
CHAPTER 6

MASTER PLAN



6.1 OVERVIEW

This chapter presents the recommended MP for OGG. See **Figure 6-1**. The Plan identifies long-term airfield and terminal area improvements needed to meet forecast aviation demand and operational requirements. It represents a guide for airport development through the year 2035 and indicates possible improvements beyond that date for which land should be reserved.

The recommended OGG MP is the result of a diligent process of study, interaction, and evaluation with OGG users and the general public. Preliminary MP recommendations were prepared based on the comments received on the development concepts presented in **Chapter 5**. These preliminary recommendations were presented to and discussed with the OGG Technical Advisory Committee, the OGG Citizens' Advisory Committee, and the public at informational meetings held by the DOTA. The

preliminary recommendations were further refined into the detailed plans presented in this chapter after review by the DOTA, FAA, OGG Technical and Citizens' Advisory Committees, and public.

6.2 LAND USE ADJUSTMENTS

This section describes and illustrates the major land uses proposed within the OGG property. It also identifies the changes in State and County land use designations that will be required to implement the OGG MP recommendations. The land use designations take into account existing and planned uses for the airfield and terminal areas. Additionally, this section identifies lands required for other aviation/non-aviation facilities and airport support activities. The future land use area allocations are based on the projected demands and requirements described in **Chapter 3** of this report.

6.2.1 AIRPORT BOUNDARY

The recommended OGG MP shown in **Figure 6-1** on Page 6-3 identifies the areas needed for the proposed land uses through the year 2035. The most significant land use changes proposed are the development of a parallel Runway 2R-20L on the east side of OGG, the extension of Runway 2-20 and a new airport access road on the west side of the OGG. The recommended plan also provides additional space and/or facilities for passenger terminal, air cargo, GA, commercial aviation, FBOs, ground transportation operator baseyards, bulk jet fuel storage, and other support activities.

The recommended OGG MP implementation will require the acquisition of additional land, particularly for the construction of the parallel runway, as shown in **Figure 6-2** for the ultimate airport development. The description-purpose and acreage of the recommended acquisitions are presented in **Table 6-1**.

LAND ID	DESCRIPTION	APPROX. AREA (Ac.)
L-1	Development of portions of Parallel Runway 2R RPZ, Connecting Taxiways, Nav aids, RSA, and East Ramp Access Road.	315.82
L-2	Development of portion of Parallel Runway 20L, Connecting Taxiways, Nav aids, RSA, RPZ, and Hāna Highway Realignment.	24.15
TOTAL (acres)/1		339.97
1 Hāna Highway RPZ = 13.87 ac. To be acquired		

Table 6-1 Table of Land Acquisition

6.2.2 RUNWAY 2-20 EXTENSION

The proposed 1,535 ft. extension of Runway 2-20 to the south is located entirely within the existing OGG boundary. Approximately 13 acres of additional land, extending across Hāna Highway will be required for the RPZ. See **Figure 6-2** on Page 6-5.

6.2.3 EAST OF PRESENT AIRPORT BOUNDARY

Construction of the new Runway 2R-20L that is parallel with Runway 2-20 would require land acquisition of approximately 315.8 acres to the east of the present OGG boundary. The proposed parallel runway would be 7,000 ft. long by 150 ft. wide, with 2,500-ft. long precision instrument RPZs at both ends. The land acquisition will also extend to the east of the Hāna Highway to develop the parallel runway and required realignment of the highway near the north end of the parallel runway. Consideration should also be given to acquiring land north of the proposed parallel runway all the way to the shoreline. The recommended acquisition includes several homes in East Spreckelsville that would be adversely affected by aircraft operations on the proposed parallel runway.

Approximately 90+ acres of land, south of Hāna Highway, should be acquired or an avigation easement obtained, for the recommended 2,500-ft. long precision instrument RPZ.

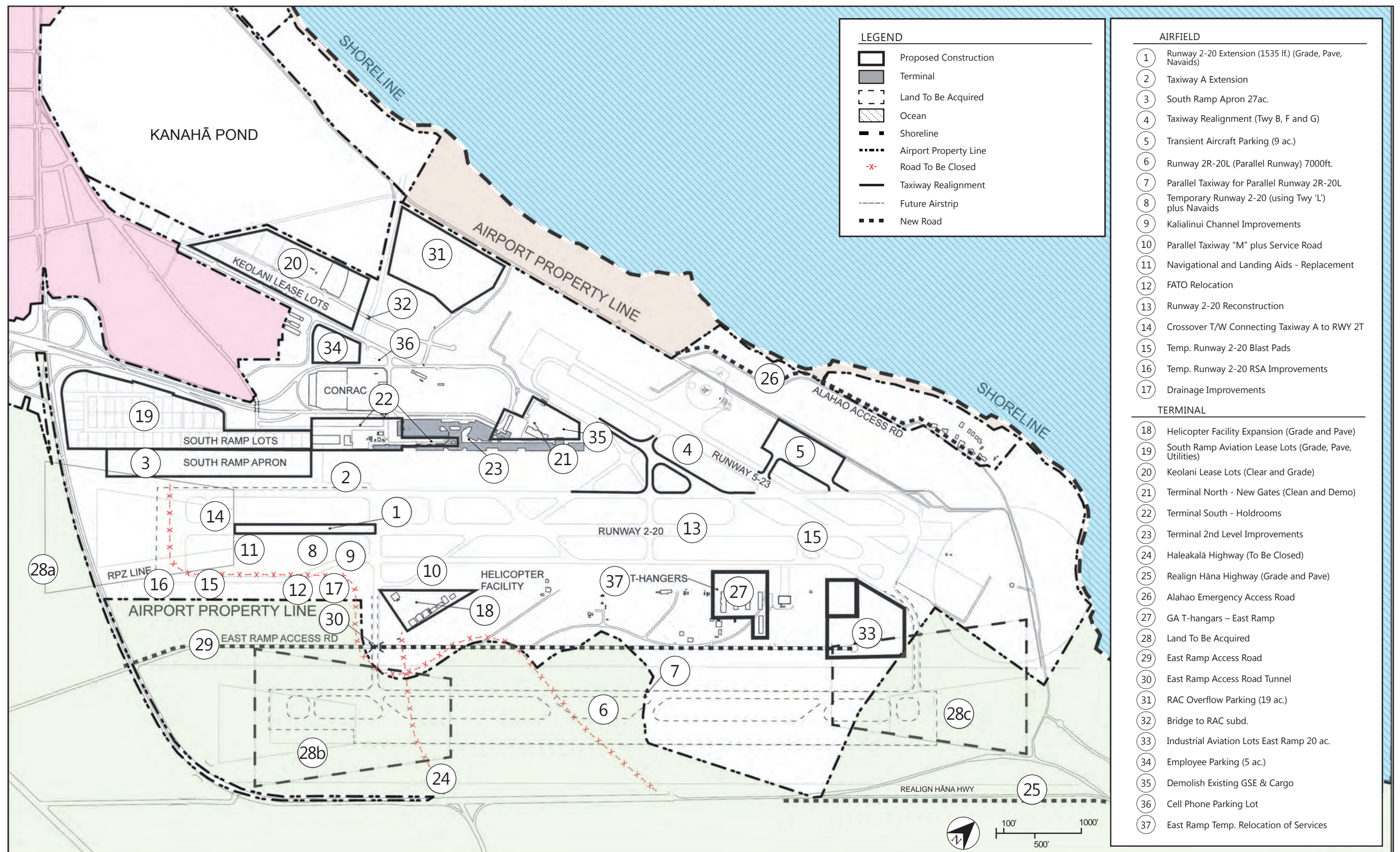
6.2.4 KANAHĀ POND STATE WILDLIFE SANCTUARY

Day-to-day operations of the Kanahā Pond State Wildlife Sanctuary located southwest of Runway 5-23, will continue to be managed by the DLNR. See **Figure 6-3** on Page 6-5. Sanctuary management and operations will continue to operate within the terms and conditions of the executed MOU between the DLNR, DOTA, and FAA.

6.2.5 STATE AND COUNTY LAND USE

6.2.5.1 STATE LAND USE DISTRICT

All lands within the State of Hawai'i are classified as an Agricultural, Conservation, Rural, or Urban district by the State LUC. Airport land uses are generally characterized as industrial uses and therefore require an "Urban" district classification. The existing and proposed State land use district classifications are shown in **Figure 6-3** on Page 6-5. Approximately 872 acres will need to be reclassified from the Agricultural to Urban district to implement the recommended OGG



Source: R.M. Towill Corporation

Figure 6-1 Preferred Plan

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Figure 6-2 Land Acquisition

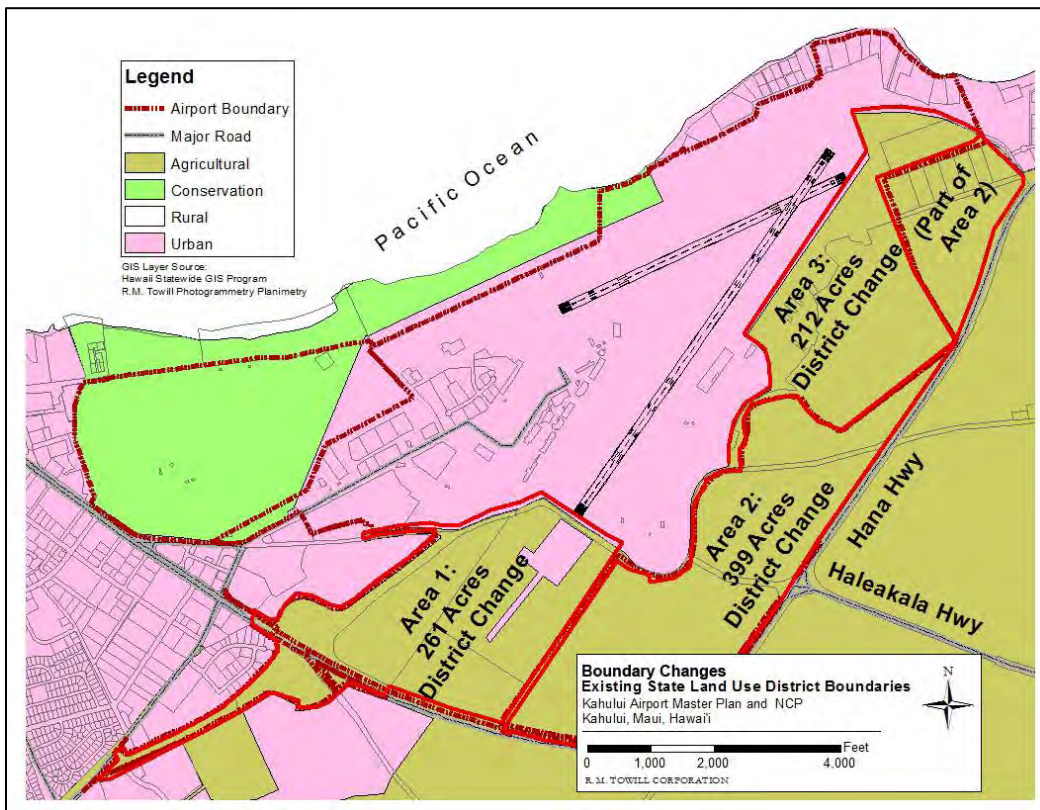


Figure 6-3 State Land Use Boundary Changes

MP. Area 1 lands, which include approximately 261 acres, should be part of the initial reclassification from the Agricultural to the Urban district in order to implement the Runway 2-20 extension and South Ramp industrial lots. See **Figure 6-3** on Page 6-5.

6.2.5.2 MAUI COUNTY GENERAL PLAN

Guiding future development of Maui County is the *Maui County General Plan 2030*. The *General Plan* provides a long range “comprehensive blueprint for the physical, economic, and environmental development, and cultural identity of the county.” Three (3) components comprise the *General Plan: the Countywide Policy Plan*, the *Maui Island Plan* (MIP), and nine (9) Community Plans.

The *Countywide Policy Plan* was adopted by the Maui County Council in March 2010. It provides broad goals, objectives, policies, and implementing actions that portray the desired direction of the County’s future. This includes: (1) a vision statement and core values for the County to the year 2030; (2) an explanation of the plan-making process; (3) a description and background information regarding Maui County today; (4) identification of guiding principles; and (5) a list of countywide goals, objectives, policies, and implementing actions related to the following core themes:

- Protect the Natural Environment
- Preserve Local Cultures and Traditions
- Improve Education
- Strengthen Social and Healthcare Services
- Expand Housing Opportunities for Residents
- Strengthen the Local Economy
- Improve Parks and Public Facilities
- Diversify Transportation Options
- Improve Physical Infrastructure
- Promote Sustainable Land Use and Growth Management
- Strive for Good Governance

Furthermore, the *Countywide Policy Plan* provides the policy framework for the development of the MIP and the nine (9) Community Plans.

An objective of the Policy Plan is directed at transportation and states:

“H. Diversify Transportation Options

Goal: Maui County will have an efficient, economical, and environmentally sensitive means of moving people and goods.

Objective:

3. Improve opportunities for affordable, efficient, safe, and reliable air transportation.”

6.2.5.3 MAUI ISLAND PLAN (MIP)

The MIP was adopted by the Maui County Council on December 28, 2012. The MIP is the second component of the *General Plan Update* providing direction and guidance for future growth of the economy, and social and environmental decisions for the island through 2030.

The MIP will be used by the Maui County Council, Maui Planning Commission, Maui County Staff, and community as a policy foundation for day-to-day decision making by:

- Developing, implementing, and applying policies and regulations (e.g., zoning and other ordinances, including the Community Plans, that describe the kind of development that is allowed); and
- Determining the appropriateness of discretionary development proposals.

A key component of the MIP is the adoption of a Directed Growth Plan establishing the desired location of future growth.

The proposed airport boundary expansion is located outside of the urban growth boundary shown in the MIP.

6.2.5.4 WAILUKU-KAHULUI COMMUNITY PLAN

The OGG is located within the *Wailuku-Kahului Community Plan* region. **Figure 6-4** shows the community plan land use designations from the *Wailuku-Kahului Community Plan Land Use Map* dated 2002. The OGG lands are designated "Airport" while adjacent lands identified for acquisition are designated "Agriculture." Approximately 580+ acres of land adjacent to the airport identified for acquisition will require a community plan land use map amendment from "Agriculture" to "Airport."

6.2.5.5 MAUI COUNTY ZONING

Figure 6-5 shows the current zoning for OGG lands. As discussed in **Chapter 2**, changes in zoning will be required to implement the recommended OGG MP projects for the airfield. The OGG lands are zoned "Airport" and "Airport/Agriculture." Adjacent lands identified for acquisition are zoned "Agriculture." Approximately 720 acres of adjacent land will need to be rezoned to "Airport" to implement the recommended OGG MP. See **Figure 6-5** on Page 6-8.

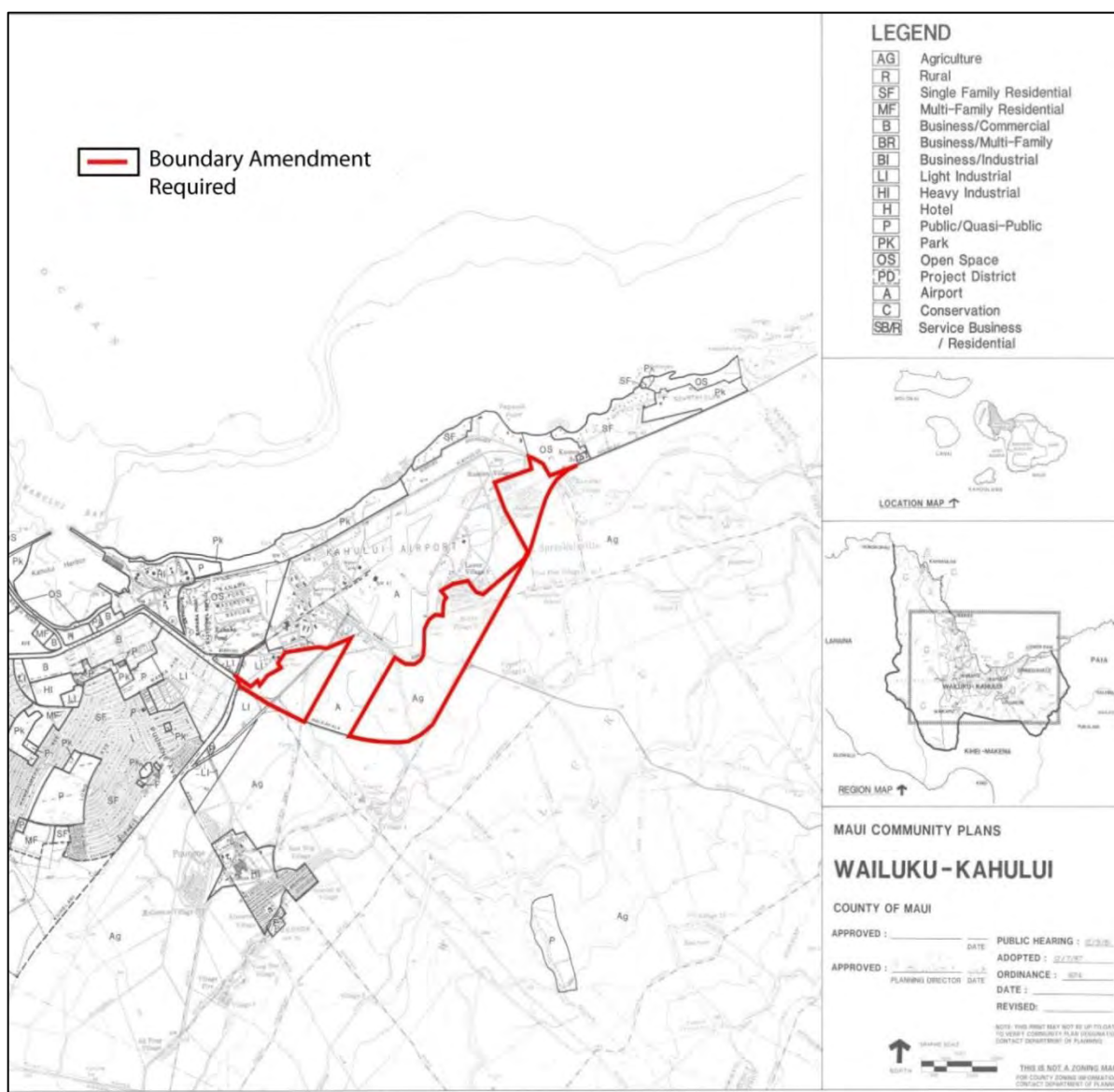


Figure 6-4 Community Plan Area Amendments

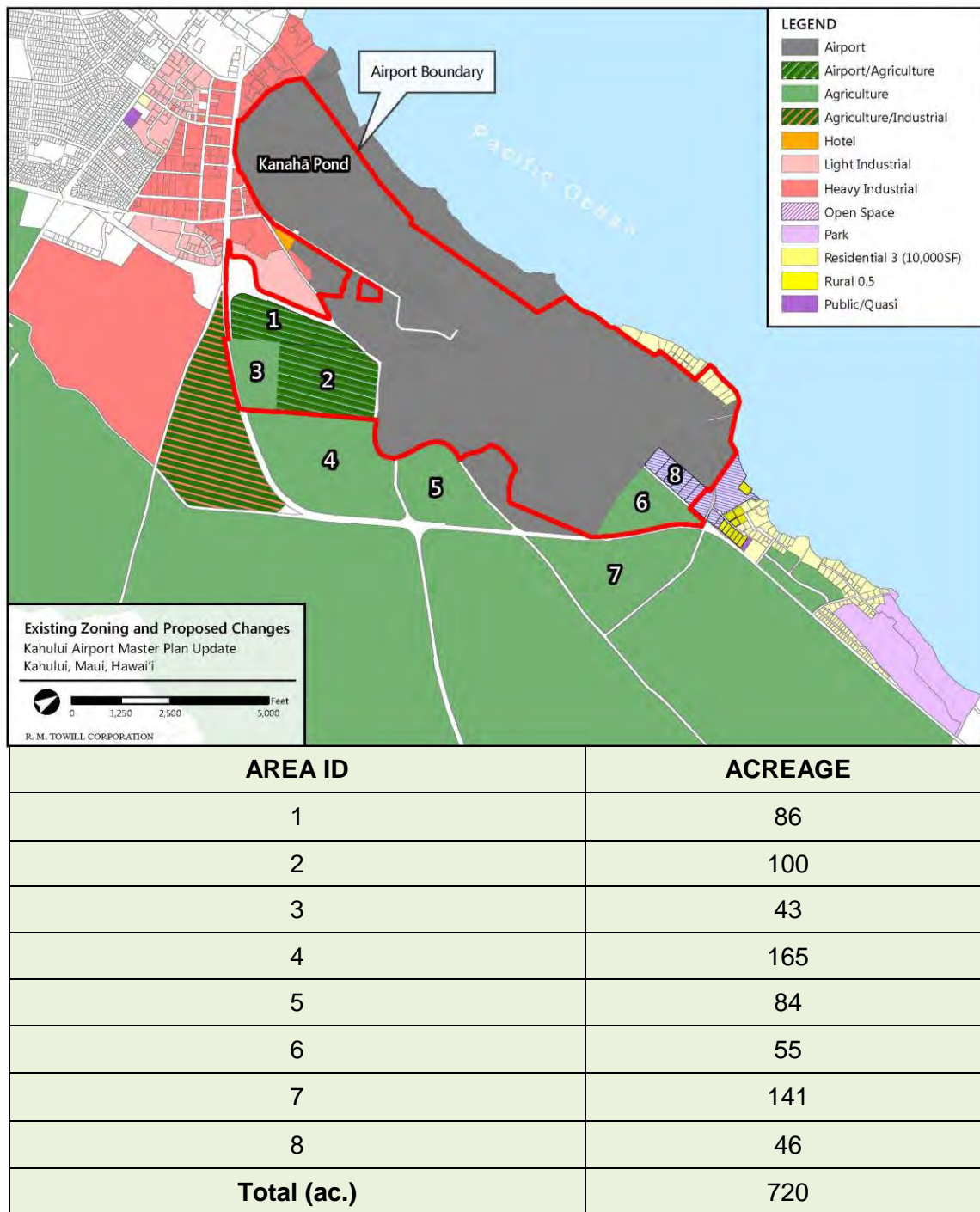


Figure 6-5 County Zone Change Areas

6.3 AIRFIELD

The runways, taxiways, holding apron areas, shoulders, blast pads, NAVAIDS, associated RSAs, and RPZs are shown in **Figure 6-1** on Page 6-5. The recommended airfield improvements include the proposed 1,535 ft. Runway 2-20 extension, proposed Taxiway "L" to a temporary 7,000 ft. runway with parallel and connecting taxiways, a new parallel 7,000 ft. Runway 2R-20L, and taxiway improvements. These projects will accommodate forecast activity through the 20-year planning period of this recommended OGG MP. The recommended improvements are described below.

6.3.1 RUNWAY 2-20

Runway 2-20 is planned for a maximum length of 8,530 ft. with no change to its present 150-ft. width. See **Figure 6-1**. To establish the 8,530-ft. length, the runway will be extended 1,535 ft. south of Runway 2 of the present Runway 2-20. The recommended runway length provides additional length for essentially unrestricted overseas passenger aircraft operations without weight penalties to the U. S. West Coast and some Midwest destinations such as Chicago, Dallas, and Denver. A 1,000-ft. long by 500-ft. wide RSA is recommended to the south of the extended Runway 2 threshold and north of the existing Runway 20 threshold. Additional taxiways are also recommended for this runway to facilitate aircraft ground movement and reduce aircraft delay times, particularly during periods of peak activity.

6.3.2 TAXIWAY "L" AND TEMPORARY RUNWAY

Taxiway "L" will be developed parallel and east for the entire length of Runway 2-20. The proposed taxiway will be developed in phases, first to facilitate the reconstruction of Runway 2-20 by serving as a temporary runway, and secondly as a taxiway that extends the entire length of Runway 2-20. The taxiway should be built to accommodate aircraft in ADG IV and V with runway-taxiway separation of 400 ft. During the period when the taxiway serves as a

temporary runway navigational aids will be required. Utilization of an existing taxiway (Taxiway "L" as referenced in this MP) is considered a cost efficient alternative to closing the primary runway. The use of Taxiway "L" will, however, require the following actions during the period that the Runway 2-20 reconstruction takes place:

- Extending the taxiway to 7,000 ft. with all required navigational aids and airfield lighting
- Developing a parallel taxiway east of Taxiway "L"
- Accommodating a service road east of the taxiway
- Relocating some helicopter operations and final approach and takeoff area (FATO)
- Relocating GA facilities and aircraft
- Relocating GA tie downs
- Moving existing fuel facilities
- Developing a Taxiway "A" connection
- Improving a drainage ditch
- Closing Haleakalā Highway

It is anticipated that once the reconstruction is completed, services and functions that were located on the east ramp will be returned to their former locations.

6.3.3 RUNWAY 2R-20L (PARALLEL RUNWAY)

A 7,000 ft. long, 150 ft. wide parallel Runway 2R-20L is recommended 2,500 ft. to the east (centerline-to-centerline separation) of the existing Runway 2-20. See **Figure 6-1** on Page 6-5. The 7,000 ft. long runway would accommodate take-off and landing of flights from the West Coast of the United States. The centerline-to-centerline runway separation will allow for simultaneous VFR operations by heavy aircraft (e.g., B-737, B-757, B-767, and B-777) as well as some staggered parallel instrument

operations under certain conditions and with precision instrument landing systems on both runways. A 1,000 ft. long by 500 ft. wide RSA area should be provided beyond both ends of this runway. Land acquisition is proposed only during the planning period for the purpose of preserving future development options and to prevent airport incompatible uses from being developed on lands adjacent to the airport.

6.3.4 RUNWAY 5-23

Runway 5-23 will continue to operate 'as-is' without any changes to its 4,990 ft. length and 150 ft. width. See **Figure 6-1** on Page 6-5. The runway will continue to be a non-precision-non-instrument runway that is used by GA and commuter/air taxi aircraft.

6.3.5 BUILDING RESTRICTION LINES AND OBJECT FREE ZONES

The recommended OGG MP retains the BRL at 1,000 ft. to the west and 750 ft. to the east of the centerline of existing Runway 2-20. The BRLs would extend past the ends of the runways to the point where they intersect the new RPZs that would accommodate the runway extensions. Both of these provisions are consistent with current FAA recommendations.

The OGG MP also recommends the establishment of a BRL of at least 750 ft. to the east and west of the centerline of the future parallel Runway 2R-20L.

The existing BRL for Runway 5-23 is situated 553 ft. on either side of the runway centerline and the plan recommends that this be retained. The existing ground transportation support buildings that are within the RPZ for Runway 5 should be relocated to comply with the latest FAA criteria.

6.3.6 TAXIWAYS

The recommended 1,535 ft. extension of Runway 2-20, construction of the 7,000 ft. parallel Runway 2R-20L, and other recommended projects will require the development of new and extended taxiways to provide access to and from the airfield as shown on **Figure 6-1** on Page 6-5. A proposed Taxiway "L" (proposed

temporary runway) and Taxiway "A" are recommended to be located south to the proposed extended end of Runway 2. New entry exit taxiways are proposed to connect the extended Runway 2-20 to Taxiway "A" and "L."

Taxiway "F" will be extended northeast of Taxiway "A" at the end of Runway 5 to provide a full-length parallel taxiway on the southeast side of Runway 5-23. A centerline separation distance of 400 ft. is recommended between the taxiway and the centerline of Runway 5-23 to accommodate Group III aircraft (e.g., B-717 and B-737). These aircraft use the runway on an infrequent basis when Runway 2-20 is not available for use. Additional entry and exit taxiways are recommended which would include portions of the connecting taxiways that would accompany the proposed parallel runway.

New taxiways should be constructed to connect: (1) the future parallel runway and associated taxiways to the existing airfield, (2) the large transient aircraft parking apron to Taxiway "A," and (3) the future GA and commercial aviation areas to the extended Taxiway "G." Additional taxiway fillets are recommended near the runway taxiway intersections to expedite aircraft movement onto the exit taxiways. The exact dimensions and placement of these fillets are to be determined during the design phase.

The taxiways serving air carrier aircraft should be 75 ft. wide. A width of 35 ft. should be considered for taxiways serving areas such as the GA area east of Runway 2-20 which would be used only by small aircraft (i.e., those with gross weights of 12,500 lbs or less).

6.3.7 APRONS

A new approximately 27 acre apron is proposed to serve the new industrial lots on the South Ramp. Future tenants of these lots will provide services or uses requiring direct airfield and apron access. A new, approximately one (1) acre, apron will be needed to service additional gates on the north end of the passenger terminal discussed in **Section 6.4.1**. This would include extending the existing apron over the existing bus parking. A holding apron is also

recommended between the proposed extended Taxiway “L” and the proposed parallel Runway 2R-20L. It would be similar in size to the new extended South Ramp apron. A transient aircraft parking apron is proposed near the intersection of Runway 2-20 and Runway 5-23. It would be approximately 9.5 acres and include paved connections to Taxiway “A” and Runway 5-23.

6.3.8 NAVIGATION AND LANDING AIDS

Existing NAVAIDS under the purview of the FAA are proposed for continued uninterrupted operations. They include runway and taxiway lighting, precision instrument approach system, glide slope facility, middle marker, and high and MALSR approach lights, clear zone of 1,000 ft. for the VORTAC, clear zone of 1,500 ft. for the ASR east of Runway 2-20 to protect the facility from encroachment by structures or other objects that could adversely impact the radar. Similar facilities are proposed for the parallel Runway 2R-20L.

For the Runway 2 extension, new navigational aids will be placed along the 1,540 ft. extension which will include relocated VASI-4, Glide Slope Facility, Wind Sock, and Runway End Indicator Lights (REIL). At the ends of the future parallel runway and extending 2500 ft., future MALSR approach lights and a Middle Marker will be also be constructed . Runway 20 would continue to utilize PAPI-4 and Runway 5-23 will continue with current navigational aids.

6.4 TERMINAL AREA PLAN

This section describes the terminal projects recommended for the OGG. See **Figure 6-6** on Page 6-13. These include the passenger terminal, commuter air taxi terminal, air cargo facilities, ground transportation subdivision, bulk fuel storage tanks, new CONRAC facilities, new aviation lease lots, and other facilities. The projects described should be phased to ensure that they are constructed only as needed and that their construction does not disrupt on-going OGG operations.

6.4.1 PASSENGER TERMINAL

The 20 existing aircraft parking positions fronting the passenger terminal are currently insufficient to support projected aircraft operations through the year 2035. Of the 20 aircraft parking positions only 13 parking positions are sized for operations by three (3) inter-island and 10 overseas aircraft. Additional parking spaces are required to support projected additional flights preventing gate shortages currently affecting operations. In addition, the DOTA and the air carriers should coordinate the reassignment of gates and facilitate the re-marking of the ramp to further maximize the use of the aircraft parking ramp.

Terminal – North-end Expansion. The north end second level of the terminal currently houses 23 departure gates, gates 17-39, with nine (9) aircraft parking positions. Expansion in this area is constrained by the runways and taxiways to the north. Space could be provided for two (2) additional air carrier aircraft parking positions on the apron to the north for expansion beyond the 2035 planning period. With the relocation of the air cargo, GSE, car rental customer windows, and customer pick-up area, this area would be available for additional terminal functions – aircraft parking positions and/or additional terminal holding areas. See **Figure 6-6**. An additional exit from the north end to the baggage claim area is proposed.

Terminal – South-end Expansion. There are six (6) holdrooms on the second level of the terminal that service gates 1–16. See **Figure 6-6** on Page 6-13. There are four (4) aircraft parking positions available (one (1) inter-island and three (3) overseas). The utility of the gates are limited by the size of the holdrooms (holding area), where each holdroom is nearly one-half of the area provided by gates 17-39. The holdrooms are proposed to be tripled in size by building over the ground-level vehicular access way and connecting with the terminal building footprint on the other side. Currently, Building 345 with a combined footprint of approximately 21,780 s.f. contains three (3) holdrooms, Gates 2-7, two (2) ticketing areas, a U. S. Department of Agriculture

(USDA) Inspection station, and two (2) restrooms. Building 341 with a combined footprint of 22,740 s.f. contains three (3) holdrooms, Gates 9-15, two (2) ticketing areas, an ice cream shop, two (2) restrooms, and two (2) airline offices. The walkway that connects the two (2) buildings would be doubled from its current footprint of approximately 5,830 s.f. The total expansion would be approximately two (2) acres. It is possible that a few additional aircraft parking positions will be required infrequently during extremely busy periods by the end of the planning period due to future airline scheduling practices, overlapping of inter-island and overseas peak hours, and turnaround time for overseas flights. To address this, the recommended OGG MP preserves space to the south of the existing aircraft parking apron and recommends additional gates to support the planned increase in Hawaiian Airlines flights. The recommended OGG MP accommodates power-in/push back operations at each aircraft parking position.

Extension of the terminal building to the south over the existing air cargo and ASIF facility is proposed once the South Ramp is developed. The terminal extension to the south would support more passenger holding areas and gates to serve additional aircraft. This may be done at a later phase and would have a potential area of approximately eight (8) acres. When completed, the ASIF and air cargo buildings will be relocated to the industrial lots on the South Ramp.

Terminal – Relocation of Art Work. The existing statue of Maui the Sun God is proposed to be relocated from its current position adjacent to the security check-point to the baggage claim area (where the current skylight is located).

6.4.2 COMMUTER AIRLINE FACILITIES

The existing commuter terminal and ramp facilities would continue as currently configured. Terminal facilities for four (4) airlines are recommended and would accommodate the following: passenger ticketing and check-in,

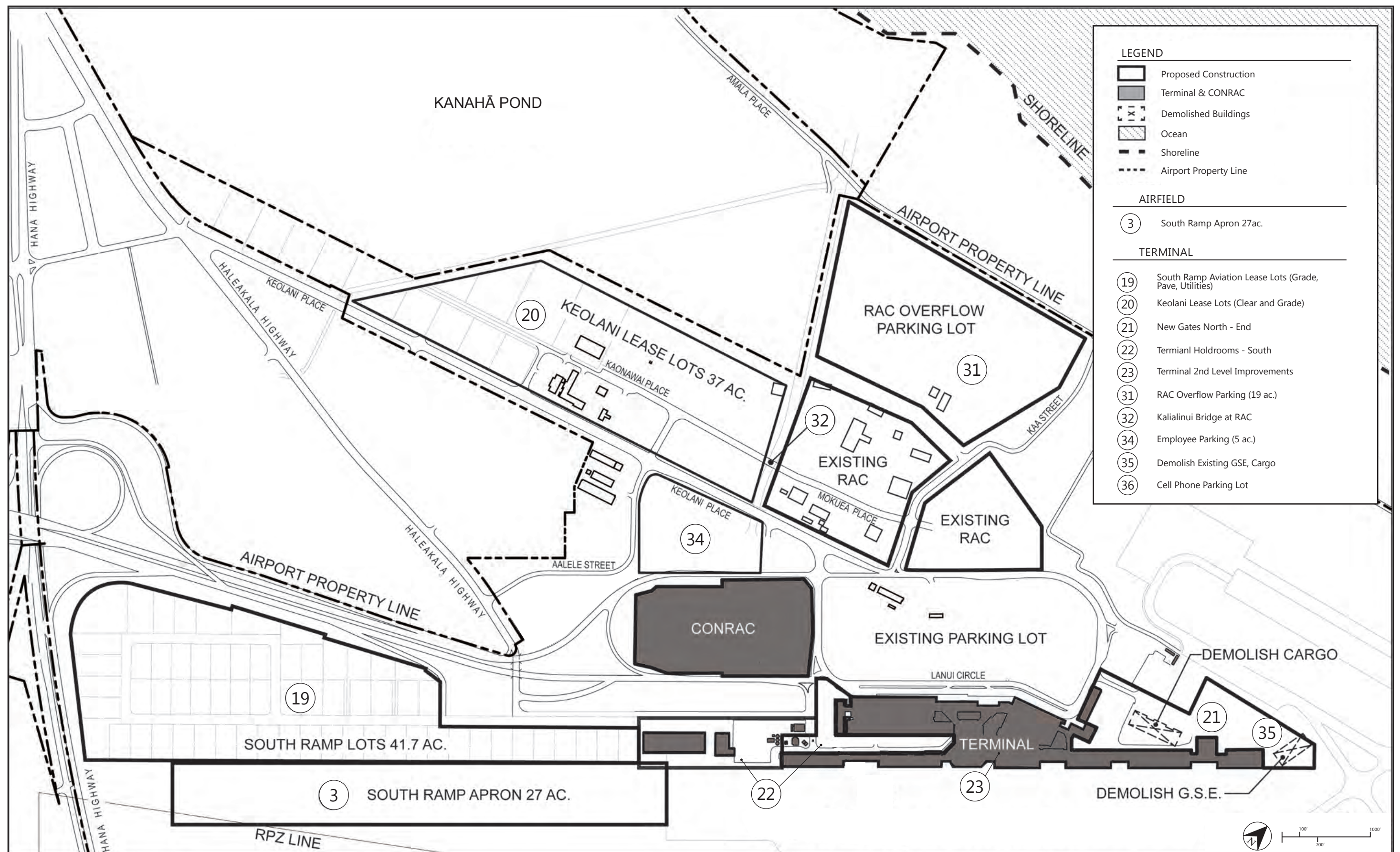
baggage claim, waiting area, airline operations, restrooms, and concessions. Approximately 10,000 s.f. of building area will be allocated along with space for approximately 100+ vehicles or three (3) acres of parking for customers.

6.4.3 U.S. POSTAL SERVICE FACILITIES

The USPS owns and operates facilities located on a five (5) acre parcel of land adjacent to Keolani Place. The utilities needed to serve this site are already in place. The disadvantage of this location is that the USPS will not have direct access to the aircraft ramp once the new airport access road is completed. Access will be via the public roads. The USPS will be offered the option to relocate to the new aviation lease lots in the South Ramp to allow the organization to have direct access to aircraft. A decision on the relocation is pending, but USPS would likely occupy approximately three (3) acres based on the offer of an improved site. If USPS decides to move, the existing five (5) acre area would be used for employee parking and a cell phone waiting lot.

6.4.4 AIR CARGO AND ASIF FACILITIES

In 2007, new air cargo facilities were developed south of the main passenger terminal primarily for cargo carried by passenger aircraft. The total area of the air cargo and ASIF facility is approximately 3.6 acres. The area includes space for vehicle circulation, stockpiling of cargo, and parking. This cargo is often referred to as belly-cargo because it is carried in the bellies of passenger aircraft. Cargo carried by all-cargo aircraft (such as Aloha Air Cargo and other all-cargo carriers) are typically referred to as hold-cargo and is also being handled there. With the development of the South Ramp, the two facilities should be relocated to this location, thus freeing space for terminal expansion.



Source: R.M. Towill Corporation

Figure 6-6 Preferred Terminal Plan - North and South

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6.4.5 FUEL STORAGE AND LOADING FACILITIES

The bulk fuel storage facilities at the OGG are located west of Keolani Place, adjacent of Kalialinui Drainage Channel. Fuel will be trucked from the storage tanks to the apron over the near term, but the OGG MP calls for a fuel pipeline to be installed between the storage tanks and the south end of the air passenger terminal building.

6.4.6 AIRLINE GROUND EQUIPMENT MAINTENANCE FACILITIES

The recommended OGG MP envisions much of the ground equipment maintenance work continuing to be done in the airlines' individual bays beneath the passenger holding rooms. However, additional space is needed for more extensive maintenance work. The OGG MP designates one (1) of the aviation lease lots in the South Ramp (approximately 0.6 acre) for this use. The existing GSE Building will be demolished to make way for the proposed north end terminal expansion.

6.4.7 STATE DOT AIRPORT MAINTENANCE FACILITIES

The DOTA maintenance baseyard is planned to remain in its present location throughout the planning period.

6.4.8 SOUTH RAMP – AVIATION LEASE LOTS

The OGG MP reserves approximately 42 acres adjacent to the South Ramp for aviation uses such as: USPS, bulk fuel storage, GSE, air cargo expansion, freight forwarders and handlers (e.g., UPS and FedEx), fixed base operators, etc. This area can be subdivided into lots ranging from one-half (0.5) acre to five (5) acres. The total available area for future leases is 41+ acres. Approximately 27 acres of new apron space will be provided to serve these lots. See **Figure 6-7** on Page 6-16.

6.4.9 CONSOLIDATED RENT-A-CAR (CONRAC)

This new facility (in progress) will provide for the following RAC functions: ready-return, quick turn-around (plus fueling), and customer service desks. Maintenance facilities are to be located in the Keolani Place lease lots. Overflow parking which currently occupies over 30 acres of space northwest of the existing ground transportation subdivision could be distributed north of the Keolani Place lease lots in a 19 acre area and in the South Ramp industrial lots. As discussed previously, there are seven (7) RAC companies located at the OGG: Alamo, Avis, Budget, DTG Operations Inc., Enterprise, Hertz, and National. See **Figure 6-8** on Page 6-18. The following acreages reflect each RAC companies parking and garage/service station facilities uses only within the existing ground transportation subdivision. As previously discussed, these RAC operations will be relocated at the Keolani Place lease lots location. Other facilities such as customer service areas will be located in the CONRAC facility. Alamo has approximately three (3) acres, Avis has two (2) acres, Budget has two and a half (2.5) acres, Enterprise has two (2) acres, Hertz has three (3) acres, and National has one-half (0.5) acre. Dollar and Thrifty are owned and operated by DTG Operations, Inc. Therefore, they would share the same facilities including a garage and parking in the proposed Keolani lease lots. Their existing space is approximately four (4) acres.

In summary, the existing RAC spaces off of Koeheke Street would need to be consolidated and functions, except maintenance, would be in the new multi-level CONRAC facility south of the existing public parking lot. Actual space leased to each company would need to be determined at a later date.

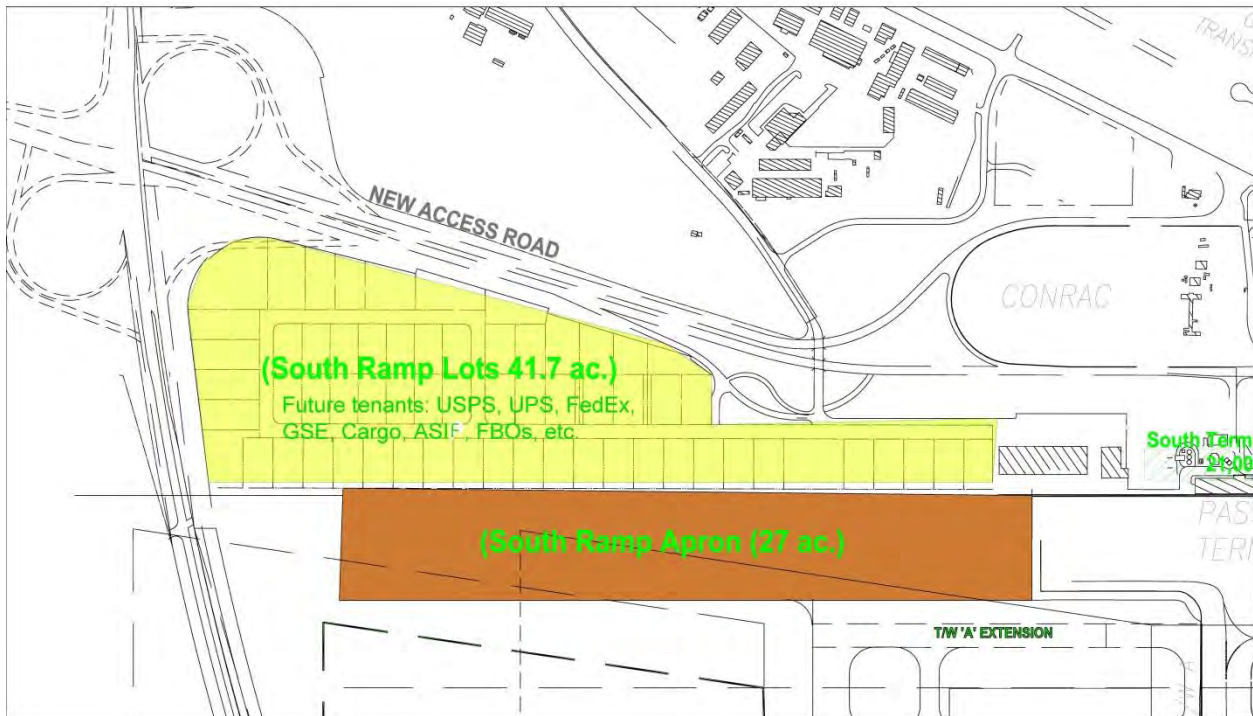


Figure 6-7 Terminal Area –South Ramp

6.4.10 EAST-SIDE TERMINAL FACILITIES

6.4.10.1 GENERAL AVIATION

The recommended OGG MP proposes the continued operation of existing GA facilities east of Runway 2-20 to accommodate the 35 based fixed-wing aircraft as well as itinerant fixed-wing aircraft.

The construction of two (2) additional T-hangars for GA, approximately 12,000 s.f. in size are recommended. The recommended OGG MP also provides space for individual executive-type hangars to be developed by lessees, as needed, and for future expansion.

Each lot would have access to both the airfield and roadway system. Space should also be provided within each lease lot for automobile parking for employees and visitors. The DOTAs current property development standards call for two (2) acre minimum lot sizes for commercial aviation and FBO lots. However, in order to meet the needs of the small GA operators in the State, it is recommended that the subdivision layout

provide some one (1) acre lease lots. The lease lots should be assigned so that GA operators who need a larger area can lease contiguous parcels. The recommended OGG MP provides space in the GA area for a future aircraft wash rack. A pilots' lounge or ready room could be provided within a FBOs hangar and office building at the end of a row of hangars. Apron lighting should be provided in the general aviation apron and hangar area. New taxiways would be provided to connect the expanded GA aircraft apron and hangar areas. East Ramp project elements are identified in **Figure 6-9** on Page 6-19.

6.4.10.2 AIR CARGO FACILITIES

A second new air cargo area is proposed in the recommended OGG MP and situated at the northern end of the East Ramp. A four (4) acre area that is part of the proposed new East Ramp lease lots will be made available to air cargo operators for their facilities. Unlike the air cargo facilities proposed for the western side of the OGG, these are intended for use by all cargo aircraft. Initially, access to the new facilities would be via existing roads; ultimately this area

would be serviced by the proposed new East Ramp spine road.

6.4.10.3 HELICOPTER FACILITIES

The existing helicopter facilities are poorly situated with respect to apron surveillance from the FAA ATCT. Its present location will place it between two (2) active runways once the recommended parallel Runway 2R-20L is constructed. This would increase the frequency of undesirable interactions between helicopter and fixed-wing aircraft operations. Consequently, relocation of these facilities is recommended. A number of OGG locations were evaluated during the master planning process, but all had significant limitations. These limitations included increased cross-runway overflights, proximity to nearby residential or recreational areas, and limited land area. In view of the foregoing, it is recommended that most facilities supporting helicopter operations eventually be relocated to a new site outside the existing OGG boundary. Possible locations include a site on the eastern side of Hāna Highway near its intersection with Haleakalā Highway. The exact size and location of these new helicopter facilities should be determined after further study.

6.4.10.4 MILITARY OPERATIONS

Several times each year the OGG is used by groups of large military transport aircraft and helicopters. It is proposed that these aircraft use the itinerant apron that is part of the East Ramp or the vacant 20 acres north of the GA facilities. The DOTA should cooperate with the U. S. Department of Defense (DOD) to provide a facility that is suitable for use as a temporary troop shelter transportation coordination office adjacent to the transient aircraft parking apron.

6.4.10.5 FAA AIRPORT TRAFFIC CONTROL TOWER

The FAA ATCT adjacent to the East Ramp is adequate with two (2) exceptions. The first exception is that hangers in the helicopter operating area at the southern end of the East Ramp obstruct FAA ATCT views of the apron. The relocation of the FATO area should alleviate this situation. The second is that the passenger terminal obscures the FAA ATCT views of the western end of Runway 5-23 and the connecting taxiway. Aircraft operating procedures have been developed to deal with the restricted visibility. The tower has adequate communication and utility links and requires no further improvement within the time frame of this MP.

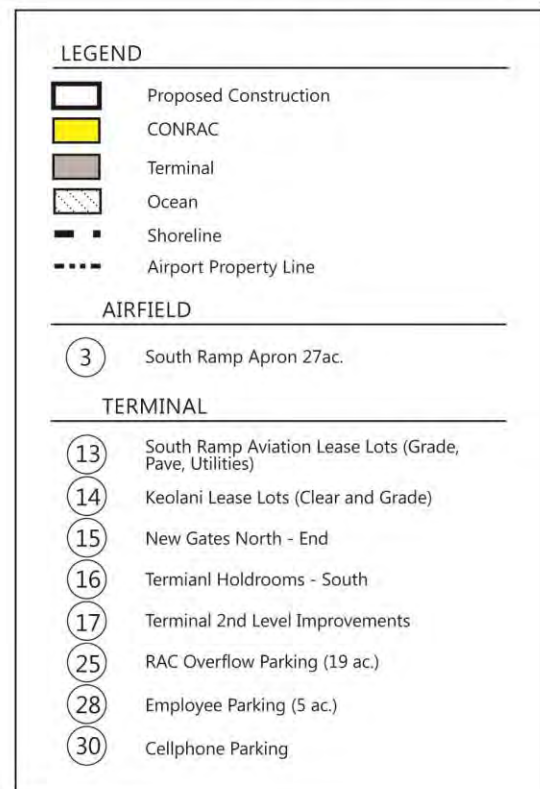
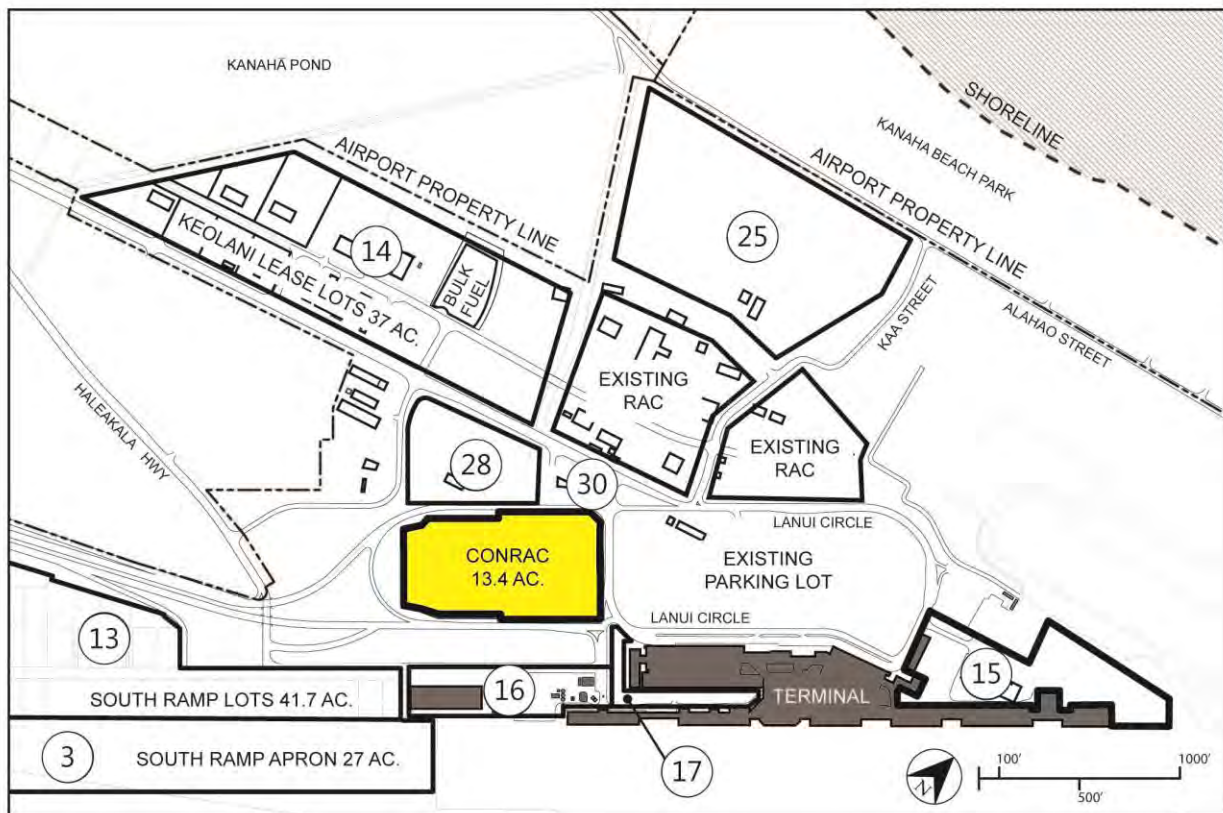


Figure 6-8 Terminal Area Rent-A-Car Facilities

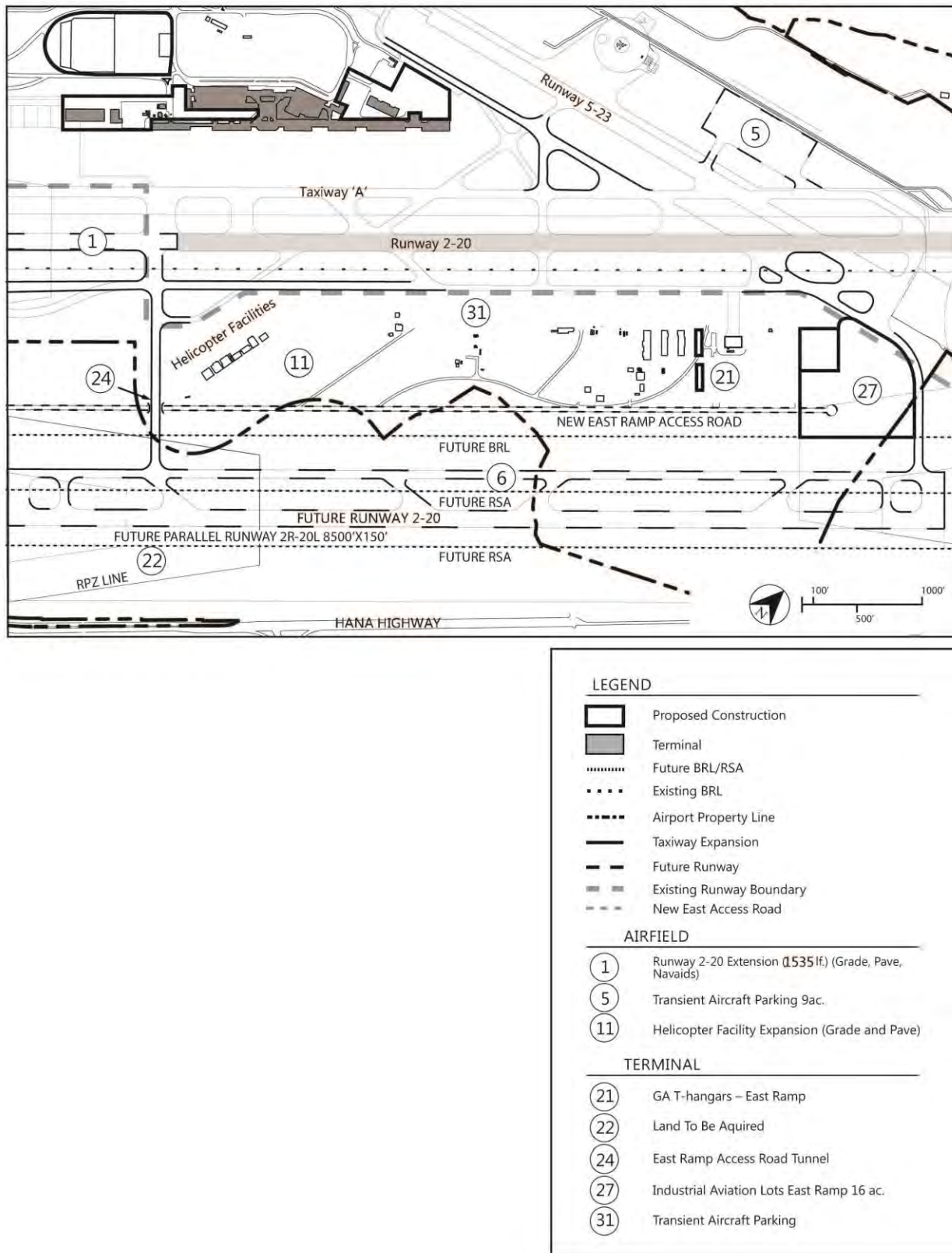


Figure 6-9 East Ramp Plan

6.5 AIRPORT AIRSPACE PLAN

The Airport Airspace Plan for the recommended airport layout is shown on **Figure 6-10** on Page 6-21. It is a graphic illustration of the imaginary surfaces as defined in the FAR Part 77, Objects Affecting Navigable Airspace.

The purpose of the Airport Airspace Plan is to identify existing and ultimate approach surfaces as well as surrounding physical and community features which may affect aircraft operations. The primary objectives in establishing the imaginary approach surfaces and RPZs are to:

- Identify surrounding terrain or objects that penetrate the imaginary surfaces
- Regulate the height of development near the OGG
- Prevent the erection of possible obstructions to navigable airspace

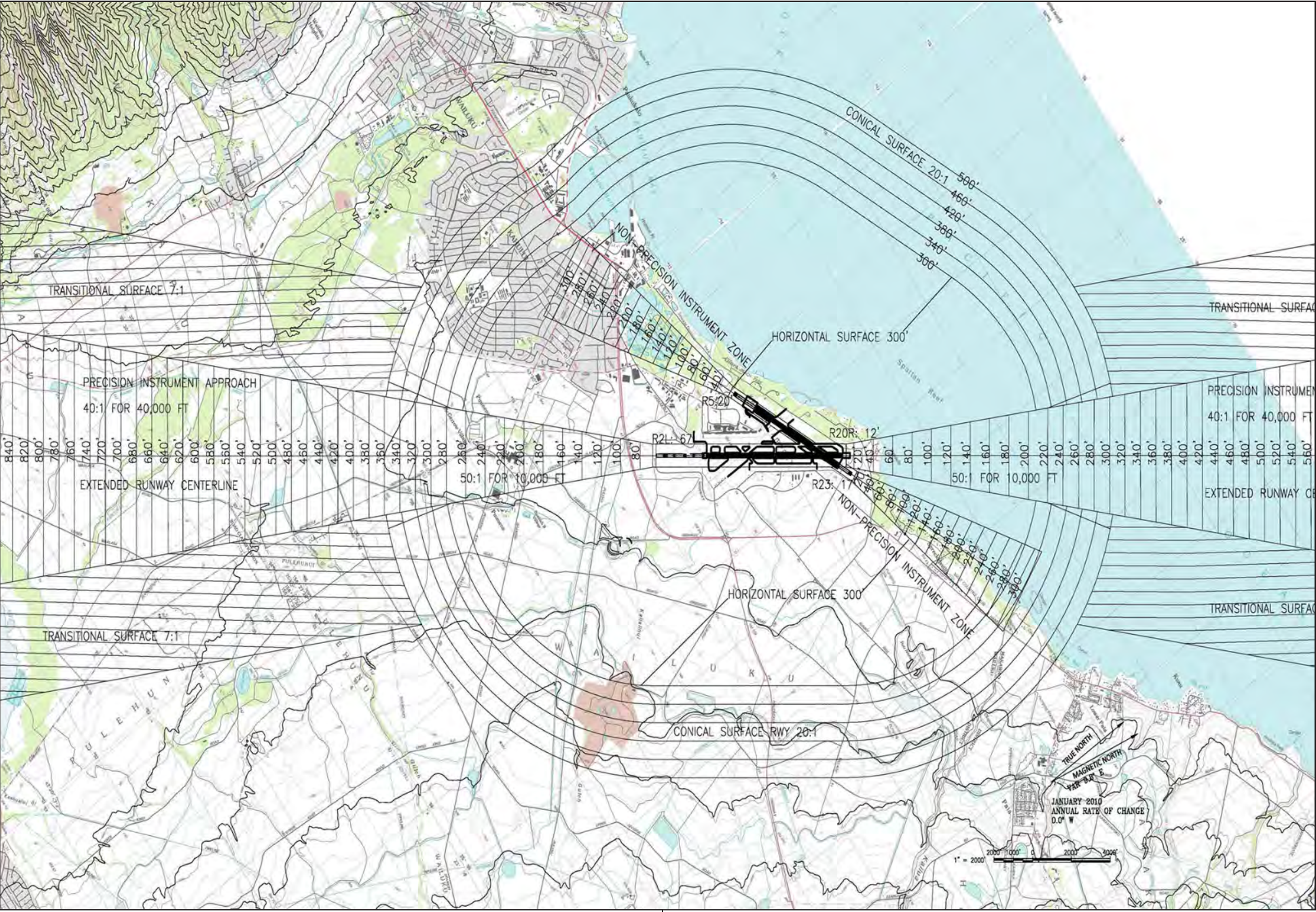
The recommended Airport Airspace Plan provides for the approach slope surfaces described below and illustrated in **Figure 6-10** on Page 6-21.

A precision instrument approach is to be retained for the extended Runway 2. A 50:1 approach slope extends out 10,000 ft. from the end of the Runway 2 primary surface (measured

along the extended runway centerline). A 40:1 approach slope extends outward from the end of the 50:1 approach slope at 10,000 ft. for an additional 40,000 ft. beyond the end of the runway primary surface. A precision instrument RPZ currently exists for Runway 2 and should be relocated with the proposed extension of the runway to the south. A precision instrument RPZ is currently provided on Runway 20 and should be maintained. A precision instrument approach, with 50:1 approach slope for 10,000 ft. and precision instrument RPZ should be protected for both ends of the proposed parallel Runway 2R-20L.

A non-precision instrument approach, with 34:1 approach slope, should be retained for both ends of Runway 5-23. It is recommended that non-precision instrument RPZs be maintained for Runways 5-23. The Airport Airspace Plan shows that a portion of the OGG horizontal and conical surfaces are penetrated by the terrain southeast of the OGG. These penetrations have been accounted for in the approach and departure procedures established for the OGG.

Currently, there are no new development projects proposed which would penetrate the runway approach surfaces.



Source: R.M. Towill Corporation

Figure 6-10 Airspace Plan

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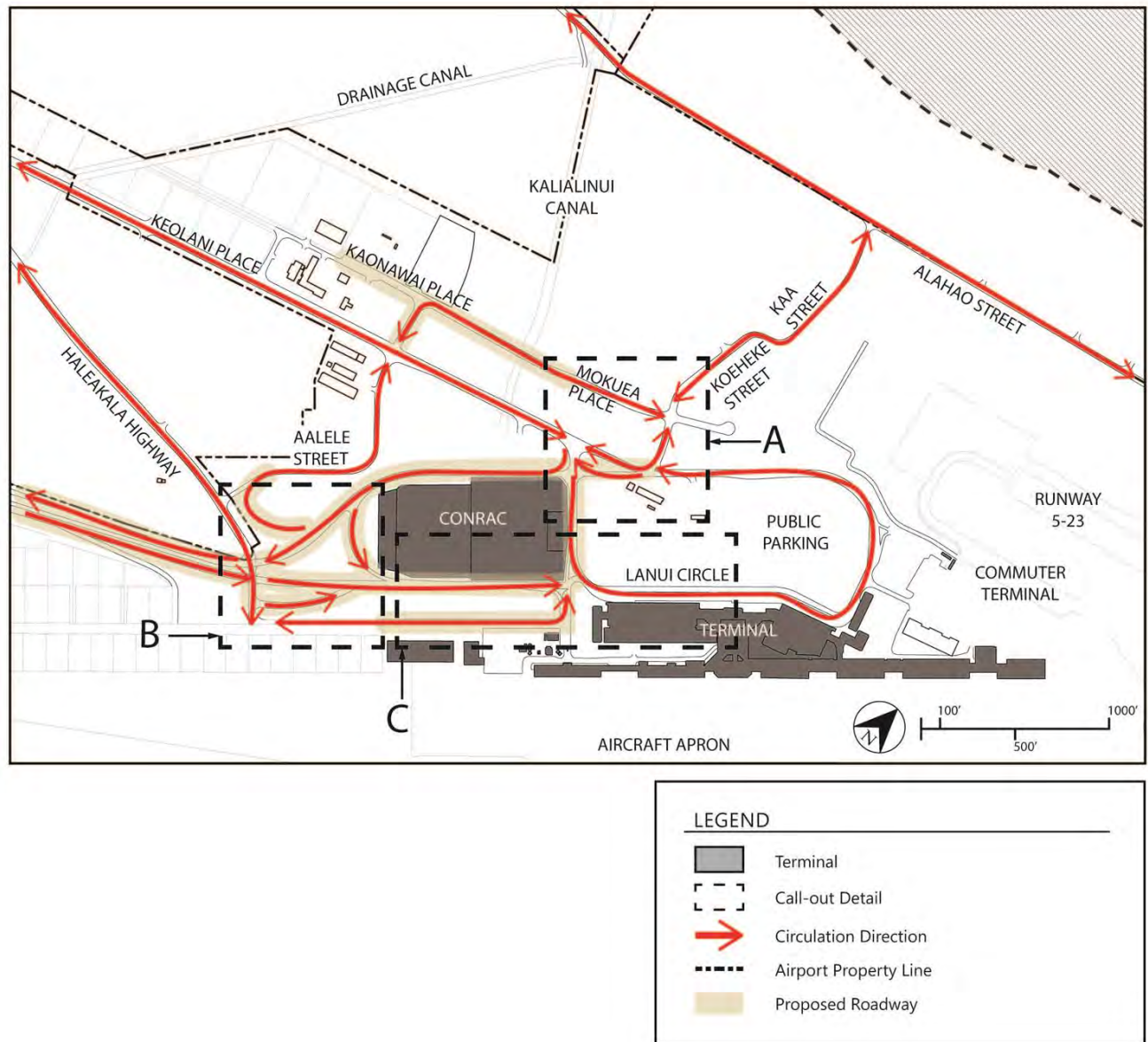


Figure 6-11 Terminal Access Plan

6.6 AIRPORT ACCESS AND CIRCULATION PLAN

This section describes facilities and measures taken to ensure that OGG facilities are accessible to users and employees, that adequate parking is provided, and that adequate provisions are made for apron access and vehicular movement within the airport operating area. See **Figure 6-11**.

6.6.1 PRIMARY AIRPORT ACCESS

The new airport access road proposed in the 1993 OGG MP is currently under construction. This new road will improve access into the OGG and better serve regional transportation needs by providing access from Hāna Highway without having to encounter the congestion on Dairy Road. This initial construction phase will utilize an at-grade signalized intersection.

The other recommended OGG MP project affecting Hāna Highway is the realignment of a

portion of the Highway adjacent to the northeastern corner of the OGG. A new highway alignment is needed to keep the RPZ, associated with the proposed parallel Runway 2R-20L, entirely within the OGG property. The land for the realignment must be acquired from A&B., which uses the land for sugarcane cultivation.

Due to the relatively low volume of traffic that is generated by existing and proposed uses on the eastern side of Runway 2-20, the existing roadways serving that area are adequate. However, Haleakalā Highway will need to be closed to through-traffic when Runway 2-20 is extended to the south. Access from Hāna Highway to the East Ramp facilities can continue on the existing roadways, Kala Street and the remnant of Haleakalā Highway, until the proposed parallel Runway 2R-20L is constructed. At that time, a new access road must be constructed between, and generally parallel to, the runways.

Because the majority of the traffic to and from the facilities planned for this area is from the Kahului side of the OGG, the recommended OGG MP Update calls for the construction of a spine road to intersect Hāna Highway at the south end of the East Ramp near the existing intersection with Pulehu Road. The recommendations in this OGG MP Update does not propose connecting the spine road to the external road network at its northern end due to the relatively low volume of traffic that is anticipated to and from the north and east, and the high cost of tunneling beneath the connecting taxiways.

6.6.2 OTHER ON-AIRPORT PUBLIC ROADS

The recommendations in this OGG MP Update propose the construction of new internal roadways to serve new and/or reconfigured development. The areas that would be served by these new roads include the additional lots for ground transportation operators, bulk fuel storage facilities, the South Ramp lease lots, and the lease lots along the northwestern side of Keolani Place. These streets should meet

commercial development quality standards with curbs, lighting, sidewalks and a storm drain system. They should be designed to accommodate moderate traffic volumes with a design speed of 25 miles per hour (mph). Most of the traffic on these roads will consist of passenger cars, vans, buses, trucks, and other vehicles. The roadway geometrics and pavement should be designed accordingly.

6.6.3 ON-AIRPORT SERVICE ROADS

In addition to public streets, the recommendations in this OGG MP Update also call for the construction of new internal service roads. These include a new perimeter road fronting the south end of Runway 5, and additional service roads to the new facilities. A service road should be constructed linking the South Ramp lease lots with the new Airport Access Road which is under construction. The volume of traffic moving along this road will be low throughout the planning period and anticipated speeds will be well below 25 mph. The pavement geometry, load carrying capability, vertical grades, and vertical clearances at the grade separated underpass beneath the proposed Airport Access Road should be designed and constructed with these requirements in mind.

When Runway 2-20 is extended, the portion of Haleakalā Highway west of the runway will terminate at the proposed new South Ramp lease lots. Public access to the cargo buildings will be provided from the south via the new access road. The apron storage areas on one (1) side of each cargo building will be included within the OGG operating area.

6.6.4 VEHICLE PARKING

As discussed in **Chapter 4**, preliminary calculations indicate that additional vehicular parking may be needed near the main passenger terminal if present vehicle usage rates continue and passenger volumes increase as forecasted. This airport parking deficiency may not appear for well over a decade. However, there are many factors that could exacerbate the parking shortfall even further. It is acknowledged,

however, that on occasional peak periods, the existing parking facilities are utilized to the limit. Because of this, construction of additional parking spaces to increase capacity before 2017 was not recommended. Instead, the recommended course of action is to develop the CONRAC and reserve land south of the existing parking lot for possible future development of additional parking facilities.

It has been recommended that all employee parking be relocated to the former USPS site. Thus, the parking lot to the north will be completely available to the public. The DOTA should monitor parking lot usage on an annual basis using data collected by the parking lot concessionaire. The data should be reviewed at least every other year and the DOTA should begin developing plans for additional facilities when daily use of the existing facilities exceeds 80% of capacity more than seven (7) times in any one (1) year. In addition, the development of an employee parking lot should be considered. This lot can be located west of Lanui Circle.

6.7 GROUND TRANSPORTATION FACILITIES

Concentrating all of the RAC customer service operations in one (1) location at the OGG will assist passengers with finding the facilities and simplify transport between the passenger terminal and baseyards. It is recommended that the existing subdivision be expanded southward across Kalialinui Gulch. From an operational standpoint, the preferred arrangement would be to extend Mokuea Place across Kalialinui Gulch.

A portion of the land in the area south of the gulch has already been improved, and all of the existing lots are currently leased for various purposes. The future development of ground transportation lots in this area must be done in two (2) increments, with each increment on either side of the existing improved lots. In order to ensure the availability of land needed for this, the renegotiation of lot leases presently used for non-airport related will allow the DOTA to terminate the leases if/when the land is determined to be needed for airport purposes.

The terms of renegotiated leases within the ground transportation development lots will provide sufficient advance notification of lease termination to avoid undue disruption to the lessees who may be required to relocate.

Existing tenants who might be affected by this policy include the Coral Factory, Enterprise, and Roberts Hawai'i. The future Keolani Place lease lots will have approximately 37 acres of available space for the relocated ground transportation uses. As discussed, it is also recommended that the ground transportation facilities within the RPZ for Runway 5 be relocated to the CONRAC and/or Keolani Place lease lots.

Lastly, some of the existing structures that are outside of the future and existing BRL and RPZ could potentially be retained by the airport for other uses. An additional 19 acres west of the RAC subdivision is proposed for the future development of RAC overflow parking.

6.8 UTILITIES

The existing utility systems are currently adequate to meet current demands; however, as the improvements described above are implemented, specific utilities will need to be upgraded to meet the anticipated demand.

With the rise in electrical costs, the DOTA is exploring the feasibility of further expanding renewable energy generation at the OGG to reduce its operational costs. The DOTA has specifically explored the use of additional solar panels to generate electricity and have commissioned studies for its implementation. Currently OGG has installed 3,420 solar panels on the roof of the passenger terminal and is awaiting approval from the Maui Electric Company to inter-connect with the electrical utility grid.

6.9 PROJECT COST ESTIMATE

Project costs are shown in **Table 6-2** on Page 6-26. Estimates are in 2015 dollars. The total amounts include cost of construction, contractors overhead, design services, and contingency to account for unanticipated costs.

The cost estimates that are presented are for guidance only and do not represent an actual contractors' bid. Local fees and taxes have not been included.

Airfield	TOTAL	
1	Runway 2-20 - Extension 1535 linear feet (lf.) (grade, pave, exclude utilities/NAVAIDS)	\$96,000,000
2	Taxiway A Extension (excludes utilities and NAVAIDS)	\$12,121,212
3	South Ramp Apron 27 acres	\$5,184,000
4	Taxiway Realignment (Taxiways "B", "F" and "G")	\$3,008,264
5	Transient Aircraft Parking 9 acres	\$4,320,000
6	Runway 2-20 (Parallel Runway) 7000 ft.	\$768,000,000
7	Parallel Taxiway for Runway 2R-20L	\$703,680,000
8	Temporary Runway 2-20	\$74,513,280
9	Kalialinui Channel Improvements	\$25,564,738
10	Taxiway "M" Expansion and Upgrade	\$37,152,000
11	Navigational and Landing Aids - Replacement	TBD by FAA
12	FATO Relocation	\$960,000
13	Runway 2-20 Reconstruction	\$104,355,840
14	Connecting Taxiways Between Runways 2-20 and Temporary Runway 2-20.	\$19,200,000
15	Temp Runway 2-20 Blast Pads	\$5,760,000
16	Temp Runway 2-20 RSA Improvements	\$3,840,000
17	Drainage Improvement	\$9,600,000
Terminal		
18	Helicopter Facility Expansion	\$5,000,000
19	South Ramp Aviation Lease Lots (grade, pave, utilities)	\$32,976,000
20	Keolani Lease Lots (clear and grade)	\$17,760,000
21	Terminal North - New Gates (clean and demo)	\$7,200,000
22	Terminal South - Holdrooms	\$96,000,000
23	Terminal South - 2nd Level Improvements	\$773,625,600
24	Haleakalā Highway Closure	\$6,363,636
25	Realign Hāna Highway (grade and pave)	\$19,365,289
26	GA T-Hangars – East Ramp	\$16,726,911
27	Land to be acquired	\$24,499,200
28	East Ramp Access Road	\$11,520,000
29	East Ramp Access Road Tunnel	\$21,600,000
30	RAC Overflow Parking (19 acres)	\$9,120,000
31	Kalialinui Bridge at RAC	\$19,200,000
32	Industrial Aviation Lots East Ramp 20 acres	\$1,536,000
33	Employee Parking (5 acres)	\$14,400,000
34	Demolish Existing GSE & Cargo	\$960,000
35	Cell Phone Parking Lot	\$4,800,000
36	East Ramp Temporary Relocation of Services	\$8,795,520
TOTAL (rounded)	\$2,964,707,492	
Source: R. M. Towill Corporation		
Notes: Total includes design fees, indirect construction costs, inspection and contingency. Fee does not include contractors' markup and taxes and required utilities. Further, costs do not include Runway 2-20 required relocation and navaids		

Table 6-2 Cost Estimate (subject to change)