

Washington-Baltimore Regional Airport System Plan

Ground Access Element Update

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**Metropolitan Washington Council of Governments
National Capital Region Transportation Planning Board**

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1.0 Introduction

The Washington-Baltimore region is one of the largest metropolitan areas in the country, providing air passengers with a choice of airports. Three large commercial service airports serve the region: Washington Dulles International Airport (IAD), Ronald Reagan Washington National Airport (DCA), and Baltimore/Washington International Thurgood Marshall Airport (BWI). A critical component of the region's airport system is the ground transportation linkage between the airports and the surrounding communities. Because of significant regional growth in jobs and households and subsequent growth in air travel, the need to maintain quick and efficient access to the region's airports for local residents, business travelers, and visitors continues to be a major concern. Both ground access congestion and airport landside congestion are expected to increase in the future, which could adversely impact the regional economy and environment. The quality of ground access provided by the region's existing and planned highway network and transit will affect travel patterns to the region's airports and the quality of life in the region.

To maintain regional economic competitiveness and quality of life, the airport ground access system must continue to provide for the timely and efficient movement of passengers, workers, and air cargo, door-to-door. The seat of the Federal government, the Washington-Baltimore region is a world-class metropolitan area that attracts major employers that require fast and reliable access to international markets and power centers. In today's global market, the area's economic competitiveness is inextricably linked to good access to air transportation, and an effective ground access system is a critical component to achieving regional prosperity. Improvements to regional transportation facilities and the development of new facilities must be made to accommodate future growth in airport ground access demand. Moreover, to meet regional air quality standards, planners and elected officials seek ways to reduce vehicle trips to and from airports while maintaining a ground access system that can accommodate growing demand.

In 1998, the National Capital Region Transportation Planning Board (TPB), the agency responsible for metropolitan transportation planning in the Washington region, unanimously adopted the "Vision" for the future of transportation in the region. The Vision is a policy document with eight key goals and associated objectives and strategies to guide transportation into the 21st century. Goal 8 of the TPB's Vision reads: *The Washington metropolitan region will support options for international and inter-regional travel and commerce.* Goal 8 has three objectives:

1. The Washington region will be among the most accessible in the nation for international and inter-regional passenger and goods movements.
2. Continued growth in passenger and goods movement between the Washington region and other nearby regions in the Mid-Atlantic area.
3. Connectivity to and between Dulles, Reagan National, and BWI Marshall Airports.

The first strategy for implementing Goal 8 is: *Maintain convenient access to all of the region's major airports for both people and goods.* TPB's Continuous Airport System Planning (CASP) work program activities are key components for implementing the Vision.

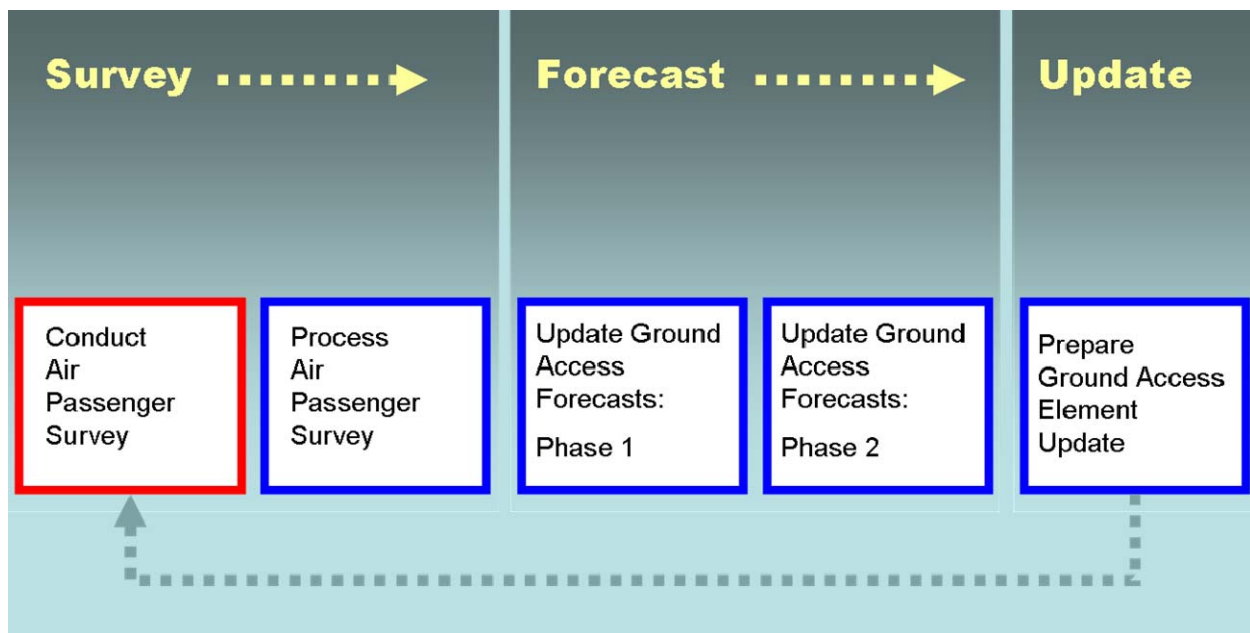
Similarly, the Baltimore Vision 2030 vision statement for economic competitiveness reads as follows:

An economically strong region that attracts and retains a wide range of accessible, well-paying and career advancement employment opportunities for persons of all skill levels; attracts businesses of all sizes that balance economic needs with environmental responsibility; promotes economic development through public/private partnerships that recognize and build upon a multimodal transportation infrastructure, which is arguably unparalleled in the nation, i.e., *presence and connectivity of major airport*, seaport, rail and highway network; and, implements a workforce development system to ensure job readiness and employment opportunities for residents of the region.

To ensure regional aviation ground access needs and goals are addressed in the regional transportation planning process, the CASP planning cycle has been better synchronized with the regional Long Range Plan update process.

In general, the airport system planning process consists of a continuous cycle that begins with a regional air passenger survey, as shown in Figure 1. This survey is followed by forecasts of future air passenger travel and ground travel of these air passengers to and from the region's three commercial airports. These forecasts in turn lead to the development of a revised ground access plan for the region. This Ground Access Element Update is the synchronizing mechanism that links airport ground access needs to regional transportation planning. It is also the final and concluding step in the planning cycle. The 2011 regional air passenger survey will be the starting point of the next cycle.

Figure 1: Washington-Baltimore Continuous Airport System Planning Cycle



2.0 Project Purpose

The purpose of this project is to update the Ground Access Element of the Regional Airport System Plan using results of recently completed regional air passenger surveys and updated regional air passenger origin/destination and ground access forecasts. This update of the Ground Access Element is the final step in the CASP planning cycle that commenced with the 2009 Washington-Baltimore Regional Air Passenger Survey. This update will provide an analysis of current and forecast ground access concerns at all three commercial airports, integrate airport system ground access and facility planning into the overall regional transportation planning process for the National Capital region, and include recommendations for essential highway and transit improvements needed to maintain efficient and convenient ground access to the region's airports in the future. This report contains the transportation supply analysis.

3.0 Study Area

Figure 2 shows the Washington-Baltimore air system planning region. The air system planning area encompasses an area larger than those normally within the purview of the Metropolitan Washington Council of Governments (MWCOC) and the Baltimore Metropolitan Council (BMC). This region consists of 29 jurisdictions and 2,604 transportation analysis zones (TAZs) that are aggregated into 161 aviation analysis zones (AAZs). Of the 23.8 million locally originating passengers at BWI, DCA and IAD in 2009, 90% came from within the air system planning area.¹

The Washington-Baltimore combined region is the seventh-largest Consolidated Statistical Area (CSA) nationally by population.² In the year 2010, the air system planning area contained nearly 3.2 million households and nearly 5 million jobs. By 2040, the air system planning area is forecast to have 4.1 million households and 6.7 million jobs. Airport access will play a major role in determining where many of these people will live and work.

As the seat of the national government, the Washington-Baltimore region is both a major domestic and international tourist destination and attracts a significant number of business travelers. Therefore tourism and business travel represent a significant portion of air travel and is important component of air service demand. In 2009, 39% of locally originating airport trips left from "non-home" originations (hotel/motel or a place of employment) and 38% of the region's air passengers' travel was for business-related reasons. Additionally, about 61% of the local air passenger originations are by persons residing in other parts of the U.S. or and other countries.

There are also smaller reliever airports throughout the region that are intended to relieve congestion from the larger commercial service airports. Reliever airports do play a substantial role in the air system of the region, and the planning for these airports is conducted by the state aviation agencies in the states where they are located. Nevertheless, it is important to mention

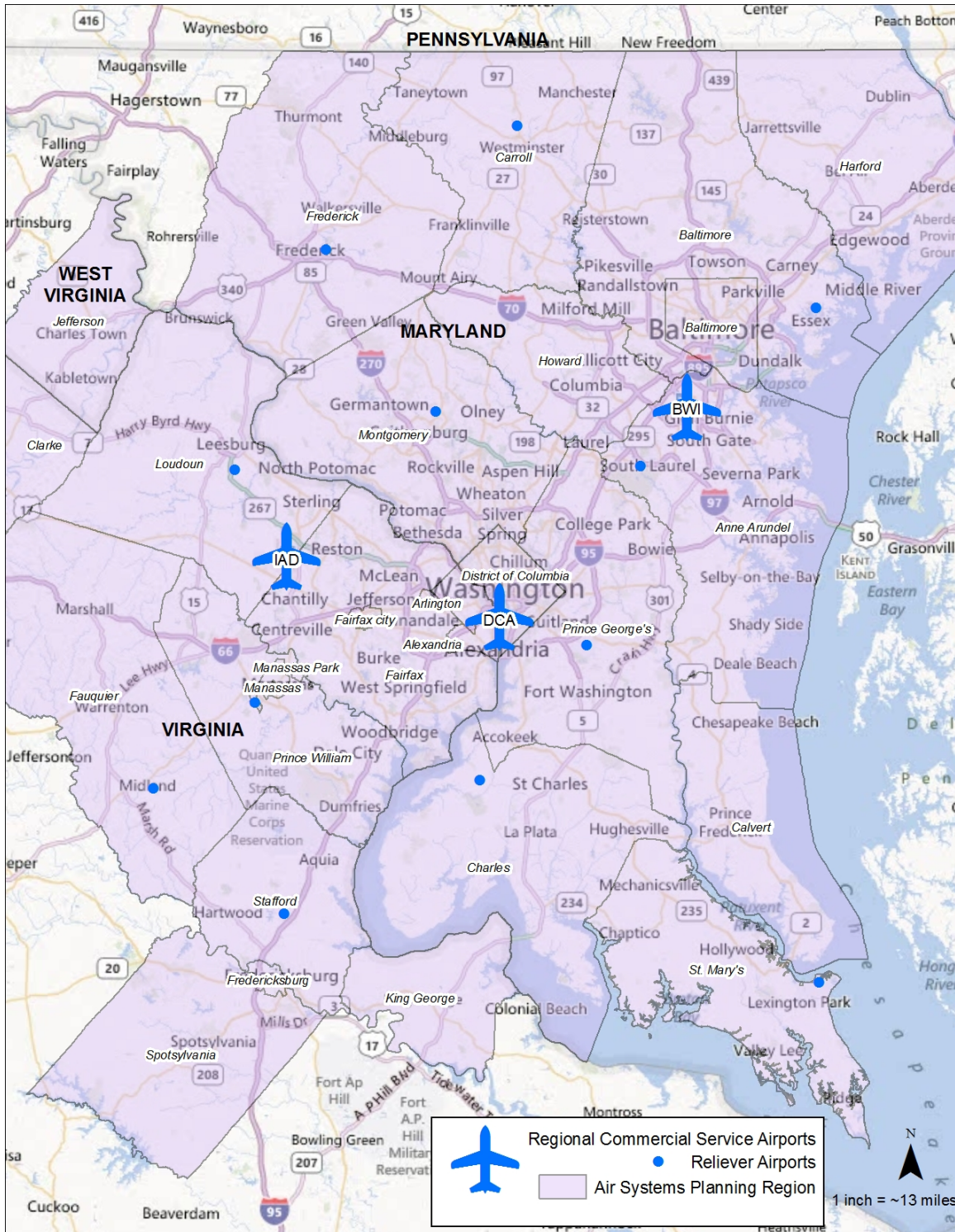
¹ For the 2007 survey this figure was 96%. This increase in locally originating air passengers whose ground access trip began outside the air systems planning region suggests that airport ground access trip lengths (distances) are increasing, underscoring the need for reliable travel times along the network.

² See <http://www.census.gov/popest/data/metro/totals/2011/>

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Phase 1: Supply Analysis

them here and acknowledge their importance in the regional air system. Ground access is a consideration for reliever airports; however, the scope of this ground access study is limited to the three large commercial service airports.

Figure 2: Washington-Baltimore Regional Air Systems Planning Area



4.0 2009 CASP Planning Cycle

4.1 Survey

The 2009 CASP planning cycle commenced with the regional air passenger survey, which was conducted in late 2009. During the two-week survey period, more than 29,000 departing passengers whose trips began at either BWI, DCA, or IAD completed questionnaires designed to provide information on the characteristics of their flight and airport preferences, ground access trips to the airport, and demographics. Altogether, 679 randomly-selected flights were surveyed. The 2009 air passenger survey was the ninth such survey to be conducted since 1981, kicking off the latest CASP planning cycle

4.2 Forecasts

In 2011, COG/TPB updated the Regional Air Passenger Origin/Destination (O/D) Forecast using data from the 2009 air passenger survey, enplanement forecasts provided by each of the three commercial airports, and the COG Round 8.1 Cooperative Forecasts and the Baltimore Metropolitan Council (BMC) Round 7c land activity forecasts. The O/D Forecast project developed forecasts of local originating air passenger trips from each aviation analysis zone to each airport.

The O/D forecasts were then used to update airport ground access forecasts of travel to the three airports from the District of Columbia and other jurisdictions in the air system planning region shown in Figure 2. Ground access forecasts included projections of ground access trips by travel mode and time-of-day from each of the 161 Aviation Analysis Zones (AAZs) to each of the three airports. This series includes base year trips for 2010, and forecast trips in 5-year increments from 2010 through 2040. The forecasts serve as the basis for updating the Ground Access Element of the Regional Airport System Plan and are used in the update of the TPB's Constrained Long Range Plan.

4.3 Ground Access Element

The 2012 update of the Ground Access Element concludes the CASP planning cycle that began with the 2009 air passenger survey. This report presents the transportation supply analysis required for the update. The transportation demand analysis will follow immediately after completion of the supply analysis report and both pieces will be included in the Ground Access Element final report.

5.0 Existing Highway Access to Regional Airports

The current state of the regional ground transportation system can have a significant impact on air travel to and from the Washington-Baltimore region. According to the 2009 air passenger survey, two-thirds of air passengers cite accessibility conditions (closest airport, better public ground transportation, and better access roads and parking) as the most important reason for

choosing their departure airport. While transit and shuttle³ operations play an increasingly important role in providing ground transportation to the region's three major commercial airports, the 2007 Air Passenger Survey found that about 94% of all originating passengers who traveled to the airport by some form of ground transportation used modes of transportation to the airports that travel on the highway network. These modes include private car, rental car, bus, taxi, and limousine, among others.

Access for airport employment and air cargo should be considered alongside access for passengers when planning to accommodate future airport ground access demand. It is noteworthy to point out that while the ground access forecast data used in this study are confined to forecasts of ground access trip made by passengers, airport employment ground access demand is addressed and included as part of the regional transportation planning process. The regional travel demand model predicts trips generated by households and employment and reasonable assumptions of airport employment are included in the regional model. As a result, airport employment is inherently included in the regional process. The Ground Access Element Update seeks to identify airport ground access needs of passengers and not airport employment because airport employment demand is already inherently included in the analysis for the TPB's Financially Constrained Long-Range Transportation Plan (CLRP). Finally, to the extent possible, air cargo needs are considered in the Ground Access Element Update, but they will be more specifically addressed in regional freight planning efforts.

5.1 BWI

Direct interstate highway access to BWI is provided by I-195. I-195 is directly connected to I-95, US 1, and the Baltimore-Washington Parkway (MD 295). Located directly adjacent to the airport boundary is a four-lane primary highway network of roadways known as the Airport Loop. The Airport Loop comprises MD 170 (Aviation Boulevard), MD 162 and MD 176 (Dorsey Road). These highways are directly connected to I-195, I-695, I-97 and MD 100. The airport is situated between four controlled access four to six-lane highways; I-695 (Baltimore Beltway), I-97, MD 100 and MD 295. These highways connect to other primary highways and the two interstate beltways (I-95/I-495 Capital Beltway and I-695 Baltimore Beltway). Interstate highways I-70, I-795, I-83 and I-97 connect to the Baltimore Beltway. Montgomery County access is currently provided by the I-270 connection to the Capital Beltway. After completion of the InterCounty Connector (ICC), access from Montgomery County to BWI will be greatly improved. Interstate access to the north and south are primarily provided by I-95 and I-83. Access to the west is provided by I-70 and access to Annapolis and the Eastern Shore is provided by I-97.

5.2 DCA

Highway access to DCA is currently provided by two major routes: the George Washington Memorial Parkway and US 1 by way of the VA 233 connecting bridge. The George Washington Memorial Parkway, operated by the National Park Service, is a controlled-access, divided highway that parallels the Potomac River from I-495 at the American Legion Bridge to Mount

³ Transit in this report refers to publicly-operated fixed guideway or fixed route services. Shuttle refers to on-demand privately operated transportation services that may or may not follow a fixed route, e.g., taxicabs, limousines, van-based fleets such as SuperShuttle, and courtesy buses for hotels, rental cars, etc.

Vernon, south of Alexandria, passing along the western border of the airport property. Along most of its length, the Parkway is four lanes, widening to six lanes between I-395 and the airport entrance. From the north, the Parkway provides access to the airport from the District of Columbia, most of Arlington County, from southern and western suburbs via I-395 and I-66, and from northern Suburban Maryland areas such as Montgomery and Frederick Counties via its connection to the Capital Beltway (I-495) at the American Legion Bridge. To the south, the Parkway provides access from Alexandria and southeastern Fairfax County. Two exit ramps are provided from the Parkway to the airport from the southbound direction. A single northbound exit into the airport is also available. Two entrance ramps onto the Parkway from the airport are available for northbound traffic and one ramp is available for southbound traffic. Primary circulation on airport property consists of a three lane one directional loop circulating counter clockwise past the terminal. Service roads connecting to the primary one-way loop feed services such as general aviation, air cargo, employee parking, economy parking and administration.

5.3 IAD

Highway access to IAD is currently provided by three routes: (1) VA 28 (Sully Road) from the north and south; (2) the Dulles Airport Access Road from the east, and the Dulles Greenway via VA 28 from the west. The Dulles Airport Access Road is the primary access to the airport. This facility is a limited-access four lane divided highway that provides high quality express service for vehicles traveling to and from the airport. The Dulles Airport Access Road is approximately 16 miles in length, extending from its intersection with I-66 near the West Falls Church Metrorail Station to its terminus at the airport. From I-495 (the Capital Beltway) to the airport, use is restricted to airport traffic and commuter buses. The Dulles Airport Access Road provides regional access to the airport, connecting eastern Fairfax County and the other close-in Northern Virginia jurisdictions to the airport, as well as the Maryland suburbs and the District of Columbia by way of the other major highways in the region.

Within the Dulles Airport Access Corridor is the Dulles Toll Road (VA 267). This road is an eight-lane facility that brackets and parallels the Airport Access Road. It was built primarily to accommodate local traffic, but also functions as a feeder to the Access Road, through a system of slip ramps located immediately west of the Beltway, between VA 7 and Hunter Mill Road, between Reston Avenue and Centerville Road, and east of VA 28. The toll road extends along Dulles Airport Access Road from the east near the Capital Beltway (where it joins the connector road to I-66), to VA 28 in the west (where it joins the Dulles Greenway, which provides a toll road extension to Leesburg in Loudoun County). VA 28 (Sully Road), which provides access from the north and south, extends southward from VA 7 (Leesburg Pike) in Loudoun County, with key connections with the airport, I-66 in Centerville in western Fairfax County, the Cities of Manassas and Manassas Park, and points farther south.

Sully Road, which was initially a 2-lane road, has undergone and continues to undergo substantial capacity expansion. It is currently a six-lane divided highway with grade separated interchanges at key intersections. A few at-grade intersections with smaller roadways remain, but these, too, will become grade-separated as part of the VA 28 improvements, which receive funding from a special real estate tax assessment district in Loudoun and Fairfax counties established for the specific purpose of supporting improvements along VA 28. One lesser

utilized road also provides direct connection to the airport. Ariane Way connects the airport property with VA 606 (Old Ox Road) to the north. This entrance is also used by employee shuttle buses, which transfer employees to and from the terminal and the employee parking lot located north of the airport off Ariane Way. Internal circulation at the airport is provided by a terminal loop serving the main terminal parking lot, enplaning passengers on the upper level and deplaning passengers on the lower level. Prior to the loop, separate access is provided to the satellite parking lot, general aviation terminal and air cargo area by way of service roads.

6.0 Existing Transit and Shuttle Service to Regional Airports

Although the automobile continues to be the predominant mode of travel for passengers to and from the airports in the metropolitan Washington-Baltimore region, transit and On-demand shuttle operations play an increasingly important role in providing ground transportation to the three major commercial airports in the region. In 2009, 37% of the originating passengers at the region's airports arrived by transit (Metrorail, Light Rail, Amtrak/MARC or scheduled bus service) or on-demand shuttle (taxi, airport bus or limousine, hotel/motel courtesy bus). BWI is served by a light rail line connecting it to downtown Baltimore and by Amtrak/MARC traveling between Baltimore and Washington. DCA is served by the Washington region's Metrorail system. Thirteen percent of passengers originating out of DCA used Metrorail. This level of ground access by rail continued to be among the highest proportions of any airport in the nation. The nature and composition of transit and shuttle operations at the three major commercial airports in the region are varied, as noted in the remainder of this section.

6.1 BWI

BWI has an extensive network of public transit and on demand shuttle services. These services are provided by three different train operations, four bus operations, three shuttle services, as well as taxis, limos, private parking and hotel shuttles.

Intercity and Commuter / Regional Rail

The BWI Marshall Rail Station is located a mile from the airport and is reached via a free shuttle from the landside terminal. Amtrak and Maryland Area Rail Commuter (MARC) service trains, heading north and south, depart from this station. Located on Amtrak's Northeast Corridor, the station has direct connections to cities from Richmond to Boston. The entire Amtrak rail system is accessible via transfers at Washington's Union Station and Baltimore's Penn Station.. On weekdays, Amtrak has sixty train departures between 4:30 am and 12:50 am. Seventeen of these departures are Acela Express trains. The Maryland Transit Administration (MTA) offers MARC service on the Penn Line from the BWI Marshall Rail Station with more than forty daily departures. MARC operates at half hour intervals in the morning and evening peaks and one hour intervals off-peak (Monday through Friday only). The Penn Line has thirteen stations from Washington Union station, through Prince Georges, Anne Arundel, Baltimore, Baltimore City, Harford and Cecil counties, ending in Perryville, MD. MARC patrons may transfer to either the Brunswick Line or Camden Line at Washington Union Station. In addition, the MARC Camden Line may be accessed by taking MTA light rail from BWI to Camden Yards in Baltimore City.

Light Rail

The BWI Marshall light rail station is located directly adjacent to Concourse E. MTA provides light rail service from BWI with thirty stations through downtown Baltimore to Hunt Valley in central Baltimore County. There are 50 departures from BWI at 15 to 20 minute frequencies from 5:00 am to 12:40 am. Additional light rail service to Ferndale and Cromwell in Glen Burnie as well as Baltimore Penn Station is available via transfer. Patrons may also transfer from light rail to the Baltimore Metro at the Lexington Market stations on both systems.

Bus Service

There are five bus lines providing scheduled transit service to BWI:

Metrobus Route B30 runs every 40 minutes, 7 days a week to the Greenbelt Metro Station, which is located on the Green Line of the Washington Metrorail System. Buses run 25 times each weekday and 21 times on Saturdays and Sunday. There are two bus stops on the lower level roadway for the B30 bus.

MTA offers the No. 17 Bus service from BWI Marshall Airport connecting to Parkway Center, Arundel Mills Mall, Airport 100 Park, and the Patapsco Light Rail Stop. This bus line provides connections to the Baltimore City public transportation system.

Annapolis Transit offers express C-60 Bus Line service to the State Capital in Annapolis and Arundel Mills Mall in Anne Arundel County. Weekday departures are between 7:45 am and 5:45 pm every two hours.

Howard Transit provides fixed route bus service (Silver Bus Line) from BWI to Columbia Mall with stops at Arundel Mills Mall and other points in between. The Howard County Transit stop at Columbia Mall is the main transfer stop for eight of the nine Howard Transit bus routes.

MTA Route 201 operates seven days a week with hourly service accommodating 34 weekday trips and 30 weekend trips. This service operates using MD 200 in Montgomery and Prince George's County and began with the opening of that roadway in fall 2011. Route 201 stops at BWI Terminal A/B and Terminal E and connects with the BWI Marshall Airport Rail Station, Arundel Mills, MARC's Dorsey Station on the Camden Line, the Burtonsville, Georgia Avenue, and Gaithersburg Park and Ride facilities in Montgomery County, as well as the Shady Grove Metrorail station (terminus of the western branch of the Red Line) and the National Institute of Standards and Technology (NIST) campus in Gaithersburg.⁴

Taxicab Service

BWI Taxi Management, Inc. is the exclusive supplier of taxi transportation services to BWI. The cabs are operated under contract with the Maryland Aviation Administration (MAA). Cabs are always waiting at the curb just outside of the baggage claim areas to take passengers to any destination in the metropolitan Washington-Baltimore area. Many vehicles are equipped to transport wheelchairs. Dispatchers are on duty to assist passengers with the cabs.

⁴ This service is operated by Atlantic Coast Charters under contract with MTA.

Limousine Service

Private Car/RMA Worldwide Chauffeured Transportation serves the Baltimore-Washington Metropolitan Area. RMA provides round trip services, immaculate late model luxury sedans, limousines and vans, professional chauffeurs, and 24-hour service.

Shuttle Service

SuperShuttle door-to-door service is also available for air passengers using BWI. Shuttles operate on a shared ride on-demand basis. Shuttles provide service to/from Baltimore's Inner Harbor Hotel District, Baltimore City and Baltimore, Prince George, Montgomery, Anne Arundel Counties and Annapolis as well as Northern Virginia.

The Airport Shuttle offers door-to-door reservation service covering the State of Maryland. Arriving passenger's flights are tracked and passengers are met at curbside. Vans carry 7 to 10 passengers.

The BayRunner Shuttle provides daily, scheduled, transportation service for passengers traveling from Salisbury, Easton, Cambridge, Ocean Pines and Ocean City, MD to BWI Marshall Airport.

Courtesy and Charter Buses

Many hotels, off-airport parking companies and rental car agencies provide transportation to/from BWI for their customers.

6.2 DCA

Metrorail and Metrobus

Public transit to DCA is provided by WMATA through its Metrorail and Metrobus operations. The Yellow Line provides service between Huntington in Southern Fairfax County, Virginia and Fort Totten in the District of Columbia, allowing access to the Pentagon, the L'Enfant Plaza area of Southwest DC, and the downtown section of the District. During Metrorail rush hour service (6:30am to 9:30am and 3:30pm to 6:00pm on weekdays), some Yellow Line service operates between Franconia-Springfield and Greenbelt. The Blue Line provides service from Franconia-Springfield in Fairfax County, Virginia, to Largo Town Center in Prince George's County, Maryland, affording access to the Pentagon and Rosslyn in Arlington and the K Street Corridor, downtown and Capitol Hill in the District of Columbia.

Access is also provided to DCA from other Metrorail lines via transfer. These include access from (1) the Orange Line from western Fairfax (Vienna) and the Rosslyn-Ballston corridor in Virginia and from New Carrollton in Prince George's County; (2) the Red Line, which provides access from the I-270 corridor (Shady Grove/Rockville) and the Glenmont and Silver Spring areas in Montgomery County, Maryland, and northwest and northeast sections of the District of Columbia; and (3) the Green Line, which provides access from Greenbelt and Branch Avenue in

Prince George's County, Maryland, and Anacostia, Columbia Heights, and other areas in the District of Columbia.

Metrobus provides limited service to Reagan National Airport, stopping at several stops throughout the airport grounds. The 11P route provides regular daily service between Fort Belvoir in Southern Fairfax County and the Pentagon, by way of Mount Vernon, Alexandria and National Airport. One additional route provides service from Reagan National Airport to Southwest DC, by way of the Pentagon. This route, however, only operates during the early morning hours on Saturday and Sunday when Metrorail is not in operation.

Washington Flyer Express Bus

The Washington Flyer offers express bus service from Reagan National Airport to downtown Washington, to suburban Maryland and to Dulles Airport.

Washington Flyer Limousine Service

The Washington Flyer offers executive-class sedans and stretch limousines with wireless phones, available both by reservation and on a walk up basis.

On-Demand Shuttle Service

SuperShuttle door to door service is also available for air passengers traveling to/from DCA. Shuttles operate on a shared ride on-demand basis.

Taxicab Service

Washington, DC, Virginia and Maryland licensed taxicabs are available at the exits of each terminal. The rates that are charged are established by the respective jurisdiction in which the taxicab is licensed. Dispatchers are available at the airport to assign individual passengers or preformed groups of travelers to appropriate taxis.

Courtesy Buses

In the Washington region, a number of hotels, rental car agencies provide transportation to/from DCA for their customers.

6.3 IAD

Metrobus and Metrorail

Public transit to Dulles Airport is provided by Metrobus Route 5A that runs from L'Enfant Plaza to Dulles Airport in the AM Peak, Midday, PM peak and evening time periods. Also, the Washington Flyer Coach Service provides service to Dulles from the West Falls Church Orange Line Metrorail station. Air passengers can reach this coach service at the West Falls Church Orange Line Metrorail station.

Construction on the Metrorail Silver Line extension to IAD began in 2009. When complete, this extension will provide Metrorail service branching off the Orange Line between the East Falls Church and West Falls Church stations to IAD via Tysons Corner and Reston along the Dulles Access Road corridor, with eventual service to Route 772 in Loudoun County. Phase 1, which is expected to begin operation in 2013, will provide service between the Orange Line and the Wiehle Avenue stations Reston. Phase 2 will extend the Metrorail from Reston and Herndon to Dulles Airport and into eastern Loudoun County. A construction start date has not been set for this latter phase, which is currently in the procurement process. This Metrorail extension is included in the 2009 Constrained Long Range Plan for the National Capital Region.

Washington Flyer Express Bus

The Washington Flyer offers express bus service to/from Dulles Airport for air passengers traveling to/from downtown Washington, suburban Maryland and to Reagan National Airport. It operates seven days a week and departs approximately every 30 minutes. Boarding announcements are made inside the airport. Transfers to local public bus service are available from Metrorail stations, including the West Falls Church station on the Orange Line

Washington Flyer Limousine Service

The Washington Flyer offers executive-class sedans and stretch limousines with wireless phones, available both by reservation and on a walk up basis.

Taxicab Service

Washington Flyer taxicabs are available curbside on the arrivals level at IAD to take passengers to any destination in the metropolitan Washington area. The cabs are operated under contract with MWAA. Uniformed dispatchers are on duty to assist passengers with the cabs.

On-Demand Shuttle Service

Super Shuttle door to door shared ride van service is available to the Washington Flyer Coach Stop as well as Union Station. Super Shuttle stops are clearly identified on the Ground Transportation roadway outside the Main Terminal.

7.0 Review of Current Travel Times/Ground Access Issues and Concerns

Information on current ground travel conditions to the three regional commercial service airports was taken from the 2011 Washington-Baltimore Regional Airport Ground Access Travel Time (GATT) study, for which data were collected on highway routes between selected regional activity centers and the three airports using GPS-equipped probe vehicles. Additional information on current highway conditions and congestion was taken from technical analysis conducted in 2011 and 2012 for the Congestion Management Processes (CMP) in the Washington and Baltimore planning regions. Data for the CMP work in both regions comes

from two sources: aerial congestion monitoring conducted by Skycomp, and travel time information from the I-95 Corridor Coalition Vehicle Probe Project (VPP, commonly referred to as INRIX data). All three data sets confirm the location of major congestion points along the airport ground access network.

7.1 2011 Washington-Baltimore Ground Access Travel Time Study

The monitored routes for the 2011 GATT study are shown in Figure 3. Travel time data collection runs were conducted on Tuesdays, Wednesdays, and Thursdays along 43 routes during the AM peak period of 6:00 – 10:00 AM, mid-day period of 10:00 A.M. – 2:00 P.M. and during the PM peak period of 3:30 – 7:00 P.M. To the extent feasible, travel-time runs were not performed in inclement weather or on days near major holidays. In addition, runs scheduled on days in which a major traffic disruption occurred were not performed. Data were collected during spring 2011. For most activity center-airport pairs, travel times have increased since monitoring was last performed in 2003. Figure 4 through Figure 6 below show average travel speeds for AM peak period, mid-day, and PM peak period conditions for travel from the activity centers to the three airports. Regionally, the AM peak period has the worst travel conditions.

7.2 National Capital Region 2012 Congestion Management Process Technical Report

The CMP technical report for the Washington region identifies the top 10 bottleneck locations based on the Skycomp and INRIX data. As the report states:

Based on the number of vehicles per lane per mile (i.e., density of traffic flow), the Spring 2011 Skycomp survey identified the top 10 most congested locations in the region, as listed [below]. Based on travel time index (the ratio of actual travel time over free flow travel time) and the number of congested hours, the I-95 Corridor Coalition/INRIX data also identified the top 10 most congested bottlenecks for the monitored freeways in the region, as listed [below]. There are 5 locations identified by both lists and merit further investigation for improvements. Out of the 10 bottlenecks identified by INRIX data, there were 7 bottlenecks always in the top 10 list from 2009 to 2011, and they should be further examined in relevant studies.⁵

Both sets of top 10 bottlenecks in the Washington Region are reported below, and all of them impact access to the three regional airports.

⁵ National Capital Region Transportation Planning Board (2012)

Figure 3: 2011 Airport Ground Access Travel Time Routes

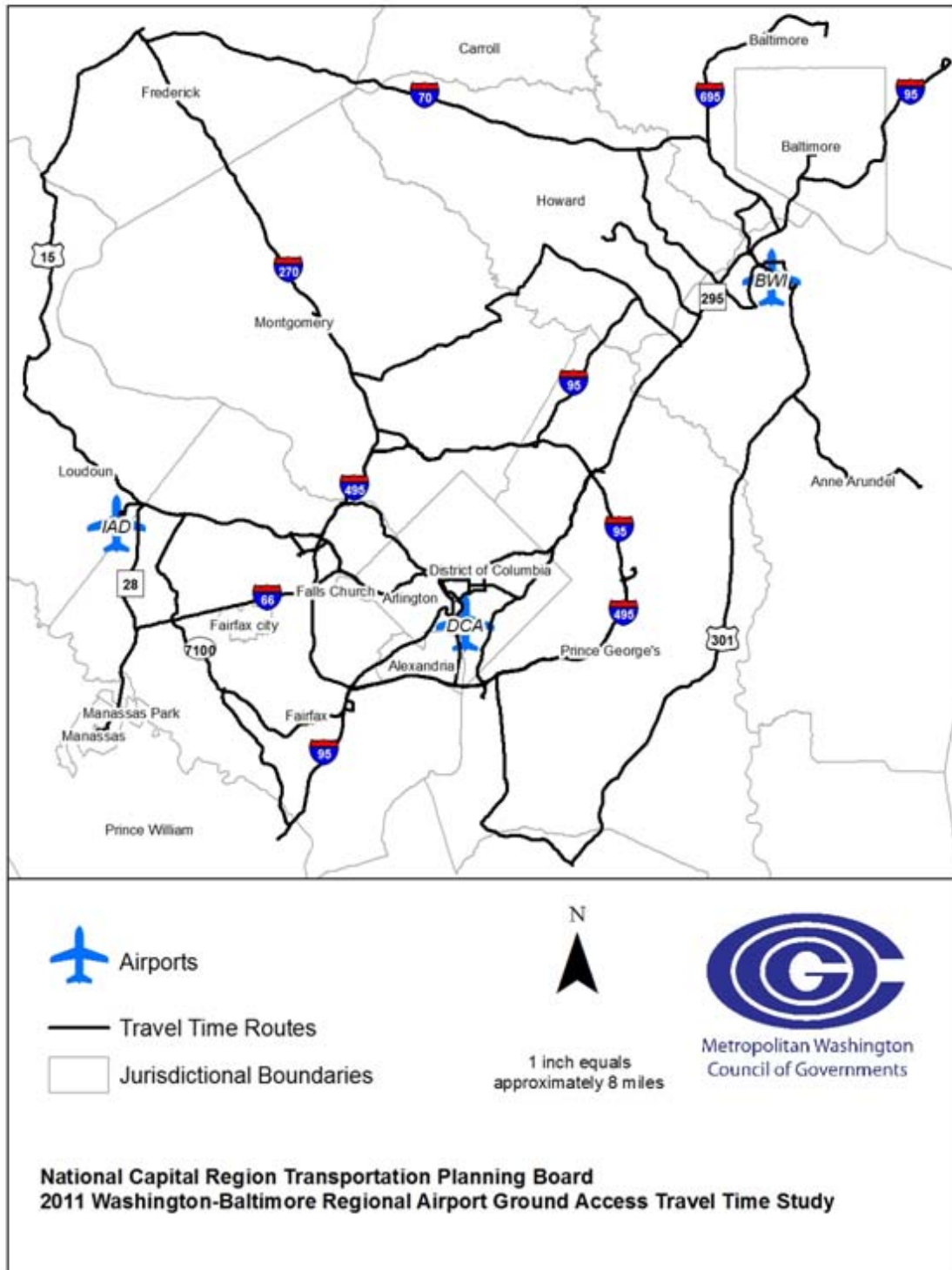


Figure 4: AM Peak Period Average Travel Speeds (mph) From Activity Centers to Airports

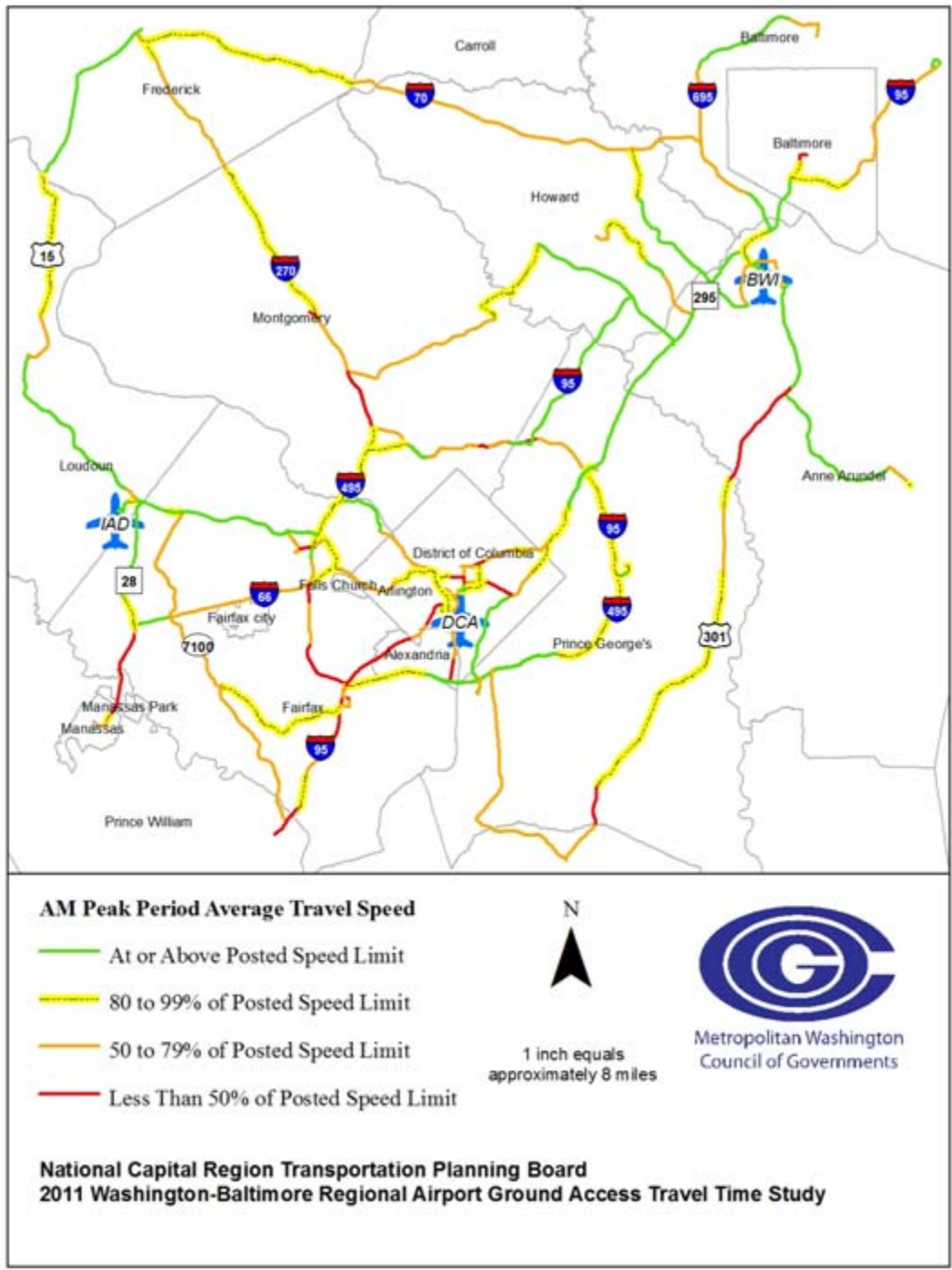


Figure 5: Mid-Day Average Travel Speeds (mph) From Activity Centers to Airports

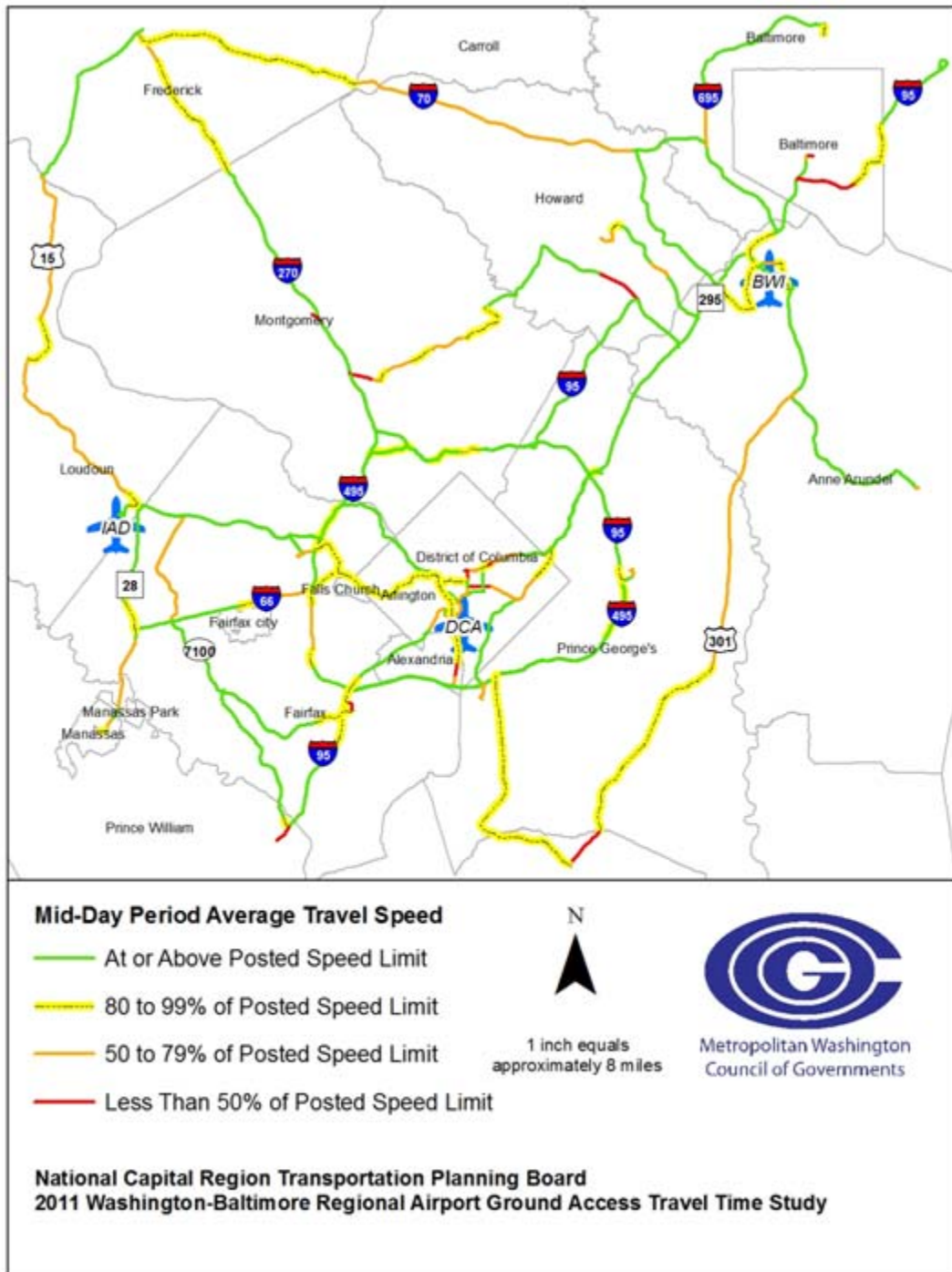


Figure 6: PM Peak Period Average Travel Speeds (mph) from Activity Center to Airports

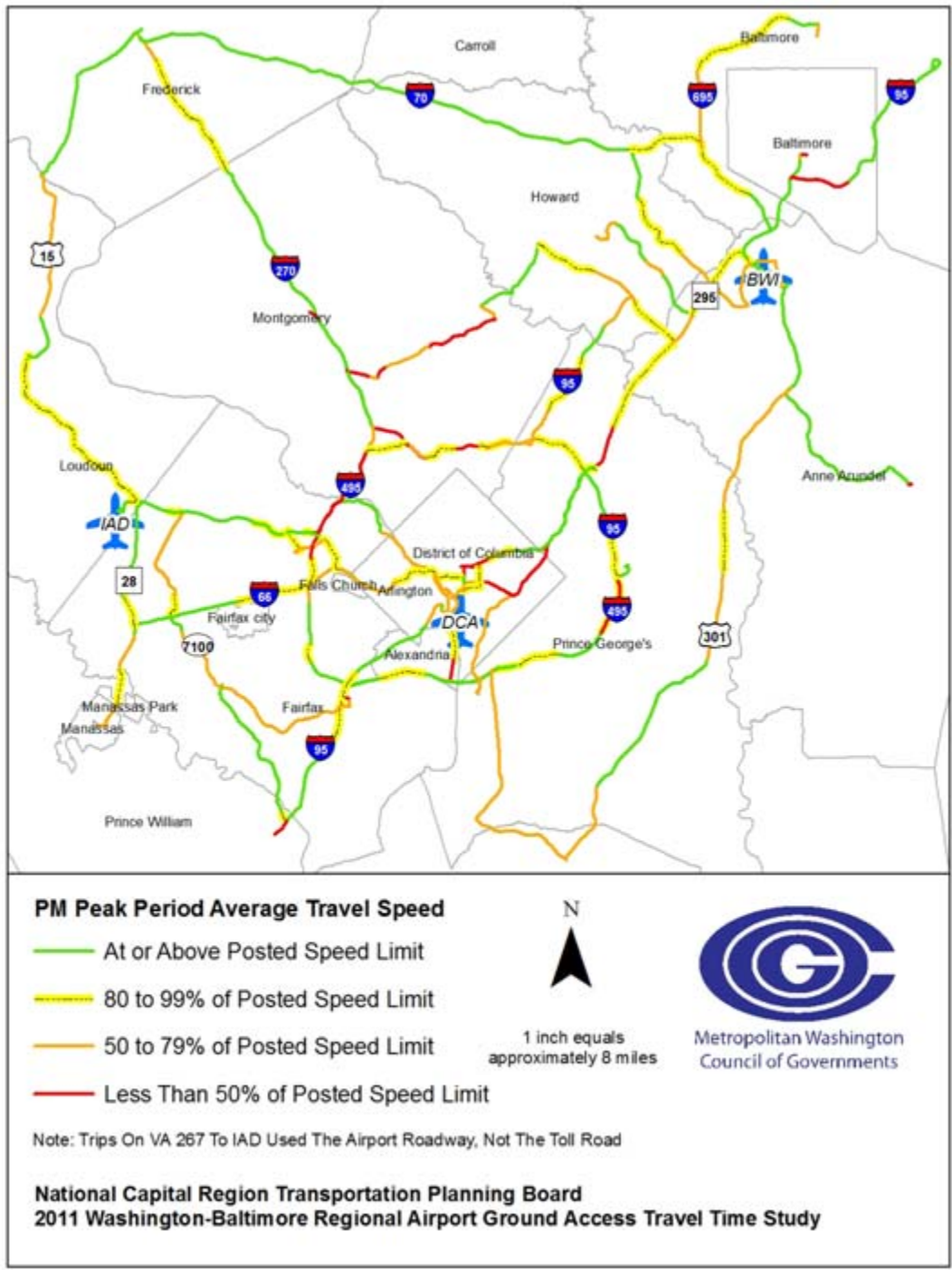


Table 1: 2011 Top 10 Freeway Bottlenecks Identified by Skycomp Aerial Survey⁶

Rank	Road/Direction	Segment/Interchange
1*	I-395 NB	VA-27 to VA-110
2A	I-495 IL	VA-193 to GW Pkwy
2B	I-395 SB/SW Fwy	4th St to 12th St
4	I-66 EB	VA-7 to Dulles Access
5A	I-495 IL	MD-355/I-270 to MD-185
5B*	I-495 OL	VA-267 to VA-123
7A	I-495 OL	I-95 to MD-695
7B*	I-495 IL	Gallows Rd to US-50
8A	I-66 EB	VA-234 Bypass to VA-234
8B*	11th St Bridge WB	I-295 to Southeast Fwy

*While impacted by construction, these links are historically congested. Locations marked by **bold text** were identified as top 10 bottlenecks by both Skycomp survey and INRIX data.

Table 2: 2011 Top 10 Bottlenecks Identified by INRIX Data⁷

Rank	Road/Direction	Segment/Interchange
1	I-95 SB	US-1/EXIT 161
2	I-395 NB	11TH ST/EXIT 11
3	MD-295 NB	POWDER MILL RD
4	I-66 EB	VA-267/EXIT 67
5	I-95 HOV SB	End of HOV
6	I-495 IL	MD-355/EXIT 34
7	I-495 OL	VA-193/EXIT 44
8	I-495 OL	MD-650/EXIT 28
9	I-495 IL	US-50/EXIT 50
10	I-66 WB	FAIRFAX DR/EXIT 71

Locations marked by **bold text** were identified as top 10 bottlenecks by both Skycomp survey and INRIX data.

7.3 Baltimore Region, Top 10 Bottleneck Locations, 1st Quarter 2012.

The Baltimore regional quarterly congestion reports identify the top 10 bottleneck locations using a composite measure called impact factor, which is the product of the following measures:

- Number of occurrences of congestion
- Average duration (time in minutes) of congestion
- Average maximum length (distance in miles) of congestion

Bottlenecks are determined using the following methodology described in the report:

⁶ *Ibid.*

⁷ *Ibid.*

Bottleneck conditions are determined by comparing the current reported speed to the reference speed for each segment of road. Reference speed values are provided by INRIX for each segment, and represent the 85th percentile observed speed for all time periods, with a maximum value of 65 mph. If the reported speed falls below 60% of the reference, the road segment is flagged as a potential bottleneck. If the reported speed stays below 60% for five minutes, the segment is confirmed as a bottleneck location. Adjacent road segments meeting this condition are joined together to form the bottleneck queue. When reported speeds on every segment associated with a bottleneck queue have returned to values greater than 60% of their reference values and remained that way for 10 minutes, the bottleneck is considered cleared. Bottlenecks whose total queue length, determined by adding the length of each road segment associated with the bottleneck, is less than 0.3 miles, are ignored.⁸

Nearly all of the top ten bottlenecks identified in the report (shown in Table 3) impact access to and from the regional airports, particularly to BWI.

Table 3: Top 10 Bottlenecks, Baltimore Region, First Quarter 2012⁹

Rank	Location
1	I-695 CW @ MD-26/Exit 18
2	I-95 N @ MD-100/Exit 43
3	I-695 CCW @ Edmondson Ave/Exit 14
4	I-695 CW @ MD-147/Harford Rd/Exit 31
5	I-695 CCW @ MD-139/Charles St/Exit 25
6	I-95 N @ MD-43/White Marsh Blvd/Exit 67
7	I-95 S @ MD-155/Exit 89
8	I-695 CCW @ MD-2/Ritchie Hwy/Exit 3
9	I-695 CCW @ MD-144/Frederick Rd/
10	I-695 CW @ MD-41/Perring Pkwy/Exit 30

⁸ Baltimore Metropolitan Council (2012).

⁹ *Ibid.*

8.0 Planned and Programmed Highway and Transit Improvements

As the metropolitan planning organizations (MPOs) responsible for transportation planning in the Washington and Baltimore regions, the TPB and the Baltimore Regional Transportation Board (BRTB) prepare financially-constrained long-range transportation plans. Both MPOs also prepare short-term transportation improvement programs (TIPs). For the Washington region, the most recently-approved plan and program is the 2012 Constrained Long-Range Plan (CLRP, for which the horizon year is 2040) and fiscal year (FY) 2013-2018 TIP, both of which were approved by the TPB on July 18, 2012. For the Baltimore region, the most recently approved plan and program are Plan It 2035 and the FY 2012-2015 TIP, both of which were approved by the BRTB on November 14, 2011. Projects and drawn from these documents represent the transportation supply that must accommodate the future demand for airport access using the ground transportation network that will be identified in the subsequent demand analysis.

All of the planning documents identify all regionally significant highway, transit and High-Occupancy Vehicle (HOV), bicycle and pedestrian projects, and studies that are realistically anticipated to be implemented by the horizon year of the CLRP. Some of these projects are either completed and/or scheduled for completion in the next few years; others will be completed much later. Projects to be initiated within six years in the TPB planning region and within three years in the BRTB planning region are included in each MPO's Transportation Improvement Program (TIP), which programs funding by source to each of these short-range projects. Each year the plans are updated to include new projects and programs, and analyzed to ensure that it meets federal requirements relating to air quality and funding.

Both the 2012 CLRP and Plan It 2035 give considerations to the multimodal, interdependent nature of the region's transportation system. The regional transportation planning process addresses the region's highway, transit, and bicycle and pedestrian modes, as well as access to the regional airports.

The 2012 CLRP and Plan It 2035 identify regionally-significant highway and transit improvement projects that will address ground access needs for air passengers and airport workers traveling to BWI, DCA and IAD, as well as help facilitate the efficient movement of air cargo. Following is a listing of the major regional highway and transit improvements and/or studies that support ground access trips to the three major commercial airports within the airport system planning area. These projects will serve to accommodate future demand growth for ground access identified in the previous section. The projects are identified by number and shown in corresponding maps for the entire air systems planning region, and separate larger scale maps for the Washington and Baltimore regions.

8.1 Major Highway Improvements and Studies

Table 4 shows major highway improvements and studies that support ground access
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Table 4: Major Highway Improvements and Studies that Support Regional Airport Ground Access

Number	Project	Completion
3	Reconstruction of 11th Street Bridge and Interchanges	2015
4	Study to upgrade MD 3 from US 50 to MD 32 to address safety and capacity concerns	2013
5	Study to investigate options for alleviating congestion on US 50 from MD 70 to MD 2 (north), including the Severn River/Pearl Harbor Memorial Bridge.	2012
6	Study to widen MD 295 from 4 to 6 lanes from MD 100 to I-195 including an interchange at Hanover Road	2012
7	I-95 John F. Kennedy Memorial Highway - Express Toll Lanes (ETL)	2015
8	Engineering to upgrade existing I-695 to an 8 lane freeway from I-83 (JFX) to I-95 (east) including the MD 139 (Charles Street) Interchange.	2015
9	Study to upgrade existing I-695 to an 8 lane freeway from I-95 to MD 122 (Security Blvd.)	2013
10	US 301 Harry W. Nice Memorial Bridge - Improvement Study Investigate capacity and safety needs of the bridge and approaches.	2012
11	Multi-modal corridor study to consider highway and transit improvements in the I-270/US 15 corridor in Montgomery and Frederick counties from Shady Grove Metro Station to north of Biggs Ford Road	TBD
12	Upgrade existing I-70 from Mt. Phillip Road to MD 144 FA	TBD
13	Widen I-70 from MD 355 to MD 144 and replace bridges	2014
14	I-95 John F. Kennedy Memorial Highway - Section 200 Study	2013
15	Study to reconstruct US 1 to a multi-lane highway from MD 152 to the Hickory Bypass	2012
16	Construct access management improvements by relocating private driveways from MD 32 to the local road system, specifically Rosemary Lane and Wellworth Way.	2014
17	Study to address current and future capacity needs on I-70 between MD 32 and US 29	TBD
18	I-95/I-495, Capital Beltway Study to widen I-495 and determine the feasibility of managed lanes from the American Legion Bridge to the Woodrow Wilson Bridge (42.2 miles).	TBD
19	Md. 200 (ICC) - Segment opened in 2011	2011
21	Grade-separated interchange at Md. 97 (Georgia Avenue) and Randolph Road	TBD
22	Study to construct capacity improvements in the MD 28 and MD 198 corridors in Montgomery and Prince George's Counties	TBD
23	US 29, Columbia Pike Construct an interchange at Musgrove/Fairland Road.	TBD

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Number	Project	Completion
24	US 29, Columbia Pike Construct interchanges at Stewart Lane, Tech Road, Greencastle Road and Blackburn Road	TBD
25	Multi-modal corridor study to consider highway/transit improvements from the Potomac River to the US 301/US 50 interchange in Bowie	TBD
26	Engineering to construct a new interchange at MD 5, MD 373 and Brandywine Road Relocated.	2016
27	Construct a new interchange with collector-distributor roads at I-95 and Contee Road Relocated (Virginia Manor Road Relocated)	2014
28	Md. 200 (ICC) - Segment to open in 2013	2013
29	Engineering for new interchange at MD 210 and Kerby Hill Road	2017
30	Multi-modal transportation study to relieve traffic congestion along MD 210 and improve intersections from I-95/I-495 to MD 228	2012
31	Study to upgrade existing MD 5 to a multi-lane freeway from US 301 interchange at T.B. to north of I-95/I-495 Capital Beltway	2013
32	Engineering to upgrade and widen existing MD 450 to a multi-lane divided highway from Stonybrook Drive to west of MD 3	2014
33	Upgrade existing MD 4 to a multi-lane freeway from MD 223 to I-95/I-495 (Capital Beltway)	2012
34	Engineering to construct a new interchange at MD 4 and Suitland Parkway.	2015
36	I-95 Fort McHenry Tunnel - Moravia Road to the Tunnel Modifications	2013
38	I-66 MULTI MODAL STUDY FROM: Interstate 66 (DC Line) TO: Interstate 495 (Capital Beltway)	2012
39	Reconstruction of interchange at Va. 244 (Columbia Pike) and Va. 27 (Washington Boulevard)	2014
40	I-66 Phase II spot improvements	2020
42	Widen U.S. 50 between Poland Road and Va. 28	2014
43	I-95 Express Lanes	2013
44	Completion of I-95/I-495 Woodrow Wilson Bridge Project (Telegraph Road interchange)	2013
45	I-495 Express Lanes	2012
47	Construct new interchange at US 17, US 29 and US 15 in Opal	2013
48	Reconstruct the existing I-66/US 29 interchange in Gainesville.	2014
49	This project involves widening a 2.5 mile stretch of the existing four lanes of I-66 to eight lanes by adding one HOV lanes and one general purpose lane in each direction and reconstruction of I-66/Rte. 15 Interchange	2017
50	Reconstruction of W.Va. 9 on new alignment from Charles Town Bypass to Jefferson County, W.Va./Loudoun County, Va. border	2012

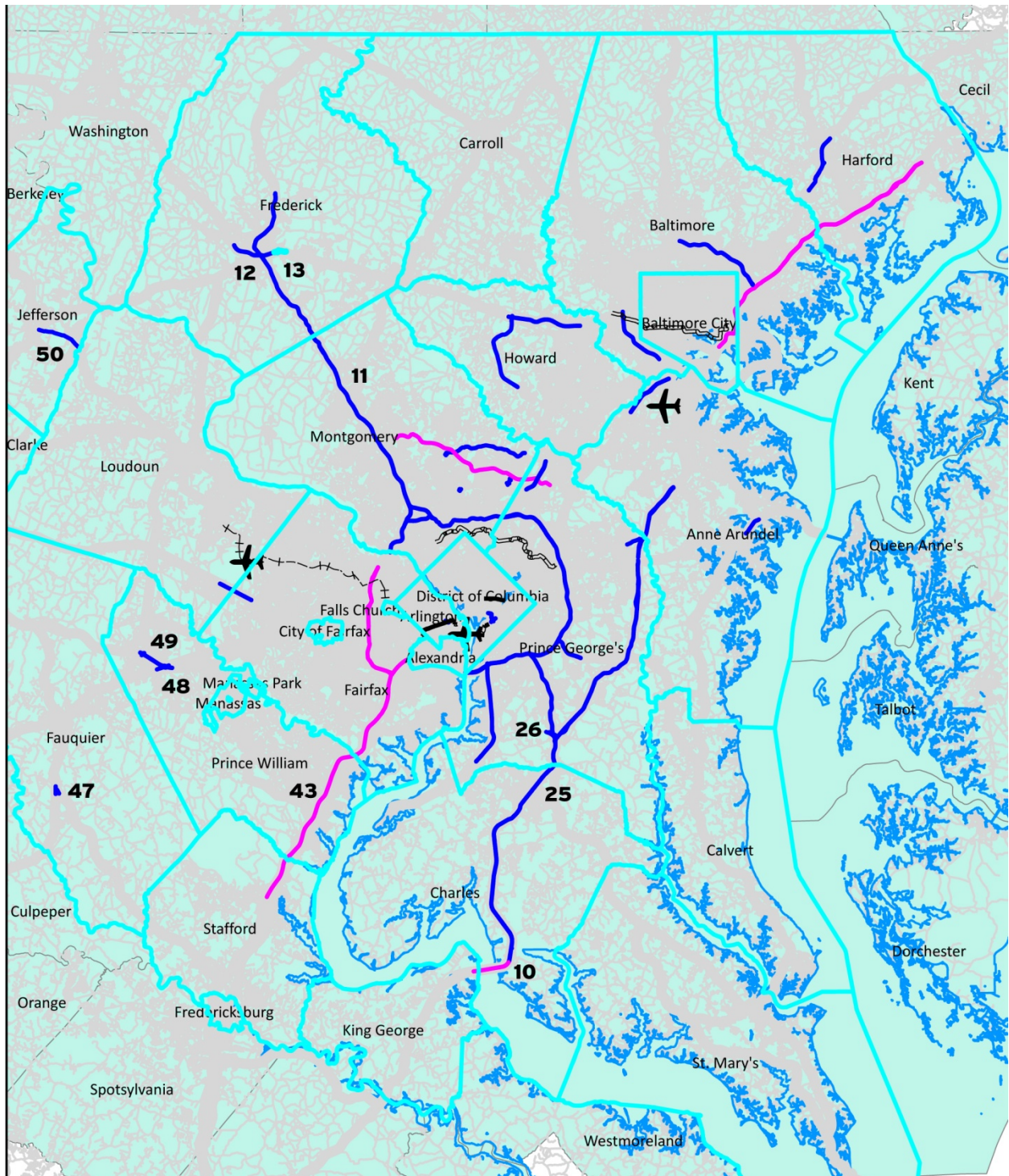
8.2 Major Transit Improvements and Studies

Table 5 shows major transit improvements and studies significant to airport trips.

Table 5: Major Transit Improvements and Studies that Support Regional Airport Ground Access

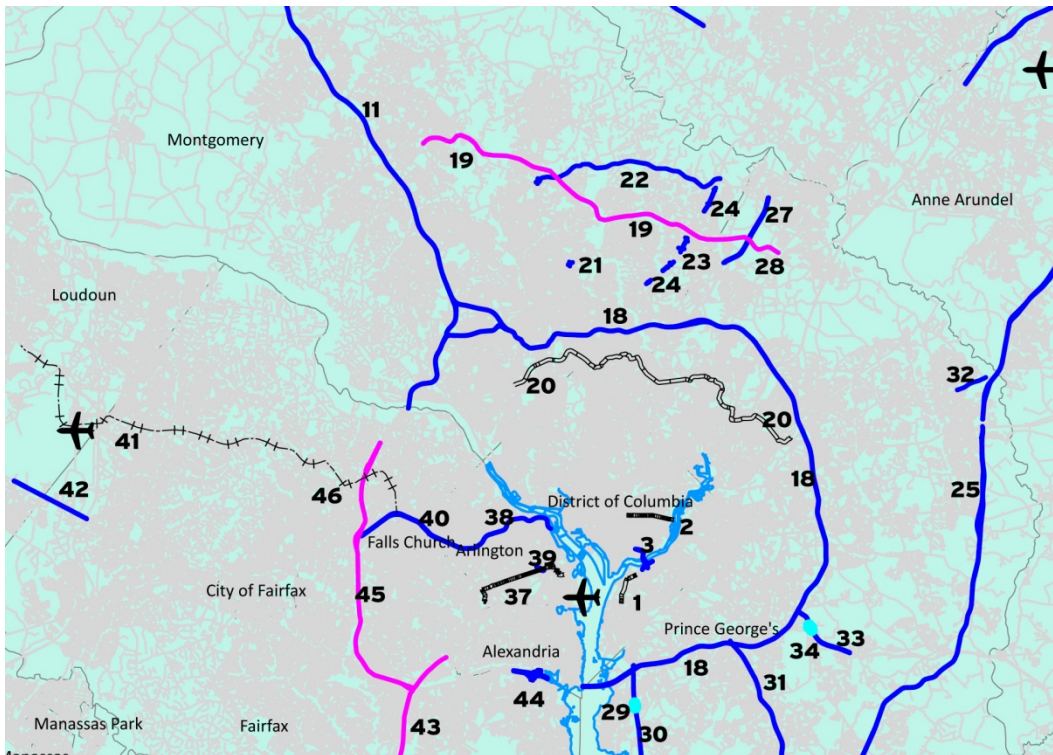
Number	Project	Completion
1	Anacostia Streetcar	2015
2	H Street, N.E./Benning Road, N.E. Streetcar	2014
20	Purple Line (preliminary engineering)	2014
35	Baltimore Light Rail Red Line (preliminary engineering)	2014
37	Columbia Pike Streetcar	2016
41	Silver Line Phase 2	2020
46	Silver Line Phase 1	2015

Figure 7: Major Highway and Transit Improvements and Studies that Support Regional Airport Ground Access – Air Systems Planning Region*



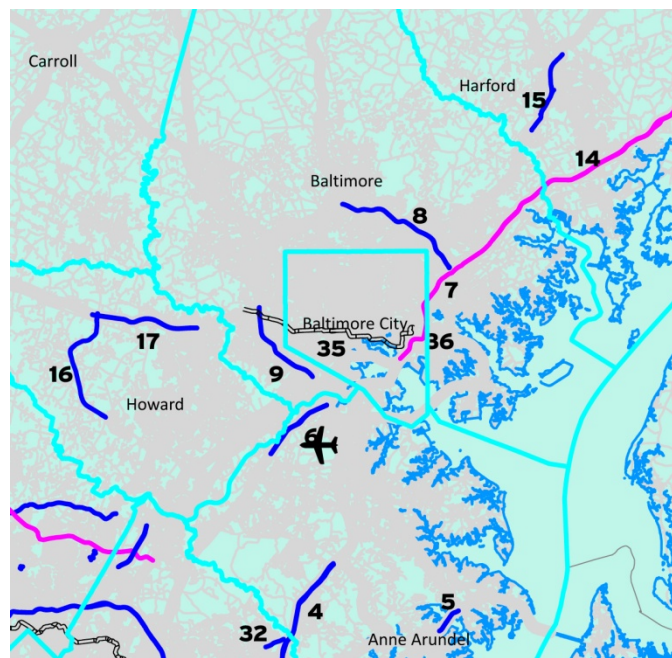
*Highways in blue, transit in black, toll facilities in magenta

Figure 8: Major Highway and Transit Improvements and Studies that Support Regional Airport Ground Access – Washington Region*



*Highways in blue, transit in black, toll facilities in magenta

Figure 9: Major Highway and Transit Improvements and Studies that Support Regional Airport Ground Access – Washington Region*



*Highways in blue, transit in black, toll facilities in magenta

8.3 Major Terminal and Access Road Transportation Improvements

In addition to the regional CLRPs and TIPs, a review of major capital projects for the airports themselves, including the Maryland Aviation Administration's (MAA) sections of the Maryland 2012-2017 Consolidated Transportation Program (CTP). Both the MAA and MWAA have invested through their Airport Improvement Programs in anticipation of a growing number of travelers at BWI, DCA and IAD. These include improvements to both inside the airport terminals as well as their ground access and circulation systems.

BWI completed roadway signage improvements as part of its comprehensive landside development program in September 2010 and completed improvements to I-195 at Aviation Blvd (MD 170) during 2011. The Environmental Assessment (EA) for the BWI Airport Layout Plan (ALP) is ongoing. BWI is also in the midst of a major terminal improvement that will construct a secure-side connector between Concourses B and C, the widening of Concourse C, and relocation of the Concourse C security checkpoint. The entire project is expected to be complete by June 2013. Other planned airport improvements will be shown in the BWI master plan, which is awaiting final FAA approval.

Aerotrains service at IAD began in January 2010 and replaces mobile lounge service between the main terminal and the A, B, and C Gates. Aerotrains does not serve the D Gates but will eventually serve the new mid-field concourse that will replace the C/D building. Finally, completion of the Metrorail Silver Line to IAD will introduce a new access point to the airport. Based on the 2012 CLRP, this improvement is expected to be completed in 2020.

There are no major landside improvements planned at DCA; however, MWAA is currently modernizing portions of Terminal A (which is the original airport terminal dating back to the 1940s) including the security checkpoint.

9.0 Forecast Growth in Local Air Passenger Originations and Regional Travel

The monitoring data reviewed in Section 7 are single point-in-time snapshots that depict conditions as they occur in the present. The *future* performance of the ground access system will be determined by how well the system responds to growing demand. As part of the planning process, the CASP program produced ground access forecasts from all locations within the air system planning region to each of the three airports. These forecasts show that during the next 30 years, demand for ground access will increase substantially as the region continues to encounter long-term growth in jobs and households, prompting corresponding growth in enplanements.

In 2009, DCA captured the most ground access trips among the three airports, with BWI capturing nearly the same number of trips. By 2040, however, ground access trips to both BWI and IAD will increase substantially with moderate growth continuing at DCA, underscoring the need to ensure the regional ground access system will be able to respond to this growing demand.

Annual air passenger enplanements for BWI are forecast to reach 23.3 million by 2040, an increase of 123% compared to 2009. Enplanements at Dulles Airport will reach more than 33.1 million by 2040, and at Reagan National Airport they are expected to reach more than 12.5 million by 2040, increases of 187% and 43%, respectively. Overall annual regional enplanements are projected to increase by 124% between 2009 and 2040.

Forecast growth in local air passenger originations is expected to exceed 100% in areas in Anne Arundel County, Howard County, Frederick County, and Charles County in Maryland. In Virginia, growth in local air passenger originations is expected to exceed 100% and in some cases 200% in areas generally west and south of Fairfax County. These include Clarke, Fauquier, King George, Loudoun, Prince William, Stafford and Spotsylvania counties and the City of Fredericksburg. Jefferson County, West Virginia, is also expected to experience substantial increases in local passenger originations. It is important to underscore the likelihood that substantial growth in local originations will also occur in jurisdictions beyond the regional Air System Planning Area, but they are not identified specifically here because forecast local origination data are not available for these areas.

In the Capital Beltway jurisdictions of Fairfax, Montgomery and Prince George's County, local air passenger originations are forecast to grow 100% or more. Similarly, in the Baltimore region, local originations in Baltimore City, Baltimore County, Harford County, Anne Arundel and Carroll County are expected to also grow between 80% and nearly 120%. Even in the District of Columbia, Arlington and Alexandria, which already have large numbers of locally originating air passenger trips, the future growth in local originations is forecast to be 65% or higher.

The current state of the regional ground transportation system, most notably the highway network, has a large impact on ground access to the region's three commercial airports. The facilities/ground access issues and problems identified in this report adversely affect ground access to the region's airports. With continuing growth in air travel now and in the future, the need to maintain quick and efficient access to the region's airports for local residents, business travelers and visitors has become an important priority.

Highway congestion in the region has grown so severe in the last several years that many of the major roads that serve the region's airports are chronically clogged. Though airport destined trips constitute a very small portion of the daily traffic, travel to the airports is being increasingly affected by the fact that increases in highway and transit capacity have not kept pace with the growth in non-airport related travel. For example, major problem areas during the morning and evening rush hour periods along I-495, I-270, I-695 (Baltimore Beltway), MD - 295 (Baltimore-Washington Parkway), I-95/395 (Virginia), are largely caused by commuters heading to and from work and home; yet these congested areas make it difficult for passengers to complete their airport ground access trips in a timely and efficient manner.

The current level of congestion on the region's roadways and transit facilities suggests that the future growth in daily travel and airport trips will exacerbate existing traffic problems. This makes completion of some of the planned highway and transit projects in the 2012 Constrained Long-Range Plan and fiscal year (FY) 2013-2018 TIP in the National Capital

Region, and Plan It 2035 and the FY 2012-2015 TIP in the Baltimore Region critically important for maintaining and improving ground access for air passengers traveling to the region's airports. Some of these transportation improvements are scheduled for completion in the next 10 years, but others will still only be in the planning stage.

10.0 Recommended Highway and Transit Improvements

This section identifies projects proposed in regional transportation plans that are critical to accommodate current and growing ground access demand. To be included in regional transportation plans, these planned improvements have already been given priority by local, regional and state transportation agencies; otherwise, they would not be included in these plans, which identify projects for which funding is reasonably foreseeable. As a result, these highway and transit improvements constitute those projects recommended in this Ground Access Element to achieve long-term airport accessibility objectives. By virtue of their inclusion in this study, priority should be given to implementing these projects to ensure future ground access demand can be met, resulting in efficient and timely ground access for air passengers, airport workers, and air cargo throughout the planning period.

10.1 Critically Important Highway Improvements

The vast majority of airport ground access trips are made using the highway system. Even certain types of transit or on-demand services, such as buses, taxis, airport courtesy shuttles, etc., require a performing highway system to be successful. Moreover, virtually all of the region's air cargo originating from airports toward their ultimate destination, or from their point of origin to the airport, accesses the region's highway network. As a result, it is essential to ensure the highway network serving airports is maintained and appropriately expanded to accommodate future ground access demand. The following highway improvements are recommended because of their critical importance:

- The widening sections along I-270, Columbia Pike (US 29) in Montgomery and Howard counties will improve airport access from Montgomery and Howard counties to BWI Marshall Airport.
- The widening sections along I-70 will improve airport access from Frederick, Carroll and Howard counties to BWI Marshall Airport.
- The widening of I-95 north between the Prince George's and Howard County line to I-695 (Baltimore Beltway), and the widening along the Columbia Pike (US 29) in Montgomery and Howard counties will improve north and southbound trips to I-195, a major artery to BWI Marshall Airport.
- The widening of I-95 South in Harford and Baltimore counties, and the widening of I-695 (Baltimore Beltway) from the intersection of I-95 South and I-895 to I-95 near Arbutus, (Baltimore county) Maryland will improve travel time to BWI Marshall Airport from origins in Baltimore, Harford and Carroll counties as well as trips from further in Pennsylvania.
- The widening of sections of the Baltimore-Washington Parkway (MD 295) from I-695 (Baltimore Beltway) to MD 100 near Arundel Mills will improve travel for airport trips southbound from Baltimore County and Baltimore City and beyond, as

- well as trips northbound from Montgomery, Howard, and Ann Arundel counties and from the DC metropolitan area to BWI Marshall Airport.
- The widening of sections along the John Hanson Highway (US 50) between the Prince George’s county line and the Bay Bridge, and the widening along I-97 between John Hanson Highway (US 50/301) and the Patuxent Freeway (MD 32/) and Robert Crain Highway (MD 3) will have an impact on travel to BWI Marshall Airport from much of Anne Arundel County and the eastern shore as well as from Delaware.
 - The widening along sections of Sykesville Road / Patuxent Freeway (MD 32), and widening of sections of MD 100 will have an impact on travel to BWI Marshall Airport from much of Howard and Carroll counties.
 - The widening of Branch Avenue (MD 5), Indian Head Highway (MD 210) and Pennsylvania Avenue (MD 4) will improve trips from southern Maryland and Prince George’s County to all airports.
 - The widening of the Richmond Highway (US 1) in Virginia, together with the widening and reconstruction of the Springfield Interchange, will improve airport trips from Fairfax, Prince William counties and from south I-95 in Virginia, primarily to Dulles and Reagan National airports.
 - The widening of sections of Fairfax County Parkway (VA 7100) and Chain Bridge Road (VA 123), and the construction of High Occupancy/Toll (HOT) lanes along the I-495 from the Springfield interchange to Old Georgetown Road (VA 193), will improve airport trips to Dulles Airport from Southern Fairfax County, Springfield area, Prince William County and Southern Virginia.
 - The widening of Leesburg Bypass (VA 7/US 15), and Harry Byrd Highway (VA 7) in Leesburg will improve airport access trips to Dulles Airport from much of western Loudoun County, from Jefferson County in West Virginia, and from Frederick County in Maryland.
 - The widening of Sully Road (VA 28), the widening and upgrade Old Ox Road (VA 606), and improvements to Lee Jackson Highway (US 50), are improvements that are intended to improve circular flow around Dulles Airport. When combined, these roadways constitute the “Dulles Loop.” Further study “missing links” that provide connections to the “Dulles Loop” as well as western access to Dulles.
 - The widening and upgrade of Loudoun County Parkway and the construction of a new 4 to 6 lane highway, Tri-County Parkway will improve travel time from Manassas and much of Prince William and Fauquier Counties to Dulles Airport, and could provide improved access as an alternate north-south connection.
 - The widening of the Dulles Access Road along with improvements on Fairfax County Parkway, Leesburg Pike (VA 7) and I-495 (Capital Beltway) will improve travel to Dulles Airport from most of the DC Metropolitan area.
 - The widening of Arlington Boulevard (US 50), Lee Highway (US 29), and sections of the Little River Turnpike (VA 236) will improve travel to Dulles Airport from most of Arlington, City of Alexandria and Fairfax County area inside the Capital Beltway.
 - The construction of HOV lanes along I-95 in Stafford County, and widening of sections along the Jefferson Davis Highway (US 1) in Stafford County, Spotsylvania County and the City of Fredericksburg will improve airport trips to all airports in general and to Dulles and Reagan National airports in particular from Southern Virginia.

- The widening along Dumfries Road (VA 234) and Prince William Parkway (VA 3000), in Prince William County will improve access to Sully Road (VA 28) to Dulles Airport from much of Prince William County, Fauquier County and beyond.

10.2 Critically Important Transit Improvements

Transit can work well for air travelers; however, to optimize transit utilization for airport ground access, consideration should be made in terms of convenience to travelers with more luggage than traditional transit riders. It is also important to underscore that road-based transit requires highway improvements to be effective to ensure on-time performance. As a result, future planning of the ground access system should not consider highway and transit separately; rather, an intermodal, system approach should be used when planning for such improvements. The following transit improvements are recommended because of their critical importance:

- Completion of the Silver Line to Route 772 in Loudoun County, will increase transit access to Dulles Airport from regional core areas in DC and Northern Virginia and other areas throughout the region served by the Metrorail system. This extension of the Metrorail system is expected to carry about 9% of the local originating air passengers traveling to Dulles airport in 2030.
- The express bus services along I-495 (Capital Beltway) and priority bus service on Fairfax County Parkway (VA 7100) will also play a role in increasing transit trips from the Fairfax County suburbs to Dulles Airport.
- Transit service improvements along the Jefferson Davis Highway (US 1), including the proposed Potomac Yard Metrorail Station in on the yellow/blue lines in Alexandria and the Crystal City/Potomac Yard Streetcar and Arlington and Alexandria, will increase transit access to all airports in general and to Reagan National Airport in particular.
- The construction of a new MARC Commuter Rail station at East Baltimore will increase transit access to BWI Marshall Airport from Eastern Baltimore City and the adjacent southeast Baltimore County.
- The following transit improvements could offer opportunities for improved airport access in general:
 - Corridor Cities Transitway along the I-270 corridor will make northern Montgomery County accessible by transit to all airports.
 - The Bi-County Transitway, or “Purple Line,” between Silver Spring and New Carrollton Metro stations will increase transit access to all airports.
 - The construction of a new VRE Commuter Rail station at Cherry Hill will increase transit access to all airports.
 - WMATA has nearly completed a regional transit system planning process that is examining options to increase system capacity through both system extensions as well as improvements to the system in the core intended to increase efficiency and throughput. Any planned improvements that may result from this process could promote improved airport ground access.

10.3 Transportation Improvements in Higher Density Regional Activity Centers

Little opportunity for street widening or new construction exists in downtown areas, such as K Street, Pennsylvania Avenue, and the New York Avenue corridors in Washington, DC, and in Old Town Alexandria, Waldorf, or downtown Baltimore. Therefore, any improvements in airport access from these areas must come from Transportation Demand Management measures (TDM), such as parking restrictions, no-left turn restrictions, reversible peak direction lanes, traffic signal timing synchronization, the promotion of peak-hour directional HOV lanes alternatives and from improvement of transit facilities and services.

11.0 Conclusion

The transportation linkage between airports and local activities remains a critical and often overlooked component of the airport system. Choice of airport and even the decision to fly are clearly linked to the quality, cost and travel time associated with the ground journey to the airport. Two of every three of the region's air passengers cited airport accessibility (closest airport, better public ground transportation and better access road and parking) as the most important reason for choosing the airport they used.

Enplanements at the three regional airports are projected to triple by 2040 when compared with 2011. Forecast growth in local air passenger originations in many areas of the region is expected to increase by even more than this figure. Both MWAA and MAA are investing hundreds of millions of dollars through their Airport Improvement Programs and other capital improvements to support these growing numbers of travelers. Such improvements include the widening of access roads to and at the terminals.

Beyond the immediate boundaries of the airports themselves, however, highway congestion in the region has grown so severe in recent years that many major roads used to access the region's airports remain clogged for an increasing number of hours each day. Though airport destined trips constitute a very small portion of the daily traffic, travel to the airports has been affected by the growth in non-airport related traffic. Traffic chokepoints observed during traffic monitoring studies are along the freeways and major arterials that are major commuting routes. Moreover, forecasts of ground access trips indicate a growing need to ensure the ground access system responds to ever-increasing demand.

The current level of congestion on the region's roadways and transit facilities suggests that the future growth in daily travel and airport trips will exacerbate existing traffic problems. This makes completion of some current and planned highway and transit projects critically important for maintaining and improving airport ground access.

When completed, the 23 mile, 11 stations Metrorail Silver Line extension to Dulles Airport will increase transit access to Dulles Airport from all parts of the region served by the Metrorail system. This extension will especially improve access and airport options for persons living, work or visiting higher density regional activity centers located in the District of Columbia and Northern Virginia. Completing this transit improvement is a key regional priority for improving

airport access in the future.

In Maryland, the construction of the ICC and widening sections of I-270, US 29, MD 28/MD198, I-95, I-295, I-695, US 50, I-97. MD5 and MD210 are some of the highly recommended priorities for improving airport access, particularly to BWI Marshall Airport. In Virginia, construction of the Tri-County Parkway, the widening of the Dulles Access Road and major sections of VA 28, the Loudoun County Parkway, VA 123, the Fairfax County Parkway, US 1 and the construction of High Occupancy/Toll (HOT) lanes on the beltway between I-395 and the Dulles Toll/Access Road are some of the highly recommended priorities for improving airport access in the Northern Virginia portion of the region.

These critically important regional transportation improvements are recommended for implementation at the earliest possible date to help ensure the attainment of Goal 8 of the TPB Vision, the goal that supports the region as a major national hub of international and inter-regional travel and commerce. Additional highway and transit infrastructure beyond improvements to existing facilities will likely be needed to ensure airport access well into the future; and taking proactive steps, such as securing needed right-of-ways, funding, etc., to ensure these measures are in place in a timely manner will be essential.

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