

## **Appendix B**

# Draft Airport Layout Plan (ALP) Update Narrative Report

(January 2015)

**Final Environmental Assessment and Section 4(f) Determination  
Proposed Improvements 2016-2020 at BWI Marshall Airport**

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# Baltimore/Washington International Thurgood Marshall Airport

## Airport Layout Plan Update Narrative Report

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January 2015



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BWI Marshall Airport Layout Plan Update  
Narrative Report  
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## 1. Introduction

### 1.1. Purpose

Baltimore/Washington International Thurgood Marshall Airport (BWI Marshall or the Airport) completed a Master Plan and Airport Layout Plan (ALP) in 2011. The 2011 Master Plan and ALP identified airfield, terminal, and landside development to accommodate projected increases in future aviation travel demand at BWI Marshall. Due to projects currently under design, and recently completed projects that have occurred at the Airport, the Maryland Aviation Administration (MAA) decided to update the ALP to accurately reflect current conditions as well as changes to the proposed development plan that have transpired since 2011.

The 2015 ALP was developed to depict projects at BWI Marshall in multiple phases. There is a current phase for Approved ALP/Environmental Finding/Construction-In-Progress projects. This In-Progress Phase includes ongoing and/or unconstructed projects that were evaluated under the BWI Marshall Environmental Assessment (EA) for which a Finding of No Significant Impact (FONSI) was issued on April 23, 2012. The remaining phases include Phase 1 (2016-2020), Phase 2 (2021-2025), and Phase 3 (2026-Ultimate). The following narrative report outlines only Phase 1 projects which were not evaluated under the previous EA and are proposed to be completed by 2020. Projects are categorized by airfield, terminal, landside, general aviation, and support facilities. Each project is described in detail including justification as to why the project is needed, other alternatives that were considered, and standards that will be used during design and construction. Additionally, Federal Aviation Regulations (FAR) Part 77 imaginary surfaces, Airport Traffic Control Tower (ATCT) line-of-sight, and navigational aid critical areas were assessed for potential impacts based on the proposed projects. Lastly, a proposed project schedule is documented for each improvement based on construction and potential completion date.

### 1.2. Airport Background

BWI Marshall is owned and operated by the MAA, a modal administration of the Maryland Department of Transportation. BWI Marshall is located nine miles south of Baltimore and 32 miles north of Washington, D.C.

Enplaned passengers continue to increase at BWI Marshall; from 1990 to 2010, there was an average annual growth rate of 3.80 percent. Total enplaned passengers are forecasted to grow from the 2012 actual count of 11,370,372 to over 16.6 million in 2030, an average annual increase of 2.30 percent.

The following section provides a summary of the demand forecast projected at BWI Marshall which helps to justify the need for several projects to be completed by 2020.

## 2. Demand Forecast

### 2.1. Background

In order to accurately develop alternatives to accommodate forecasted airport activities, the 2011 Master Plan presented a forecast of aviation demand for BWI Marshall for the years 2010, 2015, 2020, 2025, and 2030. Activity levels were projected for passenger enplanements, aircraft operations, and air cargo volumes. In light of the 2015 ALP update, MAA adopted the Federal Aviation Administration (FAA) Terminal Area Forecast (TAF) projections. The January 2013 TAF projects forecasts for years 2013 through 2040 (See Appendix A for the complete table of the BWI Marshall TAF). For purposes of the 2015 ALP Update, MAA has accepted the TAF forecast estimates through 2030.

The actual passenger enplanements and aircraft operations data from 2012 as well as the FAA TAF forecasts for years 2015, 2020, 2025, and 2030 are outlined in the following table:

Table 1: Forecasts of Total Enplanements and Total Operations

	YEAR	TOTAL ENPLANEMENTS	TOTAL AIRCRAFT OPERATIONS
Actual	2012	11,370,372	268,186
Forecast	2015	10,867,752	270,262
	2020	12,570,031	297,414
	2025	14,459,505	325,344
	2030	16,635,263	357,103

Sources:

BWI Marshall Monthly Statistical Report for December 2012

FAA TAF, January 2013

The forecast for passenger enplanements and total aircraft operations through 2030 provides an indicator of projects that are necessary to ensure that BWI Marshall is sufficiently prepared to accommodate demand, meet FAA design and safety standards, and contribute to an overall improved Airport through 2030.

### 2.2. Based Aircraft Forecasts

The 2013 FAA TAF indicates the following based aircraft forecasts:

Table 2: Forecasts of Based Aircraft

	YEAR	FAA TAF				
		SINGLE ENGINE	MULTI ENGINE	JET	HELICOPTER	TOTAL
Actual	2012	50	13	10	0	73
Forecast	2015	57	13	12	0	82
	2020	66	13	15	0	94
	2025	76	13	19	0	108
	2030	89	13	24	0	126

Sources:  
 FAA TAF, January 2013

### 2.3. Enplanements Forecasts

Passenger enplanement forecasts are considered to be the most critical of aviation demand forecasts considering that aircraft operations are essentially derived from determining passenger enplanement counts. The passenger enplanement forecast for BWI Marshall in accordance with the 2013 FAA TAF shows an increase in total enplanements from 2015 to 2020 at an average annual increase of 2.95 percent. Passenger enplanements are forecast to grow from just under 10.9 million in 2015 to over 16.6 million in 2030. The growth is anticipated to average 2.88 percent annually over the fifteen-year period. The table below outlines the 2012 actual enplanements as well as forecast enplanements at BWI Marshall:

Table 3: Forecasts of Total Enplanements

	YEAR	AIR CARRIER	COMMUTER	TOTAL ENPLANEMENTS
Actual	2012	11,276,028	94,344	11,370,372
Forecast	2015	10,396,869	470,883	10,867,752
	2020	12,053,701	516,330	12,570,031
	2025	13,897,768	561,737	14,459,505
	2030	16,024,126	611,137	16,635,263

Sources:  
 BWI Marshall Monthly Statistical Report for December 2012  
 FAA TAF, January 2013

### 2.4. Operations Forecasts

Aircraft operations consist of aircraft take-offs and landings. The following table shows the operations forecasts for BWI Marshall in accordance with the 2013 FAA TAF. Total operations are expected to have annual average growth of 1.60 percent from 2012 through 2030. Operations are anticipated to decrease in the near-term at an average annual percentage rate of -0.20 through 2015, and then increase at an annual rate of 1.87 percent from 2015 through 2030.

Table 4: Forecasts of Total Operations

	YEAR	ITINERANT COMMERCIAL AIR CARRIERS	ITINERANT GA	ITINERANT MILITARY	TOTAL ITINERANT	TOTAL LOCAL OPS	TOTAL AIRCRAFT OPS
Actual	2012	251,334	15,610	998	267,942	244	268,186
Forecast	2015	253,867	15,167	960	269,994	268	270,262
	2020	280,179	16,007	960	297,146	268	297,414
	2025	307,225	16,891	960	325,076	268	325,344
	2030	338,049	17,826	960	356,835	268	357,103

Sources:

BWI Marshall Monthly Statistical Report for December 2012

FAA TAF, January 2013

## 2.5. Annual Instrument Approaches

Annual instrument approach data for BWI Marshall is not readily available. Alternatively, Instrument Flight Rules (IFR) operations are presented below:

Table 5: IFR Operations

DATE	IFR ITINERANT					IFR OVERFLIGHT				
	AIR CARRIER	AIR TAXI	GA	MILITARY	TOTAL	AIR CARRIER	AIR TAXI	GA	MILITARY	TOTAL
2010	211,054	41,855	15,067	597	268,573	408	95	518	17	1,038
2011	218,771	39,648	13,853	636	272,908	352	106	429	37	924
2012	210,818	40,179	12,914	736	264,647	258	68	398	13	737
2013	206,901	34,454	12,517	786	254,658	282	88	316	12	698

Source:

FAA Air Traffic Activity System (ATADS), 2014

## 2.6. Forecast Summary

As depicted above, total annual passenger enplanements are projected to increase from more than 11.3 million in 2012 to over 16.6 million by 2030. Total aircraft operations are forecast to increase from 268,186 in 2012 to 357,103 in 2030. Given that BWI Marshall is projected to see a growth in enplanements and annual aircraft takeoffs and landings through the forecast period, the Phase 1 projects outlined in Section 7 have been deemed necessary for implementation by 2020.

## 2.7. Critical Aircraft

FAA Design standards are based on the critical aircraft operating at the airport, which is the most demanding aircraft that performs at least 500 annual operations at the airport. The 2011 Master Plan Technical Report completed by Landrum & Brown indicated that the critical aircraft at BWI Marshall is the Boeing 777-200, which has an Airport Reference Code (ARC) of D-V. ARC D-V includes aircraft with approach speeds of 141 knots or more but less than 166 knots, tail heights of 60 feet up to 66 feet, and wingspans of 171 feet up to 214 feet.

The Boeing 777-200 is operated primarily by international air carriers, as described in the 2011 Master Plan Technical Report. It specifically states that *“Group V aircraft are expected to account for 18 percent of international passenger operations by 2030, up from one percent in 2006. Next generation aircraft such as the Boeing 777 and 787 are expected to make up the bulk of the Group V aircraft.”*

Regarding Boeing 777-200 operations, BWI Marshall reported that there were 74 operations in 2012 and 198 operations in 2013. In addition, the following table was extracted from the international passenger fleet mix in the 2011 Master Plan.

Table 6: Boeing 777 – Projected Operations

YEAR	FLIGHTS (IN+OUT)
2010	51
2015	722
2020	767
2025	797
2030	879

Source:  
 Landrum & Brown, 2011

While the existing and future critical aircraft is the Boeing 777-200, there is the possibility that the Boeing 747-400 will become the critical aircraft in the future again. Airport records show that the Boeing 747-400 had 324 operations in 2012 and 304 operations through December 17, 2013 with at least 20 more operations scheduled for the year. Although the operations levels of the current critical aircraft are in line with the forecast, growing from 74 operations in 2012 to near 200 operations by the end of December 2013, the amount of Boeing 747-400 operations in 2012 and 2013 is significantly higher than the current critical aircraft operations. However the growth rate of the Boeing 747-400 operations between 2012 and 2013 is flat. MAA will continue to monitor the operations levels of both aircraft and may consider adopting the Boeing 747-400 aircraft as the critical aircraft again should operations levels increase and outpace the forecasted Boeing 777-200 actual and forecasted operations.

Along with the ARC, FAA AC 150/5300-13A describes the Runway Design Code (RDC) as providing information needed to determine when design standards apply to specific runways as opposed to the airport as a whole. The RDC is composed of the Aircraft Approach Category (AAC), the Airplane Design Group (ADG) and approach visibility minimums. The first two components are the same as with the ARC, but the third component expresses the visibility minimums in runway visual range (RVR) values of 1200 (lower than ¼ mile visibility), 1600 (lower than ½ mile but not lower than ¼ mile visibility), 2400 (lower than ¾ mile but not lower than ½ mile visibility), or 4000 (lower than 1 mile but not lower than ¾ mile visibility). Furthermore, FAA AC 150/5300-13A describes the Runway Reference Code (RRC) as providing the current operational capabilities of a runway where no special operating procedures are necessary. The RDC is based solely on planned development whereas the RRC has an operational application. The RDC and RRC for each runway at BWI Marshall are shown below.

Table 7: Runway Design Codes by Runway

RUNWAY	CRITICAL AIRCRAFT	EXISTING RDC	FUTURE RDC	EXISTING RRC	FUTURE RRC
10	777-200	D-V-600	SAME	D-V-1600	SAME
28	777-200	D-V-2400	SAME	D-V-2400	SAME
15R	777-200	D-V-1800	D-V-1200	D-V-2400	SAME
33L	777-200	D-V-1800	D-V-1200	D-V-2400	D-V-1600
15L	DASH 8	B-III-5000	SAME	B-III-5000	SAME
33R	DASH 8	B-III-4000	SAME	B-III-4000	B-III-4000
Future 10R	777-200	N/A	D-V	N/A	D-V-2400
Future 28L	777-200	N/A	D-V	N/A	D-V-2400

Sources:

ALP Set – Data Sheet, January 2015

FAA AC 150/5300-13A

### 3. Wind Coverage

Data was obtained from National Oceanic and Atmospheric Administration (NOAA) for a period of 20 consecutive years (1984 – 2003) to analyze wind coverage at BWI Marshall. Percent runway usage was taken into consideration for both 16 and 20 knot crosswinds. Wind coverage for both Visual Flight Rules (VFR) and IFR is shown below.

Table 8: Wind Coverage (Percent)

RUNWAY	VFR	IFR
10-28	99.95	99.96
15R-33L	99.91	99.84
15L-33R	99.35	98.88
4-22	97.88	99.49
COMBINED (EXISTING)	100.00	100.00
COMBINED (WITHOUT 4-22)	99.99	99.99

Sources:

NOAA, National Weather Service

Location of observation equipment: Baltimore, MD

Period: 1984 – 2003, 20 consecutive years

Data obtained from Earth Info, Inc., Denver, CO

As provided by the National Climatic Data Center, Asheville, NC

Number of observations: 175,320

#### 4. Near-Term and Future Approach Procedure Requirements

Based on the ALP's proposed development, there will be several new near-term and future approach procedure requirements. During the In-Progress Phase, there will be a 700-foot threshold displacement of Runway 28 which will shift the approach surface to the west by an additional 200 feet. In Phase 2, Runway 33L will be extended 1,000 feet which will shift the approach surface to the southeast by 1,000 feet. In addition to these shifts, there will be new approaches implemented for future Runway 10R-28L (Phase 3). It is proposed that both runway ends have VOR, GPS, and CAT II ILS approaches with ½ mile visibility. Since both runway ends will have precision approaches, the applicable approach surface dimensions include a length of 50,000'; inner width of 1,000'; outer width of 16,000'; and approach slope of 50:1 for the first 10,000' and 40:1 for the remaining 40,000'.

#### 5. Modifications of Standards

Modifications of Standards are described in FAA Order 5300.1F, *Modifications to Agency Airport Design, Construction, and Equipment Standards*. According to the Order, "Modifications to standards means any change to FAA standards, other than dimensional standards for runway safety areas, applicable to an airport design, construction, or equipment procurement project that results in lower costs, greater efficiency, or is necessary to accommodate an unusual local condition on a specific project, when adopted on a case-by-case basis." Requests for Modifications of Standards are submitted to the appropriate FAA Airports Regional or District Offices and are approved by either Regional Division Managers or Headquarters, based on the specific requests. The following table shows all Modifications of Standards for BWI Marshall.

Table 9: Modifications of Design Standards

NO	DESCRIPTION	FAA STANDARDS	EXISTING CONDITIONS	PROPOSED ACTION	DATE APPROVED
17	T/W B (FUTURE) & T/W S, NEAR T/W N: SLOPE ON INTERIM RON APRON	1.0 % MAX SLOPE ON AIRCRAFT APRONS	1.1 % SLOPE	TEMPORARY RON APRON TO BE CONVERTED TO A T/W IN PHASE 2	6/10/2002
18	R/W 15L-33R TO HELIPAD SEPARATION	500' CL TO CL	485' SEPARATION	TO BE RELOCATED IN PHASE 1	
19	R/W 28: 500 GAL FUEL TANK IN RPZ	NO FUEL STORAGE IN RPZ	FAA EMERGENCY GENERATOR FUEL TANK WITHIN RPZ	TO BE RELOCATED	
21	T/L W FILLET AT T/W F	GROUP III: 50' W, 100' CL RADIUS, 55' FILLET	50' W, 75' CL RADIUS, 60' FILLET	TO BE WIDENED IN PHASE 2	
40	R/W 10-28 TO T/W R SEPARATION = 400'	502'	400'	TO BE RELOCATED IN PHASE 1	
6	R/W 10-28: PROFILE LINE-OF-SIGHT	R/W PROFILE LOS - 5' ABOVE R/2	LOS RESTRICTED IN EASTERN 2,400', & 1,000' SECTION WEST OF R/W 4-22	FULL PARALLEL T/W IN PHASE 1; MOS REQUESTED	9/28/2010
15	TEMPORARY RON APRON: T/W B & T/W S: CL GRADE DIFFERENCE	1.5 % MAX	1.8 %	CONNECTING T/W NOT REQUIRED; MOS REQUESTED	9/28/2010
16	T/W S NEAR T/W N: T/W OFA	TOFA CLEAR OF PENETRATIONS	SLIGHT GROUND PENETRATION	MOS REQUESTED	9/28/2010
23	T/W A & T/W P CENTERLINE SEPARATION	GROUP V SEPARATION = 267'	245' (GROUP IV TO GROUP V)	MOS REQUESTED	9/28/2010
24	T/W A & T/W P: CL GRADE DIFFERENCE	1.5 % MAX	4.24 %	CONNECTING T/W NOT REQUIRED; MOS REQUESTED	9/28/2010
25	T/W P OFA OF 125' (MIN)	160' TOFA	GROUND PENETRATION OF TOFA	MOS REQUESTED	9/28/2010
26	CONCOURSE A&B: APRON GRADE ADJACENT TO BUILDING	1.0 % MAX GRADE	5.0 % MAX IN GSE AREA ONLY. ALL GRADES IN AIRCRAFT AREA MEET STANDARDS	MOS REQUESTED	9/28/2010
27	T/W A & P INTERSECTIONS WITH T/W'S F & H: T/W RADIUS	150' RADIUS	122.5' RADIUS TO ALLOW CENTERLINE TRACKING FOR 180 DEGREE TURN	ADEQUATE SAFETY MARGIN PROVIDED PER STANDARD; MOS REQUESTED	9/28/2010
A	R/W 10-28 CL LIGHTS	CL LIGHTS OFFSET 2.5'	3.5'	MOS REQUESTED	8/7/2012
B	T/W A DESIGN GROUP	AIRPORT ARC IS D-V	DESIGN GROUP IV BETWEEN T/W S & R/W 15R	DESIGN GROUP IV BETWEEN T/W P (OLD R/W 4-22) & R/W 15R; MOS REQUESTED	11/3/2010
C	R/W 10-28/ T/W P SEPARATION	502'	400'	T/W'S U AND R TO BE RELOCATED TO 502'; T/W P TO REMAIN AT 400'; MOS REQUESTED	9/28/2010
D	R/W 15R-33L/ T/W P SEPARATION	502'	399'	TO BE RELOCATED TO 402'; MOS REQUESTED	9/28/2010
E	T/W B & T/W S: CL GRADE DIFFERENCE	1.5 % MAX	2.8 %	CONNECTING T/W NOT REQUIRED; MOS REQUESTED	9/28/2010
F	TEMPORARY LEAD-OFF LINE MARKING FROM R/W 10 TO R/W 4	USE OF RUNWAY AS TAXIWAY NOT RECOMMENDED	R/W 4-22 IS USED AS T/W	INSTALL TEMPORARY T/W LEAD-OFF LINES FROM R/W 10 TO R/W 4; MOS REQUESTED (MAY 2011)	RETIRED 8/6/14
G	USE OF RUNWAY AS A TAXIWAY	USE OF RUNWAY AS TAXIWAY NOT RECOMMENDED	R/W 4-22 IS USED AS T/W	USE OF R/W 4 AS EXIT T/W FOR R/W 15R; MOS REQUESTED (SEPT 2011)	RETIRED 8/6/14
H	R/W 15L GLIDE SLOPE SITING	UNLESS DEEMED BY FAA TO BE FIXED-BY-FUNCTION, NAVAIDS NOT PERMITTED IN ROFA	15L GLIDE SLOPE LOCATED IN ROFA	TO BE RELOCATED IN PHASE 3	CANCELED 10/16/2014
I	R/W 33R GLIDE SLOPE SITING	UNLESS DEEMED BY FAA TO BE FIXED-BY-FUNCTION, NAVAIDS NOT PERMITTED IN ROFA	33R GLIDE SLOPE LOCATED IN ROFA	TO BE RELOCATED IN PHASE 3	CANCELED 10/16/14
J	R/W 15R-33L LINE-OF-SIGHT (LOS)	ANY TWO POINTS 5' ABOVE R/W CL SHOULD BE MUTUALLY VISIBLE THE ENTIRE LENGTH OF R/W	R/W PROFILE HAS HIGH POINT IN MIDDLE WHICH LIMITS LOS TO LESS THAN 1/2 R/W LENGTH ON SOUTH END	MOS REQUESTED	11/9/2011
K	R/W 33L BLAST PAD DIMENSIONS	GROUP V DIMENSIONS = 400' LONG BY 220' WIDE	200' LONG BY 220' WIDE	TEMPORARY MOS REQUESTED (FEB 2013)	

NOTE: NUMBERING SYSTEM IS BASED ON PREVIOUS APPROVED ALP DATED FEBRUARY 2011

Source:  
 ALP Set – Data Sheet, January 2015



## 6. Declared Distances

According to FAA AC 150/5300-13A, "declared distances represent the maximum distances available and suitable for meeting takeoff, rejected takeoff, and landing distances performance requirements for turbine powered aircraft." Declared distances can be implemented at an airport for a number of reasons, such as obtaining additional Runway Safety Area (RSA), Runway Object Free Area (ROFA), and/or Runway Protection Zone (RPZ) lengths prior to or after the runway's threshold.

There are four distances associated with declared distances: Takeoff Run Available (TORA), Takeoff Distance Available (TODA), Accelerate-Stop Distance Available (ASDA), and Landing Distance Available (LDA). FAA AC 150/5300-13A defines those distances as the following:

TORA – the runway length declared available and suitable for the ground run of an aircraft taking off

TODA – the TORA plus the length of any remaining runway or clearway beyond the far end of the TORA; the full length of TODA may need to be reduced because of obstacles in the departure area

ASDA – the runway plus stopway length declared available and suitable for the acceleration and deceleration of an aircraft aborting a takeoff

LDA – the runway length declared available and suitable for landing an aircraft"

Existing declared distances for BWI Marshall are listed below. Both Runways 10 and 28 have reductions in LDA due to obstructions.

Table 10: Existing Declared Distances

RUNWAY	TORA	TODA	ASDA	LDA
04	DECOMMISSIONED			
22				
10	10,502	10,502	10,502	9,952
28	10,502	10,502	10,502	10,002
15L	5,000	5,000	5,000	5,000
33R	5,000	5,000	5,000	5,000
15R	9,500	9,500	8,600	8,300
33L	9,500	9,500	8,800	8,300

Source:

ALP Set – Data Sheet, January 2015

Declared distances for the In-Progress Phase (2014-2015) are listed below. Declared distances for Runways 10, 15L, and 33R remain unchanged. Runway 28's LDA will be reduced by 200 feet due to the proposed 700-foot threshold displacement. Runways 15R and 33L declared distances were reduced during the RSA compliance projects.

Table 11: In-Progress (2014-2015) Declared Distances

RUNWAY	TORA	TODA	ASDA	LDA
10	10,502	10,502	10,502	9,952
28	10,502	10,502	10,502	9,802
15L	5,000	5,000	5,000	5,000
33R	5,000	5,000	5,000	5,000
15R	9,500	9,500	8,600	8,300
33L	9,500	9,500	8,800	8,300

Source:  
 ALP Set – Data Sheet, January 2015

Declared distances for Phase 1 (2016–2020) are listed below. There are no changes from the In-Progress phase.

Table 12: Phase 1 (2016-2020) Declared Distances

RUNWAY	TORA	TODA	ASDA	LDA
10	10,502	10,502	10,502	9,952
28	10,502	10,502	10,502	9,802
15L	5,000	5,000	5,000	5,000
33R	5,000	5,000	5,000	5,000
15R	9,500	9,500	8,600	8,300
33L	9,500	9,500	8,800	8,300

Source:  
 ALP Set – Data Sheet, January 2015

Declared distances for Phase 2 (2021 – 2025) are listed below. Declared distances for Runways 10, 28, 15L, and 33R remain the same from Phase 1 through Phase 2. All declared distances for Runway 15R and 33L increase due to a runway extension at the 33L end.

Table 13: Phase 2 (2021-2025) Declared Distances

RUNWAY	TORA	TODA	ASDA	LDA
10	10,502	10,502	10,502	9,952
28	10,502	10,502	10,502	9,802
15L	5,000	5,000	5,000	5,000
33R	5,000	5,000	5,000	5,000
15R	10,500	10,500	10,500	10,200
33L	10,500	10,500	9,800	9,800

Source:  
 ALP Set – Data Sheet, January 2015

Declared distances for Phase 3 (2026 – Ultimate) are listed below. Declared distances for Runways 10, 28, 15L, 33R, 15R, and 33L remain the same from Phase 2 through Phase 3. Future Runway 10R-28L will have a length of 9,000 feet and the only decreased distance is the LDA for Runway 10R due to controlling objects to the west of the approach.

Table 14: Phase 3 (2026-Ultimate) Declared Distances

RUNWAY	TORA	TODA	ASDA	LDA
10L	10,502	10,502	10,502	9,952
28R	10,502	10,502	10,502	9,802
FUTURE 10R	9,000	9,000	9,000	8,500
FUTURE 28L	9,000	9,000	9,000	9,000
15L	5,000	5,000	5,000	5,000
33R	5,000	5,000	5,000	5,000
15R	10,500	10,500	10,500	10,200
33L	10,500	10,500	9,800	9,800

Source:  
 ALP Set – Data Sheet, January 2015

## 7. Development Summary

### 7.1. Development Projects Completed Since Last ALP (February 2011)

A significant amount of construction has been completed at BWI Marshall Airport since the last ALP dated February 2011. Each improvement completed is separated below by area (Airside, Terminal, and Landside) of the Airport.

### 7.1.1. Airside

The majority of the improvements on the airside are directly related to the RSA program, pavement rehabilitation, and FAA standards compliance improvements. The following projects were completed since the last ALP update:

#### *Runway 10-28 (Including Runway 15R-33L Intersection)*

The focus of this project was on the Runway 10-28/15R-33L intersection and Runway 10-28 improvements. Both areas included a pavement rehabilitation and reduction in width for Runway 10-28 from 200 to 150 feet in accordance with FAA standards. The existing runway had 12-foot non-standard shoulders. These shoulders and the remaining runway pavement were converted to 35-foot shoulders in accordance with FAA standards. In addition, the fillet geometry was corrected to meet FAA standards for most of the connecting taxiways. Surface grading in the RSA areas at each runway end of 10-28 to comply with FAA standards was included in this project. The localizer for the Runway 28 approach was also relocated outside of the RSA.

#### *Runway 15R-33L Improvements*

The Runway 15R-33L program has been initiated with construction efforts and the primary earthwork associated with the improvements on each runway end recently completed. The runway improvements, including safety area, pavement rehabilitations, and standards, is near completion with a reopening in November 2014.

The Runway 15R-33L Improvements Project addressed all RSA deficiencies and most non-standard design conditions, rehabilitated runway/taxiway pavement, and relocated NAVAIDs. Specifically, RSA and standards improvements projects included the following: RSA grading, installation of frangible couplings on fixed-by-function objects, removal of non-standard objects within the RSA/ROFA, displacement of the 15R and 33L landing thresholds, a 3-foot shift of the Runway 15R-33L centerline, NAVAID relocation/replacement (localizers, glide slopes, ALS, PAPIs, RVR), and relocated/new section of perimeter road at Runway 33L. To ensure land use compatibility, easements will be secured for off-airport property located within the Runway 15R and 33L RPZs, and a portion of MAA's Flight Kitchen facility will be demolished.

During the Runway 15R-33L project, the runway surface was milled and overlaid with asphalt (3 to 15 inches), runway shoulders were widened to 35 feet, centerline and edge lights were replaced, and adjoining taxiway fillets have been widened to Taxiway Design Group (TDG) 6 standards. In conjunction with the Runway 15R-33L RSA project, existing Taxiway T was demolished and Taxiway R was relocated. This includes the construction of the new stub Taxiway R between Runway 15R-33L and Taxiway P, as well as the segment from Runway 15R-33L to existing Taxiway R. Finally, Taxiway R, between Taxiway P and R1, and a portion of decommissioned Runway 4-22 (future Taxiway P) between Runways 10-28 and 15R-33L have been demolished.

### *Runway 15L-33R Improvements*

Most of the improvements associated with the Runway 15L-33R RSA project have been completed. Construction efforts in 2013 included earthwork and grading within the RSA, perimeter road relocation, site preparation for localizer relocation, and RPZ reduction.

### *Taxiway Romeo (R) Improvements*

Taxiway R between Runway 15R-33L and Taxiway Papa (P) was shifted to the north and perpendicular to Runway 15R-33L in order to meet EB-75 (now included in the AC 150/5300-13A) and Runway 15R safety area requirements.

### *Taxiway Foxtrot (F) Shoulders*

Shoulders were constructed for Taxiway F to comply with AC 150/5300-13A (EB-75) and Runway 15R safety area requirements.

### *Runway 4-22 Decommissioned*

Runway 4-22 was decommissioned and is currently being used as a taxiway creating a dual taxiway system that will be converted permanently for the east side of the terminal apron.

### *Taxiway Papa (P) at Taxiway Bravo (B) Renamed Taxiway Tango (T)*

In order to have consistency with other taxiway designations, Taxiway P at Taxiway B was renamed Taxiway T.

## 7.1.2. Terminal

Terminal improvements were focused on capacity needs based on forecasts of passenger distribution in the terminal as well as project growth and operational requirements. Projects completed since the last ALP include the following:

### *Concourse B/C Connector Improvements*

This project focused on the expansion of the Terminal between Concourses B and C associated with improvements required for security checkpoints, baggage makeup, and life safety code compliance along with the need for a secure connection between Concourses B and C. The project included a widening of Concourse C to enlarge the holdrooms and widening of the egress pathway to meet the latest life safety code.

### 7.1.3. Landside

Landside improvements mostly focused on the roadways surrounding the Terminal.

## 7.2. Approved ALP/Environmental Finding/Construction-In-Progress

The Approved ALP/Environmental Finding/Construction-In-Progress Phase includes short-term development projects that are proposed to occur between the present and 2016. These projects were included in the 2011 ALP and 2012 Environmental Assessment, or subsequent pen-and-ink submittals that are not yet constructed or commissioned. Outstanding projects from the 2011 or pen-and-ink ALPs are highlighted below by projected year of completion.

### 7.2.1. 2015 Projects

#### *Runway 15R-33L Improvements*

In conjunction with the Runway 15R-33L RSA project, Taxiway D is being relocated per separation standards, and FAA EB-75-related improvements have been implemented including new Taxiway D3. A new aircraft hold pad is also under construction at the end of Runway 33L. Additionally, to ensure land use compatibility, easements will be secured for off-airport property located within the Runway 15R and 33L RPZs, and a portion of MAA's Flight Kitchen facility will be demolished.

#### *Runway 15L-33R Improvements*

Runway 15L and 33R localizers will be relocated outside of the associated critical area, frangible couplings will be installed on fixed-by-function objects, and non-standard objects will be removed from the RSA/ROFA. Easements will be secured for off-airport property located within the Runway 15L RPZ to ensure land use compatibility.

#### *Runway 10-28 Improvements (as part of Airfield Standards and Pavement Rehabilitation Project)*

Runway 10-28 NAVAIDs (glide slopes, PAPIs, ALS, and RVRs) will be relocated and/or replaced, frangible couplings will be installed on fixed-by-function objects, and non-standard objects will be removed from the RSA/ROFA. New Taxiways D, U1, and U2 will be constructed in concrete to tie into Runway 10-28. Taxiway U will be relocated per FAA separation standards and reconstructed in concrete.

#### *Concourse D-E Connector*

Improvements will include a secure connector between Concourses D and E and a consolidated passenger security checkpoint. The improved facility will enhance life safety code compliance and provide the capability for two existing domestic gates to serve international traffic.

### *Taxiway Uniform (U) Relocation*

Taxiway U will be relocated 102 feet to the north to comply with runway-taxiway centerline separation standards (502 feet) for ADG V aircraft. Existing Taxiway U and Taxiway P1 will be demolished and Taxiways U1 and U2 will be relocated and reconfigured to comply with EB-75.

### *International Terminal Bag Screening Improvements*

Concourse E will be expanded by 9,000 square feet to enhance the Checked Baggage Inspection System (CBIS) and provide for anticipated growth of international traffic. The CBIS will be modified to achieve efficient bag screening that will improve capacity and optimize conditions for worker safety. The screening improvements will incorporate a fully in-line system within an environmentally enclosed CBIS area.

### *Airfield Standards and Pavement Rehabilitation Project*

Under the Airfield Standards and Pavement Rehabilitation Project (ASPRP), decommissioned Runway 4-22 will be converted to a permanent ADG V taxiway (P) with standard shoulders. All intersecting taxiways along Future Taxiway P will be improved to include standard shoulders and TDG 6 fillets. Taxiway demolitions are also proposed during the ASPRP.

### *Sheraton Four Points Demolition*

The hotel demolition will consist of removal of the hotel building structures and the outdoor swimming pool followed by grading and seeding of the disturbed areas. The existing paved roadways and parking areas serving the hotel site will remain. A perimeter security fence with appropriate fire rescue vehicle access will be installed on the site.

### *Hotel Construction, Hourly Garage Expansion, & Sky Bridge E*

A four-star hotel is proposed in the terminal area at BWI Marshall, adjacent to the Hourly Garage. The facility will accommodate roughly 250 rooms and amenities such as conference rooms and a business center. The hotel development will include new Sky Bridge E that will connect the hotel to the Hourly Garage. BWI Marshall passengers/visitors will be able to access the terminal via existing Sky Bridges A, B and D, and newly constructed Sky Bridge E. In order to segregate vehicle traffic associated with the proposed hotel, vehicular access in the vicinity of the hotel and Hourly Garage will ultimately need to be modified. Hotel-related access projects include reconfiguration of the roadway for service vehicle access, improving hotel patron egress, constructing an additional lane for hotel/garage access, and closing the existing employee access roadway. In addition, I-195 outbound lanes will need to be widened. An additional Hourly Garage will be constructed north of the proposed hotel site to meet demand projections.

### 7.3. Phase 1 (2016 – 2020)

The Phase 1 (2016–2020) development projects shown on the 2015 ALP focus on capacity and operational improvements based on the projected operational demand. Phase 1 development is separated into 5 main groups – Airfield and Airside Improvements, Terminal Enhancements, Landside Improvements, General Aviation/Hangar Improvements, and Support Facilities.

In addition to the unconstructed projects from the 2011 and pen-and-ink ALPs, Phase 1 of the 2015 ALP is representative of short term development that will satisfy existing needs and correct existing problems. Full descriptions of Phase 1 projects include project descriptions, project justifications, alternatives considered, design standards, navigational aids, ATCT considerations, FAR Part 77, and the project schedules.

#### 7.3.1. Airfield and Airside Improvements

##### *Relocate Taxiways Romeo (R) and Foxtrot (F)*

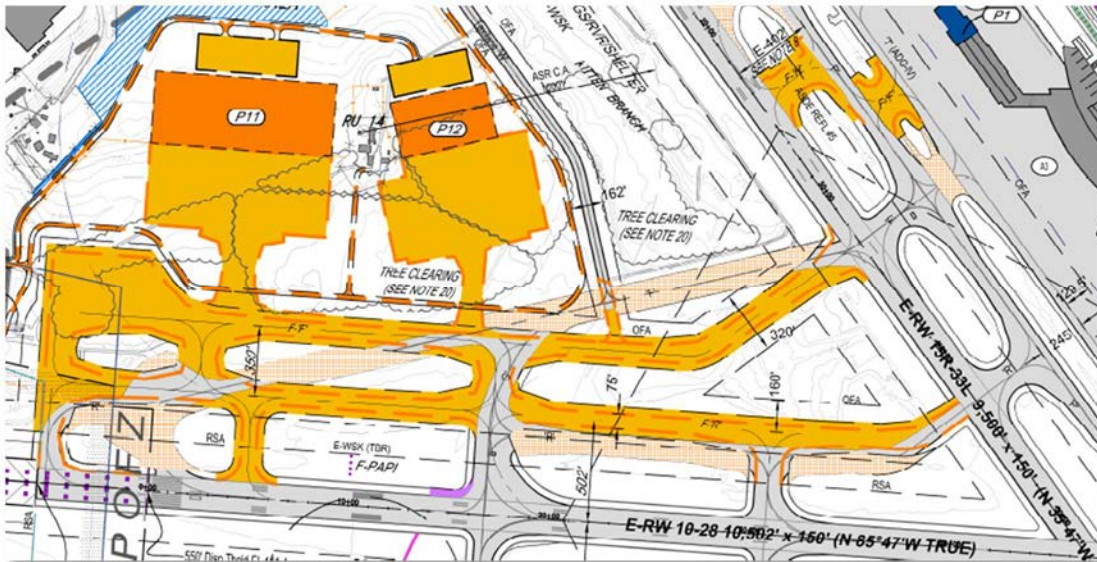
###### Project Description

Portions of the parallel taxiway system to Runway 10-28 will be demolished and reconstructed at a separation distance of 502 feet from the Runway 10-28 centerline. This project shifts Taxiway R 102 feet from its current location to meet FAA design standards for runway/taxiway separation. In conjunction with the Taxiway R reconstruction, Taxiway R1, and Taxiway G will be rebuilt to connect Runway 10-28 to the new section of Taxiway R. Taxiway G will be narrowed to minimize the risk of incursions and eliminate excessive pavement.

This project also includes demolishing and reconstructing Taxiway Foxtrot (F) between Runway 15R-33L and the Runway 10 end. In addition, the stub Taxiway F between Taxiways Papa (P) and Alpha (A) will be relocated 500 feet north to comply with EB-75, which eliminates the direct access from the Terminal A/B apron to Runway 15R-33L. Newly constructed Taxiway F will create a dual taxiway system along with Taxiway R to the Runway 10 end. New Taxiway F will proceed southeast from Runway 15R-33L and then run parallel to Runway 10-28 at a separation distance of 852 feet from the Runway 10-28 centerline, which is 350 feet from the Taxiway R centerline. Any existing Taxiway F connector pavement no longer needed for shoulder will be demolished.



Figure 1: Relocate Taxiways Romeo (R) and Foxtrot (F)



### Project Justification

The reconstruction of Taxiway R at a 502-foot separation from the Runway 10-28 centerline is needed to meet FAA design standards for an Airplane Design Group (ADG or Group) V runway having a Category II/III approach per Advisory Circular (AC) 150/5300-13A. Along the new section of Taxiway R, connecting taxiways will either be reconstructed or demolished to improve the overall efficiency of the airfield. The relocation of Taxiway F at a 350-foot separation from parallel Taxiway R provides for a dual taxiway system to access Runway 10-28 which will improve the overall efficiency of the airfield.

### Alternatives Considered

During the Master Plan process, multiple alternatives to mitigate non-conforming runway to taxiway separations were considered. Refer to the 2011 Master Plan Alternatives Chapter (Volume II) for complete technical analysis and graphical representation of the alternatives considered.

Multiple alternatives to relocate Taxiway F were considered. One alternative would relocate the taxiway stub between Runway 15R-33L and Taxiway P to the northwest by 500 feet, and leave the stub between Taxiways T and P in its current location. This taxiway stub configuration would require that aircraft arriving on Runway 33L make a 180 degree turn onto Taxiway P and then an immediate left turn onto the existing Taxiway F stub to access the apron. This circuitous taxi route is counter to the benefits of a single direction exit taxi route offered by the selected alternative. The same circuitous route would be required to taxi from the terminal apron via the relocated Taxiway F to Runway 10. Overall, this option was not favorable due to the resulting inefficient taxi routes that it would create. Another alternative included shifting the entire Phase 1 Taxiway F segment, from Taxiway P to Taxiway G, to the northwest to offset it from the stub between Taxiways P and A. This option would move Taxiway F closer to the environmentally sensitive areas associated with Kitten Branch, and was dismissed on environmental grounds.

### Design Standards

The proposed Runway 10-28 taxiway system improvement project will meet AC 150/5300-13A design standards by providing 502 feet of separation between the centerline of Runway 10-28 and Taxiway R, 852 feet of separation between the centerline of Runway 10-28 and Taxiway F, and 350 feet of separation between the centerlines of Taxiways R and F. With the reconstruction of Taxiway R, a portion of Taxiway F will be removed to ensure that 502 feet of separation is provided along Taxiway R from the intersection of Runway 15R-33L to the end of Runway 10. The remaining connecting taxiways along the new section of Taxiway F will be rebuilt to meet design standards.

### Navigational Aids

The Runway 10-28 Taxiways R and F improvement project will not affect or require the relocation of any navigational aids.

### ATCT Considerations

The proposed Runway 10-28 Taxiways R and F improvement project will not impede the visibility of airfield operational and runway approach areas from the existing ATCT. Preliminary line-of-sight analyses for the proposed ATCT Site 2A determined that tree removal will be required to maintain visibility to Taxiways F and R and the Runway 10 threshold, depending on the phasing and sequencing of the new ATCT and other projects. A total of 16.4 acres of tree removal / trimming may be necessary, of which 9.3 acres is proposed to be cleared for construction of the Phase 1 Aircraft Maintenance Facility project (P11) by 2020. The majority of the remaining 7.1 acres of trees located east of the P11 project site and Taxiway W is proposed for obstruction removal action under the Obstruction Removal project (See Section 3.7), and a more detailed obstruction analysis will be required to determine the extent of additional action that may be necessary to achieve clear line-of-sight from proposed ATCT Site 2A.

### Federal Aviation Regulations (FAR) Part 77

Aircraft operating on the new taxiway system will exceed FAR Part 77 transitional surfaces. However, such penetrations are permissible since the penetrations will result from aircraft transitioning through the area.

### Project Schedule

Based on the current condition of the existing Taxiway R pavement, construction is anticipated to occur during the 2016 construction season.



#### Alternatives Considered

A high speed exit taxiway was considered but would require greater separation between the runway centerline and taxiway to meet FAA standards.

#### Design Standards

The taxiway connector will meet current FAA design standards per AC 150/5300-13A.

#### Navigational Aids

Taxiway U3 will need a separate study to confirm that the Very High Frequency Omni-Directional Range (VOR) function is not impacted as the taxiway is located in the critical area.

#### ATCT Considerations

The planned taxiway connectors will not impact the visibility of the existing or future ATCT facility.

#### FAR Part 77

The taxiway pavement in this project is not anticipated to affect FAR Part 77 surfaces.

#### Project Schedule

The proposed project is scheduled to be under construction by 2018.

### *International Terminal Area Taxiway Fillets/Shoulders*

#### Project Description

As a result of the recent revisions to FAA standards for fillet geometry, the Terminal Area pavement projects include improvements to all substandard fillets to meet the latest criteria. Locations include the taxiways adjacent to Runway 15L-33R and the adjacent terminal area. Several of these areas were also identified to be in need of pavement rehabilitation in accordance with the PMP. In addition, the temporary remain-overnight (RON) area adjacent to the International concourse will be converted to a taxiway as part of the miscellaneous projects. This conversion will extend Taxiway B and maintain the 275-foot separation that exists today between Taxiways B and S. All FAA standards will be met as part of the conversion to include shoulders and standard fillets for the connections to Taxiways N and JJ. Completion of this improvement will eliminate a Modification of Standard (MOS) and provide for a parallel taxiway system west of Runway 15L-33R.





#### ATCT Considerations

The planned taxiway geometry will be visible from both the existing and proposed ATCT locations.

#### FAR Part 77

The project is not anticipated to affect FAR Part 77 surfaces.

#### Project Schedule

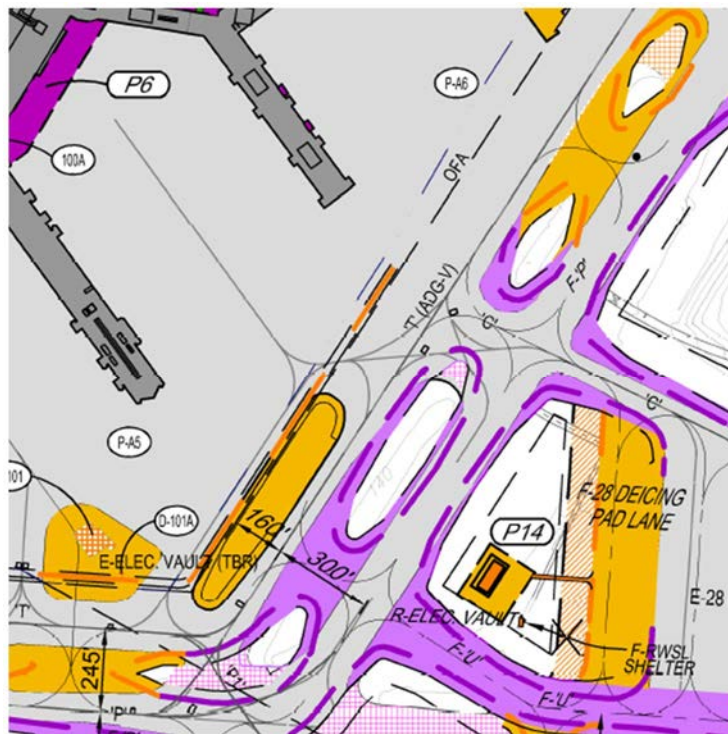
The improvement projects are anticipated to be completed in 2016.

### *New Infill Pavement Near Taxiways T, P, and Future P*

#### Project Description

Subsequent to the Airfield Lighting Vault (ALV) relocation project, infill pavement will be added to the former ALV site and to the grassy area bounded by Taxiways T, P, P1 and C. In conjunction with these infill areas, Taxiway E will be rebuilt approximately 300 feet to the east. The new impervious areas will be paved under Phase 1 in order to support standard Group V parallel taxiway separations and to accommodate a Vehicle Service Roadway (VSR) that will be repositioned closer to the airfield to provide for the necessary aircraft parking clearances at gates around the ends of Concourses C and D. Future Taxiway E will serve to facilitate aircraft movements between the runways and terminal area.

Figure 4: New Infill Pavement Near Taxiways T, P and Future P



### Project Justification

The infill pavements proposed in the vicinity of Concourses C and D will provide for standard Airplane Design Group (ADG) V taxiway separation. Additionally, the new pavement will support a VSR that will be positioned further from Concourses C and D in order to maximize the utilization of gates at the end of the concourses. New Taxiway E will ease traffic congestion in the terminal area.

### Alternatives Considered

Due to the inability to accomplish the same functions within the same geography, no other alternative, aside from the “no-build” option was considered.

### Design Standards

The planned improvements will be designed and constructed to meet FAA design standards.

### Navigation Aids

The project is located away from all navigational aid critical areas and will not interfere with any airport navigation systems.

### ATCT Considerations

The planned improvements will not affect functions or visibility of the existing or future ATCT facility.

### FAR Part 77

Aircraft operating on sections of the new pavement will exceed FAR Part 77 transitional surfaces. However, such penetrations are permissible since the penetrations will result from aircraft transitioning through the area.

### Project Schedule

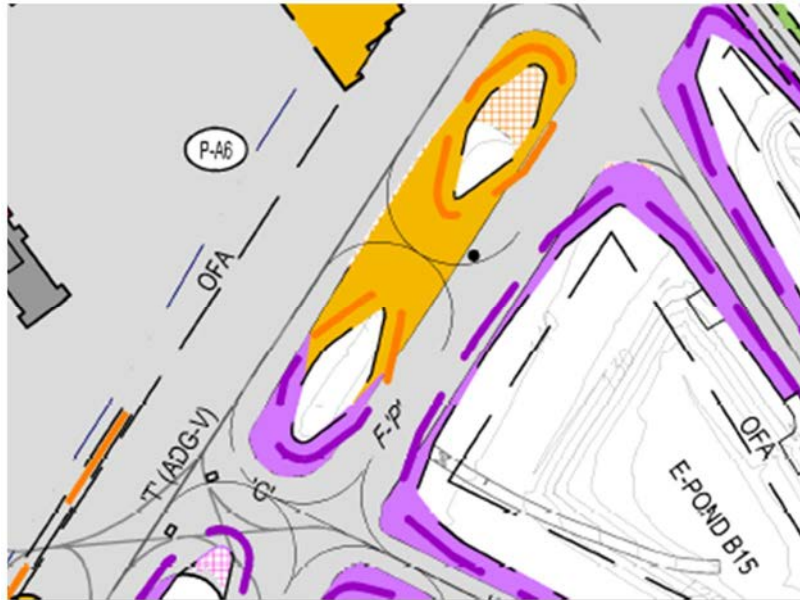
The proposed project is scheduled to be under construction by 2020.

### *Taxiway Connectors (between Taxiways T-P)*

### Project Description

After decommissioned Runway 4-22 is converted into a fully compliant ADG V taxiway (Taxiway P) a new taxiway section is proposed to enhance connectivity to/from future Taxiways Papa and Tango.

Figure 5: Taxiway Connectors (between Taxiways T-P)



#### Project Justification

The Facility Needs Chapter of the 2011 Master Plan (Volume I) outlines current and projected utilization and delay for this section of taxiway. While both East- and West-flow operations generate moderate to high taxiway utilization in this area, West flow operations tend to experience moderate to excessive delays while taxiing along this section. In the later stages of Phase 1, delay levels are anticipated to become more excessive. The proposed taxiway connection in the vicinity of Concourses C and D will improve the efficiencies of movements and reduce periodic taxi delays anticipated along the section of future Taxiway P.

#### Alternatives Considered

Due to the high demand for access to the Concourse C-D alley, the connector is optimally located and no other alternative, except for the “no-build” option was considered.

#### Design Standards

The taxiway connection will be designed to meet FAA design standards.

#### Navigational Aids

The proposed development will not infringe upon any airport navigation systems or associated critical area.

#### ATCT Considerations

The planned taxiway connectors in the vicinity of Concourses C & D will not affect functions or visibility of the existing or future ATCT facility.



#### FAR Part 77

The project is not anticipated to affect FAR Part 77.

#### Project Schedule

The proposed project is scheduled to be under construction by 2020.

### *Relocate Taxiways Kilo (K) & Lima (L)*

#### Project Description

Taxiways K and L currently provide direct access from the General Aviation (GA) Apron to Runway 15L-33R. These taxiways will be relocated to prevent direct access from the apron to the runway. The locations will be connected to Taxiway Q. During the project, existing Taxiways K and L will be demolished.

Figure 6: Relocate Taxiways Kilo (K) & Lima (L)



#### Project Justification

FAA AC 150/5300-13A strongly encourages airports to reconfigure taxiway geometry to eliminate taxiways that provide aircraft with direct access from the apron environment to runways. Relocating Taxiways K and L will improve pilot situational awareness and reduce the likelihood of runway incursions by eliminating direct access from the GA apron to Runway 15L-33R.

#### Alternatives Considered

Other alternatives assessed included the closure of Taxiway K and Taxiway L as well as using one of the existing deicing lanes as a primary access taxiway. The deicing lane alternative was implemented as a temporary solution for Taxiway K.

#### Design Standards

Both taxiway connections will meet current FAA design standards per AC 150/5300-13A.

#### Navigational Aids

The proposed development will not infringe upon any airport navigation systems or associated critical areas.

#### ATCT Considerations

The planned taxiway connectors will be visible from the existing and proposed ATCT.

#### FAR Part 77

The project is not anticipated to affect FAR Part 77 surfaces.

#### Project Schedule

The project is proposed to be completed in 2019.

#### *Isolation/RON Apron Construction*

##### Project Description

A portion of the decommissioned Runway 4 end and Taxiway Y will be converted to a parking apron and isolation area for aircraft. The area will include two parking positions to accommodate up to Group V aircraft in each position. The project will require reconfiguration of one of the aircraft rescue and firefighting (ARFF) access roads around the apron area. It will also require installation of a blast fence and the relocation of one of the remote transmitter receiver (RTR) sites.

Additionally, the existing airport beacon may require relocation for construction of the new apron parking and aircraft isolation area. A study will be performed to determine if the beacon can remain as-is, can be elevated at its existing location, or if a new location is required.

The apron parking and isolation area will include access to and from Taxiway D3, which crosses Runway 15R-33L. It will also be developed to connect to the parallel taxiway of Runway 10R-28L in the future (Phase 3).

Figure 7: Isolation/RON Apron Construction



### Project Justification

When arriving aircraft are suspected to be a public safety/security threat it is common airport protocol to direct pilots to remote sites for clearance before granting access to the terminal area. Any suspicious aircraft at BWI Marshall are currently directed to the end of decommissioned Runway 4 for inspection/clearance. After decommissioned Runway 4-22 is converted to a taxiway and associated pavement demolitions occur, access from Runway 10-28 and the terminal area to the end of decommissioned Runway 4 will be limited. The new route to the end of decommissioned Runway 4 will at times require that aircraft taxi on Runway 15R-33L. Developing an Isolation Apron with direct access to future Taxiway D3 will eliminate taxiing activity on Runway 15R-33L and provide a remote site dedicated to the investigation of suspicious aircraft. When the apron is not dedicated to isolation activity, it would provide two ADG V aircraft RON positions to fulfill current air carrier demands.

### Alternatives Considered

One alternative considered would keep the existing pavement in place and utilize the old runway pavement and Taxiway Y pavement for parking and access. The remaining geometry would not provide enough pavement for multiple Group V aircraft to park and the need for RON parking is mainly for large, (Group V) aircraft. In addition, the existing runway pavement geometry that would be used is not perpendicular to the runway and does not provide the appropriate level of situation awareness for aircraft crossing Runway 15R-33L. Therefore, this alternative was precluded from further review.

#### Design Standards

All new geometry associated with the isolation area will meet FAA standards including fillets and separation on the apron per AC 150/5300-13A.

#### Navigational Aids

The proposed development will require relocation of the RTR which is also necessary for the new ATCT facility. The airport beacon may require relocation based on further analysis. Other navigational aids are not anticipated to be impacted.

#### ATCT Considerations

The planned taxiway and apron will be visible from both the existing and proposed ATCT. An airport beacon study will be done if relocation from the existing site is deemed necessary.

#### FAR Part 77

The project is not anticipated to affect FAR Part 77 surfaces. The elevation of the aircraft tail heights at the parked positions will be below the transitional surface.

#### Project Schedule

The project is proposed to be completed in 2019.

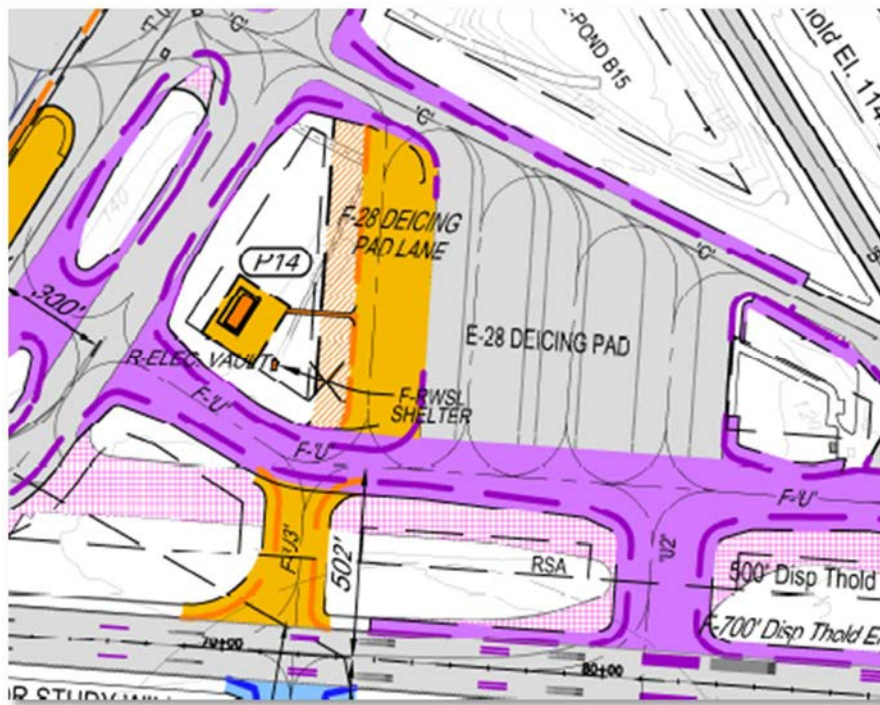
### *Runway 28 Deicing Pad Expansion*

#### Project Description

In order to meet new aircraft deicing separation standards in accordance with AC 150/5300-14B Airport Deicing Facilities, the capacity and number of parking positions on the existing Runway 28 pad will be reduced. BWI Marshall proposes to expand the pad to accommodate the new standard but maintain the existing capacity. As identified in the Master Plan, deicing capacity at the common-use pads is critical to the Airport's inclement weather operations. This expansion will add an extra lane with possibly two positions for operations. Expansion would include reconstruction of the concrete apron located on the existing pad including reconfiguration of the infrastructure to accommodate the new parking positions per the FAA standard. United Airlines proposes to relocate their deicing operation from the Runway 15R pad to the Runway 28 pad. United's blending station and a 21,000 gallon glycol tank will be relocated and connected to nearby utilities (electrical and water). Prior to expanding the Runway 28 pad, United will install temporary (mobile) facilities to accommodate their operation at the Runway 28 pad.



Figure 8: Runway 28 Deicing Pad Expansion



#### Project Justification

The existing deicing pad is not adequately sized to both meet user demand and FAA design standards. The Runway 28 deicing pad expansion will retain the current capacity and enable the Airport to satisfy FAA standards/requirements for deicing pads and associated service vehicles.

#### Alternatives Considered

Alternatives reviewed included maintaining the same positions with a reduction in lanes or proposing more deicing at parking positions on the apron. BWI Marshall operations require that the deicing positions be maintained to support the predominant flow at the Airport (Runway 28 departures and Runway 33L arrivals). Some of the apron gate locations would exceed holdover times if all deicing was performed at the gates.

#### Design Standards

All new geometry associated with the deicing pad expansion will meet FAA standards per AC 150/5300-14B and AC 150/5300-13A. Separation and collection infrastructure on the existing pad will be adjusted to meet all FAA standards. Vehicle Safety Zones (VSZ) will be included.

#### Navigational Aids

Navigational aids will not be impacted by this expansion.

#### ATCT Considerations

The Runway 28 deicing pad expansion will be visible from both the existing and new ATCT. A line-of-sight analysis was performed from the proposed ATCT. The proposed deicing layout will not result in additional shadows to the line-of-sight to the Runway 28 end.

#### FAR Part 77

The project is not anticipated to affect FAR Part 77 surfaces. The elevation of the aircraft tail heights at the parked positions will be below the transitional surface.

#### Project Schedule

The Runway 28 deicing pad expansion work is anticipated to be done in 2018-2019.

### *Helipad Relocation*

#### Project Description

Per FAA AC 150/5390-2C the standard separation between the centerline of runway approach to the centerline of an approach to a Final Approach and Takeoff Area (FATO) for simultaneous, same direction VFR operations is 500 feet (for large airplane and medium helicopters). The center of the FATO is currently offset 485 feet from the centerline of Runway 15L-33R. The Helipad will be relocated to a new location 500 feet from the centerline of Runway 15L-33R.

During the helipad relocation, the current VSR section that connects the GA Apron to the 15L end perimeter VSR, and apron light poles will be relocated east to eliminate vehicular traffic conflicts with the FATO and approach/departure surface. This VSR section will be relocated adjacent to an existing long-term airport parking lot. Security Checkpoint J (P50) will be relocated next to the future VSR in the northwest corner of an existing long-term parking lot.

Figure 9: Helipad Relocation



### Project Justification

The helipad relocation is required to eliminate an existing MOS at BWI Marshall, thus satisfying FAA design standards in FAA AC 150/5390-2C.

### Alternatives Considered

The existing and proposed helipad sites are located proximal to the BWI Marshall's only FBO where all airport helicopter traffic needs are served. Additionally the proposed location is positioned such that helicopter traffic is safely isolated from aircraft utilizing Runway 15L-33R and/or the GA Apron. As few sites in the vicinity of the FBO meet all FAA design and FAR Part 77 criteria for helipads, alternative sites were not considered.

### Design Standards

All components of the relocation project will be constructed in compliance with all FAA design standards, including FAA AC's 150/5300-13A and 150/5390-2C.

### Navigational Aids

The proposed development will not infringe upon any airport navigation systems or associated critical areas. The proposed helipad will be sited such that the limits of the future Runway 15L Glide Slope relocation project (Phase 3) and associated Critical Area may be integrated with no impact.

### ATCT Considerations

The helipad relocation improvement project will not affect functions or visibility of the existing or future ATCT facility.

### FAR Part 77

The future helipad site will not impact FAR Part 77 surfaces for Runway 15L-33R. Further, the future helipad approach/departure surfaces will be free of any objects, including the proposed section of VSR and apron light poles.

### Project Schedule

The project is proposed to be completed by 2020.

### *Obstruction Removal Project*

#### Project Description

FAR Part 77 surfaces were surveyed for all runways at BWI Marshall in 2005 and 2011. Both vegetative and manmade objects that were determined to exceed FAR Part 77 surfaces in 2005 were identified on the Master Plan ALP (February 2011), and have been or are soon to be removed under ongoing construction projects at BWI Marshall. While the 2011 survey confirmed many of the 2005 obstructions to FAR Part 77, additional vegetative and manmade penetrations were identified. Though the obstruction removal efforts at BWI Marshall have been completed, runway approaches have not been resurveyed to verify removed objects. Thus the 2005 and 2011 data points were merged on the draft ALP update. With duplicate objects, 2011 data points were retained and 2005 points were extracted from the data set, the highest elevation of the two objects was applied. The only instance where 2005 points remain is where duplicate manmade objects were not found within the 2011 data set.

All objects from the surveys that exceed FAR Part 77 are illustrated on ALP Sheets 6 and 7. Objects within BWI Marshall's inner-approaches are partially illustrated below, and on the approach plan/profile sheets (Sheets 10-13). Given the volume of obstructions within the Runway 15L Approach Surface, enlarged views of the Runway 15L approach are also detailed on Sheets 8A-8I. The disposition proposed by the MAA for each obstruction is specifically denoted in the obstruction data tables (Sheets 9A-9G).



Figure 10: Runway 10

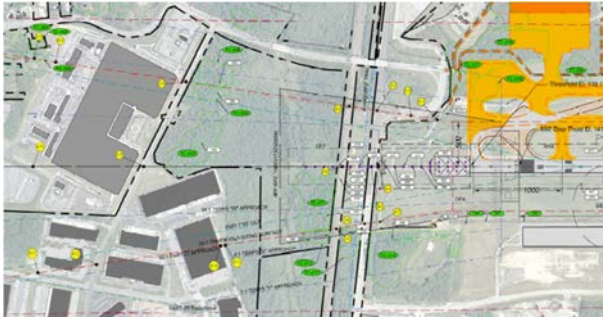


Figure 13: Runway 28

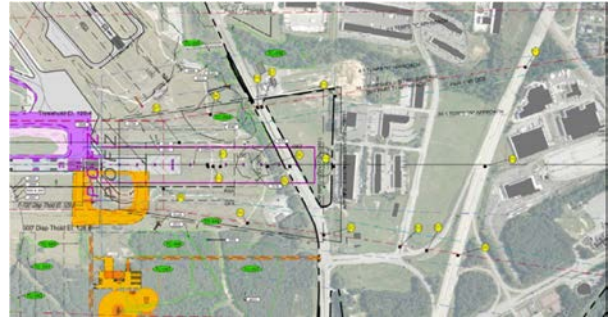


Figure 11: Runway 15R



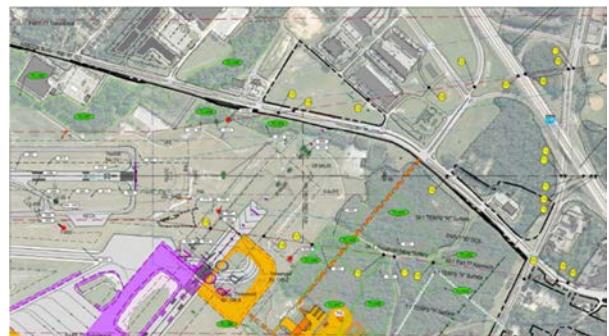
Figure 14: Runway 33L



Figure 12: Runway 15L



Figure 15: Runway 33R



Given the sheer volume of trees in the vicinity of approaches at BWI Marshall, and the inability of the surveys to capture every FAR Part 77 obstruction, the MAA has applied two factors to ensure that the next obstruction removal effort is adequately highlighted in the upcoming Environmental Assessment (EA). First, tree canopies identified on the ALP plan/profile and data sheets represent entire stands of trees that penetrate Part 77. Obstruction data tables do not necessarily reflect all trees within the canopy that penetrate FAR Part 77. Tree clearing beyond that identified in the table and on plans may be required, but will be limited to the defined boundaries of tree canopies/stands. Second, per the analysis performed by HNTB (August 2013), future heights of vegetation were projected via various growth rate methodologies. This action was taken to optimize MAA's obstacle clearing effort that results in the follow-on EA and to minimize or altogether eliminate the need to clear the same geographic areas in the future. The HNTB analysis assumed the following growth rate factors: 1) where tree species were known, the mature species height was applied, and; 2) where tree species were unknown, a growth rate of 2 feet per year was applied through 2020. The current elevation of vegetative objects is presented in the data tables and the associated penetration values shown are negative. When growth rates are applied to these objects, Part 77 surface penetrations will result and the associated action is to remove or lower the objects by 2020.

The overall strategy to obstruction removal proposed by the MAA is as follows:

- Non-Airport Property - Objects which exceed FAR Part 77 are not subject to removal unless they also exceed a 34:1 slope applied to the limits of a Precision Instrument Runway Approach Surface trapezoid. Hence all off-airport trees and manmade objects that exceed the 34:1 approach surface will be removed.
- Airport-Owned Property - The MAA will remove or lower all trees and manmade objects that exceed any Primary, Runway Approach (50:1) or Transition (7:1) surface. Where exceptions to each strategy exist they are highlighted in subsequent paragraphs.

In the case of 225 objects located on Non-Airport Property, the proposed action for 223 of the objects is to "Remove or Lower". Two communication towers (1,437 and 1,504 feet mean seal level (MSL)) roughly 8 miles northwest of Runway 15L do exceed the 34:1 approach surface but will not be removed or lowered because they are tied to FAA aeronautical studies that yielded a "Determination of No Hazard".

More than 1,000 objects exceed FAR Part 77 surfaces on Airport-Owned Property. The majority of these objects shall be addressed as follows: "Remove or Lower", "To Be Lowered/Relocated/Removed" (per an ongoing construction project), "Fixed-by-Function" as approved by the FAA in 2012, or already approved Airspace Determinations. Of the remaining objects (see subsequent tables) on Airport-Owned Property which exceed FAR Part 77, the MAA proposes the following actions: "Request Fixed-By-Function", "Obstruction Lighted", "Obstruction Light", "No Action", and "See Note 7". The objects which apply to each category are as follows: A total of 60 airfield signs/lights which facilitate navigation or aircraft movement on runways or taxiways at BWI Marshall exceed FAR Part 77. In these instances, the MAA requests that the FAA formally qualify these objects as "Fixed-By-Function". Five manmade objects (2 Buildings; 1 Security Access Gate; and 2 Windsocks) are currently obstruction lighted, and the MAA proposes to retain these objects. An additional 42 objects (Security/Safety Fence, Light Poles, a Security Guard Booth, Guard Rail, Navigational Aids, and Cargo Ground Support Equipment) are critical to airport security, safety, navigation and/or airport operations. The MAA proposes to "Obstruction Light" these objects and retain them. In 17 instances, the MAA proposes "No Action" for objects such as the ground, security fence, a railroad arm, an obstruction light, and a catenary pole. Finally, where 3 air cannons exceed FAR Part 77, the disposition of "See Note 7" applies. This note is referenced on the ALP and acknowledges the ongoing evaluation by MAA to pursue alternative sites for multiple air cannons. Any proposed alternative location will be coordinated with the FAA.

#### Project Justification

Obstruction removal is necessary to preserve a safe operating environment and to maintain or enhance existing approach procedures at BWI Marshall. By clearing FAR Part 77 as described, the MAA will be able to at least maintain existing approaches, and potentially improve various approach capability/level of service.

#### Alternatives Considered

With the exception of the 127 objects previously described, no alternatives to clearing FAR Part 77 were considered either on or off of property owned by the MAA.

#### Design Standards

During the obstruction removal project, objects will be lowered, relocated, removed, or lighted in accordance with FAA Design Standards and FAR Part 77.

#### Navigational Aids

During the obstruction removal project, navigational aids will not be impacted by the lowering, relocation, or removal of any object. Where the project requires new navigational aids, all equipment will be sited consistent with siting criteria, and efforts will be coordinated with the FAA in advance of service interruptions and relocation.

#### ATCT Considerations

The obstruction removal effort will be coordinated with ATCT to ensure minimal impact to air traffic. Objects that are proposed to be relocated will be evaluated to ensure that the new sites will not impact the existing or proposed ATCT line-of-sight.

#### Federal Aviation Regulations (FAR) Part 77

With the exception of the 127 objects previously described, all objects located on- and off-airport will meet FAR Part 77 criteria. Where objects are relocated or lowered, they will be installed or modified to clear FAR Part 77.

#### Project Schedule

The proposed project is scheduled to be under construction by 2020.

Table 15: Obstructions

#	POINT NAME	DESCRIPTION	OBJECT ELEV	OBJECT PENETRATION	PROPOSED ACTION	SURFACE NAME	LOCATION
1	n3694	OL-ON-APPR-LITE	132.6	1.4	REQUEST FIXED BY FUNCTION	PT77 28 APPR-INNR	ON AIRPORT
2	n3727	OL-ON-APPR-LITE	129.5	0.9	REQUEST FIXED BY FUNCTION	PT77 28 APPR-TRANS	ON AIRPORT
3	n3728	OL-ON-APPR-LITE	129.3	0.8	REQUEST FIXED BY FUNCTION	PT77 28 APPR-TRANS	ON AIRPORT
4	n3732	OL-ON-APPR-LITE	135.4	0.1	REQUEST FIXED BY FUNCTION	PT77 28 APPR-INNR	ON AIRPORT
5	n3734	OL-ON-APPR-LITE	138.5	0.4	REQUEST FIXED BY FUNCTION	PT77 28 APPR-INNR	ON AIRPORT
6	n3735	OL-ON-APPR-LITE	142.8	1.3	REQUEST FIXED BY FUNCTION	PT77 28 APPR-INNR	ON AIRPORT
7	427	SIGN-RUNWAY	144.9	2.6	REQUEST FIXED BY FUNCTION	PT77 10-28 PRIM	ON AIRPORT
8	1492	SIGN-RUNWAY	139.7	1.4	REQUEST FIXED BY FUNCTION	PT77 10-28 PRIM	ON AIRPORT
9	2022	SIGN-RUNWAY	144.4	4.3	REQUEST FIXED BY FUNCTION	PT77 10-28 PRIM	ON AIRPORT
10	2030	SIGN-RUNWAY	144.4	4.3	REQUEST FIXED BY FUNCTION	PT77 10-28 PRIM	ON AIRPORT
11	2144	SIGN-RUNWAY	145.8	5.3	REQUEST FIXED BY FUNCTION	PT77 10-28 PRIM	ON AIRPORT
12	2260	SIGN-TAXIWAY	144.6	3.6	REQUEST FIXED BY FUNCTION	PT77 15R-33L PRIM	ON AIRPORT
13	2276	SIGN-RUNWAY	143	2.4	REQUEST FIXED BY FUNCTION	PT77 10-28 PRIM	ON AIRPORT
14	2335	SIGN-TAXIWAY	142.6	1.7	REQUEST FIXED BY FUNCTION	PT77 10-28 PRIM	ON AIRPORT
15	2358	SIGN-TAXIWAY	144.9	3.2	REQUEST FIXED BY FUNCTION	PT77 15R-33L PRIM	ON AIRPORT
16	2371	SIGN-RUNWAY	144.3	2.5	REQUEST FIXED BY FUNCTION	PT77 15R-33L PRIM	ON AIRPORT
17	2377	SIGN-TAXIWAY	143.6	2.1	REQUEST FIXED BY FUNCTION	PT77 15R-33L PRIM	ON AIRPORT
18	2380	SIGN-TAXIWAY	144.4	2.6	REQUEST FIXED BY FUNCTION	PT77 15R-33L PRIM	ON AIRPORT
19	2420	SIGN-RUNWAY	145.5	3.8	REQUEST FIXED BY FUNCTION	PT77 15R-33L PRIM	ON AIRPORT
20	2465	SIGN-TAXIWAY	143.5	2	REQUEST FIXED BY FUNCTION	PT77 15R-33L PRIM	ON AIRPORT
21	2516	SIGN-RUNWAY	144.7	4	REQUEST FIXED BY FUNCTION	PT77 15R-33L PRIM	ON AIRPORT
22	2517	SIGN-RUNWAY	143.1	1.6	REQUEST FIXED BY FUNCTION	PT77 15R-33L PRIM	ON AIRPORT
23	2543	SIGN-TAXIWAY	142.9	1.1	REQUEST FIXED BY FUNCTION	PT77 10-28 PRIM	ON AIRPORT
24	2616	SIGN-RUNWAY	142.9	2.2	REQUEST FIXED BY FUNCTION	PT77 15R-33L PRIM	ON AIRPORT
25	2663	SIGN-RUNWAY	141	3.1	REQUEST FIXED BY FUNCTION	PT77 15R-33L PRIM	ON AIRPORT
26	2841	SIGN-RUNWAY	137.2	2.1	REQUEST FIXED BY FUNCTION	PT77 15R-33L PRIM	ON AIRPORT
27	2972	SIGN-TAXIWAY	137.5	2	REQUEST FIXED BY FUNCTION	PT77 15R-33L PRIM	ON AIRPORT
28	3007	SIGN-TAXIWAY	144.8	3.5	REQUEST FIXED BY FUNCTION	PT77 15L-33R PRIM	ON AIRPORT
29	3016	SIGN-RUNWAY	144.8	3.5	REQUEST FIXED BY FUNCTION	PT77 15L-33R PRIM	ON AIRPORT
30	3079	SIGN-TAXIWAY	135.8	1.9	REQUEST FIXED BY FUNCTION	PT77 15R-33L PRIM	ON AIRPORT
31	3087	SIGN-TAXIWAY	143.8	3	REQUEST FIXED BY FUNCTION	PT77 15L-33R PRIM	ON AIRPORT
32	3118	SIGN-TAXIWAY	140.9	0.3	REQUEST FIXED BY FUNCTION	PT77 15L-33R PRIM	ON AIRPORT
33	3207	SIGN-TAXIWAY	132.1	1.1	REQUEST FIXED BY FUNCTION	PT77 15R-33L PRIM	ON AIRPORT
34	3232	NAVAID – RVR	147.2	14.6	REQUEST FIXED BY FUNCTION	PT77 15L-33R PRIM	ON AIRPORT
35	3345	SIGN-RUNWAY	134.9	0.8	REQUEST FIXED BY FUNCTION	PT77 15L-33R PRIM	ON AIRPORT
36	3348	SIGN-TAXIWAY	131.4	3.1	REQUEST FIXED BY FUNCTION	PT77 15L-33R PRIM	ON AIRPORT
37	3352	SIGN-TAXIWAY	135.4	7.9	REQUEST FIXED BY FUNCTION	PT77 15L-33R PRIM	ON AIRPORT
38	3471	SIGN-TAXIWAY	128.8	1	REQUEST FIXED BY FUNCTION	PT77 15L-33R PRIM	ON AIRPORT
39	3472	SIGN-TAXIWAY	136.4	14.3	REQUEST FIXED BY FUNCTION	PT77 15L-33R PRIM	ON AIRPORT
40	3487	SIGN-TAXIWAY	128.1	0.4	REQUEST FIXED BY FUNCTION	PT77 15L-33R PRIM	ON AIRPORT



Table 15: Obstructions (Continued)

#	POINT NAME	DESCRIPTION	OBJECT ELEV	OBJECT PENETRATION	PROPOSED ACTION	SURFACE NAME	LOCATION
41	3492	SIGN-TAXIWAY	131	1.4	REQUEST FIXED BY FUNCTION	PT77 15L-33R PRIM	ON AIRPORT
42	3493	SIGN-TAXIWAY	138.9	19.2	REQUEST FIXED BY FUNCTION	PT77 15L-33R PRIM	ON AIRPORT
43	3502	SIGN-TAXIWAY	138.5	19.5	REQUEST FIXED BY FUNCTION	PT77 15L-33R PRIM	ON AIRPORT
44	3504	SIGN-RUNWAY	126.2	0.7	REQUEST FIXED BY FUNCTION	PT77 15L-33R PRIM	ON AIRPORT
45	3522	SIGN-TAXIWAY	135.9	18.1	REQUEST FIXED BY FUNCTION	PT77 15L-33R PRIM	ON AIRPORT
46	3524	SIGN-TAXIWAY	125.1	0.4	REQUEST FIXED BY FUNCTION	PT77 15L-33R PRIM	ON AIRPORT
47	3525	SIGN-TAXIWAY	125.9	1	REQUEST FIXED BY FUNCTION	PT77 15L-33R PRIM	ON AIRPORT
48	3574	SIGN-RUNWAY	117.2	1	REQUEST FIXED BY FUNCTION	PT77 15L-33R PRIM	ON AIRPORT
49	3579	SIGN-RUNWAY	115.2	0.7	REQUEST FIXED BY FUNCTION	PT77 15L-33R PRIM	ON AIRPORT
50	3583	SIGN-RUNWAY	116	0.7	REQUEST FIXED BY FUNCTION	PT77 15L-33R PRIM	ON AIRPORT
51	3584	SIGN-TAXIWAY	120.1	5.9	REQUEST FIXED BY FUNCTION	PT77 15L-33R PRIM	ON AIRPORT
52	3586	SIGN-TAXIWAY	116.8	2.6	REQUEST FIXED BY FUNCTION	PT77 15L-33R PRIM	ON AIRPORT
53	3590	SIGN-TAXIWAY	115.8	0.2	REQUEST FIXED BY FUNCTION	PT77 15L-33R PRIM	ON AIRPORT
54	3596	SIGN-RUNWAY	116.8	2.6	REQUEST FIXED BY FUNCTION	PT77 15L-33R PRIM	ON AIRPORT
55	3597	SIGN-RUNWAY	115	0.8	REQUEST FIXED BY FUNCTION	PT77 15L-33R PRIM	ON AIRPORT
56	3613	SIGN-RUNWAY	116	1.8	REQUEST FIXED BY FUNCTION	PT77 15L-33R PRIM	ON AIRPORT
57	3626	LIGHT-TAXIWAY	130.1	1	REQUEST FIXED BY FUNCTION	PT77 10-28 PRIM	ON AIRPORT
58	3689	SIGN-RUNWAY	115.2	1.1	REQUEST FIXED BY FUNCTION	PT77 15L-33R PRIM	ON AIRPORT
59	3725	SIGN-RUNWAY	115	0.8	REQUEST FIXED BY FUNCTION	PT77 15L-33R PRIM	ON AIRPORT
60	2582	BUILDING	183.7	21.3	OBSTRUCTION LIGHTED	PT77 15L-33R TRANS	ON AIRPORT
61	2599	CARGO ACCESS GATE	166	7.9	OBSTRUCTION LIGHTED	PT77 15L-33R TRANS	ON AIRPORT
62	2617	BUILDING	181	18.5	OBSTRUCTION LIGHTED	PT77 15L-33R TRANS	ON AIRPORT
63	3367	WINDSOCK	144.4	6.4	OBSTRUCTION LIGHTED	PT77 15L-33R TRANS	ON AIRPORT
64	3582	WINDSOCK	123.8	9.6	OBSTRUCTION LIGHTED	PT77 15L-33R PRIM	ON AIRPORT
65	n1132	FENCE	163.5	2.9	OBSTRUCTION LIGHT	PT77 15L APPR-INNR	ON AIRPORT
66	n1134	FENCE	162.5	1.9	OBSTRUCTION LIGHT	PT77 15L APPR-INNR	ON AIRPORT
67	n0784	POLE-LITE	173.3	16.4	OBSTRUCTION LIGHT	PT77 15L APPR-	ON AIRPORT
68	665	SECURITY FENCE	141.3	1.2	OBSTRUCTION LIGHT	PT77 15R APPR-INNR	ON AIRPORT
69	679	SECURITY FENCE	143.1	2.4	OBSTRUCTION LIGHT	PT77 15R-33L TRANS	ON AIRPORT
70	692	SECURITY FENCE	144.9	1.7	OBSTRUCTION LIGHT	PT77 15R-33L TRANS	ON AIRPORT
71	715	SECURITY FENCE	147.5	1.9	OBSTRUCTION LIGHT	PT77 15R-33L TRANS	ON AIRPORT
72	738	SECURITY FENCE	150.6	2.5	OBSTRUCTION LIGHT	PT77 15R-33L TRANS	ON AIRPORT
73	2539	SECURITY FENCE	161.5	0.1	OBSTRUCTION LIGHT	PT77 15L APPR-INNR	ON AIRPORT
74	2553	POLE-LIGHT	179.2	17.2	OBSTRUCTION LIGHT	PT77 15L-33R TRANS	ON AIRPORT
75	2568	POLE-LIGHT	172.6	12.7	OBSTRUCTION LIGHT	PT77 15L APPR-INNR	ON AIRPORT
76	2592	SECURITY GUARD BOOTH	162.2	4	OBSTRUCTION LIGHT	PT77 15L APPR-INNR	ON AIRPORT
77	2593	POLE-LIGHT	169	10.9	OBSTRUCTION LIGHT	PT77 15L APPR-INNR	ON AIRPORT
78	2595	POLE-LIGHT	169.3	11.4	OBSTRUCTION LIGHT	PT77 15L APPR-INNR	ON AIRPORT
79	2628	MOBILE CARGO CONTAINER	159.7	4.3	OBSTRUCTION LIGHT	PT77 15L APPR-INNR	ON AIRPORT
80	2631	MOBILE CARGO CONTAINER	159.8	4.7	OBSTRUCTION LIGHT	PT77 15L APPR-INNR	ON AIRPORT

Table 15: Obstructions (Continued)

#	POINT NAME	DESCRIPTION	OBJECT ELEV	OBJECT PENETRATION	PROPOSED ACTION	SURFACE NAME	LOCATION
81	2633	POLE	175.8	9.7	OBSTRUCTION LIGHT	PT77 15L-33R TRANS	ON AIRPORT
82	2660	MOBILE GRND. SUPT.	159.1	4	OBSTRUCTION LIGHT	PT77 15L-33R TRANS	ON AIRPORT
83	2690	MOBILE GRND. SUPT.	159.3	4.1	OBSTRUCTION LIGHT	PT77 15L-33R TRANS	ON AIRPORT
84	2729	MOBILE GRND. SUPT.	157.4	1.7	OBSTRUCTION LIGHT	PT77 15L-33R TRANS	ON AIRPORT
85	2764	MOBILE GRND. SUPT.	157.2	1.3	OBSTRUCTION LIGHT	PT77 15L-33R TRANS	ON AIRPORT
86	2771	VERTICAL POINT	156	0.4	OBSTRUCTION LIGHT	PT77 15L-33R TRANS	ON AIRPORT
87	2869	GUARD RAIL	151.5	5.1	OBSTRUCTION LIGHT	PT77 15L-33R TRANS	ON AIRPORT
88	2871	MOBILE CARGO CONTAINER	159.1	3.1	OBSTRUCTION LIGHT	PT77 15L-33R TRANS	ON AIRPORT
89	2887	GUARD RAIL	154.5	8.1	OBSTRUCTION LIGHT	PT77 15L-33R TRANS	ON AIRPORT
90	2900	GUARD RAIL	155.7	9	OBSTRUCTION LIGHT	PT77 15L-33R TRANS	ON AIRPORT
91	2906	GUARD RAIL	157.8	6.6	OBSTRUCTION LIGHT	PT77 15L-33R TRANS	ON AIRPORT
92	2908	GUARD RAIL	156.6	8.9	OBSTRUCTION LIGHT	PT77 15L-33R TRANS	ON AIRPORT
93	3220	GLIDESLOPE ANTENNA	179.3	46.6	OBSTRUCTION LIGHT	PT77 15L-33R PRIM	ON AIRPORT
94	3223	GLIDESLOPE BUILDING	148	15.4	OBSTRUCTION LIGHT	PT77 15L-33R PRIM	ON AIRPORT
95	3241	ASDE REFLECTOR	144.1	12.5	OBSTRUCTION LIGHT	PT77 15L-33R PRIM	ON AIRPORT
96	3290	WEATHER EQUIPMENT	140.9	9.6	OBSTRUCTION LIGHT	PT77 15L-33R PRIM	ON AIRPORT
97	3474	APRON LIGHT	165	11.7	OBSTRUCTION LIGHT	PT77 15L-33R TRANS	ON AIRPORT
98	3500	APRON LIGHT	161.5	10.1	OBSTRUCTION LIGHT	PT77 15L-33R TRANS	ON AIRPORT
99	3542	POLE-LIGHT	139.2	12.9	OBSTRUCTION LIGHT	PT77 15L-33R TRANS	ON AIRPORT
100	3548	GLYCOL TANK	139.2	10.7	OBSTRUCTION LIGHT	PT77 15L-33R TRANS	ON AIRPORT
101	3593	GLIDESLOPE BUILDING	120	5.9	OBSTRUCTION LIGHT	PT77 15L-33R PRIM	ON AIRPORT
102	3594	WEATHER EQUIPMENT	128.6	14.4	OBSTRUCTION LIGHT	PT77 15L-33R PRIM	ON AIRPORT
103	3595	GLIDESLOPE	149.2	35	OBSTRUCTION LIGHT	PT77 15L-33R PRIM	ON AIRPORT
104	3600	SNOW DEPTH EQUIPMENT	116.8	2.6	OBSTRUCTION LIGHT	PT77 15L-33R PRIM	ON AIRPORT
105	3611	SNOW DEPTH EQUIPMENT	117.3	3.2	OBSTRUCTION LIGHT	PT77 15L-33R PRIM	ON AIRPORT
106	3799	ASDE REFLECTOR	127.6	1.3	OBSTRUCTION LIGHT	PT77 10-28 PRIM	ON AIRPORT
107	oc-111	GROUND	125	1.2	NO ACTION	10-28	ON AIRPORT
108	n2320	GROUND	214.7	13.3	NO ACTION	15L	ON AIRPORT
109	n2404	FENCE	203.7	3.1	NO ACTION	15L	ON AIRPORT
110	n2405	FENCE	204.9	3.7	NO ACTION	15L	ON AIRPORT
111	n2406	FENCE	206	4	NO ACTION	15L	ON AIRPORT
112	n2407	FENCE	206.9	4.2	NO ACTION	15L	ON AIRPORT
113	n2408	FENCE	207.9	4.3	NO ACTION	15L	ON AIRPORT
114	n2409	FENCE	207.9	3.6	NO ACTION	15L	ON AIRPORT
115	n2410	FENCE	207.9	2.8	NO ACTION	15L	ON AIRPORT
116	n2411	FENCE	207.7	1.8	NO ACTION	15L	ON AIRPORT
117	n2412	FENCE	207.3	0.7	NO ACTION	15L	ON AIRPORT
118	oc-045	OBSTRUCTION LIGHT	251	36.1	NO ACTION	15L	ON AIRPORT
119	n0797	RAILROAD ARM	203.7	7.6	NO ACTION	15L	ON AIRPORT
120	N1075	ACCESS GATE	159.6	2.1	NO ACTION (OBSTRUCTION	15L	ON AIRPORT
121	N1077	ACCESS GATE	159.6	2	NO ACTION (OBSTRUCTION	15L	ON AIRPORT
	n1075	ACCESS GATE	159.6	2.1	NO ACTION (OBSTRUCTION	15L	ON AIRPORT

Table 15: Obstructions (Continued)

#	POINT NAME	DESCRIPTION	OBJECT ELEV	OBJECT PENETRATION	PROPOSED ACTION	SURFACE NAME	LOCATION
122	525	SIGN-TAXIWAY	144.6	2	NO ACTION	PT77 10-28 PRIM	ON AIRPORT
123	2110	POLE-CATENARY	185.5	0.3	NO ACTION	PT77 15L APPR-INNR	ON AIRPORT
124	4010	POLE (OBSTRUCTION LIGHT)	161.6	31.5	NO ACTION	PT77 15L-33R TRANS	ON AIRPORT
125	528	AIR CANNON	149.3	2.7	SEE NOTE 7	PT77 10-28 TRANS	ON AIRPORT
126	1974	AIR CANNON	145.2	5.2	SEE NOTE 7	PT77 10-28 PRIM	ON AIRPORT
127	2890	AIR CANNON	139.7	2	SEE NOTE 7	PT77 15R-33L PRIM	ON AIRPORT





#### Alternatives Considered

Relocation of Taxiway H to the north was considered but would result in an increased value to the runway occupancy time and reduce capacity. The selected alternative best serves aircraft landing on Runway 33L by maintaining a distance between Taxiway H and the Runway 33L landing threshold that reduces runway occupancy time.

#### Design Standards

The proposed Taxiway H relocation will meet AC 150/5300-13A design standards.

#### Navigational Aids

The Taxiway H relocation project will not affect or require the relocation of any navigational aids.

#### ATCT Considerations

The Taxiway H project will not impact visibility from the existing or future ATCT facility.

#### Federal Aviation Regulations (FAR) Part 77

Aircraft operating on the relocated Taxiway H will exceed FAR Part 77 transitional surfaces. However, such penetrations are permissible since the penetrations will result from aircraft transitioning through the area.

#### Project Schedule

The proposed project is scheduled to be completed by 2020.

#### *Apron Fill at North Cargo Positions F18/F20*

#### Project Description

The grass island located between positions F18A and F20A will be filled with new Portland Cement Concrete (PCC) to provide additional pavement for adjustment of parking between the two positions. The PCC will create additional area for parking and Remain Overnight (RON).

Figure 17: Apron Fill at North Cargo Positions F18/F20



#### Project Justification

Paving the island area in between the two positions provides more flexibility for fleet mix parking and cargo servicing of the positions once the aircraft are parked. In addition, the aircraft containment marking can be extended to provide the appropriate clearance area for the aircraft.

#### Alternatives Considered

Alternatives included keeping the grass area and limiting the capacity of the parking positions. While aircraft are able to fit in the current positions, servicing limitations and potential for gear overrun are likely considering the size of aircraft that will be parked at this location.

#### Design Standards

Design standards include the grade of the apron where the aircraft will park at these locations as well as the drainage area and containing contaminated flow into the water system.

#### Navigational Aids

The apron infill improvement project will not affect or require the relocation of any navigational aids.

#### ATCT Considerations

As these are existing positions, the improvement has very little likelihood to create any line-of-sight shadows on the existing taxiway system.

### Federal Aviation Regulations (FAR) Part 77

These are existing aircraft parking positions and have no potential to create any Part 77 penetrations given the distance from the runway.

### Project Schedule

The proposed project is scheduled to be under construction by 2020.

### *VSR Section from Runway 33L to Future Fire Training Facility*

#### Project Description

A VSR will be added to connect the existing roadway around the Runway 33L end to the new Aircraft Rescue and Fire Training Facility. This VSR will complete the roadway connection between the ARFF station and the training facility.

Figure 18: VSR Section from Runway 33L to Future Fire Training Facility



#### Project Justification

The new training facility will be used by personnel from the ARFF station. These personnel will need direct access across the airfield to the training facility. The VSR will provide direct on-airport access, shorten the drive time to the facility, and avoid the need to enter/exit several gates.

#### Alternatives Considered

The ARFF personnel could utilize the aircraft pavements (runways and taxiways) but this scenario does not provide dedicated access and creates a potential conflict situation between ARFF vehicles and aircraft and requires ATCT coordination. Another alternative would be to exit the airport property and re-enter via an AOA access gate on Dorsey Road. This requires additional drive time and time to access security gates.



### Design Standards

All roadway geometry will meet the requirements necessary to accommodate the largest emergency response vehicles and provide movement for a top speed of 20 mph based on this vehicle size and type.

### Navigational Aids

There are no navigational aids impacted, assuming that the road will be relocated to accommodate future Runway 10R-28L in the long term.

### ATCT Considerations

The planned VSR will not impact the visibility of the existing or future ATCT facility.

### Federal Aviation Regulations (FAR) Part 77

There are no impacts to the Part 77 surfaces, assuming the road will be relocated to accommodate future Runway 10R-28L in the long term.

### Project Schedule

The proposed project is scheduled to be under construction by 2020.

### *Taxiway Victor (V) Relocation*

#### Project Description

Taxiway V will be demolished and reconstructed at a separation distance of 600 feet from the Runway 10-28 centerline. This project removes nonstandard Taxiway V from its current location and reconfigures it to meet FAA design standards for runway/taxiway separation.

Figure 19: Taxiway Victor (V)



#### Project Justification

The reconfiguration of Taxiway V at a 600-foot separation from the Runway 10-28 centerline is needed to meet FAA design standards for an ADG Group V runway having a Category II/III approach per AC 150/5300-13A. In addition, new Taxiway V allows for more queuing of aircraft departures.

#### Alternatives Considered

The only potential alternatives were to either leave Taxiway V at its current nonstandard design or eliminate Taxiway V without reconstructing it to standards.

#### Design Standards

The proposed Runway 10-28 taxiway improvement project will meet AC 150/5300-13A design standards by providing 600 feet of separation between the centerline of Runway 10-28 and Taxiway V

#### Navigation Aids

Reconstructed Taxiway V will be located within the glideslope critical area and thus any aircraft parked while queuing on Taxiway V may affect the glideslope.

#### ATCT Considerations

The planned Taxiway V reconfiguration will be visible from the existing and proposed ATCT.

#### FAR Part 77

The project is not anticipated to affect FAR Part 77 surfaces.

#### Project Schedule

The proposed project is scheduled to be under construction by 2020.

### *Runway 15R Deicing Pad Expansion*

#### Project Description

The existing Runway 15R deicing pad will be expanded and also include an area for snow dumping (P41). In addition to providing deicing operations, the 15R pad will simultaneously allow for RON parking in the colder months. In the warmer months when deicing is not required, the pad can be wholly used for RON parking. This project will require relocation of Gate A, the bus/taxi staging area (P148), FAA RTR facility, triturator (P43), and glycol storage equipment (P40).

Figure 20: Runway 15R Deicing Pad



#### Project Justification

Expansion of the Runway 15R deicing pad enhances the utility of the pad, improves operations and supports simultaneous deicing, RON parking, and aircraft queuing.

#### Alternatives Considered

Several alternatives for the Runway 15R deicing pad were considered, ranging from a minimum build to a maximum build. The minimum build would not impact the RTR or the triturator, but would not permit simultaneous deicing operations and RON parking. In addition to the standard deicing operations, the preferred maximum build alternative, offers year-round RON parking.

#### Design Standards

The proposed Runway 15R Deicing Pad will meet all applicable AC 150/5300-14C and 150/5300-13A design standards.

#### Navigation Aids

The proposed development will not infringe upon any airport navigation systems or associated critical areas provided the RTR is relocated in conjunction with the future ATCT prior to construction.

#### ATCT Considerations

The planned Runway 15R deicing pad expansion will be visible from the existing and proposed ATCT.

#### FAR Part 77

The project is not anticipated to affect FAR Part 77 surfaces.

### Project Schedule

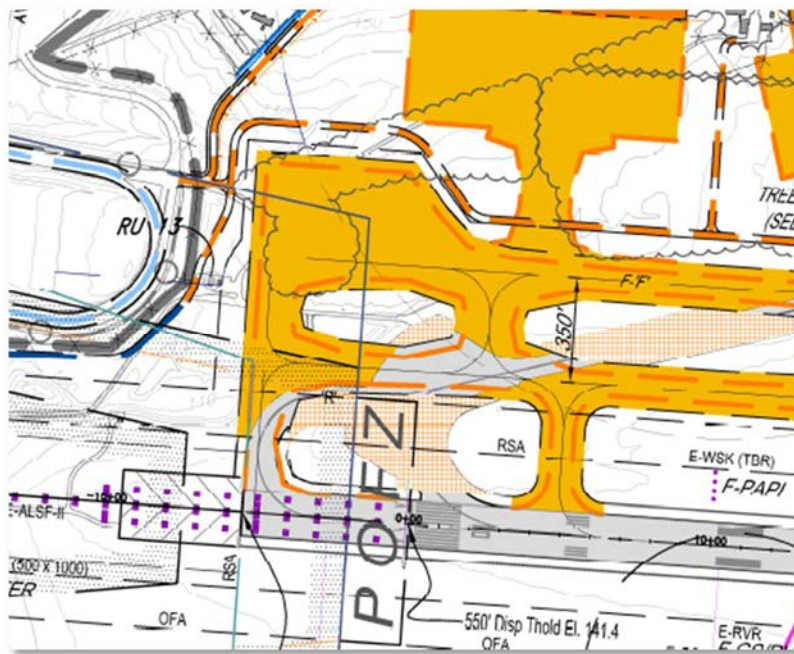
The proposed project is scheduled to be under construction by 2020.

### Runway 10 Hold Pad

#### Project Description

In conjunction with the reconstruction and extension of Taxiways F and R, a ±190,000 SF hold pad will be constructed at the Runway 10 end. The hold pad will provide the ATCT with flexibility to sequence aircraft departing Runway 10 and manage aircraft queuing.

Figure 21: Runway 10 Hold Pad



#### Project Justification

The proposed Runway 10 hold pad will improve the queuing of aircraft departing Runway 10 while also minimizing congestion along proposed Taxiway F and R.

#### Alternatives Considered

Alternatives considered for the hold pad included not developing a hold pad as well as locating the hold pad further east from the end and west of Taxiway G, and shifting the airline maintenance facilities to the west. Given that the hold pad will help to facilitate aircraft departure flow, the no-build option was rejected. The alternative site near Taxiway G was eliminated from consideration due to the ATCT line-of-sight impacts that would result from aircraft parked on the hold pad. The Taxiway G location also would require aircraft to be released into the queue and would not offer immediate access to the Runway 10 end for departure.



#### Design Standards

The proposed Runway 10 hold pad will meet 150/5300-13A design standards.

#### Navigation Aids

The proposed development is not likely to infringe upon any airport navigation systems or associated critical areas. As a portion of the Runway 10 hold pad is located within the ASR critical area, the pad requires further evaluation during the design phase to determine if any signal reflection issues would occur.

#### ATCT Considerations

The planned Runway 10 hold pad will be visible from the existing and proposed ATCT pending the proposed removal of trees from the existing Northwest Quadrant area.

#### FAR Part 77

Aircraft operating on the new hold pad will exceed FAR Part 77 transitional surfaces. However, such penetrations are permissible since the penetrations will result from aircraft transitioning through the area.

#### Project Schedule

The proposed project is scheduled to be under construction by 2020.

### 7.3.2. Terminal Enhancements

#### *Commuter Concourse Demolition and Remain Overnight (RON) Parking Construction*

##### Project Description

The Commuter Concourse at the end of Concourse D was originally constructed for airline hubbing practices that were in existence at BWI Marshall from the mid-1980s to late-1990s. Since the early 2000s, the Commuter Concourse has seen sparse activity. The Commuter Concourse apron continues to support the USAir commuter service and RON operations, but the pavement is deteriorating and in need of repair.

The Commuter Concourse has served its purpose and exceeded its useful life. The low utilization of Commuter Concourse gates warrants demolition of the concourse and conversion to a RON parking area. Given the existing pavement design specific to regional aircraft, the apron is capable of supporting Group III aircraft only. The new RON apron would be constructed to support multiple aircraft parking positions of varying size, up to ADG V standard.

Figure 22: Commuter Concourse Demolition and Remain Overnight (RON) Parking Construction



#### Project Justification

By demolishing the Commuter Concourse and converting the area to support RON positions, MAA can meet the growing demand for RON parking positions at BWI Marshall. The deferral of this project would compound the demand for RON spaces at BWI Marshall and could result in parking aircraft overnight at more remote positions. Such a practice can prove to be undesirable if the positions can only be provided where runway crossings are necessary.

#### Alternatives Considered

Due to the lack of space available on the airfield for RON parking, no alternative, other than the “no-build” option was considered.

#### Design Standards

The future RON Parking Apron will be configured to meet FAA design standards.

#### Navigation Aids

The project is located away from all navigational aid critical areas and will not interfere with any airport navigation systems.

#### ATCT Considerations

The future RON Parking Apron at the site of the existing Commuter Concourse (to be demolished) will not be operated in a manner that will affect the functions or visibility of the existing or future ATCT facility. ATCT representatives will be included in the design process to ensure that all future aircraft are positioned on the future RON Parking Apron such that tail heights will not interfere with ATCT line-of-sight visibility.

#### FAR Part 77

The presence of aircraft remaining overnight on the apron are not anticipated to affect FAR Part 77 surfaces.

#### Project Schedule

The proposed project is scheduled to be under construction by 2018.

#### *Concourse D 2-Gate Extension*

##### Project Description

Since the Commuter Concourse at Concourse D will be demolished for additional RON aircraft parking as part of a separate project, a two-gate extension of Concourse D will be developed to expand the existing holdroom space available in order to support two aircraft gate positions.

Figure 23: Concourse D 2-Gate Extension



### Project Justification

The Concourse D 2-Gate Extension is needed to replace a portion of the Commuter Concourse at Concourse D in order to accommodate forecasted demand.

### Alternatives Considered

The alternative considered added only dedicated aircraft RON spaces for this area. However, the lack of access for passenger boarding bridges and hold rooms that comply with code requirements of larger aircraft necessitates building modifications to accommodate 2 gates that would connect to the terminal. The apron at these gates could still be used for RON, but would also service airline operations with interior gate infrastructure.

### Design Standards

The project will be designed and built to meet applicable building codes and adhere to FAA design standards.

### Navigation Aids

The project is located away from all navigational aid critical areas and will not interfere with any airport navigation systems.

### ATCT Considerations

There are minimal line-of-sight shadows that result from the extension of Concourse D from both the existing and proposed ATCT locations. It is not anticipated that the shadows will obstruct the ATCT's existing/future view of aircraft operating on Taxiway T around the terminal facility.

### FAR Part 77

The project is not anticipated to affect FAR Part 77 surfaces.

### Project Schedule

The proposed project is scheduled to be under construction by 2020.

### *Concourse E (4-Gate Expansion)*

#### Project Description

A proposed extension to Concourse E will add approximately 41,000 square feet of terminal space to support the addition of four Group V aircraft gates (P3-P4). The project will be implemented in phases. The first phase will include the addition of approximately 19,000 square feet of terminal space to accommodate two Group V gates. The second phase incorporates approximately 22,000 square feet of terminal building for two additional Group V aircraft gates when demand warrants.





#### Navigational Aids

The terminal is located away from all navigational aid critical areas and will not interfere with any airport navigation systems.

#### ATCT Considerations

From the existing ATCT, there are line-of-sight shadow issues from aircraft tails parked at the 2-gate expansion; however the linear footprint of the shadows are minimal and would not obstruct the ATCT's view of aircraft on Runway 15L-33R.

The proposed ATCT will need to be commissioned prior to Phase 2 of the subject project as the 3rd and 4th gates of the terminal extension would obstruct existing ATCT visibility to Taxiways B and S. It is anticipated that Phase 2 of the concourse extension project will occur after 2018.

Once the future ATCT is completed, the overall 4-gate planned terminal extension will not affect the functions or visibility of the new facility.

#### FAR Part 77

Neither the terminal nor apron (aircraft included) portions of the project are anticipated to affect FAR Part 77 surfaces.

#### Project Schedule

The proposed project (P3) is planned to be under construction by 2018. The Phase 2 project (P4) will be completed after the new ATCT is constructed.

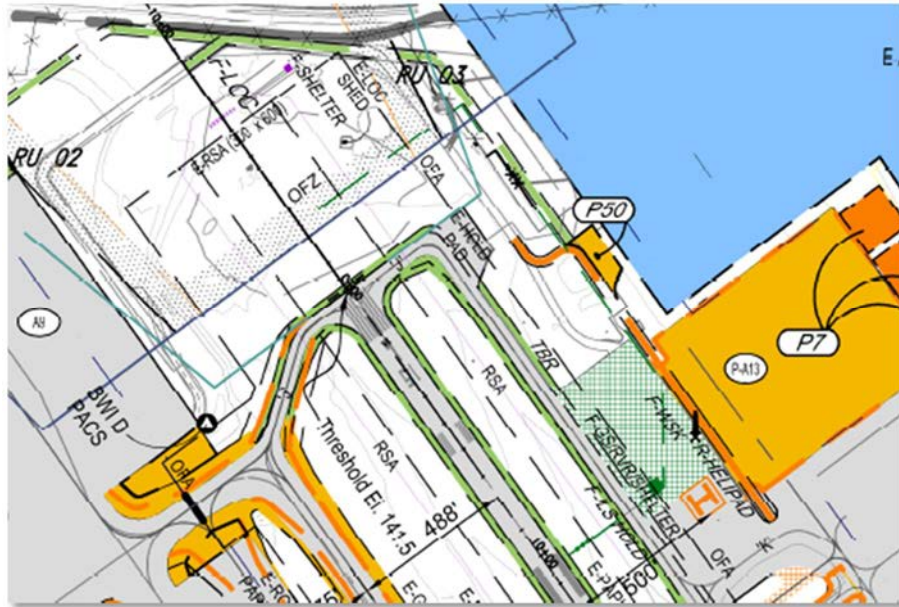
#### *Relocate Security Checkpoint Juliet*

##### Project Description

This project involves relocation of Security Checkpoint Juliet to facilitate the Concourse E expansion project. The new checkpoint (P50) will be located on the east side of Runway 15L-33R, adjacent to the GA facility expansion. Access to the airfield will be via the vehicle service road on the Runway 15L end. Security Checkpoint Juliet facilities will consist of guard booths and a vehicle inspection area.



Figure 25: Relocate Security Checkpoint Juliet



#### Project Justification

The Concourse E expansion project will eliminate the current Security Checkpoint Juliet and bisect the roadway access to the airfield through the existing location. The checkpoint will have to be relocated as a result of the proposed project.

#### Alternatives Considered

No other construction alternatives were considered.

#### Design Standards

The security checkpoint will be designed to meet all Transportation Security Administration (TSA) and BWI Marshall standards for security inspections.

#### Navigational Aids

The location of Security Checkpoint Juliet will have no impact to navigational aids.

#### ATCT Considerations

The planned location will have no impacts to the existing or proposed ATCT.

#### FAR Part 77

The new checkpoint will have no impact to Part 77 surfaces.

#### Project Schedule

The checkpoint will be completed in coordination with the Concourse E expansion and is expected to be complete or under construction by 2020.

### Relocate Airfield Lighting Vault

#### Project Description

The existing airfield lighting vault (ALV) at BWI Marshall was originally the ARFF Station and was never intended to remain the ALV for an extended period of time. Although the vault layout makes optimal use of the available space and is well organized, the vault footprint is based on its former function as an ARFF Station and is not typical of a new vault layout. The existing ALV also has dated equipment and infrastructure and currently houses Maryland Environmental Services (MES) glycol monitoring and glycol storage control equipment, as well as a Glycol Recovery Vehicle (GRV) dump location.

Most importantly, the current location severely impacts the flexibility and maneuverability of aircraft to and from the Concourse B-C apron "alley". Furthermore, the existing ALV lies in close proximity to aircraft traffic in the terminal ramp non-movement areas that are not under ATCT control. A new vault (P14) is proposed to be constructed adjacent to future Taxiway P (decommissioned Runway 4-22) and the Runway 28 deicing pad.

Figure 26: Relocate Airfield Lighting Vault



### Project Justification

The current ALV location causes a pinch point for aircraft circulation on and around the terminal ramp system as previously described. In addition, Group V aircraft cannot taxi past the ALV on the ramp, and the building severely limits the ability to install a Group V dual taxiway system around the ramp. A dual taxiway system is considered critical to the efficiency and safety of the overall ramp operation. MAA took the opportunity with the current ALP Update to propose the relocation of the facility to accomplish several benefits for the Airport including reliability, capacity and safety, utility structure organization, and resolution of drainage issues.

### Alternatives Considered

Alternatives included maintaining the existing location and upgrading all of the homerun connections. However, outages would be more extensive and the current facility was not originally an airfield lighting vault and lacks the typical features that are needed. Other proposed locations were considered, but the distance from existing airfield infrastructure would be longer and more costly. Other locations had adverse impacts to the airfield infrastructure.

### Design Standards

All facility elements will satisfy current FAA design standards, including adherence to the required safety and object free areas identified in AC 150/5300-13A.

### Navigational Aids

Other than the possibility of temporary, night-time outages during construction, there will not be any impacts to navigational aids by this project.

### ATCT Considerations

New infrastructure for the software required to operate the airfield lighting from the existing and proposed ATCT will likely be required. The system will be powered from the ALV and connected to the ATCT by communication utilities. During construction, temporary control outages may be experienced when transitioning the system to the new ALV.

Due to the limited vertical development ( $\pm 25$  feet above ground level (AGL)), the relocated lighting vault will not impact the existing or proposed ATCT line-of-sight.

### FAR Part 77

The project is not anticipated to affect FAR Part 77 surfaces. The height of the transitional surface from Runway 10-28 in the vicinity of the proposed lighting vault is approximately 35 feet AGL. Therefore, the 25-foot ALV structure will not penetrate the surface.

### Project Schedule

The proposed project is scheduled to be under construction by 2017, with all ancillary elements (existing vault demolition and pavement infill) complete by 2019.

### New Sky Bridge C

#### Project Description

During Phase 1, a project to improve accessibility from the Hourly Parking Garage to the terminal will be undertaken. The Concourse C Sky Bridge is proposed to provide direct access from Level 6 of the Hourly Garage to the terminal. This linkage will improve the access already provided by the Sky Bridges at Concourses A, B, and D as it will directly serve passengers using Concourse C. This walkway would be widely accessible throughout the Hourly Garage via multiple elevators. Sky Bridge C will also improve connectivity from the future hotel sky bridge to the Hourly Garage and terminal.

Figure 27: New Sky Bridge C



#### Project Justification

The presence of a sky bridge at Concourse C will improve the level of customer service by reducing walking distances from the Hourly Garage and future hotel to Concourses C.

#### Alternatives Considered

Other than the “no-build” alternative, no other construction alternatives were considered because all concourses other than Concourses C and E are served by existing sky bridges.

#### Design Standards

The Concourse C Sky Bridge will be designed and constructed in accordance with applicable codes.



#### Navigational Aids

This project is located away from all navigational aids and associated critical areas and will not interfere with airport navigation systems.

#### ATCT Considerations

The proposed project will not impede ATCT visibility.

#### FAR Part 77

The facilities will be designed to conform to the horizontal surface ( $\pm 293$  feet MSL).

#### Project Schedule

The proposed project is scheduled to be under construction by 2020.

### 7.3.3. Landside Improvements

#### *New Terminal Response Fire Rescue Station*

##### Project Description

A secondary Fire Rescue facility (P24) will be constructed to provide the terminal and landside with emergency response capability. The proposed location will provide for improved response times associated with terminal and landside issues as opposed to the existing midfield location handling all emergency calls.

Figure 28: New Terminal Response Fire Rescue Station



### Project Justification

The existing location of the Airport Rescue and Firefighting Facility (ARFF) adequately serves the existing and future airfield. However, Fire/Rescue personnel also respond to terminal and landside emergencies, and need to respond from a landside location rather than crossing active runways to reach people in distress, or to deal with potential terminal or other facility structural fires. A secondary Fire/Rescue station is recommended to provide adequate response times for emergencies in the terminal, North Cargo area, and the general aviation areas.

### Alternatives Considered

Four sites were evaluated for the secondary Fire Rescue facility as follows:

- Alternative 1 - Adjacent to the proposed Taxi Staging Area
- Alternative 2 - ESP Lot internal to the interchange loop ramp
- Alternative 3 - On Elm Road at the intersection adjacent to the entrance to the North Cargo Area roadway
- Alternative 4 - On the west side of Terminal Road between Aviation Boulevard and Elkridge Landing Road

Alternative 4 is the preferred site for the secondary Fire Rescue station. This alternative is close to the terminal, North Cargo area, and general aviation areas to enhance emergency response times; and can be constructed independently of other potential landside improvement projects.

### Design Standards

The Fire Rescue station and all associated projects will be designed to meet applicable codes and building requirements including FAA standards.

### Navigational Aids

The Fire Rescue station is located away from all navigational aids and associated critical areas and is not anticipated to interfere with any airport navigation systems.

### ATCT Considerations

The proposed project will not impede ATCT visibility of airfield operational and runway approach areas.

### FAR Part 77

The project does not impact Part 77 surfaces.

### Project Schedule

The proposed project is scheduled to be under construction by 2020.



### *New Vehicle Service Station*

#### Project Description

A new vehicle service station is proposed on a vacant lot, Parcel 18, at the intersection of Amtrak Way and Aviation Boulevard (P46). The station would include fueling facilities, a car wash, and a convenience store.

Figure 29: New Vehicle Service Station



#### Project Justification

The vacant lot is available for development and can generate non-aeronautical revenue for the MAA. Additionally, a proposed vehicle service station will meet the needs of Consolidated Rental Car Facility users.

#### Alternatives Considered

Given the demand for a vehicle service station and its associated amenities and that the existing lot is vacant, there were no other alternative locations considered.

#### Design Standards

The vehicle service station will be designed to meet applicable codes and building requirements.

#### Navigational Aids

The vehicle service station is located away from all navigational aids and associated critical areas and is not anticipated to interfere with any airport navigation systems.

#### ATCT Considerations

The proposed project will not impede ATCT visibility of airfield operational and runway approach areas.

#### FAR Part 77

The proposed project will not impact Part 77 surfaces.

#### Project Schedule

The proposed project is scheduled to be under construction by 2020.

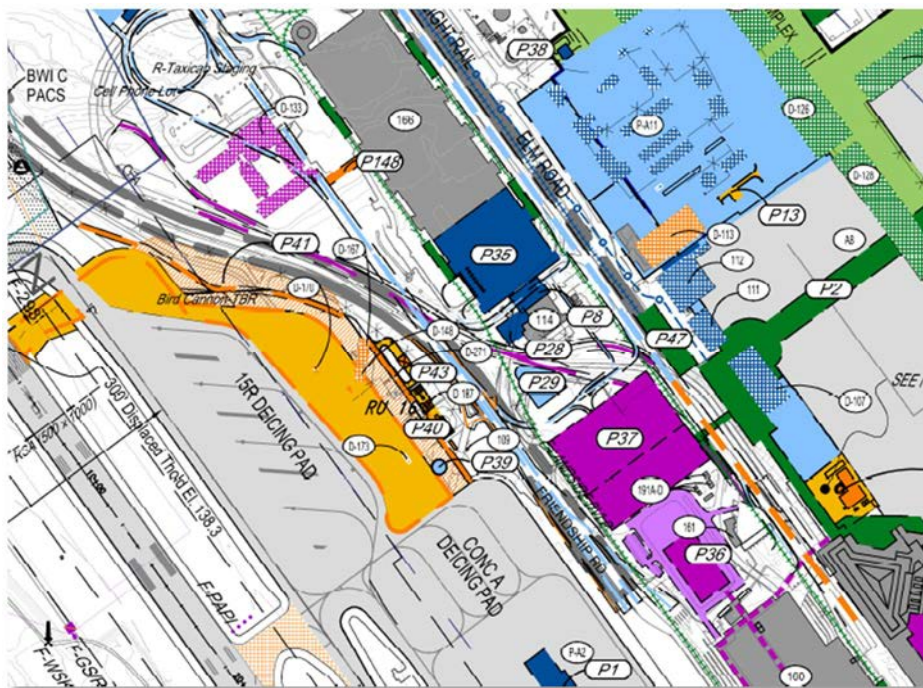
### *Terminal Roadway Widening and Access Improvements*

#### Project Description

Due to the current congestion and the future anticipated passenger forecast levels, I-195 inbound lanes will need to be widened. This project will alleviate the existing queuing issues during peak hours and increase the safety of travelers utilizing these roadways to arrive at the Airport. The location of the proposed roadways would provide sufficient width to increase the number of roadway lanes to meet traffic demand through the planning period.

In order to segregate vehicle traffic associated with the proposed hotel, vehicular access in the vicinity of the hotel and Hourly Garage will ultimately need to be modified. Hotel related access projects include reconfiguration of the roadway for service vehicle access, improving hotel patron egress, constructing an additional lane for hotel/garage access, and closing the existing employee access roadway.

Figure 30: Terminal Roadway Widening and Access Improvements



### Project Justification

Traffic operations along I-195 eastbound between MD 170 and the terminal are prone to queuing during the evening hours and delays are experienced by motorists accessing the terminal. During an observation period there were several significant queues, up to one half mile in length, witnessed. Additionally, the queuing causes access to the Upper Level roadways to become blocked at times. Therefore, modifications to the existing roadway infrastructure are necessary.

### Alternatives Considered

Four alternatives for widening I-195 were developed and reviewed as summarized below.

- Alternative 1 – Provide an additional lane from the taxi/bus storage area merge to the Upper Level roadway or provide a shorter lane by beginning construction at the island that separates the Authorized Vehicle entrance/exit from the runway to the Upper Level roadway.
- Alternative 2 - Construct an auxiliary lane between Terminal Road and the Hourly Garage with the Terminal Road ramp remaining as one lane or being marked for two lanes.
- Alternative 3 – Extend the lane for Authorized Vehicles on the Lower Level roadway to just past the split from the Upper Level roadways and allow access to the express lane via the lane for the Hourly Garage.
- Alternative 4 – Provide a temporary portable dynamic message sign near the cell phone lot and along I-195 encouraging patrons to pick up passengers on the departures level roadways during peak times of queuing.

The recommended alternative was to introduce Alternative 4 as a short-term solution while moving forward with widening the inbound lanes of I-195.

Various alternatives were evaluated to determine the optimal configuration of the hotel buildable area, and the ancillary projects and roadway layouts. The preferred alternatives utilize the existing roadway around the future hotel and Hourly Garage to the greatest extent possible, allowing for Garage expansion.

### Design Standards

The Terminal Roadway Widening and Access Improvement projects will be designed to meet applicable standards.

### Navigational Aids

These projects are located away from all navigational aids and associated critical areas and are not anticipated to interfere with any airport navigation systems.

#### ATCT Considerations

The proposed projects will not impede ATCT visibility of airfield operational and runway approach areas.

#### FAR Part 77

The roadway improvements do not impact Part 77 surfaces.

#### Project Schedule

The proposed projects are scheduled to be under construction by 2020.

### *Upper Level Roadway Widening at Concourse E*

#### Project Description

In support of the increased traffic and growth anticipated for Concourse E, MAA proposes to widen the upper level roadway by two additional lanes. Consistent with the existing terminal curbside/road between Concourses A and D, this project entails widening the outer lanes of the terminal roadway and segregating public vehicle operators (outer lanes) from private vehicle operators (inner lanes). This project will improve the level of service provided at the international concourse and of the overall terminal roadway system.

Figure 31: Upper Level Roadway Widening at Concourse E



#### Project Justification

With the increased traffic and growth anticipated for Concourse E, widening of the roadway is needed to accommodate the future demand.



#### Alternatives Considered

Besides a no-build option, no other construction alternatives were considered.

#### Design Standards

The Upper Level Roadway Widening at Concourse E will be designed to meet applicable standards.

#### Navigational Aids

These projects are located away from all navigational aids and associated critical areas and are not anticipated to interfere with any airport navigation systems.

#### ATCT Considerations

The proposed projects will not impede ATCT visibility of airfield operational and runway approach areas.

#### FAR Part 77

The roadway improvements do not impact Part 77 surfaces.

#### Project Schedule

The proposed projects are scheduled to be under construction by 2020.

### *Building 113 Demolition*

#### Project Description

Removal of the former maintenance building to create a site that can be utilized for other purposes.

Figure 32: Building 113 Demolition



#### Project Justification

The current building will require extensive improvements to meet the current code and be utilized by MAA personnel or another tenant. As a result, there is not a viable use or occupant so the building must be abandoned and demolished. Removal of the building and reuse of the site is consistent with the planned phased relocation of airport maintenance facilities to a new site

#### Alternatives Considered

The only alternative is to renovate and improve the facility to make it usable for another purpose and tenant. However, the cost to upgrade the facility to meet all applicable codes would be extensive and unreasonable.

#### Design Standards

Building 113 will be demolished according to applicable demolition and disposal codes and standards.

#### Navigational Aids

There are no impacts to navigational aids.

#### ATCT Considerations

There are no impacts to ATCT line-of-sight conditions.

#### FAR Part 77

The building demolition presents no impact to the Part 77 surfaces.

#### Project Schedule

The proposed project is scheduled for construction by 2020.

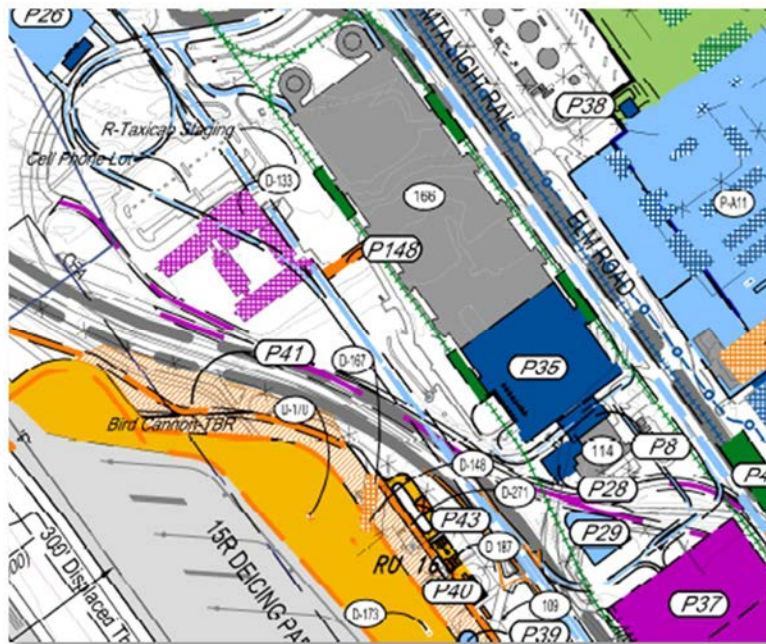
#### *Taxicab Support Building at Former Hotel Site*

##### Project Description

In conjunction with the Phase I development of the Runway 15R deicing pad expansion, the existing taxi/bus staging area and the associated administrative support building will need to be relocated. The operations will be relocated to the former Sheraton Hotel site located northwest of the proposed Runway 15R deicing pad. The staging areas will make use of the existing pavement that was formerly used for hotel parking. A new administrative support facility will be built, or a temporary staging trailer will be placed adjacent to the parking area to manage the taxi operations.



Figure 33: Taxicab Support Building at Former Hotel Site



#### Project Justification

The taxicab administration building and associated parking operations need to be relocated in order to allow for the expansion of the Runway 15R deicing pad.

#### Alternatives Considered

Other locations were considered for the relocated staging area, including utilizing portions of the existing Daily Express Parking Lot or the Long Term Economy Parking. Given the proposed location's proximity to the terminal building, the ability to make use of the existing parking facility, and the fact that the site is currently vacant, the former hotel site proved to be the most advantageous location. It is possible that the proposed site will not be developed. In this event, a temporary staging trailer would be installed on site.

#### Design Standards

The administrative support facility will be designed to meet applicable codes and building requirements.

#### Navigation Aids

There are no impacts to navigational aids.

#### ATCT Considerations

There are no impacts to ATCT line-of-sight conditions.

#### FAR Part 77

The building presents no impact to the Part 77 surfaces.

### Project Schedule

The proposed project is scheduled for construction by 2020 and will be necessary prior to the proposed expansion of the Runway 15R deicing pad.

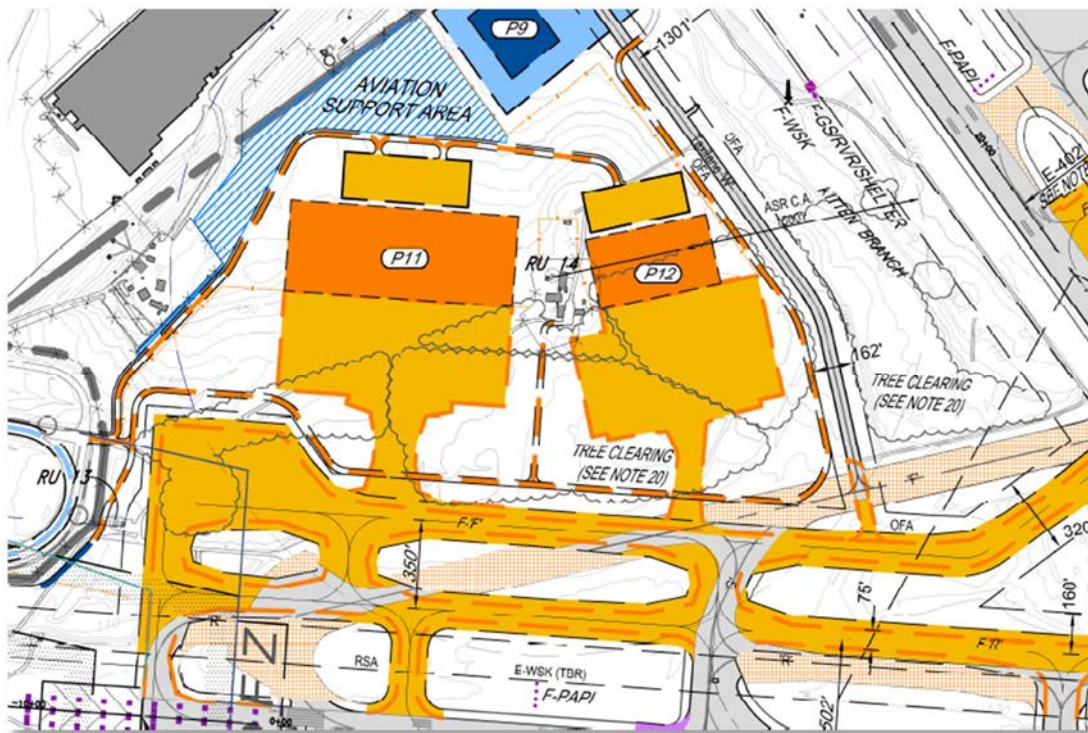
### 7.3.4. General Aviation/Hangar Improvements

#### *New Aircraft Maintenance Facilities*

#### Project Description

As identified in the 2011 Master Plan Technical Report (Volume II), two aircraft maintenance facilities (P11 and P12) are proposed during Phase 1 to accommodate the maintenance requirements of air carriers at BWI Marshall. The P11 facility is intended to accommodate a combination of ADG IV and ADG V aircraft at an elevation of 235 feet MSL. The P12 facility is intended to accommodate ADG III aircraft at an elevation of 210 feet MSL.

Figure 34: New Aircraft Maintenance Facilities



#### Project Justification

The 2011 Master Plan Technical Report identified a need for additional aircraft maintenance facilities by 2020 to ensure BWI Marshall has the ability to accommodate the demand for aircraft maintenance at the Airport.

#### Alternatives Considered

Two general site locations were initially evaluated. Within the preferred site location, multiple alternative site layout plans were considered to accommodate the aircraft maintenance facilities. The preferred building layouts were selected but altered slightly, in part, because they allow for development of both facilities and provide for development of the Runway 10 hold pad. The proposed facilities will pose impacts to the proposed Runway 10 hold pad and Taxiway F extension from the existing ATCT if the projects are completed before the ATCT relocation.

#### Design Standards

The proposed aircraft maintenance facilities will be designed and built to meet applicable building codes and FAA design standards.

#### Navigational Aids

The proposed maintenance facilities are within the ASR critical area and require further evaluation during the design phase to determine if any signal reflection issues would occur.

#### ATCT Considerations

Due to the alignments of the proposed facilities, the existing and proposed ATCT would have a clear line-of-sight to the Runway 10 end as well as the Runway 10 hold pad.

#### FAR Part 77

The proposed aircraft maintenance facilities and associated aircraft parked on the ramps will not impact the FAR Part 77 transitional or horizontal surfaces.

#### Project Schedule

The facility is proposed to be complete or under construction by 2020.

### 7.3.5. Support Facilities

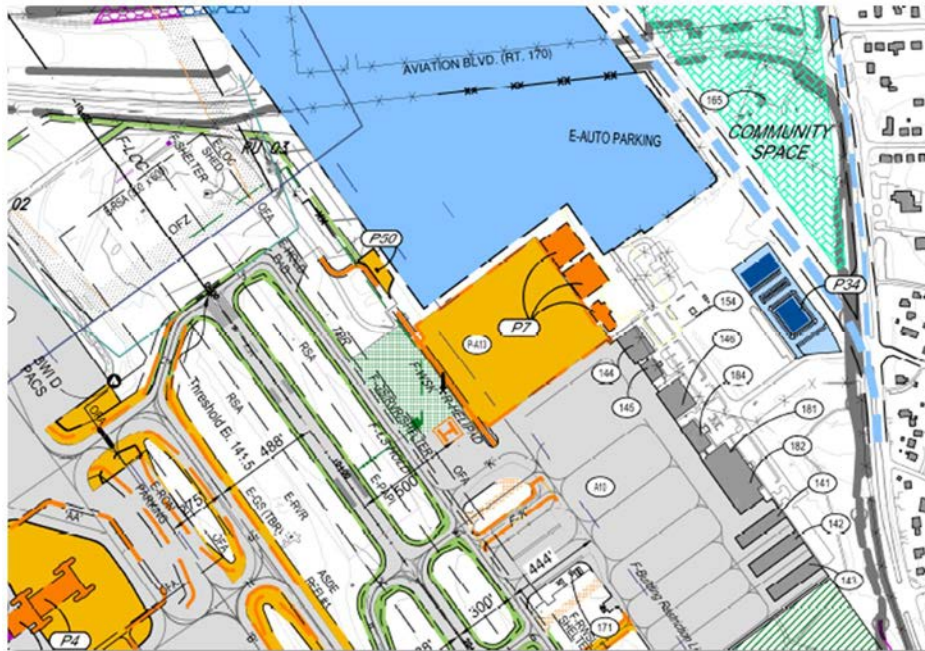
#### *Second FBO*

##### Project Description

The MAA proposes to construct additional general aviation facilities (P7) on the east side of the airfield between the existing general aviation facilities and the existing long-term parking lot. The project includes a Pilot Center, GA hangar buildings, aircraft ramp, fuel storage facility, vehicle parking, and other necessary facilities. The Pilot Center will contain the following elements: lobby waiting area, operations counter, customer service office, manager's office, flight planning room, weather room, pilot's lounge, pilot rest facility, conference rooms, and administrative offices.



Figure 35: Second FBO



#### Project Justification

The proposed additional general aviation facilities will provide more space for GA activities for based aircraft at BWI Marshall. These facilities offer the potential for increased revenue.

#### Alternatives Considered

A number of alternative sites have been considered for additional general aviation facilities at BWI Marshall. However, for operational reasons, all of the potential sites were located adjacent to the existing GA area. The alternative sites included locations south, east, and north of the proposed GA area. Locations to the south and east were eliminated from consideration due to potential environmental impacts.

#### Design Standards

The proposed general aviation facilities will be designed to meet applicable building codes and FAA design standards.

#### Navigation Aids

The future GA facilities are near the future Runway 15L glide slope. The layout for the GA facilities was altered during the Master Plan process to avoid the future Runway 15L glide slope critical area. The GA Apron will support the future helipad that must be relocated from its current site to avoid conflicts that would result from its presence in the proposed glide slope critical area.

#### ATCT Considerations

The proposed project will not impede ATCT visibility of airfield operational and runway approach areas.

#### FAR Part 77

The proposed general aviation facilities are not anticipated to affect FAR Part 77 surfaces.

#### Project Schedule

These facilities are proposed to be complete or under construction by 2020.

### *New Airport Traffic Control Tower*

#### Project Description

The MAA proposes to construct a new ATCT in the existing manager's parking lot, adjacent to Terminal E (P16). The preferred location – known as Site 2A – was determined during the MAA's ATCT site selection process which evaluated numerous potential locations. MAA then attended two separate sessions at the FAA's Airway Facilities Tower Integration Laboratory (AFTIL) to facilitate the FAA ATCT site selection process which validated the recommended Site 2A location. The height of the proposed tower is 376 feet MSL including antennas.

Figure 36: New Airport Traffic Control Tower



#### Project Justification

The existing ATCT at BWI Marshall is currently located within the main passenger terminal area, north of Concourse C, with a top of cab elevation of 281 feet MSL, and a cab eye elevation of 264 feet MSL. The location of the ATCT requires Air Traffic Control (ATC) personnel to utilize the public terminal facilities for parking and access. The existing ATCT has been deemed to be deficient for BWI Marshall in terms of size, height, airfield visibility issues, and the ability to expand.

### Alternatives Considered

As previously mentioned, multiple suitable sites were identified by the MAA for a new ATCT during the site selection process. Four sites were evaluated by the FAA through AFTIL with Site 2A being chosen by the MAA and the FAA as the preferred alternative.

### Design Standards

The facility will be designed and constructed in accordance with FAA design standards for a new ATCT and will meet applicable building codes. To ensure standard FAA design criteria will apply to future apron gradient associated with terminal development proposed in Phase 3, the existing manager's parking lot needs to be lowered by 6 feet during ATCT construction.

### Navigational Aids

The proposed ATCT could potentially interfere with the RTR in the vicinity. As part of this project, the RTR should be relocated to avoid any communication issues. There are no other impacts to navigational aids or critical areas.

### ATCT Considerations

The new ATCT (376 feet AMSL with a cab eye elevation of 346 feet AMSL) will provide the ATC personnel with unobstructed views of all the movement areas. However, it should be noted the existing ATCT should be lowered or removed to avoid visibility issues that would occur on the existing Runway 10-28.

### FAR Part 77

The new ATCT will exceed the Part 77 horizontal surface (293 feet MSL). However, a thorough constraints and airspace analysis was performed for Site 2A and it was determined to be outside the applicable FAA Order 8260.3B, United States Standard for Terminal Instrument Procedures (TERPS) surfaces. The analysis included instrument landing system category (ILS CAT) I/II/III approach and missed approach surfaces.

### Project Schedule

The facility is proposed to be complete or under construction by 2020.

### *Relocate Fire Training Facility*

#### Project Description

The MAA proposes to replace the Fire Training Facility at a site that can accommodate the necessary facilities (P45). The relocated facility will include a burn pit area, firefighting maneuvering area, training operations area, realistic interior fire building, accessory facilities, and other facilities and roadway access necessary to serve as a regional training facility.





### Alternatives Considered

In September 2013, a Fire Training Facility Relocation Analysis was conducted to determine viable locations for the facility, and develop a conceptual layout based on the latest FAA design standards. The analysis included two alternatives, with the option depicted on the ALP deemed the preferred site. The alternate site is located south of decommissioned Runway 4; as previously identified on the 2011 ALP. The analysis determined the location previously identified on the 2011 ALP was incompatible with the aviation-related development envisioned for the adjacent areas in the future.

### Design Standards

The facility will be constructed in accordance with design standards for an ARFF Training Facility per AC 150/5220-17B. Given the proximity of the site to the airfield, the facility will be designed to meet the standards set forth in AC 150/5300-13A, as well as other applicable FAA requirements.

### Navigational Aids

The relocation of the Fire Training Facility is not expected to interfere with any existing or future airport navigation systems.

### ATCT Considerations

Given that the site will be used infrequently and is located due south of existing Runway 10-28, no line-of-sight or glare impacts are anticipated from this development project for both the existing and future ATCTs.

### FAR Part 77

The proposed facility is situated within the Part 77 7:1 transitional surface for the existing Runway 10-28 and the future Runway 10R-28L. The proposed development will entail limited vertical development, and is located outside a 25-foot BRL identified for this area. Regardless, the proposed Training Facility will be designed to provide sufficient clearance to meet FAR Part 77 requirements.

### Project Schedule

The Fire Training Facility is expected to be complete by 2020.

### *Airport Maintenance Complex Relocation and Consolidation (Phase 1)*

#### Project Description

The MAA proposes to relocate and consolidate the existing airport maintenance facilities currently located at the Elm Road complex. The maintenance facilities are managed by the Airport's Office of Maintenance and Utilities (OMU), Division of Airfield. The proposed location for the consolidated maintenance facility is a developed, paved parking lot on the south side of the airfield; referred to as the Gold Lot.



- Gold Lot Site – The Gold Lot Site was the selected alternative due to its proximity to the airfield and the ability to utilize a previously developed site to reduce the overall environmental impacts. This site is ideally located to allow for site expansion and SRE staging. This site does not conflict with any previously identified use.
- Midfield Cargo Site – This site borders the midfield cargo aircraft apron which serves cargo aircraft and also provides staging area for maintenance equipment. The Midfield Cargo Site was eliminated due to the layout only accommodating narrow and contiguous buildings and extensive earthwork and grading are required.
- Second FBO Site – This alternative is located in the existing economy parking lot, where the proposed Second FBO site is to be located. Due to the site being developed, the environmental impacts are low, with minimal disruption to the existing parking lot. However, due to the site restriction, there is limited space for expandability and SRE staging.

#### Design Standards

The proposed SRE building would be constructed in conformance with MAA requirements and FAA design and construction standards. It will be clear of the future Runway 10R-28L 25-foot BRL and all other design surfaces in the vicinity; including the RSA, OFA, and navigational aid critical areas of both existing Runway 15R-33L and future Runway 10R-28L.

#### Navigational Aids

There are no proposed navigational aid impacts due to the site being located on the south side of the airfield.

#### ATCT Considerations

The proposed consolidated maintenance facility is beyond the airfield movement areas and thus would not pose any issues to the ATCT.

#### FAR Part 77

The proposed maintenance facilities are not anticipated to penetrate the Part 77 surfaces.

#### Project Schedule

The construction of the SRE building is estimated to be complete prior to 2020.

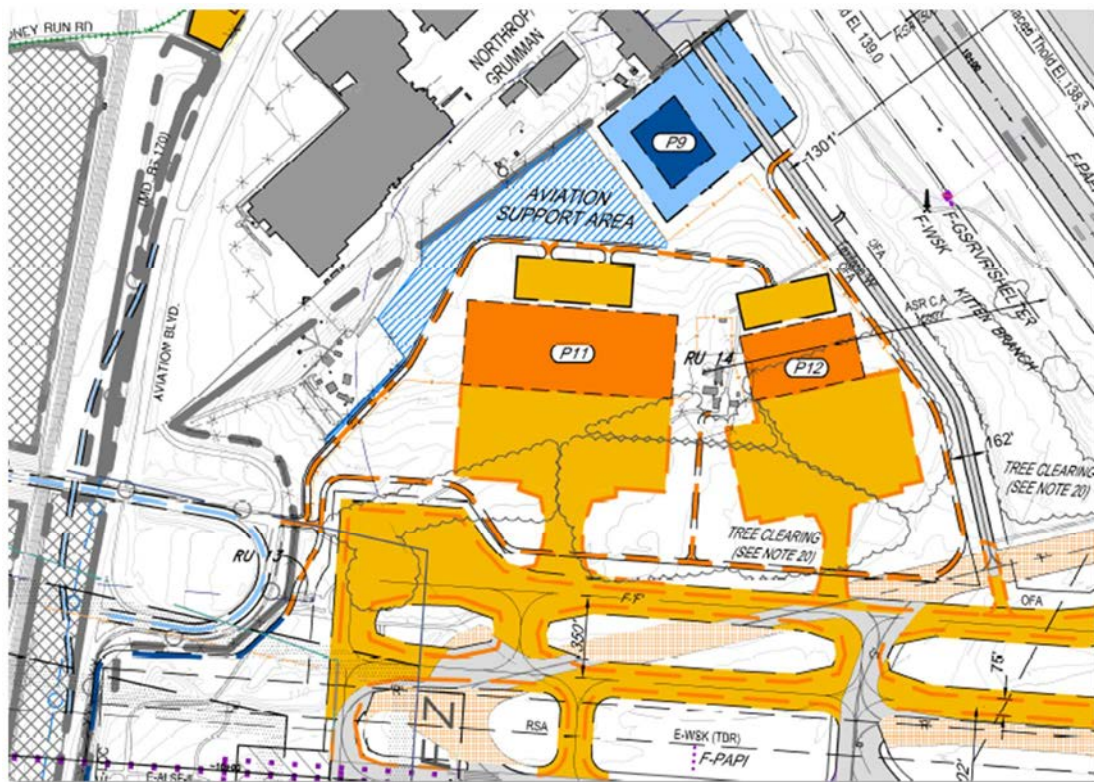


### Northwest Quadrant Perimeter Road Construction (Runway 10)

#### Project Description

The MAA proposes to construct a landside, public-use roadway to allow access to the proposed maintenance facilities as well as a secure on-airport roadway that would connect the main terminal with the Midfield Cargo Complex. The roads will be two-lanes, paved, with a maximum grade of approximately three percent. The proposed landside roadway will be used by the public to access the parking lots for the proposed maintenance facilities without entering the secure areas of the airport. The proposed secure roadway would be used by airport maintenance vehicles, security vehicles, and air cargo tug vehicles. Vehicles would enter the secure roadway through a security gate located off of Stony Road Run.

Figure 39: Northwest Quadrant Perimeter Road Construction (Runway 10)



#### Project Justification

The landside roadway system is required in order to provide access to the proposed maintenance facilities in the Northwest Quadrant. This roadway will be non-secure and allow for public access to and from the facilities without impacting the secure areas of the airport.

The airside roadway is required as BWI Marshall currently does not have an adequate, secure non-licensed vehicle roadway (NLVR) system around the perimeter of the northwest portion of the airfield. Much of the existing roadway in the northwest quadrant is unpaved and is not suitable for heavy vehicles or frequent traffic. Major portions of the roadway are not usable during inclement weather. In addition, segments of roadway in this quadrant infringe on RSAs, TOFAs, and other restricted areas. The lack of a functional roadway in this area limits the efficient and safe flow of vehicles and cargo between the terminal area and the Midfield Cargo Complex. Vehicles currently traveling between the terminal and Midfield Cargo Complex either use Aviation Boulevard or, if not licensed for public roadways, cross active runways and taxiways. Construction of a service road in the northwest quadrant will improve airside operational safety and will further the objectives of the FAA's program to prevent runway incursions.

#### Alternatives Considered

In providing access from Concourse A to the Midfield Cargo Complex, four alternatives to completing the segment of roadway between Runway 15R and Runway 10 were considered:

- Airport Perimeter Alternative – This alternative crosses Kitten Branch near the north end of Taxilane W and proceeds west along the fence line to a point northwest of the end of Runway 10.
- Airport Service Road North Alternative – This alternative crosses Kitten Branch approximately 600 feet south of the Airport Perimeter Alternative. It then runs north of the current Airport Service Road installation to reach the end of Runway 10.
- Airport Service Road South Alternative – This alternative is similar to the Airport Service Road North Alternative, except that it crosses south of the Airport Service Road installation.
- Runway 15R Parallel Alternative – This alternative runs south along Runway 15R and crosses Kitten Branch and Taxilane W along Taxiway F. It parallels Taxiway F until it reaches the end of Runway 10.

Prior to the Master Plan, the Airport Service Road North Alternative was selected as the preferred development alternative. MAA has subsequently developed only a portion (from Kitten Branch Crossing to Concourse A) of this alignment. The remaining segments of the Northwest Quadrant were realigned to best support the aircraft maintenance facilities and airside. The segments of the roadway will be constructed in Phase 1. The Airport Service Road North Alternative provides a direct route across the northwest airfield area as well as good horizontal and vertical roadway alignment. These factors allow costs to remain low relative to other alternatives, while meeting operational objectives such as decreased travel time, minimized grades, and few curves.



### Design Standards

The proposed airport perimeter service road would be constructed in conformance with MAA requirements and FAA design and construction standards. It will be clear of the Runway 15R and Runway 10 RSAs and OFAs.

### Navigational Aids

The proposed airport perimeter service road would be routed outside of the glide slope and localizer critical areas of Runway 15R and Runway 10.

### ATCT Considerations

The proposed public-access roadway and airport perimeter service road will not pass through FAA controlled airfield operating areas.

### FAR Part 77

The proposed airport perimeter service road in Phase 1 does not impact any Runway Protection Zones or approach surfaces.

### Project Schedule

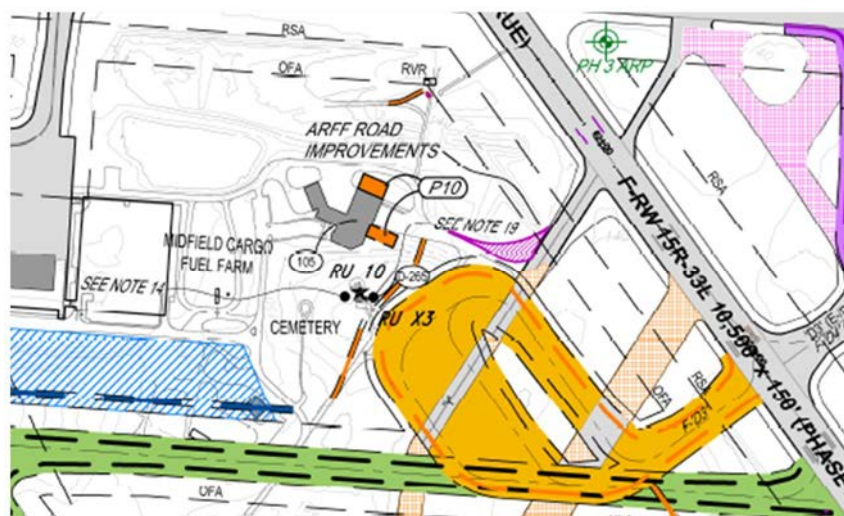
The design and construction process is expected to take two years and the project is estimated to be complete prior to 2020.

### *Existing Aircraft Rescue and Firefighting Facility (ARFF) Expansion Bays*

#### Project Description

This project involves the construction of two additional parking bays for BWI Marshall Fire/Rescue equipment immediately adjacent to the existing ARFF building as well as additional office space (P10).

Figure 40: Existing Aircraft Rescue and Firefighting Facility (ARFF) Expansion Bays



#### Project Justification

Currently, the BWI Marshall Fire Rescue Service has to double-park fire and rescue equipment inside the existing ARFF bays. This can result in emergency response delays if equipment has to be moved to allow other vehicles to exit the bay. Some equipment is also parked outside and is subject to deterioration from the elements.

#### Alternatives Considered

No other construction alternatives were considered because there is currently only one ARFF station at BWI Marshall and it is ideally located to meet crash/rescue response time requirements.

#### Design Standards

The ARFF expansion will be designed to meet FAA requirements and applicable codes as required.

#### Navigational Aids

The ARFF expansion is not expected to interfere with any airport navigation systems.

#### ATCT Considerations

The planned expansion is located adjacent to, and at the same height as, the existing ARFF building. Thus, the expansion will not affect ATCT functions.

#### FAR Part 77

The ARFF expansion will be designed to conform to the FAR Part 77 7:1 transitional surfaces for Runway 10-28.

#### Project Schedule

The ARFF building expansion is expected to be complete or under construction by 2020.

#### *Runway Deicing Chemical Storage and Access Road*

#### Project Description

An additional 20,000 gallon glycol storage tank is proposed to be added with the two existing glycol tanks in order to meet the current demand at BWI Marshall. An access road is also proposed to improve circulation to the storage tanks.

Figure 41: Runway Deicing Chemical Storage and Access Road



#### Project Justification

MAA glycol storage capacity has been exceeded and it is necessary for an additional storage tank to be incorporated. In addition, an access road to the tanks is necessary for vehicle circulation.

#### Alternatives Considered

Two glycol storage tanks already exist in the current location. Therefore, a third proposed tank will be added to the area. No other alternatives were considered.

#### Design Standards

The storage tanks and access road will be designed to meet FAA requirements and applicable codes as required.

#### Navigational Aids

The additional deicing tank and associated road will not interfere with any airport navigation systems.

#### ATCT Considerations

The planned project will not affect the existing or proposed ATCT functions.

#### FAR Part 77

This project will not result in Part 77 penetrations.

#### Project Schedule

The proposed project is expected to be complete or under construction by 2020.

## 7.4. Phase 2 (2021 – 2025)

The development for the Phase 2 (2021 – 2025) projects shown on the 2015 ALP focuses on capacity and operational improvements based on the projected operational demand. The following project descriptions for Phase 2 are divided up into airside, terminal, landside, and aeronautical use projects.

### 7.4.1. Airside

The improvements shown for airside development focus on runway extensions, additional capacity for taxiing aircraft, and development of aviation support facilities.

#### *Taxiway Uniform (U) 3 – Phase 2*

Phase 2 of Taxiway U3 is a continuation of the Phase 1 construction and includes the segment south of Runway 10-28 to Taxiway D.

#### *Runway 15R-33L Extension*

This project involves a 1,000-foot extension to Runway 15R-33L over Dorsey Road to increase the capabilities of the runway. This also involves associated taxiway improvements to complement the runway extension.

#### *Maintenance Main Building*

Construct a new maintenance main building on the Gold Lot south of the Airport. Relocate from existing structure located near the North Air Cargo Complex.

#### *Maintenance Bay Expansion*

Construct new maintenance bay building for equipment storage adjacent to the new maintenance building.

#### *Widening of Taxiway J*

Complete pavement expansion of Taxiway J for connection from Runway 15L to terminal aprons.

#### *Airline Cargo Demolition*

Removal of existing airline cargo buildings north of the proposed ATCT to facilitate expansion of this new facility and provide additional RON parking positions.

#### *Demolition of Maintenance Facilities*

Remove existing maintenance and storage buildings and facilities to provide additional apron space for cargo use northeast of Elm Road.

### *Aviation Support Area*

Expansion of the areas located south of Runway 10-28, adjacent to the existing Air Cargo Apron and northwest of the Taxiway F and Taxilane W intersection.

### *Perimeter Road Improvements*

Relocations of the perimeter roads to meet FAA design standards.

### *Substation Relocations/Expansions*

The North and South Substations will be relocated and expanded to accommodate future facility demands.

### *Northrop Grumman Hangar/Office*

Northrop Grumman, a defense contractor with manufacturing facilities located adjacent to the Airport, has expressed a need for a new hangar and apron, administrative offices, and employee parking adjacent to their existing facilities due to their projected business growth. The new facility will be located between the Runway 10 and 15R ends.

## 7.4.2. Terminal

Terminal improvements include the need for additional aircraft gates and Remain Overnight (RON) parking.

### *Concourse A Extension*

Expand Concourse A by an additional five gates.

## 7.4.3. Landside

Landside improvements in Phase 2 are focused on all support areas required for the Airport, along with relocation of services to facilitate property required for airport improvements.

### *Relocation of I-195/Aviation Blvd*

This project involves the relocation of entrance and exit roadways to the terminal to allow for the expansion of the North Cargo Complex and construction of new Terminal Concourse F. This also includes the consolidation of the long-term parking lots northeast of Runway 15L-33R.

### *Relocation of Light Rail Tracks and Light Rail Station*

Relocate the light rail tracks to facilitate cargo expansion and improvements on the northern portion of the airside. Includes new light rail facility station.

### *Daily Garage Expansion*

Expand the existing daily garage toward the terminal to meet demand projections.

### *Taxicab Staging*

Add new facility for taxicabs south of Aviation Boulevard and east of the Runway 15R end.

### *Gas Station*

Construct new gas station north of the Airport for aviation landside support.

### *Limo/Bus/Shared Ride Staging*

Expansion of limo, bus, and shared ride staging area north of the Airport (P22) for aviation support requirements.

### *Police Station*

New police station facility for landside/airport support services northeast of the existing GA terminal area along Runway 15L-33R

### *Co-Gen and Chiller Plant Expansion*

Expand existing Central Utility Plant (CUP) to meet airport demands, and construct new Co-generation facility.

### *Pump Stations*

Construct two (2) new tanks to support operations of the adjacent deicing facility near Runway 10.

### *Bus Staging Fuel Facility*

The MAA proposes to consolidate fueling facilities dedicated to MAA-owned vehicle fleets, including buses, maintenance and other staff vehicles. The consolidated facility will be located at the existing Bus Staging Area at Elkridge Landing Road. The facility will consist of fuel pumps, canopies and a control building.

### *Hiker/Biker Trail Relocation*

In conjunction with the preferred alignment selected for the Northwest Quadrant Airport Perimeter Service Roadway, the existing Hiker/Biker Trail section along Aviation Boulevard (west of Runway 10) must be relocated for the future airside access roadway to remain clear of the RSA and OFA for Runway 10-28.



### *Consolidation of Long-Term Parking Lots*

Relocated Aviation Boulevard will afford the MAA with the opportunity to optimize the efficiencies and accessibility of two existing Long-Term Parking Lots through the consolidation of both. The consolidation will improve shuttle bus service and reduce overall fuel consumption.

#### 7.5. Phase 3 (2026 – Ultimate)

Long term improvements in Phase 3 (2026 – Ultimate) are focused on meeting the ultimate capacity requirements for the Airport. The following project descriptions for Phase 3 are divided into the following categories, airside, terminal, and landside projects.

##### 7.5.1. Airside

###### *Parallel Runway 10R-28L and Associated Taxiways*

Construct a new 9,000-foot parallel Runway 10R-28L to allow for additional capacity at the Airport. This project also involves the construction of associated taxiways and NAVAIDS for the new runway.

###### *Runway 15L Improvements*

This project involves all required improvements to Runway 15L-33R to meet FAA design standards, which includes glide slope relocation, shoulders, and fillets.

###### *Aviation Support*

Develop area south of Future Runway 10R in support of airside functions.

##### 7.5.2. Terminal

###### *Concourse F*

Construct a new 14 gate Concourse F in the terminal area to allow for additional passenger capacity. Apron and taxiway access to this new terminal will be included with the improvements.

##### 7.5.3. Landside

###### *Cargo Improvements*

Relocation and expansion of the North Cargo Complex including multiple cargo facilities with concession screening facility which will allow for additional cargo capacity and also provide area needed for the construction of the new Concourse F.

###### *Truck Staging*

A new truck staging facility will be constructed on the northern end of the Airport.

### *MAC Building*

Replace the MAC building next to the proposed maintenance storage complex on the southern part of the Airport.

### *Light Rail Station*

Construct additional light rail station on northern portion of airport property near the future Concourse F. This project could potentially occur in Phase 2 if the station is proposed to be located adjacent to existing Airport Parking.

### *Automated People Mover System (APM)*

This project involves the addition of an Automated People Mover System (APM) connecting travelers and visitors from the BWI Rail Station to the terminal.

### *APM Maintenance Facility/Transfer Station*

New facility to service Automated People Mover on the north side of the Airport and south of Aviation Boulevard.

### *Non-Aviation Support Areas*

Develop multiple areas on airport property, on and off the main campus, to enhance revenue generation through various commercial service ventures.

## *8. Wildlife Hazard Management Issues*

The MAA has a FAA-approved Wildlife Hazard Management Plan (WHMP), which is reviewed and updated yearly as part of the Part 139 inspection. The review and update consists of actually editing the WHMP with corrections, additions and/or deletions of information since the previous year; a Wildlife Management Plan Checklist per *14 CFR 139.337 (f)*; and a Wildlife Management Plan review letter. These efforts are coordinated with FAA's Certification Inspector and Region annually.

## *9. Preliminary Identification of Environmental Features*

The MAA has updated resource management plans for wetlands, forests, stormwater management, and cultural resources that identify those resources and/or areas of the natural environment of the Airport that would need to be analyzed during a NEPA environmental study. Additionally, MAA has an updated air quality management plan that helps identify current and future air quality issues for the region, including greenhouse gas emissions.

## *10. Capital Improvement Program*

The Airport Capital Improvement Plan (ACIP) summaries for BWI Marshall are shown on the following pages.

Table 16: BWI ALP Projects (Phase 1)

<b>BWI ALP Projects (Phase 1)</b>	
<b>Airfield and Airside Improvements</b>	
<i>Project Title/Description</i>	<i>Estimated Cost</i>
Relocate Taxiways Romeo (R) and Foxtrot (F)	\$ 88,421,000
Taxiway Uniform (U) 3 – Phase 1	\$ 5,000,000
International Terminal Area Taxiway Fillets/Shoulders	\$ 14,000,000
New Infill Pavement Near Taxiways T, P, and Future P	\$ 15,200,000
Taxiway Connectors (between Taxiways T-P)	\$ 4,300,000
Relocate Taxiways Kilo (K) and Lima (L)	\$ 2,400,000
Isolation/RON Apron Construction	\$ 19,100,000
Runway 28 Deicing Pad Expansion	\$ 22,000,000
Helipad Relocation	\$ 350,000
Obstruction Removal	\$ 20,000,000
Relocate Taxiway Hotel (H)	\$ 8,461,000
Apron Fill at North Cargo Positions F18/F20	\$ 2,520,000
VSR Section from Runway 33L to Future Fire Training Facility	\$ 1,221,000
Taxiway Victor (V) Relocation	\$ 13,730,000
Runway 15R Pad Expansion	\$ 34,894,000
Runway 10 Hold Pad	\$ 12,977,000
<b>Terminal Enhancements</b>	
<i>Project Title/Description</i>	<i>Estimated Cost</i>
Commuter Concourse Demolition & Remain Overnight Parking Construction	\$ 15,000,000
Concourse D 2-Gate Extension	\$ 35,000,000
Concourse E (4-Gate Expansion)	\$ 80,000,000
Relocate Security Checkpoint Juliet	\$ 250,000
Relocate Airfield Lighting Vault	\$ 12,000,000
New Sky Bridge C	\$ 25,000,000
<b>Landside Improvements</b>	
<i>Project Title/Description</i>	<i>Estimated Cost</i>
New Terminal Response Fire Rescue Station	\$ 3,200,000
New Vehicle Service Station <b>(By Others)</b>	\$ -
Terminal Roadway Widening and Access Improvements	\$ 8,000,000
Upper Level Roadway Widening at Concourse E	\$ 50,000,000
Building 113 Demolition	\$ 576,000
Taxicab Support Building at Former Hotel Site	\$ 2,000,000
<b>General Aviation/Hangar Improvements</b>	
<i>Project Title/Description</i>	<i>Estimated Cost</i>
New Aircraft Maintenance Facilities - <b>(By Others)</b>	\$ -
<b>Support Facilities</b>	
<i>Project Title/Description</i>	<i>Estimated Cost</i>
Second FBO – <b>(By Others)</b>	\$ -
New Airport Traffic Control Tower (ATCT) - <b>(By Others)</b>	\$ -
Relocate Fire Training Facility	\$ 18,000,000
Airport Maintenance Complex Relocation and Consolidation (Phase 1)	\$ 38,500,000
Northwest Quadrant Perimeter Road Construction (Runway 10)	\$ 11,000,000
Existing Aircraft Rescue and Firefighting Facility (ARFF) Expansion Bays	\$ 2,100,000
Runway Deicing Chemical Storage and Access Road	\$ 1,100,000
<b>ALP PROJECTS SUBTOTAL</b>	<b>\$ 564,300,000</b>

Table 17: Additional Projects (2013-2020) – BWI Paving (not included in ALP)

<b>Additional Projects (2013-2020) - BWI Paving (not included in ALP)</b>	
<i>Project Title/Description</i>	<i>Estimated Cost</i>
Taxiway G and Taxiway R Mill and Overlay	\$ 2,813,962
Taxiway P Mill and Overlay	\$ 616,976
Taxiway A Mill and Overlay	\$ 1,970,530
Taxilane at Ramp AB Mill and Overlay	\$ 769,672
B Gates, Concrete Pavement Restoration	\$ 4,775,687
Taxiway F, Mill and Overlay	\$ 3,198,126
Cargo Ramp, Mill and Overlay	\$ 7,261,355
Cargo Ramp, Concrete Pavement Restoration	\$ 888,216
Taxilane AA, Mill and Overlay	\$ 3,452,403
Ramp BC, Mill and Overlay	\$ 820,191
Ramp DY, Mill and Overlay	\$ 1,580,553
Taxiway A Reconstruction	\$ 35,000,000
Ramp DD, Complete Reconstruction	\$ 30,362,890
Ramp EE, Mill and Overlay	\$ 3,219,232
Taxilane JJ, Complete Reconstruction	\$ 6,643,247
Ramp DE, Complete Reconstruction	\$ 34,162,324
A Gates, Concrete Pavement Restoration	\$ 1,461,429
C Gates, Concrete Pavement Restoration	\$ 1,911,800
E Gates, Concrete Pavement Restoration	\$ 3,462,219
GA Ramp (GA3, GA4, GA5, GA8), Mill and Overlay	\$ 5,356,530
GA Ramp (GA6, GA7), Mill and Overlay	\$ 13,355,509
Mid-Cargo Ramp and Taxiways G, R, Mill and Overlay	\$ 9,331,300
Taxiway D Mill and Overlay	\$ 958,934
ARFF Parking PCC Restoration	\$ 332,007
Taxi Lot 2" Mill & Overlay	\$ 633,311
GA Parking AC Reconstruction (By Others)	\$ -
Cargo Service Road 2" Overlay	\$ 257,260
Fuel Farm Rd 2" Mill & Overlay and PCC Restoration	\$ 856,463
Old Fed-Ex Facility Lot 2" Mill & Overlay	\$ 1,393,493
Amtrak Way 2" Mill & Overlay	\$ 538,506
Kaufman Building Lot 2" Mill & Overlay	\$ 215,652
Daily Road AC Reconstruct	\$ 752,001
Long-Term Parking Lot A 2" Mill & Overlay	\$ 13,205,932
Mathison Way 2" Mill & Overlay	\$ 1,310,517
Old Fort Meade Road 2" Mill & Overlay	\$ 1,054,504
Amtrak Way PCC Restoration	\$ 266,919
GA Parking 2" Mill & Overlay (By Others)	\$ -
Taxiways J, K, Q Mill & Overlay	\$ 5,997,326
Taxiways K, L, M Mill & Overlay	\$ 783,822
Taxiways M and S Mill & Overlay	\$ 2,097,515
ARFF Access Road Reconstruction	\$ 1,816,407
<b>Paving Projects Subtotal</b>	<b>\$ 204,884,720</b>
<b>TOTAL</b>	<b>\$ 769,184,720</b>



*Appendix A – FAA Terminal Area Forecasts*

2013 FAA TAF – Baltimore/Washington International Thurgood Marshall (BWI Marshall)

YEAR	AIR CARRIER	COMMUTER AIR CARRIER	TOTAL ENPLANEMENTS	ITINERANT AIRCRAFT	ITINERANT AIR TAXI	ITINERANT GA	ITINERANT MILITARY	TOTAL ITINERANT	LOCAL GA	LOCAL MILITARY	TOTAL LOCAL OPERATIONS	TOTAL AIRCRAFT OPERATIONS	TOTAL RADAR OPERATIONS	TOTAL BASED AIRCRAFT
1990	4,498,900	529,300	5,028,200	157,829	88,120	54,670	1,880	302,499	826	140	966	303,465	520,100	107
1991	4,448,719	579,038	5,027,757	148,637	84,003	46,628	1,741	281,009	1,211	100	1,311	282,320	-	100
1992	4,131,980	591,872	4,723,852	128,648	85,862	42,986	2,542	260,038	4,844	962	5,806	265,844	-	97
1993	3,772,189	664,781	4,436,970	120,201	90,082	40,553	2,125	252,961	7,286	1,427	8,713	261,674	-	97
1994	5,501,668	618,316	6,119,984	156,024	78,384	37,376	2,744	274,528	9,834	2,030	11,864	286,392	-	97
1995	5,929,125	666,390	6,595,515	153,313	88,666	34,722	1,992	278,693	16,944	1,295	18,239	296,932	-	82
1996	5,828,667	707,217	6,535,884	150,509	87,782	22,141	1,393	261,825	7,959	372	8,331	270,156	267,990	84
1997	6,439,042	613,818	7,052,860	153,263	82,923	21,780	1,635	259,601	7,058	276	7,334	266,935	506,242	63
1998	6,759,369	510,313	7,269,682	160,932	78,385	24,246	2,598	266,161	11,185	264	11,449	277,610	523,365	63
1999	7,743,205	572,377	8,315,582	187,878	75,367	28,396	2,859	294,500	12,285	34	12,319	306,819	536,766	63
2000	8,847,339	598,567	9,445,906	206,603	66,843	21,581	2,058	297,085	12,431	19	12,450	309,535	538,098	63
2001	9,720,408	595,191	10,315,599	230,103	63,061	26,992	2,727	322,883	5,543	2	5,545	328,428	545,079	87
2002	8,942,833	506,348	9,449,181	210,349	66,037	29,728	3,478	309,592	689	-	689	310,281	520,891	100
2003	9,083,637	356,371	9,440,008	209,468	46,700	33,548	2,306	292,022	3,640	337	3,977	295,999	160,918	102
2004	9,805,532	355,738	10,161,270	215,257	50,909	34,976	1,092	302,234	5,327	189	5,516	307,750	-	96
2005	9,322,247	392,053	9,714,300	219,396	54,039	31,850	865	306,150	6,337	147	6,484	312,634	-	96
2006	9,599,106	570,886	10,169,992	209,248	57,858	32,288	793	300,187	4,932	88	5,020	305,207	-	99
2007	9,765,170	613,759	10,378,929	209,291	58,451	29,508	663	297,913	3,728	38	3,766	301,679	-	79
2008	9,733,554	609,204	10,342,758	207,083	48,575	23,856	787	280,301	5,433	40	5,473	285,774	-	96
2009	9,591,301	522,215	10,113,516	199,995	44,386	17,172	728	262,281	3,130	12	3,142	265,423	-	86
2010	10,143,381	467,948	10,611,329	207,276	43,045	18,912	774	270,007	5,300	-	5,300	275,307	-	75
2011	10,524,080	529,350	11,053,430	219,750	39,317	17,183	690	276,940	378	-	378	277,318	-	73

Baltimore/Washington International Thurgood Marshall Airport  
 Airport Layout Plan Update Narrative Report

DRAFT

YEAR	AIR CARRIER	COMMUTER AIR CARRIER	TOTAL ENPLANEMENTS	ITINERANT AIRCRAFT	ITINERANT AIR TAXI	ITINERANT GA	ITINERANT MILITARY	TOTAL ITINERANT	LOCAL GA	LOCAL MILITARY	TOTAL LOCAL OPERATIONS	TOTAL AIRCRAFT OPERATIONS	TOTAL RADAR OPERATIONS	TOTAL BASED AIRCRAFT
2012*	10,524,347	518,234	11,042,581	213,337	41,395	15,898	960	271,590	276	-	276	271,866	-	74
2013*	10,020,984	420,288	10,441,272	206,084	37,504	14,843	960	259,391	268	-	268	259,659	-	77
2014*	10,077,230	447,607	10,524,837	208,969	38,329	15,004	960	263,262	268	-	268	263,530	-	80
2015*	10,396,869	470,883	10,867,752	216,074	37,793	15,167	960	269,994	268	-	268	270,262	-	82
2016*	10,736,746	481,242	11,217,988	223,204	36,583	15,331	960	276,078	268	-	268	276,346	-	84
2017*	11,066,950	490,867	11,557,817	230,123	35,486	15,497	960	282,066	268	-	268	282,334	-	86
2018*	11,386,543	499,212	11,885,755	235,416	34,918	15,665	960	286,959	268	-	268	287,227	-	89
2019*	11,715,372	507,699	12,223,071	240,831	34,359	15,835	960	291,985	268	-	268	292,253	-	92
2020*	12,053,701	516,330	12,570,031	246,370	33,809	16,007	960	297,146	268	-	268	297,414	-	94
2021*	12,401,807	525,108	12,926,915	252,037	33,268	16,180	960	302,445	268	-	268	302,713	-	97
2022*	12,759,972	534,035	13,294,007	257,833	32,736	16,355	960	307,884	268	-	268	308,152	-	100
2023*	13,128,486	543,114	13,671,600	263,763	32,212	16,531	960	313,466	268	-	268	313,734	-	102
2024*	13,507,649	552,347	14,059,996	269,829	31,697	16,710	960	319,196	268	-	268	319,464	-	105
2025*	13,897,768	561,737	14,459,505	276,035	31,190	16,891	960	325,076	268	-	268	325,344	-	108
2026*	14,299,160	571,287	14,870,447	282,384	30,691	17,074	960	331,109	268	-	268	331,377	-	111
2027*	14,712,152	580,999	15,293,151	288,879	30,200	17,259	960	337,298	268	-	268	337,566	-	114
2028*	15,137,079	590,876	15,727,955	295,524	29,717	17,446	960	343,647	268	-	268	343,915	-	118
2029*	15,574,285	600,921	16,175,206	302,321	29,242	17,635	960	350,158	268	-	268	350,426	-	122
2030*	16,024,126	611,137	16,635,263	309,275	28,774	17,826	960	356,835	268	-	268	357,103	-	126
2031*	16,486,968	621,526	17,108,494	316,389	28,313	18,019	960	363,681	268	-	268	363,949	-	130
2032*	16,963,186	632,092	17,595,278	323,666	27,860	18,214	960	370,700	268	-	268	370,968	-	134
2033*	17,453,166	642,838	18,096,004	331,111	27,414	18,411	960	377,896	268	-	268	378,164	-	138
2034*	17,957,306	653,766	18,611,072	338,726	26,975	18,610	960	385,271	268	-	268	385,539	-	142
2035*	18,476,017	664,880	19,140,897	346,517	26,544	18,811	960	392,832	268	-	268	393,100	-	147
2036*	19,009,720	676,183	19,685,903	354,487	26,119	19,014	960	400,580	268	-	268	400,848	-	152
2037*	19,558,847	687,678	20,246,525	362,640	25,701	19,220	960	408,521	268	-	268	408,789	-	157

Baltimore/Washington International Thurgood Marshall Airport  
 Airport Layout Plan Update Narrative Report

DRAFT

YEAR	AIR CARRIER	COMMUTER AIR CARRIER	TOTAL ENPLANEMENTS	ITINERANT AIRCRAFT	ITINERANT AIR TAXI	ITINERANT GA	ITINERANT MILITARY	TOTAL ITINERANT	LOCAL GA	LOCAL MILITARY	TOTAL LOCAL OPERATIONS	TOTAL AIRCRAFT OPERATIONS	TOTAL RADAR OPERATIONS	TOTAL BASED AIRCRAFT
2038*	20,123,845	699,369	20,823,214	370,981	25,290	19,428	960	416,659	268	-	268	416,927	-	162
2039*	20,705,172	711,258	21,416,430	379,513	24,885	19,639	960	424,997	268	-	268	425,265	-	167
2040*	21,303,302	723,349	22,026,651	388,242	24,486	19,851	960	433,539	268	-	268	433,807	-	172

\*Forecasts

Source: FAA TAF, January 2013

cc. Shawn Wayne



U. S. Department  
Of Transportation

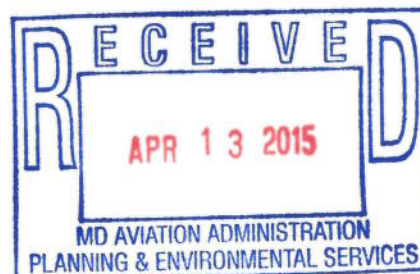
Federal Aviation  
Administration



WASHINGTON AIRPORTS DISTRICT OFFICE  
23723 Air Freight Lane, Suite 210  
Dulles, Virginia 20166  
Telephone: 703/661-1359 Fax: 703/661-1370

April 2, 2015

Mr. Paul Shank, P.E.  
Chief Engineer  
Maryland Aviation Administration  
P.O. Box 8766  
BWI Airport, Maryland 21240



Reference: Baltimore-Washington International Airport  
Interim Airport Layout Plan (ALP)

Dear Mr. Shank:

The proposed interim Airport Layout Plan (ALP) submitted November 2014 consisting of sheet 3 for the Baltimore-Washington International Airport is hereby approved. This ALP included changes to primarily reflect as built Runway Safety Area (RSA), LOI funded taxiway improvements, and minor terminal security improvement projects. The limiting conditions in our previous ALP approval letters remain in effect, most notably that the FAA has not concurred with the proposed runway 10R/28L. The review process included coordination with other FAA divisions through the airspace process (case number 2014-AEA-1269-NRA).

The contents of the ALP revision do not necessarily reflect the official views or policies of the FAA. Approval of the ALP by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development depicted therein. No new modifications to FAA design standards are noted on this revision to the ALP.

All proposed development identified on the ALP requires environmental review and shall not be undertaken without prior written environmental approval by the FAA.

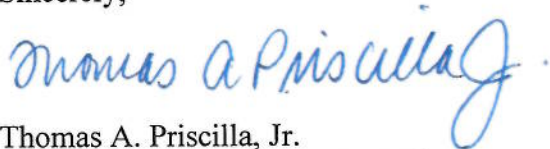
You are also reminded of your continuing responsibility to keep your ALP current at all times. Each revision must be submitted to this office for review and approval. Your ALP should be reviewed at regular intervals and updated as necessary to include this revision and any other previous revisions.

FAA's approval of this ALP represents acceptance of the location of the facilities depicted. Prior to construction, the airport owner is required to resubmit for approval the final locations, heights, and exterior finishes of structures if they have changed from that

previously presented. FAA's concerns are obstructions, impact on electronic aids and adverse effect of controller view of aircraft approaches and ground movements, which could adversely effect the safety, efficiency or utility of the airport.

Please contact me if you have any questions concerning this approval.

Sincerely,

A handwritten signature in blue ink that reads "Thomas A. Priscilla, Jr." with a stylized flourish at the end.

Thomas A. Priscilla, Jr.  
Washington Airports District Office





# Federal Aviation Administration

## Memorandum

Date: November 21, 2014

To: AEA-620 (Felix), Atlanta FPO (Lebar), AT-OEG (Dull), FS (Aviles),  
AJW-E24B (Loverde), AT-OSG (Fowler), ATCT (Proudfoot)

Prepared by: Washington ADO, Tom Priscilla

Subject: 2014-AEA-1269-NRA  
Baltimore-Washington International Airport (BWI)  
Updated Airport Layout Plan (ALP)

The Maryland Aviation Administration (Sponsor), owner and operator of BWI located in Baltimore, Maryland, has updated the approved Airport Layout Plan (ALP). The first set of changes is to reflect the construction of previously coordinated projects:

- (1) Runway 10/28, 15L/33R, and 15R/33L safety area improvements.
- (2) Runway 10/28 and 15R/33L rehabilitations
- (3) Various taxiway improvements to comply with Advisory Circular requirements
  - a. Taxiway "D"
  - b. Taxiway "U"
- (4) Pier B/C Connector
- (5) Pier C/D Connector
- (6) Pier D/E Connector
- (7) Pier E 2 gate extension
- (8) ATO ATCT site 2A

The second set of changes is to reflect the proposed projects:

- (9) Relocation of the ARFF training facility (P45)
- (10) RON Apron adjacent to ARFF building (P-10)
- (11) Maintenance complex buildings P30, P31, P32, and P33 south of proposed runway 10R/28L
- (12) Aircraft maintenance hangar P11 north of runway 10
- (13) Reconfigured taxiway "F" into dual parallel taxiway system serving runway 10
- (14) Various taxiway improvements to comply with Advisory Circular requirements
  - a. Taxiway "H"
  - b. Taxiway "F"
  - c. Taxiway "U3"
  - d. Runway 15L/33R taxiway system

5330 ALP  
BWI



Federal Aviation Administration

<< OE/AAA

Case Data Part 77 Analysis  
 Study (ASN): 2014-AEA-1269-NRA Rush:   
 Prior Study: NRA Update  
 Project: Status: NEW MapIt

Generate Letters Documents Corresp Archive Div Responses  
 Notice Of: Alteration Received: 11/21/2014  
 Duration: None Entered: 11/21/2014  
 Months: Begin: Det-to-Prop:  
 Days: End:

State: MD  
 Loc ID: BWI (NASR) BALTIMORE, BALTIMORE/  
 Airport: BALTIMORE/WASHINGTON INTL TH  
 City: BALTIMORE

Proposed  
 SE: 141  
 AGL: 1  
 AMSL: 142

Latitude: 39 - 10 - 32.62 N  
 Longitude: 76 - 40 - 08.37 W  
 Datum: NAD83 Original  Yes  
 Accuracy: 4D +/- View Quick Map

Submitted To  
 AT-OEG: ADO: TO:  
 FP: FS: FM:  
 USAF: USA: USN:  
 AT-OSG: ATCT: SBG:  
 DHS: AP Sponsor: AP(139): CASFO:  
 FSDO: SMO: Other:

Component Type:  
 PLANNING(PL)  
 Development Type:  
 PLANNING - Airport Layout Plan  
 Other Desc:

Sponsor Representative

Sponsor: maryland aviation administration  
 Attention Of: shawn ames  
 Address 1: po box 8766  
 Address 2:  
 City: bwi airport  
 State: MD Postal Code: 21240  
 Country: United States  
 Telephone: (410) 859-7089 Ext: Fax:  
 E-mail:

Representative:  
 Attention Of:  
 Address 1:  
 Address 2:  
 City:  
 State: Postal Code:  
 Country: United States  
 Telephone: Ext: Fax:  
 E-mail:  
 Note: are required if Representative is modified.

Remarks:

ADO Contact: Tom A. Priscilla  
 Telephone: (703) 661-1359 Ext:  
 Office: WASHADO  
 SBG Contact:  
 Telephone:

Division(s) Not Responded

Describe/Remarks:

NRA Case View

update to ALP. due to java issue, memo describing proposed changes cannot be attached but is included with drawing mailed out separately.

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Add View

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Frequency/ERP  
 Run Civilian Part 77 Report  
 Run Military Part 77 Report

Case Saved Part 77 Case Data Div POS Design Nearest Circle  
 Popups: Map Summary Quick View Resp Report Surfaces Report Airport Search

Record 1 of 1

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