II. Purpose and Need

2.1 Background

The Authority is preparing this EA of potential environmental impacts associated with proposed enhancements to the Runway 1-19 RSA and the Runway 1 Hold Apron and related improvements at the Airport. The EA is being prepared pursuant to the requirements and guidelines of FAA Order 1050.1E,[1] FAA Order 5050.4B,[2] and the FAA *Environmental Desk Reference for Airport Actions*. The objectives of this section are to:

- Define the Purpose and Need for the Proposed Action, where "Need" is defined as the problem facing the Authority and "Purpose" is defined as the Authority's proposed solution to the problem.
- Describe the Authority's Proposed Action.
- Identify the actions requested of the FAA.
- Define the estimated timeframe for the federal actions and implementation of the Proposed Action.

The Authority operates the Airport, which occupies approximately 733 acres of land and 127 acres of water situated along the western shore of the Potomac River in the Commonwealth of Virginia. The Airport is located in Arlington County, immediately north of the City of Alexandria, Virginia, and across the Potomac River from Washington, D.C. The regional setting of the Airport is shown on **Exhibit II-1**. There are three runways at the Airport: primary Runway 1-19 and crosswind Runways 15-33 and 4-22. Approximately 85 percent of aircraft arrivals and departures occur on Runway 1-19. The current ALP is shown on **Exhibit II-2**.

2.1.1 Runway 1-19 RSA

2.1.1.1 Regulatory Background and Design Standards

An RSA is intended to "provide a measure of safety in the event of an aircraft excursion from the runway by significantly reducing the extent of personal injury and aircraft damage during overruns, undershoots, and veer-offs."[3]

FAA Order 5200.8 established the Runway Safety Area Program (RSAP) and the procedures that the FAA follows in implementing the RSAP. The RSAP requires that all RSAs at federally obligated airports and at airports certificated under 14 CFR Part 139, *Certification and Operations: Land Airports Serving Certain Air Carriers*, shall conform to the standards contained in FAA AC 150/5300-13, *Airport Design*, to the extent practicable.[4] The Airport is a federally obligated airport certificated under 14 CFR Part 139.

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1 Federal Aviation Administration, Order 1050.1E, *Environmental Impacts: Policies and Procedures*, Change 1, March 20, 2006.

2 Federal Aviation Administration, Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, April 28, 2006.

3 Federal Aviation Administration Order 5200.8, *Runway Safety Area Program*, Section 4.

4 Federal Aviation Administration Order 5200.8, *Runway Safety Area Program*, Section 5.

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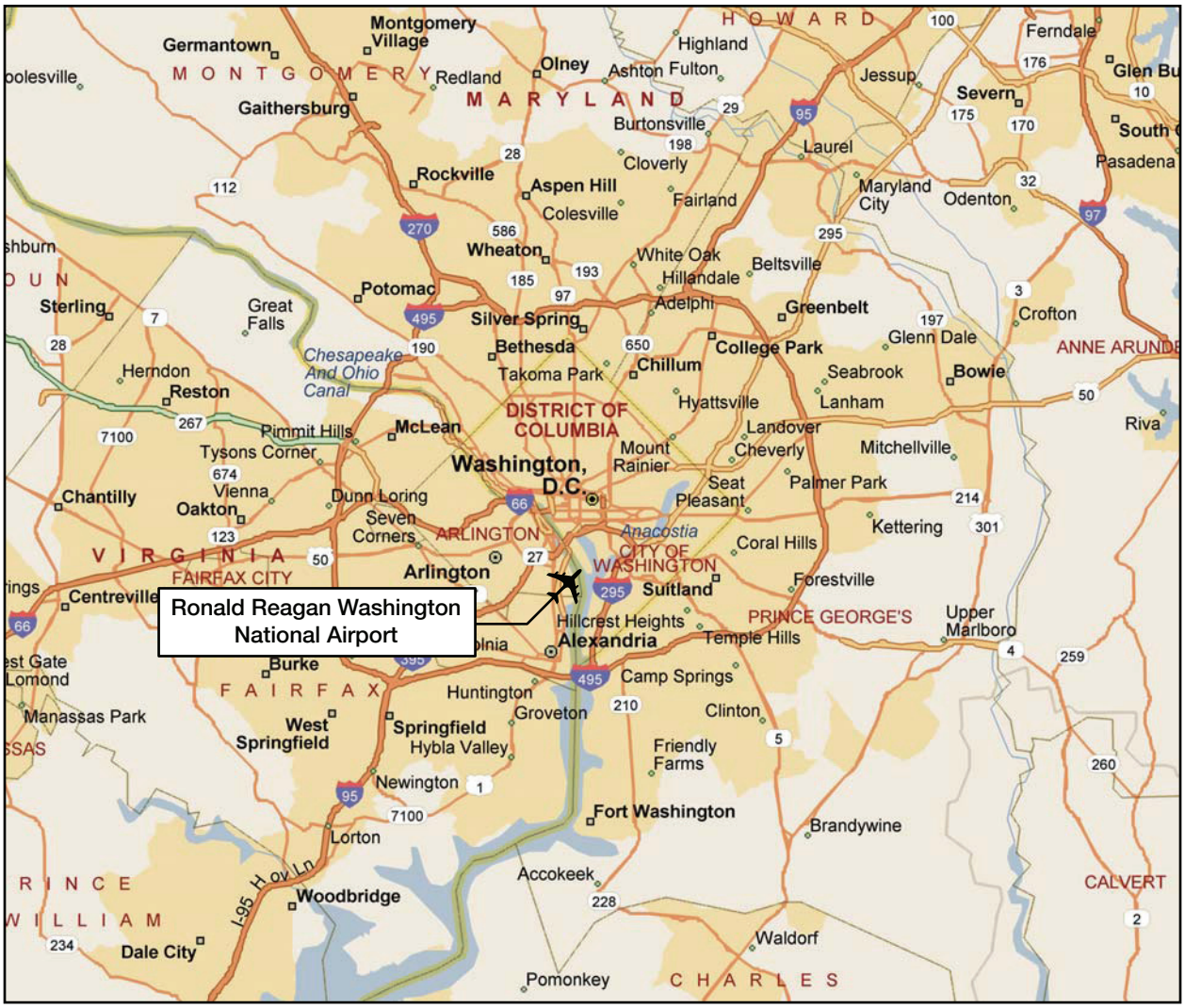

Source: MapPoint 2004.
Prepared by: Ricondo & Associates, Inc., October 2008.

Exhibit II-1

Not to Scale north

Regional Setting

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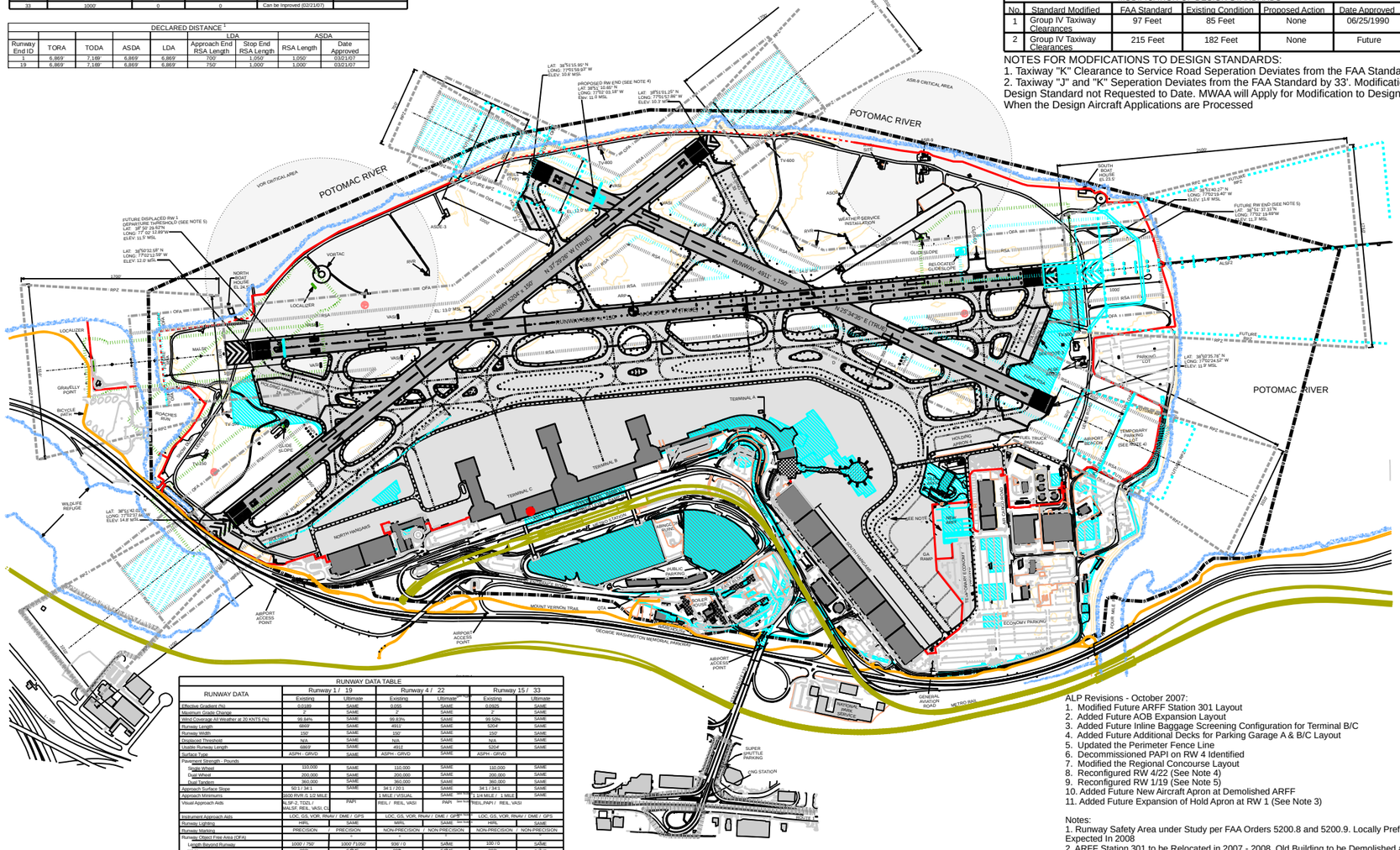
RUNWAY SAFETY AREA DETERMINATION [1]					
Runway End ID	Standard RSA Length beyond Runway	Actual RSA Length beyond RWY	Actual RSA Violations to RSA along side of RWY	RSA Determination	Date Approved
1	1000'	1000'	0	Can be Improved (02/21/07)	03/21/07
19	1000'	750'	0	Can be Improved (02/21/07)	03/21/07
4	1000'	936'	0	Can be Improved (02/21/07)	
22	1000'	0	0	Can be Improved (02/21/07)	
15	1000'	0	0	Can be Improved (02/21/07)	
33	1000'	0	0	Can be Improved (02/21/07)	

DECLARED DISTANCE [1]								
					LDA		ASDA	
Runway End ID	TORA	TODA	ASDA	LDA	Approach End RSA Length	Stop End RSA Length	RSA Length	Date Approved
1	6,869'	7,169'	6,869'	6,869'	700'	1,050'	1,050'	03/21/07
19	6,869'	7,169'	6,869'	6,869'	750'	1,050'	1,000'	03/21/07

MODIFICATION OF DESIGN STANDARDS					
No.	Standard Modified	FAA Standard	Existing Condition	Proposed Action	Date Approved
1	Group IV Taxiway Clearances	97 Feet	85 Feet	None	06/25/1990
2	Group IV Taxiway Clearances	215 Feet	182 Feet	None	Future

NOTES FOR MODFICATIONS TO DESIGN STANDARDS:
1. Taxiway "K" Clearance to Service Road Seperation Deviates from the FAA Standard by 12'
2. Taxiway "J" and "K" Seperation Deviates from the FAA Standard by 33'. Modification to Design Standard not Requested to Date. MWAA will Apply for Modification to Design Standard When the Design Aircraft Applications are Processed



LEGEND

- Runway Centerline
- Edge of Taxiway
- Runway Safety Area (RSA)
- Object Free Area (OFA)
- Future Taxiway Object Free Area (TOFA)
- Runway Protection Zone (RPZ)
- Airfield Pavement
- Airport Reference Point (ARP)
- Airport Buildings
- Airport Property Line
- Avigation Easement
- NAVAID Critical Area
- Security Intrusion Fence
- Existing Precision OFZ
- Future Precision OFZ
- Future Development
- Future Runway Safety Area (RSA)
- To Be Demolished
- Airport Beacon
- Railroads
- Airport Perimeter Fence
- Edge of Water
- Wind Cone
- Bicycle Path
- Fence

RUNWAY DATA TABLE						
RUNWAY DATA	Runway 1 / 19		Runway 4 / 22		Runway 15 / 33	
	Existing	Ultimate	Existing	Ultimate	Existing	Ultimate
Effective Gradient (%)	0.0189	SAME	0.055	SAME	0.0325	SAME
Maximum Grade Change	2	SAME	2	SAME	2	SAME
Wind Coverage All-Weather at 20 KNTS (%)	99.84%	SAME	99.83%	SAME	99.50%	SAME
Runway Length	6869'	SAME	4911	SAME	5204'	SAME
Runway Width	150'	SAME	150'	SAME	150'	SAME
Displaced Threshold	N/A	SAME	N/A	SAME	N/A	SAME
Usable Runway Length	6869'	SAME	4911	SAME	5204'	SAME
Surface Type	ASPH - GRVD	SAME	ASPH - GRVD	SAME	ASPH - GRVD	SAME
Pavement Strength - Pounds						
Dual Wheel	110,000	SAME	110,000	SAME	110,000	SAME
Dual Wheel	200,000	SAME	200,000	SAME	200,000	SAME
Dual Tandem	360,000	SAME	360,000	SAME	360,000	SAME
Approach Surface Slope	50:1 / 34:1	SAME	34:1 / 20:1	SAME	34:1 / 34:1	SAME
Approach Minimums	1000 RVR / 1 1/2 MILE		1 MILE / VOR/DME	SAME See Note 2	1 1/4 MILE / 1 MILE	SAME
Visual Approach Aids	ALSF-2, TDZL / MALSF, REIL, VASI, CL	PAPI	REIL / REIL, VASI	PAPI See Note 2	REIL,PAPI / REIL, VASI	
Instrument Approach Aids	LOC, GS, VOR, RNAV / DME / GPS		LOC, GS, VOR, RNAV / DME / GPS	SAME See Note 2	LOC, GS, VOR, RNAV / DME / GPS	
Runway Lighting	HIRL	SAME	MIRL	SAME	HIRL	SAME
Runway Marking	PRECISION	PRECISION	NON-PRECISION	NON-PRECISION	NON-PRECISION	NON-PRECISION
Runway Object Free Area (OFA)						
Length Beyond Runway	1000' / 750'	1000' / 1050'	936' / 0	SAME	100' / 0	SAME
Width	800'	SAME	800'	SAME	800'	SAME
Runway Safety Area						
Length Beyond Runway	1000' / 750'	1000' / 1050'	936' / 0	SEE NOTE 1	100' / 0	SEE NOTE 1
Width	500'	SAME	500'	SAME	500'	SAME
Runway End Coordinates: (NAD 83)						
Latitude	1: 38 51 40.27"	1: 38 51' 37.33"	4: 38 50'35.77"	SAME See Note 3	15: 38 51'42.02"	SAME
	19: 38 50'12.58"	SAME	22: 38 51'15.95"	SAME	33: 38 51'01.25"	SAME
Longitude	1: 77 03'19.40"	1: 77 02' 19.65"	4: 77 02'54.52"	SAME	15: 77 02'37.66"	SAME
	19: 77 02'12.59"	SAME	22: 77 01'59.93"	SAME	33: 77 01'57.86"	SAME
Runway End Elevation (MSL)	11.6' / 7.2'	11.6' / 11.3'	11.9' / 13.6'	SAME	14.9' / 13.3'	SAME
Displaced Threshold Elevation (MSL)	N/A	SAME	N/A	SAME	N/A	SAME
TDZ Elevation (MSL)	15' / 14'	SAME	14' / 14'	SAME	15' / 13'	SAME
Airport Reference Code (ARC)	C - IV	SAME	C - III	SAME	C - III	SAME
Critical Aircraft	757	767	737-800	757	757	757
Stage Length	1998 NM	SAME	1998 NM	SAME	1998 NM	SAME

ALP Revisions - October 2007:
1. Modified Future ARFF Station 301 Layout
2. Added Future AOB Expansion Layout
3. Added Future Inline Baggage Screening Configuration for Terminal B/C
4. Added Future Additional Decks for Parking Garage A & B/C Layout
5. Updated the Perimeter Fence Line
6. Decommissioned PAPI on RW 4 Identified
7. Modified the Regional Concourse Layout
8. Reconfigured RW 4/22 (See Note 4)
9. Reconfigured RW 1/19 (See Note 5)
10. Added Future New Aircraft Apron at Demolished ARFF
11. Added Future Expansion of Hold Apron at RW 1 (See Note 3)

Notes:
1. Runway Safety Area under Study per FAA Orders 5200.8 and 5200.9. Locally Preferred Alternative Expected In 2008
2. ARFF Station 301 to be Relocated in 2007 - 2008. Old Building to be Demolished and Future Landuse Determined as Airfield. The Relocation of Non-Movement Area Marking and Vehicular Lanes to be Addressed After a Detailed Study
3. Configuration and Expansion of Hold Apron for RW 1 is Under Study by MWAA. Final Recommended Layout Expected In 2008
4. RW 4/22 ARC Will Temporarily be Changed From C - III to B - III to Accommodate Opening of Interim Parking Near Approach End of RW 4. The New RW Length Will be 4315' the New OFA Width and Length would be 800' x 600', RSA Width and Length 300' x 600'
(This Is Temporary for 2 - 5 Years Depending on the Daily Garage Expansion Project)
5. RW 1/19 will be Reconfigured to Ensure 1000' of RSA are Available at Both RW Ends. 300' of Pavement Would be Added to the South End and the North Departure Threshold Would be Moved 300' to the South to Attain 1000' and 1050' of RSA Respectively. A Taxiway Would be Added to the South End for Access to the New RW End. Also, the Glide Slope Would be Moved to Support the New RW End

Source: Metropolitan Washinton Airports Authority, Office of Engineering, 2007.
Prepared by: Ricondo & Associates, Inc, November 2008

Exhibit II-2

Not to Scale

Airport Layout Plan

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FAA Order 5200.9, *Financial Feasibility and Equivalency of Runway Safety Area Improvements and Engineered Material Arresting Systems*, is intended to assist: (a) airport sponsors such as the Authority in developing a sound proposed action for RSA improvements for environmental review purposes, and (b) FAA Regional Airports Division Managers in preparing an RSA practicability determination as required by FAA Order 5200.8.[5] FAA Order 5200.9 provides guidance for comparing RSA improvement alternatives with improvements that use EMAS and for determining the maximum financially feasible cost for RSA improvements, whether or not they involve EMAS.

The U.S. DOT Appropriations Act for FFY 2006 requires the operators of all airports certificated under 14 CFR Part 139 to comply with FAA regulatory requirements for RSAs by FFY 2015. The Act also requires the FAA to report annually on its progress toward achieving compliance.

FAA AC 150/5300-13 provides dimensional requirements for RSAs based on the physical and operating characteristics of the design aircraft operating at an airport. Based on the characteristics of aircraft operating on Runway 1-19 at the Airport, the current standard RSA dimensions are:

- 500 feet wide and centered on the centerline of the runway;
- 1,000 feet beyond the departure runway end; and
- 600 feet prior to the landing threshold.

Prior to September 30, 2004, the standard RSA dimensions prior to the end of the runway and beyond the end of the runway for the type of aircraft operating on Runway 1-19 were the same: 1,000 feet. FAA AC 150/5300-13, Change 8, reduced the RSA dimension prior to the landing threshold from 1,000 feet to 600 feet.

Exhibit II-3 depicts the standard RSA overlaid onto existing Runway 1-19, illustrating the shift in dimensions at the runway ends depending on the direction in which the aircraft operates. For example, when aircraft arrive on and depart from Runway 1 (i.e., operate in a north flow), the dimensional requirements for the RSA would be 600 feet prior to the Runway 1 threshold and 1,000 feet beyond the end of the runway (i.e., the north end of the runway). Conversely, in south flow conditions with arrivals on and departures from the Runway 19 end, the dimensional requirements for an RSA would be 600 feet prior to the Runway 19 threshold and 1,000 feet beyond the end of the runway (i.e., the south end of the runway).

Within the RSA, the FAA requires surface conditions to be:

- Cleared, graded, and without potentially hazardous ruts, humps, depressions, or other surface variations;
- Drained by grading or storm sewers to prevent water accumulation;
- Capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and fire fighting equipment, and the occasional passage of an aircraft without causing structural damage to the aircraft; and
- Free of objects, except for objects that need to be located in the RSA because of their function.

[5] Federal Aviation Administration Order 5200.9, *Financial Feasibility and Equivalency of Runway Safety Area Improvements and Engineered Material Arresting Systems*, Section 1.

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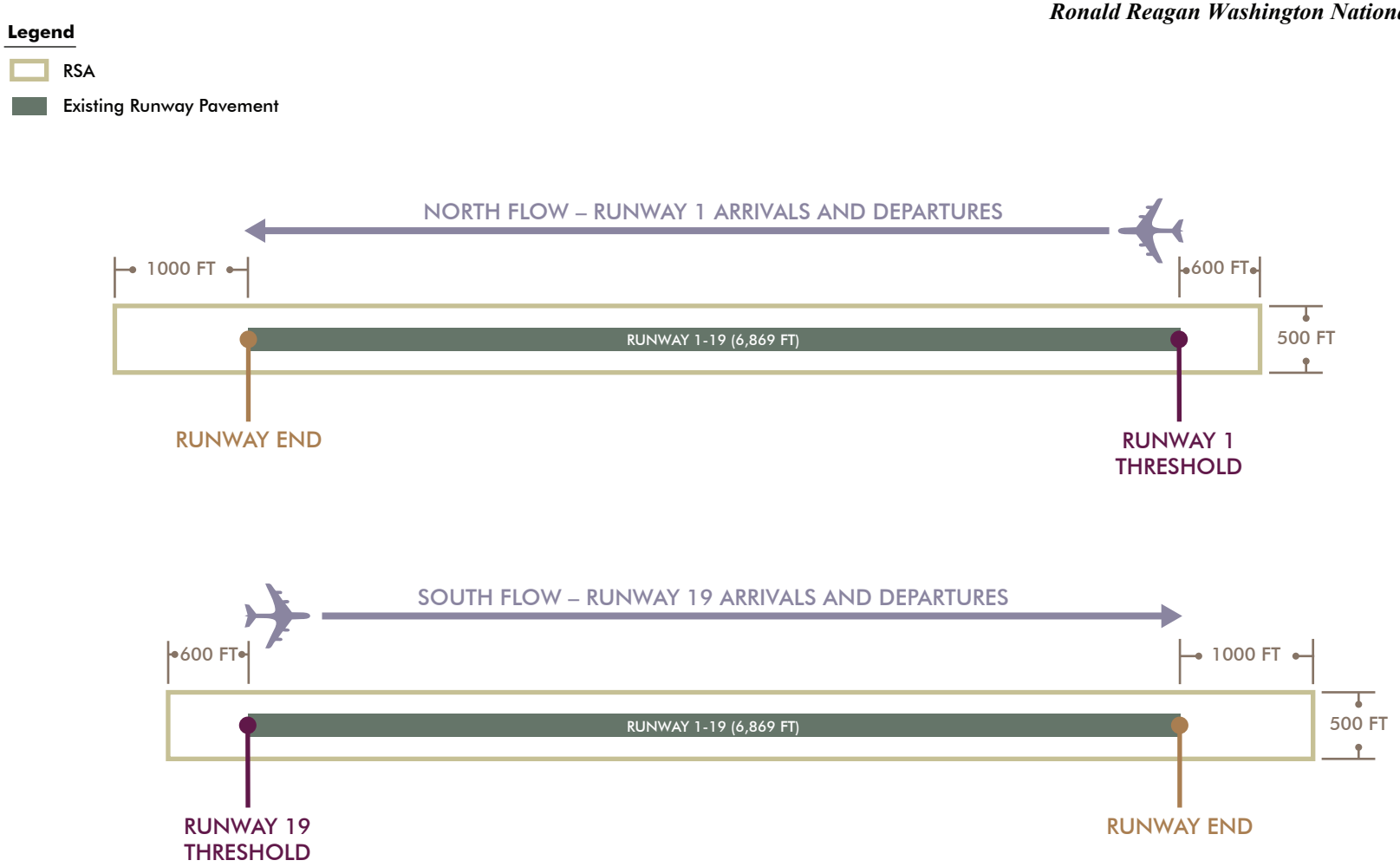

Source: Ricondo & Associates, Inc., July 2008.
Prepared by: Ricondo & Associates, Inc., July 2008.

Exhibit II-3

Not to Scale

north

Standard RSA Overlaid on Existing Runway 1-19

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2.1.1.2 Existing Conditions

A *Runway Safety Area Determination*[6] prepared by the FAA in 2007 found that the Runway 1-19 RSA required enhancements to comply with FAA Order 5200.8 and FAA AC 150/5300-13. Specifically, the FAA found that the Runway 1 RSA length beyond the northern end of Runway 1-19 is 750 feet compared to the 1,000-foot RSA design standard. The existing nonstandard RSA is shown on **Exhibit II-4**.

2.1.2 Runway 1 Hold Apron

2.1.2.1 Function and Design Standards

Aircraft departures from airports can be affected by weather, airspace, and operating conditions at the destination airports. On occasion, information on the conditions at the destination airports may become available to a flight crew only after an aircraft leaves a terminal gate or remote parking apron and the aircraft is taxiing to the runway for its anticipated scheduled departure. Departure hold aprons are intended to: provide a standing space for aircraft awaiting final air traffic control (ATC) clearance to take off, permit those aircraft cleared for take-off to move to their runway take-off positions, and enhance maneuverability for holding aircraft while also permitting bypass operations. The most advantageous position for a hold apron is adjacent to the taxiway serving the runway end[7] to avoid congestion in the terminal area and to reduce taxiing times to the runway end when the aircraft receives clearance for takeoff.

Developing and maintaining the appropriate number of runway hold aprons of the appropriate sizes at an airport are essential to maintaining airport departures at a level that reflects the ATCT departure rate. FAA AC 150/5300-13 establishes the grading and geometry design standards for hold aprons and the taxilanes and taxiways associated with hold aprons. The dimensional design standards vary according to the number and size of aircraft that operate at an airport and the anticipated number of such aircraft that may need to be held at any one time on the hold apron prior to take-off.

2.1.2.2 Existing Conditions

Depending on the size of aircraft, the Runway 1 Hold Apron can accommodate up to three aircraft. In consultation with ATCT staff, it was determined that the Runway 1 Hold Apron has insufficient capacity. The size of the aircraft operating at the Airport has increased over the years, and the size of the Runway 1 Hold Apron does not provide sufficient clearance for the largest aircraft to bypass the hold apron to move to its Runway 1 take-off position. Therefore, the function of the Runway 1 Hold Apron is limited to the queuing of aircraft awaiting departure. Airfield congestion is common during summer thunderstorms. Delays at the Airport can propagate throughout the National Airspace System.

2.1.3 Runway 1-19 Pavement

Runway pavement generally performs well for the majority of its life, after which it reaches a "critical condition" and begins to deteriorate rapidly. Several studies have shown that maintaining a pavement in good condition versus periodically rehabilitating a pavement in poor condition is four to five times less expensive. The number of years a pavement stays in good condition before rapidly

[6] Federal Aviation Administration, *Runway Safety Area Determination, Ronald Reagan-Washington National Airport, Virginia (DCA)*, February 21, 2007.

[7] Federal Aviation Administration, Advisory Circular 150/5300-13, *Airport Design*, Paragraph 409.

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Source: Ricondo & Associates, Inc., July 2008.
Prepared by: Ricondo & Associates, Inc., July 2008.

Exhibit II-4

0 1,200 ft.

north

Runway 1-19 Nonstandard Runway Safety Area

Drawing: Z:\MWAA\DCA\RSA EAs\Task 1-RW 1-19\1.2 PDEA Number 1\AutoCAD Files\Exhibit II-4 Runway 1-19 Nonstandard Runway Safety Area.dwg_Layout: 8.5 x 11L_Jun 10, 2009, 1:37pm

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deteriorating depends on several factors, including construction type and quality, pavement use, climate, and maintenance. The Authority uses a Pavement Management System at the Airport to evaluate the present condition of the pavement, and also to predict its future condition through the use of a pavement condition indicator. By projecting the rate of deterioration, the Authority can analyze life-cycle costs for various alternatives. This analysis helps to determine the optimal time for pavement improvements.[8]

The Runway 1-19 pavement was last overlaid in 1990 and, at that time, the Authority predicted that another overlay would be needed in approximately 12 years. It has been 18 years since the last overlay and the condition of the runway surface has deteriorated to the point that an overlay will be needed within the next several years.

2.2 Purpose and Need Statement

2.2.1 The Problem (Need)

The FAA has determined that the Runway 19 RSA extends beyond the northern end of Runway 19 by 750 feet, which falls short of the 1,000-foot FAA design standard.[9] As the operator of the Airport, a federally obligated airport certificated under 14 CFR Part 139, the Authority is obligated by FAA Order 5200.8 and the U.S. DOT Appropriations Act for FFY 2006 to comply with FAA regulatory requirements for RSAs by 2015.

The size of the current Runway 1 Hold Apron does not provide for the largest aircraft operating at the Airport to bypass aircraft on the hold apron, thereby limiting the function of the hold apron to the queuing of aircraft awaiting departure. Further, as noted in Section 2.3, the Authority's proposed solution to the Runway 1-19 RSA compliance issue would require using a portion of the Runway 1 Hold Apron for the extension of Taxiway J. Insufficient Runway 1 Hold Apron capacity exacerbates delays at the Airport and throughout the National Airspace System.

The Authority's Pavement Management System and inspections of the condition of the surface of Runway 1-19 pavement indicated that an overlay will be needed within the next several years.

2.2.2 The Authority's Solution (Purpose)

FAA Order 5200.8 identifies the alternatives that must be analyzed when an RSA does not comply with applicable FAA AC 150/5300-13 standards.[10] Those alternatives are to:

- Construct a standard RSA;
- Relocate, shift, and/or realign the runway;
- Reduce the length of the runway;
- Implement a combination of relocating, shifting, and/or realigning the runway and reducing runway length;
- Use declared distances; or

[8] Federal Aviation Administration, Advisory Circular 150/5380-7A, *Airport Pavement Management Program*, 3.0 a.

[9] Federal Aviation Administration, *Runway Safety Area Determination, Ronald Reagan-Washington National Airport, Virginia, (DCA)*, February 21, 2007.

[10] Federal Aviation Administration, Order 5200.8, *Runway Safety Area Program*, Section 3.

- Use Engineered Material Arresting Systems.

The critical design aircraft for Runway 1-19 is identified on the ALP as the Boeing 757.[11] At a standard day temperature of 59 degrees Fahrenheit and an elevation at sea level,[12] the Boeing 757 requires a runway length between 6,500 and 9,900 feet at its maximum take-off weight, depending on the engine and model type.[13] The Authority believes that it is important to maintain the existing length of Runway 1-19 at 6,869 feet. Declared distances are "the distances an airport owner declares available for an aircraft's take-off run, take-off distance, accelerate-stop distance, and landing distance requirements."[14] EMAS "uses materials of closely controlled strength and density placed at the end of a runway to stop or greatly slow an aircraft that overruns the runway. The best material found to date is a lightweight, crushable concrete. When an aircraft rolls into an EMAS arrestor bed, the tires of the aircraft sink into the lightweight concrete and the aircraft is decelerated by having to roll through the material."[15]

FAA AC 150/5300-13 establishes the design criteria for RSAs and hold aprons.

Within the context of the requirements of FAA Order 5200.8 and FAA AC 150/5300-13, the Authority has conducted a number of studies addressing enhancements to the Runway 1-19 RSA and the Runway 1 Hold Apron. The more recent studies include:

- Ricondo & Associates, Inc. and Airport Design Consultants, Inc., *Project Definition Document, Ronald Reagan Washington National Airport, Runway 1 Hold Apron*, September 26, 2008.
- Ricondo & Associates, Inc. and Jacobs Carter Burgess, *Project Definition Document, Ronald Reagan Washington National Airport, Runway 1-19 Safety Area Improvements*, March, 12, 2008.
- Ricondo & Associates, Inc. and Carter and Burgess, *Runway 1-19 Safety Area Constructibility Assessment*, Ronald Reagan Washington National Airport, August 2006.
- HNTB Corporation, Ricondo & Associates, Inc., and Straughan Environmental Services, Inc., *Runway 1-19 Safety Area Study – Phase III*, Ronald Reagan Washington National Airport, August 2005.
- HNTB Corporation, *Final Report, Runway Safety Area Study, Phase II*, Ronald Reagan Washington National Airport, March 25, 2003.

In the above studies, various RSA and hold apron scenarios were considered in terms of operational capabilities, potential environmental impacts, effectiveness, and feasibility. Building on the analyses in these studies, the Authority has developed a solution to the need for an enhanced Runway 1-19 RSA, expanded Runway 1 Hold Apron, and an improved surface for Runway 1-19. The proposed solution involves applying standard RSAs prior to the landing threshold and beyond the runway end, expanding the capacity of the Runway 1 Hold Apron to fulfill its intended function, particularly to allow the largest aircraft operating at the Airport to bypass other aircraft on the hold apron, and

[11] Metropolitan Washington Airports Authority, *Ronald Reagan Washington National Airport, Airport Layout Plan*, October 15, 2007.

[12] The official airport elevation (i.e., the highest point of an airport's usable runways) at the Airport is 15 feet above mean sea level (MSL).

[13] Boeing Commercial Airplanes, *757-200/300 Airplane Characteristics for Airport Planning*, August 2002.

[14] Federal Aviation Administration, Advisory Circular 150/5300-13, *Airport Design*, Paragraph 2.

[15] Federal Aviation Administration, *Fact Sheet, Engineered Material Arresting Systems*, August 11, 2008.

resurfacing Runway 1-19. This solution, and the related improvements required to implement this solution, are referred to as the Proposed Action and are described in detail in Section 2.3.

2.2.3 Summary of Authority's Purpose and Need

The Authority is obligated to enhance the Runway 1-19 RSA as needed to comply with FAA Order 5200.8 and FAA AC 150/5300-13 by FFY 2015. Currently, the largest aircraft operating at the Airport cannot bypass aircraft on the Runway 1 Hold Apron, which results in the inefficient movement of aircraft en route to their take-off position at Runway 1 and exacerbates departure delays. A portion of the existing Runway 1 Hold Apron would be converted to taxiway use when Taxiway J is extended to the relocated end of Runway 1 in conjunction with the Runway 1-19 RSA enhancements. The Authority's Pavement Management System and inspections of the condition of the surface of Runway 1-19 pavement indicated that an overlay will be needed within the next several years.

Constructing a standard RSA would enable the Authority to bring the Runway 1-19 RSA into compliance with FAA Order 5200.8 and FAA AC 150/5300-13. Expansion of the Runway 1 Hold Apron would allow the largest aircraft operating at the Airport to bypass other aircraft on the hold apron. Resurfacing Runway 1-19 would extend the useful life of the Runway 1-19 pavement.

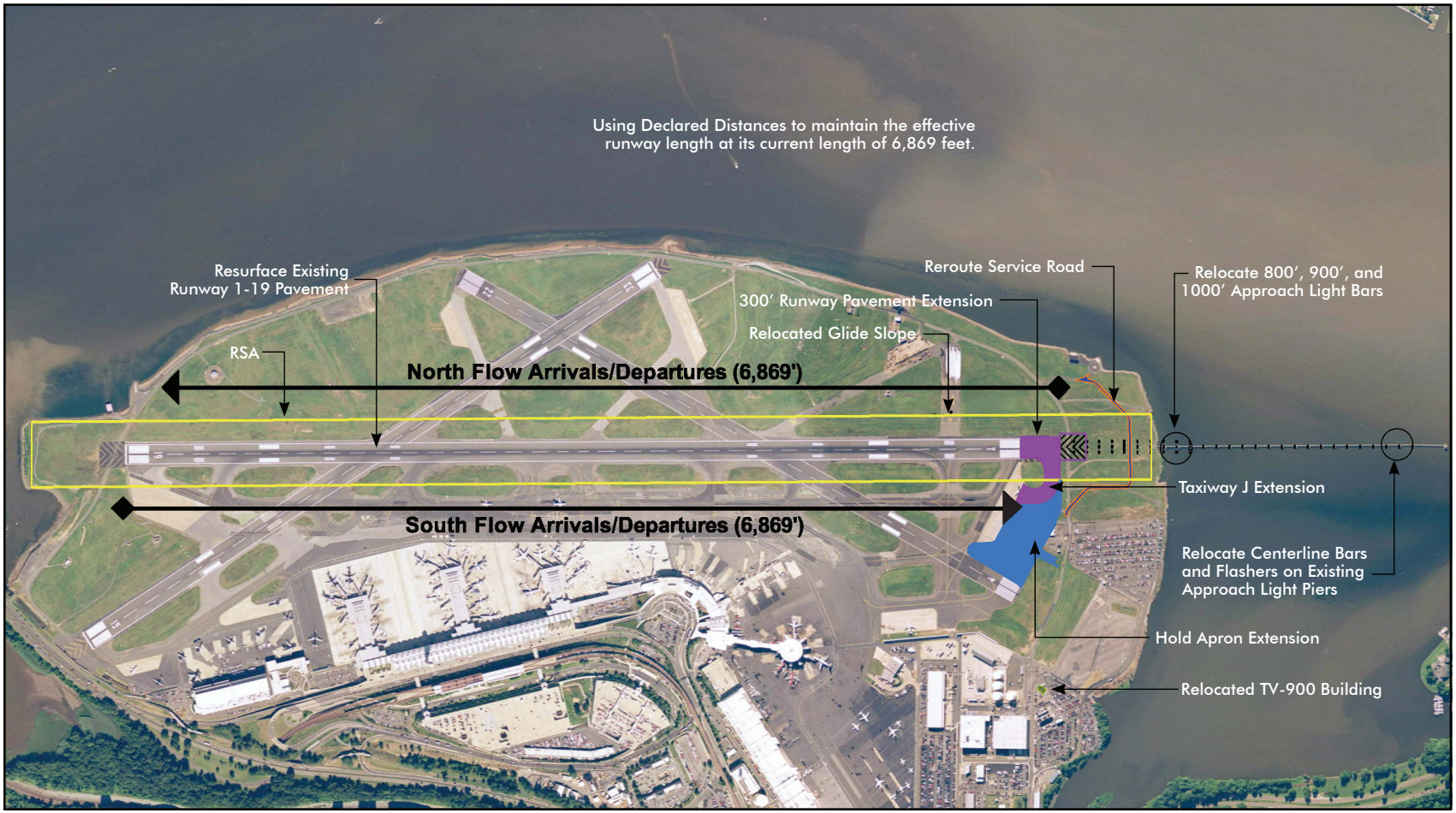
2.3 Proposed Action

The Authority's Proposed Action includes the key elements described below. Except for the reconfiguration of the approach lights, as described below, all construction would take place on Airport property.

- **Extension of the Runway 1-19 pavement 300 feet to the south.** The runway pavement would be extended 300 feet to the south at the same width as the current Runway 1-19 pavement, allowing for a fully compliant RSA without a reduction in usable runway length in either direction. A new blast pad would be constructed at the new end of Runway 1, touchdown zone (TDZ) lights would be relocated 300 feet to the south, and centerline and runway edge lighting would be added along the extended runway pavement. To minimize impacts to the Runway 1 approach lighting system, which are spaced at 100-foot intervals extending from the Runway 1 end, the runway pavement extension would be increased from the 250 feet needed to bring the RSA into compliance to 300 feet.
- **Expansion of the Runway 1 Hold Apron.** Depending on the size of the aircraft on the expanded Runway 1 Hold Apron, the apron could accommodate approximately five aircraft compared to the current apron capacity of approximately three aircraft. More importantly, the expanded apron would provide bypass taxiway capabilities for the largest aircraft operating at the Airport today and maintain parallel taxiway operations to the new end of Runway 1 via Taxiway J. The extension of Taxiway J (described below) would traverse a section of the existing Runway 1 Hold Apron, thereby rendering it unavailable for hold apron purposes and increasing the potential for causing or prolonging delays for departing aircraft. The expansion of the Runway 1 Hold Apron requires the relocation of electrical vault TV-900 to a tentative site on a paved area south of Levee Road in the vicinity of the Airport Beacon and the installation of a new ductbank along Levee Road from the relocated vault to the general area of the existing vault.

- **Extension of the Taxiway J pavement 300 feet to the south.** Taxiway J must be extended to the new Runway 1 end. New taxiway edge lights would be installed along the length of the extended pavement.
- **Designation of declared distances to maintain Runway 1-19 at its current effective length of 6,869 feet in both directions.** The threshold for Runway 19 would remain the same for arrivals and departures and the threshold for Runway 1 would be shifted 300 feet to the south. Although there would be 300 feet of new runway pavement, the runway length available for arrivals and departures on this runway would remain at 6,869 feet in both directions through the use of declared distances. Declared distances allow the Authority to establish the runway length at a specific distance regardless of the length of pavement available in order to establish the beginning and ending of the RSA. By maintaining the current effective length of Runway 1-19 at 6,869 feet in both directions, the additional 300 feet of runway pavement would not translate into an extended runway, and therefore, no changes in runway use or aircraft fleet using this runway would be expected.
- **Relocation of the existing Runway 1 approach lighting system 300 feet to the south.** The 2,400-foot-long Runway 1 approach lighting system would be shifted 300 feet to the south. Wooden pilings or caissons would be placed in the Potomac River on Airport property in order to relocate the 800-, 900-, and 1,000-foot approach light bars. The 300-foot shift of the approach lighting system would also include locating the outer three centerline bars and sequenced flashing lights on the FAA's existing pier structure. The relocated approach lights and flashers would continue to face south along the Potomac River.
- **Relocation of the glide slope antenna.** The glide slope antenna must be relocated to accommodate the new Runway 1 end.
- **Rerouting of the existing service road.** An existing service road, referred to as Levee Road, would be rerouted farther south and away from the relocated Runway 1 end. The new route of Levee Road would be as far from the Runway 1 threshold as possible to avoid interference with the approach lights and far enough from the Potomac River to avoid flooding.
- **Grading and soil stabilization.** At this time, grading and soil stabilization are expected to be limited to the areas of new runway, apron, and taxiway pavement. The Authority is awaiting further engineering design and analysis to determine whether any unpaved RSA areas would require grading or soil stabilization. There would be no significant impact associated with the placement and grading of clean fill as needed, and seeding would be conducted in accordance with an approved erosion and sediment control plan.
- **Resurfacing of Runway 1-19.** The Authority plans to resurface the runway after the other improvements are constructed. The runway resurfacing would involve milling the surface of the existing pavement and applying a new surface that meets FAA specifications.

Exhibit II-5 illustrates the Proposed Action.



Source: Aerials Express, 2007 (Aerial); Ricondo & Associates, Inc., July 2008 (Proposed Action Improvements).
Prepared by: Ricondo & Associates, Inc., July 2008.

Exhibit II-5

Not to Scale

north

The Proposed Action

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2.4 Federal Actions

The Federal (i.e., FAA) actions being requested by the Authority include:

- Unconditional approval of the updated ALP for Ronald Reagan Washington National Airport, depicting the proposed airfield pursuant to 49 United States Code (USC) § 40103(b), 44718, and 47107(a)(16); 14 CFR Part 77, *Objects Affecting Navigable Airspace;* and 14 CFR Part 157, *Notice of Construction, Alteration, Activation, and Deactivation of Airports*;
- Determinations under 49 USC. §§ 47106 and 47107 relating to the eligibility of the Proposed Action for federal funding under the AIP;
- Determination under 49 USC § 44502(b) that the Proposed Action is reasonably necessary for use in air commerce or in the interest of national defense;
- Establishment of flight procedure modifications pursuant to 14 CFR Part 95, *IFR Altitudes*;
- FAA determination that the Proposed Action would meet the federal Clean Air Act requirements;
- Continued close coordination with the Authority and appropriate FAA program offices, as required for safety during construction pursuant to 14 CFR Part 139 under 49 USC § 44706;
- Approval of the appropriate amendments to the *Airport Certification Manual* pursuant to 14 CFR Part 139;
- Appropriate amendment to air carrier operations specifications pursuant to 49 USC § 44705; and
- FAA determination of the effects on the safe and efficient use of airspace, including a review of changes to air traffic procedures for consistency with the Potomac TRACON Environmental Impact Statement.

2.5 Timeframe of the Proposed Action

The Authority currently expects to submit the Final EA to the FAA in September 2009 and anticipates that the FAA could issue its finding in October 2009. The Authority plans to concurrently construct the RSA and hold apron enhancements, and estimates that it will take up to 18 months to complete construction. If the EA schedule is met and the FAA issues a favorable finding and if construction commences in the second quarter of 2010, construction would likely be completed in the third quarter of 2011. The resurfacing of Runway 1-19 is expected to occur after the construction of the RSA enhancements and hold apron expansion.

2.6 RSAs for the Crosswind Runways

The FAA's February 21, 2007, *Runway Safety Area Determination* for the Airport concluded that RSA enhancements were required to bring the RSAs for each of the Airport's three runways into compliance with FAA Order 5200.8 and FAA AC 150/5300-13.

The Authority's Proposed Action addresses the Runway 1-19 RSA deficiencies and the need for expanded Runway 1 Hold Apron capacity. The Authority is continuing to develop and evaluate reasonable, feasible, and practicable alternatives for bringing the RSAs of the two crosswind runways into compliance with FAA standards. The operational, environmental, effectiveness, and feasibility issues associated with bringing the RSAs for the crosswind runways into compliance are

considerably more challenging than those associated with the Runway 1-19 RSA. The Authority has not yet identified a preferred alternative for the RSAs for the crosswind runways. The issue of RSA improvements for the crosswind runways is not ripe for decision. Therefore, the Authority is preparing two EAs, one for the Runway 1-19 RSA enhancements and a second for the RSA enhancements for the crosswind runways to permit the timely implementation of the RSA solution for Runway 1-19, which accommodates the majority of aircraft arrivals and departures at the Airport. Implementation of the proposed Runway 1-19 RSA improvements would not affect or in any way constrain selection of the preferred alternatives for the RSAs for the crosswind runways.