

Washington-Baltimore
Regional Airport System Plan

Ground Access Element Update

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FINAL DRAFT

**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 multiple airports. Three large commercial airports serve the region. These include Washington Dulles International (Dulles or IAD), Ronald Reagan Washington National (Reagan National or DCA), and Baltimore/Washington International Thurgood Marshall (BWI Marshall or BWI) airports.

A critical and often overlooked component of the region's airport system is the 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 an increasing concern.

Ground access and airport landside congestion are expected to increase in the future. This could have substantial adverse economic and environment effects on the region. The quality of ground access provided by the region's existing and planned highway network, transit systems and On-Demand Shuttle systems, such as the Washington Flyer service, taxicab operations and courtesy buses, will affect travel patterns to the region's airports and the quality of life in the region.

To maintain economic competitiveness and quality of life, the ground access system supporting travel to and from the region's airports must continue to provide for the timely and efficient movement of passengers, workers and air cargo to maintain swift door-to-door travel. The region is world-class metropolitan area that attracts "top-shelf" companies and employers, not to mention the federal government, that require excellent access to international markets and power centers. In today's global market, the region's economic competitiveness and ultimately its prosperity are inextricably linked to good access to air transportation, and an effective ground access system is a critical component to achieving that. Improvements to regional transportation facilities and the development of new ones must be made to accommodate future growth in airport ground access demand. Examples include Metrorail's Silver Line extension to western Fairfax and Loudoun Counties and the Inter-County Connector in Suburban Maryland, which will provide access improvements to Dulles and BWI Marshall, respectively.

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.*

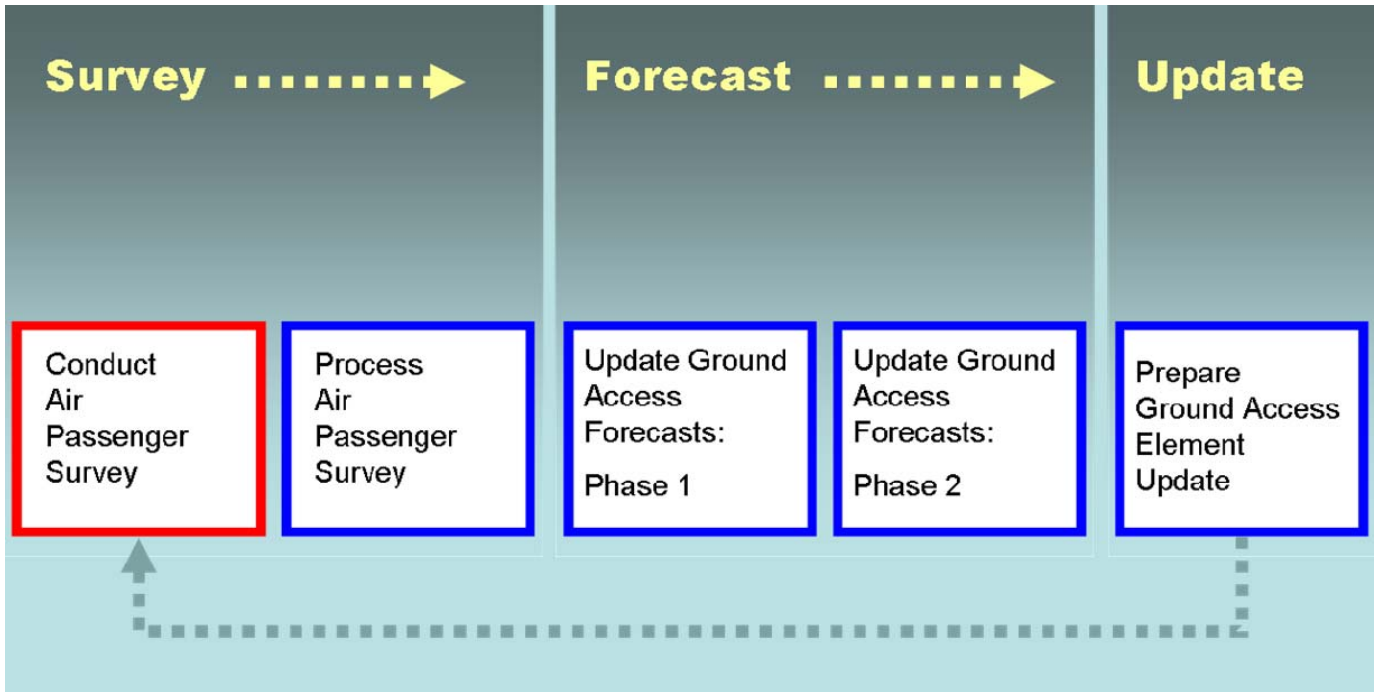
Goal 8 has three objectives:

- (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. 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 TPB’s 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. 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 2009 regional air passenger survey will be the starting point of the subsequent CASP planning cycle. The following chart illustrates the 3-step CASP planning process:



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 2007 Washington-Baltimore Regional Air Passenger Survey. This update: (1) provides an analysis of current and forecast ground access concerns at all three commercial airports-- Reagan National (DCA), Dulles (IAD), and BWI Marshall (BWI) airports; (2) integrates airport system ground access and facility planning into the overall regional transportation planning process for the National Capital region; and (3) includes recommendations for essential highway and transit improvements needed to maintain efficient and convenient ground access to the region's airports in the future.

3.0 2007 CASP Planning Cycle

3.1 Survey

The 2007 CASP planning cycle commenced with the regional air passenger survey, which was conducted in late 2007. During the two-week survey period, more than 27,000 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, 685 randomly-selected flights were surveyed. The 2007 air passenger survey was the eight such survey to be conducted since 1981, kicking off the latest CASP planning cycle

3.2 Forecasts

In 2008, COG/TPB updated the Regional Air Passenger Origin/Destination (O/D) Forecast using data from the 2007 air passenger survey, enplanement forecasts provided by each of the three commercial airports, and the COG Round 7.1 Cooperative Forecasts and the Baltimore Metropolitan Council (BMC) Round 7 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 (See Section 3, “Study Area,” for a description of the air system planning region). Ground access forecasts included projections of ground access trips by travel mode and time-of-day from each of the 160 Aviation Analysis Zones (AAZs) to each of the three airports. This series includes base year trips for 2007, and forecast trips in 5-year increments from 2010 through 2030. 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.

3.3 Ground Access Element

This update of the Ground Access element concludes the CASP planning cycle that began with the 2007 air passenger survey.

4.0 Study Area

Cities and counties making up the Washington-Baltimore air service market area, or the air system planning area, encompass an area larger than those normally within the purview of the Metropolitan Washington Council of Governments (MWCOG) and the Baltimore Metropolitan Council (BMC). From north to south, the air system planning area stretches from Harford County, Maryland, on the Susquehanna River at the Pennsylvania border to Spotsylvania County, Virginia, halfway between Washington, DC, and Richmond, VA. From east to west, the air system planning region extends from the Chesapeake Bay to beyond the front range of the Appalachian Mountains. Figure 1 shows the air system planning region, as well as the three commercial airports that serve it: BWI Marshall Airport (BWI), Reagan National Airport (DCA), and Dulles Airport (IAD).

This airport system planning region consists of 29 jurisdictions, 161 Aviation Analysis Zones and 2,604 Transportation Analysis Zones (TAZ). In fact, of the 23.6 million locally originating passengers at BWI, DCA and IAD in 2007, 96% came from within the air system planning area, underscoring the area's expanse. In other words, only 4% of locally originating passengers in 2007 began their trips to the airport from a point beyond the air system planning area.

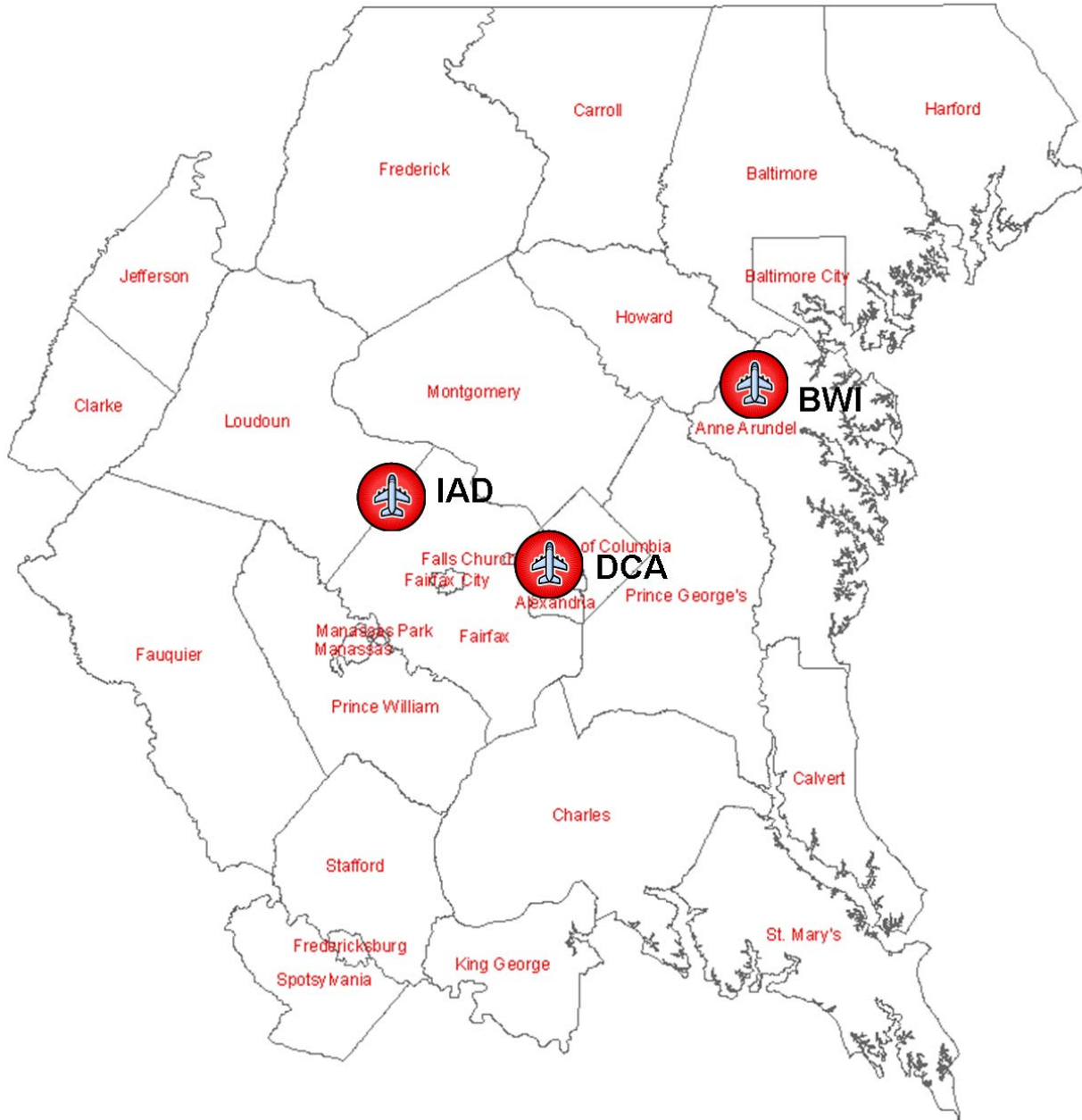
The Washington-Baltimore combined region is the fourth-largest Consolidated Metropolitan Statistical Area in the country in terms of population, exceeded only by the New York, Los Angeles and Chicago, according to the U.S. Census Bureau. By 2035, the air system planning area will have more than 10 million residents, an increase of nearly 30% since 2000. Airport access will play a major role in determining where many of these residents will work, and will likely play a prominent role in determining where they will choose to live. The combined Washington-Baltimore regional employment is also expected to increase by 40% between 2000 and 2030. Moreover, not only is the Washington-Baltimore region one of the nation's largest consumer markets, it is one of the wealthiest.

The Washington-Baltimore region is an attractive destination for foreign as well as domestic tourists. It is the seat of the federal government and has numerous national and international tourist attractions. Therefore tourism and business travel represent a significant portion of

air travel and is important component of air service demand. In 2007, 43% of locally originating airport trips left from “non-home” originations (Hotel/motel or place of employment) and 41% of the region’s air passengers’ travel was for business-related reasons. Additionally, about 51% of the local air passenger originations are by persons residing in other parts of the U.S. or and other countries. This proportion of non-resident air travelers is similar for all types of trips, such as business, personal, vacation, school, etc, indicating that the region’s three commercial airports provide an important link to governments (local and federal), firms, and individuals to other regions outside the Washington/Baltimore area.

While BWI, DCA and IAD are most commonly considered the three airports in the region, it should be noted that there are smaller airports located throughout the air system planning area. Most of these airports, which are known as “Reliever Airports,” are basically general aviation airports that are intended to relieve congestion from the larger commercial service airports: BWI, DCA, and IAD. 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 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 1
Washington-Baltimore Air System Planning Region Airport
Ground Access Element Update
Study Area



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 2007 air passenger survey, two-thirds of air passengers cite accessibility conditions (closest airport, better public ground transportation and better access road and parking) as the most important reason for choosing their departure airport. While transit and On-demand shuttle 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. In the past, passenger ground access forecasts and this Ground Access Element were not part of the regional transportation planning process and this was recognized as shortcoming in adequately considering total airport ground access. As a result, the CASP program developed a methodology to prepare passenger ground access forecasts for each airport that, when considered with airport employment ground access demand, would provide a more comprehensive snapshot of anticipated demand. 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).

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 Baltimore/Washington International Thurgood Marshall Airport

Direct interstate highway access to BWI Marshall Airport is provided by I-195. I-195 is directly connected to I-95, to US 1 and MD 295 (Baltimore Washington Parkway). 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 Ronald Reagan Washington National Airport

Highway access to Reagan National Airport is currently provided by two major routes: the George Washington Memorial Parkway and US Route 1 (Jefferson Davis Highway) 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 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 the 14th Street Bridge (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 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 Washington Dulles International Airport

Highway access to Dulles Airport 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 On-Demand Shuttle Operations 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 2007, 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 On-demand shuttle operations at the three major commercial airports in the region are varied, as noted in the remainder of this section.

6.1 Baltimore/Washington International Thurgood Marshall Airport

BWI Marshall Airport 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.

6.1.1 Public Transit Service

There are two types of public transit service to BWI Marshall Airport: bus and rail.

Rail Service

BWI Marshall Airport has both Heavy and Light Rail service, which is provided at two separate rail stations.

Heavy Rail

The BWI Marshall Rail station is located a mile from the airport and is reached via a free shuttle from the airport. Amtrak and Maryland Area Rail Commuter (MARC) service trains, heading north and south, depart from this station.

Located on Amtrak's northeast corridor, the BWI Marshall Rail station has direct connections to cities from Richmond to Boston. The entire Amtrak rail system is accessible from BWI via transfers at Washington Union and Baltimore Penn stations. 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 from the BWI Marshall Rail station with more than forty daily departures. The MARC train service operates at half hour intervals in the morning and evening peaks and one hour intervals off-peak (Monday through Friday only). MARC has thirteen stations from Washington Union station, through Prince Georges, Anne Arundel, Baltimore, Baltimore City, Harford and Cecil counties, ending in Perryville, MD.

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.

Bus Service

There are four bus lines providing scheduled transit service to BWI.

WMATA offers a direct connection between BWI Marshall and the Greenbelt Metro Station. The BWI Express/B30 service 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.

6.1.2 On-Demand Shuttle Operations

On-demand shuttle Operations to BWI are provided by taxi, limousine, shuttle bus, charter bus and hotel/motel courtesy buses.

Taxicab Service

BWI Taxi Management, Inc. is the exclusive supplier of taxi transportation services to BWI Marshall Airport. 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.

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.

On-Demand 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

In the BWI Marshall Airport region, a number of hotels, off-airport parking companies and travel agencies provide transportation to/from BWI for their customers.

6.2 Ronald Reagan Washington National Airport

6.2.1 Public Transit Service

Public transit to Reagan National Airport is provided by WMATA through its Metrorail and Metrobus operations. Currently, the Yellow line provides service between Huntington in Southern Fairfax County, Virginia and U Street-Cardoza 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. The Blue line currently 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.

6.2.2 On-Demand Shuttle Operations

On-demand shuttle service at DCA is provided by the Washington Flyer, the official ground transportation system of the Metropolitan Washington Airports Authority (MWAA), as well as by taxicabs, shuttle buses, and courtesy bus service from a number of hotels and rental car agencies.

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 and travel agencies provide transportation to/from DCA for their customers. Courtesy buses accounted for only 7% of departing passengers at this airport in 2007, which accounts for 555,000 passengers flying out of DCA that year.

6.3 Washington Dulles International Airport

6.3.1 Public Transit Service

Public transit to Dulles Airport is provided by the DC-Dulles 5A Metrobus route 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 conclude in 2013 will provide service between the Orange Line and 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. This Metrorail extension is included in the 2009 Constrained Long Range Plan for the National Capital Region.

6.3.2 On-Demand Shuttle Operations

As is the case with DCA, On-demand shuttle service at IAD is provided by the Washington Flyer, the official ground transportation of the MWAA, as well as by taxicabs, shuttle buses, and hotel and rental car courtesy buses.

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

Supershuttle door to door shared ride van service is available to the Washington Flyer Coach Stop as well as Union Station. Supershuttle 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

When the Ground Access Element was last updated in 2007, data from the 2003 Ground Access Travel Time Study were used to help measure demand on airport ground access facilities. Although the findings from the 2003 study are likely still valid, the age of the analysis is now somewhat dated. For this update, data from an ongoing mobility monitoring program were used to further confirm the findings of the 2003 Ground Access Travel Time Study and identify high-levels of user demand of major regional facilities, including ground access facilities. These data, produced by Skycomp on behalf of both TPB (for the Washington region) and BMC (for the Baltimore region), were developed through an aerial survey from fixed-wing aircraft of a broad network in the Washington and Baltimore regions. The survey entailed obtaining overlapping photographic images of each designated highway, repeated once an hour over four morning and four evening commuter periods. The morning coverage period was 6:30-9:30 a.m., and the evening period was 4:00-7:00 p.m. Survey flights were conducted on weekdays, excluding Monday mornings, Friday evenings and mornings after holidays. Data were extracted from the aerial photographs to measure average recurring daily traffic conditions by link and by time period.

Performance-ratings findings from these surveys were produced in these efforts, and those major routes relevant to airport ground access are included in this section. The ratings are presented by highway, segment, direction, and time period. For uninterrupted-flow facilities, the ratings are density-based level-of-service (LOS) designations “A”, “B”, “C”, “D”, “E” and “F”, as defined in the 2000 Highway Capacity Manual, where LOS A represents “free flow” conditions and LOS F represents “forced flow” or “breakdown” conditions.

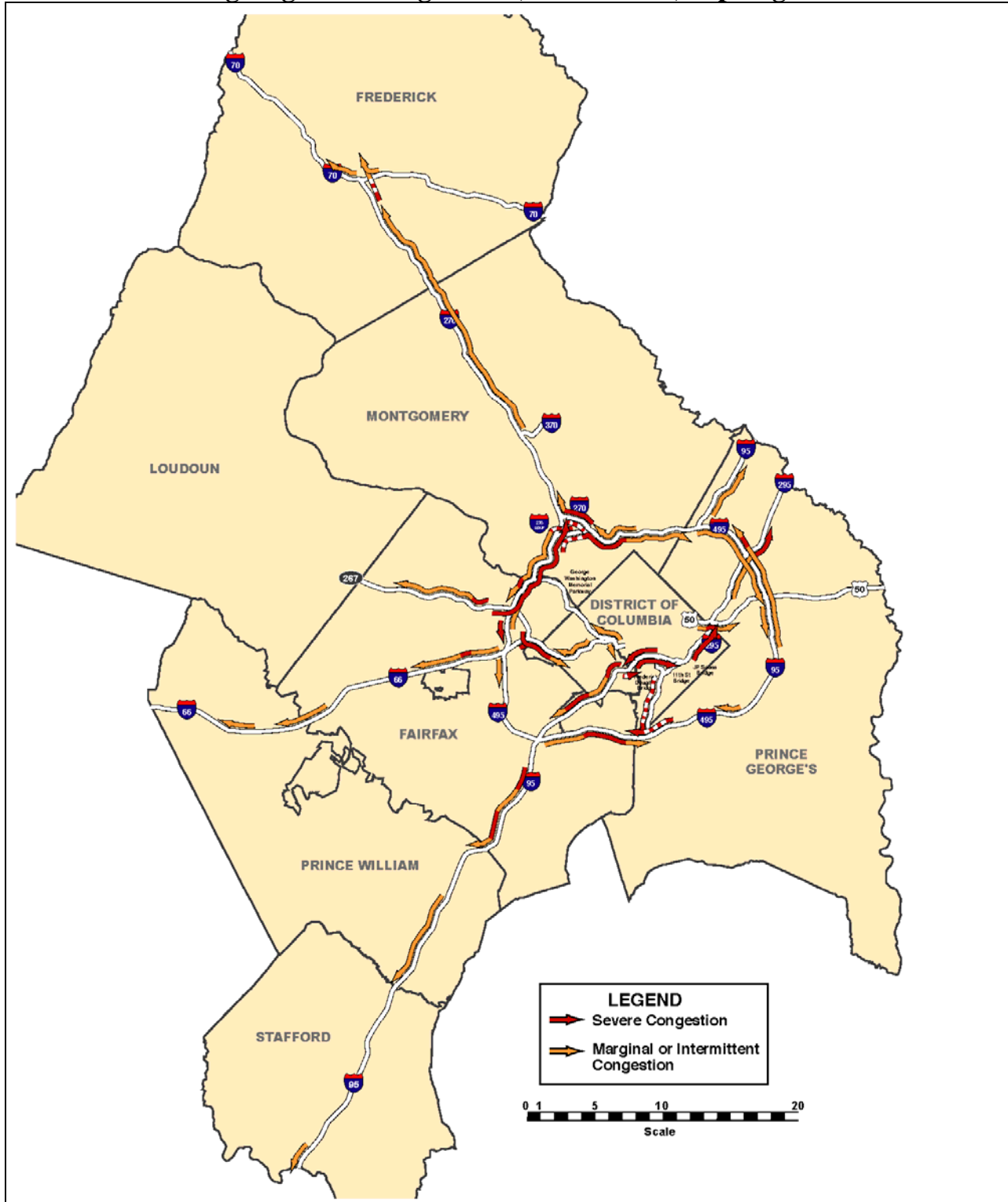
The data collection program for both regions began in 1990s and is updated on a regular basis. The most recent data, which are used in this analysis, were obtained in 2008, five years after the Ground Access Travel Time Study. The aerial survey conducted in the Washington region covers 330 centerline miles of highway in the COG/TPB region (140 of those miles were in

Maryland, including the beltway, I-270, and parts of I-95, I-70, US 50 and MD 295). The survey for the Baltimore Metropolitan region added approximately 550 centerline miles of Maryland highways. Figures 2 through 9 show the surveyed highways in the COG/TPB and BMC areas of the air system planning area and they identify key areas of severe peak congestion in the region. Peak period demand results in substantial congestion at key points of the highway network, which in turn can result in longer travel times for ground access. This results in compromised performance of the ground access system to deliver timely accessibility for air passengers, airport personnel and workers in nearby airport-supporting industries, and air cargo. The full reports, which contain more detailed maps, graphical depictions of specific highway segments included in the monitoring study, and analyses are accessible from the following links:

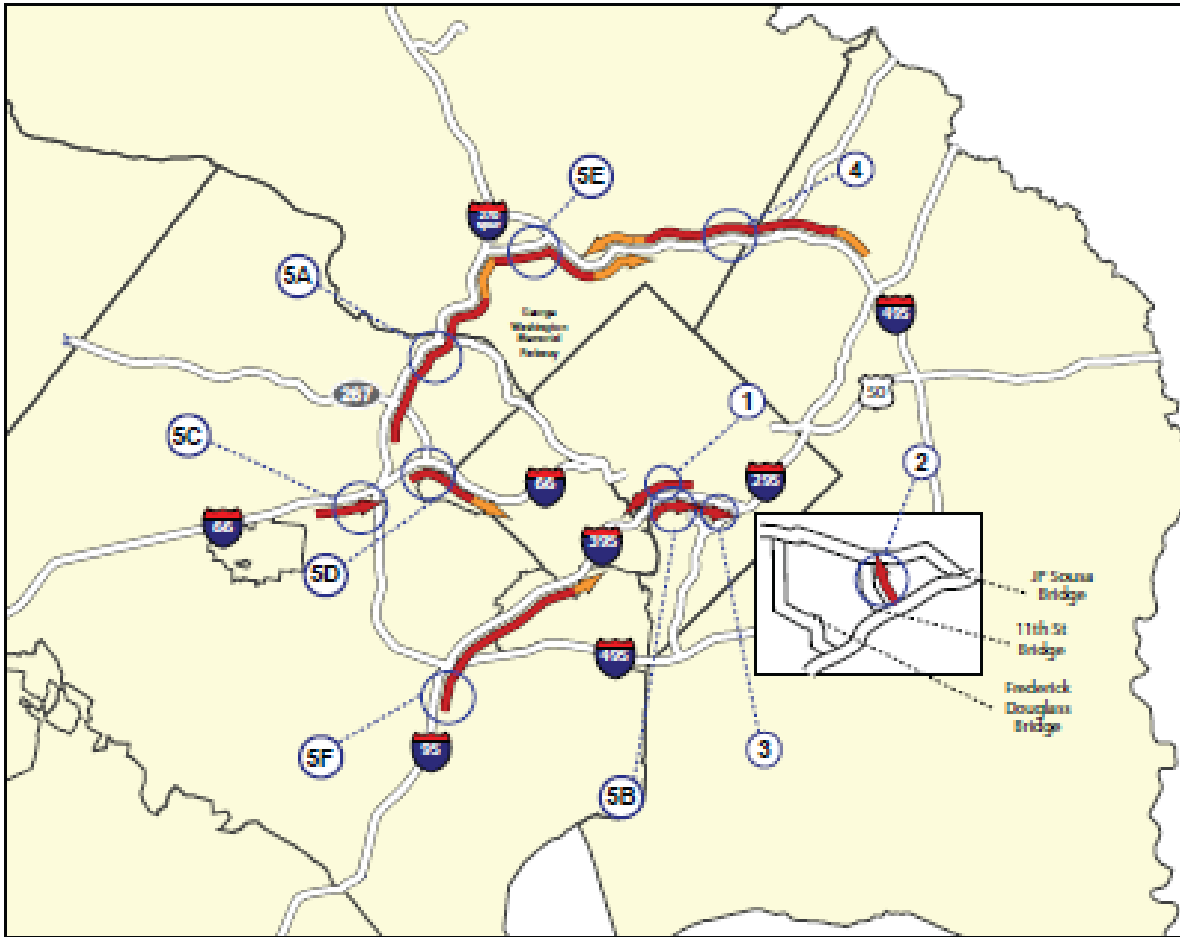
- Washington Region: http://www.skycomp.com/MDSHA/resources/MWCOG_2008.pdf
- Baltimore Region: http://www.skycomp.com/MDSHA/resources/BMC_2008.pdf

The data presented in these reports show areas where congestion on the planning area's highways occurs during peak period. Because these highways are all integral components to the region's ground access system, the results of the monitoring project demonstrate that there are several hot spots where timely ground access is a concern, and confirm the earlier findings of the 2003 Ground Access Travel Time Study. Figures 2 through 9 are taken directly from the previously-referenced Skycomp regional mobility monitoring reports.

Figure 4
Washington Metropolitan Region
Evening Regional Congestion (Peak Period)- Spring 2008



**Figure 5
Washington Metropolitan Area
Top Ten Congested Locations**



No.	Route	From	To
1	SB I-395 (5:30 to 6:30 PM)	4th St	US Route 1
2	WB 11 th St. Bridge (8 to 9 AM)	I-295	Southeast Fwy
3	NB I-395 (4:30 to 6:30 PM)	11 th Street	Pennsylvania Ave
4	OL I-4095 (8 to 9 AM)	MD 650 (New Hampshire Ave)	US 20 (Colesville Rd)
5	IL I-495 (5:30 to 6:30 PM)	VA 193 (Georgetown Pike)	George Washington Pkwy
6	NB I-395 (4:30 to 5:30 PM)	US Route 1	12 th St.
7	EB I-66 HOV (8 to 9 AM)	VA 243 (Nutley St)	I-495
8	EB I-66 (630 to 7:30 PM)	VA 267	VA 693 (Westmoreland St)
9	IL I-495 (5:30 to 6:30 PM)	MD 187 (Old Georgetown Rd)	MD 355 / I-270
10	NB I-95 (7 to 8 AM)	VA 644 (Franconia Rd)	I-495

Figure 6
Baltimore Metropolitan Region
Map of Surveyed Highways, Spring 2008

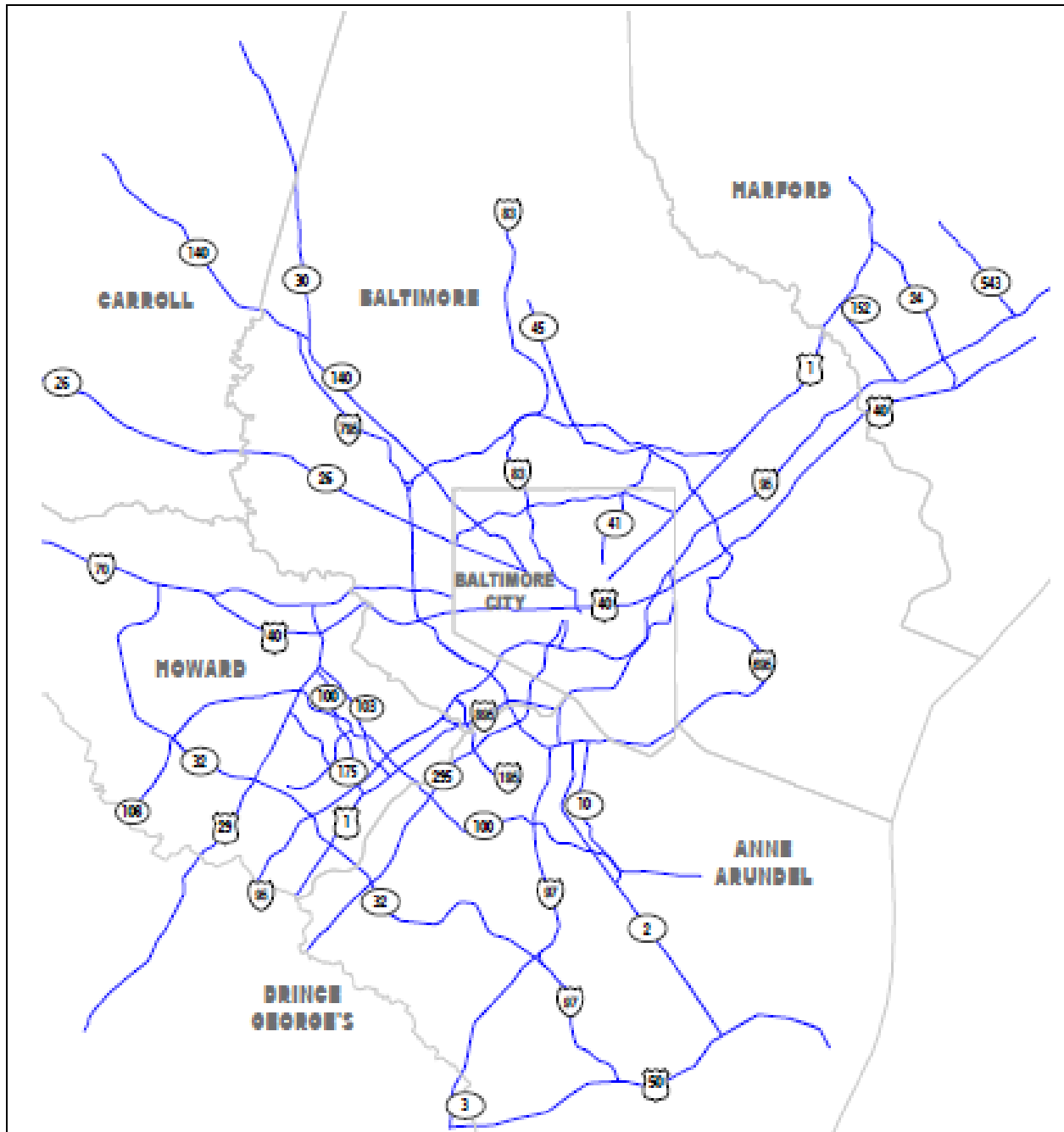


Figure 7
Baltimore Metropolitan Region
Morning Regional Congestion (Spring 2008)

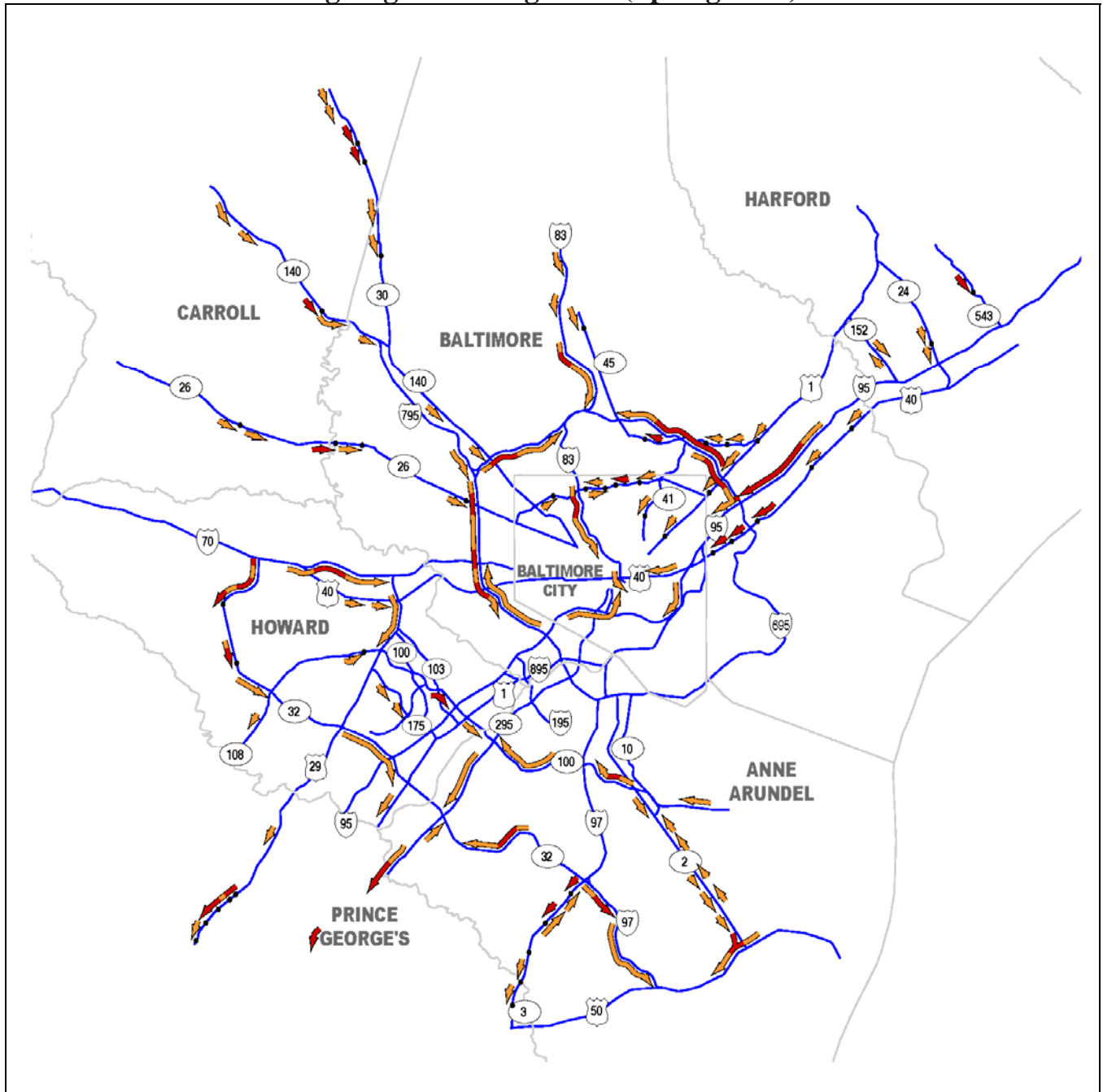


Figure 8
Baltimore Metropolitan Region
Evening Regional Congestion (Spring 2008)

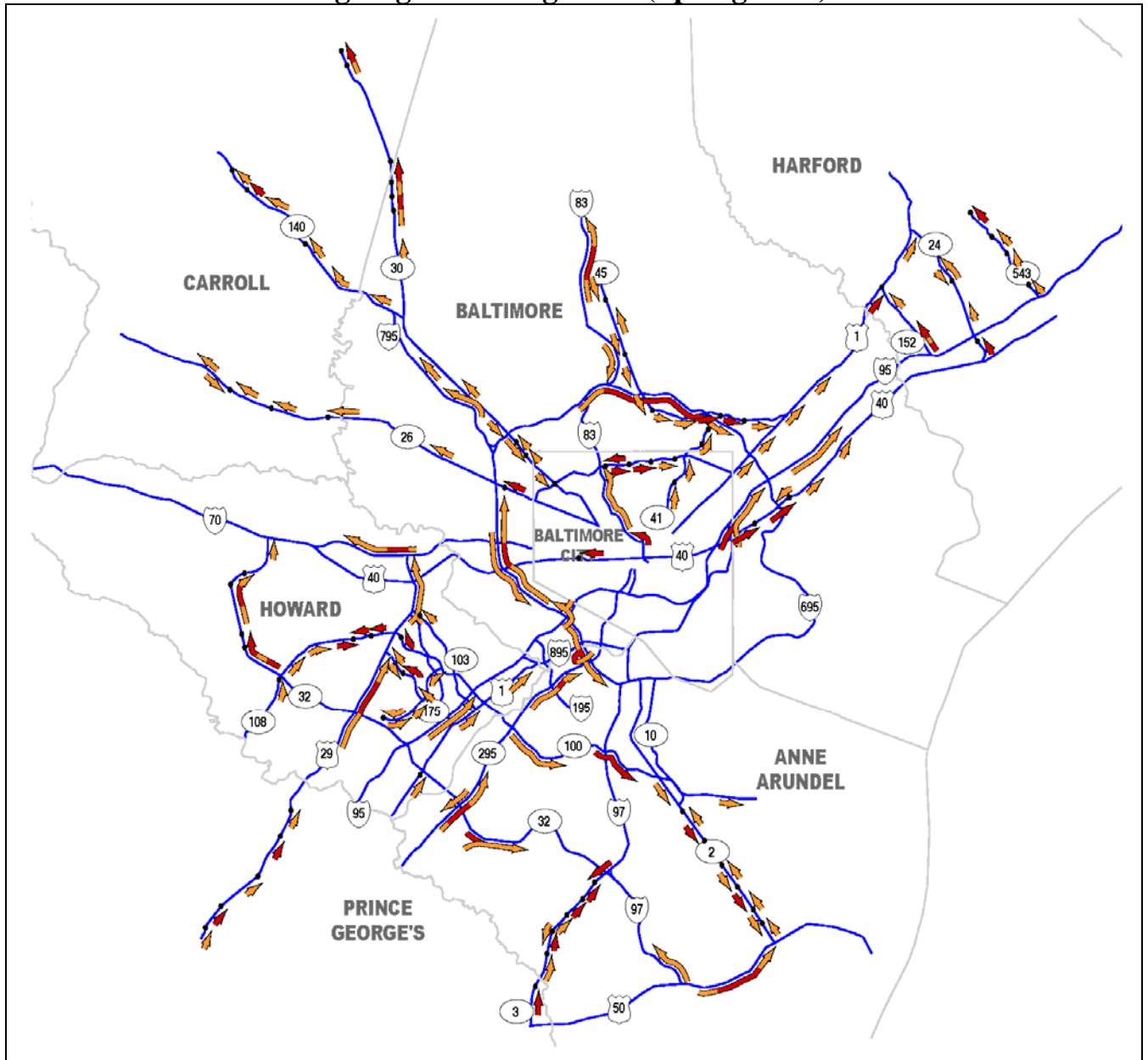
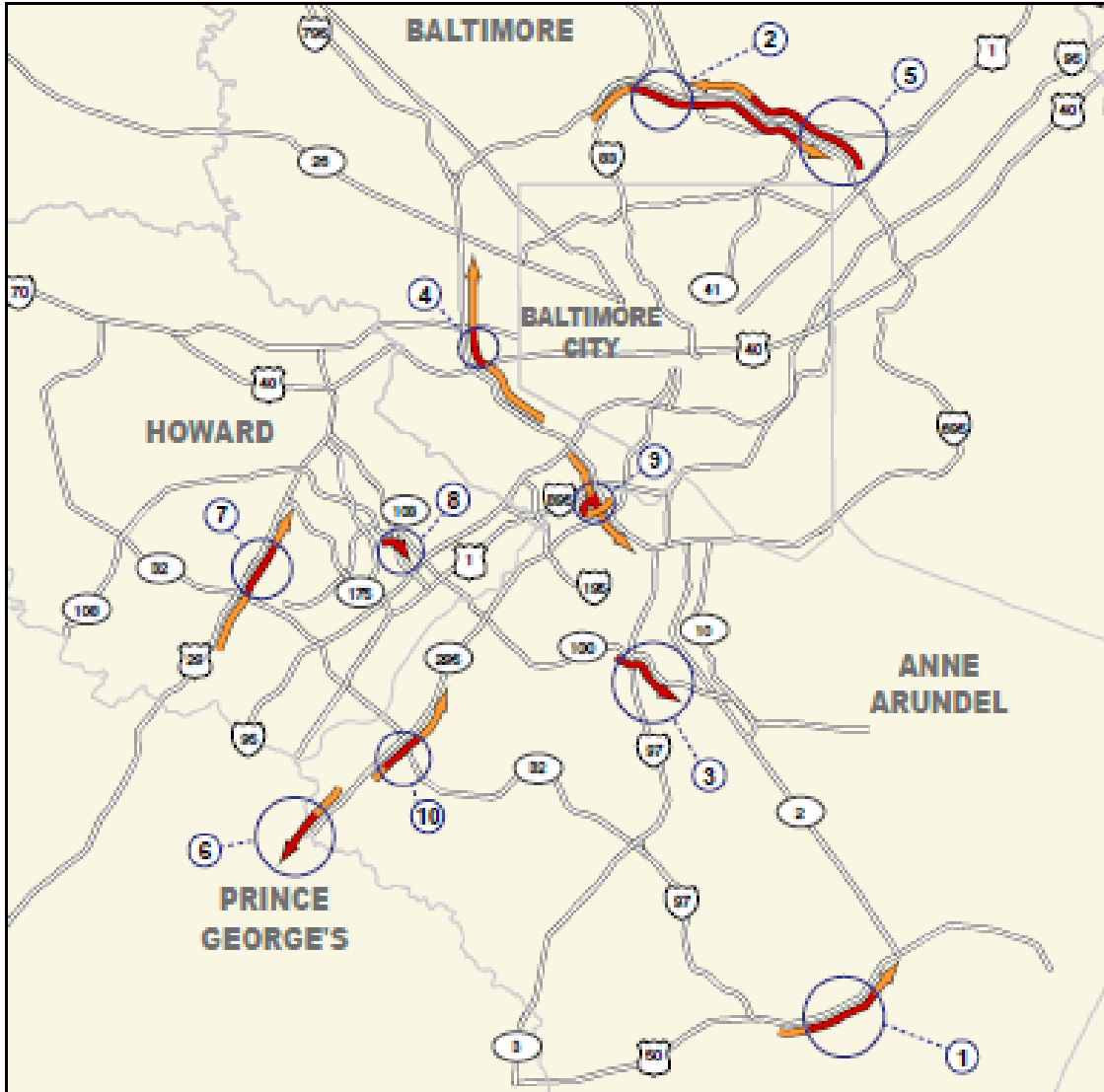


Figure 9
Baltimore Metropolitan Area
Top Ten Congested Locations



No.	Route	From	To
1	EB US 50 (5:00 to 6:00 P.M.)	SOLOMANS ISLAND RD	MD 70 (BESTGATE RD)
2	IL I-695 (5:00 to 6:00 P.M.)	I-83	MD 45 (YORK RD)
3	EB MD 100 (5:00 to 6:00 P.M.)	I-97	QUARTERFIELD RD
4	IL I-695 (5:00 to 6:00 P.M.)	US 40	I-70
5	OL I-695 (7:30 to 8:30 A.M.)	US RTE 1 (BELAIR RD)	MD 41 (PERRING PKWY)
6	SB MD 295 (7:30 to 8:30 A.M.)	MD 198	PATUXENT RIVER
7	NB US 29 (5:00 to 6:00 P.M.)	MD 32	BROKEN LAND PKWY
8	EB MD 100 (7:30 to 8:30 A.M.)	MEADOWRIDGE RD	I-95
9	OL I-695 (5:00 to 6:00 P.M.)	I-895	MD 295
10	NB MD 295 (4:00 to 5:00 P.M.)	MD 198	MD 32

8.0 Planned and Programmed Highway and Transit Improvements

As the metropolitan planning organizations (MPOs) responsible for metropolitan transportation planning in the Washington and Baltimore regions, the TPB and the Baltimore Regional Transportation Board (BRTB), respectively, prepare financially-constrained long-range transportation plans. For the Washington region, the most recent plan is the 2009 Constrained Long-Range Plan (CLRP), and for the Baltimore region, the most recent plan is the long-range plan known as Transportation Outlook 2035.

Both 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 2030. 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 five years 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 2009 CLRP and Transportation Outlook 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 2009 CLRP and Transportation Outlook 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.

8.1 Major Highway Improvements and Studies

Following are highway improvements/studies that support ground access (see Figure 10)

- 1.** I-70, widening from Mt. Phillip Road to Patrick Street (MD 144) to 4/6 lanes (5.30 miles), 2010.
- 2.** I-70, widen from 4 to 6 lanes between Baltimore National Pike (US 40) to Columbia Pike (US 29), 2030.
- 3.** I-695 (Baltimore Beltway) upgrade to an 8 lane freeway from I-83 (Baltimore Harrisburg Expressway) to I-95 (John F. Kennedy Memorial Highway) 11.38 miles , and from Security Boulevard (MD 122) to I-95 south in Arbutus, 5.67 miles, 2015.
- 4.** I-95 (John F. Kennedy Highway)
 - Widen from 8 to 12 lanes, from I-895 (Harbor Tunnel Thruway) to North of White Marsh Boulevard (MD 43), 2020.
 - From I-895 (Harbor Tunnel Thruway) to I-695 (Baltimore Beltway) widen from 4 to 5 lanes southbound.
 - Widen from 6 to 8 lanes between north of White Marsh Boulevard (MD 43) and Churchville Rd. (MD 22), near Aberdeen, 2015.
- 5.** I-95 South, widen from 8 to 10 lanes between Prince George's and Howard County lines to I-695 (Baltimore Beltway), 2020.
- 6.** MD 295 (Baltimore-Washington Parkway), widen from 4 to 6 lanes, I-695 to I-195, 2010.
- 7.** MD 295 (Baltimore-Washington Parkway), widen from 4 to 6 lanes, MD 100 to I-195, 2010.
- 8.** US 50 / US 301, widen from 6 to 8 lanes, from Anne Arundel/Prince George's County line to Bay Bridge, 2020.
- 9.** I-97, widen from 4 to 6 lanes, between John Hanson Highway (US 50/301) to Crain Highway and Patuxent Freeway (MD 32/3) intersection at Millersville, MD, 2010.
- 10.** MD 3, Robert Crain Highway, study to widen/upgrade from 4 to 6 lanes between John Hanson Highway (US 50) to Patuxent Freeway (MD 32)/I-97 intersection, 2030.
- 11.** MD 32, widen/upgrade from 4/6 lane to 8 lanes between Cedar Lane to Anne Arundel County Line and from Clarksville Pike (MD 108) to Carroll County line , 2025, 2030.

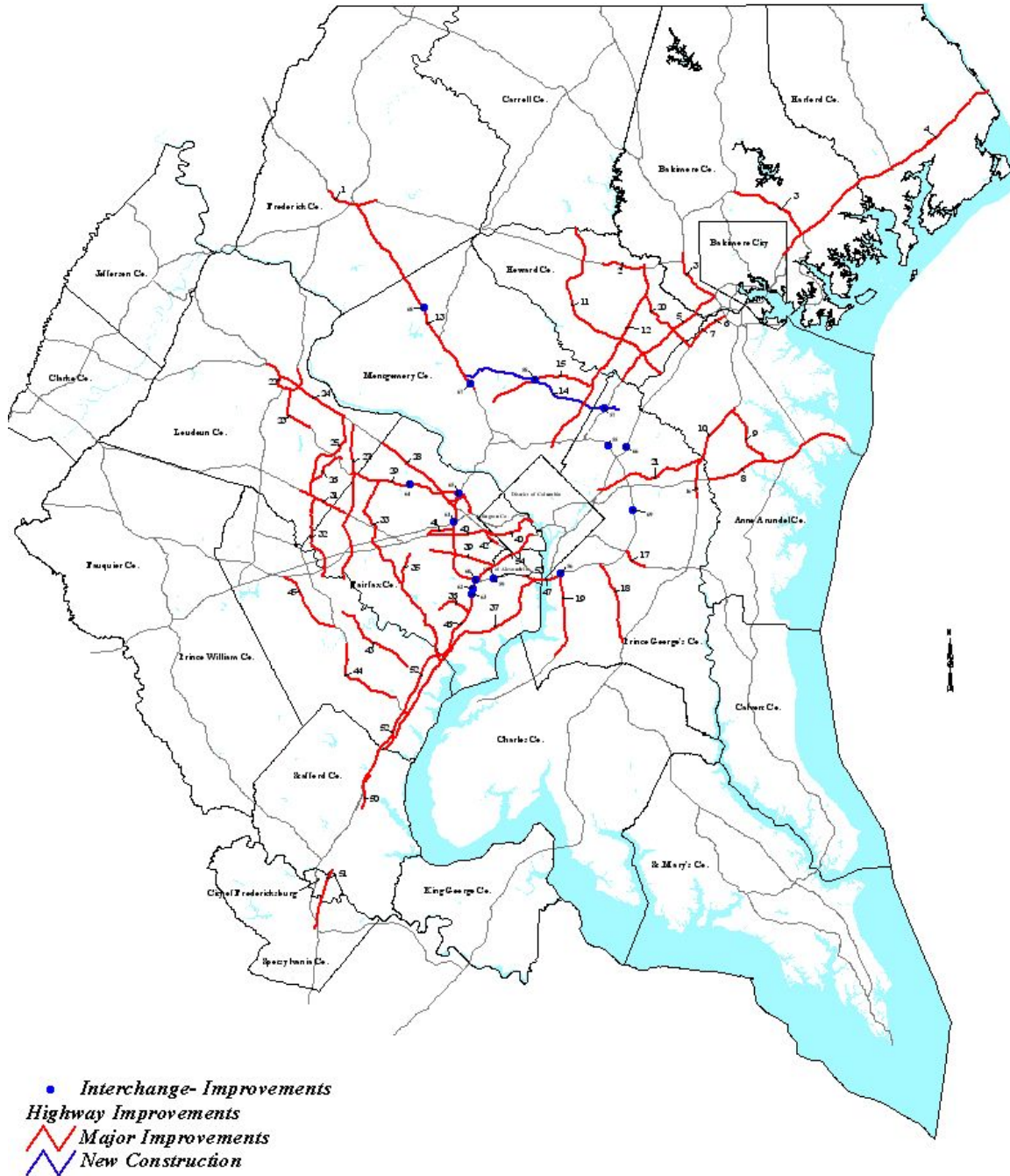
- 12.** US 29, upgrade, including intersections/interchanges, from Sligo Creek Parkway to MD 100, 2005, 2006, 2010, 2020, and widen from MD 100 to I-70, to 6/8 lanes 2015, 2030.
- 13.** I-270/US 15 corridor, Shady Grove to I-70 widen and HOV widen, 2030.
- 14.** Inter County Connector, (ICC), construct 17 mile, 6 lane road between I-270 near Gaithersburg and I-95/US1 near Laurel, 2012.
- 15.** MD 28/MD 198, construct widen, from Georgia Avenue (MD 97) to I-95 from 2/4 lanes to 4/6 lanes 2020.
- 16.** Crain Highway (US 301), widen from 4/6 lane to 8 lanes between Mount Oak Road to John Hanson Highway (US 50), 2020.
- 17.** Pennsylvania Avenue (MD 4), upgrade/widen from 4 to 6 lanes with interchanges at Westphalia Road and Suitland Parkway 2010, 2011, 2020.
- 18.** MD 5, upgrade, widen from Crain Highway (US 301) intersection to the Capital Beltway (I-95) from 4 to 6 lanes, including interchanges, 2015, 2030.
- 19.** MD 210, upgrade from Berry Road (MD 228) to Capital Beltway (I-95) 6 lanes, and interchange improvements 2030.
- 20.** MD 100, widen/reconstruct from 4/6 to 6/8 lanes between Columbia Pike (US 29) to Anne Arundel County line, Anne Arundel County line to I-97, 2025.
- 21.** MD 450, widen to 4 lanes, 2020.
- 22.** VA 7/US 15 Bypass, widen to 6 lanes, 2020.
- 23.** Dulles Greenway, widen from 4 to 6 lanes between Goose Creek Bridge to VA 7/US 15 Bypass 2005, 2006.
- 24.** Market Street / Harry Byrd Highway (VA 7), upgrade/widen from 4 to 6 lanes between Charles Town Pike (VA 9) to Sully Road (VA 28), 2015, construct interchanges 2009, 2010, 2020.
- 25.** Loudoun County Parkway, widen/upgrade 2/4 to 6 lanes from Old Ox Road (VA 606) to Leesburg Pike (VA 7), 2005, 2010.
- 26.** Old Ox Road (VA 606), widen/upgrade from 2 to 4 lanes, between VA 634 to VA 621, 2015.

- 27.** Sully Road (VA 28), widen to 6/8 lanes, from Fauquier County line to Wellington Road in Manassas and from Eastern City limit of Manassas Park to Leesburg Pike (VA 7), with interchanges, 2008, 2015.
- 28.** Leesburg Pike (VA 7), widen from 4 to 6 lanes between Rolling Holly Drive to Capitol Beltway (I-495), 2012, 2013, 2020.
- 29.** Dulles Access Road, widen to 6 lanes including interchange reconstruct at I-495, 2010.
- 30.** Dolley Madison Blvd (VA 123), widen 4/6 to 6/8 lanes from Great Falls Street (VA 694) to Leesburg Pike (VA 7), 2010, 2013.
- 31.** John Mosby Highway (US 50), widen 4/5 to 6 lanes between Gum Spring Road (VA 659) to Lee Road (VA 661), 2012, 2015.
- 32.** VA 28 Bypass, construct 4, 6 lanes 2020, 2025.
- 33.** Fairfax County Parkway (VA 7100), widen from 4 to 6 lanes between Sunrise Valley Drive and Ox Road (VA 123), 2015.
- 34.** Fairfax County Parkway, HOV (VA 7100), widen from 4 to 6 lanes between Hooes Road (VA 636) to Franconia-Springfield Parkway (VA 7900), 2015.
- 35.** Ox Road (VA 123), widen from 2/4 lane to 6 lanes from Braddock Road (VA 620) to Jefferson Davis Highway (US 1) in Woodbridge, 2015, 2020.
- 36.** Fairfax County Parkway (VA 7100), construct between Hooes Road (VA 636) to Sydenstricker Rd. 2025.
- 37.** Jefferson Davis Highway (US 1), widen from 4/6 to 6/8 lanes, from Stafford County line to Southern City Limit of Alexandria (I-95 Capital Beltway), including interchanges at VA 123, 2010, 2011, 2015, 2016, 2017, 2020.
- 38.** I-95/I-395/I-495, widening and interchange reconstruction with access ramps to High Occupancy/Toll (HOT) lanes, Transit Services I-495 HOV, 2013, 2030.
- 39.** Little River Turnpike (VA 236), upgrade/widen from 4 to 6 lanes between Picket Road to I-395, 2020.
- 40.** Arlington Boulevard (US 50), upgrade/widen 4 to 6 lanes between Eastern Fairfax City Limit to Fort Myer Drive in Rosslyn, 2015, 2020.
- 41.** Lee Highway (US 29), widen 4 to 6 lanes between Eastern Fairfax City Limit to Capitol Beltway (I-495), 2015.

- 42.** Leesburg Pike (VA 7), widen from 4 to 6 lanes between Seven Corners to Baileys Crossroads, Columbia Pike (VA 244), 2020.
- 43.** Prince William Parkway (VA 3000), widen 4 to 6 lanes between Minnieville Road (VA 640) to Liberia Avenue (VA 776), 2020.
- 44.** Dumfries Road (VA 234), widen 4 to 6 lanes between Country Club Road and Purcell Road, 2011.
- 45.** Manassas Bypass (VA 234), construct/widen 4 to 6 lanes between Southern City limit of Manassas and I-66, 2020.
- 46.** I-95, widen from 6 to 8 from Newington to VA 123, 2011.
- 47.** I-95, Woodrow Wilson Bridge, build 12-lane bridge, 2011.
- 48.** I-495 (Capital Beltway), widen and construct High Occupancy/Toll (HOT) lanes, between I-395 / I-95 and Georgetown Pike (VA 193), 2030.
- 49.** I-95, construct HOV extension from Prince William / Stafford County line to Garrisonville Road (VA 610), 2011.
- 50.** Jefferson Davis Highway (US 1), widen from 4 to 6 lanes between Telegraph Road (VA 637) to Courthouse Road (VA 630), 2025.
- 51.** Jefferson Davis Highway (US 1), widen from 4 to 6 lanes between Warrenton Road (VA 212) to Mills Drive (VA 17 Bypass), 2010, 2015, 2020, 2025, 2030.
- 52.** I-95 widen to 8 lanes (HOT lanes) with new ramps 2012, 2014.
- 53.** I-95/I-495 (Capital Beltway), widen from Telegraph Rd. (VA 241) to MD 210, 2011.
- 54.** I-95/I-395 HOT Lanes, widen construct 2-3 lanes with new ramps 2012, 2014.
- 55.** I-95/I-495 (Capital Beltway), construct interchange at Greenbelt Metro.
- 56.** I-95/I-495 (Capital Beltway), reconstruct interchange at MD 210
- 57.** I-95/I-495 (Capital Beltway), reconstruct interchange at Contee Rd.
- 58.** Inter County Connector , construct interchange at MD 28.
- 59.** I-95/I-495 (Capital Beltway), reconstruct interchange at VA 613.
- 60.** I-95/I-495 (Capital Beltway), reconstruct interchange at I-395.
- 61.** I-95/I-495 (Capital Beltway), reconstruct interchange at I-66.
- 62.** I-95/I-495 (Capital Beltway), reconstruct interchange at Springfield.
- 63.** I-95/I-495 (Capital Beltway), reconstruct interchange at Fairfax County Parkway.
- 64.** Dulles Toll Rd, construct interchange at VA 674.

- 65.** I-95/I-495 (Capital Beltway), reconstruct interchange at Dulles Toll Rd.
- 66.** MD 295 Baltimore-Washington Parkway, reconstruct interchange at MD 193.
- 67.** I-270, reconstruct interchange at Watkins Mill Rd.
- 68.** I-270, reconstruct interchange at MD 121
- 69.** I-95/I-495 (Capital Beltway), construct interchange at Arena Rd.

Figure 10
Washington-Baltimore Air System Planning Region
TPB / BTRB Highway Improvement Projects



8.2 Major Transit Improvements and Studies

Following are transit improvements/study significant to airport trips (see Figure 11)

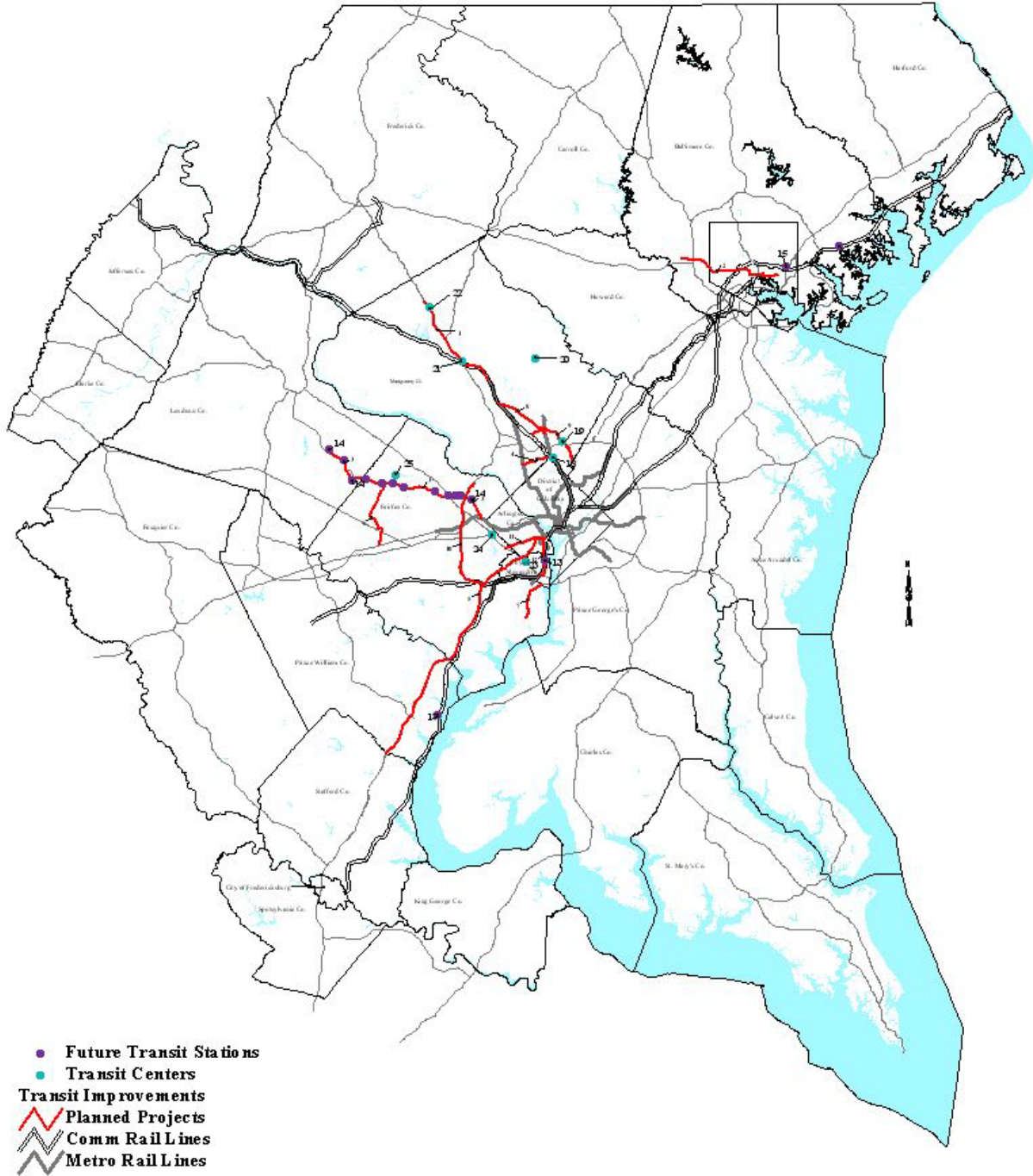
- 70.** Corridor Cities Transitway, from Shady Grove to COMSAT, 2016.
- 71.** Baltimore Corridor Transit Red Line, construct an east-west rapid transit system from social Security to Fells Point (Patterson Park) in Baltimore, 2015.
- 72.** Dulles Corridor Rapid transit:- a 23 mile extension of the Metrorail system from West Falls Church to eastern Loudoun County, with a total of 11 new stations in Tyson's Corner, Reston/Herndon area, at Washington Dulles International Airport and in eastern Loudoun County, 2011, 2015.
- 73.** Purple Line, Bethesda to Silver Spring, 2015.
- 74.** I-95/I-395 HOV/HOT/Bus lanes (3 total) Transit Services re-strip Prince William County Line to I-495.
- 75.** Fairfax County Parkway (VA 7100), HOV widen and upgrade, 6 to 8 lanes 2010, 2015.
- 76.** Priority Bus service along the Jefferson Davis Highway (US 1), right turn lanes 2025.
- 77.** Veirs Mill Road Bus Enhancements, 2015.
- 78.** University Boulevard Bus Enhancements, 2020.
- 79.** I-495 (Capital Beltway) High Occupancy Toll (HOT) lanes, transit services, 2013, 2030.
- 80.** VA 244 Columbia Pike Streetcar from Skyline to Pentagon City, 2016.
- 81.** Potomac Yard Transit way, Arlington and Alexandria, 2011.
- 82.** Construct new Metrorail Station at Potomac Yards, 2030.
- 83.** Metrorail stations along the Dulles Corridor rail line.
- 84.** Construct MARC rail station at East Baltimore, 2015.
- 85.** MARC Middle River station, relocation and station improvement, 2015.
- 86.** Construct VRE Commuter rail station at Cherry Hill, Prince William County, 2006.
- 87.** Construct Transit Center Phase II at Silver Spring Metro station 2011.
- 88.** Construct Transit Center at Four Corners intersection of Colesville Road (US 29) and University Boulevard (MD 193) 2015.
- 89.** Construct Transit Center at Olney, 2015.

- 90.** Construct Transit Center at Metropolitan Grove, 2015.
- 91.** Construct Transit Center at Clarksburg, 2015.
- 92.** Construct Transit Center at Bradlee Shopping Center in Alexandria, 2015.
- 93.** Construct Transit Center at Seven Corners Shopping Center in Falls Church, 2004.
- 94.** Construct Transit Center at Reston Town Center, 2004.

Other transit improvements/study which are not listed above and are also significant to airport trips include:

- K street Busway :-an express bus lanes running 1.5 miles between 7th street (Mt. Vernon Square) and Washington Circle, NW
- Anacostia Streetcar project Phase I (replaces CSX Shepherd Branch project).
- Construction and expansion of Parking Lots including at and on various locations on existing and future Metrorail and Commuter Rail stations.

Figure 11
Washington-Baltimore
TPB / BRTB Transit Improvement Projects



8.3 Major Terminal and Access Road Transportation Improvements

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.

At BWI Marshall, access roads to the terminal have been widened to support terminal and concourse expansions. Also, recently completed Phase I and planned Phase II of the Terminal Entrance Roadway Improvements are intended to relieve traffic congestion at the airport. A bottleneck at Elm Road from MD 170 to airport terminal is one section that will see results from these improvements. Finally, a people mover system is planned that would connect the BWI rail station, the consolidated rental car facility and the parking facilities to the terminal building is being planned.

The opening of the Terminal B and C, and the separation of arrival and departing passengers terminal, and construction of hourly parking facilities at Reagan National Airport have eased congestion along the ramps exiting from George Washington Parkway.

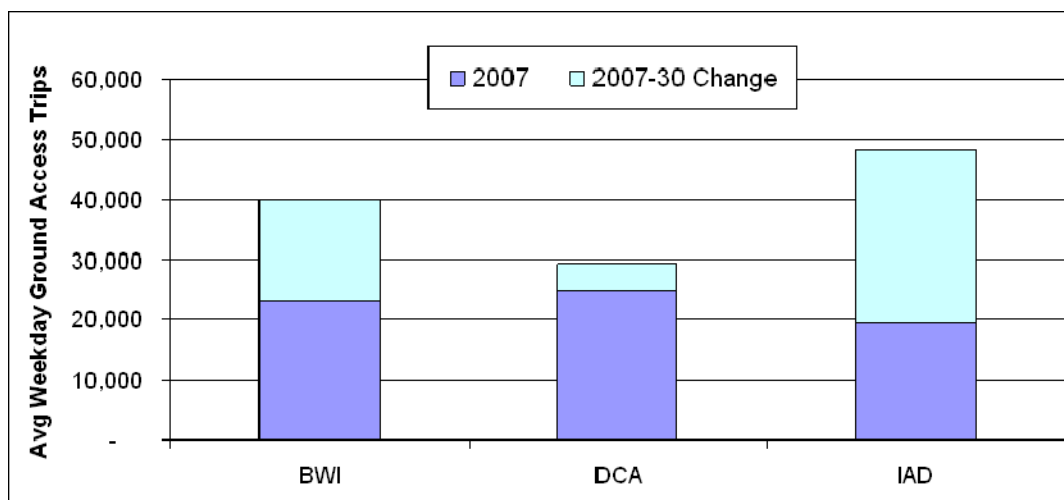
Passengers at Dulles Airport are now able to travel from the main terminal to the various concourses using a new underground train system that will ultimately replace the traditional mobile lounges.

9.0 Forecast Growth in Local Air Passenger Originations and Regional Travel

The monitoring data reviewed in Section 7.0 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.

Figure 12 shows that in 2007, DCA captured the most ground access trips among the three airports. By 2030, however, ground access trips to both BWI and IAD will increase substantially, underscoring the need to ensure the regional ground access system will be able to respond to this growing demand.

Figure 12
Average Weekday Air Passenger Ground Access Trips
Air System Planning Area



Annual air passenger enplanements for BWI Marshall Airport are forecast to reach 18.3 million by 2035, an increase of 86% compared to 2005. Enplanements at Dulles Airport will reach more than 30.1 million by 2035, and at Reagan National Airport they are expected to reach more than 11.2 million by 2035, increases of 127% and 26%, respectively. Overall annual regional enplanements are projected to increase by more than 86% between 2005 and 2030.

Forecast growth in local air passenger originations is expected to exceed 200% in areas in Anne Arundel County, Western Howard County, most of Frederick County and in southern Charles County in Maryland (See Figure 13). In Virginia, growth in local air passenger originations is expected to exceed 200% in areas generally west and south of Fairfax County. These include Clarke, Fauquier, King George, Loudoun, western Prince William, Stafford and Spotsylvania counties and the independent cities of Fredericksburg, Manassas and Manassas Park. 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 between 50% and 200%. Similarly, in the Baltimore region, local originations in Baltimore City, Baltimore County, and Carroll County are expected to also grow by 50%-200%. Only in the parts of the District of Columbia, Arlington and Alexandria, which already have large numbers of locally originating air passenger trips, is the future growth in local originations expected to be less than 50%.

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.

Obviously, 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 2009 Constrained Long Range Plan for the National Capital Region and the 2007 Baltimore Regional Transportation Plan (Transportation Outlook 2035) 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 the I-270, Columbia Pike (US 29) in Montgomery and Howard counties, and the construction of the ICC (Inter County Connector) a new 6-lane road that would run 17 miles between I-270 near Gaithersburg and I-95 near Laurel, the widening of Norbeck Road/Spencerville Road (MD 28/MD 198) in Montgomery county, together with East-West Intersection Improvement Program 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-95, 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 ultimate completion of the Woodrow Wilson Bridge and the Springfield Interchange will improve travel primarily to Dulles Airport, Reagan National Airport, and also to BWI Marshall Airport.
- 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.”
- The widening and upgrade of Loudoun County Parkway and the construction of a new 4 to 6 lane highway, Tri-County Parkway from Prince William/Fairfax County Line to Braddock Road (VA 620) 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:

- The construction of a 23 mile, 11 station Metrorail Silver Line extension to Dulles Airport, 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.

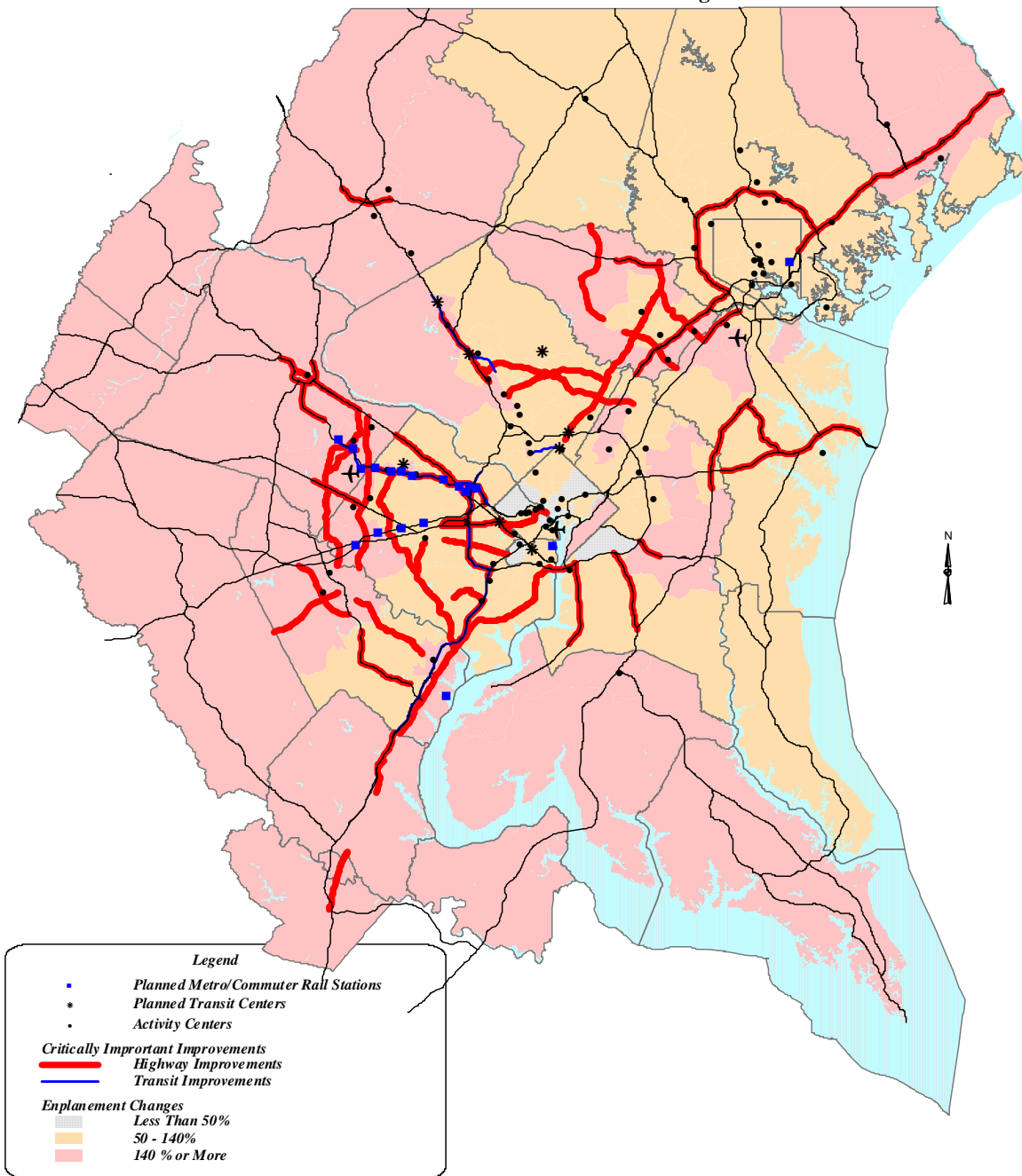
- Metrorail’s Silver Line extension to Dulles Airport in particular will also generate airport-to-airport passenger trips, especially between Dulles and Reagan National airports. Nevertheless, consideration of passengers with luggage should be made to help minimize passenger inconvenience when making train transfers in the Metrorail system..
- 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 Bethesda Metro stations will increase transit access to all airports.
 - The construction of Transit Centers at Silver Spring, Olney, Metropolitan Grove and Clarksburg in Montgomery County will integrate transit services and increase efficiency and ease of use. .

- The construction of Transit Centers at Four Corners and Seven Corners in Arlington County and City of Alexandria will integrate transit services and increase efficiency and ease of use. .
- The construction of a new VRE Commuter Rail station at Cherry Hill will increase transit access to all airports.
- WMATA is currently conducting 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.

Figure 13
Critically Important Highway and Transit Improvements
in relation to
Forecast Growth in 2030 Originations



11.0 Conclusion

The transportation linkage between airports and local activities is 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 2030 when compared with 2000. 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 2008 traffic monitoring study 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.

In the near term, the nearly complete Springfield Interchange and the Woodrow Wilson Bridge projects should ease congestion at these high volume bottlenecks and result in some

immediate improvements in ground access to all three airports. Nonetheless, much more remains to be done.

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. This rail extension will also greatly facilitate airport-to-airport passenger trips between Dulles and Reagan National airports. This planned 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.