Chapter Five

AIRPORT PLANS

AIRPORT PLANS

The planning process for the Kona International Airport at Keahole (KOA) Master Plan has included several analytical efforts in the previous chapters intended to project potential aviation demand, establish airside and landside facility requirements, and evaluate options for improving the airport to meet the identified airport facility needs. The purpose of this chapter is to describe, in narrative and graphic form, the recommended plan for the future of Kona International Airport at Keahole.

As stated in the Introduction section, the primary objective of the master plan is to provide the community and public officials with proper guidance for future development which will address aviation demands and be wholly compatible with the environment.

Specific goals outlined at the outset were to:

- Provide a high level of service to passengers while maintaining a "Hawaiian sense of place that represents the unique culture and physical environment of Kona."
- Stimulate and support island and state economic development.
- Enhance services for air cargo operations.
- Encourage international flights at the airport.
- Accommodate existing and future general aviation (including corporate aviation) customer needs.

- Maintain good relationships with neighborhood communities by minimizing environmental impacts such as noise.

From the outset of the Master Plan process, it has been clear that the people of West Hawaii highly value the unique, open air, Polynesian atmosphere of Kona International Airport at Keahole. For this community, reflection of the Hawaiian culture and island lifestyle is more than a design element: it goes to the relationship people have with their airport – a sense of connection, pride and ownership.

Accordingly, preservation and enhancement of the unique aesthetic elements of the airport has been a main priority for this Master Plan. In every recommendation made, specific attention has been paid to this aspect. It will be of utmost importance that this focus be sustained throughout the process of design and implementation of the Master Plan.

AIRPORT DESIGN STANDARDS

As a Part 139 certificated commercial service airport, Kona International Airport at Keahole must comply with FAA design and safety standards. Advisory Circular 150/ 5300-13, *Airport Design*, is the key reference used to ensure compliance with these standards. These design and safety standards are based primarily upon the characteristics of aircraft expected to use the airport on a regular basis.

As previously discussed in Chapter Three, the design codes are based upon the approach speeds and wingspans of these "critical" aircraft. This is comprised of the most demanding aircraft or "family" of aircraft conducting at least 500 annual operations at the airport.

The critical design aircraft for Kona International Airport at Keahole is driven by the transport category aircraft used in the scheduled airline and air cargo service at the airport. Analysis in Chapter Three – Facility Requirements indicated that KOA's current airport reference code (ARC) is D-V. This includes aircraft in Aircraft Design Group V such as the Boeing 747 and 777 aircraft that already operate at the airport.

Recognizing the airport's importance to air cargo on the island, and the importance of the international passenger market to the island as well, the master plan recommends the airport continue to maintain the capability to accommodate the larger civilian aircraft in the future. This would include aircraft in ARC D-V and potentially D-VI. The B747-series and B777 aircraft would be the critical aircraft in D-V. At a minimum, the airport should plan to regularly accommodate these aircraft.

Larger aircraft are now entering the civilian fleet. The Airbus A380-800 and the Boeing 747-800 are in ARC D-VI and are the largest civilian aircraft in the commercial fleet. They are expected to be used on international routes. Honolulu International Airport is being planned for A380 service to Hawaii, but KOA has been approved as an alternate airport. While ARC D-V is recommended as the critical ARC for future design at KOA, it is recommended that D-VI separation

design standards be maintained on at least one runway for future viability.

Runway 17-35 is currently designed to the ARC D-V design standards with Category (CAT) I instrument approach capability. The current runway is positioned to maintain adequate separations and clearances to support ARC D-VI at least as an alternate airport. The current runway-to-parallel taxiway separation of 881 feet provides adequate space to add a dual parallel taxiway at Group D-VI standard separations.

Ultimately, parallel Runway 17R-35L is planned to be the same length and ARC as the primary runway, but without Category (CAT) I approach minimums. The parallel runway separation standard for this runway is 400 feet. While this runway is ultimately planned for ARC D-V, its initial development will be to serve commuter, corporate, and general aviation aircraft which are in D-II or below.

Table 5A summarizes the various airfield design standards for Kona International Airport at Keahole. These standards were considered in the planned improvements for the airport site, to be discussed further within this chapter.

TABLE 5A
Airfield Design Standards
Kona International Airport at Keahole

	Runway 17-35	Initial Runway 17R-35L	Ult. Runway 17R-35L
Critical Aircraft	B 747-400	Gulfstream V	B 747-400
Airport Reference Code	D-V[1]	D-II	D-V
Instrumentation	CAT I	One-mile visibility	One-mile Visibility
RUNWAYS			
Length (ft)	12,000[2]	5,500	11,000
Width (ft.)	150	100	150
Shoulder Width (ft.)	35	20	40
Safety Area			
Width (ft.)	500	500	500
Length Beyond End (ft.)	1,000	1,000	1,000
OBJECT FREE AREA			
Width (ft.)	800	800	800
Length Beyond End (ft.)	1,000	1,000	1,000
CENTERLINE TO:			
Holding Position (ft.)	280	250	280
Parallel Taxiway (Centerline)	400 (500)	400	400
TAXIWAYS			
Width (ft.)	75	35	75
Centerline to:			
Fixed or Movable Object (ft.)	160 (193)	65.5	160
Taxiway Centerline (ft.)	267 (324)	105	267
Taxilane Centerline to:			
Fixed or Moveable Object (ft.)	138 (167)	57.5	138
RUNWAY PROTECTION ZONES			
Inner Width (ft.)	1,000	500	500
Length (ft.)	2,500	1,700	1,700
Outer Width (ft.)	1,750	1,010	1,010

Notes:
[1] Runway will be D-V, but consider ability to serve ARC D-VI aircraft as an alternate airport. Where applicable, separations for D-VI are shown in parentheses.
[2] Existing Runway 17-35 length of 11,000 feet is adequate for the foreseeable future. A 12,000-foot length is reserved on the ALP for future capability should demand dictate.

RECOMMENDED MASTER PLAN CONCEPT

The Master Plan Concept includes improvements to the airfield, terminal area, air cargo, and general aviation facilities to meet current and forecast needs over the long range planning horizon. It is also designed to ensure a viable aviation facility for the West Coast, the Big Island, and the State well beyond the long range horizon. The recommended concept is depicted on **Exhibit 5A**. The following sections further detail these plans and recommendations.

AIRFIELD RECOMMENDATIONS

The principal airfield recommendations should always focus first upon safety and security. Of key importance is to ensure that airport design standards are adequately planned for and met. Recommendations are then provided to improve the operational efficiency, circulation, and capability of the airfield. **Exhibit 5A** depicts the principal airfield recommendations.

The following subsections discuss the recommendations as they pertain to each runway, the taxiway system, and the airfield support facilities.

Runway 17-35

Runway 17-35 will remain the primary runway in the future, although it will ultimately be used in concert with a parallel runway and a helicopter touchdown and lift-off (TLOF) area. The primary runway is currently 11,000 feet, but the plan reserves the capability to extend the runway to 12,000 feet should demand dictate. The 1,000-foot extension would occur to the north, but only if and when an airline or group of airlines would commit scheduled daily flights that would require the additional length to reach long haul international destinations.

Runway 17 currently supports the airport's only CAT I instrument approach. A CAT I approach from the south on Runway 35 is reserved. This would likely be through a lateral precision performance with vertical guidance (LPV) approach utilizing satellite-based GPS (global positioning system). The only ground-based investment would be in the approach lighting necessary to obtain the lower minimums.

The other key improvements recommended for Runway 17-35 involve the taxiway access system. Parallel Taxiway A currently provides circulation and access along the mauka (east) side of the runway. The section of Taxiway A in front of the passenger terminal is planned to be relocated 114 feet makai (west). This will provide for adequate circulation for Group V aircraft in and around the passenger terminal area.

A second parallel taxiway is planned between Taxiway A and the runway to provide for flexibility with future aircraft circulation. All landside aviation facilities are located and will continue to be planned for the mauka (east) side of the airfield. As a result, aviation uses will eventually stretch along

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REVENUE SUPPORT (LARGE TRACT)
ATCBI 1,500'
PUBLIC SAFETY TRAINING CAMPUS
GENERAL AVIATION (Helicopters)
TLOF 1,700' x 200'
2,000'
AIRPORT INDUSTRIAL
Road P
AVIATION SUPPORT
Proposed Main Entrance
Existing Entrance
MIXED USE/ COMMERCIAL
HOTEL
MIXED USE/ COMMERCIAL
Kaiminani Dr.
Queen Kaahumanu Hwy.
Proposed Parallel Rd.
Conference Center
CULTURAL/EDUCATION
Halalu St.
Keaholo St.
Proposed Museum Site
NELHA
AIRPORT INDUSTRIAL
Fuel Farm
AIRPORT SUPPORT
AVIATION SUPPORT
GROUND TRANSPORTATION
AVIATION SUPPORT
Road M
Heat Exchanger Site
Pao'o St. (Road N)
AVIATION SUPPORT
Waste Water Treatment
Flight Kitchen
USPS
AIRPORT SUPPORT
AIRPORT SUPPORT
Parking
Petroglyphs
Kupipi St.
AIRPORT SUPPORT
Wash Rack
FLIGHT LINE RESERVE
3,000'
LARGE AIRCRAFT USES
Hapu'upu'u St.
AIR CARGO
FAA
ATCT
ARFF
TERMINAL
U'U Street
K
L
GENERAL AVIATION
TLOF Emergency Response Route
Remote Fuel Station
381'
500'
700'
500'
A
P
M
N
G
H
D
C
A
Taxiway A
Taxiway E
Runway 17-35 11,000' x 150' (Future 12,000' x 150')
1,000'
KATR 5,000' x 100'
Taxiway F
1,000'
VOR
Ultimate Runway 17R-35L 11,000' x 150'
Initial Parallel Runway 5,500' x 100'
Ultimate Perimeter Service Road
WATER RESCUE FACILITY/ BOAT LAUNCH

LEGEND

- Airport Property Line
- Object Free Area (OFA)
- Extended OFA
- Runway Safety Area (RSA)
- Lease Parcels
- Runway Protection Zone (RPZ)
- Ultimate Roads/Parking
- Ultimate Airfield Pavement
- Short Austere Airfield (SAAF)

Existing Facilities per Photograph

NORTH

0 1200 2400

SCALE IN FEET

RECOMMENDED MASTER PLAN CONCEPT

Exhibit 5A

the entire length of the runway in the future. The dual parallel taxiway will ultimately provide for two-way circulation, and are planned at airport design group (ADG) VI separation standards. The dual taxiway system can be developed in sections as needed to address specific circulation needs as they arise. For example, the section between taxiway exits G and H can assist with circulation in front of the terminal.

The construction of the second parallel section south of Taxiway G would permit the installation of an additional taxiway exit from Runway 17-35. The separation between taxiway exits in this area is currently 2,700 feet. An exit in this area is not currently possible due to the grade change between the runway and Taxiway A. The grade of the second parallel taxiway would be designed to allow for the exit and would result in reduced taxi times for airline and air cargo aircraft.

Additional exit taxiways have been planned to provide more efficient egress from the primary runway. This includes a high speed exit near midfield for both landing directions, as well as supplemental right-angle exits that reduce the maximum spacing between exits to 2,000 feet.

Kona Auxiliary Training Runway (KATR)

The plans depict the proposed location for the Kona auxiliary training runway (KATR) for use in military pilot-proficiency training by C-17s for landing on short field conditions. This location at KOA was selected by the Department of Defense (DOD) after evaluating a range of alternative locations throughout the Hawaiian Islands. The KATR as originally proposed by the DOD would be 4,250 feet long and 90 feet wide with taxi access to Runway 17-35 for departure after executing the short landing.

The master plan recommends that a parallel runway be developed not only for capacity, but to provide a second runway to keep the airport open when the primary runway must be temporarily closed for any reason. KOA is currently the only small hub or larger commercial service airport in Hawaii that does not have a second runway.

The following subsection outlines ultimate plans for that parallel runway development. The DOT-A, however, has been negotiating with the DOD for the potential use of the KATR as an interim solution for providing a second runway at KOA. For this to be practicable, the KATR would need to be a minimum length of 5,000 feet, a width of 100 feet, and be available for civilian use when not being used for military training. As a result, the **Exhibit 5A** and the airport layout plan depict the potential interim 5,000-foot length for the KATR. The proposed location is 700 feet makai (west) of Runway 17-35.

The KATR would be constructed by the Department of Defense and could be used until such time that a full-length parallel taxiway becomes necessary between the parallel runways. At that time, it could be incorporated into the proposed taxiway as depicted on the exhibit.

Parallel Runway 17R-35L

Parallel Runway 17R-35L is ultimately planned as a full-service runway 1,200 feet makai (west) of the primary runway. The 1,200-foot separation is recommended as it meets the FAA standard separation for parallel runways serving D-V and larger aircraft, and it also ensures that the perimeter fencing and service road can be maintained outside of the runway's object free area on the makai (west) side.

The ultimate length is planned to be 11,000 feet and would have the same design standards (D-V) and pavement strength as the primary runway. It is planned for one-mile visibility instrument approaches to each end. A full-length parallel taxiway is ultimately planned between the parallel runways along the same alignment as the proposed KATR. This would place the centerline of the taxiway at 500 feet from the centerline of the parallel runway.

It is anticipated that the runway would initially be developed at a length to accommodate at least small general aviation aircraft and corporate and commuter aircraft. An initial runway length of 5,500 feet is shown on **Exhibit 5A**. If maintained at D-II design standards and at least 60,000 pound pavement strength, this runway would be capable of accommodating approximately 60 percent of the airport's operational mix.

The initial parallel runway would be developed from the south threshold of the ultimate runway. This will make it readily accessible to the general aviation facilities already located at the south end of the airport's flight line. Future extensions of the runway would make it more usable by the commercial service and cargo aircraft. The ultimate goal is to maximize the airfield capacity of the parallel runways and ensure there is always a runway available in service when a runway must be temporarily closed in emergencies or for maintenance or construction.

Helicopter Touchdown and Lift-Off Area (TLOF)

The plan includes a separate area to accommodate helicopter operations virtually independent of fixed wing operations. The facility is focused on a touchdown and lift-off area (TLOF) to be developed approximately 3,000 feet mauka (east) of the north end of the existing runway. This will allow air traffic control to permit helicopter operations independent of operations from the main runway system. This site was chosen for its separation from the runway environment as well as its visibility from the programmed airport traffic control tower (ATCT).

The TLOF is designed to serve helicopter training and function as a base for other helicopter operations on the airport. The ultimate paved TLOF is planned to 1,700 feet long and 200 feet wide, but can be developed in stages. The TLOF is also planned with 280 feet clearance on three sides from any publicly occupied areas to provide for protection zones.

Helicopter terminal area facilities are planned mauka (east) of the TLOF to

ensure that line-of-sight is maintained to the programmed ATCT.

Support Facilities

Airfield support facilities include facilities necessary for the maintenance and operation of the airfield. These include the airport traffic control tower (ATCT), other on-site FAA facilities, an airport rescue and firefighting (ARFF) facility, airport maintenance facilities, and perimeter service roads.

The current ATCT is old and outdated. It also does not have sufficient visibility of all airfield operations areas. As this master plan was being prepared, the FAA conducted a siting study for a new ATCT. The recommended location was Site #10 from the previous chapter, and is shown on **Exhibit 5A**. The new ATCT has been programmed for design and construction by 2012.

The FAA has also evaluated potential sites for relocating the very-high omnidirectional range with tactical air navigation (VORTAC) to the airport from its current site south of KOA. Chapter Four outlined the six primary candidate sites located within the airfield operations area (AOA) that were being considered. After considering input from the DOT-A and its consultants regarding the master plan, the FAA selected a location between candidate Sites 11 and 12.

As depicted on **Exhibit 5A**, the selected site is located 900 feet makai (west) of the runway centerline, and 2,270 feet from the runway end. This location should not affect existing buildings and remain out of areas anticipated to be developed in the next 20 years. It is also located just outside the ultimate RPZ for Runway 35 and will not pose a hazard to aircraft operations.

The ARFF building equipment is currently housed in a structure next to the existing ATCT on the south side of the airport. The facility is also located behind the general aviation transient and tie-down ramps. As depicted on **Exhibit 5A**, a location for a new, modern facility has been planned to the north of the passenger terminal and just south of the proposed ATCT site. The proposed location will have more direct access to the airfield, is closer to the helicopter TLOF area, and is still close to the passenger terminal. A direct emergency access route from the ARFF to the runways and the KATR will also serve to reduce response times and eliminate the need for an auxiliary response station to meet military response times to the KATR.

Training for ARFF personnel as well as other regional first responder facilities is being planned for a 60-acre public safety training campus on the airport. In addition, a boat launch for water rescue facilities and training should be considered as part of the ARFF and regional training facilities. The proposed location is indicated on **Exhibit 5A** on the coast line near the north end of the airfield.

The airport maintenance facilities are mauka (east) of U`u Street and south

of the terminal loop road. Area to expand the airport maintenance yard has been reserved immediately south of the current location.

The plan includes relocations and an addition to the perimeter service road as necessary to maintain secure access that will essentially circumvent the entire airfield. The perimeter service road on the makai (west) side of the airfield will need to be relocated for the KATR and parallel runway development. In addition, an emergency response route is planned to extend from the north end of Taxiway A then mauka (east) to the proposed helicopter TLOF. This will provide emergency access to the helicopter facility for ARFF equipment. Similarly, service road access to the water rescue facility is also planned.

PASSENGER TERMINAL CONCEPT

The previous chapter examined potential terminal alternatives that would accommodate the needs determined for the passenger terminal area in Chapter 3 - Facility Requirements. Those alternatives considered the short-, intermediate-, and long-term planning horizon needs of the airport as well as the functional, environmental, and financial factors involved. While the planning horizons are established to be demand-driven, they have been keyed to demand levels anticipated in the five-, ten-, and twenty-year time frames.

In order for the Master Plan team and the stakeholders of the airport to better evaluate the alternatives, these factors were developed into evaluation criteria and listed in a matrix for the purposes of scoring the three alternatives. An example of this form is found in **Appendix C**. Further, a cost benefit analysis was performed for all three alternatives. This analysis can also be viewed in **Appendix C**.

From the cost benefit analysis, Alternative 1 was the least expensive option and the primary benefits include the following:

1. Maintains the current architectural character – "Hawaiian Sense of Place."

2. Increases airport operational efficiency.

3. Optimizes current facilities.

4. Increases passenger level of service.

5. Allows for expandability.

6. Constructability and minimizes impacts to airport operations.

7. Minimal expenditure.

Alternative 2 prioritizes the building of a new north terminal for overseas operations before focusing on the expansion of the existing terminal. The benefits of the new north terminal for overseas passengers include:

1. Increases passenger level of service.

2. Flexibility of facilities – baggage claim use for both international and domestic travelers.

3. Minimizes disruption of airport operations during implementation.

Alternative 3 proposes the building of a new overseas facility at the south end of the terminal area, and the benefits are similar to Alternative 2.

The recommended concept strategy for future terminal development is based on Alternatives 1 and 2. More specifically, the preferred concept includes the short and intermediate plans from Alternative 1 with the option of moving forward with either the long range plan of Alternatives 1 or 2. With either option, the Customs and Border Protection (CBP) facilities would be relocated from the existing location, thereby allowing for the construction of the North Terminal if desired at some point in the future.

The full build out of the recommended plan is illustrated in **Exhibit 5B**. It is color coded by facility operations as consistent with other diagrams in this study. The recommended terminal plan by phase will be described below. They are coordinated with exhibits that show the overall growth in relation to the terminal area as well as the operational detail of the facility.

Terminal Development Priorities

Input and comments from the public workshop, the TAC, and other stakeholders were reviewed and taken into consideration as the concept was refined and priorities established. Through further analysis and discussion of the alternatives evaluation with the Master Plan team, terminal development priorities were determined to be as follows:

1. Improve baggage claim areas to reduce crowding and improve circulation.

2. Improve ticket lobby experience and reduce crowding.

3. Improve TSA security checkpoint operations.

4. Implement TSA in-line baggage screening.

5. Increase gate holdroom areas.

6. Improve CBP international arrivals experience.

The recommended development plan for the passenger terminal follows the Short Term, Intermediate, and Long Range time frames of the aviation forecast and its requisite requirements for facilities. Generally, though the master plan requirements identify need for expanded facilities in respective 5, 10, and 20 years time frames, the master plan is "demand driven" and as such facilities should be developed to address growth or operational change at the airport. For KOA the Short Term and Intermediate plans of the terminal area, in addition to increasing capacity to meet future needs, address current need to improve passenger level of service and safety noted above. This led to the decision by DOT-A to identify an "Initial Development Phase" that combines

the Short Term and Intermediate phases for terminal area development.

Therefore, initial development of the passenger terminal will focus on improvements within the existing terminal as described below and depicted on **Exhibit 5C**.

Initial Development Phase (Short Term plus Intermediate Term)

Baggage Claim (Short Term)

The perimeter rails at baggage claim can be relocated in order to provide more space for circulation at the ends of the claim device. Currently, the space between the ends of the baggage claim devices and the perimeter rail create a pinch point. An additional baggage claim device will be added to each end of the terminal. The added claim devices will need to be sloped plate devices able to handle the baggage demand from large aircraft flying overseas.

Ticketing (Intermediate Term)

Crowding and lack of wayfinding clarity result in an inadequate level of service within the two current ticket lobbies. The best solution to resolving these issues would be to create a centralized ticket lobby with adequate space for queuing and processing functions without hindering passenger wayfinding and flow. This can be achieved first by a relocation of the Ellison S. Onizuka Space Center, which would allow space for an automated kiosk check-in area. These self-service kiosks would be the first step of a two-step process that would organize queuing and streamline passenger flow.

A centralized ticket lobby would also require the remodeling of the north ticket lobby so that the counters face the center of the terminal as do the current south ticket lobby counters. These ticket counters would be designated bag check counters for both mainland and interisland passengers. Mainland passengers at this second step of a two-step process would require processing through USDA Agricultural screening before advancing to the bag check counters. The current two locations of the TSA security checkpoints would be consolidated into one checkpoint and would be located makai (west) of the self-service kiosks where the ticket counters converge.

Airside (Intermediate Term)

On the airside, between the two departure areas, new covered centralized in-line EDS outbound baggage areas would be constructed. Tunnels would also have to be built so that the bags can be moved from the ticketing area to the EDS baggage system. The tunnels would include baggage conveyance systems, utilities, and be of a size to maintain the systems. In order to maintain the level of passenger service for the short term, restrooms and concessions would be upgraded and expanded.

Above the new outbound baggage system is a second-level concourse from

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Kupipi St.

SHORT TERM PARKING

ULTIMATE TERMINAL EXPANSION

NORTH

0 150

SCALE IN FEET

LEGEND

- Ultimate Roads/Parking
- Ultimate Airfield Pavement
- Public Area
- Holdroom
- Airline
- Ticket Queuing
- Concessions
- Aviation Department
- Security
- Security Queuing
- Restroom

Existing Facilities per Photograph

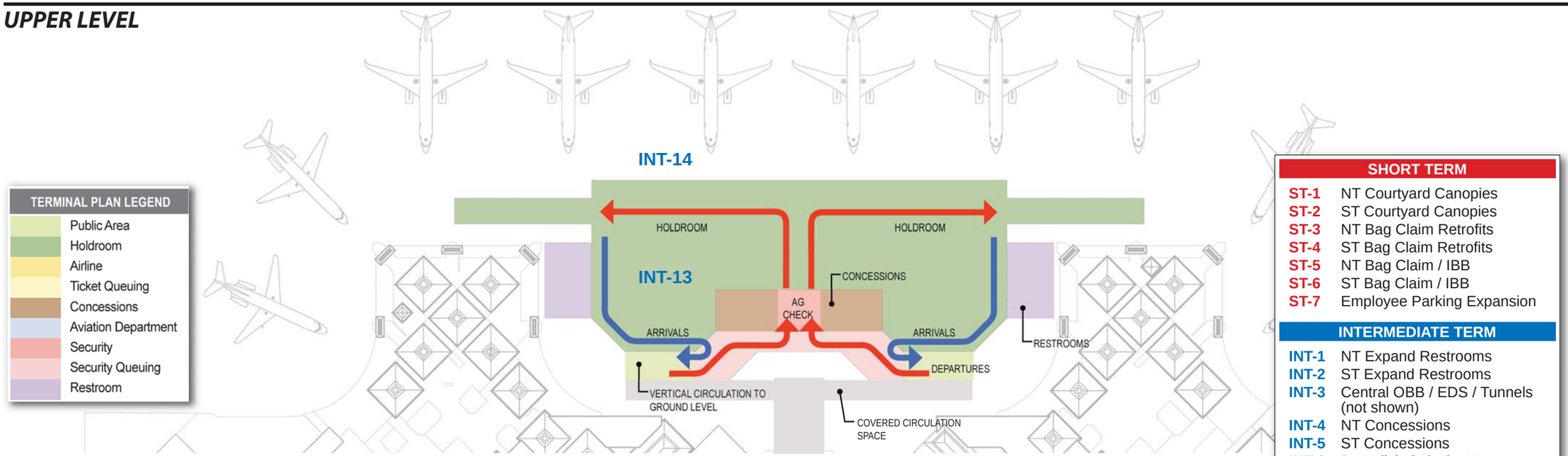
STATE OF HAWAII 1959

RECOMMENDED PASSENGER TERMINAL PLAN

Exhibit 5B

06MP06-5C-1/27/09

UPPER LEVEL



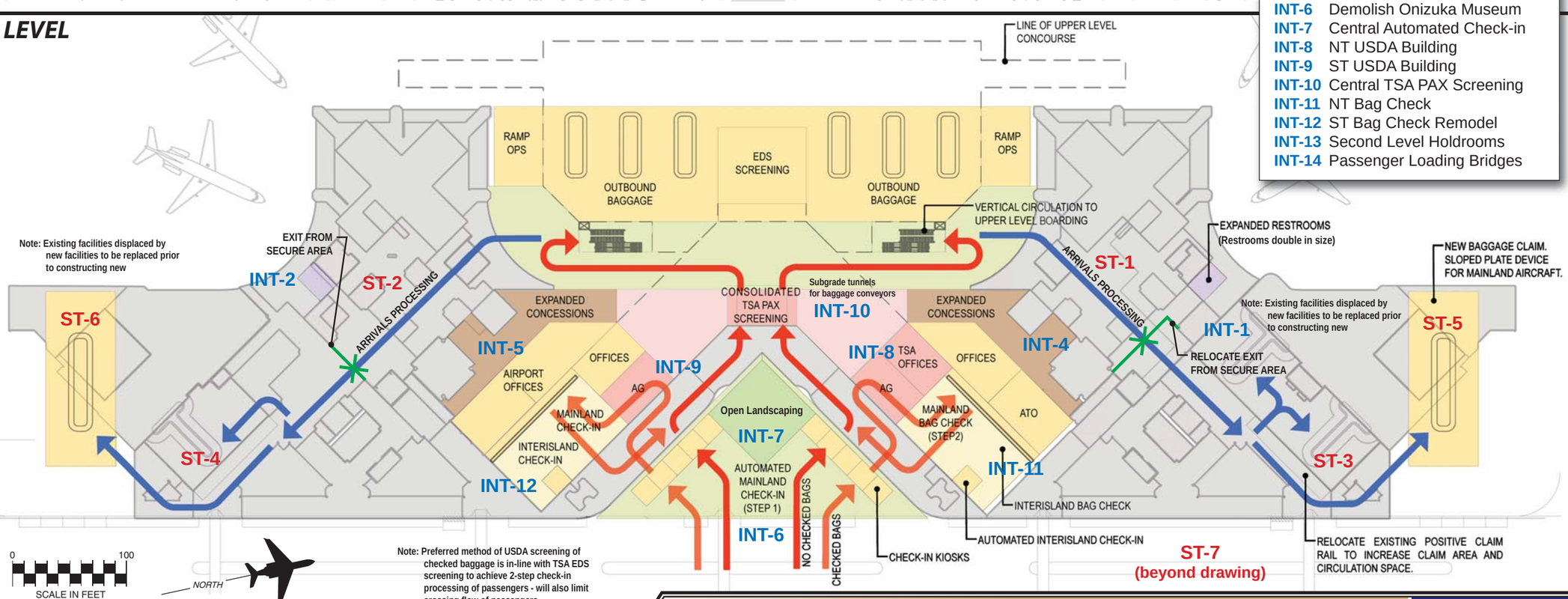
SHORT TERM

- **ST-1** NT Courtyard Canopies
- **ST-2** ST Courtyard Canopies
- **ST-3** NT Bag Claim Retrofits
- **ST-4** ST Bag Claim Retrofits
- **ST-5** NT Bag Claim / IBB
- **ST-6** ST Bag Claim / IBB
- **ST-7** Employee Parking Expansion

INTERMEDIATE TERM

- **INT-1** NT Expand Restrooms
- **INT-2** ST Expand Restrooms
- **INT-3** Central OBB / EDS / Tunnels (not shown)
- **INT-4** NT Concessions
- **INT-5** ST Concessions
- **INT-6** Demolish Onizuka Museum
- **INT-7** Central Automated Check-in
- **INT-8** NT USDA Building
- **INT-9** ST USDA Building
- **INT-10** Central TSA PAX Screening
- **INT-11** NT Bag Check
- **INT-12** ST Bag Check Remodel
- **INT-13** Second Level Holdrooms
- **INT-14** Passenger Loading Bridges

LOWER LEVEL



Note: Preferred method of USDA screening of checked baggage is in-line with TSA EDS screening to achieve 2-step check-in processing of passengers - will also limit crossing flow of passengers

which larger overseas aircraft can be accessed via passenger loading bridges. Ground boarding for narrow body aircraft on interisland routes would be maintained from the existing holdrooms. The second level concourse would be accessed via escalators and stairs at either side upon exiting the security checkpoint. Once above, passengers pass through agricultural screening of hand baggage prior to entering the main holdroom area. The second-level departures area would have restrooms and concessions.

Long Range Options

The long range plan focuses on improving the international arrivals operations. As indicated earlier, the initial plan preserves the flexibility to choose either Alternative 1 or Alternative 2 for long range terminal development. With each option, a "Beyond Plan" addresses needs if and when the long range planning horizon forecasts are exceeded.

Long Range - Option 1

Exhibit 5D presents the long range Option 1. A new immigrations facility would be built south of the existing tent structure and would be connected to the main terminal upper level concourse via a corridor and ramp. This would increase the level of service for the international arriving passengers by allowing them to deplane from loading bridges.

A new sloped plate baggage claim device would be added next to the one added in the previous phase. This new claim device would be swing use and could operate either as domestic or international depending on schedule. The current administrative buildings would be converted for use as the CBP offices and the Customs facility.

An increase in international flights is anticipated beyond the long range horizon. This option would address the need by adding an upper level concourse with loading bridges. The concourse would be directly connected to the immigrations facility via a ramp and vertical transport. The long range would also see the expansion of the CBP processing facility.

In this phase, the terminal drive would be relocated to the east in order to expand the curb and allow for more capacity at the terminal front.

Long Range – Option 2

The long range alternate plan depicted on **Exhibit 5E** addresses the needs of the airport if international demand increases significantly in the future. A new north terminal would be built for departures and arrivals processing of international passengers as well as overseas mainland passengers. Ticketing and security screening would be located on the ground floor with holdrooms, concessions, and restrooms on the second level concourse. International arriving passengers would deplane onto a sterile third level, process through immigrations, and then proceed to ground level for baggage claim and customs processing.

Once the new international facility is built and operational, the interim CBP facility built in the intermediate phase can be demolished to clear the area for increased baggage claim capacity. Three new sloped plate devices will be added between the international bag claim and the domestic bag claim device. Two of these will be for domestic use and the other will be swing use domestic or international depending on the schedule.

Airport Terminal Vision

Throughout the Master Planning process for Kona International Airport at Keahole, it has been emphasized by all involved that any future development should consider maintaining the existing unique character and ambience of the airport as a top priority. The recommended terminal plan identifies the facilities needed to be improved and built to meet the future growing demand. The final concept and all previous alternatives, however, have been studied and developed with the requirements as a base and with the vision as identified above.

The human scale of the buildings, open air structures, integration of landscape, and use of indigenous architectural style are principles that contribute to the unique experience at this airport. The terminal portion of this master plan has been developed throughout with building information modeling (BIM) as the integration tool of facility requirements and vision.

Exhibit 5F illustrates three alternatives for roof designs that can shape the future development with the principles as stated above. Roof Option 1 uses a similar roof type as the existing roof and is adapted in size to the facility function below. Roof Option 2 utilizes the language and scale of the existing hut roofs; however, they are constructed of fabric on tensile structure much like the existing CBP structure. Roof Option 3 uses a modified version of the traditional hut roof and can possibly be perforated at the top for natural air flow and have solar panels on the south facing slope. **Exhibit 5G** further illustrates the various views of these roof options.

Special Considerations

- AGRICULTURAL INSPECTIONS

Different than most airports within the US, Hawaii airports require inspection of passengers and both hand-carried and checked baggage for items not allowed into or out of the state. This requirement adds to the departures and arrivals processing of passengers and baggage. The recommended plan considers this unique condition and acknowledges the need for facilities and their detailed requirements to ensure proper inspections by both United States Department of Agriculture (USDA) and the Hawaii Department of Agriculture (HDOA).

Generally for this master plan level of detail within the terminal – for departing passengers, baggage must be inspected either prior to checking it as "aircraft checked baggage" or carrying it on board aircraft as "hand carry"

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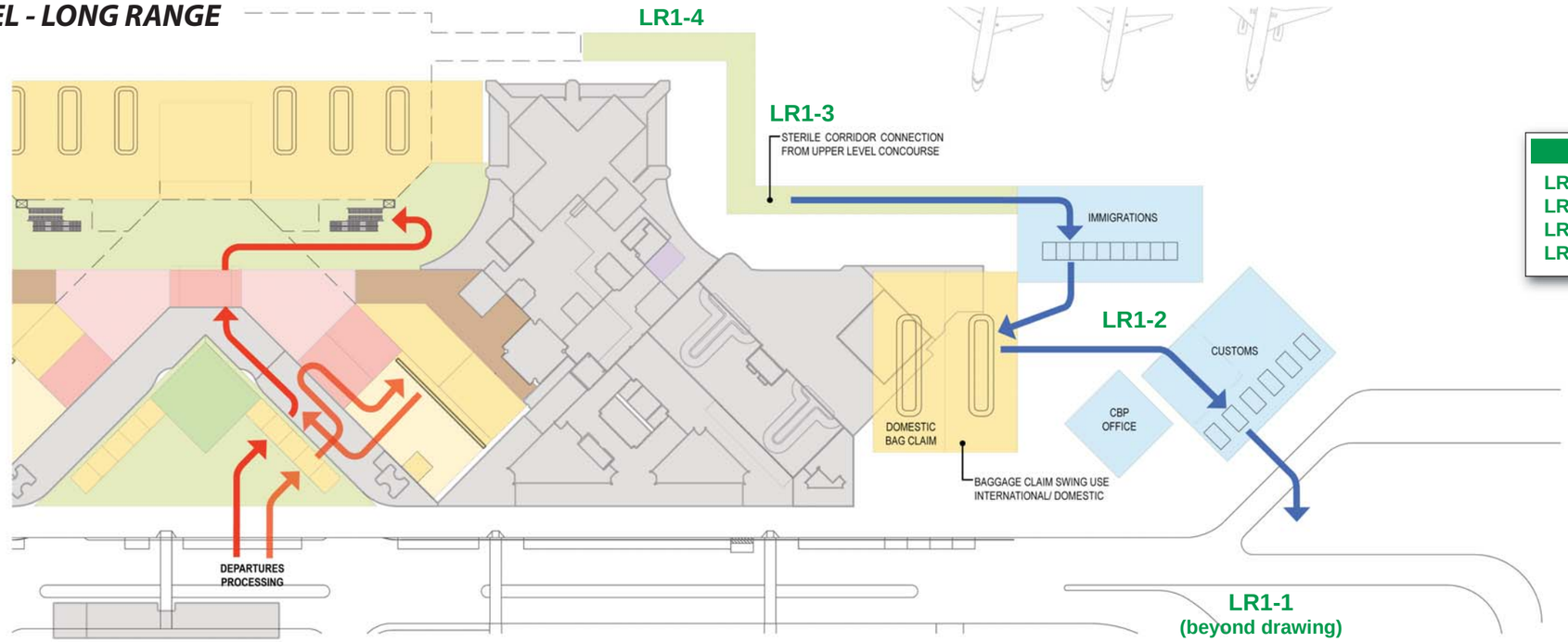
LOWER LEVEL - LONG RANGE



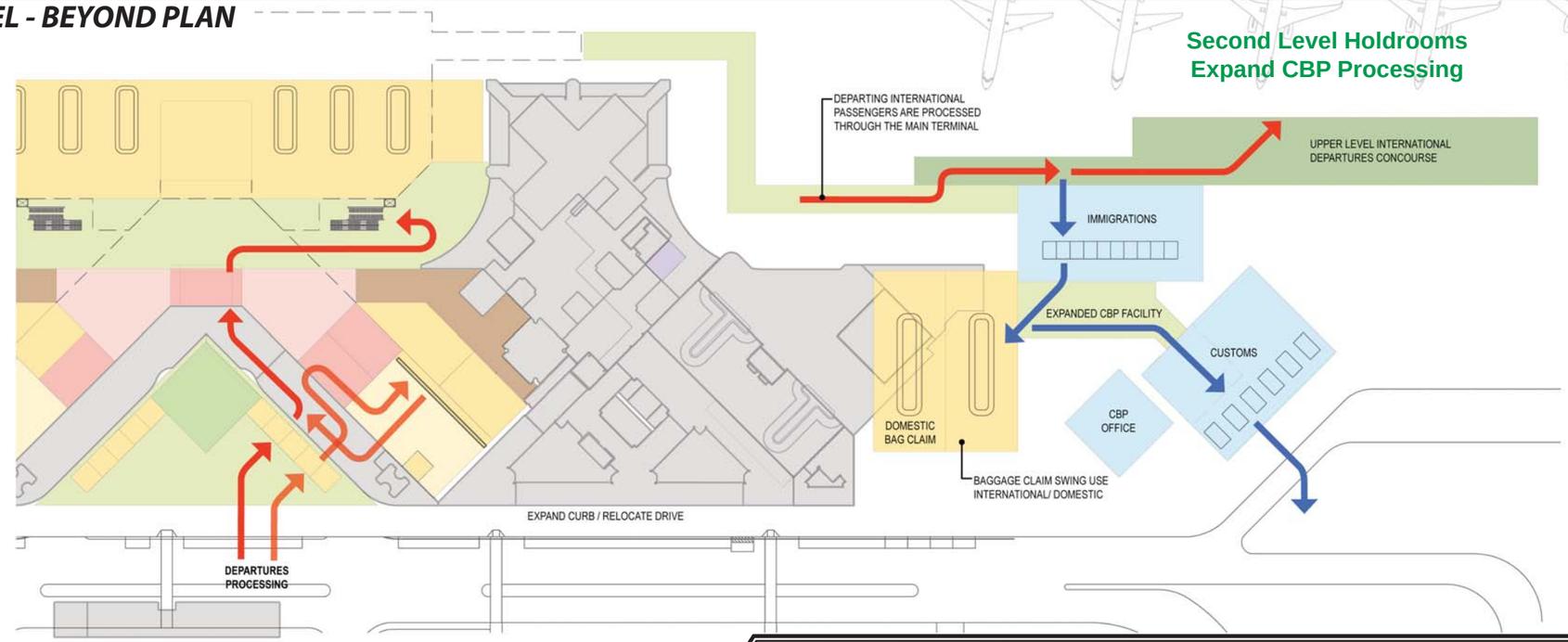
LONG RANGE

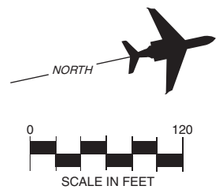
- **LR1-1** Airport Administration
- **LR1-2** CBP Facility
- **LR1-3** Arrivals Cooridor
- **LR1-4** Passenger Loading Bridges

TERMINAL PLAN LEGEND

- Public Area
- Holdroom
- Airline
- Ticket Queuing
- Concessions
- Aviation Department
- Security
- Security Queuing
- Restroom

LOWER LEVEL - BEYOND PLAN





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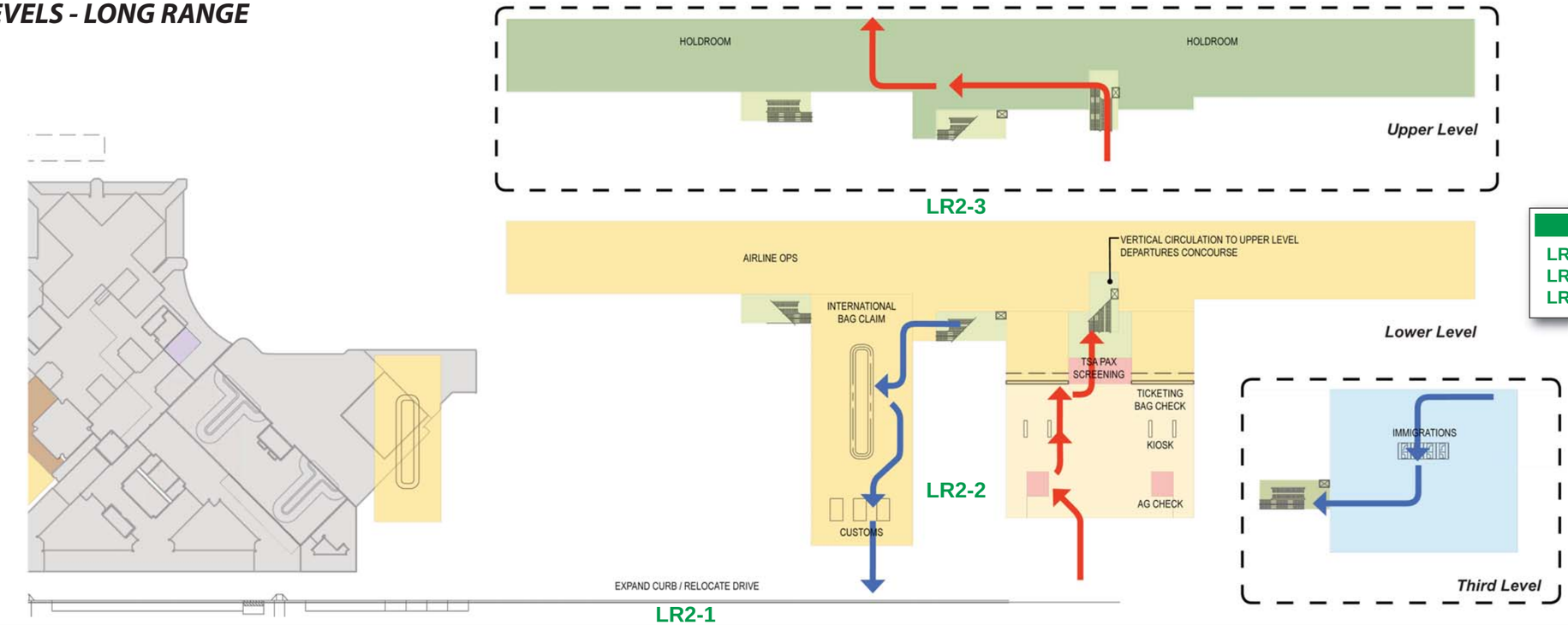
ALL LEVELS - LONG RANGE



LONG RANGE

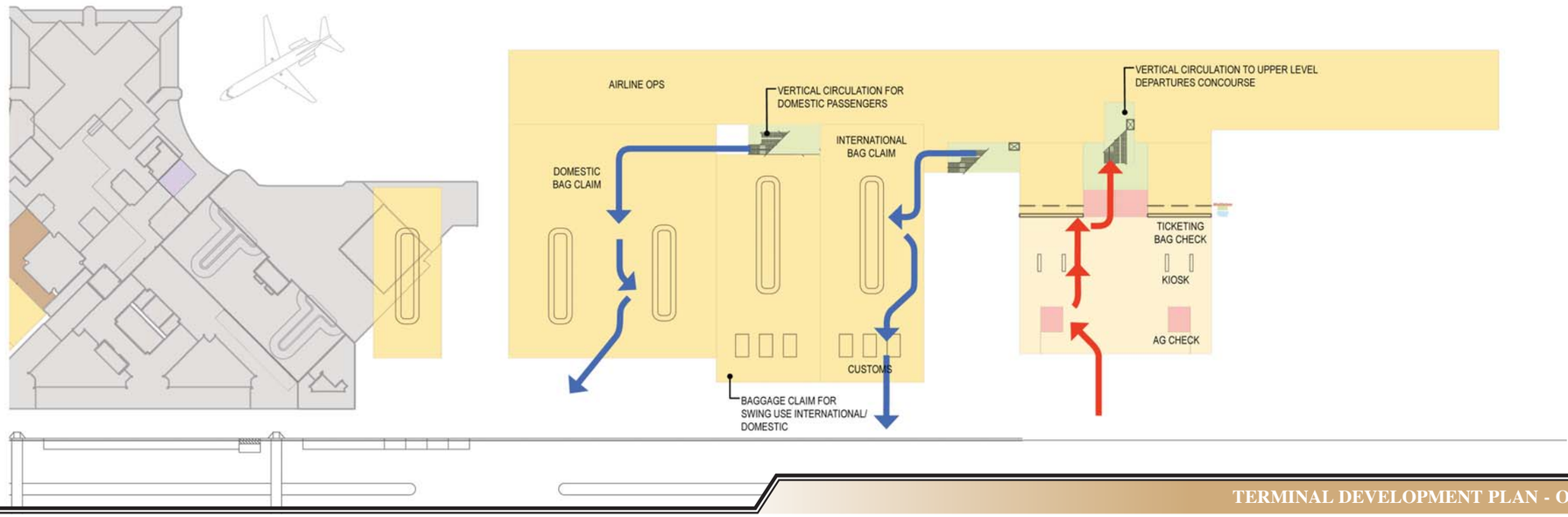
- **LR2-1** Expand Curb / Relocate Drive
- **LR2-2** North Terminal
- **LR2-3** Passenger Loading Bridges

TERMINAL PLAN LEGEND

- Public Area
- Holdroom
- Airline
- Ticket Queuing
- Concessions
- Aviation Department
- Security
- Security Queuing
- Restroom

LOWER LEVEL - BEYOND PLAN

Expand North Terminal Gates
Expand North Terminal CBP Processing



NORTH

0 120

SCALE IN FEET

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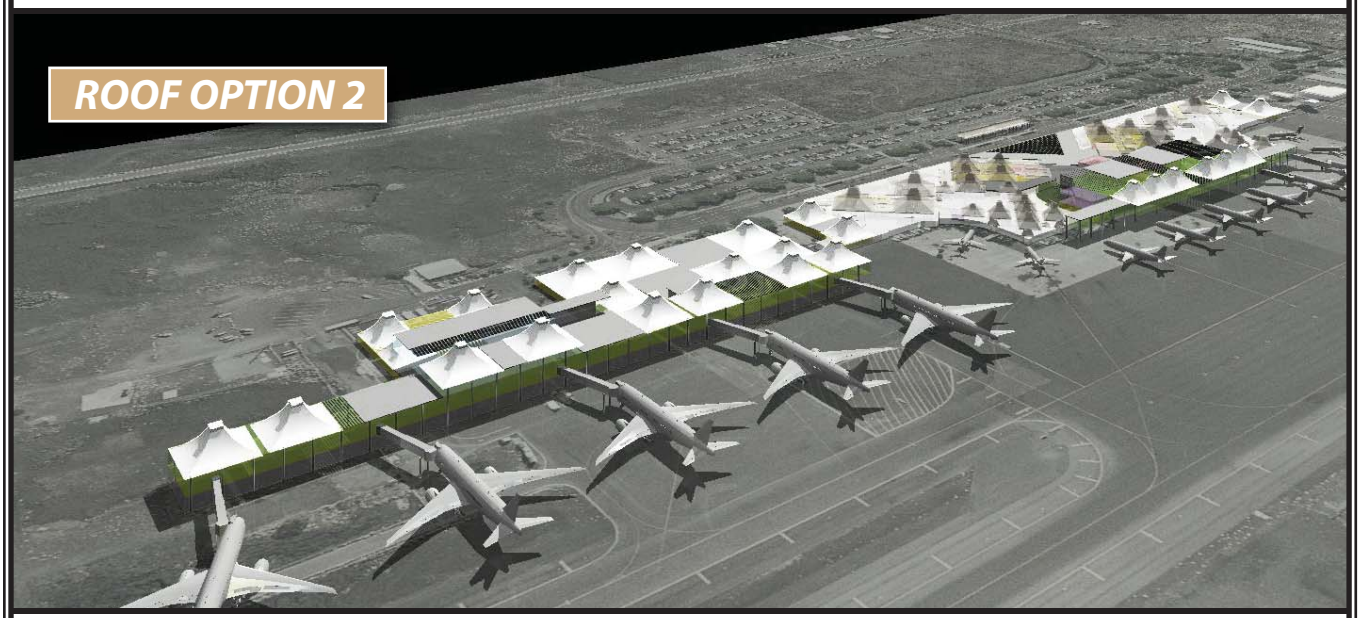
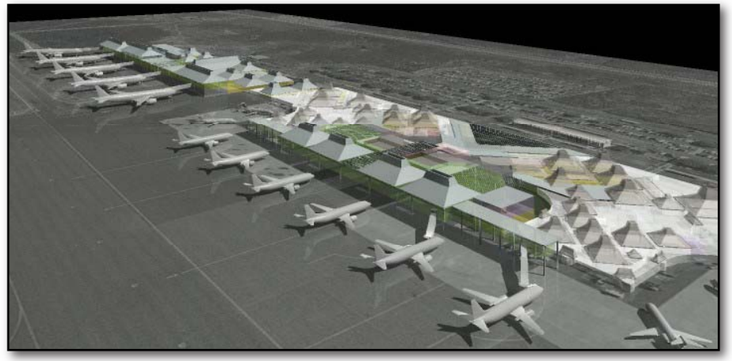
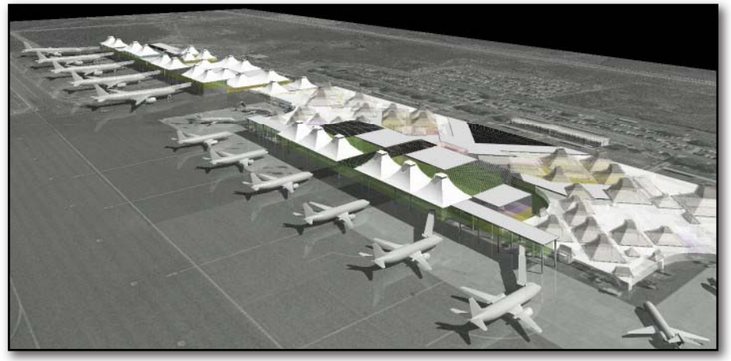


FULL BUILDOUT TERMINAL AREA MODEL

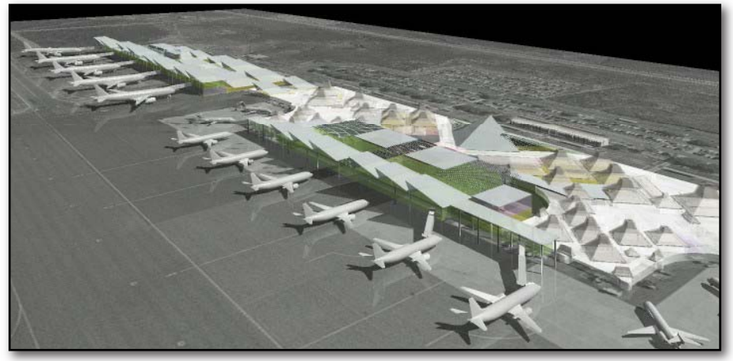
Exhibit 5F



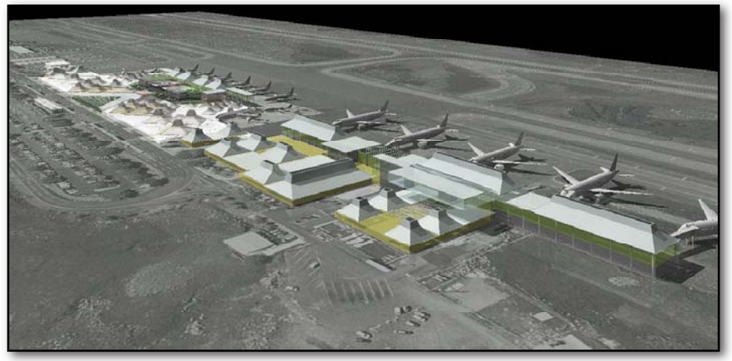
View of Initial Development From SW-Roof Option 1



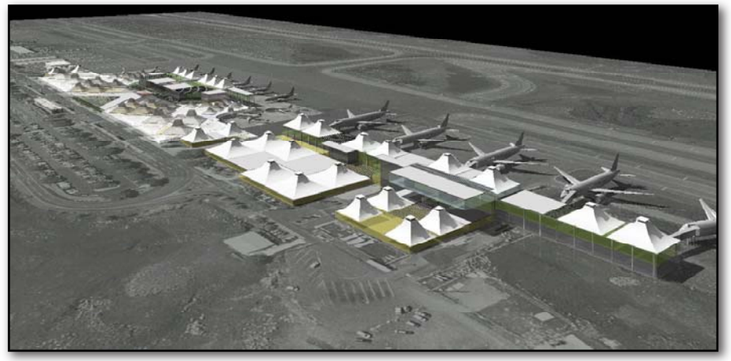
View of Terminal Area From SW - Roof Option 2



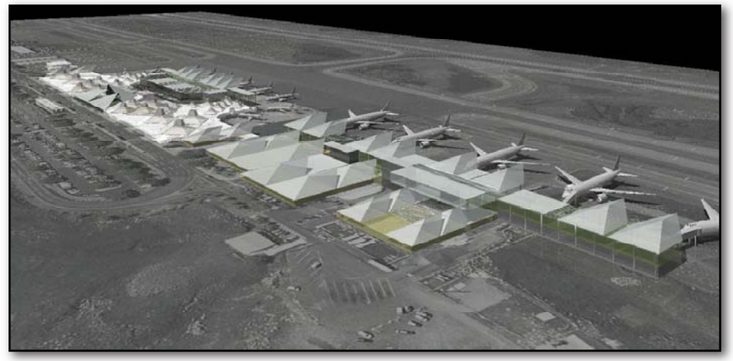
View of Terminal Area From SW - Roof Option 3



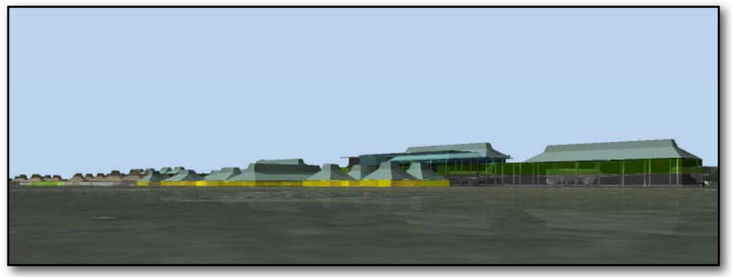
View of Terminal Area From NE - Roof Option 1



View of Terminal Area From NE - Roof Option 2

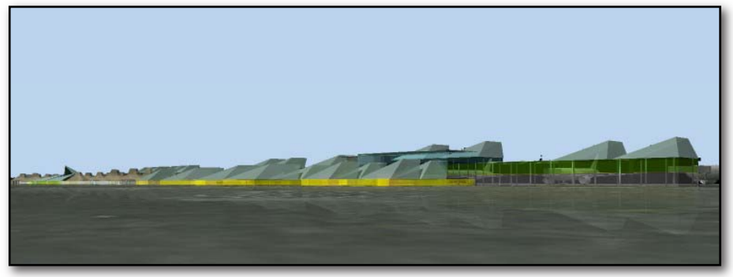


View of Terminal Area From NE - Roof Option 3



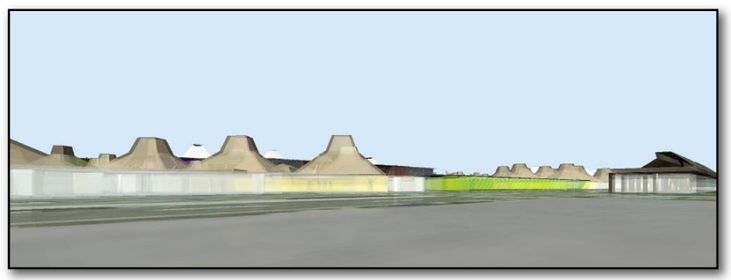
View of Terminal Area From NE - Roof Option 1

View of Terminal Area From NE - Roof Option 2

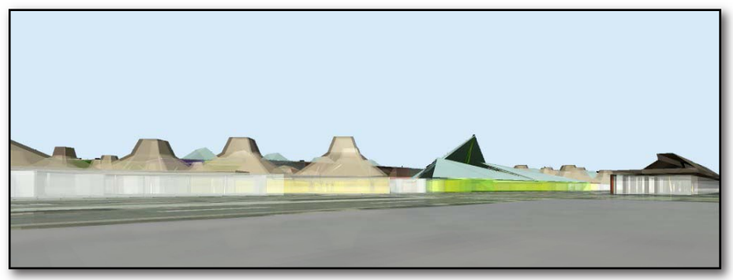


View of Terminal Area From NE - Roof Option 3

View of Terminal Area From SE - Roof Option 1



View of Terminal Area From SE - Roof Option 2



View of Terminal Area From SE - Roof Option 3

baggage. For arriving passengers, a declaration of contents not allowed into the state is required, and inspection of checked or hand carry baggage must be conducted prior to departing the airport.

Space must be allocated in the master plan to support these inspection functions as well as for agency offices to support operations and staff. The recommended plan includes spaces allocated to the inspection of checked baggage either prior to checking the bag with the airlines (as it occurs now) or after if it is in-line within the outbound baggage system, but prior to TSA screening of checked baggage.

The plan also includes an area to screen hand-carried baggage prior to passengers entering the holdroom area for mainland and international departures. The plan includes baggage claim additions of new buildings and claim devices mainly to serve larger aircraft. These buildings would include adequate space for inspection areas prior to their controlled exit points. Space is also provided in the plan for processing live domestic animals that arrive as checked baggage.

The plan includes office space within the terminal buildings adjacent to departures processing for both agencies, as well as a centralized joint-use USDA/HDOA marshalling area with direct airside access for aircraft belly freight cargo. If interim facilities are needed due to vacation of existing space in order to build new facilities, they will accommodate that agency's requirements for operations. Detailed programming for both agencies should be conducted prior to the design phase of future projects.

- AIRPORT REVENUE – CONCESSIONS

Airport concessions are important to the level of service provided passengers, visitors, and employees at the airport as well as for generating airport revenue. The airport currently has approximately 8,200 s.f. of concessions space that will be increased to approximately 15,800 s.f. in the Initial Development Phase and to 19,500 s.f. in the Long Range.

The majority of concessions are planned to be located beyond the TSA security checkpoint as that is where passengers tend to spend most of their time waiting before boarding flights. These concessions can also serve employees at the airport.

Concessions are also planned to be available to visitors prior to the security checkpoint. The type will be determined by market conditions.

The concessions post-security are located in three areas. Immediately after the TSA security checkpoint and upon turning to the north or south depending on gate location, passengers will encounter concessions opportunities laid out in a "shopping street" type arrangement. Immediately after the shopping street arrangement, is a second area for concessions that will front the existing departures courtyards. This area is accessible to all passengers, though it is directly adjacent to gates for interisland travel. A

centralized concessions area is also located in the second level departure area serving mainland flights.

In support of the concessions and departures process, the restrooms adjacent to the two interisland departures courtyards are anticipated to more than double in size. The second level departure area will have restrooms in two locations adequate to support the mainland flight activities.

- DESIGN AND CONSTRUCTION PHASES

The terminal development plan is a strategy that offers guidance for the development of the airport over time to address capacity, operational requirements, safety, and necessary services for all users of the airport.

This plan also recommends maintaining and enhancing the unique architectural character of the air terminal complex and a course of action describing a facilities development sequence to make improvements.

The next phase of study, definition of the projects in further detail, prior to detailed design and construction is a necessary step. This phase of study should be conducted with the participation of user groups that will occupy the new facilities. In addition to detailed programming and concepts this definition phase should include definition of administrative systems to implement the projects, financial strategies to support their costs, detailed scheduling for phasing and staging of construction, identification of agency requirements and reviews for permitting development (such as for broader concerns like shoreline management and detail concerns like storm water management during construction), and other design standards necessary to management of development at a major institution as an airport.

- AIRPORT SECURITY BLAST MITIGATION

The US Department of Homeland Security (US DHS) has requirements, guidelines and recommendations for air terminal buildings related to their ability to withstand forces generated by vehicle transported explosives detonated within the terminal area of airports. DOT-A conducted a separate study of the main passenger airports in the state with recommendations for physical improvements of the air terminal buildings or operational procedures for controlling vehicle access to the terminal and/or prox-imity of parking based on size categories of vehicles – or a combination of both. This master plan identifies expansion of terminal parking, relocation of the terminal curbs (though not to the 300' distance to terminal structures required by the US DHS), and relocation of the main entrance roadway systems in phases. As such, this master plan allows for layout of interim vehicle access control for the airport terminal area to enforce operational procedures that meet the various "state of alert" US DHS requirements.

- INTERIM AND TEMPORARY FACILITIES

Implementation of new facilities within the existing operating terminal area will, in some instances, require relocating airport related operations to temporary facilities. Phasing, staging, and sequencing of improvements and their construction will prioritize completion of new facilities before necessity to relocate existing operations. When temporary facilities are necessary, consideration should be given to locating those facilities in proximity to the functions they will serve. Additionally, detailed requirements for the relocated operations should be identified prior to detailed design of the temporary facilities for airlines, agencies, airport operations, concessionaires and others. This will insure that operational needs (space requirements as well as specialized information technology and communications) are met.

Terminal Parking and Access Loop

The facility requirements indicated that even with the recent additions to terminal area lots, the parking facilities will be marginally undersized by the short term planning horizon. More than 800 additional spaces will be needed by the long range planning horizon level.

With the parking area within the existing terminal loop essentially fully developed, recent additions have been located mauka (east) of the terminal loop road. This is less than desirable as pedestrians from these lots must cross terminal traffic twice. The mauka side of the loop is the area of concern as traffic tends to move faster in this area and drivers are not as prepared to encounter pedestrian traffic here as they are at the terminal curb front.

As parking needs increase, it is recommended that the terminal loop be expanded mauka to Pao`o Street (Road N). This will place all of the terminal parking lots inside the loop road. **Exhibit 5H** depicts the plan for the terminal parking and loop road system.

Pao`o Street between Keahole Street and the proposed new airport access road (Road P) to the north would be converted to a northbound one-way road to become the backside of the terminal loop system. The proposed intermediate terminal improvements could require the curb in front of the terminal to be moved 30 feet mauka (east). If the roadway shift is made, it is recommended that a wider median island and an additional outside lane be planned. The shift and additional width would extend at least to the edge of the parking lot.

This would also require the removal of the building known as the Ground Transportation Building. The building was previously used for rental car counters. It has not been needed for this use since all rental car operations were relocated to their lease areas off Keahole Street and away from the parking lot. The building currently houses a local style eatery, the only restaurant concession outside of secu-

rity on the airport. Since new restaurant facilities will be provided within the terminal modernization, the building will become disposable.

The need for the shift will depend upon the final terminal design. If the design does not require additional mauka space for pre-security queuing, the roadway and the ground transportation building could be maintained.

The parking lot would be divided into short and long term parking. Kupipi Street would bisect the lot with short term parking makai and long term parking mauka. It would also be converted to an internal one-way access spine for entering and exiting parking lots. The main entrance would be at the north end of the loop. Vehicles could enter long or short term parking from this entrance. Exits from the lots would be located farther south with the toll plaza located south of the lots. The toll plaza would exit to the mauka side of the terminal loop. An additional entrance to the long term parking lot could be made available from Pao`o Street. A second entrance to the short term lot could also be developed at the south end of the terminal frontage road.

The short term parking lot would have a higher percentage of spaces than typical. It could be priced to accommodate not just hourly parkers, but also all-day parking by island commuters, as well as overnight users willing to pay a higher rate for close-in parking. The parking as depicted on the plan will accommodate both public and employee parking needs through the long term planning horizon. Additional space is available for expansion beyond the planning horizons. It should be noted that the petroglyphs in the area would be avoided by the parking lot development plan.

The proposed parking plan is purposely designed around preserving the petroglyphs that are located mauka of Kupipi Street. This is a unique historic cultural setting that can be tied into the overall plan for maintaining the Hawaiian sense of place. As will be shown in later discussions of the overall airport land use plan, the petroglyphs are part of the link between the terminal plans, the new site for the Ellison S. Onizuka Space Center, and other areas designed to maintain and honor the Aloha Spirit.

AIR CARGO CONCEPT

The air cargo facilities are currently located south of the passenger terminal and are surrounded by general aviation facilities. The ramp can only accommodate aircraft up to Aircraft Design Group (ADG) III. Larger cargo aircraft must be parked on the ramp north of the passenger terminal. As cargo traffic grows it is recommended that cargo be consolidated to an area north of the passenger terminal and the ATCT. This will not only consolidate the use, but separate it from the general aviation activity at the south end of the terminal area.

Exhibit 5J depicts the recommended plan for the cargo area. The plan is a refinement of Cargo Alternative 2 in the previous chapter. The cargo buildings are aligned parallel to the run-

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USPS

LONG TERM PARKING

CELL PHONE LOT

Keahole St.

Pao'o St. (Road N)

TOLL PLAZA

Petroglyphs

Kupipi St.

SHORT TERM PARKING

AIRPORT MAINTENANCE EXPANSION

PASSENGER TERMINAL EXPANSION

COMMUTER AIR TERMINAL

LEGEND

- Airport Property Line
- Ultimate Road/Parking
- Ultimate Airfield Pavement
- Ultimate Building

NORTH

0 300

SCALE IN FEET

STATE OF HAWAII 1959

TERMINAL LOOP AND PARKING PLAN

Exhibit 5H

06MP06-5J-3/23/10

LEGEND

- Airport Property Line
- Ultimate Road/Parking
- Ultimate Airfield Pavement
- Ultimate Building
- Airport Traffic Control Tower (ATCT) Site Alternatives
- Passenger Terminal

NORTH

0 300

SCALE IN FEET

Halalu Street Extension

FUEL FARM (ORIGINAL SITE)

Pao'o St. - Road N

WASTEWATER TREATMENT EXPANSION AREA

RESERVE FOR TRUCK STAGING

FLIGHT KITCHEN

USPS

TERMINAL PARKING

RESERVE FOR AIRPORT SUPPORT

RESERVE FOR FUTURE TERMINAL EXPANSION

JOINT INSPECTION FACILITY

Hapu'upu'u Street

FAA

ATCT

ARFF

PASSENGER TERMINAL EXPANSION

Current BRL

AIR CARGO

Service Road

REMOTE FUEL STATION

Group VI Taxiway Clearance/Ultimate BRL

RECOMMENDED AIR CARGO CONCEPT

Exhibit 5J

way with apron makai and truck docks and vehicle parking mauka.

Space is also provided at the south end of the cargo complex for a Joint Inspection Facility building. This is designed to house the Hawaii Department of Agriculture (HDOA), the United States Department of Agriculture (USDA), and other state and federal agencies with jurisdiction over cargo exports and imports. The facility is expected to include inspection areas, treatment areas, office space, and cargo consolidation and deconsolidation areas. The facility is expected to meet all food quality and food safety requirements.

As depicted on the exhibit, the apron is sized to accommodate Group V aircraft, but could also accommodate Group VI on an infrequent basis. The apron is set back from Taxiway A to Group VI design standards as well. Space is provided on the ends as well as on the ramp side of the buildings for storage of ground support equipment (GSE).

Access to the cargo area would be extended from Pao`o Street. Secondary access points are depicted at the north and south ends of the cargo parking lot.

For the terminal loop road to be relocated to Pao`o Street as planned, the primary access for the new cargo area will need to be relocated mauka of Pao`o Street. As shown on **Exhibit 5A**, the cargo access road would then tie into an extension of Halalu Street. Halalu Street would intersect with the future airport access Road P. There will be more discussion on the access system later in this chapter.

Exhibit 5J also depicts the locations reserved for several other support uses that would be developed by others. The new FAA ATCT and the ARFF relocation sites were discussed earlier. While the flightline areas used by the ATCT and the ARFF provide the sightlines and airfield access those uses require, areas just mauka of the flightline are ideal for other uses that support both the passenger and cargo functions. Such support uses planned for this area include a United States Postal Service (USPS) facility, a flight kitchen, and a consolidated airline fuel farm.

The four-acre site owned by the Postal Service is shown on the northwest corner of the intersection of Pao`o Street and future Road P. Although consideration had been given to a potential land swap with the USPS if this site was determined to affect the Master Plan concept, the site actually works well with the recommended concept. The site has good access to Pao`o Street and the utility corridor along it. The site is also in good proximity to the cargo area to aid in the transfer of air mail between the facilities. At the same time, it stays outside the potential long term path of terminal expansion.

Just to the north across the service road from the USPS site is a parcel reserved for a flight kitchen. Mauka of the flight kitchen and across Pao`o Street is the site recommended for the consolidated fuel farm. These locations provide both of these uses with

the landside access necessary for ground deliveries as well as being a short distance from the aircraft they are intended to service.

The new setting for the cargo area and other support facilities provides another opportunity to incorporate the Hawaiian sense of place into what may ordinarily be considered one of the more drab components of the airport. Sufficient space is available to incorporate native landscaping into the area. The façades of the new cargo buildings can be designed in a manner to blend with that of the terminal, ATCT and other new structures on the airport

GENERAL AVIATION CONCEPT

The general aviation (GA) facilities are presently located south of the passenger terminal and on both sides of the air cargo area. As discussed previously, the cargo facilities are recommended to eventually be relocated to the north of the passenger terminal, providing three distinct and separate functional areas for the primary aviation uses on the airport.

Exhibit 5K outlines the recommended concept for the general aviation area. This concept is based upon the input and comment received from the TAC and the public through the alternatives review. The basic premise to the concept is derived primarily from GA Alternative 3. Aspects of the redevelopment of the northern portions of the area, however, are from Alternatives 1 and 2.

The concept essentially maintains the subdivision of function within the general aviation area that exists today. The areas south of Taxilane K would continue to primarily serve business jets and other corporate aircraft. The areas north of Taxilane K would continue to serve uses related to smaller general aviation aircraft.

Property mauka (east) of U`u Street has been divided into four areas for possible lease to private developers through a request for proposal (RFP) process. The DOT-A intends these areas to have corporate/general aviation facilities constructed to assist in meeting the future demands as expressed by the general aviation community. The areas are to be developed in accordance with the DOT-A's *Development Standards for Leased Property,* and can include, but are not limited to, storage hangars, maintenance facilities, aircraft parking, and associated infrastructure.

The four areas are essentially defined by the area between U`u Street and Pao`o Street (Road N). They are divided by extensions of Taxilane L and the future roads as shown on **Exhibit 5K**. The parcels range in size from 11 to 17 acres for a combined total of 58.59 acres. The following discussion and the layouts within these parcels as depicted on **Exhibit 5K** are intended to demonstrate the general recommended concept based upon input obtained from the general aviation community, the TAC, and the general public. It is not meant to restrict or limit the general development opportunities and options for the parcels.

06MP06-5K-3/23/10

LEGEND

- Airport Property Line
- Ultimate Airfield Pavement
- Ultimate Building
- Ultimate Road/Parking
- Lease Parcels
- General Aviation Development Areas

NORTH

0 300 600

SCALE IN FEET

HEAT EXCHANGER SITE

Pao'o St. - Road N

AREA D

AREA C

AREA B

AREA A

TOLL BOOTH

AIRPORT MAINTENANCE EXPANSION

PARKING

T-HANGARS

Road M

EXECUTIVE BOX HANGARS

CONVENTIONAL HANGARS

WASH RACK

U'u Street

COMMUTER AIR TERMINAL

GA SPECIALTY SUITES

GA RAMP

INTERIM COMMUTER AIR TERMINAL

Taxilane K

FBO

FUEL STORAGE

FBO

Taxilane L

APRON EXPANSION

RECOMMENDED GENERAL AVIATION CONCEPT

Exhibit 5K

The two northern areas (Areas C and D) are recommended to primarily serve typical general aviation uses. T-hangars and other facilities that can store and serve small general aviation aircraft (primarily in ADG I but up through ADG II) are recommended for this area.

The two southern areas (Areas A and B) are recommended to primarily serve cabin-class and corporate aircraft through at least ADG III. This could include conventional hangars to store larger aircraft and "corporate parcels" for developing corporate hangars and/or maintenance hangars.

Increased traffic and proposed revisions to the terminal loop road will make it imperative to provide access to the general aviation area that avoids the terminal loop. Therefore, the general aviation area will need to be made accessible from Pao`o Street via Road M and other roads extending makai from U`u Street.

Road M will not only provide access to two of the parcels, but will also become the access point for the two fixed base operator (FBO) sites already established fronting the apron in this core area. This road will need to be developed before U`u Street can be cut off to extend taxilane access into the parcels. The fuel storage facilities will remain between the two FBO sites and will be used to supply fuel for general aviation and corporate aircraft even after the airline fuel farm is developed north of the passenger terminal.

The ramp south of Taxilane K remains as a corporate ramp with expansion planned south of Taxilane K. If necessary, this ramp could be extended farther south of that shown on **Exhibit 5K** to meet jet parking needs. The south ramp expansion also includes a location for a wash rack next to a site that would be reserved by DOT-A for future consideration as to its use.

North of Taxilane K is the site of the interim commuter air terminal (CAT). The interim CAT will be the first LEED-certified facility on the airport. It will provide commuter terminal services until such time as a permanent location can be developed on the site now occupied by the ATCT and the ARFF. At that time, the interim terminal can be converted into a GA terminal and GA offices.

As with other new structures throughout the airport, the interim commuter terminal is being designed to carry forward the Hawaiian sense of place. The architecture fits with the terminal design, with an open air plaza available for awaiting aircraft and watching the activity in the general aviation area. First as the interim commuter terminal and later as a GA terminal, this facility can remind the user and visitor of the early days of flight around the islands.

The buildings on parcels immediately north of the commuter terminal are on small parcels that can continue to be used for general aviation businesses. Proceeding north along the flightline, the current cargo buildings can be

converted to GA specialty suites after the cargo facilities are moved north of the passenger terminal. The specialty suites would have subdivided space in each building that can be leased to various general aviation specialty operators for flight training, small aircraft charter operators, avionics shop, etc. The ramp in front of these buildings would also be converted to general aviation parking.

Under this concept, the current T-hangars and tie-downs will be able to stay in their location between the existing ARFF and cargo buildings. The transient general aviation parking currently located in front of the existing ATCT, however, would ultimately trade locations with the existing commuter parking when the permanent commuter terminal is developed just south of the passenger terminal at the location of the current ATCT and ARFF.

As depicted on **Exhibit 5K**, the commuter terminal's planned permanent location at the south end of the passenger terminal becomes the transition area between general aviation and airline activity. The commuter terminal is used by passengers flying on smaller aircraft between other airports within the Hawaiian Islands. Some passengers do transfer to commercial airline flights in the main terminal. This location will make such transfers within walking distance. In addition, day commuters will be able to use the terminal loop road to be dropped off at the commuter terminal or they can park at the south end of the short-term parking lot just across Kupipi Street.

As shown, the new permanent commuter terminal could be designed to match with the architectural style of the main terminal.

As mentioned earlier and depicted on **Exhibit 5A**, helicopter facilities are planned for the area immediately mauka (east) of the helicopter TLOF. The plan includes an access road extended from Pao`o Street to parking on the south and east sides of the helicopter terminal area. A terminal facility and vehicle parking is planned along the south edge of the parking ramp to serve helicopter tours and other operations.

Hangars are planned on the east side of the parking ramp for maintenance and storage of helicopters. Additional parcels for helicopter operators are planned for lease north of these facilities as the need arises.

LAND USE PLAN

The objective of airport land use planning is to coordinate uses of the airport property in a manner that is both functional with the design of the airport and compatible with the airport environs. There are two primary considerations for on-airport land use planning. First is to secure those areas essential to the safe and efficient operation of the airport. Second is to determine compatible land uses for the balance of the property which would be most advantageous to the airport and the community.

Exhibit 5L depicts the recommendations for the ultimate land

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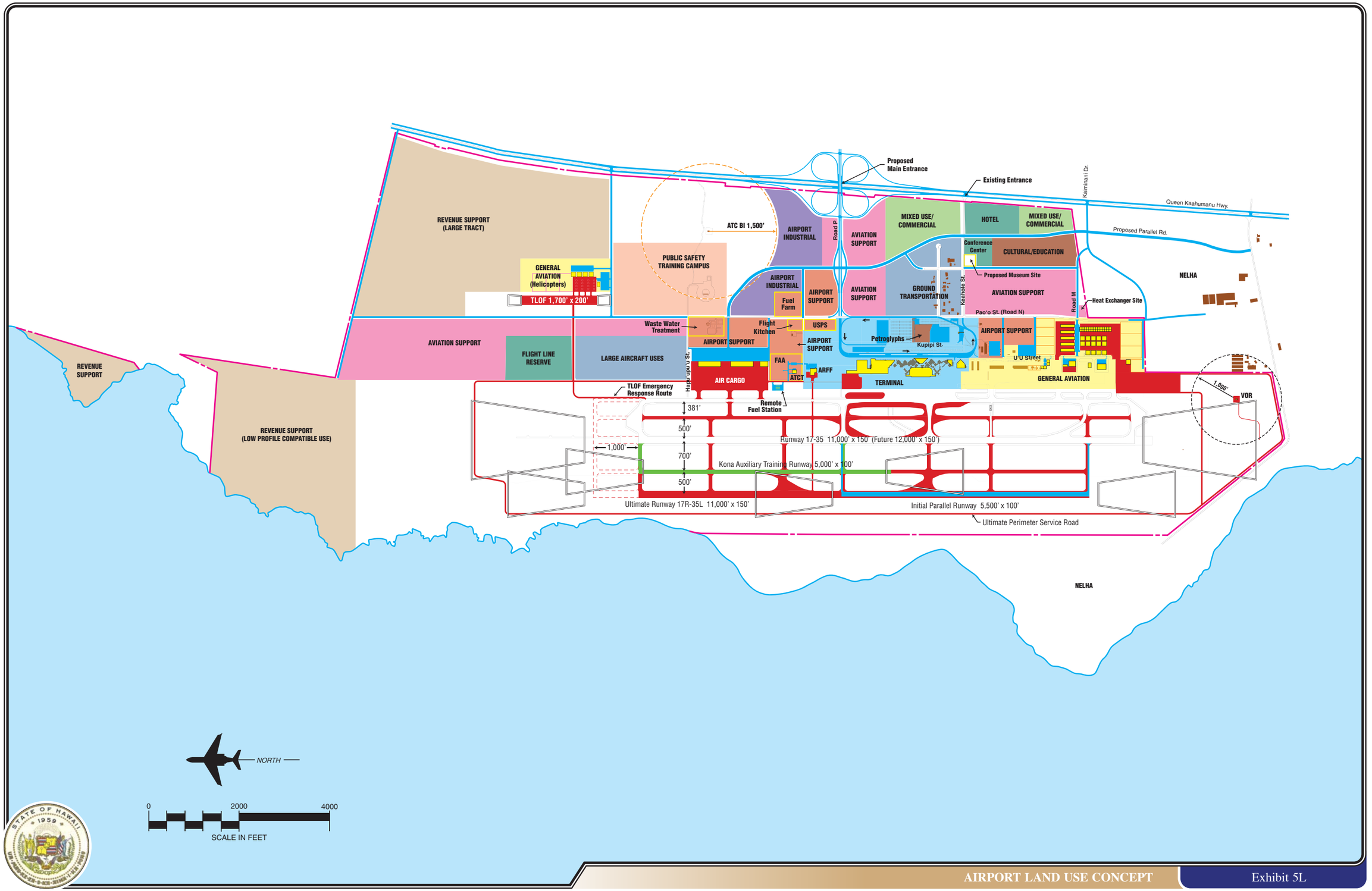

AIRPORT LAND USE CONCEPT

Exhibit 5L

use development on the airport. The long range future for an area may differ from the current use of the property. In these areas, major expansion or improvements of the existing use should be discouraged. If expansion is needed, it should be directed to the appropriate use areas depicted on the land use plan.

Several airport land use categories have been identified. The primary uses such as passenger terminal, air cargo, general aviation, and airport support have all been discussed in detail in the previous sections. These are the uses that should occupy the flightline and must be completely accommodated before other uses are considered.

Once these uses are provided for now and into the future, other uses that are compatible with and complement the primary uses can be considered. They should provide a function that is either a complimentary service to the airport (i.e., warehousing and storage, ground transportation, emergency training, hotel/conference center, etc.), a cultural tie that enhances the "Hawaiian sense of place" at the airport, and/or enhances revenues in support of the airport operation.

Flight Line Land Uses

Next to the airfield itself, the flightline is the most valuable commodity of an airport. It is the interface between air and ground transportation. For this reason, the plan calls for the area from the parallel Taxiway A to Pao`o Street to be reserved for uses directly relating to the primary functions of the airport.

Starting at the south end of the flight line is the area planned for general aviation uses. Centered on the flightline are the passenger terminal function and the terminal loop road and parking lot. As with GA, space is reserved to the north that can accommodate the passenger terminal needs through the planning horizon activity levels and beyond. To the north of the passenger terminal is the area reserved to be developed for air cargo in the future. This plan provides a separation of the three functions, yet allows interaction between the functions because of their proximity.

Areas for airport support uses are designated between the three functions. The area mauka (east) of U`u Street between the GA and terminal uses currently supports the airport maintenance facilities as well as some airport-related transmitter equipment. Space is allowed for the expansion of the maintenance facilities as well as other airport support uses in the future. Between the terminal and air cargo areas is a corridor that will accommodate the ATCT and other FAA-related functions, the ARFF, a flight kitchen, and a Postal Service facility that will handle the air mail going in and out of the airport. The support corridor will actually extend mauka west of Pao`o Street in this area to include the airline fuel farm site.

There still remains an area of flightline north of the cargo area. A portion of this area has been designated for large aircraft uses. This is

envisioned to be the location for airline maintenance facilities and for hangars that could accommodate the largest of corporate aircraft (ADG III and larger). Because these hangars will be of significant height, the area does not extend completely back to the extended Pao`o Street. There will be some restrictions on the height of buildings in the area marked for aviation support to ensure that line-of-sight can be maintained between the new ATCT and the helicopter facilities.

An additional area farther north along the flightline is simply placed in Flightline Reserve at this time. The need for this space will be long term, and there may be pressure to put it into other uses. Other temporary uses might be examined on a case-by-case basis, but they should be allowed only with the stipulation that this area could ultimately be needed for uses requiring airfield access.

Second Tier Land Uses

The second tier encompasses the airport property mauka of Pao`o Street (Road N) or beyond the runway protection zones. Priority in this area is given to access routes to the flightline (to be discussed in the next section) and to uses that directly support the airport function.

Helicopter Facilities - The helicopter facilities are actually a flightline function, but their flightline is the helicopter TLOF located 3,000 feet mauka of the north end of Runway 17-35. This allows for independent operation of helicopter activity at the airport, thereby increasing the capacity of the runway system. Thus, space is reserved for general aviation facilities related to helicopters, including a small terminal, hangars, and development parcels.

Ground Transportation Facilities - The center core area between Keahole Street and future Road P is the current and future location for ground transportation facilities. This consists primarily of rental car facilities. Additional area for ground transportation facilities has been reserved north of the existing facilities.

Aviation Support - The area immediately mauka (east) of the future terminal loop, north of the ground transportation facilities, and along Road P is reserved for aviation-related uses. This is anticipated to be an area that could host government and/or commercial uses that support the terminal and ground transportation functions. It could also host overflow parking areas. The area located mauka (east) of the general aviation area is also depicted as aviation support uses. The northern portions of this area nearest Keahole Street could house airport administration, FAA, TSA, airline and other airport-related offices that do not have to be at the flightline in a campus-like setting. Further to the south, the area would support uses more likely to be attractive to businesses that rely on general aviation for travel and small cargo shipments between islands, or for access to corporate jets and airline travel overseas. A parcel immediately south of the proposed extension of Road M is indicated

as a potential location for an airport heat exchanger site in cooperation with NELHA.

Airport Industrial - The area mauka of air cargo is specifically envisioned for industrial/warehousing uses that compliment the air cargo function. This would be an ideal location for freight forwarders and for industries that can take advantage of the proximity to the air cargo facilities for just-in-time deliveries of raw goods and supplies and for similar shipments of finished products.

Public Safety Training - An area for a public safety training campus is another use that relates to airport needs, but also has the potential to serve the broader-based community. An 80-acre campus is depicted south of the helicopter facilities. The location encompasses the current fire training pit, which could be developed into a regional ARFF training facility. The campus is envisioned to include classrooms, meeting rooms, and field areas for emergency training. The proximity to the helicopter facilities could allow it to support the public safety training function as well.

Hotel/Conference Center - An area south of Keahole Street and near the future Ellison S. Onizuka Space Center site is designated for a hotel/conference center. Many airports support hotels on-site in support of flight crews and overnight stays for passengers traveling early the next day. The conference or meeting center further supports the airport and hotel functions.

Cultural Education Center - In support of the modernization of the passenger terminal, the Ellison S. Onizuka Space Center must be relocated from its current location between the north and south passenger terminals. A location along the south side of Keahole Street and mauka (east) of Halalu Street that is closer to Queen Kaahumanu Highway is the preferred new site.

It is important to not only the Onizuka family, but also the DOT-A, the citizens of the West Coast, and all of Hawaii, that the Ellison S. Onizuka Space Center maintains a place of prominence and respect. While it would no longer be situated within the core of the terminal area for security and functional reasons, the Space Center would still anchor a spine through the airport that ties the historic aspects of Hawaiian culture with air transportation and the future.

The Space Center will anchor an area designated as a cultural education center. This is envisioned as an area that can host museums, displays, and shops in a park-like setting that captures the Hawaiian sense of place by showcasing the history and culture of the is-land.

This area would extend to the airport boundary with the Natural Energy Laboratory of Hawaii Authority (NELHA). The airport is already planning to share technology and resources with its neighbor, such as utilizing deep sea water cooling for airport buildings. Depending upon NELHA plans for educational facilities near

the entrance to their facilities, there may be an opportunity for the educational themes to be linked as well.

Mixed Use Commercial - Other areas of property are designated for uses that can further enhance revenue in support of airport operations. Mixed use commercial is planned along the frontage of Queen Kaahumanu Highway with access from the proposed Parallel Road. All would be required to fit into the architectural style reflective of the rest of the airport.

Other Revenue Support – There are large tracts to the north that could further support the revenue stream of the airport. As depicted on **Exhibit 5L**, these include a single large tract in the northeast corner of the property and a tract north of the runway system. Because of its location on the approach to the runways, this tract is recommended for a low profile use that would be compatible with aircraft noise levels of 60 to 70 DNL.

Airport Access and Circulation System

Exhibit 5L also depicts the access and circulation concept for the airport. The current access is via Keahole Street from Queen Kaahumanu Highway. The future Road P alignment offers opportunities not only to develop an expandable new access point to the highway, but also to connect to an arterial roadway system as it develops mauka (east) of the airport and Queen Kaahumanu Highway. This new access point can be developed first as a signalized intersection, but could ultimately become a grade-separated intersection as the main entrance to the airport from all three directions.

A road system is planned to develop makai (east) of Queen Kaahumanu Highway in support of a limited access plan. The Keahole Street intersection and any other interim access points that might be considered would be restricted to right in-right out only after the development of Road P.

Road P also provides better than a mile separation from the current highway intersection at Kaiminani Drive. Kaiminani Drive currently extends only mauka from the highway, but could be extended makai to provide access for both NELHA and the airport. As depicted, this roadway would become Road M on the airport and would provide access along the southern boundary and into the general aviation area.

The interior access system as shown provides the framework of arterials and connectors to serve the airport and its land use plan. Road P is planned to become a boulevard-type entrance into the airport. The roadway would terminate at Pao`o Street into the terminal loop road.

The current section of Pao`o Street between Road P and Keahole Street will become part of the terminal loop system. North and south of the terminal, however, Pao`o Street will still provide access just mauka (east) the north and south flightlines. To the north, Pao`o Street will continue to run by the entrance to the future cargo area, and the new entrance route to the future

helicopter facilities. It can ultimately be extended further north as needed to serve future development of airport properties. To the south, it will continue to extend mauka (east) the general aviation area.

A proposed parallel road located closest to the highway will ultimately relieve Pao`o Street of the north-south circulation. This road is planned to ultimately run from its southern intersection at Kaiminani Drive, north across Keahole Street before curving slightly west to an intersection with Road P. The proposed road would then continue north before turning makai (west) to intersect with Pao`o Street at the entrance to the air cargo area.

Other north-south routes of shorter lengths providing access will continue to include U`u Street serving a portion of the general aviation area, and Halalu Street providing access through the rental car area and south of Keahole Street to the Road M extension.

The Kona Community Development Plan (CDP) proposes a transit line that links the airport to a system that will run through the Kona Districts. As a major transportation center for the island, it is important for the airport to be included on this line. The route that the line takes on the airport, however, will need to be coordinated closely with DOT-A. The preferred routes would appear to be along Road P, the terminal loop, Keahole Street, and the proposed parallel road. This would focus on providing access to the core of the airport, including the terminal, the hotel/convention center, the Ellison S. Onizuka Space Center, and the cultural education center.

DEMAND-BASED CAPITAL NEEDS PLAN

With the airport development concept established, this section identifies the capital projects expected to be needed within each planning horizon. The overall cost of each project will be examined and presented in a demand-based schedule. The scheduling is based upon the key milestones for each planning horizon established earlier in the master plan and summarized in **Table 5B**.

TABLE 5B
Aviation Demand Planning Horizons
Kona International Airport at Keahole

	Base Year (2006)	Short Term	Intermediate Term	Long Term
Annual Passengers	3,033,212	3,472,000	3,819,000	4,721,000
Annual Air Cargo (Tons)	32,390	39,000	45,000	62,000
Based GA Aircraft	61	102	118	160
Annual Operations				
Airline	37,436	39,800	41,400	45,800
Air Cargo	4,372	4,700	5,100	6,100
Other Air Taxi	9,116	15,500	18,000	24,000
GA Itinerant	18,340	31,000	36,000	48,000
GA Local	54,650	89,000	101,000	134,000
Military	19,304	30,000	30,000	30,000
Total Operations	143,218	210,000	231,500	287,900

Many of the development items included in the recommended concept will need to follow demand indicators. For example, the plan anticipates the growth in operations to require the additional runway capacity. This is premised, in part, upon the anticipated growth of general aviation traffic at the airport.

The DOT-A is attempting a request for proposal (RFQ) for third party development of general aviation hangar facilities on the airport. This is a demand that is currently underserved, and is likely to serve to increase general aviation operations. If this occurs as anticipated, the DOT-A will need to move forward with airfield capacity enhancements to relieve airfield delays.

If the growth does not transpire as anticipated, airfield capacity development can and should be delayed. As a result, the earliest capital expenditures should be undertaken as needed which leads to a responsible use of capital assets. Some development, however, does not necessarily depend on growth in demand, such as pavement maintenance and projects related to safety. These types of projects are associated with day-to-day operations and should continue to be monitored and identified by airport management.

The cost estimates presented in this chapter included costs for design, engineering, construction inspection, and program management. The capital costs presented here should be viewed only as estimates subject to further refinement during design. Nevertheless, these estimates are considered reasonable for planning purposes. Cost estimates for each of the development projects are listed in 2008 dollars.

The following subsections and exhibits depict the demand-based capital needs plan for KOA. The next step in **Chapter Six – Financial Plan** will be to relate the needs to the funding sources anticipated to be available. Subsequently, the Financial Plan may prioritize projects further based upon funding capabilities. The following is a discussion of projects in each planning horizon.

SHORT TERM PROJECTS

The short term planning horizon places its major emphasis on projects with the highest priority. Terminal modernization is the key focus, but projects to satisfy the currently underserved general aviation demand are also included, along with a new ARFF station and a utilities master plan. Total costs of short term projects presented on **Exhibit 5M** are estimated at $140.7 million.

Airfield - Short term airfield improvements are limited to the expansion of the terminal apron to the west. The expansion essentially pushes Taxiway A 114 feet makai (west) where it passes by the terminal. This is needed in conjunction with the terminal modernization to maintain aircraft circulation during construction and provide adequate clearances for Group V air-

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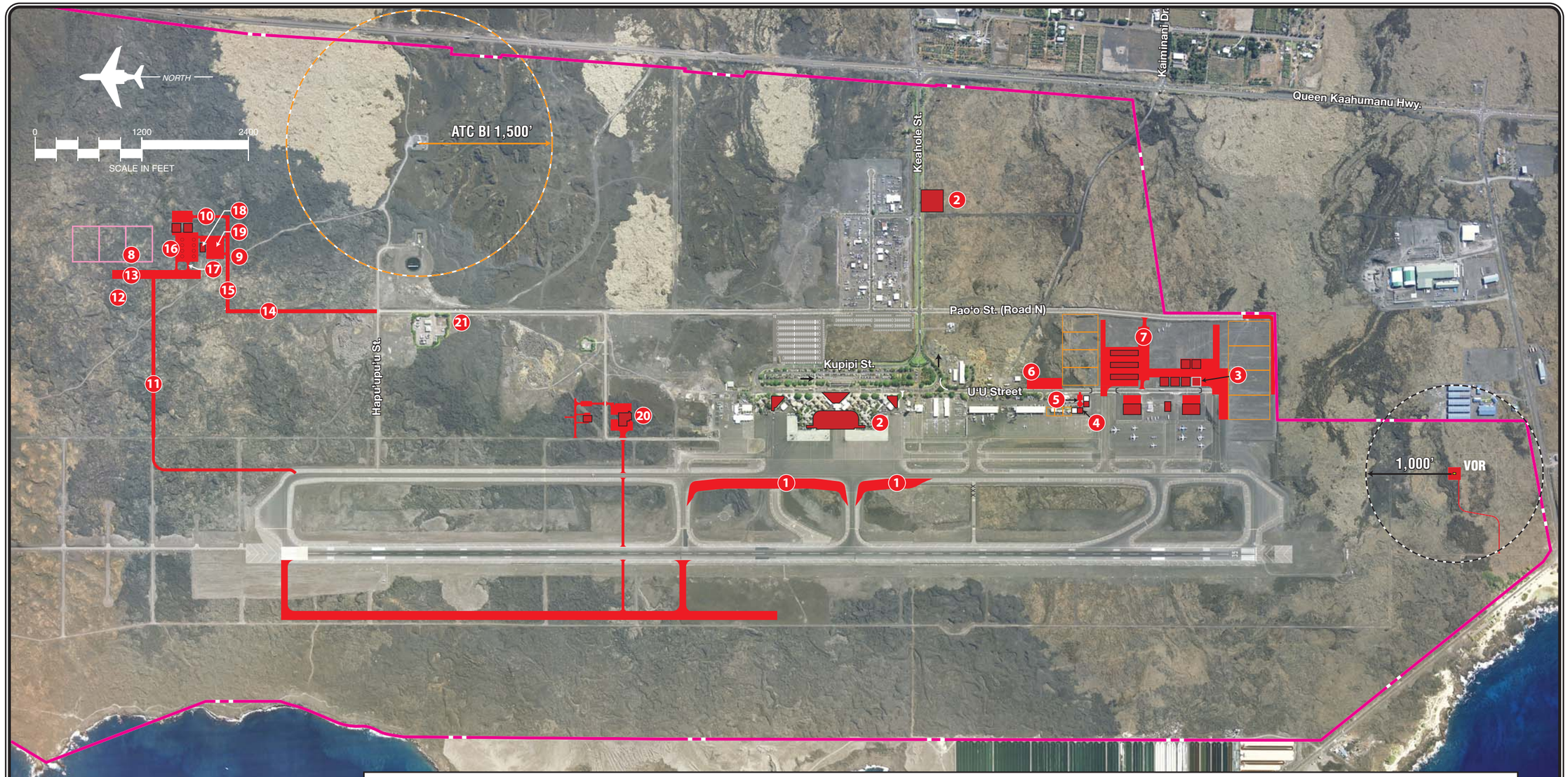

LEGEND

- Airport Property Line
- Lease Parcels
- Short Term Development

Existing Facilities per Photograph

SHORT TERM PLANNING HORIZON

	Airfield	
1	Terminal Apron Expansion West	$9,419,000
	Passenger Terminal	
2	Phase I Terminal Modernization/Expansion	$94,772,000
	General Aviation	
3	Aircraft Wash Rack	$743,000
4	Interim Commuter Air Terminal (CAT)	$3,240,000
5	Interim CAT Parking/Drop-off	$338,000
6	GA Auto Parking (Phase I)	$122,000
7	Road M from Road N	$491,000

	Heliport	
8	Heliport Area Site Preparation/Drainage	$631,000
9	Extend Utilities to Heliport Site	$675,000
10	Heliport Mauka Access Road (800 lf)	$605,000
11	Emergency Service Road (20'Wide)	$1,361,000
12	Heliport Area Perimeter Fencing (5,800 lf with 3 gates)	$431,000
13	Initial TLOF 1,000' x 100'	$2,160,000
14	Road N Extension 1,700' North	$1,285,000
15	Access Road East from Road N 800'	$605,000
16	Phase I Helicopter Parking Apron (325' x 332')	$1,748,000
17	Phase I Helicopter Taxiways (2 at 90' x 20')	$58,000
18	Heliport Terminal (100'x 60')	$3,645,000
19	Phase I Auto Parking/Access (5,700 sy)	$577,000

	Support	
20	New ARFF Station	$17,288,000
21	Utilities Master Plan	$500,000
	SHORT TERM HORIZON TOTAL	**$140,694,000**

craft upon completion of the modernization improvements.

Another short term airfield project is included on the exhibit but not in the table. The KATR planned makai of Runway 17-35 is expected to be constructed and used solely by the Department of Defense.

Phase I Terminal Modernization - The staging of the terminal modernization was discussed earlier in the chapter. The size and scope of the program suggests that it will extend beyond the first five years and into the intermediate term planning horizon. Initial projects expected in the short term include baggage claim expansion and upgrades, and other passenger amenities such as upgraded and expanded restrooms and concessions. There is also a major project for upgrading flight information displays (FIDS) the public address system, as well as the installation of fiber optic cable throughout the terminal. In addition, the Ellison S. Onizuka Space Cener will be relocated from the terminal area to its new and permanent location along Keahole Street.

General Aviation Area – The initial projects in the general aviation area are designed to address underserved demand. The Road M project will be a key component for the third party development of the general aviation areas. The development of these areas is expected to start to meet the hangar needs at the airport. An interim commuter terminal is scheduled to be developed to provide additional space for the commuter airlines operating out of the general aviation area. An aircraft wash rack is planned at the south end of the GA area. Additional vehicle parking in the general aviation area is also a key need to be met in the short term.

Heliport – The capacity analysis in **Chapter 3** indicated the airport would exceed its annual service volume (ASV) by the short term activity horizon. The first project planned to relieve capacity is the development of the helicopter takeoff area (TLOF) and associated heliport terminal facilities. The initial TLOF is planned at 1,000 feet by 100 feet with capability to expand in the future. This will allow helicopters to operate independently from the Runway 17-35 environment, thus providing some capacity relief. The other projects are designed to establish a fully functioning and independent helicopter facility.

Support – A new ARFF station is scheduled for the short term to replace the existing facility. The new ATCT is also planned to be operational by the end of the short term (2012). It is anticipated to be developed and funded solely by the FAA.

In addition, a utilities master plan is programmed to address in detail the utility needs for the airport's development.

INTERMEDIATE TERM PROJECTS

As indicated earlier, the terminal modernization program will likely extend into the intermediate term. Other intermediate term improvements

relate primarily to growth in demand. These include the establishment of the parallel general aviation runway, new cargo facilities, and additional growth in the general aviation area. Total cost of the listed intermediate term projects as depicted on **Exhibit 5N** is $267.8 million.

Airfield – While the heliport will provide initial capacity relief for the airfield, the parallel Runway 17R-35L is programmed for the intermediate term to provide additional operational capacity. The initial development is planned at 5,500 feet across the existing runway from the general aviation area. To accommodate the development, the perimeter fence and service road will need to be relocated makai (west) outside the object free area of the parallel runway.

Taxiways extending mauka (east) from the runway end will be developed to provide the initial access for aircraft. Taxiway C will need to be realigned then extended makai across Runway 17-35 to access the south end of the parallel runway. Taxiway G will need to be extended makai across the KATR to access the initial north threshold of the parallel runway.

The partial development of parallel Taxiway E is planned in the intermediate term to provide additional circulation capability as operations increase above 214,000 annually. This includes the section between Taxiways H and D. The new partial parallel taxiway will also permit the development of another exit (Taxiway D) from Runway 17-35. This exit will reduce runway occupancy times as well as reduce taxi distances for larger passenger and cargo aircraft that can't turn off by Taxiway G.

Phase II Terminal Modernization – The second phase of the terminal modernization will complete the expansion and modernization program necessary to meet the airport's needs through the intermediate term planning horizon. Projects are expected to include the consolidation of the ticketing area, in-line bag screening and agricultural inspection, and centralized TSA security screening. A second level departure area for overseas flights will also be completed in this phase.

To accommodate the ticketing area improvements, the front of the terminal will be moved mauka (east), and will require a slight relocation of the road in front of the terminal. The road will also be widened at that time and the terminal loop extended out to the Pao`o Street alignment. This will allow the parking lot to be expanded and reorganized to centralize the toll booth plaza.

Air Cargo – Phase I of the new air cargo facility is planned for the intermediate term. The facility would be developed to include approximately 60,000 square yards (540,000 square feet) of ramp for aircraft and ground equipment, a 60,000 square-foot cargo building, and a 21,000 square-foot joint agency inspection facility, as well as sufficient truck and vehicle parking through at least the intermediate term planning horizon.

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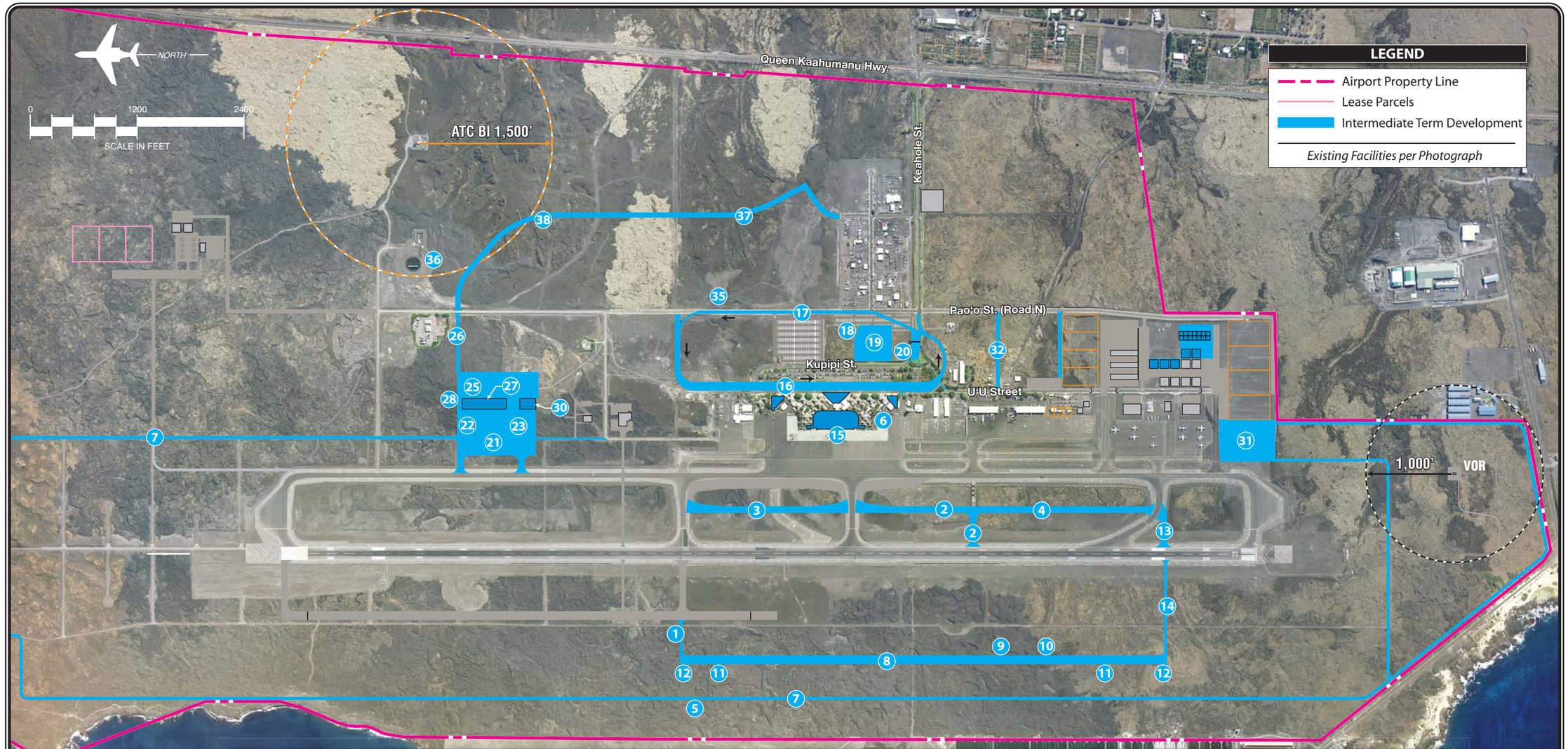

INTERMEDIATE TERM PLANNING HORIZON

	Airfield	
1	Taxiway G West of SAAF (35' wide 75,000# DWL)	$272,000
2	Taxiway D Upgrade and Parallel Taxiway E Segment	$4,212,000
3	Parallel Taxiway E Between Taxiway G and Taxiway H	$5,994,000
4	Parallel Taxiway E Between Taxiway C and D	$6,232,000
5	Relocate West Perimeter Fence	$1,128,000
6	Airfield Light Vault Upgrade	$675,000
7	Relocate West Perimeter Service Road	$5,383,000
8	Parallel Runway 17R-35L 5,500' x 100' (75,000# DWL)	$16,706,000
9	MIRL Runway 17R-35L	$371,000
10	Runway 17R-25L With Non-Precision Markings	$81,000
11	Runway 17R-35L PAPI-4's	$135,000
12	Runway 17R REIL's	$108,000
13	Taxiway C Realignment	$929,000
14	Taxiway C West to Parallel Runway (35' wide 75,000# DWL)	$888,000

	Passenger Terminal	
15	Phase II Terminal Expansion	$133,328,000
16	Terminal Frontage Road Relocation/Widening	$2,257,000
17	Terminal Loop Road Relocation	$1,411,000
18	Reconfigure Parking Lot Access/Circulation	$487,000
19	Phase I Parking Expansion (400 spaces)	$2,268,000
20	Parking Lot Toll Booth Plaza	$162,000
	Air Cargo	
21	Phase I Cargo Ramp with Taxiway Access (51,000 sy)	$9,983,000
22	Phase I Apron/Taxiway Edge Lighting (1,900 lf)	$308,000
23	Phase I Ramp Floodlighting	$338,000
24	Phase I Ground Equipment Ramp (10,000 sy)	$1,958,000
25	Phase I Cargo Building (60,000 sf)	$17,820,000
26	Phase I Access Road (650 lf x 30' wide)	$395,000
27	Phase I Truck Loading and Vehicle Parking (300' x 850')	$4,303,000

28	Phase I Cargo Security Fencing (1,600 lf with two gates)	$119,000
29	Phase I Cargo Area Utilities	$270,000
30	Joint Agency Inspection Facility	$6,237,000
	General Aviation	
31	Phase I South Apron Expansion (51,000 sy)	$5,164,000
32	General Aviation Access from Road N	$491,000
	Support	
33	Halalu Street (North to Road P)	$1,458,000
34	Halalu Street (Road P North/West to Road N)	$972,000
35	Airport Administration Facility	$10,000,000
36	Regional ARFF Facility	$25,000,000
	INTERMEDIATE TERM HORIZON TOTAL	**$267,843,000**

General Aviation – The general aviation area is expected to continue to develop hangars and other space to accommodate aircraft and general aviation business in response to demand. To accommodate growing parking needs for transient aircraft, a 51,000 square yard ramp expansion is also planned for the intermediate term.

Support – With the extended terminal loop road, Pao`o Street will no longer provide two-way access to Keahole Street from the north. Halalu Street is planned to be extended north to the new cargo area to provide this access. The extension will also serve other airport-related uses along its route, including ground transportation expansion, aviation support areas, and airport industrial uses. In addition, a new regional ARFF training facility is scheduled within the area designated as the public safety training campus.

LONG TERM PROJECTS

Long term improvements are related to extended growth in activity. These projects should only be considered if demand continues to grow as projected past the intermediate planning milestones as there is presently not enough justification to be considered earlier. Long term planning horizon capital needs are also presented on **Exhibit 5P** and are estimated at $371.6 million.

Airfield – Long term airfield improvements relate to improving efficiency, circulation, and capacity. High speed exits are planned for Taxiways G (south flow) and H (north flow) to provide more efficient exit capability for the majority of commercial and corporate jet operations. In addition, parallel Taxiway E would be extended in each direction to provide a full length second parallel along the east side of the airfield. This will be needed only when it is evident that the amount of activity along the east flight line requires two-way circulation to reduce taxiing delays and enhance safety.

As passenger and cargo traffic continues to grow, it will become more important to have back-up capability to maintain operations should Runway 17-35 be shut down for maintenance, disabled aircraft, or any other reason. Extending the parallel runway up to 11,000 feet would allow it to serve over 90 percent of the airport's operations. As the mix of commercial aircraft grows, it would also increase the capacity of the airfield.

With the extension of the parallel runway, the completion of a full length parallel taxiway system between the runways is also planned for the long term.

Long Range Terminal – As discussed earlier in the chapter, the long range improvements in the terminal area focus improvements to international operations and additional capacity, particularly in baggage claim and in gates. As activity grows beyond the 3.8 million annual passenger level, additional parking will be required. The plan calls for additional longer term parking as well as the extension of short term parking to the

north to serve the northward expansion of the terminal.

Air Cargo – As demand dictates, Phase II of the cargo development can be undertaken. This has the capability to virtually double the capacity of the air cargo facilities.

General Aviation – General aviation will also continue to develop to the south of the terminal in the long term. Besides filling in additional hangar space as needed, up to 40,000 square yards of additional parking apron is planned as well as additional auto parking. With the ARFF and the ATCT now relocated, a permanent commuter terminal is planned in their old location to be capable of interfacing with both the passenger terminal and the general aviation area.

Heliport – When demand dictates the need, the helicopter TLOF can be expanded to 1,700 feet by 200 feet for additional capacity. Additional parking apron and auto parking can be developed as well.

Support – The development of Road P as the primary terminal access is planned for the long term. While it is shown as an at grade intersection in the table, it is ultimately planned to have an interchange at Queen Kaahumanu highway. The timing of the inter-change will be dependent upon DOT-Highways and developments mauka (east) of Queen Kaahumanu.

SUMMARY

In Hawaii, a sense of place is attributed to the unique relationship between the community, the built environment and the natural surroundings. The Hawaiian culture places a high value on respect for nature and the landscape, and honoring the people of the community. This is part of the spirit of *aloha*.

Throughout the course of this master plan, the spirit of *aloha* and maintaining the Hawaiian sense of place remained the touchstone for developing future growth concepts at the airport on all levels. These principles guided the study's approach to airport land use by focusing on alternatives that considered community business growth and development along with cultural sustainability and the impact on the environment.

As the key transportation interface for persons going to and from the island, it is vital that the airport terminal area also reflect a Hawaiian sense of place. As the first place experienced upon arrival, the airport should present welcoming surroundings that foster ho`okipa (hospitality). It should encourage interaction between the kama`aina (those that have long lived in Hawaii) and the malihini (newcomers). It should embody the spirit of *aloha* as an important value and a way of life.

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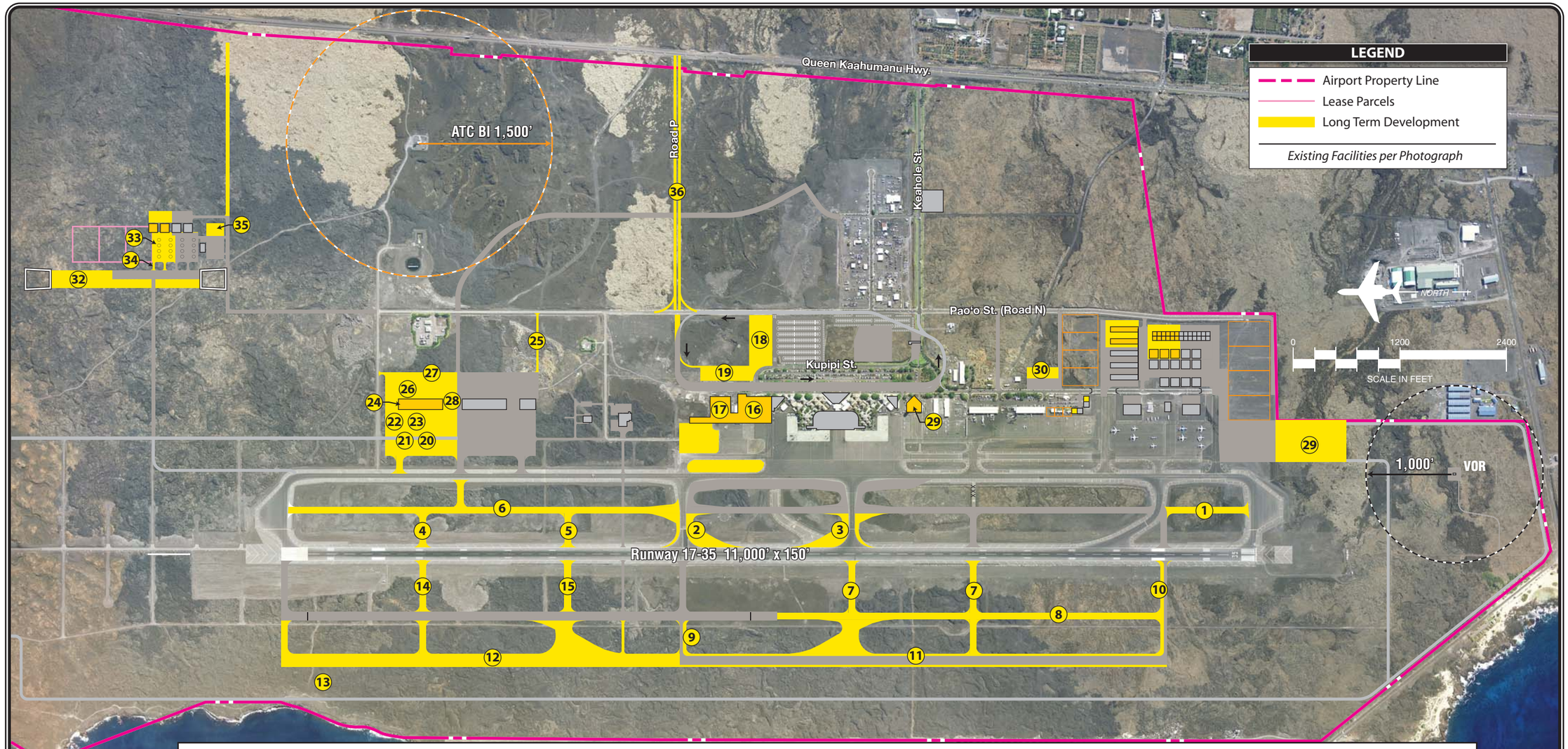

LONG TERM PLANNING HORIZON

	Airfield	
1	Parallel Taxiway E from Taxiway C South	$4,562,000
2	Taxiway G High Speed Exit	$2,592,000
3	Taxiway H High Speed Exit	$2,592,000
4	Taxiway M	$2,765,000
5	Taxiway N	$2,765,000
6	Parallel Taxiway E North from Taxiway G	$15,066,000
7	Taxiways H and D West	$4,234,000
8	Parallel Taxiway F South from SAAF	$18,900,000
9	Taxiway G West of SAAF Upgrade (full strength/width)	$1,094,000
10	Taxiway C West to Parallel Runway Upgrade (full strength/width)	$2,418,000
11	Parallel Runway 17R-35L Upgrade to Full Strength/Width	$7,425,000
12	Parallel Runway 17R-35L 4,500' Extension (include lighting & marking)	$27,338,000
13	Runway 17R PAPI-4 & REIL Relocation	$34,000
14	Taxiway M West to Parallel Runway	$5,288,000
15	Taxiway N West to Parallel Runway	$4,562,000

	Passenger Terminal	
16	Long Range Terminal Expansion	$160,728,000
17	Customs and Border Protection (CBP) Facility	$42,372,000
18	Phase II Parking Expansion (400 spaces)	$2,268,000
19	Short Term Parking North Expansion (240 spaces)	$1,361,000
	Air Cargo	
20	Phase II Cargo Ramp with Taxiway Access (44,000 sy)	$8,613,000
21	Phase II Apron/Taxiway Edge Lighting (1,300 lf)	$2,106,000
22	Phase II Ramp Floodlighting	$338,000
23	Phase II Ground Equipment Ramp (8,500 sy)	$1,664,000
24	Phase II Cargo Building (60,000 sf)	$17,820,000
25	Phase II Access Road (650 lf x 40' wide)	$527,000
26	Phase II Truck Loading and Vehicle Parking (300' x 850')	$4,303,000
27	Phase II cargo Area Utilities	$270,000
28	Phase II Cargo Security Fencing (1,300 lf with two gates)	$97,000

	General Aviation	
29	Phase II South Apron Expansion (40,000 sy)	$4,050,000
30	General Aviation Auto Parking (Phase II)	$122,000
31	Commuter Terminal (20,000 sf)	$11,340,000
	Heliport	
32	Expanded TLOF to 1,700' x 200'	$5,184,000
33	Phase II Helicopter Parking Apron (195' x 332')	$1,049,000
34	Phase II Helicopter Taxiways (2 at 90' x 20')	$58,000
35	Phase II Auto Parking (4,700 sy)	$476,000
	Support	
36	Road P (At grade, boulevard design)	$5,184,000
	LONG TERM HORIZON TOTAL	**$371,565,000**
	CAPITAL NEEDS PROGRAM TOTAL	***$780,102,000***

As a gathering place for persons brought together by transportation needs, the airport setting is a unique opportunity to promote and celebrate the cultural, historical, and ecological amenities of the island. This should include architecture that values open space and natural air flow, native landscaping, and views that exemplify this sense of place.

The spirit of *aloha* has also permeated this airport master plan process by involving the community for suggestions and support at each development stage. It is important that the community has an influence on the future growth of the airport – with a connection to the past and knowledge of the customs and traditions, they can help maintain a sense of place.

The Master Plan has strived to address the goals established at the outset of the study as follows:

- **Provide a high level of service to passengers while maintaining a "sense of place."**

  This has been the top priority of the Master Plan. The passenger terminal plan addresses the needs for the passengers for today and the long range, while maintaining the Hawaiian sense of place through its layout and architecture.

- **Stimulate and support island and state economic development**.

  This is reflected throughout the plan from providing the flexibility for passenger, cargo, and general aviation activity to grow as demand dictates, to enhance revenues of the airport and providing an employment center for the community.

- **Enhance services for air cargo operations.**

  This is reflected in the plans for the north cargo area that will provide adequate space to meet the growing cargo needs of the island. These facilities also incorporate a joint inspection facility for performing the agricultural inspection functions of the HDOA and USDA.

- **Encourage international flights at the airport.**

  The terminal plan provides the flexibility to expand the international terminal and incorporate the CBP facilities into the main terminal in the future.

- **Accommodate existing and future general aviation (including corporate aviation) customer needs**.

  Perhaps the most underserved component of the airport, the plan provides guidelines for the orderly development of the general aviation area to serve all aspects of general aviation on the West Coast.

- **Maintain good relationships with neighborhood communities by minimizing environmental impacts such as noise**.

The airfield plan provides for additional capacity in a manner that will actually reduce noise impacts on neighboring communities. The helicopter facilities will place activity farther north, away from new developments south of the airport. The parallel runway will also shift some over-flights makai of their existing routes, farther from neighborhood developments. As the plan is implemented, the airport is incorporating design considerations for sustainability and energy efficiency.

The recommended master plan is designed to assist the Hawaii Department of Transportation and the FAA in making decisions relative to future development and growth at Kona International Airport at Keahole. The plan provides for development to satisfy expected airport needs over the next 20 years and beyond.

Flexibility will be a key to future development since activity may not occur exactly as forecast. The plan has considered demands that could be placed upon the airport even beyond the normal 20-year planning period, to ensure that the facility is capable of accommodating a variety of circumstances. The recommended master plan concept provides the DOT-A with options to pursue in marketing the assets of the airport for revenue support and community development. Following the general recommendations of the plan, the airport can maintain its long-term viability and continue to provide air transportation services to the region.

In support of the Master Plan, an updated airport layout plan (ALP) for KOA has been prepared as well. A reduced-size copy of the ALP is included in **Appendix E**. Once approved by the FAA, eligible projects included on this drawing can be considered for federal funding. The next chapter will discuss the financial plan in support of the master plan concept. This will consider the development costs, scheduling, and revenue sources for funding the development plan.