The Commission to Study Southern Maryland Transportation Needs



Southern Maryland Transportation Needs Assessment

Executive Summary

In Partnership with:
The Tri-County Council for Southern Maryland
The Maryland Department of Transportation (MDOT)

Prepared by:
Cambridge Systematics, Inc.
with:
A.G. Samuel Group, Inc.
Sabra, Wang & Associates, Inc.

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date

June 25, 2008

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Executive Summary

The *Southern Maryland Transportation Needs Assessment* has been developed in support of Maryland Senate Bill 281 which established a 21-member Commission to study transportation needs in Southern Maryland. The *Transportation Needs Assessment* will enable the Tri-County Council to update the *Southern Maryland Regional Strategy – An Action Plan for Transportation* completed in 1998. Substantial growth in the region and changing commuting patterns have created the need to update the 1998 effort.

ES.1 SOUTHERN MARYLAND CONTEXT

Southern Maryland, located southeast of Washington, D.C., is surrounded on three sides by the Chesapeake Bay and the Potomac River, and divided by the Patuxent River. The region is linked to the rest of Maryland and the Washington, D.C. metropolitan area through Prince George's and Anne Arundel Counties to the north and to Virginia to the south via a bridge across the Potomac River. Southern Maryland's unique geographic location limits its connections to the rest of Maryland and to the United States transportation network. Three major highways connect the region to the north, MD 210, U.S. 301/MD 5, and MD 4, but only U.S. 301 connects the region to King George County, Virginia to the south. Two bridges across the Patuxent River link Calvert County with Charles and St. Mary's Counties. This unique geography influences regional development patterns which in turn impacts the region's demographic and economic trends.

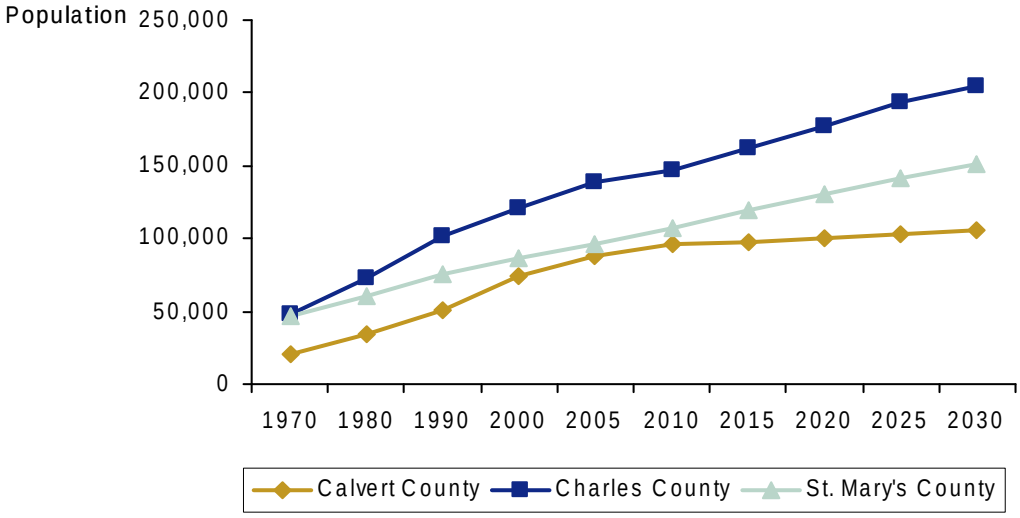
Population

Southern Maryland's population grew from 167,000 in 1980 to 322,000 in 2005, an increase of 2.6 percent per year. This is over twice as fast as the annual rate that Maryland's population grew during the same period (1.1 percent) and makes Southern Maryland the fastest growing region in the State. More than 40 percent of the overall population growth in Southern Maryland occurred in Charles County (65,000), while 34 percent (53,000) occurred in Calvert County and 23 percent (36,000) in St. Mary's County, respectively.

Figure ES.1 displays the historic and projected population growth of Charles, Calvert, and St. Mary's counties. Every household demands goods and services and generates trips for work, school, shopping, and other purposes. These population forecasts, generated prior to the recent sharp increases in fuel and other commodity prices, indicate that Southern Maryland will experience increased demand on its transportation infrastructure as well as increased mobility and accessibility needs over the next 25 years. In the event of continued increases in fuel and other transportation-related costs, it will be necessary to

revisit these forecasts in the next couple of years. In any case infrastructure renewal, system preservation, and maintenance needs will continue.

Figure ES.1 Historic and Projected Population Change in Southern Maryland Counties



Source: Maryland Department of Planning, Planning Data Services.

Economy

Maryland's economy has grown consistently over recent years. According to the United States Bureau of Economic Analysis, Maryland's gross state product, a measure of the value of all goods and services produced in the State, grew from $229 billion in 2004 to $244 billion in 2005 and $258 billion in 2006. Maryland's expanding economy has created employment opportunities for the growing labor force of Southern Maryland (Table ES.1), however, many Southern Maryland residents are employed outside the region. In 2006, over one third of the 167,005 residents of Southern Maryland in the labor force were employed outside the region, with most of those employed in the Washington, D.C. area.

Table ES.1 Labor Force, Employment, and Unemployment in Southern Maryland
2002 to 2006 (in Thousands)

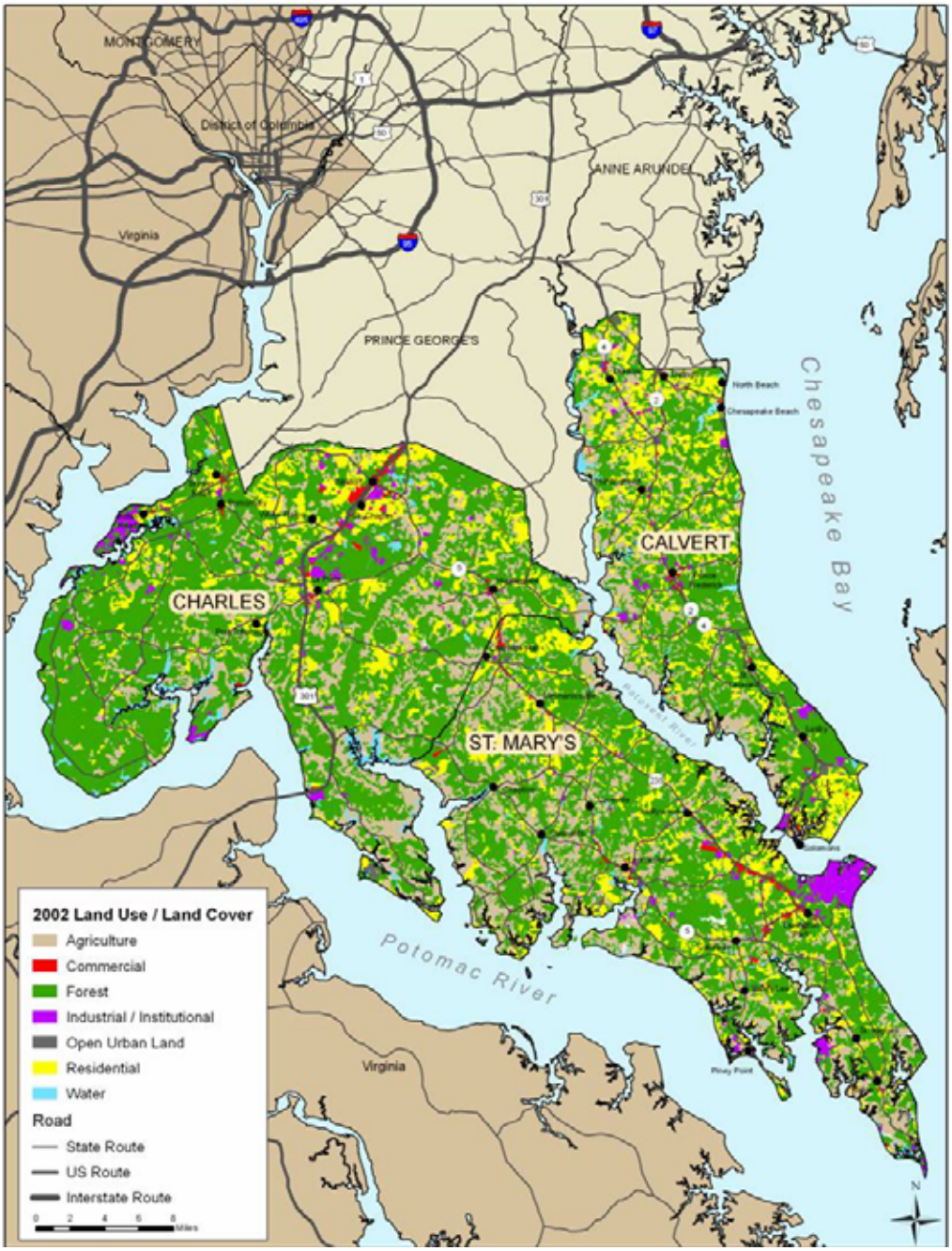
	2002	2003	2004	2005	2006
Labor Force	157.6	162.7	165.5	168.9	172.6
Employment	152.0	157.0	159.8	163.1	167.0
Unemployment	5.6	5.7	5.7	5.9	5.6
Unemployment Rate	*3.6 %*	*3.5 %*	*3.5 %*	*3.5 %*	*3.2%*

Source: United States Department of Labor, Bureau of Labor Statistics.

Land Use

Forest and agricultural land uses comprise over 75 percent of the total land cover in Southern Maryland while 16 percent of land cover is used for residential purposes and less than 10 percent is used for other purposes (Figure ES.2).

Figure ES.2 Southern Maryland Land Use



Source: Maryland Department of Planning.

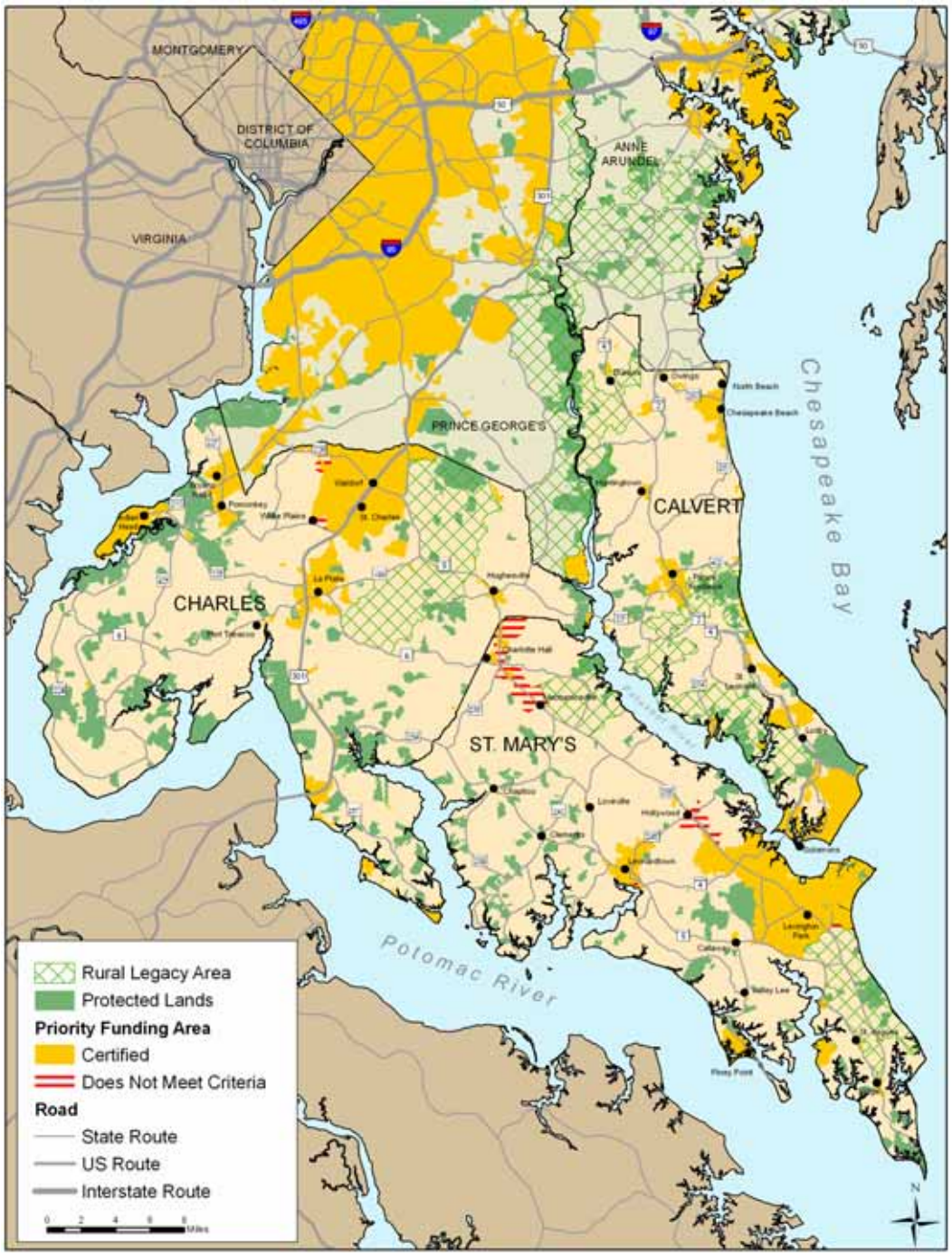
In 1997, the Maryland legislature passed the Priority Funding Areas Act, which directs State spending on projects that support growth and development such as highways, sewer and water construction, and economic development assistance. Priority Funding Areas (PFA) include existing municipalities, as they were defined in 1997, communities inside the Washington Beltway, areas designated as enterprise zones, neighborhood revitalization areas, or heritage areas, and existing industrial land.[1]

Counties can designate PFAs to focus development into areas in accordance with comprehensive plan goals.[2] Conversely, jurisdictions may discourage development from occurring in certain areas to support environmental preservation, maintenance of viable agricultural land uses, or other comprehensive plan goals. Figure ES.3 illustrates Priority Funding Areas as well as protected lands and agricultural districts.

[1] The Priority Funding Areas Act of 1997 is described on MDOT's Department of Planning web site: http://www.mdp.state.md.us/fundingact.htm.

[2] The Maryland Department of Planning must certify County-designated PFAs before State funds can be used in them under this program.

Figure ES.3 Priority Funding Areas and Preservation Areas



Source: Maryland Department of Natural Resources.

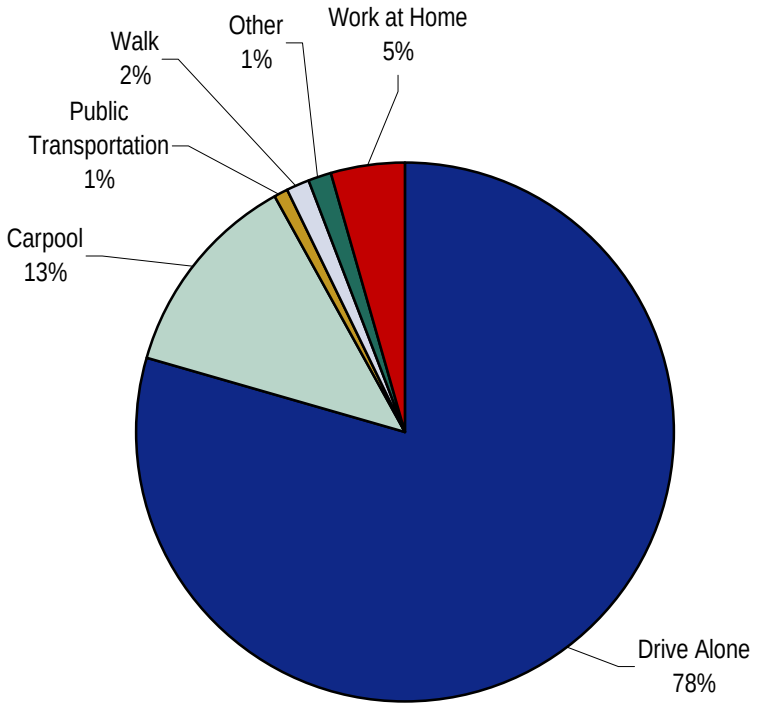
Protected Lands represent Federal-, state-, and county-owned lands, private conservation lands, easements, and agricultural districts.

Priority Funding Areas denoted as "Does Not Meet Criteria" indicate areas where the State and the County disagree on whether or not the PFA criteria are satisfied. Any proposals for projects in these areas will be referred to the Smart Growth and Neighborhood Conservation Coordinating Subcommittee for review and may require action by the Board of Public Works.

Transportation and Travel Trends

Over three quarters of the trips made in Southern Maryland are in personal vehicles (Figure ES.4). Carpooling accounts for 13 percent and public transportation accounts for one percent of work trips. About five percent of people in the region work at home. Walking, biking, or other methods account for approximately three percent of travel.

Figure ES.4 Mode of Travel to Work Southern Maryland
2000



Source: United States Census.

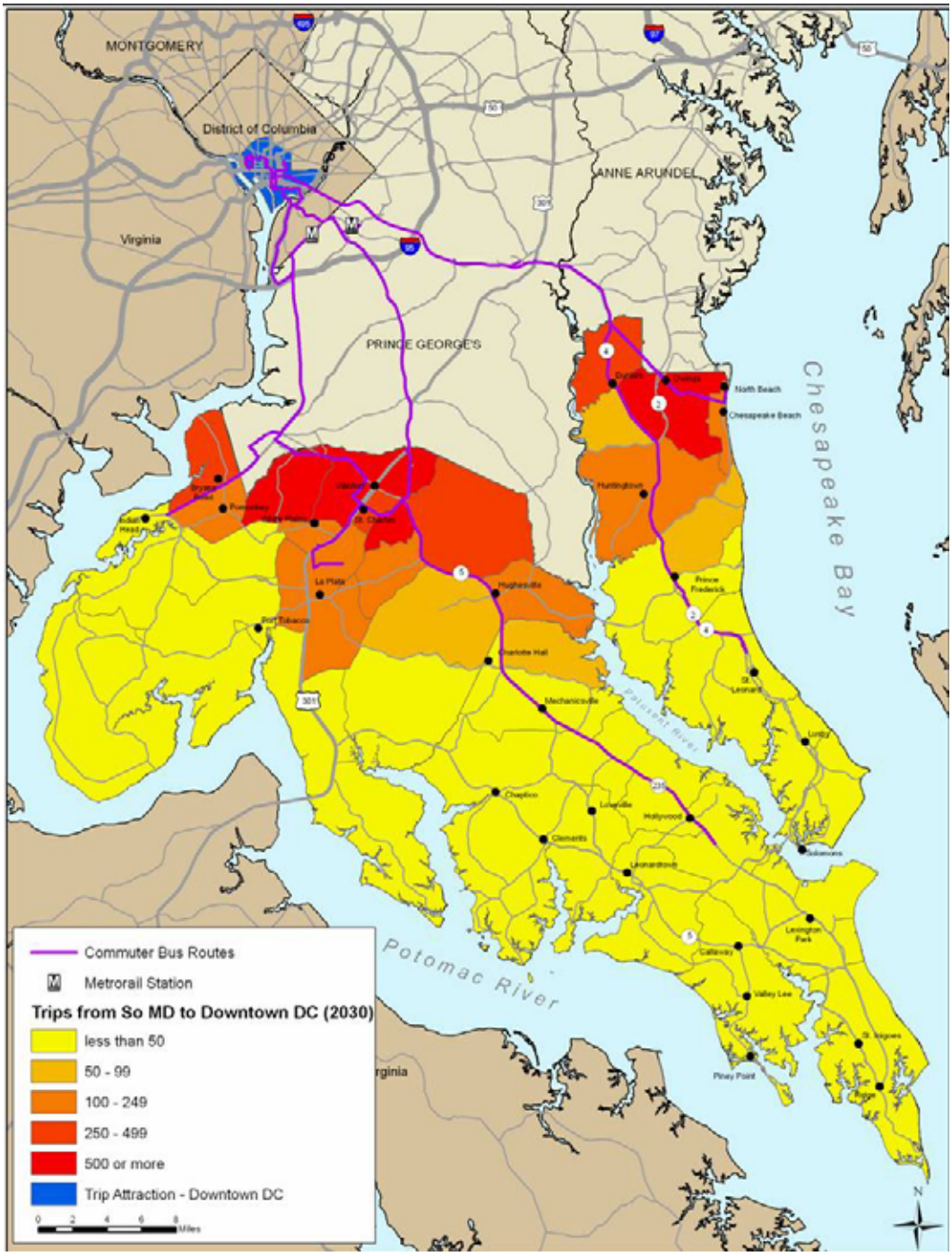
Commuting times in Southern Maryland are among the highest in the nation. In 2000, the average travel time to work in Southern Maryland was just over 35 minutes compared to a Maryland statewide average of 30 minutes and a U.S. average of 25 minutes. A slightly larger proportion of Southern Maryland commuters drive alone and a lower proportion use public transportation than for the nation as a whole. In addition, a somewhat higher percentage of workers in Southern Maryland work at home.

Projected 2030 Commuter Origins and Destinations

The Metropolitan Washington Council of Governments (MWCOG) regional model indicates that home-based work trips are projected to grow by more than 50 percent over the next 22 years. Certain areas show a large increase in transit mode share, such as from Southern Maryland to Downtown Washington, D.C., Arlington County, Montgomery County, and Western Prince George's County. These commute patterns can help identify areas for future commuter bus service.

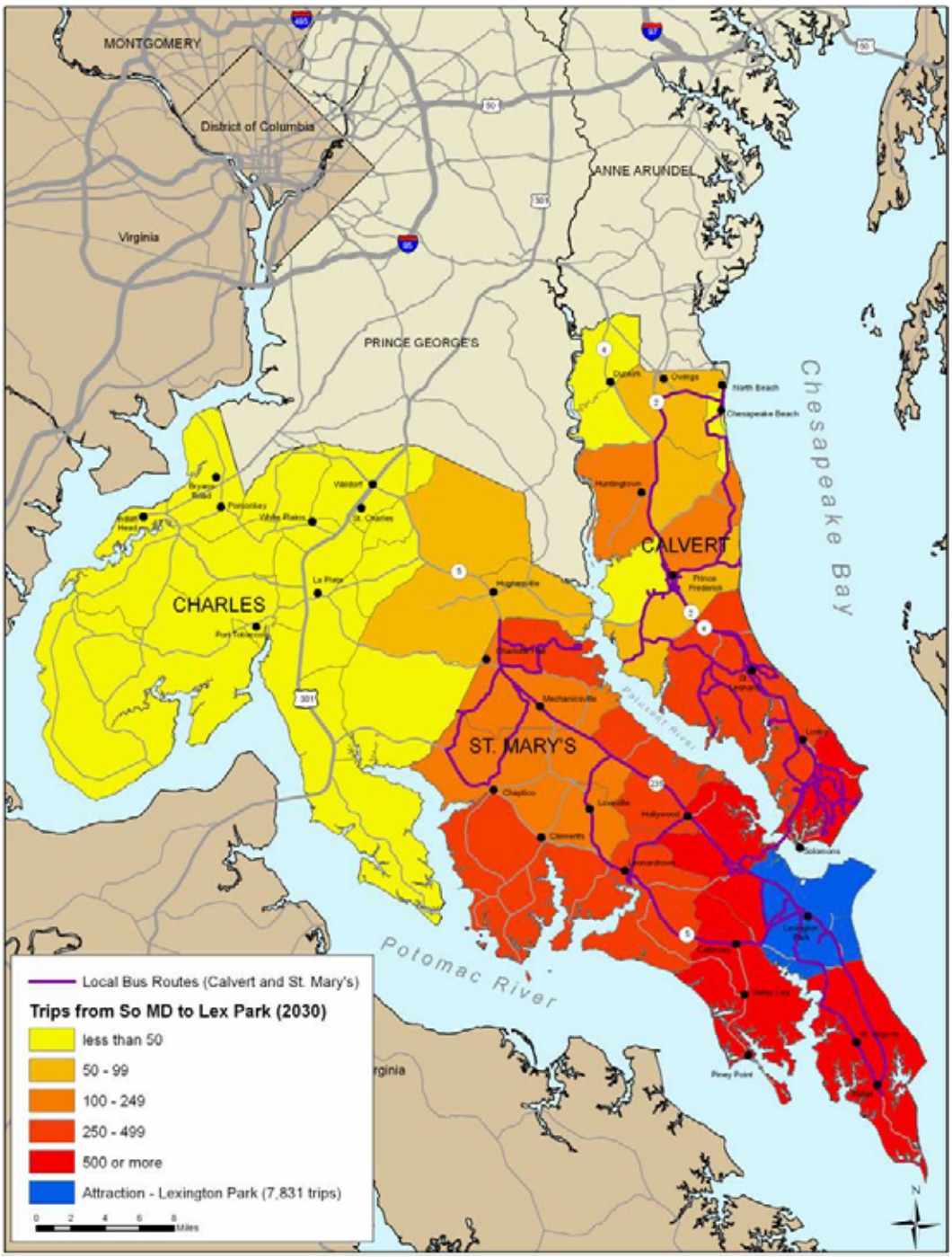
Figures ES.5 and ES.6 show travel demand (projected and A.M. peak trips) from Southern Maryland to downtown Washington, D.C. and Lexington Park, respectively. These figures clearly indicate the need for improving commuter bus services to the Washington, D.C. area, and illustrate the great potential for improved public transportation services to the Patuxent River Naval Air Station and the Lexington Park area.

Figure ES.5 Trips From Southern Maryland to Downtown Washington, D.C.
2030



Source: Metropolitan Washington Council of Governments.

Figure ES.6 Trips from Southern Maryland to Lexington Park
2030



Source: Metropolitan Washington Council of Governments.

ES.2 EXISTING TRANSPORTATION SYSTEM CONDITIONS

Highway System

The Southern Maryland highway network is the primary mode of transportation for both personal and freight travel within the State. Southern Maryland has 2,351 miles of roads, of which 1,591 miles are classified as rural and 760 miles are classified as urban. In 2006, there were 2.9 billion annual vehicle miles of travel (VMT) on Southern Maryland roadways. Table ES.2 presents centerline road mileage by functional class.

Table ES.2 Centerline Mileage of Southern Maryland Highways by Functional Classification
2006

Functional Class	County			Total
	Calvert	Charles	St. Mary's	
Urban				
Interstate	0.0	0.0	0.0	0.0
Other Expressway	3.4	0.0	0.8	4.3
Principal Arterial	14.8	31.0	18.2	64.0
Minor Arterial	9.4	28.9	8.7	47.0
Collector	28.8	33.7	17.2	79.8
Local	183.9	257.0	123.9	564.9
Subtotal Urban	*240.3*	*350.7*	*168.9*	*759.8*
Rural				
Interstate	0.0	0.0	0.0	0.0
Principal Arterial	31.9	32.2	16.0	80.1
Minor Arterial	3.6	25.7	50.1	79.5
Collector	68.1	141.2	138.5	348.3
Local	246.8	404.2	432.7	1,083.6
Subtotal Rural	*350.3*	*603.8*	*637.3*	*1,591.5*
Total	590.7	954.4	806.2	2,351.3

Source: Maryland State Highway Administration.

There are significant differences in traffic volumes carried on the various road systems. The expressway and principal arterial systems comprise just over 6 percent of the total roadway mileage, but carry over 53 percent of all vehicle traffic. By contrast, the region's collectors[3] and local roads comprise about 88 percent of total miles but carry only 31 percent of vehicle traffic. Despite their

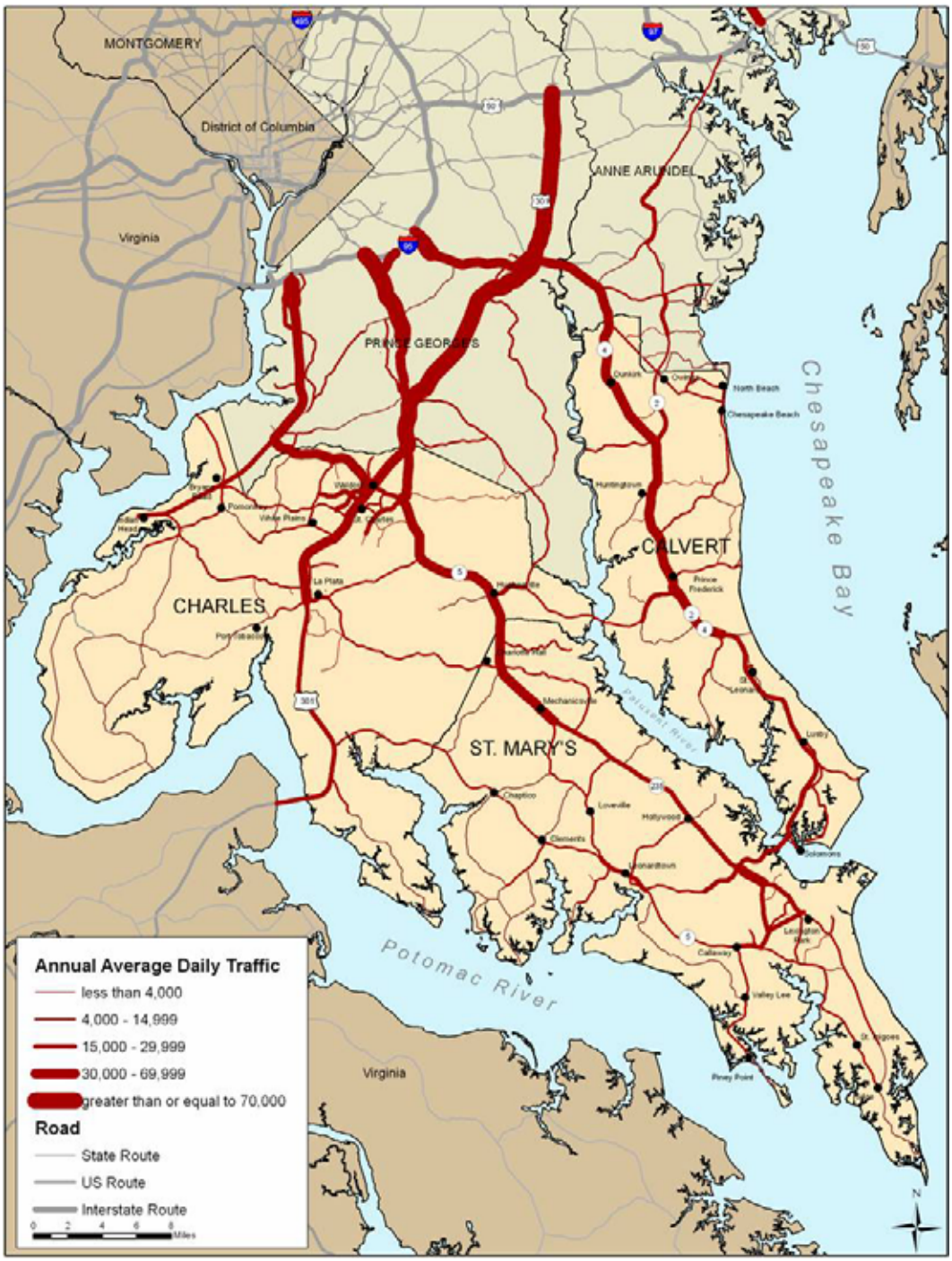
[3] The Federal Functional Classification System has two categories of rural collectors – major and minor. They have been combined in the table.

lower usage, lower volume roadways are important for a functioning transportation system and cannot be neglected.

Figure ES.7 shows traffic flows along State-maintained routes. The routes with Average Annual Daily Traffic (AADT) volumes of more than 30,000 vehicles per day include the following:

- U.S. 301 from La Plata to the Charles County / Prince George's County Line;
- MD 5 from south of Mechanicsville to the intersection with U.S. 301 north of Waldorf;
- MD 228 from U.S. 301 in Waldorf to MD 210 in Prince George's County;
- MD 2 / 4 from MD 264 to Sunderland and MD 4 from Sunderland to the Anne Arundel County line; and
- MD 235 from MD 4 to MD 237.

Figure ES.7 Average Annual Daily Traffic (AADT)
2006



Source: State Highway Administration.

Public Transportation System

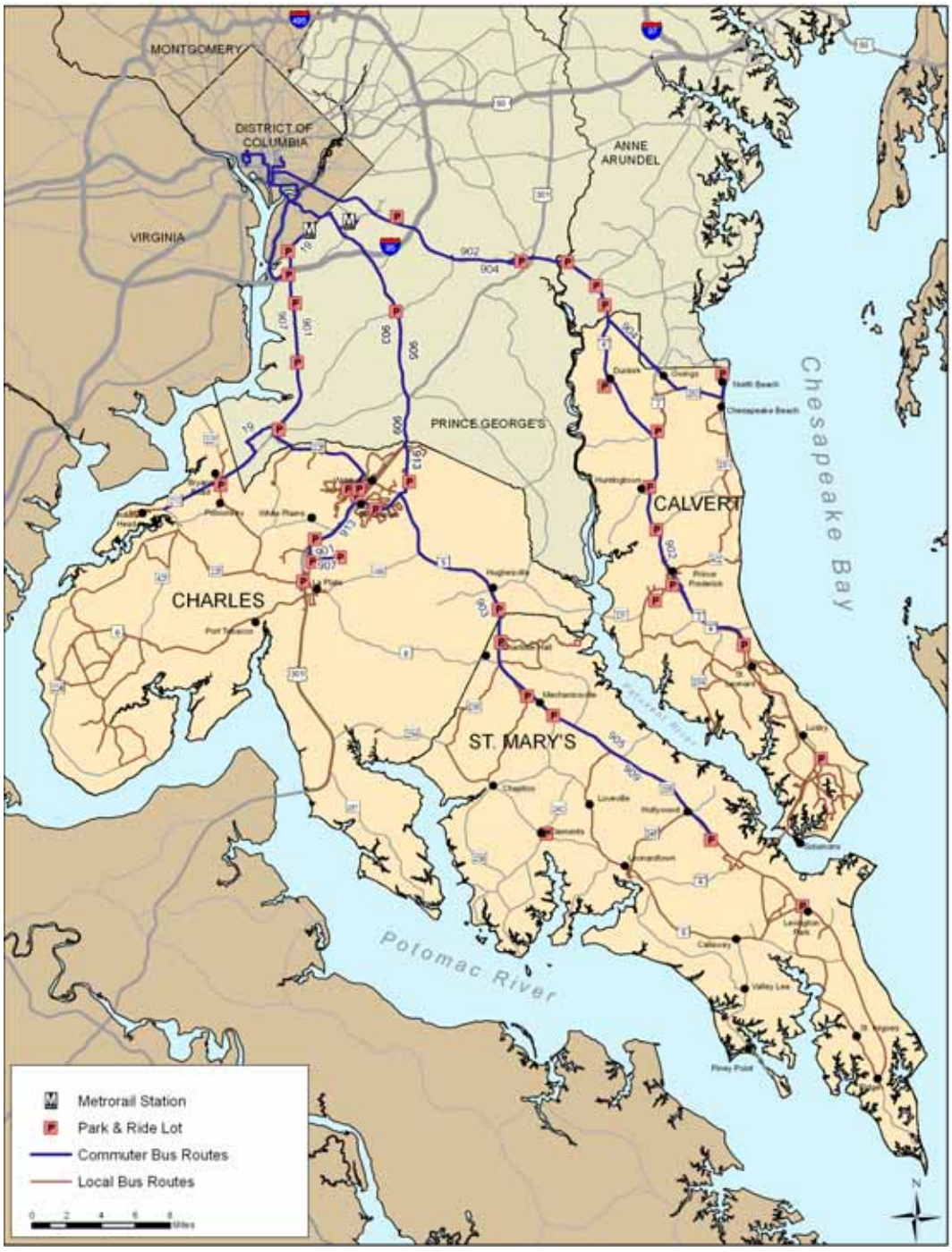
Long-distance commuting to the Washington, D.C. metropolitan area coupled with increasing congestion have increased demand for public transportation in Southern Maryland. There are five providers of transit service in the region (Table ES.3.)

Table ES.3 Transit Providers in Southern Maryland

Provider	Routes	Service Classification	Destinations
MTA	8	Commuter	D.C., Metro in Prince George's County
WMATA	1	Commuter	Metro in Prince George's County
Charles VanGO	10	Fixed/Deviated Fixed Routes, Suburban/Rural	Within Charles County, St. Mary's County
Calvert County Transit	6	Fixed/Deviated Fixed Routes, Suburban/Rural	Within Calvert County
St. Mary's SMS	9	Fixed/Deviated Fixed Routes, Suburban/Rural	Within St. Mary's

The Maryland Transit Administration (MTA) and the Washington Metropolitan Area Transit Authority (WMATA) provide fixed route commuter bus service to the region via nine routes that serve park-and-ride lots and other major attractors (Figure ES.8).

Figure ES.8 MTA and WMATA Bus Routes



Source: Maryland Transit Administration; Maryland State Highway Administration.

Each county in Southern Maryland provides a combination of fixed and deviated fixed-route services. Deviated fixed-route services typically pick up passengers along a fixed route, but allow drivers to deviate slightly to drop off riders.

ES.3 SOUTHERN MARYLAND GOALS AND OBJECTIVES

The mission of the Southern Maryland Transportation Needs Assessment is to support the development of a *multimodal transportation system* in Southern Maryland that enhances the *quality of life* for residents of the region through integrated transportation and land use planning, improved economic opportunities, and stewardship of the natural environment.

Five goals have been identified to support the mission:

1. **Mobility and Accessibility –** Support the continued development and economic growth of the region by providing multimodal transportation options to improve the mobility and accessibility of people and facilitate the movement of goods within the region.
2. **Safety and Security –** Provide a transportation system that minimizes loss of life, health, and property and allows for a response to natural or manmade emergencies.
3. **Efficiency –** Ensure the best use of existing and future transportation networks, resources, and infrastructure.
4. **Environmental Stewardship –** Ensure that transportation investments are planned and implemented in a manner that is sensitive to the natural, cultural, and social environment.
5. **Integrated Planning –** Ensure that transportation investments are consistent with land use, environmental, economic development planning, and decisions of local and neighboring jurisdictions.

The complete set of goals, goal definitions and objectives, are presented in Table ES.4. and are used as a framework for evaluating transportation projects.

Table ES.4 Southern Maryland Transportation Needs Assessment Goals and Objectives

Goal	Definition	Objectives
1. Mobility and Accessibility	Support the continued development and economic growth of the region by providing multimodal transportation options to improve the mobility and accessibility of people and facilitate the movement of goods within the region.	• Increase transportation choices available for commuting from and traveling within Southern Maryland. • Maintain and enhance levels of circulation (e.g., reduced congestion) on highways, arterials, and major collectors. • Maintain and enhance levels of service on transit. • Incorporate pedestrian and bicycle improvements into roadway improvement projects. • Improve access to and from activity centers for all modes and populations. • Improve connections between modes.
2. Safety and Security	Provide a transportation system that minimizes loss of life, health, and property and allows for a response to natural or manmade emergencies.	• Reduce the rate of crashes, fatalities, and injuries for motor vehicles, bicycles, and pedestrians. • Develop safety improvements for the region that are consistent with the Maryland Strategic Highway Safety Plan and County Traffic Safety Programs. • Support transportation improvements and programs that enhance the transportation system's capability to plan for and respond to natural and manmade security and emergency challenges. • Ensure that safety needs are considered in mobility improvements.
3. Efficiency	Ensure the best use of existing and future transportation networks, resources, and infrastructure.	• Increase person movement capacity of highway and transit modes. • Preserve and maintain critical existing infrastructure for maximum system performance. • Protect highway functional capacity by implementing access control as appropriate. • Improve the availability and quality of real-time information to increase the ease of use and attractiveness of both highways and transit. • Develop cost-effective transportation improvements that maximize the use of available resources.
4. Environmental and Cultural Stewardship	Ensure that transportation investments are planned and implemented in a manner that is sensitive to the natural, cultural, and social environment.	• Maintain air quality in the region by providing alternatives to single-occupant vehicle travel and the use of clean air technology. • Minimize the impact of transportation investments on significant natural resource areas, watersheds, and habitats. • Identify and preserve transportation infrastructure with historic, cultural, social, and/or recreational value. • Minimize the contribution of transportation investments to air, water, and noise pollution in Southern Maryland.
5. Integrated Planning	Ensure that transportation investments are consistent with environmental, economic development planning, and decisions of local and neighboring jurisdictions.	• Develop transportation investments that serve established Maryland communities and support designated growth areas (Priority Funding Areas). • Coordinate with existing and ongoing land use, environmental and economic development planning efforts. • Promote and support dynamic regional and intermodal activity centers. • Plan and develop transportation improvements cooperatively with neighboring jurisdictions and other relevant agencies.

ES.4 NEEDS ANALYSIS

A primary purpose of this effort is to provide a comprehensive understanding of transportation needs within Southern Maryland. The needs analysis has been organized by transportation mode around a set of policies and strategies that can improve the functioning of all transportation modes in the region. Where possible, specific transportation projects that can help address growing traffic and congestion in Southern Maryland have been identified. Other policies and strategies can be used to improve transportation without physical roadway construction.

Highway and Bridge

The toolbox of highway-related policies and strategies recommended for southern Maryland includes:

- Access management;
- Operational improvements;
- Travel demand management;
- Ridesharing, including carpooling and vanpooling;
- Safety strategies; and
- Strategic capacity expansion.

These strategies can be related, integrated, and combined with other non-highway strategies.

Access Management

The roadway network serves various functions, from carrying through traffic at high speeds to handling slower moving local traffic. Access management refers broadly to the systematic control of access to roadways and varies according to the roadway's function. Access control is the highest form of access management and refers to the prohibition of direct private access to an arterial. Access management employs the following general strategies:

- Maintaining proper spacing between signals and interchanges;
- Managing driveway location, spacing, and design;
- Adding exclusive turning lanes, either at intersections and driveways, and utilizing continuous left or right-turn lanes where appropriate;
- Installing median treatments, including raised medians, to prevent movements across a roadway;
- Constructing service or frontage roads and providing connectivity between parcels such that a local roadway network can be developed and maintained

that serves local trips between development pods and neighboring, compatible land uses; and

- Close coordination between State and local governments on land use and transportation planning decisions, plans, programs, and development review.

Highway Operations

Maryland has a set of strategies designed to maximize the efficiency of the transportation system using operational and technological strategies. The Coordinated Highways Action Response Team (CHART) is Maryland's integration of traveler information, incident management, and ITS technology. It includes five elements:

- **Traffic and Roadway Monitoring –** Real time data collection;
- **Incident Management –** Responding to incidents quickly and efficiently;
- **Traveler Information –** Provide real time information to travelers;
- **Traffic Management –** Strategies to control vehicular movements, increase the efficiency of the highway system, and encourage alternate modes of travel; and
- **System Integration and Communications –** Interagency and intermodal coordination and data sharing.

CHART recently completed a Rural Management and Operations/Intelligent Transportation Systems (M&O/ITS) Strategic Deployment for the State of Maryland. The plan identifies several strategies for Southern Maryland that should be implemented as soon as practical, including:

- Creating a new CHART traffic operation center (TOC) in Southern Maryland;
- Deploying dynamic message signs (DMS), closed circuit television cameras, roadway weather information systems, and traffic speed detectors at appropriate locations;
- Installing emergency evacuation guide signs; and
- Expanding CHART's freeway incident traffic management plan into Southern Maryland.

Different types of operational strategies can be used to address recurring and nonrecurring congestion (Table ES.5).

Table ES.5 Types of Congestion with Usual Mitigation Strategy

Type of Congestion	Representative Causes of Delay	Mitigation Strategy
Recurring	Infrastructure capacity shortfalls	Capacity increases
	Interchange bottlenecks	
	Weave and merge friction	
	Non-optimized traffic signal timing[a]	Systems operations and management
Nonrecurring	Breakdowns and crashes	
	Construction work	
	Weather	
	Vehicle Mix	

Source: Maryland CHART Nonconstrained Deployment Plan, 2006.

[a] Though non-optimized signal timing will lead to recurring congestion, it is addressed through operations and management, not new capacity.

Some intersection problems can be addressed using operational improvements such as:

- Changing the type of traffic control, such as from stop signs to signals or roundabouts;
- Adjusting signal timing at a single intersection or series of intersections (signal interconnects);
- Adding exclusive turning lanes;
- Grade separation; and
- Removing conflicting movements, such as forbidding left-turn movements.

As a matter of policy, it is recommended that ITS and systems management features be added to the transportation system, particularly as components of roadway reconstruction projects. Sensors and cameras for real-time monitoring of traffic conditions, combined with providing the information to motorists via radio, Internet, and dynamic message signs can help individuals avoid delays and move traffic onto less congested facilities.

Travel Demand Management and Ridesharing

Travel demand management (TDM) strategies are relatively low-cost solutions to reduce vehicular traffic at a regional level. These strategies include or are related to carpools, vanpools, biking, walking, telecommuting, alternative work-hour or workplace programs, and parking management.

Ridesharing is already in practice in Southern Maryland, with the SHA, MTA, and local governments providing ridesharing lots both exclusively for carpooling as well as with transit service (park-and-ride). Ridesharing helps to reduce congestion and VMT while providing more modal options and accessibility. Because rideshare passengers tend to have relatively long commutes, mileage

reductions can be significant. Rideshare programs typically reduce up to 8.3 percent of commute VMT, up to 3.6 percent of total regional VMT, and up to 1.8 percent of regional vehicle trips.

Safety

In 2006 there were 5,124 crashes on Southern Maryland roadways causing 68 fatalities and 2,994 serious injuries. The resulting human and economic consequences are unacceptably high. Reducing crashes, injuries, and deaths is a high priority for the region and for the State as whole, which is indicated not only in statewide priorities via plans such as the Maryland Transportation Plan, but also through county and local plans.

Maryland's Strategic Highway Safety Plan (SHSP) is a working document that provides a framework for reducing highway fatalities and serious injuries on **all** public streets and highways. The SHSP applies the 4E's of highway safety: Enforcement, Education, Engineering, and Emergency Medical Services, across the following emphasis areas:

- Reduce Impaired Driving;
- Improve Information and Decision Support Systems;
- Eliminate Hazardous Locations, including:
  - Keep Vehicles on the Roadway;
  - Improve Safety at Intersections;
  - Create Safer Work Zones; and
  - Make Walking and Crossing Streets Safer.
- Increase Occupant Protection;
- Improve Driver Competency, including:
  - Reduce Distracted Driving;
  - Enhance Safe Driving for Older Drivers;
  - Develop Safe Young Drivers;
  - Improve Motorcycle Safety; and
  - Make Truck and Bus Travel Safer.
- Curb Aggressive Driving; and
- Improve Emergency Response System.

Current SHSP efforts are focused on creating regional implementation plans based on crash data analysis. The Tri-County Council for Southern Maryland is playing a key role in this effort by facilitating cooperation and coordination of the SHSP implementation efforts among Calvert, Charles, and St. Mary's

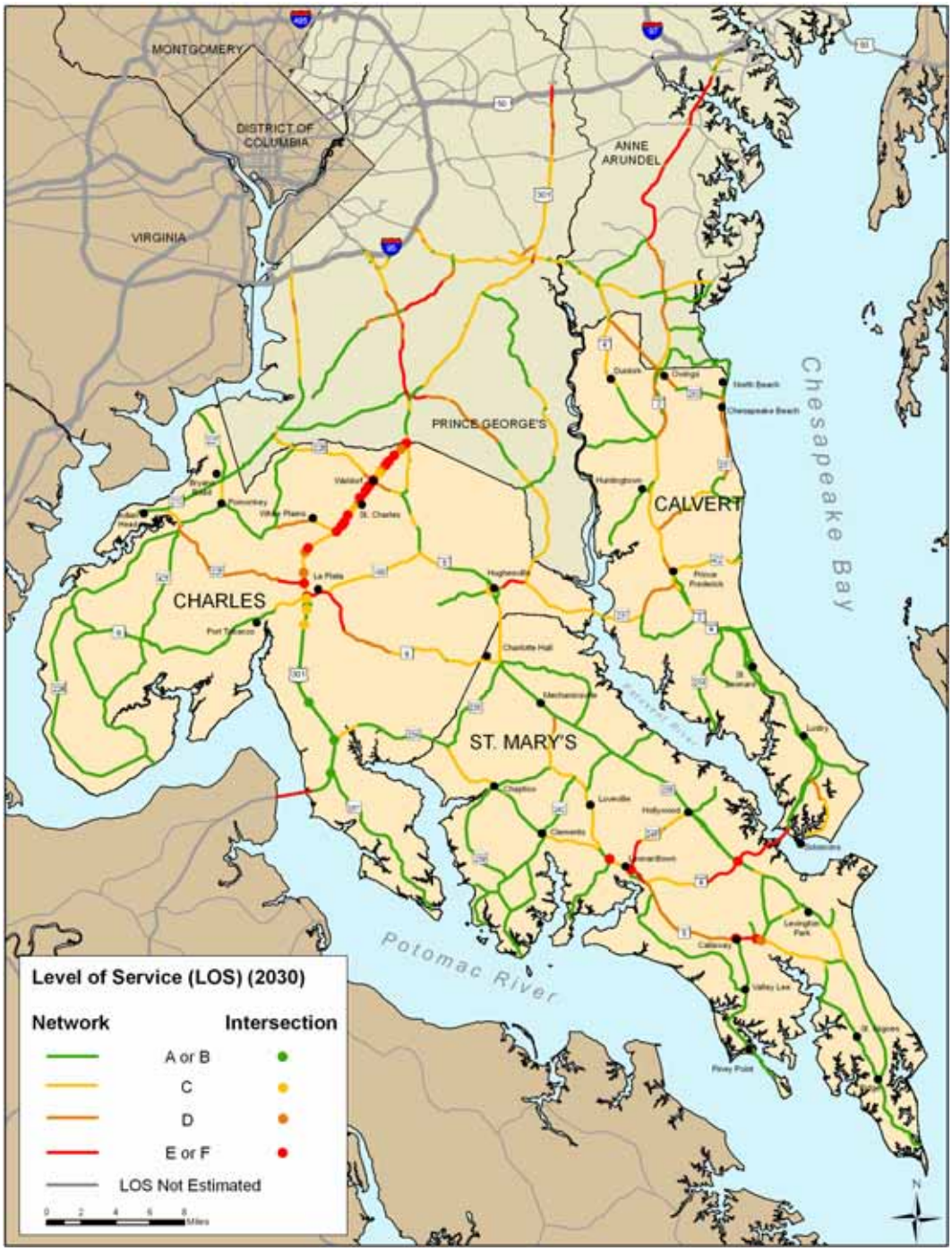
counties and by organizing the political support required to implement the identified behavioral and infrastructure safety priorities for the region.[4]

Strategic Capacity Expansion

Highway level of service (LOS) has been used to identify current and future congestion deficiencies. These deficiencies indicate the potential need for new capacity or other highway improvements and strategies. SHA considers LOS E or F to be an unacceptable level of service for a State highway. Figure ES.9 presents the LOS for mainline highway segments and selected intersections in the study area for 2030. Segments and intersections that have reached LOS E or F are colored in red. The calculations are based on the best available data and methods from the SHA, MWCOG travel demand model, and the Highway Capacity Manual procedures.

[4] Maryland Safety Summit, November 2007.

Figure ES.9 2030 Level of Service



Source: Cambridge Systematics, Inc. with data from State Highway Administration.

Public Transportation

Several strategies to improve existing transit service in Southern Maryland were identified for the Needs Assessment, including:

- Improve Local Transit Service and Coordination;
- Expand Commuter Bus Service and Park-and-Ride Lots;
- Enhance Transit Information and Dissemination; and
- Implement Feasible High-Capacity Transit Options.

Improve Local Transit Service and Coordination

Among the routes provided by the three agencies operating transit services in Southern Maryland, only two currently operate across county borders: VanGO's Waldorf/Charlotte Hall Connector (Charles to St. Mary's) and STS's Calvert Connection (St. Mary's to Calvert). In recent years these transit agencies have made progress by providing more coordinated service to users, but long trip distances and transfer requirements make it difficult for local transit systems to attract choice riders.

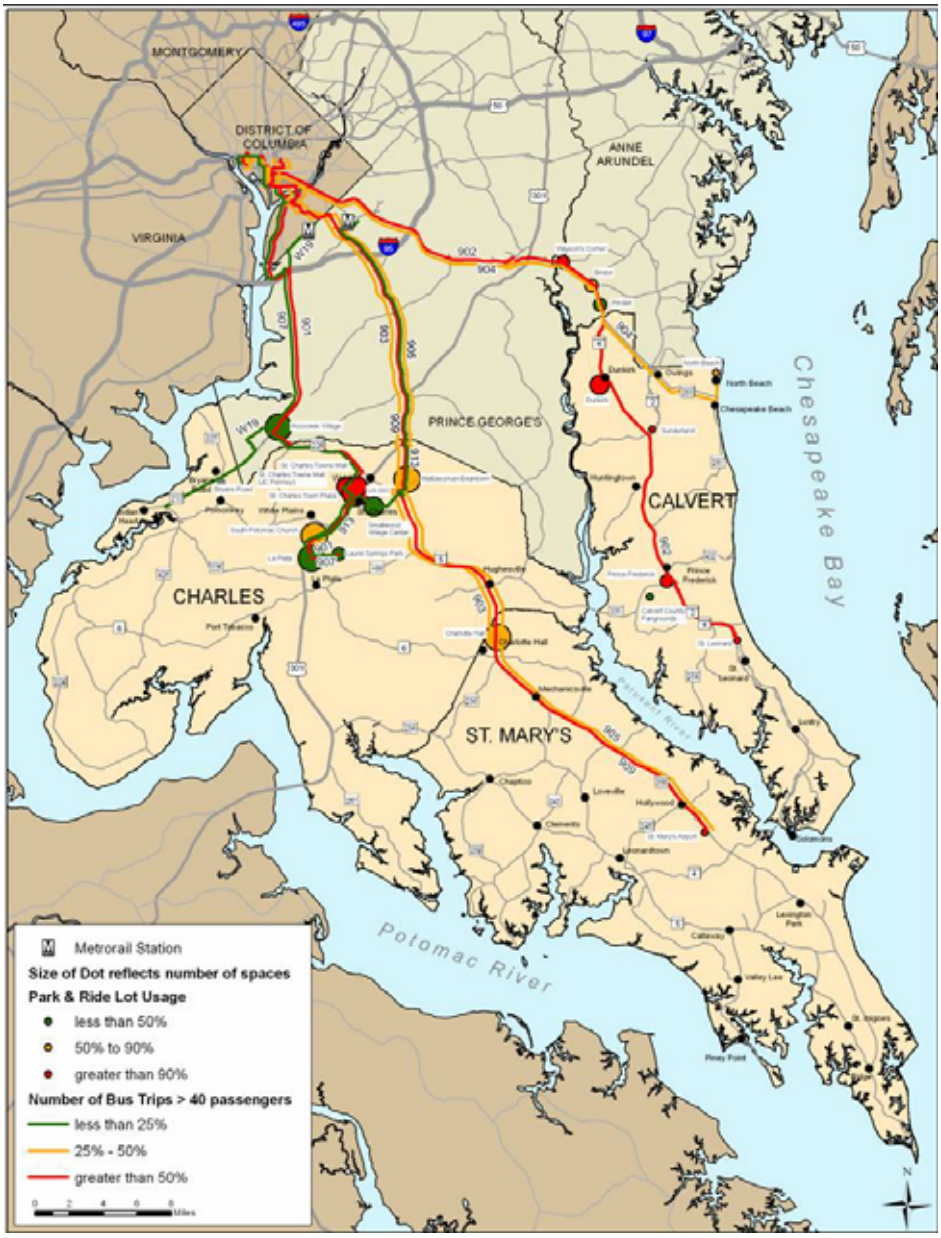
Expanded service options for local transit are likely to become increasingly viable as Southern Maryland continues to grow and as land use patterns become more mixed and dense. Options include:

- Improve Convenience for Intraregional Work Trips;
- Regionalize Local Bus Routes; and
- Coordinate Transit with Social Service Agencies.

Expand Commuter Bus Service and Park-and-Ride Lots

Commuter bus routes and the park-and-ride lots they serve are a key component of Southern Maryland's transportation system. These two components were evaluated by examining the extent of use and crowding on buses and at park-and-ride lots. Figure ES.10 displays route and park-and-ride level of service. Routes and lots that are colored red are used more intensively and are more likely to be crowded.

Figure ES.10 Commuter Bus Park-and-Ride Level of Service



Source: Maryland Transit Administration.

There are several potential methods to improve service and attract more riders to commuter buses, including:

- Coordinating transfers to and from other transit services;
- Implementing operational improvements (e.g., transit signal priority) to reduce delay at signals;

- Utilizing innovative lane designs on shoulders or medians to allow for free movement of buses in congested conditions (e.g., dedicated busway); and
- Addressing parking shortages by introducing feeder services such as shuttles, deviated fixed routes, and subscription bus service in low-density areas.

Based on a detailed analysis of home-based work trips originating in Southern Maryland, three transit corridors will benefit from improved services:

- **Charles County to Prince George's County –** Though current ridership numbers on MTA route 913 between White Plains and the Suitland Federal Center are lower than other Southern Maryland routes, the region's long-term needs will require more transit between Charles and Prince George's counties.
- **Calvert County to Prince George's County –** Over 21 percent of Calvert County-based workers commute to Prince George's County (2000 Census).
- **Enhance Service along MD 5/U.S. 301 –** MTA's eight bus routes currently carry just over 7,000 passengers per day, with 4,695 of them in the U.S. 301 Corridor. The five MTA routes that operate in that corridor are projected by 2025 to have, without any major enhancements to the existing service, 6,800 riders.[5]

As the commuter bus system sees increased ridership, additional park-and-ride facilities will be required. Many of the park-and-ride lots in Southern Maryland are well-utilized, and MTA already has plans to provide an additional 3,000 spaces by 2011. Southern Maryland and the MTA will need to regularly review the use of both park-and-ride lots and buses to ensure that sufficient capacity is available to meet rider demand.

Additional recommendations to improve the existing park-and-ride lots in Southern Maryland include:

- Improved amenities at bus stops, such as shelters and improved information (see below);
- Local bus service to park-and-ride facilities and coordination with MTA and WMATA bus route schedules;
- Encourage multiple uses of park-and-ride facilities, including ridesharing or off-hour uses; and
- Encourage sidewalk and bikeway connectivity from park-and-ride lots to surrounding areas.

[5] MD 5 / U.S. 301 Transit Service Staging Plan, October 2004.

Enhance Transit Information and Dissemination Techniques

Providing accurate and easy to understand information about available transit options is important to attracting and maintaining transit ridership. Potential improvements to customer information include:

- Enhance wayfinding signage to park-and-ride facilities;
- Provide clear transit information such as routes served and bus departure times at park-and-ride facilities, on the Internet, and by telephone.
- Create consistent signage for local transit systems.
- Make information user-friendly.

Implement Feasible High-Capacity Transit Options

Given its growing population and traffic congestion, Southern Maryland is exploring the potential to add a high-capacity transit service. Light rail or bus rapid transit (BRT) systems can move more people at greater speeds than current transit options can. Although current ridership on the commuter bus system does not yet justify high-capacity service, planning efforts are required now to ensure that such service can be implemented when justified by ridership.

In October 2004, MTA completed the *MD 5/U.S. 301 Transit Service Staging Plan*, which outlined four alternatives for staged implementation of higher capacity transit in the corridor. The four alternatives are: Enhanced Commuter Bus; BRT (Moderate Level); BRT (High Level); and Light Rail Transit. MTA is currently conducting a transit corridor right-of-way preservation study to identify land needs for a potential high-capacity transitway alignment, stations, and park-and-ride lots along the 18-mile corridor between the Branch Avenue Metrorail Station in Prince George's County and Waldorf in Charles County. The study is scheduled for completion in 2009 and will provide information for Charles and Prince George's counties to use to protect right-of-way for a high-capacity transit system. MTA used a similar approach in the past and is currently conducting a planning study for a transitway in Montgomery and Frederick Counties for which land has been set aside through a similar process.

In addition to the ongoing corridor right-of-way preservation study, the MTA is beginning a study of the feasibility of commuter rail service between Washington, D.C. and St. Mary's County (Patuxent River Naval Air Station).

Bicycle/Pedestrian

The implementation of appropriate policies and strategies can increase bicycle and pedestrian activity in Southern Maryland. Increased bicycling and walking results in significant transportation and public health benefits and, in the case of bicycle tourism in Southern Maryland, provides direct economic benefits as well.

The recommendations in this report are consistent with MDOT's *20-Year Bicycle and Pedestrian Access Master Plan*, with the Tri-County Council for Southern

Maryland's *Southern Maryland Regional Trail and Bikeway System Study,* and with various County comprehensive plans.

Policies and strategies to promote bicycle and pedestrian activity relate to improved facilities, improved connectivity, improved safety, and land use that promotes a better quality of life.

Land Use

Preparing for the expected growth in Southern Maryland through rational, ordered land use planning will minimize required transportation system expenditures and support multimodal transportation systems. Many of the most densely populated areas of Southern Maryland have developed according to auto-oriented land use principles. This style of development has contributed to the high levels of traffic congestion currently experienced by many residents in the region. Future development and redevelopment should be accommodated through Smart Growth principles to promote activity centers and more dense development in designated growth areas, or Priority Funding Areas and to mitigate potential negative environmental impacts. A balance in transportation and land use is essential to maintain a healthy quality of life in Southern Maryland.

The following land use policies and strategies will enable the region to meet the thresholds of population and land use densities required to create highly functioning and progressive transit systems.

- **Regional Growth Management –** Develop land use plans that are integrated with transportation plans.
- **Focus on Development Nodes –** Continue to focus development in Priority Funding Areas (PFA) / Activity Centers / Mixed Use Developments to concentrate trip origins and destinations.
- **Develop Design Guidelines –** Develop transit-supportive design guidelines that promote beneficial suburban design.
- **Transit-Oriented Development (TOD)/Smart Growth –** Focus land use policies to support TOD and Smart Growth, including intensification of development along transit routes.

ES.5 PROJECT EVALUATION

Many of the transportation needs identified can be addressed by implementing policies and strategies or by strategically building improved physical infrastructure or implementing operational improvements. Because the cost of addressing these identified needs are greater than available resources, some means to determine where the limited resources should best be applied is needed. This section outlines the methodology used to identify and evaluate these projects.

Evaluation Methodology

Project Selection

Projects evaluated for the Southern Maryland Transportation Needs Assessment come from these sources:

- MDOT's 2008 CTP – all projects are included;
- 2007 Tri-County Council's priority letter – all projects are included, with the exception of:
  - Intersection signalization projects;
  - Streetscape projects;
  - Sidewalk projects;
  - Projects to add turn lanes to specific intersections; and
  - Other projects that are very local in nature, related to improving vehicle fleets, or similar items;
- SHA Highway Needs Inventory (HNI) – all "Primary" projects and "Secondary" projects that are also listed in each of the county's priority letter are included;
- County projects of regional significance;
- Public input; and
- Any roadway section projected in this Needs Assessment to experience a level of service (LOS) of E or F by the year 2030.

Project Evaluation

Projects within each county are evaluated on how well they address the study's goals and objectives (Table ES.4). The evaluation process was performed collaboratively by staff from MDOT, SHA, MTA, MdTA, and the Tri-County Council for Southern Maryland.

Each project is evaluated as meeting, partially meeting, or minimally addressing each of the study goals. The degree to which a project "meets" a goal is contingent upon whether or not the project affects each objective within the goal, as well as the magnitude of that effect. The magnitude, in turn, is a function both of the project design and severity of the need it is addressing.

Environmental and Cultural Stewardship: The environmental and cultural goal must be addressed during project planning, engineering, and construction. Projects are not individually evaluated on their potential impact in this area; rather each project must be planned and constructed in a manner that minimizes its social, environmental, and cultural impact.

Table ES.6 presents the set of decision rules used to evaluate the projects.

Table ES.6 Decision Rules for Project Evaluation Analysis

Goal	Decision Rules
Mobility and Accessibility	• Projects that meet this goal provide significant circulation or mobility benefits to at least one mode – highway, transit, bike/ped; increase transportation choices or improve modal connections; and improve access to major activity centers. Projects on the primary system generally meet this goal. • Projects that partially meet this goal provide circulation benefits to one mode or improve access and linkages to activity centers. • Projects that minimally address this goal provide limited circulation benefits or only limited access to activity centers or connections between modes.
Safety and Security	• Projects that meet this goal are significantly likely to reduce crashes or provide for emergency response.
Efficiency	• Projects meet this goal if they significantly increase the person movement capacity of highways or transit service (persons per mile, etc.) or provide access controls or limits or achieve high scores on each criteria or goal, relative to their cost.
Environmental and Cultural Stewardship	• The environmental and cultural goal must be addressed during project planning, engineering, and construction. Projects are not individually evaluated on their potential impact in this area; rather each project must be planned and constructed in a manner that minimizes its environmental and cultural impact.
Integrated Planning	• Projects that meet this goal serve established communities (Priority Funding Areas); link existing land use with environmental and economic development planning efforts; and are consistent with comprehensive plans.

To see evaluations for the projects, please see the tables in Section 5.0 in the main document.

ES.6 FUNDING

Southern Maryland Transportation Funding Needs

Between $6.0 and $7.3 billion in transportation system needs have been identified through the Southern Maryland Transportation Needs Assessment. Of this total, between $2.1 and $2.4 billion has been identified as the top regional priorities, and another $3.3 to $4.1 billion has been identified as county projects of regional importance.

Table ES.7 Total Funding Needs in Southern Maryland

Level of Need Established	Low	High
Top Regional Priorities	$2,140	$2,430
County Projects of Regional Importance	$3,282	$4,136
Other Important Projects	$602	$687
Total	$6,024	$7,254

The $2.1 to $2.4 billion does not include funding for the MD 5/U.S. 301 high-capacity transit alignment currently under study. The capital costs for the proposed high-capacity transit service are likely to vary substantially, depending on the type of service developed (bus rapid transit or light rail) and the number of significant structures (bridges, overhead structures, tunnels, etc.) that are required for the proposed alternative. Some portion of the total cost may be available through the Federal New Starts program, depending on the level of benefits that are expected.

Table ES.8 presents rough ranges of costs for a typical service that requires few major structures. Bus rapid transit costs depend primarily on the extent to which the service will require an entirely separate right-of-way or will operate at times in mixed traffic. Costs for either system type will depend on the number of stations developed. These costs are for informational purposes only – detailed cost estimates will be developed as part of the Southern Maryland Transit Corridor Preservation Study.

Table ES.8 Typical Cost Ranges for BRT and Light Rail Transit Projects

	Cost per Mile (Millions)		Capital Cost for 24-Mile Alignment (Millions)		Annual Operating Costs (Millions)
Service Type	Low	High	Low	High	
Bus Rapid Transit	$5	$15	$120	$360	$27-$29
Light Rail Transit	$30	$50	$720	$1,200	

Source: Cambridge Systematics analysis of existing new starts-funded bus rapid transit and light rail projects completed within the last five years. Costs do not include preliminary engineering or right-of-way costs.

Funding Gap

The Maryland DOT has estimated that Southern Maryland can be expected to receive between $640 and $770 million between 2012 and 2030 in 2008 dollars (the year of project cost estimates). This amounts to roughly 30 percent of the top regional priority needs identified in the Needs Assessment and about 10 percent of the total need, again excluding the cost of the proposed high capacity transit alignment.

Most of the top regional priority projects identified by this Needs Assessment are large projects (a new span of the Thomas Johnson Memorial Bridge and a bypass around the Waldorf area) that will be challenging to fund, given the current resources available to the region and the State.

ES.7 RECOMMENDATIONS

The State of Maryland has an existing process for establishing local priorities through county and regional priority letters and public meetings with political

leaders in each county and region, known as the Secretary's Annual Capital Program Tour. The three counties of Southern Maryland have been working together for many years to develop joint priorities for the region and submit a Tri-County Council's priority letter each year as part of the capital programming process.

The recommendations presented here are not intended to supersede the existing process within Maryland for establishing recommendations and priorities. The Needs Assessment does lend analytic support to the existing set of priorities outlined in the Tri-County Council for Southern Maryland's priority letter, and the specific support for these recommendations are noted throughout this section.

In addition to the projects identified, these recommendations also list strategies and policies that can and should be implemented to support the development of the transportation system in Southern Maryland. These policies and strategies represent best practices in transportation system development that are appropriate for Southern Maryland and help ensure that future capital investments will provided the expected benefits.

Land Use Policies and Strategies

Preparing for the expected growth in Southern Maryland through rational, ordered land use planning will minimize required transportation system expenditures and support multimodal transportation systems. Many of the most densely populated areas of Southern Maryland have developed according to auto-oriented land use principles. This style of development has contributed to the high levels of traffic congestion currently experienced by many residents in the region. **It is strongly recommended that future development and redevelopment be accommodated through Smart Growth principles to promote activity centers and more dense development in designated growth areas, or Priority Funding Areas and to mitigate potential negative environmental impacts. This should be accomplished using transit-friendly land use strategies to allow for transit services to be expanded and improved in step with this new development and allow for transportation corridors, including highways, to be maintained in a safe and efficient manner. A balance in transportation and land use is essential to maintain a healthy quality of life in Southern Maryland. This includes key elements such as multimodal transportation planning, integrated planning, promoting transit and non-motorized transportation uses (hiker/biker trails), ridesharing, and access management.**

There are four fundamental land use criteria that must be in place to enable a successful transit program.[6] These are:

[6] Guidelines For Transit-Sensitive Suburban Land Use Design, by Edward Beimborn, Harvey Rabinowitz, and Peter Gugliotta, The Center for Urban Transportation Studies, The University of Wisconsin Milwaukee.

1. **Population Size –** Are the number of people who live and work along the transit route sufficient for transit service?
2. **Density –** Is the population sufficiently concentrated to provide a market for transit services?
3. **Concentrated Locations –** Are the locations of land uses concentrated near potential transit stops?
4. **Mixed Use –** Are there a mix of land uses to minimize travel to frequently used places?

The following **land use policies and strategies, if implemented, will enable the region to meet the thresholds of population and land use densities required** to create highly functioning and progressive transit systems.

Regional Growth Management

Regional growth management efforts seek to influence urban form at a regional level by using a regional agency to support local planning efforts. The recommendations for implementing regional growth management include:

- **Develop a Regional Growth Strategy Led by the Tri-County Council for Southern Maryland.** Currently, each county has their own comprehensive plan. Though these are critical to ensuring that development occurs in accordance with each county's specifications, Southern Maryland could develop a land use and growth vision to be used as an overall guide. This vision would help ensure the use of a common set of principles for all land use planning within the region and an understanding of the region's development capacity.
- **Continue to develop and implement access management strategies.** Each of the counties of Southern Maryland has access management policies in place. These will need to continue to be developed as part of the comprehensive planning process, corridor planning, and review of new developments. Given the growth expected in Southern Maryland, it is especially important that new developments provide an effective local network so that the State highway system can effectively provide for interregional and through trips.

Focus on Development Nodes

Development nodes are areas of focused development, such as population concentrations, major employment centers, and commercial districts.

- **Focus Majority of Development in Activity Centers/Town Centers.** Land use patterns are one of the largest influences on trip-making. Concentrating new development can positively impact intraregional travel and enhance the viability of alternative modes of transportation.
- **Ensure a Mix of Uses within each Node.** Transit, walking, and biking to and within an activity center is easier when people have access to multiple types of development. The concentration of various types of activities also improves transit viability.

Develop Design Guidelines

Design guidelines focus at the site level, facilitate pedestrian access to transit, and allow for efficient transit operations.

- **Focus on transit when conducting development and site plan reviews.** As the counties conduct development reviews, they should include criteria to consider transit accommodation, from both the customer and operator perspectives.
- **Focus on transit customer needs.** Accessibility of transit service should be considered when reviewing plans for new developments or changes to existing developments.
- **Focus on transit operator needs.** Efficient transit operations require maneuverability. Appropriate design ensures that transit vehicles are accommodated and can quickly enter and leave bus stops and transit stations.

Transit-Oriented Development/Smart Growth

Transit-Oriented Development (TOD) initiatives generally operate at the *community* level, and aim to create neighborhoods that are compact, mixed-use, pedestrian-friendly, and near transit stops. TOD and smart growth recommendations include forming partnerships between land use planners and transit operators and developing planning studies in priority areas.

- **Form partnerships between land use planners and transit operators.** Land use planners should work closely with local bus operators, MTA, and WMATA to ensure that land use plans are consistent with transit plans.
- **Develop planning studies in priority areas.**[7] Conceptual plans should be prepared for priority areas that focus on transit-oriented development and smart growth principles.

Transit

Policies and Strategies

Primary transit strategies and policies for Southern Maryland to pursue have been identified in the areas of park-and-ride lots, commuter bus service, local transit coordination, transit information and dissemination, and high-capacity transit service. **To fully realize the potential of transit to improve the quality of life in Southern Maryland, the land use strategies outlined in the previous section must be implemented.**

[7] Charles County Comprehensive Plan, 2006.

Expand / Improve Commuter Bus Service

Commuter bus service can be expanded by adding trips to existing routes and by adding new routes. Operational improvements can improve travel time reliability for bus riders and can provide a competitive advantage over use of a personal vehicle. Increasing the ridership on the commuter bus system improves the performance of the regional transportation system. The following strategies should be considered to expand and improve the commuter bus system in Southern Maryland:

- **Perform a comprehensive review of commuter bus service serving Southern Maryland and make recommendations for change.** Origin destination analysis suggests that additional service between Southern Maryland and Prince George's County may be warranted. It also suggests a market for increased bus service to the Lexington Park area including the Patuxent River Naval Air Station. MDOT and MTA should regularly review the services provided to Southern Maryland to maximize their use and efficiency.
- **Study the feasibility of operational improvements.** Queue jump lanes, transit signal priority, and access to expressway shoulders for commuter buses can provide a competitive advantage over use of a personal vehicle. Southern Maryland, SHA, and MTA should jointly identify the potential for these types of improvements.
- **Improve amenities at park-and-ride lots,** including bus shelters and stations to limit exposure to rain, snow, sun, and cold temperatures.
- **Provide easily accessible information on the web and at park-and-ride lots**, including routes and destinations served, schedules, maps, trailblazing signs, lot status signs, and, to the extent possible, real-time bus arrival and departure information.
- **Provide local bus service to park-and-ride lots** on schedules coordinated with MTA commuter buses and develop intermodal transfer stations to help concentrate local bus routes around major park-and-ride facilities and enable sharing of the operating costs of these facilities.
- **Encourage multiple uses of park-and-ride lots** such as carpools and vanpools.
- **Add park-and-ride lot capacity** where needed to support growth of the commuter bus system, including working with local jurisdictions and other partners to identify both long-term lot development opportunities and short-term lots, such as those at malls and churches.
- **Streamline planning, development, and construction of park-and-ride lots.** MTA, SHA, and County planners need to work together to ensure that park-and-ride lots, once approved and funded, are brought on line in a smooth and efficient manner.

Improve Local Transit Service and Coordination

Each county in Southern Maryland operates an independent local transit service. Increasing commuting between counties and general growth require that the region examine potential coordination and expansion of services. Specific recommendations include:

- **Study regional coordination of local bus routes.** To better serve riders, the counties of Southern Maryland should consider a regional approach to route planning, including increased cooperation and information sharing among local transit agencies; formal coordination of decisions and actions among the agencies; or consolidation of operational authority into a single regional agency.
- **Improve convenience for intraregional work trips**. With increasing growth and traffic, local transit agencies should evaluate intraregional commuter services and local circulator services within major activity centers, such as Waldorf and Lexington Park.

Implement Feasible High-Capacity Transit Options

As Southern Maryland continues to grow, options for high-capacity transit will become increasingly feasible. The MD 5/U.S. 301 corridor will likely be the first to be able to support a high-capacity route.

In October 2004, MTA completed the *MD 5/U.S. 301 Transit Service Staging Plan*, which outlined four alternatives for staged implementation of higher capacity transit in the corridor: Enhanced Commuter Bus; Moderate-Level Bus Rapid Transit (BRT); High-Level BRT; and Light Rail Transit. MTA is currently conducting a study to identify right-of-way needs for a transitway alignment, for stations, and for park-and-ride lots along the 18-mile corridor between the Branch Avenue Metrorail station and White Plains. High-capacity transit in Southern Maryland should be supported in the following ways:

- **Preserve right-of-way along the transitway identified in the MTA study.** Preserving right-of-way for the transitway will maintain the feasibility of this option. Without preservation, residential and commercial development along the transitway will make it much more difficult and expensive to build.
- **Support the results of the commuter rail feasibility study.** The MTA is about to study the feasibility of establishing commuter rail service between Washington, D.C. and St. Mary's County.

Transit Projects

The following set of transit projects have been identified for Southern Maryland based on the Tri-County priority letter and the analysis contained within the Needs Assessment. Regionally significant highway projects are listed first, followed by a specific list of additional priority projects for each county.

Regionally Significant Projects

- Accelerate Transit improvements in Southern Maryland including the accelerated implementation of the Transit Service Staging Plan in the U.S. 301/MD 5 corridor including. Implementation of regional transit improvements would include:
  - Enhanced commuter bus service from Calvert, Charles, and St. Mary's Counties to the metropolitan Washington area – including Prince George's County;
  - Construction of six additional park-and-ride lots – two in each county;
  - Identification and preservation of a transit right-of-way in the U.S. 301/MD 5 corridor from White Plains to the Branch Avenue Metrorail station (*map location T3*);
  - Bus rapid transit in the U.S. 301/MD 5 corridor; and
  - Fixed-rail transit in the U.S. 301/MD 5 corridor from Waldorf-White Plains to the Branch Avenue Metrorail station (*map location T3*).

Table ES.9 County Transit Projects of Regional Importance

Description	Map Location[a]
Calvert County	
Construct park and ride lots at Dunkirk and Prince Frederick	T1
Establish commuter bus service from Calvert County to the Suitland Metrorail Station and/or other employment destinations in Prince George's County	T2
Continue to monitor park-and-ride lot needs. Acquire land and develop park-and-ride lots as required	N/A
Charles County	
Construct park-and-ride lots at Waldorf and La Plata	T1
Enhance commuter bus service from Charles County to employment centers in the Washington, D.C. area including Prince George's County	N/A
Build a transfer station for Charles County VanGO service at the U.S. 301 park-and-ride lot	T6
Continue to monitor park-and-ride lot needs. Acquire land and develop park-and-ride lots as required	N/A
St. Mary's County	
Construct park-and-ride lots at Charlotte Hall and New Market	T1
Continue to monitor park-and-ride lot needs. Acquire land and develop park-and-ride lots as required	N/A
Enhance commuter bus service along the MD 235/MD 5 corridor	T5
Explore commuter bus service to the Patuxent River Naval Air Station to include additional transit service on-base and shuttle service between the base and local businesses along MD 235	N/A
Explore light rail and bus rapid transit to current and future rail stations	N/A

[a] Map locations are for Figure ES.11.

Highway

Southern Maryland is a peninsula bisected by the Patuxent River. As a result, the region relies on elements of highway infrastructure to provide connections within Southern Maryland, to the rest of Maryland, and to the U.S. as a whole. This includes the Governor Thomas Johnson Memorial, Governor Harry W. Nice Memorial, Benedict, and other bridges, several of which are in need of additional capacity. The following set of strategies, policies, and projects are intended to identify the capacity needs of the region and the set of policies and strategies that can help Southern Maryland address expected future growth.

Strategies and Policies

Primary highway strategies and policies for Southern Maryland to pursue have been identified in the areas of access management, operations, and travel demand management. Highway strategies should be implemented in conjunction with land use strategies to ensure an organized pattern of development in Southern Maryland and increase the efficient use of the transportation system.

Access Management

As the population of Southern Maryland continues to grow, increased long-distance commuting will result in greater demands on the region's arterials. Allowing unrestricted access to these arterials from new and existing developments will exacerbate congestion and safety issues over and above that caused by increasing through traffic. Implementing the following recommendations will help to preserve arterial capacity for through traffic and improve traffic safety.

- **Formally address access management in all county transportation plans and State or local corridor plans.** The legal and policy components of access management should be in place in corridors before extensive development occurs. Counties should require access control plans that meet their policy goals and minimize new accesses to arterials for new developments.
- **Partner with MDOT and SHA to strengthen access management.** County and SHA planners should work together to ensure that county land use plans and arterial access management plans are coordinated. Since private interests frequently use the political process to obtain direct access to arterials, State and County elected leaders and policy makers should be aware of the importance of access management to traffic flow and safety.
- **Require circulation plans for municipalities and new large-scale development that conform to access management guidelines in the region**. As the Counties of Southern Maryland review new development plans, the counties of Southern Maryland should ensure an acceptable level of local circulation that protects the capacity of the State and regional arterial system.

- **Increase spacing of signalized intersections on major arterials where possible.** In locations where closely spaced signalized intersections already exist along arterials, one or more of the following actions should be considered:
  - Restrict cross movement from the side roads and use J-turns;
  - Limit arterial left-turn movements;
  - Remove the signalized intersection and force right-turn movements at the intersection or construct overpasses or underpasses;
  - Build service or frontage roads to consolidate access points; or
  - Replace intersections with grade-separated interchanges.
- **Reduce private access to arterials.** Fewer driveways spaced farther apart allow for more orderly merging of traffic.
- **Create an effective local roadway network.** An effective local roadway network enables traffic to access local developments without using arterial highways thereby preserving their functional capacity for through trips and provides alternate routes for local and through traffic in the event of a mainline emergency.

Operations

Different types of operational strategies can be used to address recurring and nonrecurring congestion. Maryland's Coordinated Highways Action Response Team (CHART) recently completed a Rural Management and Operations/Intelligent Transportation Systems (M&O/ITS) Strategic Deployment Plan for the State of Maryland. The Plan identifies several strategies for Southern Maryland that should be implemented as soon as practical, including:

- Creating a new CHART Traffic Operations Center (TOC) in Southern Maryland;
- Deploying dynamic message signs (DMS), closed circuit television cameras, roadway weather information systems, and traffic speed detectors at appropriate locations;
- Installing emergency evacuation guide signs; and
- Expanding CHART's Freeway Incident Traffic Management Plan into Southern Maryland.

An additional operations improvement strategy is to improve and coordinate signal timing in key corridors. Currently, the State Highway Administration (SHA) examines traffic signal timing on a three-year rotation. Southern Maryland and the SHA should continue to refine the timing of individual traffic signals and consider coordinating signal timing along key corridors, such as U.S. 301 from White Plains to the Prince George's County line and the MD 2/4 Corridor through Prince Frederick.

Safety

Maryland's Strategic Highway Safety Plan (SHSP) is a working document that provides a framework for reducing highway fatalities and serious injuries on all public streets and highways. The SHSP applies the 4E's of highway safety: Enforcement, Education, Engineering, and Emergency Medical Services, across the following emphasis areas:

- Reduce Impaired Driving;
- Improve Information and Decision Support Systems;
- Eliminate Hazardous Locations;
- Increase Occupant Protection;
- Improve Driver Competency;
- Curb Aggressive Driving; and
- Improve Emergency Response System.

Current SHSP efforts are focused on creating regional implementation plans based on crash data analysis. The Tri-County Council for Southern Maryland is playing a key role in this effort by facilitating cooperation and coordination of the SHSP implementation efforts among Calvert, Charles, and St. Mary's counties and by organizing the political support required to implement the identified behavioral and infrastructure safety priorities for the region.[8]

In addition to the SHSP, many of the highway strategies related to access management and operations, if implemented, will have a positive impact on highway safety. Access management strategies improve safety by removing conflict points and managing access to the regions arterials, while operations strategies improve safety by improving response time to incidents, providing real-time incident information to the public, and monitoring roadway weather conditions.

Security

Each county in Southern Maryland has emergency evacuation information available on their web sites. This information is primarily focused on evacuation routes and locations of shelters hospitals, police stations, etc.

The Maryland CHART (Coordinated Highways Action Response Team) Program, a joint effort of MDOT, MTA, and Maryland State Police, published the *Rural Management and Operation Systems (M&O)/Intelligent Transportation Systems (ITS) Strategic Deployment Plan* in March 2007. The document outlines a strategy for deploying ITS in the rural areas of the State, including Southern Maryland.

[8] Maryland Safety Summit, November 2007.

The primary focus of this Plan is to define the M&O and ITS planning and deployment needs of rural Maryland that would lead toward reduced seasonal highway congestion, better information to motorists of evacuation and emergency procedures, and improved communications with neighboring areas.

Specific recommendations related to evacuation planning for Southern Maryland include:

- Installation and testing of 700 to 800 MHz radios for emergency operation control;
- Digital Message Signs for vital decision points for diversion routes;
- Installation of guide signs directing motorists to specific routes in the event of an emergency situation;
- Improved regional coordination in advance of emergency evacuations to develop workable strategies for detours and sheltering;
- Update of each County's Evacuation Plan to reflect the destinations and routing of evacuees; and
- Establishment of a working group in Southern Maryland to support the use and maintenance of the Strategic Plan.

Travel Demand Management

Travel Demand Management (TDM) strategies are relatively low-cost solutions to reduce vehicular traffic at a regional level. These strategies include or are related to carpools, vanpools, biking, walking, alternative work-hours or workplace programs, and parking management. Strategies to preserve important places, landscapes, and critical features can support TDM strategies by promoting more compact development which in turn encourages carpools, vanpools, etc. The following low-cost strategies should be pursued to reduce regional travel:

- **Promote telecommuting, alternative work hours, and compressed work week programs.** State and county agencies can promote these programs through marketing or incentives. These methods have the greatest effectiveness when combined.
- **Continue to encourage ridesharing and vanpooling**. The Tri-County Council for Southern Maryland has a full-time staff person dedicated to outreach on this topic. Ridesharing helps to reduce congestion and VMT while providing more modal options and accessibility. Strategies to increase ridesharing and vanpooling include:
  - Targeted incentives to employers or participants;
  - Education and outreach programs that increase the awareness of ridesharing opportunities;

- A one-stop Internet portal that provides ridematching services and information on connecting modes; and
- A guaranteed ride home program that accommodates unforeseen work schedule changes.

Highway Projects

The following set of highway projects have been identified for Southern Maryland based on the Tri-County Council for Southern Maryland's priority letter, the CTP, the HNI, public input, and the analysis contained within the Needs Assessment. Regionally significant highway projects are listed first, followed by a list of additional priority projects for each county. Note that while the identified projects are located within Calvert, Charles, and St. Mary's counties, projects in Prince George's and Anne Arundel counties are also important to the residents of Southern Maryland. In particular, implementation of identified CTP and HNI projects along the MD 210, MD 5, and MD 4 corridors in Prince George's County and along the MD 2, MD 4, and MD 260 corridors in Anne Arundel County will reduce travel time and improve safety for Southern Maryland residents who commute to destinations north of Calvert and Charles counties.

Top Regional Priorities

- Construct a Western Bypass of Waldorf with controlled access, selecting the alignment with the least environmental impact on the Mattawoman Creek watershed.[9] Construct a limited upgrade of U.S. 301 through Waldorf to facilitate traffic flow and relieve congestion at failing intersections and create a "boulevard" design for Charles County's "main street" with minimum impact on commercial businesses in the Corridor (*map location 17 in Figure ES.11*); and
  - The northernmost portion of U.S. 301 through Waldorf currently is operating at level of service (LOS) E or F. Many intersections along the route are currently or will soon be operating at LOS E or F. Many others are predicted to be at LOS D. Completion of a Western Bypass should improve the LOS on existing U.S. 301.
- Build a second span of the Governor Thomas Johnson Memorial Bridge. Widen MD 4 from the Governor Thomas Johnson Memorial Bridge to MD 235. Upgrade the intersection of MD 4 and MD 235 (*map location 1 in Figure ES.11*).

[9] Prince George's County prefers an upgrade of U.S. 301 rather than a bypass of Waldorf.

– MD 4 currently operates at a poor LOS from the Thomas Johnson Memorial Bridge to the MD 235 intersection. Analysis of 2030 conditions show continued poor LOS along this roadway segment and beyond the MD 235 intersection to MD 5 near Leonardtown.

Regionally Significant Projects

- Reconstruct the intersection of MD 2/4 and MD 231 in Prince Frederick (*map location 7 in Figure ES.11*);
- Widen MD 2/4 from south of MD 765A to north of Stoakley Road through Prince Frederick (*map location 6 in Figure ES.11*); and
- Widen MD 2/4 from MD 264 to MD 765A south of Prince Frederick (*map location 5 in Figure ES.11*).

County Projects of Regional Importance

Table ES.10 County Highway Projects of Regional Importance

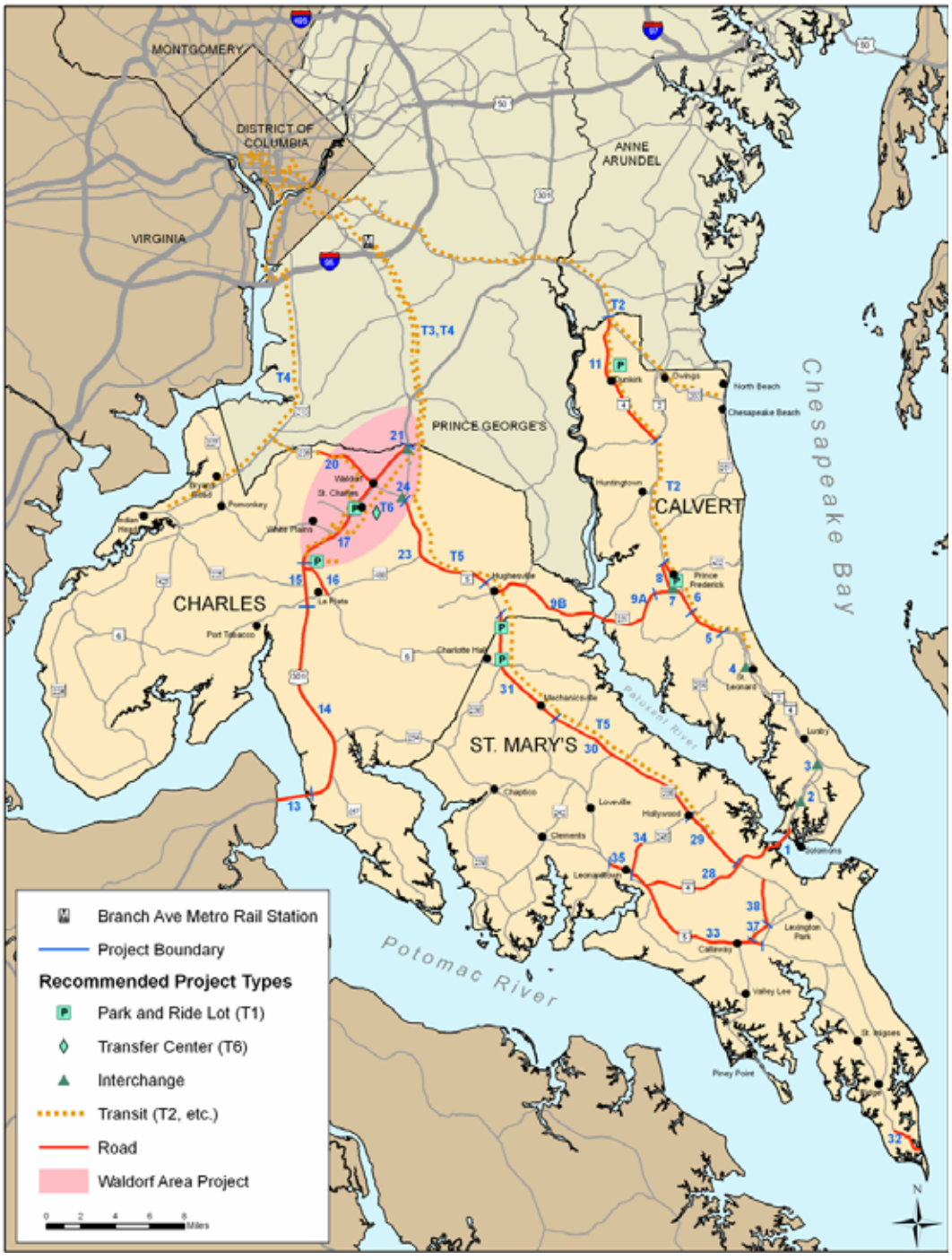
Road	Description	Map Location[a]
Calvert County		
MD 231	Widen from Barstow Road to MD 2/4 in Prince Frederick	*9A*
Prince Frederick Loop Road	Complete construction of the Prince Frederick Loop Road	8
MD 4	Widen from MD 2/4 to MD 258 with a focus on the section though Dunkirk	11
MD 2/4	Construct an interchange at Lusby Southern Connector Road	2
MD 2/4	Construct an interchange at MD 497	3
MD 2/4	Construct an interchange at Ball/Calvert Beach Roads	4
Charles County		
U.S. 301	Accelerate completion of the SHA Project Planning Study and Environmental Impact Statement for the U.S. 301 Study – Waldorf Upgrade/Bypass	17
MD 6	Build the MD 6 connector in the town of La Plata from MD 6 at Willow Lane to U.S. 301. This segment is projected to be heavily congested by 2020	16
MD 5	Improve the intersection at St. Charles Parkway by building an interchange	24
U.S. 301/MD 5	Construct an interchange at U.S. 301 and MD 5. The intersection will soon be operating at LOS E or F	21
MD 231	Widen between MD 5 and the Benedict Bridge with a focus on the section between MD 5 and MD 381. This section will function at LOS E/F by 2030.	9B

[a] Map locations are for Figure ES.11.

Road	Description	Map Location[a]
Charles County (continued)		
U.S. 301 Governor Harry W. Nice Memorial Bridge	Expand the Governor Harry W. Nice Memorial Bridge to facilitate the flow of traffic at the toll facilities and improve access from Maryland to Virginia. While currently operating at LOS D, the Bridge is projected to operate at LOS E by 2030	13
U.S. 301	Implement access controls from South of La Plata to the Potomac River	14
U.S. 301	Widen from South of La Plata to White Plains	15, 17 (part)
MD 5	Widen from North of Hughesville to MD 5 Bus/St. Charles Parkway	23
MD 228	Widen from Middletown Road to U.S. 301	20
St. Mary's County		
MD 237	Widen Chancellors Run Road (MD 237) from Pegg Road to MD 235 in Lexington Park	38
Pegg Road	Extend Pegg Road to MD 5	37
MD 5	Widen from MD 243 to MD 245	35
MD 5	Widen from MD 246 to MD 245 with a focus on the section between MD 4 and MD 245. Some segments currently operate at LOS E or F with more expected to deteriorate to this level by 2020.	33
MD 4	Widen from MD 5 to MD 235. The section between MD 235 and Indian Head Road is projected to be at LOS E or F by 2030.	28
MD 235	Widen from MD 4 to MD 245. Five intersections in this segment are currently operating at LOS E or F. Widening this section with access controls will benefit a highway segment that currently has no access control and reduce delay at the poorly functioning intersections.	29
MD 245	Widen from MD 5 to McIntosh Road. This section is projected to operate at LOS E or F by 2030	34
MD 5	Widen from MD 235 to the Charles County Line	31
MD 235	Implement access controls from MD 245 to MD 5	30
MD 5	Reconstruct from Ranger Station to Camp Brown Road. This section has narrow lanes and no shoulders. Summer traffic is heavy on this section and enforcement efforts will be improved with the addition of shoulders	32

[a] Map locations are for Figure ES.11.

Figure ES.11 Locations of Transit and Highway Project Recommendations



Source: Cambridge Systematics, based on data from State Highway Administration, Maryland Transit Administration, and Tri-County Council for Southern Maryland.

Bicycle and Pedestrian Policies and Strategies

Policies and strategies to promote bicycle and pedestrian activity relate to improved modal and neighborhood connectivity, improved facilities, and improved safety.

Improve Connectivity

To allow for increased bicycling and walking connections among transit facilities, residential areas, activity centers, parks, and tourist attractions should be maintained where existing and established where missing. The following strategies support increased connectivity.

- **Focus on improving Bicycle Level of Comfort (BLOC)** along key roadway segments identified in the Maryland Bicycle and Pedestrian Access Master Plan and on appropriate County and local roadways.
- **Expand the off-road trail system and create linkages among existing trails** by implementing the recommendations of the *Southern Maryland Regional Trail and Bikeway System Study*. Connect bike paths, sidewalks and trails to fill in any gaps.
- **Enhance and expand bicycle and pedestrian access to transit.**

Improve Facilities

To ensure that bicycle and pedestrian facilities are improved and appropriately maintained, the following strategies are recommended.

- **Integrate bicycle and pedestrian facilities into roadway development projects at both the State and local level.** These facilities can include wider lanes, bike lanes, paved shoulders, and bike safe storm drains.
- **Integrate bikeway and sidewalk maintenance and cleaning into established roadway maintenance routines.**

Improve Safety

To improve safety for bicyclists and pedestrians, the following strategies are recommended.

- **Develop bicycle and pedestrian safety plans for each County in cooperation with the State's Strategic Highway Safety Plan.**
- **Plan, design, and construct bicycle and pedestrian facilities using appropriate design standards.**
- **Provide pedestrian and bicycle traffic control devices where appropriate.**
- **Provide bicycle and pedestrian route signage as appropriate.**

Barriers and Challenges

Southern Maryland will face barriers and challenges to implementing the identified projects and strategies. These barriers and challenges generally fall into the following categories:

- Funding challenges;
- Growth, planning and zoning challenges;
- BRAC issues; and
- Geographical limitations.

Funding Challenges

Several of the top priority projects for the Southern Maryland region are for significant investments in new capacity or improved infrastructure that easily exceed the funding that has typically been available to transportation projects in the region. Notable examples include additional capacity for the Governor Thomas Johnson, and the Governor Harry W. Nice Memorial Bridges. Major infrastructure projects, such as these, will require careful examination of potential revenue sources. There will be no easy solutions, and Southern Maryland and the State of Maryland may need to explore potential Federal funding options, pricing strategies, innovative financing arrangements, and other strategies.

Federal Funding

One key funding challenge facing Southern Maryland, as well as the State of Maryland and the nation as a whole, is the growing surface transportation investment gap. In testimony before the U.S. House of Representatives Committee on Transportation and Infrastructure on January 15, 2008, the National Surface Transportation Policy and Revenue Study Commission stated that addressing this investment gap would require annual investments of between $225 billion and $340 billion (compared the current $68 billion) over the next 50 years to upgrade all modes to a state of good repair.

This gap has resulted from a funding mechanism (the gas tax) that has not grown at the Federal level in over 20 years; the Federal transportation trust fund continues to lose purchasing power each year. In combination with rising construction costs due to increases in oil and material costs, it has become difficult for states to generate enough revenue to address major projects.

Similar investment gaps are evidenced throughout all states, regions, and localities, including Southern Maryland. The high demand for transportation infrastructure projects combined with limited funding results in an environment where even worthy projects may not be funded due to greater needs demonstrated somewhere else.

State and Local Funding

Between $6.0 and $7.3 billion in total unfunded transportation system needs have been identified through the Southern Maryland Transportation Needs Assessment, but only between $640 and $770 million are expected to be available to Southern Maryland over this period. Considering only the top priority projects leaves a gap of at least $1.5 billion, not including the proposed high capacity transit service in the MD 5/U.S. 301 Corridor, which could cost up to $1.2 billion. The top priority projects identified for Southern Maryland include several 'mega projects' such as a new span of the Thomas Johnson Memorial Bridge and a bypass around Waldorf. Projects of this magnitude will always pose funding challenges. In addition, the size of the projects and natural resource constraints in Southern Maryland may add time and complexity to the project development process.

Finding funding for mega projects and addressing the overall gap in resources will require a combination of federal, State, and local efforts, as well as potential toll revenues. The State, through a fall 2007 special legislative session generated new funding for key projects in Southern Maryland, including planning for upgrades to MD 4 and the Thomas Johnson Memorial Bridge, the Waldorf bypass, and the Southern Maryland Commuter Bus program. However, the current fiscal challenges facing the State and nation will present additional hurdles challenges in the years ahead.

Local government participation in projects will be essential to further their development, including assisting in purchasing or otherwise preserving right-of-way for new transportation infrastructure. Other methods existing to generate funding for transportation, including local option sales taxes, tax increment financing and other value capture methods, property taxes, payroll taxes and others. Some of these methods would require State enabling legislation (such as a local option sales tax) and all would have to be carefully evaluated for their ability to generate revenue and their appropriateness for Southern Maryland.

Base Realignment and Closure (BRAC) Challenges

Maryland has been fortunate to benefit from the most recent round of BRAC. Although the military bases in Southern Maryland were not significantly impacted, the BRAC process highlights the value of military installations to all of Maryland. For example, Andrews Air Force Base in Prince George's County will experience significant job growth as a result of this most recent BRAC round. This will impact traffic volumes along MD 4 and U.S. 301, key commuter corridors for Southern Maryland residents employed in the Washington D.C. area. Within Southern Maryland proper, it will be important to maintain access to the Patuxent River Naval Air Station and the Indian Head Naval Surface Warfare Center as they are key components of the regional economy. At the same time, State resources are needed to provide improved access to Maryland military bases that received additional personnel in the most recent round of BRAC.

Growth, Planning, and Zoning Challenges

Southern Maryland is expecting to continue its rapid growth over the next 20 years. This rapid growth is increasing the need for new transportation investments and presenting new planning and zoning challenges. This assessment has presented a set of potential strategies for Southern Maryland to consider, several of which are oriented towards improving the efficiency of the transportation system through improved land use policies and investments in the transit system.

One challenge that the region will face is the difficulty that long-time residents of rural areas may have in embracing the transition from low-density land use patterns to higher-density suburban and urban land use patterns. Yet to prevent widespread sprawl, and the congestion associated with it, it will be vital to develop high-density, mixed-use centers to encourage transit use and walkable and bikeable pedestrian-oriented lifestyles.

Similarly, there will be significant potential challenges getting multiple jurisdictions to work together to implement the land use policies and strategies that will help make Southern Maryland more transit accessible. Individual counties and jurisdictions have authority over land use within their jurisdictions and it will take significant work to get each of the individual actors to agree with the policies identified in this needs assessment.

Geographical Limitations

Some challenges are related to the fact the Southern Maryland comprises a peninsula bounded by water on three sides and split by the Patuxent River. This is a benefit in that it reduces through travel and helps the region maintain its charm and rural character. However, the bridges integrating and connecting the region can become chokepoints that are very expensive to alleviate.

A specific challenge will occur during construction of any additional reactors at the Calvert Cliffs Nuclear Power Plant in Lusby. It is likely that many of the potentially thousands of workers would travel north over the Thomas Johnson Memorial Bridge from St. Mary's County and many others would travel south along the MD 2/4 Corridor in Calvert County. Prior to this event a traffic management plan should be developed and implemented to mitigate the increased traffic generated by this potential multi-year construction project.

ES.8 CONCLUSIONS

The Southern Maryland Transportation Needs Assessment was developed collaboratively by the Commission to Study Southern Maryland Transportation Needs, the Tri-County Council for Southern Maryland, and the Maryland Department of Transportation. Through an extensive outreach process and a detailed analysis of transportation system conditions, needs, and projects, a set of

recommended projects and strategies have been identified. The top priority projects identified include:

- A western bypass of Waldorf and limited upgrade to U.S. 301;
- A second span of the Thomas Johnson Memorial Bridge; and
- Expanded transit service to Southern Maryland with a focus on developing a high capacity transit service in the MD 5/U.S. 301 Corridor.

The Commission also recommends that the State and counties continue to promote strategies to reduce traffic congestion and promote strategic funding for transportation improvements in Southern Maryland, including:

- Providing improved transit options through analysis of and investments in high capacity transit options, park-and-ride facilities, commuter bus routes, and local transit;
- Enhancing the extent of information available for transit and highway users on the web, at transit stops and park-and-ride lots, and on the roadside;
- Promoting access management, operational improvements, and travel demand management strategies, including ridesharing, to improve the efficiency of the transportation system;
- Promoting strategic capacity expansions that address the mobility, safety, and accessibility of the transportation strategically; and
- Providing multimodal trail, bike, and pedestrian infrastructure and connectivity where needed.

Funding some of the large infrastructure projects identified in this report may require new funding mechanisms that are not currently under consideration, including local option sales taxes, tax increment financing, property taxes, or other sources. Additionally, the State and region may wish to pursue potential revenue generating strategies for the roadway system, such as tolls of bridges (e.g., as is currently done on the Governor Harry W. Nice Memorial Bridge) or of new limited access highway facilities. Given the significant transportation financing challenges facing both the State of Maryland and the nation as a whole, it will become ever more important to identify alternative funding and financing mechanisms for new transportation infrastructure investments and for local governments to participate actively in development of projects. The Southern Maryland Transportation Needs Assessment represents a good example of how State, regional, and local staff and elected officials can work together to address important transportation investment challenges.