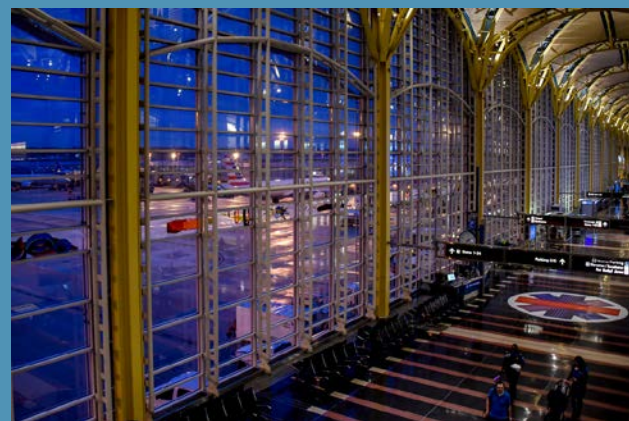


COMPREHENSIVE REGIONAL AIR SYSTEM PLAN – PHASE 2 REPORT

JANUARY 2020



National Capital Region
Transportation Planning Board

COMPREHENSIVE REGIONAL AIR SYSTEM PLAN, PHASE 2 REPORT – JANUARY 2020

Prepared by the National Capital Region Transportation Planning Board (TPB) in cooperation with the Federal Aviation Administration (FAA). Oversight was provided by the Aviation Technical Subcommittee of the TPB Technical Committee.

ABOUT THE TPB

The National Capital Region Transportation Planning Board (TPB) is the federally designated metropolitan planning organization (MPO) for metropolitan Washington. It is responsible for developing and carrying out a continuing, cooperative, and comprehensive transportation planning process in the metropolitan area. Members of the TPB include representatives of the transportation agencies of the states of Maryland and Virginia and the District of Columbia, 23 local governments, the Washington Metropolitan Area Transit Authority, the Maryland and Virginia General Assemblies, and nonvoting members from the Metropolitan Washington Airports Authority and federal agencies. The TPB is staffed by the Department of Transportation Planning at the Metropolitan Washington Council of Governments (COG).

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The comprehensive Regional Air System Plan (RASP) Phase 2 Report reviews existing conditions (supply) and anticipated needs (demand) in the regional airport system. The results of Phase 2 are documented in this report, which will inform the airport-specific needs assessment and air system-wide policy issue recommendations that will be outlined in Phase 3. All three phases will be developed in conjunction with the National Capital Region's three commercial airports and the Federal Aviation Administration (FAA). All three phases will collectively constitute the updated RASP.

I. INTRODUCTION

In 1975, the Metropolitan Washington Council of Governments (MWCOG) began the Continuous Airport System Planning (CASP) program with the landmark study, “The Future of Washington’s Airports.” Since the initial 1975 study, there has not been a fully comprehensive regional air system plan (RASP) update conducted. Rather, the CASP program has provided incremental updates over multiple plan volumes, along with a series of continual, smaller, incremental updates or amendments to the RASP.

Due to resource limitations, this RASP update has been prepared in three distinct phases, which will result in a single comprehensive document at the end of the process. All three phases will collectively constitute the updated RASP.

Phase 1 of the comprehensive Regional Air System Plan (RASP) update focused on a review of previous and existing RASPs, airport master plans, state aviation plans, and a national literature review to determine the state of the practice in regional airport system planning. Phase 2 of the comprehensive RASP update reviewed existing conditions (supply) and anticipated needs (demand) in the regional airport system. The results of Phase 2 are documented in this report, which will inform the airport-specific needs assessment and air system-wide policy issue recommendations that will be outlined in Phase 3. Note: all growth projections provided throughout this report are based on previously established Federal Aviation Administration (FAA) Terminal Area Forecast (TAF) projections, unless otherwise indicated.

Phase 2 addresses supply and demand as follows:

Supply Analysis

Conduct a supply analysis for the region’s commercial airports covering passenger and cargo facilities and other uses within the airport boundaries, using a similar approach to that performed for the Ground Access Element Update in previous Airports Capital Improvement Plan (ACIP) documents.

Demand Analysis

Conduct a demand analysis for the region’s commercial airports covering passenger and cargo facilities and other uses within the airport boundaries, using an approach similar to that performed for the Ground Access Element Update in previous ACIP documents and including a review of outputs from regional and statewide travel demand forecasting models, where available. The analysis will cover demand for air travel and surface transportation for the airports.

II. AIRPORT MASTER PLANS

An airport master plan is a detailed, long-term development plan for an individual airport.¹ Airport master plans are prepared to support the modernization or expansion of airports. As demonstrated in this section's summaries of the master plans for each of the region's three major commercial airports, the airport master planning effort involves collecting data, inventorying existing facilities, forecasting demand, determining facility requirements, evaluating alternative development plans, detailing long-range development plans and financial implementation schedules for a specific airport, and preparing an Airport Layout Plan (ALP).

The approved ALP is a key deliverable of the master planning process, serving as a record of aeronautical requirements, both current and future, and as a reference for local community deliberations on land use and zoning proposals as well as budget issues. The FAA requires all federally funded airports to have an FAA-approved ALP in place, which is typically updated and submitted to the FAA for approval every five years or as needed. The ALP should reflect an accurate depiction of existing and future proposed conditions in the airside, landside, and terminal areas, as well as proposed development over the near, interim and long-term planning horizons.²

According to a 2016 Washingtonian article – and as further articulated in the Washington-Baltimore Regional Air Passenger Survey 2017 General Findings results below – it's a close race for passengers among the region's three airports, with all three planning major upgrades in order to attract more air passengers and improve the airport experience, from the security checkpoints to the food court.³ Many of these changes are reflected in the airport master plan descriptions within this section.

In 2017, 36.4 million passengers traveled through the Washington-Baltimore Region, an increase of seven percent from 2015 (34.1 million).⁴ This total is broken down by the percentage of passengers at each airport:

- 36 percent of passengers at BWI (up from 35 percent in 2015)
- 33 percent of passengers at DCA (down from 34 percent in 2015)
- 31 percent of passengers at IAD (the same as in 2015)

¹ "Advisory Circular: The Airport System Planning Process." U.S. Department of Transportation Federal Aviation Administration, 2015.

² "Recommendation to Approve an Update to the Airport Layout Plan for Ronald Reagan Washington National Airport." Metropolitan Washington Airports Authority, 2017. http://www.mwaa.com/sites/default/files/BOD/2017-01/tab_5_recommendation_to_approve_an_update_to_the_airport_layout_plan_for_ronald_reagan_washington_national_airport.pdf

³ "Future of DC Airports – New Construction DCA BWI IAD." The Washingtonian, 2016. <https://www.washingtonian.com/2016/11/21/future-of-dc-airports-new-construction-dca-bwi-iad/>

⁴ "Washington-Baltimore Regional Air Passenger Survey – 2017 General Findings." National Capital Region Transportation Planning Board, Metropolitan Washington Council of Governments, 2018.

BALTIMORE/WASHINGTON INTERNATIONAL THURGOOD MARSHALL AIRPORT (BWI)

Consolidated Transportation Program (2018 – 2023, 2019–2024)

In 2017, a record 26.3 million enplaning air passengers flew through BWI – 1.4 million more than the previous year. To accommodate the airport’s growth, the Maryland Aviation Administration (MAA) continues improving its facilities and passenger amenities, as outlined in the forthcoming Maryland Department of Transportation Consolidated Transportation Plan 2019 - 2024 (MDOT CTP).⁵

Following the installation of a new International Checked Baggage Inspection System in 2017, a six-gate expansion of the International Concourse will open to the public in fall 2018, enhancing Customs processing for arriving travelers. Reconstruction of 28,000 square yards of concrete apron pavement surrounding Concourse B is underway and the design of a five-gate extension to Concourse A is nearing completion. In early 2019, construction will begin on the 55,000 square foot, five-gate extension to Concourse A, which serves Southwest Airlines. This is an important first step in a multi-year upgrade to Terminal A/B, which is the center of operations for Southwest Airlines at BWI.

Over the past year, BWI air cargo activity grew by approximately 60 percent. The airport responded to this rapid growth with a fast-track construction project, expanding the Midfield Cargo Apron with three new aircraft parking positions – for a total of six – to accommodate growth by an existing carrier in time for peak 2017 holiday season demand.

At BWI, airlines need to perform periodic or incidental maintenance on their aircraft. Currently there is insufficient space at the airline gates or within the terminal and adjacent areas for airlines to perform aircraft maintenance functions. The forthcoming creation of an Aircraft Maintenance Facility will support aircraft maintenance needs.⁶

With support from the Maryland Department of the Environment (MDE), MAA procured twenty new articulated shuttle buses powered by clean natural gas (CNG) for transportation between the BWI terminal and the consolidated rental car facility. For those travelers seeking the highest level of convenience, “concierge-style” valet parking was launched in the hourly garage in early 2018.

Environmental Assessment of Airport Layout Plan Phase 1 (2016–2020)

In April of 2015 the FAA conditionally approved the Airport Layout Plan (ALP) for BWI. The 2015 ALP identified three phases of improvements at BWI, which are key to meeting FAA design standards as well as the airport’s own capacity demands. Phase 1 (2016-2020) is the primary element of the ALP under consideration in the Environmental Assessment and Section 4(f) Determination recently undertaken by the Office of Environmental Services at MAA.⁷ The purpose of each element of Phase 1 and its associated projects are outlined below:

⁵ “Draft Consolidated Transportation Program 2019 to 2024.” Maryland Aviation Administration, Maryland Department of Transportation, Publication forthcoming; 2019.

⁶ “Consolidated Transportation Program 2018 to 2023.” Maryland Aviation Administration, Maryland Department of Transportation, 2018.

⁷ “Proposed Improvements 2016-2020 at Baltimore/Washington International Thurgood Marshall Airport: Draft Environmental Assessment and Draft Section 4(f) Determination.” Office of Environmental Services, Maryland Aviation Administration, Maryland Department of Transportation, 2018.
[http://www.marylandaviation.com/_media/client/environmental/2018/Draft_EA_and_Section4\(f\)_Determination_Proposed_Improv_2016_2020_BWI_v2.pdf](http://www.marylandaviation.com/_media/client/environmental/2018/Draft_EA_and_Section4(f)_Determination_Proposed_Improv_2016_2020_BWI_v2.pdf)

- **Meet FAA Design Standards**
 - Improve taxiway fillets/shoulders in the International Terminal Area
 - Construct new infill pavement near Taxiways T, P and 'Future P' (Runway 4-22 has been converted to Taxiway P but was previously referred to as Future P)
 - Relocate Taxiway K and Re-establish Taxiway L
 - Relocate Taxiways R and F
 - Relocate Taxiway V
 - Expand Runway 28 Deicing Pad
 - Remove Part 77 Obstructions: for on airport property clear the primary, approach (50:1) and transition surfaces; for off-airport properties clear to the threshold siting surface (34:1)
 - Clear trees in the VORTAC critical area to a 1,200-foot radius

- **Enhance Airfield Safety and Efficiency**
 - Construct Taxiway U3
 - Relocate Taxiway H
 - Construct Isolation/ Remain Overnight (RON) Apron
 - Construct Northwest Quadrant Perimeter Road
 - Construct vehicle service roadway (VSR) connector south of the former Runway 4 end
 - Expand existing ARFF indoor parking
 - Relocate fire training facility
 - Rehabilitate/improve pavement in accordance with the latest Pavement Management Plan

- **Accommodate Existing and Anticipated Demand**
 - Expand Runway 15R Deicing Pad
 - Construct Second FBO
 - Construct new Northrop Grumman Hangar
 - Construct new airline maintenance facility
 - Increase runway deicing chemical storage and construct access road
 - Building 113 Demolition
 - Relocate and consolidate airport maintenance complex

- **Improve Customer Service**
 - Construct new Sky Bridge C
 - Widen terminal roadway
 - Widen upper level roadway at Concourse E

- **NEPA Review of Previously Acquired Property**
 - Perform NEPA review of acquired parcel located at 1143 Stoney Run Road

RONALD REAGAN WASHINGTON NATIONAL AIRPORT (DCA)

Reagan National Project Journey

The current facilities at Ronald Reagan Washington National Airport (DCA) were designed to serve 15 million enplaning passengers per year. However, 23.9 million enplaning passengers traveled through the airport in 2017, setting new records and straining the existing infrastructure. To accommodate this level of passenger traffic and provide an improved level of service, a series of projects are underway.

Project Journey is a \$1 billion major development program that includes two key projects: new security checkpoints and a new concourse. The program is estimated to be completed in 2021.⁸

New Concourse

The new concourse will replace the 14 hardstand gates currently accessed via bus from Gate 35X. Contact gates with enclosed access to planes via jet bridges, spacious hold rooms, new concessions and an American Airlines Admirals Club lounge will be provided. The facility will increase safety and security, as well as enhance passenger convenience. It will end the need for travelers to ride buses from the terminal to board regional jets parked outside. The concourse design includes architectural features consistent with Terminal B/C's exposed metal beams, glass walls and domed ceilings while maximizing open, navigable gate areas and panoramic views of downtown Washington, D.C.

New Security Checkpoints

The new security checkpoints will be conveniently located between National Hall and walkways from the Metrorail station and parking garages. Upon activation, the new 50,000 square foot checkpoints will expand screening capacity from 20 to 28 security lanes and create a seamless, free-flowing environment between Terminal B/C (Gates 10-45).

By relocating the existing security checkpoints, passengers will be able to move freely between gate areas and enjoy all the amenities the airport offers without having to be re-screened. The resulting terminal reconfiguration will provide passengers an improved post-security experience – alleviating gate area congestion while expanding access to a variety of shopping, dining and seating options. The two new security checkpoints will be built above the existing arrivals roadway.

Airport Capital Improvement Plan, Ronald Reagan Washington National Airport, 2019 – 2023

In addition to Project Journey, various airfield improvements are underway or planned. A pavement rehabilitation project for various taxiways and Runway 4/22 is nearing completion. Expansion of Hold Bay 04 including deicing collection and storage facilities is scheduled to begin in October 2018.

Planned airfield improvements in the Airport Capital Improvement Plan (ACIP) for Reagan National Airport include taxiway geometry projects to meet FAA standards and reduce the likelihood of runway incursion, hold bay reconfiguration, and pavement rehabilitation projects. Detailed projects by year are provided below.

⁸ "Reagan National Project Journey." Ronald Reagan Washington National Airport, 2018. <http://flyreagan.com/dca/project-journey>

Air Capital Improvement Plan Projects Listed by Year:

2019

- **Construct Taxiway, J, A, C, E** (South Airfield Geometry Improvements TV-900 Electric Vault Relocation – Phase I): The relocation of the TV-900 electrical Vault is an enabling project to allow for the reconfiguration of Hold Bay 01. The project will also increase the resiliency of the vault at the south end of the Airport.

2020

These pavement rehabilitation projects are part of the ongoing pavement management program:

- **Rehabilitate Taxiways J, M, N, and N1**
- **Rehabilitate Taxiway and Apron – South GA Apron & Taxiway Papa West**

2021

- **Construction Taxiway J, A, C, E** (South Airfield Geometry Improvements Taxiway and RWY 01 Hold Apron – Phase 2): Includes the reconfiguration of the Runway 01 hold bay to meet FAA standards. In addition, the project includes deicing collection and storage facilities.
- **Expand Runway 15 Hold Bay and Rehabilitate Runways 15 and 22 Hold Bays:** Will reconfigure the Runway 15 hold bay to increase efficiency at the north end of the airport. It is also part of the ongoing pavement management program.

2022

- **Construct Taxiway J, K, N** (RIM and Hot Spot 2 Taxiway Geometry Improvements Taxiway and Hold Apron and Relocate N Phase 1): Will address the non-standard taxiway geometry associated with the FAA identified Runway Incursion Mitigation (RIM) location (Runway 19 hold bay) and Hot Spot 2. The project will meet taxiway design standards and help to decrease the likelihood of runway incursions. Runway guard lights will also be installed at Hot Spot 2 to increase pilot situational awareness.

2023

- **Relocated Taxiway N Phase II:** This project is to comply with the runway to taxiway separation distance between Taxiway N and Runway 15/33.
- **Rehabilitate Apron – Terminal B/C Ramps:** Part of ongoing pavement management program
- **Rehabilitate Apron – Terminal A Apron:** Part of ongoing pavement management program

Airport Layout Plan

The Airport Layout Plan (ALP) for Reagan National was approved by the MWAA board in January 2017 and was approved by the FAA in 2018. The update incorporates all Runway Safety Area work that was completed in previous years and all pen and ink change approvals since the last update (2012), including the Project Journey new concourse and checkpoints. New development items include the revision of planned roadway improvements, associated enabling projects (new Engineering and Maintenance Shops Building and temporary parking structure) and airfield improvements to address the Runway Incursion Mitigation (RIM)/ Hot Spot nonstandard taxiway geometry, Runway 04 Hold Bay expansion and Runway 01 Hold Bay improvements.

WASHINGTON DULLES INTERNATIONAL AIRPORT (IAD)

Airport Capital Improvement Plan, Washington Dulles International Airport, 2019 – 2023

Washington Dulles International Airport served over 22.7 million enplaning passengers in 2017, a 4.1 percent increase over the previous year. The increase was largely due to the addition of new International Airlines and destinations. This trend is anticipated to fuel continued growth in 2018. Many of the current projects at Dulles are for maintenance and/or enhancement of existing facilities. Near-term capital improvements consist of upgrades to existing concourses that will extend their useful life. Projects range from new roofing to electrical, plumbing, and new finishes. Other improvements consist of aircraft fueling system upgrades, pavement rehabilitation for aircraft parking aprons, taxiways, taxi lanes and runways, and baggage system upgrades to provide additional capacity. A small number of additional narrow body aircraft gates are envisioned that will enable existing gates to be converted to accommodate widebody aircraft.

In addition, MWA continues to rehabilitate the pavement at the airport as part of the ongoing pavement management program and bring the airfield up to Aircraft Design Group (ADG) VI and Taxiway Design Group (TDG) 7 standards. Rehabilitation of a portion of Taxiway J and Taxiway B west section rehabilitation and widening are anticipated to be completed this fall. Additional airfield pavement rehabilitation projects planned are listed below.

Air Capital Improvement Plan Projects Listed by Year:

2019

- **Reconstruct & Wide Taxi Lane B, Middle, Section 2:** Will widen Taxi Lane B to 84 feet to meet TDG-7 standards; will be the final phase of the Taxi Lane B rehabilitation and widening.

2020

- **Reconstruct North Runway 1C-19C & High-Speed Taxiways:** Will rehabilitate original pavement on the northern portion of the Runway 1C/19C. Note the southern portion of the runway was rehabilitated several years ago.

2021

- **Reconstruct Runway 1R-19L (Phase 1 Design):** This project is for the design of a complete rehabilitation and widening of the Runway 1R/19L. The original pavement panels will be replaced, and the runway widened to 200 feet to accommodate Design Group VI aircraft.
- **Reconstruct Apron B Gates, SE End, Sections 3 & 4:** This project is part of the ongoing pavement management program.

2022

These projects are part of the ongoing pavement management program:

- **Reconstruct Apron B Gates, SW End, Sections 1 & 2**
- **Reconstruct Taxiway Y Section 5**

2023

- **Reconstruct Taxi Lane A:** Part of the ongoing pavement management program.

Dulles Corridor Metrorail Project: Section 106 Activities Annual Report

In 2017, the Metropolitan Washington Airports Authority (MWAA), and a number of local stakeholders - including the Virginia Department of Transportation (VDOT), the Washington Metropolitan Area Transit Authority (WMATA), Fairfax County, Loudoun County, and the Virginia Department of Rail and Public Transportation (DRPT) – continued planning, development, design and construction activities for the Project, a 23.1-mile extension of the regional Metrorail system along the rapidly growing Dulles Corridor in Fairfax and Loudoun Counties.⁹ The Project extends the 106-mile Metrorail system existing in 2007 from the Metrorail Orange Line in Fairfax County through Tysons Corner to the Washington Dulles International Airport (Dulles Airport) and beyond to Route 772 in eastern Loudoun County. Most of the extension is being constructed in the median of the Dulles Connector Road, the Dulles International Airport Access Highway (DIAAH), and the Dulles Greenway toll road, but the alignment also diverts off median to directly serve Tysons Corner and Dulles Airport. The entire extension, once completed, will include 11 new Metrorail stations, a maintenance and storage yard on Dulles Airport property, and an expansion of the existing service facilities at the West Falls Church Station. Four of the new stations are located within Tysons Corner because it offers the significant ridership potential with the least impact on residential areas.

The Project's first phase, known as the Extension to Wiehle Avenue, completed the initial 11.7 miles of the planned extension from the current Metrorail Orange Line to Wiehle Avenue in Reston. The alignment follows the Dulles Connector Road, Route 123 and Route 7 in Tysons Corner, and the DIAAH. The Extension to Wiehle Avenue includes five new stations (McLean, Tysons Corner, Greensboro, Spring Hill, and Wiehle-Reston East), additional commuter parking, improvements to the existing Metrorail Service and Inspection Yard at West Falls Church, and an interim terminus at Wiehle Avenue. Construction was substantially completed in spring 2014 and revenue operations of the Extension to Wiehle Avenue commenced on July 26, 2014.

The Project's second phase, known as the Extension to Dulles Airport/Route 772, will complete the Project from the Phase 1 terminus at Wiehle Avenue to Route 772 in Loudoun County. From Wiehle Avenue, the alignment will continue along the DIAAH, cross Dulles Airport property, and then follow the Dulles Greenway to the terminus at Route 772. The Extension to Dulles Airport/Route 772 will include six additional stations (Reston Town Center, Herndon, Innovation Center, Dulles Airport, Loudoun Gateway, and Ashburn), additional commuter parking, and a new Service and Inspection Yard on Dulles Airport property. Revenue operations of the Extension to Dulles Airport/Route 772 is tentatively scheduled for some time in 2020.

Airport Layout Plan

The Airport Layout Plan for Dulles was last updated in July 2016. It included property boundary changes and various projects that were recently completed or planned.

⁹ "Dulles Corridor Metrorail Project: Section 106 Activities Annual Report." Metropolitan Washington Airports Authority, 2018. http://www.dullesmetro.com/silverline/assets/File/project_docs/2017%20Section%20106%20Activities%20Annual%20Report%20-%20FINAL.pdf

III. SUPPLY ANALYSIS

The following metrics were established to guide the supply analysis. The development of the supply-based metrics was informed by an iterative series of in-person interviews and phone calls conducted by TPB staff with airport planning staff from each of the region's three major commercial airports: Baltimore/Washington International Thurgood Marshall Airport (BWI), Ronald Reagan Washington National Airport (DCA), and Washington Dulles International Airport (IAD)

AIR SERVICE

The total number of aircraft gates, including both wide body gates and narrow body gates.

CARGO

Air cargo consists of four elements: apron space, warehouse space, landside space (truck maneuvering and parking), and intermodal connectivity. Apron space involves square footage of apron or number of wide-body and narrow-body parking positions. Warehouse space consists of the square footage of existing cargo warehouse space. Landside space involves truck maneuvering and parking. Intermodal connectivity includes factors that impact access to the interstate highway system and cargo rail.

GROUND ACCESS

Ground access is broken down by roadway infrastructure and the number of routes, capacity, and frequency of the following transit services: Metrorail, Metrobus or other local bus, commuter bus, commuter rail, intercity bus, and intercity rail.

CURBSIDE ACCESS

Curbside access is primarily defined by lane area and lane capacity, where lane area consists of the linear footage of lanes, and lane capacity involves the curbside capacity of lanes in terms of level of service (LOS) and/or the number of vehicles that the lanes can accommodate over the course of a year.

PARKING

Parking is defined by the number of parking spaces.

GENERAL AVIATION FACILITIES

General aviation facilities consist of three elements: apron space, hangar space, and general aviation terminal and fixed-base operator (FBO) facilities. Apron space involves the square footage of the apron, hangar space consists of the total units of corporate/group and T hangars, and general aviation terminal and FBO facilities are measured in square footage.

SUPPLY ANALYSIS FOR BALTIMORE/WASHINGTON INTERNATIONAL THURGOOD MARSHALL AIRPORT (BWI)

AIR SERVICE

The total number of aircraft gates, including both wide body gates and narrow body gates. Air service infrastructure at BWI Airport consists of 12 wide body gates and 62 narrow body gates.

CARGO

Air cargo consists of four elements: warehouse space, apron space, landside space (truck maneuvering and parking), and intermodal connectivity. Apron space involves square footage of apron or number of wide-body and narrow-body parking positions. Warehouse space consists of the square footage of existing cargo warehouse space. Landside space involves truck maneuvering and parking. Intermodal connectivity includes factors that impact access to the interstate highway system and cargo rail.

Warehouse Space

There is 412,125 SF of existing cargo warehouse space.

Apron Space and Landside Space

Aircraft Parking Spaces	Midfield cargo	12	North cargo	20	Total	32
Runway Length	RW10-28	10,502' x 150'	RW15R-33L	9,500'x150'	RW15L-33R	5,000'x100'
Ramp Area	Midfield cargo	785,000 SF	North cargo	1,317,000 SF		
Truck Maneuvering	Landside frontage	4,182 LF	Maneuvering	527,856 SF		
Truck Parking	Dock positions	251	Storage	459,000 SF		

Source: Comprehensive RASP Update, BWI Airport, 2020

Intermodal Connectivity

Primary access to the interstate highway system from the north, northwest, and northeast is provided via Interstates 95, 695, and 195, and MD 295. Access is also provided from the east via US 50/301 to I-97, from the south via I-495, and via Interstate 70, MD Route 100, and the Intercounty Connector / MD 200.

GROUND ACCESS

Ground access is broken down by roadway infrastructure and the number of routes, capacity, and frequency of the following transit services: Metrorail, Metrobus or other local bus, commuter bus, commuter rail, intercity bus, and intercity rail. For roadway access, see the intermodal connectivity outlined in the section above.

Metrobus / Local Bus

Routes	B-30 Greenbelt-BWI Airport Express Line
Capacity	50 passengers per bus
Frequency	Hourly Monday-Friday; 6 AM - 10:38 PM

Source: Comprehensive RASP Update, BWI Airport, 2020

Commuter Bus

Routes	201 Gaithersburg Park to BWI
Capacity	50 passengers per bus
Frequency	Hourly 4 AM - 12:20 AM

Source: *Comprehensive RASP Update, BWI Airport, 2020*

Commuter Rail

Routes	MARC Penn Line
Capacity	Sitting Load: 875; Crush Load: 1,155
Frequency	
Weekday: Southbound	4 AM – 9:25 PM; 27 daily trips
Weekday: Northbound	5:30 AM – 10:45 PM; 24 daily trips
Saturday: Southbound	7 AM – 9:15 PM; 9 daily trips
Saturday: Northbound	9 AM – 10:45 PM; 9 daily trips
Sunday: Southbound	8:45 AM – 5:55 PM; 6 daily trips
Sunday: Northbound	10:30 AM – 7:30 PM; 6 daily trips

Source: *Comprehensive RASP Update, BWI Airport, 2020*

Intercity Bus

Routes	LocalLink 75 & Express BusLink 107
Capacity	50 passengers per bus
Frequency	
LocalLink 75	Daily; 24 hours per day
Express BusLink 107	
Weekday	6:20 AM - 9:01 AM
Weekend	3:50 PM - 6:31 PM

Source: *Comprehensive RASP Update, BWI Airport, 2020*

Intercity Rail

Routes	Baltimore Light RailLink
Capacity	250 passengers per car; 2-car train
Frequency	
Weekday	4:01 AM-1:23 AM; every 10-30 minutes
Saturday	4:21 AM-1:23 AM; every 15-30 minutes
Sunday	9:51 AM-10:06 PM; every 15-30 minutes

Source: *Comprehensive RASP Update, BWI Airport, 2020*

CURBSIDE ACCESS

Curbside access is primarily defined by lane area and lane capacity, where lane area consists of the linear footage of lanes, and lane capacity involves the curbside capacity of lanes in terms of level of service (LOS) and/or the number of vehicles that the lanes can accommodate over the course of a year.

At BWI Airport, the existing linear feet of curbside can accommodate 30 million annual passengers.

Lane Area

Arrivals	7 lanes
Outer Curb	2,300 linear feet
Inner Curb	2,600 linear feet
Departures	6 lanes
Outer Curb	2,200 linear feet
Inner Curb	2,600 linear feet

Source: *Comprehensive RASP Update, BWI Airport, 2020*

Curbside Access by Type

- Private vehicles
- Transportation Network Companies
- Taxicabs
- Airport shuttles
- Dedicated commercial

PARKING

Parking is defined by the number of parking spaces: 417,600.

Parking by Type

- Public/Customer
- Employee
- Cell Phone
- Transportation Network Companies

GENERAL AVIATION FACILITIES

General aviation facilities consist of three elements: apron space, hangar space, and general aviation terminal and fixed-base operator (FBO) facilities. Apron space involves the square footage of the apron, hangar space consists of the total units of corporate/group and T hangars, and general aviation terminal and FBO facilities are measured in square footage.

Apron Space

Transient Aircraft Overflow Parking	10,000 square yards
RW 15L-33R Deicing Pad	13,000 square yards
Transient Aircraft Parking Apron	66,500 square yards
Based Aircraft Parking Apron	40,500 square yards

Source: *Comprehensive RASP Update, BWI Airport, 2020*

Apron Parking Space

132,500 square yards (1,192,500 SF)

Hangar Space

General Aviation Aircraft	70
T Hangars	30
Corporate Hangars	10

Source: *Comprehensive RASP Update, BWI Airport, 2020*

SUPPLY ANALYSIS FOR RONALD REAGAN WASHINGTON NATIONAL AIRPORT (DCA)

AIR SERVICE

The total number of narrow body aircraft gates. Air service infrastructure at DCA Airport consists of 47 narrow body gates.

CARGO

Air cargo consists of four elements: warehouse space, apron space, landside space (truck maneuvering and parking), and intermodal connectivity. Apron space involves square footage of apron or number of wide-body and narrow-body parking positions. Warehouse space consists of the square footage of existing cargo warehouse space. Landside space involves truck maneuvering and parking. Intermodal connectivity includes factors that impact access to the interstate highway system and cargo rail.

Warehouse Space

47,700 SF of existing cargo warehouse space exists in one cargo building with no airside access for aircraft. There are other non-cargo related tenants utilizing 16,105 SF of the warehouse space, but it can be fully utilized for cargo purposes if the need should arise in the future.

Apron Space and Landside Space

Aircraft Parking Area	Air Cargo Facility	0				
Runway Length	R/W 1-19	7169' x 150'	R/W 15-33	5204' x 150'	R/W 4-22	5000' x 150'
Ramp Area	Air Cargo Facility	0				
Truck Parking	Dock Positions	58	Landside Frontage		Truck Maneuvering	60492 SF

Source: *Comprehensive RASP Update, DCA Airport, 2020*

Intermodal Connectivity

Primary access to the interstate highway system in Virginia is provided from Richmond and points south via I-95 North to I-395 North and from Manassas and points west via I-66 East and VA 110 South to US 1 South. When traveling from Maryland, DCA Airport can be accessed via I-95 South, I-270 South, I-495 South, and I-395 South.

GROUND ACCESS

Ground access is broken down by roadway infrastructure and the number of routes, capacity, and frequency of the following transit services: Metrorail, Metrobus or other local bus. For roadway access, see the intermodal connectivity outlined in the section above.

Metrorail

The blue and yellow Metrorail lines are connected to the concourse level of Terminals B and C at Reagan National Airport. Metro begins operation at 5 a.m. on weekdays, 7 a.m. on Saturdays, and 8 a.m. on Sundays. Service ends at 11:30 pm Monday through Thursday, 1 a.m. on Fridays and Saturdays, and 11 p.m. on Sundays.

Metrobus / Local Bus – No Metrobus service at DCA.

Commuter Bus – No commuter bus service to DCA.

Commuter Rail – The nearest commuter rail stop to DCA is the VRE Crystal City Station. VRE passengers can disembark at Crystal City and transfer to the Crystal City Metrorail station and continue their ground access trip to DCA. The nearest commuter rail station for Maryland’s MARC commuter rail service is Union Station. MARC passengers can disembark at Union Station and transfer to the Union Metrorail station and continue their ground access trip to DCA.

Intercity Bus – No intercity bus service to DCA.

Intercity Rail – No intercity rail service to DCA.

CURBSIDE ACCESS

Curbside access is primarily defined by lane area and lane capacity. Lane area consists of the linear footage of lanes, and lane capacity involves the curbside capacity of lanes in terms of level of service (LOS) and/or the number of vehicles that the lanes can accommodate over the course of a year.

At DCA, there is a total of 5,705 linear feet of curbside.

Lane Area

Terminal A		Terminal B/C	
Arrivals / Departures	7 lanes	Arrivals	8 lanes
Outer Curb	460 linear feet	Outer Curb	1560 linear feet
Inner Curb	655 linear feet	Inner Curb	1400 linear feet
		Departures	5 lanes
			1630 linear feet
Total Curb: 5,705 linear feet			

Source: *Comprehensive RASP Update, DCA Airport, 2020*

Rental Car Facility

A Rental Car facility occupies 3 levels of Garage A and is walkable from the terminal facilities. The total square feet utilized by rental car operations is 931,800 sf.

Curbside Access by Type

- **Private vehicles – 2020 LF for Arrivals (Shared with Transportation Network Companies [TNCs], i.e. Uber and Lyft).**
- **Transportation Network Companies – 2020 LF for Arrivals (Shared with POVs)**
- **Taxicabs – 790 LF**
- **Airport shuttles – 575 LF**
- **Dedicated commercial – 690 LF**

PARKING

Parking is defined by the number of parking spaces: 12,212.

Parking Spaces by Type

Garage (Short-Term)	6,303
Economy (Long-Term)	2,613
Employee	3,296
Total Parking Spaces: 12,212	

Source: *Comprehensive RASP Update, DCA Airport, 2020*

Temporary Parking

During DCA's current construction there is not currently a cell phone lot available. As such, the first 60 minutes in the garages are free to accommodate cell phone passenger pickup. For TNCs, there is a 100-space staging lot located adjacent to the airport.

GENERAL AVIATION FACILITIES

General aviation facilities consist of three elements: apron space, hangar space, and general aviation terminal and fixed-base operator (FBO) facilities. Apron space involves the square footage of the apron; hangar space consists of the total units of corporate/group and T hangars; and general aviation terminal and FBO facilities are measured in square footage.

Apron Space

Transient Aircraft Parking Apron (South Hangar Area)	337,000 SF*
Hold Bay 04 Deicing Apron	128,560 SF*
Apron Area Adjacent to Hangars 3 thru 6	222,676 SF

*Transient Aircraft Parking Apron and Hold Bay 04 Deicing Apron are mainly used for air carrier operations for overnight parking.

Source: *Comprehensive RASP Update, DCA Airport, 2020*

Hangars/Office Space

Six hangars make up 444,524 square feet, 26,700 square feet of which is used for snow removal equipment storage. All other hangars are utilized for aircraft/airport support services.

General Aviation Terminal and FBO Facilities

One fixed-base operator (FBO) serves general aviation at DCA. It has a total terminal and office space of 76,913 square feet and an FBO apron space of 60,952 square feet.

SUPPLY ANALYSIS FOR WASHINGTON DULLES INTERNATIONAL AIRPORT (IAD)

AIR SERVICE

Air service is defined as the total number of aircraft gates, including both wide body gates and narrow body gates. Air service infrastructure at IAD Airport consists of 34 wide body gates and 74 narrow body gates.

CARGO

Air cargo consists of four elements: warehouse space, apron space, landside space (truck maneuvering and parking), and intermodal connectivity. Apron space involves square footage of apron or number of wide-body and narrow-body parking positions. Warehouse space consists of the square footage of existing cargo warehouse space. Landside space involves truck maneuvering and parking. Intermodal connectivity includes factors that impact access to the interstate highway system and cargo rail.

Warehouse Space

There is a total of 476,502 square feet of existing cargo warehouse space. Additionally, 34,901 square feet of office space is located within the cargo buildings on the upper levels. There are other non-cargo related tenants utilizing 4,500 SF of the warehouse space, but that space can be fully utilized for cargo purposes if the need should arise in the future.

Apron Space and Landside Space

Aircraft Parking Area	Buildings 1 and 2	192,060 SF	Buildings 3 and 4	112,500 SF	Cargo Building 5	270,100 SF	Building 6	256,618 SF
Runway Length	R/W 1R - 19L	11500' x 150'	R/W 1C - 19C	11500' x 150'	R/W 1L-19R	9400' x 150'	R/W 12-30	10500' x 150'
Truck Parking	Dock	267	Landside	3874 LF	Truck Storage	158,617 SF		

Source: Comprehensive RASP Update, IAD Airport, 2020

Intermodal Connectivity

Primary access to the interstate highway system in Virginia is provided via the Dulles Airport Access Road on I-495, south on VA 28 to I-66, and northwest on I-81 via I-66.

GROUND ACCESS

Ground access is broken down by roadway infrastructure and the number of routes, capacity, and frequency of the following transit services: Metrorail, Metrobus or other local bus, commuter bus, commuter rail, intercity bus, and intercity rail. For roadway access, see the intermodal connectivity outlined in the section above.

Metrorail

Metrorail's Phase II Silver Line Extension is expected to open in September 2020 with a 700-foot walk from the station via underground automated walkway to the Main Terminal. When complete, the Silver Line will provide service to IAD from points east and west into Loudoun County.

Metrobus/Fairfax Connector/Silver Line Express

Routes	Metrobus 5A	Fairfax Connector 981/983	Silver Line Express
Capacity	50	50	43
Frequency	7 days hourly, 5:30 AM - 11:30 PM	7 days every 20 minutes, 9:15 AM - 6:55 PM; every 40 minutes 5:55 AM - 8:35 AM; 7:15 PM - 11:50 PM	7 days every 20 minutes; 7:00 AM - 10:30 PM

Source: Comprehensive RASP Update, IAD Airport, 2020

Commuter Bus – Commuter bus service is not provided at IAD.

Commuter Rail – Commuter rail service is not provided at IAD.

Intercity Bus – Intercity bus is not provided at IAD.

CURBSIDE ACCESS

Curbside access is primarily defined by lane area and lane capacity, where lane area consists of the linear footage of lanes, and lane capacity involves the curbside capacity of lanes in terms of level of service (LOS) or the number of vehicles that the lanes can accommodate over the course of a year.

IAD is experiencing enplanement growth and as a result, the peak hour congestion has deteriorated, with delays of more than 10 minutes to reach the curbside. There is currently no long-term solution, but in the interim, the new designated pick-up area is helping minimize congestion by removing TNCs from the traffic mix. At IAD a significant limiting factor is that there is only one terminal set-up to do everything and is fixed as far as length goes.

There are 5,660 existing linear feet of curbside at IAD.

Lane Area

Arrivals	5 lanes	1,300 linear feet
Departures	5 lanes	1,300 linear feet
Commercial Inner Curb	3 lanes	1,300 linear feet
Commercial Outer Curb	3 lanes	1,300 linear feet
Commercial TNC	3 lanes	460 linear feet
Total Curb: 5,660 linear feet		

Source: Comprehensive RASP Update, IAD Airport, 2020

Curbside Access by Type

Private Vehicles	1,300 linear feet
TNCs	430 linear feet
Taxicabs	600 linear feet
Airport Shuttle	500 linear feet
Dedicated Commercial	900 linear feet

Source: Comprehensive RASP Update, IAD Airport, 2020

Rental Car Facility

Rental Car facilities are located north of the terminal area with customers transported via shuttles. The total square feet utilized by Rental Car Operations is 1,360,000 sf.

PARKING

Parking is defined by the number of parking spaces: 26,948.

Parking Spaces by Type

Terminal (Hourly)	2,203
Garage (Daily)	8,312
Economy (Long-Term)	11,643
Employee	4,790
TOTAL	26,948

Source: *Comprehensive RASP Update, IAD Airport, 2020*

Temporary Parking

In total, the cell phone lot and the TNC staging area have a total of 700 parking spaces.

GENERAL AVIATION FACILITIES

General aviation facilities consist of three elements: apron space, hangar space, and general aviation terminal and fixed-base operator (FBO) facilities. Apron space involves the square footage of the apron, hangar space consists of the total units of corporate/group and T hangars, and general aviation terminal and FBO facilities are measured in square footage.

Apron Space

Taxiway F Remote Hardstands (R Gates)	1,408,088 square feet
Remote Deicing Pad	671,720 square feet

Source: *Comprehensive RASP Update, IAD Airport, 2020*

These aprons are primarily used by air carriers for overnight parking but are used occasionally for General Aviation as well.

Hangars

Eight hangars make up 354,000 square feet, 35,000 square feet of which is used for office space. All other hangars are utilized for aircraft/airport support services.

General Aviation Terminal and FBO Facilities

Two fixed-based operators (FBO) serve general aviation at IAD, which have a total terminal and office space of 21,600 square feet and an FBO apron space of 154,600 square feet.

IV. DEMAND ANALYSIS

The demand analysis was informed by an iterative series of in-person interviews and phone calls conducted by TPB staff with airport planning staff from each of the region's three major commercial airports – Baltimore/Washington International Thurgood Marshall Airport (BWI), Ronald Reagan Washington National Airport (DCA), and Washington Dulles International Airport (IAD). The following demand-based metrics were established to guide the demand analysis:

AIR SERVICE

Air service demand is measured by the total number of flights, enplanements by type (wide/narrow body aircraft and international/domestic airlines), and total number of gate turns (average number of gate turns multiplied by plane seating capacity).

CARGO

Air cargo demand consists of total annual cargo tonnage and factors influencing air cargo tonnage.

GROUND ACCESS

Ground access demand consists of ridership of the following modes: automobiles (broken down by sub-categories of private vehicle personal use, taxicabs, and transportation network companies), rental cars, Metrobus, commuter rail, intercity bus, and intercity rail.

CURBSIDE ACCESS

Curbside access demand is primarily defined by the frequency with which curbs reach the range of levels of service (LOS). LOS is a qualitative measure used to relate the quality of motor vehicle traffic *service*. LOS is used to analyze roadways and intersections by categorizing traffic flow and assigning quality *levels* of traffic based on performance measure like vehicle speed, density, and congestion. Typically, six levels of service are assigned a letter designation from A to F, with LOS A representing the best operating conditions, and LOS F the worst.

PARKING

Parking demand is defined by the number of people per car, annual ridership of the shuttle fleet, and/or the frequency of lot closures due to reaching capacity.

GENERAL AVIATION ACTIVITY

General aviation activity demand consists of annual operations statistics and the number of carriers and/or clients.

DEMAND ANALYSIS FOR BALTIMORE/WASHINGTON INTERNATIONAL THURGOOD MARSHALL AIRPORT (BWI)

AIR SERVICE

The total number of flights, enplanements by type (wide/narrow body aircraft and international/domestic airlines), and total number of gate turns (average number of gate turns multiplied by plane seating capacity).

Number of Flights

Type	2018	2045 Forecast
Domestic	114,232	194,981
International	2,325	3,967
Total	116,557	198,948

Source: Comprehensive RASP Update, BWI Airport, 2020

Enplanements

Aircraft Type	2018 Flights	2045 Forecast	TAF Growth Rate
Wide Body	78,254	119,944	1.594
Narrow Body	13,542,427	20,757,270	1.594
International	668,117	1,024,062	1.594
Domestic	12,952,564	19,853,153	1.594
TOTAL	13,620,681	20,877,214	

Source: Comprehensive RASP Update, BWI Airport, 2020

Gate Turns Multiplied by Average Seating Capacity

In 2018, the average number of turns per gate was 4.77 multiplied by an average seating capacity of 177 per aircraft, totaling 846 gate turns. Average seating capacity is estimated to be 191 by 2045. Assuming 4.77 turns per gate remains constant, the projected total is 912 gate turns by 2045.

CARGO

Air cargo consists of total annual cargo tonnage and factors influencing air cargo tonnage.

Air Cargo Tonnage

In 2018 air cargo totaled 214,156 short tons of freight and mail. The short ton is a mass measurement unit equal to 2,000 pounds. Assuming an approximate 1.3 percent growth rate, air cargo is projected to reach approximately 311,548 short tons by 2045.

Influences on Local Cargo Tonnage

Air cargo has increased by 80 percent over the last five years at BWI. E-commerce is creating a demand for intermodal air freight facilities and services in Maryland and at BWI Airport in particular. Amazon opened four fulfillment centers in Maryland and Under Armor is expected to open a large distribution center in Baltimore as well. The Governor's position that Maryland is "Open for Business"

is also contributing to encouraging economic and industry growth. BWI provides competitively convenient road access for air freight handlers.

GROUND ACCESS

Ground access consists of ridership of the following modes: automobiles (broken down by sub-categories of private vehicle personal use, taxicabs, and TNCs), rental cars, Metrobus, commuter rail, intercity bus, and intercity rail.

Automobile: Annual use total and modal percent share.

Private Car	5,299,000	63%
Rental Car	1,193,000	14%
TNC (Uber/Lyft)	633,000	8%
Taxi	303,000	4%

Source: *Washington-Baltimore Regional Air Passenger Survey, 2017*

Rental Car

962,773 total rentals in 2018. There is no forecasted growth, and conservative estimates are considering a 0.5-1 percent annual decrease.

Metrobus / Local Bus: B-30

Less than one percent, or less than 192,735, of air passengers traveled to BWI by bus in 2018. MTA does not officially produce ridership projections.

Commuter Bus: 201

While MTA does not produce official ridership projections, it is estimated that Bus 201's total ridership was 11,568 in FY 2018.

Commuter Rail: MARC Penn Line

MARC daily boarding at the BWI rail station exceeds 2,200 trips on weekdays, 500 on Saturdays and 300 on Sundays. Total MARC boarding at the BWI rail station in 2018 exceeded 600,000 trips. Three percent, or roughly 217,000 of total passengers traveled by commuter rail in 2018.

Intercity Bus: LocalLink 75 and Express BusLink 107

Average weekday ridership in 2019 for Route 75 was 1,238. The last record for Route 107 is from January 2018, with an average weekday ridership of 28.

Intercity Rail: Light Rail and Amtrak

In 2018 the average Light Rail weekday station boarding was 1,030 at BWI Airport and 212 at BWI Business Park, for a total ridership of 192,735. Amtrak MARC Station ridership for 2018 was 748,540.

CURBSIDE ACCESS

Curbside access is primarily defined by the frequency with which curbs reach the range of levels of service (LOS: A-F).

Levels of Service

Data is not available for the frequency with which curbs reach range of levels of service (A-F).

PARKING

Parking is defined by the number of people per car, annual ridership of the shuttle fleet, and/or the frequency of lot closures due to reaching capacity.

Vehicle Occupancy:

Data is not available for vehicle occupancy.

Shuttle Ridership

Annual shuttle fleet ridership was approximately six million in 2018. Assuming an approximate 1.6 percent growth rate, shuttle ridership is projected to reach approximately 9.2 million by 2045.

Frequency of Lot Closures

	Number of Lot Closures 2018	Average Length of Time Closed (Hours: Minutes)	Lot Closure Rate			
			Lot Closures 2018 / 365 days		Lot Closures 2018 / 12 months	
Express Lot	244	7:50	0.668	per day	20.333	per month
Long-Term Parking	51	6:20	0.140	per day	4.250	per month
Daily Garage	5	9:06	0.014	per day	0.417	per month
Hourly Garage	1	6:55	0.003	per day	0.083	per month

Source: *Comprehensive RASP Update, BWI Airport, 2020*

GENERAL AVIATION ACTIVITY

General aviation activity consists of annual operations statistics and the number of carriers and/or clients.

Annual Operations

In 2018 general aviation operations totaled 10,022. Assuming an approximate 1.3 percent growth rate, this number is projected to reach approximately 14,195 by 2045.

Carriers

In 2018 there were 45 BWI-based tenants, while occasional, transient clients are not tracked.

DEMAND ANALYSIS FOR RONALD REAGAN WASHINGTON NATIONAL AIRPORT (DCA)

AIR SERVICE

The total number of flights, enplanements by type (wide/narrow body aircraft and international/domestic airlines), and total number of gate turns (average number of gate turns multiplied by plane seating capacity).

Enplanements

Aircraft Type	2018 Flights	2045 Forecast
International	183,576	273,357
Domestic	11,526,279	17,100,643
Total	11,709,855	11,373,000

Source: *Comprehensive RASP Update, DCA Airport, 2020*

Gate Turns Multiplied by Average Seating Capacity

In 2018, the average number of turns per gate was 7.4 multiplied by an average seating capacity of 120 per aircraft, totaling 888 seats per gate per day.

CARGO

Air cargo consists of total annual cargo tonnage and factors influencing air cargo tonnage.

Air Cargo Tonnage

In 2018 air cargo totaled 2,336 short tons of freight and mail.

GROUND ACCESS

Ground access consists of ridership of the following modes: automobiles (broken down by sub-categories of private vehicle personal use, taxicabs, and transportation network companies), rental cars, Metrobus, commuter rail, intercity bus, and intercity rail.

All Modes: annual use total and percent share by mode

Private Car	2,889,000	29%
TNC (Uber/Lyft)	2,057,000	21%
Taxicab	1,783,000	18%
Rental Car	853,000	9%
Metrorail	1,263,000	13%
Other	960,000	10%

Source: *Washington-Baltimore Regional Air Passenger Survey, 2017*

CURBSIDE ACCESS

Curbside access is primarily defined by the frequency with which curbs reach the range of levels of service (LOS: A-F).

Levels of Service

Data is not available for the frequency with which curbs reach range of levels of service (A-F).

PARKING

Parking is defined by the number of people per car, annual ridership of the shuttle fleet, and/or the frequency of lot closures due to reaching capacity.

Vehicle Occupancy

Data is not available for the number of vehicle occupancy.

Shuttle Ridership

Annual ridership of shuttle fleet is not available at the time of this report's creation.

Frequency of Lot Closures

Parking lots never reach capacity at DCA.

GENERAL AVIATION ACTIVITY

General aviation activity consists of annual operations statistics and the number of carriers and/or clients.

Annual Operations

In 2018 general aviation operations totaled 3,916. Assuming a 2 percent growth rate, by 2045 this number is projected to reach 6,684.

Carriers

Number of carriers/clients is not available at the time of this report's creation.

DEMAND ANALYSIS FOR WASHINGTON DULLES INTERNATIONAL AIRPORT (IAD)

AIR SERVICE

The total number of flights, enplanements by type (wide/narrow body aircraft and international/domestic airlines), and total number of gate turns (average number of gate turns multiplied by plane seating capacity).

Enplanements

Aircraft Type	2018 Flights	2045 Forecast
International	3,986,716	6,606,660
Domestic	7,956,547	13,185,340
Total	11,943,263	19,792,000

Source: *Comprehensive RASP Update, IAD Airport, 2020*

Gate Turns Multiplied by Average Seating Capacity

In 2018, the average number of turns per gate was 3.1 multiplied by an average seating capacity of 120 per aircraft, totaling 372 seats per gate per day.

CARGO

Air cargo consists of total annual cargo tonnage and factors influencing air cargo tonnage.

Air Cargo Tonnage

In 2018 air cargo totaled 300,934 short tons of freight and mail.

GROUND ACCESS

Ground access consists of ridership of the following modes: automobiles (broken down by sub-categories of private vehicle personal use, taxicabs, and transportation network companies), rental cars, Metrobus, commuter rail, intercity bus, and intercity rail.

All Modes: annual use total and percent share by mode

Private Car	3,420,000	52%
TNC (Uber/Lyft)	871,000	13%
Taxicab	759,000	11%
Rental Car	837,000	13%
Metrorail	0	0%
Other	718,000	11%

Source: *Washington-Baltimore Regional Air Passenger Survey, 2017*

CURBSIDE ACCESS

Curbside access is primarily defined by the frequency with which curbs reach the range of levels of service (LOS: A-F).

Levels of Service

Data is not available for the frequency with which curbs reach range of levels of service (A-F).

PARKING

Parking is defined by the number of people per car, annual ridership of the shuttle fleet, and/or the frequency of lot closures due to reaching capacity.

People Per Car

Data is not available for the number of people per car.

Shuttle Ridership

Annual ridership of shuttle fleet is not available at the time of this report's creation.

Frequency of Lot Closures:

Parking lots never reach capacity at IAD.

GENERAL AVIATION ACTIVITY

General aviation activity consists of annual operations statistics and the number of carriers and/or clients.

Annual Operations

In 2018 general aviation operations totaled 35,528 flights.

Carriers

Number of carriers/clients is not available at the time of this report's creation.

V. CONCLUSION

The comprehensive Regional Air System Plan (RASP) Phase 2 Report concludes with a draft set of metrics that will be evaluated during RASP Phase 3: Needs Assessment and Air System-Wide Recommendations. Resulting directly from the supply and demand analyses conducted in RASP Phase 2, all three participating airports have identified the overarching need for future, more detailed and dynamic ground access studies for their respective facilities. Planning staff from each airport emphasized that the exercise of reporting key supply and demand-based metrics covering the range of their facility's operations has served incredibly helpful in reaching the conclusion that further studies will be crucial in improving their overall system performance.

DRAFT NEEDS ASSESSMENT METRICS

Air Service

- **Gate totals:** number of wide body gates and number of narrow body gates

Cargo

- **Warehouse space:** square footage of existing cargo warehouse space
- **Aircraft cargo capacity:** international wide-body flights and air cargo carrier capacity
- **Aircraft parking space:** for runway length, aircraft parking ramps, truck maneuvering
- **Intermodal connectivity:** access to the interstate highway system and cargo rail

Ground Access

- **Automobiles:** broken down by sub-categories of private vehicle personal use, taxicabs, and transportation network companies (TNCs, such as Uber and Lyft)
- **Rental car:** square footage of parking facility
- **Metro bus:** number of routes, capacity, frequency of service
- **Commuter rail:** number of routes, capacity, frequency of service
- **Intercity bus:** number of routes, capacity, frequency of service
- **Intercity rail:** number of routes, capacity, frequency of service

Curbside Access

- **Lane area:** linear footage of lanes
- **Lane capacity:** curbside capacity of lines, which represents the number of cars and/or passengers that the lanes can accommodate over the course of a year

Parking

- **Parking spaces:** number of parking spaces
- **Fleet size:** bus shuttle fleet size

General Aviation Activity

- **Ramp space:** area of ramp space for general aviation activity
- **Square footage:** total area of general aviation operations
- **Parking spaces:** number of parking spaces that support general aviation aircraft
- **Apron type**

DRAFT AIR SYSTEM-WIDE RECOMMENDATIONS METRICS

REVENUE

The region – and industry as a whole – is experiencing a major shift away from the traditional sources of revenue, including parking revenue, that the airport industry has relied on for the past several decades. As the region’s ground access landscape continues to evolve, airports must continue thinking creatively and reacting nimbly to the changes underway. Given each airport’s (proposed or actual) major future transportation infrastructure projects underway, there are potential revenue-generating opportunities for the increased posturing of BWI, DCA, and IAD as the gateways to the region.

GROUND ACCESS

Growing traffic congestion and surface transportation disruptors throughout the region continues to necessitate a greater amount of resources and strategic consideration be dedicated to each airport’s individual ground access facilities, as well as the system-wide infrastructure that connects the region’s air passengers and airport employees to the region’s airports.

UNKNOWNNS

From autonomous vehicles to major transportation investments like MAGLEV and the pedestrian bridge connecting Amazon HQ2 in Crystal City to DCA, a range of unknowns will have significant implications for how the region’s airports continue to expand, contract, and differentiate their facilities and services.

CAPACITY

REGIONAL AIRPORT BALANCE

REGULATION

NEXTGEN

LAND USE COMPATIBILITY

UNMANNED AIRCRAFT SYSTEMS