DEPARTMENT OF TRANSPORTATION'S

REPORT TO LEGISLATURE

OF

THE STATE OF HAWAII

ON

ACT 213

SESSION LAWS OF HAWAII 2007

Section 127:
Honolulu International Airport
Item C-2: New Connector and Automated People Mover System
Item C-3: Elliott Street Support Facilities
Item C-7: New Mauka Concourse Improvements
Item C-8: Diamond Head Concourse Improvements

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
NOVEMBER 2007

Honolulu International Airport
Terminal Modernization Program
House Bill 500
State Project AO-1030-15

Summary Progress Report
November 2, 2007

BACKGROUND

The Terminal Modernization Program (TMP), developed in consultation with the airlines, includes a series of phased planning, design and construction capital improvement projects focused on expanding and improving Honolulu International Airport airside terminal. The TMP has been in various stages of development since early 2005 and has, within the last year, culminated in a preferred modernization planning alternative that has formed the basis of an overall, airline approved, terminal area plan.

The State of Hawaii Department of Transportation Airports Division (DOT-A) under State Project AO-1030-15, awarded contracts to two consultant groups to complete and implement the TMP. In September 2006, Parsons was selected as the overall TMP manager, and Hellmuth, Obata + Kassabaum, (HOK)/KYA Design Group (KYA) as the Master Architect to develop overall basis of design and standards requirements for each of the program's diverse elements.

This TMP team, in conjunction with DOT-A staff, has endeavored to establish total program scope and phasing concurrence within a changing operational and fiscally challenging environment. These changes have resulted in a restructuring and realignment of TMP priorities which have required further study to ensure that current budget limitations are met and airline scope requirements can still be fulfilled.

The objective of these projects is to collectively improve the efficiency, operational adequacy, and capacity of airport terminal facilities within a budget of $2.7B dollars. To achieve this objective, the TMP will, over a period of years in a phased progression of work, replace several existing terminal concourses and other airside facilities with new modern facilities designed to improve passenger flow, meet long-term future airside requirements, and result in a airport facility passenger experience befitting of the image the State of Hawaii would like to provide arriving and departing passengers.

It is intended that, when complete, the TMP basis for design and resulting Terminal Area Plan will be incorporated into the final reports and drawings for the

Airport Master Plan and implemented within the context of the master plan. Ultimately, this will become the basis for the preparation of a revised FAA approved Airport Layout Plan, and the phasing plan for all future design and construction activities associated with the Terminal Modernization Plan to be completed within 12 years.

PROGRESS REPORT

The following reflects the TMP progress of conceptual planning and design for the following requested items:

ITEM C-02: HNL, New Connector and Automated People Mover System, Oahu
Design: $9,000,000
Construction: $12,256,000)

Design and construction for pre-design, schematic design, and construction management for the automated people mover (APM) system and superstructure and design of the APM system, and other related improvements

The primary purpose of the New Connector and Automated People Mover System is to provide for the secure transfer of arriving international passengers between the International Arrival gates on the existing and future Diamond Head Concourses and the International Arrivals Building. This strategy has the dual benefit of minimizing the unassisted walking distances required of arriving international passengers and maintaining the greatest operational flexibility for any gate that is configured for international arrivals. Secondarily, the APM system provides for a time effective conveyance of transferring passengers between the existing Inter-Island Terminal and the Ewa Concourse, with existing and future Diamond Head Concourse gates.

In January 2007, Lea+Elliott, Inc was formally added to the Program Management Team for the HNL Terminal Modernization Program, under subcontract to Parsons Corporation. L+E is the pre-eminent Automated People Mover designer and is recognized as a world leader in this field. In the past 9 months, L+E has been performing conceptual planning and design for the APM component of this Group of Projects. During that time, they have submitted planning and design documents covering the following topics:

- APM Regulatory and Code Requirements
- APM Passenger Travel Analysis
- APM Comparative Airport Walking Distances
- APM Ridership Estimates
- Summary of APM System Responsibilities and Implementation Plan

- APM Procurement Methodology

This activity is proceeding within the budget and schedule anticipated by the Appropriation.

ITEM C-03: HNL Elliott Street Support Facilities, Oahu
Design: $9,000,000
Construction: $12,256,000

Design and construction for support facilities near Elliott Street include maintenance facilities, cargo facilities, relocation of taxiways and other related improvements

The TMP includes the replacement and relocation of cargo, aircraft maintenance, and other supporting facilities in the Elliott Street area. These need to be relocated to make way for new airline facilities that will be demolished as part of terminal improvements, and to re-align and re-classify taxi-lanes to accommodate larger FAA design group IV and V aircraft.

In April, 2007, with DOT-A and airline approvals, the Master Architect and Program Management Team began an analysis of airport master planning documents as a basis from which to develop Elliott Street Area Planning options that would incorporate the phasing requirements of the TMP, and the development and replacement needs of existing Elliott Street facilities due to taxi-lanes G and L re-alignment for group IV and V aircraft accessibility to Mauka gates.

This options analysis was completed in July, with a recommendation to proceed to complete the final Elliott Street Area Plan, which has been submitted on September 28th, 2007. This area plan includes:

- Existing conditions and constraints
- Proposed Re-alignment of Taxiways G and L
- Existing Pavement Condition
- Elliott Street Area Plan Alternatives
- Elliott Street Area Plan Final Recommendation
- Elliott Street Recommended Phasing
- Project Implementation

On October 30th, the Master Architect was provided notice to proceed with Elliott Street Support Facilities Functional Programming. This activity will identify the programming requirements for all facilities impacted by the Elliott Area Plan, in preparation for their replacement-in-kind, and relocation.

Hickam Area Hardstand
Authorization to proceed on design work has been approved for an undeveloped area of the Elliott Street Area Plan referred to as the "Hickam Land." This area is intended to accommodate the relocation of Elliott Street hangar facilities. Since it is vacant, design and construction of hardstand for the future hangar facilities can begin immediately. Completion of these hardstands is scheduled for the 1st Qtr. 2009 on a design/build basis.

All of these activities are proceeding within the budget and schedule anticipated by the Appropriation.

ITEM C-07: HNL, New Mauka Concourse Improvements, Oahu
Design: $4,276,000
Construction: $3,064,000

Design and construction for a new commuter terminal, the construction of a new Mauka concourse near the inter-island terminal and other related improvements

Some of the planning assumptions that recommended the commuter terminal and New Mauka Concourse design and construction work to begin as part of the first phase of the TMP have changed. The changes are operational in nature and are a result of decisions by the air carriers as to where specific airline gates and flight operations will be handled and located. Based on these airline relocation decisions, the original phasing plan is no longer feasible. Therefore the New Mauka Concourse and the new commuter terminal will not be included in the TMP initial phase, but will be included in a later phase; deferred until required on a capacity demand basis. The Terminal Area Plan has already addressed these changes and is updated accordingly.

ITEM C-08: HNL, Diamond Head Concourse Improvements, Oahu
Design: $15,355,000
Construction: $20,750,000

Design and Construction for the relocation of tenants at the Diamond Head Concourse, demolition of the existing and replacement of a new Diamond Head Concourse, and other related improvements.

The relocation of tenants and the replacement of the Diamond Head Concourse remains part of the TMP initial phase program; however, it has also been changed as a result of air carrier relocation decisions. These decisions involve requests to facilitate the co-location of Aloha and United Airlines terminal operations on the existing Diamond Head concourse as soon as possible, and then to maintain this operational requirement as part of the overall Diamond

Head concourse replacement. These plans are in the process of being incorporated into the Terminal Area Plan and require a plan to accommodate these additional interim gates.

The Master Architect is revising the area plan to reflect these changes and incorporate them into the final Terminal Modernization Plan. Because this may involve additional costs, the Program team is evaluating options to determine whether these changes can be absorbed with revised phasing, under current budget and funding limits.

All of these activities are proceeding within the budget and schedule anticipated by the Appropriation.

TERMINAL MODERNIZATION PROGRAM COORDINATION AND PHASING

Address the coordination and phasing of all modernization projects at Honolulu International Airport:

In September 2006, the DOT-A selected and issued a Notice to Proceed to the Parsons Corporation and its team of sub-consultants for provision of Program Management Services for the Honolulu International Airport Terminal Modernization Program. During their Start-up Phase, two principle activities were accomplished that specifically impose methodology for coordination of the phasing of all HNL TMP projects. The Program Manager developed a formal Program Implementation Program (PIP) that provided best practices and procedures for the planning, design, procurement and construction of the individual projects and collective program. As part of the PIP, a Work Breakdown Structure (WBS) was developed that formed the basis for all future schedule development and cost estimation. This WBS is for the entire TMP and creates structure and order to the individual projects. Secondly, a Master Architect was selected by DOT-A with the assistance of the PM and a scope of services was defined with the specific objective of controlling the individual project design development for the entire program under one design entity. This imposes a consistent program-wide Basis of Design upon each project at the earliest stage of Design. In 2007, the PM and MA have been working as a single Program Management Team, under the direction of a single DOT-A Program Manager to formally validate and refine the TMP Baseline Definition, Baseline Schedule and Baseline Estimate. This process is used in almost every major airport capital improvement program throughout the country.

PEOPLE MOVER TRANSPORTATION SYSTEMS AND TECHNOLOGIES

Identify the transportation system(s) and technologies being considered for the people mover project.

On May 4th, 2007, The TMP issued a Lea+Elliott report on the Airport People Mover (APM). This APM System Overview is attached for additional information and summarizes the transportation systems and technologies that are being considered for the people mover project.

TMP CONSTRUCTION MITIGATION PLANS

Outline plans to mitigate the impacts of construction on travelers and other users of the airport.

The Program Management Team has prepared two documents that outline the anticipated approaches to mitigating construction impacts to travelers and other airport users:

1. A comprehensive, airport wide construction management program will be implemented well in advance of the first construction contract being executed. The tenets of this program are included in the Program Implementation Plan in Chapter 1, Section 4 (Table of Contents is attached for reference). During the earliest phases of design, construction management best practices will be incorporated in such areas as:

    - Establishing a program-wide construction staging plan, identifying lay down yards and identifying the parking plans for each group of projects.
    - Establishing Program Wide construction haul routes, including site access plans and site logistic plans.
    - Establishing Construction Material and Equipment guidelines for local access.

2. A Public Outreach and Communications Plan has been prepared that details the approach ensuring that effective and timely information on TMP design, construction and phasing activities that interface with airport users and the traveling public. The goal of this plan is to facilitate successful program implementation by establishing a systematic, ongoing communications program that provides for timely and meaningful exchange of information, opinions and ideas among the PMT, various stakeholders and the general public so as to:

    - Deliver effective, appropriate and accurate information to stakeholders and the public.
    - Optimize input into the planning process.
    - Incorporate inputs into Program decision making so that program implementation reflects the concerns, needs and preferences of stakeholders, within the bounds of technical requirements and feasibility
    - Win and maintain stakeholder support for the program.
    - Identify optimal solutions to design challenges such as correcting adequacies in passenger processing and concession capacity.

- Maintain and/or enhance the revenue streams of airport businesses during construction.
- Identify and address stakeholder concerns and disagreements at an early stage, before they interfere with Program implementation.
- Coordinate Program implementation to minimize operational disruption and provide an optimum travel experience for passengers.

The plan seeks to establish ongoing and effective communication between the PMT and the following audiences:

Program Stakeholders
- DOT-A
- Project design consultants and contractor

Airport Stakeholders
- Airlines
- Other airport businesses and tenants, including car rentals, caterers, lei sellers, taxicabs, bus companies, retail concessionaires, etc.
- Federal and State regulators, including the FAA, TSA and the state Departments of Health and Agriculture
- Contractors performing work at HNL

Off-Airport Stakeholders
- The Governor's office, including the Tourism Liaison
- The Legislature
- The Congressional delegation
- Hawaiian cultural organizations
- Disability advocates
- Sustainable development advocates

Public Stakeholders
- Air passengers
- Media Stakeholders
- Major local news media
- National and international tourism media

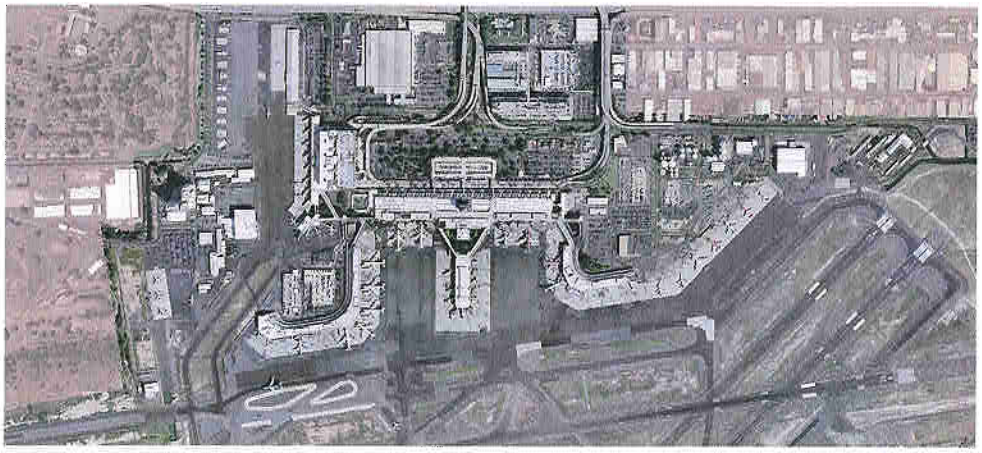
The objectives for this plan include:

- Facilitate constructive, open communication among stakeholders
- Acquire timely, relevant information for Program decision-makers
- Provide timely, accurate and appropriate Program information to target audiences
- Achieve stakeholder buy-in to the Program and the design of projects
- Provide timely and accurate information about program activities to airport users to avoid confusion and interference with operations

- Manage public issues as they arise to minimize negative impact on Program implementation and stakeholder support
- Consistently present a positive, competent public image of the Program and its implementation in order to attract and maintain public support.

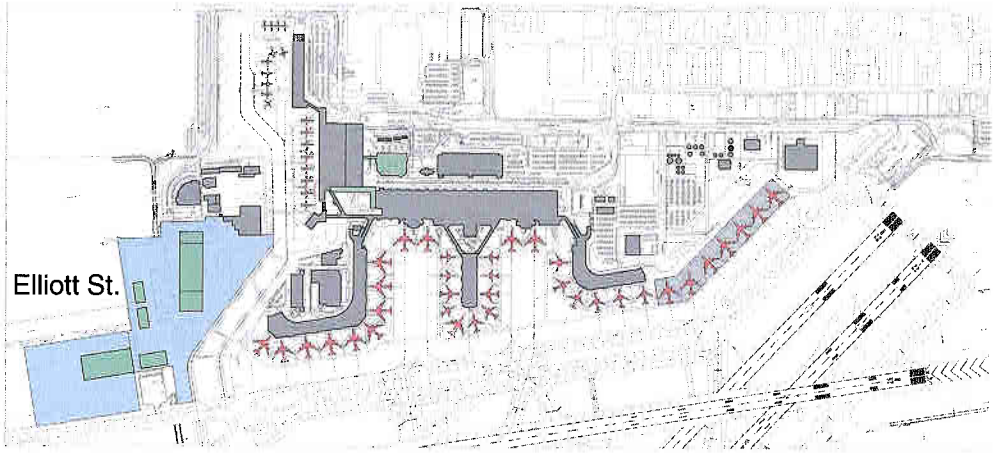
DRAWINGS AND MAPS OF PROPOSED AIRPORT CHANGES

Include preliminary drawings and maps showing the proposed changes to the airport.

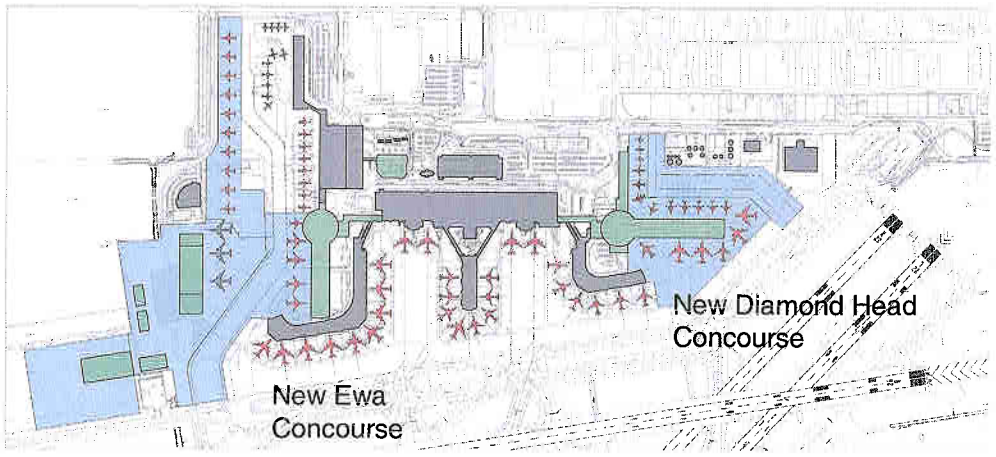


Existing Terminal Area

Stage 1: Existing Terminal Area



Stage 2: Elliott Street Area

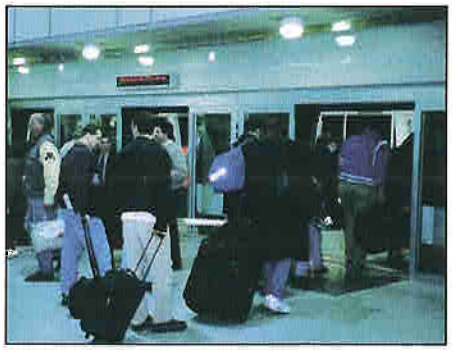


Stage 3: New Diamond Head
and Ewa Concourses

Stage 4: New Waikiki Concourse &
Taxilane G & L Realignment

HONOLULU INTERNATIONAL AIRPORT

AUTOMATED PEOPLE MOVER SYSTEM OVERVIEW



May 4, 2007

Prepared By:

Lea+Elliott

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1.0 INTRODUCTION

The Honolulu International Airport (HNL) Terminal Modernization Program includes an automated people mover (APM) that will replace the Wiki Wiki bus system as the primary means of passenger conveyance on the airside of the terminal complex. The APM is included in the initial group of projects that are planned to be built as part of the Terminal Modernization Program. The other projects in this group, which interface with the APM system, include the new Diamond Head (DH) and Ewa (Phase 1) Concourses and the new Overseas Terminal (OST) Connector. Alternative 3 for the Terminal Modernization Program is the basis for the Program Management Team's (PMT) work and this overview.

Over approximately the next eight months, the APM Consultant will be developing the Basis of Design for the APM. This effort will require coordination with the Master Architect, the Project Management Consultant (PMC), and Airport staff and stakeholders. The Basis of Design, as outlined in the APM Consultant's scope of work, is comprised of the following five tasks:

1. Construction Sequence and Schedule Review
2. Finalize Project Definition
3. Procurement Planning
4. Construction Cost Estimate and Schedule
5. Facilities Design Criteria

The purpose of this overview is to provide a common understanding of the planning that has been done for the HNL APM to date, outline the decisions that need to be made, and to discuss the next steps for implementing the APM.

2.0 WHAT IS AN APM

An APM is a fully automated and driverless transit system that operates on an exclusive right of way / guideway. Each manufacturer has a proprietary system design which is not interchangeable with another manufacturer's. Further details on APM systems can be found in Section 6.0, Technology Options.

All APM systems can best be divided into two general areas as follows:.

- Operating system: this consists of the vehicles, train control, power distribution, central control and maintenance facility finish-out, and communication subsystems.
- Facilities: these include the APM stations, guideway structure, the maintenance facility (MF), central control, power distribution substations and station equipment rooms.

Examples of a couple of APM systems are shown in the images below.

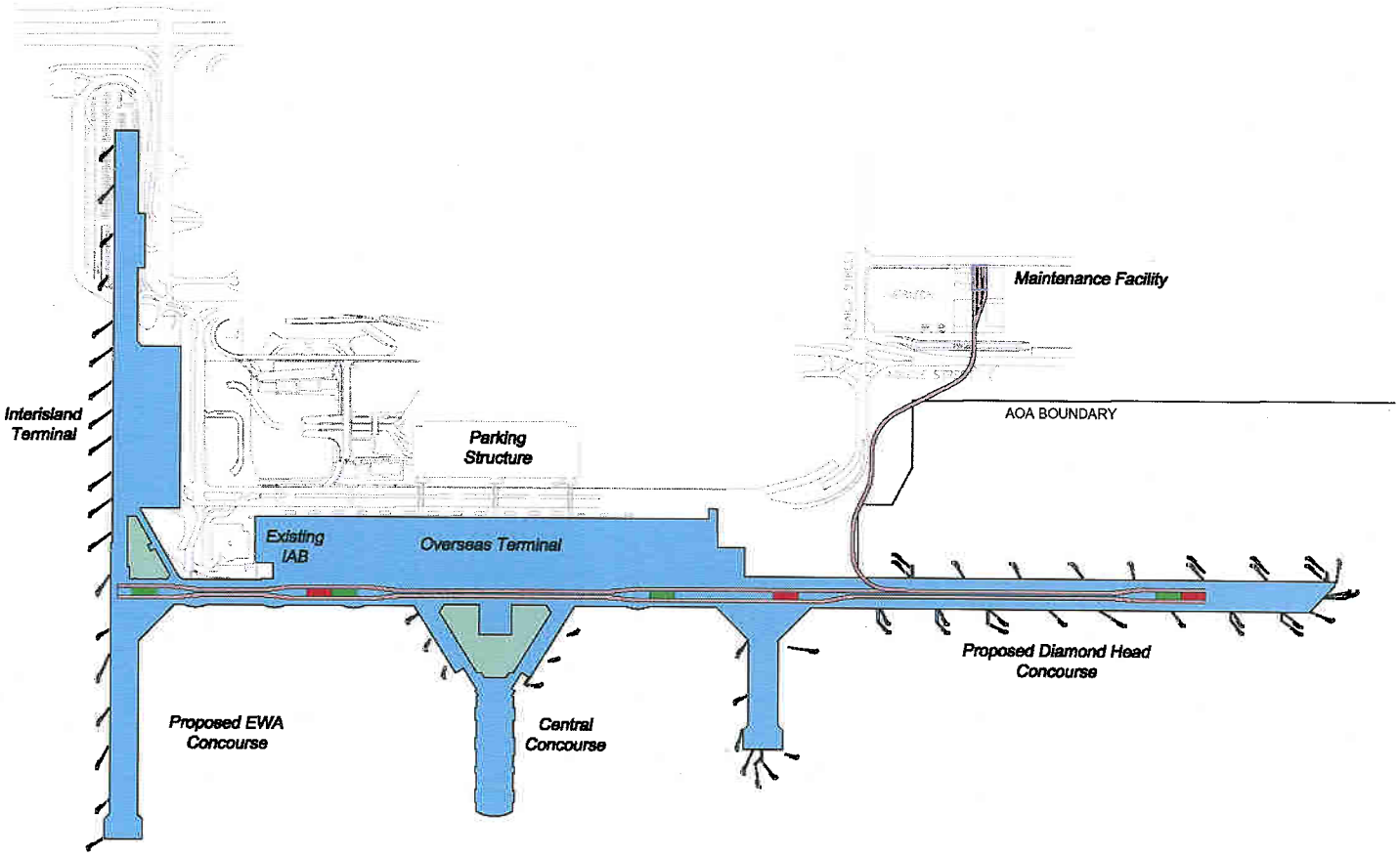
APM Station and Guideways

APM Station Interior

3.0 THE HNL APM

Alternative 3, the basis for the PMT's work, is depicted in Figure 1 with the dual lane APM system and stations.

Figure 1 – HNL Alternative 3 with Two-OST Station Option



The HNL APM, as depicted in Figure 1, is a dual lane system with stations located at the OST and the Ewa and DH Concourses. The APM operates on the airside and is accessible to all secure passengers: arriving passengers and those departing passengers who have cleared security. The main goal of the APM is to provide airside passenger conveyance between key activity centers, such as gates, security, the International Arrivals Building (IAB), concessions, and baggage claim.

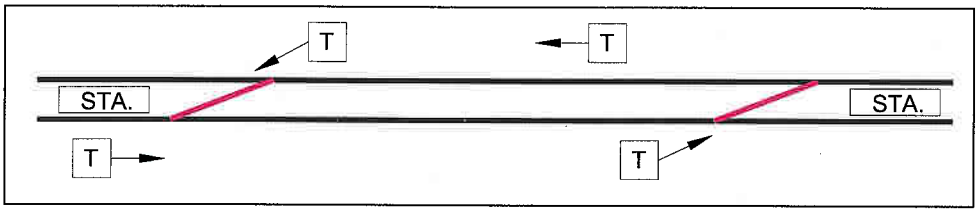
Since all arriving international passengers are required to remain sterile prior to (going through) customs and immigration, the APM will operate dedicated sterile trains and stations that transport international arriving passengers directly to the IAB. All other secure, non-sterile departing passengers will use dedicated non-sterile stations and trains and can travel freely on the airside. In Figure 1 above, the red stations represent the sterile stations and the green stations represent the non-sterile stations.

The APM alignment shown in Figure 1 is one possible option. Further planning and coordination is necessary to determine the final APM alignment, number of stations, and locations for APM facilities. Section 5.0, APM Facilities, Interfaces, and Decisions, defines the facilities required for the APM, discusses the interfaces between the operating system and facilities, and outlines the decisions that are required to progress the APM planning process and complete the Basis of Design.

3.1 OPERATIONS AND CONFIGURATION

The APM is approximately 4,500 ft. of dual lane guideway that operates in a pinched-loop configuration. A pinched loop configuration is comprised of dual lane guideways with crossovers (two back-to-back switches) that allow bi-directional trains to move from one guideway to the other at either end of the system. All trains run in the same counterclockwise direction. Figure 2 below depicts a simple pinched loop operation. The diagonal lines represent the crossovers, while the arrows on the trains, represented as the boxed "T"s, show the travel path.

Figure 2 – Example Pinched Loop Configuration



With the pinched loop configuration, it is possible to operate more than two trains simultaneously. The number of trains operating is dependent on the peak hour during the day and the minimum desired, and operationally possible, headway (time between train arrivals).

At HNL, arriving and departing international and domestic passengers have separate peak hours. With the pinched loop operations, it will be possible to change the number of secure and non-secure trains in order to handle the expected peak hour ridership without requiring much overlap in the requirement for both secure and non-secure

trains. During the morning peak for arriving international passengers, secure trains may be staged in order to be ready to take the secure passengers to the IAB. During the international arrivals peak, minimal non-secure trains will continue to operate. During the midday departing domestic peaks, all operating trains can be non-secure, as there are no longer any arriving international flights.

Once a decision is made on station locations, further definition of APM operations will be provided.

3.2 APM OPERATIONS SIMULATION

The operation of the APM for the various alignment alternatives were simulated to provide roundtrip and station-to-station travel times. Table 1 below provides a summary of the travel time information for Alternative 3 with the two OST stations option shown in Figure 1. These travel times were then used to determine passenger travel times between key activity centers at the airport, which is discussed in Section 3.3 below.

Table 1 – Operations Analysis Results for Alternative 3

APM						
Alignment	Number of Trains	Cars/Train	Round Trip Travel Time (min)	Headway (min)	Wait Time (min)	Line Capacity (PPHPD)
Alt 3 two station OST (non-sterile only)	2	1	7.3	3.7	1.8	810
	2	2	7.3	3.7	1.8	1630

3.3 PASSENGER TRAVEL ANALYSIS

Travel times and distances were analyzed for representative trips that passengers can expect to experience when arriving at or departing from HNL. These trips include check-in to gates, gates to the IAB, and gates to baggage claim. Various modes of passenger conveyance were also analyzed for each trip, such as walking only, riding the APM, and walking and/or standing on moving walkways.

These travel analysis results were used when analyzing the possible passenger conveyance and airport layout alternatives.

Table 2 below presents a summary of a few of the representative travel times and walking distances for Alternative 3:

Table 2 – Sample Passenger Travel Analysis Results for Alternative 3

ARRIVING INTERNATIONAL PASSENGERS							
Trip		Walking	Standing on Moving Walkway	Walking on Moving Walkway	APM and Walking	APM and Standing on Moving Walkway	APM and Walking on Moving Walkway
Ewa (average gate) to Existing IAB	Travel Time (min)	7.5	9.7	6.5	9.3	11.2	8.3
	Equivalent Walking Distance (ft)	1373	763	1151	1089	554	894

ARRIVING DOMESTIC PASSENGERS							
Trip		Walking	Standing on Moving Walkway	Walking on Moving Walkway	APM and Walking	APM and Standing on Moving Walkway	APM and Walking on Moving Walkway
DH (average gate) to Baggage Claim	Travel Time (min)	9.4	11.4	8.4	9.2	9.2	9.2
	Equivalent Walking Distance (ft)	1868	1298	1661	912	912	912

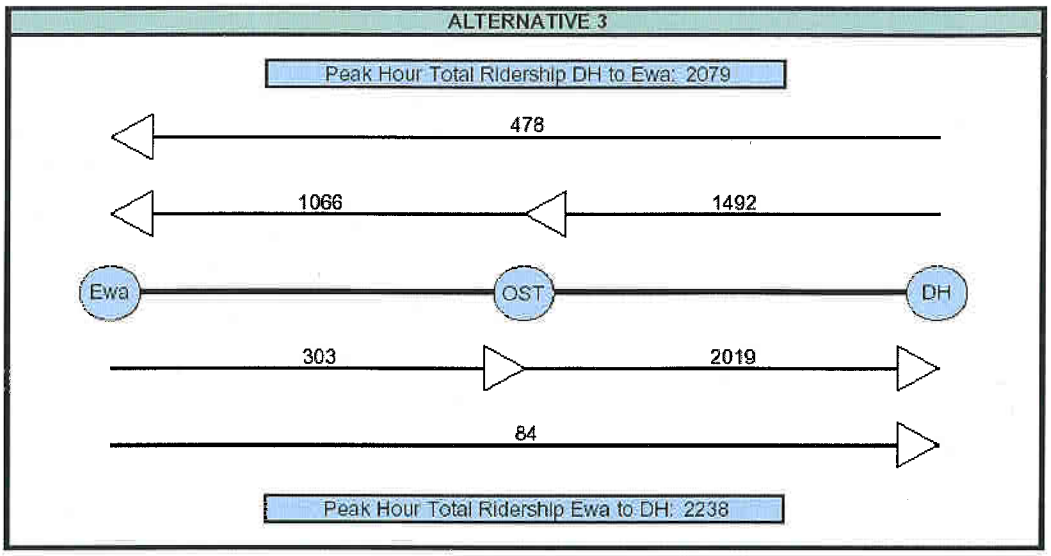
DEPARTING INTERNATIONAL AND DOMESTIC PASSENGERS							
Trip		Walking	Standing on Moving Walkway	Walking on Moving Walkway	APM and Walking	APM and Standing on Moving Walkway	APM and Walking on Moving Walkway
Check-In (average counter) to DH (average gate)	Travel Time (min)	12.9	16.1	11.4	10.9	11.6	10.6
	Equivalent Walking Distance (ft)	2715	1840	2397	1366	1176	1297

3.4 RIDERSHIP

Ridership analysis was performed on two of the alternatives studied during the Master Plan to determine the peak hour total ridership for each direction of travel. For each alternative, the ridership for four passenger types was analyzed: departing international, departing domestic, arriving domestic, and arriving international. As there was limited information available, assumptions for APM usage and flight and passenger distribution were combined with the available information, which included peak hour passengers, peak hours for each passenger type, and percentage of connecting passengers. Each passenger type has a different peak hour. Therefore, the highest ridership within all four peak hours for each direction was chosen as the final peak hour total ridership.

Figure 3 below summarizes the peak hour total ridership per direction for Alternative 3 and displays the expected ridership between the three main links: Ewa Concourse to/from OST, OST to/from DH Concourse, and Ewa Concourse to/from DH Concourse. It is important to note that the link ridership numbers for the DH-OST and Ewa-OST links include the ridership for the DH-Ewa link. For example, the 1492 passengers riding between the DH and OST includes the 478 passengers riding from DH to Ewa.

Figure 3 – Summary of Peak Hour Ridership for Alternative 3



Further details on the ridership analysis are available.

4.0 DIVISION OF RESPONSIBILITIES

Four key players are responsible for the planning, design, procurement, and construction of the APM system: the APM Consultant, Master Architect, APM Supplier, and Facilities Contractor(s). Each has specific responsibilities for different parts of the APM system. The following table presents a summary of the proposed division of these responsibilities between the four parties.

Table 3 - Summary of Responsibilities

Entity	Responsibilities
APM Consultant	• Finalize the APM basis of design, which will include alignment studies, ridership, operations analysis, and preliminary APM alignment planning. • Provide the Facilities Design Criteria Handbook, which provides a conceptual definition of the APM facilities, and defines the interfaces between the APM systems and airport fixed facilities. • Develop the APM system (operating system and facilities) to a conceptual engineering level. • Prepare APM procurement documents for the operating system, and provide support during procurement and APM supplier selection process. • Provide implementation oversight during operating system final design, manufacturing, installation, testing and acceptance. • Manage interfaces between operating system and facilities.
Master Architect	• Interface the APM facilities with HNL facilities. • Finalize APM facilities design (stations, maintenance facility, guideway structures, etc) while coordinating with the APM Consultant.
APM Supplier	• Finalize operating system design and provide technology specific facility interface requirements. • Manufacture, supply, install, test, and implement all APM operating system equipment, including vehicles, guideway equipment (guide rails, running surface, power rails, etc), guideway switches, power distribution system, central control and maintenance facility finish-out, communications systems, and train control systems.
Facilities Contractor(s)	• Construct the facilities, including the stations, maintenance facility, central control, power distribution system substations, and guideway.

5.0 APM FACILITIES, INTERFACES, AND DECISIONS

This section defines the facilities required for the APM, discusses the interfaces between the operating system and facilities, and outlines the decisions that are required to progress the APM planning process and complete the Basis of Design.

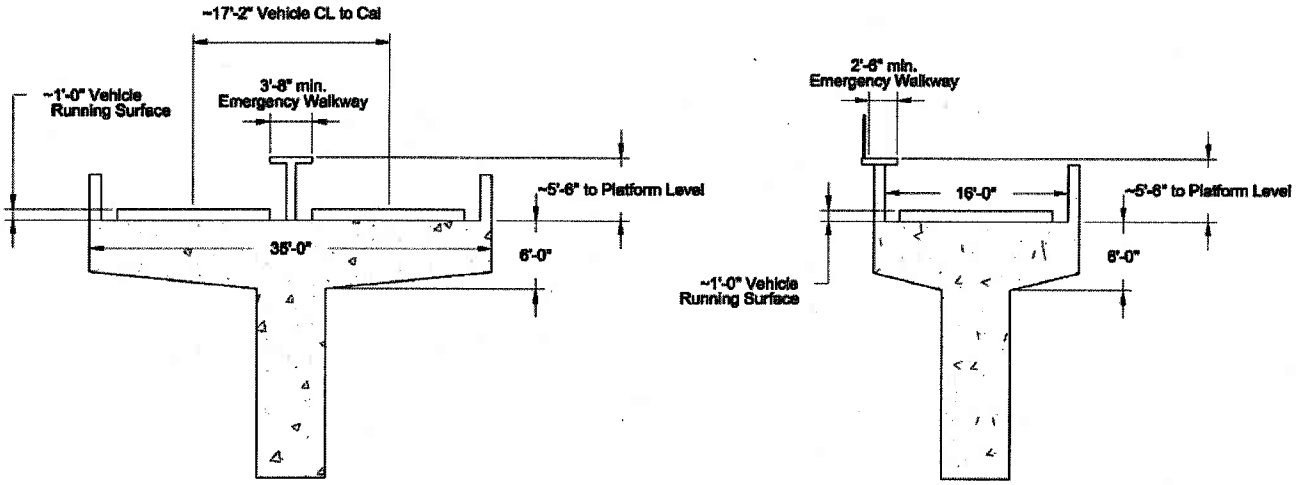
5.1 GUIDEWAY

The guideway provides an exclusive right-of-way for the vehicles to travel along. As shown in the figure below, the guideway incorporates vehicle guidance, trackway switches, traction power, and an emergency walkway.

APM Dual Lane Guideway

The guideway will be planned using generic dimensions in order to allow all technologies. Figure 4 depicts a generic guideway cross sections for single and dual lane guideways. At crossovers, the guideway depth has to be increased to allow for switches.

Figure 4 – Generic Guideway Cross Sections



Dual Lane Guideway Cross Section

Single Lane Guideway Cross Section

The guideway for the HNL APM will be incorporated into three new facilities that are being designed by the Master Architect: OST Connector, new DH Concourse, and new Ewa Concourse (Phase 1).

5.1.1 Interface

The APM Consultant will provide the alignment, structural requirements, and other spatial requirements and interfaces to the Master Architect. The Master Architect will incorporate the guideway design into the three new facilities served by the APM. The MF spur will be designed separately.

5.1.2 Decisions

In order to complete the Basis of Design tasks, a decision on the final alignment needs to be made over the next few months. The final alignment will require coordination between the APM Consultant, Master Architect, the PMC, and Airport staff.

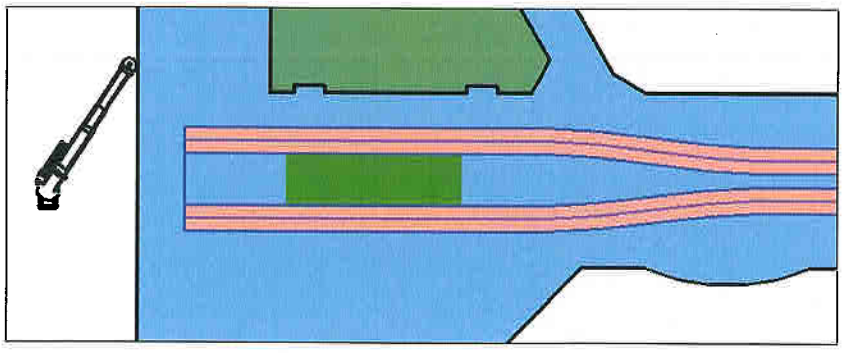
5.2 STATIONS

The stations provide the interface between the APM system and other airport facilities. The image below depicts the interface between the station and the airside concession and circulation areas.

DFW: APM station above concessions and concourse areas

The HNL APM will have center platform stations, approximately 30 ft. by 100 ft., with platform doors and vertical circulation to the 2nd level on both ends. Figure 5 depicts the Ewa Concourse station.

Figure 5 - Ewa Concourse APM Station



In addition to the station and vertical circulation, station equipment rooms (approximately 600 sf.) will be required at each station. These rooms are to be located within 200 ft. of the station, but are not required to be directly on the station platforms. Further passenger and operational analysis is needed prior to defining the final station dimensions and spatial requirements.

Stations will be incorporated into the new OST Connector and Ewa and DH Concourse facilities and will be located on the 4th level at the IAB and the Ewa and DH Concourses in order to avoid the 3rd level sterile corridors. Stations located along the OST connector may have the option to be located on the 3rd level, depending on OST configuration, sterile corridors, and station locations.

5.2.1 Interface

On-going coordination between the APM Consultant and the Master Architect will be required during the finalization of the APM station locations and interfaces with HNL facilities. The APM Consultant will provide the number of necessary vertical circulation, station sizing, passenger flow requirements, and other interface requirements. The Master Architect will ensure a proper interface between the APM station requirements and the impacted HNL facilities and will be responsible for design of the station, including the vertical circulation and signage.

5.2.2 Decisions

The final number and locations for the APM stations need to be decided, as they impact passenger level of service and costs. This is an iterative process to find the best option to balance passenger level of service and APM operations and will require the input of the APM Consultant, Master Architect, the PMC, and Airport staff.

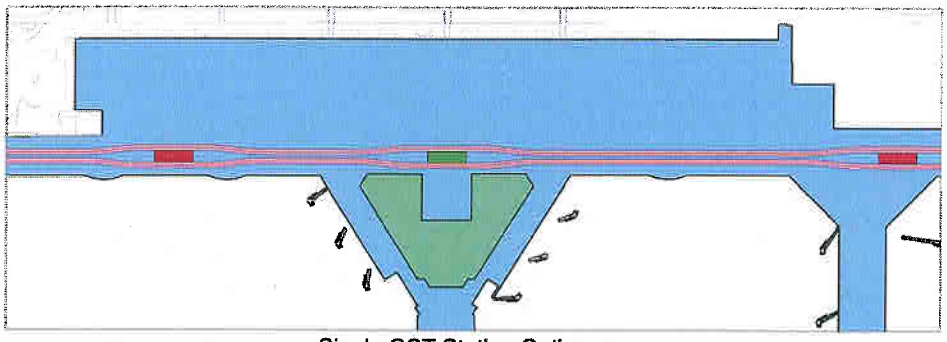
The decision for which level the station is located on is not required at this time, as station levels are driven by the location and number of OST stations. It is assumed that if possible, the stations will be located on the 3rd level to provide both a higher level of service for passengers and a lower capital cost.

The layout of Alternative 3 necessitates one non-sterile station at the Ewa Concourse, two non-sterile and sterile stations, each, at the DH Concourse, and one sterile station at the existing IAB. However, it is not clear as to the number of non-sterile stations required for the OST.

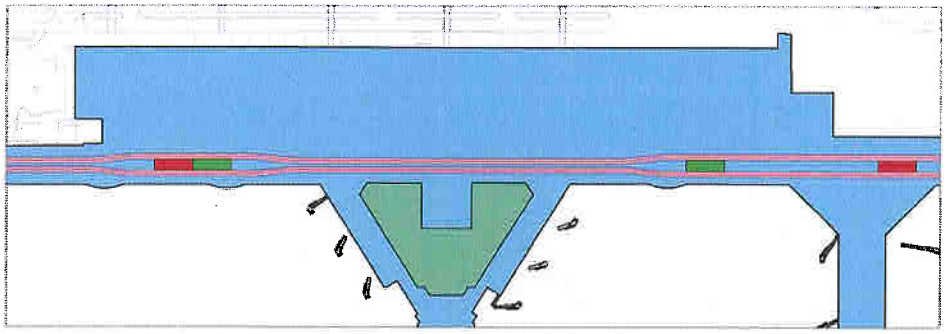
- Non-Secure Stations: OST

  The multiple security locations along the OST impact passenger flow and therefore APM usage. Figure 6 below depicts the OST with a single OST station option and with a two OST station option. Table 4 summarizes the pros and cons associated with both options.

Figure 6 - OST Station Options



Single OST Station Option



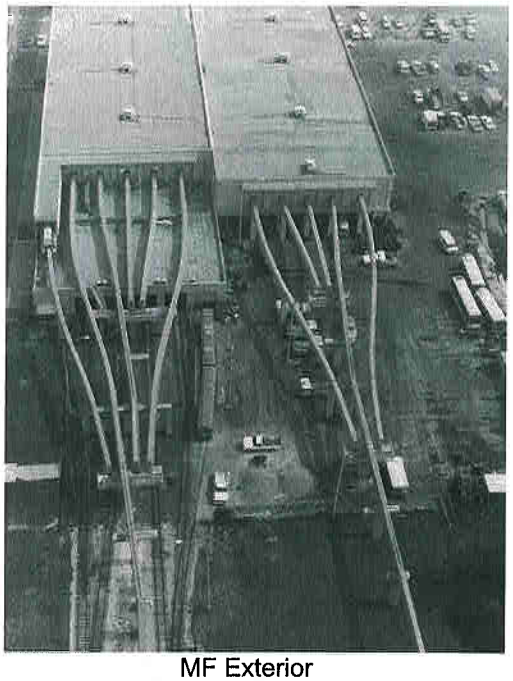
Two OST Station Option

Table 4 – Pros and Cons for the Number of Non-Secure OST Stations

Non-Secure Stations: OST		
Option	**Pros**	**Cons**
1 Station	• Lower cost	• May require changes to passenger flows through security to maximize APM usage.
2 Station	• May provide a higher level of service as stations can balance all five security checkpoints. • Provides a shorter travel distance for international passengers returning airside to transfer to other flights with a future DH IAB.	• Higher cost. • May not be necessary if two outermost security checkpoints are not used. • May require passengers to make an extra stop.

5.3 MAINTENANCE FACILITY

The maintenance facility provides the required space to perform vehicle maintenance and houses the offices, employee break rooms/lockers, electrical and mechanical shops, parts and equipment storage, and shipping/receiving docks and freight elevators. Typically, the Central Control Facility is co-located with the MF. The following images depict both the exterior and interior of a typical MF.

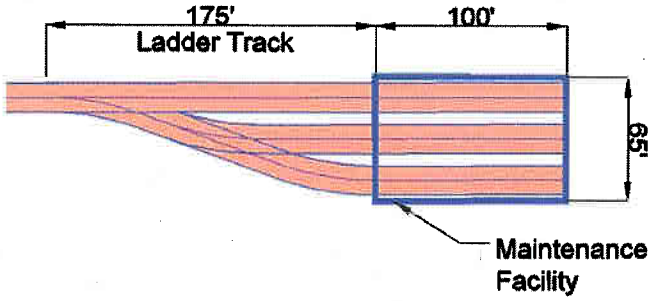


MF Exterior

MF Interior

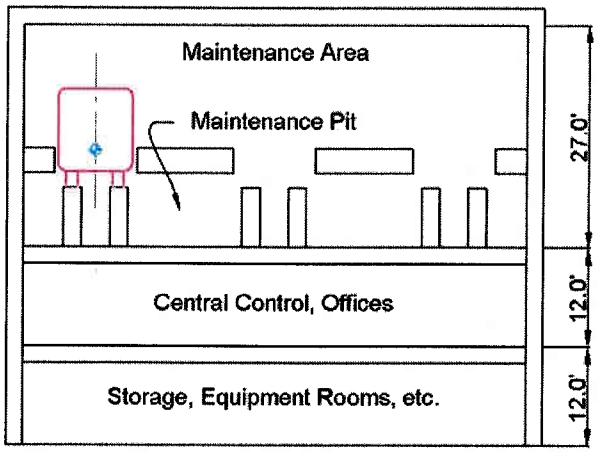
The HNL APM MF building will require a foot print of approximately 65 ft. x 100 ft. to allow for three lanes of maintenance work. The MF will also require approximately 175 ft. in front of the MF for the ladder track that provides vehicle access to all three maintenance lanes. Figure 7 below depicts the plan view of the MF and the ladder track.

Figure 7 – Maintenance Facility Plan and Ladder Track



Maintenance pits will be located below the guideway to allow for work below the parked vehicles. Approximately 27 ft. of clearance is required from the floor of the maintenance pit to the ceiling. Two additional floors, to be located either above or below, are needed to house the remaining MF services. Figure 8 depicts a plan and section view of a typical maintenance facility.

Figure 8 – Typical Maintenance Facility Plan Section



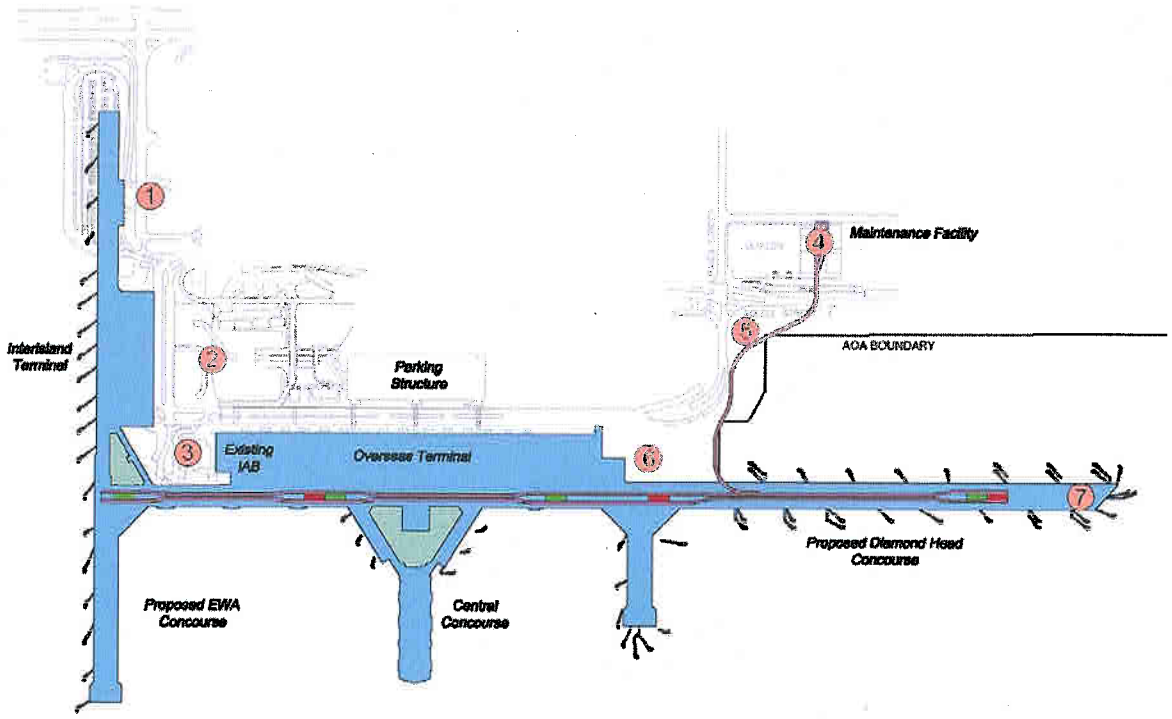
5.3.1 Interface

The APM Consultant, Master Architect, PMC, and Airport staff will coordinate during the development of the APM Basis of Design to ensure that adequate space is allotted for the MF and, where applicable, that the proper interfaces between the MF and other HNL facilities are accounted for.

5.3.2 Decisions

The main decision related to the MF is to determine its final location. Figure 9 depicts possible locations for the APM maintenance facility.

Figure 9 - Possible Maintenance Facility Locations



Further analysis of each location is required to determine a final location. The following four criteria are to be used in determining the location of the MF: APM operations, interfaces with other facilities, land use, and cost.

- **APM Operations:** MF proximity to the guideway may impact APM operations. For example, locating the MF as close to the center of the alignment optimizes operations by minimizing average response and recovery times.
- **Interfaces With Other Facilities:** Discusses the interface between the APM and HNL facilities and possible impacts one has on the other.
- **Land Use:** Discusses other facilities that may be able to be co-located with the MF, facilities or functions that must be relocated due to the placement of the MF in that location, and, for some options, if the MF is the best possible use of available land.
- **Cost:** Cost of the MF is dependent on the length, height, and structural requirements for the spur track and the height of the alignment at the MF, as well as any costs associated with integrating non-APM functions with the MF building.

Table 5 below provides a preliminary evaluation of the potential MF locations based on these four criteria.

Table 5 – Preliminary Evaluation of Possible Maintenance Facility Locations

Location	APM Operations	Interfaces With Other Facilities	Land Use	Cost
(1) DH of current Commuter Terminal	• Provides long average response and recovery time due to location of access to MF spur and proximity of MF to the alignment.	• May be difficult to construct guideway in the restricted space between the IIT garage and new garage.	• Would limit future development on the site.	• Higher cost due to the long spur track.
(2) In the new parking garage between the IIT and OST	• N/A	• Garage contract has been awarded without provision for the MF.	• Parking provides better land use.	• N/A
(3) Above the current tour group bus stop (IAB/Makai Pier corner)	• Provides reasonable average response and recovery time due to location of access to MF spur and proximity of MF to the alignment.	• Limited land available between the existing facilities. Further study required to determine if fit is possible.	• Disruption to HNL "Sense of Place" for international and other tour passengers. • MF located adjacent to terminal area may no provide optimal land use.	• Close proximity to APM alignment will reduce the cost for a spur track. • Will require the construction cost for a new stand alone MF.
(4) Mauka of Aolele St., DH of the Verizon Property	• Provides long average response and recovery time due to location of access to MF spur and proximity of MF to the alignment.	• Roadways/ramps may impact APM design. • Alignment restricted by AOA Boundary.	• Would limit future development on the site.	• Higher cost due to the long spur track.
(5) DH/Makai corner of Aolele St./Paiea St. intersection	• Provides reasonable average response and recovery time due to location of access to MF spur and proximity of MF to the alignment.	• Roadways/ramps may impact APM design. • Alignment restricted by AOA Boundary.	• Would limit future development on the site.	• Would require the cost for the MF spur track. • Will require the construction cost for a new stand alone MF.
(6) Above a potential future DH IAB (Note: MF construction will be complete prior to construction of the DH IAB)	• Provides shorter average response and recovery time due to location of access to MF spur and close proximity of MF to the alignment.	• Required depth for MF may not allow for DH IAB • DH IAB operations would require MF guideway to be higher than alignment. • MF will impact construction and design of the DH IAB.	• MF located adjacent to terminal area may no provide optimal land use.	• Close proximity to APM alignment will reduce the cost for a spur track. • Higher cost due to construction above future facilities.
(7) Very DH end of the extended DH concourse	• Provides long average response and recovery time due to location of access to MF spur and proximity of MF to the alignment. • Only allows for airside access to MF.	• DH Concourse floor plans will need to be altered to accommodate MF requirements.	• Will not impact land use, as the space below will be usable concourse space.	• Will not require cost for a dedicated MF spur track. • Higher cost due to construction above other facilities.

Note: This table is preliminary and will be expanded during discussions with the Master Architect, PMC, and Airport staff.

5.4 POWER DISTRIBUTION SYSTEM (PDS) SUBSTATION

The PDS Substations provide the traction power for the APM system. Power for lighting, HVAC equipment, and other "housekeeping" loads are to be provided with the other HNL facilities.

PDS Substations are single level facilities that require a clearance of approximately 14 ft. and approximately 1,500 s.f. for AC distribution and 2,500 s.f. for DC distribution. As it is not known whether an AC or DC system will be installed, 2,500 s.f. will be planned for at this time.

The PDS substations should be located as close to the guideway as possible, with a maximum distance of 500 ft., in order to minimize voltage drop. It is preferable to locate the PDS substation on the ground level. A substation is also required every 2000 ft. of dual lane guideway for AC distribution, or every 5000 ft. for DC distribution. For the MF locations that require a long spur track, an additional PDS substation may be required, in addition to those required for the main alignment.

The HNL APM is approximately 4,500 ft. of dual lane guideway, excluding spur tracks to the MF, and will therefore require 1-2 PDS substations for DC distribution and 2-4 for AC distribution.

5.4.1 Interface

Coordination between the APM Consultant, Master Architect, PMC, and Airport staff will be needed to determine final locations of the substations and to ensure that adequate power is available. Power load estimates will be determined during the development of the APM Basis of Design.

5.4.2 Decisions

The locations for the PDS substations, that are applicable for all technologies, need to be determined. Possible locations include the 1st floor along the alignment and at the MF.

Once the APM supplier is selected, the final substation size and number of locations will be determined by the APM Supplier.

6.0 APM TECHNOLOGY

APMs are fully automated bi-directional trains that operate on exclusive right-of-ways. Vehicle movements are controlled by the Automated Train Control, which provides safe and reliable service. Because the system is automated, platform walls are recommended in order to provide for a safe passenger platform. On-board and station static and dynamic signs will alert the rider to when trains are arriving and which trains to board. Emergency walkways will be provided either along the edge or between guideways to allow for safe passenger evacuation.

There are two types of APM systems: self-propelled and cable-propelled. However, a cable-propelled system is not recommended for the HNL APM, as it is not capable of

pinched-loop operations. Self-propelled technologies offer a higher level of flexibility and are more suitable for systems that require multiple train operations, such as with the HNL APM's sterile and non-sterile train operations. Therefore, self-propelled technology is assumed for the HNL APM.

Each APM technology is unique and all have different spatial and operational requirements. To maximize competition during the procurement of the APM operating system, the system will be planned using general criteria that do not preclude any technologies.

In order to optimize the final design of the HNL facilities by designing for known APM requirements, the APM supplier is to be selected prior to the commencement of HNL facility final design.

Potential self-propelled vehicles applicable to HNL include:


Bombardier CX-100 (SFO)


Bombardier Innovia (DFW)

Mitsubishi Crystal Mover (MIA)


Siemens Val 256/258 (ORD)


IHI Niigata NTS


Siemens AirVal

7.0 ENVIRONMENTAL

Environmental clearance was obtained for the APM proposed in the late 1980's/early 1990's in the previous Master Plan. Confirmation is required to determine if the previous environmental clearance covers the currently planned APM.

The possibility for Leadership in Energy and Environmental Design (LEED©) certification for the APM stations and maintenance facility should be studied. It is currently unknown if LEED© certification is possible for APM guideway structures.

8.0 CONTRACTING APPROACH AND PROCUREMENT METHODOLOGY

The APM Consultant will work with the PMC and Airport staff to determine the best contracting approach and procurement methodology for the APM operating system and facilities.

The **contracting approach** is the way the work is divided into packages (contracts) that best suits the nature of the project and the parties expected to carry it out. The **procurement methodology** is the procedure used to select that team that will do the Work defined in the contract package. The **Work** of an APM project can best be divided into two general areas: **Operating System** and **Facilities**. (Please see Section 2.0 for definitions of these two terms.)

The goal of developing a contracting approach is to determine the division of responsibilities that ensures they are distributed to the most capable parties. Since the APM operating systems are proprietary, patented design that are not capable of combining with other APM operating systems, the best contracting approach is a single turnkey project where the APM operating system is procured under a single contract.

Minimizing interfaces, conflicts and contractor dependencies should be the deciding factors in assigning the work of the facilities. Facility work that is not involved with other construction (such as terminals, concourses, and parking garages), whose only purpose is the APM, is best packaged with the operating system contract. At this point all facilities associated with the APM, except possibly the maintenance facility, are part of other construction and should be packaged with that construction.

The APM Consultant will provide assistance in determining the procurement methodology for the operating system and will work with PMC and Airport staff to identify all legal and procurement policies and requirement that will govern the APM procurement. Different types of public procurements include: one-step low price, one-step best value, two-step low price two-step best value, and a competitive negotiated procurement. Determining the procurement process before the development of the procurement documents is suggested, as it may impact the language used in the procurement documents.

9.0 CONSTRUCTION PHASING

A phasing plan was developed during the Master Plan effort and may require further refinement as the HNL TMP effort progresses. One of the key constraints to keep in mind when determining the construction phasing for the APM is the necessity to maintain airport operations during construction, specifically to ensure that there is intra-terminal transportation during the project construction, be it via bus, APM, moving walkways, and/or sterile corridors.

10.0 IMPLEMENTATION SCHEDULE

The current implementation schedule for the APM is shown in Table 6 and will require changes as the HNL TMP is further defined.

Table 6 – Preliminary Implementation Schedule

Task	Schedule
APM Planning and Basis of Design	May 2007 – Feb 2008
Operating System Preliminary Engineering and Procurement Document Preparation	Mar 2008 – Jan 2009
Procurement	Feb 2009 – Aug 2009
Operating System Final Design, Manufacture, Supply, Install, Test, and Acceptance	Sep 2009 – May 2015

11.0 SUMMARY OF KEY DECISIONS NEEDED

The following items need to be finalized or decided in order to complete the APM Basis of Design:

- Alignment
- Station locations
- Number of stations
- MF location
- PDS substation locations
- Definition of interfaces between APM operating system contract and facilities
- Plan for service to potential future DH IAB? If yes, plan for a future IAB station at the Ewa end of the APM?
- Plan for a potential future landside two-station connection between HNL terminals and Mass Transit station? Or will Aolele St. alignment with a Mass Transit station near the lei stands provide a high enough level of service?
- Assess need for test track