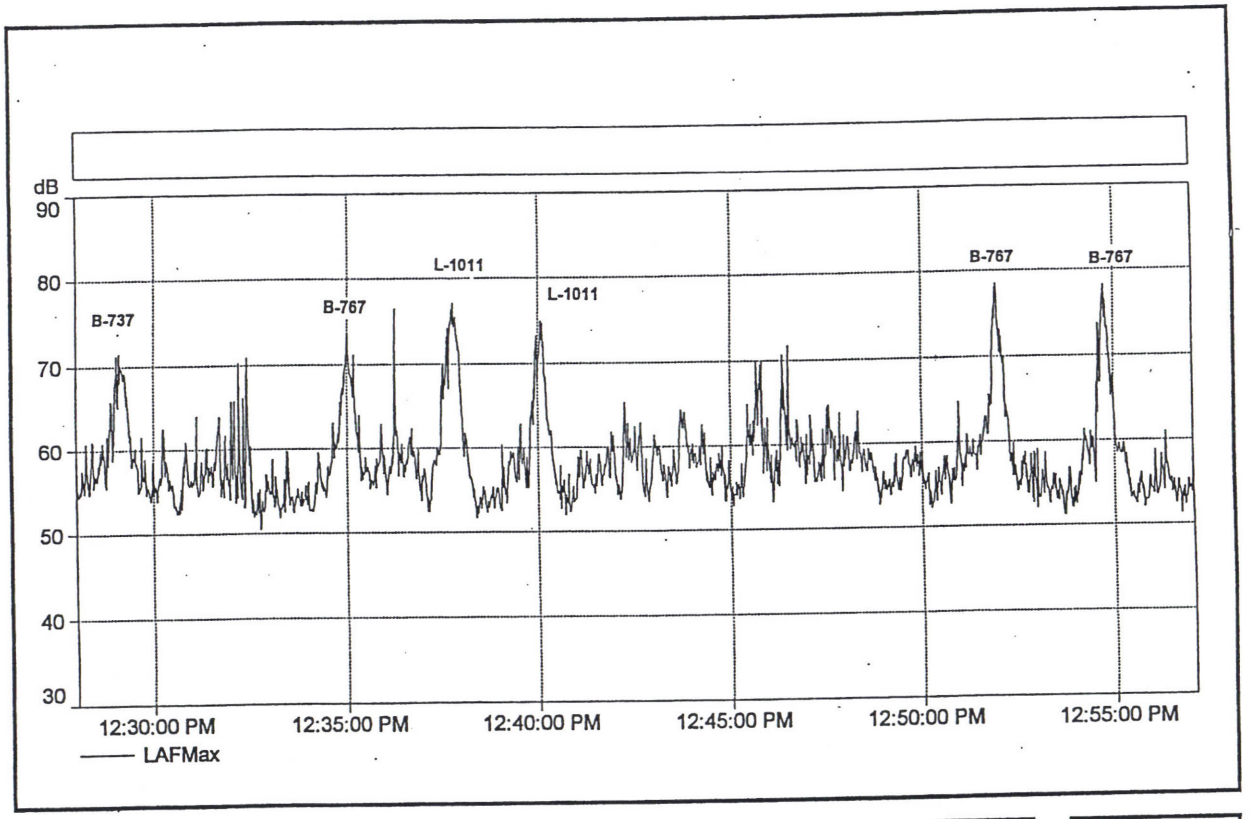
DBA VS. TIME HISTORY OF AIRCRAFT NOISE LEVELS AT LOCATION A (1141 TO 1211 HOURS; 10/16/01)

FIGURE 9



DBA VS. TIME HISTORY OF AIRCRAFT NOISE LEVELS AT LOCATION A (1511 TO 1541 HOURS; 10/16/01)

FIGURE 10



DBA VS. TIME HISTORY OF AIRCRAFT NOISE LEVELS AT LOCATION D (1228 TO 1257 HOURS; 10/22/01)

FIGURE 11

TABLE 6A

EXISTING (CY 1998) TRAFFIC VOLUMES AND NOISE LEVELS ALONG VARIOUS ROADWAY SECTIONS (AM PEAK HOUR)

LOCATION	SPEED (MPH)	TOTAL VPH	********** VOLUMES (VPH) ********** AUTOS	M TRUCKS	H TRUCKS	50' Leq	100' Leq	200' Leq
Fort Weaver Rd. - North of Geiger Rd.	38	2,674	2,568	53	53	74.7	70.2	63.8
Fort Weaver Rd. - South of Geiger Rd.	38	2,630	2,524	53	53	74.7	70.2	63.8
Fort Weaver Rd. - North of Golf Course Rd	38	2,630	2,524	53	53	74.7	70.2	63.8
Fort Weaver Rd. - South of Golf Course Rc	38	2,620	2,516	52	52	74.7	70.1	63.8
Geiger Rd. - West of Fort Weaver Rd.	37	1,000	975	20	5	68.2	65.6	62.3
Geiger Rd. - East of Kapolei Parkway	37	761	742	15	4	67.8	64.4	61.1
Geiger Rd. - West of Kapolei Parkway	37	637	621	13	3	67.0	63.7	60.3
Iroquois Rd. - East of Fort Weaver Rd.	37	612	597	12	3	66.2	63.5	60.1
Iroquois Rd. - West of Keaunui Dr.	37	489	477	10	2	65.8	62.5	59.1
Iroquois Rd. - East of Keaunui Dr.	37	305	297	6	2	63.9	60.5	57.2
Iroquois Rd. - West of Street C	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Iroquois Rd. - East of Street C	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Kapolei Parkway - North of Geiger Rd.	37	296	292	4	0	63.1	60.0	56.6
Kapolei Parkway - South of Geiger Rd.	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Kapolei Parkway - North of Entrance A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Kapolei Parkway - South of Entrance A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Kapolei Parkway - North of Entrance B	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Kapolei Parkway - South of Entrance B	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Kapolei Parkway - North of Street A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Kapolei Parkway - South of Street A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Street A - West of Ft. Weaver Rd.	32	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Golf Course Rd. East of Ft. Weaver Rd.	25	12	12	0	0	43.8	40.8	37.4
Street A - East of Kapolei Parkway	32	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Keaunui Drive - South of Iroquois Rd.	32	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE 6B

EXISTING (CY 1998) TRAFFIC VOLUMES AND NOISE LEVELS ALONG VARIOUS ROADWAY SECTIONS (PM PEAK HOUR)

LOCATION	SPEED (MPH)	TOTAL VPH	********** VOLUMES (VPH) ********** AUTOS	M TRUCKS	H TRUCKS	50' Leq	100' Leq	200' Leq
Fort Weaver Rd. - North of Geiger Rd.	38	2,782	2,670	56	56	75.4	71.3	65.0
Fort Weaver Rd. - South of Geiger Rd.	38	2,564	2,462	51	51	75.1	71.0	64.7
Fort Weaver Rd. - North of Golf Course Rd	38	2,564	2,462	51	51	75.1	71.0	64.7
Fort Weaver Rd. - South of Golf Course Rc	38	2,551	2,449	51	51	75.0	70.9	64.6
Geiger Rd. - West of Fort Weaver Rd.	37	1,002	977	20	5	68.2	65.6	62.3
Geiger Rd. - East of Kapolei Parkway	37	802	782	16	4	67.2	64.7	61.3
Geiger Rd. - West of Kapolei Parkway	37	784	764	16	4	67.1	64.6	61.2
Iroquois Rd. - East of Fort Weaver Rd.	37	566	552	11	3	65.9	63.2	59.8
Iroquois Rd. - West of Keaunui Dr.	37	543	529	11	3	65.7	63.0	59.7
Iroquois Rd. - East of Keaunui Dr.	37	474	463	9	2	65.7	62.3	59.0
Iroquois Rd. - West of Street C	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Iroquois Rd. - East of Street C	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Kapolei Parkway - North of Geiger Rd.	37	218	215	3	0	66.1	63.1	60.0
Kapolei Parkway - South of Geiger Rd.	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Kapolei Parkway - North of Entrance A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Kapolei Parkway - South of Entrance A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Kapolei Parkway - North of Entrance B	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Kapolei Parkway - South of Entrance B	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Kapolei Parkway - North of Street A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Kapolei Parkway - South of Street A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Street A - West of Ft. Weaver Rd.	32	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Golf Course Rd. East of Ft. Weaver Rd.	25	33	33	0	0	48.2	45.2	41.8
Street A - East of Kapolei Parkway	32	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Keaunui Drive - South of Iroquois Rd.	32	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE 7

YEAR 1998 AND 2010 DISTANCES TO 65 AND 75 DNL CONTOURS

STREET SECTION	65 DNL SETBACK (FT) CY 1998	65 DNL SETBACK (FT) CY 2010	75 DNL SETBACK (FT) CY 1998	75 DNL SETBACK (FT) CY 2010
Fort Weaver Rd. - North of Geiger Rd.	249	286	75	95
Fort Weaver Rd. - South of Geiger Rd.	241	265	71	84
Fort Weaver Rd. - North of Golf Course Rd.	241	265	71	84
Fort Weaver Rd. - South of Golf Course Rd.	238	230	70	68
Geiger Rd. - West of Fort Weaver Rd.	170	178	12	21
Geiger Rd. - East of Kapolei Parkway	136	167	8	29
Geiger Rd. - West of Kapolei Parkway	132	153	8	11
Iroquois Rd. - East of Fort Weaver Rd.	90	215	7	18
Iroquois Rd. - West of Keaunui Dr.	86	215	7	18
Iroquois Rd. - East of Keaunui Dr.	77	103	10	8
Iroquois Rd. - West of Street C	N/A	103	N/A	8
Iroquois Rd. - East of Street C	N/A	22	N/A	2
Kapolei Parkway - North of Geiger Rd.	89	238	9	51
Kapolei Parkway - South of Geiger Rd.	N/A	232	N/A	49
Kapolei Parkway - North of Entrance A	N/A	232	N/A	49
Kapolei Parkway - South of Entrance A	N/A	230	N/A	47
Kapolei Parkway - North of Entrance B	N/A	230	N/A	47
Kapolei Parkway - South of Entrance B	N/A	227	N/A	46
Kapolei Parkway - North of Street A	N/A	227	N/A	46
Kapolei Parkway - South of Street A	N/A	190	N/A	33
Street A - West of Ft. Weaver Rd.	N/A	183	N/A	20
Golf Course Rd. East of Ft. Weaver Rd.	1	70	0	7
Street A - East of Kapolei Parkway	N/A	146	N/A	16
Keaunui Drive - South of Iroquois Rd.	N/A	64	N/A	7

Notes:

(1) All setback distances are from the roadways' centerlines.
(2) See Table 6B for traffic volume, speed, and mix assumptions.
(3) Setback distances are for unobstructed line-of-sight conditions.
(4) DNL assumed to be 2.0 dB greater than PM peak hour Leq(h) along Ft. Weaver Road.
(5) DNL assumed to be 1.4 dB greater than PM peak hour Leq(h) along all other roadways.

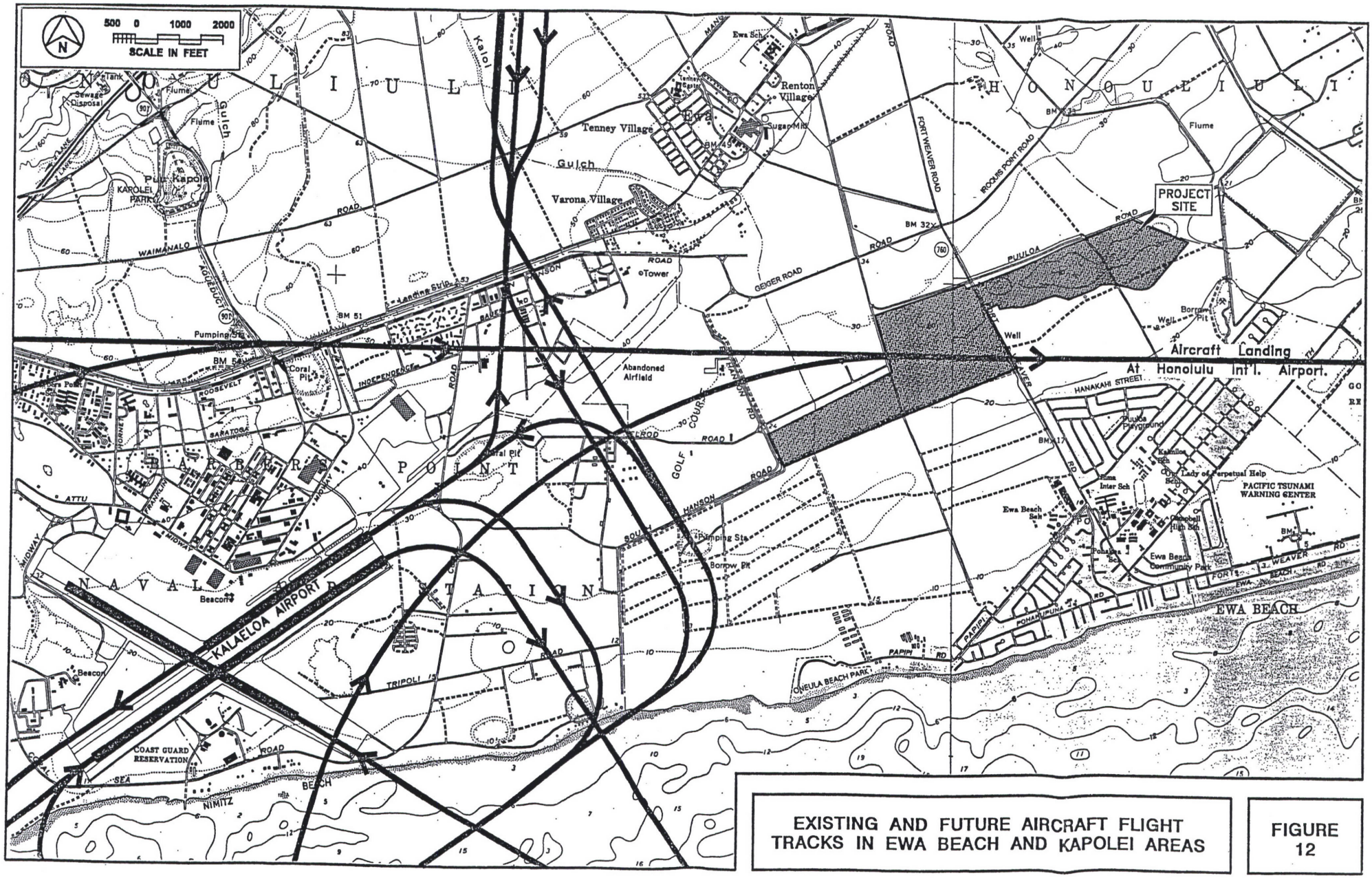
traffic lanes, and which are not shielded by sound attenuating walls. These homes are located in areas which are in the "Significant Exposure - Normally Unacceptable" noise exposure category. For those buildings which are shielded from the road traffic, existing traffic noise levels are 5 to 10 DNL units less than those units along the roadways' Rights-of-Way. Along the first row of homes which front Fort Weaver and Geiger Roads, roadway traffic noise is the dominant noise source.

Aircraft Noise. Existing aircraft noise levels during 2000 and 2001 (prior to September 11, 2001) were estimated using the measured aircraft noise levels shown in Tables 5A through 5H, aircraft schedules and operations forecasts for the 12-month period in 2000 and 2001 (prior to September 11, 2001), the aircraft flight tracks shown in Figure 12, a standard glide slope of 3 degrees (except for the special approach profile used by the F-15 aircraft) and modeling with the FAA INM Version 6.0. Average daily landings over the project site by various aircraft categories were estimated to be as follows: 13.1 B-747; 16.5 DC-10/L-1011; 21.2 B-757/767; 14.4 B-737(200); 1.5 DC-9(50); 10.6 B-717(200); 1.5 C-130; 2.0 C-141; 1.4 KC-135R; 0.7 C-5A; 7.5 F-15; and 0.5 KC-10.

The resulting Base Year airport noise contours over the project site are shown in Figures 13 and 14. Aircraft noise levels over the project site prior to the September 11, 2001 were less than 60 DNL. The aircraft noise measurement data at Locations A through D shown in Tables 5A through 5D are consistent with the noise contours, with measured average noise levels during the measurement periods as follows: Leq (5.93 hours) = 54.8 dB at Location A; Leq (9.63 hours) = 57.4 dB at Location B; Leq (5.32 hours) = 65.8 dB at Location C; and Leq (11.33 hours) = 55.5 dB at Location D. The measured average noise level at Location C was skewed upward by a pair of F-15 aircraft which measured 107.9 dB (SEL). Without that loud single event, the average noise level at Location C would have been 57.5 dB.

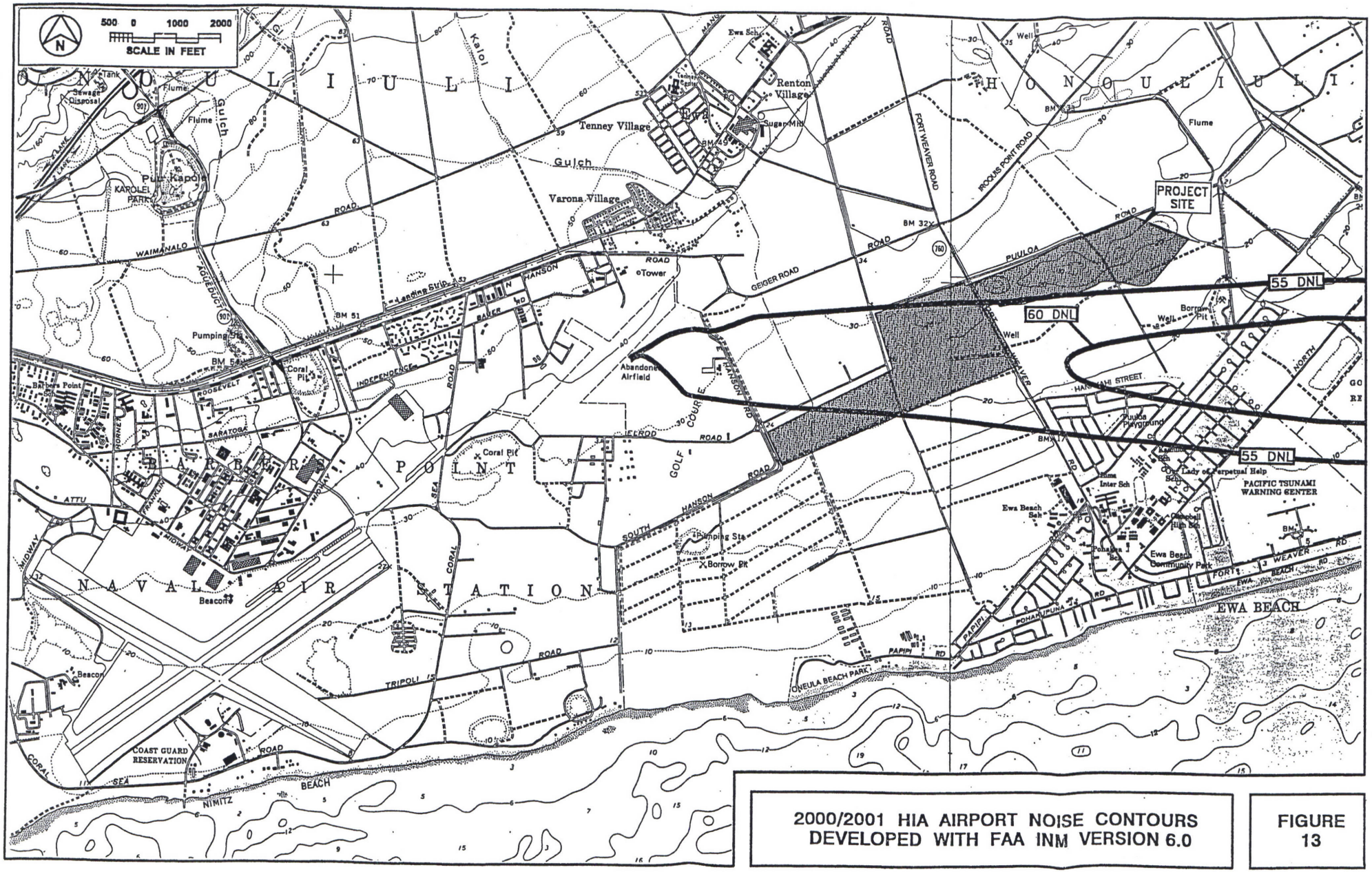
The estimated DNL's at Locations A through D were also calculated by applying the average SEL data shown in Tables 5A through 5D to the number of average daily aircraft operations shown in the earlier paragraph, which produced the following results: 52 DNL at Location A; 57 DNL at Location B; 60 DNL at Location C; and 55 DNL at Location D. The higher computed DNL values at Locations B and C were skewed upward by the relatively high SEL measurements during a single B-747 (93.9 dB) and F-15 pair (107.9 dB) flyby events at Locations B and C, respectively. The INM predictions for the SEL values of the B-747 and F-15 flyby events at locations B and C, respectively, were 83.9 dB and 96.1 dB. This suggests that the measured average SEL values for these two aircraft shown in Tables 5B and 5C were skewed upward by the relatively small sample sizes of the measurement data.

The aircraft noise contours shown in Figures 13 and 14 suggest that the proposed land uses in the Ewa By Gentry - Makai Development project should be compatible with the aircraft noise levels associated with Honolulu International Airport. The proposed land uses should be acceptable and in compliance with the land



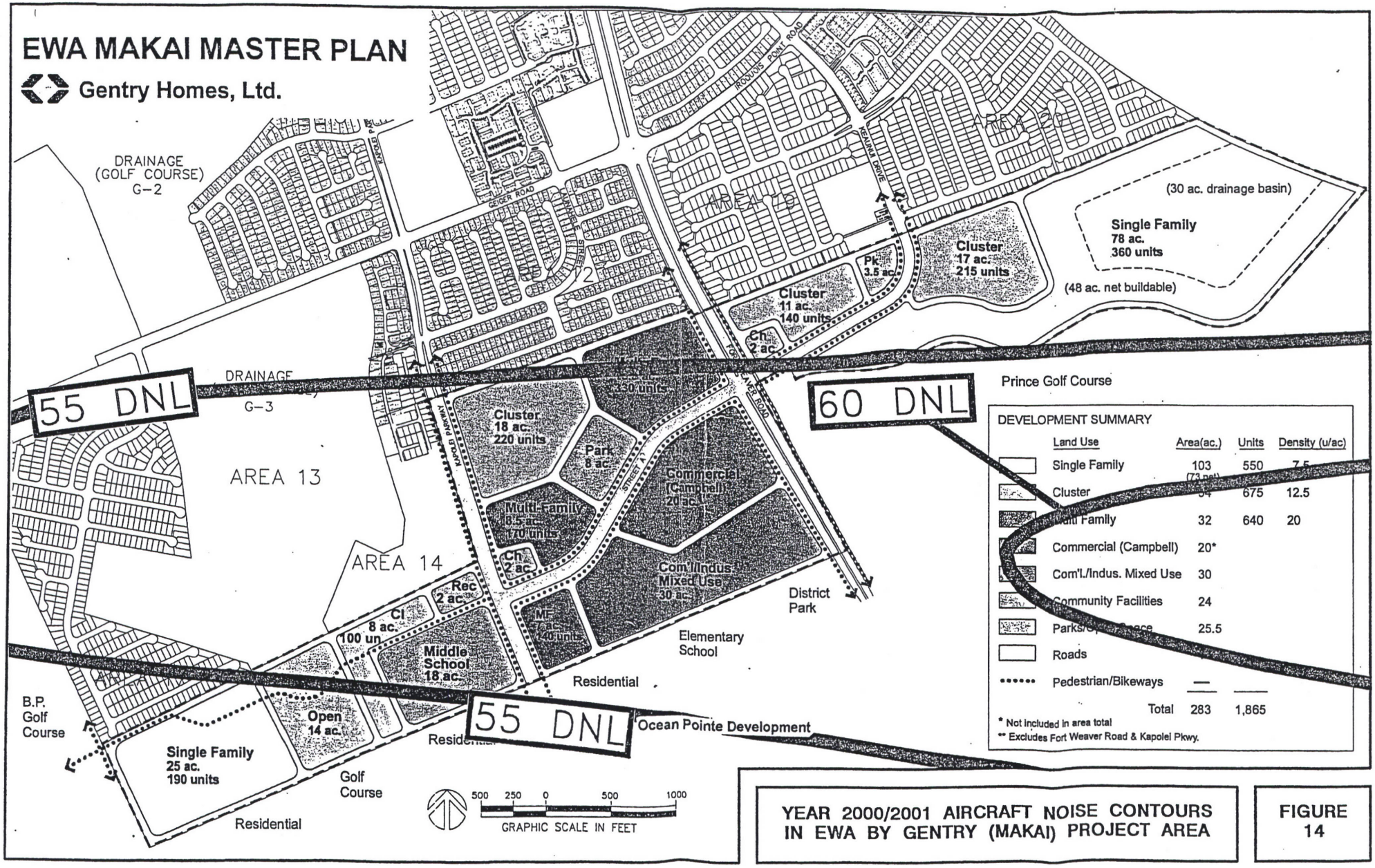
EXISTING AND FUTURE AIRCRAFT FLIGHT TRACKS IN EWA BEACH AND KAPOLEI AREAS

FIGURE 12



2000/2001 HIA AIRPORT NOISE CONTOURS DEVELOPED WITH FAA INM VERSION 6.0

FIGURE 13



DEVELOPMENT SUMMARY

Land Use	Area(ac.)	Units	Density (u/ac)
Single Family	103 (73 net)	550	7.5
Cluster	54	675	12.5
Multi-Family	32	640	20
Commercial (Campbell)	20*		
Com'l./Indus. Mixed Use	30		
Community Facilities	24		
Parks/Open Space	25.5		
Roads			
Pedestrian/Bikeways	—	—	
Total	283	1,865	

* Not included in area total
** Excludes Fort Weaver Road & Kapolei Pkwy.

YEAR 2000/2001 AIRCRAFT NOISE CONTOURS IN EWA BY GENTRY (MAKAI) PROJECT AREA

FIGURE 14

use compatibility recommendations shown in Table 3, and aircraft noise levels over the project site should not place constraints on the locations of the proposed land uses.

The results of the aircraft noise level measurements in the immediate vicinity of the project site (see Tables 5A through 5D), indicate that the loudest aircraft noise events were typically associated with overflights by military jet aircraft. The number of overflights by military aircraft are significantly lower than the number of overflights by civilian jet aircraft. However, because the DNL system used to construct the aircraft noise contours uses a cumulative (or energy) averaging methodology, the louder noise events will tend to control the final DNL values. This has been and is still a typical characteristic of the aircraft noise environment in the project area.

CHAPTER VI. FUTURE NOISE ENVIRONMENT

Traffic Noise. Predictions of future traffic noise levels were made using the traffic volume assignments of Reference 8 for CY 2010 with and without the proposed project. The future projections of non-project and project traffic volumes for the No Build and Build Alternatives are shown in Appendix C. The future assignments of project plus non-project traffic on the roadway sections which would service the project are shown in Tables 8A and 8B for the AM and PM peak hours of traffic, respectively. Tables 8A and 8B contain the CY 2010 traffic volumes and average noise levels at 50, 100, and 200 feet from the roadways' centerlines for the Build Alternative. Future average vehicle speeds along all existing roadways were assumed to be identical to those used for CY 1998 (see Tables 6A and 6B).

Table 7 summarizes the predicted increases in the future setback distances to the 65 and 75 DNL (or Ldn) traffic noise contour lines along the roadways in the project environs and attributable to both project plus non-project traffic in CY 2010. The setback distances in Table 7 do not include the beneficial effects of noise shielding from terrain features and man-made structures (walls or buildings) or the detrimental effects of additive contributions of noise from intersecting streets. As indicated in Table 7, the setback distances to the 65 DNL contour are predicted to range from 230 to 286 feet from the centerline of Fort Weaver Road following project build-out in CY 2010. Along the Kapolei Parkway, setback distances to the 65 DNL contour are predicted to range from 227 to 238 feet from the roadway's centerline. Along Geiger and Iroquois Roads, setback distances to the 65 DNL contour are expected to range from 22 to 215 feet.

The increases in future traffic noise levels on the various roadways due to non-project and project traffic are shown in Tables 9A and 9B, for the AM and PM peak hours of traffic respectively. The increase in future traffic noise attributable to project traffic will be moderate and will typically range between 0.8 and 1.6 dB (Leq). The increases in future traffic noise levels as measured by the DNL (or Ldn) descriptor system should be similar to those shown in Table 9B for the PM peak hour. As indicated in Tables 9A and 9B, non-project traffic is expected to cause the larger increases in traffic noise along the new roadways in the project area. Increases in future traffic noise due to project traffic are expected to be largest (2.0 to 2.5 DNL) along the new Street A, which is located within the project boundaries.

In CY 2010, the dominant traffic noise sources in the project area will continue to be traffic noise from Fort Weaver Road. Traffic noise along the new sections of Kapolei Parkway south of Geiger Road and the new Street A will also be dominant noise sources within the project boundaries, particularly at those receptor locations which are removed from Ft. Weaver Road.

Essentially all locations which front Ft. Weaver Road, Geiger Road, Kapolei Parkway, Iroquois Road, and Street A will experience relatively high noise levels above

TABLE 8A

FUTURE (CY 2010) TRAFFIC VOLUMES AND NOISE LEVELS ALONG VARIOUS ROADWAY SECTIONS (AM PEAK HOUR, WITH PROJECT)

LOCATION	SPEED (MPH)	TOTAL VPH	********** VOLUMES (VPH) ********** AUTOS	M TRUCKS	H TRUCKS	50' Leq	100' Leq	200' Leq
Fort Weaver Rd. - North of Geiger Rd.	38	3,685	3,537	74	74	76.7	72.6	66.3
Fort Weaver Rd. - South of Geiger Rd.	38	3,140	3,014	63	63	76.0	71.9	65.6
Fort Weaver Rd. - North of Golf Course Rd	38	3,140	3,014	63	63	76.0	71.9	65.6
Fort Weaver Rd. - South of Golf Course Rc	38	2,510	2,410	50	50	75.0	70.9	64.6
Geiger Rd. - West of Fort Weaver Rd.	37	1,455	1,419	29	7	70.5	67.2	63.9
Geiger Rd. - East of Kapolei Parkway	37	1,280	1,248	26	6	69.3	66.7	63.4
Geiger Rd. - West of Kapolei Parkway	37	725	706	15	4	67.6	64.3	60.9
Iroquois Rd. - East of Fort Weaver Rd.	37	1,040	1,014	21	5	68.5	65.8	62.4
Iroquois Rd. - West of Keaunui Dr.	37	1,040	1,014	21	5	68.5	65.8	62.4
Iroquois Rd. - East of Keaunui Dr.	37	535	521	11	3	65.7	63.0	59.6
Iroquois Rd. - West of Street C	37	535	521	11	3	65.7	63.0	59.6
Iroquois Rd. - East of Street C	37	215	210	4	1	61.7	58.9	55.6
Kapolei Parkway - North of Geiger Rd.	37	3,180	3,116	48	16	73.7	70.6	65.0
Kapolei Parkway - South of Geiger Rd.	37	2,975	2,915	45	15	73.4	70.3	64.7
Kapolei Parkway - North of Entrance A	37	2,975	2,915	45	15	73.4	70.3	64.7
Kapolei Parkway - South of Entrance A	37	2,825	2,769	42	14	73.2	70.1	64.5
Kapolei Parkway - North of Entrance B	37	2,825	2,769	42	14	73.2	70.1	64.5
Kapolei Parkway - South of Entrance B	37	2,760	2,705	41	14	73.1	70.0	64.4
Kapolei Parkway - North of Street A	37	2,760	2,705	41	14	73.1	70.0	64.4
Kapolei Parkway - South of Street A	37	2,145	2,102	32	11	72.0	68.9	63.3
Street A - West of Ft. Weaver Rd.	32	1,200	1,176	18	6	67.8	64.7	61.3
Golf Course Rd. East of Ft. Weaver Rd.	32	640	627	10	3	65.1	62.0	58.6
Street A - East of Kapolei Parkway	32	950	931	14	5	66.8	63.7	60.3
Keaunui Drive - South of Iroquois Rd.	32	425	417	6	2	63.1	60.1	56.7

TABLE 8B

FUTURE (CY 2010) TRAFFIC VOLUMES AND NOISE LEVELS ALONG VARIOUS ROADWAY SECTIONS (PM PEAK HOUR, WITH PROJECT)

LOCATION	SPEED (MPH)	TOTAL VPH	********** VOLUMES (VPH) ********** AUTOS	M TRUCKS	H TRUCKS	50' Leq	100' Leq	200' Leq
Fort Weaver Rd. - North of Geiger Rd.	38	3,830	3,676	77	77	76.8	72.7	66.3
Fort Weaver Rd. - South of Geiger Rd.	38	3,245	3,115	65	65	76.1	72.0	65.6
Fort Weaver Rd. - North of Golf Course Rd	38	3,245	3,115	65	65	76.1	72.0	65.6
Fort Weaver Rd. - South of Golf Course Rc	38	2,395	2,299	48	48	74.8	70.7	64.3
Geiger Rd. - West of Fort Weaver Rd.	37	1,715	1,672	34	9	70.5	68.0	62.7
Geiger Rd. - East of Kapolei Parkway	37	1,555	1,516	31	8	70.9	67.5	62.2
Geiger Rd. - West of Kapolei Parkway	37	900	877	18	5	67.8	65.2	61.8
Iroquois Rd. - East of Fort Weaver Rd.	37	1,290	1,258	26	6	69.5	66.7	63.4
Iroquois Rd. - West of Keaunui Dr.	37	1,290	1,258	26	6	69.5	66.7	63.4
Iroquois Rd. - East of Keaunui Dr.	37	640	624	13	3	66.4	63.7	60.3
Iroquois Rd. - West of Street C	37	640	624	13	3	66.4	63.7	60.3
Iroquois Rd. - East of Street C	37	165	161	3	1	60.5	57.9	54.5
Kapolei Parkway - North of Geiger Rd.	37	3,195	3,131	48	16	73.7	70.6	65.0
Kapolei Parkway - South of Geiger Rd.	37	3,040	2,979	46	15	73.5	70.4	64.8
Kapolei Parkway - North of Entrance A	37	3,040	2,979	46	15	73.5	70.4	64.8
Kapolei Parkway - South of Entrance A	37	2,925	2,866	44	15	73.3	70.2	64.7
Kapolei Parkway - North of Entrance B	37	2,925	2,866	44	15	73.3	70.2	64.7
Kapolei Parkway - South of Entrance B	37	2,815	2,759	42	14	73.2	70.1	64.6
Kapolei Parkway - North of Street A	37	2,815	2,759	42	14	73.2	70.1	64.6
Kapolei Parkway - South of Street A	37	2,010	1,970	30	10	71.8	68.7	63.2
Street A - West of Ft. Weaver Rd.	32	1,740	1,705	26	9	69.4	66.3	62.9
Golf Course Rd. East of Ft. Weaver Rd.	32	640	627	10	3	65.1	62.0	58.6
Street A - East of Kapolei Parkway	32	1,385	1,357	21	7	68.4	65.3	61.9
Keaunui Drive - South of Iroquois Rd.	32	590	578	9	3	64.7	61.6	58.2

TABLE 9A

CALCULATIONS OF PROJECT AND NON-PROJECT TRAFFIC NOISE CONTRIBUTIONS (CY 2010) (AM PEAK HOUR)

STREET SECTION	NOISE LEVEL (DB) NON-PROJECT TRAFFIC	INCREASE DUE TO: PROJECT TRAFFIC
Fort Weaver Rd. - North of Geiger Rd.	1.2	1.2
Fort Weaver Rd. - South of Geiger Rd.	0.3	1.4
Fort Weaver Rd. - North of Golf Course Rd.	0.3	1.4
Fort Weaver Rd. - South of Golf Course Rd.	0.4	0.4
Geiger Rd. - West of Fort Weaver Rd.	0.9	0.7
Geiger Rd. - East of Kapolei Parkway	1.4	0.9
Geiger Rd. - West of Kapolei Parkway	-0.3	0.9
Iroquois Rd. - East of Fort Weaver Rd.	1.5	0.8
Iroquois Rd. - West of Keaunui Dr.	2.5	0.8
Iroquois Rd. - East of Keaunui Dr.	1.5	1.0
Iroquois Rd. - West of Street C	62.0	1.0
Iroquois Rd. - East of Street C	58.9	0.0
Kapolei Parkway - North of Geiger Rd.	9.6	1.0
Kapolei Parkway - South of Geiger Rd.	69.5	0.8
Kapolei Parkway - North of Entrance A	69.5	0.8
Kapolei Parkway - South of Entrance A	69.2	0.9
Kapolei Parkway - North of Entrance B	69.2	0.9
Kapolei Parkway - South of Entrance B	69.2	0.8
Kapolei Parkway - North of Street A	69.2	0.8
Kapolei Parkway - South of Street A	68.4	0.5
Street A - West of Ft. Weaver Rd.	61.0	3.7
Golf Course Rd. East of Ft. Weaver Rd.	19.4	1.8
Street A - East of Kapolei Parkway	60.5	3.2
Keaunui Drive - South of Iroquois Rd.	59.3	0.8

TABLE 9B

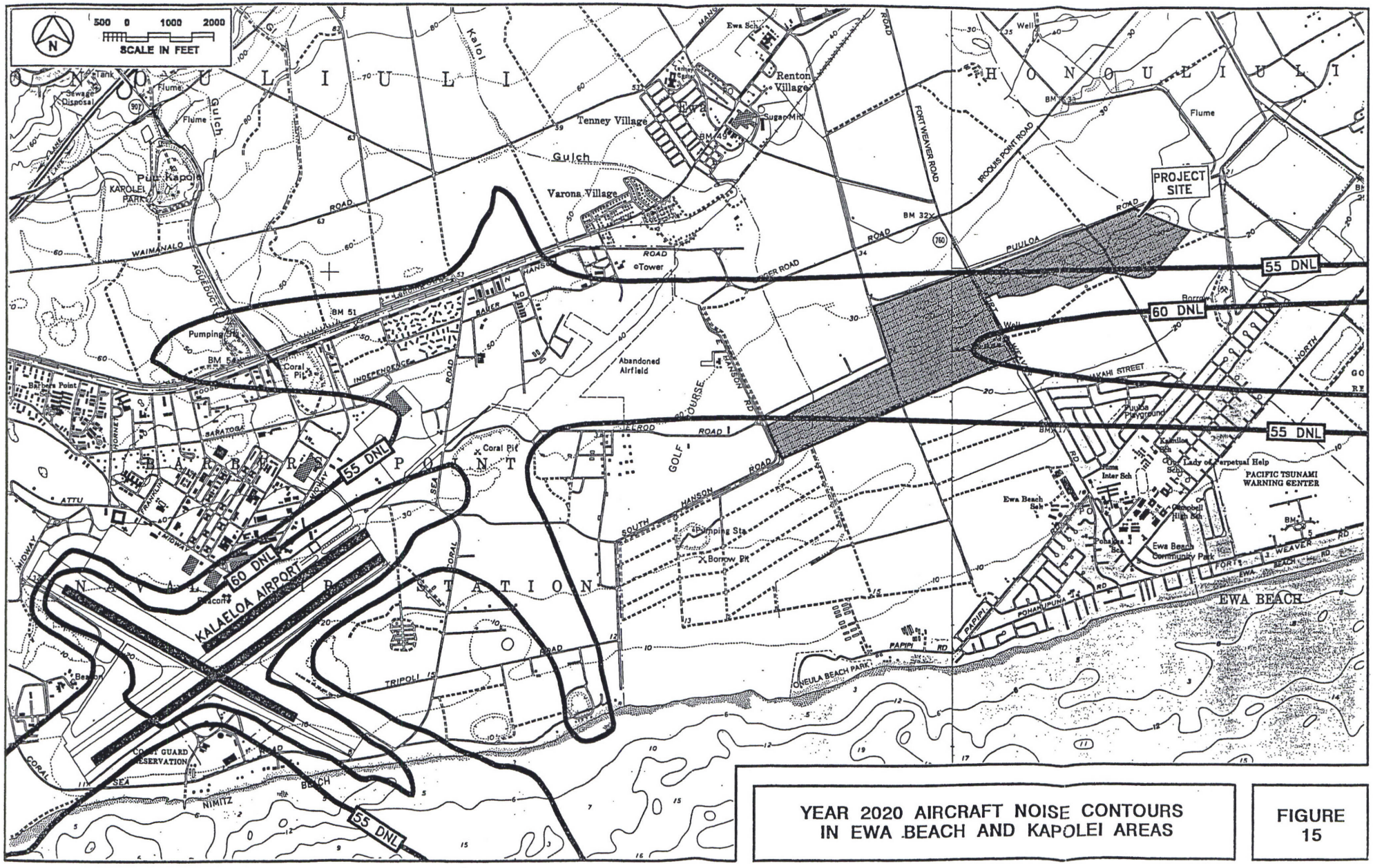
CALCULATIONS OF PROJECT AND NON-PROJECT TRAFFIC NOISE CONTRIBUTIONS (CY 2010) (PM PEAK HOUR)

STREET SECTION	NOISE LEVEL (DB) NON-PROJECT TRAFFIC	INCREASE DUE TO: PROJECT TRAFFIC
Fort Weaver Rd. - North of Geiger Rd.	0.0	1.4
Fort Weaver Rd. - South of Geiger Rd.	-0.6	1.6
Fort Weaver Rd. - North of Golf Course Rd.	-0.6	1.6
Fort Weaver Rd. - South of Golf Course Rd.	-0.6	0.4
Geiger Rd. - West of Fort Weaver Rd.	1.3	1.1
Geiger Rd. - East of Kapolei Parkway	2.0	0.8
Geiger Rd. - West of Kapolei Parkway	-0.3	0.9
Iroquois Rd. - East of Fort Weaver Rd.	2.7	0.8
Iroquois Rd. - West of Keaunui Dr.	2.9	0.8
Iroquois Rd. - East of Keaunui Dr.	0.5	0.9
Iroquois Rd. - West of Street C	62.8	0.9
Iroquois Rd. - East of Street C	61.3	-3.4
Kapolei Parkway - North of Geiger Rd.	6.4	1.1
Kapolei Parkway - South of Geiger Rd.	69.6	0.8
Kapolei Parkway - North of Entrance A	69.6	0.8
Kapolei Parkway - South of Entrance A	69.4	0.8
Kapolei Parkway - North of Entrance B	69.4	0.8
Kapolei Parkway - South of Entrance B	69.3	0.8
Kapolei Parkway - North of Street A	69.3	0.8
Kapolei Parkway - South of Street A	68.2	0.5
Street A - West of Ft. Weaver Rd.	63.8	2.5
Golf Course Rd. East of Ft. Weaver Rd.	16.0	0.8
Street A - East of Kapolei Parkway	63.3	2.0
Keaunui Drive - South of Iroquois Rd.	60.7	0.9

65 DNL. Those receptor locations which are noved from the major roadways as well as shielded by existing and new buildings s uld experience traffic noise levels less than 65 DNL.

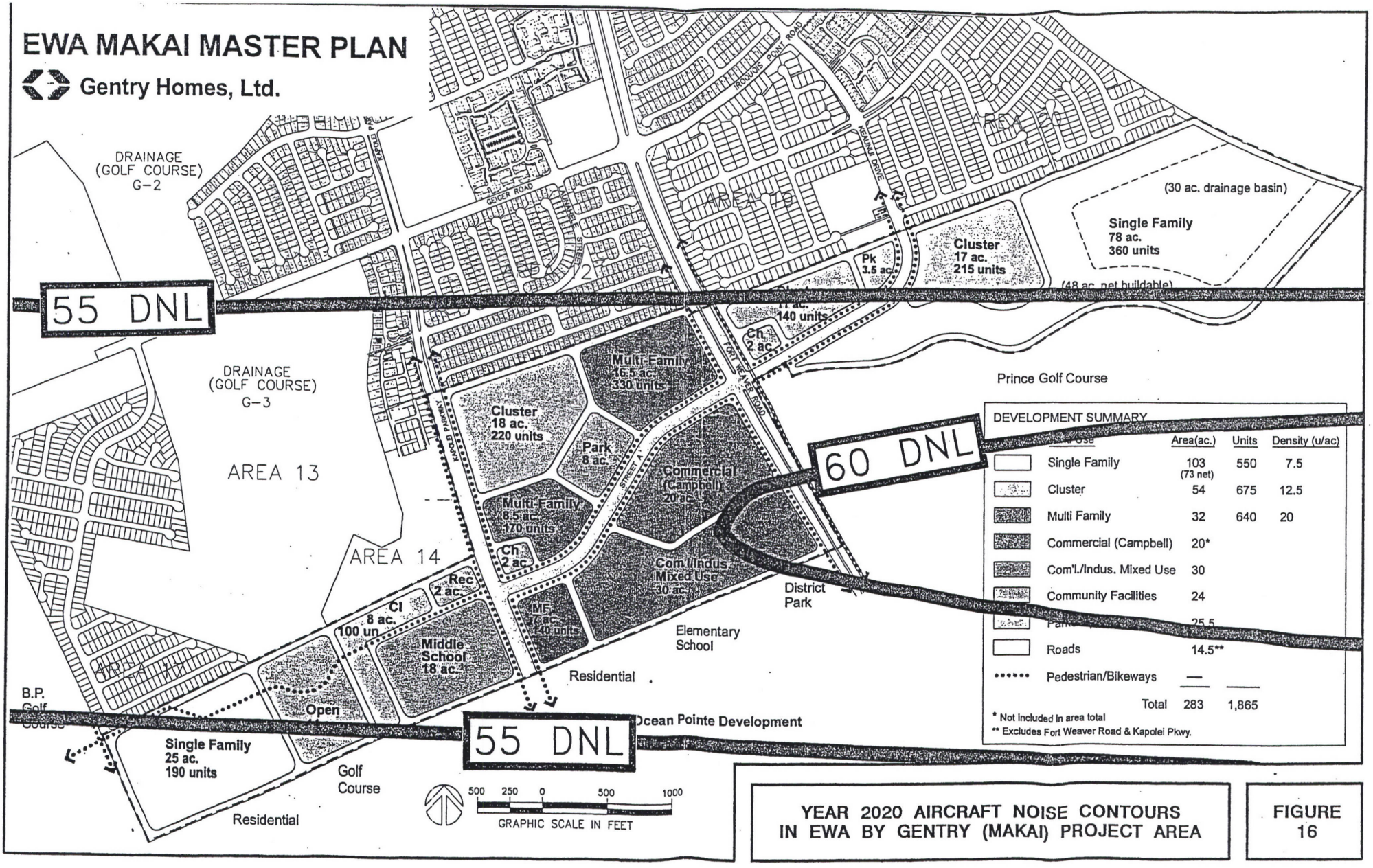
Aircraft Noise. The aircraft noise cor urs in the project environs for the CY 2020 period were developed using the avail le forecasts for Honolulu International Airport from Reference 10, and are shown in jure 15. Figure 15 depicts the forecast combined aircraft noise contours of Kalaeloa d Honolulu International Airports in the Kapolei and Ewa Beach areas. The contours ; similar to those reported in Reference 10, except that the FAA INM Verison 6.0 w used to develop the current contours shown in Figure 15. The worst case approacl rofiles for aircraft landing at HIA which were identical to those used in developing the 92 FAR Part 150 contours of Figures 3 and 4 were also used in developing the contou shown in Figure 15.

The relationship of the CY 2020 aircra noise contours to the project site are shown in Figure 16. The CY 2020 contours own in Figure 16 indicate that the 60 DNL aircraft noise contour could encroach int the project site, and primarily over the commercial and industrial sections of the d elopment. The available CY 2020 forecasts for aircraft noise over the project sit ndicate that the 60 DNL contour could expand slightly and begin to extend into the oject site in the south section of the project alongside Ft. Weaver Road (see Figure 6). The residential and school parcels of the development should remain outside e 60 DNL contour. Planned noise sensitive uses of the project have been locat l outside the 60 DNL contour for CY 2020 in recognition of the existing planning guic ines shown in Table 3.



YEAR 2020 AIRCRAFT NOISE CONTOURS IN EWA BEACH AND KAPOLEI AREAS

FIGURE 15



DEVELOPMENT SUMMARY

Land Use	Area(ac.)	Units	Density (u/ac)
Single Family	103 (73 net)	550	7.5
Cluster	54	675	12.5
Multi Family	32	640	20
Commercial (Campbell)	20*		
Com'l./Indus. Mixed Use	30		
Community Facilities	24		
Park	25.5		
Roads	14.5**		
Pedestrian/Bikeways	—	—	
Total	283	1,865	

* Not included in area total
** Excludes Fort Weaver Road & Kapolei Pkwy.

YEAR 2020 AIRCRAFT NOISE CONTOURS IN EWA BY GENTRY (MAKAI) PROJECT AREA

FIGURE 16

CHAPTER VII. POTENTIAL NOISE IMPACTS ASSOCIATED WITH THE PROPOSED PROJECT AND POSSIBLE MITIGATION MEASURES

Traffic Noise Impacts. The increases in traffic noise levels attributable to the project from the Base Year to CY 2010 are predicted to not exceed 1.6 DNL along Ft. Weaver Road, and should not exceed 1.1 DNL along Geiger Road, Iroquois Road, Kapolei Parkway, and Keaunui Drive south of Iroquois Road. A traffic noise level increase of 1.6 DNL is considered to be moderate, but not significant. Traffic noise level increases of 0 to 1.0 DNL are considered to be insignificant and will be difficult to detect, particularly if the increase occurs over a 9 to 12 year period. Larger increases of 2.0 to 2.5 DNL are predicted to occur on the new Street A within the project area.

Potential noise impacts from project and non-project traffic are possible in the project environs, both in respect to existing and planned noise sensitive receptors along these roadways. Existing and future residences which are located along essentially all of the major roadways in the project area may be impacted by the future traffic noise along these roadways if their setback distances from the roadway centerlines are less than those shown for the 65 DNL contour in Table 7. The setbacks of existing homes along Fort Weaver Road, Geiger Road, Iroquois Road, and Kapolei Parkway are not adequate for avoiding future adverse noise impacts from traffic by CY 2010, with or without the project. For this reason, existing homes which front these two roadways are expected to be impacted by traffic noise in the future if they are not shielded by sound walls.

Because traffic noise along public roadways are generated by non-project as well as project traffic, mitigation of off-site traffic noise impacts are generally performed by individual property owners along the roadways' Rights-of-Way or by public agencies during roadway improvement projects. These mitigation measures generally take the form of increased setbacks, sound attenuating walls and/or berms, total closure and air conditioning, or the use of sound attenuating windows. Where adequate setbacks beyond the 65 DNL noise contour are not available, the construction of 6 to 8 feet high sound walls is generally effective for attenuating traffic noise at single story structures, or at the ground floors of multistory structures. If 6 to 8 feet high walls and/or berms are utilized to reduce traffic noise, at least 5 to 10 DNL units of reduction should be possible at ground level units. Second floor units will normally not benefit from the construction of 6 to 8 feet high walls. Whenever mitigation of traffic noise at the upper floors are required, the use of closure and air conditioning, or the use of sound attenuating windows are the more appropriate sound attenuation measures.

Aircraft Noise Impacts. The siting of future noise sensitive developments within the 60 DNL airport noise contour is not recommended by the State Department of Transportation, Airports Division. Residences, schools, churches, health centers, day-care centers, and hotels are included within the noise sensitive land use category. The siting of industrial and commercial uses within the 60 DNL contour is considered to be acceptable, since closure and air conditioning of industrial and commercial office spaces is the rule rather than an exception. The siting of these types of uses (or other

non-noise sensitive land uses) within the high noise areas is usually encouraged, since it tends to preclude future development of noise sensitive uses on the same lands.

By siting planned noise sensitive uses outside the existing and forecasted 60 DNL noise contours for Honolulu International Airport, risks of adverse aircraft noise impacts have been reduced to acceptable levels. The noise contour disclosure provisions of Reference 5 must be applied over all project lands which are located within the 1992 aircraft noise contours developed by the Hawaii State Department of Transportation, Airports Division during the last FAR Part 150 Noise Compatibility Program (see Figures 3 and 4). These official 1992 FAR Part 150 contours are the applicable contours for disclosure purposes. These disclosure provisions are intended to further reduce risks of occupant dissatisfaction with the aircraft noise levels in the project environs.

Unfortunately, the 1992 FAR Part 150 contours are dated, and probably cannot be used to depict existing conditions (prior to September 11, 2001). The 2007 forecast contours shown in Figure 6 are also dated since they utilized airport operations forecasts developed in the 1980's. The 2000/2001 and 2020 contours shown in Figures 13 through 16 are probably more representative of the existing and future aircraft noise contours over the project site, and they indicate that additional aircraft noise mitigation measures (other than disclosures) should not be required.

Combined Traffic and Aircraft Noise. When applying for FHA/HUD financial assistance on residential developments, sound attenuation measures are normally required if total exterior noise levels exceed 65 DNL. Traffic noise levels will exceed 65 DNL along the highway corridors and major thoroughfares which service the project. If the traffic noise level equals 65 DNL and the aircraft noise level equals 57 DNL at a project dwelling, the total noise level will be 66 DNL, which exceeds the FHA/HUD standard of 65 DNL. Where existing and forecasted aircraft noise levels over the project site do not exceed 55 DNL, combined traffic and aircraft noise levels should not exceed 65 DNL when traffic noise levels are less than 65 DNL. Where traffic noise levels exceed 65 DNL, the combined noise levels will be identical to the traffic noise levels and will not be dependent upon the levels of aircraft noise, as long as aircraft noise levels remain at least 10 DNL units below the traffic noise levels.

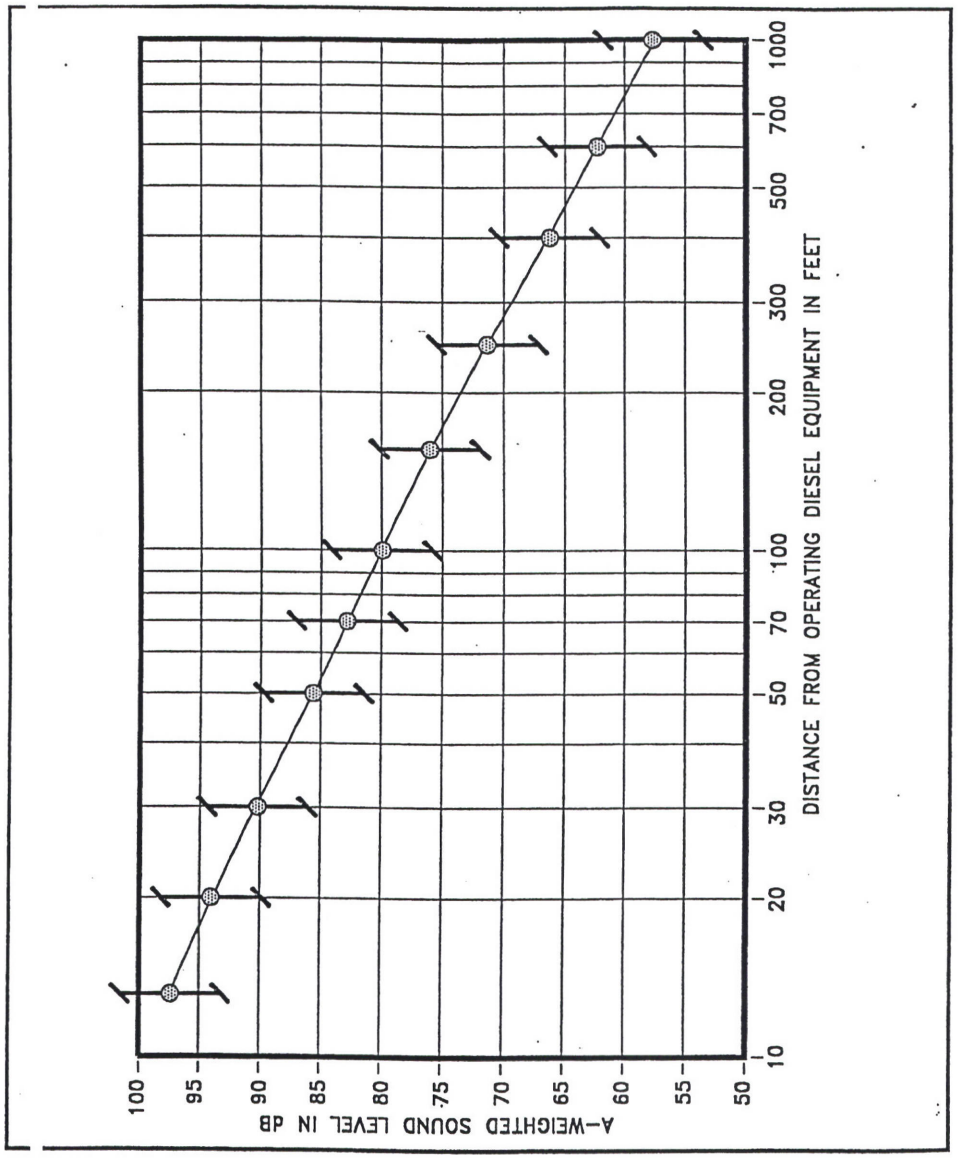
Aircraft noise contours for CY 2010 (the same year as the traffic noise predictions) were not constructed because detailed aircraft operations forecasts for Honolulu International Airport were not available. However, if the worst case CY 2020 aircraft noise contours are combined with the CY 2010 traffic noise contours, the following changes in the CY 2010 setback distances to the 65 DNL contours shown in Table 7 are predicted for locations within the 55 DNL contours shown in Figures 15 and 16:

a. Ft. Weaver Road north of Street A: Increase from 265 feet to 287 feet.
b. Kapolei Parkway north of Entrance A: Increase from 232 feet to 249 feet.
c. Kapolei Parkway south of Entrance A: Increase from 230 feet to 253 feet.

d. Kapolei Parkway north of Entrance B: Increase from 230 feet to 260 feet.
e. Kapolei Parkway south of Entrance B: Increase from 227 feet to 256 feet.
f. Kapolei Parkway north of Street A: Increase from 227 feet to 256 feet.
g. Kapolei Parkway south of Street A: Increase from 190 feet to 209 feet.
h. Street A east of Kapolei Parkway: Increase from 146 feet to 182 feet.
i. Street A west of Fort Weaver Road: Increase from 183 feet to 227 feet.
j. Golf Course Road east of Fort Weaver Road: Increase from 70 feet to 83 feet.

Construction Noise. Audible construction noise will probably be unavoidable during the entire project construction period. During periods of construction, it is 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 from construction activity (excluding pile driving activity) are shown in Figure 17. The noise sensitive properties which are predicted to experience the highest noise levels during construction activities on the project site are the existing residences north and adjacent to the project site. Adverse impacts from construction noise are not expected to be in the "public health and welfare" category due to the temporary nature of the work and due to the administrative controls available for its regulation. Instead, these impacts will probably be limited to the temporary degradation of the quality of the acoustic environment in the immediate vicinity of the project site.

Mitigation of construction noise to inaudible levels will not be practical in all cases due to the intensity of construction noise sources (80 to 90+ dB at 50 feet distance), and due to the exterior nature of the work (grading and earth moving, trenching, concrete pouring, hammering, etc.). The use of properly muffled construction equipment should be required on the job site, and heavy truck and equipment staging areas should be located away from the existing residences to the north. The incorporation of State Department of Health construction noise limits and curfew times, which are applicable on the island of Oahu (Reference 6), is another noise mitigation measure which can be applied to this project. Figure 18 depicts the allowed hours of construction for construction noise which exceed the allowable noise limits at the project's property lines. Noisy construction activities are not allowed during the nighttime hours, or on Sundays and holidays under the DOH permit procedures.



ANTICIPATED RANGE OF CONSTRUCTION NOISE LEVELS VS. DISTANCE

FIGURE 17

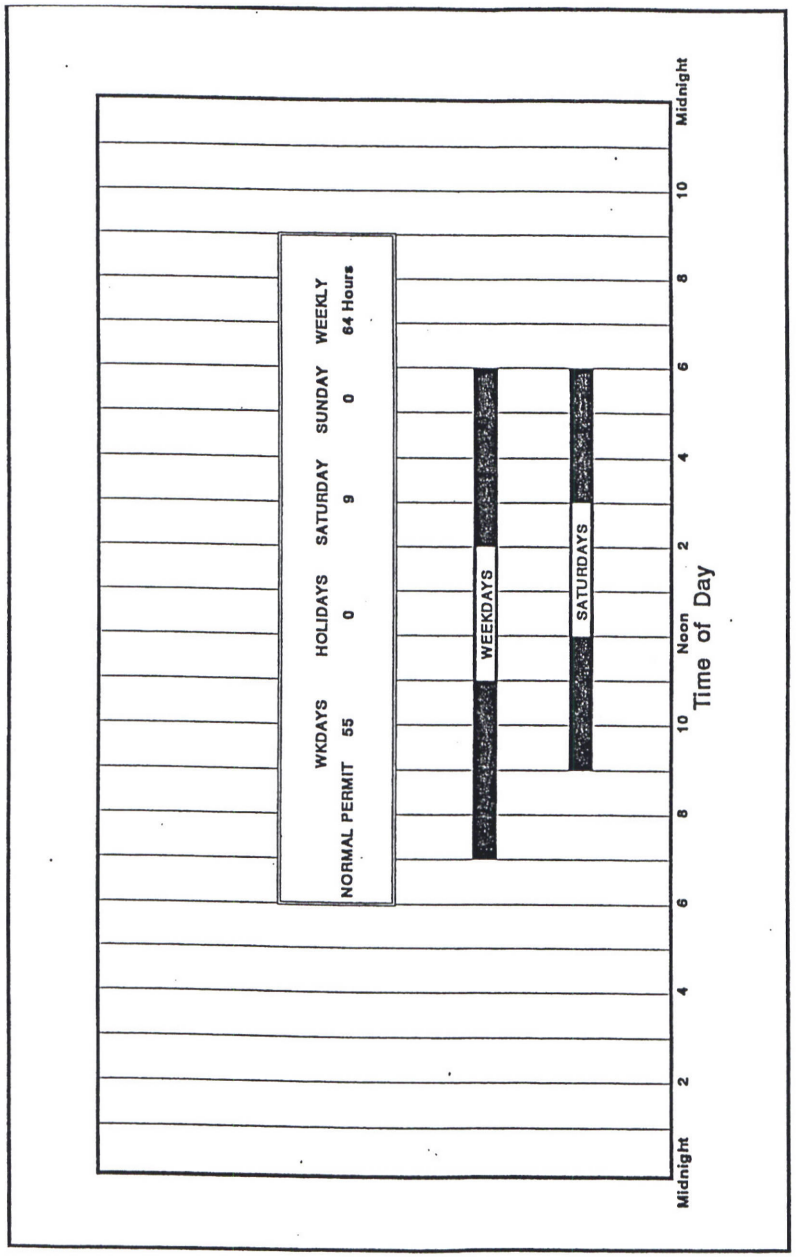


FIGURE 18

AVAILABLE WORK HOURS UNDER DOH PERMIT PROCEDURES FOR CONSTRUCTION NOISE

APPENDIX A. REFERENCES

(1) "Guidelines for Considering Noise in Land Use Planning and Control;" Federal Interagency Committee on Urban Noise; June 1980.

(2) American National Standard, "Sound Level Descriptors for Determination of Compatible Land Use," ANSI S12.9-1998/ Part 5; Acoustical Society of America.

(3) "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.

(4) "Information on Levels of Environmental Noise Requisite to Protect the Public Health and Welfare with an Adequate Margin of Safety;" U.S. Environmental Protection Agency; EPA 550/9-74- 004; March 1974.

(5) "Mandatory Seller Disclosures in Real Estate Transactions;" Chapter 508D, Hawaii Revised Statutes; July 1, 1996.

(6) "Title 11, Administrative Rules, Chapter 46, Community Noise Control;" Hawaii State Department of Health; September 23, 1996.

(7) "FHWA Highway Traffic Noise Model User's Guide;" FHWA-PD-96-009, Federal Highway Administration; Washington, D.C.; January 1998 and Version 1.1 User's Guide (Addendum) of September 2000.

(8) "Traffic Impact Analysis, Ewa By Gentry - Makai Development;" Parsons Brinckerhoff Quade & Douglas, Inc.; September 1998.

(9) "Honolulu International Airport Master Plan Update & Noise Compatibility Program, Volume 2, Part 1, FAR Part 150 - Noise Exposure Maps and Noise Compatibility Program;" State Department of Transportation, Airports Division; December 1989.

(10) "Kalaeloa Airport Master Plan - Final Report;" State Department of Transportation, Airports Division; November 1998.

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., decl).

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,

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 Over Time(T)[4]	$L_{eq(T)}$	$L_{Aeq(T)}$	$L_{Beq(T)}$	$L_{peq(T)}$
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 C

SUMMARY OF BASE YEAR AND FUTURE YEAR TRAFFIC VOLUMES

ROADWAY LANES	**** CY 1998 ***** AM VPH	PM VPH	CY 2010 (NO BUILD) AM VPH	PM VPH	CY 2010 (BUILD) AM VPH	PM VPH
Fort Weaver Rd. - North of Geiger Rd.(NB)	1,496	1,206	1,795	1,230	2,375	1,725
Fort Weaver Rd. - North of Geiger Rd.(SB)	1,178	1,576	1,005	1,515	1,310	2,105
Two-Way	2,674	2,782	2,800	2,745	3,685	3,830
Fort Weaver Rd. - South of Geiger Rd.(NB)	1,333	1,100	1,310	1,035	1,835	1,520
Fort Weaver Rd. - South of Geiger Rd.(SB)	1,297	1,464	1,000	1,195	1,305	1,725
Two-Way	2,630	2,564	2,310	2,230	3,140	3,245
Fort Weaver Rd. - North of Golf Course (NB)	1,333	1,100	1,310	1,035	1,835	1,520
Fort Weaver Rd. - North of Golf Course (SB)	1,297	1,464	1,000	1,195	1,305	1,725
Two-Way	2,630	2,564	2,310	2,230	3,140	3,245
Fort Weaver Rd. - South of Golf Course (NB)	1,333	1,098	1,270	1,050	1,360	1,150
Fort Weaver Rd. - South of Golf Course (SB)	1,287	1,453	1,030	1,160	1,150	1,245
Two-Way	2,620	2,551	2,300	2,210	2,510	2,395
Geiger Rd. - West of Street X (WB)	N/A	N/A	140	50	140	50
Geiger Rd. - West of Street X (EB)	N/A	N/A	70	105	70	105
Two-Way	N/A	N/A	210	155	210	155
Geiger Rd. - East of Street X (WB)	N/A	N/A	285	310	315	425
Geiger Rd. - East of Street X (EB)	N/A	N/A	285	370	385	430
Two-Way	N/A	N/A	570	680	700	855
Geiger Rd. - West of Street Y (WB)	N/A	N/A	285	310	315	425
Geiger Rd. - West of Street Y (EB)	N/A	N/A	285	370	385	430
Two-Way	N/A	N/A	570	680	700	855
Geiger Rd. - East of Street Y (WB)	N/A	N/A	285	325	315	440
Geiger Rd. - East of Street Y (EB)	N/A	N/A	290	395	390	455
Two-Way	N/A	N/A	575	720	705	895
Geiger Rd. - West of Kapolei Parkway (WB)	386	359	305	325	335	440
Geiger Rd. - West of Kapolei Parkway (EB)	251	425	290	400	390	460
Two-Way	637	784	595	725	725	900
Geiger Rd. - East of Kapolei Parkway (WB)	403	394	545	585	675	720
Geiger Rd. - East of Kapolei Parkway (EB)	358	408	510	700	605	835
Two-Way	761	802	1,055	1,285	1,280	1,555

APPENDIX C (CONTINUED)

SUMMARY OF BASE YEAR AND FUTURE YEAR TRAFFIC VOLUMES

ROADWAY LANES	**** CY 1998 ***** AM VPH	PM VPH	CY 2010 (NO BUILD) AM VPH	PM VPH	CY 2010 (BUILD) AM VPH	PM VPH
Geiger Rd. - West of Kaahupahau St. (WB)	403	417	545	585	155	720
Geiger Rd. - West of Kaahupahau St. (EB)	341	428	510	700	605	835
Two-Way	744	845	1,055	1,285	760	1,555
Geiger Rd. - East of Kaahupahau St. (WB)	455	567	550	610	680	745
Geiger Rd. - East of Kaahupahau St. (EB)	629	466	680	735	775	870
Two-Way	1,084	1,033	1,230	1,345	1,455	1,615
Geiger Rd. - West of Fort Weaver Rd. (WB)	394	522	550	610	680	745
Geiger Rd. - West of Fort Weaver Rd. (EB)	606	480	675	735	775	970
Two-Way	1,000	1,002	1,225	1,345	1,455	1,715
Iroquois Rd. - East of Fort Weaver Rd. (WB)	341	301	610	410	740	495
Iroquois Rd. - East of Fort Weaver Rd. (EB)	271	265	255	660	300	795
Two-Way	612	566	865	1,070	1,040	1,290
Iroquois Rd. - West of Keaunui Dr. (WB)	366	329	610	410	740	495
Iroquois Rd. - West of Keaunui Dr. (EB)	123	214	250	660	300	795
Two-Way	489	543	860	1,070	1,040	1,290
Iroquois Rd. - East of Keaunui Dr. (WB)	182	260	285	200	360	245
Iroquois Rd. - East of Keaunui Dr. (EB)	123	214	145	320	175	395
Two-Way	305	474	430	520	535	640
Iroquois P. Rd. - West of Street C (WB)	N/A	N/A	285	200	360	245
Iroquois P. Rd. - West of Street C (EB)	N/A	N/A	145	320	175	395
Two-Way	N/A	N/A	430	520	535	640
Iroquois P. Rd. - East of Street C (WB)	N/A	N/A	135	65	135	65
Iroquois P. Rd. - East of Street C (EB)	N/A	N/A	80	100	80	100
Two-Way	N/A	N/A	215	165	215	165
Kapolei Parkway - North of Geiger Rd. (NB)	103	135	2,015	805	2,435	1,150
Kapolei Parkway - North of Geiger Rd. (SB)	193	83	515	1,635	745	2,045
Two-Way	296	218	2,530	2,440	3,180	3,195
Kapolei Parkway - South of Geiger Rd. (NB)	N/A	N/A	1,970	855	2,270	1,120
Kapolei Parkway - South of Geiger Rd. (SB)	N/A	N/A	490	1,645	705	1,920
Two-Way	N/A	N/A	2,460	2,500	2,975	3,040

APPENDIX C (CONTINUED)

SUMMARY OF BASE YEAR AND FUTURE YEAR TRAFFIC VOLUMES

ROADWAY LANES	**** CY 1998 ***** AM VPH	PM VPH	CY 2010 (NO BUILD) AM VPH	PM VPH	CY 2010 (BUILD) AM VPH	PM VPH
Kapolei Parkway - North of Entrance A (NB)	N/A	N/A	1,970	855	2,270	1,120
Kapolei Parkway - North of Entrance A (SB)	N/A	N/A	490	1,645	705	1,920
Two-Way	N/A	N/A	2,460	2,500	2,975	3,040
Kapolei Parkway - South of Entrance A (NB)	N/A	N/A	1,790	805	2,090	1,070
Kapolei Parkway - South of Entrance A (SB)	N/A	N/A	515	1,580	735	1,855
Two-Way	N/A	N/A	2,305	2,385	2,825	2,925
Kapolei Parkway - North of Entrance B (NB)	N/A	N/A	1,790	805	2,090	1,070
Kapolei Parkway - North of Entrance B (SB)	N/A	N/A	520	1,580	735	1,855
Two-Way	N/A	N/A	2,310	2,385	2,825	2,925
Kapolei Parkway - South of Entrance B (NB)	N/A	N/A	1,750	810	2,020	1,050
Kapolei Parkway - South of Entrance B (SB)	N/A	N/A	535	1,545	740	1,765
Two-Way	N/A	N/A	2,285	2,355	2,760	2,815
Kapolei Parkway - North of Street A (NB)	N/A	N/A	1,735	810	2,020	1,050
Kapolei Parkway - North of Street A (SB)	N/A	N/A	550	1,550	740	1,765
Two-Way	N/A	N/A	2,285	2,360	2,760	2,815
Kapolei Parkway - South of Street A (NB)	N/A	N/A	1,650	535	1,720	640
Kapolei Parkway - South of Street A (SB)	N/A	N/A	350	1,315	425	1,370
Two-Way	N/A	N/A	2,000	1,850	2,145	2,010
Kaahupahau St. - North of Geiger Rd.(NB)	30	80	70	50	70	50
Kaahupahau St. - North of Geiger Rd.(SB)	141	25	140	110	140	110
Two-Way	171	105	210	160	210	160
Kaahupahau St. - South of Geiger Rd.(NB)	194	66	150	85	150	85
Kaahupahau St. - South of Geiger Rd.(SB)	69	123	55	135	55	135
Two-Way	263	189	205	220	205	220
Entrance A - East of Kapolei Parkway (WB)	N/A	N/A	175	100	175	100
Entrance A - East of Kapolei Parkway (EB)	N/A	N/A	25	75	25	75
Two-Way	N/A	N/A	200	175	200	175
Entrance A - West of Kapolei Parkway (WB)	N/A	N/A	25	90	25	90
Entrance A - West of Kapolei Parkway (EB)	N/A	N/A	80	50	85	50
Two-Way	N/A	N/A	105	140	110	140

APPENDIX C (CONTI UED)

SUMMARY OF BASE YEAR AN FUTURE YEAR TRAFFIC VOLUM S

ROADWAY LANES	**** CY 1998 ** AM VPH	PM V H	CY 2010 (NO BUILD) AM VPH	PM VPH	CY 2010 (BUILD) AM VPH	PM VPH
Entrance B - West of Kapolei Parkway (WB)	N/A	N/	25	90	25	90
Entrance B - West of Kapolei Parkway (EB)	N/A	N/	80	50	85	50
Two-Way	N/A	N/	105	140	110	140
Entrance B - East of Kapolei Parkway (WB)	N/A	N/	0	0	125	35
Entrance B - East of Kapolei Parkway (EB)	N/A	N/	0	0	110	65
Two-Way	N/A	N/	0	0	235	100
Street X - Sorth of Geiger Rd. (NB)	N/A	N/	215	270	315	330
Street X - Sorth of Geiger Rd. (SB)	N/A	N/	145	265	175	380
Two-Way	N/A	N/	360	535	490	710
Street Y - South of Geiger Rd. (NB)	N/A	N/	5	30	5	30
Street Y - South of Geiger Rd. (SB)	N/A	N/	0	20	0	20
Two-Way	N/A	N/	5	50	5	50
Keaunui Dr. - North of Iroquois Rd. (NB)	166	80	35	60	35	60
Keaunui Dr. - North of Iroquois Rd. (SB)	197	76	85	70	85	70
Two-Way	363	15	120	130	120	130
Keaunui Dr. - South of Iroquois Rd. (NB)	N/A	N/	260	175	315	215
Keaunui Dr. - South of Iroquois Rd. (SB)	N/A	N/	90	315	110	375
Two-Way	N/A	N/	350	490	425	590
Golf Course - East of Fort Weaver Rd. (WB)	1	12	105	100	465	365
Golf Course - East of Fort Weaver Rd. (EB)	11	21	45	150	175	515
Two-Way	12	33	150	250	640	880
Street A - West of Fort Weaver Rd. (WB)	N/A	N/	245	495	585	850
Street A - West of Fort Weaver Rd. (EB)	N/A	N/	255	495	615	890
Two-Way	N/A	N/	500	990	1,200	1,740
Street A - East of Kapolei Parkway (WB)	N/A	N/	180	445	370	730
Street A - East of Kapolei Parkway (EB)	N/A	N/	285	435	580	655
Two-Way	N/A	N/	465	880	950	1,385
Street A - West of Kapolei Parkway (WB)	N/A	N/	10	50	110	350
Street A - West of Kapolei Parkway (EB)	N/A	N/	0	60	305	290
Two-Way	N/A	N/	10	110	415	640
Street C - South of Iroquois P. Rd. (NB)	N/A	N/	150	135	225	180
Street C - South of Iroquois P. Rd. (SB)	N/A	N/	65	220	95	295
Two-Way	N/A	N/	215	355	320	475

ORIGINAL

LAND USE COMMISSION
STATE OF HAWAII
2003 MAR 21 A 9:14

EWA MAKAI
SOCIAL IMPACT ASSESSMENT

PREPARED BY EARTHPLAN

SEPTEMBER 2002

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1 BACKGROUND AND INTRODUCTION

1.1 Report Description

Gentry Homes, Inc. proposes to develop an area adjacent to the existing Ewa by Gentry community in Ewa, Oahu. The project requires a re-designation from Agriculture to Urban by the State Land Use Commission. This report contains the social impact assessment conducted as part of this process. It will be summarized in and appended to the report that will accompany the petition to the Land Use Commission.

This social impact assessment was prepared by Earthplan, Inc., whose offices are located at 81 South Hotel Street, Suite 211, Honolulu, Hawaii. Berna Cabacungan, principal of Earthplan, was project manager, and principal analyst and writer. Sara Verga assisted in project research.

The remaining portions of this section describe the proposed actions and discuss the role and purpose of social impact assessments.

Section 2 describes the existing social environment in terms of population trends and, demographic information. Section 3 extends the baseline information by exploring what may occur in the region with or without the proposed changes.

Proposed social impacts are described in Section 4 in terms of population changes, the project's relationship to regional public policies and community expectations, and public facilities and services.

1.2 Description of the Proposed Project

Gentry Homes, Inc., proposes to develop the region of Ewa Makai. This project is located on both sides of Fort Weaver Road in Ewa. It is bordered on the east side by the Hawaii Prince Golf Course and on the west by the Barbers Point Golf Course. The south side of the project site is bordered by a district park, residential areas, an elementary school, and the Hawaii Prince Golf Course. The north side of the project site is bordered by the Ewa Gentry community.

The proposed development includes 1,865 residential units, a commercial and industrial mixed use area, and related public and community facilities on 283 acres in Ewa. An overview of the proposed project is provided in Table 1.

Table 1: Proposed Uses/ Units/ Acres

Land Use	Units	Area (ac.)
Single Family	550	93 (73 net)
Cluster	675	64 (54 net)
Multi Family	640	32
Commercial (Campbell)		20
Commercial / Industrial Mixed Use		30
Community Center		2
Middle School		18
Church / Day Care		4
Parks/Open Space		25.5
Roads		14.5
Total	**1,865**	**283**

Figure A illustrates the Ewa Makai project and the following describes the location of these uses in the project site:

East of Fort Weaver Road: On the easternmost portion of the project site, 360 single-family residences will be developed on 68 acres. Two cluster areas will also be developed. One will be on 27 acres of land and will include 215 units; the other, on eleven acres of land with140 units. A 3.5-acre park, which will be contiguous to a planned six-acre park in the adjacent community, is also planned, as well as four acres for church facilities.

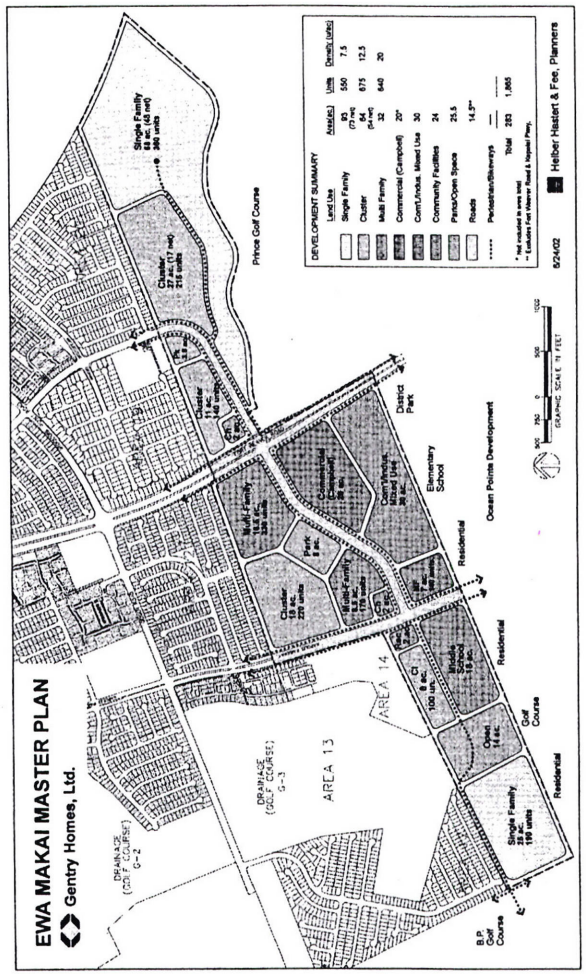


Figure A: Proposed Ewa Makai Project

West of Fort Weaver Road and east of Kapolei Parkway: The western portion of Fort Weaver Road will be divided into two areas by the new Kapolei parkway. The area between Fort Weaver Road and Kapolei Parkway will be further divided by the extension of Keaunui Drive in the east-west direction. North of this road will include two multi-family sections separated by an eight-acre community park. One multi-family neighborhood will be developed on 16.5 acres and will include 330 units; the other will be developed on 8.5 acres and will include 170 units. Also in this area is a cluster development comprising 220 units on 18 acres. Four acres are planned for church facilities.

South of Keaunui Drive extension is a 30-acre Industrial/ Commercial area that is adjacent to the Laulani Commercial Center which is being developed by the Estate of James Campbell. Also in this portion of the project site is a seven- acre multi family lot with 140 units fronting Kapolei Parkway Road.

West of Kapolei Parkway: On the western side of Kapolei Parkway, the developer proposes that 18 acres, adjacent to a two-acre community center, be set aside for a middle school. Cluster housing comprising 100 units is proposed for eight acres and 190 single family units are proposed for 25 acres. Approximately 14 acres of open space will separate the cluster units from the single-family housing.

Total Development Summary: The total development that is planned for Ewa Makai are 93 acres of single family homes totaling to 550 units. Sixty-four acres of cluster homes totaling 675 units will also be built, as well as 32 acres of multi-family homes totaling 640 units. Industrial and Commercial mixed use development will be on 30 acres of land on the project site. Twenty four acres of land will be devoted to community facilities, with the remaining 25.5 acres being left for parks and open space, and 14.5 acres being set aside for roads (excluding Fort Weaver Road and Kapolei Parkway).

1.3 The Role and Purpose of Social Impact Assessments

The social aspects of an area relate 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, became a recognized subfield of research and policy application, with the passage of the U.S. National Environmental Policy Act (NEPA) legislation in 1969. [2] It is an interdisciplinary, inter-professional field of social science knowledge and application. SIA draws sometimes from social science, but other times from organizational development, political analysis, or journalism. 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.

The goal of SIA is to predict the social effects of a policy, program or project while still in the planning stage, before those effects have occurred. The overall framework for SIA is anticipatory research, which seeks to place the expectation and attainment of desired outcomes on a rational and reliable basis.

Commonly identified uses of SIA 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. Different people and different communities 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 scenario because it provides the analyst with a realistic social context for the proposed action.

---

[1] *Kathleen Christiansen,* ***Social Impacts of Land Development: An Initial Approach to Estimating Impacts on Neighborhood Usages and Perceptions*** *(1976)*

[2] *Rabel Burdge and Frank Vanclay, "Social Impact Assessment,"* ***Environmental and Social Impact Assessment,*** *ed. Frank Vanclay and Daniel A. Bronstein (1996), 34.*

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, underlying 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 import 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.

2 PROFILE OF THE EXISTING COMMUNITY

2.1 Study Area Definition

2.1.1 Overall Study Area

The Overall Study Area for this report is the Ewa Development Plan region, which covers the entire Ewa plain, includes the coastline between West Loch and Kahe Point, and extends to the mauka areas. Formerly, virtually this entire region comprised the Ewa Neighborhood Board No. 23 area. To accommodate the current and anticipated population growth, the City divided the previous Neighborhood Board area into two Boards: the Ewa (No. 23) area and Makakilo/ Kapolei/ Honokai Hale/ Nanakai Gardens Neighborhood Board (No. 24) area.

The Makakilo/ Kapolei/ Honokai Hale/ Nanakai Gardens Neighborhood Board area encompasses the western portion of the Ewa Development Plan area. A focal point of this western half is the City of Kapolei, which forms the region's new commercial and government center.

Honokai Hale and Nanakai Gardens form a contiguous residential community containing approximately 290 residences. The Villages of Kapolei is a cooperative housing development between the government and several private developers. Currently being developed in phases, the project will include eight residential villages and support facilities on approximately 890 acres of land at full build-out. Located on the southern foothills of Wai`anae Range, the development of Makakilo began in the early 1960s as a planned hillside residential project of Finance Realty. When completed, the entire development should include about 6,200 homes.

2.1.2 Primary Study Area

The Primary Study Area for this report is the Ewa Neighborhood Board area, which is generally the eastern portion of the Ewa Development Plan area. The Primary Study Area includes the existing communities of Ewa Beach, Ewa Villages, West Loch Estates, Ewa by Gentry and Ocean Pointe. Figure B illustrates the Primary Study Area for this report.

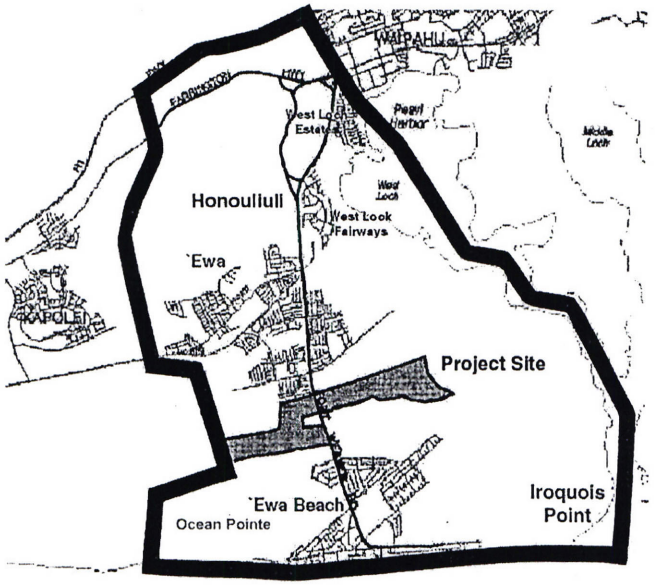


Figure B: Primary Study Area for This SIA

The name and existence of the present town of Ewa comes from the founding of the Ewa Plantation, incorporated in early 1890[3]. By 1877, James Campbell had acquired approximately 41,000 acres of arid ranch lands on the Ewa plain. With the need for water apparent, Campbell arranged for the drilling of Hawaii's first artesian wells, an effort that proved successful and made available water reserves for the area. In 1889, the Honouliuli lands were leased to B.F. Dillingham, who later subleased a portion of those lands to W.R. Castle who, with Castle and Cooke, organized the Ewa Plantation Company. A merger of Ewa Plantation with Oahu Sugar occurred in 1970.[4]

[3] *Yardley, 1891.*

[4] *The Estate of James Campbell, 1974.*

According to written reports, the lands of Ewa Beach were once part of the Magoon, Parish, and Dowsett Estates and used for seafront summer homes. In 1948, approximately 200 people lived in the area. The Ewa Beach Community Association formed in 1950. By 1958, the population had grown to 300. Of those, approximately 70 percent were families of personnel from the nearby Barbers Point Naval Air Station.[5] Today, the community contains residential subdivisions, shopping areas, schools, churches, and all the public and private amenities associated with small towns that exist throughout the island.

Ewa Villages was at one time home to nearly 3,000 Ewa Plantation sugar workers and their families. Today, efforts to restore many of the historic structures and houses from the villages of Tenney, Renton, and Varona are being undertaken through the City and County of Honolulu's Revitalization Program. In addition to restoration, over 1,000 new homes will be constructed at market and affordable prices. The community includes an 18-hole municipal golf course and commercial space.[6]

West Loch Estates, a City and County of Honolulu master-planned community, includes 1,600 residential units on approximately 500 acres of land acquired from the Estate of James Campbell. The first phase, completed in 1990, contains 593 homes. The second phase, completed in 1994, contains approximately 700 residential units. The development also includes an 18-hole municipal golf course, a shoreline park, and units designed for senior living.

Ewa by Gentry, an ongoing development of the Gentry companies, began selling homes in their Soda Creek project in 1988. The 1,000-acre master-planned community, located on both sides of Fort Weaver Road, will include approximately 7,200 homes. Approximately 5,000 units have been completed thus far.

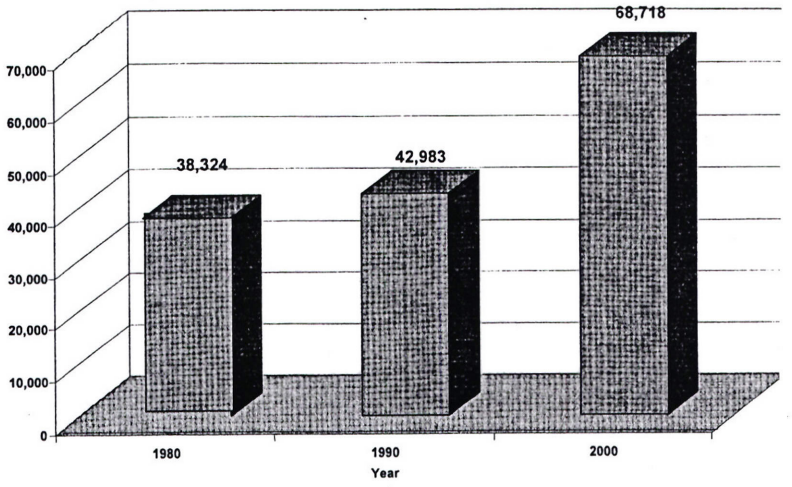
[5] *Information is taken from Ewa Area Chronology, a typed record of events for the area contained at the Ewa Beach Community Library. Reference to specific information cited is listed as HSB 12/19/58, 14:1 and HSB 12/18/58.*

[6] *Historic Hawaii, 1991, and the Estate of James Campbell, 1994.*

2.2 Population Trends

Designated the Secondary Urban Center by the City and County of Honolulu, the Ewa region has been undergoing many changes over the last two decades. As more residential units are being built, the population of this region has increased from 38,324 in 1980, to 42,983 in 1990 and to 68,718 persons in 2000, as illustrated in *Figure C*.

Figure C: Ewa Development Plan Population, 1980, 1990, 2000



In terms of average annual growth rates, these increases mean that the Study Area has been growing at rates much higher than that of the City and County of Honolulu. From 1980 to 1990, the Oahu-wide population grew from 762,534 to 836,231 persons; this represents an average annual growth rate of 0.9 percent. By 2000, the Oahu-wide population grew to 876,156 persons, which represents an average annual growth rate of 0.5 percent from 1990 to 2000.

In the Ewa Development Plan area, the average annual growth rate between 1980 and 1990 was 1.2 percent. As development activity increased, the growth rate increased significantly, as indicated by the 5.9 percent average annual growth rate from 1990 to 2000.

The Total Study Area is expected to increase its proportion of the total islandwide population, as shown on Table 2.

Table 2: Projected Growth for Development Plan Regions, 2010 and 2020

	2010 Projection	Percent of Total Oahu Population	2020 Projection	Percent of Total Oahu Population
Primary Urban Center	454,070	48.9%	484,646	48.5%
Ewa	**88,401**	**9.5%**	**100,697**	**10.1%**
Central Oahu	153,300	16.5%	166,794	16.7%
East Honolulu	46,182	5.0%	50,762	5.1%
Koolaupoko	113,780	12.3%	118,963	11.9%
Koolauloa	14,068	1.5%	15,726	1.6%
North Shore	17,305	1.9%	19,648	2.0%
Waianae	41,095	4.4%	42,164	4.2%
Total	**928,201**		**999,400**	

Source: Provided by Steve Young, City Development of Planning and Permitting, July 3, 2002.

In 2000, the Ewa Development Plan area accounted for 7.8 percent of the total Oahu population. By 2010, it is projected that Ewa will comprise nine percent of Oahu's population; by 2020, ten percent.

2.2.1 Total and Primary Study Areas

Table 3 presents demographic information for Oahu, the Ewa Development Plan area and the Ewa Neighborhood Board area.

Table 3: Demographic Information for Oahu, the Total Study Area and the Primary Study Area, 1990 and 2000

	Oahu		Total Study Area, Ewa Development Plan Area		Primary Study Area, Ewa Neighborhood Board	
	1990	2000	1990	2000	1990	2000
Population	836,231	876,156	42,931	68,718	26,898	53,099
Age						
Less than 5	7.4%	6.5%	11.9%	9.1%	9.9%	9.4%
5 to 17	17.1%	20.0%	18.9%	22.6%	23.0%	22.8%
18 to 64	64.5%	60.1%	64.2%	61.5%	60.9%	60.9%
65 and older	11.0%	13.4%	4.9%	6.8%	6.2%	6.9%
Median age	32.2	35.7	27.5	31.2	27.8	30.8
Ethnicity (1)						
Caucasian	31.7%	21.3%	40.1%	18.4%	32.9%	16.9%
Asian	45.6%	46.0%	42.3%	46.0%	48.3%	49.7%
Hawaiian	10.8%	8.9%	9.5%	7.5%	13.0%	6.8%
All Other	12.0%	23.8%	8.2%	28.0%	5.8%	26.6%
Households						
Total Households	265,304	286,450	11,449	14,324	6,768	14,324
Family households	74.4%	71.8%	99.8%	84.5%	88.9%	85.1%
Average household size	3.02	2.95	3.65	3.68	3.96	3.68
Average family size	3.50	3.59	3.59	4.24	4.10	4.08
Housing Units						
Number	281,683	315,988	11,722	20,804	6,971	15,845
Owner Occupied	49.0%	49.5%	52.1%	63.7%	52.9%	62.8%
Renter Occupied	45.2%	41.2%	45.3%	27.3%	44.2%	27.6%
Vacant Units	5.8%	9.3%	2.6%	9.0%	2.9%	9.6%

Notes:

1. Ethnicity proportions are presented for information only. 1990 and 2000 information cannot be compared because of methodology differences in gathering information. In 1990, census respondents were required to pick one ethnic category. In 2000, multi-ethnic respondents were allowed to select the appropriate number of categories.

*Sources: The 1990 information for Oahu and Ewa is from Summary Tape 1-A of the 1990 census. The 2000 Oahu information is from the U.S. Census Bureau (**Profiles of General Demographic Characteristics. 2000 Census of Population and Housing, Hawaii** [May 2001]). The 2000 Ewa information is from the City and County of Honolulu Department of Planning and Permitting (**Community Profiles: Neighborhood Board Areas, 1990 and 2000** (January 2002)].*

Age

The Total and Primary Study Areas tend to be younger than the Oahu population. When compared to the islandwide community, both had relatively higher proportions of people 17 years old and younger, and lower proportions of people 65 years and older.

In terms of median age, the Total and Primary Study Areas consistently had lower median ages than the islandwide community. The Oahu 1990 median age was 32.2 years; for 2000, 35.7 years. The 1990 median ages for the Total and Primary Study Areas were 27.5 and 27.8 years, respectively. The 2000 median ages for the Total and Primary Study Areas were 31.2 and 30.8 years, respectively.

From 1990 and 2000, the Total Study Area experienced a slight increase in youngsters 17 years and younger (from 31 to 32 percent), a decrease in those 18 to 64 years (64 to 62 percent), and an increase in the 65 years and older category (five to seven percent).

Between 1990 and 2000, the Primary Study Area experienced stability in all categories. Both census years indicated similar proportions of people 17 years (33 percent), 18 to 64 years (61 percent) and 65 years and older (from six to seven percent).

Ethnicity [7]

A detailed analysis of ethnic trends is not possible due to the methodology differences in gathering information between the 1990 and 2000 census taking. In 1990, census respondents were required to pick a single ethnic category. In 2000, multi-ethnic respondents were allowed to select the appropriate number of categories. Nevertheless this information provides relative ethnic proportions.

When compared to the 2000 islandwide ethnic profile, the Total Study Area tended to have lower proportions of Caucasians (Oahu 21 percent; Total Study Area 18 percent) and Hawaiians (Oahu nine percent; Total Study Area eight percent).

[7] *Ethnicity proportions are presented for information only. 1990 and 2000 information cannot be compared because of methodology differences in gathering information. In 1990, census respondents were required to pick one ethnic category. In 2000, multi-ethnic respondents were allowed to select the appropriate number of categories.*

The Primary Study Area had proportionally less Caucasians (17 percent), and other/mixed (27 percent) and more Asians (50%) when compared to the Total Study Area.

Both Oahu and the Total Study Area Asian Population amounted to 46 percent of the total population. The proportion of those of other and mixed races was higher in the Total Study Area (28 percent) than on Oahu (24 percent).

Households and Families

Both the Total and Primary Study Areas had significantly high proportions of family households when compared to the islandwide community. In 1990 and 2000, about 74 and 72 percent, respectively, were family households out of the total household count. In the Total Study area, almost all of the households were family households in 1990, and 84 percent were family households in 2000. In the Primary Study Area, 89 percent of the households were families in 1990, and 85 percent in 2000.

Household and family sizes were higher in the Total and Primary Study Areas than in the Oahu-wide community. In 1990 and 2000, the Oahu-wide average household size was three persons. The average household size for the Total Study Area was 3.7 persons in 1990 and 2000. In the Primary Study Area, the average household size was four persons in 1990 and decreased to 3.7 persons in 2000.

The Oahu-wide average family size was 3.5 and 3.6 persons in 1990 and 2000, respectively. For the Total Study Area, family sizes averaged 3.6 and 4.2 persons in 1990 and 2000, respectively. Average family size in the Primary Study Area was 4.1 persons in 1990 and 2000.

Housing Units

The Total Study Area experienced a 77 percent increase in housing units from 11,721 to 20,804 units from 1990 to 2000. The Primary Study Area housing units more than doubled from 1990 to 2000, from 6,972 to 15,845 units.

Both increases were significantly high, when compared to the twelve percent increase experienced on Oahu from 1990 to 2000.

In terms of housing unit occupancy in 2000, about half of the Oahu housing supply was occupied by its owners and 41 percent were renter-occupied. Approximately 5.8 percent of the housing units were vacant.

The Total and Primary Study Areas experienced an increase in owner-occupied units from 1990 to 2000, and had significantly higher proportions when compared to Oahu. The 2000 owner-occupancy rate for the Total Study Area was 64 percent; for the Primary Study Area, 63 percent.

Housing vacancy was also high in the Total and Primary Study Areas due to the ongoing construction activity. The Total Study Area had a nine percent housing vacancy rate; the Primary Study Area, ten percent.

2.2.2 Primary Study Area Communities

The City Department of Planning and Permitting has prepared 2000 census information on specific Oahu communities that is not available in standard census products. In the Primary Study Area, such information is available for Ewa Villages / Honouliuli, Ewa Gentry / West Loch, Ewa Beach / Iroquois Point, and Ocean Pointe.

It is noted that, while these are the major communities within the Ewa Neighborhood Board area, which is the Primary Study Area, the boundaries for these individual communities are not inclusive of the entire Neighborhood Board area. The information presented in Table 4 is presented nevertheless to provide comparisons of the communities near the proposed Ewa Makai.

Age-wise, the older communities of Ewa Villages / Honouliuli had relatively older populations with a median age of 34.1 years. The Ewa Beach / Iroquois Point community, also older neighborhoods, has the lowest median age of 30.1 years.

In terms of ethnicity, over half of the Ewa Villages / Honouliuli (68 percent) and Ewa Gentry / West Loch (55 percent) populations were of Asian ancestry in 2000. In Ewa Beach / Iroquois Point and Ocean Pointe, respectively 40 and 44 percent of the population were Asian

Caucasians accounted for only four and 13 percent of the Ewa Villages / Honouliuli and Ewa Gentry / West Loch populations, respectively. The Caucasian proportions were higher in Ewa Beach / Iroquois Point and Ocean Pointe, where respectively 24 and 19 percent were in this category.

Table 4: Demographic information for Neighborhoods in the Primary Study Area, 2000

	Ewa Villages/ Honouliuli	Ewa Gentry/ West Loch	Ewa Beach/ Iroquois Point	Ocean Pointe
Population	5,214	19,123	18,506	728
Age				
Less than 5	7.1%	9.8%	9.0%	9.8%
5 to 17	19.9%	21.2%	23.7%	1.8%
18 to 64	58.0%	63.9%	58.7%	69.0%
65 and older	15.0%	5.1%	8.6%	3.4%
Median age	34.1	31.4	30.1	31.4
Ethnicity				
Caucasian	4.4%	12.8%	23.6%	19.4%
Asian	67.6%	54.9%	40.2%	44.4%
Hawaiian and other Pacific Islanders	5.2%	5.6%	8.5%	4.1%
All Other	22.8%	26.6%	27.7%	32.1%
Households				
Total Households	1,279	4,650	3,898	183
Family households	84.1%	79.2%	90.4%	74.7%
Average household size	3.95	3.25	4.25	2.97
Average Family size	4.45	3.74	3.68	3.48
Housing Units				
Total	1,386	6,247	5,001	261
Owner Occupied	71.6%	71.9%	45.9%	93.9%
Renter Occupied	20.6%	22.2%	40.4%	0.0%
Vacant Units	7.7%	6.0%	13.8%	6.1%

Source: City and County of Honolulu, Department of Planning and Permitting, Community Profiles: Island Development Plan Areas, 1990 and 2000 (January 2002)

Ewa Beach / Iroquois Point had the highest proportion of Hawaiians and other Pacific Islanders, with eight percent. The lowest proportion was found in Ocean Pointe, at four percent.

The older communities tended to have larger household sizes. The largest households were found in Ewa Beach / Iroquois Point where the average household size was 4.24 persons. In Ewa Villages / Honouliuli, an average of 3.95 persons lived in each household.

These communities also had the highest proportions of family households. Over 90 percent of households in Ewa Beach / Iroquois Point were family households. In Ewa Villages / Honouliuli, 84 percent were family households.

Ocean Pointe had the smallest household and family sizes in 2000, with 2.97 persons and 3.48 persons, respectively.

Generally, housing units in these communities tended to be owner-occupied, with the highest level of owner-occupancy in the new community of Ocean Pointe.

Only the Ewa Beach / Iroquois Point community had a relatively high proportion of renters. Forty percent of the housing units were renter-occupied and 46 percent were owner-occupied. Housing vacancies were also the highest in this community, with 14 percent of the housing unit supply vacant in 2000.

3 MAJOR FORCES FOR CHANGE

The Total and Primary Study Areas are expected to undergo major changes regardless of whether the proposed project is implemented. These changes extend the baseline context of the social environment and are outlined in this section. Section 3.1 presents changes advocated by the public sector, and private sector projects are presented in Section 3.2.

3.1 Ewa Development Plan

The City and County of Honolulu guides and directs land use and growth through a three-tier system of policies, planning principles, guidelines, and regulations. The General Plan forms the first tier of this system and comprises statements of objectives and policies. Adopted in 1977, the General Plan has been amended several times, although the basic elements in the original document remain the same.

The second tier of the system includes the Development and Sustainable Communities Plans. There are eight plans that cover the Primary Urban Center, East Honolulu, Central Oahu, Ewa, Waianae, North Shore, Kooloauloa, and Koolaupoko.

The third tier of the system comprises the implementing ordinances, including the Land Use Ordinance and the City's Capital Improvement Program.

The project is in the Ewa Development Plan area. The General Plan calls for the Secondary Urban Center to be centered in Kapolei, which is planned as the focus of major economic activity and housing development, and a center for government services. It also encourages development of the Secondary Urban Center at Kapolei, and residential development of the urban fringe areas in Ewa.

In keeping with the General Plan, the Ewa Development Plan provides a secondary employment center with its nucleus in the City of Kapolei to supplement the Primary Urban Center (PUC). It concentrates primary employment activities at industrial and resort areas, government facilities and higher education centers around the City of Kapolei.

The Ewa Development Plan also provides for significant residential development throughout Ewa, and calls for a variety of housing types from affordable units and starter homes to mid-size multi-family and single family units.

The Ewa Development Plan contains land use policies, principles and guidelines related to open space preservation and development, regional parks and recreation complexes, community-based parks, historic and cultural resources, the City of Kapolei, residential development and non-residential development. The following are social-related policies that are relevant to the proposed Ewa Makai.

- **Residential Development**

  The Ewa Development Plan calls for a housing density of ten to 15 units per acre in aggregate areas zoned for residential use. Low density areas should have between five to twelve units per acre and medium density areas should have ten to 13 units per acre. High density areas should have 25 to 90 units per acre. Building heights restrictions include two stories for low density housing, up to three stories for medium density and up to 90 feet for high density.

  The Ewa Development Plan also calls for:

  - A physical definition of neighborhoods,
  - A compatible mix of building forms,
  - Transit-oriented streets,
  - Opportunities for pedestrian and bicycle travel, and
  - Integration of linear corridors.

- **Community-Based Parks**

  The Development Plan calls for new residential development to include land for open space and recreation at a minimum of two acres per 1,000 residents. Community-based parks include

  - mini parks, with a .25-mile service radius,
  - neighborhood parks, with a .50-mile service radius,
  - community parks, with a one mile-service radius, and
  - district parks, with a two-mile service radius.

Further, the Ewa Development Plan notes that the existing deficit to City park stands at almost 40 acres, and that an additional 76 acres of community-based parks and recreation should be developed to meet the needs of the projected 2020 population.

- **Commercial Centers**

  The Ewa Development Plan identifies four types of commercial centers, based on size and function. These types include neighborhood commercial center (five to ten acres), community commercial center (ten to 30 acres), major community commercial center (up to 50 acres) and regional community center (more than 50 acres). The latter two types of commercial centers are only located in the City of Kapolei, as that region is intended to provide for regional shopping needs.

  For the neighborhood and community commercial centers, the Plan provides guidelines for street frontage, floor area, and types of uses. Generally, these commercial centers should be dedicated mostly to retail uses and office uses that provide services to the surrounding community.

- **Industrial Uses**

  Industrial centers in the Ewa Development Plan region include the Barbers Point Industrial Area and the Honouliuli Industrial Area. Service-oriented industrial uses, such as automobile repair shops, contractor's yards, and businesses serving residential and commercial areas, can be located near the City of Kapolei, in the Kapolei Business Park and on industrial-designated land in the Barbers Point Naval Air Station. Alternatively, a commercial, cultural or recreational entertainment attraction may be permitted in the area fronting the OR&L Historic Railway. An industrial area in Laulani is also included in the Ewa Development Plan; it is intended for service oriented light industrial use.

3.2 Private Development Efforts

Ewa is a region in transition and there are major changes which are being undertaken as part of the effort to establish the region as the island's secondary urban core. Kapolei is envisioned as providing an urban center with facilities for commerce, finance, government services, and industrial activities. The major components include several commercial and office complexes, the existing James Campbell Industrial Park, the new 800- acre Kapolei Business Park, Barbers Point Harbor, Ko'Olina Resort, and the City of Kapolei's numerous residential neighborhoods.

Specific projects underway in the Primary Study Area include the following:

Ocean Pointe

Adjacent to Ewa Beach and south of the project site, Ocean Pointe is a planned 1,100-acre community that includes a full-service 1,400-slip marina with a maritime commercial complex. This complex includes light industrial, commercial and retail facilities, as well as ancillary visitor accommodations. The project also includes 4,850 residential units, a golf course and a 20-acre district park.

Developer HASEKO (Ewa) recently submitted a request to rezone a portion of the project to accommodate drainage system modifications. The proposed changes included reduction of the marina size from 120 to 70 acres, converting the eastern basin to a portion of the golf course, reducing the golf course from 27 to 18 holes, reduction and reconfiguration of the commercial and industrial support area, and incorporating a neighborhood business area. The rezoning request for reconfiguration was recently approved by the Honolulu City Council.

Ewa by Gentry

Gentry has completed approximately 5,000 housing units in Ewa by Gentry, which is located just north of the project site. When development is completed in 2010, there will be approximately 7,200 housing units.

Ewa Villages

The City and County of Honolulu acquired 600 acres northwest of the project site. This area surrounds and includes the former plantation villages, including Tenney, Renton and Varona Villages. Existing structures in Ewa Villages are being rehabilitated for reuse, and related affordable and market housing is being developed. A total of 1,900 residential units will be available at full buildout.

4 Potential Social Impacts

4.1 Population Impacts

The Ewa Makai development will result in an increase in the residential population due to the increase in residential units. Table 5 presents the range of potential population impacts.

Table 5: Range of Potential Impact on Resident Population

Range	Low	Middle	High
Basis	2000 average household size on Oahu	2000 average household size in Ewa Gentry, a comparable mix of housing types	2000 average household size in Primary Study Area
Average household size	2.95	3.25	3.68
Projected Ewa Makai Residential Population	**5,502**	**6,061**	**6,863**

On the low end of the possible range, the proposed project could add 5,500 persons to the region, based on the Oahu 2000 average family size of 2.95 persons. This is considered the low end of the range because the Oahu housing supply has a high proportion of medium and high density units. Further , Oahu has relatively high proportion of renters and low proportion of family households.

The high end of the possible range is 6,900 persons based on the 2000 Primary Study Area average household size of 3.68 persons. This is considered the high end because the Primary Study housing type mix has a relatively high proportion of single family units.

The most likely estimate of population impact is the mid-range projection that Ewa Makai may add 6,000 persons to the region. This estimate is based on the 2000 average household size in Ewa Gentry, a relatively recent community with a mix of units and community amenities similar to that proposed in Ewa Makai.

The projected Ewa Development Plan population for 2010 is 88,400 persons [8] The proposed project would comprise approximately seven percent of this projected population.

The projected Ewa Development Plan population for 2020 is 100,700 persons. Ewa Makai would comprise approximately six percent of the projected population.

4.2 Project Relationship to Public Policies and Community Expectations

4.2.1 Public Policies

The proposed Ewa Makai is consistent with public policy as set forth in the Ewa Development Plan.

Overall growth and residential policy

The project is consistent with public policy to promote residential development in the urban fringe of the Ewa Development Plan area. Ewa Makai is included in Phase 1 of the Development Plan phasing of Ewa development. It is referred to as Laulani Residential, with 1,100 units, and Fairways Residential with 900 units. [9]

Ewa Makai also offers a variety of housing types, including single-family homes, townhouses, and residential cluster neighborhoods, which provides for a wide range of affordability for a mixture of household types and sizes.

Residential component

The project is well below the residential density called for in the Ewa Development Plan. The residential density for single-family units is 7.5 units per acre, which is within the Development Plan range of five to twelve units per acre. The combined project density for cluster and multi-family units is 15 units per acre, which is within the Development Plan range of ten to 30 units per acre.

[8] *See Table 2.*

[9] *See Table 2-2 of the Ewa Development Plan.*

The project includes 24 acres for community facilities, consistent with the Ewa Development Plan residential provision for community facilities including churches, community centers and elderly and child care centers.

Further, the developer intends to comply with design and land use guidelines related to building height and form, compatibility and architectural character.

Community-Based Parks

The proposed project may result in a resident population between 5,500 and 6,900 persons. Based on the parks standards set forth by the Ewa Development Plan, these population levels would require community park acreage between eleven and 13.8 acres. The proposed project includes 13.5 acres designated for park space, plus 14 acres designated for open space. The Ewa Makai project is consistent with the policies related to community-based parks in that the 13.5 acres generally meet the standard that would apply to the high end of the population estimate.

Commercial and Industrial Areas

The Industrial/ Commercial component of Ewa Makai is included in the Development Plan phasing of Ewa Development Plan, as part of Laulani Commercial. Thirty acres is designated for Industrial use.

4.2.2 Community Reaction

This study included a review of Ewa Neighborhood Board actions to assess possible community issues on this project. We reviewed Board minutes of meetings held from June 2000 to May 2002.

This Board deals with issues related to a stable residential community. In terms of proposed community changes, the Board generally tends to support the improvement of existing facilities, such as sidewalks, bus stops, and a Conditional Use Permit to convert a church office space into classrooms. After reviewing project merits, the Board also supported ocean-related projects including a moi farm and a limu restoration project. The Ocean Pointe rezoning request was supported in January 2001.

The Board reviewed park night closure, and its members voted to support the testing of night closure at Geiger Park and eventually supported permanent night closure at that facility. When the Board evaluated uniform park night closures, the Board was divided. Some felt that the consideration should be given to people living adjacent to parks, while others felt that parks should be open to those who want to use them after 10 P.M.

Regarding new development projects, the Board was somewhat supportive, but continue to express concern about infrastructure impacts, particularly those related to roadways and traffic circulation. When the Ewa Makai project was discussed in February 2001, the Board discussed a construction moratorium but the motion was withdrawn. The Board voted to not support the rezoning request from Ewa by Gentry in Area 20.

In October 2001, the Board voted to support a moratorium on further construction until proper highway improvements are in place. The Board has since worked with the City, State, and private developers, namely Gentry Homes, Ltd. and HASEKO. In February 2002, the Board unanimously voted to withdraw its request for a construction moratorium noting that the private developers have historically completed their share of improvements in a timely manner.

The Ewa Makai project was discussed in the Planning and Zoning Committee in January 2002. Key issues included:

- Moving the residential units around the planned 14-acre open space area, though this concern was alleviated when it was learned that this is not a designated park
- The adequacy of school facilities, considering the cumulative growth planned for the region
- Infrastructure concerns, namely roads, drainage and schools

In March 2002, the Ewa Neighborhood Board passed the following motion:

1. *Support the development of the Ewa Makai project, which incorporates the infrastructure development for roads/technology, sewage and the intermediate school site development*
2. *The Department of Education should actively encourage parents of students in overcrowded area schools to apply for geographic exemptions to attend Iroquois Point Elementary*
3. *Do not support any future request for increasing density in the project*
4. *Future legislators need to ensure CIP funding for the development of the new intermediate school* [10]

[10] *City and County of Honolulu Neighborhood Commission,* ***Ewa Neighborhood Board No. 23 Minutes of Regular Meeting: Thursday, March 14, 2002, Ewa Public Library.***

4.3 Public Services and Facilities

4.3.1 Police Protection

The project site is served by the Kapolei Police Station, which is located at 1100 Kamokila Boulevard in Kapolei. There is also a storefront office next to the 7-eleven store at 91-1669 Fort Weaver Road.

The Primary Area, which is the Ewa Neighborhood Board area is divided into Police Beats 874, 875, 876, 877, and 879. The project site is located in Police Beats 875 and 876. At any given time, there is a minimum of 14 officers assigned to this region.

Potential project impacts on current services would be a likely increase in calls for police services.[11]

It is recommended that the Ewa Makai project can mitigate impacts on police protection services through security measures such as on-site security, design measures such as well-lit public areas and walkways, and the establishment of neighborhood watch programs. As an extension of the Ewa by Gentry Community, Ewa Makai will have on-site security and will be part of an established community watch program.

4.3.2 Fire Protection

In the event of a single alarm fire, the project site would be served by the Waipahu Fire Station. For a multiple alarm such as a structure fire, three engine companies and one ladder company would be sent from the Ewa Beach, Waipahu, and Kapolei Fire Stations. The ladder company would originate from the Waipahu Fire Station.

Five firefighters are assigned to the Waipahu Fire Station, with a minimum of four people on call at all times. A minimum of four people would respond in the event of a single alarm incident. In the event of a multiple alarm incident, there would be a minimum of 18 firefighters responding from the three engine and one ladder companies, as well as a fire chief and the assigned driver. The response time to the project site depends on traffic, but is usually from four to six minutes.

[11] *Based on letter dated 13 June 2002 from Chief of Police Lee Donohue in response to questions provided by Earthplan.*

If a backup company is needed, the backup company can come from the Waipahu, Ewa Beach, and Kapolei Fire Stations. In the event of a second alarm in a multiple incident, two additional engine companies from the Waikele and Pearl City Fire Stations would respond, as well as a ladder company coming from the Kapolei Fire Stations.[12]

The project will increase the demand for fire protection services by adding new structures and approximately 6,000 people to the area.

4.3.3 Emergency Medical Services

The Honolulu Emergency Services Department, hereafter referred to as EMS, is responsible for providing the following:

- an efficient, effective and economical operation of the pre-hospital emergency medical care and emergency ambulance service,
- a comprehensive aquatic safety program at 19 City beach parks, including lifeguard services,
- injury prevention, public education and public health programs, and
- coordination with other agencies and jurisdictions [13]

In an emergency response, either EMS personnel or the nearest fire station is notified. EMS uses a global tracking system that places each vehicle within 30 feet of its current location.

The Ewa area is primarily serviced by two ambulances from St. Francis West and the Waipahu Fire Station. There is also a single Rapid Response Unit based at Kalaeloa. The Rapid Response Unit does not transport patients, however.

Ambulances are staffed by two paramedics, and the Rapid Response Unit is staffed by a single paramedic. If needed, additional EMS vehicles respond from Waianae and Aiea. The average response time to the project site is approximately six to nine minutes.[14]

[12] *Based on personal communication with Captain John Clark, Deputy Fire Chief, on June 3, 2002*

[13] *Salvatore S. Lanzilotti, Emergency Services Department (undated).*

[14] *Based on personal communication from Robin McCulloch, Chief of EMS, on July 8, 2002.*

4.3.4 Public Education

Based on current district boundaries, residents of the Ewa Makai community will be served by the Pohakea and Ewa Beach Elementary Schools, Ilima Intermediate, and Campbell High School. The current and projected enrollments of these schools are presented in Table 6.

Table 6: Current and Future Enrollment for Schools Servicing Ewa Makai Area

School	Current Student Enrollment	Projected Student Enrollment for 2007
Ewa Beach Elementary	581	831
Pohakea Elementary School	562	649
Ilima Intermediate School	1,012	1,243
Campbell High School	2,033	2,289

**Personal communication with Sanford Beppu, Facilities Branch, Hawaii State Department of Education, June 10, 2002.*

The proposed project will impact these facilities by increasing the school-aged population. Table 7 presents the long-term projection for Ewa Makai students at full build-out, and as the on-site population stabilizes.

Table 7: Long-Term Projected School Population for Ewa Makai

Grade Level	Projected Population Estimate
Kindergarten through sixth grade	466
Seventh and eighth grade	205
Ninth through twelfth grade	224
Total	895

Based on personal communication with Keith Kameoka, Statistical Research, Hawaii State Department of Education, July 8, 2002.

In general, the project's impact on the area's schools fall within the projected 2007 enrollment. The region is targeted for significant residential population growth with or without Ewa Makai, however, so it is likely that cumulative growth will exceed projected 2007 enrollment if the project is implemented.

The Gentry Companies has been working with the State Department of Education to determine the developer's contribution to the public education system. As of this writing, the parties have agreed that reserving 18 acres for a new middle school meets the developer's fair share requirement.

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LAND USE COMMISSION
STATE OF HAWAII
2003 MAR 21 A 9:11

Dear Mr. Hosoda:

Re: Proposed Ewa by Gentry Makai Development

At your request, this supplemental letter responds to your questions regarding our report covering market assessments and fiscal and economic impacts for the proposed Ewa by Gentry Makai development.

BACKGROUND

Gentry Investment Properties (Gentry) is seeking State Land Use reclassification and City rezoning of the Ewa makai property to permit continuing development of Ewa by Gentry. Gentry proposes to develop condominiums and single-family homes that are priced competitively with its current inventory.

As you know, John Child & Company estimated the market support and projected the fiscal and economic impacts of the proposed Ewa by Gentry Makai Development as of September 10, 2001. The analysis assumes condominium units have an average price of about $150,000 and single-family homes about $320,000. You have asked us to supplement our analysis by addressing the impact of September 11, 2001 and subsequent significant events on the John Child market assessments and fiscal and economic projections for the proposed Ewa by Gentry Makai Development.

The significant events following the date of the report include:

1. The events of September 11, 2001
2. State Land Use Commission (SLUC) approval of the proposed Koa Ridge development proposed by Castle & Cooke, Inc.
3. Revised Hawaii Input-Output economic model.

1. THE EVENTS OF SEPTEMBER 11, 2001 DID NOT ALTER THE PROJECTIONS

The events of September 11 do not alter the assessments and projections in the John Child report. The John Child report was completed at the end of 2001. At that time all of our reports contained a statement that the impact of September 11, 2001 could not be predicted.

At this time we are able to determine that the events of September 11, 2001 did not have a significant impact on residential home sales on Oahu, and especially in Ewa. In fact, Oahu's housing market has strengthened since September 2001 as evidenced by increased sales, shorter marketing times and an overall increase in housing prices.

If we were to update our market assessments, the changes would consider the improved residential market conditions in terms of market activity and housing prices. For example, our assessments for the Ewa by Gentry Makai residential developments assumed Gentry would sell about 265 to 287 housing units/year between 2002 and 2016. In comparison, Gentry's actual sales in 2002 surpassed our projection. Gentry sold 315 units in 2002, about 10% to 20% higher than projected. Gentry anticipates their 2003 sales volumes will be at or above this level.

In addition, our assessments assumed average sales prices for the Ewa by Gentry Makai residential units ranging from about $150,000 for a multi-family condominium unit to about $320,000 for a single-family dwelling. In fact, the overall market has strengthened and home prices have increased. Therefore, homes in this price range would have strong market demand.

Based on Gentry's actual sales activity in 2002 and current strong housing market conditions, the proposed Ewa by Gentry Makai residential developments could be expected to exceed our assessments as of September 10, 2001.

2. APPROVAL OF KOA RIDGE DEVELOPMENT DOES NOT CHANGE THE PROJECTIONS

The John Child Report assumed that the Koa Ridge development in Central Oahu would be approved and that Koa Ridge would meet the needs of the Central Oahu residential market. Based on these assumptions, the market assessments for the Ewa by Gentry residential developments focused on the projected supply and demand for new housing in Ewa Oahu. As a result, the recent SLUC approval of the proposed Koa Ridge development would not change the market assessments and projected fiscal and economic impacts for the Ewa by Gentry Makai Development.

In addition, because infrastructure must be built in Koa Ridge sales of residential units are not anticipated until 2007 or 2008. In comparison, sales of the Ewa by Gentry Makai residential developments could begin in about 2005. Based on the projected timetables for the Koa Ridge and Ewa by Gentry Makai developments, the proposed Koa Ridge development is not expected to adversely affect demand for the Ewa by Gentry Makai residential units.

3. REVISED STATE INPUT-OUTPUT ECONOMIC MODEL CANNOT BE USED TO UDPATE THE PROJECTIONS

The economic impacts of Ewa by Gentry Makai were based on the Hawaii Input-Output Study - 1992 Benchmark Report prepared by DBEDT as of December 1998. In March 2002, DBEDT released its 1997 Benchmark Report. According to Dr. Khem Sharma, Economist with the Research and Economic Analysis Division of DBEDT, the methodology was changed and the input-output multipliers cannot be compared. The 1997 multipliers do not update the 1992 multipliers; instead they provide different projections. However, these projections would continue to show positive economic impacts from the Ewa by Gentry Makai development.

* * * * *

We appreciate the opportunity to continue to assist you. Please call us if you have questions.

Sincerely,

JOHN CHILD & COMPANY, INC.

Karen Char, MAI, CRE
President

KC/SHT/jin

Report to

Gentry Homes, Ltd.

Covering Market Assessments and Fiscal
and Economic Impacts for the

PROPOSED EWA BY GENTRY MAKAI DEVELOPMENT

As of
September, 2001

JOHN CHILD & COMPANY
APPRAISERS & CONSULTANTS

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Dear Mr. Hosoda:

Re: Proposed Ewa by Gentry Makai Development

At your request, John Child & Company has evaluated the market support and fiscal and economic impacts for the proposed Ewa by Gentry Makai Development. This letter summarizes the study background and assessments that are presented in the accompanying report.

STUDY BACKGROUND

Gentry Investment Properties (Gentry) has the development rights for about 283 acres of agriculturally zoned land lying makai of the existing Ewa by Gentry community. The land is identified as Ewa by Gentry Makai (Ewa Makai property) and includes about 115 acres east of Fort Weaver Road (Ewa Makai East) and about 168 acres west of Fort Weaver Road (Ewa Makai West). The Ewa Makai property has a State Land Use classification of Agriculture, City & County of Honolulu (City) General Plan designation of Urban, City zoning designation of AG-1 Restricted Agriculture and AG-2 General Agriculture, and City development plan designations of low- and medium-density residential; industrial; parks and golf courses; and agricultural and preservation. The Ewa Makai property represents the last major development site along Fort Weaver Road. The property is surrounded by the Ewa Gentry, Ocean Pointe, and Ewa Beach neighborhoods.

Gentry proposes the following mix of uses for the Ewa Makai property:

841 Bishop Street, Penthouse • Honolulu, Hawaii 96813
T 808.533.2951 • F 808.523.7672 • email: info@johnchild.com

Proposed Land Uses for Ewa Makai

Land use	Land area (acres)	
Residential	189.0	[1]
Industrial-commercial	30.0	
Subtotal	219.0	
Community facilities	24.0	
Parks and open space	25.5	
Roads	14.5	
Subtotal	64.0	
Total	283.0	

You have asked us to assist you by assessing the market support for the residential and industrial-commercial developments proposed for the Ewa Makai property and the fiscal and economic impacts for the proposed Ewa by Gentry Makai development.

STUDY OBJECTIVES AND PURPOSE

The objectives of our assistance are to assess the:

1) Market support for the proposed residential and industrial-commercial developments in the Ewa by Gentry Makai Development, and

2) Fiscal and economic impacts of the proposed Ewa by Gentry Makai Development, including the effects on expenditures, household income and employment, and government revenues and expenditures.

The purpose of our assistance is to provide market assessments and fiscal and economic impact assessments for submission to the State Land Use Commission and the City and County of Honolulu Department of Planning and Permitting and City Council in conjunction with Gentry's application for rezoning of the Ewa Makai property.

[1] Includes about 30 acres of undevelopable land designated as a drainage basin.

EFFECTIVE DATE OF REPORT

The effective date of this report is September 10, 2001.

This report is based on historical real estate patterns and trends as of September 10, 2001. On September 11, 2001, the world experienced a horrific terrorist attack. The impact of this and ensuing events on the Hawaiian economy and its real estate market is unpredictable and not considered in this report.

STUDY CONDITIONS

This report is subject to the Study Conditions included in Section I of the accompanying report.

PROPOSED RESIDENTIAL DEVELOPMENT FOR THE EWA MAKAI PROPERTY

Gentry proposes a mix of single-family detached dwellings, single-family condominium (cluster) units, and multi-family condominium units for the Ewa Makai property. Gentry plans 1,865 units as follows:

Proposed Residential Development in Ewa Makai

	Units	% of total
Single-family detached dwellings	550	29.5%
Single-family condominium units (cluster)	675	36.2
Multi-family condominium units	640	34.3
Total	1,865	100.0%

Of the total, 715 units are planned for Ewa Makai East and 1,150 units are planned for Ewa Makai West. Gentry plans to develop Ewa Makai East and continue westward to Ewa Makai West.

The average sales prices and unit sizes for the Ewa Makai units are summarized by development type as follows:

Proposed Residential Units

Development type	Average living area (sf)	Average sales price (current dollars)
Single-family detached dwellings	1,800	$320,000
Single family condominium units (cluster)	1,200	225,000
Multi-family condominium units [1]	800 - 1,000	140,000 - 160,000

PROJECTED ABSORPTION OF GENTRY'S EWA MAKAI RESIDENTIAL UNITS

The projected absorption of Gentry's existing, planned and proposed residential units are summarized as follows:

- Based on the projected population growth in the Ewa Gentry-Ocean Pointe area and Gentry's estimated market share of future new housing demand, Gentry is projected to sell about 287 units annually beginning in 2001.
- As of January 1, 2001, Gentry had 1,616 housing units that are available or planned and assumed to be sold prior to development of Ewa Makai. Based on the projected new housing demand, the 1,616 units are projected to be sold out by 2006.
- The 1,865 units proposed for the Ewa Makai development are projected to be sold between 2006 and 2013.
- The 829 units planned for Areas 14, 17 and 31 are expected to be sold between 2013 and 2016.

The projected absorption of Gentry's existing, planned and proposed new housing units from 2001 to 2016 is shown as follows:

[1] Multi-family condominium projects may include duplexes and town homes, including smaller walk-up models. Therefore, a range is shown to reflect variations in size and sales price for the various subtypes.

Projected Absorption of Gentry's Housing Units

Development year	Calendar year	Gentry's share of new housing demand	-	Existing and planned housing units (Ewa by Gentry)	-	Proposed housing units (Ewa Makai)	-	Planned housing units (area 14, 17, and 31)	=	Remaining demand
0	2001	287		287		0		0		0
1	2002	287		287		0		0		0
2	2003	287		287		0		0		0
3	2004	287		287		0		0		0
4	2005	287		287		0		0		0
5	2006	287		181		106		0		0
6	2007	287		0		287		0		0
7	2008	287		0		287		0		0
8	2009	287		0		287 [1]		0		0
9	2010	276		0		276		0		0
10	2011	276		0		276		0		0
11	2012	276		0		276		0		0
12	2013	276		0		70 [2]		206		0
13	2014	276		0		0		276		0
14	2015	265		0		0		265		0
15	2016	265		0		0		82		183
Total units		4,493	-	1,616	-	1,865	-	829	=	183

[1] Absorption of 715 units proposed for Ewa Makai East.
[2] Absorption of 1,150 units proposed for Ewa Makai West.

PROJECTED ABSORPTION OF THE EWA MAKAI INDUSTRIAL-COMMERCIAL SITE

The estimated and projected industrial-commercial land requirement for Ewa Makai considers the following:

- The market assessment for the 30-acre industrial-commercial site assumes the property is primarily used for light and/or service industrial purposes with ancillary retail uses that would support the industrial tenants as permitted under the IMX-1 zoning district.

- A mix of light and/or service industrial and retail uses already exists in similar neighborhoods throughout Oahu.
- The mixed-use development would be compatible with the adjacent Laulani commercial development.

Gentry proposes to develop the 30-acre industrial-commercial site in 2007 because it plans to develop Ewa Makai East before Ewa Makai West. Assuming no other lands are rezoned to permit competitive industrial-commercial use, the demand for industrial-commercial uses supports development of the 30-acre site in Ewa Makai.

PROJECTED ECONOMIC IMPACTS

Development of Ewa Makai is projected to result in the following direct, indirect and induced economic impacts in the State of Hawaii:

	Construction period: 2005-2013		Operational employment beginning in 2009
	Total	Average annual	Annual
Estimated output (expenditures) [1]:			
Direct	$ 432,600,000	$ 48,100,000	$60,000,000 [2]
Indirect and induced	475,900,000	52,900,000	[4]
Total	908,500,000	100,900,000 [3]	
Estimated new jobs:			
Direct	N/A	310	1,500
Indirect and induced		547	[4]
Total		857	
Estimated additional household income [1]:			
Direct	$ 201,400,000	$ 22,400,000	$24,400,000
Indirect and induced	180,700,000	20,100,000	[4]
Total	382,100,000	42,500,000	

[1] In 2001 dollars.
[2] Estimated retail sales and service revenues from the industrial-commercial development.
[3] Averages do not foot because of rounding.
[4] Not quantified for the purpose of this report. Therefore, the total impact is understated.

PROJECTED FISCAL IMPACTS

The fiscal impacts to the State of Hawaii and the City & County of Honolulu governments are summarized as follows [1]:

	Construction period: 2005-2013	Annual: beginning 2014
State of Hawaii:		
General excise tax revenues	$29,800,000	$ 2,400,000
State income tax revenues	15,300,000	1,250,000
Total revenues	45,200,000	3,650,000
Less: expenditures	0	0
Net fiscal impact	$45,200,000	$ 3,650,000
City & County of Honolulu:		
Real property tax benefit	$12,600,000	$ 2,509,000
Less: expenditures	(4,300,000)	(701,000)
Net fiscal impact	$ 8,300,000	$ 1,810,000

* * * * *

[1] In 2001 dollars that are rounded.

We appreciate the opportunity to assist you on this interesting assignment. Please call us if you have questions.

Sincerely,

JOHN CHILD & COMPANY, INC.

Karen Char, MAI, CRE
President

Shelly H. Tanaka
Appraiser

Cynthia C. Nakamura
Appraiser

David K. Soong
Analyst

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LETTER OF TRANSMITTAL
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Certification

Qualifications of John Child & Company, Inc.
Qualifications of Karen Char, MAI, CRE
Qualifications of Cynthia C. Nakamura
Qualifications of Shelly H. Tanaka
Qualifications of David K. Soong

This section presents the study background, study objectives and purpose, effective date of report, definitions, and study conditions.

STUDY BACKGROUND

Gentry Investment Properties (Gentry) has the development rights for about 283 acres of agriculturally zoned land lying makai of the existing Ewa by Gentry community. The land is identified as Ewa by Gentry Makai (Ewa Makai property) and includes about 115 acres east of Fort Weaver Road (Ewa Makai East) and about 168 acres west of Fort Weaver Road (Ewa Makai West). The Ewa Makai property has a State Land Use classification of Agriculture, City & County of Honolulu (City) General Plan designation of Urban, City zoning designation of AG-1 Restricted Agriculture and AG-2 General Agriculture, and City development plan designations of low- and medium-density residential; industrial; parks and golf courses; and agricultural and preservation. The Ewa Makai property represents the last major development site along Fort Weaver Road. The property is surrounded by the Ewa Gentry, Ocean Pointe, and Ewa Beach neighborhoods, as shown in Exhibit I-A.

Gentry Homes, Ltd. (Gentry) is seeking State Land Use reclassification of the Ewa Makai property to Urban and City rezoning, as shown in Exhibit I-B.

The mix of uses for the Ewa Makai property is summarized as follows:

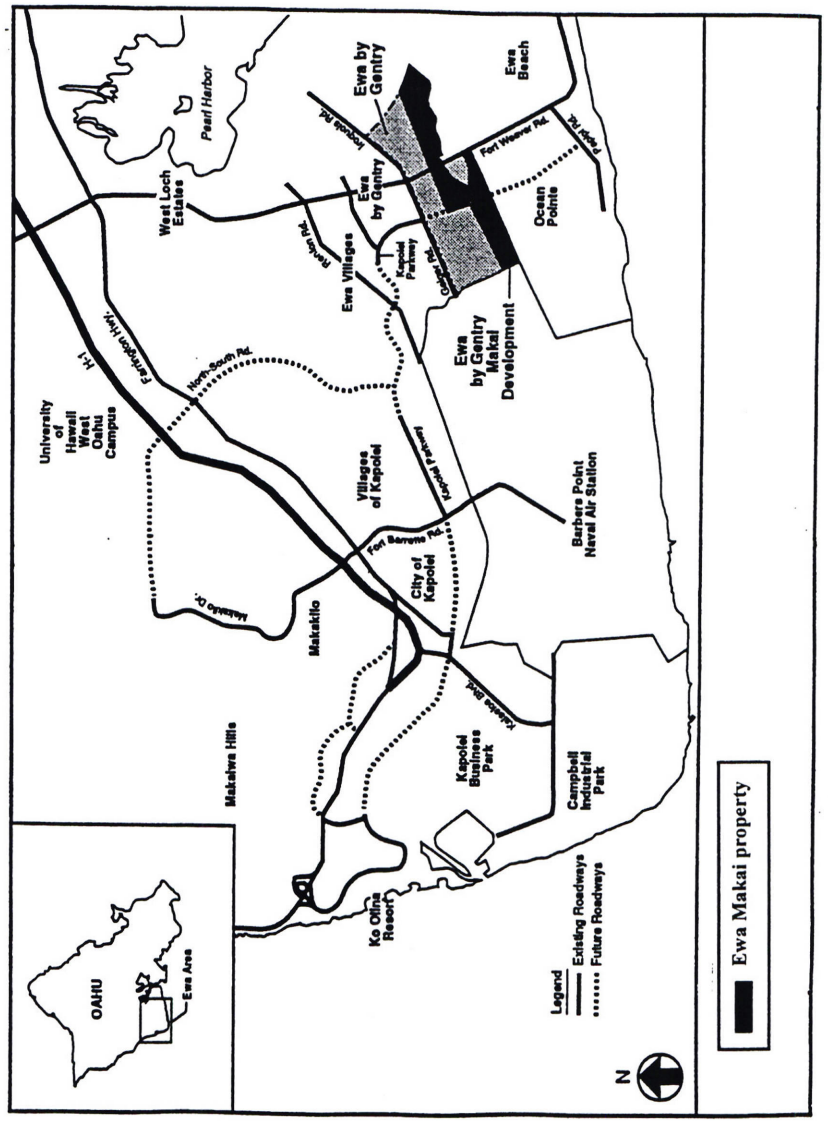
Proposed Land Uses for Ewa Makai

Land use	Land area (acres)	
Residential	189.0	[1]
Industrial-commercial	30.0	
Subtotal	219.0	
Community facilities	24.0	
Parks and open space	25.5	
Roads	14.5	
Subtotal	64.0	
Total	283.0	

You have asked us to assist you by assessing the market support for the residential and industrial-commercial developments proposed for the Ewa Makai property and the fiscal and economic impacts for the proposed Ewa by Gentry Makai development.

[1] Includes about 30 acres of undevelopable land reserved for a drainage basin.

MAP OF EWA AREA

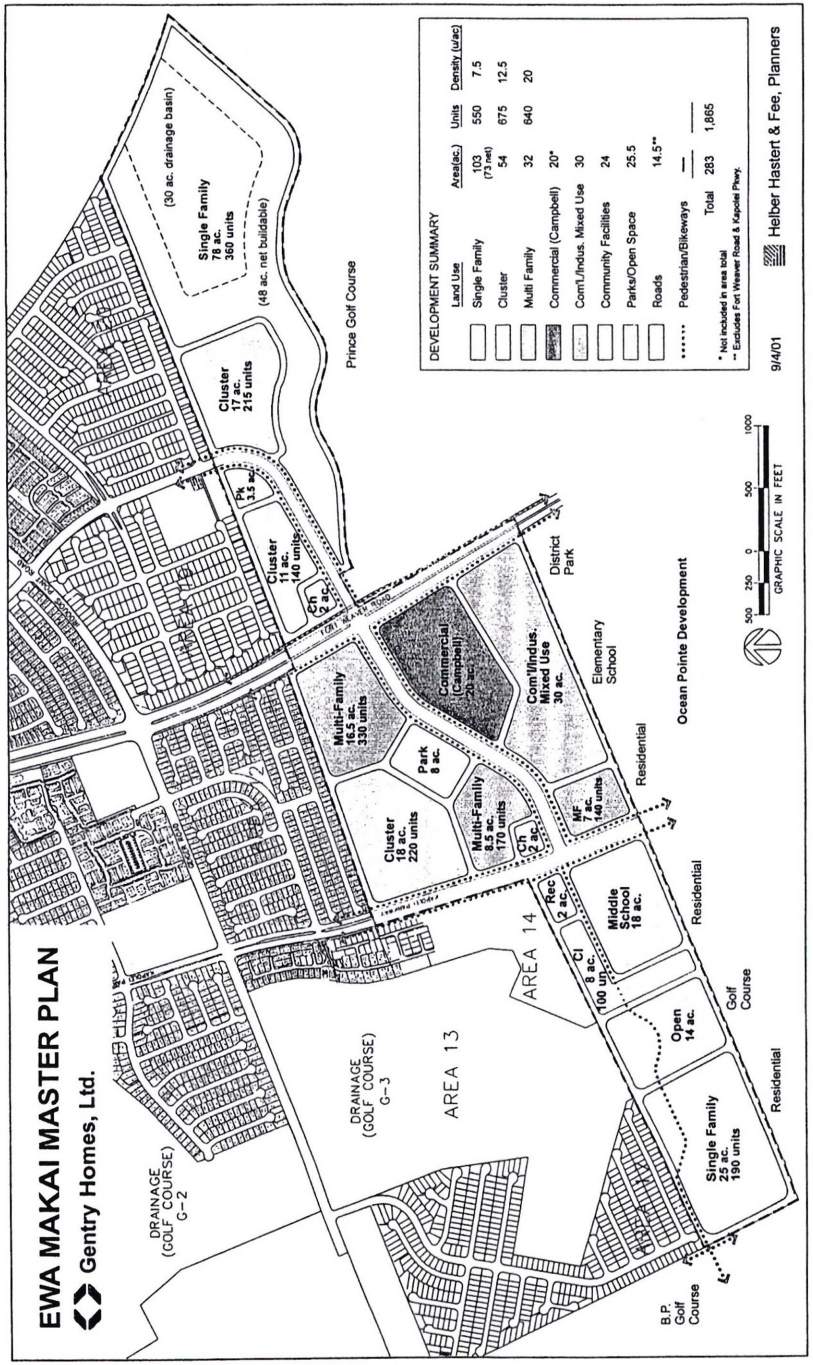


Source: Gentry Homes, Ltd.

Ewa by Gentry Makai

Exhibit I-B

EWA MAKAI MASTER PLAN MAP



Source: Gentry Homes, Ltd.

STUDY OBJECTIVES AND PURPOSE

The objectives of our assistance are to assess the:

1) Market support for the proposed residential and industrial-commercial developments in the Ewa by Gentry Makai Development, and

2) Fiscal and economic impacts of the proposed Ewa by Gentry Makai Development, including the effects on expenditures, household income and employment, and additional government revenues and expenditures.

The purpose of our assistance is to provide market assessments and fiscal and economic impact assessments for submission to the State Land Use Commission and the City and County of Honolulu Department of Planning and Permitting and City Council in conjunction with Gentry's application for rezoning of the Ewa Makai property.

EFFECTIVE DATE OF REPORT

The effective date of this report is September 10, 2001.

This report is based on historical real estate patterns and trends as of September 10, 2001. On September 11, 2001, the world experienced a horrific terrorist attack. The impact of this and ensuing events on the Hawaiian economy and its real estate market is unpredictable and not considered in this report.

CONSULTING ASSIGNMENT

This assignment is a consulting service that conforms with Standard 4 and 5 as described in the Uniform Standards of Professional Appraisal Practice (USPAP).

REPORTING

Our analyses are presented in a report that summarizes the data, reasoning and analyses that were used to develop the market and impact assessments. Data and analyses not included in the report are available in our files.

STUDY CONDITIONS AND ASSUMPTIONS

The study conditions and assumptions that are the basis of the analyses, opinions and conclusions of this report are summarized as follows:

Report Purpose and Intended Users

The purpose of our assistance is to provide market and impact assessments for submission to the State Land Use Commission and the City and County of Honolulu Department of Planning and Permitting (DPP) and City Council in conjunction with Gentry's application for rezoning of the Ewa Makai lands.

As a result, this report is intended for use only by Gentry Homes, Ltd. and its related entities, the State Land Use Commission, DPP and the City Council. In accepting this report, the client specifically agrees that our report is not intended for any other purpose or users.

Basis of Analyses, Opinions, and Conclusions

The assessments are based on assumptions that have been formulated based on information and descriptions provided by Gentry Homes, Ltd. These assumptions are significant to the valuation or are key factors upon which the valuation depends. Some assumptions inevitably will not materialize and unanticipated events and circumstances may occur subsequent to the date of this report. Therefore, the actual results may vary from the projections and the variations could be material.

In addition, the analyses, opinions, and conclusions of this report rely on data and information provided by others. The information is believed to be reliable; however, no responsibility is assumed for the accuracy of information provided by others.

The analyses, opinions, and conclusions assume:

1. No hidden or unapparent surface or subsurface conditions of the property, structures, soils, subsoils, geological formations, ground water, or drainage conditions exist that would render the property more or less valuable.

2. The client has provided us with all significant, relevant information covering the subject of this report.

No responsibility is assumed for matters legal in nature affecting the property or its title, which is assumed to be good and merchantable.

Properties in Hawaii typically include a reservation in favor of the State of Hawaii of all mineral and metallic mines. Our analyses, opinions and conclusions assume these reservations do not have an impact on the value or use of the property.

Any drawings, maps, photographs, and similar exhibits accompanying this report are included to assist the reader in visualizing the property. No responsibility is assumed for the accuracy of these exhibits.

All applicable public and private zoning codes and regulations, building and health codes, and other factors that affect the utility and value of the property were considered.

Legality of Improvements

This report assumes that any existing and/or proposed improvements comply with all applicable federal, state, and county regulations, laws and private covenants and restrictions unless specifically stated otherwise.

Hazardous Substances

The existence of hazardous substances that could be present on the property, or other environmental conditions that could impact the property, were not identified by others nor observed during the site visit. The appraisers are not trained or qualified to detect hazardous substances or conditions even if these hazards, or evidence of potential presence of these hazards, are visible on the property.

This report assumes no hazardous substance or condition exists that would impact the analyses, opinions or conclusions. If a hazardous substance or condition exists, it could have a negative effect on the value of the property.

Native Hawaiian Rights

The legality of the traditional gathering rights of native Hawaiians that could be exercised on the property, or other native Hawaiian rights that could impact the property, was not considered in this report. This report assumes that the "traditional gathering rights" or any other "rights of native Hawaiians" would not be exercised on the property or properties that are the subject of this report and on any comparable properties that are included in this report. If native Hawaiian rights exist on the property and not the comparable properties, it could have a negative effect on the value of the property.

Archaeological or Historically Significant Conditions

The existence of archaeological or historically significant conditions that could be present on the property were not identified nor observed during the site visit. The appraisers are not trained or qualified to recognize archaeological or historically significant conditions, even if these conditions are visible on the property.

This report assumes no archaeological or historically significant condition exists that would impact the analyses, opinions or conclusions. If an archeological or historically significant condition exists, it could impact the value of the property.

Americans With Disabilities Act (ADA)

The Americans with Disabilities Act (ADA) became effective January 26, 1992. This report was not based on any specific compliance survey and analysis of this property to determine whether or not it is in conformity with the various detailed requirements of the ADA. A survey of the property together with a detailed analysis of the requirements of the ADA could reveal that the property is not in compliance with one or more of the requirements of the ADA. If so, it could have a negative effect on the value of the property.

Terms of Assignment

We have no obligation to update our report because of events and transactions occurring subsequent to the effective date of the report.

Neither our fees nor payment were contingent upon the results of the report.

Use of Report

This report is valid only if presented in whole, with original photographs and exhibits, if any, and the official seal of John Child & Company embossed on the letter of transmittal and certification.

This report or any portion of this report may not be reproduced or published without the prior written consent of John Child & Company, and then only with proper qualification.

The contents of this report or portions of this report, the identity of the appraisers or any reference to John Child & Company, the Appraisal Institute, the Counselors of Real Estate, or the American Society of Appraisers, or to their respective designations may not be disseminated to the public through advertising media, public relations media, news media, sales media, or any other public means of communication.

Limitation on Liability

John Child & Company shall not be liable to Client or to any third party (including without limitation lenders and other persons to whom Client may show this report for the purposes of obtaining credit, insurance or any other benefit or promise) in the event that the use or value of the subject property is or becomes different from the use or value estimates, analyses, opinions or conclusions in this report unless it is established by clear and convincing evidence that John Child & Company acted in bad faith or willfully and recklessly failed to exercise an appropriate standard of care in the community while performing this assignment. In any event, John Child & Company's liability to Client or to any third party shall be limited to the amount of the fees to complete this assignment.

This report may not be shown to any third party without our consent and without receiving a written acknowledgement from any person to whom it is shown that such person has read, understands and agrees to be bound by the limitation of liability in this paragraph.

II – RESIDENTIAL MARKET OVERVIEW

This section overviews historical residential market trends in terms of new home sales, average sales prices, unit mix and average living areas, and resales trends in Ewa and Central Oahu.

NEW HOME SALES TRENDS

New home sales and development trends in the Ewa Oahu and Central Oahu districts were analyzed for the purpose of assessing the residential housing market pertinent to the proposed Ewa Makai development. The delineation of the Ewa Oahu and Central Oahu districts is shown on a map included as Exhibit II-A.

Historical sales of new homes in the Ewa Oahu and Central Oahu areas are reviewed in terms of trends in:

- Historical sales volumes
- Unit mix and average living areas
- Average sales prices.

Historical Sales Volumes

- New home sales in the Central Oahu and Ewa Oahu districts totaled about 1,000 to 1,100 units annually between 1997 and 2000 and have generally increased over the past three years, as shown in Exhibit II-B.

- The primary new housing markets and major developers in the Ewa Oahu and Central Oahu districts are identified as follows [1]:

  - Ewa Oahu, including:
    - Ewa by Gentry (Gentry)
    - Other Ewa Gentry (Unity House, Schuler Homes)
    - Ocean-Pointe (Haseko Homes)
    - Makakilo (Finance Realty)
    - Kapolei-Ko Olina (Watt Residential Partners, Iwalani Development Partners, Schuler Homes)

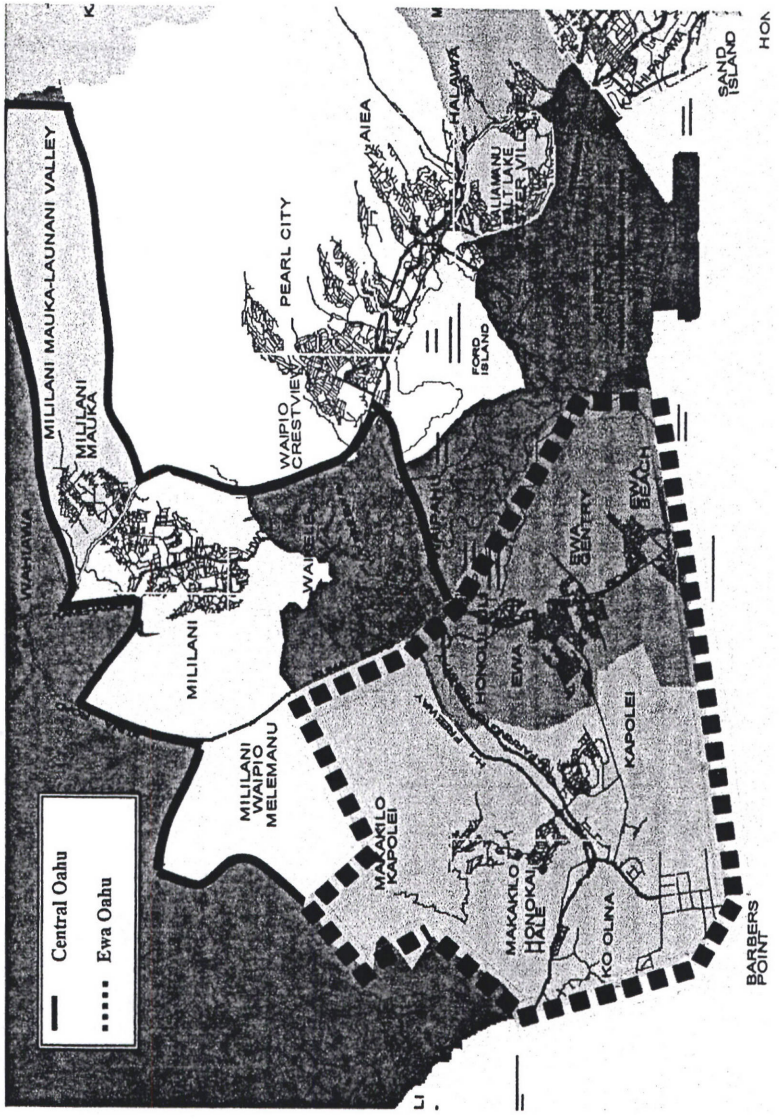
  - Central Oahu:
    - Mililani, including Launani Valley (Castle & Cooke, Waihuna Joint Venture)
    - Waikele-Waipio Gentry (Schuler Homes)
    - Royal Kunia (Kunia Residential Partners)

[1] New home sales in the Ewa Villages project are excluded as this market is not considered to be competitive with Gentry and other developments in Ewa Oahu and Central Oahu.

Ewa by Gentry Makai

Exhibit II-A

LOCATION OF CENTRAL AND EWA OAHU DISTRICTS

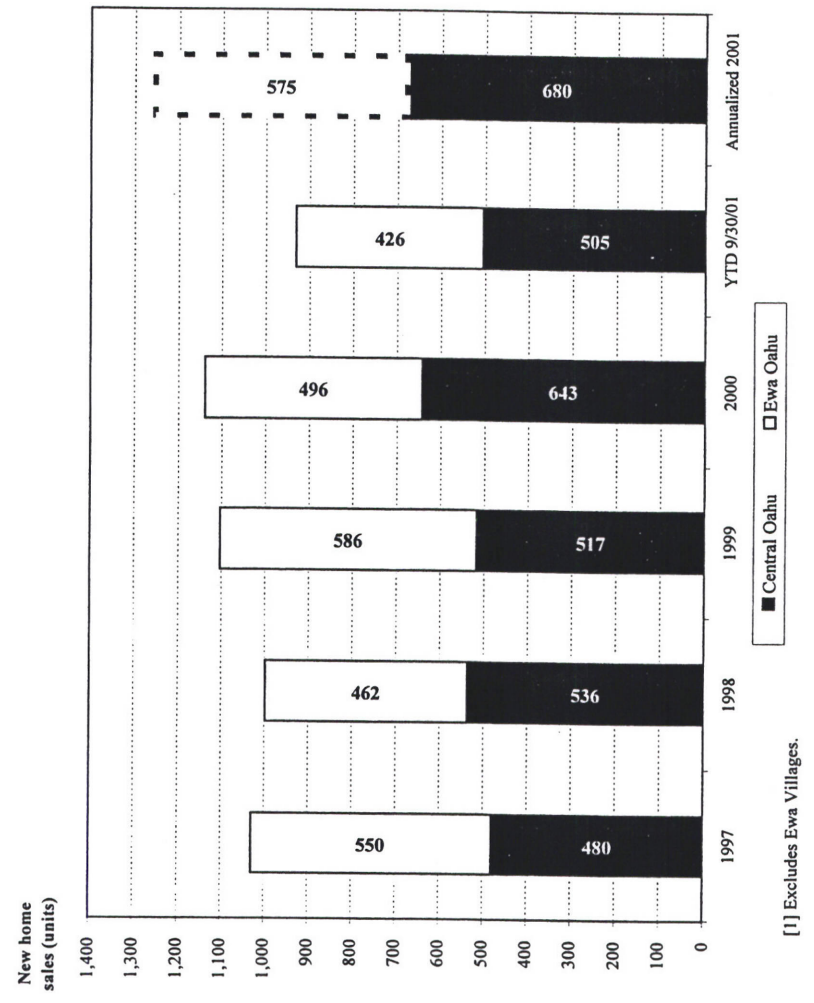


Source: Information Delivery Service, Honolulu GIS Maps, 1997-1998.

Ewa by Gentry Makai

Exhibit II-B

NEW HOME SALES IN CENTRAL OAHU AND EWA OAHU [1]
1997 - YTD SEPTEMBER 2001



Source: John Child & Company, based on data from MLS Hawaii, Inc. Research TMK and Gentry Homes, Ltd.

- Since 1997, Gentry's share of the total Ewa Oahu and Central Oahu new housing market has declined from about 23% in 1998 to under 20% in 2000 and YTD 2001, as shown in Exhibit II-C.

- However, Gentry attributes the recent decline in market share to planning and production issues and not consumer demand.

Unit Mix and Average Living Areas

- New sales of traditional single-family detached homes (traditional SFDs) have generally increased since 1997.

- Sales of single-family condominium units (SFD condos) increased between 1997 and 2000; at the same time, sales of multi-family condominium units (multi-family condos) declined, as shown in Exhibit II-D.

- The decline in YTD 2001 sales of SFD condos is primarily attributed to the lack of new SFD condo developments.

  - Ewa Oahu

    - Gentry is the only developer of SFD condos in Ewa Oahu. Gentry has consistently sold over 100 SFD condos each year since 1997.

    - Multi-family condo sales include town homes and duplexes. Multi-family condo sales since 1999 primarily consist of town home units in the Ocean Pointe development by Haseko Homes (Haseko).

    - Since 1999, Gentry has sold more SFD condos than Haseko's town homes in the Ocean Pointe development during the same years, as shown in Exhibit II-E.

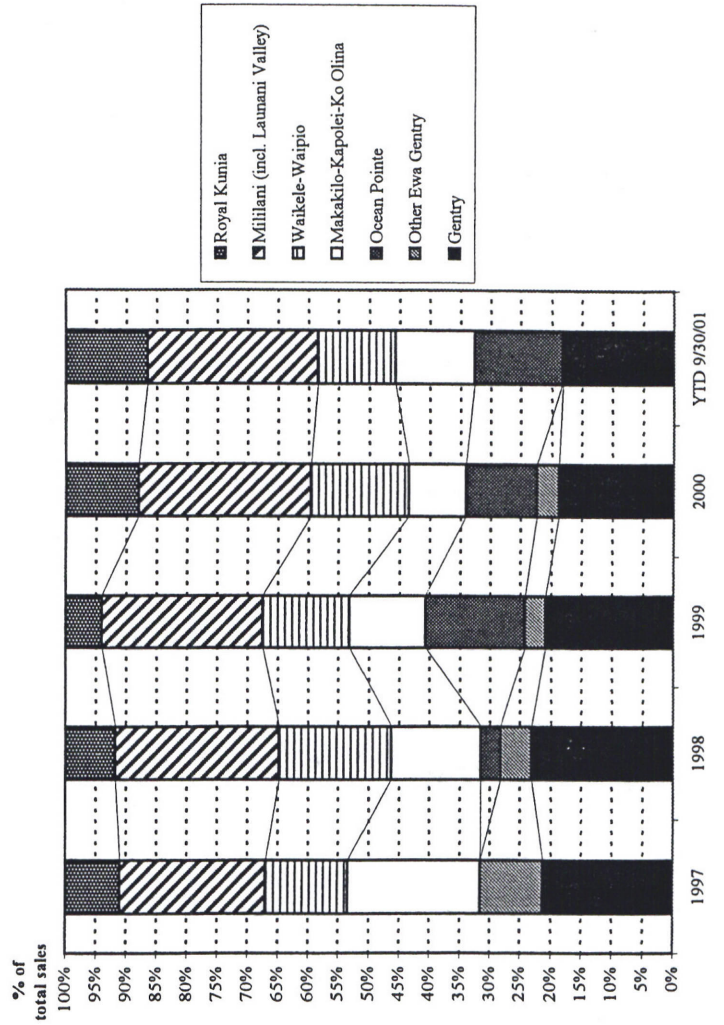
  - Central Oahu

    - SFD condo sales in Central Oahu increased from about 85 units in 1997 to about 153 units in 2000, as shown in Exhibit II-F. The decline in sales of SFD condos in YTD 2001 is mainly attributed to a lack of new supply relative to prior years.

    - Multi-family condo sales for the nine months ending September 30, 2001 have outpaced annual sales between 1997 and 2000, and is mainly attributed to an increase in sales at new projects in Launani Valley and Waikele.

- Average living areas in the Ewa Gentry-Ocean Pointe area and Central Oahu area have generally increased since 1997 and reflect a trend towards larger homes, as shown in Exhibits II-G and II-H.

NEW HOME SALES BY MAJOR DEVELOPMENT AREA IN CENTRAL OAHU AND EWA OAHU 1997 - YTD SEPTEMBER 2001

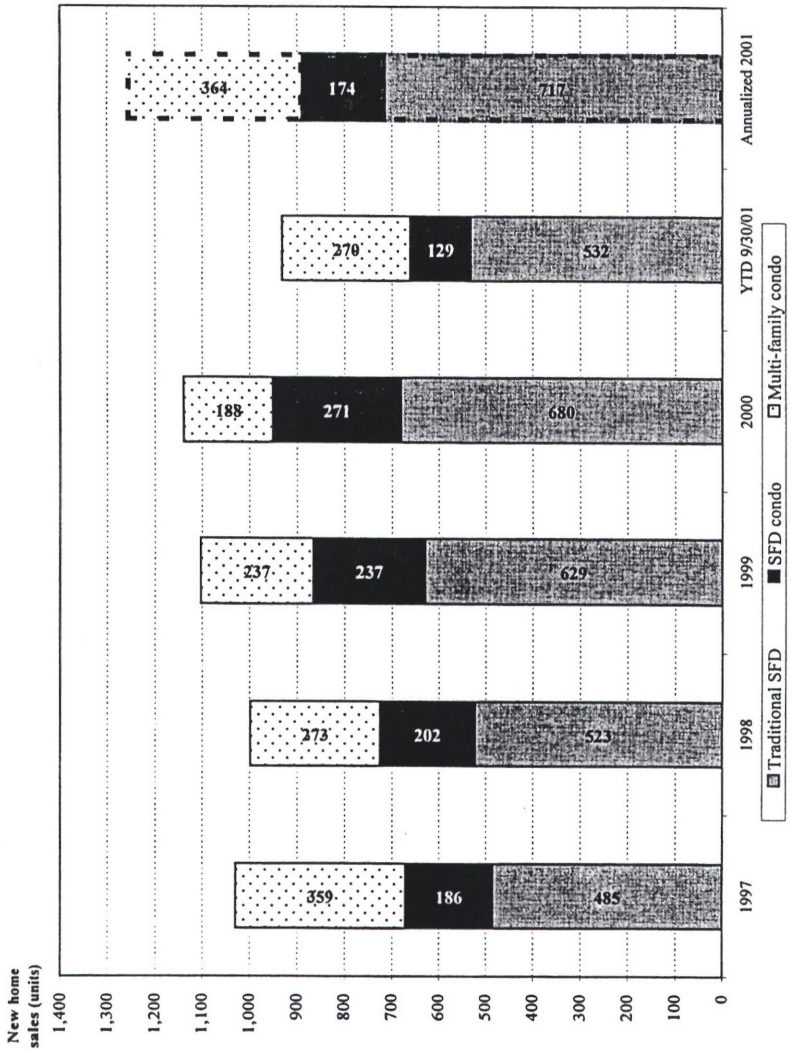


Source: John Child & Company, based on data from MLS Hawaii, Inc. Research TMK and Gentry Homes, Ltd.

Ewa by Gentry Makai

Exhibit II-D

COMPOSITION OF NEW HOME SALES IN CENTRAL OAHU AND EWA OAHU
1997 - YTD SEPTEMBER 2001

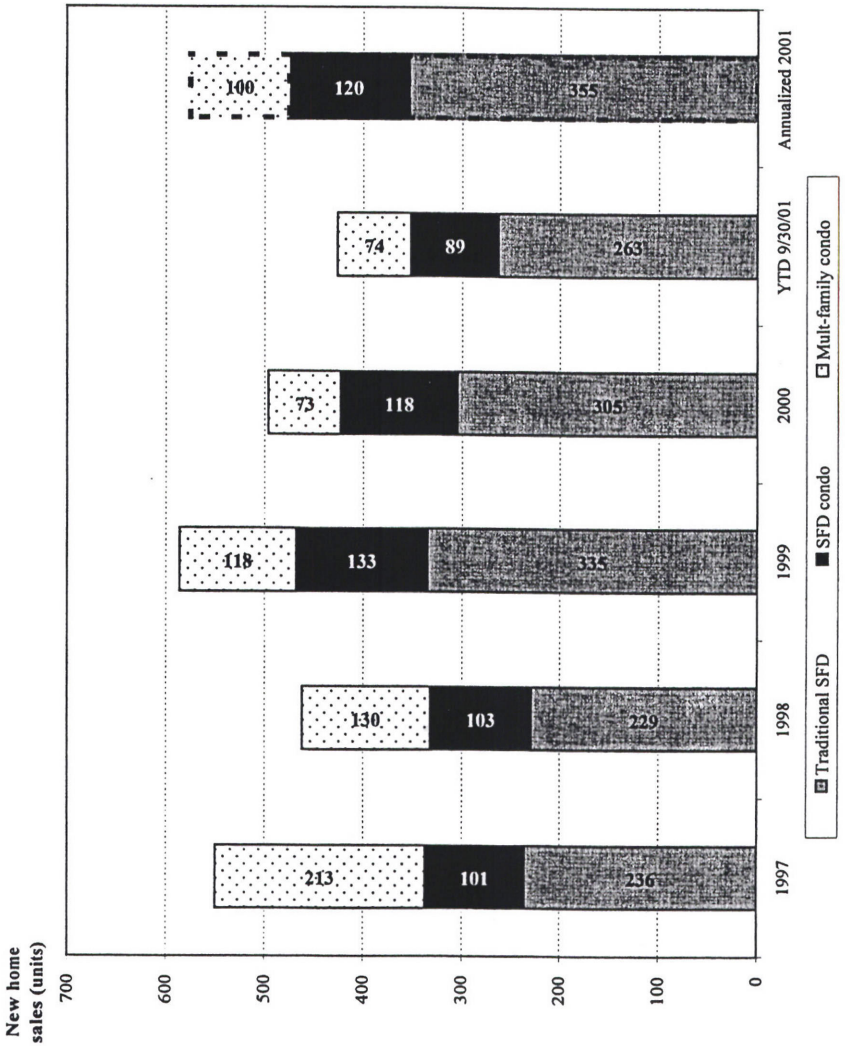


Source: John Child & Company, based on data from MLS Hawaii, Inc. Research TMK and Gentry Homes, Ltd.

Ewa by Gentry Makai

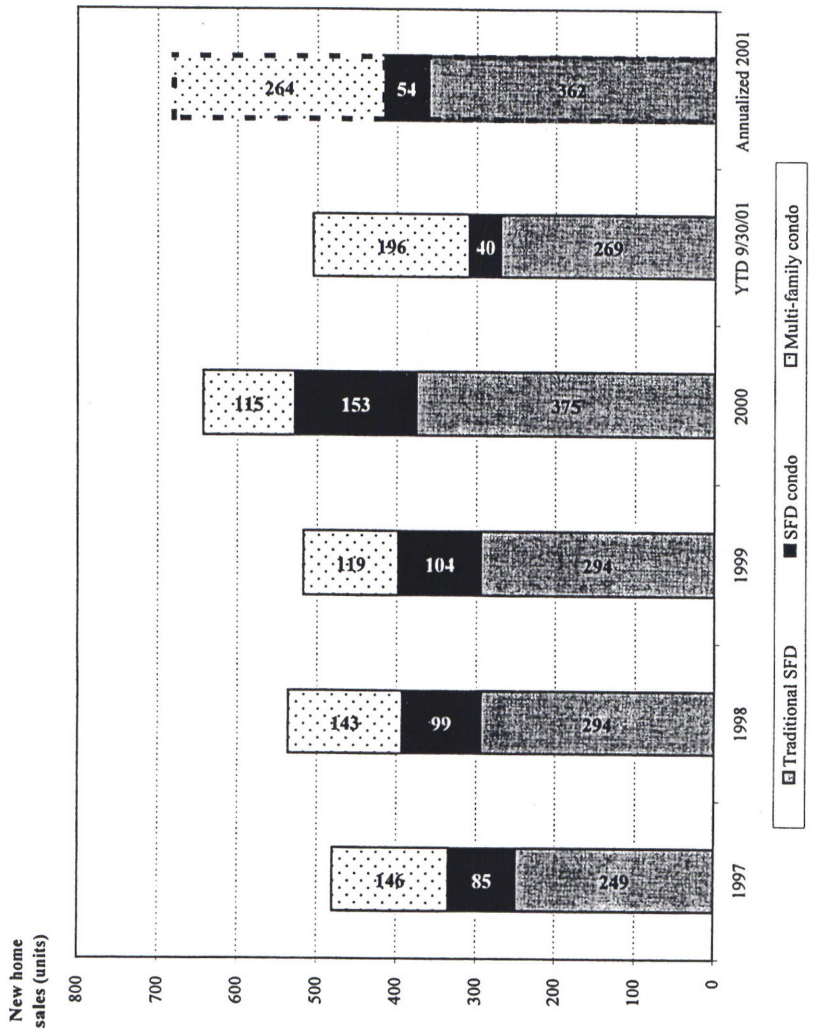
Exhibit II-E

COMPOSITION OF NEW HOME SALES IN EWA OAHU
1997 - YTD SEPTEMBER 2001



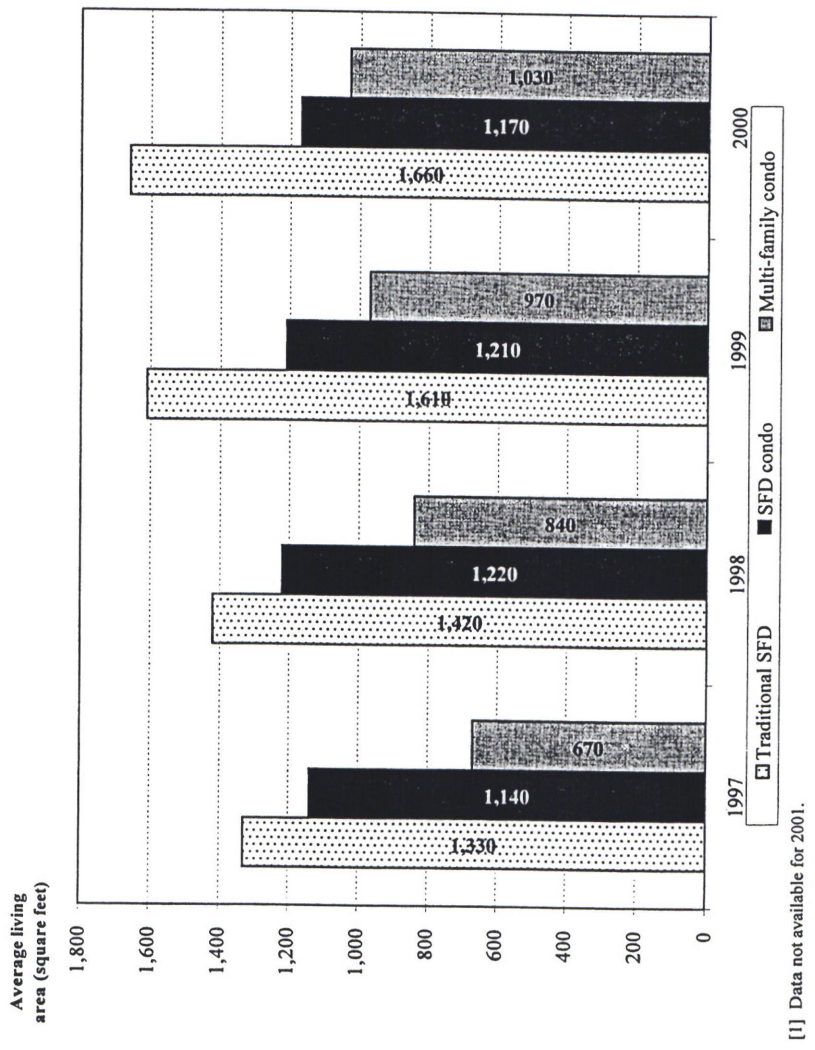
Source: John Child & Company, based on data from MLS Hawaii, Inc. Research TMK and Gentry Homes, Ltd.

COMPOSITION OF NEW HOME SALES IN CENTRAL OAHU
1997 - YTD SEPTEMBER 2001



Source: John Child & Company, based on data from MLS Hawaii, Inc. Research TMK and Gentry Homes, Ltd.

AVERAGE LIVING AREA OF NEW HOMES IN EWA GENTRY-OCEAN POINTE
1997 - 2000 [1]

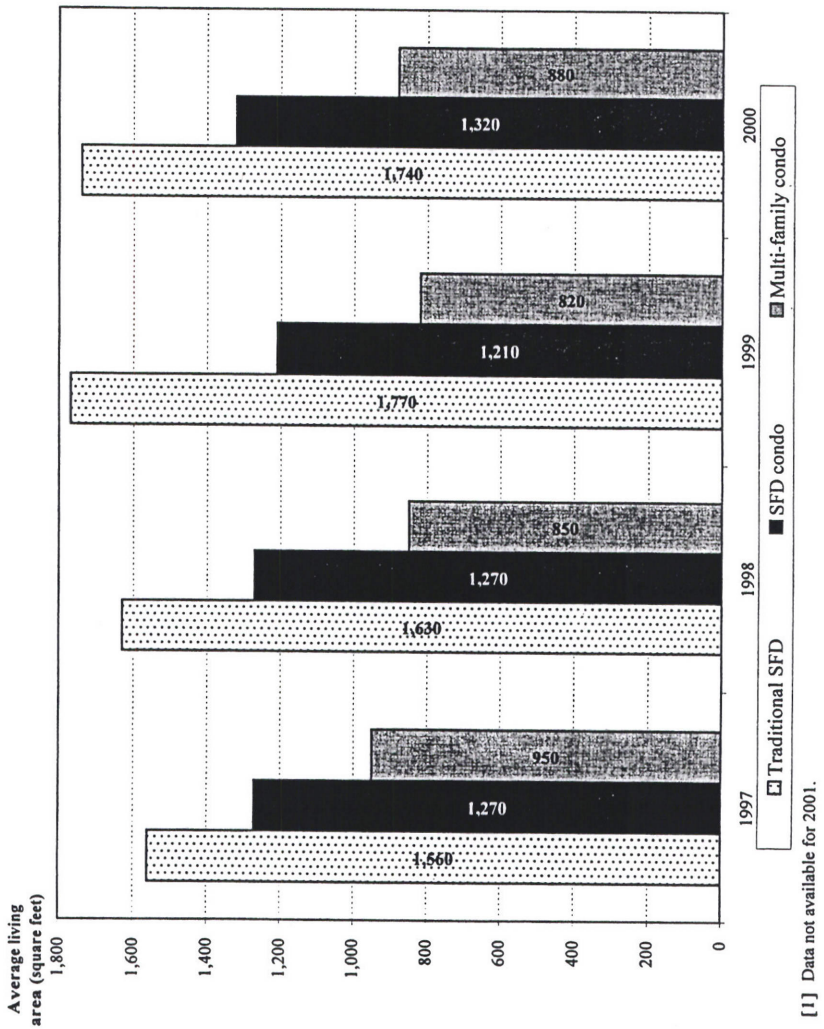


[1] Data not available for 2001.

Source: John Child & Company, based on data from MLS Hawaii, Inc. Research TMK.

Ewa by Gentry Makai Exhibit II-H

AVERAGE LIVING AREA OF NEW HOMES IN CENTRAL OAHU
1997 - 2000 [1]



Source: John Child & Company, based on data from MLS Hawaii, Inc. Research TMK.

Average Sales Prices

- Since 1997, average sales prices for new traditional SFDs in the Ewa Gentry-Ocean Pointe area have steadily increased from about $250,000 to about $300,000 [1]. Sales prices of SFD condos have also increased from about $200,000 to about $235,000, as shown in Exhibit II-I.

- Similar to the trend in prices in Ewa Gentry-Ocean Pointe, the average sales prices for traditional SFDs in Central Oahu have increased since 1997, as shown in Exhibit II-J.

- Central Oahu homes generally sell at higher prices compared to Ewa Gentry-Ocean Pointe. However, the gap between traditional SFD prices in Ewa Gentry-Ocean Pointe and Central Oahu narrowed from about $65,000 in 1997 to about $45,000 in 2000. The decline in the price disparity is attributed to sales in the Ocean Pointe development and more expensive products by Gentry, such as the Carriages and Sonoma developments.

HOUSING RESALES TRENDS

MLS Hawaii, Inc. tracks single-family and condominium resales data for Oahu. The MLS resales trends for various West Oahu and Central Oahu neighborhoods are highlighted for the single family and condominium markets as follows:

Single-Family Market

- With the exception of Makakilo, sales of single-family dwellings in Ewa Oahu and Central Oahu neighborhoods are at their highest levels since 1997, as shown in Exhibit II-K.

- The average days a unit is on the market (DOM) prior to selling has generally declined over the past 4 1/2 years. Marketing times have lengthened slightly in 2001 as indicated by resales data as of June 30, 2001 (YTD 2001); however, the average DOM remains shorter than in 1997, as shown in Exhibit II-L.

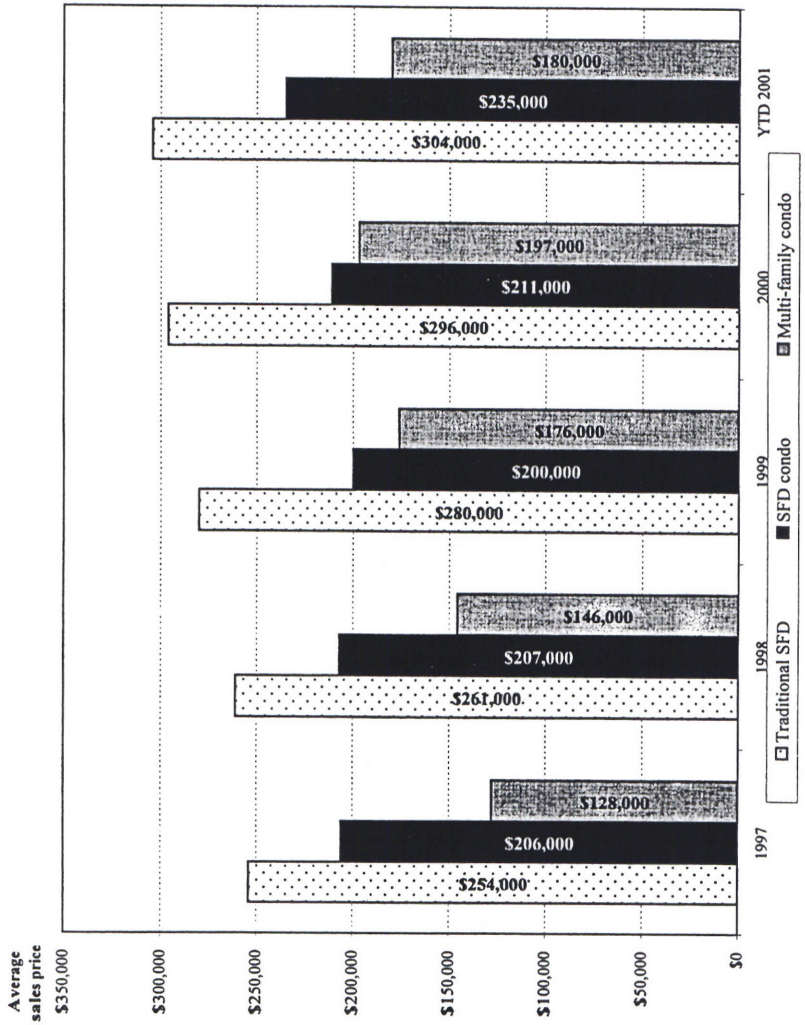
- Average sales prices have generally declined since 1997 and have begun to increase as the inventory of homes decreases, as shown in Exhibit II-M.

[1] The average living area and average sales price trends are shown for the Ewa Gentry and Ocean Pointe areas only and exclude Makakilo, Kapolei and Ko Olina to minimize any bias that could be caused by variations in the data.

Ewa by Gentry Makai

Exhibit II-I

AVERAGE SALES PRICE OF NEW HOMES IN EWA GENTRY-OCEAN POINTE
1997 - YTD SEPTEMBER 2001

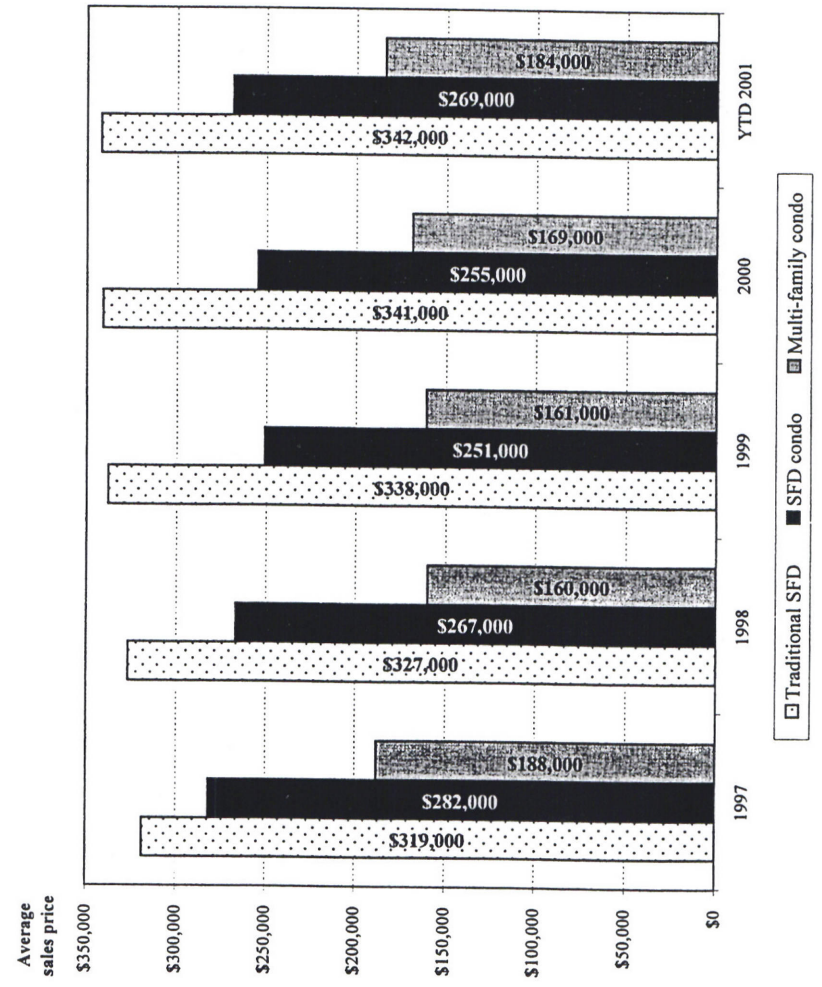


Source: John Child & Company, based on data from MLS Hawaii, Inc. Research TMK and Gentry Homes, Ltd.

Ewa by Gentry Makai

Exhibit II-J

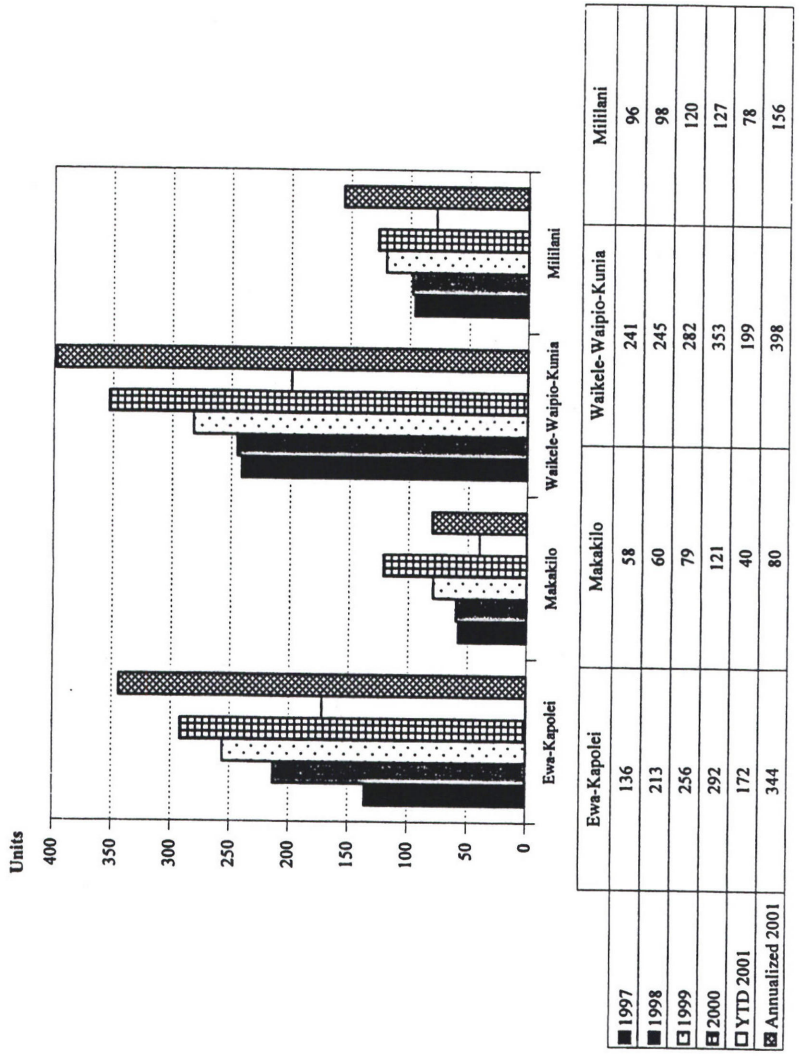
AVERAGE SALES PRICE OF NEW HOMES IN CENTRAL OAHU
1997 - YTD SEPTEMBER 2001



Source: John Child & Company, based on data from MLS Hawaii, Inc. Research TMK and Gentry Homes, Ltd.

Exhibit II-K

SINGLE FAMILY RESALES IN ZONE 9
1997 - YTD JUNE 2001

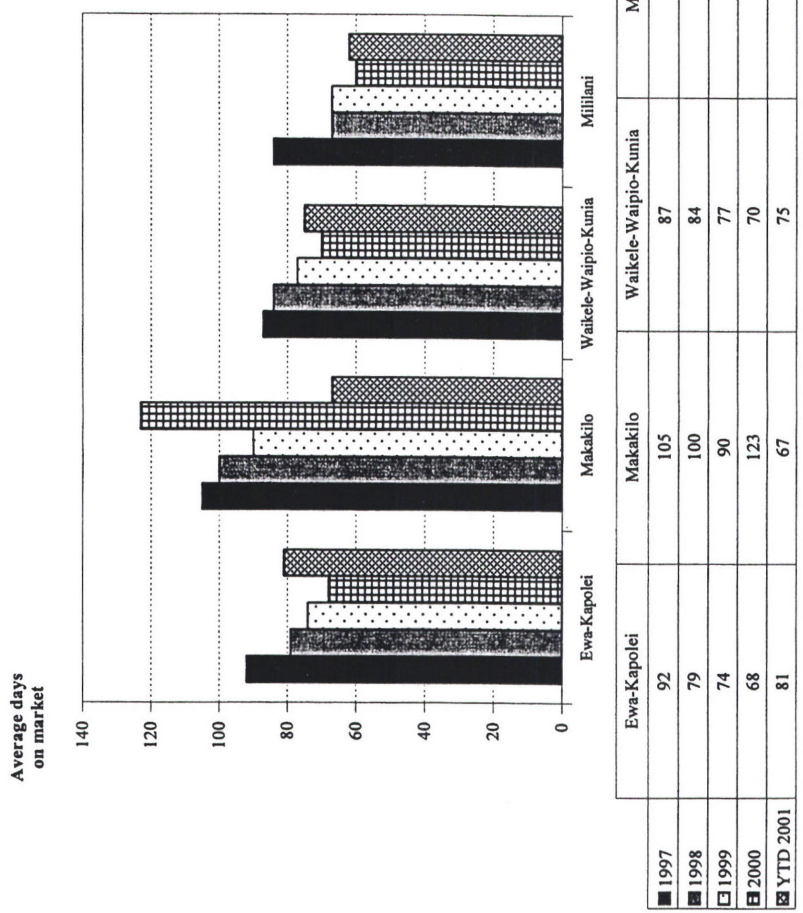


	Ewa-Kapolei	Makakilo	Waikele-Waipio-Kunia	Mililani
1997	136	58	241	96
1998	213	60	245	98
1999	256	79	282	120
2000	292	121	353	127
YTD 2001	172	40	199	78
Annualized 2001	344	80	398	156

Source: Honolulu Board of Realtors, **Multiple Listing Service Quarterly Reference Book,** 1997 to 2nd Quarter 2001.

Exhibit II-L

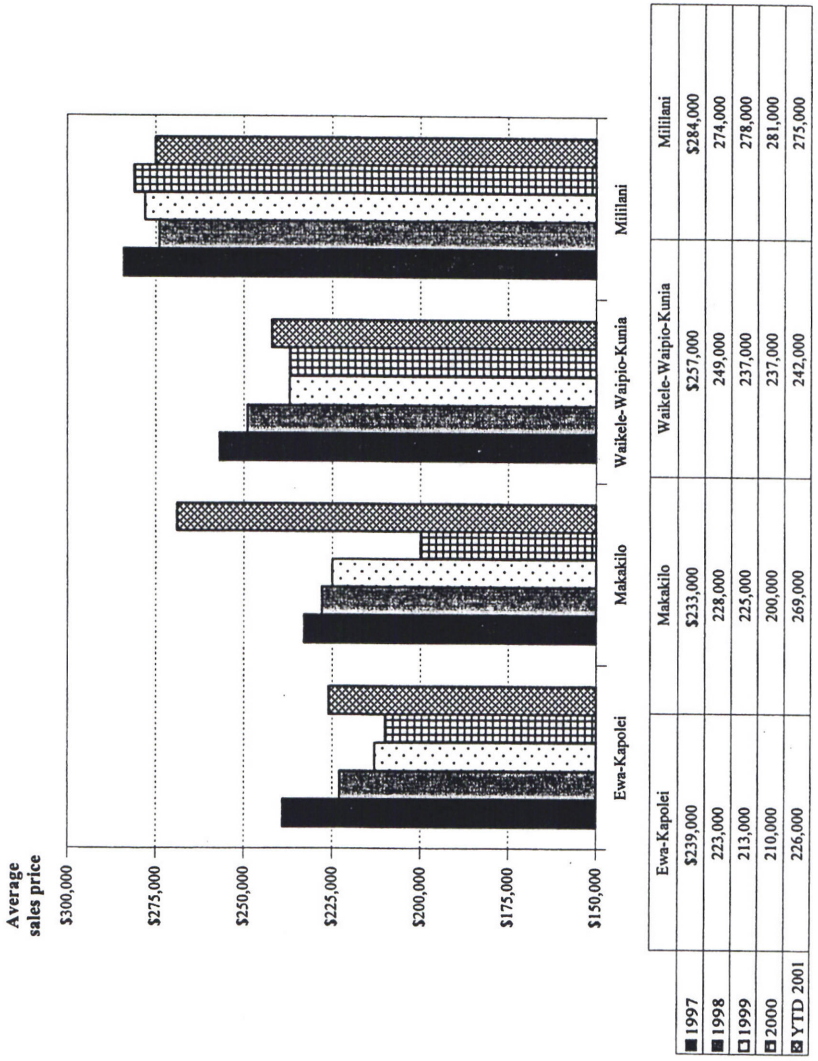
AVERAGE MARKETING TIME OF SINGLE FAMILY HOMES IN ZONE 9
1997 - YTD JUNE 2001



	Ewa-Kapolei	Makakilo	Waikele-Waipio-Kunia	Mililani
1997	92	105	87	84
1998	79	100	84	67
1999	74	90	77	67
2000	68	123	70	60
YTD 2001	81	67	75	62

Source: Honolulu Board of Realtors, **Multiple Listing Service Quarterly Reference Book,** 1997 to 2nd Quarter 2001.

AVERAGE RESALES PRICE OF SINGLE FAMILY HOMES IN ZONE 9
1997 - YTD JUNE 2001



Source: Honolulu Board of Realtors, **Multiple Listing Service Quarterly Reference Book**, 1997 to 2nd Quarter 2001.

Condominium Market [1]

- Similar to the single-family housing market, condominium resales have generally increased since 1997, with the largest increase observed in the Ewa-Kapolei area, as shown in Exhibit II-N.
- The increase in condominium resales activity is also shown in the general decline in average DOM. The average DOM in the Ewa-Kapolei area, in particular, has declined to less than 1/2 of the average marketing time for condominium units in 1997, as shown in Exhibit II-O.
- The sharp increase in condominium resales over the past two years is primarily attributed to a decline in condominium prices throughout Ewa and Central Oahu. However, prices in all areas have begun to increase based on YTD 2001 data, as shown in Exhibit II-P.

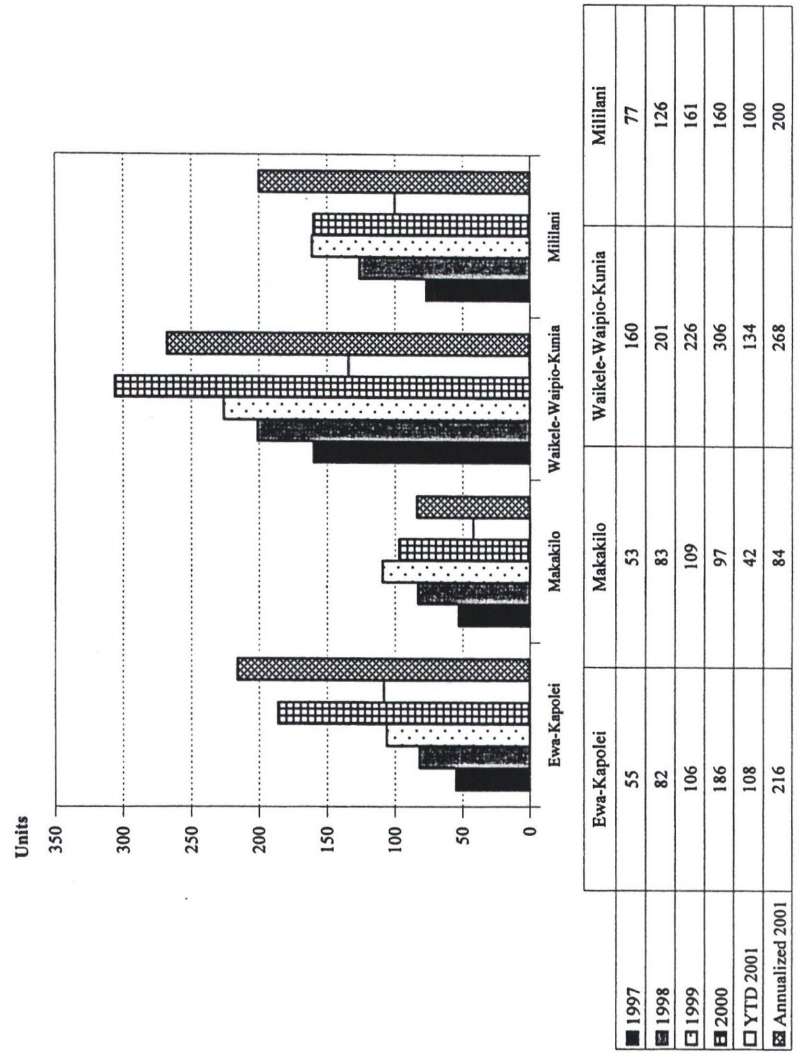
SUMMARY OF RESIDENTIAL MARKET TRENDS

The residential housing market in Ewa Oahu and Central Oahu has strengthened over the past four-and-a-half years based on the following:

- Increase in new home sales, particularly in traditional SFD and SFD condominimum markets
- Recovering multi-family condominium market
- Faster turnover in the housing resales market, as indicated by shorter marketing times and an overall increase in the number of resales
- Increasing sales prices of both new homes and resales.

[1] Includes single-family detached condominium units, town homes, duplexes, and multi-family low-rise and high-rise condominium units.

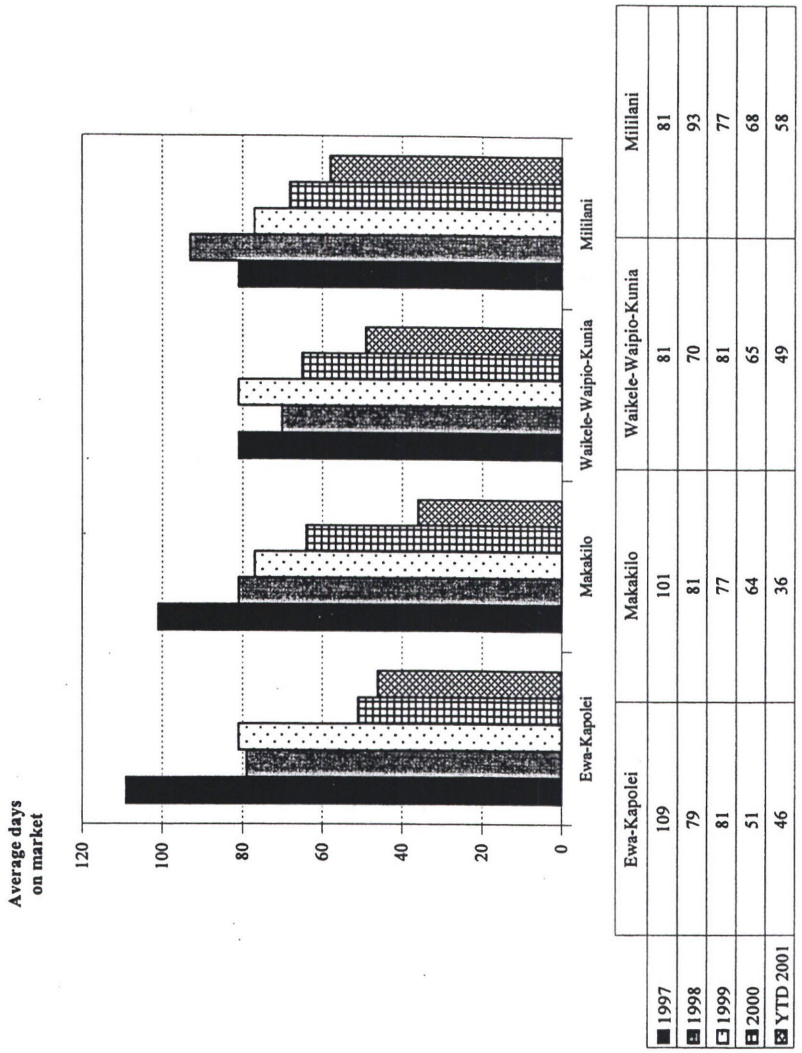
CONDOMINIUM RESALES IN ZONE 9 [1]
1997 - YTD JUNE 2001



	Ewa-Kapolei	Makakilo	Waikele-Waipio-Kunia	Mililani
1997	55	53	160	77
1998	82	83	201	126
1999	106	109	226	161
2000	186	97	306	160
YTD 2001	108	42	134	100
Annualized 2001	216	84	268	200

Source: Honolulu Board of Realtors, **Multiple Listing Service Quarterly Reference Book**, 1997 to 2nd Quarter 2001.

AVERAGE MARKETING TIME OF CONDOMINIUMS IN ZONE 9 [1]
1997 - YTD JUNE 2001

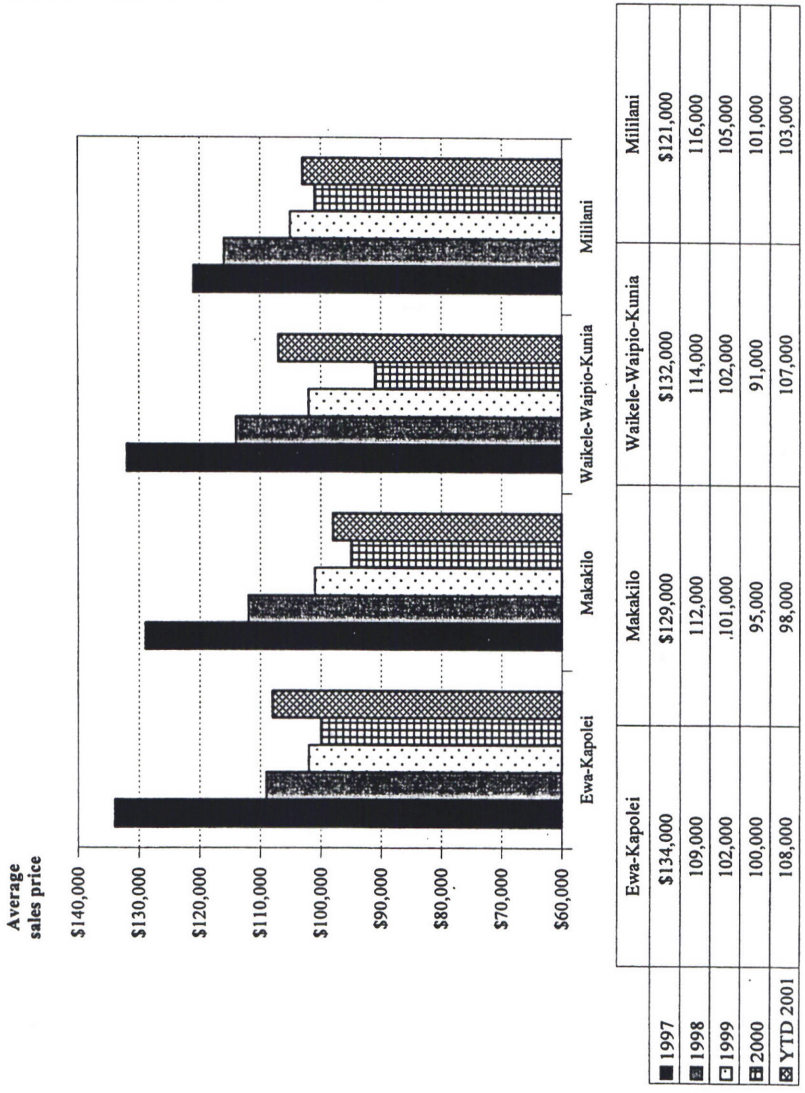


	Ewa-Kapolei	Makakilo	Waikele-Waipio-Kunia	Mililani
1997	109	101	81	81
1998	79	81	70	93
1999	81	77	81	77
2000	51	64	65	68
YTD 2001	46	36	49	58

Source: Honolulu Board of Realtors, **Multiple Listing Service Quarterly Reference Book**, 1997 to 2nd Quarter 2001.

Exhibit II-P

AVERAGE RESALES PRICE OF CONDOMINIUMS IN ZONE 9 [1]
1997 - YTD JUNE 2001



	Ewa-Kapolei	Makakilo	Waikele-Waipio-Kunia	Mililani
1997	$134,000	$129,000	$132,000	$121,000
1998	109,000	112,000	114,000	116,000
1999	102,000	101,000	102,000	105,000
2000	100,000	95,000	91,000	101,000
YTD 2001	108,000	98,000	107,000	103,000

Source: Honolulu Board of Realtors, **Multiple Listing Service Quarterly Reference Book**, 1997 to 2nd Quarter 2001.

This section presents the residential market assessments for Ewa Makai in terms of the proposed development, projected demand for residential development, Gentry's existing available and planned inventory, and the projected absorption of the Ewa Makai residential units.

PROPOSED RESIDENTIAL DEVELOPMENT FOR THE EWA MAKAI PROPERTY

Gentry proposes a mix of single-family detached dwellings, single-family condominium (cluster) units, and multi-family condominium units for the Ewa Makai property. A total of 1,865 units are planned as follows:

Proposed Residential Development

	Total units	% of total
Single-family detached dwellings	550	29.5%
Single-family condominium units (cluster)	675	36.2
Multi-family condominium units	640	34.3
Total	1,865	100.0%

Of the total, 715 units are planned for Ewa Makai East and 1,150 units are planned for Ewa Makai West. Gentry plans to develop Ewa Makai East and continue westward to Ewa Makai West.

AVERAGE SALES PRICES AND UNIT SIZE

The average sales prices and unit sizes for the Ewa Makai units are summarized by development type as follows:

Development type	Average living area (sf)	Average sales price (current dollars)
Single-family detached dwellings	1,800	$320,000
Single family condominium units (cluster)	1,200	225,000
Multi-family condominium units [1]	800 - 1,000	140,000 - 160,000

[1] Multi-family condominium projects may include duplexes and town homes, including smaller walk-up models. Therefore, a range is shown to reflect variations in size and sales price for the various subtypes.

The estimated sales prices and living areas are comparable to current developments throughout the Ewa Oahu and Central Oahu districts.

HISTORICAL MARKET SUPPORT FOR THE PROPOSED UNITS

Market support for the proposed Ewa Makai units is highlighted by housing development type as follows:

Single-Family Detached Dwellings (Traditional SFDs)

- Since 1997, sales of traditional SFDs have steadily increased and now comprise about 60% of all new home sales in Central Oahu and Ewa Oahu.
- The trend is projected to continue because of the affordability of the Central Oahu and Ewa Oahu developments and lack of competitive SFDs in the primary urban center.

Single-Family Condominium Units (SFD condos)

- SFD condos offer home purchasers an opportunity to buy single-family homes at lower price points.
- With the exception of YTD 2001, SFD condos represent a larger share of new home sales. More SFD condos were sold than multi-family condos in Ewa Oahu since 1999.
- With the exception of Gentry, no SFD condominium projects are available or planned in the Ewa district. In comparison, a number of multi-family developments are available and planned. Ocean Pointe is selling SFDs and town homes and will release smaller town homes this year. Town homes are planned for Ko Olina and Kapolei.

Multi-Family Condominium Units (Multi-Family Condos)

- Sales prices of multi-family condominiums in Central Oahu declined significantly over the past decade. Similarly, resale prices of multi-family condos originally developed and sold by Gentry and other developers in the 1990s have declined substantially. However, both new home sales and resales within the multi-family condominium market during YTD 2001 are increasing.
- Multi-family condominium development targets entry-level buyers.
- Land zoned for multi-family condominium units could alternatively be developed with SFD condominium developments with lower densities.

PROJECTED DEMAND FOR RESIDENTIAL DEVELOPMENT

The projected demand for the proposed 1,865 units in the Ewa Makai development is discussed under the following subheadings.

OMPO Projections

- Market support for the Ewa Makai residential units is based on the projected growth in the resident population in Ewa and Gentry's projected market share of the new housing demand.
- The projected growth in the resident population is based on population projections by the Oahu Metropolitan Planning Organization (OMPO). The population projections were completed prior to the release of the 2000 U.S. Census population counts. According to the City & County of Honolulu Department of Planning and Permitting, the OMPO projections represent the most recent projections.
- The OMPO projected about 68,100 persons in the Ewa district in 2000 and 114,005 persons in 2025. The OMPO projections for the Ewa district reflect about a 67% increase in the resident population during this period compared with an 18% increase projected for Oahu overall, as shown in Exhibit III-A.

Resident Population and Housing Characteristics

- The Ewa district includes the Ewa Gentry, Ocean Pointe, Kapolei, Ko Olina and Makakilo areas. The relevant market for projecting demand for residential development of the Ewa Makai property is the Ewa Gentry-Ocean Pointe area. The Ewa Gentry-Ocean Pointe area consists of census tracts 84.01, 84.03, and 84.04, as shown in Exhibit III-B.
- According to the 2000 U.S. Census, the total population in the Ewa district in 2000 was 67,156. The Ewa Gentry-Ocean Pointe area comprised about 21% of the total population.
- In 2000, the Ewa Gentry-Ocean Pointe area had 4,545 occupied households with an average household size of 3.1 persons. All other areas had an average household size of 3.8.
- The average vacancy rate of owner-occupied units in the Ewa Gentry-Ocean Pointe area was about 3.6%, as shown in Exhibit III-C.

Ewa by Gentry Makai

Exhibit III-A

PROJECTED RESIDENT POPULATION BY DISTRICT
2000 - 2025

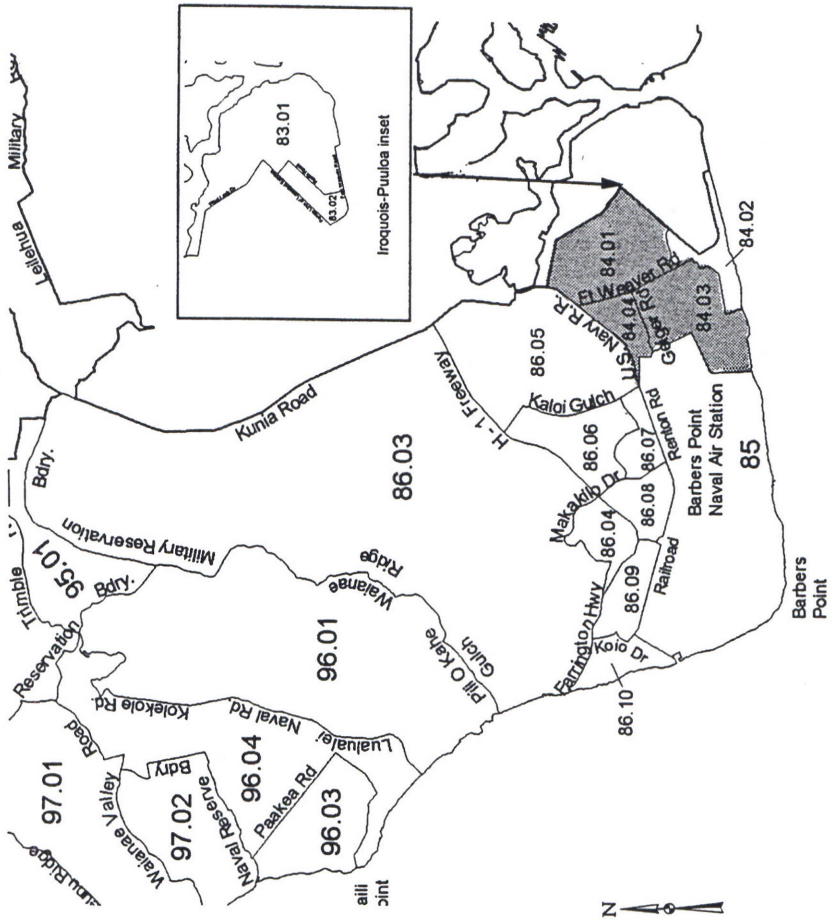
No.	District	Resident Population 2000	Resident Population 2025	Change in Resident Population: Total persons	Change in Resident Population: Percent change: Total	Change in Resident Population: Percent change: Average annual
1	Downtown	14,501	24,664	10,163	70.1%	2.1%
2	Kakaako	5,965	31,255	25,290	424.0	6.8%
3	Makiki	35,028	41,156	6,128	17.5	0.6
4	McCully	32,711	40,540	7,829	23.9	0.9
5	Waikiki	21,900	24,120	2,220	10.1	0.4
6	Diamond Head	25,411	26,631	1,220	4.8	0.2
7	Kaimuki	28,669	31,349	2,680	9.3	0.4
8	Manoa	18,942	19,695	753	4.0	0.2
9	Nuuanu	31,611	35,553	3,942	12.5	0.5
10	Kalihi	37,292	38,811	1,519	4.1	0.2
11	Iwilei	20,756	25,315	4,559	22.0	0.8
12	Airport/Pearl Harbor	29,582	29,901	319	1.1	0.0
13	Salt Lake	49,328	49,705	377	0.8	0.0
14	Pearl City/Aiea	74,617	75,736	1,119	1.5	0.1
15	Waipahu	58,845	81,748	22,903	38.9	1.3
16	Mililani	89,535	91,229	1,694	1.9	0.1
17	**Ewa**	**68,092**	**114,005**	**45,913**	**67.4%**	**2.1%**
18	Waianae	39,286	42,897	3,611	9.2	0.4
19	North Shore	17,885	19,828	1,943	10.9	0.4
20	Koolauloa	13,208	16,364	3,156	23.9	0.9
21	Kaneohe	66,215	68,995	2,780	4.2	0.2
22	Kailua	49,256	50,125	869	1.8	0.1
23	East Honolulu	44,280	50,185	5,906	13.3	0.5
	Total	872,915	1,029,807	156,892	18.0	0.7

Source: OAHU Regional Transportation Plan Preliminary Land Use Evaluation Population Totals by District, prepared by OMPO consultants for the Department of Planning & Permitting, City & County of Honolulu.

Ewa by Gentry Makai

Exhibit III-B

CENSUS TRACTS IN EWA OAHU



Source: John Child & Company and Office of Planning, Department of Business, Economic Development and Tourism, State of Hawaii.

RESIDENT POPULATION AND HOUSING CHARACTERISTICS
2000

Census tract	2000 name	Resident Population Total	Resident Population % of total	Occupied Households Total	Occupied Households % of total	Average household size [3]	Owner-occupied vacancy rate	
Ewa Gentry-Ocean Pointe:								
84.03 (por.)	Ocean Pointe [1]	755	1.1%	228	1.2%	3.31	3.1%	
84.01	Ewa Genty-East	3,300	4.9	873	4.7	3.78	5.7	
84.04, 84.03 (por.)	Ewa Genty-West [2]	10,184	15.2	3,444	18.6	2.96	3.1	
Subtotal		14,239	21.2%	4,545	24.5%	3.13	3.6	[4]
Iroquois-Kapolei-Makakilo:								
83.01	Iroquois Point	3,856	5.7%	1,007	5.4%	3.83	0.0%	
83.02	Puuloa	6,563	9.8	1,346	7.3	4.88	2.3	
84.02	Ewa Beach	8,087	12.0	1,959	10.6	4.13	1.6	
85.00	Barbers Point	1,311	2.0	397	2.1	3.30	55.6	
86.03	Kahe	9,882	14.7	3,071	16.6	3.22	1.9	
86.04	Makakilo	4,097	6.1	1,028	5.5	3.99	1.6	
86.05	East Kapolei-Ewa Villages	8,607	12.8	2,295	12.4	3.75	2.0	
86.06	Villages of Kapolei-North	7,290	10.9	1,930	10.4	3.78	1.3	
86.07	Villages of Kapolei-South	1,544	2.3	446	2.4	3.46	11.0	
86.08	City of Kapolei	0	0.0	0	0.0	NA	NA	
86.09	Ko Olina Expansion	1,671	2.5	499	2.7	3.35	4.2%	
86.10	Ko Olina-Campbell Ind. Park	9	0.0	4	0.0	2.25	0.0	
Subtotal		52,917	78.8%	13,982	75.5%	3.78	4.0	[4]
Total		67,156	100.0%	18,527	100.0%	3.62	3.9	[4]

[1] Includes portions of census tract 84.03 developed and sold by Haseko Homes and known as the Ocean Pointe development.
[2] Includes portions of census tract 84.03 that comprise the Sun Terra and Huelani subdivisions developed and sold by Gentry.
[3] Calculated as resident population divided by occupied households.
[4] Weighted based on the total housing units in each census tract.

Source: John Child & Company, based on U.S. Census Bureau, 2000 Census.

Projected Resident Population

- Based on 114,005 persons in 2025 projected by OMPO and an actual population of 67,156 persons in 2000, the resident population in the Ewa district is projected to increase by about 46,849 persons.
- New home sales are a primary indicator of new population growth in the area. Between 1997 and 2000, new home sales in the Ewa Gentry-Ocean Pointe area comprised about 54% to 69% of total new home sales in the entire Ewa district, as shown in Exhibit III-D.
- Based on the historical market shares, about 65% of the projected resident population growth between 2000 and 2025, or about 30,452 persons is expected to occur in the Ewa Gentry-Ocean Pointe area.
- The projected resident population growth is interpolated for the 24 years between 2000 and 2025 based average annual growth rates of about 8% declining to just under 3% by 2025, as shown in Exhibit III-E.
- The annual population growth is projected to be about 1,300 persons over the next ten years. The projected population growth is reasonable based on current market trends and the estimated population growth from new home sales in the Ewa Gentry-Ocean Pointe area, as summarized in Exhibit III-F.

Projected New Housing Demand

- The demand for new homes in the Ewa Gentry-Ocean Pointe area is projected after an allowance for vacancy. Based on the projected resident population, an average household size of 3.1 persons, and an estimated 95% occupancy rate, about 4,400 new homes are projected to be required by 2010, as shown in Exhibit III-G.

Gentry's Share of New Housing Demand

- Gentry's market share of this new housing demand is estimated based on its historical market share of new home sales in the Ewa Gentry-Ocean Pointe area.
- In 1999 and 2000, new home sales in the Ewa Gentry neighborhood, including the Unity House and Schuler Homes projects (identified as Other Ewa Gentry), represented about 60% to 66% of new home sales in the combined Ewa Gentry-Ocean Pointe neighborhood. Gentry's market share of the projected new housing demand is estimated to be about 65%, as shown in Exhibit III-H.
- Based on a market share of 65%, Gentry's share of the new housing demand is projected to be about 287 new housing units annually over the next 8 years, as shown in Exhibit III-I.

NEW HOME SALES IN THE EWA DISTRICT
1997 - 2000

Year	Ewa Gentry		Ocean Pointe	Ewa Gentry-Ocean Pointe		Iroquois-Kapolei-Makakilo [2]		Total Ewa Oahu
	Gentry	Other [1]		Total	% of total	Total	% of total	
1997	219	107	-	326	54.0%	278	46.0%	604
1998	231	51	33	315	61.8	195	38.2	510
1999	231	36	182	449	61.2	285	38.8	734
2000	214	41	134	389	68.7	177	31.3	566

[1] Represents units in the Ewa Gentry neighborhood that were developed and sold by Unity House and Schuler Homes.
[2] New housing sales in Kapolei, Ko Olina, Makakilo, and Ewa Villages.

Source: John Child & Company, based on MLS Hawaii, Inc. **Research TMK.**

INTERPOLATION OF PROJECTED RESIDENT POPULATION
2000 - 2025

Calendar year	Ewa Gentry-Ocean Pointe			Iroquois-Kapolei-Makakilo	
	Total	Average Annual Increase			
		Total	%		Total
2000	14,239 [1]	1,300	7.8%	52,917 [1]	67,156 [1]
2001	15,540	1,300	7.8	---	---
2002	16,840	1,300	7.8	---	---
2003	18,140	1,300	7.8	---	---
2004	19,440	1,300	7.8	---	---
2005	20,740	1,300	5.6	---	---
2006	22,040	1,300	5.6	---	---
2007	23,340	1,300	5.6	---	---
2008	24,640	1,300	5.6	---	---
2009	25,940	1,300	5.6	---	---
2010	27,190	1,250	4.2	---	---
2011	28,440	1,250	4.2	---	---
2012	29,690	1,250	4.2	---	---
2013	30,940	1,250	4.2	---	---
2014	32,190	1,250	4.2	---	---
2015	33,390	1,200	3.3	---	---
2016	34,590	1,200	3.3	---	---
2017	35,790	1,200	3.3	---	---
2018	36,990	1,200	3.3	---	---
2019	38,190	1,200	3.3	---	---
2020	39,290	1,100	2.6	---	---
2021	40,390	1,100	2.6	---	---
2022	41,490	1,100	2.6	---	---
2023	42,590	1,100	2.6	---	---
2024	43,690	1,100	2.6	---	---
2025	44,691	1,001	---	69,314	114,005
Distribution of new population growth 2000 - 2025:					
Persons	30,452			16,397	46,849 [2]
Percent	65% [3]			35%	100%

[1] Actual 2000 resident population, as shown in Exhibit III-C.
[2] The total population growth of 46,849 persons in the Ewa district is based on the projected population of 114,005 persons in 2025 and the actual 2000 popoulation of 67,156 persons, as shown in Exhibits III-A and III-C.
[3] The estimated population growth is allocated and interpolated for the Ewa Gentry-Ocean Pointe area based on the estimated population growth attributed to new home sales in the area, as shown in Exhibit III-D.

Source: John Child & Company.

Ewa by Gentry Makai

Exhibit III-F

ESTIMATED POPULATION GROWTH FROM NEW HOME SALES IN EWA GENTRY-OCEAN POINTE
1997 - 2000

Year	New home sales [1]	x	Average household size [2]	=	Additional persons (rounded)
1997	326		3.1		1,010
1998	315		3.1		980
1999	449		3.1		1,390
2000	389		3.1		1,210

[1] New home sales in the Ewa Gentry-Ocean Pointe area include units in Ewa Gentry that were developed and sold by Unity House and Schuler Homes.

[2] Based on the average household size for the area as reported in the 2000 census.

Source: John Child & Company.

Ewa by Gentry Makai

Exhibit III-G

PROJECTED DEMAND FOR NEW HOMES IN EWA GENTRY-OCEAN POINTE
2001 - 2025

Development year	Calendar year end	Increase in resident population	÷	Average household size	=	Additional Housing Units Required: Unadjusted demand	Demand adjusted for vacancy [1]	Cumulative demand
0	2001	1,300		3.1		419 [2]	441	441
1	2002	1,300		3.1		419	441	882
2	2003	1,300		3.1		419	441	1,323
3	2004	1,300		3.1		419	441	1,764
4	2005	1,300		3.1		419	441	2,205
5	2006	1,300		3.1		419	441	2,646
6	2007	1,300		3.1		419	441	3,087
7	2008	1,300		3.1		419	441	3,528
8	2009	1,300		3.1		419	441	3,969
9	2010	1,250		3.1		403	424	4,393
10	2011	1,250		3.1		403	424	4,817
11	2012	1,250		3.1		403	424	5,241
12	2013	1,250		3.1		403	424	5,665
13	2014	1,250		3.1		403	424	6,089
14	2015	1,200		3.1		387	407	6,496
15	2016	1,200		3.1		387	407	6,903
16	2017	1,200		3.1		387	407	7,310
17	2018	1,200		3.1		387	407	7,717
18	2019	1,200		3.1		387	407	8,124
19	2020	1,100		3.1		355	374	8,498
20	2021	1,100		3.1		355	374	8,872
21	2022	1,100		3.1		355	374	9,246
22	2023	1,100		3.1		355	374	9,620
23	2024	1,100		3.1		355	374	9,994
24	2025	1,001		3.1		323	340	10,334

[1] Assuming a stabilized occupancy of 95%.

[2] A total of 305 units were sold in the Ewa Gentry-Ocean Pointe area as of year-to-date September 30, 2001. On an annualized basis, sales would total about 411 units compared with 419 units projected for 2001. However, Gentry believes its year-to-date home sales are lower than actual demand because they have lagged behind in planning and production.

Source: John Child & Company.

NEW HOUSING MARKET SHARES IN EWA GENTRY-OCEAN POINTE
1997 - 2000

	Ewa Gentry						Ocean Pointe		Total
	Gentry		Other [1]		Total				Ewa Gentry-Ocean Pointe
Year	Total	% of market	Total	% of market	Total	% of market	Total	% of market	
1997	219	67.2%	107	32.8%	326	100.0%	-	0.0%	326
1998	231	73.3	51	16.2	282	89.5	33	10.5	315
1999	231	51.4	36	8.0	267	59.5	182	40.5	449
2000	214	55.0	41	10.5	255	65.6	134	34.4	389
Estimated market share for Gentry 2001 - 2025						**65%**			

[1] Includes units in the Ewa Gentry area that were developed and sold by Unity House and Schuler Homes.

Source: John Child & Company, based on data from MLS Hawaii, Inc. Research TMK.

GENTRY'S SHARE OF NEW HOUSING DEMAND
2001 - 2025

Development year	Calendar year end	Projected new housing demand [1]	x	Gentry's market share [2]	=	Gentry's Share of New Housing Demand (Units) Annual	Cumulative
0	2001	441		65%		287	287
1	2002	441		65		287	574
2	2003	441		65		287	861
3	2004	441		65		287	1,148
4	2005	441		65		287	1,435
5	2006	441		65		287	1,722
6	2007	441		65		287	2,009
7	2008	441		65		287	2,296
8	2009	441		65		287	2,583
9	2010	424		65		276	2,859
10	2011	424		65		276	3,135
11	2012	424		65		276	3,411
12	2013	424		65		276	3,687
13	2014	424		65		276	3,963
14	2015	407		65		265	4,228
15	2016	407		65		265	4,493
16	2017	407		65		265	4,758
17	2018	407		65		265	5,023
18	2019	407		65		265	5,288
19	2020	374		65		243	5,531
20	2021	374		65		243	5,774
21	2022	374		65		243	6,017
22	2023	374		65		243	6,260
23	2024	374		65		243	6,503
24	2025	340		65		221	6,724

[1] Total annual new housing demand (units) for the Ewa Gentry-Ocean Pointe area, as estimated in Exhibit III-G.

[2] Gentry's market share is estimated to be about 65% of total new home sales in Ewa Gentry-Ocean Pointe.

Source: John Child & Company.

GENTRY'S INVENTORY OF AVAILABLE AND PLANNED HOUSING UNITS

On January 1, 2001, Gentry had 1,616 housing units currently under development or planned for the existing Ewa Gentry neighborhoods. The inventory of available and planned units excludes 829 units planned for sites identified as Areas 14, 17 and 31, as follows:

- 545 units planned for Area 14 and Area 17:
  - Because these sites do not have access or utilities, development will be postponed until Ewa Makai West is completed. Therefore, the analysis assumes the 545 units planned for these sites are developed and sold after the Ewa Makai development.

- 284 units planned for Area 31:
  - Gentry does not own the site identified as Area 31 and has plans to acquire the site when it acquires the Ewa Makai property. Development of Area 31 will be delayed until after development of the Ewa Makai property.

The location of Areas 14, 17 and 31 in relation to the Ewa Makai property is shown on a Land Use Plan map in Exhibit III-J.

PROJECTED ABSORPTION OF GENTRY'S EWA MAKAI RESIDENTIAL UNITS

The projected absorption of Gentry's existing, planned and proposed residential units are summarized as follows:

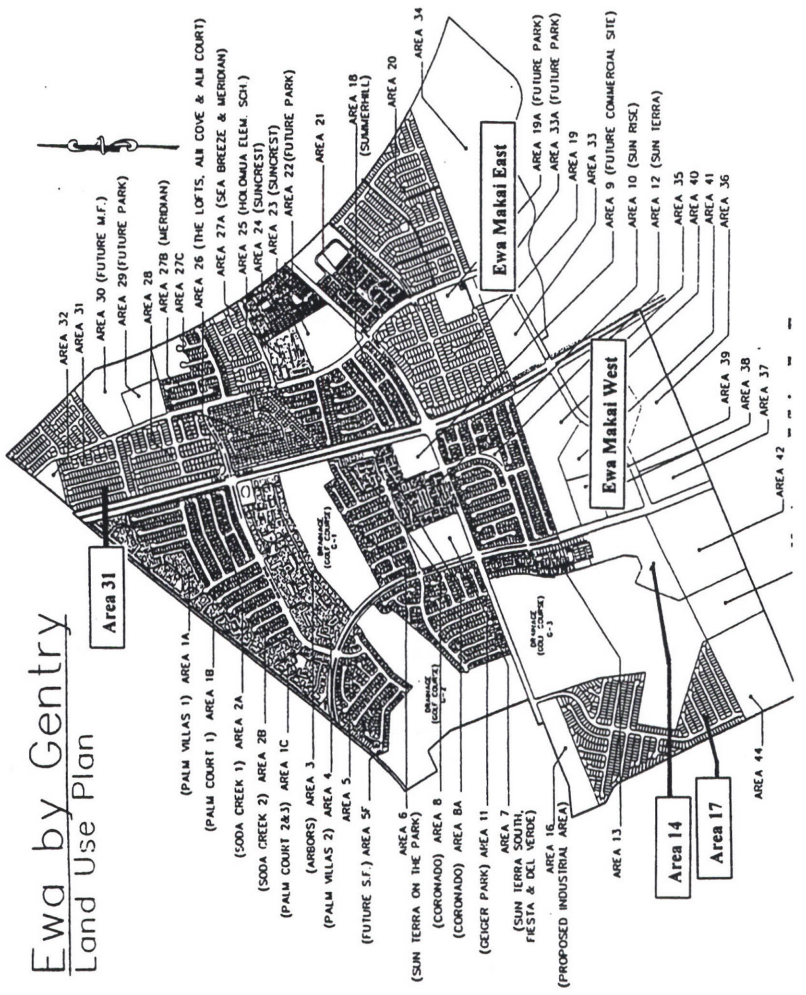
- Based on the projected population growth in the Ewa Gentry-Ocean Pointe area and Gentry's estimated market share of future new housing demand, Gentry is projected to sell about 287 units annually beginning in 2001.

- As of January 1, 2001, Gentry had 1,616 housing units that are available or planned and assumed to be sold prior to development of Ewa Makai. Based on the projected new housing demand, the 1,616 units are projected to be sold out by 2006.

- The 1,865 units proposed for the Ewa Makai development are projected to be sold between 2006 and 2013.

- The 829 units planned for Areas 14, 17 and 31 are expected to be sold between 2013 and 2016.

LAND USE PLAN MAP



Source: Gentry Homes, Ltd.

The projected absorption of Gentry's existing, planned and proposed new housing units from 2001 to 2016 is shown in Exhibit III-K.

PROJECTED ABSORPTION OF GENTRY'S AVAILABLE, PLANNED, AND PROPOSED NEW HOUSING UNITS INVENTORY
2001 - 2016

Development year	Calendar year end	Gentry's share of new housing demand	-	Existing and planned housing units (Ewa by Gentry)	-	Proposed housing units (Ewa Makai)		-	Planned housing units (area 14, 17, and 31)	=	Remaining demand
0	2001	287		287		0			0		0
1	2002	287		287		0			0		0
2	2003	287		287		0			0		0
3	2004	287		287		0			0		0
4	2005	287		287		0			0		0
5	2006	287		181		106			0		0
6	2007	287		0		287			0		0
7	2008	287		0		287			0		0
8	2009	287		0		287	[1]		0		0
9	2010	276		0		276			0		0
10	2011	276		0		276			0		0
11	2012	276		0		276			0		0
12	2013	276		0		70	[2]		206		0
13	2014	276		0		0			276		0
14	2015	265		0		0			265		0
15	2016	265		0		0			82		183
Total units		4,493	-	1,616	-	1,865		-	829	=	183

[1] Absorption of 715 units proposed for Ewa Makai East.
[2] Absorption of 1,150 units proposed for Ewa Makai West.

Source: John Child & Company.

IV – INDUSTRIAL-COMMERCIAL MARKET ASSESSMENTS

This section presents the market assessments for the industrial-commercial development proposed for Ewa Makai in terms of the proposed development, permitted uses in the IMX-1 district, relevant trade area, land use patterns, and the projected absorption of the proposed industrial-commercial development.

PROPOSED INDUSTRIAL-COMMERCIAL DEVELOPMENT

About 30 acres of the Ewa Makai property is proposed for IMX-1, industrial-commercial mixed use. The 30-acre site is adjacent to about 20 acres of commercial zoned land identified as the Laulani commercial site owned by Campbell Estate. Gentry also owns about 12 acres of industrial zoned land identified as a portion of Area 16, as shown in Exhibit IV-A.

PERMITTED USES IN THE IMX-1 ZONING

Section 21-3.140 of the Revised Ordinances of Honolulu 1990, as amended states:

> "The purpose of the industrial-commercial mixed use district is to allow mixing of some industrial uses with other uses. The intent of this district is to provide for areas of diversified business and employment opportunities by permitting a broad range of uses, without exposing nonindustrial uses to unsafe and unhealthy environments....This district is intended to promote and maintain a viable mix of light industrial and commercial uses."

The permitted uses in the IMX-1 zoning district include commercial, light industrial and other uses, as summarized in Exhibit IV-B.

ASSUMPTIONS RELATED TO THE MARKET ANALYSIS

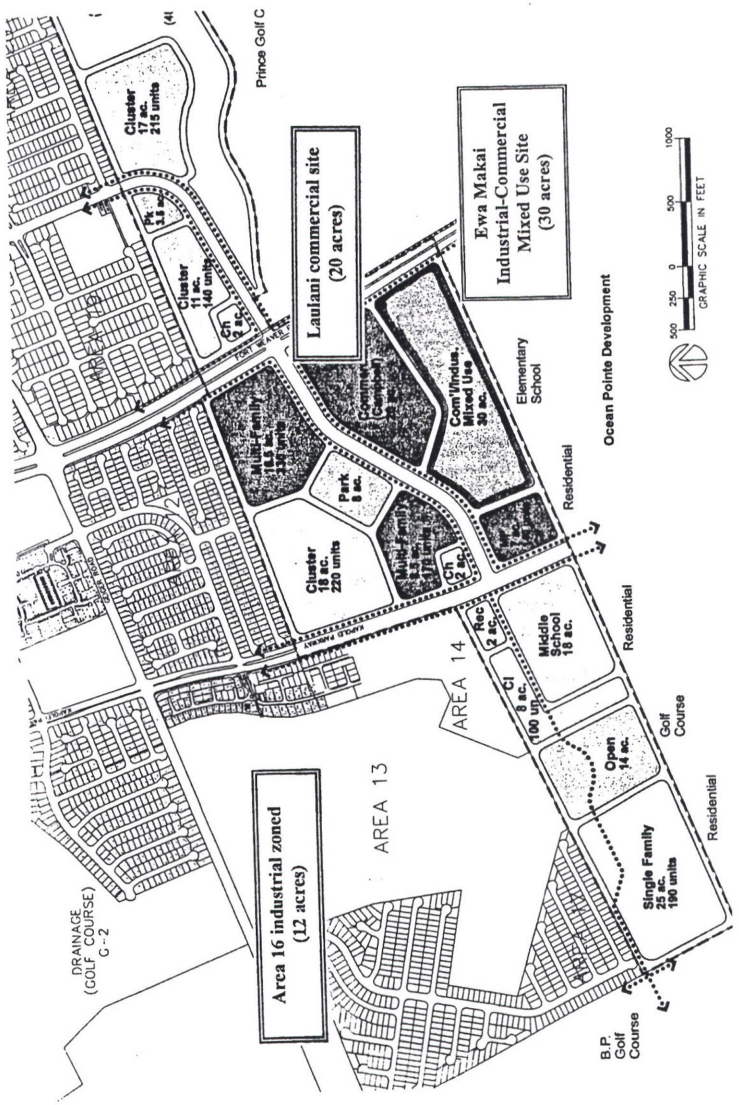
Assumptions related to the market analysis are highlighted as follows:

- The Laulani commercial site is vacant, and Campbell Estate does not plan to develop the property for at least three years. However, this report assesses the demand for the proposed Ewa Makai industrial-commercial development assuming the Laulani commercial site is fully developed as a town center.

- The market analysis assumes the 30-acre site is primarily used for light and/or service industrial purposes with ancillary retail use and the Laulani commercial site is primarily used for commercial retail uses. This assumption recognizes that the Laulani commercial site has superior configuration and retail street frontage along Fort Weaver Road.

Ewa by Gentry Makai — Exhibit IV-A

LOCATION OF INDUSTRIAL-COMMERCIAL SITE



Source: Gentry Homes, Ltd. *Ewa Makai Master Plan*, prepared by Helber Haster & Fee, Planners, dated 9/4/01.

PERMITTED USES IN THE IMX-1 DISTRICT

COMMERCIAL AND BUSINESS USES
Amusement & recreation facilities, indoor [1]
Automobile sales & rentals
Sales & distribution of automobile parts & supplies
Bars, nightclubs, taverns
Business services
Cabarets
Catering establishments
Convenience stores
Eating establishments
Financial institutions
Home improvement centers
Laboratories, medical
Laboratories, research
Plant nurseries
Photography studios [1]
Retail establishments [1]
Self-storage facilities
Veterinary establishments

INDUSTRIAL USES
Building & home improvement and furnishing services
Building & home improvement materials and equipment sales
Building & home improvement materials and equipment distributions
Food manufacturing & processing
Manufacturing, processing and packaging, light
Motion picture & television production studios
Publishing plants for newspapers, books & magazines
Repair establishments, minor
Warehousing
Wholesaling & distribution

OTHER USES
Art galleries & museums [1]
Day-care facilities
Meeting facilities
Public uses and structures
Schools, vocational, technical, industrial, trade
Automobile service stations
Commercial parking lots & garages
Broadcasting stations
Agriculture products processing, minor
Sales and service of machinery used in agriculture production
Kennels

[1] Commercial use subject to special density controls.

Source: Chapter 21, Land Use Ordinance, Revised Ordinances of Honolulu 1990, as amended.

- Development of the Area 16 industrial zoned land is not likely to occur until the Ewa Makai property and associated infrastructure, including the extension of the Kapolei Parkway and the widening of Geiger Road, is completed. Therefore, this report assumes development of Area 16 would occur after development of the industrial-commercial site in Ewa Makai.

RELEVANT TRADE AREA

The relevant trade area used to project demand for industrial-commercial land use is discussed under the following subheadings.

Delineation of the Ewa Trade Area

The trade area for industrial-commercial land uses includes the following neighborhoods:

- "New Ewa" trade area:
  - Ewa Gentry
  - Ocean Pointe
  - East Kapolei-Ewa Villages, including West Loch (portion).
- "Ewa Beach" trade area:
  - Ewa Beach
  - Iroquois Point
  - Puuloa.

The relative location of the neighborhoods comprising the Ewa trade area is shown on a map included as Exhibit IV-C.

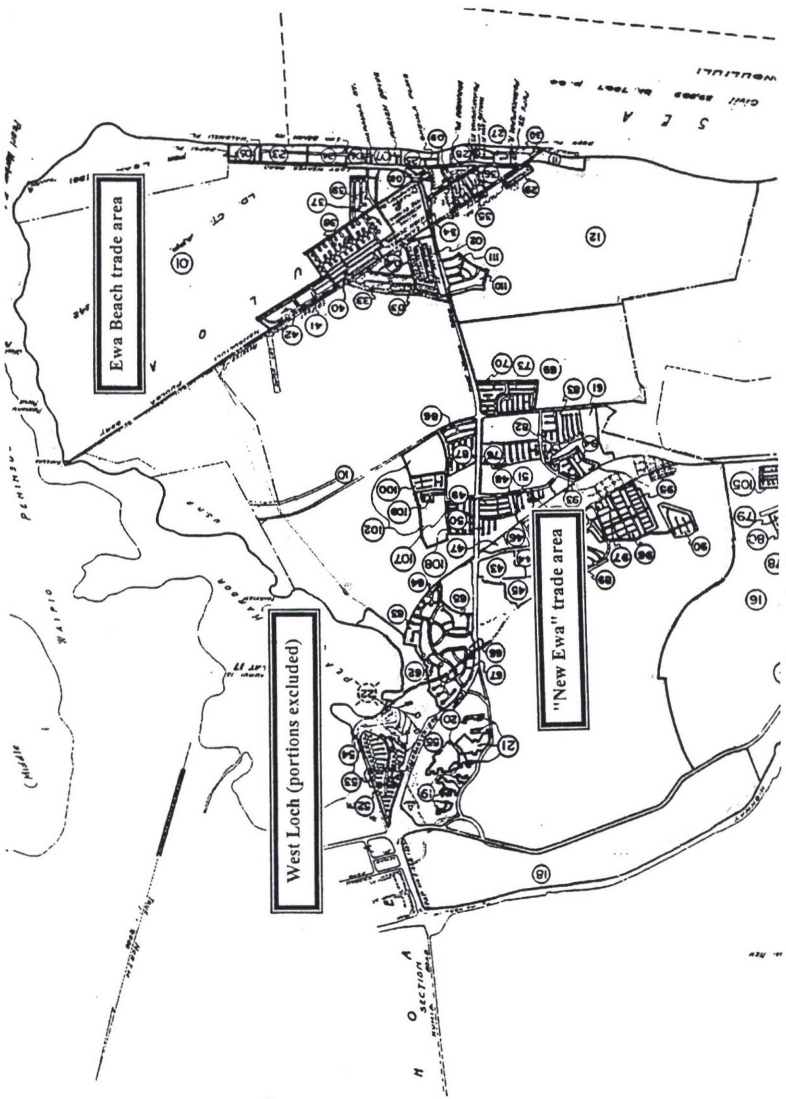
Projected Resident Population in the Ewa Trade Area

The population projections for the Ewa Gentry-Ocean Pointe [1] and other neighborhoods are based on the 2000 actual resident population and the following assumptions:

- The resident population for the East Kapolei-Ewa Villages area is projected to increase based on an estimated average annual growth rate of about 1.5% until 2004 and declining to under 1% by 2025.

[1] Refer to Exhibit III-E.

MAP OF THE EWA TRADE AREA [1]



Source: John Child & Company.

- The resident population for the Ewa Beach area is projected based on an estimated average annual growth rate of about 1.5% until 2004 and declining to under 1% by 2025.

- The projected resident population in the Puuloa and Iroquois Point neighborhood assumes a zero population growth over the projection period.

Based on these assumptions, the population in the Ewa trade area is projected to increase from about 39,600 to about 74,000 persons by 2025, as shown in Exhibit IV-D.

LAND USE PATTERNS

Current land use patterns in similar neighborhoods on Oahu, including Kakaako, Waipio, Waipahu, Mapunapuna, Kailua, Kaneohe and Kalihi, show that industrial zoned lands are occupied by retail tenants, thus creating a mix of light industrial and commercial land uses. The retail businesses on industrial zoned lands do not require the retail prominence of business-zoned lands and instead benefit from the surrounding industrial employment and customer base.

The IMX-1 zoning proposed for the Ewa Makai site would legally permit a mix of light industrial and commercial uses. Neighborhood uses that would be appropriate for the Ewa Makai site are shown in Exhibit IV-E.

HISTORICAL AND PROJECTED INDUSTRIAL-COMMERCIAL LAND DEMAND

The historical industrial-commercial land demand is analyzed and current and future demand is projected using two different indicators of land demand. The indicators are:

1. Industrial-commercial land per capita
2. Industrial employment density.

The indicators support development and absorption of the industrial-commercial site planned in 2007-2008.

1. Estimated Industrial-Commercial Land Demand Per Capita

The projected demand for industrial-commercial land in the Ewa trade area was analyzed based on the existing industrial-commercial land per capita in similar neighborhoods.

PROJECTED RESIDENT POPULATION IN THE EWA TRADE AREA
2000 - 2025

Year	New Ewa Trade Area: Ewa Gentry-Ocean Pointe [1]	New Ewa Trade Area: East Kapolei-Ewa Villages [2]	New Ewa Trade Area: Total	Ewa Beach Trade Area: Ewa Beach [2]	Ewa Beach Trade Area: Iroquois Pointe [3]	Ewa Beach Trade Area: Puuloa [3]	Ewa Beach Trade Area: Total	Total Ewa trade area (rounded)
2000	14,239	6,807	21,046	8,087	3,856	6,563	18,506	39,600
2001	15,540	6,910	22,450	8,210	3,856	6,563	18,629	41,100
2002	16,840	7,010	23,850	8,330	3,856	6,563	18,749	42,600
2003	18,140	7,120	25,260	8,450	3,856	6,563	18,869	44,100
2004	19,440	7,230	26,670	8,580	3,856	6,563	18,999	45,700
2005	20,740	7,340	28,080	8,710	3,856	6,563	19,129	47,200
2006	22,040	7,420	29,460	8,810	3,856	6,563	19,229	48,700
2007	23,340	7,500	30,840	8,910	3,856	6,563	19,329	50,200
2008	24,640	7,580	32,220	9,010	3,856	6,563	19,429	51,600
2009	25,940	7,660	33,600	9,110	3,856	6,563	19,529	53,100
2010	27,190	7,740	34,930	9,210	3,856	6,563	19,629	54,600
2011	28,440	7,810	36,250	9,290	3,856	6,563	19,709	56,000
2012	29,690	7,880	37,570	9,370	3,856	6,563	19,789	57,400
2013	30,940	7,950	38,890	9,450	3,856	6,563	19,869	58,800
2014	32,190	8,020	40,210	9,540	3,856	6,563	19,959	60,200
2015	33,390	8,090	41,480	9,630	3,856	6,563	20,049	61,500
2016	34,590	8,150	42,740	9,710	3,856	6,563	20,129	62,900
2017	35,790	8,220	44,010	9,790	3,856	6,563	20,209	64,200
2018	36,990	8,290	45,280	9,870	3,856	6,563	20,289	65,600
2019	38,190	8,360	46,550	9,950	3,856	6,563	20,369	66,900
2020	39,290	8,430	47,720	10,030	3,856	6,563	20,449	68,200
2021	40,390	8,470	48,860	10,080	3,856	6,563	20,499	69,400
2022	41,490	8,510	50,000	10,130	3,856	6,563	20,549	70,500
2023	42,590	8,550	51,140	10,180	3,856	6,563	20,599	71,700
2024	43,690	8,590	52,280	10,230	3,856	6,563	20,649	72,900
2025	44,691	8,630	53,321	10,280	3,856	6,563	20,699	74,000

[1] Resident population in the Ewa Gentry-Ocean Pointe area was previously estimated in Exhibit III-E.
[2] The resident population in the East Kapolei-Ewa Villages census tract excludes an estimated 1,800 persons in tax map parcels 9-1-52, 53 and 54 of the West Loch subdivision that are considered to be outside of the retail trade area. The resident population growth in the Ewa Beach and East Kapolei-Ewa Villages census tracts is projected based on an estimated average annual growth rate of about 1.5% and declining to under 1% by 2025.
[3] The projected resident population in the Puuloa and Iroquois Point census tracts assumes zero growth.

Source: John Child & Company and the U.S. Census Bureau, 2000 Census.

NEIGHBORHOOD INDUSTRIAL-COMMERCIAL USES

A
Accountants
Accountants - CPAs
Acoustical Consultants
Acupuncture
Adjusters
Adoption Services
Advertising Agencies & Counselors
Air Conditioning Contractors
Air Conditioning Equipment & Systems
Air Conditioning Repair
Airport Transportation
Alcohol Abuse & Addiction Info & Treatment
Alterations-Clothing
Alternative Health
Amusement Places
Antique Dealers & Repair/Restoration
Appliances-Household-Major-Service & Repair
Appraisers
Architects
Art Galleries, Dealers & Consultants
Attorneys
Automobile Body Repair & Paint
Automobile Detailing
Automobile Lubricating & Oil Service
Automobile Parts & Supplies - New
Automobile Radios & Stereos Installation
Automobile Rental
Automobile Repair & Service
Automobile Tinting - Window
Automobile Upholstery Repair & Cleaning
Awnings & Canopies

B
Baby Accessories & Services
Bakers-Retail
Banks
Barbers
Bathroom Remodeling
Beauty Salons & Services
Books - New
Bowling
Brake Service & Repair
Building Materials
Burglar Alarms-Monitoring & Systems

C
Cabinet Makers
Cabinets
Cabinets-Refinishing & Resurfacing
Candy & Confectionery-Retail
Car Wash & Polish
Carpet & Rug-Dealers-New
Carpet, Rug & Upholstery Cleaners
Caterers
Cellular Phones Equipment & Service
Cemeteries & Memorial Parks
Check Cashing Service
Children's & Infant's Wear-Retail
Chinese Foods
Chiropractic Doctors
Churches
Cleaners
Clinics
Clothing-Retail
Cocktail Lounges
Coffee Houses
Coins & Collectibles
Collection Agencies
Compact Discs, Records & Tapes-Retail
Computer-Dealers
Computer-Service & Repair
Concrete Contractors
Contact Lenses
Contractors-Remodeling & Repairing
Convenience Stores
Cookies & Crackers
Copy & Duplicating Service
Cosmetics
Counselors - Personal
Craft Supplies-Retail

D
Dancing Instruction
Delicatessens - Retail
Dentists
Diaper Service
Discount Stores
Doors
Draperies - Retail
Dry Wall Contractors

E
Electric Contractors
Electric Equipment-Service & Repair
Electronic Equipment & Supplies - Dealers
Engineers-Consulting
Engines-Rebuild & Exchange
Environmental Consultants
Escrow Service
Exercise & Physical Fitness

F
Family Planning Counseling
Fans - Retail
Fax Services
Fence Contractors
Financial Advisors & Services
Firearms Training
Fish & Seafood-Retail
Fishermen's Supplies
Floor Laying, Refinishing & Resurfacing
Florists-Retail
Foods-Carry Out
Furniture Rent & Lease
Furniture Repair & Refinish
Furniture-Retail

G
Garden & Lawn Equipment & Supplies
Gardeners
Gasoline-Retail
Gift Shops
Glass-Automobile
Glass-Plate, Window, Etc
Golf Equipments & Supplies
Greeting Cards
Gutters & Downspouts
Gymnastics Instruction

H
Hardware-Retail
Hawaiian Foods
Health Clubs
Health & Diet Food Products-Retail
Hearing Aids
Home Improvements
Home Inspection
House Cleaning

Source: Gentry Homes, Ltd.

I
Ice Cream & Frozen Desserts-Dealers
Insurance
Interior Designers
Investigators
J
Juices
K
Karaoke
Kitchen Cabinets & Equipment-Household-Retail
Kitchen Planning & Remodeling
L
Landscape Contractors
Laundries
Leather Apparel-Repairing
Liquor Stores
Loans
Locks & Locksmiths
Lumber - Retail

M
Mailbox Rental & Receiving
Manicuring
Marriage, Family, Child & Individual Counselors
Martial Arts-Instruction
Mason Contractors
Massage - Licensed Therapists
Mortgages
Motorcycle Repair
Mufflers & Exhaust Systems-Engine-Retail
Music Instruction-Instrumental
Music Instruments-Retail
N
Nail Salons
O
Office Supplies
Optometrists-OD
P
Packaging Services
Paint - Retail
Painting Contractors
Party Supplies
Pawnbrokers
Pest Control Services
Pet Shops

P (continued)
Pharmacies
Photo Finishing-Retail
Physical Therapists
Physicians & Surgeons
Plumbing Contractors
Plumbing Repair
Pretzels
Psychologists
R
Real Estate
Rental Service Stores & Yards
Roof Contractors
S
Schools-Industrial, Technical & Trade
Screens-Door & Window-Repairing & Servicing
Service Stations-Gas & Oil
Shoe Repair
Shoes-Retail
Signs
Solar Energy Equipment & Systems-Dealers
Sprinklers-Garden & Lawn-Installation & Service
Storage-Self Service
Surfboards-Retail
T
Tailors
Tattooing
Tax Return Preparation
Taxicabs
Television & Radio Dealers & Service
Termite Control
Tile-Ceramic-Contractors
Tinting Contractors-Window
Tire Dealers-Retail
Title Companies
Towing-Automotive
Toys-Retail
Transmissions-Automobile
Travel Agencies & Bureaus
Tree Service
Tutoring

U
Upholsterers
V
Vacuum Cleaners-Household-Dealers
Vacuum Cleaners-Repairing & Parts
Veterinarians
Veterinary Hospitals
Video Equipment-Service & Repair
Video Tapes & Discs-Sales & Rentals
W
Wall Coverings-Fabric, Plastic, Etc-Contractors
Wallpapers & Wall Coverings-Retail
Washing Machines & Dryers-Dealers
Washing Machines & Dryers-Rent & Lease
Washing Machines & Dryers-Service & Repair
Water Heaters-Repairing
Water Purification & Filtration Equipment
Waterproofing Contractors
Wedding Chapels & Ceremonies
Wedding Consultants, Arrangements & Services
Welding
Wheel Alignment, Frame & Axle Servicing-Automotive
Window Cleaning
Window Tinting
Windshield Repair
Woodworking
Y
Yoga Instruction

Source: Gentry Homes, Ltd.

Industrial-Commercial Land Per Capita in Similar Neighborhoods

The existing industrial-commercial land in the Ewa trade area was compared with selected neighborhoods in Central and Windward Oahu that are similar to the Ewa trade area in terms of neighborhood demographics and location. The selected neighborhoods are mature in terms of population growth, land use and development patterns.

For the purpose of this analysis, only industrial or industrial-commercial mixed-use lands were included as industrial-commercial lands. Industrial-commercial land in these neighborhoods range from about 0.72 acres for every 1,000 residents in Kailua-Kaneohe to about 2.15 acres for every 1,000 residents in Waipio-Mililani, as shown in Exhibit IV-F.

Supportable Industrial-Commercial Land in the Ewa Trade Area

Based on the 2001 resident population in the Ewa trade area and an estimated ratio of 0.75 acres of industrial-commercial land for every 1,000 residents, support for almost 31 acres of industrial-commercial land currently exists. The projected population growth could support another 25 acres of industrial-commercial land by 2025, as shown in Exhibit IV-G.

Gentry owns about 12 acres of light industrial-zoned land identified as a portion of Area 16 that will be developed after Ewa Makai. Based on the analysis of demand per capita, development of the Area 16 industrial-zoned land could be supported after development of the Ewa Makai site. About 38 acres zoned for industrial use in Ocean Pointe (Ewa Marina) are not intended for service industrial uses and neighborhood commercial uses that are appropriate for the Ewa Makai site and are not considered to be competitive with the Ewa Makai site.

2. Industrial Employment Density [1]

The industrial employment density is a corollary analysis that projects the demand for light industrial land only. The projected demand for industrial land is analyzed based on the DPP's forecasted industrial employment base for the Ewa trade area.

Projected Employment Densities for Ewa

The City & County of Honolulu Department of Planning and Permitting (DPP) forecasts employment densities for selected neighborhoods as of 2025. An industrial employment density of about 8.1 industrial jobs per 1,000 residents was forecast for the Ewa area. In comparison to the forecast industrial employment density for the Ewa neighborhood, the average industrial employment density for similar neighborhoods is about 26.2 jobs per 1,000 residents. Based on the industrial employment densities for similar neighborhoods, about 25 industrial jobs for every 1,000 residents could be supported in the Ewa trade area, as shown in Exhibit IV-H.

[1] For the purpose of this analysis, industrial employment density refers to the number of industrial jobs per 1,000 residents in a given trade area.

INDUSTRIAL-COMMERCIAL LANDS IN SIMILAR NEIGHBORHOODS

Area	Neighborhoods included	2000 resident population	Industrial-Commercial Land (Acres) Total	Per 1,000 residents
Kailua	Kailua, Maunawili	41,382	7.9 [1]	0.19
Kaneohe	Kaneohe, Heeia, Ahuimanu, Kahaluu	51,355	58.5	1.14
	Combined Kailua-Kaneohe	92,737	66.4	0.72
Waipio-Mililani	Waipio Gentry, Waikele, Village Park, Mililani Town, Mililani Mauka	56,608	121.5[2]	2.15

[1] Excludes Kapaa Quarry and surrounding industrial zoned lands.
[2] Includes Costco in Waipio Gentry and excludes Mililani Tech Park.

Source: John Child & Company based on MLS Hawaii, Inc. REsearch TMK and the 2000 U.S. Census.

PROJECTED INDUSTRIAL-COMMERCIAL LAND REQUIREMENT 2001 - 2025

Development year	Calendar year end	Resident population in trade area x	Estimated land requirement (acres/ 1,000 residents) =	Projected industrial-commercial land requirement (cumulative acres)
0	2001	41,100	0.00075	30.8
1	2002	42,600	0.00075	32.0
2	2003	44,100	0.00075	33.1
3	2004	45,700	0.00075	34.3
4	2005	47,200	0.00075	35.4
5	2006	48,700	0.00075	36.5
6	2007	50,200	0.00075	37.7
7	2008	51,600	0.00075	38.7
8	2009	53,100	0.00075	39.8
9	2010	54,500	0.00075	40.9
10	2011	55,900	0.00075	41.9
11	2012	57,300	0.00075	43.0
12	2013	58,700	0.00075	44.0
13	2014	60,100	0.00075	45.1
14	2015	61,500	0.00075	46.1
15	2016	62,900	0.00075	47.2
16	2017	64,200	0.00075	48.2
17	2018	65,600	0.00075	49.2
18	2019	66,900	0.00075	50.2
19	2020	68,100	0.00075	51.1
20	2021	69,300	0.00075	52.0
21	2022	70,500	0.00075	52.9
22	2023	71,700	0.00075	53.8
23	2024	72,900	0.00075	54.7
24	2025	74,000	0.00075	55.5

Source: John Child & Company.

FORECAST EMPLOYMENT DENSITIES FOR SELECTED NEIGHBORHOODS IN 2025 INDUSTRIAL JOBS

Neighborhood	Employment density [1]
Ewa (1990 census tract 84) [2]	**8.1**
Central Oahu:	
Waipio	16.9
Waipio-Mililani	17.9
Waipio-Mililani-Village Park	48.5
Windward Oahu:	
Kaneohe	28.3
Kaneohe-Waikane	23.0
Kailua (excl. Mokapu)	26.8
Kailua-Waimanalo	24.7
Central and Windward Oahu:	
Average	26.2
Median	24.2
Estimated employment density for Ewa trade area	25.0

[1] Employment density, or the number of jobs for every 1,000 residents, includes jobs in the industrial and transportation/communication/utilities sectors only for the purposes of projecting industrial demand. Jobs in the retail, service, finance/insurance/real estate (FIRE), military, government, hotel, agriculture, and construction sectors are excluded.

[2] The forecast 2025 employment density for 1990 census tract 84 that includes Ewa Gentry, Ocean Pointe and Ewa Beach is not consistent with the current or forecasted densities of similar neighborhoods.

Source: City & County of Honolulu Department of Planning and Permitting, **Year 2025 Forecast Population, Housing and Employment by Census Tract, July 2000.**

Based on this density, the Ewa trade area resident population could currently support about 1,028 industrial jobs, shown as follows:

Trade area population (2001)	41,100
Estimated employment density [1]	.025
Supportable industrial jobs	1,028

Supportable Industrial Land

The number of industrial jobs estimated for the Ewa trade area is converted to an industrial land requirement based on the ratio of employees to land typical for industrial jobs. Average absorption rates, or the ratio of employees to one acre of land, range from one acre of land for every 5.9 employees in the transportation and warehousing sector to about 251.0 employees for labor-intensive retail establishments such as eating and drinking establishments.

Based on the anticipated uses, an average absorption rate of 50 employees/acre is considered to be conservative for projecting the industrial land requirements for the Ewa trade area, as shown in Exhibit IV-I.

Based on an estimated 1,028 industrial jobs and an average absorption rate of 50 employees/acre, support exists for about 21 acres, as shown in Exhibit IV-J.

This analysis does not consider the full range of industrial-commercial uses that would be appropriate for the Ewa Makai site. Therefore, the analysis understates the projected demand for the Ewa Makai industrial-commercial site.

PROJECTED ABSORPTION OF THE EWA MAKAI INDUSTRIAL-COMMERCIAL SITE

The estimated and projected industrial-commercial land requirement for Ewa Makai considers the following:

- The market assessment for the 30-acre industrial-commercial site assumes the property is primarily used for light and/or service industrial purposes with ancillary retail uses that would support the industrial tenants as permitted under the IMX-1 zoning district.
- A mix of light and/or service industrial and retail uses already exists in similar neighborhoods throughout Oahu.
- The mixed-use development would be compatible with the adjacent Laulani commercial development.

[1] Represents an estimated industrial employment density of 25 industrial jobs for every 1,000 residents in the Ewa trade area.

INDUSTRIAL LAND ABSORPTION RATES (EMPLOYEES/ACRE)

Industrial-commercial mixed use jobs	Average absorption rates (employees/acre)	
Transportation & warehousing	5.9	
Misc. manufacturing	9.6	
Construction	53.5	
Trade [1]	80.2	[2]
Other services [3]	105.4	
Finance, insurance & real estate (FIRE)	210.8	
Eating & drinking establishments	251.0	
Estimated rate for Ewa trade area	**50.0**	

[1] The trade sector includes furniture stores and lumber and building material outlets.
[2] The average absorption rate is estimated for trade, other services, FIRE, and eating & drinking establishments based on the reported average floor area per employee and an estimated building to land ratio of 0.85, for comparative purposes only.
[3] "Other services" include labor intensive activities such as legal and accounting services, as well as space extensive activities such as theater and YMCA.

Source: John Child & Company, based on land use files of the City & County of Honolulu Department of Planning and Permitting (fka Department of General Planning), circa 1975 and 1987.

PROJECTED DEMAND FOR INDUSTRIAL LAND
2001 – 2025

Development year	Calendar year end	Trade area population	x Estimated employment density (jobs/resident) =	Supportable industrial jobs	÷ Estimated absorption rate (employees/acre) =	Projected demand for industrial land [1]
0	2001	41,100	0.025	1,028	50	21.0
1	2002	42,600	0.025	1,065	50	21.0
2	2003	44,100	0.025	1,103	50	22.0
3	2004	45,700	0.025	1,143	50	23.0
4	2005	47,200	0.025	1,180	50	24.0
5	2006	48,700	0.025	1,218	50	24.0
6	2007	50,200	0.025	1,255	50	25.0
7	2008	51,600	0.025	1,290	50	26.0
8	2009	53,100	0.025	1,328	50	27.0
9	2010	54,500	0.025	1,363	50	27.0
10	2011	55,900	0.025	1,398	50	28.0
11	2012	57,300	0.025	1,433	50	29.0
12	2013	58,700	0.025	1,468	50	29.0
13	2014	60,100	0.025	1,503	50	30.0
14	2015	61,500	0.025	1,538	50	31.0
15	2016	62,900	0.025	1,573	50	31.0
16	2017	64,200	0.025	1,605	50	32.0
17	2018	65,600	0.025	1,640	50	33.0
18	2019	66,900	0.025	1,673	50	33.0
19	2020	68,100	0.025	1,703	50	34.0
20	2021	69,300	0.025	1,733	50	35.0
21	2022	70,500	0.025	1,763	50	35.0
22	2023	71,700	0.025	1,793	50	36.0
23	2024	72,900	0.025	1,823	50	36.0
24	2025	74,000	0.025	1,850	50	37.0

[1] The analysis does not consider the full range of industrial-commercial uses that would be appropriate for the Ewa Makai site. Therefore, the projections understate the demand for the Ewa Makai industrial-commercial site.

Source: John Child & Company.

Gentry proposes to develop the 30-acre industrial-commercial site in 2007 because it plans to develop Ewa Makai East before Ewa Makai West. Assuming no other lands are rezoned to permit competitive industrial-commercial use, the demand for industrial-commercial uses supports development of the 30-acre site in Ewa Makai because:

- Based on the industrial-commercial land per capita in similar neighborhoods, the existing availability of industrial-commercial land accessible to the resident population in the Ewa trade area is limited.

- The existing and forecast industrial employment in the Ewa trade area is considered low based on employment densities in similar neighborhoods. The industrial-commercial development could create a variety of industrial and commercial employment opportunities for the residents in the area.

V - FISCAL AND ECONOMIC IMPACT ANALYSES – STUDY APPROACH

The fiscal and economic impacts of the proposed Ewa Makai development are projected based on the following study approach and assumptions.

Reporting

All estimates are reported in 2001 dollars unless otherwise stated and do not reflect inflation.

Input-Output Model

The economic impacts of the Ewa Makai development are analyzed in terms of the total output, employment, and household income that are generated from the development of Ewa Makai. These impacts were projected using the methodology and multipliers reported in **The Hawaii Input-Output Study 1992 Benchmark Report** prepared by the State of Hawaii Department of Business, Economic Development & Tourism (DBEDT) in December 1998 ("DBEDT's I-O study").

DBEDT defines "impact analysis" as:

> The estimation of production changes which would occur in the economy as a result of increased or decreased output in a given sector. This technique can provide information to planners on the ramifications of a proposed project or give policy-makers an idea as to how government actions might impact on the size of various sectors. [1]

Description of Construction Expenditures

The economic impacts and certain fiscal impacts of the Ewa Makai development, including general excise tax and income tax revenues, are based on the construction expenditures associated with the residential and industrial-commercial developments.

As used in this report, "construction expenditures" refers to the direct and indirect costs associated with the residential housing units, including in-tract (onsite) costs; industrial-commercial pad sites and building construction; parks; and offsite costs including exterior roadway improvements, sidewalks, water and sewer mains, and drainage basin. For the purpose of estimating the economic impacts based on DBEDT's I-O study, "construction expenditures" **exclude** the following:

- Carrying costs such as points, fees, service charges and interest on any construction loans and land loans to finance the development
- Entrepreneurial (developer's) profit
- Developer's cost of land.

[1] The State of Hawaii Department of Business, Economic Development & Tourism (DBEDT), **The Hawaii Input-Output Study 1992 Benchmark Report**, December 1998.

In DBEDT's I-O study, these expenditures are not considered to be direct construction expenditures; however, when carrying costs are paid and when units are sold, the carrying costs, land costs and profit flow directly into the economy and provide additional economic benefits.

Direct construction costs for the Ewa Makai residential developments and industrial-commercial pad sites, including in-tract and offsite costs, are based on direct construction cost estimates provided by Gentry Homes, Ltd. (Gentry). The construction cost estimates provided by Gentry were compared to construction costs experienced in comparable projects in the State of Hawaii and were considered to be consistent and reliable for the purpose of this report.

The industrial-commercial pad sites will be developed by the individual buyers. Plans and specifications for building improvements on the industrial-commercial site are unknown. For the purpose of this report, the construction costs associated with development of the industrial-commercial buildings are estimated based on a conservative building-to-land ratio and direct construction cost.

Gentry will be responsible for grading and landscaping costs, including irrigation, for two park sites to be dedicated to the City & County of Honolulu (City). The proposed park sites are 3.5 acres and 8.0 acres. The cost to prepare the parks for dedication to the City is estimated to total about $120,000/acre, or about $1,380,000 for the total 11.5 acres.

Indirect construction costs for the residential, industrial-commercial, and infrastructure improvements are estimated by John Child & Company as a percentage of total direct construction costs based on indirect construction costs experienced in comparable projects.

This report focuses on the fiscal and economic impacts of the salable residential and industrial-commercial sites in Ewa Makai. As a result, construction expenditures and the associated economic impacts **exclude** the following:

- Construction of the proposed middle school, estimated to total about $37.0 million, including $2.5 million for design and $34.5 million for site work and building construction. The estimated construction cost is assumed to be mostly financed by bonds issued by the State of Hawaii. Gentry is assumed to pay its fair share of the school construction costs, currently estimated by the Department of Education Facilities Management Division to be about $1,000 for every residential housing unit in the Ewa Makai development, or about $1,865,000. Gentry's share of the construction costs may take the form of a land donation to the Department of Land and Natural Resources (DLNR) on behalf of the State of Hawaii.

- Development of two church sites and a recreational facility site is not covered in this study. These three 2-acre sites are assumed to be sold to and developed by private entities.

- Onsite work associated with the 14-acre site in Ewa Makai West designated for open space.

These items will add economic benefits that have not been considered.

Real Property Tax Increase Based on Rezoning

Currently, the Ewa Makai lands are zoned for agricultural use. The 2001 land assessed value for the total 283 acres is $72,400, or about $256/acre. Gentry is seeking rezoning of 189 acres to residential and 30 acres to industrial-commercial mixed use (IMX-1). Upon rezoning, the lands would immediately be assessed at these higher-order urban land uses. The County would collect additional real property taxes on the rezoned lands.

However, this report recognizes that State Land Use reclassification and County rezoning is typically a lengthy process and the timing of rezoning is not predictable. The real property tax increase is assumed to occur in 2005 when the market supports development of Ewa Makai. Therefore, the real property tax benefit is understated as it does not account for increased real property tax revenues that could be generated if the lands are rezoned prior to 2005.

VI - PROJECTED CONSTRUCTION EXPENDITURES

This section projects the construction expenditures that would result from development of Ewa Makai. Construction expenditures are the basis of the Input-Output model (I-O model) and multipliers reported by the Department of Business, Economic Development & Tourism (DBEDT) and are the basis of projecting the economic impacts of Ewa Makai.

RESIDENTIAL DEVELOPMENT

- Direct construction costs include materials, products, equipment, labor and contractor's profit and overhead. Based on construction costs for similar unit types currently under development in the Ewa by Gentry neighborhoods, the direct construction costs for the Ewa Makai units are estimated to range from about $83,000 for a typical multi-family condominium unit to about $145,000 for a typical traditional single-family detached dwelling.

- Based on the estimated construction costs and Gentry's proposed unit mix for Ewa Makai, the weighted direct construction cost/unit for the mix of 1,865 units is estimated to be about $111,000, as shown in Exhibit VI-A.

- Indirect construction costs include architectural and engineering fees, surveys, administrative overhead, property taxes, and sales and marketing expenses and are estimated at 26% of direct construction costs.

- Based on the projected annual absorption of the 1,865 residential units in Ewa Makai, construction expenditures are estimated to be about $14.8 million in 2006 and increase to about $40.1 million by 2007. Construction expenditures for the 1,865 units are projected to total about $260.7 million over eight years, as shown in Exhibit VI-B.

Industrial-Commercial Development

- Direct construction costs for the industrial-commercial site, assuming development of individual pad sites to be offered for sale, are estimated by Gentry to be about $200,000/acre, or about $6,000,000 for the 30-acre site.

- Indirect costs include architectural and engineering fees, surveys, administrative overhead, property taxes, and sales and marketing expenses and are estimated as 26% of direct construction costs, or about $1,560,000.

- Assuming the 30-acre site is phased over two years, construction expenditures for the industrial-commercial pad sites are estimated to be about $3.8 million annually, as shown in Exhibit VI-C.

Ewa by Gentry Makai — Exhibit VI-A

WEIGHTED DIRECT CONSTRUCTION COST/UNIT

Unit type	Estimated direct costs/unit	x	Unit mix	=	Weighted direct cost/unit
Single-family detached dwellings	$145,000		29.5%		$42,775
Single family condominium units	109,000		36.2%		39,458
Multi-family condominium units	83,000		34.3%		28,469
Total, rounded			100.0%		$111,000

Source: Gentry Homes, Ltd.

PROJECTED CONSTRUCTION EXPENDITURES FOR THE RESIDENTIAL UNITS
2006 - 2013

Calendar year end	Projected absorption (units)	x	Estimated direct construction cost/unit	=	Total direct costs	+	Indirect costs [1]	=	Total (rounded) [2]
2006	106		$111,000		$11,766,000		$3,059,160		$14,800,000
2007	287		111,000		31,857,000		8,282,820		40,100,000
2008	287		111,000		31,857,000		8,282,820		40,100,000
2009	287		111,000		31,857,000		8,282,820		40,100,000
2010	276		111,000		30,636,000		7,965,360		38,600,000
2011	276		111,000		30,636,000		7,965,360		38,600,000
2012	276		111,000		30,636,000		7,965,360		38,600,000
2013	70		111,000		7,770,000		2,020,200		9,800,000
Total	1,865				$207,015,000		$53,823,900		$260,700,000

[1] Estimated as 26% of total direct costs.
[2] For the purpose of this impact analyses, construction expenditures exclude carrying costs, entrepreneurial profit, and the cost of land.

Source: John Child & Company and Gentry Homes, Ltd.

PROJECTED CONSTRUCTION EXPENDITURES FOR THE INDUSTRIAL-COMMERCIAL PAD SITES
2007 - 2008

Calendar year	Projected absorption (acres)	x	Estimated direct costs/acre	=	Total direct costs	+	Indirect costs [1]	=	Total (rounded) [2]
2007	15.0		$200,000		$3,000,000		$780,000		$3,800,000
2008	15.0		200,000		3,000,000		780,000		3,800,000
Total					$6,000,000		$1,560,000		$7,600,000

[1] Estimated as 26% of total direct costs.
[2] For the purpose of this impact analyses, construction expenditures exclude carrying costs, entrepreneurial profit, and the cost of land.

Source: John Child & Company and Gentry Homes, Ltd.

- The industrial-commercial pad sites will be developed by the individual buyers. Plans and specifications for the building improvements are not predictable. For the purpose of this report, the construction costs for the industrial-commercial buildings are conservatively estimated based on an average building-to-land ratio of 0.60, direct construction costs of $84/sf of building area, and indirect construction costs equal to 20% of direct costs.

- The direct construction cost is based on building costs estimated for Class A industrial properties in the Marshall & Swift "Marshall Valuation Service" reports. Indirect construction costs assume zero to minimum marketing costs and project administration costs are associated with the primarily owner-user developments.

- Based on these assumptions, a 26,000sf building on a one-acre site in the industrial-commercial development is projected to cost about $2.6 million. Assuming 15 acres are developed in both 2008 and 2009, about $39.0 million in annual construction is projected for the industrial-commercial site, as shown in Exhibit VI-D.

- Total construction costs associated with the industrial-commercial development, including the costs to create the pad sites and the building construction costs, are projected to be about $85.6 million, as shown in Exhibit VI-E.

Infrastructure Costs

- Infrastructure costs assume Gentry begins construction of the necessary infrastructure in 2005, about one year prior to construction of the residential units in Ewa Makai East.

- Infrastructure costs include in-tract costs and offsite costs. The direct costs for the infrastructure improvements are estimated to total about $52.2 million and $24.9 million, respectively, and include the necessary onsite improvements, construction of the drainage basin on 30 acres of land in Ewa Makai East, the extension of the Kapolei Parkway in Ewa Makai West, and roadway and utility improvements.

- Indirect costs are estimated as 10% of the total direct construction costs and include engineering fees, surveys, and administrative overhead.

- Total infrastructure costs are projected to increase from about $6.6 million in 2005 to about $15.3 in 2008 and total about $84.9 million over the construction period, as shown in Exhibit VI-F.

Park Improvements

A 3.5-acre site and an 8.0-acre site are reserved for parks that will be dedicated to the City & County of Honolulu. This report assumes the two parks are created in 2009. Park dedication rules require that Gentry grade and grass the sites and install an irrigation system at its expense. The cost to prepare the parks for dedication to the City is estimated to total about $120,000/acre, or about $1,380,000 for the 11.5 acres.

PROJECTED COSTS FOR INDUSTRIAL-COMMERCIAL BUILDINGS
2008 - 2009

Average building area/acre [1]	26,000
x estimated direct building construction cost/sf	$84
Estimated direct costs/acre of land	$2,184,000
Estimated indirect costs [2]	436,800
Estimated construction cost/acre, rounded	$2,600,000
x developed land (acres)	15
Annual construction cost [3]	$39,000,000

[1] In square feet; conservatively estimated based on a building-to-land ratio of about 0.60.
[2] Estimated to be 20% of total direct costs.
[3] Assumes 15 acres developed in 2008 and 15 acres developed in 2009.

Source: John Child & Company and Gentry Homes, Ltd.

PROJECTED CONSTRUCTION COSTS FOR INDUSTRIAL-COMMERCIAL DEVELOPMENT
2007 - 2009

Year	Pad sites	+	Building construction	=	Total
2007	$3,800,000		$0		$3,800,000
2008	3,800,000		39,000,000		42,800,000
2009	0		39,000,000		39,000,000
Total	$7,600,000		$78,000,000		$85,600,000

Source: John Child & Company and Gentry Homes, Ltd.

PROJECTED INFRASTRUCTURE COSTS
2005 - 2012

Year	In-tract Costs					Offsite Costs					Total infrastructure costs
	Direct costs	+	Indirect costs [1]	=	Total (rounded)	Direct costs	+	Indirect costs [1]	=	Total (rounded)	
2005	$3,252,000		$325,200		$3,600,000	$2,700,000		$270,000		$3,000,000	$6,600,000
2006	9,528,000		952,800		10,500,000	1,900,000		190,000		2,100,000	12,600,000
2007	7,600,000		760,000		8,400,000	5,100,000		510,000		5,600,000	14,000,000
2008	7,600,000		760,000		8,400,000	6,250,000		625,000		6,900,000	15,300,000
2009	5,920,000		592,000		6,500,000	3,400,000		340,000		3,700,000	10,200,000
2010	5,480,000		548,000		6,000,000	4,150,000		415,000		4,600,000	10,600,000
2011	7,920,000		792,000		8,700,000	1,400,000		140,000		1,500,000	10,200,000
2012	4,900,000		490,000		5,400,000	0		0		0	5,400,000
Total	$52,200,000		$5,220,000		$57,500,000	$24,900,000		$2,490,000		$27,400,000	$84,900,000

[1] Estimated as 10% of total direct costs. For the purpose of projecting the economic impacts, finance costs including interest expense and loan fees are excluded.

Source: John Child & Company and Gentry Homes, Ltd.

Total Construction Expenditures

Based on the projected absorption periods and construction cost estimates, construction expenditures for the Ewa Makai developments are projected to total about $432.6 million over the nine-year period between 2005 and 2013, and average about $48.1 million annually, as shown in Exhibit VI-G.

Construction expenditures to complete the residential development are projected to total about $324.4 million, and average about $36.0 million annually over the nine-year construction period. The average annual construction expenditure attributable to the residential development in Ewa Makai would represent about 9% of the total residential construction on Oahu in 2000, as shown in Exhibit VI-H.

PROJECTED CONSTRUCTION EXPENDITURES
2005 - 2013

Calendar year	Residential	Industrial-commercial	Infrastructure	Park improvements	Total (rounded)
2005	$0	0	6,600,000	0	6,600,000
2006	14,800,000	0	12,600,000	0	27,400,000
2007	40,100,000	3,800,000	14,000,000	0	57,900,000
2008	40,100,000	42,800,000	15,300,000	0	98,200,000
2009	40,100,000	39,000,000	10,200,000	1,380,000	90,700,000
2010	38,600,000	0	10,600,000	0	49,200,000
2011	38,600,000	0	10,200,000	0	48,800,000
2012	38,600,000	0	5,400,000	0	44,000,000
2013	9,800,000	0	0	0	9,800,000
Total	260,700,000	85,600,000	84,900,000	1,380,000	432,600,000
Percent of total	60.3%	19.8%	19.6%	0.3%	100.0%
Average annual (rounded)					$48,100,000

Source: John Child & Company.

Ewa by Gentry Makai Exhibit VI-H

RESIDENTIAL CONSTRUCTION EXPENDITURES AS A PERCENT OF OAHU TOTAL

Direct and indirect construction	$260,700,000
Allocable share of infrastructure costs, rounded	63,700,000 [1]
Total construction expenditures for the Ewa Makai residential development, rounded	$324,400,000
Average annual expenditures, rounded	$36,000,000 [2]
Total residential construction on Oahu	397,474,000 [3]
Ewa Makai as a percent of Oahu residential construction	9.1%

[1] Estimated as 75% of total infrastructure costs of $84.9 million, for comparison purposes only.

[2] The estimated average annual expenditures is understated as it assumes a full 9-year construction period between 2005 to 2013.

[3] Value of residential construction in the City & County of Honolulu for the fiscal year ended June 30, 2000.

Source: John Child & Company and the City and County of Honolulu, **Comprehensive Annual Financial Report for the Fiscal Year Ended June 30, 2000.**

VII – ECONOMIC IMPACTS

This section describes the expected direct, indirect and induced impacts of the Ewa Makai development in terms of output (expenditures), construction and other employment, and additional household income in the State.

OUTPUT IMPACTS (EXPENDITURES)

Output impacts measure the dollar change in the output of the State's economy and represents total expenditures, or sales.

Construction Expenditures

The Ewa Makai residential and industrial-commercial developments will generate direct, indirect and induced output impacts (expenditures) in Hawaii as a result of the construction.

Direct Construction Expenditures

The direct impact of the Ewa Makai development is measured by the total construction expenditures injected directly into the State's economy between 2005 and 2013. The annual construction expenditure was projected to range from about $6.6 million to $98.2 million and average about $48.1 million annually. In comparison, the State's construction industry output totaled about $1.654 billion in 1999, as measured by the Gross State Product (GSP) for the construction sector. The projected average annual construction expenditure of $48.1 million for the Ewa Makai developments would represent almost 3% of the total construction industry output.

Indirect and Induced Expenditures

The direct construction expenditures will, in turn, create additional expenditures in other industries as suppliers of construction materials and equipment, for instance, are required to purchase goods and services from other vendors in the State. These latter expenditures are an indirect effect. Based on multipliers reported by DBEDT, every $1 in construction spending generates another $0.27 to $0.30 in sales in other industries. Therefore, the total $432.6 million in direct construction expenditures is projected to create another $117.0 million in sales in other industries.

In addition, direct and indirect expenditures "induce further productive activity of their own through consumption expenditures" [1]. Based on the multipliers reported by DBEDT, these induced expenditures are projected to total about $358.9 million over the construction period between 2005 and 2013.

[1] DBEDT I-O Study.

Total Expenditures

The total direct, indirect, and induced expenditures created by development of Ewa Makai is projected to total about $908.5 million and average about $100.9 million annually, as shown in Exhibit VII-A and summarized as follows:

Projected Expenditures
(Dollars in millions)
2005 - 2013

	Total	Average annual	
Direct	$432.6	$48.1	
Indirect	117.0	13.0	
Induced	358.9	39.9	
Total	$908.5	$100.9	[1]

Industrial-Commercial Sales

The industrial-commercial development in Ewa Makai could create additional economic (output) impacts in terms of service and retail sales to the surrounding neighborhood. The projected sales is speculative because of the variation in the type of users that could operate from the site. Therefore, the following projection of industrial-commercial sales is included primarily for the purpose of projecting the potential order of magnitude of economic benefits.

According to the U.S. Census Bureau's 1997 Economic Census of Retail Trade, 17 retail establishments existed in the Ewa Beach area. The establishments surveyed include motor vehicle and parts dealers, building material and supplies dealers, food and beverage stores, gasoline stations, clothing stores, and general merchandise stores. The 17 establishments surveyed reported total sales of about $34.8 million in 1997, or slightly more than $2.0 million/establishment on average. The average retail sales/establishment reported for Honolulu County for this same period was about $2.5 million.

For the purpose of this report, average annual sales of $2.0 million are conservatively projected for each of 30 establishments that could locate at the property. (This projection assumes a ratio of 1 establishment/acre). The projected sales volume of $2.0 million/establishment would equate to about $77/gf of building area. [2]

[1] Averages do not add because of rounding.
[2] Based on an average building area of 26,000gf/acre of land used in Exhibit VI-D.

PROJECTED EXPENDITURES
2005 - 2013

Calendar year	Direct impact (construction expenditures)	Indirect impact	Induced impact	Total impact
2005	$6,600,000	$1,980,000	$5,700,000	$14,280,000
2006	27,400,000	7,398,000	22,700,000	57,498,000
2007	57,900,000	15,633,000	48,700,000	122,233,000
2008	98,200,000	26,514,000	81,500,000	206,214,000
2009	90,700,000	24,489,000	75,300,000	190,489,000
2010	49,200,000	13,284,000	40,800,000	103,284,000
2011	48,800,000	13,176,000	40,000,000	101,976,000
2012	44,000,000	11,880,000	36,100,000	91,980,000
2013	9,800,000	2,646,000	8,100,000	20,546,000
Total	$432,600,000	$117,000,000	$358,900,000	$908,500,000
Average annual	$48,100,000	$13,000,000	$39,900,000	$100,900,000

Note: Dollars are rounded.

Source: John Child & Company, based on information provided by Gentry Homes, Ltd. and the Department of Business, Economic Development & Tourism (DBEDT), **The Hawaii Input-Output Study 1992 Benchmark Report,** December 1998 ("I-O study").

Based on the assumptions, the industrial-commercial development could result in another 30 service industrial and/or retail establishments producing sales in excess of $60 million at full build-out in 2009. The indirect and induced impacts of the industrial-commercial sales have not been quantified. Therefore, the economic benefits that would result from the industrial-commercial development are understated.

EMPLOYMENT IMPACTS

The residential and industrial-commercial developments will generate short-term employment during the construction of the new residential units and industrial-commercial pad sites and buildings. Additionally, industrial-commercial jobs at businesses that would locate at the industrial-commercial site would create permanent, or long-term, employment for the residents in the Ewa area. Both short-term and long-term employment impacts are projected as follows.

New Jobs During Construction Period

Direct, indirect and induced new jobs are estimated for the construction period.

Direct Construction Employment

Direct construction employment includes onsite laborers, operatives and craftsmen, as well as professional, managerial, sales and clerical workers who may be employed elsewhere in the State.

Multipliers in DBEDT's I-O study show that every $1.0 million of residential construction spending (in 1992 dollars) creates another 7.5 construction related jobs. Another 11.0 to 11.5 jobs are created for every $1.0 million of industrial-commercial and road construction. Based on the relative values of the construction expenditures estimated for the residential, industrial-commercial, and infrastructure improvements, about 7.5 to 9.5 construction related jobs are estimated for every $1.0 million in construction expenditures associated with the Ewa Makai developments.

Based on Gentry's development schedule, construction sequencing could begin as early as 2005 and proceed through 2013. Based on the projected construction expenditures for Ewa Makai (adjusted to reflect 1992 dollars), about 705 full-time and part-time jobs in the construction industry are estimated at peak construction in 2008. The average annual direct construction employment is estimated to be about 310 full-time and part-time jobs. The Bureau of Labor Statistics reported 15,410 full-time and part-time employees in construction and extraction occupations in 1999 in the State. The average annual construction employment created by the Ewa Makai development would represent about 2% of this total.

Indirect and Induced Employment

According to the DBEDT I-O study, another 15 full-time, part-time, and self-employment jobs would be created in other industries as a result of every $1.0 million in construction. Based on these indirect and induced multiplier effects, an average of 136 and 411 jobs, respectively, would be created annually during the construction period.

Total Employment Impacts During Construction Period

Based on the projected construction expenditures and multiplier effects applicable to the construction industry, an average of about 857 new jobs would be created annually in the State during the Ewa Makai construction period, as shown in Exhibit VII-B and summarized as follows:

Projected Average Annual New Jobs
2005 - 2013

Direct	310
Indirect	136
Induced	411
Total	857

Long-Term Operational Employment Impacts

Development of the industrial-commercial site would create permanent or long-term operational employment opportunities in the Ewa Gentry neighborhood. The projected employment at establishments in the Ewa Makai industrial-commercial development assumes the tenants would include light and/or service industrial and retail uses compatible with the residential character of the surrounding neighborhood.

Average absorption rates are measured as the ratio of employees to one acre of land for various industrial-commercial sectors. These rates range from one acre of land for every 5.9 employees in the transportation and warehousing sector to about 251.0 employees for labor-intensive retail establishments such as eating and drinking establishments, as shown in Exhibit VII-C.

Based on the anticipated uses at the Ewa Makai industrial-commercial site, an average absorption rate of 50 employees/acre is considered to be conservative for projecting the operational employment upon development of the industrial-commercial site. An additional 1,500 full-time, part-time, and self-employment jobs would be created at full development in 2009, as shown as follows:

Total land area (acres)	30
Employees/acre	x 50
Projected new jobs	1,500

Indirect and induced employment effects were not projected because of the anticipated variation in the types of business establishments that could locate in the industrial-commercial development. As a result, the employment impact is understated.

PROJECTED NEW JOBS
2005 - 2013

Calendar year	Estimated Construction Expenditures (Millions of Dollars) 2001 dollars	Inflation factor [1]	1992 dollars	Estimated New Jobs [2] Direct impact	Indirect impact	Induced impact	Total impact
2005	$6.60	1.32	$5.00	46	19	58	123
2006	27.40	1.32	20.76	161	78	235	475
2007	57.90	1.32	43.86	356	165	498	1,019
2008	98.20	1.32	74.39	705	277	838	1,820
2009	90.70	1.32	68.71	642	256	772	1,670
2010	49.20	1.32	37.27	292	140	423	856
2011	48.80	1.32	36.97	281	139	418	838
2012	44.00	1.32	33.33	250	125	376	750
2013	9.80	1.32	7.42	56	28	84	167
Average annual employment				310	136	411	857

[1] The estimated construction expenditures for the Ewa Makai developments represents current (2001) dollar amounts. Employment multipliers reported by DBEDT are applicable to 1992 construction dollars. Therefore, the estimated construction expenditures are converted to 1992 dollars based on the ratio of the 2000 construction cost index to the 1992 construction cost index. The application of the employment multipliers reported by DBEDT assumes labor productivity remained constant since 1992.

[2] Includes full-time, part-time and self-employment jobs. Averages may not foot because of rounding.

Source: John Child & Company, based on information provided by Gentry Homes, Ltd. and the DBEDT I-O study.

INDUSTRIAL-COMMERCIAL LAND ABSORPTION RATES
(EMPLOYEES/ACRE)

Industrial-Commercial Jobs	Average absorption rates (employees/acre)	
Transportation & warehousing	5.9	
Misc. manufacturing	9.6	
Construction	53.5	
Trade [1]	80.2	[2]
Other services [3]	105.4	
Finance, insurance & real estate	210.8	
Eating & drinking establishments	251.0	
Estimated rate for the industrial-commercial site	**50.0**	

[1] The trade sector includes furniture stores and lumber and building material outlets.

[2] The average absorption rate is estimated for trade, other services, FIRE, and eating & drinking establishments based on the reported average floor area per employee and an estimated building-to-land ratio of 0.85, for comparative purposes only.

[3] "Other services" include labor intensive activities such as legal and accounting services, as well as space extensive activities such as theater and YMCA.

Source: John Child & Company, based on land use files of the City & County of Honolulu Department of Planning and Permitting (fka Department of General Planning), circa 1975 and 1987.

HOUSEHOLD INCOME

Income impacts from the Ewa Makai development measure the effect of the development on household income consisting of wages, salaries and proprietors' (self-employment) income. The income effects also include fringe benefits that are estimated to be about 40% of salary and wage income for construction employment and 25% for the long-term operational employment. [1]

Income impacts are significant because they directly affect the State income tax revenue base. In addition, the State's general excise tax base is indirectly affected as an increase in household income generally translates to an increase in consumption. The income impacts from the construction and operational employment opportunities that would be created by the Ewa Makai development are estimated as follows:

Construction Employment Income Impacts

The direct, indirect and induced income impacts from construction employment are projected as follows.

Direct Income Impact

Based on DBEDT's multipliers for the construction industry, salaries, wages and fringe benefits are projected to represent about $0.47 of every dollar of construction expenditure. Based on construction spending of about $6.6 million to $98.2 million annually, labor income resulting from the Ewa Makai residential and industrial-commercial developments is projected to be about $201.4 million over the nine-year construction period.

Based on the projected employment during the construction period, the average income/employee ranges from about $64,000 to about $83,000. DBEDT estimates that salaries and wages comprise about 60% and fringe benefits comprise about 40% of total income. The indicated average annual salary and wage income/employee is about $45,200. By comparison, the Bureau of Labor Statistics reports that the mean annual salary for all employees in construction and extraction occupations in Honolulu in 1999 was about $45,180, as shown in Exhibit VII-D.

Indirect and Induced Income

Indirect and induced income impacts represent the household income change in other sectors of the economy resulting from the Ewa Makai development. Based on multipliers reported by DBEDT, an additional $49.6 million and $131.1 million of indirect and induced income effects are projected assuming full development of the residential and industrial-commercial components as planned.

[1] Based on information reported by DBEDT and the Bureau of Labor Statistics.

Ewa by Gentry Makai — Exhibit VII-D

PROJECTED DIRECT HOUSEHOLD INCOME FROM CONSTRUCTION EMPLOYMENT 2005 - 2013

Calendar year	Total direct construction expenditures	Projected household (labor) income [1]	÷	Projected construction employment (jobs)	=	Annual Household Income/ Construction Job (rounded): Total including fringe benefits	Annual Household Income/ Construction Job (rounded): Salary/wage income [2]
2005	$6,600,000	$3,102,000		46		$67,400	$40,400
2006	27,400,000	12,878,000		161		80,000	48,000
2007	57,900,000	27,213,000		356		76,400	45,800
2008	98,200,000	45,172,000		705		64,100	38,500
2009	90,700,000	41,722,000		642		65,000	39,000
2010	49,200,000	23,124,000		292		79,200	47,500
2011	48,800,000	22,936,000		281		81,600	49,000
2012	44,000,000	20,680,000		250		82,700	49,600
2013	9,800,000	4,606,000		56		82,300	49,400
Total, rounded	$432,600,000	$201,400,000					

Estimated average annual salary	$45,200
Average salary for construction industry [3]	45,180

[1] Labor expense represents about $0.47 for every $1.00 of construction spending.
[2] The average annual salary (2001 dollars) assumes 40% of the total household income/job is in the form of fringe benefits, based on information provided by DBEDT.
[3] As reported by the Bureau of Labor Statistics for the Honolulu Metropolitan Statistical Area (SMA) in 1999.

Source: John Child & Company, based on information provided by Gentry Homes, Ltd. and the DBEDT I-O study.

Total Construction Employment Income

The projected construction employment would create an additional $201.4 million in household income annually over the nine-year construction period. Indirect and induced income impacts are also projected for other sectors of the economy. As a result, total household income in the State could increase by an additional $382.1 million during the construction period, as shown in Exhibit VII-E and summarized as follows:

Projected Household Income
(Dollars in millions)
2005 - 2013

	Total	Average annual
Direct	$201.4	$22.4
Indirect	49.6	5.5
Induced	131.1	14.6
Total	$382.1	$42.5

Operational Employment Income

The income impacts from the construction period would cease in 2013 after the development is completed. However, additional income impacts would result from the long-term operational employment projected for the businesses operating at the industrial-commercial site.

About 1,500 full-time and part-time jobs are projected to result from the industrial-commercial development at full development in about 2009. The projected direct income impact resulting from the projected operational employment could generate about $24.4 million in annual household income thereafter, as shown in Exhibit VII-F.

Indirect and induced income impacts were not projected because of the anticipated variation in the types of business establishments that could locate in the industrial-commercial development. As a result, the long-term income impact from operational employment is understated.

PROJECTED INCOME FROM CONSTRUCTION EMPLOYMENT
2005 - 2013

Calendar year	Direct impact	Indirect impact	Induced impact	Total impact
2005	$3,102,000	$858,000	$2,040,000	$6,000,000
2006	12,878,000	3,014,000	8,508,000	24,400,000
2007	27,213,000	6,369,000	17,918,000	51,500,000
2008	45,172,000	11,784,000	29,444,000	86,400,000
2009	41,722,000	10,884,000	27,194,000	79,800,000
2010	23,124,000	5,412,000	15,264,000	43,800,000
2011	22,936,000	5,368,000	14,596,000	42,900,000
2012	20,680,000	4,840,000	13,180,000	38,700,000
2013	4,606,000	1,078,000	2,916,000	8,600,000
Total	$201,400,000	$49,600,000	$131,100,000	$382,100,000
Average annual	$22,400,000	$5,500,000	$14,600,000	$42,500,000

Note: Numbers are rounded.

Source: John Child & Company, based on information provided by Gentry Homes, Ltd. and the DBEDT I-O study.

PROJECTED INCOME IMPACT FROM OPERATIONAL EMPLOYMENT [1]

Projected new jobs		1,500
Annual hours, assuming full-time jobs [2]	x	2,080
Estimated labor hours		3,120,000
Minimum wage rate [3]	x	$6.25
Annual wage & salary income, rounded		19,500,000
Fringe benefit factor [4]	x	125%
Annual income impact, rounded		$24,400,000

[1] Assuming full development of the 30-acre IMX-1 site.
[2] The analysis estimates labor hours assuming the projected new jobs are full-time jobs with a typical 2,080 hours annually. This potential overstating of labor hours is mitigated by application of the minimum wage rate to estimate the annual wages and salary income. These assumptions would imply an average full-time salary for each of the 1,500 jobs of $13,000 excluding fringe benefits.
[3] State minimum wage rate effective January 1, 2003.
[4] Reflects additional fringe benefit income estimated as 25% of wage and salary income, based on averages reported by the Bureau of Labor Statistics.

Source: John Child & Company, based on information provided by Gentry Homes, Ltd. and the DBEDT I-O study.

PROJECTED ECONOMIC IMPACTS

Development of Ewa Makai is projected to produce the following direct, indirect and induced economic impacts in the State of Hawaii:

	Construction period: 2005-2013		Operational employment beginning in 2009
	Total	Average annual	Annual
Estimated output (expenditures) [1]:			
Direct	$ 432,600,000	$ 48,100,000	$60,000,000 [2]
Indirect and induced	475,900,000	52,900,000	[4]
Total	908,500,000	100,900,000 [3]	
Estimated new jobs:			
Direct	N/A	310	1,500
Indirect and induced		547	[4]
Total		857	
Estimated additional household income [1]:			
Direct	$ 201,400,000	$ 22,400,000	$24,400,000
Indirect and induced	180,700,000	20,100,000	[4]
Total	382,100,000	42,500,000	

[1] In 2001 dollars.
[2] Estimated retail sales and service revenues from the industrial-commercial development.
[3] Averages do not foot because of rounding.
[4] Not quantified for the purpose of this report. Therefore, the total impact is understated.

VIII – FISCAL IMPACTS

This section evaluates the fiscal impacts of the proposed Ewa Makai development by comparing the tax revenues and expenditures to the State of Hawaii and City & County of Honolulu.

REVENUE AND EXPENDITURE ANALYSIS

The fiscal impacts of the proposed Ewa Makai development are analyzed in terms of the revenues that would be generated and expenditures that would be incurred by the State and County governments. The following table summarizes the primary revenue and expenditure items that would be affected:

	State	County
Revenues	General excise taxes State income taxes	Real property taxes
Expenditures	Roadway improvements Schools	Fire and police protection Water and sewer services Drainage improvements Roadway improvements and maintenance Refuse collection Parks and recreational facilities

The impacts on individual State and County services were assessed based on preliminary comments from various agencies received by Gentry. Additional information was obtained from independent interviews with representatives of the State of Hawaii Departments of Taxation, Transportation and Education and City & County of Honolulu Real Property Tax Assessor's Office, Police Department and Departments of Transportation, Facility Maintenance, Environmental Services, and Parks and Recreation.

FISCAL IMPACTS TO THE STATE OF HAWAII

The estimated fiscal impacts to the State of Hawaii are discussed in terms of the following revenues and expenditures [1]:

State Revenue Sources

Revenues to the State government would be composed of general excise taxes on the construction expenditures and sales revenues from the industrial-commercial development, and personal income taxes on the additional salary and wage income created by construction and operational employment, discussed as follows:

[1] All figures are reported in 2001 dollars and do not reflect inflation unless otherwise stated.

Projected General Excise Tax Revenues

- General excise tax (GET) revenues are projected based on the projected construction expenditures for the Ewa Makai development.
- Based on a current GET rate of 4.0% and total construction expenditures of about $432.6 million, an additional $16.6 million in GET revenues is projected for the State, as shown in Exhibit VIII-A
- The projected GET revenues from construction are understated because the projections do not account for GET pyramiding.
- In addition, GET revenues would be generated on the retail sales and service revenues from business that would operate at the industrial-commercial site. The potential sales and service revenues could total about $60.0 million beginning in 2009. Based on a GET rate of 4%, the additional sales from the industrial-commercial development could produce another $2.4 million annually.
- GET revenues could total about $29.8 million between 2005 and 2013 and total about $2.4 million annually thereafter, as shown in Exhibit VIII-B.

Projected State Income Tax Revenues

- Income tax revenues are estimated based on the projected salary and wage incomes from the construction and operational employment and do not consider income taxes on indirect and induced income.
- Based on an average State income tax rate of 7%, income tax revenues on labor income from the projected construction employment are projected to total about $8.5 million, as shown in Exhibit VIII-C.
- Additional State income taxes will be generated by the long-term operational employment at the industrial-commercial development. Assuming the industrial-commercial site is fully developed and operational beginning in 2009, an additional $1.25 million in State income tax revenues could be expected annually, as shown in Exhibit VIII-D.
- Based on the income tax rate assumptions, income tax revenues are projected to increase from about $133,000 in 2005 when construction begins to almost $3.0 million at peak construction in 2009. Income tax revenues would decline to about $1.25 million after construction is completed in 2013 and consist of taxes on wages and salaries from operational employment, as shown in Exhibit VIII-E.

PROJECTED GENERAL EXCISE TAX REVENUES FROM CONSTRUCTION
2005 – 2013

Calendar year	Projected construction expenditures	Projected general excise tax revenues
2005	$6,600,000	$254,000
2006	27,400,000	1,054,000
2007	57,900,000	2,227,000
2008	98,200,000	3,777,000
2009	90,700,000	3,488,000
2010	49,200,000	1,892,000
2011	48,800,000	1,877,000
2012	44,000,000	1,692,000
2013	9,800,000	377,000
Total, rounded	$432,600,000	$16,600,000

Source: John Child & Company.

PROJECTED GENERAL EXCISE TAX REVENUES
2005 – 2013

Calendar year	Source of GET Revenues: Construction	Industrial-commercial sales	Total (rounded)
2005	$254,000	$0	$254,000
2006	1,054,000	0	1,054,000
2007	2,227,000	0	2,227,000
2008	3,777,000	1,200,000 [1]	4,977,000
2009	3,488,000	2,400,000	5,888,000
2010	1,892,000	2,400,000	4,292,000
2011	1,877,000	2,400,000	4,277,000
2012	1,692,000	2,400,000	4,092,000
2013	377,000	2,400,000	2,777,000
Total, rounded	$16,600,000	$13,200,000	$29,800,000

[1] Assumes 1/2 of the industrial-commercial site is developed in 2008.

Source: John Child & Company.

Ewa by Gentry Makai — Exhibit VIII-C

PROJECTED STATE INCOME TAX REVENUES FROM CONSTRUCTION EMPLOYMENT
2005 – 2013

Calendar year	Total jobs [1]	x	Average annual salary and wage income/job [2]	=	Total salary and wage income	x	State income tax rate [3]	=	State income taxes
2005	46		$40,400		$1,900,000		7.0%		$133,000
2006	161		48,000		7,700,000		7.0		539,000
2007	356		45,800		16,300,000		7.0		1,141,000
2008	705		38,500		27,100,000		7.0		1,897,000
2009	642		39,000		25,000,000		7.0		1,750,000
2010	292		47,500		13,900,000		7.0		973,000
2011	281		49,000		13,800,000		7.0		966,000
2012	250		49,600		12,400,000		7.0		868,000
2013	56		49,400		2,800,000		7.0		196,000
Total, rounded									$8,500,000

[1] Projected in Exhibit VII-B. Includes full-time, part-time and self-employed workers.
[2] Projected in Exhibit VII-D. Excludes fringe benefits.
[3] The effective State income tax rate for households with taxable income of $40,000 in 2000 ranges from about 6.4% for married taxpayers filing joint returns to 7.4% for single taxpayers.

Source: John Child & Company.

Ewa by Gentry Makai — Exhibit VIII-D

PROJECTED STATE INCOME TAX REVENUES FROM OPERATIONAL EMPLOYMENT [1]

Annual wages & salaries at full development	$19,500,000 [2]
State income tax rate	6.4% [3]
Annual income tax, rounded	$1,250,000

[1] Assuming full development in 2009.
[2] Salary and wage income only; excludes fringe benefit income.
[3] The effective State income tax rate for households with taxable incomes of $20,000 to $40,000 ranges from about 5.3% to 6.4% for married taxpayers filing joint returns to about 6.4% to 7.4% for single taxpayers.

Source: John Child & Company.

PROJECTED STATE INCOME TAX REVENUES
2005 – 2013

Calendar year	Construction employment	Operational employment	Total (rounded)
2005	$133,000	$0	$133,000
2006	539,000	0	539,000
2007	1,141,000	0	1,141,000
2008	1,897,000	625,000 [1]	2,522,000
2009	1,750,000	1,250,000	3,000,000
2010	973,000	1,250,000	2,223,000
2011	966,000	1,250,000	2,216,000
2012	868,000	1,250,000	2,118,000
2013	196,000	1,250,000	1,446,000
Total, rounded	$8,500,000	$6,800,000	$15,300,000

[1] Assumes 1/2 of the industrial-commercial site is developed in 2008.

Source: John Child & Company.

State Expenditure Items

The impact of the Ewa Makai development on State highways (roadways) and schools is discussed under the following subheadings.

Roadway Improvements

No additional expenditures for roadway improvements are likely to be required because of the increased resident population in Ewa Makai. State funds are already being expended to widen portions of Fort Weaver Road in response to neighborhood concerns about increased traffic on this main thoroughfare. Gentry is also financing current intersection improvements to Kolowaka Road and Fort Weaver Road. Gentry is assumed to continue to pay its fair share of future roadway improvements to Fort Weaver Road that would benefit the entire Ewa community from Ewa Beach to West Loch.

School Improvements

An 18-acre site is reserved for a middle school. The middle school would benefit the entire Ewa neighborhood including the Ewa Makai development. However, plans for the middle school are currently not included in the Department of Education's six-year plan.

Net Fiscal Impacts to the State

No additional capital or operating expenditures would be required of the State as a direct result of the Ewa Makai development [1]. Based on the projections, the Ewa Makai development could generate another $45.2 million in GET and income tax revenues during the construction period between 2005 and 2013, shown as follows:

[1] State government expenditures incurred for the construction and operation of the future middle school site and additional improvements to Fort Weaver Road are not included in the analysis because these expenditures would be incurred for the benefit of the entire Ewa neighborhood.

Net Fiscal Impact to the State
2005 - 2013

Calendar year	GET revenues	+	Income tax revenues	- Expenditures	=	Net fiscal impact
2005	$254,000		$133,000	$0		$387,000
2006	1,054,000		539,000	0		1,593,000
2007	2,227,000		1,141,000	0		3,368,000
2008	4,977,000		2,522,000	0		7,499,000
2009	5,888,000		3,000,000	0		8,888,000
2010	4,292,000		2,223,000	0		6,515,000
2011	4,277,000		2,216,000	0		6,493,000
2012	4,092,000		2,118,000	0		6,210,000
2013	2,777,000		1,446,000	0		4,223,000
Total, rounded	$29,800,000		$15,300,000	$0		$45,200,000 [1]

Upon full development, operational employment at the industrial-commercial site is projected to produce annual income tax revenues of about $1.25 million annually thereafter. Additional GET revenues of $2.4 million could result from the business activity at the industrial-commercial site, for a net revenue increase of about $3.65 million annually from 2014.

FISCAL IMPACTS TO THE CITY & COUNTY OF HONOLULU

The estimated fiscal impacts to the City & County of Honolulu (County) are discussed in terms of the following revenues and expenditures:

County Revenue Sources

Additional County government revenues are generated from the rezoned lands. The Ewa Makai lands are currently zoned for agricultural use, and the 2001 land assessed value equates to about $256/acre. Rezoning of the Ewa Makai development lands would create real property tax benefits immediately as the assessed value of vacant residential and industrial-commercial lands would be greater than the assessed value of the lands as zoned for agricultural use.

Because the timeline for rezoning is uncertain, real property tax revenues from the Ewa Makai development are projected beginning in 2005. The projections do not account for the additional real property tax revenues that could be collected on the Ewa Makai lands if rezoning occurs before 2005.

[1] Row does not foot because of rounding.

The projected real property tax revenues from the Ewa Makai development are discussed as follows.

Residential Development

- Development plans for Ewa Makai are conceptual. Plans and specifications outlining design and quality characteristics for the various components of the development are not available. However, based on current pricing and sales patterns in the Ewa by Gentry neighborhood and comparable neighborhoods in Ewa and Central Oahu, the average sales price of the Ewa Makai residential units is assumed to range from about $150,000 for a multi-family condominium unit to about $320,000 for a traditional single-family detached dwelling.

- Based on current real property tax rates, the average sales prices for the individual unit types, and the proposed unit mix for Ewa Makai, the weighted real property tax/unit is estimated to be about $905, as shown in Exhibit VIII-F.

- The residential development could be expected to generate about $1.69 million in real property taxes upon full build-out in 2013, as shown in Exhibit VIII-G.

Industrial-Commercial Development

- Gentry plans to develop and sell industrial-commercial pad sites in 2007 and 2008. Building construction on the individual pad sites is assumed to occur in 2008 and 2009. The projected real property tax revenues that would be generated by the industrial-commercial development assume the following:
  - The vacant land is assessed based on an estimated current land assessed value of $7/ft, or about $305,000/acre.
  - The estimated building assessed values assume the individual pad sites are developed with an average building-to-land ratio of 0.60.
  - The average building assessed value is estimated to be about $100/ft of building area.

- Rezoning of the 30-acre site to industrial-commercial is projected to generate annual real property taxes of about $2,900/acre of vacant (unimproved) land, or $27,300/acre after improvements are constructed, as shown in Exhibit VIII-H.

- Assuming development of the industrial-commercial site in 2008 and 2009, full development of the 30-acre site could generate total real property taxes of about $819,000 annually, as shown in Exhibit VIII-I.

ESTIMATED REAL PROPERTY TAX/UNIT FOR RESIDENTIAL UNITS

Unit type	Average sales price	x	2001 real property tax assessment rate [1]	=	Estimated real property tax/unit	x	Unit mix	=	Weighting
Single-family detached dwellings	$320,000		$3.65		$1,168		29.5%		$345
Single-family condominium units	225,000		4.21		947		36.2		343
Multi-family condominium units	150,000		4.21		632		34.3		217
Estimated real property tax/unit							100.0%		$905

[1] Real property tax assessment rate/$1,000 of assessed value. The real property tax assessed value for Ewa Makai units is based on the estimated average sales prices (current dollars).

Source: John Child & Company.

PROJECTED REAL PROPERTY TAX REVENUES FROM RESIDENTIAL DEVELOPMENT
2005 - 2013 and After

Calendar year	Projected new homes	Ewa Makai units	Projected Real Property Tax Revenues [1] Per unit	Projected Real Property Tax Revenues [1] Total (rounded)
2005	0	$0	$905	$0
2006	106	106	905	96,000
2007	287	393	905	360,000
2008	287	680	905	620,000
2009	287	967	905	880,000
2010	287	1,254	905	1,130,000
2011	276	1,530	905	1,380,000
2012	276	1,806	905	1,630,000
2013 and after	59	1,865	905	1,690,000

[1] The projected real property tax revenues from the Ewa Makai residential development are understated because they do not account for real property taxes that would be owed on the undeveloped residentially-zoned lands.

Source: John Child & Company.

Ewa by Gentry Makai — Exhibit VIII-H

ESTIMATED REAL PROPERTY TAXES/ACRE FOR THE INDUSTRIAL-COMMERCIAL SITE

	Land	Building	Total
Total square feet/acre	43,560	26,100 [2]	
Assessed value/square foot of land (building) area [1]	$7	$100	
Estimated assessed value, rounded	$305,000	$2,600,000	
x 2001/02 tax assessment rate [3]	9.39	9.39	
Estimated real property tax/acre, rounded	$2,900 +	$24,400 =	$27,300

[1] The land assessed value for the industrial-commercial site is conservatively estimated based on current land assessed values for similar industrial sites in Campbell Industrial Park.

[2] Estimated based on an estimated average building-to-land ratio of 0.60.

[3] Per $1,000 of assessed value.

Source: John Child & Company.

Ewa by Gentry Makai — Exhibit VIII-I

PROJECTED REAL PROPERTY TAXES FROM INDUSTRIAL-COMMERCIAL DEVELOPMENT 2005 - 2013 and After

	Land Area (Acres)		Projected Real Property Tax Revenues (Rounded)		
Year	Unimproved	Improved	Unimproved [2]	Improved [3]	Total
2005	30	0	$87,000	$0	$87,000
2006	30	0	87,000	0	87,000
2007	30	0	87,000	0	87,000
2008	15	15 [1]	43,500	409,500	453,000
2009	0	30	0	819,000	819,000
2010	0	30	0	819,000	819,000
2011	0	30	0	819,000	819,000
2012	0	30	0	819,000	819,000
2013 and after	0	30	0	819,000	819,000

[1] Assumes building improvements are constructed on the industrial-commercial pad sites in 2008 and 2009.

[2] Based on an estimated real property tax of $2,900/acre of undeveloped (unimproved) land.

[3] Based on an estimated real property tax of $27,300/acre of improved industrial land and buildings.

Source: John Child & Company.

Total Real Property Tax Benefit

- The 283 acres comprising the Makai development lands are currently assessed at about $72,400, or about $256/acre. Based on the current tax assessment rate for agricultural-zoned lands, the County collected real property taxes of about $716 in 2001 [1].

- In comparison, full development of the Ewa Makai residential and industrial-commercial components in 2013 could generate $2.5 million in real property tax revenues annually, as shown in Exhibit VIII-J

County Expenditure Items

The impact of the Ewa Makai development on the various County services is discussed under the following subheadings.

Fire and Police Protection

The County will not incur additional capital expenditures for fire and police facilities as a result of the Ewa Makai development. However, an additional police officer or two may be required in response to the increased population at full development.

The Honolulu Police Department budgeted $40,322 for each Metropolitan Police Officer in 2001. The annual cost includes salary, supplies and equipment. Based on this estimate, an additional two police officers that could be required as a result of the Ewa Makai development is projected to increase the City's expenditure by about $81,000 annually, as shown in Exhibit VIII-K.

Water and Sewer Services

County expenditures for water and sewer services or infrastructure would not increase as a result of the Ewa Makai development. Gentry will be responsible for the necessary offsite and onsite infrastructure costs including water lines and mains and sewer connections. Residents and businesses locating in the Ewa Makai development would additionally be responsible for utility hookups and charges.

Drainage Improvements

The County will not incur any expense for drainage improvements. Gentry's plans for the Ewa Makai development include a drainage basin on 30 acres in Ewa Makai East. Costs to create the drainage basin are included in the projected offsite costs to be borne by Gentry.

[1] Agricultural land in Honolulu is currently assessed at a tax rate of $9.89 per $1,000 of assessed value.

PROJECTED REAL PROPERTY TAX BENEFIT
2005 – 2013 and After

Calendar year	Projected real property tax revenues: Residential units	+ Industrial-commercial development	= Total	- Current real property taxes [1]	= Projected real property tax benefit (rounded)
2005	$0	$87,000	$87,000	($716)	$86,000
2006	96,000	87,000	183,000	(716)	182,000
2007	360,000	87,000	447,000	(716)	446,000
2008	620,000	453,000	1,070,000	(716)	1,069,000
2009	880,000	819,000	1,700,000	(716)	1,699,000
2010	1,130,000	819,000	1,950,000	(716)	1,949,000
2011	1,380,000	819,000	2,200,000	(716)	2,199,000
2012	1,630,000	819,000	2,450,000	(716)	2,449,000
2013 and after	1,690,000	819,000	2,510,000	(716)	2,509,000

[1] The current real property taxes for the 283-acre Makai property are based on the 2001 land assessed value of $72,400, or about $256/acre, and a 2001 tax rate of $9.89 per $1,000 of. assessed value

Source: John Child & Company.

Ewa by Gentry Makai Exhibit VIII-K

PROJECTED POLICE EXPENDITURES
2005 – 2013 and After

Calendar year	Projected new homes (cumulative)	Projected police expenditures
2005	0	($40,300) [1]
2006	106	(40,300)
2007	393	(40,300)
2008	680	(40,300)
2009	967	(80,600) [1]
2010	1,254	(80,600)
2011	1,530	(80,600)
2012	1,806	(80,600)
2013 and after	1,865	(80,600)

[1] Assumes one additional police officer is required when construction of the Ewa Makai infrastructure begins and another when development of Ewa Makai West begins.

Source: John Child & Company.

Roadway Improvements and Maintenance

The County will not incur additional expenditures for roadway improvements. Gentry will be responsible for all costs associated with the construction of the interior roadways that will service its residential and industrial-commercial developments. Projected offsite costs for the Ewa Makai development included costs to extend the Kapolei Parkway in Ewa Makai West.

Roadway maintenance expenditures would mainly include street sweeping, pavement re-striping, drain lines maintenance and pothole patching. According to the Road Maintenance Division of the City & County of Honolulu Department of Facility Maintenance, the annual roadway maintenance costs for the new roadways in Ewa Makai are anticipated to be relatively minimal. The major County expenditure would be for roadway resurfacing that is estimated to cost about $84,000/lane mile for subdivision roads and about $138,000/lane mile for major roads connecting subdivisions in Ewa Makai.

Current development plans for Ewa Makai include about 4.89 lane miles of major roads and 4.09 lane miles of subdivision roads [1]. Roadway resurfacing costs for the major roads in Ewa Makai is estimated to total about $670,000 every 10 years and $340,000 every 15 years for the subdivision roads. Based on these estimates, the annual additional roadway maintenance expenditure for Ewa Makai is estimated to average about $90,000 upon completion, as shown in Exhibit VIII-L.

The annual cost to maintain and operate 475 streetlights estimated for the Ewa Makai roadways is estimated to total about $69,000, or about $145/light. Total roadway maintenance and operating expenditures, including streetlight energy and maintenance, is projected to cost the County government about $159,000 annually by 2009, as shown in Exhibit VIII-M.

Refuse Collection

Based on discussions with the Refuse Division of the City & County of Honolulu, the initial outlay for the Ewa Makai residential development is estimated to total about $86,000. This amount represents the estimated cost for refuse cans for the 1,225 single-family detached dwellings and single-family condominium (cluster) units planned for Ewa Makai. Operating expenses attributable to the single-family detached and single-family condominium homes in Ewa Makai are estimated to average about $315/household annually. Based on these estimates, the County would incur an additional $386,000 in refuse collection expenditures annually as a result of the Ewa Makai development, as shown in Exhibit VIII-N.

Refuse collection and disposal for the multi-family condominium units and industrial-commercial development in Ewa Makai will be handled by private sources. Therefore, development of the multi-family condominium units and the industrial-commercial site will not result in additional refuse collection costs to the County.

[1] One lane-mile is equal to 52,800 square feet of roadway. For the purpose of estimating road resurfacing and maintenance costs, four-lane public roadways in Ewa Makai are classified as "major roads" and two-lane public roadways are classified as "subdivision roads."

Ewa by Gentry Makai — Exhibit VIII-L

ESTIMATED ROADWAY MAINTENANCE COSTS

	4-lane "major" roads	2-lane "subdivision" roads	Total
Lane miles	4.89	4.09	8.98
x resurfacing cost/lane mile	$138,000	$84,000	
Estimated resurfacing cost, rounded	670,000	340,000	
Divided by number of years between road resurfacing jobs [1]	10	15	
Annual average	$67,000	$23,000	$90,000

[1] Major county roadways are resurfaced about every 10 years; subdivision roadways are resurfaced about every 15 years. Other roadway maintenance costs could not be quantified based on information from the City & County of Honolulu Department of Facilities Maintenance. However, the department expects these costs to be relatively nominal.

Source: John Child & Company.

Ewa by Gentry Makai — Exhibit VIII-M

PROJECTED ROADWAY MAINTENANCE AND OPERATING EXPENDITURES
2005 – 2013 and After

Calendar year		Roadways	Streetlights	Total
2005		$0	$0	$0
2006	[1]	(41,000)	(31,000)	(72,000)
2007		(41,000)	(31,000)	(72,000)
2008		(41,000)	(31,000)	(72,000)
2009	[2]	(90,000)	(69,000)	(159,000)
2010		(90,000)	(69,000)	(159,000)
2011		(90,000)	(69,000)	(159,000)
2012		(90,000)	(69,000)	(159,000)
2013 and after		(90,000)	(69,000)	(159,000)

[1] Assumes approximately 4.07 lane miles of roadways and the pro rata share of streetlights in Ewa Makai East are developed and dedicated immediately prior to construction of the residential units.
[2] Assumes approximately 4.9 lane miles of roadways and the pro rata share of streetlights in Ewa Makai West are developed and dedicated immediately prior to construction of the residential units.

Source: John Child & Company.

PROJECTED REFUSE COLLECTION EXPENDITURES
2005 - 2013 and After

Calendar year	Projected new homes (cumulative)	Refuse cans (rounded) [1]	+ Operating expenditures [2]	= Total
2005	0	0	0	0
2006	106	(7,400)	(33,000)	(40,400)
2007	393	(20,100)	(124,000)	(144,100)
2008	680	(20,100)	(214,000)	(234,100)
2009	967	(20,100)	(305,000)	(325,100)
2010	1,254	(18,100)	(386,000)	(404,100)
2011	1,530	0	(386,000)	(386,000)
2012	1,806	0	(386,000)	(386,000)
2013 and after	1,865	0	(386,000)	(386,000)

[1] Estimated as $70/refuse can for single-family and single-family condominium developments only. Refuse collection bins for multi-family condominium projects are the responsibility of the developer or community association. The analysis assumes the 1,225 single-family and single-family condominium units in Ewa Makai are developed before the multi-family condominium units.

[2] Refuse collection costs are estimated based on an average expense of $315/household for the 1,225 single-family and single-family condominium units.

Source: John Child & Company.

Parks and Recreational Facilities

Two sites in the Ewa Makai development are identified for park use. Gentry will be required to grade and landscape the sites at an estimated cost of about $120,000/acre that includes irrigation improvements. The parks are projected to be developed in 2009. The annual cost to the City to maintain these park areas is estimated to be about $75,000.

The site currently identified for a recreational facility is about 2 acres. According to the City & County Department of Parks and Recreation, the 2-acre site is not large enough for dedication to the City. The report assumes this site is maintained by the developer or community association.

Total County Expenditures

Ewa Makai is an extension of the existing Ewa by Gentry community and adjoins developed master-planned communities. Therefore, County services including ambulance, fire, and sanitation are adequate for the expanded population.

The County would incur additional operating expenditures for police protection, roadway maintenance, refuse collection and park maintenance. The additional expenditures are estimated to total about $40,000 in 2005 and increase to about $700,000 by full development of Ewa Makai in 2013, as summarized in Exhibit VIII-O.

Net Fiscal Impacts to the County

Based on the projections, the Ewa Makai development could generate another $12.6 million in real property taxes between 2005 and 2013. The net fiscal impact to the County is projected to be about $8.3 million during this period after an allowance for the increased expenditures, shown as follows:

Net Fiscal Impact to the County
2005 - 2013

Calendar year	Real property tax benefit	- Expenditures	= Net fiscal impact
2005	$86,000	($40,000)	$46,000
2006	182,000	(153,000)	29,000
2007	446,000	(256,000)	190,000
2008	1,069,000	(346,000)	723,000
2009	1,699,000	(640,000)	1,059,000
2010	1,949,000	(719,000)	1,230,000
2011	2,199,000	(701,000)	1,498,000
2012	2,449,000	(701,000)	1,748,000
2013	2,509,000	(701,000)	1,808,000
Total, rounded	$12,600,000	($4,300,000)	$8,300,000

PROJECTED COUNTY GOVERNMENTAL EXPENDITURES
2005 – 2013 and After

Calendar year	Police protection	+ Roadway maintenance, including streetlights	+ Refuse collection	+ Park operating expenses	= Total expenditures (rounded)
2005	($40,300)	$0	$0	$0	($40,000)
2006	(40,300)	(72,000)	(40,400)	0	(153,000)
2007	(40,300)	(72,000)	(144,100)	0	(256,000)
2008	(40,300)	(72,000)	(234,100)	0	(346,000)
2009	(80,600)	(159,000)	(325,100)	(75,000)	(640,000)
2010	(80,600)	(159,000)	(404,100)	(75,000)	(719,000)
2011	(80,600)	(159,000)	(386,000)	(75,000)	(701,000)
2012	(80,600)	(159,000)	(386,000)	(75,000)	(701,000)
2013 and after	(80,600)	(159,000)	(386,000)	(75,000)	(701,000)

Source: John Child & Company.

PROJECTED FISCAL IMPACTS

The fiscal impacts to the State of Hawaii and the City & County of Honolulu governments are summarized as follows [1]:

	Construction period: 2005-2013	Annual: beginning 2014
State of Hawaii:		
General excise tax revenues	$29,800,000	$ 2,400,000
State income tax revenues	15,300,000	1,250,000
Total revenues	45,200,000	3,650,000
Less: expenditures	0	0
Net fiscal impact	$45,200,000	$ 3,650,000
City & County of Honolulu:		
Real property tax benefit	$12,600,000	$ 2,509,000
Less: expenditures	(4,300,000)	(701,000)
Net fiscal impact	$ 8,300,000	$ 1,810,000

[1] In 2001 dollars that are rounded.

CERTIFICATION

We certify, to the best of our knowledge and belief:

- Reported statements of fact are true and correct.
- Reported analyses, opinions and conclusions are limited only by the reported assumptions and limiting conditions and are our unbiased professional analyses, opinions and conclusions.
- We have no present or prospective interest in the property that is the subject of this report, and we have no personal interest or bias with respect to the parties involved.
- Our engagement was not contingent upon developing or reporting predetermined results.
- Our compensation is not contingent on the reporting of a predetermined value or direction in value that favors the cause of the client, the amount of the value estimate, the attainment of a stipulated result, or the occurrence of a subsequent event and is not contingent on an action or event resulting from the analyses, opinions or conclusions in, or use of, this report.
- Reported analyses, opinions and conclusions were developed, and this report conforms with the requirements of the Standards of Professional Appraisal Practice and Code of Professional Ethics of the Appraisal Institute and American Society of Appraisers (ASA), and the use of this report is subject to the requirements of these professional organizations relating to review by its duly authorized representatives.
- The State of Hawaii has a Real Estate Appraiser Certification program. As of the date of this report, Karen Char, MAI, CRE (CGA-184) is a certified general appraiser by the State of Hawaii.
- As of the date of this report, Karen Char, MAI has completed the requirements of the continuing education program of the Appraisal Institute. ASA has a mandatory recertification program. Karen Char, ASA is currently certified under this program.
- The undersigned made a personal visit to the real estate that is the subject of this report.
- No one other than the undersigned prepared the analysis, opinions and conclusions in this report.

JOHN CHILD & COMPANY, INC.

Karen Char, MAI, CRE
President

Cynthia C. Nakamura
Appraiser

Shelly H. Tanaka
Appraiser

David K. Soong
Analyst

Date signed: December 3, 2001

SCOPE OF PROFESSIONAL SERVICES

Background

John Child & Company is a professional corporation that specializes in real estate consulting, appraisal, and business valuation. Since 1937, it has continued to revolutionize the field with innovative ways of ensuring and expanding the growth of its clients.

The Company provides a critical knowledge of local market conditions and trend, gained from analysis and interpretation of the community and economy of Hawaii. As a result, clients receive sound alternatives and progressive solutions backed by experience and insight.

Its professional team members hold local, regional and national leadership positions in their professional organizations and teach at universities, helping to establish and promote the highest standards of professional practice and ethics for the industry.

The strength of the Company is based on its commitment to quality and timeliness, expressed in the accountability through which it has achieved its growth and earned the trust and confidence of its clients for over 60 years.

Real Estate Consulting and Appraisal

The Company's real estate consulting and appraisal practice includes a range of specialized services covering real estate in Hawaii and the Pacific area. Professional services include:

- Valuation of real estate
- Market and financial feasibility analyses
- Highest and best use studies
- Economic and fiscal impact assessments
- Arbitration
- Litigation support
- Valuation of fractional interests in real estate.

Prior assignments cover a variety of real estate interests including fee simple, leasehold, leased fee and other partial rights and fractional interests. These assignments cover a variety of land uses and property types such as:

- Agricultural, conservation and vacant land
- Golf courses
- Healthcare facilities
- Hotels and resort properties
- Industrial property
- Master planned and mixed-use projects
- Office buildings and commercial property
- Residential developments (single-family, multi-family and condominium)

- Redevelopment projects
- Shopping centers and retail facilities
- Special-purpose property
- Timeshare intervals.

Business Valuation

The Company's business valuation practice includes the valuation of closely-held businesses, including controlling and minority interests in corporations, partnerships, limited liability companies (LLCs) and limited liability partnerships (LLPs). Its business valuation practice provides assistance in:

- Analysis of minority interest and marketability discounts
- ESOP valuation
- Estate planning, estate and gift tax reporting
- Litigation support
- Lost earnings
- Marital dissolution
- Mergers and acquisitions
- Stock transfers and redemptions.

REPRESENTATIVE ASSIGNMENTS

The Company has prepared real estate consulting and appraisal assignments and business valuations for over 60 years. Recent assignments that are representative of its current real estate consulting and business valuation practices are briefly described.

Real Estate Consulting and Appraisal

The Company's real estate appraisal and consulting practice covers a variety of properties and property interests. Real estate interests include fee simple, leasehold, leased fee and other partial rights and fractional interests. Representative projects are listed by development type as follows:

Redevelopment

Aloha Tower
Honolulu Waterfront Master Development Plan
Kakaako Revelopment Plan
Kakaako Waterfront Park
Pawaa Redevelopment Masterplan
Kapalama Development Complex

Resorts

Kaanapali North Beach
Kauai Lagoons
Ko Olina
Kuilima
Mauna Kea
Princeville
Waikoloa Beach Resort
Wailea Resort
Hawaiian Rivera (proposed)
Kaupulehu (proposed)
Manini'owali (proposed)
Regents International (proposed)

Hotels

Ala Moana Hotel
Coco Palms
Embassy Suites Kaanapali
Hilton Hawaiian Village
Hotel Hana Maui
Hyatt Regency Waikiki
Hyatt Regency Maui
Kahala Hilton
Kea Lani Hotel
Kona Village
Maui Marriott
Maui Wailea Inter-Continental Hotel
Pacific Beach Hotel
Princeville Hotel
Sheraton Poipu Beach
Wailea Beach Resort
Waikiki Circle Hotel
Waikiki Beachcomber

Shopping Centers

Ala Moana
Coconut Grove
Enchanted Lakes
Hawaii Kai
Hawaii Kai Towne Center
Koko Marina
Koolau Center
Lanihau Center
Mililani
Pearl City
Prince Kuhio Mall
Princeville
Royal Hawaiian
Wailea Shopping Village
Windward City
Windward Mall

Golf Courses

Asahi Kanko Olomana Course
Dunes at Maui Lani (proposed)
Hawaii Country Club
Hawaii Kai
Kaanapali
Kauai Lagoons (Kiele and Lagoons)
Ko Olina
Mid-Pac Country Club
Pearl Country Club
Princeville (Makai and Prince)
Sandalwood Golf Course
Waikapu Country Club
Waikele
Waikoloa (Kings)
Waikoloa Village (two proposed)
Wailea (Blue, Emerald, Gold)

Office Buildings

1164 Bishop
Ala Moana Building
Ala Moana Pacific Center
ANA Kalakaua Center
Commerce Tower
Davies Pacific Center
Financial Plaza of the Pacific
Grosvenor Center
Harbor Court
Hawaiian Life Building
Hawaii National Bank
HMSA Building
Pan Am Building
Waialae Building
Waikiki Bank of Hawaii Building
Waikiki Trade Center

Industrial Properties

Airport Trade Center
Bougainville Commercial Center
Halawa Center
Hawaii Business Center
Lihue Industrial Park
Panasonic/Technics Center
Robinson Industrial Tract

Residential

Ewa by Gentry
Harbor Court
Honolulu Park Place
Imperial Plaza
Kalele Kai
Kamaole Heights
Kamehame Ridge
Ko Olina Fairways
Makakilo
Mawaena Kai
Mililani
Nauru Tower
One Archer Lane
Royal Capitol Plaza
Uplands at Maunakea
Victoria Tower
Wailea Golf Vistas
Wailea Pualani Estate

Healthcare

Arcadia Retirement Residence
Kauai Care Center (skilled nursing facility)
Regency at Hualalai (assisted living)
Straub Hospital & Clinic

Special Purpose

- Cemeteries/Memorial Parks
- Chinese Cultural Plaza
- Condominium Lease to Fee Conversion
- Hawaii Newspaper Agency Building
- Hawaiian Home Land Claims
- Kanepuu Conservation Easement
- Kapaa Land Fill
- Kaumalapau Harbor
- Kealia Pond
- NAS Barbers Point Electrical Distribution System
- Palmyra Atoll
- Residential Lease to Fee Conversation
- State of Hawaii Airports
- Telecommunications Sites
- Visitor Attractions

Business Valuation

The Company's business valuation practice focuses on closely-held businesses in Hawaii. Business valuation assignments typically estimate the market value of a closely-held corporation or partnership and the value of minority interests in the business.

These assignments are prepared to assist in estate planning and estate and gift tax reporting to the Internal Revenue Service. Business valuations are also used to assist in litigation, mergers and acquisitions covering controlling and minority interests in the closely-held businesses.

Recent valuations of closely-held businesses include:

Corporations

- Aala Produce, Inc. - supplier of provisions to vessels
- Finance Investment, Ltd. - real estate developer, investor and provider of diversified financial services
- Gay & Robinson, Inc. - sugar grower
- Jas W. Glover Holding Company, Ltd. - construction contractor
- K. Inouye Properties, Inc. - real estate investor and manager
- Loyalty Development Company, Inc. - real estate developer, investor and manager
- Palani Ranch Company, Inc. - cattle rancher
- Sen Plex Corporation - plumbing and air conditioning contractor, real estate manager
- SSFM Engineers - professional engineering services

Limited Partnerships and Limited Liability Companies

- Aaron Properties Partners of Hilo - Hilo Burger King
- Caroline J. Robinson Limited Partnership - real estate investor
- CGB Partners - real estate investor
- J.L.P. Robinson LLC - real estate investor
- K.J.L. Associates - real estate investor and manager
- KVH Partners - real estate investor
- Lanihau Partners - real estate developer and manager
- Leong Brothers - real estate investor and manager
- Loyalty Investments - real estate investor
- Taihook Associates - real estate investor and manager

CLIENTS

The Company provides professional services to a range of clients representing private, non-profit and public interests. Selected clients in private industry, non-profit organizations and public agencies are listed.

PRIVATE INDUSTRY

Attorneys/Accountants

- Alston Hunt Floyd & Ing
- Ashford & Wriston
- Cades Schutte Fleming & Wright
- Carlsmith Ball
- Case & Lynch
- Chun Kerr Dodd Beaman & Wong
- Dwyer Imanaka Schraff Kudo Meyer & Fujimoto
- Goodsill, Anderson, Quinn & Stifel
- Hong Iwai & Hulbert
- Ing Horikawa Kuwada & Jorgensen
- Kobayashi, Sugita & Goda
- KPMG Peat Marwick
- McCorriston Miller Mukai McKinnon
- Milberg Weiss Bershad Hynes & Lerach
- Oshima Chun Fong & Chung
- Paul Johnson Park & Niles
- Price Okamoto Himeno & Lum
- Rush Moore Craven Sutton Morry & Beh
- Tom & Petrus
- Torkildson Katz Jossem Fonseca Jaffe Moore & Hetherington
- White & Tom

Architects/Planners

- AM Partners, Inc.
- Belt Collins & Associates
- C.H. Guernsey & Company
- Helber, Hastert & Fee Planners
- Kober/Hanssen/Mitchell Architects
- Leo H. Daley/Alfred A. Yee Division
- Parsons Brinckerhoff Quade & Douglas, Inc.
- PBR Hawaii
- RM Towill Corp.
- Townscape, Inc.

Banks/Lenders

- Bank of America
- Bank of Hawaii
- Chemical Bank
- Citibank, N.A.
- City Bank
- Continental Bank, Chicago
- First Federal Savings and Loan Association
- First Hawaiian Bank
- Fukuoka City Bank
- GE Capital Hawaii, Inc.
- GE Capital Real Estate
- GMAC Commercial Mortgage
- Hawaii National Bank
- Honolulu Federal Savings
- Key Commercial Mortgage
- Liberty Bank, Connecticut
- Nippon Credit Bank
- Orix Corporation
- Sanwa Bank, Ltd.
- The Bank of Tokyo-Mitsubishi, Ltd.
- The Chuo Mitsui Trust & Banking Co., Ltd.
- The Daiwa Bank, Ltd.
- The Industrial Bank of Japan, Ltd.
- The Kyowa-Saitama Bank
- The Long-Term Credit Bank of Japan, Ltd.
- Wells Fargo Bank

Builders

- Armstrong Builders, Ltd.
- Charles Pankow Builders
- Pacific Construction Co., Ltd.
- Tokyu Construction Co., Ltd.

Closely Held Corporations/Limited Partnerships/Family Trusts

- Akala Partners (Twigg-Smith family)
- Gay & Robinson (Selwyn Robinson family)
- Jas. W. Glover Holding Company, Ltd. (Van Orden family)
- J.L.P. Robinson LLC (James L.P. Robinson family)
- KJL Associates (Luke family)
- KVH Partners and CGB Partners (Knudsen Trust beneficiaries)
- Lanihau Partners, LP
- Leong Brothers
- Loyalty Development, Loyalty Investments (Ching family)
- MAR Trusts (Mark A. Robinson)
- Palani Trust (Greenwell family)
- Sen Plex Corp. (Sen family)
- Taihook Associates

Developers/Landowners

- A&B Properties, Inc.
- Aloha Towers Associates
- Bedford Properties, Inc. (fka Kaiser National Housing Corporation Development Company)
- Bradley Holdings
- Central Pacific Realty
- Chiyoda Hawaii Corporation
- Dowling Company, Inc.
- Finance Realty
- Gentry Companies
- Hanalei Land Company
- Haseko (Hawaii), Inc.
- Hemmeter/Tokyu Waterfront Joint Venture
- Kaneohe Ranch
- McCormack Properties
- Nansay Hawaii
- Niu Pia Farms
- O. G. Hawaii Corporation
- Pahio Development
- Pauahi Management Corp.
- Stone Companies
- Tesoro Hawaii Corporation
- The Estate of James Campbell
- The Myers Corporation
- The Queen Emma Foundation
- Toyo Real Estate Co., Ltd.

Diversified Corporations

- Amfac/JMB Hawaii, Inc.
  - Amfac Property Development Co.
- Azabu USA Corporation
- Dole Foods (fka Castle & Cooke, Inc.)
- Castle & Cooke Retail
- Mililani Town, Inc.
- Oceanic Properties, Inc.
- Kitano Indo Gaisa Co., Ltd.
- Kokusai-Motorcars Co., Ltd.
- Nissho Iwai Corporation
- Shimizu Corporation
- Shinwa Golf Kabushiki Kaisha

Investors/Investment Bankers/Insurance Companies

- IDG Realty, Ltd.
- ITOCHU Corporation (C. Itoh & Co., Ltd.)
- MassMutual
- Meridian Pacific
- The Equitable Life Assurance Society of the United States of American

Resort Operators/Owners

- Alpha U.S.A., Inc.
- Kapalua Land Company, Ltd.
- Princeville Development Company
- Wailea Resort Company, Inc.
- Shinwa International

Retailers

- City Mill Co., Ltd.
- J.C. Penney Company, Inc.
- Kyotaru International
- Louis Vuitton Hawaii, Inc.
- McDonald's Restaurants of Hawaii

Trust Companies and Trusts

- Bishop Trust Co., Ltd.
- First Hawaiian Trust
- Hawaiian Trust Co., Ltd.
- Knudsen Trusts
- Liliuokalani Trust

NON-PROFIT ORGANIZATIONS

- Chaminade College
- Kamehameha Schools
- KCAA Pre-Schools of Hawaii
- Nature Conservancy
- Punahou School
- Straub Hospital
- Young Women's Christian Association (YWCA)
- Trust for Public Land

PUBLIC AGENCIES

Bank Regulatory Agencies

- Federal Depository Insurance Corporation (FDIC)
- Federal Home Loan Bank Board (FHLBB)

City & County of Honolulu

- Honolulu Public Transit Authority
- Dept. of Housing and Community Development
- Department of Public Works
- Department of the Corporation Counsel

County of Hawaii

- Department of Finance

County of Kauai

- Department of Water

Federal Agencies

- Internal Revenue Service
- U.S. Attorney General
- U.S. Department of the Army
- U.S. Department of the Navy
- U.S. Dept. of Interior, Fish & Wildlife Service

Public Utilities

- Citizens Utilities Company - Kauai Electric
- GTE Hawaiian Telephone Co.
- Hawaiian Electric Industries (HEI, Inc.)
- Pacific Resources, Inc.

State of Hawaii

- Attorney General
- Department of Hawaiian Home Lands
- Department of Land & Natural Resources
- Department of Transportation
- Hawaii Community Development Authority
- Housing Finance and Development Corporation
- Office of State Planning

PROFESSIONAL TEAM QUALIFICATIONS

The Company's professional team has a wide range of real estate experience gained through a range of field experience, professional accomplishments, training and education. Team members have earned their reputation for quality work and professional service.

Professional Designations

Team members hold designations earned from the major professional organizations. Team members have earned the MAI (Members Appraisal Institute) designation from the Appraisal Institute, the CRE (Counselor of Real Estate) from The Counselors of Real Estate (formerly the American Society of Real Estate Counselors and ASA (Senior Member) from the American Society of Appraisers.

State Certification

Members of the professional team are Certified General Appraisers under the State of Hawaii license and certification program and are qualified to prepare appraisal reports for mortgage financing purposes for federally insured lending institutions.

Other Qualifications and Training

Professional team members are qualified as expert witnesses in the courts of Hawaii, California and Massachusetts; instruct and lecture at the University of Hawaii and for various business and professional organizations; serve as review appraisers and arbitrators; and continue to attend courses, seminars and workshops to strengthen their own specialized appraisal skills and education.

Professional Team Members

Professional team members include:

- Karen Char, MAI, CRE, ASA, President
- Paul D. Cool, MAI, CRE, Vice President
- Uson Y. Ewart, MAI, ASA, Vice President
- Robert J. Vernon, MAI, CRE, ASA
- Cynthia C. Nakamura, Appraiser
- Shelly H. Tanaka, Appraiser
- David K. Soong, Analyst

The education and professional experiences of team members are outlined in their accompanying resumes.

KAREN CHAR, MAI, CRE, ASA
President

As President of John Child & Company, Karen is responsible for developing and managing the Company's professional practice that includes real estate consulting, appraisal, and business valuation. She specializes in complex real estate and business valuation assignments.

Karen originally joined the Company in 1973 and has over 27 years of professional experience. She has served in elected and appointed national leadership positions in the Counselors of Real Estate and the Appraisal Institute.

Education

- Master of Business Administration, University of Hawaii, 1972.
- Bachelor of Business Administration, University of Hawaii, 1970.
- Punahou School, 1967.
- Various courses, workshops, and seminars sponsored by the Appraisal Institute

Professional Associations

- Member, The Counselors of Real Estate (formerly the American Society of Real Estate Counselors, CRE designation).
  - Chief Delegate to the Pan Pacific Congress of Real Estate Appraisers, Valuers and Counselors: New Zealand, 2000; Singapore, 1998; Sydney, 1996; Yokohama, 1994; Speaker: New Zealand, 1988 and Korea, 1990
  - Member, National Board of Governors, 1995 - 2000
  - National Vice President, 1997
  - Vice Chair, National Ethics & Professional Practice Committee, 1995; Member, 1993-1998 and 2000-2002
  - Member, National Finance Committee, 1995-1997
  - Member, International Task Force (fka National International Activities Committee)
  - 1992-1999
  - Member, National Communications Committee, 1993-1995, 2001; National Public Relations,
  - 1998-2001, Technology Committee, 2001
  - Chair, Honolulu Convention Committee, 1992

- Member, Appraisal Institute (MAI designation)
  - Member (representing Region VII, Arizona, Hawaii, Southern California and Southern Nevada), National Appellate Division (serves as National Ethics Appeal Board),
  - 1997 - 1999
  - Member, Regional Ethics Panel
  - Vice Chair, National Admissions Committee of the General Appraisal Board, 1991
  - Governing Councilor, 1986-1988
  - Vice Chair, National Bylaws Committee, 1986-1989
  - Vice Chair, Organizing Committee, Pan Pacific Congress of Real Estate Appraisers, Valuers and Counselors, Honolulu, 1986
  - Member, National Bylaws Committee, 1985

As President of John Child & Company, Karen is responsible for developing and managing the Company's professional practice that includes real estate consulting, appraisal, and business valuation. She specializes in complex real estate and business valuation assignments.

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  - Member, National Board of Governors, 1995 - 2000
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  - Vice Chair, National Ethics & Professional Practice Committee, 1995; Member, 1993-1998 and 2000-2002
  - Member, National Finance Committee, 1995-1997
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  - 1992-1999
  - Member, National Communications Committee, 1993-1995, 2001; National Public Relations,
  - 1998-2001, Technology Committee, 2001
  - Chair, Honolulu Convention Committee, 1992

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  - 1997 - 1999
  - Member, Regional Ethics Panel
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  - Governing Councilor, 1986-1988
  - Vice Chair, National Bylaws Committee, 1986-1989
  - Vice Chair, Organizing Committee, Pan Pacific Congress of Real Estate Appraisers, Valuers and Counselors, Honolulu, 1986
  - Member, National Bylaws Committee, 1985

  - Member, National Admissions Committee, 1982-1990
  - Chairman, National Evaluation Report Subcommittee, 1982
  - President, 1986; Vice President, 1985; Secretary, 1984; Honolulu Chapter No. 15
  - Grader, National Board of Examiners, 1982-1983
  - Admissions Chairman, Southwest Region, 1983

- Senior Member, American Society of Appraisers, (ASA designation, specializing in business valuation).

- Arbitrator, NASD Dispute Resolution, Inc.

Other Real Estate Associations

- President, Hawaii Chapter of the National Association of Office and Industrial Properties (NAIOP Hawaii), 1998
  - Member, Board of Directors, 1996 - 1998
  - Chair, Leasehold Issues Committee, 1996-1997
  - Responsible for writing NAIOP's reports as follows:
    - Ground Lease Renegotiation Issues and Practical Alternatives, September 1996
    - Lease Rent Arbitration and USPAP, January, 1997

Professional Experience

- Chief Executive Officer and President, John Child & Company, Inc., 1984 to present.
- Senior Manager, Peat, Marwick, Mitchell & Co. (now known as KPMG Peat Marwick), 1979-1984.
- Appraiser, John Child & Company, Inc., 1972-1978.

Professional Certification

- The Appraisal Institute conducts a voluntary program of continuing education for its designated members. Members who meet the minimum standards of this program are awarded periodic educational certification. Karen Char, MAI is certified under this program.

- The American Society of Appraisers conducts a mandatory program of recertification through continuing education and/or participation in professional activities each five years. Karen Char, ASA, is certified under this program.

State Certification

- Certified General Appraiser, State of Hawaii, License Number CGA-184, expiring December 31, 2001.

Court Testimony

- Qualified as an expert witness in the valuation of real property and closely-held businesses in the Courts of the State of Hawaii.

Cindy is experienced in valuing all types of real property on all of the major islands of Hawaii as of effective dates as far back as the 1920's. Her retrospective assignments required her to examine historical economic conditions, land use patterns, and changes in the highest and best use of real estate for agricultural, residential, commercial and industrial land uses. As a result, Cindy provides clients with a clear understanding of current trends in the real estate market and the significant valuation issues that affect the value of real estate.

Many of Cindy's assignments are relatively large. These assignments include real estate portfolios held by major corporations, trusts, family partnerships, and developers. These portfolios include improved and vacant properties held in fee simple, leasehold and leased fee on Oahu, Maui, Kauai, Hawaii, Molokai and Lanai.

Some of Cindy's assignments have been unusual. For example, she has appraised wildlife refuges, wetlands, submerged lands, and conservation and utility easements. She has also valued airports and harbors.

Cindy's more traditional real estate appraisals cover properties such as major shopping centers, Class A, B, and C office buildings, luxury, first class and economy hotels, resort developments, residential subdivisions, and condominium developments. She also prepares market studies and has recently completed market studies for commercial and residential developments on Maui and Oahu.

Cindy has been with John Child & Company since 1990. She is a Hawaii State Certified General Appraiser and an Associate Member of the Appraisal Institute.

Education

- Bachelor of Science, Business Administration, University of California at Berkeley, 1984
- Punahou School, 1980
- Various courses, workshops, and seminars sponsored by the Appraisal Institute including:
  - Appraisal Institute, Advanced Sales Comparison, 2000
  - Appraisal Institute, Report Writing and Valuation Analysis, 2000
  - Appraisal Institute, Standards of Professional Appraisal Practice, Part C, 1999
  - Appraisal Institute, New Industrial Valuation, 1998
  - Appraisal Institute, Eminent Domain and Condemnation Appraising, 1998
  - Appraisal Institute, Litigation Skills for the Appraiser: An Overview, 1998
  - Appraisal Institute, Advanced Sales Comparison & Cost Approaches, 1996
  - Appraisal Institute, Standards of Professional Practice Parts A and B, 1996
  - Appraisal Institute, Environmental Risk and the Real Estate Appraisal Process, 1995
  - Appraisal Institute, Advanced Applications, 1995
  - Appraisal Institute, Highest and Best Use Market Analysis, 1993
  - Appraisal Institute, Hotel/Motel Market Study, Valuation and Investment, 1992
  - Appraisal Institute, Capitalization Theory & Techniques, Part B, 1992
  - AIREA, Uniform Standards of Professional Practice A & B, 1991
  - AIREA, Capitalization Theory & Techniques, Part A, 1989

  - AIREA, Basic Valuation Procedures, 1988
  - AIREA, Real Estate Appraisal Principles, 1987
  - SREA, Uniform Residential Appraisal Report Seminar, 1987
  - SREA, Anatomy of Residential Housing Seminar, 1987
  - California State Board of Equalization, Income Approach to Value, 1989
  - California SBE, Residential Appraisal Procedures, 1989
  - California SBE, Introduction to Appraising for Property Tax Purposes, 1987
  - University of Hawaii Small Business Management Program, Blueprint Reading Fundamentals, 1990

Professional Association

- Associate, Appraisal Institute (candidate for MAI designation)

Professional Experience

- Appraiser, John Child & Company, Inc. (1990 to present)
- Real Property Appraiser, City & County of San Francisco, California (1987-1990)

State Certification

- Certified General Appraiser, State of Hawaii, License Number CGA-324, expiring December 31, 2001.

Qualifications

SHELLY H. TANAKA
Appraiser

Shelly prepares valuations of closely held businesses and real estate. Her business valuations include limited partnerships, corporations, and limited liability companies (LLCs) and limited liability partnerships (LLPs). Because of her familiarity with both real property and business valuation, she is able to effectively assist clients in their acquisitions and mergers, stock transfers and redemptions, estate planning and gifting decisions, internal accounting, ESOP reporting, and divorce settlement.

Shelly's real estate valuations include commercial, industrial, residential, and agricultural properties on Oahu, Maui, Kauai, and Hawaii. Shelly appraises leasehold, leased fee, and fee simple interests, undivided fractional interests, and timeshare intervals for attorneys, landowners and developers, U.S. and Japanese banks, trusts, estates and corporations. Recently, Shelly completed health care market assessments and real estate appraisals for a skilled nursing home, an assisted living project and other health care facilities on Oahu, Kauai, and the island of Hawaii.

In addition Shelly is proficient in research and analysis for litigation. She has worked on two class action lawsuits providing complex and timely analysis to assist in settlement negotiations.

Shelly joined the Company in August 1998 while pursuing a Master in Business Administration degree at the University of Hawaii at Manoa. During her study, she was admitted to the Beta Gamma Sigma honor society and graduated from the MBA program With Distinction in December 1998. Shelly obtained her undergraduate degree in psychology at the University of California at Los Angeles where she graduated Cum Laude in 1994.

Education

- Master of Business Administration, With Distinction, University of Hawaii at Manoa, 1998
  - Beta Gamma Sigma Honor Society, 1997
- Bachelor of Arts, Psychology, Cum Laude, University of California at Los Angeles, 1994
  - Golden Key Honor Society, 1994
  - Phi Eta Sigma Honor Society, 1990
  - Alpha Lambda Delta Honor Society, 1990
- Iolani School, Magna Cum Laude 1990
- Courses, workshops and seminars including:
  - Appraisal Institute, Industrial Valuation, 1998
  - Appraisal Institute, Advanced Sales Comparison, 2000

Professional Association

- Associate, Appraisal Institute (candidate for MAI designation)

Professional Experience

- Appraiser, John Child & Company, Inc. (1998 to present)
- Corporate Loan Representative, Central Pacific Bank (1997 to 1998)

Qualifications

DAVID K. SOONG
Analyst

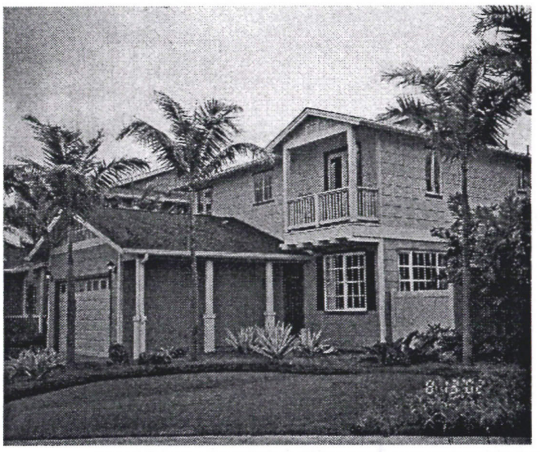
Education

- Master of Business Administration, With Significance, University of Hawaii at Manoa, 1997
- Bachelor of Business Administration, With Significance, Finance and Business Economics and Quantitative Methods, University of Hawaii at Manoa, 1991
- Kamehameha Schools, 1986

Professional Experience

- Analyst, John Child & Company, Inc. (2001)
- Real Estate Loan Officer, First Hawaiian Bank (July 2000 to May 2001)
- Real Estate Loan Representative, First Hawaiian Bank (February 1999 to July 2000)
- Credit Analyst/Senior Credit Analyst, First Hawaiian Bank (July 1992 to February 1999)

ORIGINAL









LAND USE COMMISSION
STATE OF HAWAII
2003 MAR 21 A 9: 14

EWA MAKAI

PROJECT MASTER PLAN

March 2003

Introduction

The Project Master Plan for Ewa Makai is a guide that describes how the project will promote the vision, policies, and guidelines for Ewa as set forth in the Ewa Development Plan (Ewa DP). The Ewa DP, adopted in 1997, provides conceptual, long-range visions and policies to guide land use and infrastructure decisions affecting the Ewa region.

This Project Master Plan for Ewa Makai follows the format and key elements described in Section 5.4.2 of the Ewa DP.

Project Description

The 283-acre Ewa Makai development will be a continuation of the existing Ewa by Gentry community. Ewa by Gentry, which is situated to the north of the Ewa Makai parcels, is a 1,000-acre planned development that will consist of approximately 7,200 homes at build out. About 5,100 homes have been completed thus far. The complementary phases of the Ewa Makai and the Ewa by Gentry communities will facilitate more effective overall planning and provision of required infrastructure for the entire master planned community.

Major Planned Land Uses
The Conceptual Master Plan for the Subject Property, which consists of approximately 283 acres, includes the following land uses: approximately 550 single family detached units (93 acres), 675 cluster units (64 acres), 640 multi-family units (32 acres), community facilities (24 acres) (including a middle school, a community recreation center complex, and two church sites), an industrial/commercial complex (30 acres), parks (11.5 acres), open space for infrastructure/drainage (14 acres), and roadways (14.5 acres). A copy of the Conceptual Master Plan is included as Exhibit A on the following page.

The following is a brief description of the major land use elements of the Ewa Makai Conceptual Master Plan:

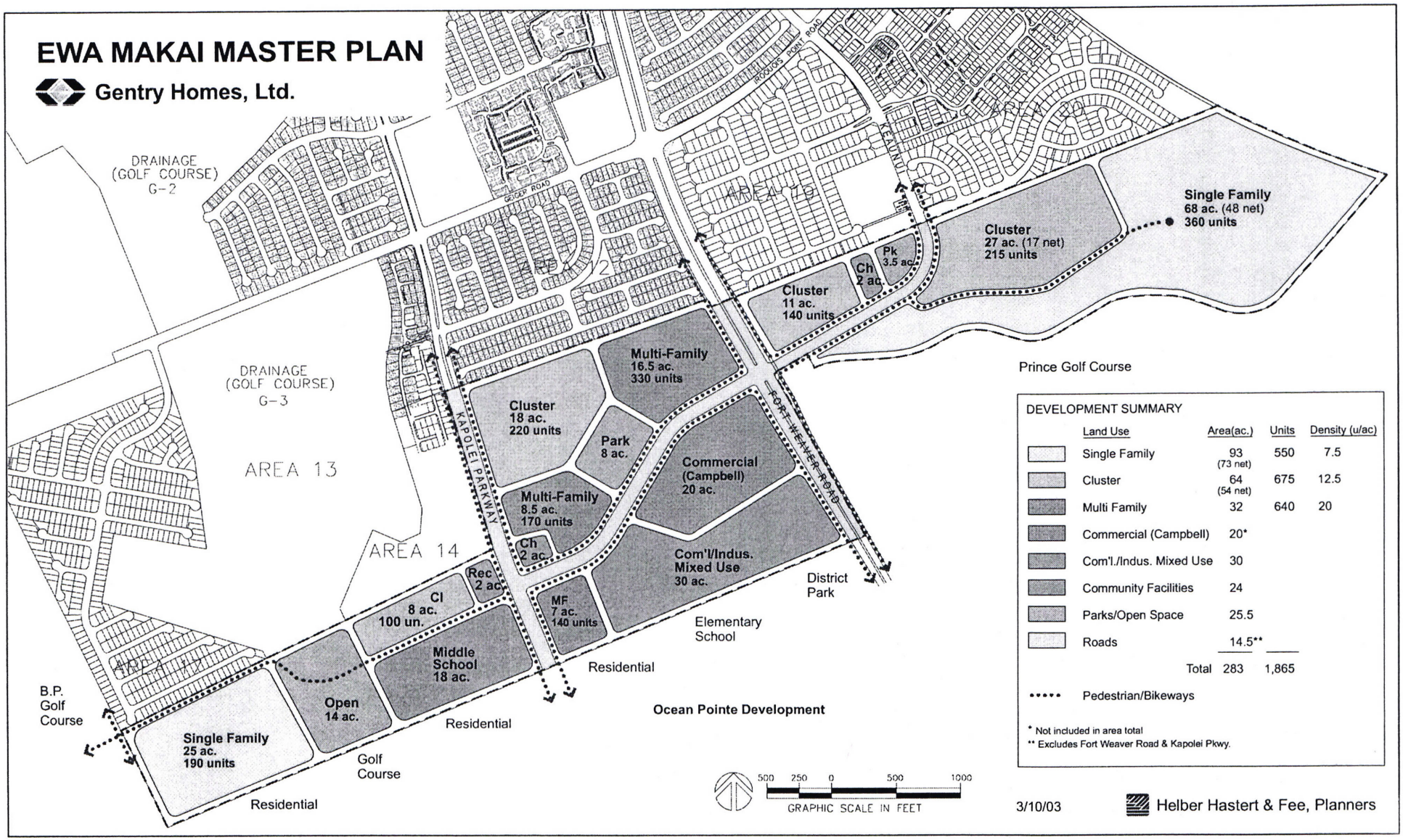
Residential

Approximately 550 single family homes, 675 single family cluster homes and 640 multi-family units are planned for development on the Subject Property. These units are intended to meet the housing needs of a spectrum of income and age groups.

Parks/Open Space Corridor

The conceptual plan incorporates two neighborhood parks: an 8-acre park in Ewa Makai-West and a 3.5 acre park in Ewa Makai-East. The 8-acre park in Ewa Makai-West will be centrally located and within walking or biking distance for many area residents. The 3.5 acre park in Ewa Makai-East will be an extension of a planned 6.8 acre park in the existing Ewa by Gentry community, thereby increasing the overall park size to 10.3 acres. In addition, a 2-acre private community recreation center complex is planned in Ewa Makai-West for use by Ewa by Gentry residents, and additional private recreational areas may be developed in conjunction with individual residential developments.

The open space/drainage corridor will function as a collector for surface runoff and an aesthetic amenity extending from the makai end of the Coral Creek Golf Course in Ewa by Gentry to the mauka boundary of Haseko's planned golf course in Ocean Pointe. The channel through the project is planned to be a wide, grass-lined drainage way that will have a bottom width ranging from about 450 feet near the Gentry golf course boundary to about 330 feet at the Ocean Pointe boundary with 4:1 side slopes. The major drainage channel will be designed in accordance with City and County Storm



DEVELOPMENT SUMMARY

Land Use	Area(ac.)	Units	Density (u/ac)
Single Family	93 (73 net)	550	7.5
Cluster	64 (54 net)	675	12.5
Multi Family	32	640	20
Commercial (Campbell)	20*		
Com'l./Indus. Mixed Use	30		
Community Facilities	24		
Parks/Open Space	25.5		
Roads	14.5**		
Total	283	1,865	
Pedestrian/Bikeways			

* Not included in area total
** Excludes Fort Weaver Road & Kapolei Pkwy.

Exhibit A

Drainage Standards in anticipation of dedicating the channel to the City. It is envisioned that the 14-acre drainage way will be an attractive, landscaped open space that could also provide for recreational activities.

Tentative site plans also call for the development of open space areas in Ewa East that will incorporate needed drainageways and retention/detention basins into attractive vegetated greenways and open space areas within the community.

Industrial-Commercial Area

A 30-acre industrial-commercial complex is intended as an adjunct to the future 20-acre Laulani Commercial Center. *(Note: The Laulani Commercial Center, which is not a part of the current land use petition and zone change, was processed separately by the landowner, Campbell Estate, and has already received its land entitlements.)* The 30-acre industrial-commercial complex is envisioned to provide services supplemental to the needs of the area and would also provide a source of employment for an estimated 1,500 full-time, part-time, and self-employment jobs at build-out.

Church/Day Care Sites

To address the spiritual and educational needs of the community, two 2-acre church sites are planned for both Ewa Makai-West and Ewa Makai-East. It is envisioned that the church sites will serve as centers for day care and/or other community services during the weekdays.

Community Recreation Center

Plans call for a 2-acre site to be dedicated to the Ewa by Gentry Community Association on which it will build a recreational facility for use by its residents. It is anticipated that such a community center will provide a meeting facility in which various functions and activities could take place, including parties, group meetings, and classes. The actual planned uses would be largely contingent on the community's needs and desires, and could include also such recreational amenities as a swimming pool, play courts, playground areas, etc.

Middle School

An 18-acre site will be dedicated to the State Department of Education for the development of a public intermediate or middle school. Plans for the school have not been drafted as yet.

Statement of Consistency with Ewa Development Plan Vision, Policies, Principles, and Guidelines

The Ewa Makai community will be consistent with the following key elements of the vision, policies, principles, and guidelines of the Ewa Development Plan. The Ewa Development Plan, adopted in 1997, provides conceptual, long-range visions and policies to guide land use and infrastructure decisions affecting the Ewa region. The Ewa Makai community will be consistent with the Ewa Development Plan in the following respects:

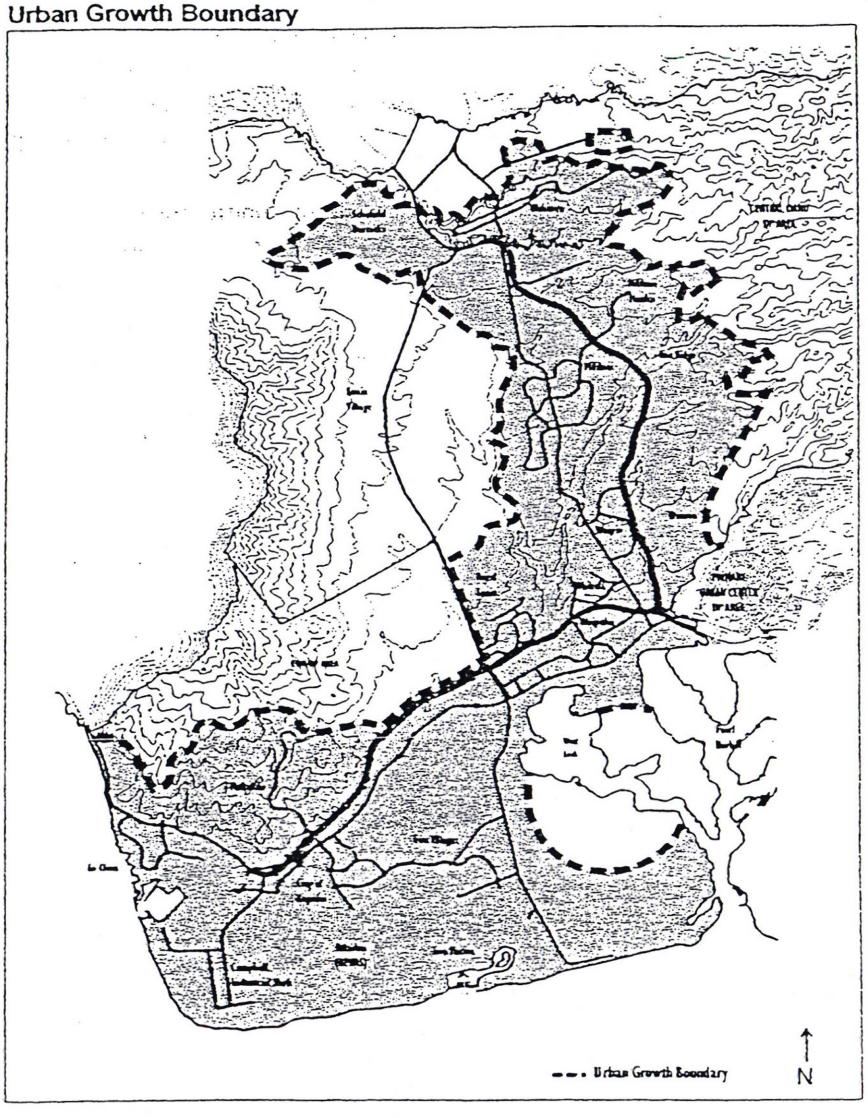
1. CONSISTENCY WITH EWA DP VISION

Ewa Makai is consistent with the following key elements of the vision:

Urban Growth Boundary – *"The Urban Growth Boundary for Ewa was drawn to give long-range protection from urbanization for over 3,000 acres of prime agricultural land and for preservation of open space while providing adequate land for urban development in Ewa for the foreseeable future."*

The Ewa Makai development lies within the Urban Growth Boundary for Ewa as shown on the map below.

Urban Growth Boundary



Open Space and Greenways – *"A network of Open Space and Greenways will link the Secondary Urban Center and associated employment centers, new master planned residential developments and revitalized established communities, an Ewa shoreline park, and a major regional park and recreation complex at Kalaeloa."*

The proposed development will be an extension of the Ewa by Gentry master planned community, which incorporates an open space network within the community. Significant acreages of open space will be retained in parks, as well as in the landscaped drainageways and retention areas that will provide visual greenbelts in the Ewa Makai development. The community is also adjacent to agricultural lands in the West Loch Naval Magazine Blast Zone and the Coral Creek, Barbers Point and Hawaii Prince golf courses, all of which are designated as part of the regional open space system. Greenway corridors include the Kapolei Parkway and Fort Weaver Road.

Kalaeloa Regional Park and Recreation Complex – *"A major Regional Park and Recreation Complex at Kalaeloa will provide needed open space, recreation opportunities, and access to the beaches and ocean."*

A bikepath through Ewa Makai will serve to link the community with the proposed regional park.

Master Planned Residential Communities – *"A network of master planned residential communities will provide a wide variety of housing and accommodate the need for affordable housing."*

Laulani and Fairways (aka Ewa Makai-West and Ewa Makai-East, respectively) are among the planned residential communities slated for development in the Ewa Development Plan area. These units are intended to meet the needs of a spectrum of income and age groups, and will include entry-level, move-up, and other types of housing units.

Communities Designed to Support Non-Automotive Travel – *"The master planned residential communities will be designed or redeveloped to support pedestrian and bike use within the community and transit use for trips outside the community."*

As an extension of the Ewa by Gentry master planned community, the project will support pedestrian and bicycle use through the development of sidewalks and bikepaths within the community and along Fort Weaver Road. Ewa Makai will also be designed to accommodate City bus service along its main streets, and will be located in proximity to a ferry service that is currently in the planning stages.

Conservation of Natural Resources – *"Ewa Natural Resources, including potable water, coastal water quality, and wetlands and other wildlife habitat, will be conserved by:*

- *Developing a dual water distribution system with potable water for drinking and other clean water uses, and non-potable water for irrigation and industrial use.*

- *Designing the regional drainage and wastewater treatment system to minimize non-point source pollution of the ocean and Pearl Harbor.*
- *Protecting valuable habitats for endangered waterbirds located in Batis Salt Marsh in Ewa Marina and in the West Loch of Pearl Harbor and for endangered plants located within Barbers Point Naval Air Station and elsewhere."*

A dual water distribution system is currently being used in Ewa by Gentry, and will continue to be used in Ewa Makai where feasible. Additionally, the drainage and wastewater treatment systems in Ewa Makai will be designed as part of a regional system to minimize non-point source pollution of the ocean. Ewa Makai does not contain any endangered flora or fauna and is not sited on the Ewa DP map of key natural resources.

Preservation and Enhancement of Historic and Cultural Resources – There are no known historic or cultural sites in Ewa Makai. However, mauka views of the Waianae Range and views of central Honolulu and Diamond Head will be retained to the extent feasible.

Phased Development – Ewa Makai will be consistent with the phased development component of the Ewa Development Plan in the following respects:

- It will provide **increased land supply** to support economic development and job creation and to accommodate residential growth with an emphasis on providing affordable housing and a diversity of housing types.

- It will provide for **moderate growth of an industrial-commercial center in an Urban Fringe Area** to primarily serve the needs of the surrounding residential communities.

- It is **consistent with the phasing plan** to support residential and commercial development. The Fairways and Laulani Residential projects (Ewa Makai-East and Ewa Makai-West) and the 30-acre Laulani Industrial project are listed in the Phase I development timetable (1997-2005)

- There will be **adequate facilities** to ensure that development does not outpace infrastructure development.

- There will be **public and private sector coordination on infrastructure needs** to support the directed growth strategy of the General Plan.

2. CONSISTENCY WITH EWA DP LAND USE POLICIES, PRINCIPLES, AND GUIDELINES

The vision for the development of Ewa will be implemented through the application of general land use policies, principles, and guidelines. The Ewa Makai development will be consistent with these policies, principles, and guidelines, as follows:

a. Open Space Preservation and Development

Planning Principles – Planning principles that will guide the development of Ewa Makai include the following:

Visual and Physical Definition of Urban Areas. *"Within the Urban Growth Boundary, the open space system should visually distinguish and physically separate individual communities, neighborhoods, and land use areas in Ewa."*

The Ewa by Gentry community, of which Ewa Makai will be an extension, will be visually distinguished by the open space system. It is bordered on the east by the agricultural areas of the U.S. Navy Blast Zone, to the south by the Hawaii Prince Golf Course, and to the west by the Kalaeloa Golf Course. Portions of the southern boundary will be bordered by the future Ocean Pointe golf course and a 20-acre district park.

Passive and Active Open Spaces. *"The open space system shall consist of areas in active use, as well as passive areas. Active areas include parks, golf courses, and agricultural fields. Passive areas include the State Conservation District, fallow land in the State Agriculture District, drainage and utility corridors."*

Creation of Open Space Network. *"The various types of open space should be linked as an open space network, with major open space areas connected by open space corridors along transportation routes, utility corridors, and drainageways."*

Open space areas, in and around the Ewa Makai development, will be connected by greenways along major transportation corridors, as well as the open space drainageway that will be part of the Kaloi Gulch drainage system.

Dual Use of Drainageways and Utility Corridors. *"To create the regional open space network, drainageways and utility corridors should be viewed as opportunities to link major open spaces with pedestrian and bike paths along open space corridors. To accommodate such uses, where possible, drainageways should be retained as natural or man-made vegetated channels rather than be replaced by concrete channels."*

An open space area in Ewa Makai-West will extend from the Coral Creek Golf Course to the Ocean Pointe golf course, providing a natural drainage channel. A pedestrian/bike path will traverse through this open space and will connect parks within the community with the proposed Kalaeloa Regional Park and the shoreline.

Ewa Makai-East will have a vegetated drainageway leading to a retention/detention basin. This open space greenway will contain a pedestrian/bike path and other recreational features where appropriate.

Relation to Open Space Map

Appendix A of the Ewa DP shows components of the regional open space system. The Kaloi Gulch drainage channel in Ewa Makai-West, as well as the greenways along Kapolei Parkway and the Fort Weaver Road corridor are included as part of the open space system. Although there will be smaller community and neighborhood parks in Ewa Makai, these are not shown on the map because only island-wide, regional, and district parks are shown.

Guidelines
The following guidelines are relevant to Ewa Makai:

Natural Gulches and Drainageways. "Planned improvements to the Ewa drainage systems should be integrated into the regional open space network by emphasizing the use of retention basins and recreational access in the design approach."

As noted above, the drainage channel in Ewa Makai-West will form an open space link between the Coral Creek and Ocean Pointe golf courses.

The drainage system in Ewa Makai-East will consist of a dual use recreational/vegetated drainageway leading to a retention/detention basin at the eastern corner.

Greenways and Open Space Corridors. "The rights-of-way for major arterials and collector streets should be designed as landscaped parkways or greenways, complete with a landscaped median strip, landscaped sidewalk, and bikeways. Major arterials should have separate bike paths, and major collectors should have bike lanes. Suggested width for major arterials, including right-of-way and planting strips, is 120 feet wide and for major collectors is 100 feet wide."

The rights-of-way for major arterials and collector streets in Ewa Makai will conform to the above to the extent possible. Landscaped bike paths, sidewalks, and median strips (as applicable), are an integral part of the existing Ewa by Gentry community and will continue to play an important role in providing greenways and open space corridors in Ewa Makai.

b. Regional Parks and Recreation Complexes – There are no regional parks or recreation complexes planned for Ewa Makai.

c. Community-Based Parks

General Policies – General policies that will guide the development of parks in Gentry Makai include the following:

"Adequate parks to meet residents' recreational needs should be provided."

"New residential development should strive to provide land for open space and recreation purposes at a minimum of two acres of park per 1,000 residents."

Based on an estimated population of 5,595 residents (1,865 units x 3 persons per household), an estimated 11.2 acres of land should be provided for open space and recreation purposes in Ewa Makai. The Ewa Makai Master Plan far exceeds this requirement: 25.5 acres of land are being set aside for public parks and open space, and another 2 acres are being set aside for a private community recreation center. Mini parks may also be developed within neighborhoods.

Guidelines – The following guidelines are relevant to the development of community-based parks in Ewa Makai.

"Where feasible, Community and Neighborhood Parks should be sited at the center of neighborhoods, in order to maximize accessibility."

"Development master plans should provide accessible pathways from surrounding streets to facilitate pedestrian and bicycle access to all features in parks."

Both park areas that are planned for Ewa Makai will be centrally located and will be accessible to both pedestrians and bicyclists via pathways from surrounding streets.

d. **Historic and Cultural Resources** – Because the Ewa Makai area was formerly cultivated in sugar, it does not contain any historic features or native Hawaiian cultural and archaeological sites. However, plans for the project will promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of the makai mountain views, as well as views of central Honolulu and Diamond Head to the extent possible. There are no ocean views from the Subject Property.

e. **Existing and Planned Residential Development** – Section 3.6.3 of the Ewa DP provides general policies and guidelines for the development of new communities and the expansion or renovation of existing communities. Ewa Makai will be consistent with these policies and guidelines, as follows:

General Policies – The development of Ewa Makai will be consistent with the following general policies.

Overall density – *"To achieve the desired compactness and character of development in planned residential communities, the housing density of the aggregate area zoned for residential use (including the streets) should be in the range of 10 to 15 units per acre."*

Densities in the Ewa Makai community will range from 7.5 units/acre to 20 units/acre. The overall density will average 10 to 11 units per

acre. These units will be in conformance with the height guidelines for planned residential developments (i.e., low density units will not exceed two stories, and medium density developments will not exceed three stories).

Physical Definition of Neighborhoods – *"The boundaries of neighborhoods should be made evident through the use of street patterns, landscape or natural features, and building form and siting. The focus of neighborhood activity should be on the local street or a common pedestrian right-of-way or recreation area."*

Ewa Makai is divided into three distinct neighborhoods: (1) the area west of Kapolei Parkway; (2) the area between Kapolei Parkway and Fort Weaver Road; and (3) the area east of Fort Weaver Road. Each neighborhood has a central park or open space feature which is linked to the surrounding residential areas by a network of pedestrian and bike paths. The two major highways, along with the Barbers Point and Hawaii Prince golf courses, and the Navy open space provide distinct boundaries for the three neighborhoods.

Compatible Mix of Building Forms – *"There should be a variety of housing types and densities to avoid visual monotony and accommodate a variety of housing needs, but without sharp contrasts between the exterior appearance of adjacent housing areas."*

The proposed rezoning will provide a mixture of housing types and densities, consistent with the above policy. The homes will be compatible with the exterior appearance of adjacent housing areas.

Transit-Oriented Streets. *"Street patterns and rights-of-way should be designed to accommodate mass transit service and make it convenient to access for as many households as possible."*

Major streets and rights-of-way will be designed to accommodate mass transit service that is convenient to as many of Ewa Makai's households as possible.

Pedestrian and Bicycle Travel. *"Pedestrian and bicycle travel should be encouraged, particularly to reach neighborhood designations such as schools, parks, and convenience stores."*

Ewa Makai will provide both sidewalks and bikepaths throughout the community, making it convenient and easy for residents to access neighborhood destinations.

Integration of Linear Corridors. *"Physical and visual connections between communities should be encouraged through the creative design of transportation and utility corridors and drainage systems."*

The Ewa Makai community will be connected to the communities on the north (Ewa by Gentry) and the south (Ocean Pointe) by Kapolei

Parkway and Fort Weaver Road. In addition, the Kaloi Gulch drainage system passes through the west side of the community as a proposed 14-acre landscaped open area linking the Coral Creek and Ocean Pointe golf courses.

Provision of Community Facilities. "Land should be provided for community facilities, including churches, community centers, and elderly and child care centers."

Land has been set aside in Ewa Makai for two church/day care center sites, a community recreation center, and a middle school.

Guidelines: Low Density Residential – The following are guidelines for the development of low density residential areas consisting of one and two-story single family attached and/or detached dwellings with individual entries.

Density – "Density should be 5 to 12 units per acre, typical of residential zoning districts and allowing the application of optional design standards for Clusters and Planned Unit Developments."

The proposed density for the single family and cluster developments will range from 7.5 to 12.5 units per acre. The overall average will be 9.6 units per acre.

Building Height – "In general, buildings should not exceed two stories, although the height may vary according to required flood elevation, slope, and roof form."

Single family and cluster homes in Ewa Makai will not exceed two stories.

Site Design – "The site design for small-lot developments should avoid monotonous rows of garages and driveways along neighborhood street frontages by employing features such as varied building setbacks and shared driveways."

Where feasible, the site design will strive to employ features such as varied building setbacks and shared driveways to avoid monotony.

Building Form – "Buildings should provide visual interest and individual identity by using varied roof forms, exterior colors and finishes, building orientation, floor plans and architectural details."

The above elements will be incorporated to the extent possible in order to provide visual interest and individual identity.

Guidelines: Medium Density Residential – The following are the Ewa DP's guidelines for the development of medium density residential areas consisting of two- and three-story townhouse or low-rise apartment buildings.

Density – *"Density should be 10 to 30 units per acre."*

The average density for the multi-family developments in Ewa Makai will be approximately 20 units per acre.

Building Height – *"In general, buildings should not exceed three stories above grade. Maximum building heights should allow for pitched roof forms."*

Multi-family buildings will not exceed three stories.

Building Form – *"Building form, orientation, location of entries and landscape screening should be employed to maintain a sense of residential scale and provide greater privacy and individual identity for housing units."*

The above elements will be incorporated to the extent possible in order to maintain residential scale and provide greater privacy and individual identity for housing units.

Compatibility – *"Building scale, roof form and the quality of materials should be compatible with those of adjacent low-density residential areas."*

Compatibility with adjacent low-density residential areas will be taken into consideration when designing multi-family buildings.

Guidelines: High Density Residential – Not applicable. There will be no high density residential buildings in Ewa Makai.

Circulation System – The Ewa Development Plan states:
"Master-planned projects should each have a circulation plan, or 'circulation element' in their Project Master Plan."

Transit Routes and Facilities -- *"The circulation plan should define the hierarchy of streets within the project and its relationship to the surrounding transportation network. The circulation plan should also indicate existing and proposed bus routes and specific measures to accommodate efficient transit service for as many households as possible. Most residences should be within a five-minute (or one-quarter mile) walking distance of a proposed bus route. The rights-of-way along transit routes should make provisions for bus shelters, bus pull-outs, and, if applicable, park-and-ride facilities and/or future transit stations."*

A hierarchy of streets is planned throughout the Ewa Makai development area. Two major arterials, Fort Weaver Road and the extension of the Kapolei Parkway, run through the area providing the primary access to the Ewa Beach, Ocean Pointe and Iroquois Point communities. The only major collector road within the project is a proposed continuation of Keaunui Drive extending from the east side

of the Ewa by Gentry development across Fort Weaver Road to the Kapolei Parkway.

Currently two regional City bus lines (#41 & #42) pass through the Ewa Makai project area, both on Fort Weaver Road. In addition, a local circulator bus (#431) provides hourly service from the Waipahu Transit Center through the Ewa Villages and existing Ewa by Gentry development mauka of Geiger/Iroquois Point Road.

In order to serve the Ewa Makai area, it would be relatively easy to move the current circulator route (#431) from Geiger/Iroquois Point Road down to the proposed extension of Keaunui Drive where it crosses Fort Weaver Road and connects to the Kapolei Parkway as shown on the Ewa Makai Circulation Plan. A circulator bus along this route would place approximately 80% of the residential units and all of the non-residential uses in Ewa Makai within a quarter mile of a public transportation route.

If a secondary loop were added to the expanded circulator route along a proposed collector road within the residential area at the east end of the project (as shown on the Circulation Plan), 90% of the units would then be within a quarter mile of the route.

Bus pull-outs, shelters and other improvements will be constructed in accordance with any proposed bus routes within the Ewa Makai area.

<u>Pedestrian and Bicycle Routes and Facilities</u> -- *"The circulation plan should indicate any pedestrian and bicycle paths that are physically separated from roadways. Street intersections along these separated paths should have a narrow curb radius and include special signage and paving to encourage safe and convenient pedestrian and bicycle crossings. Interior pedestrian/bicycle routes may be provided as an alternative to paved sidewalks along local streets."*

The Ewa Makai area is designed to be a pedestrian and bicycle-friendly environment. Arterial, collector and local access streets will be designed in accordance with new City standards with sidewalks and bike lanes or bike paths where appropriate.

A separate pedestrian and bicycle path will be provided across the open area makai of the Coral Creek golf course. This path will provide an important link for residents in the Ewa Makai area to the Barbers Point golf course and the beach and future recreation facilities at Kalaeloa. Other portions of this pathway between the Kapolei Parkway and the Barbers Point/Kalaeloa boundary will be integrated into the local roadway network and will be designed to encourage safe and convenient travel for all users.

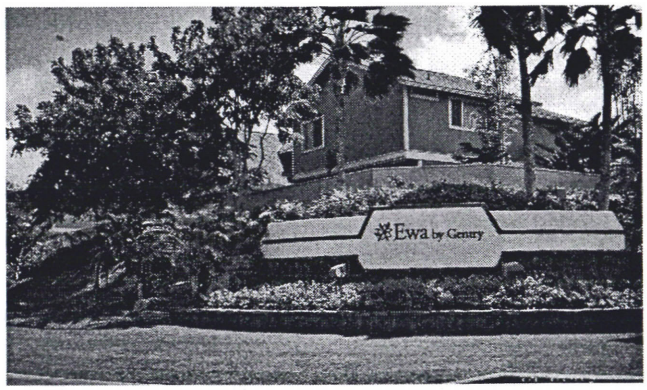
<u>Landscape Treatment</u> -- *"Conceptual street tree plans should be indicated in the circulation plan. Entries to the community should be identified with*

special landscape treatment. The rights-of-way for major arterials and major collector streets should be designed as landscaped parkways, complete with a landscaped median strip, landscaped sidewalk, and bikeways. Canopy trees should be planted to shade the sidewalk/bikepath areas. Landscaped treatment along the edges of the project should be appropriate for the natural setting and designed to provide continuity and transition from adjacent development areas."

Landscaping of public streets, pedestrian/bike paths, community entries and development buffers in the Ewa Makai area will be based on the use of plant materials appropriate to the Ewa climate and environment. They will be similar to landscaped elements and features currently used in the Ewa by Gentry community.

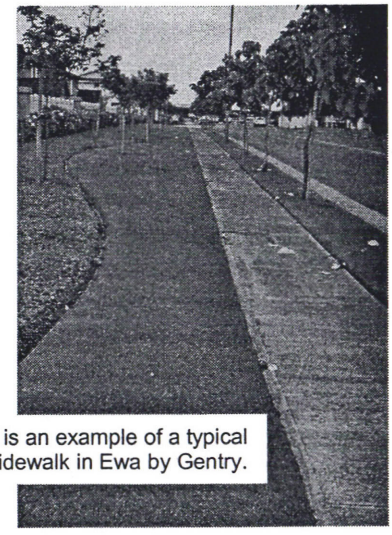
As in Ewa by Gentry, entries to Ewa Makai will be identified with special landscape treatments, such as rock walls, indirect lighting, dramatic plantings, and perhaps special water features.





Examples of entry features in Ewa by Gentry.

The streetscape zones which parallel Ewa Makai's roadway network will be the most prominent elements of the community's public landscape. Consequently, their design quality will play a critical role in creating a positive, unified visual image and an attractive pedestrian environment.



Pictured here is an example of a typical landscaped sidewalk in Ewa by Gentry.

The rights-of-way for major arterials and major collector streets will be designed as landscaped parkways, complete with landscaped median strip, landscaped sidewalk and bikeways.





Shade trees will be planted along bikepaths/sidewalks on the major collector streets to create an overhead canopy which provides a sense of enclosure and tempers the visual impact of cars.

Flowering trees may be used to enhance the secondary streets and cul-de-sacs. The street tree program will conform to City and County regulations for planting and maintenance. All species used will be selected from the official street tree list published by the Department of Parks and Recreation.

Relation to Urban Land Use Map – The planned low- and medium-density areas in the Ewa Makai Master Plan will be consistent with the Ewa Urban Land Use Map shown as Exhibit A in the Ewa Development Plan.

Relation to Zoning – The planned residential areas in Ewa Makai will be consistent with the Guidelines for Appropriate Zoning set forth in Table 3.3 of the Ewa Development Plan.

f. **Non-Residential Development: Industrial Centers** – The industrial-commercial employment center in Ewa Makai-West is proposed for service-oriented light industrial use and is included for development in Phase I of the Phasing Plan for the Ewa DP area. (See Table 2.2.) It will be consistent with the planning principles set forth in Section 3.7.3.2 that refer to appropriateness of scale and environmental compatibility.

3. PUBLIC FACILITIES AND INFRASTRUCTURE POLICIES AND PRINCIPLES

Chapter 4 of the Ewa DP sets forth policies and principles to guide the planning and construction of proposed public and private public facility projects and infrastructure systems to carry out the vision for future development of Ewa. The Ewa Makai development will be consistent with these policies and principles as follows:

a. Transportation Systems

Roadway Network - One of the major elements of the future Ewa roadway network is Kapolei Parkway which is planned as a major corridor. The portion of Kapolei Parkway through Ewa by Gentry has already been completed. When remaining portions of the roadway are completed, including those portions through HASEKO's Oceanpointe community, the Ewa Makai community, and State and City properties, Kapolei Parkway will serve as a major link from Ewa Beach to the city of Kapolei. Eventually, it will serve as a link from Ewa Beach to the resort area of Ko Olina.

Bikeway System – The Ewa DP states that major bike paths should run along the OR&L right-of-way and Kapolei Parkway and along the North-South Road and Fort Weaver Road. Bike paths currently exist throughout the Ewa by Gentry community and along Fort Weaver Road and Kapolei Parkway, and will be included in the Ewa Makai development, as well.



Transit-Oriented Community Street Systems - Circulation systems within the Ewa Makai community will be designed to facilitate bicycle and pedestrian travel, allow for increased transit use, and reduce dependence on automobile travel.

b. **Water Allocation and System Development**

Adequacy of Water Supply – All necessary on-site water facilities will be provided in consultation with the Board of Water Supply (BWS) and will be built in accordance with an approved Water Master Plan. In addition, Gentry is a member of the Ewa Plain Water Development Corporation (EPWDC), a non-profit corporation responsible for planning, financing, and implementing the construction of regional source development, storage reservoirs, and distribution systems. Major portions of EPWDC's water program (including dedicated source and well facilities, storage and transmission for a water system of 6.72 million gallons per day) have already been implemented and were dedicated to BWS in 1991. It is anticipated that water supply for Ewa Makai will be provided from the Ewa Shaft, a large capacity well that BWS recently acquired from Campbell Estate.

Dual Transmission Lines/Use of Nonpotable Water – As with Ewa by Gentry, a dual water system will be developed in Ewa Makai to conserve the supply of potable water. Nonpotable water will be used where feasible for purposes such as landscape irrigation.

c. **Wastewater Treatment**

Wastewater produced by the Ewa Makai development will be connected to the Honouliuli Wastewater Treatment Plant, a municipal sewer service system.

d. **Drainage Systems**

The Ewa DP states that drainage system designs should emphasize control and minimization of non-point source pollution and the retention and/or detention of storm water on-site and in appropriate open space and wetland areas. Natural and man-made vegetated drainageways and retention basins are proposed for Ewa Makai. A drainageway that is part of the Kaloi Gulch Drainage Basin is proposed for Ewa Makai-West, connecting the Coral Creek Golf Course with Ocean Pointe's planned golf course.

In Ewa Makai-East, a landscaped drainageway, recreation area, and large retention basin will be built as part of the residential subdivision. These drainage facilities will be used to detain or infiltrate storm water flows to reduce their volume and runoff rates and the amounts of sediments and pollutants transported. The retention/detention basins may be developed as part of a landscaped walkway that will double as a visual amenity, though final plans are undetermined at this time.

e. **School Facilities**

The Ewa DP states that the State Department of Education (DOE) has projected a need by 2020 for two new intermediate schools, one of which has already been built in the Villages of Kapolei. Although the Ewa DP lists East Kapolei Intermediate as the second intermediate school site, the development of East Kapolei is uncertain at this time. In cooperation with the DOE, Gentry has agreed to dedicate an 18-acre middle school site in Ewa Makai-West to service the educational needs of this growing area and to address its fair share contribution for the provision of adequate school facilities.

f. **Public Safety**

The project site is served by the Kapolei Police Station, which is located at 1100 Kamokila Boulevard in Kapolei. There is also a storefront office next to the 7-Eleven store at 91-1669 Fort Weaver Road. According to the Honolulu Police Department, because of the number of residential units planned, and with the corresponding addition of pedestrian and vehicular traffic in and around the area, there will be an increase in the need for police service. It is anticipated that the revenues collected from real property taxes of the new residences and industrial-commercial center will finance the increased cost of police services needed. No additional requirements are anticipated for the Honolulu Fire Department.

Availability or Adequacy of Other Public Services and Facilities

In addition to the public services and facilities that are noted above, the following public services and facilities will also be available and adequate.

g. **Solid Waste Handling and Disposal**

Solid waste handling and disposal will be coordinated with the City Department of Environmental Services, Refuse Division, with written notification submitted in advance of when the refuse service is expected to begin. The design of residential communities within Ewa Makai will comply with the Division's requirements in order to enable refuse pick-up.

h. **Public Utilities**

The project will be serviced by a number of public utilities including the Hawaiian Electric Co. (HECO) for electric power, Verizon (telephone), Board of Water Supply (water and sewer), and various cable television providers including Oceanic Cable and Americast. There is also a possibility of using The Gas Company for gas service.

HECO indicated that it will be able to serve this new development from the Fort Weaver Substation which was installed in an earlier phase of the Ewa by Gentry project. Therefore, the installation of additional substation transformer capacity and extension of cables, ducts, and associated

electrical facilities should encounter no significant obstacles to providing timely and reliable service.

i. Parks

The conceptual plan incorporates two neighborhood parks: an 8-acre park in Ewa Makai-West and a 3.5 acre park in Ewa Makai-East. The 8-acre park in Ewa Makai-West will be centrally located and within walking or biking distance for many area residents. The 3.5 acre park in Ewa Makai-East will be an extension of a planned 6.8 acre park in the existing Ewa by Gentry community, thereby increasing the overall park size to 10.3 acres. In addition, a 2-acre private community recreation center complex is planned in Ewa Makai-West for use by Ewa by Gentry residents, and additional private recreational areas may be developed in conjunction with individual residential developments. Master planning and development of new parks will be provided in accordance with the requirements of the City's Park Dedication Ordinance.

j. Public Agency Impact

Police Protection

The project will be served by the Kapolei Police Station, which is located at 1100 Kamokila Boulevard in Kapolei. There is also a storefront office next to the 7-11 store at 91-1669 Fort Weaver Road.

Based on a letter dated June 13, 2002 from Police Chief Lee Donahue, there will likely be an increase in calls for police services when Ewa Makai is developed. It is recommended that the Ewa Makai project can mitigate impacts on police protection services through security measures such as on-site security, design measures such as well-lit public areas and walkways, and the establishment of neighborhood watch programs. As an extension of the Ewa by Gentry community, Ewa Makai will have on-site security and will be part of an established neighborhood security watch program.

Fire Protection

In the event of a single alarm fire, the project site would be served by the Waipahu Fire Station. For a multiple alarm such as a structure fire, three engine companies and one ladder company would be sent from the Ewa Beach, Waipahu, and Kapolei Fire Stations, with the ladder company originating from the Waipahu Fire Station. The project would increase the demand for fire protection services by adding new structures and an increased population.

Emergency Medical Services (EMS)

In an emergency response, either EMS personnel or the nearest fire station is notified. EMS uses a global tracking system that places each vehicle within 30 feet of its current location.

The Ewa area is primarily serviced by two ambulances from St. Francis West and the Waipahu Fire Station. There is also a single Rapid Response Unit based at Kalaeloa. The Rapid Response Unit does not transport patients.

If needed, additional EMS vehicles respond from Waianae and Aiea. The average response time to the project site is approximately six to nine minutes.

Public Education

Based on current district boundaries, residents of Ewa Makai will be served by the Pohakea and Ewa Beach Elementary Schools, Ilima Intermediate, and Campbell High School. The proposed project will impact these facilities by increasing the school-aged population. In general, the project's impact on the area's schools fall within the projected 2007 enrollment.

The Gentry Companies has been working with the State Department of Education to determine the developer's fair share contribution to the public education system. The parties have agreed that reserving 18 acres for a new middle school meets the developer's fair share requirement.

Site Analysis

Impact on Significant Historic and Cultural Resources

Table 3.1 of the Ewa Development Plan identifies the various Significant Historic and Cultural Resources in Ewa. The following are listed as "Historic Features": Lanikuhonua; OR&L Historic Railway; Ewa Villages; and the Pearl Harbor Historic Landmark. Ewa Makai will not impact these historic features.

Identified as "Native Hawaiian Cultural and Archaeological Sites" are the Barbers Point Archaeological District and Oneula Archaeological District. These will not be impacted by the development of Ewa Makai.

The following are listed as "Significant Views and Vistas":

- Distant vistas of the shoreline from the H-1 Freeway above the Ewa Plain;
- Views of the ocean from Farrington Highway between Kahe Point and the boundary of the Waianae Development Plan Area.
- Views of the Waianae Range from H-1 Freeway between Kunia Road and Kaloi Gulch and from Kunia Road;
- Views of na pu'u o Kapolei, Palailai, and Makakilo;
- Mauka and makai views; and
- Views of central Honolulu and Diamond Head.

These views and vistas should not be affected by the development of Ewa Makai.

Impact on Ewa Development Plan Open Space Map

The development of Ewa Makai will be consistent with the Open Space Map that is included as Appendix A of the Ewa Development Plan. The Kaloi Gulch drainage channel in Ewa Makai-West, as well as the greenways along Kapolei Parkway and the Fort Weaver Road corridor, are included as part of the open space system. Although there will be smaller community and neighborhood parks in Ewa Makai, these are not shown on the map because only island-wide, regional, and district parks are shown. In addition, the open areas in Ewa Makai-East that will be part of the drainage system will provide green space, but are not currently shown on the Open Space Map.

Land Use

Table 5.1 of the Ewa Development Plan shows the general zoning district categories from the Land Use Ordinance. The following table indicates the proposed pattern of land uses in Ewa Makai in accordance with these categories.

EWA MAKAI ZONING DISTRICT CATEGORIES

Zoning District Category	Zoning District Title	Requested Designation	Current Designation	No. of Acres
Preservation	General	P-2	AG-2	14
Residential	R-5	R-5	AG-1, AG-2	93
Apartment	Low-Density	A-1	AG-1, AG-2	146
Ind-Comm Mixed Use	Ind-Comm Mixed Use	IMX-1	AG-2	30
			Total	**283**

Ewa Makai - West

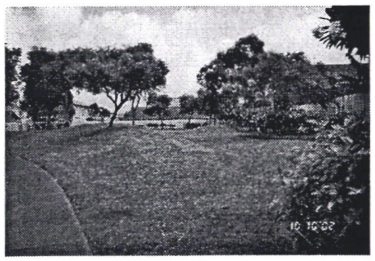
Zoning District Category	Zoning District Title	Requested Designation	Current Designation	No. of Acres
Preservation	General	P-2	AG-2	14
Residential	R-5	R-5	AG-2	25
Apartment	Low-Density	A-1	AG-2	102.5
Ind-Comm Mixed Use	Ind-Comm Mixed Use	IMX-1	AG-2	30
			Total	171.5

Ewa Makai - East

Zoning District Category	Zoning District Title	Requested Designation	Current Designation	No. of Acres
Residential	R-5	R-5	AG-1	68
Apartment	Low-Density	A-1	AG-1	43.5
			Total	111.5

Open Space

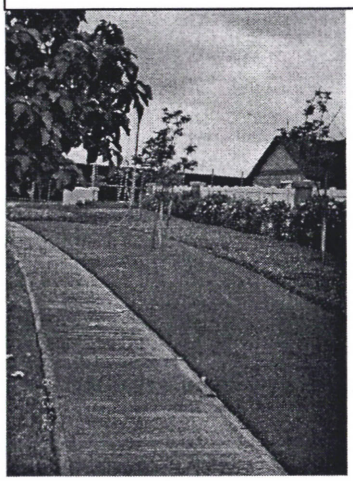
Ewa Makai's open space and landscape system will provide attractive facilities which meet the needs of community residents, and will be consistent with the regional open space system set forth in the Ewa Development Plan.



As an extension of the Ewa by Gentry master planned community, Ewa Makai will likewise incorporate an open space network within the community. Significant acreages of open space will be retained in parks, as well as in the landscaped drainageways and retention areas that will be provide visual greenway. The community is also adjacent to agricultural lands in the West Loch Naval Magazine Blast Zone, as well as the Coral Creek, Barbers Point and Hawaii Prince golf courses, all of which are designated as part of the regional open space system. Greenway corridors include the Kapolei Parkway and Fort Weaver Road.



Ewa Makai's landscape system will provide attractive open spaces within the community.





Parks and adjacent golf courses will be part of the open space plan for Ewa Makai.





Greenway corridors will include Fort Weaver Road and Kapolei Parkway shown here.

A discussion of the open space plan for Ewa Makai as it relates to the Ewa DP can be found on pages 8 to 9 of this document.

Circulation

A hierarchy of streets is planned throughout the Ewa Makai development area. Two major arterials, Fort Weaver Road and the Kapolei Parkway, extend through the area providing the primary access to the Ewa Beach, Ocean Pointe and Iroquois Point communities. The only major collector road within the project is a continuation of Keaunui Drive extending from the east side of the Ewa by Gentry development across Fort Weaver Road to the Kapolei Parkway.

Currently two City bus lines (#41 & #42) pass through the Ewa Makai project area, both on Fort Weaver Road. In order to provide improved coverage for residents in Ewa Makai and Ewa by Gentry, Gentry will work with the City's Department of Transportation Services and its consultant(s) to implement recommendations on new transit routes and an expanded hub and spoke system to better serve the needs of these communities. Suggested routes would be along Keaunui Drive (for areas east of Fort Weaver Road), as well as through Kapolei Parkway (for areas west of Fort Weaver). This would place the vast majority of the residential units in the Ewa by Gentry development within one-quarter mile of a public bus route.

The Ewa Makai area is designed to be a pedestrian and bicycle-friendly environment. Arterial, collector and local access streets will be designed in accordance with new City standards with sidewalks and bike lanes or bike paths where appropriate.

A separate pedestrian and bicycle path will be provided across the open area makai of the Coral Creek golf course. This path will provide an important link for residents in the Ewa Makai area to the Barbers Point golf course and the beach and future recreation facilities at Kalaeloa. Other portions of this pathway between the Kapolei Parkway and the Barbers Point/Kalaeloa boundary will be integrated into the local roadway network and will be designed to encourage safe and convenient travel for all users.

On the east side of the Ewa Makai area, a landscaped drainageway will contain a separate pedestrian and bicycle path linking that residential area to the adjoining parks and regional circulation network.

Exhibit B on the following page indicates the proposed major roadways, the location of Ewa Makai in relation to the planned regional roadway network (as set forth in the Ewa Highway Master Plan), pedestrian and bicycle routes, and proposed transit routes.

EWA MAKAI CIRCULATION MAP

Gentry Homes, Ltd.

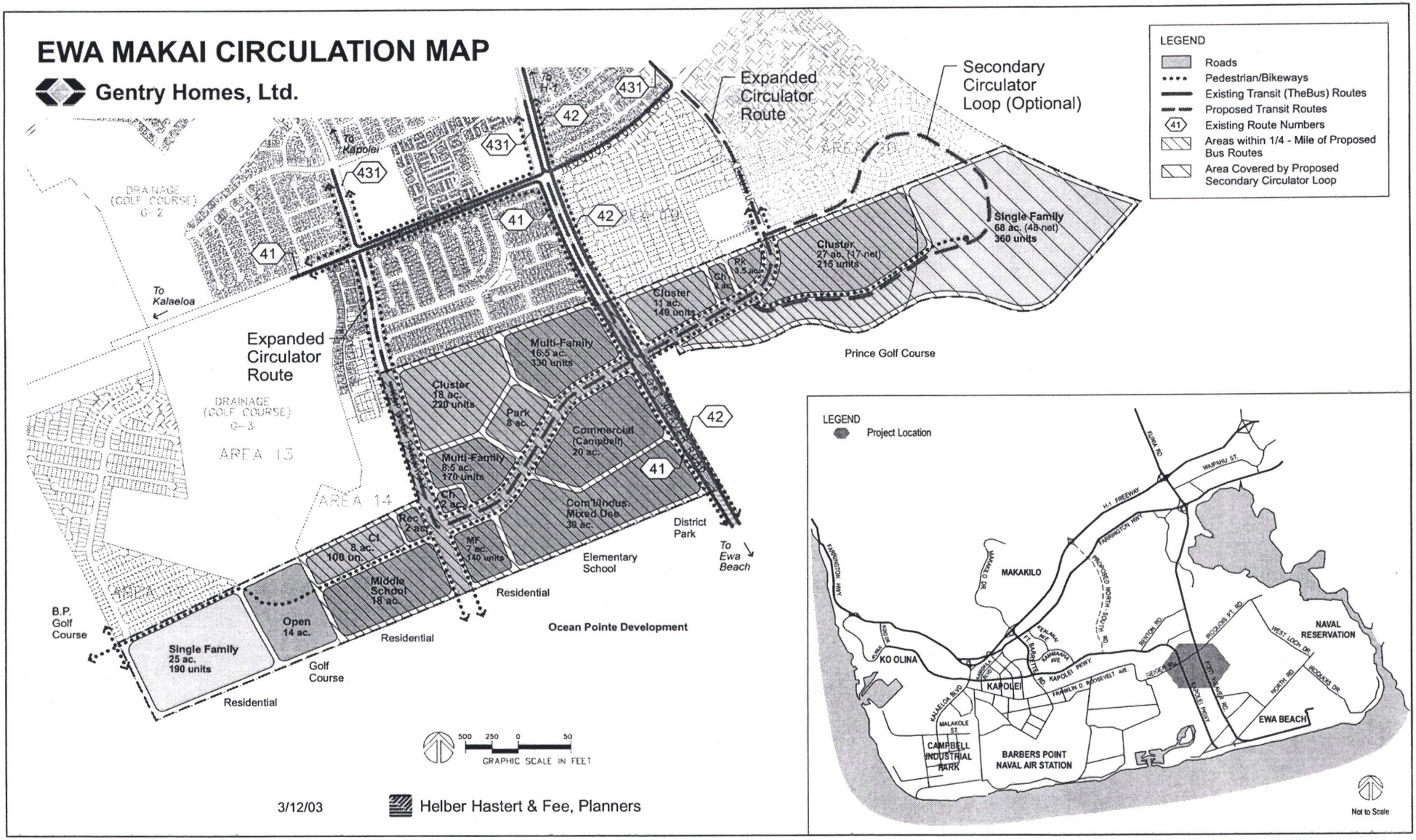


Exhibit B

Design Theme or Character

The Ewa Makai community will be a continuation of the Ewa by Gentry development and will therefore conform to similar design themes. The following pages describe what is envisioned for the Ewa Makai developments.

Neighborhood Structure

Ewa Makai will be developed as a series of sub-neighborhoods with each neighborhood having a distinct identity within the larger community setting. Generally, internal collector roads will divide the community into sub-neighborhoods ranging in size from 7 acres to 78 acres. A mix of residential designs and model types will be utilized within each area to promote a variety of architectural forms, attractive landscaping, and a mix of household sizes.

Single Family Residential

360 single family homes are planned for Ewa Makai-East, while 190 homes are planned for Ewa Makai-West. Most of the single family units will be sold in fee as house and lot packages, although a few custom built homes on larger lots may also be a possibility. Single family residences in Ewa Makai would take advantage of the frontage along the existing Hawaii Prince and Barbers Point Golf Courses.



Densities for single family homes in Ewa Makai will average approximately 7.5 units per acre on 5,000 s.f. lots.



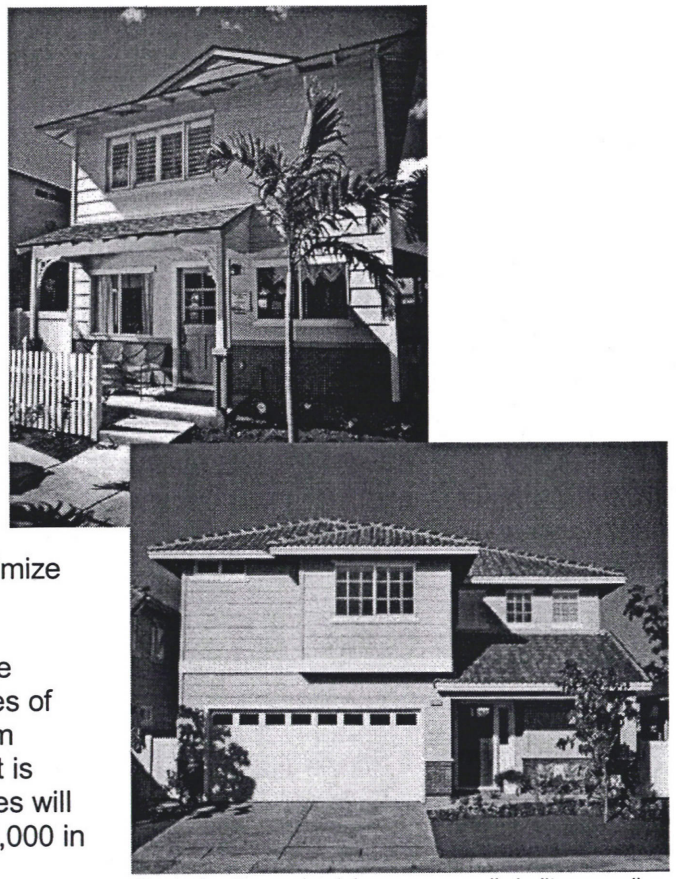
The proposed Ewa Makai single family residential subdivisions will be designed for consistency with the existing Ewa by Gentry community. Architectural and special relationships created by buildings, fencing, planting, and lighting will continue to be critical considerations when designing single family homes, as these are all inter-related elements in the total environment of the housing unit. Presently, single family densities are estimated to average 7.5 units per acre, based on lot sizes averaging 5,000 square feet. Average prices will range from $300,000 to $405,000 in 2002 dollars.

Cluster Homes

355 single family condominiu0m homes or "cluster units" are planned for Ewa Makai-East, while 320 such homes are planned for Ewa Makai-West. These single family or duplex condominiums will be sold in fee simple on lands that are zoned A-1 Low Density Apartment.

In contrast to the more conventional layout of homes, single family condominiums are often zero-side yard units on smaller lots, with each lot being a "limited common element." Because of the small size, individual homes will be carefully designed to maximize the feel for interior space, and at the same time, optimize the limited exterior space.

Smaller houselots and reduced infrastructure costs have enabled Gentry to sell these types of units at very competitive prices, making them popular choices among new homebuyers. It is anticipated that sales prices for cluster homes will range from approximately $200,000 to $300,000 in 2002 dollars.



Single family condominiums are usually built on smaller lots, with each lot being a "limited common element. Densities average about 12.5 units per acre.

Multi-Family Residential

Approximately 640 multi-family homes are planned for Ewa Makai-West. It is envisioned that multi-family residential areas will consist of townhomes or low-rise apartment buildings with densities of approximately 20 units per acre, with product types being largely dependent upon market conditions at the time of sale. It is estimated that these units will sell for approximately $150,000 to $200,000 in 2002 dollars.



A typical multi-family neighborhood will consist of 2- or 3-story walk-up townhomes or apartment buildings with densities of approximately 20 units per acre.

To minimize the need for vehicular transportation, the multi-family units will be located in areas proximate to public transportation facilities and a "town center" in Ewa Makai consisting of an industrial-commercial employment center, a retail-office complex, a neighborhood park, a district park (in the adjacent Ocean Pointe community), a community recreation center, churches, a middle school, and an elementary school (also in Ocean Pointe). The town center will be pedestrian and bicycle friendly to enable easy access to these destinations by those living in the multi-family homes.

Industrial-Commercial Area



A 30-acre industrial-commercial complex is intended as an adjunct to the planned 20-acre Laulani Commercial Center, and is expected to contain about 35 to 40 lots ranging in size from approximately 15,000 square feet up to 3 acres. Uses are anticipated to be similar to those found in the existing industrial-commercial developments in Kaneohe, Kalihi, Waipio, Kakaako, Mapunapuna, and Hawaii Kai. It would include warehousing, light assembly operations, wholesaling, commercial, and other permitted uses. The IMX-1 district is intended to provide for a range of uses without exposing non-industrial uses to unsafe and unhealthy environments. The IMX-1 district is intended to promote and maintain a viable mix of light industrial and commercial uses to provide employment and to serve the surrounding community.

Based on the number of lots, the lot sizes, and the anticipated operations, it is expected there will be approximately 40 major buildings within the complex. Although the proposed IMX-1 zoning allows floor area ratio (FAR) maximums of 1.5 to 2.5 (depending on the mix of industrial and non-industrial uses), it is anticipated that the average FAR for this development will be approximately 0.60. Assuming approximately 4 acres of the 30-acre site is taken up by roadways, the remaining 26 acres of developable land would generate approximately 680,000 square feet of total building floor area.

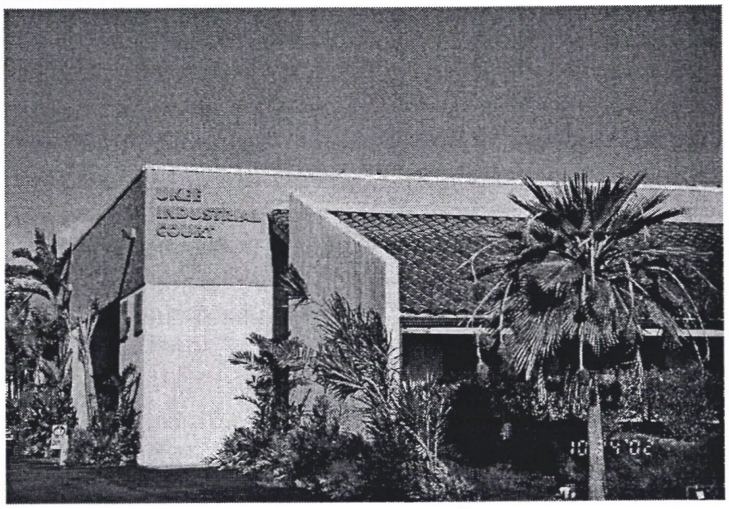




Although off-street parking requirements will vary significantly depending on the specific types of uses on each lot, most will require between 1 stall per 300 square feet and 1 stall per 1,500 square feet of floor area. Assuming an average of 1 stall per 900 square feet, approximately 756 parking stalls will be needed within the complex.



Although the zoning map for the area will establish the maximum height of buildings in the complex, it is anticipated that structures will not exceed 40 feet. Many are expected to be single-story facilities. Some may have mezzanines or second story spaces for administrative or light storage uses, and others may be "high cube" facilities.



The visibility of large building volumes from the neighboring residential area, park, and elementary school would be minimized through such means as appropriate site planning, landscaping, privacy walls, and street trees. Uses in the industrial-commercial area will be restricted to those that are compatible within the setting of a residential community, including non-polluting industries and those whose noise levels are kept at an acceptable level.

Pictured on these pages are a few examples of the types of buildings and uses found in the Gentry Business Park that might be appropriate for Ewa Makai.





Telecommunications

The Ewa Makai community will continue to be serviced by Verizon Hawaii, which provides the basic backbone infrastructure for telephone service throughout Ewa by Gentry.

All homes will come equipped with conduits for Oceanic-Time Warner to install cable television service and Roadrunner internet access. Residents of Ewa Makai who utilize Oceanic's cable services will also be able to access the Oceanic cable channel that is available exclusively to homes in the Ewa by Gentry community. Programming on this channel is run by the Ewa by Gentry Community Association and centers around activities, special events, meetings, and other items of interest to residents of Ewa by Gentry. The community channel is a great way for Ewa by Gentry residents to keep abreast of what is happening in their neighborhood.

ORIGINAL

BEFORE THE LAND USE COMMISSION

OF THE STATE OF HAWAII

In the Matter of the Petition of GENTRY INVESTMENT PROPERTIES Petition For District Boundary Amendment	DOCKET NO. A03-738 GENTRY INVESTMENT PROPERTIES

AFFIDAVIT OF SERVICE OF PETITION FOR LAND USE DISTRICT BOUNDARY AMENDMENT

LAND USE COMMISSION
STATE OF HAWAII
2003 MAR 21 A 9:14

OF COUNSEL:
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A Law Corporation

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CURTIS T. TABATA, #5607-0
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Telephone: 526-9566

Attorneys for Petitioner
GENTRY INVESTMENT PROPERTIES

BEFORE THE LAND USE COMMISSION

OF THE STATE OF HAWAII

In the Matter of the Petition of GENTRY INVESTMENT PROPERTIES Petition For District Boundary Amendment	DOCKET NO. A03-738 GENTRY INVESTMENT PROPERTIES

AFFIDAVIT OF SERVICE OF PETITION
FOR LAND USE DISTRICT BOUNDARY AMENDMENT

STATE OF HAWAII)
)
CITY AND COUNTY OF HONOLULU)

TOSHIMASA HOSODA, being first duly sworn on oath, deposes and says:

A. Affiant is the Senior Vice President of Gentry Homes, Ltd. and agent of the Petitioner for a State of Hawaii Land Use District Boundary Amendment from Agricultural District to Urban District, identified as Docket No. A03-738, for land situated at Ewa, Oahu, Hawaii and identified as Tax Map Key Nos. 1-9-1-10:7 and 1-9-1-69:5.

B. In compliance with §15-15-48(a), Hawaii Administrative Rules ("HAR"), Affiant did on March 21, 2003, deposit in the United States Mail, postage prepaid, by certified mail, a copy of the Petition for District Boundary Amendment, to the following:

State of Hawaii
Office of Planning
235 South Beretania Street, 6th Floor
Honolulu, Hawaii 96813

City & County of Honolulu
Department of Planning & Permitting
650 South King Street
Honolulu, Hawaii 96813

City & County of Honolulu
Planning Commission
650 South King Street
Honolulu, Hawaii 96813

The Estate of James Campbell
1001 Kamokila Boulevard
Kapolei, Hawaii 96707

Hawaiian Electric Company, Inc.
900 Richards Street
Honolulu, Hawaii 96813

Oahu Sugar Company, Ltd.
c/o Amfac Land Company, Ltd.
700 Bishop Street, Suite 501
Honolulu, Hawaii 96813

City & County of Honolulu
Board of Water Supply
630 South Beretania Street
Honolulu, Hawaii 96843

Seibu, Inc.
100 Holomoana Street
Honolulu, Hawaii 96815

C. This Affidavit is provided in compliance with §15-15-50(c)(5), (C), HAR.

That further Affiant sayeth naught.

Dated: Honolulu, Hawaii, March 21, 2003.

Toshimasa Hosoda

Subscribed and sworn to me
this 21st day of March 2003

Name SYLVIA T. HAYASHI
Notary Public, State of Hawaii
My commission expires: 10·26·03

ORIGINAL

BEFORE THE LAND USE COMMISSION

OF THE STATE OF HAWAII

In the Matter of the Petition of GENTRY INVESTMENT PROPERTIES Petition For District Boundary Amendment	DOCKET NO. A03-738 GENTRY INVESTMENT PROPERTIES

AFFIDAVIT OF SENDING OF NOTIFICATION OF PETITION FILING

LAND USE COMMISSION
STATE OF HAWAII
2003 MAR 21 A 9:14

OF COUNSEL:
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BEFORE THE LAND USE COMMISSION

OF THE STATE OF HAWAII

In the Matter of the Petition of GENTRY INVESTMENT PROPERTIES Petition For District Boundary Amendment	DOCKET NO. A03-738 GENTRY INVESTMENT PROPERTIES

AFFIDAVIT OF SENDING OF NOTIFICATION OF PETITION FILING

STATE OF HAWAII)
)
CITY AND COUNTY OF HONOLULU)

TOSHIMASA HOSODA, being first duly sworn on oath, deposes and says:

A. Affiant is the Senior Vice President of Gentry Homes, Ltd. and agent of the Petitioner for a State of Hawaii Land Use District Boundary Amendment from Agricultural District to Urban District, identified as Docket No. A03-738, for land situated at Ewa, Oahu, Hawaii and identified as Tax Map Key Nos. 1-9-1-10:7 and 1-9-1-69:5.

B. In compliance with §15-15-50(d), Hawaii Administrative Rules ("HAR"), Affiant did on March 21, 2003, deposit in the United States Mail, post paid, by regular mail, a copy of the attached Notification of Petition Filing, to the persons identified in the attached mailing list.

C. This Affidavit is provided in compliance §15-15-50(d), HAR.

That further Affiant sayeth naught.

Dated: Honolulu, Hawaii, March 21, 2003.

Toshimasa Hosoda

Subscribed and sworn to me
this 21st day of March 2003

Name SYLVIA T. HAYASHI
Notary Public, State of Hawaii
My commission expires: 10-26-03

Friday, March 21, 2003

Notification of Petition of Filing

This is to advise you that a petition to amend the State Land Use District Boundaries with the following general information has been submitted to the State of Hawaii Land Use Commission:

Docket No:	A03-738
Petitioner/Address:	Gentry Investment Properties P.O. Box 295 Honolulu, HI 96809-0295
Landowner:	The Estate of James Campbell
Tax Map Key:	Ewa Makai-East 9-1-10:7 Ewa Makai-West 9-1-69:5
Location:	Ewa, Oahu, Hawaii
Requested Reclassification:	Agriculture to Urban
Acreage:	283 acres
Proposed Uses:	1,865 single family and multi-family residential units, industrial/commercial mixed uses, public facilities (including a middle school, parks, churches/day care centers, and a community center), and open space.
Date Submitted:	March 21, 2003

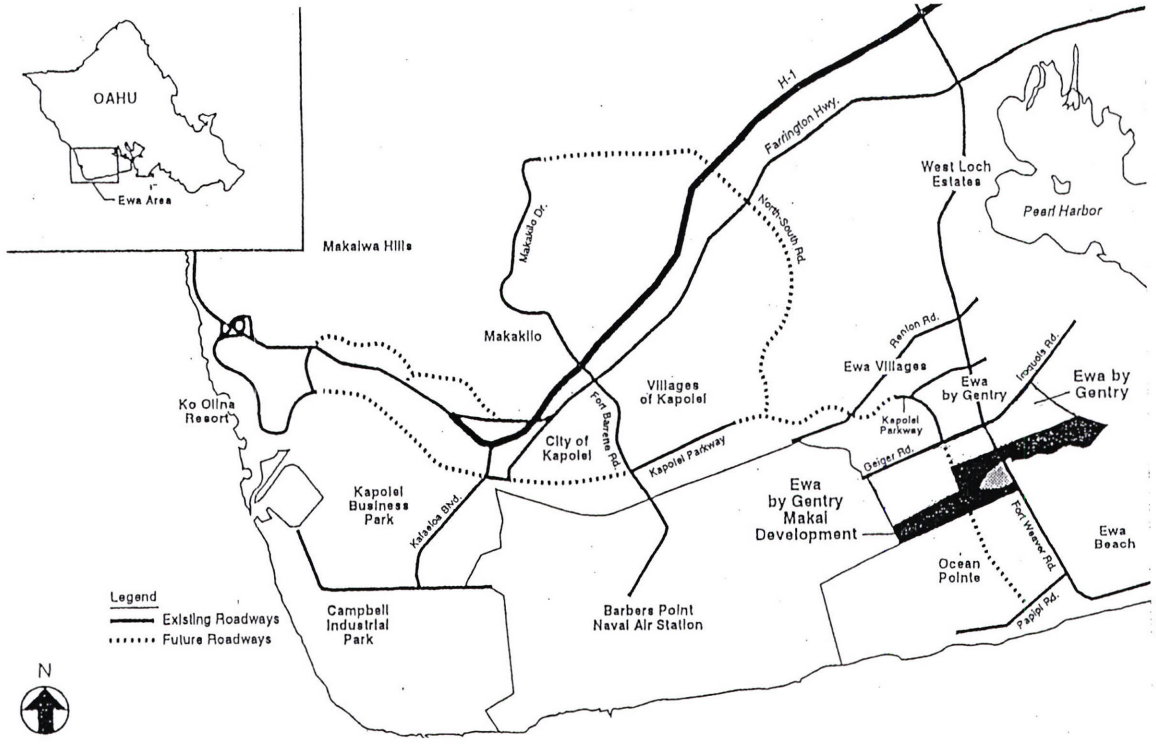
You may review detailed information regarding the petition at the State Land Use Commission Office or the Department of Planning and Permitting, City and County of Honolulu.

The Land Use Commission Office is located at 235 South Beretania Street, Room 406, Honolulu, Hawaii. Office hours are from 7:45 a.m. to 4:30 p.m., Mondays through Fridays.

A hearing on this petition will be scheduled at a future date. If you are interested in participating in the hearing as a public witness, please write or call the Commission office at P.O. Box 2359, Honolulu, HI 96804-2359; Phone (808)587-3822.

If you intend to participate in the hearing as an intervenor, pursuant to §15-15-52, Hawaii Administrative Rules, you should file a Notice of Intent to Intervene with the Commission within 30 days of the date of this notice. Please contact the Commission for further information.

Location and Vicinity Map



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OAHU MAILING LIST
(3/10/03)

ORIGINAL

BEFORE THE LAND USE COMMISSION

OF THE STATE OF HAWAII

In the Matter of the Petition of GENTRY INVESTMENT PROPERTIES Petition For District Boundary Amendment	DOCKET NO. A03-738 GENTRY INVESTMENT PROPERTIES

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the Petition For District Boundary Amendment in this matter was duly served upon the parties listed below via U.S. certified mail, postage prepaid on March 21, 2003

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LAND USE COMMISSION
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