

**PMOC REPORT ON UALENA STREET OPTION FOR  
AIRPORT RUNWAY PROTECTION ZONE (RPZ)  
AVOIDANCE**

**Honolulu High-Capacity Transit Corridor Project  
City and County of Honolulu  
Honolulu, HI**

**April 2010 (DRAFT)**

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Length of time PMOC firm and person have been assigned to this project: Five Years  
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## LIST OF ACRONYMS

‘Ewa	▪	Toward ‘Ewa; westward direction
FAA	▪	Federal Aviation Administration
FTA	▪	Federal Transit Administration
Koko Head	▪	Toward Koko Head; eastward direction
LPA	▪	Locally Preferred Alternative
Makai	▪	Toward the ocean; southward direction
Mauka	▪	Toward the mountains; northward direction
NTP	▪	Notice to Proceed
PMOC	▪	Project Management Oversight Contractor
PMSC	▪	Project Management Support Consultant
RPZ	▪	Runway Protection Zone
SCC	▪	Standard Cost Category
SHPO	▪	State Historic Preservation Office
WOFH	▪	West Oahu / Farrington Highway

## 1.0 OVERVIEW

In April 2010 the Federal Transit Administration (FTA) directed the Project Management Oversight Contractor (PMOC) to review and comment on the decision of the City and County of Honolulu (Grantee) to use the Ualena Street Option as a result of latest revisions to its Airport Runway Protection Zone (RPZ) Avoidance Study. That study, from January 2010, originally showed a Grantee preference for the baseline locally preferred alternative (LPA) on Aolele Street, but estimate revisions since that time have now changed the lowest cost alternative from Aolele Street to the Ualena Street Option. Whichever alternative is selected must be assured to provide acceptable safety clearance as required for operations on Runway 22L/4R.

Previous reviews of the Project by the PMOC pointed out a potential clearance problem with the project's alignment at and near the Lagoon Drive Station and bridge spanning Lagoon Drive. It is evident from aerial photography and mapping that that station and bridge are in a direct line with the mauka (towards the mountains) end of Runway 22L/4R, about 1500 feet away. Subsequent to the initial reviews, Federal Aviation Administration (FAA) policy experts have confirmed that the Project, as currently baselined, would indeed conflict with the airport FAA airspace surface, as defined by a square-cornered theoretical cone which starts at the mauka end of the runway and then expands from 1000 feet wide at the runway to 6,466 feet wide, 10,200 feet away, while gradually rising at its base at a rate of 40 feet horizontal to 1 foot vertical.

In response to FTA's concerns over these RPZ violations, the Grantee, in its January 2010 report, developed and presented three alternative designs and accompanying estimates to achieve the needed vertical clearances. The Grantee has also produced a description and estimate of airport modifications that would provide the required clearances to the current baseline alternative along Aolele Street. After study and cost analysis of all the alternatives, two options remain under consideration:

- Aolele Street – This is the Locally Preferred Alternative (LPA) as defined in the Draft Environmental Impact Statement. To provide clearance to RPZ, the January 2010 report included \$20M in airport modifications, specifically, to move both ends of Runway 22L/4R 462 feet in the makai (towards the sea) direction. *It is this \$20M estimate that, with FAA and Honolulu International Airport (HNL) input, was found to be inadequate.*
- Ualena Street – This alternative moves the Project alignment one block in the mauka direction, where it would be situated in the center of this crowded business-oriented street. To enter the street from the west ('Ewa end), the alignment would cross several Honolulu International Airport-owned but privately-leased surface parking lots; where returning to the LPA on the east (Koko Head) end, the alternative would require acquisition and demolition of two commercial buildings on Waiwai Loop, Koko Head of Lagoon Drive.

This report addresses the advantages and disadvantages of the Ualena Street Option versus those of the LPA, otherwise known as the Aolele Street Option. Special concerns about the construction and operations challenges to be encountered by using the Ualena Street Option are discussed along with the project ramifications resulting from the proposed change in alignment from the LPA to that option.

## **2.0 FINDINGS**

### **2.1 Aolele Street**

#### **2.1.1 Description of Route**

The Aolele Street alignment follows Aolele Street from the Honolulu Airport Station Koko Head to Lagoon Drive, from which it steps across Ke'ehi Lagoon Park until it rejoins the H1 (Nimitz/Queen Liliuokalani) Freeway right-of-way. The alignment is elevated for the entire comparison length, first over Aolele Street, then over a green space on the street right-of-way mauka of the street to Lagoon Drive, then over the park access road and other Ke'ehi Lagoon Park land from Lagoon Drive to the tie-in with the other alignments on the H1 right-of-way just 'Ewa of the Moanalua Stream. Although the original version of this alignment showed impact to the four tennis courts on the mauka end of Ke'ehi Lagoon Park, it is now reported that only the lights for those courts will be affected. Lighting will be provided for four of the other park tennis courts as compensation for this impact.

Although in an urban setting, this comparison section of the Project is relatively uncomplicated on the Aolele Street alignment, since it is largely sited over undeveloped land or parkland. Aolele Street and the Lagoon Park roadway are relatively devoid of utilities, structures and site development. The buildings adjacent to the Aolele Street alignment between Paiea Street and Lagoon Drive are serviced by driveways and utility feeds from the next street mauka of Aolele, Ualena Street. The proposed Aolele Street guideway alignment is effectively on the back, unaccessible portion of those properties.

While chosen as the Locally Preferred Alternative, LPA, the Aolele Street alignment was discovered to have one potentially fatal flaw – it is located approximately 1,500 feet from and in the direct flight path of Honolulu International Airport's 9,000-foot-long Runway 4R/22L. Even more critically, the Project plans a station at Lagoon Drive, which, as a place of public assembly, would be in violation of FAA rules.

To avoid the conflict with the runway while keeping the Aolele Street routing as its preferred alternative, the Grantee has proposed modifications to the airport runway itself. By relocating both mauka and makai runway ends 462 feet in the makai direction, the project would be able to keep the alignment and the key Lagoon Drive Station at least 200 feet outside the 1700-foot long RPZ. Another change noted in the station plans is the relocation of the Lagoon Drive Station to a point just 'Ewa of the RPZ, some 1300 feet 'Ewa of Lagoon Drive.

#### **2.1.2 Discussion of Advantages and Disadvantages**

The Aolele Option is the most direct route, with the smallest community construction impact and need for the least amount of private property acquisition. However, this route did have the “fatal flaw” associated with the FAA airport safety zones, which no longer made it the least expensive alternative.

In proposing the runway reconfiguration, the Grantee has developed an adaptation of this alternative that, it would seem, will allow Project construction to proceed along Aolele Street.

The escalation of costs for runway reconstruction and associated airport work is the cause of this option no longer being the most desirable.

The remaining issues that could derail this choice are whether airport construction proposals are accepted and acted upon in a manner and on a schedule such that they have no negative impact on the Project, and whether the known impact to the Ke'ehi Lagoon Park is adjudged to be significant and avoidable.

## **2.2 Ualena Street**

### **2.2.1 Description of Route**

The Ualena Street alignment would follow its namesake street for a distance of about 1,300 feet and would include the Lagoon Drive Station. This alignment would be located about 250 feet mauka of the Aolele Street alignment. The alignment would be identical to the Aolele Street alignment from the beginning of the comparison section at Station 1149+00 to Station 1179+00, at which point it would transition across the block through six airport-owned but privately leased commercial properties before landing in the middle of Ualena Street at Station 1195+00. After the Lagoon Drive Station, this alignment would continue for several hundred feet down the center of Waiwai Loop before transitioning through another three commercial properties to where it enters Ke'ehi Lagoon Park at about Station 1218+00. From there, this route would join the Aolele route within the park, having some but not all of the impacts to the park as that baseline alternative.

As with all the alternatives considered, the Ualena Option uses entirely elevated guideway, similar to the standard expected to be used on most of the Project.

The Grantee allowed that there was some discussion about whether the Ualena Option was also in violation of the airport RPZ requirements. However, it is anticipated that this may not be an issue, as the violation is thought to be very small and either avoidable by minor final design modifications or by FAA waiver.

For the 1,300 feet of this alternative's running within Ualena Street and the 800 feet within Waiwai Loop, the alignment will impose itself above a busy secondary street. Many utilities will need to be relocated and many driveways and building entrances serving as many as 45 small enterprises will need to be accommodated. Street parking will likely be a casualty of the need for space in the narrow right-of-way.

### **2.2.2 Discussion of Advantages and Disadvantages**

The Ualena Street Option would provide an alignment likely to receive FAA approval, although there is some minor concern that adjustments or concessions would be needed from FAA to assure that approval. The cost, initially estimated to be greater than the base Aolele Option, has now been found to be less expensive. This change is attributed to upwardly adjusted airport runway relocation costs in the LPA/Aolele Street Option. The Ualena Option would likely be less risky to the project budget and schedule, due to its non-dependence upon airport work in order to achieve project viability.

If, however, avoiding impact to Ke'ehi Lagoon Park becomes an environmental 4(f) issue, the Ualena Option is not without fault. While this alternative's impact to the park is about half that of the base Aolele alternative, the option will nevertheless require some parkland construction and intrusion. The lighting of the tennis courts on the mauka edge of the park are affected as much by this alternative as they are by the Aolele Option.

If project environmental documents are changed and reissued as a result of a decision to change to the Ualena Street Option, such changes will have to be vetted to assure that there are no new impacts, such as to historic properties or parklands, which could present mitigation challenges. Field observations by PMOC show that such impacts are unlikely, although issues regarding business interference, property acquisitions, loss of street parking and construction sequencing may present challenges.

Particular concerns of a change to the Ualena Street Option include:

- The “neighborhood” being affected is completely non-residential and includes light industrial businesses, retail services, and some airport related industry. It includes no schools, churches or houses.
- Along the alignment, as many as 45 businesses front along Ualena Street and, Koko Head of Lagoon Drive, Waiwai Loop. Virtually every one of these businesses has one or more driveways to access the street. Most of these commercial properties appear occupied.
- Many of the businesses along the route are served by trucks of varying size, requiring clearances and adequate turning radii into the driveways. The guideway piers, usually about 120 feet on centers, will need to be strategically located so as not to preclude truck movements into and out of business driveways.
- Four businesses along the route will need to be relocated, including two at the proposed Lagoon Drive Station and two at the Koko Head end of the Waiwai Loop part of the alignment, where the guideway will cut through two full acquisition properties to rejoin the LPA/Aolele Street Option in Ke'ehi Lagoon Park.
- On street parking is currently allowed and heavily utilized along the route. These parking spaces will likely be eliminated by construction of the guideway.
- Construction may need to be staged to avoid impacts to business properties that have unusually high seasonal traffic patterns or rush periods. Surveys may be required to identify and plan for mitigation of any such requirements.
- The route has heavy overhead wire density. Most of these wires will need to go underground, including distribution lines that provide power and communications to businesses along both sides of the street.
- The proposed Lagoon Street Station will require full acquisition of two properties on the Koko Head side of Lagoon Street, one on each side of Waiwai Loop. Four other properties will be affected by partial acquisitions to provide access to the elevated station.
- One of the properties being acquired for the Lagoon Street Station is a gas station. It is unknown whether there might be any soil contamination issues concerning the site.
- The properties being affected by the mid-block transition on the 'Ewa side of the realignment are all owned by the Honolulu International Airport and are fully paved and mostly occupied by a rental car company (National) for a remote storage location for that company's airport operation. The Ualena Street Option will cut diagonally across these

six properties on an elevated guideway. Presumably, with allowable access across the guideway right-of-way and under the physical guideway, much of the parking lot could continue to support its current function. The guideway would, however, preclude or severely restrict further development of the affected property unless odd-shaped parcel fragments could be patched together and utilized.

- Ualena Street currently has a four-lane and two-sidewalk configuration, with two-way traffic in the center of the street and one parking lane on each side. Sidewalks start at the curb and usually extend to the building walls or edges of parking lots. Utility and light poles and fire hydrants are located within the sidewalks. There is little landscaping along the street – what landscaping that does exist is located beyond the sidewalks.
- The Koko Head end of the Ualena Street Option will be built within Ke’ehi Lagoon Park, but mostly above that park’s access road and parking lot. The guideway will have little functional or aesthetic affect on the park. Four tennis courts on the Mauka edge of the park, near Nimitz Highway, will lose their lights as a result of the project, but plans exist to install lights on four other tennis courts closer to Lagoon Drive as compensation for that loss.
- Besides tennis, Ke’ehi Lagoon Park is also used for picnicking, baseball, cricket, soccer, softball and outrigger canoeing. These functions will not be affected by the guideway itself, although interim parking for these activities may be reduced during construction.
- The only building along the Ualena Street route that could be eligible for the National Register is the Employers Council Building on Waiwai Loop, which is not directly impacted by the guideway, although an adjacent property would be acquired and its unoccupied building would be demolished.
- The grantee notes that the Ualena Street Option still intrudes on the airport runway’s “less-restrictive controlled activity area,” but that the FAA has indicated the acceptability of the proposed route. There would be no violation of the runway’s building restriction line, approach surface and transitional surface regulations.

### **3.0 IMPACT TO SCHEDULE**

Although the Grantee did not provide information to support an analysis of schedule impacts, it is reasonable to assume that the time to construct the Aolele and Ualena Street Options would be roughly equivalent. While there would be a greater number of utility relocations and a greater degree of traffic control, business access maintenance, and construction access, the PMOC does not believe that the impact to the overall project schedule (i.e. revenue operations date) would be significant enough that a decision should be based on time impacts alone. Once a decision is made on the option to carry forward, the Grantee should update its Master Project Schedule accordingly. This would include incorporating any work associated with relocation of Runway 22R/4L if the Aolele Option is selected.

### **4.0 CONCLUSION**

The Grantee has produced documents that fairly and accurately depict a fair number of alternatives to the base LPA Aolele Option. Following discussion, the impacts of these alternatives have been flushed out to achieve a level of estimating confidence equaling or exceeding that of the overall project. PMOC is confident that the documents provided

adequately describe both the scope of the work and the approximate cost of that work, as best as can be determined at this level of design.

This exercise has shown that the Project can indeed be built in a manner that does not violate FAA requirements for safety zones on the mauka approach from or to Runway 22R/4L. However, the most economical way to meet those requirements is to use the Ualena Street Option, avoiding airport runway relocation at a cost of some impact to business activity along Ualena Street and Waiwai Loop.

Even though the Aolele Option can achieve the runway requirements, doing so would require greater expense and reliance upon activities of the Airport and the FAA to implement runway changes in a manner that would not adversely affect the budget or schedule of the Project. It is also clear that the Aolele Option would continue to have greater impacts to Ke'ehi Lagoon Park, which may or may not become an issue.

The Ualena Option could be built to avoid having to do any runway work and at a cost savings relative to the Aolele Option. The Ualena Option would still have significant, although reduced, impact to Ke'ehi Lagoon Park and would involve significant utility work and business community impact to the commercial/light industrial environment on Ualena Street and Waiwai Loop.