

**Federal Aviation Administration (FAA)**  
**Runway Incursion Mitigation (RIM) Program**  
**Airfield Alternatives Analysis Report**  
**Orlando Executive Airport (ORL)**

Prepared by the Orlando Executive Airport and  
Planning, Engineering & Construction Department



**Greater Orlando Aviation Authority (GOAA)**

August 11, 2015

# FAA Runway Incursion Mitigation (RIM) Program

## Airfield Alternatives Analysis Report

### Orlando Executive Airport (ORL)

August 2015

#### Introduction

This airport planning document was produced in support of the Federal Aviation Administration's (FAA) Runway Incursion Mitigation (RIM) Program that was announced in June 2015. This report was developed by the airport sponsor (Greater Orlando Aviation Authority) and was prepared in conjunction with the FAA Orlando Airports District Office (ADO) and other airport stakeholders.

The RIM is the FAA's long term initiative to address ways to minimize runway incursions at FAA towered airports. This airport runway safety initiative is a multi-year program to identify, prioritize, and implement solutions to address locations to mitigate runway incursions caused by an aircraft.

Guidance for the development of this runway safety initiative analysis and cost estimate report is based on two June 2015 emails provided by the FAA Orlando Airports District Office (ADO). In these guidelines, the FAA identified several types of potential RIM mitigation measures:

- Capital Geometry Improvements
- Signage, Marking & Lighting
- Operational Solutions
- Other Available Technologies
- None

The FAA's RIM preliminary inventory includes a location at the Orlando Executive Airport (ORL) and this site has been identified as **RIM ORL-01** (*refer to Figure 1*). This FAA area of interest is focused on Taxiway E4 (north of Runway 7) in the airport's West Airfield area.

#### Airport Overview

Orlando Executive Airport (ORL) is a public use general aviation airport located in East Central Florida. ORL is the primary reliever facility to Orlando International Airport (MCO) which is a large hub commercial service airport. The FAA designated ORL as a "National Airport" in its May 2012 *General Aviation Airports: A National Asset* publication report. The airport originally opened in 1928 as Orlando Municipal Airport.

ORL has two intersecting runways (7/25 and 13/31) and both are paved and lighted (*refer to Figure 2*). At a length of 6,004', Runway 7/25 is the airport's main runway and only precision instrument runway (with an ILS CAT I approach on each end). Runway 13/31 is the airport's crosswind runway (with visual approaches). The current FAA approved Airport Layout Plan (ALP) for ORL lists the Airport Reference Code (ARC) as C-II. The 2003 ORL Airport Master Plan indicates that Runway 7 is the airport's most active runway end serving approximately 55% of all aircraft operations.

The airport's FAA Air Traffic Control Tower (ATCT) is operational daily between 7 AM and 10 PM. To serve international general aviation aircraft arrivals, an on-demand U.S. Department of

Homeland Security's Custom and Border Protection (CBP) facility is also located on-site. Airport tenants include two full service fixed base operators (FBO) and three flight schools.

During 2014, a total of 109,396 aircraft operations (comprising of general aviation, air taxi, corporate/business aviation, flight training, law enforcement, medical/air ambulance, media, and military) were conducted at the airport. On an average daily basis in 2014, about 300 aircraft operations were conducted at the airport. In the 2007 ORL FAR Part 150 Noise and Land Use Compatibility Study, itinerant aircraft operations were estimated at approximately 72% of airport's annual traffic activity (based on 2014 data, annual and average daily itinerant operations were approximately 78,765 and 216, respectively). In June 2015, a total of 197 aircraft (consisting of single engine airplane, multi engine airplane, turbojet, and helicopter) were based at ORL.

#### Airport Runway Safety

In response to national runway safety related issues, the FAA established a Runway Safety Action Team (RSAT) for ORL in 1998. Consisting of representatives from the FAA (regional and local), Aviation Authority staff, ORL airport tenants, members of the local flying community, and other airport user participants, this RSAT group meets at ORL on a periodic basis.

In 2013, the ORL RSAT addressed several airfield "Hot Spots". Runway safety related Information on these runway/taxiway and taxiway/taxiway intersections areas is currently provided in the FAA's Airport/Facility Directory (A/FD) and Airport Diagram aeronautical publications. Other runway safety related initiatives at ORL, previously implemented by the Aviation Authority, have included new airfield pavement markings and pilot information related signage.

#### Review of FAA Database

The FAA maintains an on-line national runway incursion incident database known as *Aviation Safety Information Analysis and Sharing (ASIAS)*.

Based on ASIAS statistical data for ORL, during the period between October 2001 and February 2015, a total of fifty events were recorded at the airport. Between July 2002 and December 2014, nineteen surface incidents apparently occurred on and or in the vicinity of Runway 7/25. In the review of the Runway 7 event related data, it appears only nine of these incidents were in the vicinity of Runway 7 & Taxiway E4 and all of these were classified as Pilot Deviations (PD). The common finding in these incidents was either an "unauthorized runway crossing" or "taxiing onto the runway without clearance". Failure to maintain pilot situational awareness may be the issue for these recorded runway incursion incidents.

#### Airport Stakeholder Coordination

The FAA's RIM Program initiative was discussed at ORL's monthly Airport Advisory Committee meeting in June 2015. Several RIM related discussions were also held with FAA ADO representatives and Aviation Authority senior staff during June, July, and August 2015.

#### Existing Conditions – Runway 7 and Taxiway E4

Runway 7/25 has a total of eight taxiway connectors (or active runway exits) along the north side of the runway. One of these connectors is Taxiway E4, which is largely oriented in a southwest to northeast direction, is located adjacent to the runway's west end.

Taxiway E4 (formerly known as Taxiway J) was originally constructed as a runway and has varying widths (*refer to Sheet 1 of 8*). Between Runway 13/31 and Taxiway G, Taxiway E4 has an approximate width of 72'. South of Taxiway G, Taxiway E4's width increases to approximately 196'; this pavement surface currently includes three parallel rows of taxiway striping that are spaced approximately 96' and 61' apart. The portion of Taxiway E4 immediately adjacent to

Runway 7 has a width of approximately 114'. The runway holdbar pavement marking on Taxiway E4 measures approximately 7' in width.

Photographs of airfield features (pavement markings, signage, and lighting) that are currently available at the Runway 7 & Taxiway E4 intersection are shown in Figures 3 and 4. Other ORL airfield photographs (at the intersection of Runway 13 & Taxiway E6) are provided in Figure 5.

### Preliminary Project Alternatives

In this airfield planning analysis, a total of nine Runway Incursion Mitigation (RIM) alternatives were identified and evaluated. To optimize runway and airfield safety, these preliminary alternatives include pilot education related features, airport facility upgrades (markings & signage), airfield pavement geometry modifications, and other airport capital improvements

A summary of this planning analysis, the ORL RIM airfield alternatives summary comparison matrix, is provided in Figure 6. Alternative benefits and other issues are listed. "Order of Magnitude" project costs were estimated for each alternative. These options ranged from no cost/low cost to higher cost and have varying construction durations.

A narrative description (and associated concept exhibit) for each preliminary RIM airfield alternative follows:

#### No-Action (Alternative #1)

This alternative reflects the airport's current conditions (*refer to Sheet 1A of 8*). No airfield modifications or new construction are proposed. The total project cost is estimated at \$0.

#### Airfield Marking and Signage Enhancements (Alternative #2)

This alternative includes the installation of new airfield pavement markings and signage on or adjacent to Taxiway E4 (*refer to Sheet 2 of 8*). New pavement markings would include a "red and white" checkerboard box pattern and "Do Not Enter" (yellow text on black) in front of the runway holdbar; these proposed pavement markings would resemble those currently available at the intersection of Runway 13 and Taxiway E6 (*refer to Figure 5*). Enhanced taxiway centerline markings would be added to each of the three rows of taxiway striping located between Taxiway G and Runway 7. Non-illuminated pilot information related signage (*refer to Figure 5*) would also be installed on the west and east sides of Taxiway E4. This work can be completed by ORL staff. The total project cost is estimated at \$0.

These proposed airfield pavement marking and signage features may need to be addressed in a Modification of Standards (MoS) application for FAA review and approval.

#### Pilot/Airmen Continuing Education (Alternative #3)

This alternative would be conducted in conjunction with the implementation of Alternative #2 and would also be an extension of the FAA's ongoing Runway Safety Action Team (RSAT) program for ORL (*refer to Sheet 3 of 8*). This option would support continued outreach to enhance situational awareness on the airfield. The total project cost is estimated at \$0.

#### Taxiway E4 Pavement Modifications (Alternative #4)

This alternative includes the reduction in the Taxiway E4 pavement width to 35' in the area between Taxiway G and Runway 7 and would provide a 90 degree taxiway connector to the runway (*refer to Sheet 4 of 8*). Excess airfield pavement would be removed. No new airfield pavement would be needed. The total project cost is estimated at approximately \$255,000.

#### BP-43 Airfield Pavement Rehabilitation (Alternative #5)

This alternative includes the pavement rehabilitation (mill & overlay) of Taxiway E4 (the portion located between Runway 13/31 and Runway 7) (*refer to Sheet 5 of 8*). Other taxiways identified in the Aviation Authority's upcoming BP-43 project include Taxiway A (the portion located between Taxiways E4 and B), Taxiway F, Taxiway G, and Taxiway E6 (the portion located between Runway 13/31 and the West Ramp). These taxiway and taxiway segments would be constructed in accordance with FAA Advisory Circular 150/5300-13A design standards. The scope for the future BP-43 project could be potentially refined during the upcoming ORL ALP Update airport planning project (*FAA AIP 3-12-0058-030-2015*). The total project cost is estimated at \$10,330,000.

#### Extension of Taxiway A (Alternative #6)

This alternative includes the extension of Taxiway A to the west (maintained at a distance of 500' from the Runway 7/25 centerline) and construction of a new taxiway connector (A7) (*refer to Sheet 6 of 8*). This project would provide Runway 7/25 with a full length parallel taxiway. The portion of Taxiway E4 south of Taxiways A and G would be removed. A portion of the stormwater drainage facility (Pond #2) would require filling in. This airfield project will likely require NEPA environmental review and approval by the FAA. The total project cost is estimated at approximately \$1,232,000.

#### Realignment of Taxiway A (Alternative #7)

This alternative includes the extension of Taxiway A to the west (at a distance of 400' from the Runway 7/25 centerline), modifications to the Taxiway A/E4/K intersection, and construction of a new taxiway connector (A7) (*refer to Sheet 7 of 8*). This project would provide Runway 7/25 with a full length parallel taxiway. The portion of Taxiway E4 south of Taxiways A and G would be removed. The stormwater drainage facility (Pond #2) would not require any filling. The total project cost is estimated at \$1,365,000.

#### Runway 7 and Taxiway A Extensions – 2003 ORL ALP (Alternative #8)

This long term alternative was developed during the previous ORL airport master planning project and is shown on the FAA approved 2003 ORL ALP drawing (*refer to Sheet 8 of 8*). The alternative includes a 500' extension of Runway 7 (displaced threshold) to the southwest, extension of parallel Taxiway A, extension to Taxiway K, construction of new taxiway connectors (A7 and A8), removal of a portion of Taxiway E4 (former J) pavement, and removal of Runway 7 blast pad pavement. This project would provide Runway 7/25 with a full length parallel taxiway. Modifications to the FAA's MALSR equipment installed on Runway 7 (and also potentially to the FAA's Runway 7 ILS CAT I infrastructure) will also be necessary. A portion of the stormwater drainage facility (Pond #2) would require filling in. The total project cost is estimated at approximately \$13,733,000.

#### Runway Guard Lights (Alternative #9):

This alternative includes the installation of new airfield lighting equipment adjacent to or on existing Taxiway E4 (north of Runway 7) such as runway guard lights (RGL). This alternative is an example of other available technologies. The RGL options were assumed to be sited either on the west & east sides of this taxiway or along the existing runway holdbar pavement marking located on this taxiway. The cost for elevated RGL equipment (also known as "wig-wags") is estimated at approximately \$101,000. The cost for in-pavement RGL equipment is estimated at \$107,000.

#### Preferred Project Alternatives

After evaluating the feasibility of these preliminary RIM alternatives along with reviewing their estimated costs and anticipated project durations, the Aviation Authority recommends two short term project alternatives for the FAA's consideration and review. To provide an additional airfield safety enhancement at a no/low cost and also for near term implementation, the proposed preferred project options are Alternatives #2 and #3. As potential long term improvements, Alternatives #7 and #8 are recommended for further evaluation.

**FAA Runway Incursion Mitigation (RIM) Program**

**Airfield Alternatives Analysis Report**

**Orlando Executive Airport (ORL)**

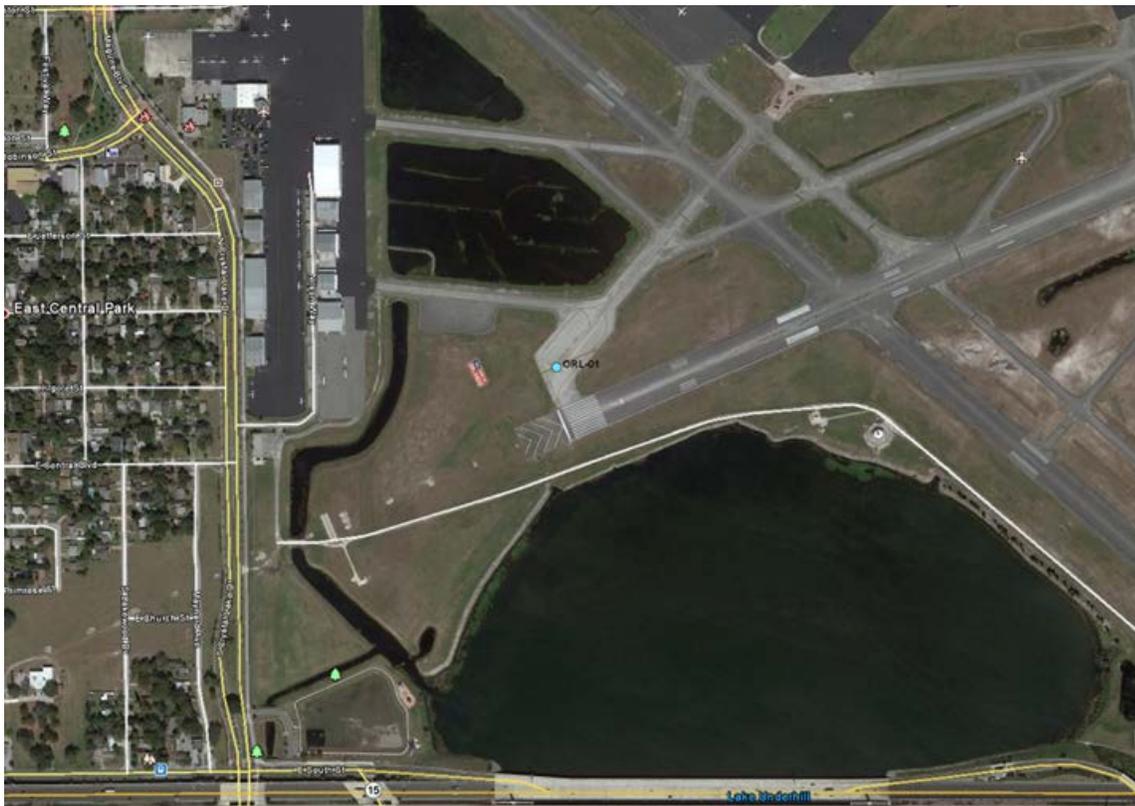
**INDEX OF APPENDICES**

- **A – Airport Diagrams and Existing Airfield Features Photographs (Figures 1 to 5)**
- **B – Preliminary Airfield Alternatives Exhibits (Sheets 1 to 8)**
- **C - Airfield Alternatives Summary Comparison Matrix (Figure 6)**

## **Appendix A:**

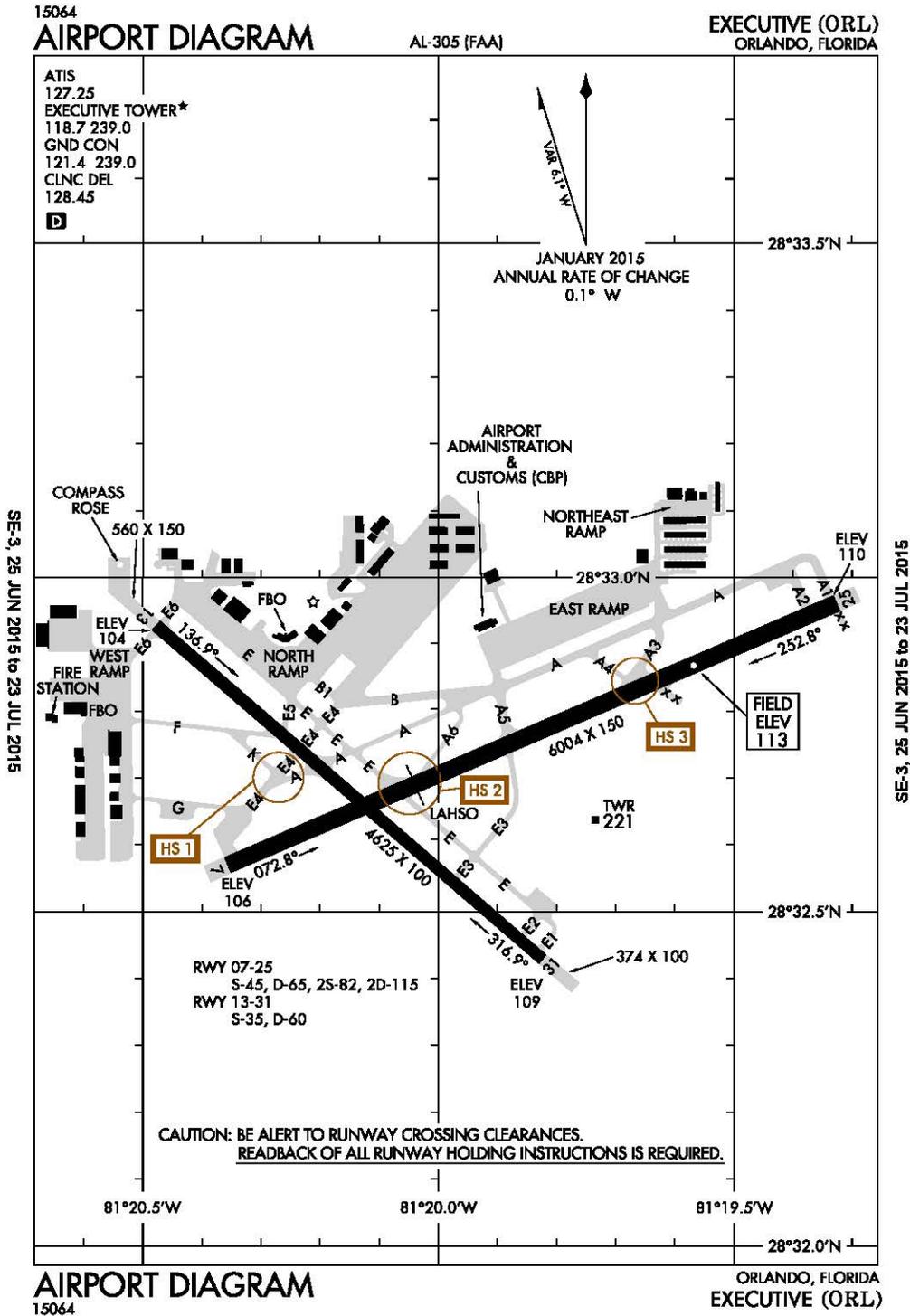
### **Airport Diagrams and Existing Airfield Features Photographs (Figures 1 to 5)**

**Figure 1 - FAA Runway Incursion Mitigation (RIM) Program Inventory  
Orlando Executive Airport (ORL)**



*The FAA's RIM location for Orlando Executive Airport: RIM ORL-01 (light blue dot)*

Figure 2 - FAA Airport Diagram  
Orlando Executive Airport (ORL)



**Figure 3 – “Existing Conditions” – Runway 7 & Taxiway E4  
Orlando Executive Airport (ORL)**



*Above photographs are of runway holdbar and other airfield pavement markings currently located on Taxiway E4 (north of Runway 7/25).*

**Figure 4 -“Existing Conditions” – Runway 7 & Taxiway E4  
Orlando Executive Airport (ORL)**



*Above photographs are of airfield signage (runway holding position and pilot information) currently installed adjacent to Taxiway E4 (north of Runway 7/25).*

**Figure 5 - “Existing Conditions” – Runway 13 & Taxiway E6  
Orlando Executive Airport (ORL)**

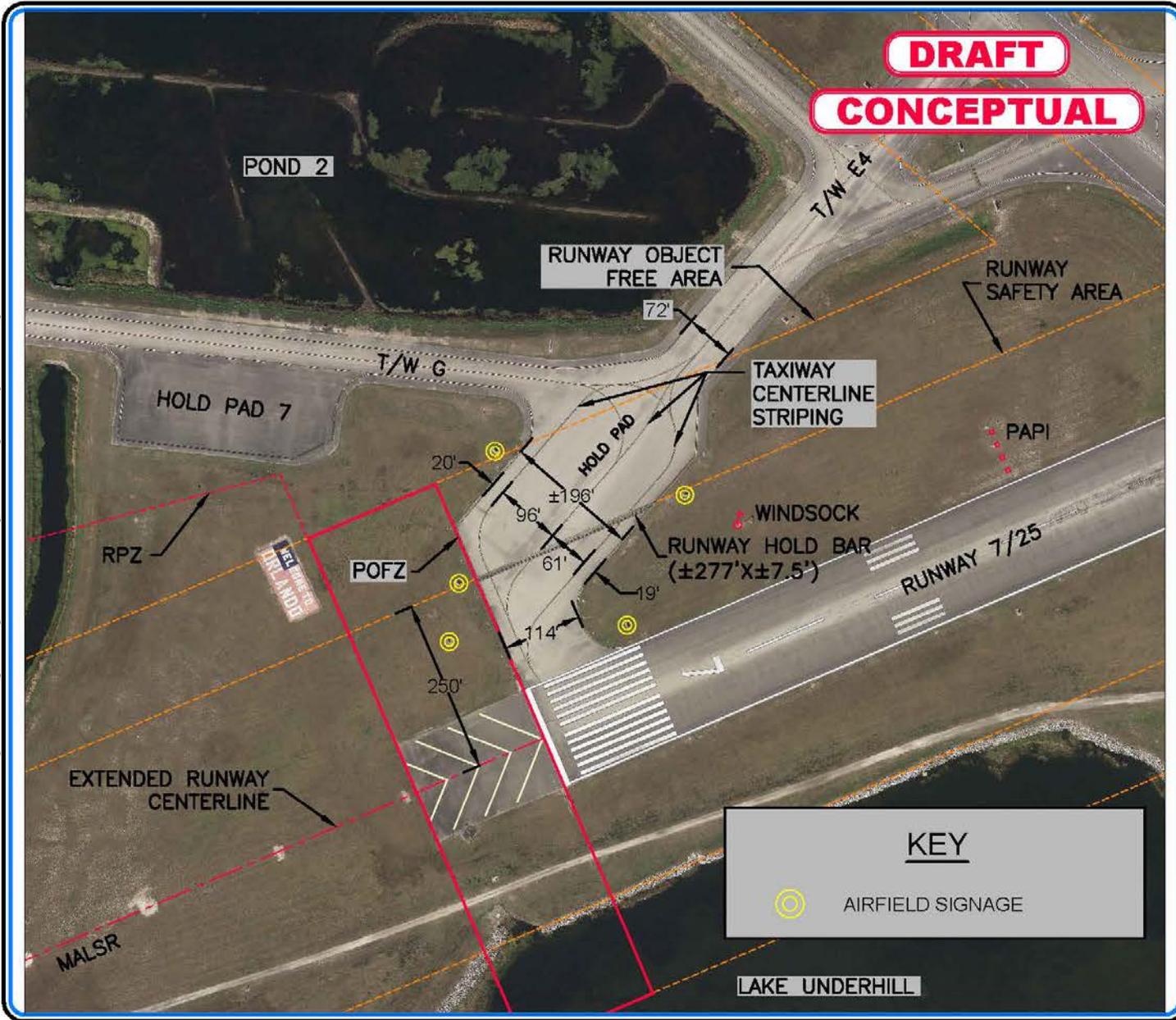


*Above photographs are of airfield pavement markings and signage (runway holding position and pilot information) currently located on and adjacent to Taxiway E6 (west of Runway 13/31).*

## **Appendix B:**

### **Preliminary Airfield Alternatives Exhibits (Sheets 1 to 8)**

**DRAFT**  
**CONCEPTUAL**



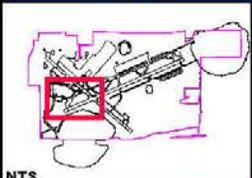
**KEY**

⊙ AIRFIELD SIGNAGE

GREATER ORLANDO AVIATION AUTHORITY  
**ORL**  
**ORLANDO EXECUTIVE AIRPORT**  
**GOAA**  
 PLANNING & ENGINEERING

TITLE  
**FAA RUNWAY INCURSION MITIGATION (RIM) PROGRAM**  
**RUNWAY 7 & TAXIWAY E4 INTERSECTION**  
**EXISTING CONDITIONS**

GRAPHIC SCALE IN FEET  
 0 100 200  
 KEY MAP



REVISION HISTORY

DATE	CHANGE
7/09/15	LAST REVISED
8/27/16	INITIAL SET

REFERENCE INFO

PROJECT NO.:	P-6032
REQUESTED BY:	MH
DRAWN BY:	KA
CHECKED BY:	MH
DATE CREATED:	6/24/2016



**DRAFT  
CONCEPTUAL**



GREATER ORLANDO  
AVIATION AUTHORITY  
\*\*ORL\*\*  
**ORLANDO  
EXECUTIVE  
AIRPORT**  
GOAA

PLANNING & ENGINEERING

TITLE

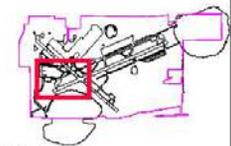
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INCURSION  
MITIGATION (RIM)  
PROGRAM  
ALTERNATIVE #1:  
NO ACTION**



GRAPHIC SCALE IN FEET



KEY MAP



NTS

REVISION HISTORY

DATE	CHANGE
7/09/16	LAST REVISED
6/27/15	INITIAL SET

REFERENCE INFO

PROJECT NO.:	P-6032
REQUESTED BY:	MH
DRAWN BY:	KA
CHECKED BY:	MH
DATE CREATED:	6/24/2016

SHEET NO.

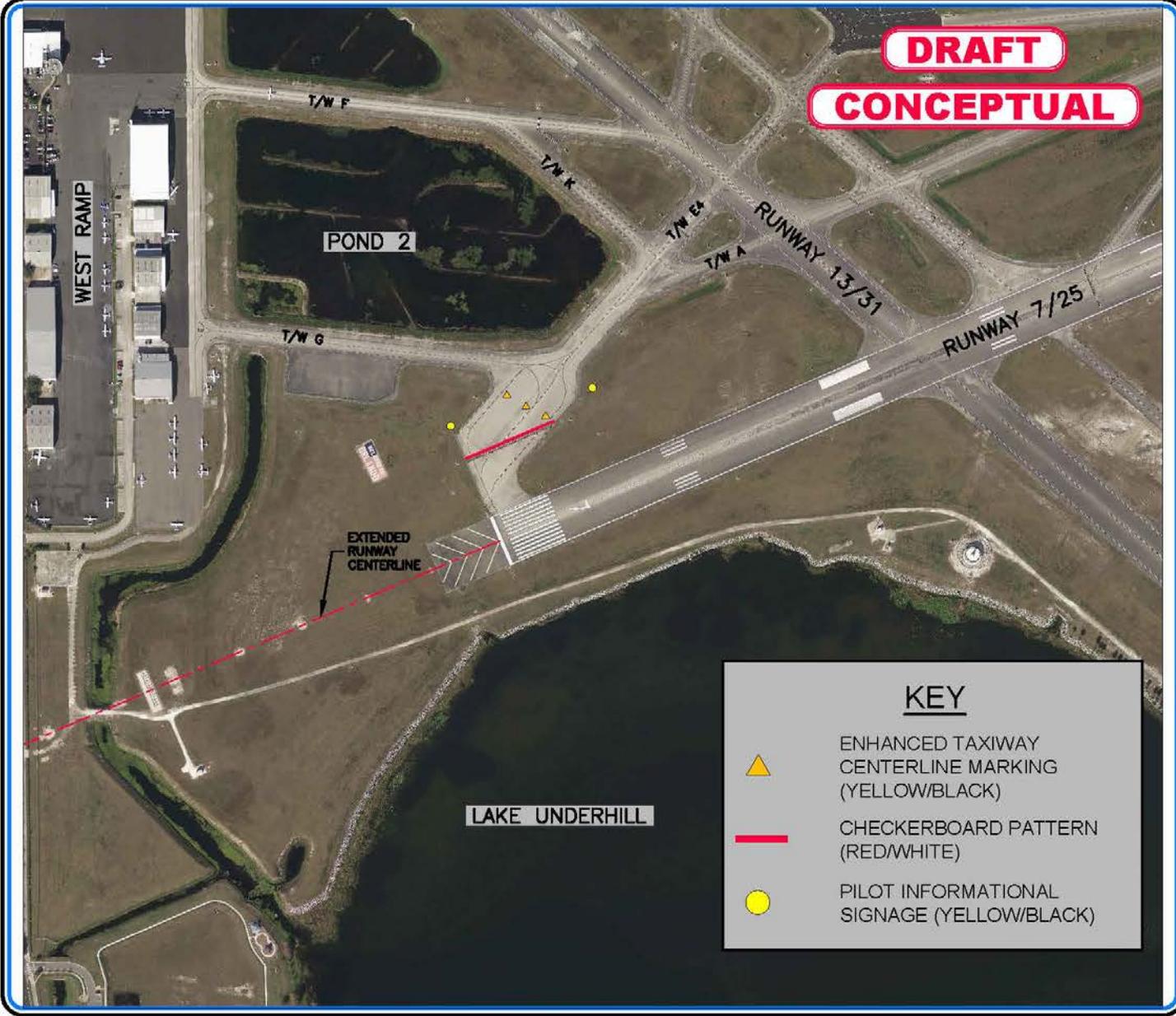
**1A OF 8**

**LAKE UNDERHILL**

**KEY**



AIRFIELD SIGNAGE



**DRAFT**  
**CONCEPTUAL**

**KEY**

- ENHANCED TAXIWAY CENTERLINE MARKING (YELLOW/BLACK)
- CHECKERBOARD PATTERN (RED/WHITE)
- PILOT INFORMATIONAL SIGNAGE (YELLOW/BLACK)

GREATER ORLANDO AVIATION AUTHORITY  
 \*\*ORL\*\*  
**ORLANDO EXECUTIVE AIRPORT**  
 GOAA  
 PLANNING & ENGINEERING

TITLE

**FAA RUNWAY INCURSION MITIGATION (RIM) PROGRAM ALTERNATIVE #2: AIRFIELD MARKING AND SIGNAGE ENHANCEMENTS**

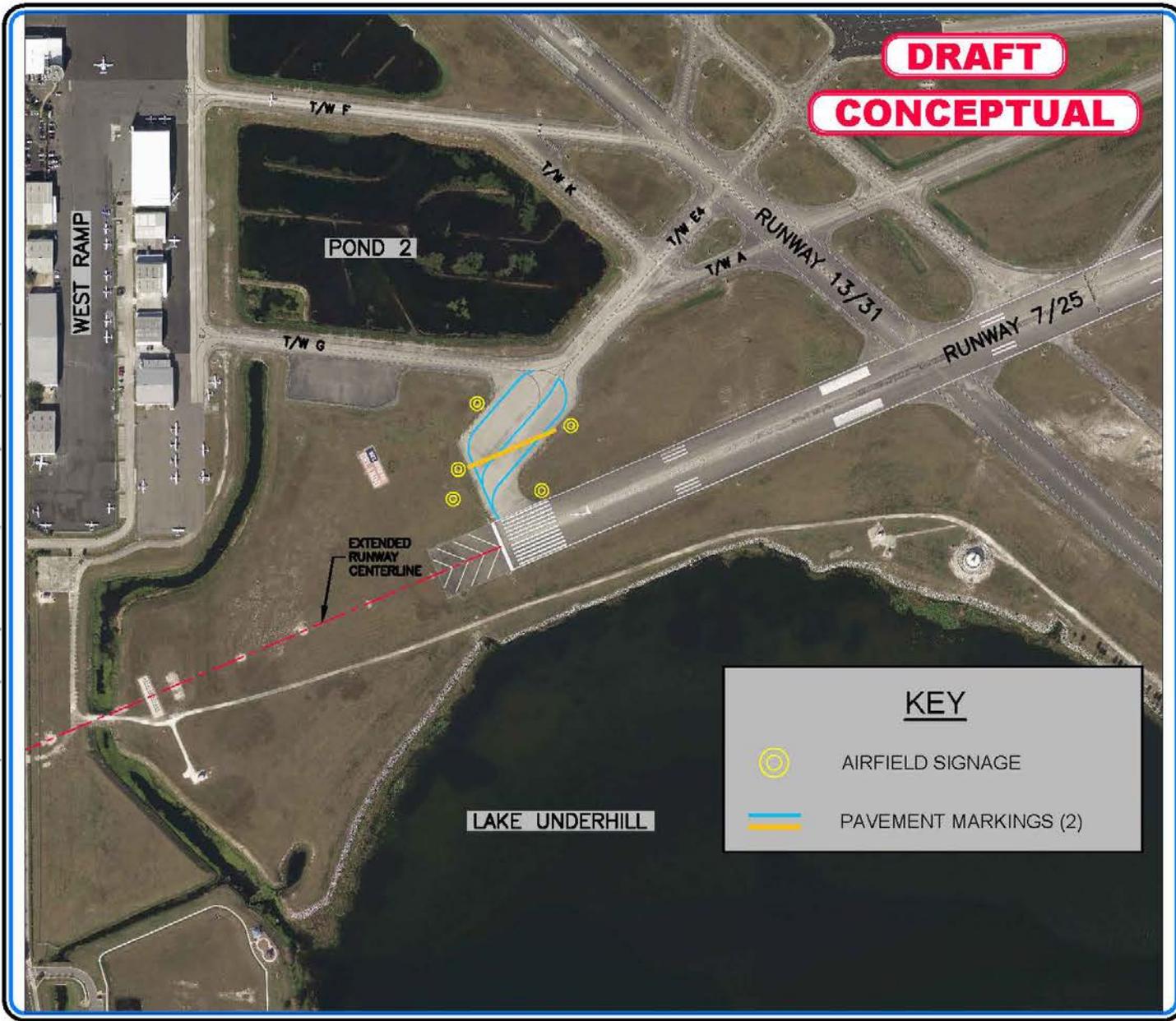
GRAPHIC SCALE IN FEET  
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KEY MAP

NTS

REVISION HISTORY	
DATE	CHANGE
7/09/16	LAST REVISED
6/27/15	INITIAL SET

REFERENCE INFO	
PROJECT NO.:	P-6032
REQUESTED BY:	MH
DRAWN BY:	KA
CHECKED BY:	MH
DATE CREATED:	6/24/2015



**DRAFT  
CONCEPTUAL**

**KEY**

-  AIRFIELD SIGNAGE
-  PAVEMENT MARKINGS (2)

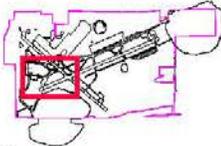
 GREATER ORLANDO AVIATION AUTHORITY  
 \*\*ORL\*\*  
**ORLANDO EXECUTIVE AIRPORT**  
 GOAA  
 PLANNING & ENGINEERING

TITLE

**FAA RUNWAY INCURSION MITIGATION (RIM) PROGRAM ALTERNATIVE #3: PILOT/AIRMEN CONTINUING EDUCATION**

  
 GRAPHIC SCALE IN FEET  
 0 200 400

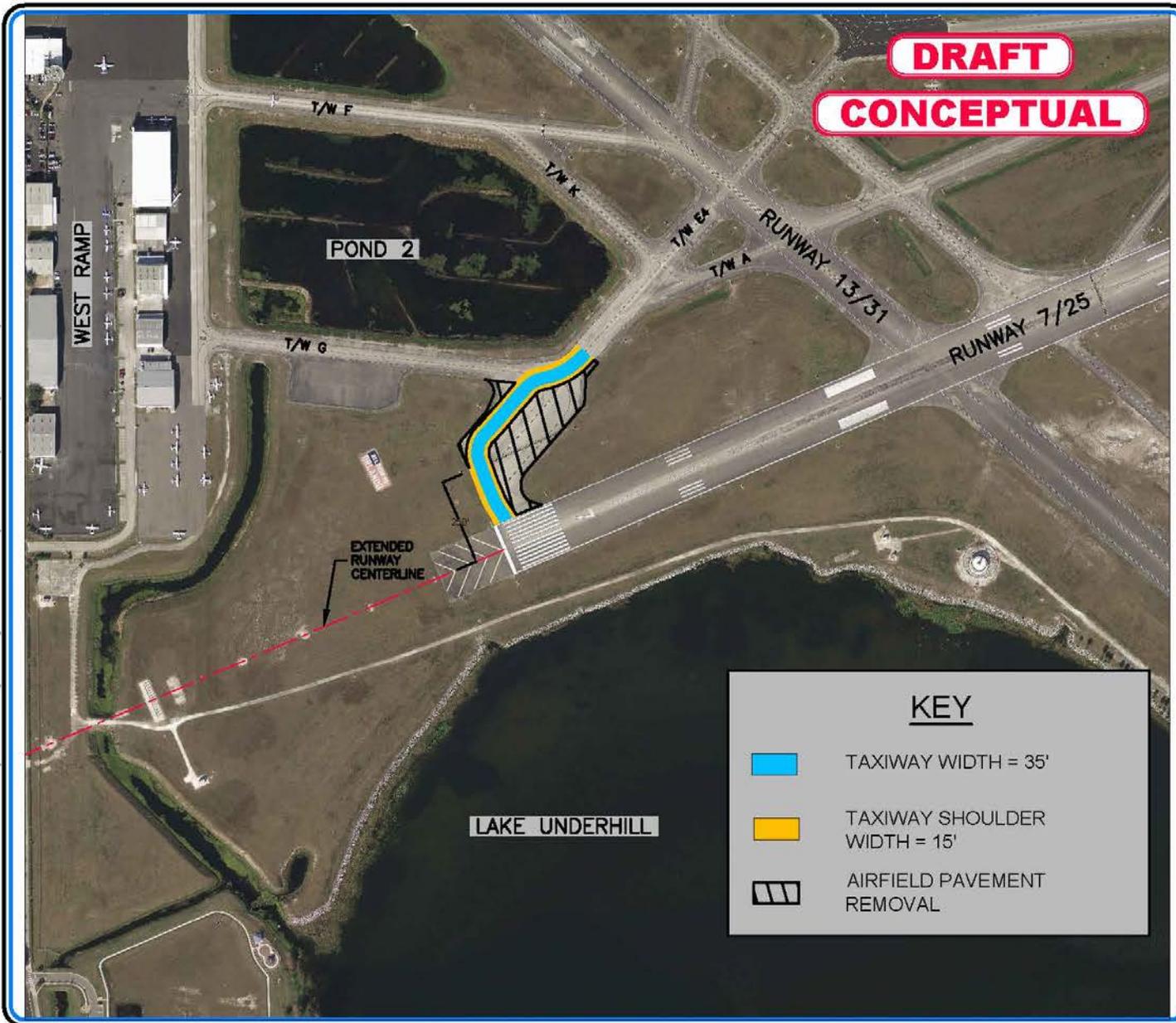
KEY MAP



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6/27/15	INITIAL SET

REFERENCE INFO	
PROJECT NO.:	P-6032
REQUESTED BY:	MH
DRAWN BY:	KA
CHECKED BY:	MH
DATE CREATED:	6/24/2015



**DRAFT**  
**CONCEPTUAL**

**KEY**

- TAXIWAY WIDTH = 35'
- TAXIWAY SHOULDER WIDTH = 15'
- AIRFIELD PAVEMENT REMOVAL

GREATER ORLANDO AVIATION AUTHORITY

\*\*ORL\*\*  
ORLANDO EXECUTIVE AIRPORT  
GOAA

PLANNING & ENGINEERING

---

TITLE

FAA RUNWAY INCURSION MITIGATION (RIM) PROGRAM  
ALTERNATIVE #4:  
TAXIWAY E4 PAVEMENT MODIFICATIONS

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GRAPHIC SCALE IN FEET

0      200      400

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KEY MAP

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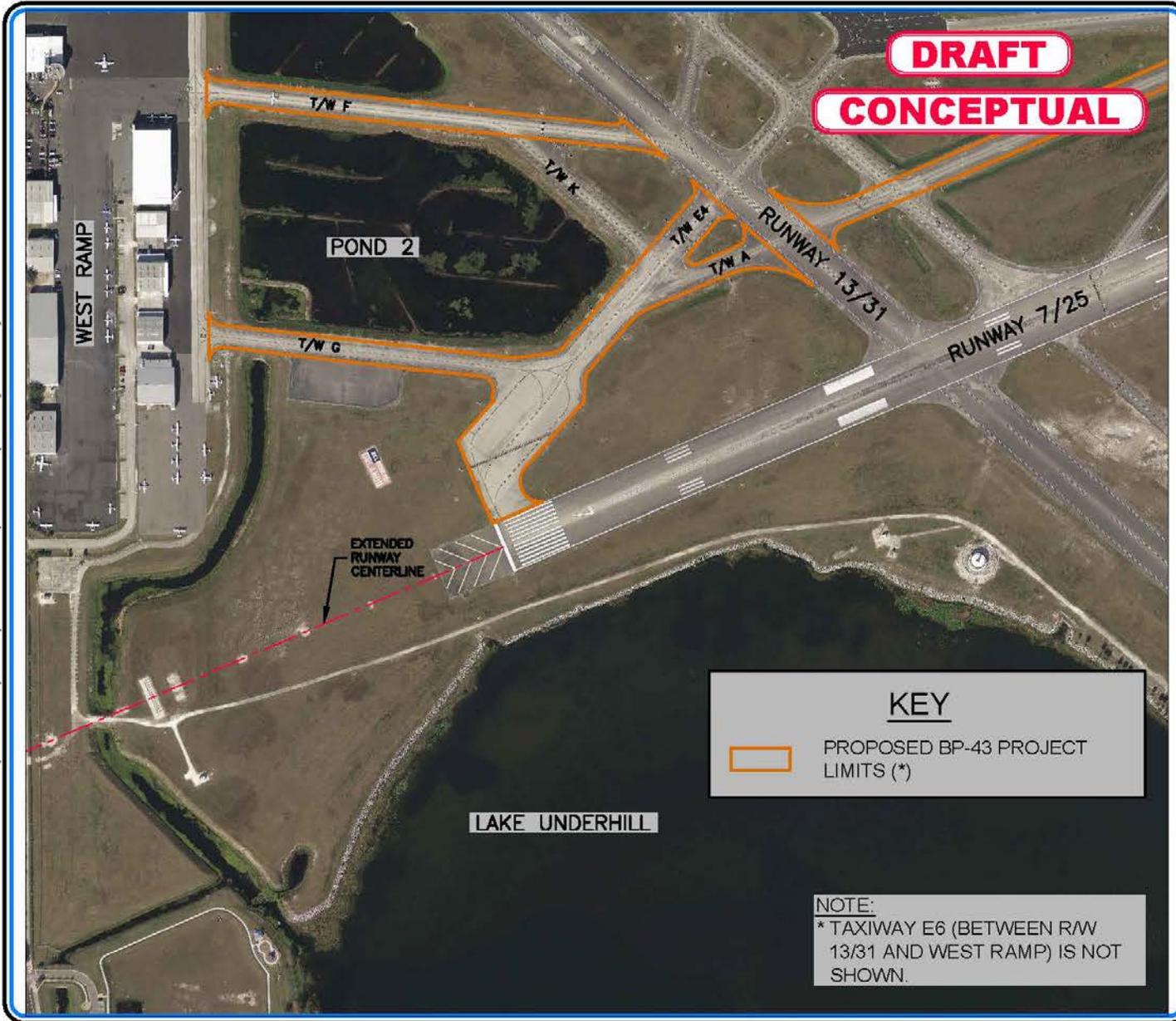
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REVISION HISTORY	
DATE	CHANGE
7/09/16	LAST REVISED
6/27/15	INITIAL SET

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REFERENCE INFO

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REQUESTED BY:	MH
DRAWN BY:	KA
CHECKED BY:	MH
DATE CREATED:	6/24/2016
SHEET NO.	4 OF 8



**DRAFT**  
**CONCEPTUAL**

**KEY**

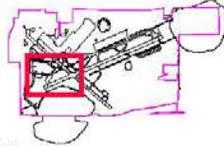
 PROPOSED BP-43 PROJECT LIMITS (\*)

**NOTE:**  
\* TAXIWAY E6 (BETWEEN RW 13/31 AND WEST RAMP) IS NOT SHOWN.

GREATER ORLANDO AVIATION AUTHORITY  
 \*\*ORL\*\*  
**ORLANDO EXECUTIVE AIRPORT**  
 GOAA  
 PLANNING & ENGINEERING

TITLE  
**FAA RUNWAY INCURSION MITIGATION (RIM) PROGRAM ALTERNATIVE #5: BP-43 AIRFIELD PAVEMENT REHABILITATION**

GRAPHIC SCALE IN FEET  
 0 200 400

KEY MAP  


NTS

REVISION HISTORY	
DATE	CHANGE
7/09/15	LAST REVISED
6/27/15	INITIAL SET

REFERENCE INFO

PROJECT NO.:	P-6032
REQUESTED BY:	MH
DRAWN BY:	KA
CHECKED BY:	MH
DATE CREATED:	6/24/2015
SHEET NO.	

**5 OF 8**



**DRAFT**  
**CONCEPTUAL**

**KEY**

	TAXIWAY WIDTH = 35'
	TAXIWAY SHOULDER WIDTH = 15'
	PORTION OF EXISTING DRAINAGE POND TO BE FILLED

GREATER ORLANDO  
AVIATION AUTHORITY

\*\*ORL\*\*  
**ORLANDO  
EXECUTIVE  
AIRPORT**  
GOAA

PLANNING & ENGINEERING

TITLE

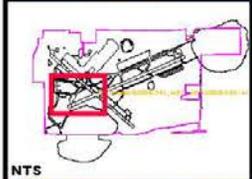
**FAA RUNWAY  
INCURSION MITIGATION  
(RIM) PROGRAM  
ALTERNATIVE #6:  
TAXIWAY A  
EXTENSION**

N  
W E  
S

GRAPHIC SCALE IN FEET

0 200 400

KEY MAP



REVISION HISTORY

DATE	CHANGE
7/09/16	LAST REVISED
6/27/16	INITIAL SET

REFERENCE INFO

PROJECT NO.:	P-6032
REQUESTED BY:	MH
DRAWN BY:	KA
CHECKED BY:	MH
DATE CREATED:	6/24/2016
SHEET NO.	



**DRAFT**  
**CONCEPTUAL**

**KEY**

	TAXIWAY WIDTH = 35'
	TAXIWAY SHOULDER WIDTH = 15'



**\*\*ORL\*\***  
**ORLANDO**  
**EXECUTIVE**  
**AIRPORT**  
**GOAA**

PLANNING & ENGINEERING

TITLE

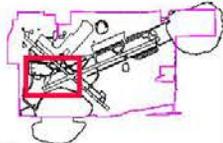
**FAA RUNWAY**  
**INCURSION MITIGATION**  
**(RIM) PROGRAM**  
**ALTERNATIVE #7:**  
**REALIGNMENT OF**  
**TAXIWAY A**



GRAPHIC SCALE IN FEET

0 200 400

KEY MAP



NTS

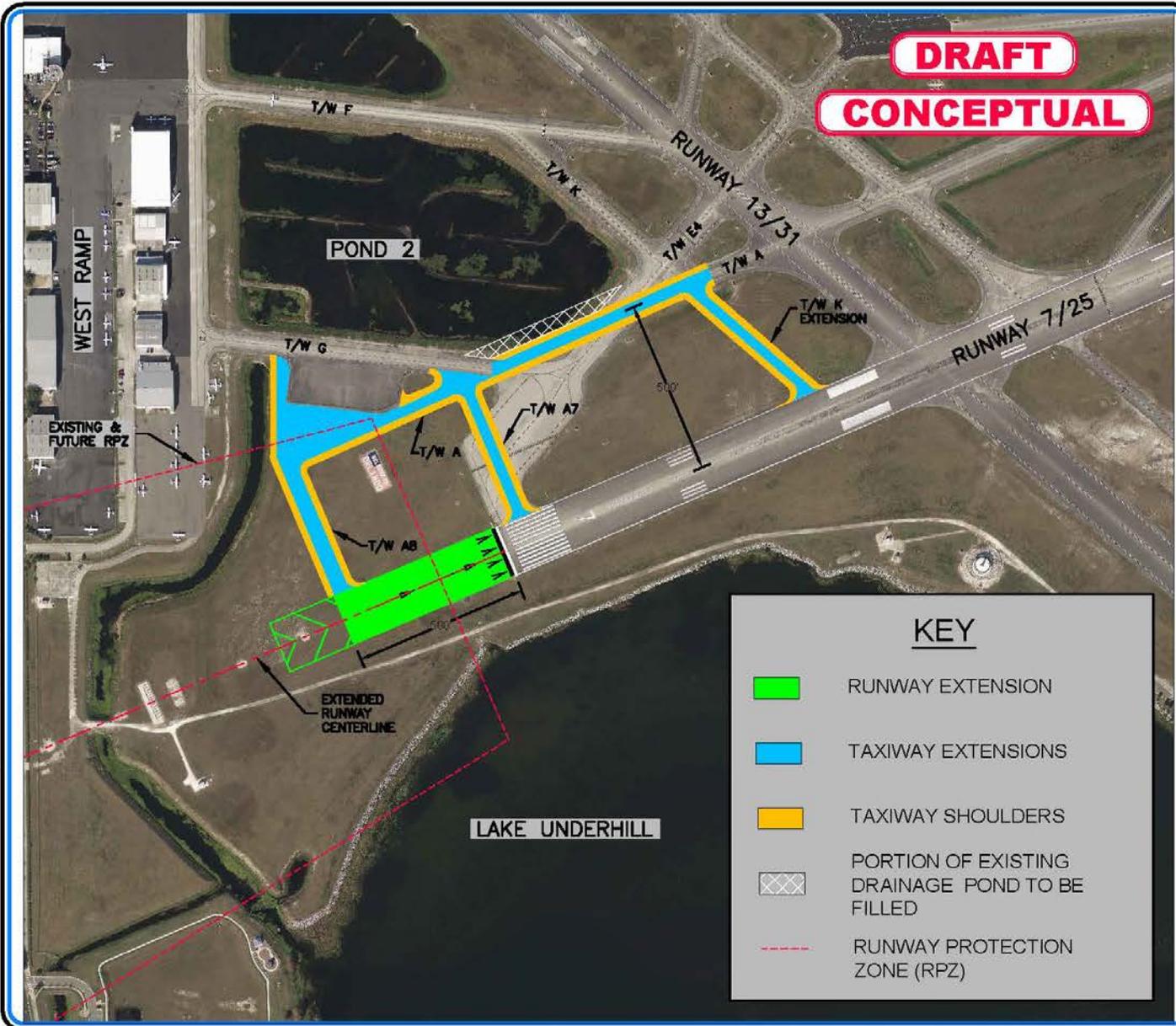
REVISION HISTORY

DATE	CHANGE
7/09/15	LAST REVISED
6/27/15	INITIAL SET

REFERENCE INFO

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CHECKED BY:	MH
DATE CREATED:	6/24/2015
SHEET NO.	

**DRAFT**  
**CONCEPTUAL**



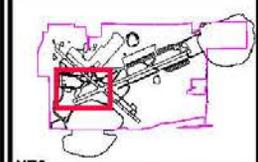
**KEY**

- RUNWAY EXTENSION
- TAXIWAY EXTENSIONS
- TAXIWAY SHOULDERS
- PORTION OF EXISTING DRAINAGE POND TO BE FILLED
- RUNWAY PROTECTION ZONE (RPZ)

GREATER ORLANDO AVIATION AUTHORITY  
 \*\* ORL \*\*  
 ORLANDO EXECUTIVE AIRPORT  
 GOAA  
 PLANNING & ENGINEERING

TITLE  
**FAA RUNWAY INCURSION MITIGATION (RIM) PROGRAM ALTERNATIVE #8: RUNWAY 7 & TAXIWAY A EXTENSIONS (2003 ORL ALP)**

N  
W E  
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 GRAPHIC SCALE IN FEET  
 0 200 400  
 KEY MAP



NTS

REVISION HISTORY	
DATE	CHANGE
7/09/15	LAST REVISED
6/27/15	INITIAL SET

REFERENCE INFO	
PROJECT NO.:	P-6032
REQUESTED BY:	MH
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CHECKED BY:	MH
DATE CREATED:	6/24/2015

## **Appendix C:**

### **Airfield Alternatives Summary Comparison Matrix (Figure 6)**

**AIRFIELD ALTERNATIVES ANALYSIS SUMMARY  
 FAA RUNWAY INCURSION MITIGATION (RIM) PROGRAM  
 ORLANDO EXECUTIVE AIRPORT (ORL)**

Updated 8/11/15

Alternative #	Alternative Title	Exhibit #	Project Description	Benefits/Other Issue(s)	Construction Project Duration	Total Project Cost	Comments:
1	No Action / Existing Conditions	1 of 8, 1A of 8	No change	<ul style="list-style-type: none"> <li>No cost.</li> <li>Preservation of three aircraft run-up/queuing lines on Taxiway E4 and maintains nearby Taxiway G Hold Pad.</li> <li>Current FAA "Hot Spot" locations (3) @ORL. Nearby Hot Spot "HS 1" designated at intersection of Taxiways A, E4 &amp; K.</li> </ul>	-	\$0	
2	Airfield Marking & Signage Enhancements	2 of 8	Installation of additional airfield pavement marking and signage (similar to those available at Runway 13/ Taxiway E6 intersection): <ul style="list-style-type: none"> <li>Red &amp; White "Checkerboard Box" Striping and Yellow &amp; Black "Do Not Enter" markings.</li> <li>Enhanced Taxiway Centerline Markings</li> <li>Pilot Informational Signage</li> </ul>	<ul style="list-style-type: none"> <li>Low cost.</li> <li>Preserves three aircraft run-up/queuing lines on Taxiway E4 and maintains nearby Taxiway G Hold Pad.</li> <li>For nonstandard items, a Modification of Standards (MoS) Application may need to be submitted for FAA review/approval.</li> </ul>	1 month	\$0	<i>Recommended short term alternative</i>
3	Pilot / Airmen Education	3 of 8	Continuation of FAA's ongoing ORL Runway Action Safety Team (RAST) along with implementation of some/all of Alternative #2.	<ul style="list-style-type: none"> <li>Low cost.</li> <li>Preservation of three aircraft run-up/queuing lines on Taxiway E4 and nearby Taxiway G Hold Pad.</li> <li>A FAA Runway Safety Action Team (RAST) was established for ORL in 1998.</li> </ul>	Continuous	\$0	<i>To be conducted with Alternative 2</i>
4	Taxiway E4 Pavement Modifications	4 of 8	<ul style="list-style-type: none"> <li>Reduction in Taxiway E4 width (from 72'/114'/196' to 35'±).</li> <li>Removal of excess airfield pavement</li> </ul>	<ul style="list-style-type: none"> <li>For Runway 7 departures, potential aircraft congestion on Taxiways A, E4, and G.</li> <li>Reduction of aircraft run-up/queuing lines (from three to one) on Taxiway E4. Aircraft run-up activity will likely shift to Taxiway G Hold Pad.</li> </ul>	1 month	\$255,000	
5	BP-43 Airfield Pavement Rehabilitation	5 of 8	Upcoming rehabilitation of several West Airfield taxiways & taxiway segments.	<ul style="list-style-type: none"> <li>Preliminary BP-43 project scope includes mill/overlay of Taxiways F, G, and portions of A, E4 &amp; E6.</li> <li>Proposed ORL ALP Update planning project should identify any major airfield geometry issues (based on FAA AC 150/5300-13A) and this study is to include updated project cost estimates.</li> <li>Potential update to BP-43 project scope based on FDOT's 2015 ORL Airfield Pavement Ten Year Major Rehabilitation Report.</li> </ul>	2 years	\$10,333,000	
6	Taxiway A Extension	6 of 8	Airfield capacity enhancements: <ul style="list-style-type: none"> <li>Extension of Taxiway A (provides full parallel to Runway 7/25)</li> <li>Construction new taxiway connector (A7)</li> <li>Removal of Taxiway E4 pavement section</li> </ul>	<ul style="list-style-type: none"> <li>Taxiway A extension is located 500' ± from Runway 7/25 centerline. Construction of new taxiway connector A7 (to existing Runway 7 end). Both of these items are consistent with the FAA approved ORL ALP.</li> <li>Requires a portion of South Pond #2 to be filled in.</li> <li>Aircraft run-up activity will likely shift to Taxiway G Hold Pad.</li> <li>This project is potentially subject to FAA NEPA environmental review and approval.</li> </ul>	3 months	\$1,232,000	
7	Realignment of Taxiway A	7 of 8	Airfield capacity enhancements: <i>(planning derivative of 2003 ORL ALP)</i> <ul style="list-style-type: none"> <li>Extension of Taxiway A (provides full parallel to Runway 7/25)</li> <li>Construction of new taxiway connector (A7)</li> <li>Modifications to Taxiway A, E4, and K intersection.</li> <li>Removal of Taxiway E4 pavement section.</li> </ul>	<ul style="list-style-type: none"> <li>Taxiway A extension is located 400' ± from Runway 7/25 centerline. Construction of new taxiway connector A7 (to existing Runway 7 end).</li> <li>South Pond #2 is preserved and does not to be filled in.</li> <li>Aircraft run-up activity will likely shift to Taxiway G Hold Pad.</li> </ul>	3 months	\$1,365,000	<i>Recommended for further evaluation</i>
8	Runway 7 and Taxiway A Extensions (2003 ORL ALP)	8 of 8	Long term airfield capacity related improvements: <i>(from 2003 FAA approved ORL ALP)</i> <ul style="list-style-type: none"> <li>500' runway extension (future displaced threshold)</li> <li>Extensions of Taxiways A (provides full parallel to Runway 7/25) and K</li> <li>Construction of new taxiway connectors (A7 &amp; A8)</li> <li>Removal of Taxiway E4 pavement section</li> </ul>	<ul style="list-style-type: none"> <li>High project cost.</li> <li>Requires a portion of South Pond #2 to be filled in.</li> <li>Potential modifications to FAA's MALSR (&amp; ILS) equipment on Runway 7.</li> <li>Aircraft run-up activity will be served by the expanded Taxiway G Hold Pad.</li> </ul>	TBD	\$13,733,000	<i>Recommended for further evaluation</i>
9	Runway Guard Lights (RGL) - Elevated / In-Pavement	-	Installation of RGL equipment either adjacent to or along the runway holdbar on existing Taxiway E4 (north of Runway 7)	<ul style="list-style-type: none"> <li>Low cost.</li> <li>For nonstandard items, a Modification of Standards (MoS) Application may need to be submitted for FAA review/approval.</li> </ul>	1 month	\$101,000; \$107,000	

**Notes:**

- Above total project costs are based on "Order of Magnitude" cost estimates and do not include environmental planning related costs or regulatory agency permitting fees.
- Costs rounded to nearest \$1,000.
- Estimated construction durations do not include design, permitting, bid/award, contractor mobilization, and project closeout phases.