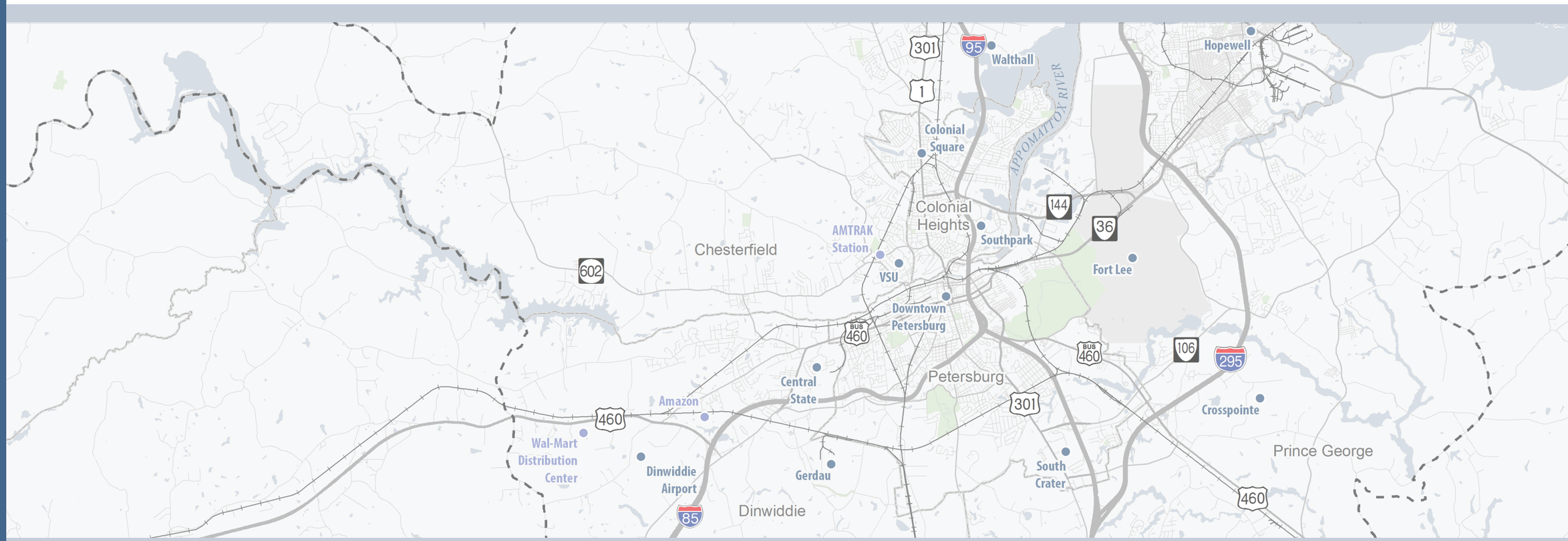
Tri Cities Area MPO
Congestion Management Process

December 2016



Tri-Cities Area MPO

Michael Baker INTERNATIONAL

Tri-Cities
Metropolitan Planning Organization

Congestion Management Process

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1. Introduction

The Congestion Management Process is an important part of transportation planning. It uses data on congestion to help staff, decision makers and the public understand how well the transportation system is working and select cost effective projects for reducing or mitigating congestion and its effects. This report is the third in a series of Congestion Management Process (CMP) studies for the Tri-Cities area. It is an update to the Congestion Management System report developed and approved in 2003. Federal requirements state that a CMP is required in metropolitan areas with population exceeding 200,000, known as Transportation Management Areas (TMAs). Federal requirements also state that in all TMAs, the CMP shall be developed and implemented as an integrated part of the metropolitan transportation planning process.

Although a CMP is required in every TMA, federal regulations are not prescriptive regarding the methods and approaches that must be used to implement a CMP. This flexibility has been provided in recognition that different metropolitan areas may face different conditions regarding traffic congestion and may have different visions of how to deal with congestion. The flexibility in the development of the CMP allows MPOs to design their own approaches and processes to fit their individual needs. The CMP is an on-going process, continuously progressing and adjusting over time as goals and objectives change, new congestion issues arise, new information sources become available, and new strategies are identified and evaluated.

The Tri-Cities transportation study area is located in southeastern Virginia within the I-85, I-95 and I-295 travel corridors. Major arterial routes servicing the area are Virginia Route 10, Virginia Route 36, US 301, US 1, US 460, Virginia Route 156 and Virginia Route 144. The Tri-Cities supports a multi modal transportation system with highway, transit, rail, pedestrian and bicycle transportation accessible to its population.

The Tri-Cities Area MPO includes a population of approximately 200,000 in an area comprised of the Cities of Petersburg, Colonial Heights and Hopewell, and portions of Chesterfield County, Prince George County and Dinwiddie County. Representatives from each local government within the study area, representatives of the Virginia Department of Transportation (VDOT), the Virginia Department of Rail and Public Transportation (VDRPT), and Crater Planning District Commission (CPDC) comprise the Metropolitan Planning Organization (MPO) for the Tri-Cities area. A representative from the U.S. Army installation at Fort Lee and a representative from the National Park Service at Petersburg National Battlefield also serve on the MPO technical committee as advisory members. Together these entities are organized with the purpose of developing a systematic process for planning and implementation of transportation system improvements in the Tri-Cities transportation study area.

The most recent Congestion Management document was adopted by the Tri-Cities MPO in 2003 as a Congestion Management System (CMS) document. This document outlined how the Tri-Cities Area MPO proposed to address any existing or future congestion problems identified in that process. The CMS process has since changed and is now referred to as a Congestion Management Process (CMP).

The change in name from Congestion Management Systems reflects the shift in perspective and practice to address congestion management as a process providing effective management and operations and stronger links to the planning and environmental review processes, based on cooperatively developed travel demand reduction and operational management strategies as well as capacity increases.

The CMP uses a number of analytic tools to define and identify congestion within a region, corridor, and activity center or project area, and to develop and select appropriate strategies to reduce congestion or mitigate the impacts of congestion. The improvement in mobility and reduction in congestion should be aimed at more than improving the highway system. The CMP should incorporate multimodal transportation systems – including transit systems, Intelligent Transportation System (ITS) enhancements and Transportation Demand Management (TDM) measures, such as ridesharing programs. The final rule enables State and local officials to retain the authority to select performance measures and to define acceptable existing and future congestion levels.

2. Congestion Management Process

The Congestion Management Process Model is built upon activities or actions that are common to successful CMPs, and at a basic level must be implemented to comply with federal regulations. The actions, however, may be integrated into the MPO planning process in many different ways, providing a flexible framework from which MPOs can develop an individualized CMP approach.

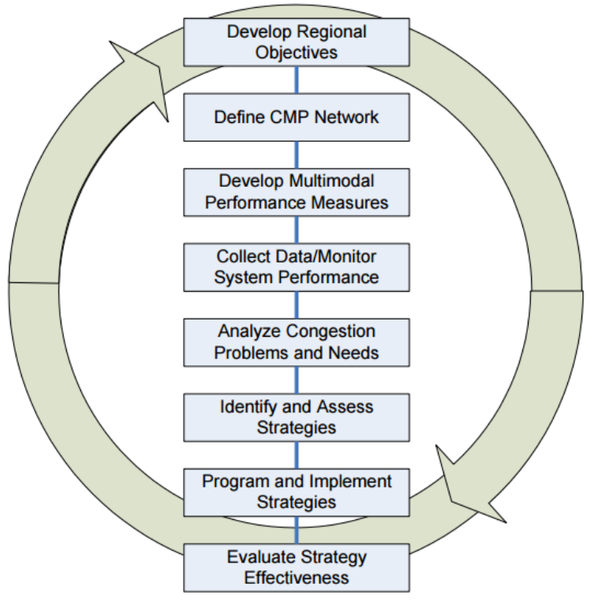
The FHWA's *Congestion Management Process: A Guidebook* indicates that the elements of a successful CMP defined in the Process Model that follows serve as a guide for the actions to be taken in developing a CMP, recognizing that while the CMP includes a general sequence of activities, the cyclical nature of the metropolitan planning process means that there are iterations within the sequence, and MPOs may have some variations to this approach. These eight actions include:

1. ***Develop Regional Congestion Management Objectives*** – First, it is important to consider, —What is the desired outcome? And —What do we want to achieve? It may not be feasible or desirable to try to eliminate all congestion, and so it is important to define objectives for congestion management that achieve the desired outcome. Some MPOs also define congestion management principles, which shape how congestion is addressed from a policy perspective.
2. ***Define CMP Network*** – This action involves answering the question, —What components of the transportation system are the focus?, and involves defining both the geographic scope and system elements (e.g., freeways, major arterials, transit routes) that will be analyzed in the CMP.
3. ***Develop Performance Measures*** – The CMP should address, measuring congestion regionally and locally. The performance measures should relate to, and support, regional objectives.
4. ***Collect Data/Monitor System Performance*** – After performance measures are defined, collect data and analyze it to determine how well the transportation network performs when compared to the performance measures. Data collection will likely be continuous and involve many data sources and partners.

5. ***Analyze Congestion Problems and Needs*** – Using data and analysis techniques, the CMP should address the questions, —What congestion problems are present in the region, or are anticipated?
6. ***Identify and Assess Strategies*** – Working together with partners, the CMP should address the question, —What strategies are appropriate to mitigate congestion? This action involves both identifying and assessing potential strategies, and may include efforts conducted as part of the MTP, corridor studies, or project studies.
7. ***Program and Implement Strategies*** – This action involves answering the question, —How and when will solutions be implemented? It typically involves including strategies in the MTP, determining funding sources, prioritizing strategies, allocating funding in the TIP, and ultimately, implementing these strategies.
8. ***Evaluate Strategy Effectiveness*** – Finally, efforts should be undertaken to assess, —What have we learned about implemented strategies? This action may be tied closely to monitoring system performance under Action 4, and is designed to inform future decision making about the effectiveness of transportation strategies.

Figure 1 illustrates these steps highlighting the cyclical nature of the congestion management process. While these actions are presented in a linear form, it is important to recognize that within the cycles of transportation planning, some of these actions may be revisited, or occur on an on-going basis, while others may not. For instance, in updating the MTP, the MPO may revisit or develop new congestion management objectives, which may lead to development of new performance measures; but the MPO might not redefine other aspects of its CMP at the same time. The CMP network might not be updated with each update of the MTP, and data collection activities may occur on an annual basis or some other cycle. Consequently, the Process Model is not intended to serve as a step-by-step approach, but is intended to convey the general flow of the approach, building on regional objectives to implementation of strategies, and evaluation of their effectiveness.

Figure 1: Elements of the Congestion Mitigation Process



Source: FHWA Congestion Management Process Guidebook

3. Application Area

Defining the CMP network involves defining:

- The geographic boundaries or application area; and
- The system components/network of surface transportation facilities

The Tri-Cities CMP includes analyses within the Tri-Cities MPO boundaries for the roadway network designated as part of the National Highway System as well as roadway links identified by the MPO Technical Committee as significant to the area. In addition to the roadway network, this document will address other multimodal transportation elements that can help take advantage of strategies that rely upon the other modes to reduce single occupancy vehicle (SOV) travel.

- Transit services
- Bicycle networks
- Pedestrian networks
- Freight Movement
- Passenger Rail

The application area or study area is defined as the key roadways, transportation systems and programs within the Tri-Cities MPO (Colonial Heights, Hopewell, Petersburg and the urbanized portions of the Chesterfield, Dinwiddie and Prince George Counties). Within these communities, specific elements of the transportation system are identified and assessed through the CMP process. Figure 2 shows the study area and presents points of interest identified by the Tri-Cities MPO Technical Committee and activity centers for the area as shown in the 2040 VTRANS Study done by the Office of Intermodal Planning and Investment.

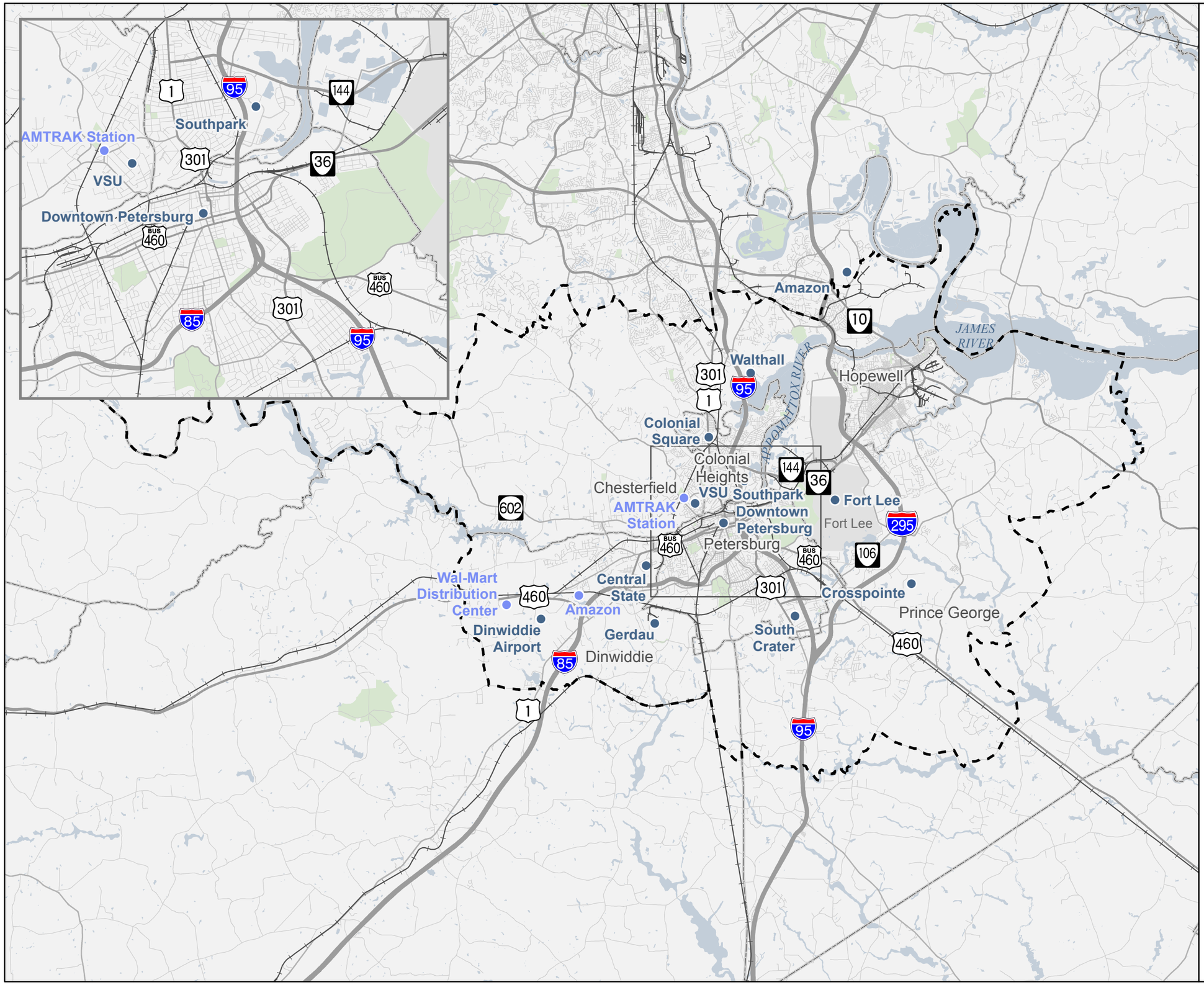
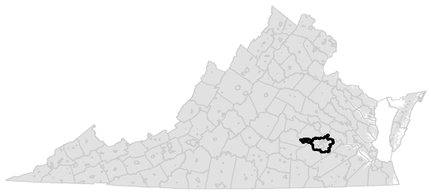


Figure 2
Tri-Cities Congestion Management Process
Activity Centers

- VTRANS Activity Centers
- Points of Interest
- MPO Boundary
- Jurisdictions



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4. Regional Objectives

The starting point for the CMP is the development of regional objectives for congestion management. These objectives draw from the regional vision and goals that are articulated in the Tri-Cities MPO Draft 2040 Long Range Transportation Plan. Goals highlighted and in bold text are goals related to transportation network congestion that are addressed in this CMP.

Congestion management objectives define what the region wants to achieve regarding congestion management, and are an essential part of an objectives-driven, performance-based approach to planning for operations. Objectives are not designed to measure the success or failure of specific programs, activities, or projects; they are meant to address regional priorities to help guide the direction of future decision making.

Table 1 shows the Tri-Cities MPO's regional objectives as shown in the 2040 Draft LRP.

Table 1: Tri-Cities MPO 2040 Draft Long Range Plan Regional Objectives

National Surface Transportation Performance Measures (PMs)	Goals & Objectives for TCAMPO 2040 Transportation Plan Update
Safety – To achieve a significant reduction in traffic fatalities and serious injuries on all public roads.	Goal 1: Reduce the annual number of highway crashes per 100 million vehicle miles of travel
	Objective 2: Achieve an annual reduction in crashes per 100 million vehicle miles of travel by 1%
	Goal 2: Reduce the annual number of transit crashes per 100 million transit passenger miles traveled
	Objective 2: Achieve an annual reduction in crashes per 100 million vehicle miles of travel by 1%
	Goal 3: Reduce the annual number of bike and pedestrian crashes
	Objective 3: Achieve an annual reduction in number of bike and pedestrian crashes by 2 crashes
Infrastructure Condition – To maintain the highway infrastructure in a state of good repair (highway segments located with the corporate limits of cities are not currently included in the databases used for this performance measure)	Goal 1: Improve pavement conditions in the VDOT - Richmond Construction District
	Objective 1: Achieve 82% of pavement in fair or better condition
	Goal 2: Improve bridge conditions in the VDOT - Richmond Construction District
	Objective 2: Achieve 92% of bridges not structurally deficient
Transit rolling stock - To maintain the age of transit rolling stock within Federal replacement standards	Goal 1: Reduce the average age of buses in the PAT fleet
	Objective 1: Achieve an annual reduction in average PAT fleet bus age to equal applicable Federal Transit Administration standards
	Goal 2: Reduce the average age of demand response vehicles in PAT fleet to equal applicable Federal Transit Administration standards
	Objective 2: Achieve an annual reduction in average PAT demand response vehicle age to equal applicable Federal Transit Administration standards
Congestion Reduction – To achieve a significant reduction in congestion on the National Highway System	Goal 1: Reduce the number of annual hours of delay per peak period traveler
	Objective 1: Achieve an annual reduction in hours of delay per peak period traveler of 1 percent
System Reliability – To improve the efficiency of the surface transportation system	Goal 1: Reduce the annual gallons of fuel lost due to congestion per peak hour traveler
	Objective 1: Achieve an annual reduction of fuel lost due to congestion per peak hour traveler of 1%
Freight Movement and Economic Vitality – To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.	Goal 1: Increase the ratio of jobs by place of work to households
	Objective 1: Achieve an annual increase in jobs by place of work to households by .01 jobs
	Goal 2: Increase the tonnage share of freight flow by rail
	Objective 2: Increase the tonnage share of freight flow by rail by 1 percent annually
	Goal 3: Increase the value share of freight flow by rail
	Objective 3: Increase the $ value of freight flow share by rail by 1 percent annually
	Goal 4: Increase the number of jobs in transportation/warehousing sector
	Objective 4: Increase the number of jobs in the transportation/warehousing sector by 1 percent annually
Environmental Sustainability – To enhance the performance of the transportation system while protecting and enhancing the environment.	Goal 1: Increase the number of annual transit revenue miles per capita
	Objective 1: Achieve an annual increase in number of revenue miles per capita by .10 mile
	Goal 2: Increase annual passenger rail ridership
	Objective 2: Achieve increased annual passenger rail ridership by 500
	Goal 3: Increase the number of registered vanpools
	Objective 3: Increase the number of registered vanpools by 1 vanpool
Reduced Project Delivery Days – To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices	Goal 1: Increase the number of projects completed on-time in the VDOT – Richmond District during 2016
	Objective 1: Reduce number of projects not completed on-time in 2016 by 1
	Goal 2: Increase the number of projects completed on-budget in the VDOT – Richmond District in 2016
	Objective 2: Reduce the number of projects not completed on-budget in the VDOT – Richmond District in 2016 by 1

5. Congestion Management Process Network

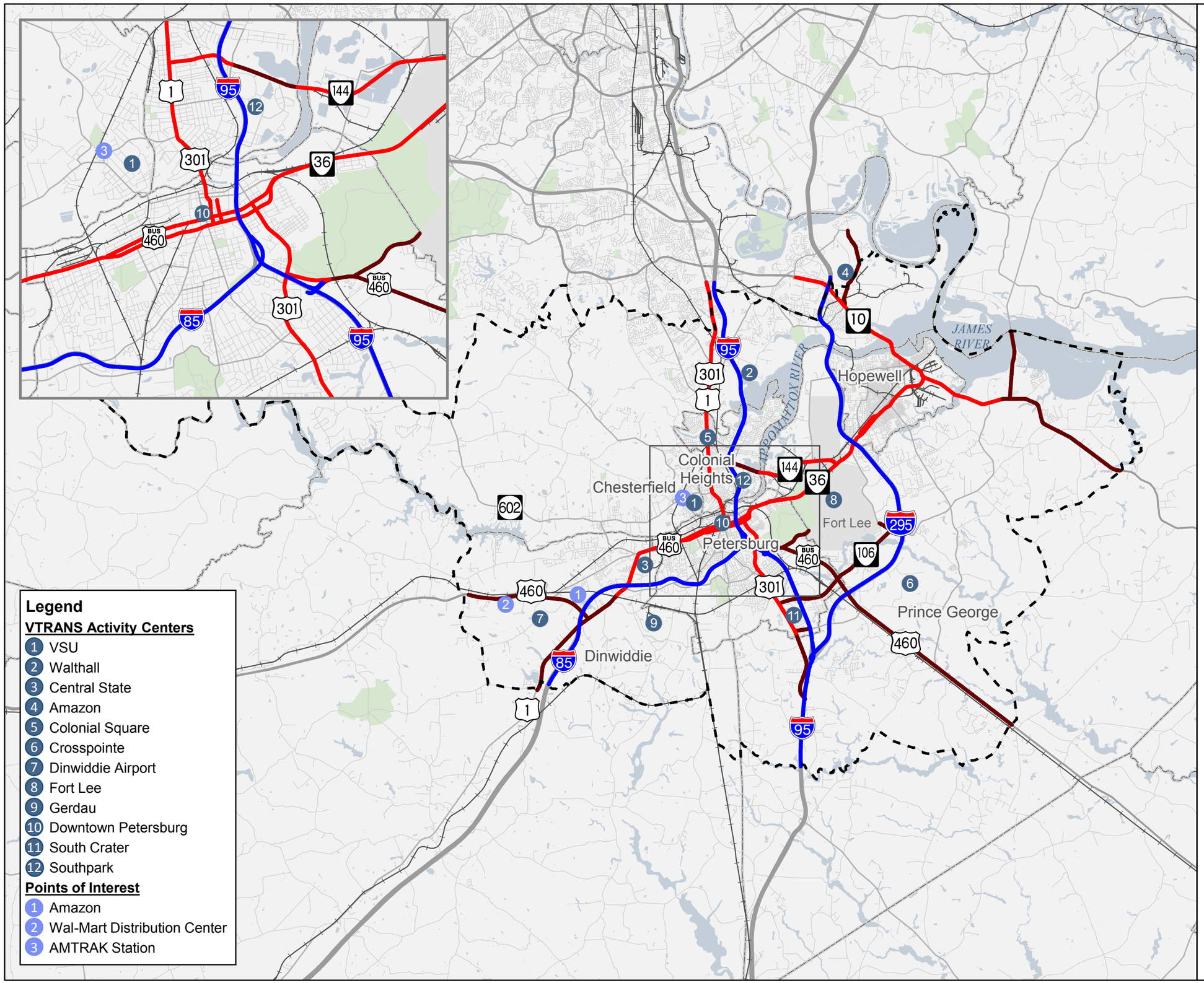
Only the facilities of the National Highway System (NHS) are required by FHWA to be evaluated by the CMP. Figure 3 shows the highway network of the congestion management system stratified as freeways, arterials, rural multi-lane highways and rural two lane highways. Based upon local knowledge, the Tri-Cities MPO staff has identified additional roadway segments to include in the CMP. These are shown in Table 2. In addition each segment of the roadway network is identified in the tables in Appendix A. Proposed projects on these chosen transportation facilities will need to be evaluated using the CMP.

Roadways on the CMP were divided into segments matching those used by VDOT in its traffic monitoring program. By using the same roadway segments as VDOT, the CMP database can be easily updated as new data is produced by VDOT. VDOT now separately categorizes their roadway system into Freeway, Arterial, Rural Multi-Lane, and Rural Two-Lane facilities. The CMP database has been categorized in a like manner. Using short segments allows the CMP to better identify congested locations and evaluate congestion mitigation measures.

Table 2: Roadway Segments Added to CMP Network

Jurisdiction	Facility Name	From	To	Length (miles)	Lanes	Classification
Chesterfield County	ENON CHURCH ROAD	RTE 10	RTE 697	0.73	2	Rural 2 lane
Chesterfield County	ENON CHURCH ROAD	RTE 697	RTE 886	1.27	2	Rural 2 lane
Chesterfield County	ENON CHURCH ROAD	RTE 886	RTE 618	0.81	2	Rural 2 lane
City of Hopewell	RANDOLPH ROAD	RTE 156 (WINSTN CHURCHIL DR)	ECL HOPEWELL	1.26	4	Urban Arterial
City of Hopewell	NORTH 6TH AVENUE	WEST BROADWAY STREET	RANDOLPH ROAD	0.31	4	Urban Arterial
City of Petersburg	COURT HOUSE ROAD	COUNTY DRIVE	ECL PETERSBURG	0.10	4	Rural multi-lane
City of Petersburg	HICKORY HILL DRIVE	COUNTY DRIVE	DEAD END NEAR ECL PETERSBURG	0.91	2	Rural 2 lane
City of Petersburg	WAGNER ROAD	RTE I-95 NORTHJ	COUNTY DRIVE	1.32	4	Rural multi-lane
Dinwiddie County	BOYDTON PLANK ROAD	RTE 613 NORTH	RTE 460	3.09	2	Rural 2 lane
Dinwiddie County	BOYDTON PLANK ROAD	RTE 460	RTE 670	0.80	2	Rural 2 lane
Dinwiddie County	BOYDTON PLANK ROAD	RTE 670	RTE 603	0.48	2	Rural 2 lane
Dinwiddie County	BOYDTON PLANK ROAD	RTE 603	RTE 142	0.15	3	Urban Arterial
Dinwiddie County	BOYDTON PLANK ROAD	RTE 142	RTE I-85	0.15	4	Rural multi-lane
Dinwiddie County	AIRPORT STREET	RTE I-85	RTE 1	0.21	4	Rural multi-lane
Prince George County	JAMES RIVER DRIVE	RTE 609	RTE 156	4.78	2	Rural 2 lane
Prince George County	JAMES RIVER DRIVE	RTE 156	RTE 156 BYP (OLD 644)	0.73	4	Rural multi-lane
Prince George County	JAMES RIVER DRIVE	RTE 156 BYP (OLD 644)	ECL HOPEWELL	1.17	4	Urban Arterial
Prince George County	COURTHOUSE ROAD	ECL PETERSBURG	RTE 630	1.40	2	Rural 2 lane
Prince George County	COURTHOUSE ROAD	RTE 630	RTE 634	0.99	2	Rural 2 lane
Prince George County	JORDAN POINT ROAD	RTE 10	CHARLES CITY CL	2.32	2	Rural 2 lane
Prince George County	SOUTH CRATER ROAD	RTE I-95	RTE 626 SOUTH	1.06	2	Rural 2 lane
Prince George County	SOUTH CRATER ROAD	RTE 626 SOUTH	SCL PETERSBURG	1.19	2	Rural 2 lane
Prince George County	ALLIN ROAD	RTE 106	RTE 630	0.51	2	Rural 2 lane

Figure 3
Tri-Cities Congestion Management Process
Roadway Network



Legend

VTRANS Activity Centers

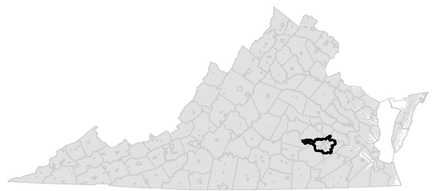
1. VSU
2. Walthall
3. Central State
4. Amazon
5. Colonial Square
6. Crosspointe
7. Dinwiddie Airport
8. Fort Lee
9. Gerdau
10. Downtown Petersburg
11. South Crater
12. Southpark

Points of Interest

1. Amazon
2. Wal-Mart Distribution Center
3. AMTRAK Station

- VTRANS Activity Centers
- Points of Interest
- MPO Boundary
- Jurisdictions
- Rural Primary
- Urban Arterial
- Interstate

Source: VDOT SPS Database



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6. Multimodal Performance Measures

Performance measures provide a means of evaluating the efficiency of the transportation system. Performance measures are based upon the data collected and allow the severity, scope and duration of congestion to be assessed objectively.

Developing performance measures to identify, assess, and communicate to others about congestion is a critical element of the Tri-Cities CMP. Effective performance measures help staff to effectively assess system performance, identify problem areas, and recommend solutions to the public and decision makers. The decision makers are then better able to select among alternative projects. Performance measures developed for the CMP should be consistent with the goals and objectives of the Long Range Plan.

The purpose of performance measures is to characterize current and future conditions on the regional transportation system. However, performance measures serve other purposes in the CMP including:

- characterizing existing and expected conditions on the regional transportation system;
- tracking progress towards meeting regional objectives;
- Identifying specific congested locations;
- Assessing the effectiveness of congestion mitigation strategies, programs and projects ; and
- To communicate system performance, often via visualization, to decision-makers, the public, and MPO member agencies.

Performance measures are used regionally to measure the performance of the whole transportation system and locally to measure the performance of individual facilities, identify areas with congestion problems and evaluate the performance of local improvement. The following sections discuss the performance measures evaluated in this CMP.

6.1 Highway Performance Measures

The Tri-Cities CMP uses five performance measurements to evaluate congestion on each highway segment. Three of these measures- VC ratio (v/c), number of congested roadway miles on the network, and vehicle miles traveled on the roadway network- were used in the 2003 CMS. This report adds two new performance measures: annual peak hours of delay and travel time ratio.

Each performance measure is evaluated for the most recent year for which data exists and for 2020. The MPO believes that it is important to evaluate congestion over time. However, the MPO desires to be able to quickly assess the accuracy of the projections. Therefore the year 2020 is used as a meaningful interim year. The existing VC ratios and TTRs are displayed graphically on the transportation system map and numerically in the CMP database table. The projected VC ratios for the year 2020 are also displayed on a map and presented numerically in a table. The CMP roadway network congested roadway miles and vehicle miles traveled are presented numerically and graphically. Such a process will allow the MPO to determine present conditions, as well as to project possible future conditions on the network.

The volume to capacity ratio used in the CMP is the peak period flow divided by the ultimate (LOS E) capacity for each segment. The VC ratio typically ranges from 0.0 to 1.0 although VC ratios over 1 may exist because of the assumptions made in estimating flow rate or capacity. The VC ratio is calculated for 2014 and 2020.

The Virginia Department of Transportation estimates the VC ratio for roadway segments in the Statewide Planning System (SPS) database by calculating the hourly flow rate in passenger cars per hour per lane and dividing that by the lane capacity for each roadway type.

The existing VC ratio for 2014 in this study can be compared with the 2003 previous study's projected VC ratio for 2015. Such a process will allow the MPO to evaluate the effectiveness of the CMP process, as well as to project possible locations for future congestion on the CMP network. A road segment showing a VC ratio of 0.80 or greater in the congestion management system will be considered congested.

The congested roadway miles on the CMP roadway network will be calculated for the years 2014 and 2020 using the information available in the VDOT SPS database. For each roadway classification, the total number of roadway miles with a VC ratio of 0.80 or greater will be included in the total value.

The VDOT SPS database will also be used to calculate the VMT on the CMP roadway network. The VMT will be calculated by roadway classification for the years 2014 and 2020. The 2014 VMT from this report will be compared to the projected 2015 VMT calculated in the Tri-Cities CMS completed in 2003.

Travel Time data was obtained from TomTom (Global Navigation) for comparison with the VC ratio data from the VDOT SPS database. The TomTom data provides average peak weekday condition travel times for a two-year period. The travel time data will be analyzed to obtain the Travel Time Ratio (TTR) for each roadway segment identified as part of the CMP network. The TTR is the ratio of average peak travel time to a free-flow travel time. For example, a value of 1.20 means that average peak travel times are 20 percent longer than free-flow travel times. TTRs for both the AM and PM peak hours were developed for the roadway segments in the Tri-Cities CMP.

6.2 Transit Performance Measures

Petersburg Area Transit (PAT) provides fixed-route transit service in the City of Petersburg, the Ettrick portion of Chesterfield County, the Southpark Mall in Colonial Heights, the Central State Hospital area of northern Dinwiddie County, Hopewell, the Route 36 Corridor and the Fort Lee Areas of Prince George County.

The arrangement of stops along the PAT routes offers several opportunities for connection with other modes of transportation. Auto, taxi, pedestrian routes and bicycle can access nearly all of the stops. The central transfer station in downtown Petersburg is located adjacent to many pedestrian oriented businesses and can be accessed through all PAT routes. Connection to the Amtrak services located at the Ettrick Station is available on the Ettrick Route of the PAT.

Greater Richmond Transit Company (GRTC) also serves the area with an express route between the Petersburg Transit Center and downtown Richmond. These transit systems can play a critical role in mobility enhancement and congestion relief. Due to the role transit can play in regional mobility, transit performance measures for total passenger miles and number of unlinked passenger trips were added to the CMS Plan in 2003 and are revisited for this 2016 update. GRTC data was not available for the 2003 CMS Plan.

6.3 Bicycle Performance Measures

The Tri-Cities MPO completed an update of the regional bikeway plan in August 2003 that recognizes that bicycling is a safe, convenient and viable transportation alternative and to integrate bicycles and walking in the transportation system of the Tri-Cities. The bikeway plan recommends a future bikeway route structure that can be promoted by the localities as a safe and convenient substitute for motor vehicle travel for recreation and commuting. Bicycle network performance measures were not included in the 2003 CMS plan but were analyzed as part of this 2016 CMP update. The VDOT SPS database includes data for each roadway in the Tri-Cities MPO boundary that includes a bicycle facility. This data is mapped to determine the connectivity of the Tri-Cities MPO bicycle network to major activity centers in the area that were developed as part of the Office of Intermodal Planning and Investment (OIPI) 2040 VTRANS study. Bicycle infrastructure connectivity is used for the performance measure in the 2016 CMP update.

6.4 Pedestrian Performance Measures

The 2035 Long Range Transportation Plan includes the following statement regarding pedestrian walkways:

"Pedestrian walkways are an important part of the transportation system. Walkways can provide a link between other modes of transportation in the system. Pedestrian facilities should be considered in both new development and improvements to existing development. Where feasible, efforts should be made to include pedestrian facilities as an option to other transportation modes that may be detrimental to air quality."

Pedestrian network performance measures were not included in the 2003 CMS plan but were analyzed as part of this 2016 CMP update. The VDOT SPS database includes data for each roadway in the Tri-Cities MPO boundary that includes a pedestrian facility. This data will be mapped to determine the connectivity of the Tri-Cities MPO pedestrian network to major activity centers in the area that were developed as part of the Office of Intermodal Planning and Investment (OIPI) 2040 VTRANS study. Pedestrian infrastructure connectivity will be used for the performance measure in the 2016 CMP update.

6.5 Freight Performance Measures

Trucking is an important freight movement component of the transportation system in the Tri-Cities. The network of interstates and primary highways; availability of rail and ports access to the region and mid-point location along the east coast are factors supporting the movement of freight. The 2035 Long Range Transportation Plan states:

"The warehouse/distribution centers and other major generators of truck traffic need to be considered in corridor and other transportation planning studies conducted in the Tri-Cities."

This CMP will measure freight movement performance by evaluating the congestion of roadways adjacent to major freight distribution centers and determining the vehicle miles traveled (VMT) for heavy vehicles based on data included in the VDOT SPS database.

6.6 Passenger Rail Performance Measures

Intercity passenger rail services in the Tri-Cities area is provided by Amtrak. The Ettrick Station is located just east of Route 36 in Chesterfield County and provides an important modal connection. The Ettrick Route of the PAT serves the Tri-Cities Amtrak Station. The need for alternative locations for a passenger rail station was identified in environmental documents prepared for the Southeast High-Speed Rail (SEHSR) corridor.

Passenger rail performance for the Tri-Cities area is measured based on the congestion of roadways adjacent to the Amtrak Ettrick Station as well as the connectivity of the Amtrak Ettrick Station to other transportation modes.

7. Data Collection and System Monitoring

The process of collecting data and monitoring the transportation system should be an ongoing program to determine and monitor the level and severity of congestion that may occur and to evaluate the effectiveness of implemented actions. Existing data sources of the affected localities, the MPO and the Virginia Department of Transportation shall be utilized.

The major data component of the Tri-Cities CMP is a database named the VDOT Statewide Planning System (SPS) containing roadway characteristics, traffic counts, service volumes, and other data for each road segment in the CMP. The information in the database will be updated regularly as transportation improvements are completed, congestion strategies are implemented or as new traffic counts are supplied by the Virginia Department of Transportation.

The database also includes projected traffic counts and service volumes for the road segments of the CMS. These projected figures are supplied by VDOT through their transportation planning efforts. Existing traffic counts are projected to future volumes using growth rates reflected in the region's modeling efforts. Such modeling is based on changes proposed by the *Tri-Cities Area 2035 LRPT.* This data is used for planning purposes, rather than for operational analysis.

Other data sources used in this CMP document include the TomTom data discussed in Section 6.1. The TomTom travel time data is used as a performance measure for the highway component of the CMP. Data obtained directly from the PAT and GRTC can be used to monitor transit performance while data can be obtained from Amtrak to monitor passenger rail performance. Recently, the Federal Highway Administration (FHWA) published in the Federal Register a Notice of Proposed Rulemaking (NPRM) to propose national performance management measure regulations to assess the performance of the National Highway System, Freight Movement on the Interstate System, and the Congestion Mitigation and Air Quality Improvement Program. This NPRM proposes regulations that would make progress towards the following national goals:

- Congestion reduction - To achieve a significant reduction in congestion on the NHS.
- System reliability - To improve the efficiency of the surface transportation system.
- Freight movement and economic vitality - To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.
- Environmental sustainability - To enhance the performance of the transportation system while protecting and enhancing the natural environment.

In addition, this NPRM:

- Provides for greater consistency in the reporting of condition/performance;
- Proposes requirements for the establishment of targets that can be aggregated at the national level;
- Proposes reporting in a consistent manner on progress achievement; and
- Proposes a process for determining a State DOT's significant progress.

The above rule will require performance measures and utilize available GPS data sources. Future updates to the CMP may be coordinated with these efforts and the data sources used to prepare such measures.

The data used to support the CMP may be affected by routine traffic maintenance or special events in the region. Traffic management services on all interstate facilities and all highway facilities located in the county portions of the study area are provided by VDOT. The traffic management services for all other highway facilities located in the study area are provided by local governments. Congestion resulting from routine maintenance and/or special events, such as sporting events, is most often temporary and will be evaluated by the MPO on a case-by-case basis. Long-term strategies may not be the most cost effective for such temporary congestion problems.

8. Tri-Cities CMP Performance Measure Results

The performance measure data for each transportation component was analyzed as discussed in Section 6 and the results are summarized in the following text.

8.1 Screening Results for CMP Roadway Network

The CMP network roadways were evaluated using data from the VDOT SPS database to determine the VC ratio for each roadway segment. Figure 4 shows the VC ratios for the worst peak hour for each roadway on the study area map for 2014 and Figure 5 shows the VC ratios for the worst peak hour for 2020. Table 3 lists the congested roadway segments by classification in the CMP network. Blue highlights identify potentially congested roadway segments in 2014 and red highlights show potentially congested roadway segments in 2020. Segments are considered to be potentially congested when the v/c ratio is 0.8 or greater. Since the completion of the 2003 Tri-Cities CMS document, the Highway Capacity Manual (HCM) methodology has been revised. To remain consistent with the latest methodologies, VDOT has updated the SPS database to utilize the most recent HCM methodologies which has resulted in changes to the capacities were used in the VC ratio calculations in the 2003 report. Consequently, analysis results may be inconsistent in some cases when comparing the projected values from the 2003 Tri-Cities CMS and the 2015 congestion data shown in this CMP. Appendix B shows the remaining uncongested roadway segments within the CMP network along with each segment length, the peak hour flow rate in vehicles per hour (VPH), average annual daily traffic volume (AADT), and vehicle-miles traveled (VMT), which is the daily vehicular volume multiplied by the segment length in miles.

As shown in Table 3, nine roadway segments are potentially congested in the present year (2014) and ten roadway segments are potentially congested in 2020.

The causes of congestion in the Tri-Cities MPO area are typical of any urban roadway network; Basic commuting patterns, signalized intersections, and gateway facilities leading to/from major traffic generators and roadway segments adjacent to freeway interchanges. Major traffic generators in the Tri-Cities MPO that contribute to congestion include:

- Southpark Mall in Colonial Heights
- Virginia State University in Chesterfield County
- Amazon Distribution Center in Chesterfield County just north of the City of Hopewell
- Fort Lee in Prince George County

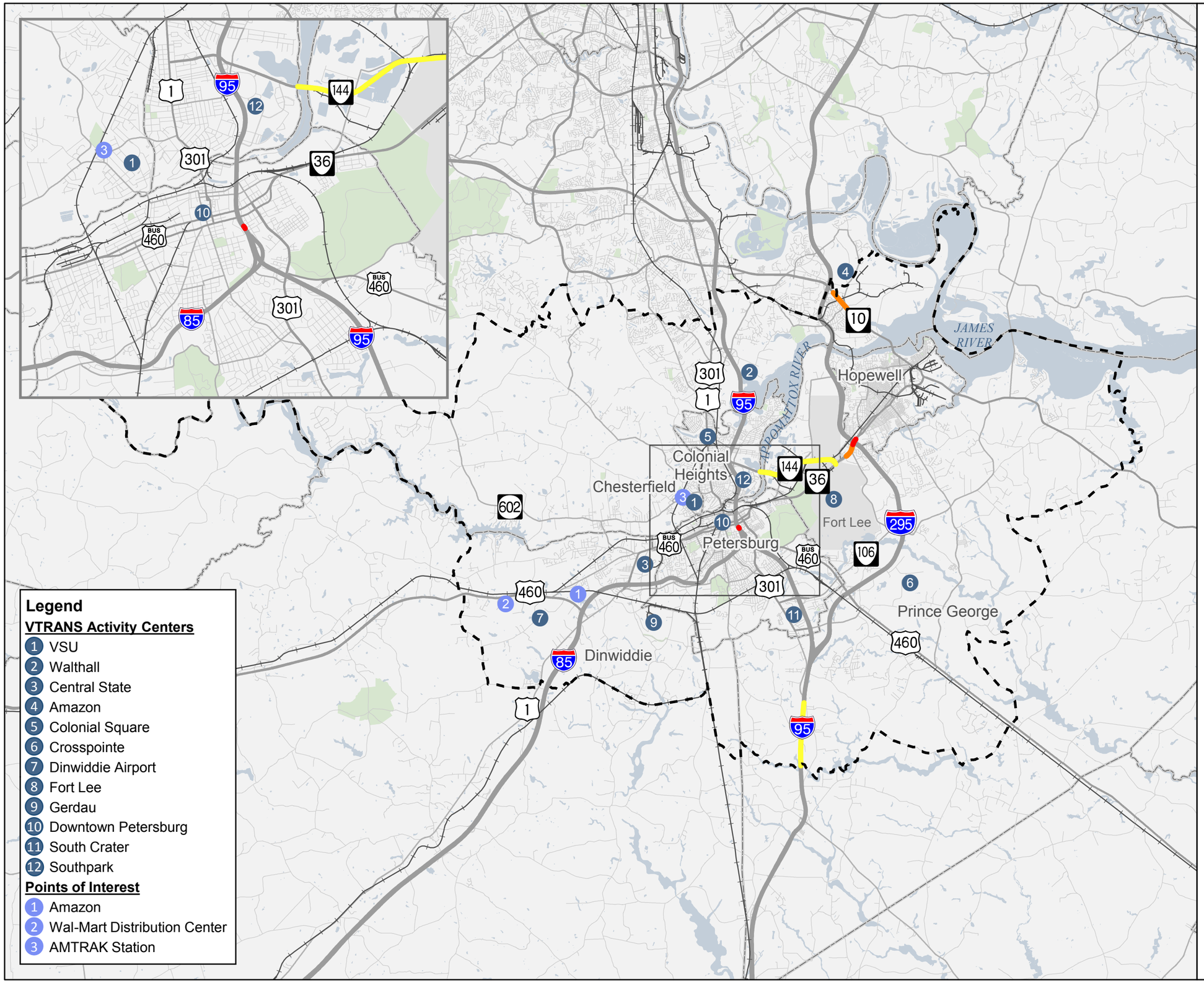
The total annual delay for the worst peak hour was calculated for each roadway segment using the VDOT SPS database. Figure 8 presents the results for the base year and future year for the roadway segments in the CMP network as well as roadway segments that are in the MPO boundary but not part of the CMP network.

The AM and PM peak hour travel time ratios along each roadway were calculated using data received from TomTom (Global Navigation). Figure 6 presents the AM TTRs for all roadways in the study area (NHS and non-NHS) and Figure 7 shows the PM TTRs for the study area.

During the AM peak hour, the TTR for most of the study area roadways ranges from 1.0 to 1.2, representing lightly congested condition. There are some locations that show a higher TTR, however these locations relate to the typical urban traffic discussed previously. The PM peak hour TTR map shows a greater number of roadways with TTRs less than 1.05, particularly the freeway segments of I-85, I-95, and I-295. Many of the arterial facilities, however, show increases in TTRs when compared to the AM peak hour. Many of these locations including Route 144, Route 36, Route 1, and Route 10 have previously been identified as facilities with congestion issues with mitigation procedures ongoing. A list of proposed projects shown in the Tri-Cities Transportation Improvement Plan for roadways on the CMP network is shown in Appendix C. A list of projects for CMP roadways proposed in the Draft Tri-Cities Long Rang Plan is shown in Appendix D.

A comparison of the TTR and VC ratio maps reveals the limitations of analyzing roadways using information from a database that is not continually updated with real-time information. The TTR maps show light to heavy congestion on many of the CMP network roadways where the VDOT SPS database is showing VC ratios that do not reflect a congested condition. It would be expected that the VC ratio would be greater for roadway links showing higher TTRs.

Figure 4
Tri-Cities Congestion Management Process
2014 Peak Period Volume to Capacity Ratio



Legend

VTRANS Activity Centers

1. VSU
2. Walthall
3. Central State
4. Amazon
5. Colonial Square
6. Crosspointe
7. Dinwiddie Airport
8. Fort Lee
9. Gerdau
10. Downtown Petersburg
11. South Crater
12. Southpark

Points of Interest

1. Amazon
2. Wal-Mart Distribution Center
3. AMTRAK Station

- VTRANS Activity Centers
- Points of Interest
- MPO Boundary
- Jurisdictions

Existing VC Ratio*

- 0.81 - 0.90
- 0.91 - 0.95
- 0.96 - 1.50

*Condition is based on the worst peak for each segment

Source: VDOT SPS Database

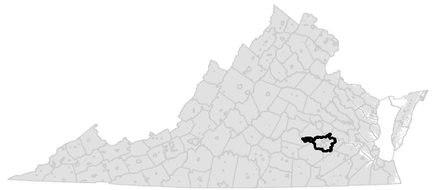


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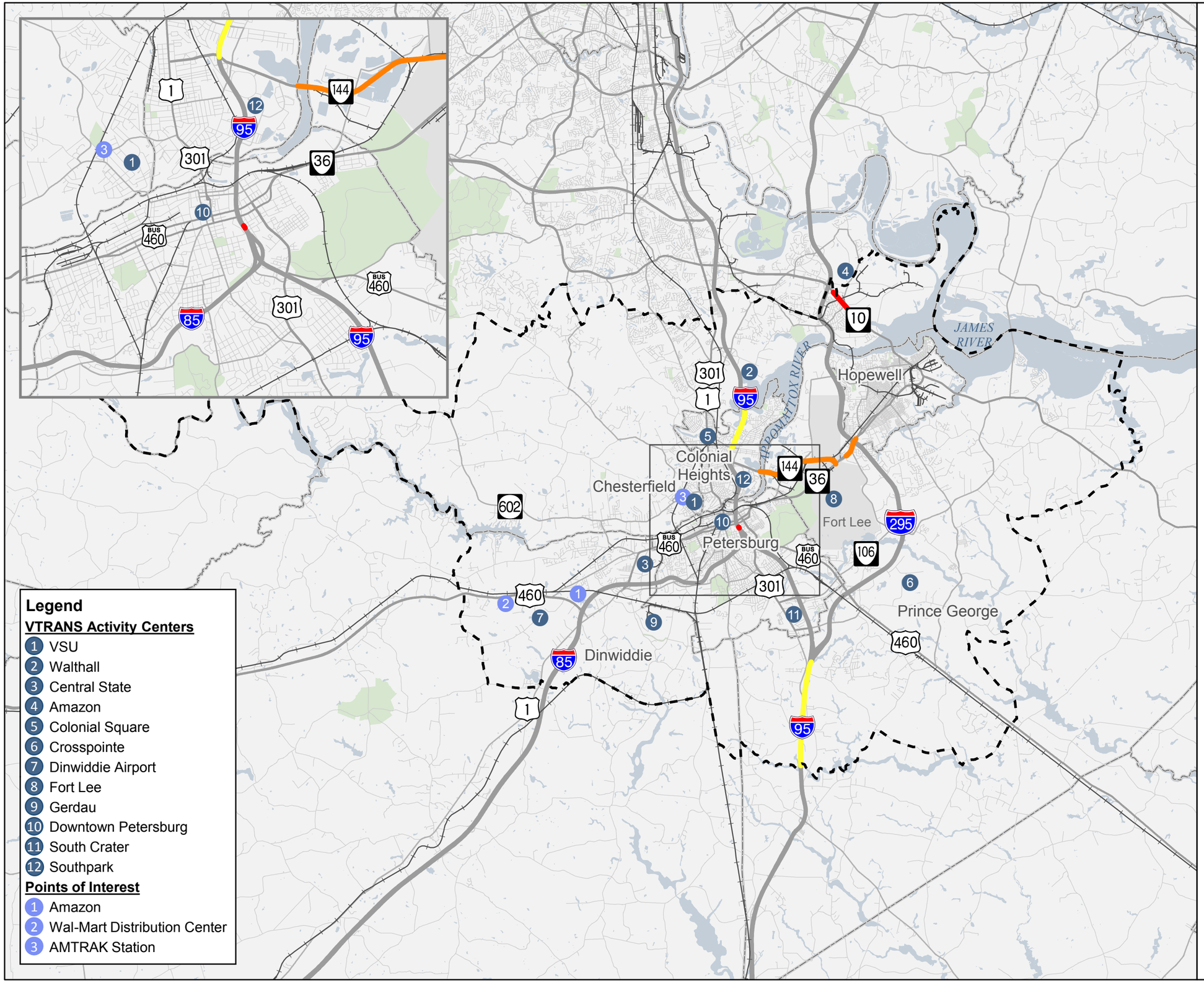
Figure 5
Tri-Cities Congestion Management Process
2020 Expected Peak Hour Volume to Capacity Ratio



Legend

VTRANS Activity Centers

1. VSU
2. Walthall
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Points of Interest

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2. Wal-Mart Distribution Center
3. AMTRAK Station

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- Points of Interest
- MPO Boundary
- Jurisdictions

VC Ratio 2020*

- 0.81 - 0.90
- 0.91 - 0.95
- 0.96 - 1.50

*Condition is based on the worst peak for each segment

Source: VDOT SPS Database

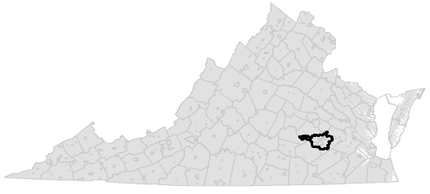

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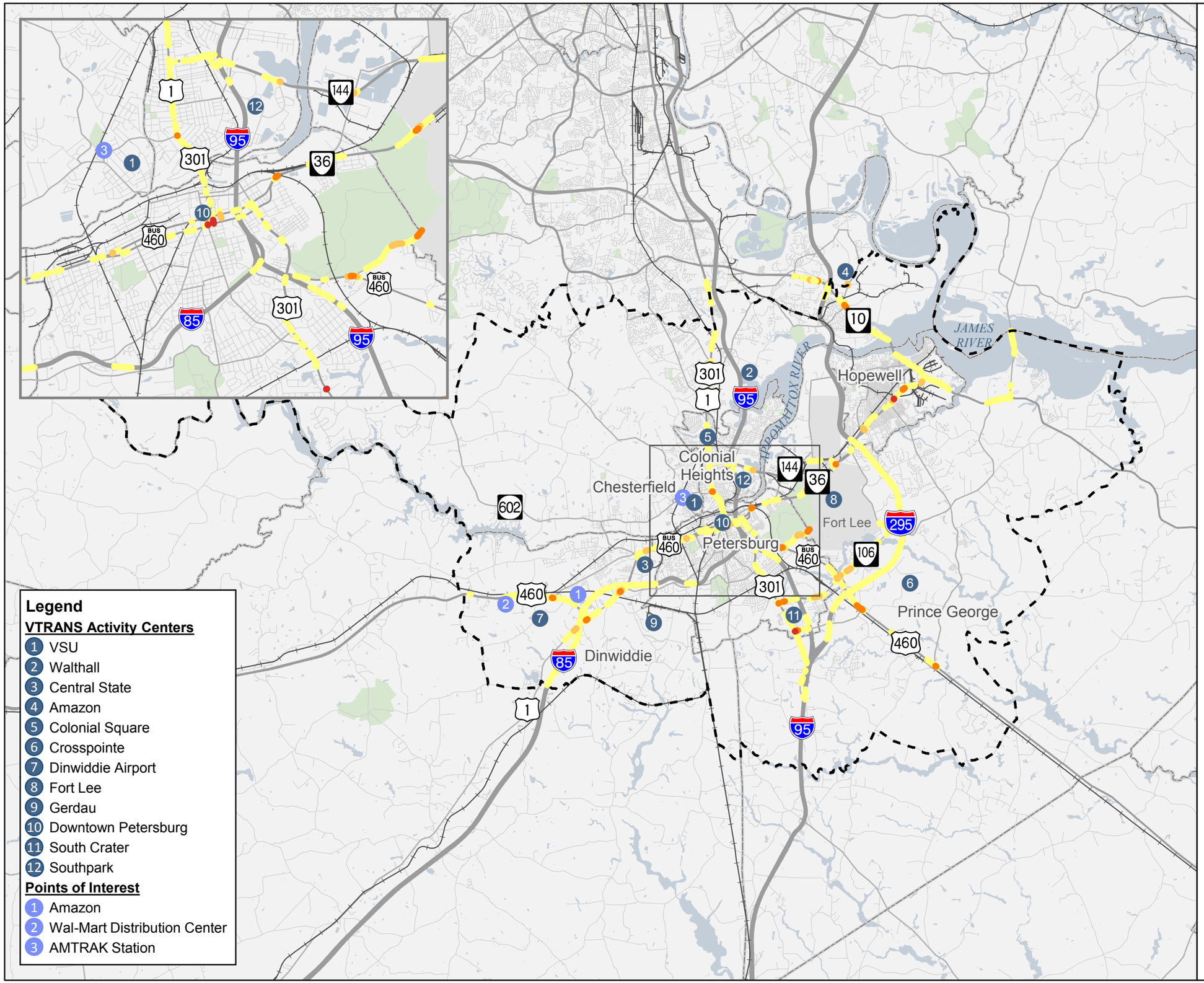
Figure 6
Tri-Cities Congestion Management Process
2015 Peak AM Travel Time Ratio



Legend

VTRANS Activity Centers

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Points of Interest

1. Amazon
2. Wal-Mart Distribution Center
3. AMTRAK Station

- VTRANS Activity Centers
- Points of Interest
- MPO Boundary
- Jurisdictions

Peak AM TTR

- 1.06 - 1.20
- 1.21 - 1.30
- 1.31 - 1.50
- Peak TTR >1.50

Source: TomTom Data

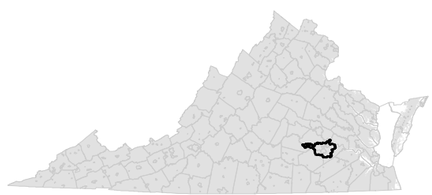

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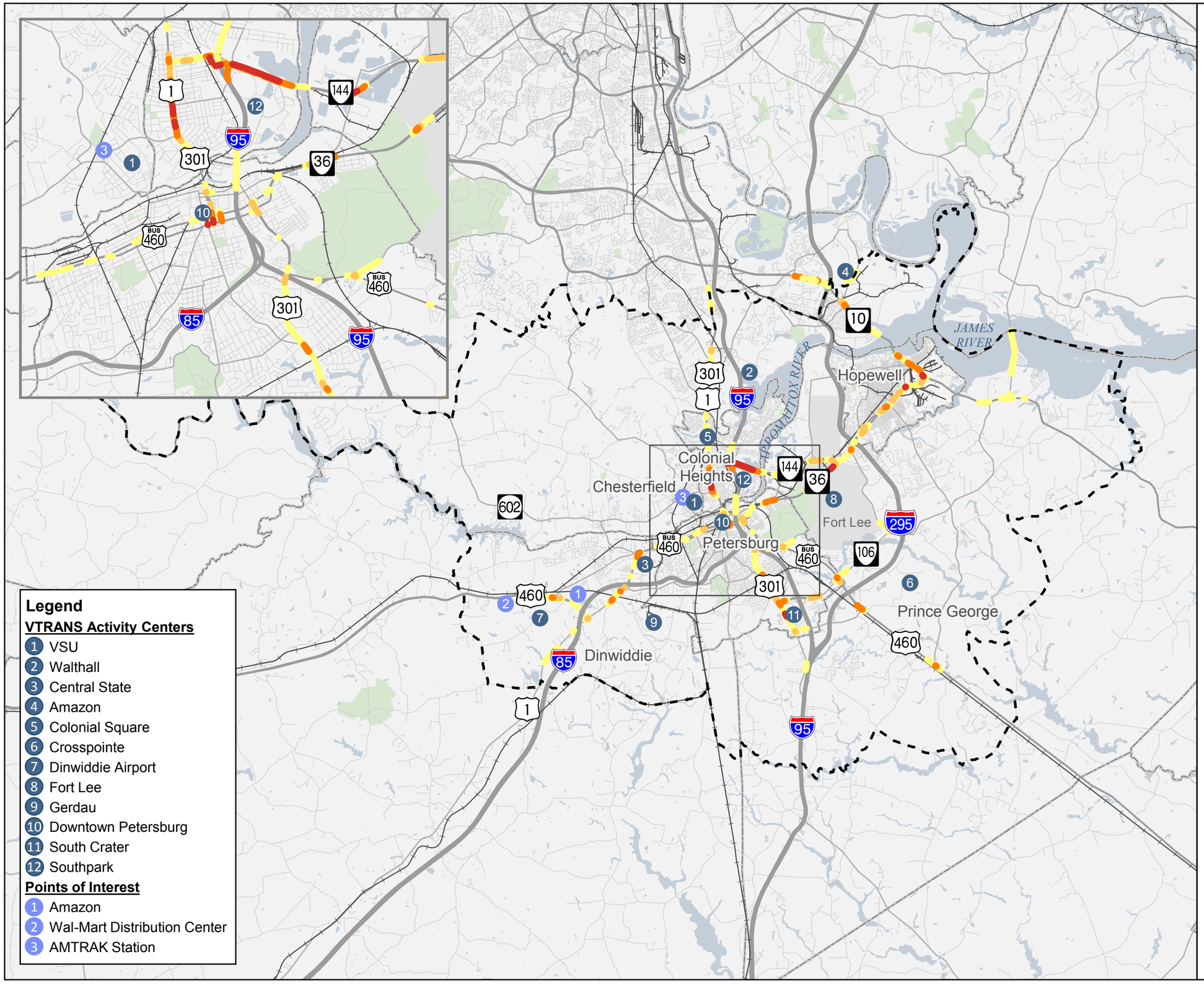
Figure 7
Tri-Cities Congestion Management Process
2015 Peak PM Travel Time Ratio



Legend

VTRANS Activity Centers

1. VSU
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3. Central State
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7. Dinwiddie Airport
8. Fort Lee
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12. Southpark

Points of Interest

1. Amazon
2. Wal-Mart Distribution Center
3. AMTRAK Station

- VTRANS Activity Centers
- Points of Interest
- MPO Boundary
- Jurisdictions

Peak PM TTR

- 1.06 - 1.20
- 1.21 - 1.30
- 1.31 - 1.50
- Peak TTR > 1.50

Source: TomTom Data

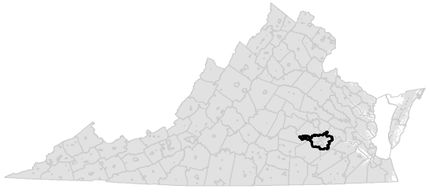

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Table 3: Highway Performance Measures Screening Results

Facility Type	Jurisdiction	Facility Name	From	To	Length (miles)	Lanes	2014 AADT	2014 Hourly Flow Rate	2014 VC Ratio	2014 VMT	2020 AADT	2020 Hourly Flow Rate	2020 VC Ratio	2020 VMT
Freeway	Prince George County	I-95	WARWICK SWAMP	NB OFF RAMP RTE 301	2.17	4	40,321	4,959	0.82	87,497	42,794	5,263	0.87	92,863
	Prince George County	I-95	NB OFF RAMP RTE 301	SB ON RAMP RTE I-295	1.38	4	42,931	5,109	0.76	59,245	46,647	5,551	0.83	64,373
	City of Colonial Heights	I-95	TEMPLE AVENUE RAMP	NCL COLONIAL HEIGHTS	2.38	6	95,926	9,593	0.80	228,304	104,201	10,421	0.87	247,998
	City of Petersburg	I-95	.25 MI NORTH RTE I-85	MINGEA STREET OP	0.09	4	87,555	7,968	0.95	7,880	95,153	8,659	1.03	8,564
Urban Arterial	Chesterfield County	EAST HUNDRED ROAD	RTE 746	RTE I-295 RAMP	0.90	4	28,214	3,301	0.94	25,393	30,660	3,587	1.02	27,594
	Chesterfield County	TEMPLE AVENUE	PRINCE GEORGE CL	ECL COLONIAL HEIGHTS	0.19	4	32,593	3,194	0.85	6,193	35,418	3,471	0.92	6,729
	Prince George County	TEMPLE AVENUE	ECL COLONIAL HEIGHTS	PUDDLEDOCK RD (RTE 645)	0.59	4	32,593	3,194	0.85	19,230	36,148	3,542	0.94	21,327
	Prince George County	TEMPLE AVENUE	PUDDLEDOCK RD (RTE 645)	ROUTE 36	1.99	4	32,593	3,194	0.85	64,860	36,148	3,542	0.94	71,935
	City of Hopewell	OAKLAWN BOULEVARD	WCL HOPEWELL	JEFFERSON PARK ROAD	0.52	4	34,590	3,079	0.92	17,987	35,840	3,190	0.95	18,637
	City of Hopewell	OAKLAWN BOULEVARD	JEFFERSON PARK ROAD	RTE I-295	0.22	4	33,293	3,296	0.95	7,324	33,414	3,308	0.95	7,351

Figure 8: Tri-Cities Total Annual Peak Hours of Delay

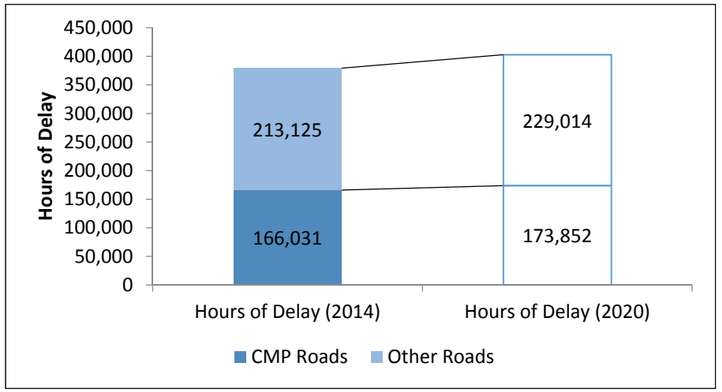


Table 4 shows the results of a statistical evaluation of the VC ratios and Travel Time ratios. The purpose of this evaluation was to verify that the 'rules of thumb' used to identify congestion provided accurate guidance for identifying congested sections of the CMP network.

For the volume to capacity ratios the rule of thumb break points were 0.81 for light congestion, 0.91 for moderate congestion and greater than 0.95 for heavy congestion. Using the mean and standard deviation (+σ, +2σ and +3σ) would change the ranges slightly, but not significantly so the original cut points were kept.

The travel time ratios have the additional complication of having different values for the morning and evening. In this case also the original break points for congestion (1.06 for light congestion, 1.21 for moderate congestion, 1.31 for heavy congestion and greater than 1.50 for extreme congestion.

Table 4: Highway Congestion Performance Measures Statistical Data

Performance Measure	Number of Entries	Mean	Standard Deviation	25th Percentile	Median	75th Percentile
VC Ratio	167	0.39	0.2048	0.23	0.33	0.49
AM TTR	2694	1.03	0.0647	1.01	1.02	1.04
PM TTR	2694	1.06	0.0946	1.01	1.03	1.05

The total congested roadway miles and total vehicle miles traveled on the CMP roadway network for the years 2014 and 2020 were calculated using the VDOT SPS database for each roadway type and are shown graphically in Figure 9 and Figure 10, respectively. This data will be used for comparison with the 2015 congested roadway miles and vehicle miles traveled determined in the Tri-Cities 2003 CMS later in this report in Section 11. Evaluation and Effectiveness of Implemented Strategies**.**

Figure 9: CMP Congested Roadway Miles by Roadway Type

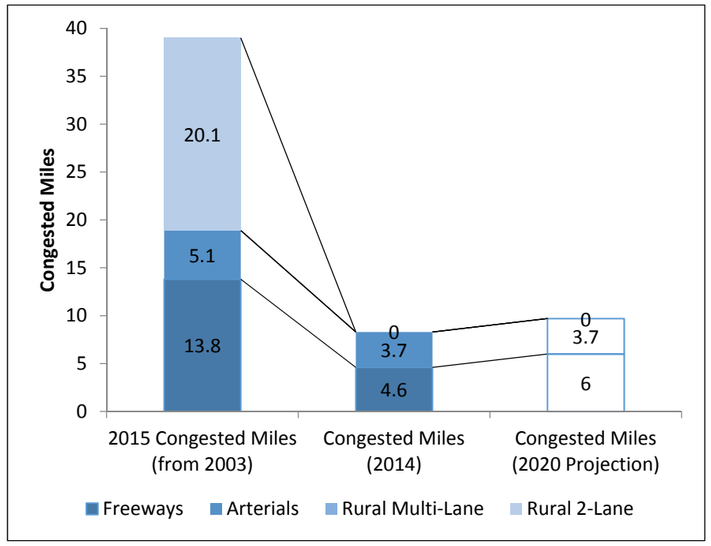
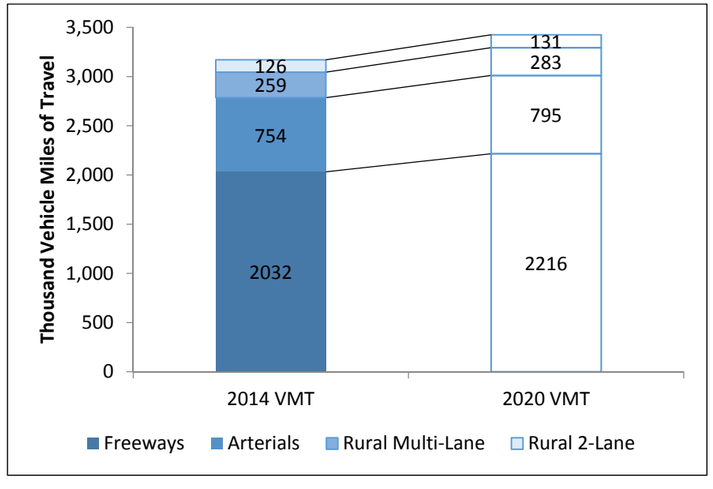


Figure 10: CMP Vehicle Miles Traveled by Roadway Type



The VDOT SPS database includes the number of annual crashes for each roadway link. The crash rate (per 100 million vehicle miles traveled) was calculated and is presented on the study area map in Figure 12**.** As shown in the figure, the roadway segments with the highest crash rates do not have a direct correlation to the roadway segments that show higher VC ratios. The facilities with the highest crash rates are within downtown Petersburg and along Route 1 and Route 36, which are roadways with more densely spaced traffic signals and development. Crash rates are also higher on roadway links adjacent interchanges with freeway facilities.

The VDOT Dashboard (v3) website includes data on incident durations for each VDOT district. Incident duration is a measure of how long it takes to clear unplanned events, which affect traffic, from Virginia highways. The data includes not only VDOT measurements – all responders are included: State Police, Fire and Rescue, VDOT, etc. Only vehicle, tractor-trailer, or HAZMAT events are included (not congestion or traffic slowdowns). Figure 11 shows the incident durations for the VDOT Richmond District (which includes the Tri-Cities MPO) from June 2014 to July 2015. The average incident duration for this time period is 68 minutes. Time is measured from when an event is verified and logged in, until responders have cleared.

Figure 11: VDOT Richmond District Incident Durations (June 2014 – July 2015)

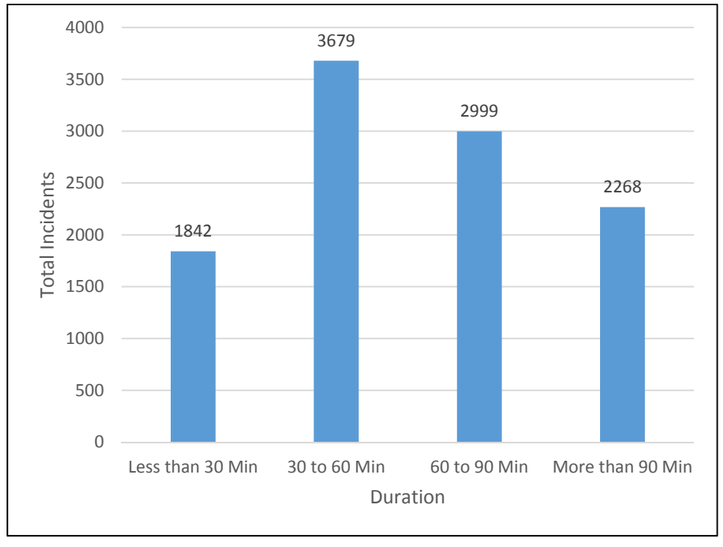
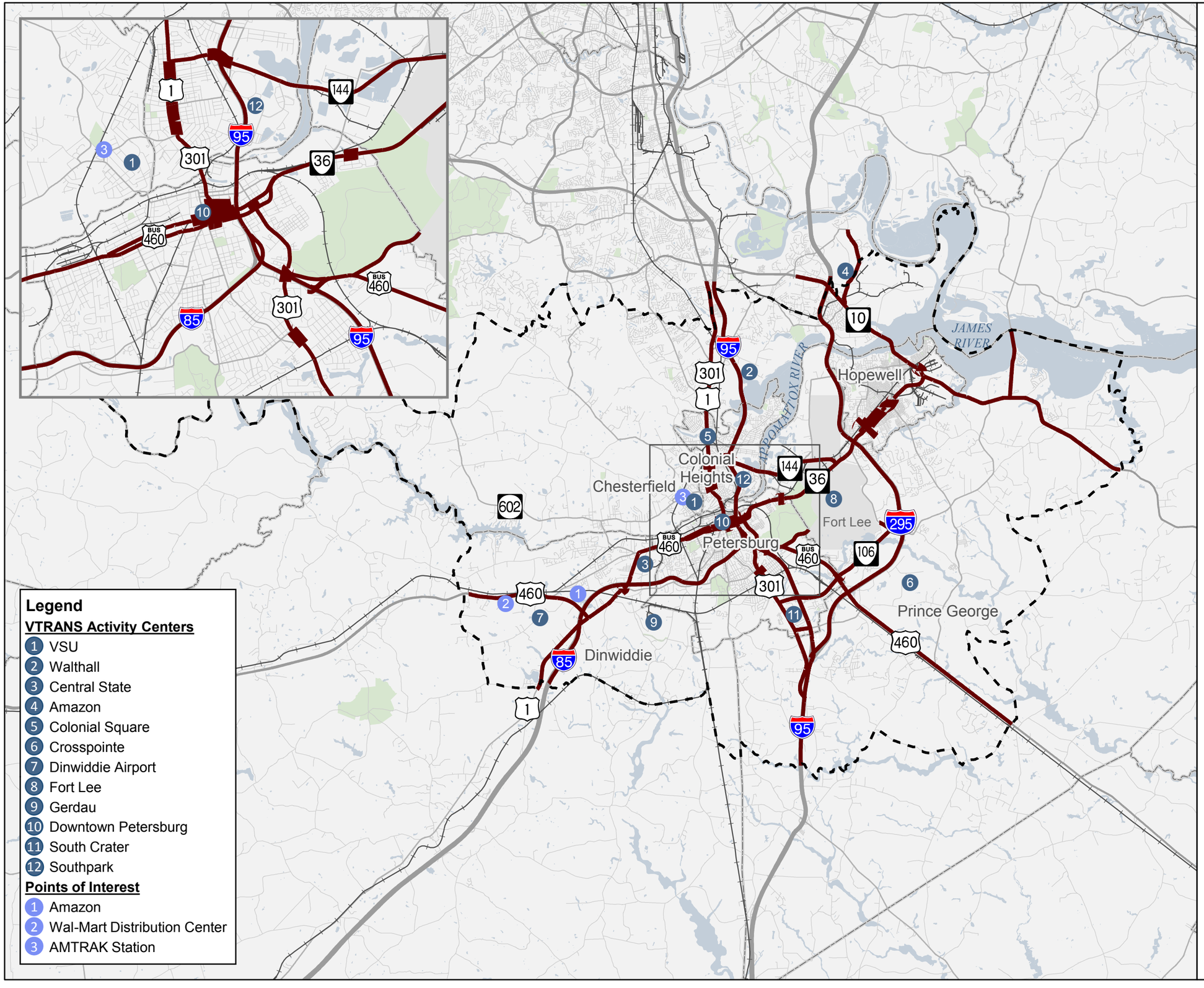


Figure 12
Tri-Cities Congestion Management Process
2014 Crash Rate



Legend

VTRANS Activity Centers

1. VSU
2. Walthall
3. Central State
4. Amazon
5. Colonial Square
6. Crosspointe
7. Dinwiddie Airport
8. Fort Lee
9. Gerdau
10. Downtown Petersburg
11. South Crater
12. Southpark

Points of Interest

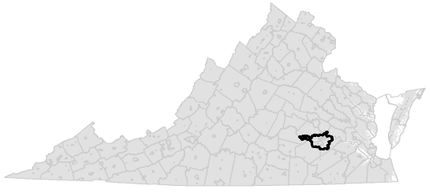
1. Amazon
2. Wal-Mart Distribution Center
3. AMTRAK Station

- VTRANS Activity Centers
- Points of Interest
- MPO Boundary
- Jurisdictions

Crash Rate per 100 million VMT

- 0 - 450
- 451 - 1,500
- Crash Rate > 1,500

Source: VDOT SPS Database



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8.2 Screening Results for Transit Systems

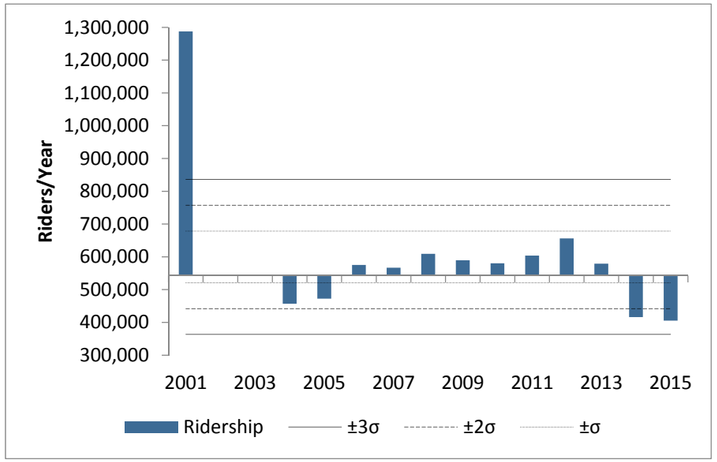
The City of Petersburg completed construction of a multimodal transit station in 2010 at the corner of Washington Street and Union Street in downtown Petersburg. This station serves the PAT buses, GRTC buses, and Greyhound intercity buses. In addition to fixed-route services, PAT offers paratransit service for senior citizens, Medicare card holders, and persons with disabilities living within Petersburg, Colonial Heights, or Hopewell.

Since the completion of the 2003 Tri-Cities CMS, The GRTC has expanded service to CMP study area via an express route (95x), the Richmond/Petersburg Express Route. This route has a stop at the Petersburg Transit Center, as well as four stops in downtown Richmond. The 2016 fiscal year ridership for this route was approximately 27,500 and the total passenger miles traveled was approximately 500,000. The average weekday ridership for the route was 107 trips per day. Although ridership data for this route was not available for the 2003 CMS, this performance measure can be used for strategy evaluations in future CMP documents

The performance measures for the PAT were carried forward from the 2003 Tri-Cities CMS. Total passenger miles is the total distance traveled by every passenger using the service. Unlinked passenger trips refers to a trip on a transit vehicle regardless of the type of fare paid or transfer presented. Figure 13 presents this information for the year 2001, which was originally shown in the 2003 CMS, and data from either the National Transit Database or PAT for 2004 through 2015. Years 2003 through 2011 came from the NTD. Years 2013 through 2015 were provided by PAT. Since 2004 annual unlinked ridership has averaged 599,903 trips per year. However, since serviced cuts began in 2013 ridership has been declining as shown in the figure.

Figure 13 shows a drastic decrease in total passenger miles and unlinked passenger trips from 2001 to 2012. The reason behind this decrease is not entirely known, however conversations with PAT staff suggest that in the mid-2000s, decreases in the number of service routes and increases in fares could have assisted in those reductions. Another difference that contributes to the reduction is the abuse of bus transfer passes, riders were using their transfer passes for themselves and other non-paying riders. The PAT has since adjusted the procedure for bus transfers and reduced the time frame that the transfer pass can be used. The 2015 data presented in the previous table reflects accurate data.

Figure 13: Petersburg Area Transit Ridership Data



8.3 Screening Results for Bicycle Infrastructure

There are no bicycle facilities on the Tri-Cities NHS roadway network nor does the VDOT SPS database identify bicycle facilities on any other non-NHS roadways in the study area. The MPO completed the Tri-Cities Area Bikeway Plan Update in 2003. This plan identifies locations that might be easily developed into bike paths or bike trails. The plan also includes a list of recommended bicycle facility sites for each City and County included in the Tri-Cities MPO as well as possible funding sources. These improvements are listed in Appendix E.

8.4 Screening Results for Pedestrian Infrastructure

Pedestrian facilities on roadways within the CMP study area were identified using the VDOT SPS database. Although this CMP only studies NHS roadways, few of these facilities include bike lanes and some roadways prohibit pedestrian facilities all together (interstates). For these reasons, all roadways within the study area were evaluated to determine the overall pedestrian network connectivity in the MPO CMP study area. The results of the screening are shown in Figure 14. The figure shows a network of pedestrian facilities throughout downtown Petersburg as well as the Virginia State University (VSU) campus. The City of Hopewell also has a network of sidewalks although not to the scale of the previously mentioned locations. Other than these areas, the pedestrian facility network is sporadic.

Control Charts

Figures 13 and 17 in this report are control charts. A control chart is a graph documenting how a process changes, and how it varies, over time. The data are plotted in time series and the analyst calculates the average and standard deviation. The average is used for the x-axis and ledger lines one, two, and three standard deviations (σ) are shown on either side of the x-axis. By comparing current data to these lines, you can draw conclusions about whether the process variation is consistent (in control) or is unpredictable (out of control, affected by special causes of variation).

A special cause is present in the process if any points fall above the upper control limit or below the lower control limit. Action should be taken to find the special cause. Points on the control limits are not considered to be out of statistical control.

Figure 14
Tri-Cities Congestion Management Process
2014 Sidewalks

- VTRANS Activity Centers
- Points of Interest
- MPO Boundary
- Jurisdictions
- Sidewalks on NHS System
- Other Sidewalks

Source: VDOT SPS Database

Legend

VTRANS Activity Centers

1. VSU
2. Walthall
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12. Southpark

Points of Interest

1. Amazon
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3. AMTRAK Station

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8.5 Screening Results for Freight Movement

The heavy vehicle percentages from the VDOT SPS database were used to evaluate freight movement in the Tri-Cities MPO. As shown in Figure 16, the facilities with the highest percent of heavy vehicles are the freeways, particularly I-295 which serves as a bypass around the City of Richmond and the Tri-Cities area. U.S. Route 460 is a primary freight corridor that runs east-west and offers an alternative route to the often congested I-64 facility. Route 106, over the James River and Route 10 in Prince George County, adjacent to the Route 106 James River Bridge, also see a high percentage of heavy vehicles; as these roadways can be used to access I-64 to the east. For the existing conditions, the I-95 segments to the north and south of the MPO study area, and Route 10 at the northern boundary of the study area, are the only facilities showing a VC ratio greater than 0.80 along with a heavy vehicle percentage above four percent.

The heavy vehicle miles traveled (VMT) for all of the CMP network roadway facility types was calculated using the VDOT SPS database and are shown in a graphical format in Figure 16.

Figure 15: CMP 2014 Heavy Vehicle Miles Traveled by Roadway Type

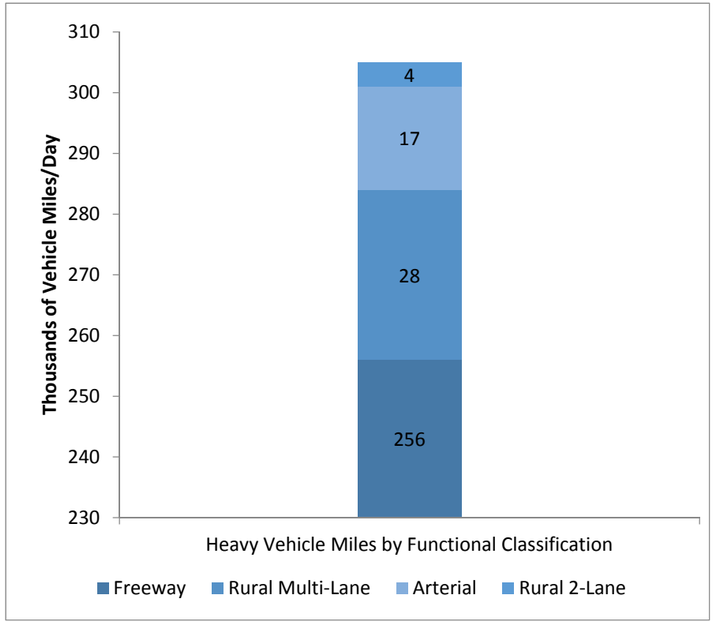
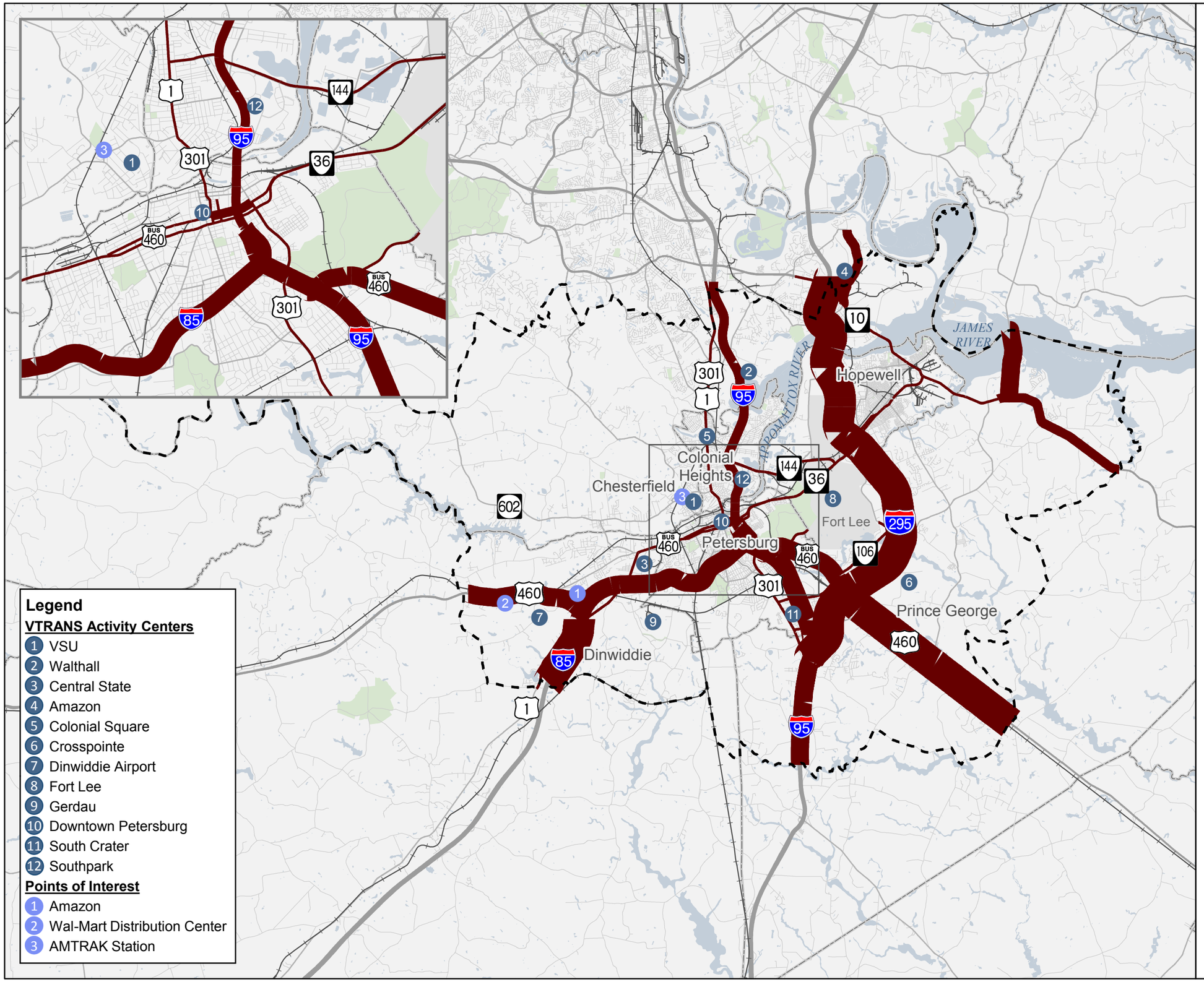


Figure 16
Tri-Cities Congestion Management Process
2014 Heavy Vehicle Percentage



Legend

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Points of Interest

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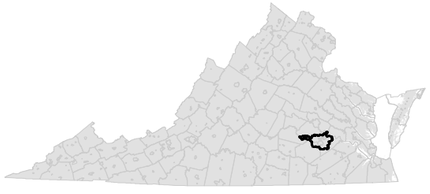
- VTRANS Activity Centers
- Points of Interest
- MPO Boundary
- Jurisdictions

Percent of Heavy Vehicles in Traffic Stream

- 0% - 4%
- 5% - 9%
- 10% - 15%
- 16% - 21%

Source: VDOT SPS Database



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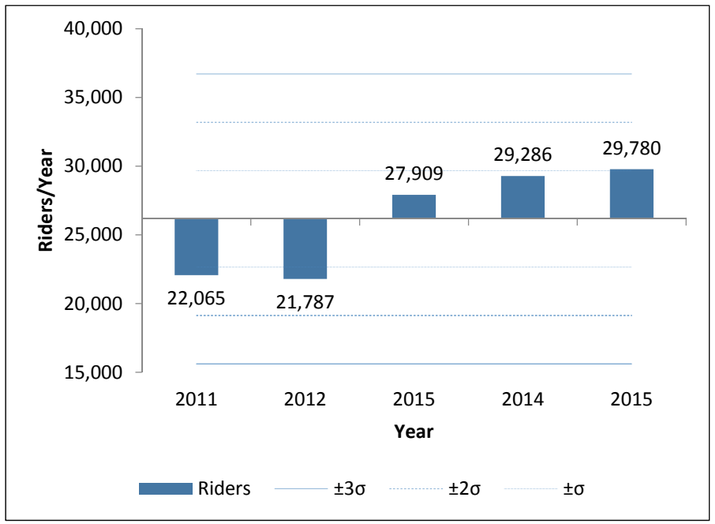
8.6 Screening Results for Passenger Rail

Amtrak provides passenger rail service for the Tri-Cities MPO area at the Ettrick (Petersburg) station just east of Route 36 in Chesterfield County. The station is classified as a Class IV Small Station in the Tri-Cities Multimodal Station Environmental Assessment document. That document also states that "Passenger Rail use is directly related to the ease of public access to passenger rail stations". A review of the previous figures shown in this CMP document can determine the accessibility to the Amtrak Ettrick Station from other transportation modes. A summary of the connectivity of the Amtrak Station to other modes of transportation are presented in the following bullet points:

- There are no sidewalks leading to the station from Ganger Street. There are sidewalks along all roadways leading to the Amtrak Station.
- There are sidewalks throughout the VSU campus which is directly adjacent to the Amtrak Station.
- There are sidewalks throughout the neighborhood that is on the west side of Route 36 adjacent to the Amtrak Station.
- Sidewalks extend east from the Amtrak Station along Granger Street approximately 3500 feet to Dupuy Road.
- Sidewalks extend north from the Amtrak Station along Route 36 approximately 1700 feet to Hickory Road (route 628).
- Sidewalks extend south from the Amtrak Station along Route 36 approximately 3400 feet to College Avenue.
- There are no bicycle facilities leading to the Amtrak Station. Bike riders must share the road with vehicles. There are also no bicycle racks.
- The GRTC does not provide a bus route to the Amtrak Station.
- PAT currently has a bus stop on Granger Street, approximately 0.1 miles from the station, however there is not a bus route that provides direct access to the Amtrak station.
- The Ettrick Amtrak Station is approximately two miles west of I-95. Way-finding to the station along roadways traffic is provided from I-95 northbound and southbound.

Figure 17 shows yearly rail passengers at Amtrak's Ettrick Station between 2011 and 2015. The increase in ridership starting in 2012 corresponds to the addition of Petersburg to Norfolk service.

Figure 17: Annual Rail Passengers at Ettrick Station



9. Identification and Evaluation of Proposed Strategies

The process of the CMP should identify any possible alternatives to projects which would increase SOV capacity on the CMP network and determine the effectiveness of proposed projects in eliminating congestion. In this urban area, the congestion management strategies will contribute to the reduction in the congestion identified by the CMP screening process. Since strategies are specific to certain road types, the reorganization of roads in the CMP network by specific roadway functional class categories will assist in the determination of potential strategies. Furthermore, the process will evaluate the effectiveness of the proposed strategies based on the performance measures identified for the Tri-Cities area.

It is required that the CMP provide reasonable alternatives to any project proposed on the CMP network that will result in a significant increase in single occupancy vehicle (SOV) capacity. The Federal Highway Administration identifies four broad categories of strategies for consideration by the CMP. Strategies identified under these categories will be used by the MPO in evaluating alternatives for implementation. The four categories are identified below. In addition to these four categories, this CMP will provide strategies to improve bicycle and pedestrian infrastructure.

Demand Management Strategies. Travel Demand Management (TDM), nonautomotive travel modes, and land use management can all help to provide travelers with more options and reduce the number of vehicles or trips during congested periods. These include strategies that substitute communication for travel, or encourage regional cooperation to change development patterns and/or reduce sprawl.

Traffic Operations Strategies. These strategies focus on getting more out of what we have. Rather than building new infrastructure, many transportation agencies have embraced strategies that deal with operation of the existing network of roads. Many of these operations-based strategies are supported by the use of enhanced technologies or Intelligent Transportation Systems (ITS).

Public Transportation Strategies. Improving transit operations, improving access to transit, and expanding transit service can help reduce the number of vehicles on the road by making transit more attractive or accessible. These strategies may be closely linked to strategies in the previous two categories (demand management and

traffic operations). As with traffic operations, transit operations are often enhanced by ITS.

Road Capacity Strategies. This category of strategies addresses adding more base capacity to the road network, such as adding additional lanes and building new highways, as well as redesigning specific bottlenecks (such as interchanges and intersections) to increase their capacity. Given the expense and possible adverse environmental impacts of new single-occupant vehicle capacity, management and operations strategies should be given due consideration before additional capacity is considered.

9.1 Travel Demand Management (TDM) Strategies

Various TDM strategies attempt to reduce the amount of vehicles on the roadway during peak travel periods by encouraging ride-sharing and the use of mass transit, as well as traveling during off-peak hours. TDM strategies are most effective in large agencies or organizations, however successful regional programs have been developed that match commuters that originate from the same residential areas to like employment centers. Table 5 lists potential strategies TDM strategies for the Tri-Cities area.

Table 5: TDM Strategies

TDM Strategies	Benefit	Implementation Costs and Time Estimates	Applicable to Tri-Cities MPO
Site-Specific	Reduce costs to individual commuters, lower energy consumption, reduce congestion, lower capital costs for employers and improve air quality. Alone will probably not have large impact on congestion. These programs can be coordinated with the Ridefinders program being used by the Richmond MPO.	Relatively cheap and easy to implement but that does not guarantee success.	Yes. However success depends on employer support and employee willingness to participate.
Alternative hours of Travel (Flex-time)	Removes vehicles from roadway network during the most congested times. May also reduce congestion at entrances to employment centers. Many employers show decrease in sick time and overtime costs after instituting program.	Low cost. Short implementation Time.	Yes, but may have problems with Private Sector agreements.
Assistance Programs (Help to make other TDM more successful)	Guaranteed rides, van-lease programs, employer recognition or subsidies, ridematching and trip planning, strong marketing of the TDM strategies all help the TDM be more successful.	Low to moderate costs to implement. Short implementation time.	Yes, the PAT currently has assistance programs in place.
Teleworking	Teleworking eases congestion by reducing commuter travel. Under a telework agreement, employees perform their work at home, typically one to three days a week, thereby eliminating work trips on those days.	Low cost. Short implementation Time.	Yes, but may have problems with Private Sector agreements.
Smart Growth	As a strategy for managing travel demand, smart growth involves the public and private sectors in shaping new development patterns to help reduce SOV travel.	Cost depends on private sector cooperation. Long implementation time.	Yes. Long term smart growth strategies should begin during the planning process.

9.2 Intelligent Transportation System (ITS) Strategies

Table 6 shows various ITS strategies that should be considered in the Tri-Cities area. These strategies help provide driver guidance, time and synchronize signals, and indicate roadway congestion to a control center.

Table 6: ITS Strategies

ITS Strategies	Benefit	Implementation Costs and Time Estimates	Applicable to Tri-Cities MPO
Regional Multi-Modal Traveler Information/Assistance	Websites to allow drivers to check roadway conditions before getting on the roadway. Also allows dynamic ridesharing. Transportation Management Centers (TMC) allow surveillance of roadways.	Costs depend on the type of system. Web-based services can be relatively cheap and easy, while TMCs require a lot of equipment and coordination.	Yes. VDOT currently runs traveler assistance programs however these can be improved or upgraded with new ITS technology.
Electronic Toll Collection	Makes toll system more efficient.	Higher capital costs. Moderate to long time-table.	There are currently no tolled facilities in the Tri-Cities MPO area
Incident Management System	Reduces time to respond to accidents and breakdowns. Leads reduction in lane blockage and rubbernecking.	Costs range depending on the coverage and service times (some focus on peak hour only). Can be relatively quick to implement depending on availability of equipment.	Yes. These systems would be particularly useful on roadways with high crash rates and/or congestion
Railroad Grade Crossing System	Provides warning for train crews of obstruction on the tracks. Vehicle Proximity Alert System – Large trucks/buses alerted of approaching train.	Moderate to high costs to implement. Moderate implementation time.	Railroad Grade Crossing Systems are applicable to the MPO area but the costs/benefits would most likely prohibit the implementation.

9.3 Transit Strategies

The PAT service that currently runs in the Tri-Cities urban area may be improved to meet modified demand, introduce new service or modify fare structures. Table 7 presents transit strategies for the Tri-Cities MPO area. The Tri-Cities Area 2010 Transit Development Plan includes financially constrained and unconstrained recommendations for the area. These recommendations are shown in Appendix F.

9.4 Road Capacity Strategies - Freeways

As described previously in this report, four freeway segments are potentially congested in 2020 based on the analysis of the VDOT SPS data. These segments include the following:

- I-95 from Warwick Swamp to the southbound off ramp to Route 301
- I-95 from the southbound off ramp to Route 301 to the southbound on-ramp to I-295
- I-95 from the Temple Avenue ramp to NCL Colonial Heights
- I-95 from 0.25 miles north of I-85 to the East Wythe Street overpass

The strategies shown in Table 8 can be applied to improve congested freeway segments. These strategies are in addition to traditional roadway improvements and widening. These types of projects are viable alternatives in many cases that provide additional SOV capacity. The summary below lists potential strategies specific to freeway segments and presents costs and implementation timeframes for the strategies.

Table 7: Transit Strategies

Transit Strategies	Benefit	Implementation Costs and Time Estimates	Applicable to Tri-Cities MPO
System Service Expansion (introduce rail, local bus, express bus)	Improve connections where projected demand exists. Increase mobility opportunities for poor, disabled and elderly.	Costs depend on the type of improvement. An expansion of existing service where demand exists can be lower cost and short term. Creation of a new mode can be extremely expensive and require years of implementation.	Yes. Although GRTC has recently expanded service to the Tri-Cities area, additional stops can be considered.
Improved Routing	Focuses routes and service to existing demand. Makes system more efficient.	Low cost because it uses existing equipment. Short time table.	Yes
Fare Structures	Modifies fees to make service more affordable or more effective.	Low costs to implement. Wrong rates could reduce ridership. Short implementation time.	Yes. PAT has recently restructured fees and procedures.
New Modes	May introduce more attractive service.	High costs to develop routes, cover capital costs and operate system.	Yes, however time and cost make this prohibitive
Park-n-Ride Lots	Useful for commuters and transit. Increases densities for service and carpoolers.	Modest costs, depending on size and extent. Tri-Cities area has recently introduced park-n-ride lots.	Yes. The Tri-Cities MPO area currently has no park-n-ride lots.
Electronic fare payment systems	These systems facilitate payment for parking, bus and train fares as well as tolls. May decrease congestion by reducing wait/stop times	Moderate costs for equipment and implementation	Yes. The PAT has only 4 locations that sell bus passes.

Table 8: Freeway Strategies

Freeway Strategies	Benefit	Implementation Costs and Time Estimates	Applicable to Tri-Cities MPO
Incident Management Systems	Major benefit is to reduce delay caused by breakdowns and accidents. By some estimates, over 60% of congestion is non-reoccurring. Thus a key to reducing congestion, is to handle incidents as quickly as possible.	Some examples include motorcycle patrols with very substantial benefits for moderate to substantial costs. Video detection provides very substantial benefits for very substantial costs. Public education can have substantial benefits for minor costs. Quick to moderate timetable for implementation.	Yes. These systems would be particularly useful on roadways with high crash rates and/or congestion such as I-95.
Highway Information Systems	Gives driver on the road information to avoid and thereby minimize congestion.	Can be high costs for equipment. A substantial amount of time is needed to plan and implement this system.	Yes. There are currently no variable message signs in the Tri-cities MPO area.
HOV	Benefits for drivers that carpool or use transit.	Requires modification of existing freeway lanes. Could result in a loss of capacity in multi-use lanes. May take time to stripe or redesign road.	Although applicable to freeways within the Tri-Cities area, cost of construction and lack of HOV ridership make this prohibitive.
Park-n-Ride Lots	Useful for commuters and transit. Increases densities for service and carpoolers.	Modest costs, depending on size and extent. Tri-Cities area has recently introduced park-n-ride lots.	Yes. The Tri-Cities MPO area currently has no park-n-ride lots.

9.5 Road Capacity Strategies – Arterials and Rural Facilities

As described previously in this report, six arterial segments appear congested (a road segment showing a v/c ratio of 0.80 or greater is considered congested) in 2015 and 2020 based on the analysis of the VDOT SPS data. These segments include the following:

- East Hundred Rd from Route 746 to the I-295 ramp
- Temple Avenue from the eastern city limits (ECL) Colonial Heights to Puddledock Road
- Temple Avenue from the Prince George County Line to the eastern city limits (ECL) Colonial Heights
- Temple Avenue from Puddledock Road to Route 36
- Oaklawn Boulevard from western city limits (WCL) Hopewell to Jefferson Pk Rd
- Oaklawn Boulevard Blvd from Jefferson Park Road to I-295

The TomTom data screening results show congestion taking place primarily at signalized locations along arterials. This is especially true for the AM peak hour. The results for the PM peak hour show similar issues at signalized intersections however, Route 10, Route 36, and Route 144 show congestion along roadway segments.

The CMP screening process for roadways did not identify any potentially congested rural segments however most rural facilities can utilize some strategies that have been proposed for arterial segments.

The following strategies can be applied to improve the design and geometry of the arterial and rural roadway segments. These strategies range from specific spot improvements to major reconstruction along the corridor. These types of projects are viable alternatives in many cases that provide additional SOV capacity.

Table 9 lists potential strategies specific to arterial and rural segments and presents costs and implementation timeframes for the strategies. All of these strategies are applicable to roadways within the MPO area. Costs for each strategy were developed using the 2015 VDOT TMPD Planning Level Cost Estimate Spreadsheet tool. The strategies are divided into design strategies and operational strategies for consistency with the 2003 Tri-Cities CMS plan.

Table 9: Arterial and Rural Roadway Strategies

Design Strategies	Benefit	Implementation Costs and Time Estimates
Super Street Arterials	Widening roadway and reducing number of access points (grade separate intersecting streets). Could increase capacity 50%, and decrease delay significantly.	The costs per mile are estimated at $10-20 million/mile. The design and construction of such a facility will be expensive and time-consuming. May involve land acquisition and access modifications.
Intersection Improvements	Can have substantial benefits due to the reduction in traffic conflicts, queuing and improvement of traffic flow	Costs are relatively modest and vary depending on improvement. Implementation time can be very short for small projects (add turn lane or change control devices).
One Way/ Reversible Streets	High volumes and vehicle conflicts may lead to consideration of one-way streets. Works best where one predominant flow is apparent. Can increase capacity or improve multi-modal potential. Could improve pedestrian safety, however traffic speeds may increase.	Could be relatively low cost ($1000-$4,000/block), but should be studied to see if one-way or reversible flow will improve flow. Should consider parallel streets in vicinity. Transition back to two-way should be considered at end of one-way section. Care should be taken using reversible lanes.
Access Management	Major benefit occurs by decreasing accidents. Reduces conflicts and decreases slower vehicles entering and exiting roadway.	Politically charged issue. Difficult to control private access. Can be moderate cost, but may require purchase of property.
Roundabouts	Improves safety and operations for most locations. Traffic volumes for certain turning movements could negate benefits	High cost, especially in tight urban areas.
Operations Strategies	**Benefit**	**Implementation Costs and Time Estimates**
Signal Improvements	Signal coordination will provide for orderly traffic movement, provide reasonable timing for pedestrian and side-street crossing, increase capacity of intersection and reduce accidents	One of the most cost-effective tools. Such improvements can be integrated in a relatively short period of time.
Arterial Surveillance	By some estimates over 60% of congestion is non-reoccurring. Thus a key to reducing congestion, is to handle incidents as quickly as possible.	Major costs associated with intersection control devices and operations costs. Requires coordinated effort. May take time to design, implement and coordinate systems.
Turn Prohibitions	Adding raised medians limits conflicting movements. Direct turning vehicles to turn bays / lanes so they don't slow through traffic. Safer pedestrian crossings.	Relatively low cost (Continuous median strip to control left turns estimated at $3,000/block) and easy to implement. May limit access to businesses (economic impacts) and cause political conflict.
Improved Signage	Reduces driver confusion and traffic flows improve.	Modest costs, varying on the complexity and number installed
Intersection geometric improvements	This category may involve increasing the radius of corners to facilitate the movement of trucks and buses through an intersection.	Low cost and short implementation time. The cost to widen a radius for trucks ranges from $270,000-$350,000
Intersection turn lanes	The addition of new turn lanes can provide greater capacity for the intersection without modifying the basic geometry of the intersection.	Moderate cost and short implementation time. Cost of construction for one turn lane can range from $1,130,000 to $2,190,000
Center turn lanes	Center turn lanes provide an area where vehicles can move out of the thru lanes and pause while making a left-hand turn.	Low to moderate cost and short implementation time. Most benefit when working in existing ROW
Traffic channelization	Channelization is the separation or regulation of conflicting traffic movements into definite paths of travel by traffic islands or pavement marking to facilitate the safe and orderly movements of both vehicles and pedestrians.	Low cost and short implementation time. Cost will depend on method of channelization.
Eliminate at-grade rail crossings	In a few areas of the region, at-grade rail crossings reduce traffic flow on major arterials. The separation of rail and roadway travel improves congestion and safety.	High Cost as this would most likely require bridge construction and railroad coordination. Long implementation time.
Parking modifications	Parking modifications include parking restrictions intended to improve the operation of roadways by eliminating parking spaces near intersections and by restricting peak hour parking.	Low Cost and short implementation time. May limit access to businesses (economic impacts) and cause political conflict.

9.6 Pedestrian and Bicycle Strategies

Through this CMP process, there were no bicycle facilities identified on the roadways in the CMP study area (NHS and non-NHS roadways). The 2003 Tri-Cities Area Bikeway Plan update includes bicycle recommendations for each City and County in the Tri-Cities MPO. The goals, objectives, and policies from that document are shown to the right of this page in Table 10. The recommendations are shown in Appendix E.

Table 11: Pedestrian Infrastructure Strategies

Pedestrian Infrastructure Strategies	Benefit	Implementation Costs and Time Estimates
Upgrade roadways to improve pedestrian safety and comfort	This strategy includes sidewalks, rumble strips, curb ramps, pedestrian refuges, etc.	Most are low cost with short implementation times.
Give extra pedestrian crossing time at signalized intersections	Improve intersection safety for pedestrians by slowing cars and helping drivers and pedestrians see each other. This may negatively impact vehicle operations.	Low cost and short implementation time.
Install pedestrian countdown signals	Gives pedestrians a better understanding of available walking time.	Low cost and short implementation time.
Target enforcement of high-risk behaviors on high-injury corridors	Enforcement of speed limits can reduce vehicle travel speeds which increases pedestrian safety	Depends on cooperation with local law enforcement

The purpose of pedestrian infrastructure strategies is to get more people to walk instead of using their automobiles to travel short distances; possible strategies for the Tri-Cities MPO are shown above in Table 11.

Table 10: Bicycle Goals, Objectives, and Policies from 2003 Tri-Cities Bike Plan

Goals	Objectives	Policies
To establish a bikeway system in the Tri-Cities Area	To prepare a bikeway plan for the Tri-Cities Urban Area	To research local needs for bikeways and delineate a bikeway system to meet these needs.
		Coordinate with the local jurisdictions and other interested groups for their awareness, interest and ideas.
		To use existing Policy and Technical Committees as a means of evaluating regional bikeway problems.
		To follow the guidelines recommended by VDOT in the Virginia Bicycle Facility Resource Guide in establishing and implementing a bikeways system when possible.
		Coordinate and integrate bikeway planning and greenway planning with other transportation programs.
	Develop a system of bicycle routes, lanes, and paths/trails throughout the Tri-Cities Urban Area	Where at all possible utilize existing bikeways in conjunction with proposed routes.
		Provide connecting routes between all of the jurisdictions in the study are wherever possible.
		Encourage the design and development of inter-jurisdictional bikeways to be a continuous system and provide loop routes for different return trips.
		Encourage the routing of bikeways through scenic areas.
		Request VDOT to include provision for bikeways along all future highway construction, when there is support from locality, public and funding is available.
		Research State and Federal funding sources to assist local governments in the financing of bikeways.
	Develops bikeways that are direct, convenient, safe and easy to use.	Develop a system of bikeway graphics that clearly identifies bikeways. Bikeways signs, maps and painted lanes will suffice in most cases.
		Encourage local jurisdictions to maintain and provide interested citizens with appropriate mapping of the bikeway system.
		Develop a bikeway system that will be convenient to all sections of each jurisdiction.
		Encourage use of roadway-maintenance funds to improve current routes along which bicycles are ridden by realigning grates, repairing potholes, making traffic signals more responsive to bicycles, etc.
		Develop a network of off-street bike paths integrated with the on- street system.
To encorage the use of the bicycle as an alternate means of everyday transportation	Provide bikeway access to and within the study areas' major Generators of bicycle and automotive traffic.	Encourage inclusion of all bicycle ways to connect all recreation and school sites whenever possible.
		Wherever possible encourage bicycle paths or trails within the confines of the parks, recreational areas and school sites.
		Connect all major commercial areas (shopping centers and central business districts) with convenient residential areas along safe transportation routes.
		Encourage localities to establish bikeways that link major roadways.
	Plan for support facilities and services for bicyclists.	Encourage bicycle-parking facilities in all new employment and commercial developments.
		Encourage bicycle-parking facilities in all new apartment complexes, schools, parks, churches, hospitals, public buildings, and other areas of large gatherings.
		Encourage the construction of bicycle-parking facilities in all of the existing areas mentioned above.
		Encourage the installation of bicycle-parking facilities in the public right-of-ways.
		Work with Virginia State University, Richard Bland College and area schools to promote bicycle commuting and to assist in siting bicycle parking areas.
		Consider adopting zoning requirements for lockers and showers to be added to new buildings.
		Consider requiring bicycle parking at major public events to help ease traffic and parking.
To make bicycling and walking safer in the Tri-Cities urban area	Develop a comprehensive public-awareness program involving bicyclists, motorists and pedestrians on the use and safety of bikeways.	Expand the bicycle-safety education program in public schools whenever possible.
		Utilize existing civic clubs and associations, as well as local police and sheriff's departments, for the continuation of bicycle-safety clinics.
		Utilize media of television, radio, and newspapers in order to promote a public-awareness program for bicycle safety.
		Implement a helmet usage campaign.
	Increase enforcement of traffic laws for the protection and safety of bicyclists and pedestrians.	The bicycle safety-enforcement program must be applied to children as well as to adults.
		The enforcement system must serve a dual purpose—for education and as a deterrent.
		Promote citizen participation in planning, encouraging bicycle and pedestrian safety education and public-awareness programs.
	Increase public awareness of the benefits of bicycling and walking and of available resources and facilities.	Develop adult and youth bicycle and pedestrian education and safety program.
		Market the health benefits of walking and bicycling.
		Develop a "Share the Road" public awareness campaign.
	Complete a network of sidewalks and trails that serve pedestrians needs, especially for short trips to employment centers, schools, commercial districts, bus stops, and institutions.	Complete missing sidewalk connections wherever possible to make direct routes for walking.
		Identify impediments and obstacles to walking to schools.
		Consider the installation of sidewalks, where feasible, as part of all new transportation improvements.
		Encourage walking for fitness and recreational purposes

9.7 Passenger Rail Strategies

Passenger rail ridership at the Ettrick Amtrak Station has steadily increased over the past few years and is projected to continue to increase. Although there are no direct strategies that the Tri-Cities MPO can initiate to increase passenger rail ridership, many of the previously shown strategies for other modes of travel can indirectly influence ridership. There is a current study, The Tri-Cities Area Multimodal Station Environmental Assessment which is investigating possible locations for a new passenger rail station. Previous studies have been undertaken to improve passenger rail capacity in the region as listed below:

- Richmond/Hampton Roads Passenger Rail Project - The Federal Rail Administration (FRA) and the Department of Rail and Public Transportation (DRPT) completed a Tier 1 Environmental Impact Statement (EIS) for the Richmond to Hampton Roads Passenger Rail Project in 2012. This EIS evaluated the feasibility and impacts of the proposed high speed rail passenger service from Richmond to Hampton Roads, with consideration for two primary alignments: one north of the James River from Richmond to Newport News, and a second south of the James River to Norfolk. This EIS defined the routed south of the James River for higher speed service from Richmond through the Tri-Cities area to Norfolk with a total of 12 (six round trip) trains, with a continuation of conventional passenger rail service from Richmond to Newport News with a total of six (three round trip) trains.

- Southeast High Speed Rail Corridor- FRA is working with DRPT, North Carolina Department of Transportation (NCDOT, South Carolina, and Georgia to advance high speed rail in the southeast. The corridor would connect Washington, D.C., Richmond, Raleigh, Charlotte, and Atlanta with an extension from Richmond to Hampton Roads.

10. Programming and Implementation of Strategies

Implementation of CMP strategies occurs on three levels: system or regional, corridor, and project.

Regional-level implementation of congestion management strategies occurs through inclusion of strategies in the fiscally-constrained MTP and the TIP. At the corridor level, more specific strategies such as bicycle and pedestrian improvements and operational improvements can be assessed in studies and implemented using a variety of funding sources, including Federal funding streams such as the Surface Transportation Program (STP), National Highway System (NHS) funds, and the Congestion Mitigation and Air Quality Improvement (CMAQ) Program, as well as through state or local funding or other discretionary funding sources. The Surface Transportation Block Grant Program (STBG) is a possible funding source for bicycle and pedestrian infrastructure projects. For larger projects, particularly capacity-adding projects, demand management and operational strategies should also be analyzed for incorporation into the project as part of the project development process.

This tiered approach to strategy implementation integrates the CMP into all aspects of MPO planning and allows a flexible and robust incorporation of congestion management. It also introduces the consideration of scale. The CMP offers one way to bridge that gap by translating system-level understanding to inform project-level decisions.

Once the strategies chosen as alternatives for relieving congestion have been evaluated, they will be presented to the MPO. The congestion relief benefits of each as well as a cost analysis will be prepared for each strategy. From these strategies, the MPO will choose those projects that should be included in the Transportation Improvement Program (TIP). The TIP includes an implementation schedule for all projects and expected sources of funding. The CMP process occurs on an annual basis as TIP projects are selected. The formal CMP document is prepared every three years and reports the status of the process and approach.

11. Evaluation and Effectiveness of Implemented Strategies

After CMP strategies have been implemented, continued monitoring of the transportation network is necessary to determine the effectiveness of the strategies. The efforts of the MPO to relieve congestion in the region can be monitored using the SPS database and other tools described throughout this report. It is through this process that the MPO will be able to determine if the congestion relief strategies it has recommended are truly making a positive impact on the region's transportation system.

The CMP is a working document and should change to meet the current needs of the Tri-Cities area. By monitoring the results of CMP activities, the MPO can review and modify the components of the CMP. Adjustments may include collecting new or additional data, adding or deleting strategies *et cetera*.

The update of the CPS database, noting the changes deemed necessary, and the inclusion of the identified and projected traffic congestion as documented in this report will be tracked. Every three years the Tri-Cities MPO will provide the CMP Operations Plan, documenting CMP efforts and their effectiveness and discussing the status of congestion management activities. Any background data developed in the evaluation of projects and alternatives will also be included along with the annual update of the CMP.

To assist the Tri-Cities MPO in monitoring the effectiveness of CMP strategies, this CMP document will compare the applicable screening results to those included in the 2003 CMS plan.

Figure 18 and Figure 19 compare the total number of congested roadway miles from each document and the CMP network vehicle miles traveled, respectively.

Figure 18: CMP Network Total Congested Roadway Miles Comparison (2003 vs 2016)

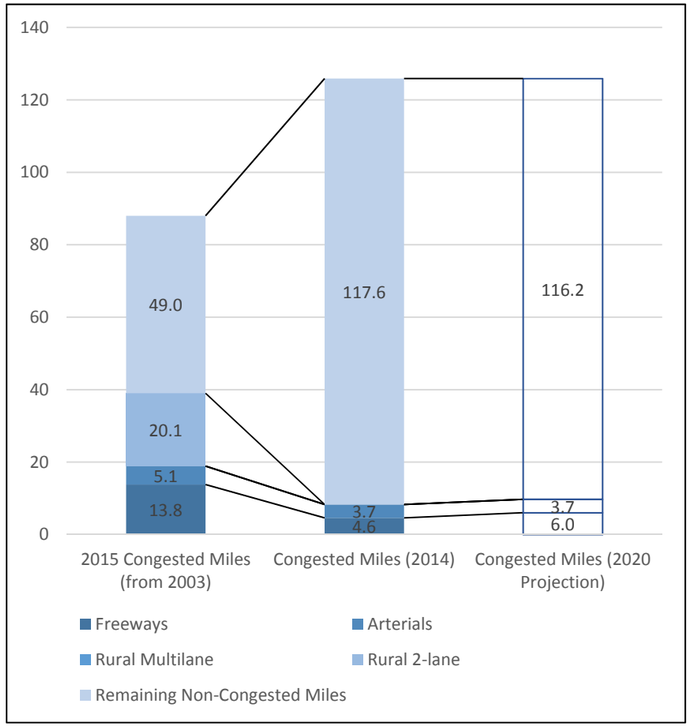
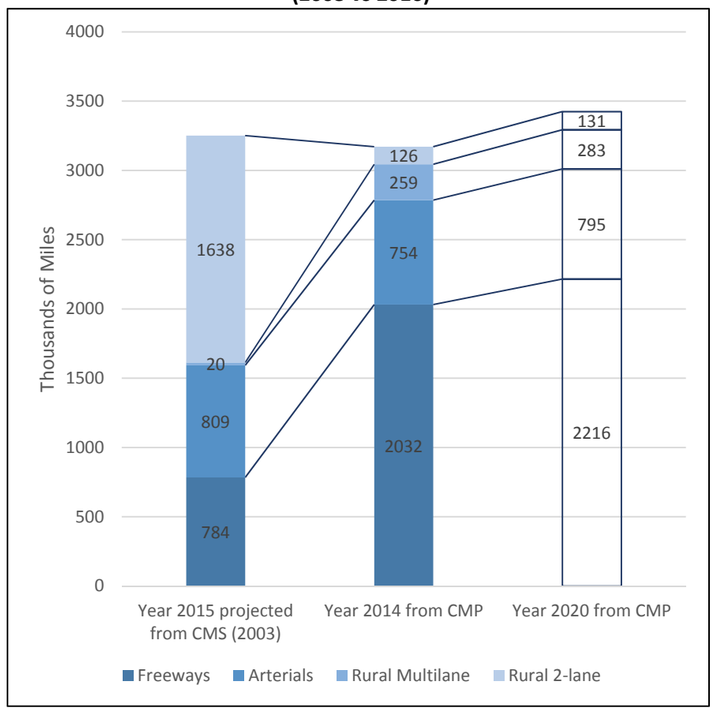


Figure 18 shows a reduction in congestion over the CMP roadway network since the completion of the 2003 CMS document. The most noticeable decrease is on rural two-lane facilities; the 2003 CMS calculated approximately 20 congested miles for this category and this current CMP shows there are no congested roadways of this type. The figure also shows a reduction in congested roadway miles for freeways and arterials. When comparing the 2014 and 2020 congested roadway miles calculated for this CMP, there is expected to be a slight increase in congestion on freeway facilities. Figure 19 shows that the previous 2003 CMS document may have overestimated the number of vehicle miles traveled on rural two-lane roadways for the year 2015 and underestimated the miles traveled on freeways. Never-the-less, the total number of vehicle miles traveled projected for the year 2015 from that document was within two percent of the total vehicle miles for 2014 calculated for this CMP. Figure 19 also shows that the number of vehicle miles traveled is expected to increase approximately eight percent between 2014 and 2020.

Figure 19: CMP Vehicle Miles Traveled by Roadway Type (2003 vs 2016)



The performance measures, goals, and objectives shown in the 2040 Draft Tri-Cities Long Range Plan (discussed in Section 4 of this report) generally differ from those performance measures used for this CMP. Although the LRP includes more regional planning components than just surface transportation, it is important the CMP and LRP include similar transportation system performance measures to avoid confusion in the MPO decision making process.

It is recommended, that during the LRP update process, the goals and objectives for the surface transportation network be modified to coincide with the performance measures used for the CMP. Below is a list of suggested changes for the goals and objectives shown in the LRP. These will allow the two documents to work in tandem to guide the decision making process for Tri-Cities MPO.

- Add "Reduce the vehicle miles traveled along NHS roadways" as a goal under the Congestion Reduction performance measure.
- Add "Reduce the travel time ratio along NHS roadways" as a goal under the System Reliability performance measure.
- Add "Reduce the vehicle miles traveled for trucks and heavy vehicles along NHS roadways" as a goal under the Freight Movement and Economic Vitality performance measure.
- Add "Increase pedestrian infrastructure" as a goal under the Environmental Sustainability performance measure
- Add "Increase bicycle infrastructure" as a goal under the Environmental Sustainability performance measure
- Add "Increase the connectivity between different transportation modes" as a goal under the Environmental Sustainability performance measure

12. Glossary of Terms

Term	Definition	Notes
AADT	Average Annual Daily Traffic	
CPDC	Crater Planning District Commission	
CMS	Congestion Management System	The CMS was required for TMAs beginning in 1991 and has evolved into the CMP to better recognize the ongoing nature of the efforts.
CMP	Congestion Management Process	A process intended to improve transportation systems by monitoring and evaluating congestion in a systematic fashion. See also CMS
Congested Roadway	Roadway with VC ratio of 0.8 or greater	
ECL	Eastern Corporate Limits	
GRTC	Greater Richmond Transit Company	
Headway	The average time, or distance between vehicles moving in the same direction on a route.	
HCM	Highway Capacity Manual	
HOV	High Occupancy Vehicle	Vehicles with more than one traveler
ITS	Intelligent Transportation System	
LOS	Level of Service	For highways the LOS ranges from A (the best) to F (stop and go)
LOS E	Level of Service E	The highest capacity at which traffic continues to flow smoothly along the facility. Typically this occurs at a speed of approximately 30 mph.
LRP	Long Range Plan	Refers to the Tri-Cities MPO Long Range Plan
MPO	Metropolitan Planning Organization	
NHS	National Highway System	
OIPI	Office of Intermodal Planning and Investment	
PAT	Petersburg Area Transit	
SOV	Single Occupancy Vehicle	
SPS	Statewide Planning System	
TDM	Travel Demand Management	
TIP	Transportation Improvement Program	
TMA	Transportation Management Area	An urbanized area with a population greater than 200,000.
TMPD	Transportation Mobility and Planning Division	The TMPD is a division of VDOT
TTR	Travel Time Ratio	Ratio of average peak travel time to a free-flow travel time
Ultimate Capacity	The highest, theoretical, hourly capacity for a roadway section	
VC Ratio	Volume to Capacity Ratio	
v/c	Volume to Capacity Ratio	
VDOT	Virginina Department of Transportation	
VMT	Vehicle Miles Traveled	
VPH	Vehicles Per Hour	
Wayfinding signage	Signs intended to help the user locate where they are in relation to their destination	
WCL	Western Corporate Limits	

Tri-Cities
Metropolitan Planning Organization
Congestion Management Process

Appendix A

Tri-Cities CMP Roadway Network

CMP Network Roadway Segments (Freeways)

Jurisdiction	Facility Name	From	To	Length (miles)	Lanes
Chesterfield County	I-95	NCL COLONIAL HEIGHTS	RTE 620	1.55	6
Chesterfield County	I-95	RTE 620	RTE 10	2.90	6
Chesterfield County	I-295	RTE 10	HOPEWELL CL	2.42	6
Dinwiddie County	I-85	ROWANTY CREEK	HATCHER RUN	0.29	4
Dinwiddie County	I-85	HATCHER RUN	RTE 460	2.50	4
Dinwiddie County	I-85	RTE 460	RTE 603 OP	1.62	4
Dinwiddie County	I-85	RTE 603 OP	RTE 1 NORTH	0.30	4
Dinwiddie County	I-85	RTE 1 NORTH	SCL PETERSBURG	1.18	4
Prince George County	I-95	WARWICK SWAMP	NB OFF RAMP RTE 301	2.17	4
Prince George County	I-95	NB OFF RAMP RTE 301	SB ON RAMP RTE I-295	1.38	4
Prince George County	I-95	SB ON RAMP RTE I-295	SCL PETERSBURG	0.96	4
Prince George County	I-295	1ST SCL HOPEWELL	2ND NCL HOPEWELL	1.21	6
Prince George County	I-295	2ND SCL HOPEWELL	3RD NCL HOPEWELL	0.95	6
Prince George County	I-295	3RD SCL HOPEWELL	RTE 460	5.91	4
Prince George County	I-295	RTE 460	RTE I-95 SOUTH	3.03	4
City of Colonial Heights	I-95	NCL PETERSBRG	TEMPLE AVENUE RAMP	1.19	6
City of Colonial Heights	I-95	TEMPLE AVENUE RAMP	NCL COLONIAL HEIGHTS	2.38	6
City of Hopewell	I-295	CHESTERFIELD CL	1ST SCL HOPEWELL	0.80	6
City of Hopewell	I-295	2ND NCL HOPEWELL	2ND SCL HOPEWELL	0.34	6
City of Hopewell	I-295	3RD NCL HOPEWELL	RTE 36 ON RAMP	0.15	6
City of Hopewell	I-295	RTE 36 ON RAMP	PRINCE GEORGE CL	0.48	6
City of Petersburg	I-85	SCL PETERSBRG	SQUIRREL LEVEL ROAD	1.01	4
City of Petersburg	I-85	SQUIRREL LEVEL ROAD	RTE I-95 NORTH	3.14	4
City of Petersburg	I-95	SCL PETERSBRG	RIVES ROAD	0.33	4
City of Petersburg	I-95	RIVES ROAD	WAGNER ROAD	0.64	4
City of Petersburg	I-95	WAGNER ROAD	COUNTY DRIVE	2.09	4
City of Petersburg	I-95	COUNTY DRIVE	SOUTH CRATER ROAD	0.56	4
City of Petersburg	I-95	SOUTH CRATER ROAD	RTE I-85 NB ON RAMP	0.56	4
City of Petersburg	I-95	RTE I-85 NB ON RAMP	.25 MI NORTH RTE I-85	0.26	4
City of Petersburg	I-95	.25 MI NORTH RTE I-85	MINGEA STREET OP	0.09	4
City of Petersburg	I-95	MINGEA STREET OP	EAST WYTHE STREET OP	0.35	6
City of Petersburg	I-95	EAST WYTHE STREET OP	EAST BANK STREET OP	0.16	6
City of Petersburg	I-95	EAST BANK STREET OP	NCL PETERSBURG	0.48	6

CMP Network Roadway Segments (Urban Arterials)

Jurisdiction	Facility Name	From	To	Length (miles)	Lanes
Chesterfield County	JEFFERSON DAVIS HIGHWAY	NCL COLONIAL HEIGHTS	RTE 144	0.22	4
Chesterfield County	JEFFERSON DAVIS HIGHWAY	RTE 144	SOUTH RTE 619	0.35	4
Chesterfield County	JEFFERSON DAVIS HIGHWAY	SOUTH RTE 619	NORTH RTE 619	1.10	4
Chesterfield County	JEFFERSON DAVIS HIGHWAY	NORTH RTE 619	RTE 366	2.77	4
Chesterfield County	EAST HUNDRED ROAD	HOPEWELL CL	RTE 904 / POINT OF ROCK RD	1.09	4
Chesterfield County	EAST HUNDRED ROAD	RTE 904 / POINT OF ROCK RD	RTE 746	1.30	4
Chesterfield County	EAST HUNDRED ROAD	RTE 746	RTE I-295 RAMP	0.90	4
Chesterfield County	EAST HUNDRED ROAD	RTE I-295 RAMP	RTE 618	1.46	6
Chesterfield County	TEMPLE AVENUE	PRINCE GEORGE CL	ECL COLONIAL HEIGHTS	0.19	4
Dinwiddie County	BOYDTON PLANK ROAD	RTE 603	RTE 142	0.15	3
Dinwiddie County	BOYDTON PLANK ROAD	RTE I-85	RTE 1303	0.47	4
Dinwiddie County	BOYDTON PLANK ROAD	RTE 1303	RTE 226	0.87	2
Dinwiddie County	WASHINGTON STREET	RTE 226	RTE 319	0.29	2
Dinwiddie County	WASHINGTON STREET	RTE 319	WCL PETERSBURG	0.16	2
Prince George County	JAMES RIVER DRIVE	RTE 156 BYP (OLD 644)	ECL HOPEWELL	1.17	4
Prince George County	OAKLAWN BOULEVARD	ECL PETERSBURG	LEE AVE	0.76	4
Prince George County	OAKLAWN BOULEVARD	LEE AVE	WCL HOPEWELL	1.45	4
Prince George County	TEMPLE AVENUE	ECL COLONIAL HEIGHTS	PUDDLEDOCK RD (RTE 645)	0.59	4
Prince George County	TEMPLE AVENUE	PUDDLEDOCK RD (RTE 645)	ROUTE 36	1.99	4
City of Colonial Heights	BOULEVARD	SCL COLONIAL HEIGHTS	WASHINGTON AVENUE	0.04	4
City of Colonial Heights	BOULEVARD	WASHINGTON AVENUE	DUPUY AVENUE	0.49	4
City of Colonial Heights	BOULEVARD	DUPUY AVENUE	LYNCHBURG AVENUE	0.17	4
City of Colonial Heights	BOULEVARD	LYNCHBURG AVENUE	EAST WESTOVER AVENUE	0.23	4
City of Colonial Heights	BOULEVARD	EAST WESTOVER AVENUE	PIEDMONT AVENUE	0.05	4
City of Colonial Heights	BOULEVARD	PIEDMONT AVENUE	BRANDERS BRIDGE ROAD	0.28	4
City of Colonial Heights	BOULEVARD	BRANERS BRIDGE ROAD	TEMPLE AVENUE	0.26	4
City of Colonial Heights	BOULEVARD	TEMPLE AVENUE	LAKEVIEW AVEUE	0.74	4
City of Colonial Heights	BOULEVARD	LAKEVIEW AVENUE	EAST ELLERSLIE AVENUE	0.17	4
City of Colonial Heights	BOULEVARD	EAST ELLERSLIE AVENUE	SHERWOOD AVENUE	0.19	4
City of Colonial Heights	BOULEVARD	SHERWOOD AVENUE	NCL COLONIAL HEIGHTS	0.62	4
City of Colonial Heights	TEMPLE AVENUE	BOULEVARD	RTE I-95	0.50	4
City of Colonial Heights	TEMPLE AVENUE	RTE I-95	CONDUIT ROAD	0.37	4
City of Hopewell	RANDOLPH ROAD	WCL HOPEWELL	NORTH 6TH AVENUE	0.22	4
City of Hopewell	RANDOLPH ROAD	NORTH 6TH AVENUE	MAIN STREET	0.40	4
City of Hopewell	RANDOLPH ROAD	MAIN STREET	CITY POINT ROAD	0.18	3
City of Hopewell	RANDOLPH ROAD	CITY POINT ROAD	RTE 156 (WINSTN CHURCHIL DR)	0.56	2
City of Hopewell	RANDOLPH ROAD	CITY POINT ROAD	RTE 156 (WINSTN CHURCHIL DR)	0.56	2
City of Hopewell	RANDOLPH ROAD	RTE 156 (WINSTN CHURCHIL DR)	ECL HOPEWELL	1.26	4
City of Hopewell	OAKLAWN BOULEVARD	WCL HOPEWELL	JEFFERSON PARK ROAD	0.52	4
City of Hopewell	OAKLAWN BOULEVARD	JEFFERSON PARK ROAD	RTE I-295	0.22	4
City of Hopewell	OAKLAWN BOULEVARD	RTE I-295	COLONIAL CORNER	0.43	6
City of Hopewell	OAKLAWN BOULEVARD	COLONIAL CORNER	ASHLAND AVENUE	0.22	3
City of Hopewell	OAKLAWN BOULEVARD	ASHLAND AVENUE	WOODLAWN STREET	0.65	3
City of Hopewell	WINSTON CHURCH DRIVE	WOODLAWN STREET	MILES AVENUE	0.16	4
City of Hopewell	WINSTON CHURCH DRIVE	MILES AVENUE	HIGH AVENUE	0.39	4
City of Hopewell	NORTH 6TH AVENUE	WEST BROADWAY STREET	RANDOLPH ROAD	0.31	4
City of Hopewell	WOODLAWN STREET	NORTH OAKLAWN BOULEVARD	SURRY AVENUE	0.35	3
City of Hopewell	WOODLAWN STREET	SURRY AVENUE	DINWIDDIE STREET	0.15	3
City of Hopewell	WOODLAWN STREET	DINWIDDIE STREET	SYCAMORE STREET	0.11	3
City of Hopewell	WOODLAWN STREET	SYCAMORE STREET	COLONIAL CORNER	0.35	3
City of Hopewell	WINSTON CHURCH DRIVE	ARLINGTON ROAD	SOUTH 6TH AVENUE	0.55	4
City of Hopewell	WINSTON CHURCH DRIVE	SOUTH 6TH AVENUE	RANDOLPH ROAD	0.80	4

CMP Network Roadway Segments (Urban Arterials) continued

Jurisdiction	Facility Name	From	To	Length (miles)	Lanes
City of Petersburg	WEST WASHINGTON STREET	WCL PETERSBURG	SUMMIT STREET	0.40	4
City of Petersburg	WEST WASHINGTON STREET	SUMMIT STREET	ELM STREET	0.18	4
City of Petersburg	WEST WASHINGTON STREET	ELM STREET	.32 MI EAST ELM STREET	0.32	4
City of Petersburg	WEST WASHINGTON STREET	.32 MI EAST ELM STREET	ATLANTIC STREET	0.25	4
City of Petersburg	WEST WYTHE STREET	ATLANTIC STREET	CHAPPELL STREET	0.18	3
City of Petersburg	WEST WYTHE STREET	CHAPPELL STREET	GUARANTEE STREET	0.82	3
City of Petersburg	WEST WYTHE STREET	GUARANTEE STREET	PERRY STREET	0.08	4
City of Petersburg	WEST WYTHE STREET	PERRY STREET	MARKET STREET	0.15	4
City of Petersburg	WEST WYTHE STREET	MARKET STREET	SYCAMORE STREET	0.20	4
City of Petersburg	EAST WYTHE STREET	SYCAMORE STREET	ADAMS STREET	0.08	3
City of Petersburg	SOUTH ADAMS STREET	EAST WYTHE STREET	EAST WASHINGTON STREET	0.10	3
City of Petersburg	NORTH ADAMS STREET	EAST WASHINGTON STR.	FRANKLIN STREET	0.06	3
City of Petersburg	NORTH ADAMS STREET	FRANKLIN STREET	HENRY STREET	0.16	2
City of Petersburg	2ND ST	HENRY STREET	EAST BANK STREET	0.07	4
City of Petersburg	2ND ST	EAST BANK STREET	BOLLINGBROOK STREET	0.07	4
City of Petersburg	2ND ST	BOLLINGBROOK STREET	NCL PETERSBURG	0.35	4
City of Petersburg	WEST WASHINGTON STREET	NORTH ADAMS STREET	SYCAMORE STREET	0.09	4
City of Petersburg	WEST WASHINGTON STREET	SYCAMORE STREET	NORTH MARKET STREET	0.19	4
City of Petersburg	WEST WASHINGTON STREET	NORTH MARKET STREET	GUARANTEE STREET	0.24	2
City of Petersburg	WEST WASHINGTON STREET	GUARANTEE STREET	SOUTH STREET	0.27	2
City of Petersburg	WEST WASHINGTON STREET	SOUTH STREET	ATLANTIC STREET	0.71	2
City of Petersburg	EAST WYTHE STREET	SOUTH CRATER ROAD	OLD WYTHE STREET	0.26	3
City of Petersburg	EAST WYTHE STREET	OLD WYTHE STREET	AMELIA STREET	0.17	2
City of Petersburg	EAST WASHINGTON STREET	AMELIA STREET	PUDDLEDOCK ROAD	0.87	4
City of Petersburg	EAST WASHINGTON STREET	PUDDLEDOCK ROAD	ECL PETERSBURG	0.58	4
City of Petersburg	EAST WASHINGTON STREET	AMELIA STREET	.31 MI EAST CRATER ROAD	0.12	3
City of Petersburg	EAST WASHINGTON STREET	.31 MI EAST CRATER ROAD	NORTH CRATER ROAD	0.31	4
City of Petersburg	SOUTH CRATER ROAD	SCL PETERSBRG	RIVES ROAD	0.20	4
City of Petersburg	SOUTH CRATER ROAD	RIVES ROAD	WAGNER ROAD	0.91	4
City of Petersburg	SOUTH CRATER ROAD	WAGNER ROAD	NORTH FLANK ROAD	0.43	4
City of Petersburg	SOUTH CRATER ROAD	NORTH FLANK ROAD	MORTON AVENUE	0.55	4
City of Petersburg	SOUTH CRATER ROAD	MORTON AVENUE	SYCAMORE STREET	0.32	4
City of Petersburg	SOUTH CRATER ROAD	SYCAMORE STREET	SOUTH BOULEVARD	0.26	4
City of Petersburg	SOUTH CRATER ROAD	SOUTH BOULEVARD	I-95 SOUTHBOUND RAMP	0.69	4
City of Petersburg	SOUTH CRATER ROAD	I-95 SOUTHBOUND RAMP	I-95 NORTHBOUND RAMP	0.18	4
City of Petersburg	SOUTH CRATER ROAD	I-95 NORTHBOUND RAMP	EAST WYTHE STREET	0.97	4
City of Petersburg	SOUTH CRATER ROAD	EAST WYTHE STREET	EAST WASHINGTON AVENUE	0.10	4
City of Petersburg	EAST WASHINGTON STREET	NORTH CRATER ROAD	RTE I-95	0.25	4
City of Petersburg	EAST WASHINGTON STREET	RTE I-95	ADAMS STREET	0.33	4
City of Petersburg	EAST WYTHE STREET	ADAMS STREET	JEFFERSON STREET	0.12	2
City of Petersburg	EAST WYTHE STREET	JEFFERSON STREET	RTE I-95 SOUTH	0.22	2
City of Petersburg	EAST WYTHE STREET	RTE I-95 SOUTH	SOUTH CRATER ROAD	0.28	2
City of Petersburg	COUNTY DRIVE	RTE 460	RTE 301	0.51	1
City of Petersburg	JEFFERSON STREET	EAST WYTHE STREET	EAST WASHINGTON STR	0.09	2
City of Petersburg	JEFFERSON STREET	EAST WASHINGTON STR.	HENRY STREET	0.16	2

CMP Network Roadway Segments (Rural Multilane)

Jurisdiction	Facility Name	From	To	Length (miles)	Lanes
Dinwiddie County	BOYDTON PLANK ROAD	RTE 142	RTE I-85	0.15	4
Dinwiddie County	COX RD	RTE 708/631(CLAIBORNE RD)	RTE 632 W.(OLGERS RD)	2.25	4
Dinwiddie County	COX RD	RTE 632 W.(OLGERS RD)	RTE 226 (COX RD)	0.79	4
Dinwiddie County	AIRPORT STREET	RTE 226	RTE I-85	1.28	4
Dinwiddie County	AIRPORT STREET	RTE I-85	RTE 1	0.21	4
Prince George County	JAMES RIVER DRIVE	RTE 156	RTE 156 BYP (OLD 644)	0.73	4
Prince George County	COUNTY DRIVE	RTE 618	RTE 156	3.27	4
Prince George County	COUNTY DRIVE	RTE 156	RTE 630	3.20	4
Prince George County	COUNTY DRIVE	RTE 630	RTE I-295	0.78	4
Prince George County	COUNTY DRIVE	RTE I-295	ECL PETERSBURG	0.23	4
City of Colonial Heights	TEMPLE AVENUE	CONDUIT ROAD	ECL COLONIAL HEIGHTS	0.93	4
City of Petersburg	COURT HOUSE ROAD	COUNTY DRIVE	ECL PETERSBURG	0.10	4
City of Petersburg	COUNTY DRIVE	.21 ME I-95 (MAINT BREAK)	.41 ME I-95 (MAINT BREAK)	0.20	4
City of Petersburg	COUNTY DRIVE	.41 ME I-95 (MAINT BREAK)	RTE 109 HICKORY HILL ROAD	0.28	4
City of Petersburg	COUNTY DRIVE	RTE 109 HICKORY HILL ROAD	RTE 106 (WAGNER RD)	2.16	4
City of Petersburg	COUNTY DRIVE	RTE 106 (WAGNER RD)	ECL PETERSBURG	0.34	4
City of Petersburg	WAGNER ROAD	SOUTH CRATER ROAD	RTE I-95 NORTH	1.01	4
City of Petersburg	WAGNER ROAD	RTE I-95 NORTHJ	COUNTY DRIVE	1.32	4

CMP Network Roadway Segments (Rural Two-Lane)

Jurisdiction	Facility Name	From	To	Length (miles)	Lanes
Chesterfield County	ENON CHURCH ROAD	RTE 10	RTE 697	0.73	2
Chesterfield County	ENON CHURCH ROAD	RTE 697	RTE 886	1.27	2
Chesterfield County	ENON CHURCH ROAD	RTE 886	RTE 618	0.81	2
Dinwiddie County	BOYDTON PLANK ROAD	RTE 613 NORTH	RTE 460	3.09	2
Dinwiddie County	BOYDTON PLANK ROAD	RTE 460	RTE 670	0.80	2
Dinwiddie County	BOYDTON PLANK ROAD	RTE 670	RTE 603	0.48	2
Prince George County	JAMES RIVER DRIVE	RTE 609	RTE 156	4.78	2
Prince George County	COURTHOUSE ROAD	ECL PETERSBURG	RTE 630	1.40	2
Prince George County	COURTHOUSE ROAD	RTE 630	RTE 634	0.99	2
Prince George County	JORDAN POINT ROAD	RTE 10	CHARLES CITY CL	2.32	2
Prince George County	SOUTH CRATER ROAD	RTE I-95	RTE 626 SOUTH	1.06	2
Prince George County	SOUTH CRATER ROAD	RTE 626 SOUTH	SCL PETERSBURG	1.19	2
Prince George County	ALLIN ROAD	RTE 106	RTE 630	0.51	2
City of Petersburg	HICKORY HILL DRIVE	COUNTY DRIVE	DEAD END NEAR ECL PETERSBURG	0.91	2
City of Petersburg	RIVES ROAD	SOUTH CRATER ROAD	RTE I-95	0.48	2

Tri-Cities
Metropolitan Planning Organization
Congestion Management Process

Appendix B

Tri-Cities CMP Roadway Segment VC Ratios

CMP Network Roadway Segments (Freeways)

Jurisdiction	Facility Name	From	To	Length (miles)	Lanes	2014 AADT	2014 Hourly Flow Rate	2014 VC Ratio	2014 VMT	2020 AADT	2020 Hourly Flow Rate	2020 VC Ratio	2020 VMT
Chesterfield County	I-95	NCL COLONIAL HEIGHTS	RTE 620	1.55	6	95,926	8,825	0.72	148,685	104,201	9,586	0.78	161,512
Chesterfield County	I-95	RTE 620	RTE 10	2.90	6	94,886	8,635	0.67	275,169	103,083	9,381	0.73	298,941
Chesterfield County	I-295	RTE 10	HOPEWELL CL	2.42	6	32,589	2,705	0.22	78,865	35,537	2,950	0.24	86,000
Dinwiddie County	I-85	ROWANTY CREEK	HATCHER RUN	0.29	4	26,077	2,999	0.43	7,562	28,706	3,301	0.47	8,325
Dinwiddie County	I-85	HATCHER RUN	RTE 460	2.50	4	26,077	2,999	0.40	65,193	28,706	3,301	0.44	71,765
Dinwiddie County	I-85	RTE 460	RTE 603 OP	1.62	4	38,209	3,783	0.47	61,899	42,116	4,170	0.52	68,228
Dinwiddie County	I-85	RTE 603 OP	RTE 1 NORTH	0.30	4	38,209	3,783	0.47	11,463	42,116	4,170	0.52	12,635
Dinwiddie County	I-85	RTE 1 NORTH	SCL PETERSBURG	1.18	4	47,754	3,677	0.49	56,350	52,971	4,079	0.55	62,506
Prince George County	I-95	WARWICK SWAMP	NB OFF RAMP RTE 301	2.17	4	40,321	4,959	0.82	87,497	42,794	5,263	0.87	92,863
Prince George County	I-95	NB OFF RAMP RTE 301	SB ON RAMP RTE I-295	1.38	4	42,931	5,109	0.76	59,245	46,647	5,551	0.83	64,373
Prince George County	I-95	SB ON RAMP RTE I-295	SCL PETERSBURG	0.96	4	25,767	1,823	0.26	24,736	32,070	2,269	0.27	30,787
Prince George County	I-295	1ST SCL HOPEWELL	2ND NCL HOPEWELL	1.21	6	32,589	3,487	0.32	39,433	35,537	3,802	0.35	43,000
Prince George County	I-295	2ND SCL HOPEWELL	3RD NCL HOPEWELL	0.95	6	32,589	3,487	0.32	30,960	35,537	3,802	0.35	33,760
Prince George County	I-295	3RD SCL HOPEWELL	RTE 460	5.91	4	22,925	2,659	0.32	135,487	24,711	2,866	0.35	146,042
Prince George County	I-295	RTE 460	RTE I-95 SOUTH	3.03	4	18,190	2,219	0.27	55,116	19,755	2,410	0.30	59,858
City of Colonial Heights	I-95	NCL PETERSBRG	TEMPLE AVENUE RAMP	1.19	6	87,891	7,910	0.61	104,590	95,278	8,575	0.66	113,381
City of Colonial Heights	I-95	TEMPLE AVENUE RAMP	NCL COLONIAL HEIGHTS	2.38	6	95,926	9,593	0.80	228,304	104,201	10,421	0.87	247,998
City of Hopewell	I-295	CHESTERFIELD CL	1ST SCL HOPEWELL	0.80	6	32,589	3,487	0.32	26,071	35,537	3,802	0.35	28,430
City of Hopewell	I-295	2ND NCL HOPEWELL	2ND SCL HOPEWELL	0.34	6	32,589	3,487	0.32	11,080	35,537	3,802	0.35	12,083
City of Hopewell	I-295	3RD NCL HOPEWELL	RTE 36 ON RAMP	0.15	6	22,925	2,659	0.21	3,439	24,711	2,866	0.23	3,707
City of Hopewell	I-295	RTE 36 ON RAMP	PRINCE GEORGE CL	0.48	6	22,925	2,659	0.21	11,004	24,711	2,866	0.23	11,861
City of Petersburg	I-85	SCL PETERSBRG	SQUIRREL LEVEL ROAD	1.01	4	47,754	4,537	0.57	48,232	52,971	5,033	0.64	53,501
City of Petersburg	I-85	SQUIRREL LEVEL ROAD	RTE I-95 NORTH	3.14	4	52,931	4,923	0.61	166,203	58,556	5,446	0.69	183,866
City of Petersburg	I-95	SCL PETERSBRG	RIVES ROAD	0.33	4	33,558	3,624	0.49	11,074	36,209	3,910	0.53	11,949
City of Petersburg	I-95	RIVES ROAD	WAGNER ROAD	0.64	4	33,558	3,624	0.49	21,477	36,209	3,910	0.53	23,174
City of Petersburg	I-95	WAGNER ROAD	COUNTY DRIVE	2.09	4	46,034	4,419	0.57	96,211	49,921	4,792	0.62	104,335
City of Petersburg	I-95	COUNTY DRIVE	SOUTH CRATER ROAD	0.56	4	46,034	4,419	0.57	25,779	49,921	4,792	0.62	27,956
City of Petersburg	I-95	SOUTH CRATER ROAD	RTE I-85 NB ON RAMP	0.56	4	46,034	4,419	0.57	25,779	49,921	4,792	0.62	27,956
City of Petersburg	I-95	RTE I-85 NB ON RAMP	.25 MI NORTH RTE I-85	0.26	4	42,624	3,367	0.41	11,082	46,225	3,651	0.44	12,019
City of Petersburg	I-95	.25 MI NORTH RTE I-85	MINGEA STREET OP	0.09	4	87,555	7,968	0.95	7,880	95,153	8,659	1.03	8,564
City of Petersburg	I-95	MINGEA STREET OP	EAST WYTHE STREET OP	0.35	6	87,555	7,968	0.63	30,644	95,153	8,659	0.68	33,304
City of Petersburg	I-95	EAST WYTHE STREET OP	EAST BANK STREET OP	0.16	6	102,367	8,087	0.64	16,379	111,158	8,781	0.69	17,785
City of Petersburg	I-95	EAST BANK STREET OP	NCL PETERSBURG	0.48	6	102,367	8,087	0.64	49,136	111,158	8,781	0.69	53,356

CMP Network Roadway Segments (Urban Arterials)

Jurisdiction	Facility Name	From	To	Length (miles)	Lanes	2014 AADT	2014 Hourly Flow Rate	2014 VC Ratio	2014 VMT	2020 AADT	2020 Hourly Flow Rate	2020 VC Ratio	2020 VMT
Chesterfield County	JEFFERSON DAVIS HIGHWAY	NCL COLONIAL HEIGHTS	RTE 144	0.22	4	23,136	2,082	0.56	5,090	23,809	2,143	0.57	5,238
Chesterfield County	JEFFERSON DAVIS HIGHWAY	RTE 144	SOUTH RTE 619	0.35	4	17,768	1,546	0.49	6,219	18,329	1,595	0.51	6,415
Chesterfield County	JEFFERSON DAVIS HIGHWAY	SOUTH RTE 619	NORTH RTE 619	1.10	4	17,768	1,546	0.47	19,545	18,883	1,643	0.50	20,771
Chesterfield County	JEFFERSON DAVIS HIGHWAY	NORTH RTE 619	RTE 366	2.77	4	16,394	1,459	0.42	45,411	17,480	1,556	0.45	48,420
Chesterfield County	EAST HUNDRED ROAD	HOPEWELL CL	RTE 904 / POINT OF ROCK RD	1.09	4	22,380	1,992	0.54	24,394	22,562	2,008	0.54	24,593
Chesterfield County	EAST HUNDRED ROAD	RTE 904 / POINT OF ROCK RD	RTE 746	1.30	4	22,380	1,992	0.54	29,094	22,562	2,008	0.54	29,331
Chesterfield County	EAST HUNDRED ROAD	RTE 746	RTE I-295 RAMP	0.90	4	28,214	3,301	0.94	25,393	30,660	3,587	1.02	27,594
Chesterfield County	EAST HUNDRED ROAD	RTE I-295 RAMP	RTE 618	1.46	6	37,804	3,251	0.60	55,194	41,082	3,533	0.65	59,980
Chesterfield County	TEMPLE AVENUE	PRINCE GEORGE CL	ECL COLONIAL HEIGHTS	0.19	4	32,593	3,194	0.85	6,193	35,418	3,471	0.92	6,729
Dinwiddie County	BOYDTON PLANK ROAD	RTE 603	RTE 142	0.15	3	11,841	1,030	0.62	1,776	11,947	1,039	0.63	1,792
Dinwiddie County	BOYDTON PLANK ROAD	RTE I-85	RTE 1303	0.47	4	14,464	1,331	0.36	6,798	15,927	1,466	0.40	7,486
Dinwiddie County	BOYDTON PLANK ROAD	RTE 1303	RTE 226	0.87	2	14,464	1,331	0.72	12,584	15,927	1,466	0.79	13,856
Dinwiddie County	WASHINGTON STREET	RTE 226	RTE 319	0.29	2	11,767	1,236	0.72	3,412	11,944	1,255	0.73	3,464
Dinwiddie County	WASHINGTON STREET	RTE 319	WCL PETERSBURG	0.16	2	11,767	1,236	0.72	1,883	11,944	1,255	0.73	1,911
Prince George County	JAMES RIVER DRIVE	RTE 156 BYP (OLD 644)	ECL HOPEWELL	1.17	4	9,034	777	0.25	10,570	9,347	804	0.26	10,936
Prince George County	OAKLAWN BOULEVARD	ECL PETERSBURG	LEE AVE	0.76	4	15,149	1,394	0.47	11,513	15,604	1,436	0.48	11,859
Prince George County	OAKLAWN BOULEVARD	LEE AVE	WCL HOPEWELL	1.45	4	15,080	1,583	0.41	21,866	15,393	1,616	0.42	22,320
Prince George County	TEMPLE AVENUE	ECL COLONIAL HEIGHTS	PUDDLEDOCK RD (RTE 645)	0.59	4	32,593	3,194	0.85	19,230	36,148	3,542	0.94	21,327
Prince George County	TEMPLE AVENUE	PUDDLEDOCK RD (RTE 645)	ROUTE 36	1.99	4	32,593	3,194	0.85	64,860	36,148	3,542	0.94	71,935
City of Colonial Heights	BOULEVARD	SCL COLONIAL HEIGHTS	WASHINGTON AVENUE	0.04	4	10,653	959	0.28	426	11,151	1,004	0.29	446
City of Colonial Heights	BOULEVARD	WASHINGTON AVENUE	DUPUY AVENUE	0.49	4	10,653	959	0.30	5,220	11,151	1,004	0.31	5,464
City of Colonial Heights	BOULEVARD	DUPUY AVENUE	LYNCHBURG AVENUE	0.17	4	18,910	1,607	0.44	3,215	20,259	1,722	0.47	3,444
City of Colonial Heights	BOULEVARD	LYNCHBURG AVENUE	EAST WESTOVER AVENUE	0.23	4	18,910	1,607	0.44	4,349	20,259	1,722	0.47	4,660
City of Colonial Heights	BOULEVARD	EAST WESTOVER AVENUE	PIEDMONT AVENUE	0.05	4	19,145	1,704	0.48	957	20,510	1,825	0.51	1,026
City of Colonial Heights	BOULEVARD	PIEDMONT AVENUE	BRANDERS BRIDGE ROAD	0.28	4	19,145	1,704	0.48	5,361	20,510	1,825	0.51	5,743
City of Colonial Heights	BOULEVARD	BRANERS BRIDGE ROAD	TEMPLE AVENUE	0.26	4	20,815	1,769	0.47	5,412	22,062	1,875	0.50	5,736
City of Colonial Heights	BOULEVARD	TEMPLE AVENUE	LAKEVIEW AVEUE	0.74	4	23,164	1,992	0.53	17,141	23,957	2,060	0.55	17,728
City of Colonial Heights	BOULEVARD	LAKEVIEW AVENUE	EAST ELLERSLIE AVENUE	0.17	4	18,975	1,632	0.45	3,226	20,135	1,732	0.48	3,423
City of Colonial Heights	BOULEVARD	EAST ELLERSLIE AVENUE	SHERWOOD AVENUE	0.19	4	26,341	2,397	0.66	5,005	27,255	2,480	0.68	5,178
City of Colonial Heights	BOULEVARD	SHERWOOD AVENUE	NCL COLONIAL HEIGHTS	0.62	4	24,138	2,245	0.66	14,966	24,960	2,321	0.68	15,475
City of Colonial Heights	TEMPLE AVENUE	BOULEVARD	RTE I-95	0.50	4	27,045	2,299	0.61	13,523	29,390	2,498	0.66	14,695
City of Colonial Heights	TEMPLE AVENUE	RTE I-95	CONDUIT ROAD	0.37	4	32,617	2,772	0.71	12,068	35,446	3,012	0.77	13,115
City of Hopewell	RANDOLPH ROAD	WCL HOPEWELL	NORTH 6TH AVENUE	0.22	4	18,970	1,669	0.44	4,173	19,118	1,682	0.44	4,206
City of Hopewell	RANDOLPH ROAD	NORTH 6TH AVENUE	MAIN STREET	0.40	4	11,812	1,004	0.29	4,725	11,998	1,020	0.30	4,799
City of Hopewell	RANDOLPH ROAD	MAIN STREET	CITY POINT ROAD	0.18	3	9,869	878	0.53	1,776	10,288	915	0.55	1,852
City of Hopewell	RANDOLPH ROAD	CITY POINT ROAD	RTE 156 (WINSTN CHURCHIL DR)	0.56	2	9,869	878	0.53	5,527	10,288	915	0.55	5,761
City of Hopewell	RANDOLPH ROAD	CITY POINT ROAD	RTE 156 (WINSTN CHURCHIL DR)	0.56	2	9,869	878	0.53	5,527	10,288	915	0.55	5,761
City of Hopewell	RANDOLPH ROAD	RTE 156 (WINSTN CHURCHIL DR)	ECL HOPEWELL	1.26	4	7,415	682	0.24	9,343	8,225	757	0.27	10,364
City of Hopewell	OAKLAWN BOULEVARD	WCL HOPEWELL	JEFFERSON PARK ROAD	0.52	4	34,590	3,079	0.92	17,987	35,840	3,190	0.95	18,637
City of Hopewell	OAKLAWN BOULEVARD	JEFFERSON PARK ROAD	RTE I-295	0.22	4	33,293	3,296	0.95	7,324	33,414	3,308	0.95	7,351
City of Hopewell	OAKLAWN BOULEVARD	RTE I-295	COLONIAL CORNER	0.43	6	26,426	2,273	0.42	11,363	28,132	2,420	0.45	12,097
City of Hopewell	OAKLAWN BOULEVARD	COLONIAL CORNER	ASHLAND AVENUE	0.22	3	9,847	837	0.29	2,166	9,903	842	0.29	2,179
City of Hopewell	OAKLAWN BOULEVARD	ASHLAND AVENUE	WOODLAWN STREET	0.65	3	18,692	1,551	0.53	12,150	18,719	1,553	0.53	12,167
City of Hopewell	WINSTON CHURCH DRIVE	WOODLAWN STREET	MILES AVENUE	0.16	4	18,692	1,551	0.41	2,991	18,719	1,553	0.41	2,995
City of Hopewell	WINSTON CHURCH DRIVE	MILES AVENUE	HIGH AVENUE	0.39	4	11,853	948	0.25	4,623	12,806	1,024	0.27	4,994
City of Hopewell	NORTH 6TH AVENUE	WEST BROADWAY STREET	RANDOLPH ROAD	0.31	4	9,879	948	0.26	3,062	9,976	957	0.26	3,093
City of Hopewell	WOODLAWN STREET	NORTH OAKLAWN BOULEVARD	SURRY AVENUE	0.35	3	10,385	883	0.30	3,635	10,472	890	0.30	3,665
City of Hopewell	WOODLAWN STREET	SURRY AVENUE	DINWIDDIE STREET	0.15	3	9,934	874	0.30	1,490	10,611	934	0.32	1,592
City of Hopewell	WOODLAWN STREET	DINWIDDIE STREET	SYCAMORE STREET	0.11	3	9,934	874	0.30	1,093	10,611	934	0.32	1,167
City of Hopewell	WOODLAWN STREET	SYCAMORE STREET	COLONIAL CORNER	0.35	3	9,934	874	0.30	3,477	10,611	934	0.32	3,714
City of Hopewell	WINSTON CHURCH DRIVE	ARLINGTON ROAD	SOUTH 6TH AVENUE	0.55	4	16,475	1,302	0.38	9,061	16,740	1,323	0.39	9,207
City of Hopewell	WINSTON CHURCH DRIVE	SOUTH 6TH AVENUE	RANDOLPH ROAD	0.80	4	7,399	599	0.22	5,919	7,689	622	0.23	6,151

CMP Network Roadway Segments (Urban Arterials) continued

Jurisdiction	Facility Name	From	To	Length (miles)	Lanes	2014 AADT	2014 Hourly Flow Rate	2014 VC Ratio	2014 VMT	2020 AADT	2020 Hourly Flow Rate	2020 VC Ratio	2020 VMT
City of Petersburg	WEST WASHINGTON STREET	WCL PETERSBURG	SUMMIT STREET	0.40	4	12,650	1,176	0.32	5,060	12,769	1,187	0.32	5,108
City of Petersburg	WEST WASHINGTON STREET	SUMMIT STREET	ELM STREET	0.18	4	12,808	1,166	0.31	2,305	12,945	1,178	0.31	2,330
City of Petersburg	WEST WASHINGTON STREET	ELM STREET	.32 MI EAST ELM STREET	0.32	4	14,620	1,170	0.33	4,678	15,059	1,205	0.34	4,819
City of Petersburg	WEST WASHINGTON STREET	.32 MI EAST ELM STREET	ATLANTIC STREET	0.25	4	14,620	1,170	0.33	3,655	15,059	1,205	0.34	3,765
City of Petersburg	WEST WYTHE STREET	ATLANTIC STREET	CHAPPELL STREET	0.18	3	7,046	634	0.23	1,268	7,086	638	0.23	1,275
City of Petersburg	WEST WYTHE STREET	CHAPPELL STREET	GUARANTEE STREET	0.82	3	7,046	634	0.22	5,778	7,086	638	0.22	5,811
City of Petersburg	WEST WYTHE STREET	GUARANTEE STREET	PERRY STREET	0.08	4	7,046	634	0.16	564	7,086	638	0.16	567
City of Petersburg	WEST WYTHE STREET	PERRY STREET	MARKET STREET	0.15	4	9,814	913	0.23	1,472	10,108	940	0.24	1,516
City of Petersburg	WEST WYTHE STREET	MARKET STREET	SYCAMORE STREET	0.20	4	9,645	916	0.23	1,929	9,934	943	0.24	1,987
City of Petersburg	EAST WYTHE STREET	SYCAMORE STREET	ADAMS STREET	0.08	3	13,639	1,200	0.41	1,091	14,143	1,244	0.42	1,131
City of Petersburg	SOUTH ADAMS STREET	EAST WYTHE STREET	EAST WASHINGTON STREET	0.10	3	4,777	401	0.20	478	5,221	438	0.22	522
City of Petersburg	NORTH ADAMS STREET	EAST WASHINGTON STR.	FRANKLIN STREET	0.06	3	9,105	829	0.45	546	9,361	852	0.46	562
City of Petersburg	NORTH ADAMS STREET	FRANKLIN STREET	HENRY STREET	0.16	2	8,041	700	0.40	1,287	9,785	852	0.49	1,566
City of Petersburg	2ND ST	HENRY STREET	EAST BANK STREET	0.07	4	3,013	303	0.09	211	3,591	361	0.11	251
City of Petersburg	2ND ST	EAST BANK STREET	BOLLINGBROOK STREET	0.07	4	3,893	391	0.12	273	4,029	405	0.12	282
City of Petersburg	2ND ST	BOLLINGBROOK STREET	NCL PETERSBURG	0.35	4	11,548	982	0.31	4,042	11,647	990	0.31	4,076
City of Petersburg	WEST WASHINGTON STREET	NORTH ADAMS STREET	SYCAMORE STREET	0.09	4	15,739	1,401	0.36	1,417	16,211	1,443	0.37	1,459
City of Petersburg	WEST WASHINGTON STREET	SYCAMORE STREET	NORTH MARKET STREET	0.19	4	11,329	1,054	0.27	2,153	11,669	1,086	0.28	2,217
City of Petersburg	WEST WASHINGTON STREET	NORTH MARKET STREET	GUARANTEE STREET	0.24	2	10,290	967	0.49	2,470	10,599	996	0.50	2,544
City of Petersburg	WEST WASHINGTON STREET	GUARANTEE STREET	SOUTH STREET	0.27	2	8,894	774	0.39	2,401	9,016	785	0.40	2,434
City of Petersburg	WEST WASHINGTON STREET	SOUTH STREET	ATLANTIC STREET	0.71	2	8,228	741	0.38	5,842	8,339	751	0.38	5,921
City of Petersburg	EAST WYTHE STREET	SOUTH CRATER ROAD	OLD WYTHE STREET	0.26	3	10,403	780	0.27	2,705	11,145	836	0.29	2,898
City of Petersburg	EAST WYTHE STREET	OLD WYTHE STREET	AMELIA STREET	0.17	2	10,403	780	0.41	1,769	11,145	836	0.44	1,895
City of Petersburg	EAST WASHINGTON STREET	AMELIA STREET	PUDDLEDOCK ROAD	0.87	4	23,261	2,070	0.64	20,237	25,186	2,241	0.69	21,912
City of Petersburg	EAST WASHINGTON STREET	PUDDLEDOCK ROAD	ECL PETERSBURG	0.58	4	16,583	1,542	0.48	9,618	17,559	1,633	0.51	10,184
City of Petersburg	EAST WASHINGTON STREET	AMELIA STREET	.31 MI EAST CRATER ROAD	0.12	3	11,279	1,184	0.41	1,353	11,617	1,219	0.42	1,394
City of Petersburg	EAST WASHINGTON STREET	.31 MI EAST CRATER ROAD	NORTH CRATER ROAD	0.31	4	11,004	1,177	0.30	3,411	12,146	1,299	0.33	3,765
City of Petersburg	SOUTH CRATER ROAD	SCL PETERSBRG	RIVES ROAD	0.20	4	8,737	751	0.23	1,747	9,167	788	0.24	1,833
City of Petersburg	SOUTH CRATER ROAD	RIVES ROAD	WAGNER ROAD	0.91	4	9,987	899	0.28	9,088	9,962	897	0.28	9,065
City of Petersburg	SOUTH CRATER ROAD	WAGNER ROAD	NORTH FLANK ROAD	0.43	4	20,872	1,774	0.45	8,975	21,525	1,830	0.46	9,256
City of Petersburg	SOUTH CRATER ROAD	NORTH FLANK ROAD	MORTON AVENUE	0.55	4	21,231	1,805	0.46	11,677	22,378	1,903	0.49	12,308
City of Petersburg	SOUTH CRATER ROAD	MORTON AVENUE	SYCAMORE STREET	0.32	4	21,231	1,805	0.46	6,794	22,378	1,903	0.49	7,161
City of Petersburg	SOUTH CRATER ROAD	SYCAMORE STREET	SOUTH BOULEVARD	0.26	4	14,317	1,188	0.31	3,722	14,844	1,232	0.32	3,859
City of Petersburg	SOUTH CRATER ROAD	SOUTH BOULEVARD	I-95 SOUTHBOUND RAMP	0.69	4	20,546	1,705	0.45	14,177	20,928	1,737	0.46	14,440
City of Petersburg	SOUTH CRATER ROAD	I-95 SOUTHBOUND RAMP	I-95 NORTHBOUND RAMP	0.18	4	10,227	828	0.22	1,841	10,405	842	0.22	1,873
City of Petersburg	SOUTH CRATER ROAD	I-95 NORTHBOUND RAMP	EAST WYTHE STREET	0.97	4	10,227	828	0.22	9,920	10,405	842	0.22	10,093
City of Petersburg	SOUTH CRATER ROAD	EAST WYTHE STREET	EAST WASHINGTON AVENUE	0.10	4	7,184	625	0.17	718	7,326	637	0.17	733
City of Petersburg	EAST WASHINGTON STREET	NORTH CRATER ROAD	RTE I-95	0.25	4	13,141	1,327	0.35	3,285	13,208	1,334	0.35	3,302
City of Petersburg	EAST WASHINGTON STREET	RTE I-95	ADAMS STREET	0.33	4	16,441	1,299	0.34	5,426	16,487	1,303	0.34	5,441
City of Petersburg	EAST WYTHE STREET	ADAMS STREET	JEFFERSON STREET	0.12	2	13,639	1,200	0.61	1,637	14,048	1,236	0.63	1,686
City of Petersburg	EAST WYTHE STREET	JEFFERSON STREET	RTE I-95 SOUTH	0.22	2	15,667	1,332	0.68	3,447	15,821	1,345	0.69	3,481
City of Petersburg	EAST WYTHE STREET	RTE I-95 SOUTH	SOUTH CRATER ROAD	0.28	2	10,660	810	0.41	2,985	10,741	816	0.41	3,007
City of Petersburg	COUNTY DRIVE	RTE 460	RTE 301	0.51	1	1,316	124	0.13	671	1,348	127	0.13	687
City of Petersburg	JEFFERSON STREET	EAST WYTHE STREET	EAST WASHINGTON STR	0.09	2	3,610	292	0.22	325	3,718	301	0.23	335
City of Petersburg	JEFFERSON STREET	EAST WASHINGTON STR.	HENRY STREET	0.16	2	798	81	0.04	128	884	90	0.05	141

CMP Network Roadway Segments (Rural Multilane)

Jurisdiction	Facility Name	From	To	Length (miles)	Lanes	2014 AADT	2014 Hourly Flow Rate	2014 VC Ratio	2014 VMT	2020 AADT	2020 Hourly Flow Rate	2020 VC Ratio	2020 VMT
Dinwiddie County	BOYDTON PLANK ROAD	RTE 142	RTE I-85	0.15	4	11,841	1,030	0.17	1,776	11,947	1,039	0.17	1,792
Dinwiddie County	COX RD	RTE 708/631(CLAIBORNE RD)	RTE 632 W.(OLGERS RD)	2.25	4	12,263	1,116	0.19	27,592	13,368	1,217	0.21	30,078
Dinwiddie County	COX RD	RTE 632 W.(OLGERS RD)	RTE 226 (COX RD)	0.79	4	15,376	1,322	0.22	12,147	17,185	1,478	0.24	13,576
Dinwiddie County	AIRPORT STREET	RTE 226	RTE I-85	1.28	4	15,526	1,320	0.21	19,873	17,349	1,475	0.24	22,207
Dinwiddie County	AIRPORT STREET	RTE I-85	RTE 1	0.21	4	7,529	708	0.10	1,581	7,755	729	0.11	1,629
Prince George County	JAMES RIVER DRIVE	RTE 156	RTE 156 BYP (OLD 644)	0.73	4	9,546	859	0.14	6,969	9,727	875	0.14	7,101
Prince George County	COUNTY DRIVE	RTE 618	RTE 156	3.27	4	13,102	1,179	0.18	42,844	14,385	1,294	0.20	47,039
Prince George County	COUNTY DRIVE	RTE 156	RTE 630	3.20	4	13,619	1,198	0.16	43,581	15,419	1,356	0.18	49,341
Prince George County	COUNTY DRIVE	RTE 630	RTE I-295	0.78	4	13,619	1,198	0.16	10,623	15,247	1,341	0.18	11,893
Prince George County	COUNTY DRIVE	RTE I-295	ECL PETERSBURG	0.23	4	12,576	1,031	0.14	2,892	13,715	1,124	0.15	3,154
City of Colonial Heights	TEMPLE AVENUE	CONDUIT ROAD	ECL COLONIAL HEIGHTS	0.93	4	27,251	2,344	0.40	25,343	29,614	2,547	0.43	27,541
City of Petersburg	COURT HOUSE ROAD	COUNTY DRIVE	ECL PETERSBURG	0.10	4	6,748	614	0.08	675	7,152	651	0.09	715
City of Petersburg	COUNTY DRIVE	.21 ME I-95 (MAINT BREAK)	.41 ME I-95 (MAINT BREAK)	0.20	4	9,619	1,010	0.15	1,924	9,877	1,037	0.15	1,975
City of Petersburg	COUNTY DRIVE	.41 ME I-95 (MAINT BREAK)	RTE 109 HICKORY HILL ROAD	0.28	4	18,235	1,659	0.31	5,106	18,964	1,725	0.32	5,310
City of Petersburg	COUNTY DRIVE	RTE 109 HICKORY HILL ROAD	RTE 106 (WAGNER RD)	2.16	4	9,619	1,010	0.15	20,777	9,877	1,037	0.15	21,334
City of Petersburg	COUNTY DRIVE	RTE 106 (WAGNER RD)	ECL PETERSBURG	0.34	4	12,576	1,031	0.15	4,276	13,442	1,102	0.16	4,570
City of Petersburg	WAGNER ROAD	SOUTH CRATER ROAD	RTE I-95 NORTH	1.01	4	15,781	1,341	0.19	15,939	17,908	1,522	0.22	18,087
City of Petersburg	WAGNER ROAD	RTE I-95 NORTHJ	COUNTY DRIVE	1.32	4	11,327	1,008	0.15	14,952	11,598	1,032	0.15	15,309

CMP Network Roadway Segments (Rural Two-Lane)

Jurisdiction	Facility Name	From	To	Length (miles)	Lanes	2014 AADT	2014 Hourly Flow Rate	2014 VC Ratio	2014 VMT	2020 AADT	2020 Hourly Flow Rate	2020 VC Ratio	2020 VMT
Chesterfield County	ENON CHURCH ROAD	RTE 10	RTE 697	0.73	2	3,832	487	0.24	2,797	3,963	0.25	0.17	2,893
Chesterfield County	ENON CHURCH ROAD	RTE 697	RTE 886	1.27	2	1,885	204	0.10	2,394	2,204	0.11	1.17	2,799
Chesterfield County	ENON CHURCH ROAD	RTE 886	RTE 618	0.81	2	646	71	0.03	523	701	0.03	2.17	568
Dinwiddie County	BOYDTON PLANK ROAD	RTE 613 NORTH	RTE 460	3.09	2	8,586	764	0.30	26,531	8,589	0.30	3.17	26,540
Dinwiddie County	BOYDTON PLANK ROAD	RTE 460	RTE 670	0.80	2	11,841	1,030	0.38	9,473	11,947	0.39	4.17	9,558
Dinwiddie County	BOYDTON PLANK ROAD	RTE 670	RTE 603	0.48	2	11,841	1,030	0.38	5,684	11,947	0.39	5.17	5,735
Prince George County	JAMES RIVER DRIVE	RTE 609	RTE 156	4.78	2	3,665	315	0.26	17,519	3,737	0.27	6.17	17,863
Prince George County	COURTHOUSE ROAD	ECL PETERSBURG	RTE 630	1.40	2	9,381	844	0.28	13,133	10,170	0.30	7.17	14,238
Prince George County	COURTHOUSE ROAD	RTE 630	RTE 634	0.99	2	9,381	844	0.28	9,287	10,170	0.30	8.17	10,068
Prince George County	JORDAN POINT ROAD	RTE 10	CHARLES CITY CL	2.32	2	4,677	454	0.19	10,851	4,774	0.19	9.17	11,076
Prince George County	SOUTH CRATER ROAD	RTE I-95	RTE 626 SOUTH	1.06	2	6,210	571	0.26	6,583	6,369	0.27	10.17	6,751
Prince George County	SOUTH CRATER ROAD	RTE 626 SOUTH	SCL PETERSBURG	1.19	2	6,210	571	0.24	7,390	6,369	0.25	11.17	7,579
Prince George County	ALLIN ROAD	RTE 106	RTE 630	0.51	2	5,333	523	0.20	2,720	5,441	0.20	12.17	2,775
City of Petersburg	HICKORY HILL DRIVE	COUNTY DRIVE	DEAD END NEAR ECL PETERSBURG	0.91	2	8,771	1,079	0.57	7,982	10,116	0.66	13.17	9,206
City of Petersburg	RIVES ROAD	SOUTH CRATER ROAD	RTE I-95	0.48	2	6,889	689	0.23	3,307	7,492	0.25	14.17	3,596

Tri-Cities
Metropolitan Planning Organization
Congestion Management Process

Appendix C

Tri-Cities Transportation Improvement Program

Fiscal Years 2015-2018

Highway Projects

Interstate Projects

UPC NO	73268	SCOPE	Reconstruction w/o Added Capacity			
SYSTEM	Primary	JURISDICTION	Dinwiddie County		OVERSIGHT	NFO
PROJECT	RTE 1 - INTERSECTION IMPROVEMENT				ADMIN BY	VDOT
DESCRIPTION	FROM: On Rte 226, 0.041 Mile East of Rte 600 TO: Intersection Rte 1 (0.1350 MI)					
ROUTE/STREET	BOYDTON PLANK ROAD (0001)				TOTAL COST	$2,859,537

	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
RW	Federal - RSTP	($17,873)	($71,493)	$0	$0	$0
CN	Federal - RSTP	$197,140	$788,558	$0	$0	$0
CN AC	Federal - AC	$84,461	$337,842	$0	$0	$0
MPO Note						

UPC NO	85623	SCOPE	Safety			
PROJECT	RTE 95 - INTERCHANGE IMPROVEMENT/ ROUNDABOUT				ADMIN BY	VDOT
DESCRIPTION	FROM: 0.041 MI W HAMILTON AVE TO: 0.069 MI E EXISTING I-95 RAMP (0.3690 MI)					
ROUTE/STREET	TEMPLE AVE (0095)				TOTAL COST	$20,048,717

	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
PE	Federal - NH	$28,580	$114,319	$0	$0	$0
RW	Federal - NHPP		$4,734,774	$0	$0	$0
CN	Federal - NH	$0	$331,339	$0	$0	$0
	Federal - NHPP	$0	$223,559	$0	$0	$0
	Federal - STP/F	$0	$0	$0	$1,907,608	$0
CN TOTAL		$0	$554,898	$0	$1,907,608	$0
CN AC	Federal - AC	$0	$10,347,504	$0	$0	$0
MPO Note						

SYSTEM	Interstate	JURISDICTION	Colonial Heights	OVERSIGHT	FO

Primary Projects

UPC NO	90367	SCOPE	Safety			
SYSTEM	Primary	JURISDICTION	Chesterfield County		OVERSIGHT	NFO
PROJECT	RTE 1 - INSTALL NB RTL				ADMIN BY	VDOT
DESCRIPTION	FROM: 0.10 MI S RTE 620 (WOODS EDGE RD) TO: RTE 620 (WOODS EDGE RD) (0.1000 MI)					
ROUTE/STREET	JEFFERSON DAVIS HIGHWAY (0001)				TOTAL COST	$776,106

	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
RW	Federal - CM	$60,000	$240,000	$0	$0	$0
CN	Federal - CM	$66,621	$266,484	$0	$0	$0
CN AC	Federal - AC	$1,600	$6,401	$0	$0	$0
MPO Note						

UPC NO	93209	SCOPE	Reconstruction w/ Added Capacity			
SYSTEM	Primary	JURISDICTION	Prince George County		OVERSIGHT	NFO
PROJECT	ARRA Hopewell/Prince George 36 Corridor Improvements				ADMIN BY	VDOT
DESCRIPTION	FROM: 0.260 MI W RT144 TO: JEFFERSON PARK RD. (RTE 630) (0.9420 MI)					
PROGRAM NOTE	Parent UPC....linked to Child UPC 103921					

	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
PE	Federal - ARRA	$0	$16,066	$0	$0	$0
RW	Federal - ARRA	$0	($198,579)	$0	$0	$0
CN	Federal - ARRA	$0	$182,513	$0	$0	$0
MPO Note						
ROUTE/STREET	OAKLAWN BOULEVARD (0036)				TOTAL COST	$9,877,181

UPC NO	103921	SCOPE	Reconstruction w/ Added Capacity			
SYSTEM	Primary	JURISDICTION	Prince George County		OVERSIGHT	NFO
PROJECT	ARRA- C - HOPEWELL/PRINCE GEORGE 36 CORRIDOR IMPROVEMENTS				ADMIN BY	VDOT
DESCRIPTION	FROM: 0.260 MI W RT144 TO: JEFFESON PARK RD (RTE 360) (0.9420 MI)					
PROGRAM NOTE	Child UPC....linked to Parent UPC 93209; all funding obligated based on current allocations/estimate					
ROUTE/STREET	OAKLAWN BOULEVARD (0036)				TOTAL COST	$41,177

	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
RW	Other	$0	($17,211)	$0	$0	$0
CN	Other	$0	($1,612)	$0	$0	$0
MPO Note						

UPC NO	104697	SCOPE	Reconstruction w/o Added Capacity			
SYSTEM	Primary	JURISDICTION	Prince George County		OVERSIGHT	NFO
PROJECT	RTE 36 - IMPROVEMENTS AT FT. LEE ENTRANCE				ADMIN BY	VDOT
DESCRIPTION	FROM: SIEGE ROAD TO: 11TH STREET (1.2700 MI)					
ROUTE/STREET	RT 36 (OAKLAWN BLVD) (0036)				TOTAL COST	$1,510,000

	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
PE	Federal - RSTP	$60,000	$240,000	$0	$0	$0
RW	Federal - DEMO	$88,164	$352,654	$0	$0	$0
	Federal - RSTP	$5,199	$20,797	$0	$0	$0
RW TOTAL		$93,363	$373,451	$0	$0	$0
RW AC	Federal - AC	$6,637	$26,549	$0	$0	$0
CN AC	Federal - AC	$142,000	$568,000	$0	$0	$0
MPO Note						

Primary Projects (continued)

UPC NO	105110	SCOPE	Safety			
SYSTEM	Primary	JURISDICTION	Prince George County		OVERSIGHT	NFO
PROJECT	RTE 106 - INTERSECTION IMPROVEMENTS				ADMIN BY	VDOT
DESCRIPTION	FROM: RTE 616 (LAUREL SPRINGS ROAD) TO: RTE 616 (LAUREL SPRINGS ROAD)					
ROUTE/STREET	COURTHOUSE ROAD (0106)				TOTAL COST	$614,500
	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
PE	Federal - RSTP	$24,000	$96,000	$0	$0	$0
RW	Federal - RSTP	$40,050	$0	$160,198	$0	$0
CN	Federal - RSTP	$58,851	$0	$0	$235,402	$0
MPO Note						

UPC NO	98994	SCOPE	Safety			
SYSTEM	Primary	JURISDICTION	Chesterfield County		OVERSIGHT	NFO
PROJECT	RTE 144 - ADD TURN LANE				ADMIN BY	VDOT
DESCRIPTION	FROM: 0.062 MI S RTE 1141 (SOUTH ST) TO: 0.095 MI N RTE 1141 (SOUTH ST) (0.1570 MI)					
	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
RW	Federal - CM	$50,002	$200,006	$0	$0	$0
CN	Federal - CM	$160,918	$436,103	$67,505	$140,065	$0
MPO Note						
ROUTE/STREET	HARROWGATE ROAD (0144)				TOTAL COST	$1,409,506

UPC NO	98882	SCOPE	Safety			
SYSTEM	Primary	JURISDICTION	Colonial Heights		OVERSIGHT	NFO
PROJECT	RTE 144 (TEMPLE AVE) - EXTEND TURN LANE AT CONDUIT RD				ADMIN BY	Locally
DESCRIPTION	FROM: 0.05 Miles EAST OF CONDUIT RD TO: 0.17 Miles EAST CONDUIT RD (0.2200 MI)					
ROUTE/STREET	TEMPLE AVENUE (0144)				TOTAL COST	$450,000
	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
CN	Federal - CM	$77,000	$308,000	$0	$0	$0
MPO Note						

UPC NO	98883	SCOPE	Safety			
SYSTEM	Primary	JURISDICTION	Colonial Heights		OVERSIGHT	NFO
PROJECT	RTE 144 (TEMPLE AVE) - SIGNAL COORDINATION				ADMIN BY	Locally
DESCRIPTION	FROM: RTE 1 TO: ECL COLONIAL HEIGHTS (2.0000 MI)					
ROUTE/STREET	TEMPLE AVENUE (0144)				TOTAL COST	$495,000
	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
PE	Federal - AC CONVERSION	$20,000	$0	$80,000	$0	$0
CN	Federal - CM	$79,000	$0	$0	$89,043	$226,957
MPO Note						

UPC NO	100499	SCOPE	Reconstruction w/o Added Capacity			
SYSTEM	Primary	JURISDICTION	Prince George County		OVERSIGHT	NFO
PROJECT	RTE 460 - ADD LEFT TURN LANE WESTBOUND AT RTE 657				ADMIN BY	VDOT
DESCRIPTION	FROM: 0.102 MI. W OF RTE. 657 (Enterprise Drive) TO: 0.163 MI. E OF RTE. 657 (Enterprise Drive) (0.2700 MI)					
ROUTE/STREET	COUNTY DRIVE (0460)				TOTAL COST	$1,232,315
	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
RW	Federal - CM	$44,000	$176,000	$0	$0	$0
CN	Federal - CM	$24,220	$96,878	$0	$0	$0
CN AC	Federal - AC	$122,244	$488,974	$0	$0	$0
MPO Note						

UPC NO	100432	SCOPE	New Construction Roadway			
SYSTEM	Primary	JURISDICTION	Statewide		OVERSIGHT	FO
PROJECT	Project oversight (Rt 460 Corridor Improvement Project)				ADMIN BY	VDOT
PROGRAM NOTE	Linked with UPC 103803. Based on the length of the project 13.57% is in the Tri-Cities. MPO Area, 29.51% is in the HRTPO, and 56.92% is in rural areas.					
ROUTE/STREET	RT. 460 (0460)				TOTAL COST	$89,126,668
	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
CN	Federal - AC CONVERSION	$0	$0	$7,500,000	$10,123,510	$0
	Federal - NHPP	$0	$250,000	$0	$0	$0
	Federal - STP/F	$0	$20,674,752	$0	$0	$0
CN TOTAL		$0	$20,924,752	$7,500,000	$10,123,510	$0
CN AC	Federal - AC	$0	$56,520,944	$0	$0	$0
MPO Note						
DESCRIPTION	FROM: Intersection w/Rt 58, CIty of Suffolk TO: Intersection w/I-295, Prince George Cty (55.0000 MI)					

UPC NO	103754	SCOPE				
SYSTEM	Primary	JURISDICTION	Statewide		OVERSIGHT	FO
PROJECT	Route 460 PPTA Debt Service				ADMIN BY	VDOT
DESCRIPTION	FROM: Intersection with Route 58, City of Suffolk TO: Intersection with I-295, Prince George County (55.0000 MI)					
PROGRAM NOTE	Based on the length of the project 13.57% is in the Tri-Cities MPO Area, 29.51% is in the HRTPO, and 56.92% is in rural areas.					
ROUTE/STREET	0460				TOTAL COST	$884,578,239
	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
PE	Federal - AC CONVERSION	$0	$0	$38,025,314	$56,531,124	$59,594,591
	Federal - NHPP	$0	$9,645,477	$0	$0	$0
PE TOTAL		$0	$9,645,477	$38,025,314	$56,531,124	$59,594,591
PE AC	Federal - AC	$0	$852,345,389	$0	$0	$0
MPO Note						

Primary Projects (continued)

UPC NO	103803	SCOPE	New Construction Roadway		
SYSTEM	Primary	JURISDICTION	Statewide	OVERSIGHT	FO
PROJECT	Route 460 PPTA Construction			ADMIN BY	VDOT
DESCRIPTION	FROM: Intersection of I-295, Prince George County TO: Intersection of Route 58, City of Suffolk (55.0000 MI)				
PROGRAM NOTE	All funding obligated based on current allocations/estimate. Based on the length of the project 13.57% is in the Tri-Cities MPO Area, 29.51% is in the HRTPO, and 56.92% is in rural areas.				
ROUTE/STREET	0460			TOTAL COST	$1,396,045,200

	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
		$0	$0	$0	$0	$0
MPO Note						

Secondary Projects

UPC NO	101028	SCOPE	Safety		
SYSTEM	Secondary	JURISDICTION	Chesterfield County	OVERSIGHT	NFO
PROJECT	RTE 600 - REALIGN INTERSECTION			ADMIN BY	Locally
DESCRIPTION	FROM: 0.2 MI S RTE 626 (Hickory Road) TO: 0.2 MI N RTE 626 (Hickory Road) (0.4000 MI)				
ROUTE/STREET	MATOACA ROAD (0600)			TOTAL COST	$2,289,793

	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
PE	Federal - AC CONVERSION	$50,874	$0	$0	$203,495	$0
RW	Federal - RSTP	$130,000	$0	$0	$0	$520,000
MPO Note						

UPC NO	80993	SCOPE	Reconstruction w/ Added Capacity		
SYSTEM	Secondary	JURISDICTION	Dinwiddie County	OVERSIGHT	NFO
PROJECT	RTE 600 - ROUNDABOUT			ADMIN BY	VDOT
DESCRIPTION	FROM: On Rte 226, 0.105 Mile West of Rte 600 TO: On Rte 226, 0.041 Mile East of Rte 600 (0.1470 MI)				
ROUTE/STREET	FERNDALE ROAD (0600)			TOTAL COST	$4,907,239

	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
PE	Federal - STP/F	($48,919)	($195,675)	$0	$0	$0
RW	Federal - RSTP	$37,740	$150,960	$0	$0	$0
CN	Federal - EB	$1,494	$5,974	$0	$0	$0
	Federal - RSTP	$545,367	$2,181,467	$0	$0	$0
CN TOTAL		$546,860	$2,187,441	$0	$0	$0
CN AC	Federal - AC	$106,836	$427,345	$0	$0	$0
MPO Note						

UPC NO	61294	SCOPE	Safety		
SYSTEM	Secondary	JURISDICTION	Dinwiddie County	OVERSIGHT	NFO
PROJECT	RTE 601 - INTERSECTION IMPROVEMENT - ADD RIGHT TURN LANE			ADMIN BY	VDOT
DESCRIPTION	FROM: 0.112 mi west of intersection Rte 600 TO: intersection Rte 600 (0.1120 MI)				
ROUTE/STREET	RIVER ROAD (0601)			TOTAL COST	$819,987

	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
PE	Federal - STP/F	$2,725	$10,898	$0	$0	$0
CN	Federal - STP/F	$668	$2,672	$0	$0	$0
MPO Note						

UPC NO	82849	SCOPE	Safety		
SYSTEM	Secondary	JURISDICTION	Prince George County	OVERSIGHT	NFO
PROJECT	RTE 630 - INTERSECTION IMPROVEMENT			ADMIN BY	VDOT
DESCRIPTION	FROM: ROUTE 460 TO: 0.1 MILE SOUTH OF ROUTE 460 (0.1000 MI)				
ROUTE/STREET	BULL HILL ROAD (0630)			TOTAL COST	$274,083

	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
PE	Federal - CM	($6,200)	($24,800)	$0	$0	$0
CN	Federal - CM	$49,817	$199,266	$0	$0	$0
MPO Note						

Secondary Projects (continued)

UPC NO	87941	SCOPE	Safety		
SYSTEM	Secondary	JURISDICTION	Prince George County	OVERSIGHT	NFO
PROJECT	RTE 630 - ROUNDABOUT			ADMIN BY	Locally
DESCRIPTION	AT AVENUE A - FT LEE (0.2000 KM)				
ROUTE/STREET	JEFFERSON PARK ROAD (0630)			TOTAL COST	$192,304

	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
PE AC	Federal - AC	$12,000	$48,000	$0	$0	$0
RW AC	Federal - AC	$11,114	$44,457	$0	$0	$0
CN AC	Federal - AC	$15,347	$61,386	$0	$0	$0
MPO Note						

UPC NO	87953	SCOPE	Safety		
SYSTEM	Secondary	JURISDICTION	Prince George County	OVERSIGHT	NFO
PROJECT	TRAFFIC SIGNAL INSTALLATION - JEFFERSON PK/MIDDLE			ADMIN BY	VDOT
DESCRIPTION	AT THE INTERSECTION W/ MIDDLE ROAD (646)				
ROUTE/STREET	JEFFERSON PARK ROAD (0630)			TOTAL COST	$170,627

	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
CN	Federal - STP/F	$18,032	$0	$0	$72,126	$0
CN AC	Federal - AC	$14,125	$0	$0	$56,501	$0
MPO Note						

UPC NO	80986	SCOPE	Reconstruction w/o Added Capacity		
SYSTEM	Secondary	JURISDICTION	Prince George County	OVERSIGHT	NFO
PROJECT	RTE 646 - INTERSECTION IMPROVEMENTS			ADMIN BY	VDOT
DESCRIPTION	FROM: 0.08 Miles S. Int. Rte 156 TO: Int. Rte 156 (0.0800 MI)				
PROGRAM NOTE	All funding obligated based on current allocations/estimate				
ROUTE/STREET	MIDDLE ROAD (0646)			TOTAL COST	$1,324,137

	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
RW AC	Federal - AC	$362	$1,449	$0	$0	$0
CN	Federal - STP/SU	($8,258)	($33,032)	$0	$0	$0
CN AC	Federal - AC	($20,349)	($81,395)	$0	$0	$0
MPO Note						

UPC NO	105131	SCOPE	Reconstruction w/ Added Capacity		
SYSTEM	Secondary	JURISDICTION	Prince George County	OVERSIGHT	NFO
PROJECT	RTE 645 - WIDENING			ADMIN BY	VDOT
DESCRIPTION	FROM: RTE 144 (TEMPLE AVE) TO: PETERSBURG CITY LIMITS				
ROUTE/STREET	PUDDLEDOCK ROAD (0645)			TOTAL COST	$5,869,322

	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
PE	Federal - RSTP	$164,156	$0	$0	$0	$656,622
PE AC	Federal - AC	$35,845	$0	$0	$0	$143,378
MPO Note						

Urban Projects

UPC NO	52434	SCOPE	Reconstruction w/o Added Capacity		
SYSTEM	Urban	JURISDICTION	Colonial Heights	OVERSIGHT	NFO
PROJECT	RTE 1 - ADD CENTER TURN LANE			ADMIN BY	Locally
DESCRIPTION	FROM: WESTOVER AVE TO: WINDSOR AVE (0.1800 MI)				
ROUTE/STREET	BOULEVARD (0001)			TOTAL COST	$2,588,721

	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
PE	Federal - CM	$3,596	$14,382	$0	$0	$0
RW	Federal - CM	$0	($1)	$0	$0	$0
MPO Note						

UPC NO	90374	SCOPE	Reconstruction w/o Added Capacity		
SYSTEM	Urban	JURISDICTION	Colonial Heights	OVERSIGHT	NFO
PROJECT	RTE 1 - ADD CENTER TURN LANE			ADMIN BY	Locally
DESCRIPTION	FROM: WINDSOR AVE TO: PICKWICK AVE (0.0800 MI)				
PROGRAM NOTE	All funding obligated based on current allocations/estimate				
ROUTE/STREET	BOULEVARD (0001)			TOTAL COST	$1,587,012

	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
RW	Federal - CM	($800)	($3,200)	$0	$0	$0
CN AC	Federal - AC	($40,299)	($161,197)	$0	$0	$0
MPO Note						

UPC NO	99194	SCOPE	Resurfacing		
SYSTEM	Urban	JURISDICTION	Colonial Heights	OVERSIGHT	NFO
PROJECT	Branders Bridge Road and Route 1 - intersection improvement			ADMIN BY	Locally
DESCRIPTION	FROM: west of Route 1 TO: Route 1 (0.1000 MI)				
ROUTE/STREET	BRANDERS BRIDGE ROAD (U000)			TOTAL COST	$245,000

	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
PE	Federal - CM	$7,000	$0	$0	$28,000	$0
CN	Federal - CM	$42,000	$0	$0	$0	$168,000
MPO Note						

UPC NO	101287	SCOPE	Reconstruction w/o Added Capacity		
SYSTEM	Urban	JURISDICTION	Colonial Heights	OVERSIGHT	NFO
PROJECT	DUPUY AVE - MINOR WIDENING			ADMIN BY	Locally
DESCRIPTION	FROM: WCL COLONIAL HTS TO: 0.1 MI. WEST RTE. 1 (BOULEVARD) (0.3800 MI)				
ROUTE/STREET	DUPUY AVENUE (U000)			TOTAL COST	$4,083,000

	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
CN	Federal - RSTP	$520,400	$2,000,541	$81,059	$0	$0
MPO Note						

Urban Projects (continued)

UPC NO	3945	SCOPE	Reconstruction w/o Added Capacity			
SYSTEM	Urban	JURISDICTION	Colonial Heights		OVERSIGHT	NFO
PROJECT	RTE 1 - IMPROVE INT AT DUPUY AVE				ADMIN BY	Locally
DESCRIPTION	FROM: DUPUY AVE - FR: BATTERY PLACE TO: BOULEVARD TO: ROUTE 1 - FR: PICKWICK AVE TO: LAFAYETTE AVE (0.3800 MI)					
ROUTE/STREET	DUPUY AVENUE & BOULEVARD (0001)				TOTAL COST	$6,702,314
	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
RW	Federal - STP/SU	($8,000)	($32,000)	$0	$0	$0
CN	Federal - AC CONVERSION	$33,955	$135,819	$0	$0	$0
MPO Note						

UPC NO	101288	SCOPE	Reconstruction w/o Added Capacity			
SYSTEM	Urban	JURISDICTION	Colonial Heights		OVERSIGHT	NFO
PROJECT	LAKEVIEW AVE - MINOR WIDENING				ADMIN BY	Locally
DESCRIPTION	FROM: BRIJIDAN LA TO: BOULEVARD (RTE 1) (0.4000 MI)					
ROUTE/STREET	LAKEVIEW AVENUE (U000)				TOTAL COST	$3,314,000
	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
RW	Federal - RSTP	$70,000	$280,000	$0	$0	$0
CN	Federal - RSTP	$510,000	$2,040,000	$0	$0	$0
MPO Note						

UPC NO	97691	SCOPE	Resurfacing			
SYSTEM	Urban	JURISDICTION	Colonial Heights		OVERSIGHT	NFO
PROJECT	RTE 144 (TEMPLE AVE) - TURN LANE AT DIMMOCK PKWY				ADMIN BY	Locally
DESCRIPTION	FROM: 0.02 Miles West OF DIMMOCK PKWY intersection TO: 0.13 Miles East DIMMOCK PKWY intersection (0.1500 MI)					
ROUTE/STREET	TEMPLE AVENUE (0144)				TOTAL COST	$510,000
	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
CN	Federal - CM	$81,000	$324,000	$0	$0	$0
MPO Note						

UPC NO	105109	SCOPE	Bridge Rehab w/o Added Capacity			
SYSTEM	Urban	JURISDICTION	Colonial Heights		OVERSIGHT	NFO
PROJECT	REHABILITATE BRIDGES -VARIOUS LOCATIONS				ADMIN BY	Locally
DESCRIPTION	FROM: VARIOUS LOCATIONS TO: VARIOUS LOCATIONS					
ROUTE/STREET	VARIOUS (9999)				TOTAL COST	$650,000
	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
PE	Federal - AC CONVERSION	$27,000	$0	$108,000	$0	$0
RW	Federal - RSTP	$10,000	$0	$0	$40,000	$0
CN	Federal - RSTP	$93,000	$0	$0	$280,000	$92,000
MPO Note						

UPC NO	90018	SCOPE	Reconstruction w/o Added Capacity			
SYSTEM	Urban	JURISDICTION	Hopewell		OVERSIGHT	NFO
PROJECT	CEDAR LEVEL RD - WIDENING				ADMIN BY	VDOT
DESCRIPTION	FROM: COBBLESTONE PKWY TO: UR-9036 (MILES AVE) (0.5190 MI)					
ROUTE/STREET	CEDAR LEVEL ROAD (9047)				TOTAL COST	$13,500,000
	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
RW	Federal - RSTP	$80,000	$320,000	$0	$0	$0
	Federal - STP/F	$120,000	$480,000	$0	$0	$0
RW TOTAL		$200,000	$800,000	$0	$0	$0
CN	Federal - STP/F	$915,819	$1,241,309	$374,106	$1,259,955	$787,907
CN AC	Federal - AC	$1,504,181	$0	$0	$0	$6,016,723
MPO Note						

UPC NO	12955	SCOPE	Safety			
SYSTEM	Urban	JURISDICTION	Hopewell		OVERSIGHT	NFO
PROJECT	RTE 10 - IMPROVE INTERSECTION				ADMIN BY	VDOT
DESCRIPTION	FROM: 0.162 MI West Hummel Ross Road TO: 0.09 MI East Hummel Ross Road (0.2520 MI)					
ROUTE/STREET	E. RANDOLPH ROAD (0010)				TOTAL COST	$1,480,387
	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
RW	Federal - CM	$95,977	$383,906	$0	$0	$0
CN	Federal - CM	$102,790	$396,107	$15,052	$0	$0
CN AC	Federal - AC	$31,288	$125,150	$0	$0	$0
MPO Note						

UPC NO	100500	SCOPE	Reconstruction w/o Added Capacity			
SYSTEM	Urban	JURISDICTION	Hopewell		OVERSIGHT	NFO
PROJECT	RTE 36 - INTERSECTION IMPROVEMENT				ADMIN BY	VDOT
DESCRIPTION	FROM: .2 miles west of Route 630 TO: .2 miles east of Rotue 630 (0.4000 MI)					
ROUTE/STREET	OAKLAWN BOULEVARD (0036)				TOTAL COST	$72,600
	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
PE	Federal - CM	$2,904	$11,616	$0	$0	$0
MPO Note						

UPC NO	101033	SCOPE	Safety			
SYSTEM	Urban	JURISDICTION	Petersburg		OVERSIGHT	NFO
PROJECT	RTE 301 - UPGRADE SIGNALS				ADMIN BY	VDOT
DESCRIPTION	FROM: 0.02 MI SOUTH OF WALNUT BLVD TO: 0.02 MI NORTH OF WALNUT BLVD					
ROUTE/STREET	CRATER ROAD (0301)				TOTAL COST	$797,056
	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
PE	Federal - RSTP	$3,200	$12,800	$0	$0	$0
RW	Federal - RSTP	$60,000	$240,000	$0	$0	$0
CN	Federal - RSTP	$79,411	$317,645	$0	$0	$0
MPO Note						

Urban Projects (continued)

UPC NO	101289	SCOPE	Reconstruction w/o Added Capacity			
SYSTEM	Urban	JURISDICTION	Petersburg		OVERSIGHT	NFO
PROJECT	PUDDLEDOCK ROAD - INTERSECTION IMPROVEMENT				ADMIN BY	VDOT
DESCRIPTION	FROM: 0.2 miles North of Industrial Drive TO: 0.2 miles South of Industrial Drive (0.4000 MI)					
ROUTE/STREET	PUDDLEDOCK ROAD (U000)				TOTAL COST	$521,770
	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
PE	Federal - AC CONVERSION	$20,000	$80,000	$0	$0	$0
CN	Federal - CM	$31,864	$127,457	$0	$0	$0
CN AC	Federal - AC	$52,490	$209,959	$0	$0	$0
MPO Note						

UPC NO	104870	SCOPE	Reconstruction w/ Added Capacity			
SYSTEM	Urban	JURISDICTION	Petersburg		OVERSIGHT	NFO
PROJECT	RTE 301 - EXTEND LTL (BOTH NB & SB) S. CRATER RD @ MORTON RD				ADMIN BY	VDOT
DESCRIPTION						
ROUTE/STREET	S. CRATER RD. (0301)				TOTAL COST	$550,000
	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
PE	Federal - CM	$20,000	$0	$0	$0	$80,000
MPO Note						

UPC NO	104878	SCOPE	Reconstruction w/ Added Capacity			
SYSTEM	Urban	JURISDICTION	Petersburg		OVERSIGHT	NFO
PROJECT	RTE 301 - EXTEND SB LTL ON S. CRATER RD. @ MED PARK BLVD.				ADMIN BY	VDOT
DESCRIPTION						
ROUTE/STREET	S. CRATER RD. (0301)				TOTAL COST	$335,000
	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
PE	Federal - CM	$10,000	$0	$0	$0	$40,000
MPO Note						

UPC NO	101039	SCOPE	Safety			
SYSTEM	Urban	JURISDICTION	Petersburg		OVERSIGHT	NFO
PROJECT	SOUTH CRATER ROAD AREA - SIGNAL COORDINATION				ADMIN BY	VDOT
DESCRIPTION	FROM: FLANK RD TO: RIVES RD (1.4000 MI)					
ROUTE/STREET	SOUTH CRATER ROAD (0301)				TOTAL COST	$660,000
	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
PE	Federal - AC CONVERSION	$26,400	$105,600	$0	$0	$0
CN	Federal - CM	$105,600	$0	$0	$422,400	$0
MPO Note						

UPC NO	77537	SCOPE	Safety			
SYSTEM	Urban	JURISDICTION	Petersburg		OVERSIGHT	NFO
PROJECT	DOWNTOWN TRAFFIC SIGNAL OPTIMIZATION - VARIOUS STREETS				ADMIN BY	Locally
PROGRAM NOTE	All funding obligated based on current allocations/estimate					
ROUTE/STREET	VARIOUS (U000)				TOTAL COST	$325,000
	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
		$0	$0	$0	$0	$0
MPO Note						
DESCRIPTION	FROM: N Jefferson St / S Jefferson St TO Perry St AND TO: Wythe St / Halifax St TO: Bollingbrook St/ Bank St					

UPC NO	104869	SCOPE	Traffic Management/Engineering			
SYSTEM	Urban	JURISDICTION	Petersburg		OVERSIGHT	NFO
PROJECT	UPGRADE SIGNALS - VARIOUS LOCATIONS				ADMIN BY	VDOT
DESCRIPTION	FROM: VARIOUS LOCATIONS TO: VARIOUS LOCATIONS					
ROUTE/STREET	VARIOUS (0000)				TOTAL COST	$450,000
	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
PE	Federal - CM	$30,000	$0	$120,000	$0	$0
CN	Federal - CM	$60,000	$0	$0	$240,000	$0
MPO Note						

UPC NO	101030	SCOPE	Safety			
SYSTEM	Urban	JURISDICTION	Petersburg		OVERSIGHT	NFO
PROJECT	RTE 36 - UPGRADE SIGNAL + EXTEND LTL				ADMIN BY	VDOT
DESCRIPTION	FROM: .127 mi. W. of RTE 9038 (Puddledock Rd.) TO: RTE 9038 (Puddledock Road) (0.1270 MI)					
ROUTE/STREET	WASHINGTON STREET (0036)				TOTAL COST	$752,745
	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
PE	Federal - RSTP	$11,022	$44,087	$0	$0	$0
CN	Federal - RSTP	$119,527	$478,109	$0	$0	$0
MPO Note						

Miscellaneous Projects

UPC NO	T204	SCOPE	Other		
SYSTEM	Miscellaneous	JURISDICTION	Petersburg	OVERSIGHT	NFO
PROJECT	Nonattainment Area			ADMIN BY	Locally
DESCRIPTION	Tri-Cities MPO Air Quality Maintenance Area				
ROUTE/STREET	DEQ/MRAQC (MRAQ)			TOTAL COST	$435,000

	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
PE	Federal - CM	$0	$142,000	$28,000	$28,000	$28,000
	Federal - RSTP	$10,000	$40,000	$0	$0	$0
PE TOTAL		$10,000	$182,000	$28,000	$28,000	$28,000
PE AC	Federal - AC	$7,000	$0	$0	$0	$28,000
MPO Note						

UPC NO	72904	SCOPE	Preliminary Engineering		
SYSTEM	Miscellaneous	JURISDICTION	Richmond District-wide	OVERSIGHT	NFO
PROJECT	RSTP TRANSPORTATION PLANNING SUPPLMENTL FUNDING FOR CRATER PDC			ADMIN BY	Locally
DESCRIPTION					
ROUTE/STREET	RPSF			TOTAL COST	$916,825

	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
PE	Federal - AC CONVERSION	$13,926	$0	$18,568	$18,568	$18,568
	Federal - RSTP	$4,642	$18,568	$0	$0	$0
PE TOTAL		$18,568	$18,568	$18,568	$18,568	$18,568
PE AC	Federal - AC	$18,568	$286,786	$0	$0	$0
MPO Note						

Project Groupings

GROUPING	Construction : Bridge Rehabilitation/Replacement/Reconstruction					
ROUTE/STREET					TOTAL COST	$11,331,729

	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
PE	Federal - BR	$27,190	$458,760	$0	$0	$0
RW	Federal - AC CONVERSION	$0	$0	$32,350	$0	$0
	Federal - BR	($2,978)	$272,807	$0	$0	$0
RW TOTAL		($2,978)	$272,807	$32,350	$0	$0
RW AC	Federal - AC	$0	$32,350	$0	$0	$0
CN	Federal - AC CONVERSION	$0	$0	$0	$1,515,201	$1,275,578
	Federal - BR	$6,429	$25,716	$5,626,073	$0	$0
CN TOTAL		$6,429	$25,716	$5,626,073	$1,515,201	$1,275,578
CN AC	Federal - AC	$0	$264,323	$2,790,779	$0	$0
MPO Note						

GROUPING	Construction : Rail					
ROUTE/STREET					TOTAL COST	$720,000

	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
CN	Federal - STP/RAIL	$72,000	$648,000	$0	$0	$0
MPO Note						

GROUPING	Construction : Safety/ITS/Operational Improvements					
ROUTE/STREET					TOTAL COST	$62,887,683

	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
PE	Federal - EB	$3,996	$15,985	$0	$0	$0
	Federal - STP/F	($9,663)	($38,651)	$0	$0	$0
	Federal - STP/SRS	$0	($93)	$0	$0	$0
PE TOTAL		($5,390)	($20,270)	$0	$0	$0
RW	Federal - STP/F	($2,857)	($11,429)	$0	$0	$0
	Federal - STP/SRS	$0	$6,000	$30,000	$0	$0
RW TOTAL		($2,857)	($5,429)	$30,000	$0	$0
CN	Federal - AC CONVERSION	$0	$0	$4,429,304	$13,800,456	$2,746,682
	Federal - CM	$9,663	$38,651	$0	$0	$0
	Federal - EB	$145,241	$580,962	$0	$0	$0
	Federal - HSIP	($898)	($8,086)	$0	$0	$0
	Federal - NHPP	$0	$16,231,908	$0	$0	$0
	Federal - STP/F	$22,444	$89,774	$0	$0	$0
	Federal - STP/SRS	$0	$155,949	$0	$200,092	$0
	Other	$96,475	$713,068	$0	$0	$0
CN TOTAL		$272,923	$17,802,226	$4,429,304	$14,000,548	$2,746,682
CN AC	Federal - AC	$0	$34,878,607	$0	$6,860,031	$0
MPO Note						
	Federal - HSIP	$277	$2,489	$0	$0	$0

Project Groupings (continued)

GROUPING	Construction : Transportation Enhancement/Byway/Non-Traditional					
ROUTE/STREET					TOTAL COST	$3,861,048
	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
PE	Federal - STP/EN	($129,538)	($518,152)	$0	$0	$0
CN	Federal - AC CONVERSION	$129,976	$519,905	$0	$0	$0
	Federal - STP/EN	$45,908	$183,631	$0	$0	$0
	Federal - TAP/F	$90,515	$362,061	$0	$0	$0
CN TOTAL		$266,399	$1,065,597	$0	$0	$0
MPO Note						

GROUPING	Maintenance : Preventive Maintenance and System Preservation					
PROGRAM NOTE	Funding identified to be obligated districtwide as projects are identified.					
ROUTE/STREET					TOTAL COST	$2,343,635
	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
CN	Federal - NHPP		$9,379,031	$56,274,186	$56,274,186	$51,584,671
	Federal - STP/F		$19,685,342	$20,980,485	$17,395,356	$19,979,529
CN TOTAL			$29,064,373	$77,254,671	$73,669,542	$71,564,200
MPO Note						

GROUPING	Maintenance : Preventive Maintenance for Bridges					
PROGRAM NOTE	Funding identified to be obligated districtwide as projects are identified.					
ROUTE/STREET					TOTAL COST	
	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
CN	Federal - BR		$1,721,001	$2,093,426	$2,465,851	$2,465,850
	Federal - STP/F		$6,140,188	$2,222,159	$2,222,160	$1,686,277
CN TOTAL			$7,861,189	$4,315,585	$4,688,011	$4,152,127
MPO Note						

GROUPING	Maintenance : Traffic and Safety Operations					
ROUTE/STREET					TOTAL COST	
	FUND SOURCE	MATCH	FY15	FY16	FY17	FY18
CN	Federal - STP/F		$5,145,700	$5,876,336	$5,391,386	$5,653,765
MPO Note						
PROGRAM NOTE	Funding identified to be obligated districtwide as projects are identified.					

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Appendix D

Draft 2040 Tri-Cities Long Range Transportation Plan Project List

Draft 2040 Tri-Cities Long Range Transportation Plan Project List

JURISDICTION	PROJECT DESCRIPTION	TYPE	FACILITY NAME	START	END	LENGTH	FUNCT CLASS	COST ESTIMATE
CHESTERFIELD	WIDEN N. ENON CHURCH ROAD FROM ROUTE 10 TO BERMUDA HUNDRED ROAD (0.7 MILE) FROM TWO LANES TO FOUR LANES.	WIDENING	ENON CHURCH ROAD	ROUTE 10	BERMUDA HUNDRED ROAD	0.7	URBAN MINOR ARRTERIAL	$5,600,000
CHESTERFIELD	CONSTRUCT NEW STATION AND PLATFORM TO ACCOMMODATE FUTURE TRACK EXPANSION, IMPROVE PARKING AND ON-SITE CIRCULATION, PROVIDE PEDESTRIAN AND BICYCLE FACILITIES ON-SITE.	RAIL	ETTRICK STATION	N/A	N/A	N/A	N/A	$9,000,000
CHESTERFIELD	WIDEN ROUTE 10 FROM I-295 TO BURGESS ROAD (1 MILE) FROM FOUR LANES TO SIX LANES.	WIDENING	RT. 10	I-295	BURGRESS ROAD	1	PRINCIPAL ARTERIAL	$19,542,600
CHESTERFIELD	WIDEN ROUTE 10 FROM BURGESS ROAD TO POINT OF ROCKS ROAD (1.2 MILES) FROM FOUR LANES TO SIX LANES.	WIDENING	RT. 10	BURGRESS ROAD	POINT OF ROCKS ROAD	1.2	PRINCIPAL ARTERIAL	$25,014,528
CHESTERFIELD	WIDEN ROUTE 10 FROM POINT OF ROCKS ROAD TO THE HOPEWELL CITY LIMITS(1 MILE) FROM FOUR LANES TO SIX LANES.	WIDENING	RT. 10	POINT OF ROCKS ROAD	HOPEWELL CL	1	PRINCIPAL ARTERIAL	$10,250,000
CHESTERFIELD	CONSTRUCT SIDEWALK ALONG SOUTH (ETTRICK) STREET AND JAMES STREET TO IMPROVE PEDESTRIAN ACCESS TO THE TRAIN STATION.	SIDEWALKS	SOUTH STREET (ETTRICK)	SOUTH STREET	JAMES STREET	0.2	SUBDIVISION STREET	$875,000
CHESTERFIELD	CONSTRUCT SIDEWALK ALONG THE WEST SIDE OF ROUTE 1 FROM WHERE IT CURRENTLY ENDS AT WHITEPINE ROAD TO MILHORN STREET TO IMPROVE PEDESTRIAN ALONG THE CORRIDOR.	SIDEWALKS	RT. 1	WHITEPINE ROAD	MILHORN STREE	1.5	PRINCIPAL ARTERIAL	$3,200,000
CHESTERFIELD	CONSTRUCTION OF 5'-WIDE CONCRETE SIDEWALK ALONG THE EAST SIDE OF HARROWGATE ROAD, FROM HARROW DRIVE TO NORTH STREET; CONSTRUCTION OF 5' WIDE CONCRETE SIDEWALK ALONG THE WEST SIDE OF HARROWGATE ROAD, FROM COUGAR TRAIL TO DOGWOOD AVENUE; AND PEDESTRIAN IMPROVEMENTS TO THE SOUTH SIDE OF COUGAR TRAIL FROM CARVER MIDDLE SCHOOL TO HARROWGATE ROAD	SIDEWALKS	HARROWGATE ROAD	HARROW DRIVE	NORTH STREET	0.45	MINOR ARTERIAL	$647,220
CHESTERFIELD	CONSTRUCT SIDEWALK ALONG NORTH SIDE OF EAST RIVER ROAD FROM DUPUY AVENUE TO CHESTERFIELD AVENUE TO IMPROVE PEDESTRIAN ACCESS TO VSU, THE TRAIN STATION AND CHESTERFIELD AVENUE	SIDEWALKS	EAST RIVER ROAD	DUPUY AVENUE	CHESTERFIELD AVENUE	0.7	MINOR ARTERIAL	$780,000
CHESTERFIELD	RECONSTRUCT CHESTERFIELD AVENUE FROM MAIN STREET TO JAMES STREET TO PROVIDE A SEPARATE 8'-WIDE TWO-WAY BICYCLE TRACK ON THE NORTH SIDE.	RECONSTRUCTION	CHESTERFIELD AVE	MAIN STREET	JAMES STREET	0.5	MINOR ARTERIAL	$15,000,000
COLONIAL HEIGHTS	RECONSTRUCT BOULEVARD (RT. 1) FROM JAMES AVE NORTH TO CITY LIMITS	RECONSTRUCTION	RT.1 (BOULEVARD)	JAMES AVE	NCL	1.95	PRINCIPAL ARTERIAL	$54,098,625
COLONIAL HEIGHTS	IMPROVEMENTS TO THE RAMP/INTERCHANGE AREA AT I-95 AND SOUTHPARK BOULEVARD (EX. 53)	RECONSTRUCTION	I-95	I-95 (RAMP/INTERCHANGE)	SOUTHPARK BOULEVARD	N/A	INTERSTATE	$32,480,000
COLONIAL HEIGHTS	RECONSTRUCT INTERSECTION AT TEMPLE AVE (RT. 144) AND BOULEVARD (RT. 1/301).	RECONSTRUCTION	TEMPLE AVE (RT. 144)	TEMPLE AVE (RT. 144)	BOULEVARD (RT. 1/301)	N/A	PRINCIPAL ARTERIAL	$6,525,000
COLONIAL HEIGHTS	CONSTRUCT TWO NEW TRAVEL LANES (ONE EASTBOUND – ONE WESTBOUND) ON TEMPLE AVE FROM I-95 EAST TO CITY LIMITS	NEW CONTRUCTION	TEMPLE AVE	I-95	ECL	1.15	PRINCIPAL ARTERIAL	$13,475,700
DINWIDDIE	WIDENING RT. 1 (BOYDTON PLANK RD.) FROM I-85 EXIT 63B NORTH/NORTHEAST TO THE PETERSBURG CITY LIMITS.	WIDENING	RT. 1 (BOYDTON PLANK RD)	I-85 EXIT 63B NORTH/NORTHEAST	PETERSBURG CL	4	OTHER PRINCIPAL ARTERIAL	$8,622,080
HOPEWELL	I-295 ACCESS RAMPS W/SOUND BARRIERS	NEW CONTRUCTION	I-295	RIVER ROAD	NCL	N/A	INTERSTATE	$45,370,500
PETERSBURG	WIDEN I-95 FROM THE PETERSBURG SCL TO THE SOUTHERN MPO BOUNDARY	WIDENING	I-95	PETERSBURG SCL	SOUTHERN MPO BOUNDARY	N/A	INTERSTATE	$81,251,560
PETERSBURG	WIDEN I-295 FROM THE I-95 / I-295 INTERCHANGE IN PRINCE GEORGE TO THE HOPEWELL SCL	WIDENING	I-295	I-95/I-295 IN PG	HOPEWELL SCL	N/A	INTERSTATE	$175,206,720
PETERSBURG	U.S. ROUTE 460 CORRIDOR IMPROVEMENT PROJECT (RECONSTRUCTION 4 LANES)	RECONSTRUCTION	US-460	RT. 630 (BULL HILL RD)	PG SOUTHERN MPO BOUNDARY	7.2	MAJOR ARTERIAL	$68,640,000
TRI-CITIES AREA MPO	TCAMP: US-460/I-85/I-95 INTERCHANGE (2015 SMART SCALE/BH2 PROJECT)	NEW CONTRUCTION	US-460/I-85/I-95 INTERCHANG	CRATER RD	WANGER RD.	3	INTERSTATE	$17,224,517

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Appendix E

Bicycle Recommendations from the 2003 Tri-Cities Area Bikeway Plan

Excerpt from the
2003 Tri-Cities Area
Bikeway Plan

IV. EXISTING LOCAL PLANNING DOCUMENTS

Existing comprehensive plans, recreational plans, and other relevant planning documents from six Tri-Cities Urbanized Area jurisdictions were reviewed as part of this study. In addition, The Lower Appomattox River Corridor Greenway and Blueway Conceptual Master Plan and Appomattox River Corridor Plan Summary were inspected. The primary purpose of the review was to identify plans for bicycle, pedestrians, and safety improvements in the urbanized area. Planning and recreation department staff in four of the six localities, plus public works staff in Petersburg and transportation staff in Chesterfield County were also interviewed to identify current status of bikeway plans and pedestrian safety issues in the urbanized area.

Chesterfield County

Chesterfield County is involved in the planning and development of bicycle and trail facilities. In 1975, the planning staff developed a guideline for planning bikeways in Chesterfield County through a list of goals and objectives aimed at providing safer, user- oriented facilities for the County.

In 1989, Chesterfield County Bikeway Plan was developed which proposes a combination of exclusive bicycle roadways (bike paths separated from automobile traffic), bicycle lanes (paved areas designated for bicyclists along existing highways) and bike routes (existing low volume highways signed for bike traffic, but not widened). The plan has been used in consideration of development proposals and public capital improvements projects.

The plan is considered as the first step in developing a comprehensive bikeway facility plan for the County. It identifies the primary routes for bike travel. Follow-up plans should be undertaken to address local and neighborhood level needs. It is also recognized that less hazardous bicycle travel over many of the identified routes can only be achieved when the existing highways are improved to include bike trails or lanes.

Chesterfield County Parks and Recreation Department also developed a study in July, 1998 entitled “The Appomattox Riverfront Trail”. The proposed trail will provide access to and along the River, linking Virginia State University’s Randolph Farm Research Station to the Village of Ettrick and the University’s main campus. The new trail is about two miles long and paved, encompassing 0.4 miles of sidewalks and 1.5 miles of trail.

The City of Colonial Heights

The City of Colonial Heights Comprehensive Plan adopted in February, 1997 includes a discussion of Bikeway Element. “Realizing the growing usage of bicycles, congested roadways, and energy conservation needs, a Tri-Cities Area Bikeway Plan was prepared by the Crater Planning District Commission in 1975. The study was prepared to provide Colonial Heights, as well as the other Tri-Cities areas, with a series of guidelines and suggested routes to consider in their bikeway planning needs. While the study was prepared 20 years ago, the guidelines and proposals are still pertinent today.

There are currently no existing bikeways in Colonial Heights, however, in the City’s adopted Recreation and Open-Space Master Plan (prepared by the Crater Planning District Commission in 1973) specific streets have been planned for a bikeway system. The City is building a diversified recreation system that is aimed at organized programs being planned at specific sites throughout Colonial Heights which may possibly require a bicycle trip”.

In addition, the City’s Comprehensive Plan also recommends the following objective for parks and recreation service and development.

“Plan for the establishment of a bicycle trail system for non-motorized vehicles in connection with planned recreation area”.

Dinwiddie County

On August 7, 2002, the Dinwiddie County Board of Supervisors adopted Dinwiddie County’s Comprehensive Plan Update. The County acknowledges the importance of alternative mode of transportation in the County. The following planning objectives are stated in the Plan.

“Encourage the use of alternative mode of transportation to provide for an efficient intermodal transportation system”.

“Pursue the development of a connecting network of linear park, trail and/or greenway to connect with a future regional greenway system”.

In addition, Dinwiddie County initiated a “Trekking Dinwiddie” project. The purpose of this initiative is to use a trail system to educate visitors and citizens alike, link communities and historic battlefield sites in the County.

“The proposed trail system focuses on developing a regional network linking Dinwiddie battlefield sites, schools, and facilities with extensions to the Appomattox River and neighboring localities. The foundation for this system currently exists by utilizing inactive railroad rights-of-way, utility corridors, and roads that could total approximately 100 miles. Multiple trails for walking, biking, and equestrian use could be developed with numerous trailheads. These trails could connect regional destinations such as Appomattox Riverside Park, Lake Chesdin, Petersburg National Battlefield, and Pamplin Historical Park with communities such as DeWitt, Carson, Sutherland, and Dinwiddie.

The proposed battlefield trails network would link sites identified by the Civil War Sites Advisory Commission as significant to the Petersburg Campaign. These battlefield areas include: Boydton Plank Road, Five Forks, Globe Tavern, Hatchers Run, Lewis Farm, Peebles Farm, Petersburg Breakthrough, Reams Station, Sutherland Station, and White Oak Road”.

The City of Hopewell

On December 11, 2001, the Hopewell City Council adopted the newly updated Hopewell Comprehensive Plan. The Plan includes a discussion of the need to provide an alternative transportation option in the City.

“The Cityy and State are looking at improving the alternative transportation methods available in Hopewell. The River Road project and the Courthouse Road/ Berry Street project both have proposed bike lanes. Attempting to address part of this problem is the Cabin Creek Trail connecting Atwater

Park/Atwater Soccer Complex and Crystal Lake/Mathis Park while ultimately connecting the new athletic fields at Hopewell High School.

The Alternative Transportation Plan should also focus on connectivity in the City. All areas of the City should be connected and easily accessible by those who have limited mobility or lack access to a motorized vehicle. Connectivity of the neighborhoods, commercial areas, and industrial areas allows people to travel easily from one area of the City to another without clogging the main roads that move traffic through the City".

The transportation element of the Plan further states: As noted earlier in the plan there is a segment of the population of the City that does not have access to automobiles. These citizens, generally the elderly, the poor and the young, should also have access to transportation even though they may not own or drive an automobile. For these citizens transit, bicycles, and pedestrian lanes enable them to carry out their day-to-day activities.

The City endorses the 1979 Tri-Cities Urban Area Bikeways Plan and professes to implement.

"There are no designated bike routes in Hopewell. The Tri-Cities MPO has stated that a regional bike plan has been approved although this plan does not seem to have been implemented in the City.

(a) Implement the Tri-Cities MPO Bicycle Plan.
(b) Work with VDOT to have the establishment of bicycle lanes made a priority with all new road construction in the City.
(c) Add bicycle lanes to existing roadways where feasible.

The Plan also touches on pedestrian access and safety issues. "Many of the neighborhoods in the City have no sidewalks. This means that people choosing to walk must walk on the berm of the road. This is not a safe alternative, especially for those who must walk. Pedestrian lanes also do not connect many areas of the City, especially the retail centers near the I-295 interchange. Finally, crossing many of the major roads in the City is often risky due to continuous turn lanes and short signalization.

(a) Secure funding to complete the Cabin Creek Trail and study whether this trail can be extended to other parts of the City.
(b) Require new residential developments to ensure ease of pedestrian traffic.
(c) Work with VDOT to have sidewalks added to all roadway construction where appropriate.
(d) Conduct a Pedestrian Access study to show ways to improve pedestrian access in the City.
(e) Install signalized crosswalks at major intersections and ensure that pedestrians can cross safely".

The City of Petersburg

The City of Petersburg adopted its Comprehensive Plan in February, 2001. The Plan places a heavy emphasis on downtown planning and returning of pedestrian to downtown. It suggests that "any urban plan for downtown Petersburg should be a program of public outdoor pedestrian amenities, which are at present largely absent. There should be places to sit, to walk, to meet and talk, to relax, and, most importantly, to watch other people. Programming frequent outdoor activity is one way to attract people and create a sense of excitement, but the pedestrians themselves are the source of most of this energy. Therefore, every means must be found to attract pedestrians and to make them want to return".

It further identifies the Appomattox River Heritage Trail, currently under development along the waterfront downtown, is an important linkage. "The City should explore every means possible of linking this pedestrian amenity with downtown pedestrian ways"……"The goal is completion of the trail along the entire downtown waterfront and then at least as far west as Battersea; a preferable alignment would extend the trail west to the Appomattox Riverside Park, where the City owns three miles of the riverside up to the Abutment Dam. By this further extension, the Heritage Trail is intended to be part of an Appomattox trail system proposed as a priority by the Lower Appomattox River Corridor Plan".

Currently, there is no designated bikeway in Petersburg. However, the City recognizes the need of a bikeway system in the City. The Comprehensive Plan recommends that a city bikeway plan should be developed to accommodate increased bicycle traffic. "Bicycling is an important method of transit in a city dominated by low- and moderate income households".

Prince George County

Prince George County Board of Supervisors adopted Prince George County's Comprehensive Plan Update in May, 1999. Currently, there is no designated bikeway in the County. However, the Plan recommends that Prince George County develop a County Bikeway Plan to address the needs of providing alternative mode of transportation to its citizens in the urbanized area.

Regional Documents

Appomattox River Corridor Plan Summary

In June, 1999, Crater Planning District Commission, in collaboration with the National Park Service prepared an Appomattox River Corridor Plan Summary. The purpose of this Plan is to assist communities along the river in developing a consensus and building partnerships for their visions of recreation development, resource conservation, economic development, and water quality protection.

The major recommendation of the Plan is to develop a Regional Trail System. "It is recommended that a regional trail system along the corridor be established. The system may consist of natural, bike and heritage trails, and other linear open space in the region. The goal of this action is to link all recreational, cultural and natural features, and historic sites on both sides of the Appomattox.

There are numerous corridors of land within the Appomattox River Basin that offer the potential to serve as trails. The preliminary regional trail system could include river and stream corridors, canals, utility easements, abandoned railroad rights-of-way, flood plains, designated resource protection areas and existing trails. There are hundreds of acres of flood plains and wetlands in the corridor. They are considered unsuitable for development but are excellent elements for a trail system.

There are significant public land holdings in the River Basin. These properties include the Petersburg National Battlefield, the U. S. Army Quartermaster Center and Fort Lee, two

national cemeteries, the Federal Correctional Institute, Virginia State University, Central State Hospital, Southside Virginia Training Center, and several state and local park and recreational sites. All of these public lands can be potentially linked through a regional trail system".

National Project

National Millennium Trails

To celebrate America's rich history and its bright future in the 21st century, First Lady Hillary R. Clinton and U. S. Secretary of Transportation Rodney E. Slater designated 16 National Millennium Trails in June, 1999. "The National Millennium Trails connect our nation's landscape, heritage and culture and demonstrates our national commitment to improving the quality of life for all Americans" said Secretary Slater.

One of the sixteen designated trails, Civil War Discovery Trail, travels through the study area. **I**t calls for a trail connecting the civil war battlefields, military routes and site of historical significance in the area and from New York to Florida. This is a public/ private partnership program which is led by the U. S. Department of Transportation, the Rails to Trails Conservancy and a collaboration of other agencies and organizations. In Virginia, the partner organization is Virginia Trails Association.

V. BIKEWAY PLAN

A bikeway plan should accommodate as many bicyclists' interests as possible, provide continuity of purpose and satisfy bicyclists' desired corridors of travel. Bikeway planning is commonly thought of as the effort undertaken to develop a bikeway system— a system of bike paths, bike lanes, and bike routes—all interconnected and spaced closely enough to almost totally satisfy the travel needs of bicyclists. In fact, no such system could really provide for the vast demand for bicycle travel. Bicyclists, even more than motorists seek the most direct routes from where they are to where they want to go, particularly those who are using the bicycle for more than casual recreation. Because of the diversity of needs of bicyclists, and the fact that many trips are quite short, a bikeway system could not provide for most bicycle travel unless it were of the same detail as the street system. For this reason, roads, together with bikeway, must serve as the bicycle- transit system to provide for the travel needs of bicyclists.

Bicycle planning is more appropriately defined as the effort undertaken to provide for safe and efficient bicycle travel. An effective program is one that is conducted in recognition of the fact that billions of dollars have been spent on a road system to allow people to travel almost any place they wish. Most of these roads are sufficient to accommodate shared use by bicyclists and motorists, and hence, most bicycle travel has occurred and will continue to occur on that system.

Probably the most important effort that could be undertaken to enhance bicycle travel would be improved maintenance and upgrading of existing roads that are used regularly by bicyclists, regardless of whether or not bikeways are designated. This effort requires that increased attention be given to the right-hand portion of roadways where bicyclists are expected to ride. An attempt should be made to improve the width and quality of the surface and to maintain the right-hand portion in a condition suitable for bicycle riding. Also important is the consideration of bicycle needs in the implementation of major construction projects and normal safety and operational improvements. For example, in constructing new roads, adequate width should be provided to permit shared use by motorists and bicyclists. When resurfacing, full shoulders should be resurfaced, as well as traffic lanes. When constructing truck-passing lanes, the paved shoulders should not be sacrificed, causing bicyclists to ride within a truck lane. When placing a roadway-edge stripe, an attempt should be made to provide sufficient room outside the stripe for bicyclists. When considering the restriping of roadways for more traffic lanes, the impact on bicycle travel should be assessed. These efforts, to preserve or improve an area for bicyclists to ride, can benefit motorists as well as bicyclists.

Another very important aspect of providing for the needs of bicyclists is in the area of support facilities. If bicycles are to be used extensively for daily trips, secure bicycle storage at common destination points (e.g., office buildings, shopping centers, schools, etc.) is necessary. The lack of secure bicycle parking can be a serious deterrent to bicycle use.

In order to take maximal advantage of the opportunities for bicycling, bicycle planning should be an integral part of the planning for other transportation modes and land-use development. Only through this effort can adequate provisions for bicycle parking and transit interface (e.g., "bikes on buses"; parking at transit terminals and park-And ride facilities) be assured. COMMUTING

Experts indicate that bike commuting is practical when distances do not exceed six or seven miles. However, some individuals' cycle great distances, but they are exceptional. Therefore, the selection of major arterial streets, which carry motorists into the major employment centers from medium- and low density residential areas six miles away, should be considered. It is suggested by The Bicycle Institute of America, when planning bike routes to consider using parallel quiet streets which could become alternative routes along major thoroughfares, but utilize the major boulevards when there is no alternative. Attention should also be given to wide streets that could potentially accommodate an exclusive bike lane. To simplify the study areas to the bare essentials and identify only those streets which the bicyclists will use is another consideration.

LOCATING BICYCLE FACILITIES

Adaptable locations which might easily be developed into Bike Paths/Trails with alterations, other than vehicular thoroughfares, are:

1. Abandoned railroad rights-of-way.
2. Telephone-line, power line and gas-pipeline rights-of-way provide more than adequate clearances for bicycles trails. Grades may or may not be within grade specifications.
3. Riverbanks, embankments and certain greenways usually provide long and gently curved scenic locations for bicycle trails.
4. National, state, regional and local parks and forest preserves offer scenic and historic locations for bicycle trails, as well as recreational facilities and terminal parking lots for bicyclists.
5. Abandoned roadways, when their short lengths might provide adequate services.
6. Fire breaks offer sufficient widths and clearances for bicycle trails.
7. Sidewalks or pedestrian walkways in areas of low-

pedestrian volumes may easily be converted to bikeways when permitted by local ordinance.

Bicycle paths could be located almost any place where there is available space accessible to the cyclist. While the bicycle is a wheeled vehicle, it is still capable of being negotiated over a wide variety of types of terrain and surfaces. Most persons who ride bicycles will take the easiest and quickest route to reach their destination. The bicyclist will take every shortcut he can; however, he is required by law to obey all laws and traffic requirements that pertain to operators of motor vehicles. The bikeways presented have been developed to encourage safe bicycling and walking, provide a means to commute to and from any major businesses and allow a recreationalist to tour his community by pedal power or foot power.

More than 100 miles of bikeways have been selected through the cooperation and assistance of affected local jurisdiction staffs. The majority of bikeways shown will be using existing local streets and highways and link activity areas and major destination points, such as schools, recreation areas, employment centers, historic sites, shopping areas, etc.

Some of the bikeways follow selected collector streets and major thoroughfares for efficient intra-city trips. Individual and group needs for longer recreational and sport- riding trips are accommodated through regional bikeways which connect with proposed routes in other jurisdictions, as well as with commuter routes in the study area.

Currently, there are no designated bike lanes or bike routes in the study area. All planned bikeway facilities are presented in the proposed 2003 Tri-Cities Bikeway Plan and are described as follows:

Petersburg

The City of Petersburg has no dedicated bikeways incorporated within its roadway system. The plan combines proposed bike routes and bike lanes with a system to provide a safe and adequate amount of bicycle commuting and recreational activity. The City proposed to have 28 miles of bike routes, and the Petersburg National Battlefield Park adjacent to the City has 4.5 miles of bike lanes, and approximately 9 miles of bike paths. The bikeway system is developed in neighborhood "loop-routes" enabling the cyclist to begin and end his ride at the same location. The system also provides a connecting bike-route link to other neighborhood routes.

Improvements to the proposed system will incorporate added bike routes, bike lanes and additional bike paths throughout the municipal park areas. A short narrative explanation of the types of bikeways planned for Petersburg follows:

1. Washington Street-Wythe Street: This roadway system is a one way traffic circulation, going west along Washington Street and east along Wythe Street. A bike lane is proposed, from the beginning of the one-way system in both directions. Parking should be removed along the right side of the street to accommodate the bike lane. The bikeway will act as the City's primary east-west bicycle commuting roadway, carrying persons to Fort Lee, Hopewell and Central State Hospital.

2. South West Street-West High Street-Madison Street: A bike-route system connecting the Washington-Wythe Streets corridor to the City's northern residential area. Along High Street and throughout the restored neighborhoods and the redeveloping downtown area, the same classification will continue. The YMCA along Madison Street presently attracts numerous bicycle riders.

3. North and South Sycamore Street: Due to narrow streets, a bike-lane system is suggested. It connects the neighborhoods in the Walnut Hill area to downtown, the hospital, and library. This is one of the major north-south thorough-fares in the City carrying high volumes of vehicular traffic at all times of the day. A possible alternate parallel route could encompass Monticello and Westover Avenues.

4. South Boulevard-Walnut Hill East: Primarily a recreational bike-route system to carry cyclists to the proposed bicycle lanes along Sycamore Street and Johnson Road.

5. Johnson Road-Baylors Lane-Lee Park: This bikeway encompasses an alternate roadway in a north-south direction into the central business district from the southwestern residential neighborhoods, the high school and major city park area. A bike lane designation along Johnson Road, and a bike route for Baylors Lane and Virginia Avenue, should be connected to the Lee Park existing bike trails.

6. Defense Road-Fort Lee Road-Ferndale Avenue-Farmer Street: This bike-route system loops a residential neighborhood in West Petersburg and connects to the Washington-Wythe Streets bike lanes and South West Street loop route. A neighborhood park and fairground area are located along this route, as well as a historic scenic road.

7. South Halifax Road-Flank Road-Battlefield Park Subdivision: A bike lane should be developed along the historic Flank Road, and continuation of the bike-route classification in the Battlefield Park neighborhood, as well as along South Halifax Road.

8. South Crater Road-Wagner Road-Rives Road: South Crater Road from Walnut Boulevard southward to Rives Road a bike lane should be developed. At this point, Rives and Wagner Road will act as connecting bike routes to Prince George County and Fort Lee.

9. Hickory Hill Road-Fort Lee-National Battlefield Park: This roadway is a valuable connecting thorough-fare between the National Battlefield Park, Fort Lee and Prince George County. A bike route is prescribed for Hickory Hill Road and bike lane into Fort Lee.

10. Appomattox River Heritage Trail-Upper Appomattox Canal Trail-Appomattox Riverside Park: This bike path/trail starts from Pocahontas Island along the River to Old Town Harbour, and westward to Fleet Street/Campbell's Bridge area. The proposed Upper Appomattox Canal Trail System is from Campbell's Bridge, follow the River to Matoaca Bridge. It connects to the canal trail system inside the Appomattox Riverside Park. Connection will be provided to other bikeway systems in southern Chesterfield, northern Dinwiddie and the downtown Petersburg area.

- Bicycle-Bus Transfer Stations: There is need for three bicycle-transfer locations in Petersburg. One in the central business district to carry bicycles across into Virginia State University, another along West Washington Street

near Central State Hospital and a third at the National Battlefield Park-Fort Lee vicinity.

Colonial Heights

There are no existing bikeways in Colonial Heights; however, in the City's adopted Recreation and Open-Space Master Plan, specific streets have been planned for a bikeway system. The City is primarily a bedroom community for local employment elsewhere in the Tri-Cities Urban Area. The planned system includes:

11. Boulevard (U.S. 301-1): This street is the City's major local thoroughfare and carries the largest number of commuter and shopping vehicles per day. Along this street are located the City's business and commercial establishments. A bike lane is suggested along the Boulevard.

12. Ellerslie Avenue-Temple Avenue-Conduit Road: These streets should be developed for bike lanes connecting residential neighborhoods, schools and recreation areas to the north and shopping mall to the south. A spur bike path is proposed for the area between Covington Road and Yacht Basin Drive on Conduit Road where an elementary school, public library and White Bank park are planned.

13. Sherwood Drive-Forest View Drive-Fairmont Drive-Biltmore Drive: A bike- route system should encompass this neighborhood and connect the cyclists to the Boulevard bike lanes.

14. Lakeview-Springdale-Woodale-Seaboard Coastline Railroad Right-of-Way: A continuation of the bike route system from the Sherwood Hills area, connecting the Lakeview Elementary School to the recently acquired abandoned railroad right-of-way, where a bike path should be encouraged as a north-south connecting bikeway throughout the City.

15. White Bank Park-Fort Clifton: There is a bike-path/trails system through White Bank Park. This system should link with a trail system in the Fort Clifton area connecting the two facilities and offering access to Tussing Elementary School. These trail systems would be accessible to residents by way of Conduit Road bike lanes.

16. East Westover Avenue-Lower Conduit-Flora Avenue and the Junior High School: This system will constitute a bike route, encompassing the residents around the junior high school. East Westover Avenue should be classified as a bike lane, to safely carry the City's southern bicycle traffic towards the bike lanes on the Boulevard and Conduit Road.

17. Carroll Avenue-Chesterfield Avenue-Battery Place-Meridian Avenue: Basically a bike-route system connecting the City's southwestern neighborhoods with the recreational areas at the stadium.

18. Temple Avenue: This roadway system carry commuter motorists and cyclists in an easterly direction to Fort Lee and Hopewell. Bike lanes should be developed in conjunction with future improvements projects.

19. Proposed Appomattox River Park: Also indicated for future park usage is a linear park along the river encompassing the landfill area. A series of bike trails should be developed.

Hopewell

The City of Hopewell recognized the importance of providing alternative transportation method in the City. The River Road project and the Courthouse Road/Berry Street project both have proposed bike lanes. The Cabin Creek Trail is another option to connect Altwater Park and Crystal Lake/Mathis Field area.

20. Route 36-Oaklawn Boulevard-Woodlawn Street-Winston Churchill Drive: Oaklawn Boulevard , Woodlawn Street and Winston Churchill Drive represent the City's main east-west thoroughfare connecting the Fort Lee area and Petersburg to the west and the industrial plants and Route 10 to the east. A bicycle lane should be encouraged along these streets. All other local bike routes connect with this system and are funneled in either an eastern or western direction.

21. South Mesa-Mesa Drive (and Smithfield Avenue-Wilmington Avenue): A bike lane should be developed along this route connecting bicycle traffic from the City's eastern and northern most residential areas and the high-school recreation area. A bike route along Wilmington Avenue will connect Smithfield Avenue, Woodlawn Street and Oaklawn Boulevard across the Norfolk and Western Railroad tracks.

22. City Hall-Central Business District-City Point: Continuing a bicycle lane from South Mesa Drive into the CBD, at which point a loop-bike route carries cyclists around Appomattox Street, Cedar Lane to City Point Park, and Brown Avenue and back to the East Broadway area. Historic Appomattox Manor is seen along this route. It may also connect to the planned new waterfront marina area.

23. Route 10-Central Business District-Hopewell Street-Randolph Road: This system connects Hopewell with Chesterfield County across the Appomattox River on the north and south toward Prince George County and places beyond. A bicycle lane should be constructed from the Hopewell Yacht Club at the City's northern boundaries, to the southern City limits beyond Bailey's Creek at which point a bike route shall begin through Prince George County.

24. Weston Circle-15th Avenue-High Avenue-Arlington Road: This bike route connects the northern city bicycle traffic along Randolph Road and Broadway and the major east-west thoroughfare and bike lane along Winston Churchill Drive then continues via Arlington Road into Prince George County. The Cavalier Square Shopping Center and numerous neighborhoods can be reached by this bike lane.

25. Cabin Creek Trail: This bike path/trail connects Atwater Park/Atwater Soccer Complex to Crystal Lake/Mathis Park, following River Road and ultimately linking the new athletic fields at Hopewell High School.

Dinwiddie

Dinwiddie is presently in need of a bikeway system in the urbanized area of the County to carry commuter and recreational cyclists to and from employment in the Petersburg area, County schools and recreational sites. The County has initiated a "Trekking Dinwiddie" project. The purpose of this initiative is to promote a trail system by linking communities and historic battlefield sites in the County. The proposed bikeway system reads as follows:

26. U. S. 1-Route 613-Virginia 226: A bicycle lane should carry cyclists along U. S.

Highway 1 from the West Washington Street bike lane in Petersburg down to
Route 613 beyond Lake Jordan. Routes 613, 631, and 632 could be developed as collector bike routes up to Route 460.

27. Route 632-Route 601-Route 776: Development of a bike-route system along Route 601 toward Route 600 to the east, where the Appomattox Riverside Park is located. This is a linear historic park along the river providing bike paths and bike trails throughout. To the west, the bike route leads to the Lake Chesdin Dam and boat landing area.

28. Route 672-Route 613-Defense Road: The bicycle-route designation should continue from Petersburg along historic Defense Road, past the entrance to Central State Hospital into Dinwiddie County. A bike-route designation should also be introduced along Route 603, 672 and 613, encompassing the Petersburg National Military Park along Route 613. This will connect to the historic Flank Road coming from Petersburg. This will provide a continued Historic Road Tour through both communities.

29. South Johnson Road-Route 677: This will connect Richard Bland College with the Johnson Road bike lane system, and provide a bike-route designation along Route 677 connecting Halifax Road to the Dinwiddie bikeways.

30. Trekking Dinwiddie Trail: The proposed trail system will utilize inactive railroad right-of-ways, utility corridors and roads for walking, biking and equestrian uses. In the urbanized area the following battlefield sites are to be linked: Boydton Plank Road, Globe Tavern, Hatchers Run, Reams Station, Pebbles Farm, and White Oak Road.

Prince George County

The bicycle plan has investigated the northern portion of Prince George County for a bikeway system. Only this portion of the County is within the urbanized area and the transportation study area has the greatest need for a bikeway system. This system acts primarily as a commuter route and as a secondary recreational cycling system. The bikeways connect with adjoining community bikeways wherever possible. The major concerns in the County are the narrow roads and their high speeds of traffic. Suggested bikeways are described as follows:

31. Route 106-Route 460-Route 630: A bicycle route should be planned along Route
106 from Route 460; eastward toward the courthouse is suggested. Walton
Elementary School is located along this road and will carry recreational cyclists to events at the school, as well as link Petersburg, and the planned bike routes along Route 5 toward Williamsburg. Route 630, 629 and 156 will provide a southern connection from the Rives Road bike route over to the Prince George County
High School area. From the high school, Route 156 should be classified as a bike lane.

32. Route 644-Route 10/Route 156: After the Route 156 intersection, Route 106 becomes Route 156 bypass and should be developed as a bike route over to Route
10/Route 156, which is designated as bike route continuing to the east. Route 10/Route 156 should be designated as a bike route due to the narrowness of the bridge over the James River. This route, however, will undoubtably attract numbers of cyclists going to and from historic Route 5 and the Williamsburg area.

33. Route 156-Route 106-Route 630: The continuation of Arlington Road's bike lane in Hopewell joining Prince George County's Route 156 at the City limits will carry cyclists safely into and out of Hopewell and major employment centers.
This bike lane should continue southward to Route 106 and go west by the
Beazley Elementary School, Courthouse and County offices, and connect with
Route 630 going north toward Route 36 in Hopewell.

34. South Crater Road-Birdsong Road-Richard Bland College: A bike route should be planned along Birdsong Road from its intersections with South Crater Road to Flank Road and Johnson Road, then sourthward to Richard Bland College.

The Prince George County bikeways that are designated as bike routes should be expanded into bike lanes when future highway widening occur, or when a large influence, such as a subdivision or employment center, may be developed. Other power- line easements and right-of-way should also be considered as possible recreational bike paths.

Southern Chesterfield County

A portion of Chesterfield County is located within the Tri-Cities Urban Area and is included in the study. The County is involved in the planning and development of bikeways and trail facilities. Followings are examples attempting to coordinate the jurisdictional systems with southern Chesterfield County.

35. Chesterfield Avenue-Hickory Road: Chesterfield Avenue from Campbell's Bridge to River Road, passing Oldtown Creek and along Hickory Road should be designated as a bike route system. At its intersection with Southlawn Avenue, a bike route is recommended to lead into the Ettrick Community Center/Park. This bike route will follow Woodpecker Road to its intersection with Matoaca Road/ Lakeview Drive.

36. Branders Bridge Road-Colonial Heights City Limits-Lakeview Avenue: This system along Branders Bridge Road should be used as a bike route carrying commuters and recreationalists into Colonial Heights. The Lakeview Avenue extension into Chesterfield County should contain a bike-route classification.

37. Virginia State University (VSU): Throughout the campus, a system for bikeways should be examined and developed with River Road and Chesterfield Avenue as bike lanes around the school. An intra-campus bikeway system could use College Avenue and Hayden Street as double bike-laned streets bisecting the campus and consider bicycle routes along the other streets.

38. VSU Randolph Farm-Ettrick: This is a bike path/trail system along the north bank of the Appomattox River, from VSU's Randolph Farm to Ettrick Cemetery, then follow sidewalk to Chesterfield Avenue. At this point, it can go north connecting to VSU campus bikeways network or go south connecting to the Appomattox River Heritage Trail in Petersburg.

39. Route 600-River Road (Virginia 36): This bike route will carry cyclists from Colonial Heights, westerly along River Road, toward Matoaca and Route 600, connecting with the bike route in Dinwiddie County and the Appomattox Riverside Park and its bike-trail network.

Tri-Cities
Metropolitan Planning Organization
Congestion Management Process

Appendix F

Transit Recommendations

Excerpt from the
The Tri-Cities Area 2010
Transit Development Plan

Chapter 5

Operations Plan

INTRODUCTION

The Tri-Cities Area 2010 Transit Development Plan has included four technical memoranda that provided an overview and analysis of public transit services in the Tri- Cities, discussed goals, objectives, and standards, analyzed the need for transit services, and developed potential organizational and service alternatives for improving public transportation in the region. The process has been guided by the Tri-Cities Area Metropolitan Planning Organization's Technical Committee.

This operations plan is organized in three sections, and each section includes constrained and unconstrained projects. The major sections are: 1) recommendations concerning changes to the existing public transit services; 2) recommendations for new transit services; and 3) organizational recommendations. Chapters 6 and 7 provide the companion capital and financial plans.

RECOMMENDATIONS CONCERNING THE EXISTING PUBLIC TRANSIT SERVICES

Constrained Plan

Given the economic climate during which this plan is being prepared, most of the constrained recommendations concerning the existing public transit network include ways in which service can be provided more effectively. The original TDP goals were more visionary than the current fiscal realities will allow.

The following recommendations for the existing PAT transit service network have been endorsed by the Technical Committee:

• ***Modify the South Crater Road and Walnut Hill Routes*** to provide service to the Southside Regional Medical Center (SRMC), reduce service duplication, and improve on-time performance. Berkeley Manor and Battlefield Park neighborhoods will be cut from the South Crater Road Route and the SRMC will be added to the route. The Deerfield neighborhood will continue to be served by the South Crater Road Route. As such a major destination, the SRMC will also be served by the Walnut Hill Route by eliminating the Deerfield neighborhood, which will remain on the South Crater Road Route. Both routes would continue to serve the Wal-Mart area, as it is a major activity stop. The map for this recommendation is presented as Figure 5-1. This recommendation is cost neutral with regard to operating costs, though there will be some costs associated with changing the printed routes and schedules.

• ***Reduce Saturday Service to Reflect Demand.*** The Saturday ridership on the PAT system, as recorded during the boarding and alighting data collection period, is 61% of the weekday ridership; however almost the entire route network is in operation on Saturdays. This recommendation considers looking closely at the Saturday ridership and reducing service where appropriate to reflect demand. For example, the Washington Avenue and the Lee Avenue Routes had significantly lower ridership on Saturdays. Rather than offering 30-minute headways on these routes on Saturdays, it is suggested that these routes be interlined on Saturdays to offer hourly headways. This action would save 12.5 revenue service hours (one bus) on Saturdays, for a total of 650 annual operating hours.

• ***Cost.*** Reducing Saturday service for Lee Avenue and Washington Avenue would save PAT about $34,450 annually.

• ***Update Route Maps and Improve Website.*** The public information that is currently available for PAT services is out of date, including the route maps and schedules and the web information. This alternative focuses on updating the route maps, schedules, and website information to reflect current services. This should be done after the proposed TDP changes are adopted for implementation.

- ***Cost.*** A preliminary estimate for updating and printing the route and schedule brochures and updating the website is between $10,000 and $15,000.

Unconstrained Plan

The City of Petersburg does not currently have transit expansion funds available. If funds were to become available, for example through the reauthorization of the federal transportation legislation, the following project could be implemented.

- ***Provide Limited Evening Service.*** Transit service currently ends between 5:30 p.m. and 7:30 p.m., depending upon the route and the day of the week. The most frequently requested improvement from the rider survey results was for longer hours of service. The focus of this project is to provide limited evening service, offering transit services on a partial route network, based on where evening services are likely to be needed and most heavily used. The route network could be different for evening service, as it is in several cities, reflecting the lower potential demand and focusing on core ridership areas. For PAT, it would make sense to operate some kind of combined Washington Avenue/Lee Avenue Route, South Crater Road, South Park Mall, and possibly Ettrick. It is estimated that this configuration could be accomplished with three vehicles, plus an ADA complementary paratransit vehicle. This project will likely need to wait until funds become available.

- ***Cost.*** If four vehicles are used (three fixed-route, one ADA) for an additional three hours of evening service, Monday through Saturday, the additional annual revenue service hours would be 3,720 at a cost of about $197,000 annually. Evening transit service has been recognized in the past as a legitimate use of Job Access Reverse Commute (JARC) funds, so this

may be a potential funding source to partially offset this expense. JARC funds provide a 50% match for operating projects, which would bring the local cost to $98,500 annually, if PAT were to be awarded a JARC grant.

RECOMMENDATIONS FOR NEW SERVICES

The transit needs analysis revealed that there are unmet transit needs in several areas of the region. Some of these needs are regional, i.e., connecting one jurisdiction to another, and some are local, i.e., providing public transportation options in jurisdictions that currently have little or no service.

Constrained Plan

- ***Provide Circulator Service in Hopewell.*** The transit needs analysis showed that there is a need for transit services in the City of Hopewell, both for internal City trips, and for regional trips. The concept for the Hopewell Circulator is to develop a convenient route that serves as many major origins and destinations as is feasible for one vehicle and offer a connection to the region at the Crossings Shopping Center (current terminus of PAT's Hopewell/Fort Lee Route). A proposed route is provided as Figure 5-2. This route is 10.4 miles round trip, which is a little short for hourly service, but would allow for some additions to the route or allow for a deviated fixed- route, which would eliminate the need for separate ADA complementary paratransit. It is anticipated that as a new service, there will likely be a few alterations from the original proposed route. The City of Hopewell has sponsored a 2010 Congestion Mitigation and Air Quality (CMAQ) candidate project for this service and the project rated high. FY 2011 funds through the CMAQ program are likely to be available for this project. If CMAQ funds are awarded, the grant would be for a three-year demonstration project. After the demonstration period, the City would consider a service contract with PAT for regular fixed-route service. This concept was originally developed with the thought that PAT would be the operator of the service; however, as the sponsor of the CMAQ grant, the City of Hopewell was considering operating the service itself, as they do already operate a senior transportation program. Subsequent guidance from VDRPT indicated that PAT, as the region's designated recipient for Federal S.5307 funds, would need to take the lead on providing service funded under a CMAQ grant. It may be possible for PAT to subcontract the actual operation back to the City of Hopewell.

  - ***Cost.*** If a 12-hour span of service were provided on this circulator, Monday through Saturday, the annual operating costs would be about$197,000 annually (using PAT's costs). The costs could potentially be lower using the existing senior transportation program. A vehicle would be required for this service ($60,000 for a 20-passenger body-on-chassis vehicle).

Unconstrained Plan

There are three recommended projects that were conceptually endorsed, but are not currently funded. These projects are outlined below.

- **Provide Additional Service in Colonial Heights.** The only transit service currently provided in Colonial Heights is the PAT Southpark Mall Route, which travels from downtown Petersburg via I-95 directly to the Mall area.

  The demographic analysis provided in Chapter 3 showed that there are areas of relatively high need in Colonial Heights, specifically in the Boulevard Corridor. Riders also requested transit service to the Boulevard area. This recommendation proposes a new route, which could potentially supplant the current Southpark Mall Route. The proposed new route would originate in Petersburg at the Petersburg Station, travel on Wythe Street to Adams Street and into Colonial Heights via the Boulevard. The route would continue on the Boulevard to Ellerslie, and then travel east to make a right onto Conduit to the Southpark Mall, and then making the current loop through the mall area and would return via the same path. This route is shown in Figure 5-3 and is 12.7 miles round trip, which would allow one vehicle to complete the route in one hour.

  - ***Cost.*** If this service were be operated 12.5 hours per day, six days a week, using one vehicle, the total annual operating costs would be about

  $208,000 annually (assuming PAT operation). It should be noted that this route could supplant the current Southpark Mall route, which could result in a cost neutral solution, with the expectation that the City of Colonial Heights would enter into a cost-sharing arrangement with the City of Petersburg to contribute towards the annual operating costs for this route. If this new route supplants the current Southpark Mall Route, an expansion vehicle would not be needed. If an expansion vehicle is needed, the capital cost for that vehicle would be about $300,000.

- **Provide a Direct Connection between Fort Lee/Hopewell and Southpark Mall.** As discussed in Chapter 3, Fort Lee is expanding considerably and there will be many more soldiers living at Fort Lee temporarily while they complete different training programs. These soldiers typically do not have vehicles with them and have some time on the weekends to leave Fort Lee for shopping and recreational opportunities. The focus of this project is to provide a direct connection for these soldiers, as well as for family members and

employees of Fort Lee, so that they can access goods and services in a convenient manner. Figure 5-4 provides a map of the route, which is proposed to originate at the Southpark Mall, travel to Fort Lee, then to the Crossings Shopping Center. The route would then do the same in reverse, but would not enter Fort Lee heading westbound (this option can be discussed, but would likely take too much time to enter Fort Lee in both directions and the extra ride time to the Crossings Shopping Center is relatively short). This route could offer a transfer with the current or changed Southpark Mall route at the Southpark Mall. There could also be transfer opportunities with the proposed Hopewell Circulator at the Crossings Shopping Center, allowing residents of Hopewell to access Fort Lee and the Southpark Mall. The round trip mileage for this route is 11.5 miles, which would allow one vehicle to complete the trip in one hour. The hours of service for this route may need to be different from weekday to weekend to reflect likely demand. It is suggested that this route provide service in a complementary manner to the current Petersburg/Fort Lee Route and not supplant it, given that the origination is at the Southpark Mall, rather than Petersburg.

- ***Cost.*** If service on this route were to be operated on a 14-hour span of service Monday through Saturday, with hours that vary according to demand, the annual cost of service would be $230,000. It would be expected that Fort Lee would help fund this route. A vehicle would also be required to be purchased to operate this route. A heavy duty transit bus costs about $300,000 and a body-on-chassis 20-passenger vehicle costs about $60,000. It should be noted that during the alternatives deliberation, representatives from Fort Lee indicated that they would likely be interested in the weekend portion of the route only.

- ***Provide New Demand-Response Service in Prince George County.*** Prince George County currently has the lowest level of transit service among the MPO jurisdictions. The transit needs analysis indicated that some level of transit service was needed in the County, starting with service for people with disabilities, the elderly, and people with low incomes. This proposal involves initiating a demand-response transportation program to begin to meet some of the County's most basic public transportation needs. A "starter" program would likely include two vehicles, operating Monday-Friday, ten hours a day or so. This type of program could be contracted to a private provider or an existing non-profit, in order to take advantage of existing capabilities in the area of scheduling, dispatch, and oversight. It could be modeled after the program that is in operation in Chesterfield County -- Access Chesterfield. If and when this project is pursued, it is recommended that the County apply for a New Freedom grant that could be used to help fund the expenses for the program. Oversight for the program could be provided by an existing County department, or through a regional mobility management program.

    - ***Cost.*** If two vehicles were in operation five days a week, ten hours a day, the total annual operating costs would be about $275,000. Two vehicles would cost about $60,000 each. It should be noted that the costs are based on PAT's operating costs, and may be lower with a local human non- profit or private operator.

Table 5-1 provides a summary of the projects included in the six-year TDP.

Table 5-1: TDP Projects Recommended for Implementation

Project	Purpose	Annual Operating Cost	Capital or Planning	Capital Cost
Constrained Projects for PAT:				
Adjust South Crater Road and Walnut Hill Routes	To provide service to the Southside Regional Medical Center and reduce duplication of service in residential neighborhoods.	Cost Neutral	None	$ -
Reduce Saturday Service to Reflect Demand	To improve productivity and provide a level of service that more	($34,450)	None	$ -
Update Route Maps and Improve Website	To provide accurate and timely information to the public.	$15,000	None	$ -
Unconstrained Projects for PAT:				
Consider Later Hours of Service on a Partial Route Network	To offer limited evening service to allow PAT riders to use transit to get home from retail jobs, evening classes, and errands.	$197,000	None	$ -
Constrained Projects, Regional:				
Provide Circulator Service in Hopewell	To provide transit service for Hopewell residents so that they can access employment, shopping, medical, and other necessary destinations. The City of Hopewell has applied for CMAQ funding for	$197,000	1 vehicle	$60,000

Table 5-1: TDP Projects Recommended for Implementation

Project	Purpose	Annual Operating Cost	Capital or Planning	Capital Cost
Unconstrained Projects, Regional:				
Provide Additional Service in Colonial Heights	Provide transit service geared to the needs of the residents of Colonial Heights, addressing transit need found through the demographic analysis and the surveys	$208,000 or cost neutral if supplants the current	1 vehicle or no vehicles, if supplants existing	$300,000 or none, if supplants existing
Provide a Direct Connection between Fort Lee/Hopewell and Southpark Mall	Provide access to shopping and recreational opportunities for Fort Lee residents and their family members and provide access to job opportunities at Fort Lee and the Southpark Mall for Hopewell residents	$230,000	1 vehicle	Heavy duty: $300,000 Body- on-Chassis: $60,000
Provide New Demand-Response Service in Prince George County	To provide basic mobility for people in Prince George County who currently have no transit service	$275,000	2 vehicles	$120,000

ORGANIZATIONAL RECOMMENDATIONS

While the transit needs analysis indicated that regional services are desired, and several previous TDPs in the region have recommended a regional structure for overseeing public transportation in the Tri-Cities, no interest has been expressed by any of the local governments or Fort Lee to change the current organizational structure for the delivery of public transportation in the Tri-Cities.

PAT Management Structure

Although not specifically discussed during the alternatives analysis, there was an alternative that suggested that the City fill the vacant position of Assistant Director of Public Works. This position is still listed on the City's "Listing of Authorized Personnel." It is recommended that this position be filled, particularly if funds become available for service expansions.

Cost Sharing

One of the more visionary goals for the TDP was to develop a regional structure for providing public transportation in the Tri-Cities. If a regional structure had been agreed upon, then a cost-sharing strategy would have been a component of that model. Since a regional structure was not recommended by the TAC, the issue of cost-sharing among jurisdictions for the existing route structure is still unresolved. This section of the plan offers a potential cost-sharing plan which can be used if there is agreement among the jurisdictions to support regional routes.

A potentially equitable manner to share the costs among jurisdictions would be to develop a model that includes both services offered by the City (i.e., total annual vehicle mileage per jurisdiction); and services consumed by area residents (i.e., residency/ridership by jurisdiction). This model would account for the nature of the regional services that are primarily designed for the benefit of City residents, while considering that there is also a benefit to the neighboring jurisdictions. Upon further review, it was decided that vehicle mileage per jurisdiction would be a simpler model to implement. At this time there have been no agreements regarding cost sharing.

As regional services are developed in the future, some sort of cost allocation agreement will likely need to be implemented.

Chapter 6
Capital Improvement Plan

INTRODUCTION

This chapter of the TDP describes the major capital projects (vehicles, facilities, and equipment) needed to support the provision of public transportation in the Tri- Cities for the six-year period covered by this TDP.

VEHICLE REPLACEMENT AND EXPANSION PROGRAM

As described in Chapter 1, PAT owns 27 vehicles; 16 of which are heavy duty transit buses (Gilligs); six of which are paratransit vehicles; and five of which are service or supervisory vehicles. The revenue service vehicles range in model years from 1997 to 2007.

PAT was able to secure American Reinvestment and Recovery Act (ARRA) funding to replace two of the paratransit vehicles. These vehicles should arrive in FY 2011. Replacing the four other 2000 model paratransit vehicles is a priority for the vehicle replacement program, as the recommended useful life for paratransit vans is four to five years. These vehicles are recommended for replacement as soon as is possible. It should be noted that the State's current five-year capital budget calls for one paratransit replacement van in FY 2012 and one in FY 2016, and this TDP calls for four to be replaced in FY 2012.

The supervisory vehicles and the service truck have also exceeded the recommended useful life and are recommended for replacement as soon as is feasible (FY2012, if possible).

PAT's six 1997 Gilligs have also reached their useful life, though the current route network is such that only three of them need to be replaced, while the remaining three can be retired when they are no longer useful to PAT. The 2007 Gilligs will need to be replaced in 2019, which is beyond the range of this TDP. PAT also has a 2001 Gillig, which will need to be replaced in 2013. The VDRPT Five Year Capital Budget calls for four buses to be replaced in FY 2013, consistent with replacing three of the 1997 Gilligs and the 2001 Gillig.

While it is unclear when funds will be available for expansion of service, the VDRPT Five Year Capital Budget calls for an expansion bus in 2012 and four in 2014. Table 6-1 provides the six-year vehicle replacement and expansion schedule, based on this TDP and the State's Five Year Capital Budget.

OTHER CAPITAL EQUIPMENT

Stimulus Projects

In addition to the two paratransit vans (included for FY 2011 on the vehicle replacement plan), PAT was also awarded the following capital equipment through the ARRA:

- Construction of the multi-modal center -- project change orders resulted in the need for an additional $500,000
- Furnishings for the multi-modal center ($69,000)
- ADP Software ($10,000)
- ADP Hardware -- three computers, copiers, scanners, and printers for the multi-modal center ($10,750)
- Shop equipment -- the replacement of existing floor jack lifts ($120,000)
- Purchase and installation of a generator to support the multi-modal center ($150,000)
- Vehicle locator system ($63,927)
- New communications system ($145,000)
- Signage -- bus stop signs and poles ($5,000)
- Rehabilitation/renovation of some bus stop locations to enhance ADA accessibility, including concrete repairs and curb cuts ($200,000)

Bike Racks for Vehicles

Currently only one of PAT's vehicles is equipped with a bike rack. Equipping the entire fleet would allow transit riders additional flexibility and would serve to expand the reach of transit in the community. Retrofitting the Gilligs is estimated to cost about $1,200 per vehicle, while buying them at the time of bus purchase is about $700 per vehicle. If bike racks were to be purchased for the eight 2007 Gilligs that are not already equipped, the cost is estimated to be $ 9,600. This project is not currently included in VDRPT's Five Year Capital Budget.

FACILITIES

PAT's operating, maintenance, and vehicle storage facility is currently located at 309 Fairgrounds Road, adjacent to the West End Park Fairgrounds. There is space at this facility for expansion and PAT has a need for two additional maintenance bays and a wash bay. The office portion of the facility also needs to be updated, as the administrative staff recently moved from this facility to the new Petersburg Station facility in downtown.

VDPRT's Five Year Capital Budget included $5 million in FY 2012 for maintenance facility renovation.

Table 6-1
Petersburg Area Transit Vehicle Replacement Program

Vehicle Type	Useful Life	Current Fleet	Vehicle Procurements					
			FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
Paratransit Vans	5	6	2	4				2
Heavy Duty Transit Buses	12	16			4			
Support Vehicles	5	5	2	3				
Total Vehicles		27	4	7	4	0	0	2

Unconstrained Vehicle Expansion Plan

Vehicle Type	Useful Life	Vehicle Procurements					
		FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
Paratransit Vans	5						
Heavy Duty Transit Buses	12		2	2			
Body on Chassis	5	1		3			
Support Vehicles	5						
Total Vehicles		1	2	5	0	0	0

Note: The unconstrained plan includes vehicles for the Colonial Heights, Fort Lee, and Prince George service