2019 CONGESTION MANAGEMENT PROCESS

CMP CONGESTION MANAGEMENT PROCESS

DELAWARE VALLEY dvrpc REGIONAL PLANNING COMMISSION

The Delaware Valley Regional Planning Commission is the federally designated Metropolitan Planning Organization for a diverse nine-county region in two states: Bucks, Chester, Delaware, Montgomery, and Philadelphia in Pennsylvania; and Burlington, Camden, Gloucester, and Mercer in New Jersey.

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DVRPC's vision for the Greater Philadelphia Region is a prosperous, innovative, equitable, resilient, and sustainable region that increases mobility choices by investing in a safe and modern transportation system; that protects and preserves our natural resources while creating healthy communities; and that fosters greater opportunities for all.

DVRPC's mission is to achieve this vision by convening the widest array of partners to inform and facilitate data-driven decision-making. We are engaged across the region, and strive to be leaders and innovators, exploring new ideas and creating best practices.

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Executive Summary

The Congestion Management Process (CMP) is an ongoing and systematic process that uses performance-based and other measures to identify and prioritize congested locations on the regional transportation network, analyzes potential causes, develops multimodal transportation strategies to mitigate congestion, and evaluates the effectiveness of implemented strategies to improve mobility, and enhance safety across the region. Congestion can be an indicator of prosperity, but if left unmanaged, it can limit access to jobs, housing, educational opportunities, health services, and other amenities.

The CMP is a requirement of the federal Surface Transportation Act legislation (23 CFR Parts 450.322 and 500.109) for urbanized areas (UZAs) with populations greater than 200,000, known as Transportation Management Areas (TMAs). These federal regulations specify that the CMP be implemented as a continuous part of the metropolitan planning process, like that of the Delaware Valley Regional Planning Commission (DVRPC) Long-Range Plan, Transportation Improvement Program (TIP), and the Unified Planning Work Program (UPWP). Regulations require that alternatives to building new Single-Occupant Vehicle (SOV) road capacity to be explored first, and where additional capacity is found to be necessary, multimodal supplemental strategies must be developed to obtain the most long-term value from the investment.

As part of the Moving Ahead for Progress in the 21st Century Act (MAP-21) and continuing with the Fixing America's Surface Transportation Act (FAST Act), new national performance management measures have been adopted by the Federal Highway Administration (FHWA) effective May 20, 2017. The intent is to better align proposed project improvements through performance-based planning and programming. The CMP integrates the national performance management reliability and traffic congestion measures, known as PM3 measures, to assist in identifying and prioritizing congested locations and for developing strategies to improve mobility.

See the CMP website at **www.dvrpc.org/webmaps/CMP2019** for the mapping of CMP objective measures and multimodal strategies to mitigate congestion by congested corridor and subcorridor area.

1. Introduction

A CMP is an ongoing and systematic program to manage traffic congestion and improve the flow of people and goods. The CMP advances the goals outlined in the DVRPC Long-Range Plan, including reducing congestion, and improving mobility, reliability, multimodal accessibility, safety, and economic vitality across the region. The CMP is also a requirement of the federal surface transportation legislation and needs to be updated on a continuing basis. The CMP uses performance measures to identify and prioritize congested locations, analyzes potential causes, establishes multimodal transportation strategies to mitigate congestion, and evaluates the effectiveness of implemented strategies.

The CMP is developed with significant input and guidance from the CMP Advisory Committee to meet needs across the region. It provides medium-term planning to strengthen the connection between the Long-Range Plan and the TIP. The CMP supports the TIP and Long-Range Plan to inform the process of identifying the most congested locations, and advancing the most appropriate strategies to mitigate congestion; it provides screening criteria for the Long-Range Plan and competitive grant programs, such as the Congestion Mitigation and Air Quality (CMAQ) Program; and it provides useful analysis and assistance for working with transportation planning partners on project planning throughout the region.

In 2019, the Texas A&M Transportation Institute released its annual “Urban Mobility Report” using INRIX 2017 data. INRIX is an international big data firm that provides location-based data and analytics, and specializes in transportation needs. The Texas A&M Transportation Institute ranked the Philadelphia PA-NJ-DE-MD UZA tenth in travel delay and eighth in excess fuel consumed compared to other large UZAs in the nation as a result of traffic congestion. To provide some perspective, Dallas-Fort Worth-Arlington TX ranked ninth in travel delay, just one rank above Philadelphia; and Boston MA-NH-RI ranked eleventh, one rank below. The Los Angeles-Long Beach-Anaheim CA UZA ranked first in travel delay, and New York-Newark NY-NJ-CT ranked first in excess fuel consumed as a result of congestion. The effect of traffic congestion includes lost time, extra fuel costs, and deterioration of air quality. Left unmanaged, congestion leads to a negative overall impact on the health, competitiveness, and sustainability of a region. However, it is unrealistic to conclude that all congestion can be completely eliminated; some degree of congestion may be acceptable, or even desirable, as a sign of a healthy and growing economy. Consequently, a set of strategies are necessary to reduce and manage congestion, knowing that it cannot be completely eliminated.

1.1 Federal Requirements

Federal regulations provide guidance on how Metropolitan Planning Organizations (MPOs), like DVRPC, should address congestion management. The original regulations date back to the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users. These regulations were retained and largely unchanged by subsequent federal legislation, including MAP-21, and the current FAST Act (Pub. L. No. 114-94), which was signed into law in December 2015. The CMP is a requirement under the regulations (23 CFR Parts 450.322 and 500.109) for UZAs with populations greater than 200,000, known as TMAs. These regulations specify that the CMP program be implemented as a continuous part of the metropolitan planning process like the other core federal requirements: Long-Range Plan, TIP, and UPWP. According to the regulations, MPOs that serve a TMA must maintain a CMP that provides for:

> safe and effective integrated management and operation of the multimodal transportation system, based on cooperatively developed and implemented metropolitan-wide strategy, of new and existing transportation facilities…through the use of travel demand reduction and operational management strategies.

Congestion mitigation involves travel demand reduction, such as decreasing SOVs, increasing transit ridership, and improving system management and operation. Regulations require that alternatives to building new SOV road capacity should be explored first. Where additional capacity is found to be necessary, multimodal supplemental strategies must be included to obtain the most long-term value from the investment.

Starting with MAP-21 and continuing with the FAST Act, the legislation created a performance-based surface transportation program with specific requirements for state Departments of Transportation (DOTs), MPOs, and transit agencies. As part of the FAST Act, there are new federal requirements (23 CFR Part 490 National Performance Management Measures) regarding measuring system performance on the National Highway System (NHS), known as PM3 measures. These measures are established statewide and by UZA, and are integrated into the CMP as applicable.

The statewide PM3 measures used in the CMP are recognized as Level of Travel Time Reliability (LOTTR) and Truck Travel Time Reliability (TTTR). LOTTR assesses the performance of the NHS, while TTTR addresses the freight movement on the interstate system, which is part of the NHS. The LOTTR and TTTR measures are established by the state DOTs in coordination with MPOs, such as DVRPC, and other planning partners.

The UZA PM3 measures are recognized as Peak Hour Excessive Delay (PHED) and Percent Non-Single-Occupant Vehicle (Non-SOV) travel, and each assesses traffic congestion as part of the CMAQ Program. Both PHED and percent Non-SOV travel are required to be established in UZAs of over one million in population that are, in all or part, of a designated nonattainment or maintenance area for air quality conformity purposes under the Clean Air Act. DVRPC, as the largest MPO in the Philadelphia PA-NJ-DE-MD UZA, is responsible for establishing baseline and two- and four-year targets for PHED and percent Non-SOV travel measures in coordination with state DOT and MPO planning partners that share a portion of the UZA. The partners include: Pennsylvania Department of Transportation (PennDOT), New Jersey Department of Transportation (NJDOT), Delaware Department of Transportation, Maryland Department of Transportation, North Jersey Transportation Planning Authority, South Jersey Transportation Planning Organization, and Wilmington Area Planning Council. Beginning in the second performance period (2022–25), UZA populations greater than 200,000 will also be required to have established baseline and target values for PHED and percent Non-SOV travel. The Trenton-Mercer UZA in Mercer County, New Jersey, which is in the DVRPC region, will meet that population criteria, and DVRPC will coordinate efforts to establish traffic congestion baseline measures, and two- and four-year targets.

1.2 DVRPC's Perspective on the CMP

Philosophy

Although a CMP is required to be established in TMAs and meet certain compliance requirements, federal regulations are not prescriptive on the methods and approaches to implement. DVRPC's perspective of the CMP is that it is a medium-term planning effort that advances the goals of DVRPC's Long-Range Plan and strengthens the connection between the Long-Range Plan and the TIP. The CMP is a systematic process that provides for traffic analysis of the regional transportation network, identifies and prioritizes congested locations, identifies multimodal strategies to mitigate congestion and improve mobility, and evaluates the effectiveness of implemented strategies. Where more SOV road capacity is necessary, the CMP includes potential supplemental strategies to reduce travel demand, improve operations, and get the most long-term value from the investment.

Principles

The CMP is used to identify congested corridor areas and categorize them into subcorridor areas, and then at a regional planning level set very appropriate and secondary strategies to mitigate congestion and improve mobility. This effort uses regional transportation system performance measures, recommendations from corridor studies, and guidance from the CMP Advisory Committee. The CMP is also used to identify emerging regionally significant growth areas that are not currently congested but may likely become so in the future. Proactive and low-cost region wide strategies are recommended for these areas to help prevent them from becoming congested. Finally, the CMP defines procedures to follow for federally funded major capacity-adding road projects if they are not in CMP corridor areas, or in corridors where major SOV capacity is not listed as a CMP strategy. Such projects may be appropriate, but they need to start with a higher burden of proof, given the limits of funding.

The CMP provides information on the transportation system performance and identifies strategies to minimize congestion and improve the mobility of people and goods. The general strategies include: (1) improvements to Transportation System Management and Operations (TSMO), including the implementation of Intelligent Transportation Systems (ITS); (2) Transportation Demand Management (TDM), including growth management and smart transportation policies that promote alternative modes of transportation besides the automobile, such as walking and bicycling; (3) transit improvements and new investments in transit; (4) goods movement improvements; and (5) road improvements and new roads.

Adding new road capacity to mitigate congestion must be a last resort. The order for prioritizing strategies and programs is: (1) to maintain, optimize, and modernize the existing transportation system, and rights-of-way, including optimizing the services delivered by the system to provide for options and convenience for transferring between modes; (2) manage demand for transportation by fostering efficient land use patterns, encouraging Non-SOV options, and other strategies that reduce the need for and length of trips; (3) and increase capacity of the existing multimodal transportation system as appropriate.

New major SOV capacity-adding projects may be appropriate where no other strategies reasonably reduce congestion, but these projects must be developed in an appropriate way. They must include multimodal supplemental strategy improvements to get the most long-term value from the investment. This begins with the strategies that are listed in the CMP for the project area, which are then refined through meetings with stakeholders in the project's preliminary design stage. The supplemental strategy improvements should be funded at the same time as the main project, and the implementation be monitored by DVRPC staff and reported to state and federal agencies.

Federal regulations require projects that add SOV capacity to be consistent with the CMP in order to be eligible for federal funding. If they are not consistent, further analysis is required and will be reviewed by DRVPC staff for further eligibility. Final engineering for major SOV capacity-adding projects should not be funded in the TIP without a table of supplemental strategies that has been approved by the DVRPC Board. The DVRPC Long-Range Plan is used to help determine which congested facilities will receive major additional SOV capacity, and this must balance CMP findings with transportation priorities, land use and smart growth policies, and financial constraints. If adding SOV capacity is not listed as a strategy for a subcorridor area, the proposed project must meet a higher burden of proof to add capacity, and the project must include analysis of multimodal strategies, including ones listed in the CMP. Capacity-adding projects outside CMP corridors must demonstrate consistency with the Long-Range Plan, follow CMP procedures, and compare well in terms of TIP and Long-Range Plan evaluation criteria with projects in the region.

Both statewide and UZA PM3 measures will be used to help identify and prioritize congested locations, and to develop strategies to mitigate congestion. Specifically, this includes the LOTTR and TTTR roadway reliability measures, and the PHED traffic congestion measure. CMP congestion analysis will be used in future PM3 measure reporting periods to inform the process of setting two- and four-year targets for both PHED and percent Non-SOV measures.

1.3 Integrating the CMP into the Transportation Process Planning

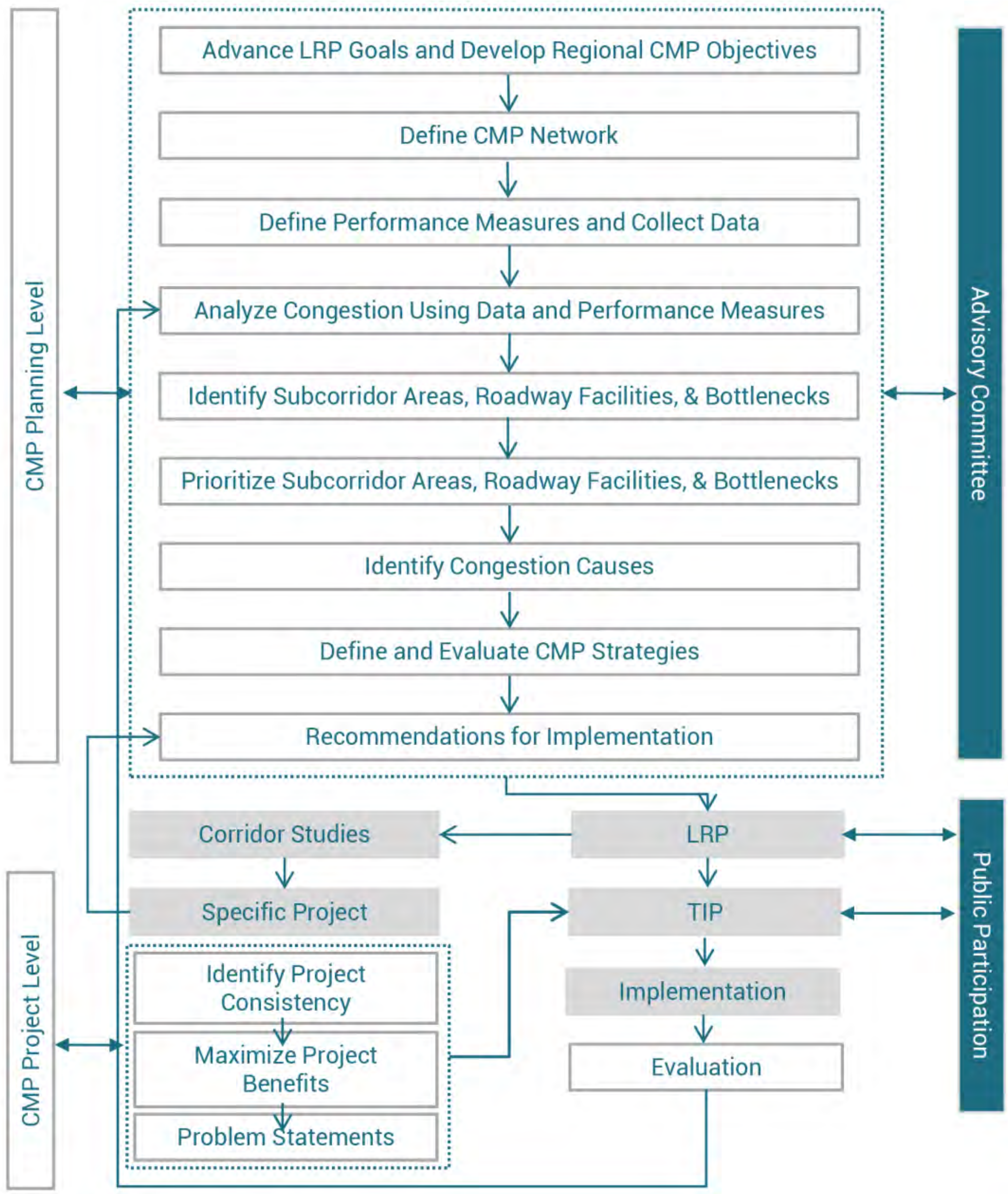
Federal regulations require that CMPs be implemented as an ongoing part of the metropolitan planning process. Data is collected and analyzed against performance measures, congested locations are prioritized, potential causes of congestion are reviewed, strategies are recommended to mitigate congestion, recommendations are made for implementation, and improvements are evaluated for effectiveness. Figure 1 identifies CMP process flows (outlined in gray) and how the CMP is integrated into the transportation planning process.

CMP objectives flow from the transportation goals of the Long-Range Plan, and congested locations that meet more CMP objective criteria will be given stronger support for recommended improvements. The primary goals of the CMP are drawn from the Long-Range Plan, specifically to “increase mobility and reliability, and reduce congestion” on the transportation network. The CMP should help provide strategies to minimize growth in recurring and nonrecurring congestion and improve the reliability of the transportation system. The Long-Range Plan contains additional principles and goals that serve as guidance for the CMP. They include: (1) integrate existing and new modes into an accessible multimodal network; (2) rebuild and maintain the region’s transportation network; (3) move toward zero transportation deaths; (4) facilitate goods movement; (5) create a more secure transportation system; (6) sustain the environment; (7) improve transportation system management and operations; (7) develop livable communities; and (8) advance equity and foster diversity.

Congestion and other CMP objective measures are used to identify priority congested locations, and then a list of strategies are recommended to mitigate congestion based on identifying any known causes, and from guidance from the CMP Advisory Committee. These congested locations are mapped by focus roadway facility, intersection bottleneck, and congested corridor and subcorridor area. (See Chapter 4 for more information on the congested locations and the performance measures used.) Projects that exist at these locations may be given higher-priority, but they need to be weighed against Long-Range Plan regional priorities. This system of analysis using performance measures based on CMP objective criteria allows projects to be prioritized based on quantitative measures, with the expectation that higher priority projects will generate the most benefit to the regional transportation network. The CMP is also intended to be used at the project level to help get the most long-term value from an investment. The CMP analysis results are utilized by DVRPC staff and other stakeholders as part of the problem statement process and PennDOT Connects development process with NJDOT and PennDOT, respectively.

The CMP furthers the growth management goals identified in the Long-Range Plan by recommending congestion management strategies at locations that align with current and future land uses in coordination with the CMP Advisory Committee. For example, where congested locations exist in moderate- to high-density mixed use areas without space available for roadway widening, it may be recommended that bus transit improvement studies be conducted. In congested locations with many access points and smaller lots with mixed uses, access management strategies and increased bicycle and pedestrian infrastructure investments may be proposed as future transportation alternatives to supplement the existing roadway network.

Figure 1: Integrating the CMP into the Transportation Planning Process

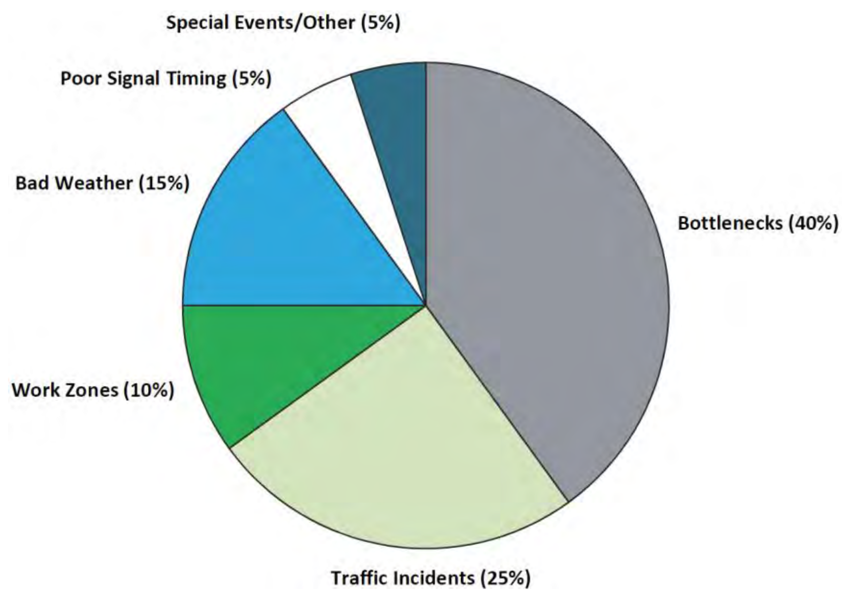


Source: DVRPC

1.4 What is Congestion?

Congestion defined at its most basic level is demand for road space exceeding supply. The U.S. Department of Transportation defines congestion as "the level at which the transportation system performance is no longer acceptable due to traffic interference." The performance may vary by the type of transportation facility, location, or time of day. There are two primary types of congestion: recurring and nonrecurring. Recurring congestion tends to be concentrated in shorter time periods, such as rush hour, and is typically associated with excessive traffic volumes resulting in reduced speed, and flow rate on the roadway system. Nonrecurring congestion, on the other hand, is caused by irregularly occurring events that affect the travel time reliability. The CMP addresses both types of congestion. The causes of recurring congestion can include: daily peak period commuter traffic; insufficient capacity; excess volume; bottlenecks, such as roadway geometry deficiencies; traffic signal timing and coordination issues; heavy truck volumes; seasonal activities; and long-term construction. The causes of nonrecurring congestion can include crash incidents, disabled vehicles, special events, bad weather, and short-term construction. A national estimate of congestion by source provides a guide for emphasizing various congestion mitigation strategies (see Figure 2).

Figure 2: Sources of Congestion National Summary



Source: FHWA

Certainly, the congestion sources' percentages will vary by urban and rural location, and by the type of facility. For example, arterial roadways with traffic signals may have some congestion related to poor signal timing, but this would not apply on limited-access freeways. Travel time reliability, or the variability of congestion, is an important measure to evaluate as a part of nonrecurring congestion. Traffic incidents, such as disabled vehicles or crashes, can unexpectedly make the typical 20-minute trip a 40-minute one. Also, the interaction between multiple types and sources of congestion may vary from day to day, causing frustration for commuters. Some events can cause other events to occur. For example, high congestion levels can lead to increases in traffic crashes due to closer vehicle spacing, or bad weather can lead to crashes. TSMO and ITS improvements for addressing reliability issues can typically be performed at lower costs with less impact on the environment, compared to capacity-adding improvements. DVRPC's *Connection 2040 Technical Analysis* report (DVRPC Publication #13043) included a study of ITS and roadway system expansion costs based on Travel Demand Model results, and determined that system expansion traffic delay reduction capital costs were 36 percent higher than for ITS improvements. The CMP identifies recurring and nonrecurring congested locations. Recurring congestion is identified using the Travel Time Index (TTI) measure and indicates highly congested locations that occur on a recurring basis. Nonrecurring congestion is identified using the Planning Time Index (PTI) measure that indicates locations that have highly unreliable travel times.

1.5 CMP Study Area and Transportation Networks

DVRPC is the federally designated MPO for 352 municipalities in the nine-county Greater Philadelphia region. DVRPC serves Bucks, Chester, Delaware, Montgomery, and Philadelphia counties in Pennsylvania; and Burlington, Camden, Gloucester, and Mercer counties in New Jersey. The area is home to 5,717,933 people and employs approximately 3,108,237 people (by place of residence) according to 2015 population and employment estimates, respectively, as identified in the Long-Range Plan *(Connections 2045)*. The region has one of the most comprehensive transportation networks in the nation. Major roadways that pass through the area include interstates I-95, I-76, I-676, I-476, I-276, I-295, I-195, and the Pennsylvania and New Jersey Turnpikes. Major U.S. routes include US 1, US 13, US 30, US 130, US 202, US 206, US 422, and US 322 (see Figure 3). Extensive bus and fixed-rail transit networks exist in the region as well, including light, commuter, and heavy passenger rail. Light rail includes, for example, the River LINE in New Jersey, or the Girard Avenue trolley line in Philadelphia; commuter rail includes regional lines, such as Lansdale/Doylestown and Paoli/Thorndale in Pennsylvania, and the New Jersey Transit Northeast Corridor service in New Jersey. Heavy rail lines (or subways) in Philadelphia include the Broad Street and Market-Frankford lines. Intercity rail service includes the Amtrak Northeast Corridor serving Philadelphia's 30th Street Station and points south, such as Washington, DC, and points north to Boston; and the Keystone Corridor that serves 30th Street Station and points west to Harrisburg and beyond. Major freight lines that provide for goods movement in the region include CSX and Norfolk Southern. Some locations in the region are experiencing significant growth, while others remain unchanged; some are high-density urban areas, and others are more rural. Given this variation, it is important that the CMP congestion mitigation strategies reflect the challenges and opportunities that are unique to each location.

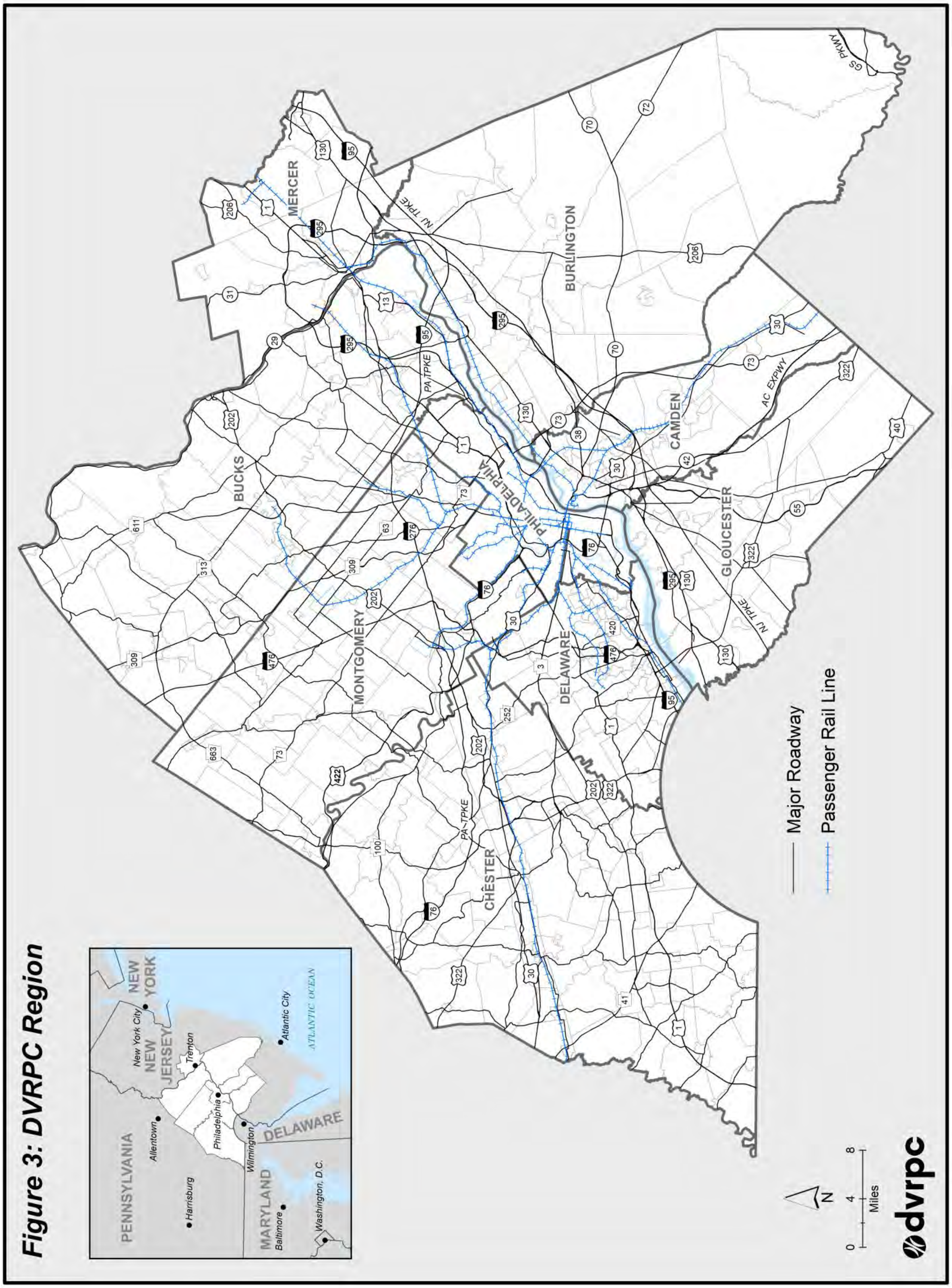


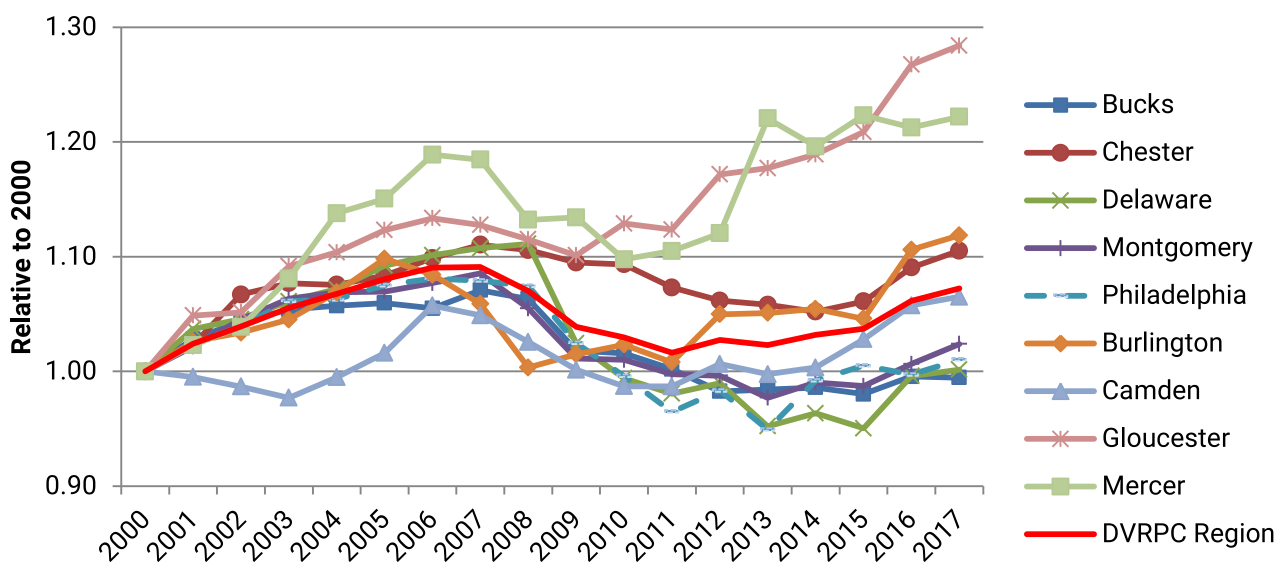
Figure 3: DVRPC Region

1.6 Regional Trends

Vehicle miles of travel (VMT) is the FHWA's primary measure of travel activity on the nation's roadways. More travel tends to increase the amount of congestion on the roadways, which makes this an important measure to track. It is measured as daily VMT for all vehicles. From 2000 to 2017, VMT increased by 7 percent for the DVRPC region (see Figure 4), but there were variations during this period. From 2000 to 2007, VMT steadily increased by about 9 percent, however, over the subsequent years (2007 to 2011) VMT dropped by 7 percent. This coincided with rising gasoline prices and a weakened economy; and the trend was similar statewide and nationally. However, between 2011 and 2017, travel trends increased again at about 5 percent. Gloucester County experienced greater gains during this time period than any other county in the region at 16 percent, while Bucks County experienced the least with a decrease of 1 percent. Over the same time period (2000 to 2017), population increased by about 7 percent, equal to that of the VMT.

Population and employment are projected to modestly increase according to DVRPC forecasts. Population is projected to increase by 658,135, (11.5 percent) from 2015 to 2045, and employment by 372,813 (11.8 percent) over the same time period. Given these trends, increased levels of traffic congestion will likely occur, unless mitigation strategies, programs, and policies are developed.

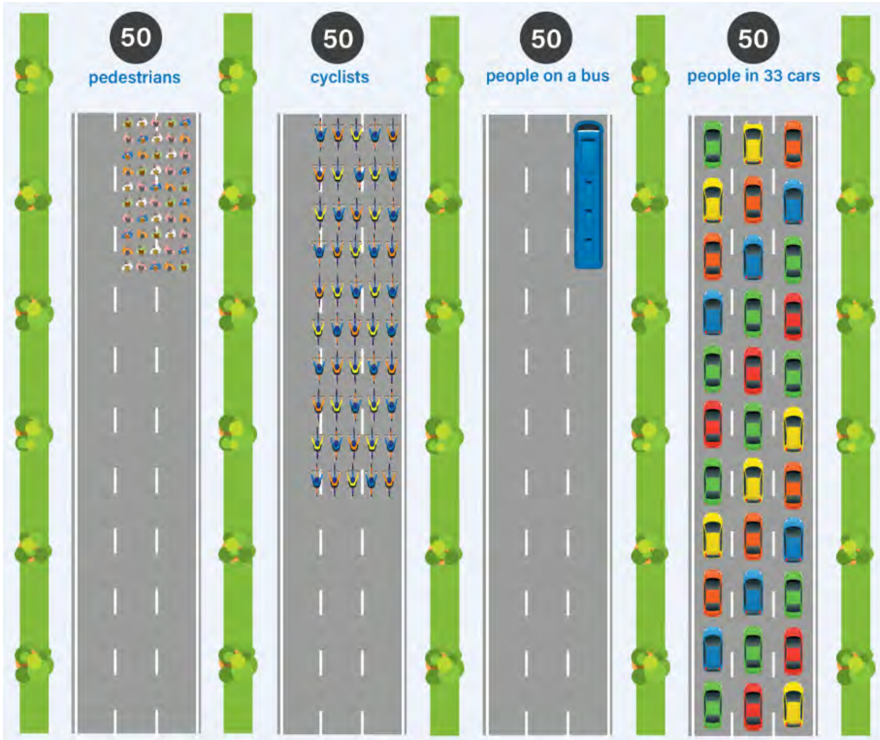
Figure 4: Regional VMT



Sources: PennDOT, NJDOT

Transit ridership and other Non-SOV modes are important factors to consider in reducing traffic congestion. For example, you can significantly fit more people inside a bus, than in a vehicle within the same space. Figure 5 illustrates this by showing how much space 50 people fill for different modes: pedestrians, cyclists, people on a bus, and in cars. Car occupancy is based on the DVRPC 2012–13 household travel surveys which indicate an average occupancy of 1.67 persons per vehicle.

Figure 5: Mode Share Capacity



Source: DVRPC

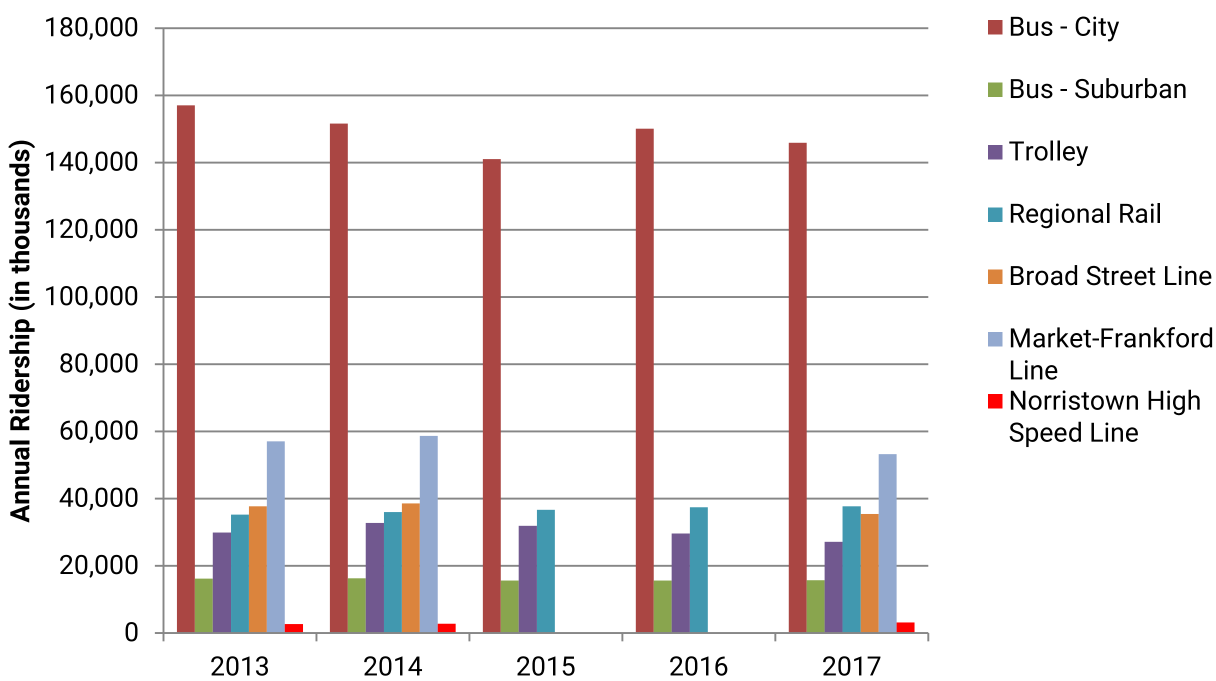
The Southeastern Pennsylvania Transportation Authority (SEPTA) annual bus ridership has been trending down in the last five years (2013–17). City bus ridership has decreased from approximately 157.02 million in 2013 to 145.85 in 2017, a 7.1 percent decrease, while suburban ridership decreased at a lesser rate, from approximately 16.16 million in 2013 to 15.72 in 2017, a 2.7 percent decrease (see Figure 6). Trolley service has decreased 9.4 percent over the same time period, from about 29.91 million to 27.11 million. Regional rail, on the other hand, has experienced increases in ridership over the same time period; 7.0 percent from 35.25 million to 37.70 million. The heavy rail lines, including the Broad Street and Market-Frankford lines decreased by 6.0 percent and 6.6 percent, respectively, while the Norristown High Speed Line increased from 2.70 million to 3.11 million (6.7 percent).

NJ Transit annual bus ridership in the New Jersey portion of the DVRPC region, like SEPTA, has declined over the analysis period. It decreased 17 percent from approximately 16.46 million to 13.67 million (see Figure 7). The River LINE and Atlantic City line decreased by 5.1 percent and 23.4 percent, respectively. However, the Northeast Corridor line, which is operated by NJ Transit along Amtrak's line from the Trenton Transit Center to New York Penn Station, increased in ridership from 32.74 million to 34.84 million (6.4 percent).

The Port Authority Transit Corporation (PATCO) transit ridership increased during the analysis period by 2.8 percent, from 10.54 million to 10.84 (see Figure 8). Decreased ridership in 2014 was due in part to track outages resulting from the Ben Franklin Bridge/PATCO track rehabilitation project.

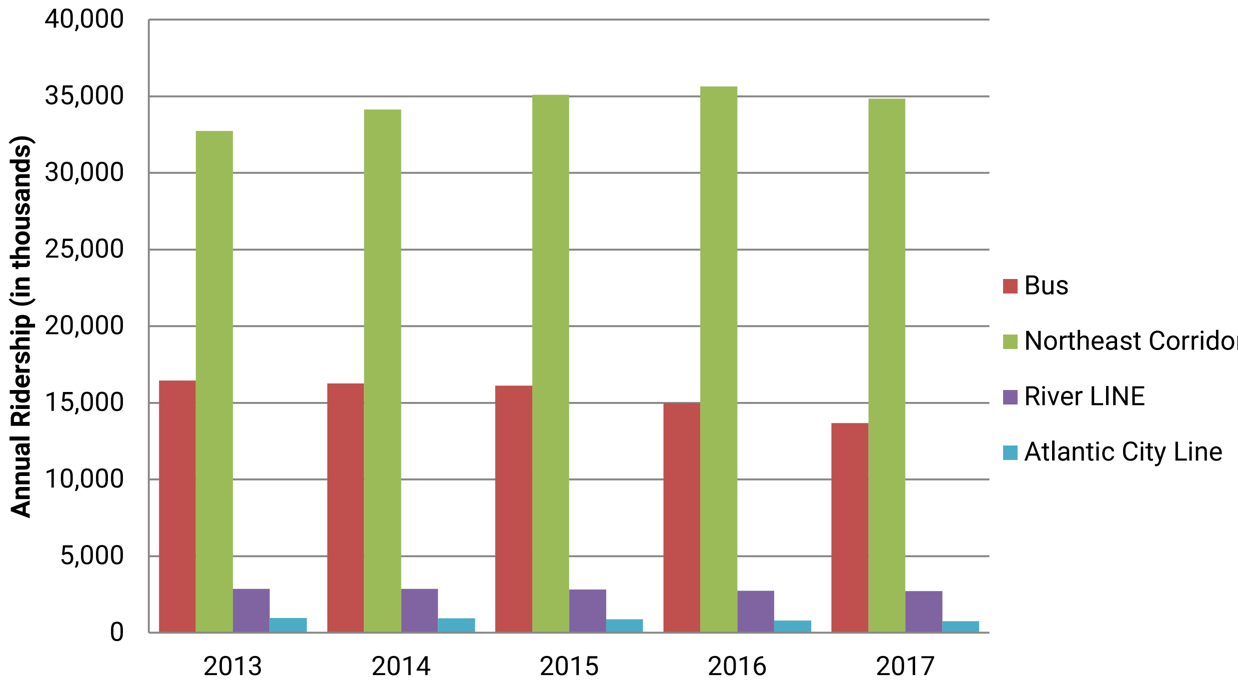
The overall decrease in bus and trolley ridership could be attributed to various factors, including increases in car ownership; cheaper gas prices; introduction of shared-ride services, such as Uber and Lyft; and traffic delays that may entice riders with the means to find alternative transportation. Consequently, increased traffic congestion on the roadways may be a result, and strategies to mitigate congestion need to be identified.

Figure 6: SEPTA Ridership



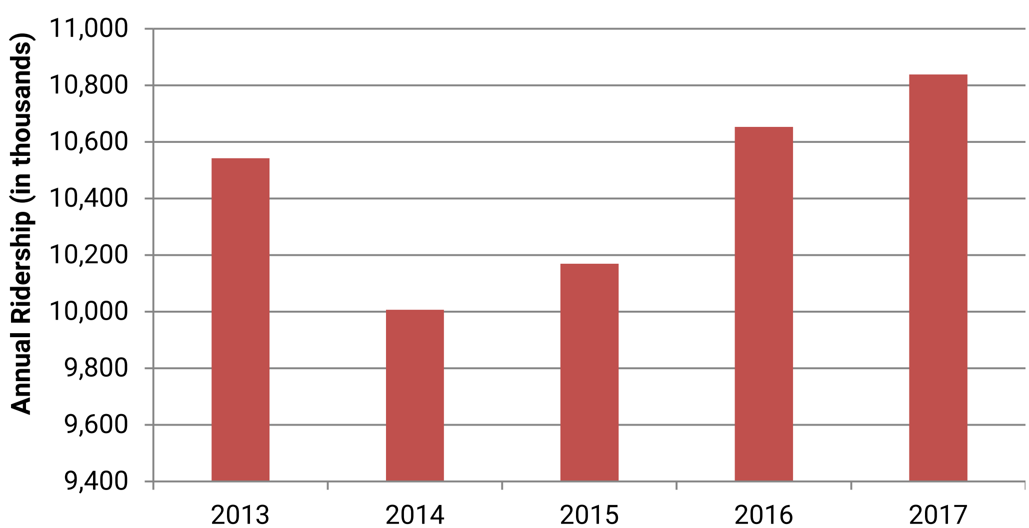
Data Source: SEPTA Annual Service Plan
Note: 2015 and 2016 Data Not Available for the Broad Street, Market-Frankford, and Norristown High Speed Lines

Figure 7: NJ Transit Ridership



Data Source: NJ Transit Annual Ridership Data

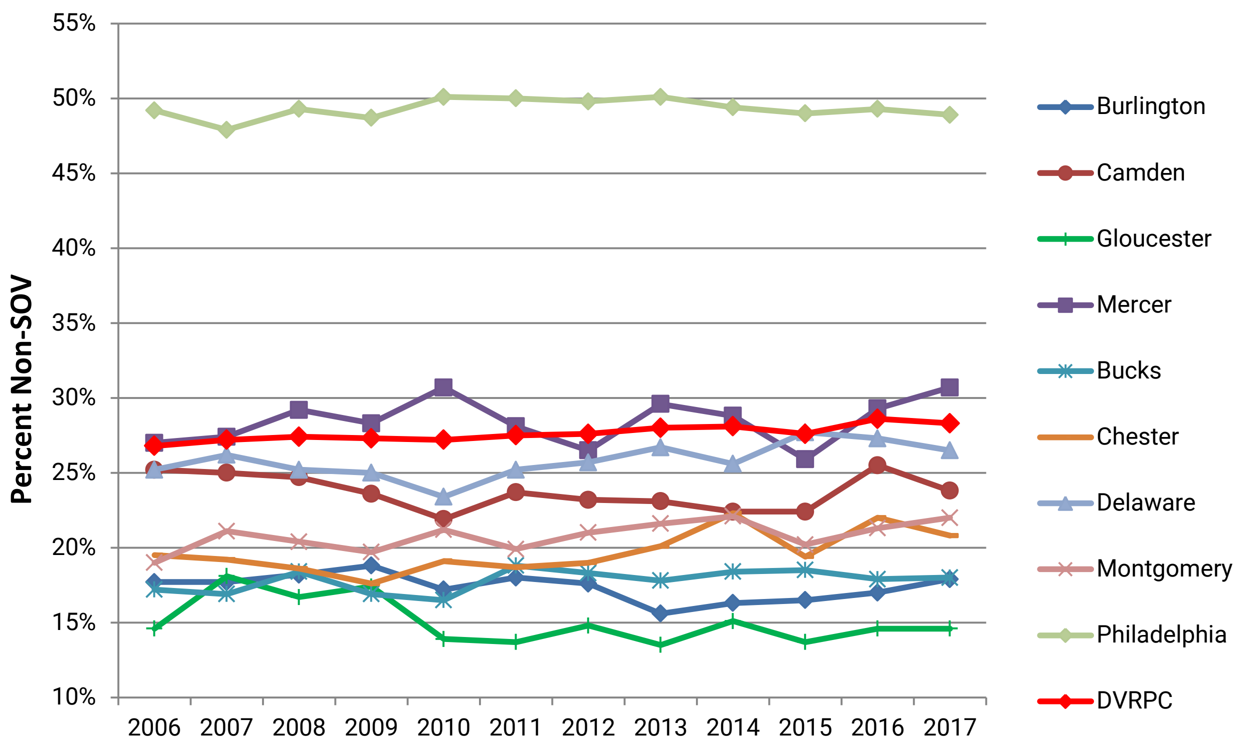
Figure 8: PATCO Ridership



Data Source: Delaware River Port Authority Comprehensive Annual Financial Reports

Other modes of travel besides SOV (or driving alone), should be encouraged and developed to improve mobility and reduce congestion where appropriate. To help track progress toward achieving this, the U.S. Census American Community Survey (ACS) provides journey-to-work trip estimates for percent Non-SOV travel. This measure includes carpool, train, bus, walk, bicycle, taxi, rideshare, working at home, etc.; anything other than driving alone. Although all trips (not just journey to work) would be optimal to track, this regularly updated and approved ACS dataset is recognized as one of the best available to measure mode share. Increases in transit ridership, ridesharing, transportation network companies, walking, and biking would contribute to increases in this measure. As expected, Philadelphia far exceeds other counties throughout the region in percent Non-SOV travel, averaging about 49 percent from 2006–17 (see Figure 9). Mercer County, New Jersey followed by Delaware County, Pennsylvania contains the second and third most Non-SOV travel, averaging 29 percent, and 26 percent, respectively. Gloucester County, New Jersey experiences the least at 15 percent on average.

Figure 9: Percent Non-SOV Travel by County

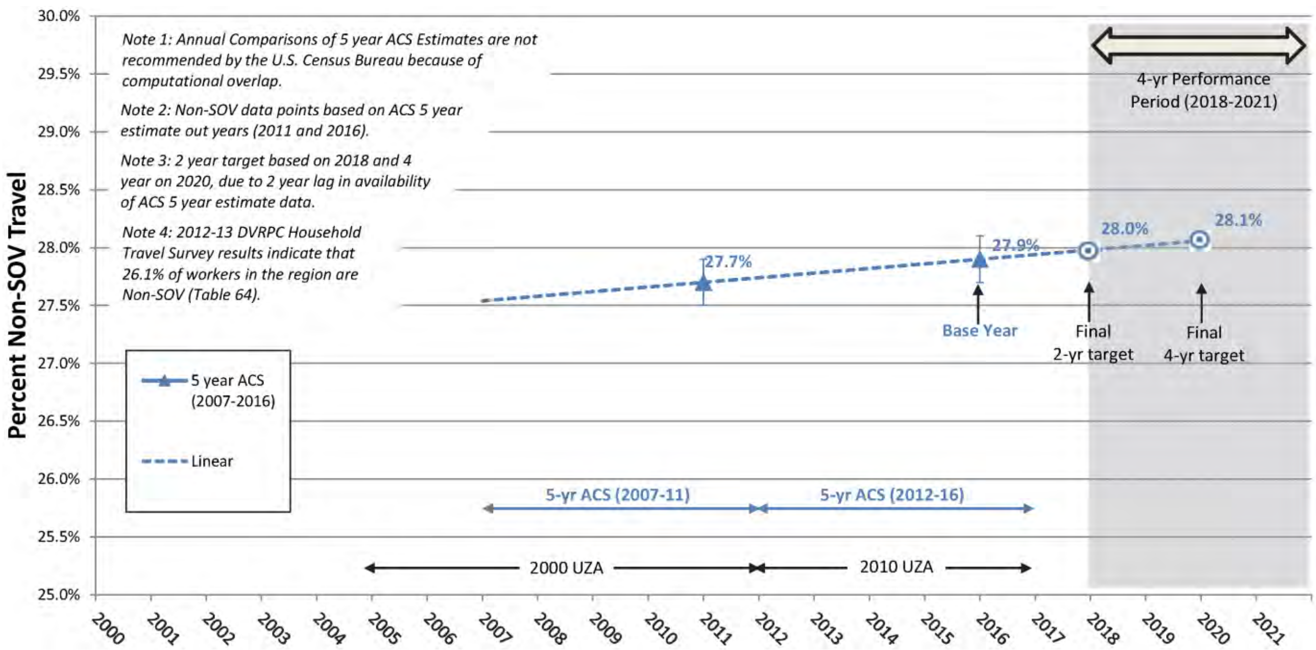


Data Source: U.S. Census ACS 1-year S0801: Percent Non-SOV Travel

Percent Non-SOV travel is also one of the required national performance management traffic congestion measures to track as part of the FAST Act for UZAs with populations greater than one million (populations greater than 200,000 starting in 2022). DVRPC, as the largest MPO agency in the Philadelphia PA-NJ-DE-MD UZA, established baseline, and two- and four-year targets for percent Non-SOV based on U.S. Census ACS five-year estimates in coordination with planning partners (see Figure 10). The 2017 baseline year value is 27.9 percent (based on the 2012 through 2016 ACS 5-year estimate) and the two- and four-year targets (2018 and 2020) follow a linear trend at 28.0 percent and 28.1 percent, respectively.

There are various considerations and uncertainties in meeting the established targets. There is a two-year time lag in reporting percent Non-SOV, so any Non-SOV completed project would not be reflected in the measure until two years later. Changes to the measure are incremental due to five-year averages. Also, land use changes will continue to affect trip making and the use of Non-SOV modes, and changes in pricing (e.g., fuel costs, transit fares, and tolls) would affect this measure.

Figure 10: Percent Non-SOV Travel Trends Philadelphia PA-NJ-DE-MD UZA



Data Sources: U.S. Census Bureau, DVRPC

2. Regional Objectives for Congestion Management

Congestion management objectives should define what the DVRPC region wants to achieve regarding managing congestion in the context of livability, economic vitality, safety, and multimodal access. The objectives should support goals of the DVRPC Long-Range Plan, including performance and operation of the transportation system.

CMP objectives include: (1) minimize growth in recurring congestion and improve mobility; (2) improve the reliability of the transportation system and provide transit where it is most needed for accessibility; (3) maintain the existing core transportation network; (4) improve safety and reduce nonrecurring congestion due in part to crashes; (5) maintain movement of goods by truck; (6) maintain transportation preparedness for major events, especially ones that call for interregional movements; (7) integrate national performance management PM3 measures; and 8) at the end of the day, ensure that all transportation investments support DVRPC Long-Range Plan principles. These include prioritizing transportation investments in less sensitive environmental areas; investing to support land use centers first, then infill and redevelopment areas, and then emerging growth areas; sustaining the environment; developing livable communities; expanding the economy; advancing equity and fostering diversity; and creating an integrated, multimodal transportation network. These objectives flow from the Long-Range Plan goals (see Table 1).

The Long-Range Plan goals and CMP objectives flow into specific CMP measure criteria that are used in the analysis of the performance of the regional transportation system, and for developing strategies to mitigate congestion. The table includes a general description of the measure criteria for each CMP objective. The criteria analysis was multimodal and was performed using Geographic Information Systems (GIS), where the results are represented on the roadway network. The measure criteria are further described in Chapter 3.

Table 1: Long-Range Plan Goals, CMP Objectives, and Analysis Criteria

Long-Range Plan Goal	CMP Objective	CMP Measure Criteria
Increase Mobility and Reduce Congestion	Minimize growth in recurring congestion and improve mobility	High TTI weekday peak hour (7:00–8:00 AM or 5:00–6:00 PM) [1]
		Medium TTI weekday peak hour (7:00–8:00 AM or 5:00–6:00 PM) [1]
		Anticipated congestion: Long-Range Plan model run (2015–45), highest peak hour (7:00–8:00 AM or 5:00–6:00 PM)
		Anticipated congestion, and moderate congestion on existing roads (2015)
Increase Reliability and Accessibility	Improve the reliability of the transportation system and provide transit where it is most needed for accessibility	High Transit Score: high population and employment density, and zero-car households
		Near transit passenger rail stations
		High PTI weekday peak hour (7:00–8:00 AM or 5:00–6:00 PM) [1]
		Medium PTI weekday peak hour (7:00–8:00 AM or 5:00–6:00 PM) [1]
Rebuild and Maintain Infrastructure	Maintain the existing core transportation network	NHS, including freight connectors
		Substantial transit bus and shuttle routes
		Transit bus and shuttle routes
		Transit passenger rail, including Amtrak
		Freight: centers, ports, rail lines, and Philadelphia airport
Move Toward Zero Transportation Deaths	Improve safety and reduce nonrecurring congestion due in part to crashes	High crash frequency (crashes per million VMT)
		High crash severity
Facilitate Goods Movement	Maintain movement of goods by truck	High Truck Travel Time Index (TTTI) weekday peak hour (7:00–8:00 AM or 5:00–6:00 PM) [2]
		Medium TTTI weekday peak hour (7:00–8:00 AM or 5:00–6:00 PM) [2]
Enhance Security	Maintain transportation preparedness for major events, especially ones that call for inter-regional movements far beyond normal; this also serves routine needs	High household or employment density by Traffic Analysis Zone
		Heavily used transit stations
		Limerick nuclear power plant evacuation zone
		Major roadway bridges
		Major passenger and freight rail bridges
		Key military locations
		Stadium and waterfront
Support Long-Range Plan Principles/Land Use	Prioritize transportation investments in less sensitive environmental areas; invest to support centers first, then infill and redevelopment areas, and then emerging growth areas	Land use centers
		Infill and Redevelopment Areas, and Emerging Growth Areas
		Environmental Screening Tool
Integrate PM3 Performance Measures		
	Prioritize transportation investments by integrating national PM3 reliability and traffic congestion performance measures	High LOTTR [2]
		Medium LOTTR [2]
		PHED [2]
		TTTR [2] Index

[1] Data Source: INRIX XD
[2] Data Source: National Performance Management Research Dataset (NPMRDS)

3. Congestion, Reliability, and Other CMP Objective Measure Criteria

Congestion is a broad and subjective term that makes it challenging to measure. Transportation agencies are continually developing approaches that attempt to quantify congestion using congestion performance and other measures that are available to systematically assess roadways and other facilities. For DVRPC, these measures derive from CMP objectives that flow from the goals of the DVRPC Long-Range Plan. Collecting data and monitoring many of these measures may be cumbersome and impractical. DVRPC has established collection parameters based on availability, staff time, overall cost, and the ability to partner with others. The measures can be categorized into congestion and reliability measures, and other CMP objective measure criteria.

Congestion and Reliability Measures

Congestion and reliability measures help to identify the extent, intensity, and variability of congestion on the transportation network. The main data source used for these measures is INRIX XD travel time data, which was collected and processed on most roads in the region for every minute of every day for all of 2017, and analyzed over weekdays and peak time periods. The data was chosen over other travel time datasets due to advantages of more coverage and improved granularity. The measures used include TTI, PTI, and vehicle and volume delays. Another data source is INRIX travel time data from the I-95 Corridor Coalition's University of Maryland Center for Advanced Transportation Technology Laboratory (CATT Lab) Probe Data Analytics (PDA) Software Suite. The Coalition contracts with private companies to provide travel time data collected from connected vehicles and other location-based services, and develops tools to access and analyze it using various congestion and reliability measures. For purposes of the CMP, the PDA software was used to analyze truck delays using the TTTI measure, and intersection bottleneck vehicle and volume delays. Another data source is the DVRPC regional Travel Demand Model, which was used to identify potential future congestion using base and future year volume-to-capacity (V/C) ratios. The V/C ratio is a traditional traffic engineering measure indicating road capacity sufficiency, or whether the physical geometry provides sufficient capacity for travel movements. It is an important measure for comparing a roadway's performance over a future time period, compared to travel time data, which is a more effective measure for indicating existing quality of service, and a driver's frustration.

New national performance management reliability and congestion PM3 measures derived from the National Performance Management Research Dataset (NPMRDS), are used in the CMP congestion analysis. While the measures are reported at the statewide and UZA level for target setting, the data is collected by roadway segment and available for a more granular analysis. This data contains speeds and travel times by road segment, like INRIX, but is limited to the NHS. The PM3 measures include: LOTTR, TTTR, and PHED.

A transit reliability measure is utilized by the CMP to help measure bus transit service efficiency in the region. Congestion, transit agency, and DVRPC regional Travel Demand Model data are combined to develop this composite reliability indicator.

More detailed descriptions of these measures are described below.

Travel Time Index (TTI)
This measure is derived from the INRIX XD travel time data, and is defined as the ratio of the peak period average travel time to the free-flow travel time (uncongested travel time) for a given roadway segment. Free-flow values were determined for this, and all other INRIX based measures, using reference speeds

provided by INRIX for each road segment based on 85th percentile observed speeds for all time periods. The greater the TTI value, the more congestion it indicates. A TTI of 1.00 indicates vehicles are traveling at free-flow speeds, while one at 1.50 indicates that a 20-minute free-flow trip takes 30 minutes. Roadways with a TTI between 1.20 and 1.50 are considered moderately congested, and ones greater than 1.50 are considered highly congested analyzed for weekdays during peak hours 7:00–8:00 AM and 5:00–6:00 PM.

Planning Time Index (PTI)
This measure is also derived from the INRIX XD travel time data, but is defined as the ratio of the peak period 95th percent travel time to the free-flow travel time for a given roadway segment. The 95th percentile indicates that 95 percent of the travel times are less, and 5 percent more, and measures the variability or reliability of travel. A PTI of 1.00 means the trip time is consistently the same from day to day, while higher values mean more variation and congestion. A PTI of 3.00 indicates a 20-minute free-flow trip will take 60 minutes in the peak period, which is equivalent to one work day a month (19/20), where one might expect to plan to leave 40 minutes earlier to arrive on time. Roadways with a PTI between 2.00 and 3.00 are considered moderately unreliable and ones greater than 3.00 are considered highly unreliable analyzed for weekdays during peak hours 7:00–8:00 AM and 5:00–6:00 PM.

Peak Vehicle Delay
This measure indicates the travel time or planning time delay by roadway segment, measured in seconds, which is the difference between the average peak period travel time and the free-flow time. The greater the difference, the greater the delay. This measure is derived from the INRIX XD data for weekdays during the peak hours 7:00–8:00 AM and 5:00–6:00 PM, and is used to analyze and rank delay by focus roadway facility and intersection bottleneck. For the focus roadway facilities, the vehicle delay is divided by the facility length, resulting in a peak vehicle delay per mile measure. Roads with high vehicle delay need to be identified since it is important to manage congestion for every driver on the road, not just locations with high traffic volumes.

Peak Volume Delay
This measure indicates peak period vehicle delay as a function of traffic volumes for the peak hour (7 percent of traffic flow for the AM, and 9 percent for the PM), measured in hours. Roads with both high vehicle and volume delay normally lead to congestion with a more regional impact, compared to ones with just high vehicle delay, due to the sheer number of vehicles involved. This measure is used to analyze and rank peak volume delay by focus roadway facility and intersection bottleneck. For focus roadway facilities, the volume delay is divided by the facility length, resulting in a peak volume delay per mile measure. The volume part of the delay measure is derived from traffic flow defined as Annual Average Daily Traffic (AADT), which is the average number of daily vehicles that traverse a roadway analyzed for all days in the week over a one-year period. AADT is determined through continual and seasonal traffic counts conducted by PennDOT, NJDOT, and to a major extent by DVRPC. For purposes of this CMP, AADT was conflated to INRIX roadway segments using GIS and other tools to calculate peak hour volume delays. The conflation results in minor inaccuracies that can occur when transferring spatial data between two spatially inconsistent databases.

High Growth V/C
This measure indicates where traffic congestion might likely increase in the future, according to the time span of the DVRPC Long-Range Plan (currently 2015 to 2045). DVRPC Travel Demand Model runs provide AM and PM peak period V/C by roadway link (or segment) for both the base year (2015) and future year (2045). It identifies potential future congested roadways using the 2045 socioeconomic forecasts and programmed projects approved for funding. Links with a 30 percent or more change for either the AM or PM peak hour are flagged as high anticipated growth V/C segments. Segments with both existing

moderate congestion and high anticipated growth congestion are given added weight in this measure. Like AADT, Travel Demand Model V/C was conflated to INRIX roadway segments.

National Performance Management Measures (PM3)

New PM3 measures adopted by FHWA in May 2017 as part of the FAST Act help better align proposed project improvements through performance-based planning and programming. Baseline and required targets are established at the statewide and UZA levels with the intention of programming projects to meet the regional targets (see Table 2). Although the baseline and target values are established at the statewide and UZA levels, they are calculated at the roadway segment level from the NPMRDS data, which includes only roadways on the NHS. This roadway data is utilized in the CMP to identify and prioritize congested locations, and to develop strategies to mitigate congestion. The three PM3 measures used in the CMP are LOTTR, TTTR and PHED, and they are described below.

Level of Travel Time Reliability (LOTTR)

This statewide measure helps to assess the performance of the NHS and indicates the percentage of person miles traveled on the interstate and non-interstate system NHS that are reliable within a region (see 23 CFR 490.507(a)(1,2)). Both VMT and average vehicle occupancy are factored into the reliability measure to calculate the percentage of person miles traveled that are reliable. Table 2 shows the applicable statewide baseline, and two- and four-year targets for this measure. For Pennsylvania, 89.8 percent and 87.4 percent of person miles traveled on the interstate and non-interstate NHS, respectively, are reliable for the 2017 baseline, as compared to New Jersey where 82.0 percent and 84.1 percent of person miles traveled on the interstate and non-interstate, respectively, are reliable. Both Pennsylvania and New Jersey kept the two- and four-year targets the same as the baseline, since there is a lack of historical data to establish a trend. The measure is calculated by roadway segment and indicates reliability measured by the ratio of the 80th percentile travel time to a “normal” travel time (50th percentile). The threshold criteria for reliability is 1.50; anything greater is considered unreliable. Figure 11 shows the interstate and non-interstate roadways in the region that are unreliable according to the measure criteria, with the ones colored brown as the most unreliable. This measure is calculated for four peak time periods: weekdays 6:00–10:00 AM, 10:00 AM–4:00 PM, and 4:00–8:00 PM; and weekends 6:00 AM–8:00 PM. The time period with the greatest unreliability is used as the criteria for determining reliability by roadway segment. For purposes of the CMP, a LOTTR value between 1.50 and 2.00 is considered moderately unreliable, and greater than 2.00 is considered most unreliable.

Truck Travel Time Reliability (TTTR)

This statewide measure helps to assess freight movements on the interstate system within the region, and is also referred to as the freight reliability measure (see 23 CFR 490.607). The TTTR indicates the reliability of the interstates for freight movement measured by the ratio of the 95th percentile travel time to a “normal” travel time (50th percentile). Unlike LOTTR, there is no threshold criteria established for unreliability, the higher the value, the more unreliable. Table 2 shows the applicable statewide baseline and two- and four-year targets. For Pennsylvania and New Jersey the freight reliability for the 2017 baseline is 1.34 and 1.81, respectively. In Pennsylvania the two- and four-year targets remain the same as the baseline; however, in New Jersey the two- and four-year targets increase at 1.90 and 1.95, respectively. Figure 12 shows the interstate roadways classified into four categories, with roadways colored brown as the most unreliable. This measure is calculated for five peak time periods: weekdays 6:00–10:00 AM, 10:00 AM–4:00 PM, and 4:00–8:00 PM; weekends 6:00 AM–8:00 PM, and every day 8:00 PM–6:00 AM. The time period with the highest TTTR is used as the criteria for determining reliability by road segment. For purposes of the CMP, a TTTR value equal to or greater than the regional average is considered unreliable.

Annual Hours of Peak Hour Excessive Delay (PHED) Per Capita

This UZA measure helps to assess excessive traffic congestion and the role it plays in pollutant emissions as part of the CMAQ Program (see 23 CFR 490.707(a)). The measure applies to only UZAs, such as the Philadelphia metropolitan region, that contain populations over one million and that are, in all or part, of a designated nonattainment or maintenance area for ozone, carbon monoxide, or particulate matter for air quality conformity purposes under the Clean Air Act. Travel times, hourly traffic volumes, posted speed limits, mode shares (passenger vehicles, transit, and trucks), and average vehicle occupant factors are used to calculate excessive delay at the roadway segment level for peak periods 6:00–10:00 AM and 3:00–7:00 PM, and then aggregated to the UZA for the full reporting calendar year. The "excessive" part of the PHED name is because some level of congestion is recognized as acceptable, and is thus not counted in the measure. This corresponds to the recognition that it is not possible, nor sometimes desirable, to eliminate all congestion delay; some congestion relates to economic activity and thriving places. The "per capita" implies that the total delay is shared by all residents; and it is beneficial for some trips to be avoided and shifted to walking or biking, or shifted out of the peak time period. Annual hours of PHED per capita is indicated by the ratio of the total delay to the population of the UZA. Table 2 shows the baseline value of 16.8 hours of PHED per capita and the two- and four-year targets of 17.0 and 17.2, respectively. Figure 13 shows the annual hours of PHED by roadway. Roadways outside the UZAs are excluded from this measure, which includes some areas in each of the counties, with the exception of Philadelphia, which is totally inclusive, and Mercer County, New Jersey, since it is part of the Trenton-Mercer UZA. For purposes of the CMP, roadways with PHED values two or more times the regional average are considered high excessive delay.

Truck Travel Time Index (TTTI)

This measure uses truck-only travel times on the NHS (interstate and non-interstate) from the NPMRDS data, separate from the PM3 measures, to identify congested locations due to truck traffic. It is defined as the ratio of the observed truck travel time to the free-flow truck travel time by roadway segment. Free-flow values are based on observed speeds for all time periods. Roadways with a TTTI between 2.00 and 3.00 are considered moderately congested and ones greater than 3.00 are considered highly congested analyzed for weekdays during peak hours 7:00–8:00 AM and 5:00–6:00 PM.

Bus Transit Reliability

This composite bus transit reliability measure combines congested roadway data using 2017 TTI, bus transit speeds, and bus on-time performance (OTP) information to identify corridors where bus transit service is particularly slow or delayed, and where road or transit improvements could increase reliability in the region. Bus route speeds were calculated using the distance between stop points and the scheduled time for each stop point as provided in the General Transit Feed Specification. OTP represents the percentage of time the bus route is considered on time. A trip is considered on time when it arrives between zero and six minutes after the scheduled time. Bus transit reliability was also weighted by riders to indicate road segments and routes that are most impacted by ridership. The Surface Transit Reliability web mapping tool is available on the DVRPC website at **www.dvrpc.org/webmaps/RTSP/#reliability/tool**. For purposes of the CMP, the reliability score was averaged by route and mapped to identify which routes performed more reliably than others according to the analysis (see Figure 14). The mapping indicates that brown routes are less reliable, with many of them in the urban areas, and fewer in the suburban and rural areas. For any given route there may be some sections that are more reliable than others, so for more detailed reliability score analysis, see the Surface Transit Reliability web mapping tool.

Table 2: PM3 Baseline and Target Values for Reliability and Traffic Congestion Measures

Measure	2017 Baseline		2019 2-Year Target		2021 4-Year Target	
	PA	NJ	PA	NJ	PA	NJ
Interstate Reliability (Statewide)	89.8%	82.0%	89.8%	82.0%	89.8%	82.0%
Non-Interstate Reliability (Statewide)	87.4%	84.1%	Not Required		87.4%	84.1%
Truck Reliability (Statewide)	1.34	1.81	1.34	1.90	1.34	1.95
Annual Hours of PHED Per Capita	Philadelphia (PA-NJ-DE-MD) 16.8		Philadelphia (PA-NJ-DE-MD) 17.0 (Optional Target)		Philadelphia (PA-NJ-DE-MD) 17.2	
Percent Non-SOV Travel	Philadelphia (PA-NJ-DE-MD) 27.9%		Philadelphia (PA-NJ-DE-MD) 28.0%		Philadelphia (PA-NJ-DE-MD) 28.1%	

Sources: DVRPC, PennDOT, NJDOT, U.S. Census Bureau

Other CMP Objective Measures and Criteria

Other CMP objective measures, separate from congestion and reliability measures, are developed to support CMP objectives that flow from goals of the Long-Range Plan (see Table 1). The measures help to prioritize congested roadways for improvements and to develop strategies to mitigate congestion. The measures can be classified by CMP objective and Long-Range Plan goals, and include increasing accessibility, rebuilding and maintaining infrastructure, improving safety, enhancing security, and supporting Long-Range Plan land use principles.

Supporting the increasing accessibility goal involves weighing congested roadway locations more where they exist near transit passenger stations, and in areas where there are high population and employment densities, and zero-car households.

The rebuilding and maintaining infrastructure goal involves weighing congested locations more where they exist on the NHS; on the National Highway Freight Network and associated freight connectors; on transit bus and shuttle routes; near transit, passenger and freight rail, and the Philadelphia International Airport; and within freight centers.

The improving safety goal involves weighing congested roadways more where they exist along high crash frequency and severity corridors. High crash frequency corridors are ones where actual crash rates are four or more times the average rate for a type of roadway. Roadway types include urban or rural, divided or undivided, limited access or no access control, and ones with roadway width and AADT thresholds. Crash rates are calculated as crashes per one hundred million VMT, and average crash rates are assigned for each combination of roadway types. High crash severity corridors are ones with five or more kills or severe injuries per mile of roadway. Both crash frequency and severity are analyzed from PennDOT and NJDOT crash databases over a five-year time period from 2013 to 2017.

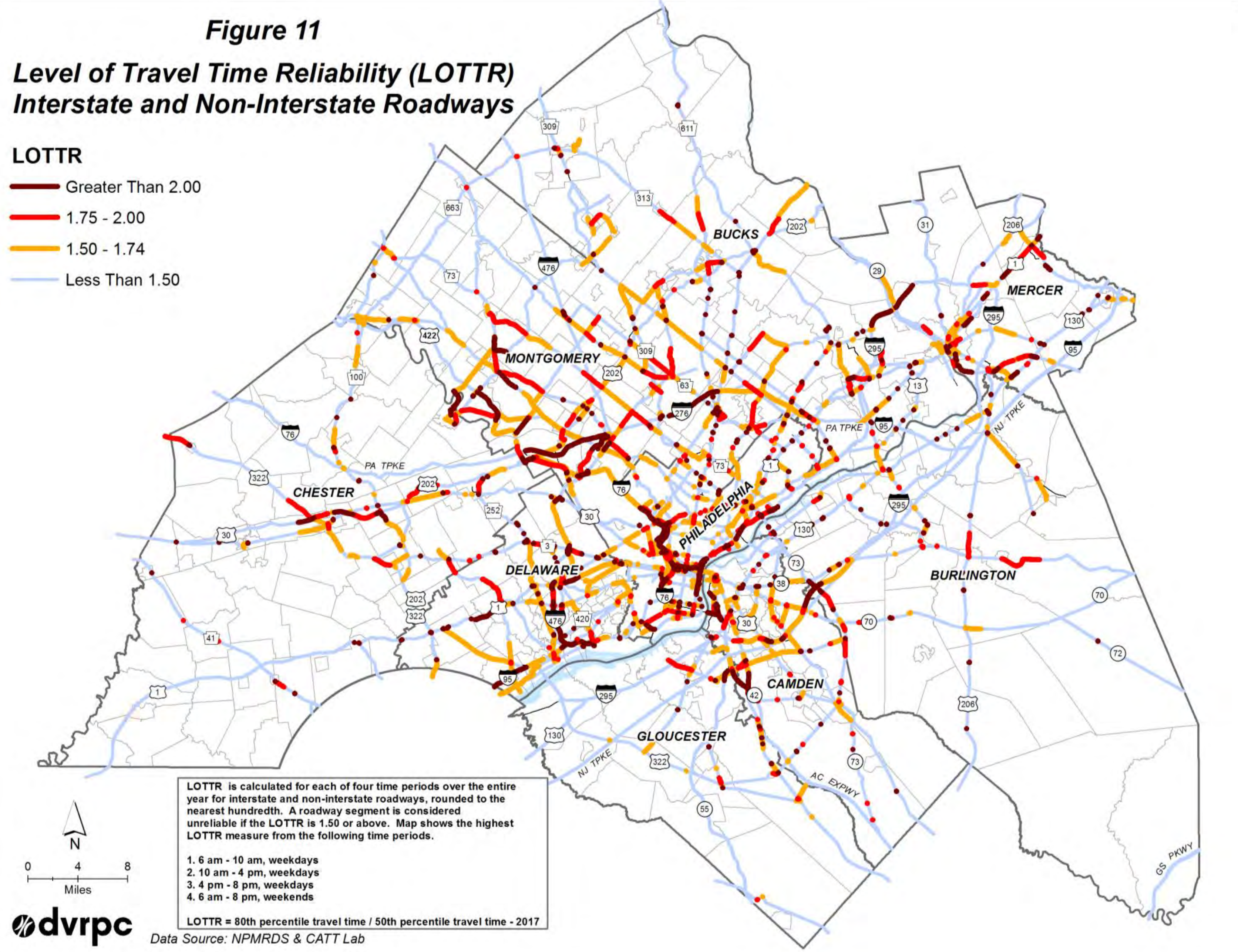
The enhancing security goal involves weighing congested roadways more where they exist within high household and employment density areas; near heavily used transit stations; near major roadway, passenger, and freight rail bridges; near key military, stadium, and waterfront locations; and within the Limerick nuclear power plant evacuation zone.

Supporting the Long-Range Plan land use principles goal includes weighing congested roadways more where they are within land use centers; within infill, redevelopment and emerging growth areas; and at locations with fewer environmental impacts.

See Figure 15 for composite mapping of the CMP objective measures. Congested locations that meet more CMP objective criteria than others contain higher point totals and are given stronger support for managing congestion. This analysis is used to help prioritize congested corridor and subcorridor areas, which is further described in Chapter 4, section 6. Also, see the CMP website at **www.dvrpc.org/webmaps/CMP2019/** for the CMP objective measures and criteria.

Figure 11

Level of Travel Time Reliability (LOTTR) Interstate and Non-Interstate Roadways



LOTTR is calculated for each of four time periods over the entire year for interstate and non-interstate roadways, rounded to the nearest hundredth. A roadway segment is considered unreliable if the LOTTR is 1.50 or above. Map shows the highest LOTTR measure from the following time periods.

1. 6 am - 10 am, weekdays
2. 10 am - 4 pm, weekdays
3. 4 pm - 8 pm, weekdays
4. 6 am - 8 pm, weekends

LOTTR = 80th percentile travel time / 50th percentile travel time - 2017

Data Source: NPMRDS & CATT Lab

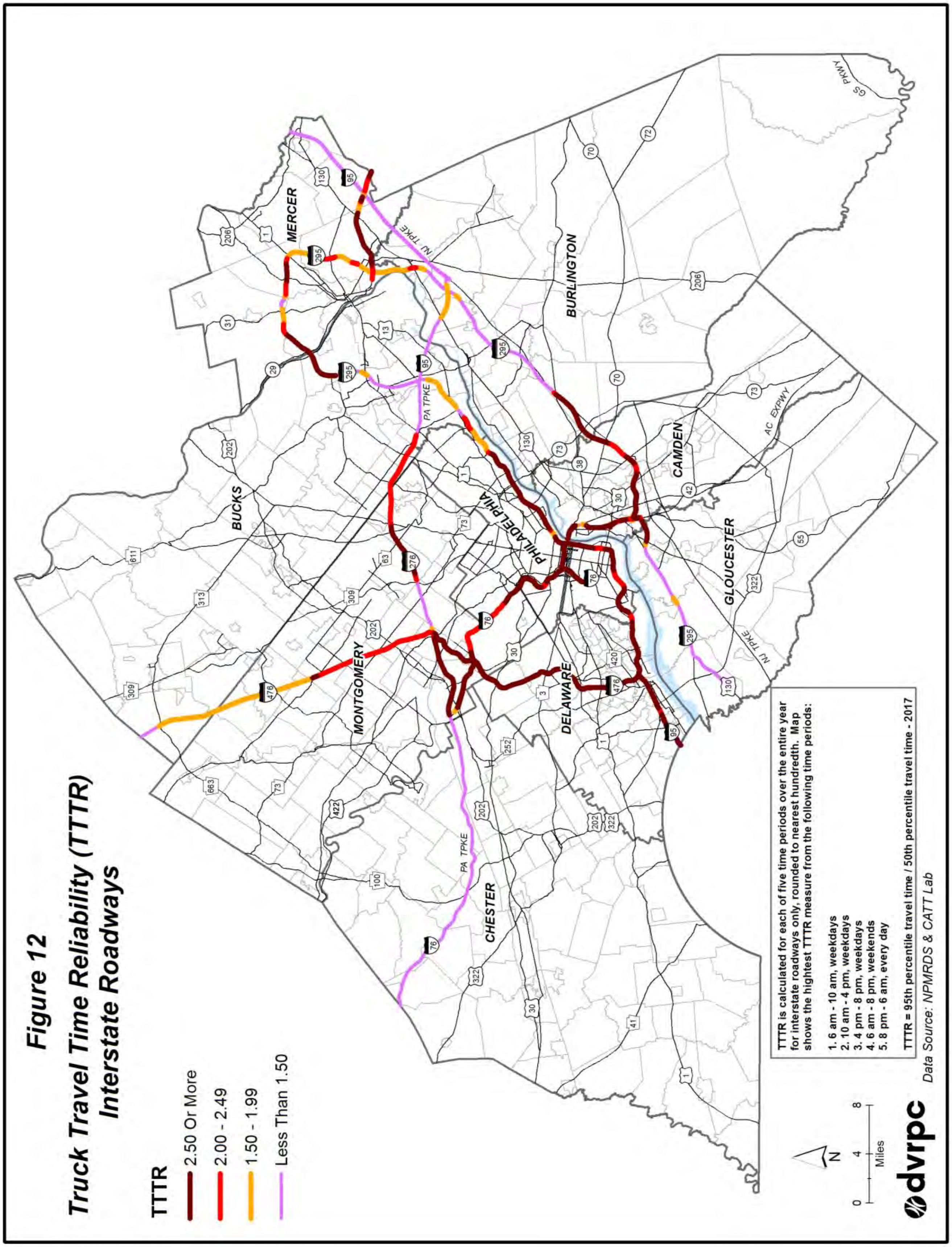
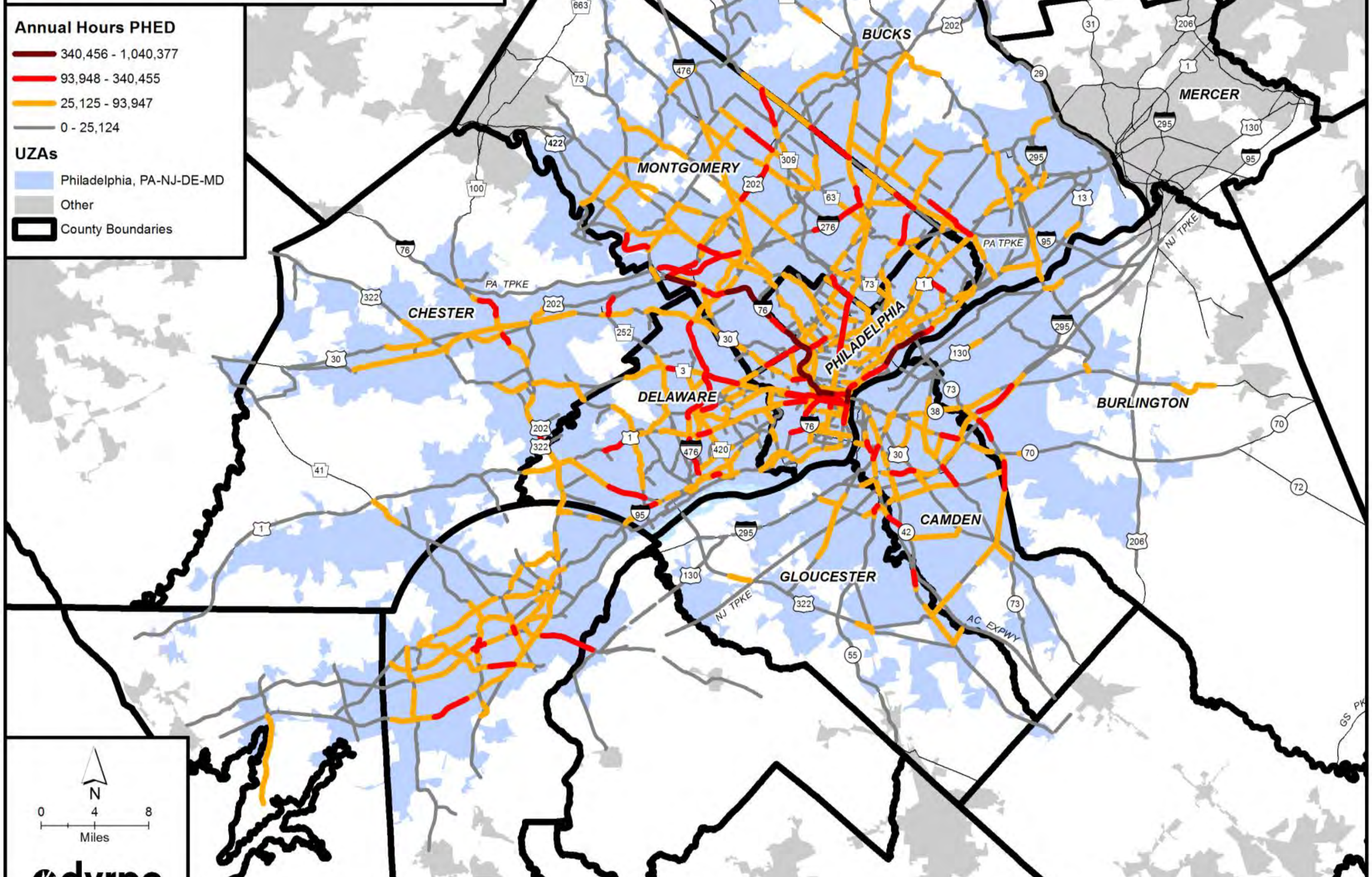


Figure 12
Truck Travel Time Reliability (TTTR) Interstate Roadways

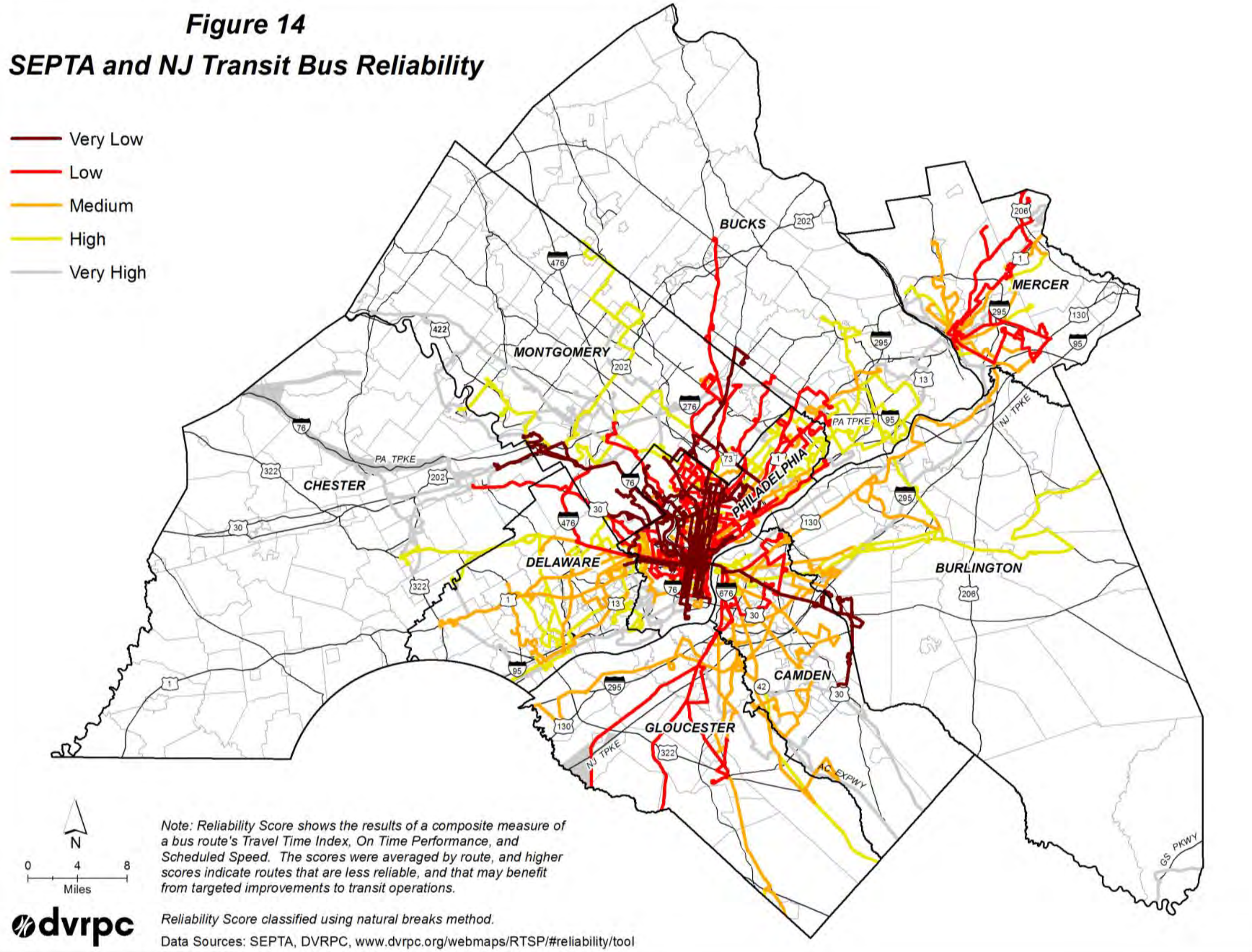
Figure 13
Peak Hour Excessive Delay (PHED) in Philadelphia PA-NJ-DE-MD UZA



Data Source: Urban Areas - U.S. Census Bureau, PHED: NPMRDS & CATT Lab

Figure 14

SEPTA and NJ Transit Bus Reliability

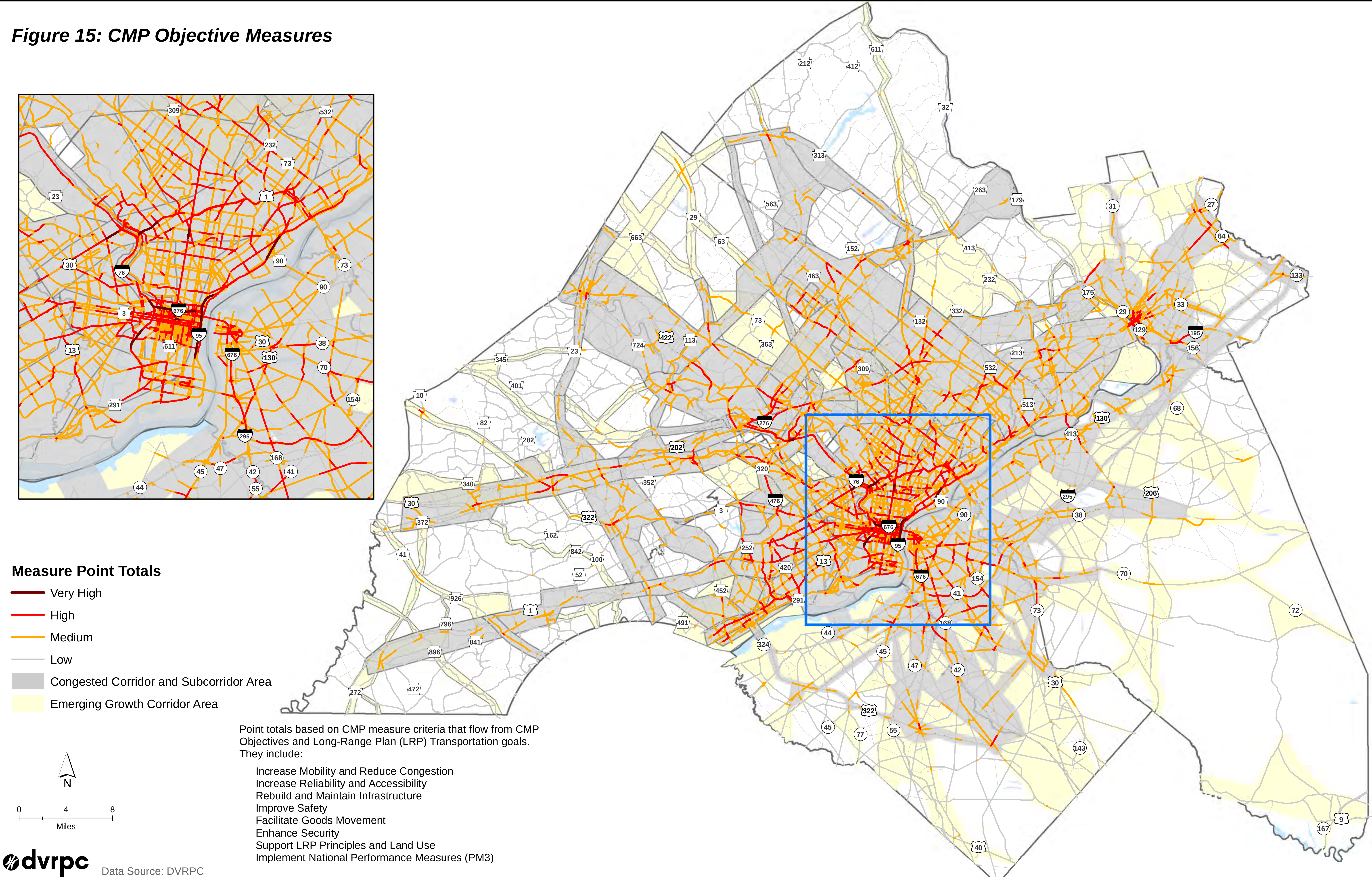


Note: Reliability Score shows the results of a composite measure of a bus route's Travel Time Index, On Time Performance, and Scheduled Speed. The scores were averaged by route, and higher scores indicate routes that are less reliable, and that may benefit from targeted improvements to transit operations.

Reliability Score classified using natural breaks method.

Data Sources: SEPTA, DVRPC, www.dvrpc.org/webmaps/RTSP/#reliability/tool

Figure 15: CMP Objective Measures



Point totals based on CMP measure criteria that flow from CMP Objectives and Long-Range Plan (LRP) Transportation goals. They include:

- Increase Mobility and Reduce Congestion
- Increase Reliability and Accessibility
- Rebuild and Maintain Infrastructure
- Improve Safety
- Facilitate Goods Movement
- Enhance Security
- Support LRP Principles and Land Use
- Implement National Performance Measures (PM3)

dvrpc

Data Source: DVRPC

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4. Network Analysis

The CMP transportation network is represented on the region's INRIX XD road network where travel time data is available to help identify congested locations. Other data and mode share networks are conflated to the road network using GIS tools to help analyze and prioritize congested locations, such as DOT and DVRPC traffic volumes, Travel Demand Model high growth V/C roads, transit routes, NHS roads, nearby passenger rail stations, and high crash frequency and severity corridors, to name a few. Although congestion is analyzed and mapped by roadway segment across the network using congestion and other CMP objective measures, further analysis is conducted by aggregating road segments by facility to analyze peak travel time and planning time vehicle and volume delays.

4.1 Selecting Focus Roadway Facilities

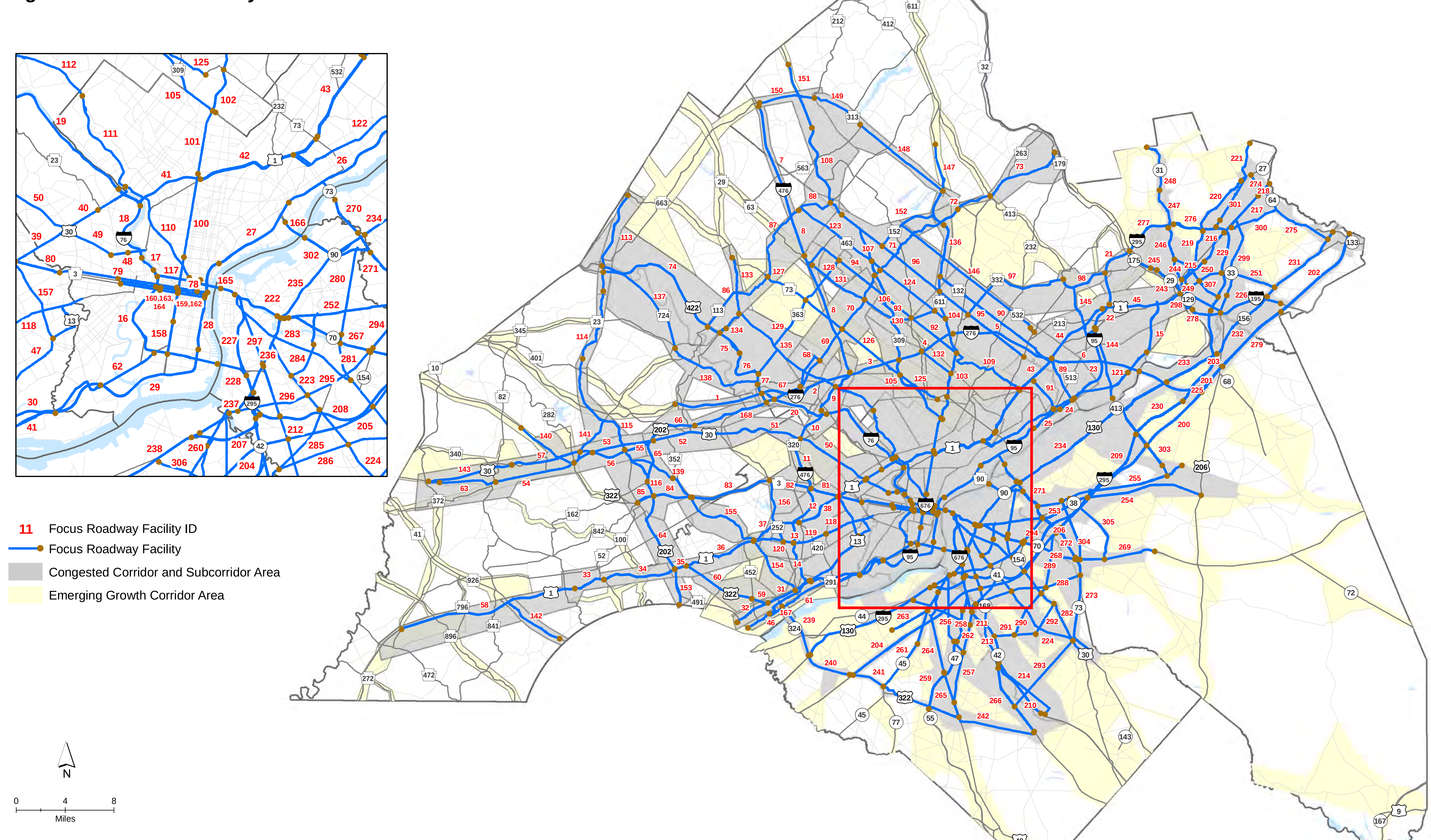
Identifying congested locations for larger areas, like the DVRPC region, lends itself to also analyzing at the roadway facility level, rather than just by roadway segment, to better understand how some roadway corridors are performing better than others, and to track congestion over time. There are 168 and 108 focus roadway facilities identified (276 in all) in the Pennsylvania and New Jersey portions of the DVRPC region, respectively (see Figure 16). The primary criteria for selecting these facilities is based on locations that indicate high congestion using TTI, PTI, and other congestion performance measures, and that are within the CMP congested corridor, subcorridor, and emerging growth corridor areas. These areas are used to assist in prioritizing congested locations and developing a set of focused strategies to manage congestion (see Chapter 4, section 5). Focus roadway facility limits are delineated based on where there are breaks between these congested corridor and subcorridor areas, and between major interchanges, and major arterial roadways. Roads, such as cloverleaf interchange ramps, are not included in roadway facilities mainly due to lack of traffic volume data to analyze delays, but mainline merge roadways that typically contain volumes are included, such as ramps connecting I-476 to I-95 in Delaware County, or NJ 42 to I-295 in Camden County.

Peak vehicle and volume delay measures are calculated from the INRIX travel time data, then totaled by facility and divided by the facility length, and ranked separately for the Pennsylvania and New Jersey portions of the DVRPC region from most to least in delay, for both measures. The delay is divided, or normalized, by facility length since longer facilities would tend to over-represent delay. For example, US 1 (Roosevelt Blvd) from PA 73 to I-276 (Pennsylvania Turnpike) in Philadelphia is 28.59 miles, while US 1 from I-276 (Pennsylvania Turnpike) to I-95 in Bucks County is only 12.03 miles. Facility miles is the mileage in each direction of vehicle travel.

Tables 3 and 4 contain a list of the focus roadway facilities in the Pennsylvania and New Jersey portions of the DVRPC region, respectively, sorted by roadway name, and ranked by both peak travel time vehicle and volume delay with a rank of one being the most delayed. The delay rankings are color coded by quartiles from the most to least in delay, with brown being the most delayed and yellow the least. Most of the focus roadway facilities are more delayed during the PM peak hour, but there are a few that are more during the AM peak hour, which are highlighted in gray in the "AM/PM Highest Delay" column. Vehicle and volume delays are measured in seconds and hours, respectively. Although congestion measures are of primary importance for the CMP, they are not the sole factors to consider in ranking focus roadway facilities, and influencing investment decisions. Additional factors to consider are the other CMP objective measures as aligned with the Long-Range Plan, which are used to help select priority congested corridor and subcorridor areas (see Chapter 4, section 6) and to identify strategies to mitigate congestion (see Chapter 4, section 7).

The focus roadway facilities should be considered in DVRPC corridor and other planning studies, and could be added to the TIP and Long-Range Plan evaluation criteria. They will need to be weighed against regional priorities and the region’s extreme funding constraint.

Figure 16: Focus Roadway Facilities



Data Source: DVRPC

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Table 3

Focus Roadway Facilities in the Pennsylvania Portion of the DVRPC Region: Peak Travel Time Vehicle and Volume Delay (Sorted by Roadway Name)

								Peak Hour Vehicle Delay per Mile					Peak Hour Total Volume Delay per Mile							
Map ID	Roadway	From Limit	To Limit	Miles	Limited Access	Municipality	County	AM Delay (sec)	PM Delay (sec)	Peak Delay	AM/PM Highest Delay	Rank	Rank	AADT	Volume AM Delay	Volume PM Delay	Total Peak Delay	AM/PM Highest Delay	AM Peak Volume Delay (Hr)	PM Peak Volume Delay (Hr)
119	Baltimore Pk	North Ave	I-476	5.55	No	Nether Providence, Springfield	Delaware	30.98	70.20	70.20	PM	19	42	28,450	30,526.07	86,547.52	86,547.52	PM	8:28:46	24:02:28
118	Baltimore Pk	US 13	North Ave	6.66	No	various	Delaware	14.96	62.30	62.30	PM	27	65	18,610	10,728.79	52,178.36	52,178.36	PM	2:58:49	14:29:38
120	Baltimore Pk	I-476	US 1	6.27	No	Nether Providence, Media, Middletown	Delaware	18.39	36.37	36.37	PM	83	105	18,297	12,097.45	29,132.52	29,132.52	PM	3:21:37	8:05:33
146	Bristol Rd	PA 532	US 202 Bus	27.97	No	various	Bucks	19.50	31.62	31.62	PM	95	134	10,746	7,731.80	16,442.53	16,442.53	PM	2:08:52	4:34:03
95	County Line Rd	PA 532	PA 611	17.62	No	various	Bucks, Montgomery	14.86	32.68	32.68	PM	92	94	21,306	11,830.64	34,266.23	34,266.23	PM	3:17:11	9:31:06
96	County Line Rd	PA 611	PA 309	16.59	No	various	Bucks, Montgomery	21.32	43.94	43.94	PM	62	103	15,635	11,341.95	30,121.14	30,121.14	PM	3:09:02	8:22:01
2	I-276 Turnpike	I-76 (Valley Forge)	I-476 NE Ext (Plymouth Meeting)	16.17	Yes	Upper Merion, Plymouth	Montgomery	0.64	36.84	36.84	PM	81	23	76,141	2,002.06	131,333.14	131,333.14	PM	0:33:22	36:28:53
4	I-276 Turnpike	PA 309 (Fort Washington)	PA 611 (Hatboro)	9.66	Yes	Upper Dublin, Upper Moreland	Montgomery	32.86	10.48	32.86	AM	91	28	101,739	114,074.51	48,929.37	114,074.51	AM	31:41:15	13:35:29
3	I-276 Turnpike	I-476 NE Ext (Plymouth Meeting)	PA 309 (Fort Washington)	8.15	Yes	Whitemarsh	Montgomery	5.24	14.36	14.36	PM	134	47	121,790	22,318.26	78,684.95	78,684.95	PM	6:11:58	21:51:25
5	I-276 Turnpike	PA 611 (Hatboro)	US 1	16.01	Yes	Various	Bucks, Montgomery	7.68	3.42	7.68	AM	146	111	94,619	25,431.97	14,551.84	25,431.97	AM	7:03:52	4:02:32
6	I-276 Turnpike	US 1	New Jersey Line	15.24	Yes	Bensalem, Bristol	Bucks	0.77	0.90	0.90	PM	166	164	48,604	1,393.20	2,264.11	2,264.11	PM	0:23:13	0:37:44
21	I-295	PA 29 (Delaware River)	US 1	11.06	Yes	Lower Makefield	Bucks	14.37	4.88	14.37	AM	133	121	52,004	21,504.25	10,434.75	21,504.25	AM	5:58:24	2:53:55
22	I-295	US 1	BUS 1 (Lincoln Hwy)	4.62	Yes	Middletown	Bucks	1.72	2.73	2.73	PM	160	153	56,672	3,529.43	7,425.83	7,425.83	PM	0:58:49	2:03:46
23	I-295/I-95	BUS 1 (Lincoln Hwy)	PA 132/Street Rd	13.86	Yes	Middletown, Bristol, Bensalem	Bucks	2.24	3.19	3.19	PM	159	151	65,151	5,261.55	9,530.28	9,530.28	PM	1:27:42	2:38:50
13	I-476	US 1	Baltimore Pk (Swarthmore)	3.54	Yes	Marple, Springfield	Delaware	69.03	34.27	69.03	AM	21	12	93,802	223,371.28	142,980.63	223,371.28	AM	62:02:51	39:43:01
11	I-476	US 30 (Villanova)	US 3 (Broomall)	8.94	Yes	Radnor, Haverford	Delaware	2.32	42.63	42.63	PM	68	13	111,452	8,897.87	211,276.38	211,276.38	PM	2:28:18	58:41:16
9	I-476	I-276 Turnpike (Plymouth Meeting)	I-76 (Conshohocken)	8.63	Yes	Plymouth, W. Conshohocken	Montgomery	20.78	28.68	28.68	PM	104	16	121,558	93,424.34	174,254.44	174,254.44	PM	25:57:04	48:24:14
14	I-476	Baltimore Pk (Swarthmore)	I-95	8.12	Yes	Nether Providence, Ridley	Delaware	48.63	45.56	48.63	AM	51	18	79,417	136,743.90	145,985.54	145,985.54	PM	37:59:04	40:33:06
10	I-476	I-76 (Conshohocken)	US 30 (Villanova)	5.83	Yes	W. Conshohocken, Lower Merion, Radnor	Delaware, Montgomery	1.45	22.89	22.89	PM	122	25	122,696	6,490.82	126,857.01	126,857.01	PM	1:48:11	35:14:17
12	I-476	US 3 (Broomall)	US 1	7.37	Yes	Marple	Delaware	22.49	26.94	26.94	PM	110	31	87,070	67,339.20	107,281.96	107,281.96	PM	18:42:19	29:48:02
8	I-476 (Turnpike NE Ext)	Lansdale	Plymouth Meeting	20.56	Yes	Various	Montgomery	2.83	7.00	7.00	PM	149	123	64,752	5,602.16	20,624.72	20,624.72	PM	1:33:22	5:43:45
7	I-476 (Turnpike NE Ext)	Quakertown	Lansdale	25.95	Yes	various	Bucks, Montgomery	1.57	0.87	1.57	AM	163	162	51,351	2,822.90	2,019.55	2,822.90	AM	0:47:03	0:33:40
165	I-676	North 6th St	Benjamin Franklin Bridge	2.04	Yes	Philadelphia	Philadelphia	25.01	18.00	25.01	AM	118	45	89,027	80,712.20	75,103.09	80,712.20	AM	22:25:12	20:51:43
117	I-676 (Vine Street Expy)	I-76	I-95	4.11	Yes	Philadelphia	Philadelphia	38.97	162.29	162.29	PM	3	1	125,770	151,708.15	923,585.48	923,585.48	PM	42:08:28	256:33:05
17	I-76	I-676 (Vine Street Expy)	US 30 (Girard Ave)	2.55	Yes	Philadelphia	Philadelphia	20.70	119.77	119.77	PM	7	2	136,099	90,556.26	680,658.59	680,658.59	PM	25:09:16	189:04:19
18	I-76	US 30 (Girard Ave)	US 1 (City Ave)	7.73	Yes	Philadelphia	Philadelphia	91.81	73.72	91.81	AM	11	3	155,424	459,505.58	515,200.65	515,200.65	PM	127:38:26	143:06:41
19	I-76	US 1 (City Ave)	I-476	14.66	Yes	Lower Merion	Montgomery	45.23	59.98	59.98	PM	30	6	122,860	188,063.49	350,905.80	350,905.80	PM	52:14:23	97:28:26
20	I-76	I-476	I-76 Turnpike	10.72	Yes	Upper Merion	Montgomery	27.75	58.65	58.65	PM	33	9	100,036	98,805.47	275,195.19	275,195.19	PM	27:26:45	76:26:35
16	I-76	Walt Whitman Bridge	I-676 (Vine Street Expy)	13.61	Yes	Philadelphia	Philadelphia	23.47	51.94	51.94	PM	42	10	112,111	84,205.17	262,186.87	262,186.87	PM	23:23:25	72:49:47
1	I-76 Turnpike	PA 29	I-76 (Valley Forge)	15.15	Yes	Charlestown, Tredyffrin	Chester	0.10	0.60	0.60	PM	167	166	53,881	173.16	1,421.61	1,421.61	PM	0:02:53	0:23:42
28	I-95	Frankford Ave	I-76 (Walt Whitman Bridge)	7.53	Yes	Philadelphia	Philadelphia	9.12	67.68	67.68	PM	23	4	140,962	47,561.99	419,413.76	419,413.76	PM	13:12:42	116:30:14
27	I-95	PA 90 (Betsy Ross Bridge)	Frankford Ave	8.55	Yes	Philadelphia	Philadelphia	59.00	41.85	59.00	AM	31	5	188,704	388,403.22	354,572.79	388,403.22	AM	107:53:23	98:29:33
26	I-95	Academy Rd	PA 90 (Betsy Ross Bridge)	10.72	Yes	Philadelphia	Philadelphia	49.63	15.00	49.63	AM	47	7	189,669	321,497.46	122,963.34	321,497.46	AM	89:18:17	34:09:23
32	I-95	US 322 (Commodore Barry Bridge)	County Boundary	6.28	Yes	Upper Chichester	Delaware	19.70	43.61	43.61	PM	64	8	137,661	111,608.54	283,143.96	283,143.96	PM	31:00:09	78:39:04
31	I-95	I-476	US 322 (Commodore Barry Bridge)	7.77	Yes	Chester	Delaware	17.25	24.68	24.68	PM	119	14	173,512	110,040.23	209,622.43	209,622.43	PM	30:34:00	58:13:42
30	I-95	PA 291 (Philadelphia Airport)	I-476	12.87	Yes	Philadelphia, Tinicum, Ridley	Delaware, Philadelphia	3.90	22.41	22.41	PM	123	27	115,946	13,867.47	116,803.45	116,803.45	PM	3:51:07	32:26:43
29	I-95	I-76 (Walt Whitman Bridge)	PA 291 (Philadelphia Airport)	11.00	Yes	Philadelphia	Philadelphia	3.21	19.82	19.82	PM	128	37	113,558	12,172.96	99,760.36	99,760.36	PM	3:22:53	27:42:40
25	I-95	PA 63	Academy Rd	5.43	Yes	Bensalem, Philadelphia	Bucks	1.59	13.78	13.78	PM	137	54	113,364	6,449.42	70,548.83	70,548.83	PM	1:47:29	19:35:49
24	I-95	PA 132/Street Rd	PA 63	3.19	Yes	Bensalem	Bucks	1.70	5.14	5.14	PM	156	122	86,753	5,621.04	20,990.69	20,990.69	PM	1:33:41	5:49:51
157	Lansdowne Ave	US 13	US 1	7.41	No	Lansdowne, Upper Darby	Delaware	52.88	63.25	63.25	PM	25	64	18,022	40,003.97	53,255.23	53,255.23	PM	11:06:44	14:47:35
78	Market St	I-95 (Penns Landing)	PA 611 (Broad St)	2.28	No	Philadelphia	Philadelphia	42.94	126.65	126.65	PM	6	36	15,647	23,329.49	99,801.32	99,801.32	PM	6:28:49	27:43:21
79	Market St	PA 611 (Broad St)	63rd St (Cobbs Creek Pkwy)	8.29	No	Philadelphia	Philadelphia	17.03	72.70	72.70	PM	18	70	12,123	8,149.65	49,952.52	49,952.52	PM	2:15:50	13:52:33
130	Norristown Rd	PA 463	US 202	12.71	No	Horsham, Upper Dublin, Lower Gwynedd	Montgomery	29.97	39.74	39.74	PM	74	101	17,161	18,294.70	30,820.12	30,820.12	PM	5:04:55	8:33:40
116	PA 100	US 30 Bypass	US 202	6.66	Yes	West Whiteland, West Goshen	Chester	4.09	45.65	45.65	PM	58	39	41,986	8,532.39	96,185.84	96,185.84	PM	2:22:12	26:43:06
115	PA 100	Nantmead Rd	US 30 Bypass	17.47	No	various	Chester	14.99	29.03	29.03	PM	103	79	29,240	13,574.35	39,940.32	39,940.32	PM	3:46:14	11:05:40
114	PA 100	S. Hanover St	Nantmead Rd	14.12	No	various	Chester	10.38	13.93	13.93	PM	136	145	15,280	6,677.47	11,474.11	11,474.11	PM	1:51:17	3:11:14
113	PA 100	PA 73	S. Hanover St	17.03	No	various	Montgomery	7.02	10.40	10.40	PM	143	146	22,457	5,257.16	11,171.80	11,171.80	PM	1:27:37	3:06:12
141	PA 113	PA 100	US 30 Business	8.38	No	Uwchlan, East Caln, Downingtown	Chester	14.80	22.90	22.90	PM	121	115	21,929	11,455.07	22,936.68	22,936.68	PM	3:10:55	6:22:17
86	PA 113	US 422	PA 73 (Skippack Pk)	14.09	No	various	Montgomery	18.18	28.18	28.18	PM	107	142	9,818	6,251.96	12,586.81	12,586.81	PM	1:44:12	3:29:47
88	PA 113	Allentown Rd	PA 309	7.02	No	Franconia, Souderton, Hilltown	Montgomery	14.10	21.77	21.77	PM	126	150	9,723	4,690.88	9,873.43	9,873.43	PM	1:18:11	2:44:33
87	PA 113	PA 73 (Skippack Pk)	Allentown Rd	13.37	No	Skippack, Lower Salford, Franconia	Montgomery	9.67	12.34	12.34	PM	139	154	12,516	4,641.27	7,277.83	7,277.83	PM	1:17:21	2:01:18
90	PA 132 (Street Rd)	US 1	PA 611 (Easton Rd)	23.15	No	various	Bucks	16.61	42.88	42.88	PM	67	53	34,906	20,649.46	70,907.65	70,907.65	PM	5:44:09	19:41:48
89	PA 132 (Street Rd)	I-95	US 1	7.13	No	Bensalem	Bucks	10.74	40.19	40.19	PM	72	59	34,921	12,735.53	62,766.31	62,766.31	PM	3:32:16	17:26:06
138	PA 23	PA 724	PA 422	17.17	No	various	Chester, Montgomery	22.35	33.46	33.46	PM	89	114	14,250	11,474.79	23,214.11	23,214.11	PM	3:11:15	6:26:54
156	PA 252	Baltimore Pk	PA 3	10.87	No	various	Delaware	25.79	50.81	50.81	PM	43	77	17,722	15,840.65	40,969.58	40,969.58	PM	4:24:01	11:22:50
134	PA 29	Ridge Pk	PA 422	4.86	No	Collegeville, Upper Providence	Montgomery	5.92	26.67	26.67	PM	112	110	22,446	4,160.91	25,643.84	25,643.84	PM	1:09:21	7:07:24
133	PA 29	PA 73 (Skippack Pk)	Ridge Pk	9.43	No	Perkiomen, Collegeville	Montgomery	26.33	25.74	26.33	AM	114	147	8,967	8,367.42	10,743.93	10,743.93	PM	2:19:27	2:59:04
62	PA 291	I-95	I-76	11.05	No	Philadelphia	Philadelphia	18.43	28.08	28.08	PM	109	96	28,042	14,448.60	33,800.30	33,800.30	PM	4:00:49	9:23:20
61	PA 291	US 13	I-95	17.26	No	various	Delaware	4.89	6.18	6.18	PM	152	159	14,880	2,569.51	3,879.15	3,879.15	PM	0:42:50	1:04:39

Table 3
Continued

								Peak Hour Vehicle Delay per Mile					Peak Hour Total Volume Delay per Mile							
Map ID	Roadway	From Limit	To Limit	Miles	Limited Access	Municipality	County	AM Delay (sec)	PM Delay (sec)	Peak Delay	AM/PM Highest Delay	Rank	Rank	AADT	Volume AM Delay	Volume PM Delay	Total Peak Delay	AM/PM Highest Delay	AM Peak Volume Delay (Hr)	PM Peak Volume Delay (Hr)
80	PA 3	63rd St (Cobbs Creek Pkwy)	US 1	5.18	No	Upper Darby	Delaware	37.52	63.65	63.65	PM	24	60	24,043	31,374.86	61,820.56	61,820.56	PM	8:42:55	17:10:21
160	PA 3 (Chestnut St)	Broad St	23rd St	0.76	No	Philadelphia	Philadelphia	32.14	217.45	217.45	PM	2	19	8,068	16,606.87	144,952.68	144,952.68	PM	4:36:47	40:15:53
161	PA 3 (Chestnut St)	23rd St	44th St	1.70	No	Philadelphia	Philadelphia	29.77	87.76	87.76	PM	14	20	17,543	36,719.74	140,286.25	140,286.25	PM	10:12:00	38:58:06
159	PA 3 (Chestnut St)	Front St	Broad St	1.16	No	Philadelphia	Philadelphia	10.58	100.20	100.20	PM	10	63	5,890	4,378.06	54,446.91	54,446.91	PM	1:12:58	15:07:27
163	PA 3 (Walnut St)	Broad St	23rd St	0.77	No	Philadelphia	Philadelphia	33.25	221.92	221.92	PM	1	17	7,309	18,091.83	149,223.19	149,223.19	PM	5:01:32	41:27:03
162	PA 3 (Walnut St)	Front St	Broad St	1.16	No	Philadelphia	Philadelphia	57.58	131.04	131.04	PM	5	29	8,643	36,283.30	112,162.67	112,162.67	PM	10:04:43	31:09:23
164	PA 3 (Walnut St)	23rd St	44th St	1.69	No	Philadelphia	Philadelphia	12.36	90.17	90.17	PM	12	33	12,805	10,162.37	104,623.20	104,623.20	PM	2:49:22	29:03:43
81	PA 3 (West Chester Pk)	US 1	I-476	4.84	No	Haverford	Delaware	76.48	83.37	83.37	PM	16	24	32,899	86,113.31	130,019.13	130,019.13	PM	23:55:13	36:06:59
82	PA 3 (West Chester Pk)	I-476	PA 252	6.74	No	Marple, Newtown	Delaware	30.06	58.84	58.84	PM	32	41	31,750	34,002.94	87,787.01	87,787.01	PM	9:26:43	24:23:07
84	PA 3 (West Chester Pk)	PA 352	US 202	6.35	No	Westtown, East Goshen, West Goshen	Chester	21.37	48.98	48.98	PM	50	52	31,400	24,234.43	72,105.48	72,105.48	PM	6:43:54	20:01:45
85	PA 3 (West Chester Pk)	US 202	US 322 Bus (High St)	3.04	No	West Goshen, West Chester	Chester	4.87	31.54	31.54	PM	96	69	27,615	5,113.58	49,989.91	49,989.91	PM	1:25:14	13:53:10
83	PA 3 (West Chester Pk)	PA 252	PA 352	13.28	No	various	Chester, Delaware	4.58	17.36	17.36	PM	129	125	24,729	4,214.75	20,515.27	20,515.27	PM	1:10:15	5:41:55
107	PA 309	PA 63	PA 113	15.95	No	Montgomery, Hatfield, Hilltown	Montgomery	23.09	49.69	49.69	PM	46	48	36,914	28,142.42	77,588.93	77,588.93	PM	7:49:02	21:33:09
151	PA 309	Bethlehem Rd	Cherry Rd	11.15	No	Richland, Quakertown	Bucks	15.72	42.42	42.42	PM	69	58	34,420	18,265.83	63,696.06	63,696.06	PM	5:04:26	17:41:36
105	PA 309	PA 611	I-276	14.27	Yes	various	Montgomery	20.06	35.72	35.72	PM	86	66	52,526	22,639.38	51,806.83	51,806.83	PM	6:17:19	14:23:27
106	PA 309	I-276	PA 63	10.96	Yes	Upper Dublin, Lower Gwynedd	Montgomery	1.92	7.18	7.18	PM	148	128	64,828	4,072.02	19,736.60	19,736.60	PM	1:07:52	5:28:57
108	PA 309	PA 113	PA 663/PA 313	16.39	No	Hilltown, West Rockhill, Richland	Bucks	0.89	0.92	0.92	PM	165	165	36,263	1,148.88	1,527.86	1,527.86	PM	0:19:09	0:25:28
150	PA 313	PA 309	I-476 NE Ext (Quakertown)	6.53	No	Quakertown, Milford	Bucks	15.90	28.50	28.50	PM	106	106	21,211	11,874.67	27,319.55	27,319.55	PM	3:17:55	7:35:20
148	PA 313	PA 611	PA 563	17.55	No	various	Bucks	15.72	21.77	21.77	PM	125	136	15,913	8,644.55	16,029.39	16,029.39	PM	2:24:05	4:27:09
149	PA 313	PA 563	PA 309	11.36	No	East Rockhill, Richland, Quakertown	Bucks	6.24	11.12	11.12	PM	141	157	12,793	2,747.66	6,298.17	6,298.17	PM	0:45:48	1:44:58
98	PA 332	PA 413 (Newtown Bypass)	I-95	8.97	No	Newtown, Lower Makefield	Bucks	4.08	16.04	16.04	PM	130	108	34,800	4,978.85	26,469.48	26,469.48	PM	1:22:59	7:21:09
97	PA 332	County Line Rd	PA 413 (Newtown Bypass)	19.74	No	Warminister, Northampton, Newtown	Bucks	13.91	25.30	25.30	PM	116	131	16,102	8,076.34	18,159.19	18,159.19	PM	2:14:36	5:02:39
155	PA 352	US 1	PA 3	14.18	No	Middletown, Edgmont, Westtown	Chester, Montgomery	19.36	34.49	34.49	PM	88	109	16,875	11,719.19	25,970.90	25,970.90	PM	3:15:19	7:12:51
154	PA 352	I-95	US 1	11.10	No	various	Delaware	16.55	25.07	25.07	PM	117	130	19,703	11,104.99	18,804.39	18,804.39	PM	3:05:05	5:13:24
139	PA 352/ Boot Rd (SR 2020)	Pottstown Pk	PA 3	12.34	No	East & West Goshen, West Whiteland	Chester	18.04	31.91	31.91	PM	94	126	13,639	9,278.49	20,442.25	20,442.25	PM	2:34:38	5:40:42
129	PA 363 (S Valley Forge Rd)	PA 73 (Skippack Pk)	US 422	15.23	No	Worcester, Lower Providence	Montgomery	31.81	44.90	44.90	PM	61	84	18,153	22,262.90	37,877.85	37,877.85	PM	6:11:03	10:31:18
128	PA 363 (S Valley Forge Rd)	PA 63 (Welsh Rd)	PA 73 (Skippack Pk)	8.65	No	Lansdale, Towamencin, Worcester	Montgomery	35.63	39.03	39.03	PM	76	117	13,098	17,113.71	22,759.02	22,759.02	PM	4:45:14	6:19:19
142	PA 41	US 1	PA 7	10.40	No	London Grove, Avondale, New Garden	Chester	17.17	32.07	32.07	PM	93	116	16,209	9,295.09	22,931.31	22,931.31	PM	2:34:55	6:22:11
144	PA 413	State Line	I-295	10.98	No	Middletown, Bristol	Bucks	24.71	36.60	36.60	PM	82	89	19,451	19,187.59	37,074.66	37,074.66	PM	5:19:48	10:17:55
145	PA 413	I-295	PA 332	11.32	No	Middletown, Langhorne, Langhorne Manor	Bucks	18.44	36.20	36.20	PM	84	102	18,352	11,554.90	30,571.01	30,571.01	PM	3:12:35	8:29:31
124	PA 463	PA 309	PA 611	15.44	No	Montgomery, Horsham	Montgomery	23.74	40.59	40.59	PM	71	86	21,241	17,580.17	37,391.52	37,391.52	PM	4:53:00	10:23:12
123	PA 463	PA 113	PA 309	14.17	No	various	Montgomery	23.25	35.75	35.75	PM	85	118	11,326	10,862.69	22,698.92	22,698.92	PM	3:01:03	6:18:19
103	PA 611	PA 73	I-276	11.23	No	Jenkintown, Abington, Upper Moreland	Montgomery	24.26	62.46	62.46	PM	26	46	28,056	23,525.18	78,938.86	78,938.86	PM	6:32:05	21:55:39
104	PA 611	I-276	US 202	9.10	No	various	Bucks, Montgomery	19.72	46.77	46.77	PM	56	50	35,156	26,534.07	75,398.39	75,398.39	PM	7:22:14	20:56:38
136	PA 611	PA 132 (Street Rd)	US 202	8.85	No	Warrington, Doylestown	Bucks	8.89	28.15	28.15	PM	108	74	35,596	11,412.54	46,325.17	46,325.17	PM	3:10:13	12:52:05
102	PA 611	PA 309	PA 73	3.93	No	Cheltenham	Montgomery	20.55	32.93	32.93	PM	90	80	26,544	19,726.37	39,722.19	39,722.19	PM	5:28:46	11:02:02
147	PA 611	US 202	Stump Rd	14.68	No	Doylestown Twp., Plumstead	Bucks	9.03	14.34	14.34	PM	135	143	24,316	6,702.47	12,399.04	12,399.04	PM	1:51:42	3:26:39
100	PA 611 (Broad St)	Girard St	US 1	7.20	No	Philadelphia	Philadelphia	34.33	88.44	88.44	PM	13	26	29,291	35,008.84	117,893.95	117,893.95	PM	9:43:29	32:44:54
101	PA 611 (Broad St)	US 1	PA 309	5.56	No	Philadelphia	Philadelphia	43.38	86.97	86.97	PM	15	35	26,643	37,636.81	101,186.16	101,186.16	PM	10:27:17	28:06:26
99	PA 611 (Broad St)	Washington Ave	Girard St	5.43	No	Philadelphia	Philadelphia	41.22	79.00	79.00	PM	17	49	23,050	31,013.48	77,272.98	77,272.98	PM	8:36:53	21:27:53
158	PA 611 (S Broad St)	I-76	Washington Ave	2.96	No	Philadelphia	Philadelphia	40.57	52.34	52.34	PM	40	75	18,857	26,632.74	45,399.68	45,399.68	PM	7:23:53	12:36:40
92	PA 63	PA 611 (Easton Rd)	PA 153 (Limekiln Pk)	9.49	No	various	Montgomery	17.22	45.23	45.23	PM	59	76	20,125	12,407.61	44,586.25	44,586.25	PM	3:26:48	12:23:06
94	PA 63	PA 309	I-476	16.57	No	various	Montgomery	27.28	49.78	49.78	PM	45	81	16,584	16,535.72	38,557.05	38,557.05	PM	4:35:36	10:42:37
109	PA 63	US 1	PA 611 (Easton Rd)	14.67	No	Philadelphia, Lower Moreland, Abington	Montgomery, Philadelphia	19.80	37.49	37.49	PM	80	100	15,333	12,198.73	31,167.37	31,167.37	PM	3:23:19	8:39:27
91	PA 63	I-95	US 1	5.80	Yes	Bensalem, Philadelphia	Bucks, Philadelphia	1.01	7.84	7.84	PM	145	112	57,110	2,255.68	23,931.60	23,931.60	PM	0:37:36	6:38:52
93	PA 63	PA 153 (Limekiln Pk)	PA 309	5.52	No	Upper Dublin, Lower Swynedd, Horsham	Montgomery	16.26	29.16	29.16	PM	102	140	10,047	5,724.62	13,267.58	13,267.58	PM	1:35:25	3:41:08
137	PA 724	PA 100	PA 23	18.80	No	various	Chester	8.74	11.16	11.16	PM	140	156	13,881	4,271.07	6,636.19	6,636.19	PM	1:11:11	1:50:36
126	PA 73	PA 309	US 202	12.40	No	Springfield, Whitemarsh, Whitpain	Montgomery	32.73	57.61	57.61	PM	35	78	15,139	17,631.10	40,741.41	40,741.41	PM	4:53:51	11:19:01
125	PA 73	SR 2056 (Washington Lane)	PA 309	7.39	No	Cheltenham, Springfield	Montgomery	29.98	39.13	39.13	PM	75	119	11,387	13,637.85	22,621.33	22,621.33	PM	3:47:18	6:17:01
127	PA 73	US 202	PA 113	15.72	No	Whitpain, Worcester, Skippack	Montgomery	26.45	24.86	26.45	AM	113	137	13,748	12,783.75	15,115.44	15,115.44	PM	3:33:04	4:11:55
112	Ridge Ave	Northwestern Ave (County Line)	I-476	7.59	No	Whitemarsh, Plymouth	Montgomery	16.65	48.17	48.17	PM	53	68	26,153	15,052.95	51,208.75	51,208.75	PM	4:10:53	14:13:29
110	Ridge Ave	Callowhill St	US 1	10.71	No	Philadelphia	Philadelphia	25.57	67.77	67.77	PM	22	97	11,066	9,618.62	33,210.50	33,210.50	PM	2:40:19	9:13:30
111	Ridge Ave	US 1	Northwestern Ave (County Line)	14.35	No	Philadelphia	Philadelphia	26.30	35.23	35.23	PM	87	113	17,681	13,943.89	23,518.75	23,518.75	PM	3:52:24	6:31:59
135	Ridge Pk	I-476	PA 29	19.72	No	various	Montgomery	27.29	45.16	45.16	PM	60	99	18,154	14,931.77	31,846.41	31,846.41	PM	4:08:52	8:50:46
166	Route 90	Richmond St	Betsy Ross Bridge	1.99	Yes	Philadelphia	Philadelphia	0.99	0.38	0.99	AM	164	167	37,657	1,389.16	680.84	1,389.16	AM	0:23:09	0:11:21
132	SR 2017 (Susquehanna Rd)	PA 611	I-276	6.02	No	Abington, Upper Dublin	Montgomery	43.15	58.39	58.39	PM	34	88	14,188	21,609.09	37,208.58	37,208.58	PM	6:00:09	10:20:09
131	Sumneytown Pk	US 202	PA 63 (Forty Foot Rd)	10.76	No	various	Montgomery	40.79	50.33	50.33	PM	44	82	16,901	24,131.82	38,426.94	38,426.94	PM	6:42:12	10:40:27
41	US 1	I-76	PA 611	6.01	Yes	Philadelphia	Philadelphia	22.47	57.23	57.23	PM	37	11	91,080	66,801.18	251,233.67	251,233.67	PM	18:33:21	69:47:14
35	US 1	US 202	US 322	2.05	No	Concord	Delaware	11.47	55.68	55.68	PM	38	34	41,406	16,728.54	103,781.01	103,781.01	PM	4:38:49	28:49:41

Table 3
Continued

								Peak Hour Vehicle Delay per Mile					Peak Hour Total Volume Delay per Mile							
Map ID	Roadway	From Limit	To Limit	Miles	Limited Access	Municipality	County	AM Delay (sec)	PM Delay (sec)	Peak Delay	AM/PM Highest Delay	Rank	Rank	AADT	Volume AM Delay	Volume PM Delay	Total Peak Delay	AM/PM Highest Delay	AM Peak Volume Delay (Hr)	PM Peak Volume Delay (Hr)
38	US 1	I-476	PA 3	8.09	No	Springfield, Upper Darby	Delaware	34.84	57.58	57.58	PM	36	43	31,520	39,279.62	86,455.83	86,455.83	PM	10:54:40	24:00:56
39	US 1	PA 3	US 30 (Girard Ave)	5.57	No	Lower Merion, Haverford	Delaware, Montgomery	28.33	52.12	52.12	PM	41	55	28,706	27,897.88	69,087.02	69,087.02	PM	7:44:58	19:11:27
36	US 1	US 322	PA 352	12.53	No	Concord, Chester Heights, Middletown	Delaware	13.53	37.67	37.67	PM	79	67	28,210	14,238.80	51,598.16	51,598.16	PM	3:57:19	14:19:58
33	US 1	Cypress St (Kennett Square)	PA 52 (Kennett Pk) South	5.14	No	East Marlborough, Kennett	Delaware	9.16	21.91	21.91	PM	124	90	35,244	11,762.36	36,414.60	36,414.60	PM	3:16:02	10:06:55
44	US 1	I-276 Turnpike	I-95	12.03	Yes	Bensalem, Middletown	Bucks	6.15	10.14	10.14	PM	144	104	63,922	14,207.84	29,936.14	29,936.14	PM	3:56:48	8:18:56
34	US 1	PA 52 (Kennett Pk) South	US 202	12.10	No	Pennsbury, Chadds Ford	Chester, Delaware	6.88	15.33	15.33	PM	132	129	28,255	6,902.39	19,644.69	19,644.69	PM	1:55:02	5:27:25
45	US 1	I-95	County Line	12.87	Yes	Falls, Morrisville	Bucks	6.65	3.03	6.65	AM	151	141	50,721	12,657.79	7,306.34	12,657.79	AM	3:30:58	2:01:46
37	US 1	PA 352	I-476	8.72	Yes	Middletown, Upper Providence, Marple	Delaware	3.68	5.33	5.33	PM	154	149	44,138	5,035.27	10,344.68	10,344.68	PM	1:23:55	2:52:25
58	US 1	PA 10	Cypress St (Kennett Square)	29.73	Yes	various	Chester	2.16	1.53	2.16	AM	162	163	26,394	2,399.24	2,041.90	2,399.24	AM	0:39:59	0:34:02
40	US 1 (City Ave)	US 30 (Girard Ave)	I-76	5.91	No	Lower Merion, Philadelphia	Montgomery, Philadelphia	34.00	133.35	133.35	PM	4	15	33,754	41,080.38	203,590.16	203,590.16	PM	11:24:40	56:33:10
42	US 1 (Roosevelt Blvd)	PA 611	PA 73	22.52	No	Philadelphia	Philadelphia	29.26	38.30	38.30	PM	77	56	39,277	44,088.33	67,667.92	67,667.92	PM	12:14:48	18:47:48
43	US 1 (Roosevelt Blvd)	PA 73	I-276 Turnpike	28.59	No	Philadelphia	Philadelphia	12.96	26.80	26.80	PM	111	87	30,353	12,995.57	37,295.58	37,295.58	PM	3:36:36	10:21:36
47	US 13	I-95	Cobbs Creek Pkwy	17.13	No	various	Delaware	25.75	49.05	49.05	PM	49	83	17,222	17,202.71	38,124.10	38,124.10	PM	4:46:43	10:35:24
122	US 13	PA 63	US 1 (Roosevelt Blvd)	13.70	No	Bensalem, Philadelphia	Bucks, Philadelphia	26.41	47.98	47.98	PM	54	91	16,994	16,335.81	36,183.25	36,183.25	PM	4:32:16	10:03:03
121	US 13	I-95	PA 63	14.36	No	Bristol, Bensalem	Bucks	12.51	28.53	28.53	PM	105	120	17,587	7,030.97	21,862.19	21,862.19	PM	1:57:11	6:04:22
46	US 13	County Line	I-95	13.26	No	Chester	Delaware	10.44	26.12	26.12	PM	115	144	10,438	3,985.83	12,383.45	12,383.45	PM	1:06:26	3:26:23
15	US 13	US 1	I-95	13.74	No	Falls, Tullytown, Bristol	Bucks	8.36	10.69	10.69	PM	142	148	20,900	5,986.02	10,395.97	10,395.97	PM	1:39:46	2:53:16
153	US 202	US 1	State Line Rd	6.14	No	Concord, Chadds Ford	Delaware	17.10	60.29	60.29	PM	29	32	39,491	22,631.07	105,063.31	105,063.31	PM	6:17:11	29:11:03
67	US 202	I-76	DeKalb St	5.29	No	Upper Merion	Montgomery	19.54	60.65	60.65	PM	28	38	42,045	27,922.68	97,453.56	97,453.56	PM	7:45:23	27:04:14
66	US 202	US 30	PA 29	9.79	Yes	East Whiteland	Chester	1.12	15.48	15.48	PM	131	72	69,637	2,617.54	47,748.92	47,748.92	PM	0:43:38	13:15:49
69	US 202	Johnson Hwy (202 split)	PA 73 (Skippack Pk)	6.34	No	East Norriton, Whitpain	Montgomery	19.44	46.92	46.92	PM	55	85	17,257	11,840.97	37,459.70	37,459.70	PM	3:17:21	10:24:20
70	US 202	PA 73 (Skippack Pk)	PA 309	10.65	No	Whitpain, Lower Gwynedd, Montgomery	Montgomery	24.18	43.94	43.94	PM	63	92	18,735	16,699.20	35,597.48	35,597.48	PM	4:38:19	9:53:17
68	US 202	DeKalb St	Johnson Hwy (202 split)	10.81	No	Bridgeport, Norristown	Montgomery	29.47	49.43	49.43	PM	48	95	16,535	15,347.55	34,103.07	34,103.07	PM	4:15:48	9:28:23
71	US 202	PA 309	PA 611	14.78	No	Montgomery, Warrington, Doylestown	Bucks, Montgomery	15.01	24.25	24.25	PM	120	124	19,028	9,704.90	20,615.12	20,615.12	PM	2:41:45	5:43:35
65	US 202	PA 3	US 30	9.68	Yes	West Whiteland,West Goshen,East Goshen	Chester	2.52	7.25	7.25	PM	147	133	52,017	5,107.33	16,461.25	16,461.25	PM	1:25:07	4:34:21
73	US 202	PA 413	NJ Border	13.80	No	Buckingham, Solebury	Bucks	9.95	21.31	21.31	PM	127	138	15,775	4,829.85	14,377.67	14,377.67	PM	1:20:30	3:59:38
168	US 202	PA 29	I-76	14.09	Yes	Tredyffrin, Upper Merion	Chester, Montgomery	2.22	3.85	3.85	PM	157	139	82,611	7,058.58	14,216.44	14,216.44	PM	1:57:39	3:56:56
72	US 202	PA 611	PA 413	9.92	No	Doylestown, Buckingham	Bucks	3.97	5.25	5.25	PM	155	160	14,639	2,170.47	3,825.41	3,825.41	PM	0:36:10	1:03:45
152	US 202 Bus	PA 611	County Line Rd	10.75	No	various	Bucks	12.87	31.22	31.22	PM	97	127	13,078	6,248.11	20,253.46	20,253.46	PM	1:44:08	5:37:33
52	US 30	PA 252 (Leopard Rd)	US 202	11.59	No	Tredyffrin, Willistown, East Whiteland	Chester	24.06	54.33	54.33	PM	39	71	20,697	18,149.05	48,409.47	48,409.47	PM	5:02:29	13:26:49
50	US 30	US 1 (City Ave)	I-476	12.68	No	Lower Merion, Radnor	Delaware, Montgomery	13.55	48.24	48.24	PM	52	73	20,582	9,726.87	46,432.51	46,432.51	PM	2:42:07	12:53:53
51	US 30	I-476	PA 252 (Leopard Rd)	13.83	No	Radnor, Tredyffrin, Easttown	Chester, Delaware	12.97	37.79	37.79	PM	78	93	18,817	9,426.62	35,426.39	35,426.39	PM	2:37:07	9:50:26
48	US 30 (Girard Ave)	US 13 (N 33rd St)	Lancaster Ave	2.96	No	Philadelphia	Philadelphia	49.69	119.22	119.22	PM	8	21	21,484	43,150.24	140,280.30	140,280.30	PM	11:59:10	38:58:00
49	US 30 (Lancaster Ave)	Girard Ave	US 1 (City Ave)	4.42	No	Philadelphia	Philadelphia	59.16	105.76	105.76	PM	9	62	12,033	25,642.76	57,742.36	57,742.36	PM	7:07:23	16:02:22
53	US 30 (Lancaster Ave)	US 202	US 322 (Downingtown)	13.60	No	Downingtown, East Caln West Whiteland	Chester	14.91	42.91	42.91	PM	66	98	17,777	8,575.40	33,140.35	33,140.35	PM	2:22:55	9:12:20
54	US 30 (Lancaster Ave)	US 322 (Downingtown)	PA (82) Coatesville	13.12	No	Downingtown, Caln, Coatesville	Chester	17.53	29.19	29.19	PM	101	135	12,546	7,436.27	16,359.23	16,359.23	PM	2:03:56	4:32:39
63	US 30 (Lancaster Ave)	Coatesville	US 30 Bypass	11.15	No	Sadsbury, Valley, Coatesville	Chester	6.21	6.92	6.92	PM	150	161	9,860	2,619.20	3,556.92	3,556.92	PM	0:43:39	0:59:17
56	US 30 Bypass	PA 100	US 30 Business	6.44	Yes	West Whiteland, East Caln	Chester	0.87	30.24	30.24	PM	100	57	58,689	1,530.92	64,786.11	64,786.11	PM	0:25:31	17:59:46
57	US 30 Bypass	US 30 Business	Reeceville Rd	13.37	Yes	East Caln, Downingtown, Caln	Chester	30.71	11.48	30.71	AM	98	61	55,792	57,981.19	26,809.48	57,981.19	AM	16:06:21	7:26:49
55	US 30 Bypass	US 202	PA 100	3.60	Yes	West Whiteland	Chester	5.87	4.40	5.87	AM	153	152	40,789	8,393.57	8,062.58	8,393.57	AM	2:19:54	2:14:23
143	US 30 Bypass	Reeceville Rd	PA 10	14.18	Yes	various	Chester	0.53	0.47	0.53	AM	168	168	30,659	682.45	769.63	769.63	PM	0:11:22	0:12:50
60	US 322	PA 452	US 1	12.43	No	Upper Chichester, Bethel, Concord	Delaware	46.12	69.81	69.81	PM	20	51	23,869	39,235.32	74,417.76	74,417.76	PM	10:53:55	20:40:18
140	US 322	PA 82	US 30 Business	10.46	No	various	Chester	45.88	21.04	45.88	AM	57	107	17,305	26,687.75	15,205.17	26,687.75	AM	7:24:48	4:13:25
59	US 322	I-95	PA 452	2.87	No	Upper Chichester	Delaware	13.06	8.85	13.06	AM	138	132	40,516	17,337.70	14,374.99	17,337.70	AM	4:48:58	3:59:35
167	US 322	I-95	Commodore Barry Bridge	2.64	Yes	Chester City	Delaware	1.24	2.31	2.31	PM	161	158	42,196	1,832.57	4,385.76	4,385.76	PM	0:30:33	1:13:06
64	US 322/US 202	US 1	PA 3	13.11	No	various	Chester, Delaware	25.85	39.80	39.80	PM	73	40	49,608	43,390.51	89,157.56	89,157.56	PM	12:03:11	24:45:58
77	US 422	Trooper Rd	US 202	5.35	Yes	Upper Merion, West Norriton	Montgomery	9.32	41.53	41.53	PM	70	22	84,156	27,260.88	136,223.31	136,223.31	PM	7:34:21	37:50:23
76	US 422	Egypt Rd	Trooper Rd	6.81	Yes	Upper Providence, Lower Providence	Montgomery	43.53	36.61	43.53	AM	65	30	67,608	102,297.38	112,136.35	112,136.35	PM	28:24:57	31:08:56
75	US 422	PA 29	Egypt Rd	5.73	Yes	Upper Providence	Montgomery	30.59	11.17	30.59	AM	99	44	79,034	80,778.80	41,480.06	80,778.80	AM	22:26:19	11:31:20
74	US 422	PA 100	PA 29	24.67	Yes	various	Montgomery	3.22	2.14	3.22	AM	158	155	54,359	7,040.31	5,891.28	7,040.31	AM	1:57:20	1:38:11

Most Delayed
Somewhat Delayed
Somewhat Not Delayed
Least Delayed

AM Delay

Table 4

Focus Roadway Facilities in the New Jersey Portion of the DVRPC Region: Peak Travel Time Vehicle and Volume Delay (Sorted by Roadway Name)

								Peak Hour Vehicle Delay per Mile					Peak Hour Total Volume Delay per Mile							
Map ID	Roadway	From Limit	To Limit	Miles	Limited Access	Municipality	County	AM Delay (sec)	PM Delay (sec)	Peak Delay	AM/PM Highest Delay	Rank	Rank	AADT	Volume AM Delay	Volume PM Delay	Total Peak Delay	AM/PM Highest Delay	AM Peak Volume Delay (Hr)	PM Peak Volume Delay (Hr)
210	AC Expressway	Williamstown Rd (Exit 38)	Western Terminus (US 42)	11.12	Yes	Winslow, Gloucester	Camden, Gloucester	1.75	1.84	1.84	PM	97	98	40,788	2,320.09	3,146.02	3,146.02	PM	0:38:40	0:52:26
299	CR 533	NJ 33	US 1	15.09	No	Hamilton, West Windsor	Mercer	10.87	34.43	34.43	PM	29	40	20,545	7,913.51	33,886.05	33,886.05	PM	2:11:54	9:24:46
291	CR 534 (Blackwood-Cementon Rd)	NJ 42	CR 686 (Gibbsboro Rd)	6.81	No	Gloucester, Lindenwold, Pine Hill, Clementon	Camden	15.43	23.26	23.26	PM	57	57	21,280	11,020.09	22,210.19	22,210.19	PM	3:03:40	6:10:10
306	CR 534/CR 640	NJ 41	US 130	10.20	No	Deptford, Woodbury, West Deptford	Burlington	9.13	25.72	25.72	PM	50	68	15,429	4,974.75	18,879.97	18,879.97	PM	1:22:55	5:14:40
255	CR 537 (Marne Hwy)	NJ 73	CR 630 (Woodlane Rd)	25.19	No	various	Burlington	8.15	19.12	19.12	PM	63	84	11,764	3,392.61	11,142.49	11,142.49	PM	0:56:33	3:05:42
303	CR 541/691	CR 537 (Washington St)	US 130	12.45	No	Mt. Holly, Westampton, Burlington	Burlington	10.36	23.47	23.47	PM	56	50	26,656	10,034.59	26,447.49	26,447.49	PM	2:47:15	7:20:47
286	CR 544	NJ 41	US 30	6.24	No	Gloucester, Runnemede, Magnolia	Camden	28.58	28.43	28.58	AM	41	72	14,406	12,202.78	16,730.60	16,730.60	PM	3:23:23	4:38:51
288	CR 544	CR 673	NJ 73	5.88	No	Voorhees, Cherry Hill	Camden	7.21	14.41	14.41	PM	79	73	23,577	6,355.57	16,607.96	16,607.96	PM	1:45:56	4:36:48
287	CR 544 (Evesham Rd)	US 30	CR 673	5.70	No	Magnolia, Lawnside, Voorhees	Camden	20.41	56.98	56.98	PM	3	36	16,258	11,248.66	35,134.32	35,134.32	PM	3:07:29	9:45:34
296	CR 551 (Kings Hwy)	US 30	US 130	6.13	No	various	Camden	16.91	20.98	20.98	PM	60	76	13,978	8,613.90	13,903.61	13,903.61	PM	2:23:34	3:51:44
263	CR 551 (Kings Hwy)	CR 678 (Berkley Rd)	NJ 45	6.64	No	E. Greenwich, W. Deptford, Woodbury	Gloucester	5.38	8.36	8.36	PM	89	96	10,998	2,035.80	4,194.37	4,194.37	PM	0:33:56	1:09:54
265	CR 553 (Kings Hwy)	NJ 55	NJ 47	5.07	No	Mantua, Pitman, Glassboro	Gloucester	6.32	16.02	16.02	PM	72	78	15,592	3,929.92	12,349.85	12,349.85	PM	1:05:30	3:25:50
264	CR 553 (Kings Hwy)	I-295	NJ 55	14.63	No	various	Gloucester	4.48	10.28	10.28	PM	87	91	14,010	2,381.52	7,175.75	7,175.75	PM	0:39:42	1:59:36
282	CR 561	I-295	CR 689 (Berlin - Cross Keys Rd)	14.01	No	various	Camden	15.23	30.72	30.72	PM	39	37	21,703	13,431.24	34,859.42	34,859.42	PM	3:43:51	9:40:59
283	CR 561	I-676	I-295	15.34	No	various	Camden	14.72	26.30	26.30	PM	49	67	14,378	7,664.23	19,116.60	19,116.60	PM	2:07:44	5:18:37
275	CR 571	US 1	US 130	13.89	No	West Windsor, East Windsor	Mercer	11.47	15.97	15.97	PM	73	74	19,455	8,045.49	13,998.24	13,998.24	PM	2:14:05	3:53:18
274	CR 571 (Washington Rd)	NJ 27	US 1	3.30	No	Princeton, West Windsor	Mercer	13.37	43.29	43.29	PM	16	52	13,345	6,244.55	26,150.84	26,150.84	PM	1:44:05	7:15:51
301	CR 583 (Princeton Pk)	I-295	NJ 27	9.90	No	Lawrence, Princeton	Mercer	14.50	31.15	31.15	PM	38	61	13,976	7,605.63	20,352.37	20,352.37	PM	2:06:46	5:39:12
305	CR 603	NJ 70	CR 537 (Marne Hwy)	12.30	No	Evesham, Mt. Laurel, Moorestown	Burlington	13.14	22.83	22.83	PM	58	88	8,838	4,038.23	8,418.57	8,418.57	PM	1:07:18	2:20:19
304	CR 607	NJ 70	CR 537 (Marne Hwy)	10.67	No	Evesham, Mt. Laurel, Moorestown	Burlington	9.97	38.15	38.15	PM	23	59	15,135	4,196.54	21,254.58	21,254.58	PM	1:09:57	5:54:15
307	CR 622 (Olden Av)	I-295	NJ 31	9.74	No	Hamilton, Trenton, Ewing	Mercer	16.51	39.14	39.14	PM	20	34	19,485	11,345.47	36,441.98	36,441.98	PM	3:09:05	10:07:22
284	CR 636	US 30	NJ 38	6.50	No	Haddon, Cherry Hill	Camden	13.61	37.57	37.57	PM	26	30	20,797	9,913.86	38,343.33	38,343.33	PM	2:45:14	10:39:03
300	CR 638	US 1	CR 571	7.78	No	Lawrence, West Windsor	Mercer	13.30	33.54	33.54	PM	33	56	15,031	6,835.82	22,960.80	22,960.80	PM	1:53:56	6:22:41
280	CR 644	Route 90	NJ 70	8.30	No	Cherry Hill, Pennsauken	Camden	5.33	29.78	29.78	PM	40	41	22,760	4,385.85	33,068.09	33,068.09	PM	1:13:06	9:11:08
281	CR 644	NJ 70	CR 561	3.49	No	Cherry Hill, Haddonfield	Camden	22.69	46.24	46.24	PM	11	46	12,628	9,374.11	29,414.48	29,414.48	PM	2:36:14	8:10:14
289	CR 673 (Springdale Rd)	CR 561 (Haddonfield-Berlin Rd)	CR 616 (Church Rd)	10.34	No	Voorhees, Cherry Hill, Mount Laurel	Camden	12.68	37.30	37.30	PM	27	44	19,895	9,424.92	31,440.48	31,440.48	PM	2:37:05	8:44:00
290	CR 673 (White Horse Rd)	CR 561 (Haddonfield-Berlin Rd)	CR 534 (Blackwood-Cementon Rd)	8.24	No	various	Camden	32.71	50.33	50.33	PM	6	32	19,558	22,735.32	37,059.11	37,059.11	PM	6:18:55	10:17:39
292	CR 686 (Gibbsboro Rd)	CR 534 (Blackwood-Cementon Rd)	CR 561 (Lakeview Dr)	5.87	No	Cementon, Lindenwold, Gibbsboro	Camden	19.62	44.26	44.26	PM	13	39	14,785	11,278.17	34,004.85	34,004.85	PM	3:07:58	9:26:45
293	CR 689 (Berlin - Cross Keys Rd)	NJ 42	AC Expressway	14.38	No	Winslow, Gloucester, Pine Hill, Berlin	Camden	11.18	25.11	25.11	PM	52	47	23,095	8,696.76	28,926.00	28,926.00	PM	2:24:57	8:02:06
226	I-195	I-295	I-95 (NJ Turnpike)	11.61	Yes	Hamilton, Robbinsville	Mercer	4.63	26.66	26.66	PM	46	12	75,764	13,353.77	91,271.59	91,271.59	PM	3:42:34	25:21:12
208	I-295	NJ 42 (Exit 26)	NJ 70 (Exit 34)	14.24	Yes	various	Camden	17.30	39.22	39.22	PM	19	3	112,610	68,780.62	199,618.25	199,618.25	PM	19:06:21	55:26:58
277	I-295	NJ 31	NJ 29	9.18	Yes	Hopewell, Ewing	Mercer	1.62	33.78	33.78	PM	31	10	62,566	3,659.17	97,608.91	97,608.91	PM	1:00:59	27:06:49
209	I-295	NJ 70 (Exit 34)	NJ 541 (Exit 47)	25.76	Yes	various	Camden, Burlington	1.20	15.13	15.13	PM	76	18	95,242	4,139.95	65,514.54	65,514.54	PM	1:09:00	18:11:55
276	I-295	US 1	NJ 31	9.57	Yes	Hopewell, Lawrence	Mercer	4.23	15.61	15.61	PM	75	19	86,352	13,803.34	64,533.49	64,533.49	PM	3:50:03	17:55:33
207	I-295	US 130	NJ 42 (Exit 26)	8.00	Yes	West Deptford, Westville, Bellmawr	Camden	14.25	7.70	14.25	AM	80	24	106,849	53,049.82	37,458.06	53,049.82	AM	14:44:10	10:24:18
203	I-295	CR 656 (Florence Columbus Rd)	I-195	16.93	Yes	various	Burlington	2.23	2.65	2.65	PM	94	82	90,445	6,785.98	11,307.18	11,307.18	PM	1:53:06	3:08:27
229	I-295	I-195	US 1	13.21	Yes	Hamilton, Lawrence	Mercer	3.46	1.84	3.46	AM	93	85	85,673	10,668.69	7,164.47	10,668.69	AM	2:57:49	1:59:24
230	I-295	CR 541 (Mt. Holly Rd)	CR 656 (Florence Columbus Rd)	9.61	Yes	Burlington, Springfield, Florence	Burlington	1.24	0.95	1.24	AM	99	97	84,638	3,851.07	3,669.20	3,851.07	AM	1:04:11	1:01:09
227	I-676	I-76	Benjamin Franklin Bridge	8.83	Yes	Camden City	Camden	3.44	44.60	44.60	PM	12	4	77,733	10,178.15	183,891.55	183,891.55	PM	2:49:38	51:04:52
228	I-76	Walt Whitman Bridge	I-295	6.53	Yes	Camden City, Gloucester City, Bellmawr	Camden	3.04	39.54	39.54	PM	18	1	136,800	15,658.72	233,213.46	233,213.46	PM	4:20:59	64:46:53
225	I-95	State Line	NJ Turnpike	12.46	Yes	Burlington, Florence, Mansfield	Burlington	0.88	0.88	0.88	AM	102	107	38,966	1,166.32	1,481.91	1,481.91	PM	0:19:26	0:24:42
298	NJ 129	NJ 29	US 1	3.88	No	Trenton, Hamilton	Mercer	32.96	46.52	46.52	PM	9	22	28,640	31,202.65	56,567.50	56,567.50	PM	8:40:03	15:42:47
297	NJ 168	I-295	CR 561 (Haddon Av)	9.40	No	various	Camden	17.54	46.34	46.34	PM	10	29	17,771	11,571.19	38,448.43	38,448.43	PM	3:12:51	10:40:48
213	NJ 168	NJ 42	AC Expressway	7.24	No	Gloucester	Camden	15.65	25.30	25.30	PM	51	69	12,801	7,242.69	17,724.14	17,724.14	PM	2:00:43	4:55:24
212	NJ 168 (Black Horse Pk)	I-295	NJ 42	7.91	No	Gloucester City, Runnemede, Bellmawr	Camden	42.96	66.24	66.24	PM	2	20	19,114	28,864.39	61,601.89	61,601.89	PM	8:01:04	17:06:42
243	NJ 29	Cass St	CR 579 (Sullivan Way)	6.53	No	City of Trenton	Mercer	7.23	27.80	27.80	PM	43	26	46,281	8,559.00	49,341.82	49,341.82	PM	2:22:39	13:42:22
278	NJ 29	Cass St	I-295	6.85	Yes	City of Trenton, Hamilton	Mercer	9.59	6.46	9.59	AM	88	62	60,687	20,196.26	18,347.94	20,196.26	AM	5:36:36	5:05:48
245	NJ 29	CR 579 (Sullivan Way)	I-295	5.39	Yes	City of Trenton, Ewing	Mercer	3.32	5.89	5.89	PM	92	94	20,305	2,337.47	5,602.29	5,602.29	PM	0:38:57	1:33:22
247	NJ 31	I-295	CR 623 (Pennington Harbourton Rd)	6.92	No	Hopewell, Pennington	Mercer	11.61	18.78	18.78	PM	65	60	26,968	9,942.13	20,860.03	20,860.03	PM	2:45:42	5:47:40
248	NJ 31	CR 623 (Pennington Harbourton Rd)	CR 518 (Lambertville Hopewell Rd)	8.48	No	Hopewell	Mercer	5.25	13.39	13.39	PM	81	80	18,658	3,572.27	12,271.21	12,271.21	PM	0:59:32	3:24:31
244	NJ 31	US 206	CR 622 (Olden Ave)	3.68	No	City of Trenton, Ewing	Mercer	8.78	16.80	16.80	PM	70	89	9,962	3,230.71	8,066.65	8,066.65	PM	0:53:51	2:14:27
246	NJ 31	CR 622 (Olden Ave)	I-295	5.67	No	Ewing	Mercer	7.45	10.37	10.37	PM	86	90	15,428	3,921.06	7,444.63	7,444.63	PM	1:05:21	2:04:05
251	NJ 33	I-295	US 130	9.00	No	Robbinsville, Hamilton	Mercer	5.17	31.55	31.55	PM	37	53	18,252	3,170.34	25,856.22	25,856.22	PM	0:52:50	7:10:56
249	NJ 33	US 1	CR 622 (Olden Ave)	2.47	No	City of Trenton	Mercer	10.82	34.23	34.23	PM	30	66	13,158	4,980.01	19,783.74	19,783.74	PM	1:23:00	5:29:44
250	NJ 33	CR 622 (Olden Ave)	I-295	3.94	No	City of Trenton, Hamilton	Mercer	9.30	18.63	18.63	PM	66	77	15,310	5,163.42	12,732.12	12,732.12	PM	1:26:03	3:32:12
253	NJ 38	NJ 73	I-295	8.20	No	Maple Shade, Moorestown, Mt. Laurel	Burlington	10.82	54.90	54.90	PM	4	9	45,027	17,004.42	110,349.92	110,349.92	PM	4:43:24	30:39:10
252	NJ 38	US 130	NJ 73	10.47	No	Maple Shade, Cherry Hill, Pennsauken	Burlington, Camden	5.46	33.62	33.62	PM	32	16	57,709	10,443.51	85,778.94	85,778.94	PM	2:54:04	23:49:39
254	NJ 38	I-295	US 206	19.54	No	various	Burlington	4.34	13.23	13.23	PM	82	64	34,946	5,275.50	20,030.94	20,030.94	PM	1:27:56	5:33:51
294	NJ 41	NJ 70	NJ 38	5.43	No	Cherry Hill, Maple Shade	Camden, Burlington	11.98	47.76	47.76	PM	8	21	26,722	11,320.36	60,204.71	60,204.71	PM	3:08:40	16:43:25

Table 4
Continued

Map ID	Roadway	From Limit	To Limit	Miles	Limited Access	Municipality	County	Peak Hour Vehicle Delay per Mile: AM Delay (sec)	PM Delay (sec)	Peak Delay	AM/PM Highest Delay	Rank	Peak Hour Total Volume Delay per Mile: Rank	AADT	Volume AM Delay	Volume PM Delay	Total Peak Delay	AM/PM Highest Delay	AM Peak Volume Delay (Hr)	PM Peak Volume Delay (Hr)
285	NJ 41	NJ 42	US 30	7.87	No	Deptford, Runnemede, Barrington	Camden, Gloucester	30.85	50.39	50.39	PM	5	35	16,734	15,762.01	35,795.45	35,795.45	PM	4:22:42	9:56:35
262	NJ 41	NJ 42	NJ 47	6.87	no	Deptford	Gloucester	20.61	27.41	27.41	PM	44	63	16,418	11,042.98	20,108.72	20,108.72	PM	3:04:03	5:35:09
295	NJ 41 (Kings Highway)/ CR 551	NJ 70	US 30	6.56	No	Haddon Heights, Haddonfield, Cherry Hill	Camden	24.20	38.13	38.13	PM	24	58	10,635	10,011.66	21,906.76	21,906.76	PM	2:46:52	6:05:07
211	NJ 42	AC Expressway	I-295	16.39	Yes	various	Camden, Gloucester	26.54	5.51	26.54	AM	47	8	112,270	112,469.85	30,115.07	112,469.85	AM	31:14:30	8:21:55
266	NJ 42	AC Expressway	US 322	12.85	Yes	Washington, Monroe	Gloucester	4.04	20.21	20.21	PM	61	31	36,486	6,204.21	37,284.13	37,284.13	PM	1:43:24	10:21:24
260	NJ 45	US 130	Kings Hwy	6.11	No	Woodbury, West Deptford, Westville	Gloucester	16.38	38.77	38.77	PM	21	38	16,837	11,381.73	34,258.15	34,258.15	PM	3:09:42	9:30:58
261	NJ 45	Kings Hwy	US 322	14.61	No	various	Gloucester	5.06	14.49	14.49	PM	78	83	16,712	2,767.37	11,295.62	11,295.62	PM	0:46:07	3:08:16
257	NJ 47	NJ 55	US 322	13.22	No	Deptford, Washington, Glassboro	Gloucester	7.21	24.74	24.74	PM	53	55	17,867	5,010.66	23,419.28	23,419.28	PM	1:23:31	6:30:19
256	NJ 47	US 130	NJ 55	11.22	No	Deptford, Westville	Gloucester	19.30	14.39	19.30	AM	62	86	15,162	10,418.07	10,186.32	10,418.07	AM	2:53:38	2:49:46
258	NJ 55	NJ 42	NJ 47	8.05	Yes	Deptford	Gloucester	42.30	12.41	42.30	AM	17	11	70,260	93,443.25	35,271.82	93,443.25	AM	25:57:23	9:47:52
259	NJ 55	NJ 47	US 322	12.63	Yes	Deptford, Washington, Mantua	Gloucester	0.83	0.78	0.83	AM	104	102	65,149	1,831.82	2,168.38	2,168.38	PM	0:30:32	0:36:08
267	NJ 70	NJ 38	I-295	10.16	No	Pennsauken, Cherry Hill	Camden	7.19	38.23	38.23	PM	22	13	52,231	13,161.97	90,246.83	90,246.83	PM	3:39:22	25:04:07
268	NJ 70	I-295	NJ 73	6.65	No	Cherry Hill, Evesham	Camden, Burlington	15.42	37.59	37.59	PM	25	15	50,949	26,491.45	87,400.29	87,400.29	PM	7:21:31	24:16:40
269	NJ 70	NJ 73	Eayrestown Rd	13.22	No	Evesham, Medford	Burlington	12.46	31.98	31.98	PM	35	28	27,330	11,613.84	42,505.05	42,505.05	PM	3:13:34	11:48:25
272	NJ 73	NJ Turnpike (Exit 4)	NJ 70	5.73	No	Mt. Laurel, Evesham	Burlington	20.75	78.77	78.77	PM	1	2	56,512	47,897.58	226,904.70	226,904.70	PM	13:18:18	63:01:45
271	NJ 73	US 130	NJ Turnpike (Exit 4)	10.40	No	various	Camden, Burlington	11.07	31.68	31.68	PM	36	14	59,166	23,176.10	88,448.53	88,448.53	PM	6:26:16	24:34:09
273	NJ 73	NJ 70	US 30	17.55	No	Berlin, Voorhees, Evesham	Camden, Burlington	14.34	28.00	28.00	PM	42	23	43,207	22,855.45	56,309.11	56,309.11	PM	6:20:55	15:38:29
270	NJ 73	Tacony Palmyra Bridge	US 130	5.56	No	Palmyra, Pennsauken	Camden, Burlington	2.47	11.01	11.01	PM	85	54	45,675	4,066.95	25,035.79	25,035.79	PM	1:07:47	6:57:16
302	NJ 90	Betsy Ross Bridge	NJ 73	6.59	Yes	Pennsauken	Burlington, Camden	1.61	1.22	1.61	AM	98	105	33,503	1,878.40	1,786.73	1,878.40	AM	0:31:18	0:29:47
206	NJ Turnpike	Exit 4 (Camden - Philadelphia)	Exit 5 (Burlington - Mt. Holly)	19.83	Yes	Mount Laurel, Westampton	Burlington	0.54	2.33	2.33	PM	95	92	63,948	1,206.81	6,709.00	6,709.00	PM	0:20:07	1:51:49
205	NJ Turnpike	Exit 3 (Woodbury - South Camden)	Exit 4 (Camden - Philadelphia)	17.01	Yes	various	Camden	0.54	1.92	1.92	PM	96	95	63,547	1,214.84	5,519.79	5,519.79	PM	0:20:15	1:32:00
279	NJ Turnpike	Exit 7 (Bordentown - Trenton)	Exit 7A (Trenton - Hamilton Twp)	26.27	Yes	various	Burlington, Mercer	0.97	0.92	0.97	AM	101	99	61,560	2,088.55	2,556.85	2,556.85	PM	0:34:49	0:42:37
201	NJ Turnpike	Exit 6 (PA Turnpike)	Exit 7 (Bordentown - Trenton)	11.25	Yes	various	Burlington	0.72	0.87	0.87	PM	103	101	49,836	1,448.93	2,232.15	2,232.15	PM	0:24:09	0:37:12
200	NJ Turnpike	Exit 5 (Burlington - Mt. Holly)	Exit 6 (PA Turnpike)	16.09	Yes	various	Burlington	0.83	0.49	0.83	AM	105	103	68,621	2,076.14	1,782.74	2,076.14	AM	0:34:36	0:29:43
202	NJ Turnpike	Exit 7A (Trenton - Hamilton Twp)	Exit 8 (Hightstown - Freehold)	34.64	Yes	Robbinsville, East Windsor	Mercer	0.67	0.45	0.67	AM	107	106	67,294	1,578.62	1,359.45	1,578.62	AM	0:26:19	0:22:39
204	NJ Turnpike	Exit 2 (Swedesboro-Glassboro)	Exit 3 (Woodbury - South Camden)	25.67	Yes	various	Gloucester	0.20	0.23	0.23	PM	108	108	54,358	377.36	550.50	550.50	PM	0:06:17	0:09:10
214	Sicklerville Rd/ 536 Spur	AC Expressway	NJ 42	12.41	No	Winslow, Camden	Camden	9.46	11.42	11.42	PM	83	87	16,173	6,737.60	9,311.38	9,311.38	PM	1:52:18	2:35:11
218	US 1	Alexander Rd	County Line	2.76	No	West Windsor	Mercer	14.23	43.71	43.71	PM	15	5	84,131	42,186.83	169,116.05	169,116.05	PM	11:43:07	46:58:36
217	US 1	I-295	Alexander Rd	8.68	No	Lawrence, West Windsor	Mercer	3.80	34.44	34.44	PM	28	6	88,123	14,137.27	136,719.97	136,719.97	PM	3:55:37	37:58:40
216	US 1	CR 616 (Whitehead Rd)	I-295	6.17	Yes	Lawrence	Mercer	10.36	16.66	16.66	PM	71	27	50,215	21,245.57	46,274.91	46,274.91	PM	5:54:06	12:51:15
215	US 1	Delaware River	CR 616 (Whitehead Rd)	7.43	Yes	Trenton, Lawrence	Mercer	3.75	17.37	17.37	PM	68	33	51,901	6,776.53	37,047.80	37,047.80	PM	1:52:57	10:17:28
236	US 130	US 30	I-76	4.46	No	various	Camden	4.46	44.14	44.14	PM	14	7	56,493	8,639.49	115,658.47	115,658.47	PM	2:23:59	32:07:38
235	US 130	NJ 73	US 30	10.36	No	Pennsauken	Camden	7.74	22.54	22.54	PM	59	25	50,494	13,646.35	51,847.46	51,847.46	PM	3:47:26	14:24:07
237	US 130	I-76	I-295	6.09	No	various	Camden, Gloucester	16.37	23.72	23.72	PM	54	42	27,311	17,071.79	32,129.40	32,129.40	PM	4:44:32	8:55:29
234	US 130	I-95	NJ 73	29.45	No	various	Burlington	9.41	15.01	15.01	PM	77	45	42,288	14,160.15	29,773.12	29,773.12	PM	3:56:00	8:16:13
231	US 130	NJ 133	I-195	15.22	No	Hamilton, Robbinsville, East Windsor	Mercer	7.82	19.00	19.00	PM	64	48	32,076	9,158.99	28,872.53	28,872.53	PM	2:32:39	8:01:13
233	US 130	I-295	I-95	9.30	No	Florence, Mansfield, Bordentown	Burlington	5.13	15.84	15.84	PM	74	65	27,672	4,928.75	19,937.42	19,937.42	PM	1:22:09	5:32:17
232	US 130	I-195	I-295	13.26	No	Bordentown, Hamilton	Burlington, Mercer	4.56	11.23	11.23	PM	84	75	29,134	5,054.50	13,922.79	13,922.79	PM	1:24:14	3:52:03
238	US 130/I-295	I-295	US 322	24.09	Yes	various	Gloucester	0.75	0.72	0.75	AM	106	100	74,513	1,857.10	2,317.62	2,317.62	PM	0:30:57	0:38:38
221	US 206	CR 604 (Elm Rd)	County Line	7.01	No	Princeton	Mercer	22.10	32.99	32.99	PM	34	51	18,500	13,432.99	26,192.31	26,192.31	PM	3:43:53	7:16:32
219	US 206	I-195	I-295	16.93	No	Hamilton, Trenton, Lawrence	Mercer	21.91	23.54	23.54	PM	55	71	15,023	10,844.37	17,037.52	17,037.52	PM	3:00:44	4:43:58
220	US 206	I-295	CR 604 (Elm Rd)	11.08	No	Lawrence, Princeton	Mercer	12.24	17.09	17.09	PM	69	81	15,501	6,730.51	12,116.46	12,116.46	PM	1:52:11	3:21:56
223	US 30	US 130	I-295	10.15	No	various	Camden	12.75	47.94	47.94	PM	7	17	33,962	11,105.68	75,012.94	75,012.94	PM	3:05:06	20:50:13
224	US 30	I-295	NJ 73	20.91	No	various	Camden	19.12	26.48	26.48	PM	48	43	24,218	17,748.20	31,536.10	31,536.10	PM	4:55:48	8:45:36
222	US 30	I-676	US 130	4.06	Yes	Camden City	Camden	1.01	8.06	8.06	PM	90	49	77,077	2,520.65	27,022.52	27,022.52	PM	0:42:01	7:30:23
240	US 322	I-295	NJ Turnpike	8.12	No	Logan, Woolwich	Gloucester	17.46	27.13	27.13	PM	45	70	16,889	8,289.61	17,387.49	17,387.49	PM	2:18:10	4:49:47
242	US 322	NJ 55	NJ 42	19.08	No	Harrison, Glassboro, Monroe	Gloucester	10.86	18.56	18.56	PM	67	79	14,381	5,647.90	12,279.70	12,279.70	PM	1:34:08	3:24:40
241	US 322	NJ Turnpike (Exit 2)	NJ 55	14.18	No	Woolwich, Harrison	Gloucester	6.54	6.96	6.96	PM	91	93	18,963	4,011.66	5,751.31	5,751.31	PM	1:06:52	1:35:51
239	US 322	Commodore Barry Bridge	I-295	7.59	Yes	Logan	Gloucester	1.14	1.21	1.21	PM	100	104	33,420	1,503.74	2,065.83	2,065.83	PM	0:25:04	0:34:26

Most Delayed
Somewhat Delayed
Somewhat Not Delayed
Least Delayed

AM Delay

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4.2 Most Congested Focus Roadway Facilities

The top five focus roadway facilities with the highest peak vehicle delay and volume delay using both travel times and planning times were identified separately for the Pennsylvania and New Jersey portions of the DVRPC region. Some facilities were in the top five for both delay measures for travel times and planning times, which resulted in 10 and 11 of the most congested roadway facilities in the Pennsylvania and New Jersey portions of the DVRPC region, respectively (see Table 5). These facilities are listed in ascending order by roadway name, along with the map identifier, from and to limit, and municipality and the county in which they are located. The number of most congested focus roadway facilities is limited due to the importance of targeting locations with the worst traffic congestion and due to funding availability. Some of these facilities are part of projects programmed on the Pennsylvania TIP (Fiscal Year [FY] 2019–22) and New Jersey TIP (FY 2020–23), and others are on the Long-Range Plan (*Connections 2045*). Facilities not ranked as the most congested should also be considered for improvements, but weighed against other regional priorities and the region's extreme funding constraint.

Focus Roadway Facility Summaries

The following pages include a map summary of each of the most congested focus roadway facilities in the order listed in Table 5, along with a map title indicating the facility map identifier and name. Each summary page provides the following information:

Main Map
Shows the location of the most congested roadway facility, along with road segments that show high congestion indicated by the TTI measure (TTI 1.5 or more, and TTI 2.0 or more).

Summary of Conditions
Provides information on delay measure rankings, and other roadway facility characteristics related to congestion.

Congestion Measures
Lists the congestion performance measures for the most congested roadway facility. The peak travel time (TT) and planning time (PT), and peak vehicle and volume delay measures are derived from the INRIX travel time data. The volume delay measure is, in part, based on PennDOT, NJDOT, and DVRPC collected traffic volumes. The LOTTR, TTTR, and PHED are PM3 measures from the NPMRDS database, and high growth V/C forecasted congestion is from the DVRPC regional Travel Demand Model.

Planned Improvements on the Long-Range Plan and TIP
Indicates existing projects on the roadway facility that are programmed on the Pennsylvania TIP (FY 2019–22), New Jersey TIP (FY 2020–23), and the Long-Range Plan (*Connections 2045*). Long-Range Plan projects indicated with a letter designate transit projects, and ones with a number designate road projects.

Very Appropriate Strategies
Indicates the most appropriate strategies to mitigate congestion for the roadway facility.

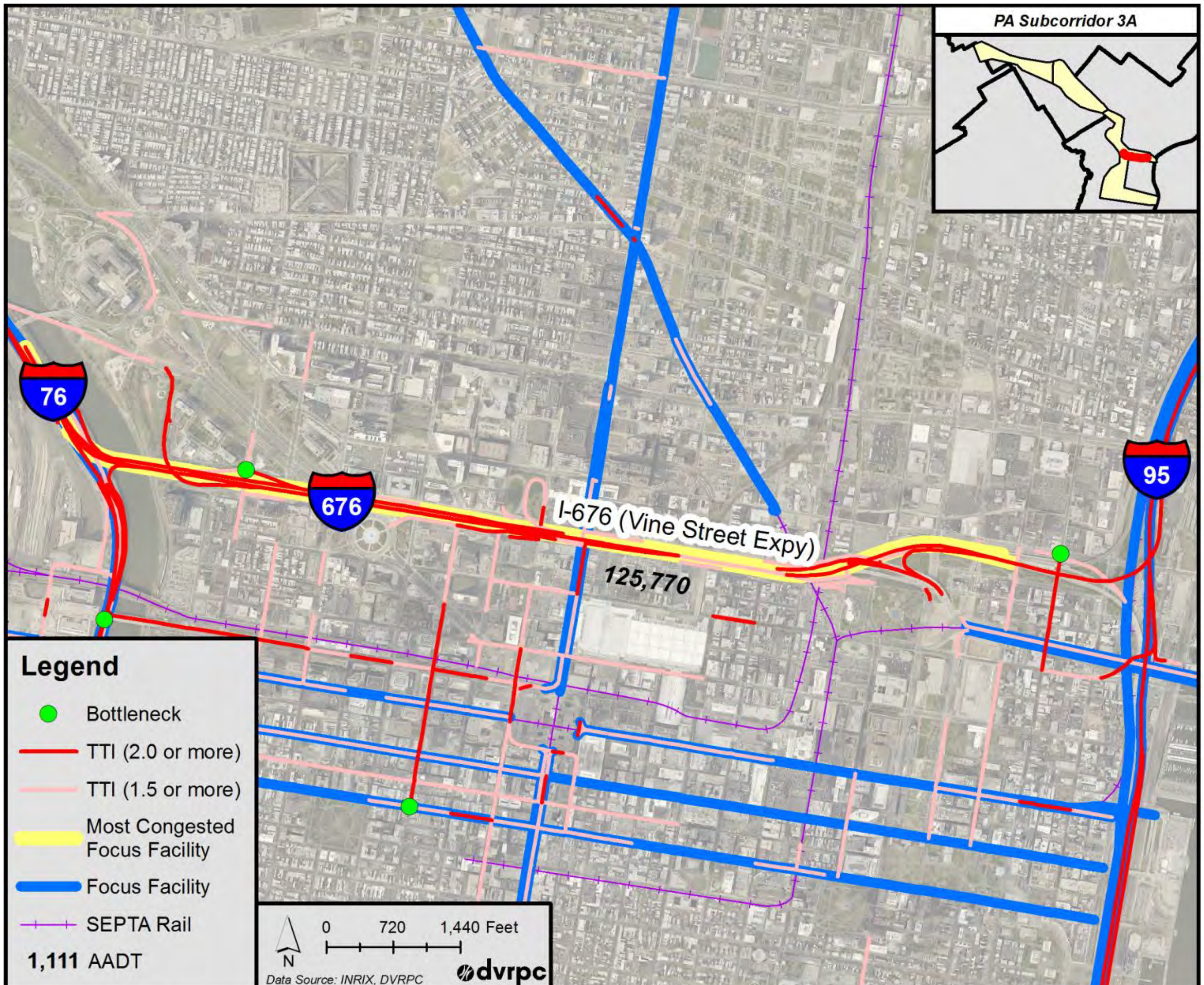
Additional Factors
Provides additional information for the roadway facility location that may affect mitigation strategies, and investment decisions. This includes whether it is on the NHS, along a bus transit route, near a park and ride lot, associated with high crash frequency or severity, or is part of a signal system (only arterial

roadways). It also indicates the number of focus intersection bottlenecks and associated high congestion segments (TTI 2.5 or more).

Table 5: Most Congested Focus Roadway Facilities

Map ID	Roadway	From Limit	To Limit	Municipality	County
Pennsylvania					
117	I-676 (Vine Street Expy)	I-76	I-95	Philadelphia	Philadelphia
17	I-76	I-676 (Vine Street Expy)	US 30 (Girard Ave)	Philadelphia	Philadelphia
18	I-76	US 30 (Girard Ave)	US 1 (City Ave)	Philadelphia	Philadelphia
28	I-95	Frankford Ave	I-76 (Walt Whitman Bridge)	Philadelphia	Philadelphia
27	I-95	PA 90 (Betsy Ross Bridge)	Frankford Ave	Philadelphia	Philadelphia
78	Market St	I-95 (Penns Landing)	PA 611 (Broad St)	Philadelphia	Philadelphia
160	PA 3 (Chestnut St)	Broad St	23rd St	Philadelphia	Philadelphia
163	PA 3 (Walnut St)	Broad St	23rd St	Philadelphia	Philadelphia
162	PA 3 (Walnut St)	Front St	Broad St	Philadelphia	Philadelphia
40	US 1 (City Ave)	US 30 (Lancaster Ave)	I-76	Lower Merion, Philadelphia	Montgomery, Philadelphia
New Jersey					
287	CR 544 (Evesham Rd)	US 30	CR 673	Magnolia, Lawnside, Voorhees	Camden
208	I-295	NJ 42 (Exit 26)	NJ 70 (Exit 34)	Various	Camden
227	I-676	Benjamin Franklin Bridge	I-76 (Walt Whitman Bridge)	Camden City	Camden
228	I-76	Walt Whitman Bridge	I-295	Camden City, Gloucester City, Bellmawr	Camden
212	NJ 168 (Black Horse Pk)	I-295	NJ 42	Gloucester City, Runnemede, Bellmawr	Camden
253	NJ 38	NJ 73	I-295	Maple Shade, Moorestown, Mt. Laurel	Burlington
285	NJ 41	NJ 42	US 30	Deptford, Runnemede, Barrington	Camden, Gloucester
294	NJ 41	NJ 70	NJ 38	Cherry Hill, Maple Shade	Camden, Burlington
272	NJ 73	NJ Turnpike (Exit 4)	NJ 70	Mt. Laurel, Evesham	Burlington
218	US 1	Alexander Rd	County Line	West Windsor	Mercer
217	US 1	I-295	Alexander Rd	Lawrence, West Windsor	Mercer

Figure 17: Facility 117
I-676 (Vine Street Expy) from I-76 to I-95, Philadelphia PA



Summary of Conditions

I-676 (Vine Street Expy) from I-76 to I-95 in the City of Philadelphia is ranked **#3** and **#1** in peak travel time vehicle and volume delay, respectively, and **#7** and **#1** in peak planning time vehicle and volume delay, respectively. The limited access interstate contains three travel lanes in each direction.

Congestion Measures

TT PM Peak Vehicle Delay (sec):	162.29
PT PM Peak Vehicle Delay (sec):	349.47
Facility Miles:	4.11
TT PM Peak Volume Delay (hr):	256:33:05
PT PM Peak Volume Delay (hr):	547:50:18
High Level of Travel Time Reliability:	Yes
High Truck Travel Time Reliability:	Yes
High Peak Hour Excessive Delay:	Yes
TDM Forecasted Congestion (miles):	0.33

Planned Improvements on 2045 LRP & FY 2019-22 TIP

* 2045 LRP: MRP X - South Jersey BRT; #192 - Vine St Expy Cap; #193 - 30th St Station
* FY 2019-22 TIP: MPMS #91490 - Signal/ITS improvements

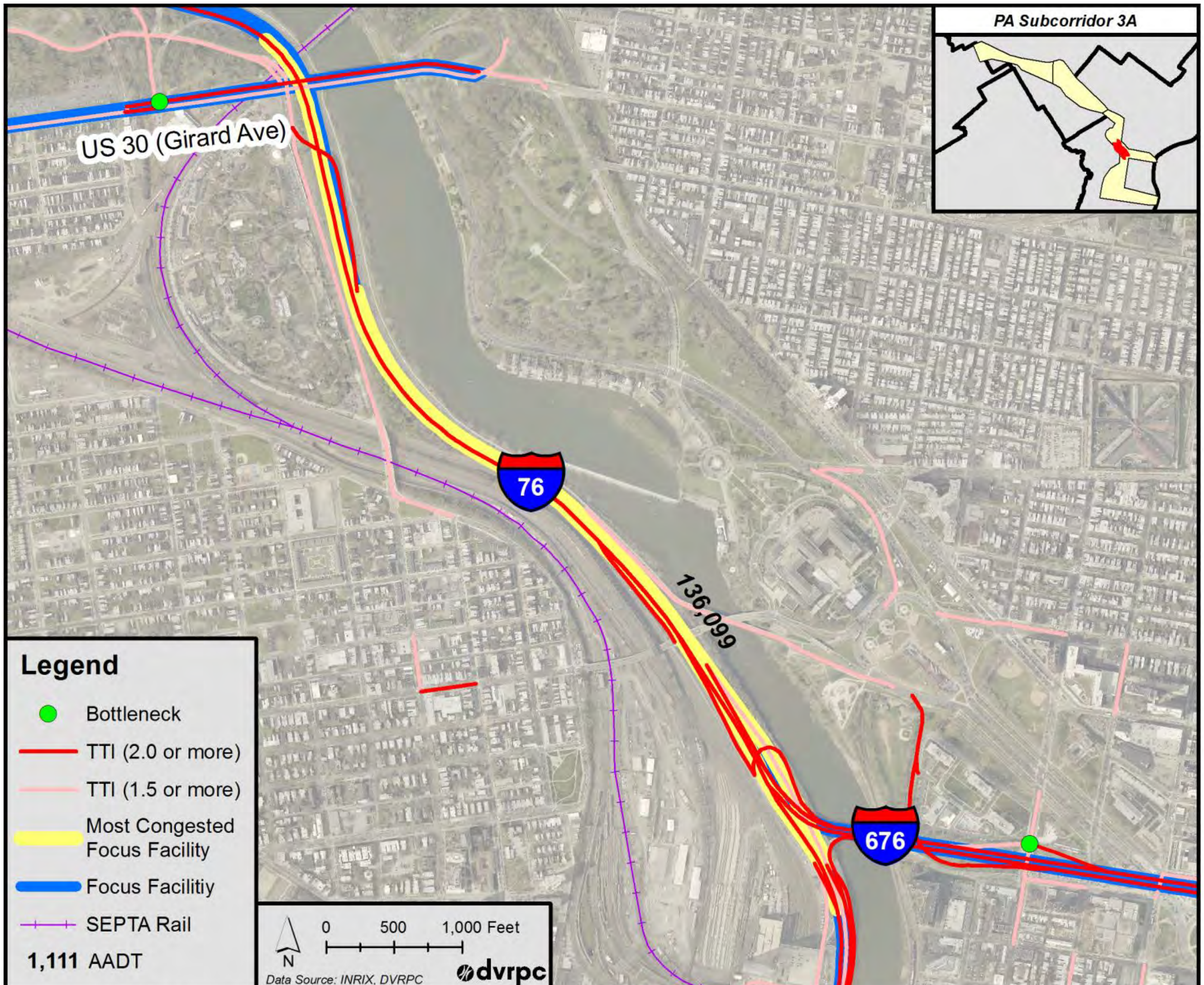
Very Appropriate Strategies

1) Intelligent Transportation Systems (ITS)
2) Integrated Corridor Management (ICM)
3) Incident Management
4) Signal Improvements
5) Transit Infrastructure Improvements
6) Expanded Parking for Existing Transit Stations (including remote, all modes)

Additional Factors

National Highway System:	Yes
DVRPC High Crash Frequency:	Yes
DVRPC High Crash Severity:	Yes
Transit Route:	Yes
Park and Ride:	No
Bottleneck Intersections, Segments:	0,14
Traffic Signals:	N/A
AADT:	125,770

Figure 18: Facility 17
I-76 from I-676 (Vine Street Expy) to US 30 (Girard Ave), Philadelphia PA



Summary of Conditions

I-76 (Schuylkill Expy) from I-676 (Vine Street Expy) to US 30 (Girard Ave) in the City of Philadelphia is ranked **#7** and **#2** in peak travel time vehicle and volume delay, respectively, and **#14** and **#3** in peak planning time vehicle and volume delay, respectively. I-76 is a limited access interstate roadway that contains three travel lanes in each direction.

Congestion Measures	
TT PM Peak Vehicle Delay (sec):	119.77
PT PM Peak Vehicle Delay (sec):	254.81
Facility Miles:	2.55
TT PM Peak Volume Delay (hr):	189:04:19
PT PM Peak Volume Delay (hr):	407:18:09
High Level of Travel Time Reliability:	Yes
High Truck Travel Time Reliability:	Yes
High Peak Hour Excessive Delay:	Yes
TDM Forecasted Congestion (miles):	0.42

Planned Improvements on 2045 LRP & FY 2019-22 TIP

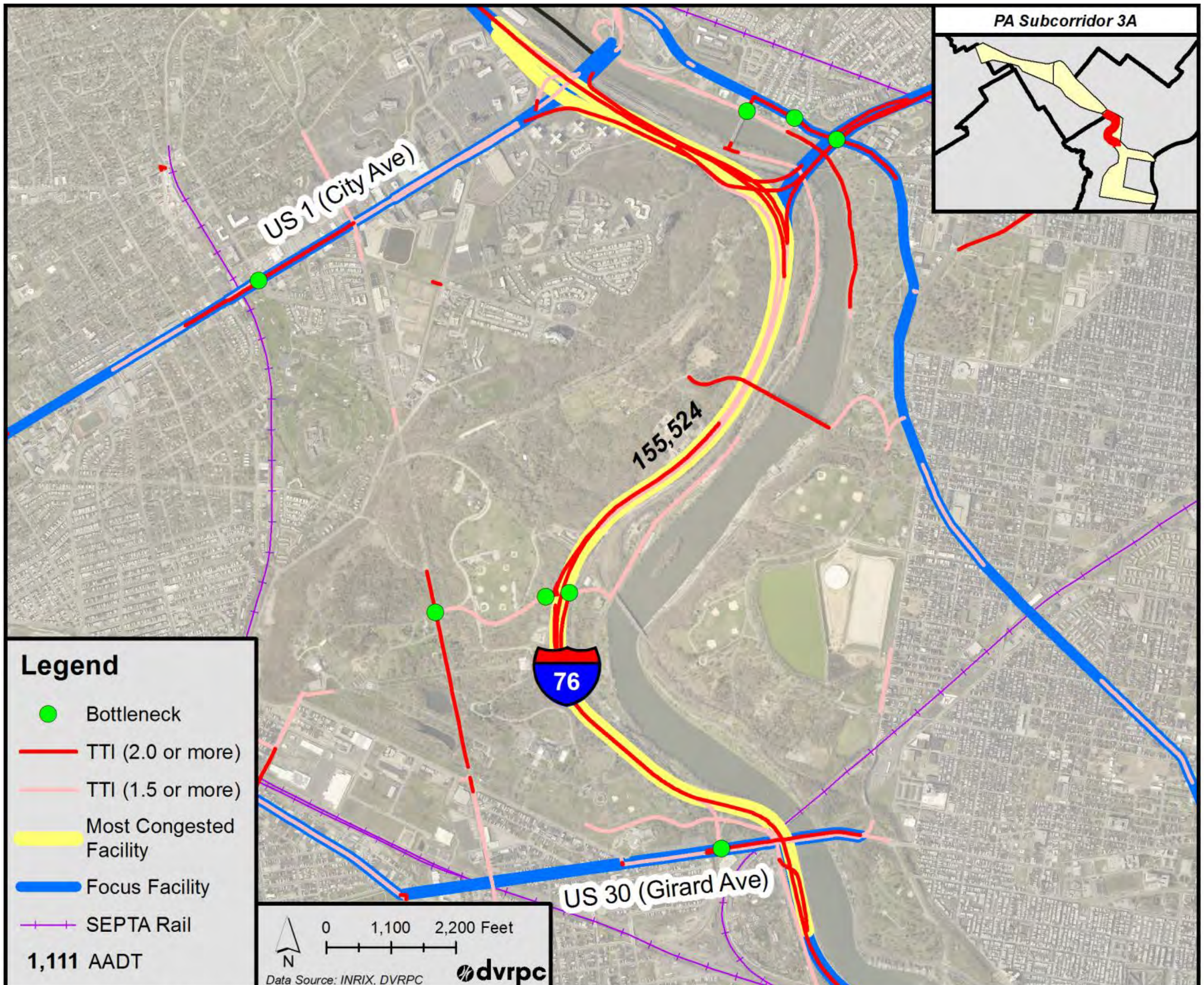
* 2045 LRP: MRP #193 - 30th St Station, #204 - I-76 Philadelphia Active Traffic Management
* FY 2019-22 TIP: MPMS #91490 - Signal/ITS improvements

Very Appropriate Strategies

1) Active Traffic Management and Active Transportation and Demand Management
2) Integrated Corridor Management (ICM)
3) Incident Management
4) Transit Infrastructure Improvements
5) Expanded Parking for Existing Transit Stations (including remote, all modes)
6) Signal Improvements

Additional Factors	
National Highway System:	Yes
DVRPC High Crash Frequency:	Yes
DVRPC High Crash Severity:	Yes
Transit Route:	Yes
Park and Ride:	No
Bottleneck Intersections, Segments:	0,3
Traffic Signals:	N/A
AADT:	136,099

Figure 19: Facility 18
I-76 from US 30 (Girard Ave) to US 1 (City Ave), Philadelphia PA



Summary of Conditions

I-76 (Schuylkill Expy) from US 30 (Girard Ave) to US 1 (City Ave) in the City of Philadelphia is ranked **#11** and **#3** in peak travel time vehicle and volume delay, respectively, and **#17** and **#2** in peak planning time vehicle and volume delay, respectively. I-76 is a limited access interstate that contains three to four travel lanes in each direction.

Congestion Measures

TT PM Peak Vehicle Delay (sec):	91.81
PT PM Peak Vehicle Delay (sec):	226.96
Facility Miles	7.73
TT PM Peak Volume Delay (hr):	143:06:41
PT PM Peak Volume Delay (hr):	411:17:45
High Level of Travel Time Reliability:	Yes
High Truck Travel Time Reliability:	Yes
High Peak Hour Excessive Delay:	Yes
TDM Forecasted Congestion (miles):	0.42

Planned Improvements on 2045 LRP & FY 2019-22 TIP

* 2045 LRP: MRP #204 - I-76 Philadelphia Active Traffic Management
* FY 2019-22 TIP: MPMS #91490 - Signal/ITS improvements

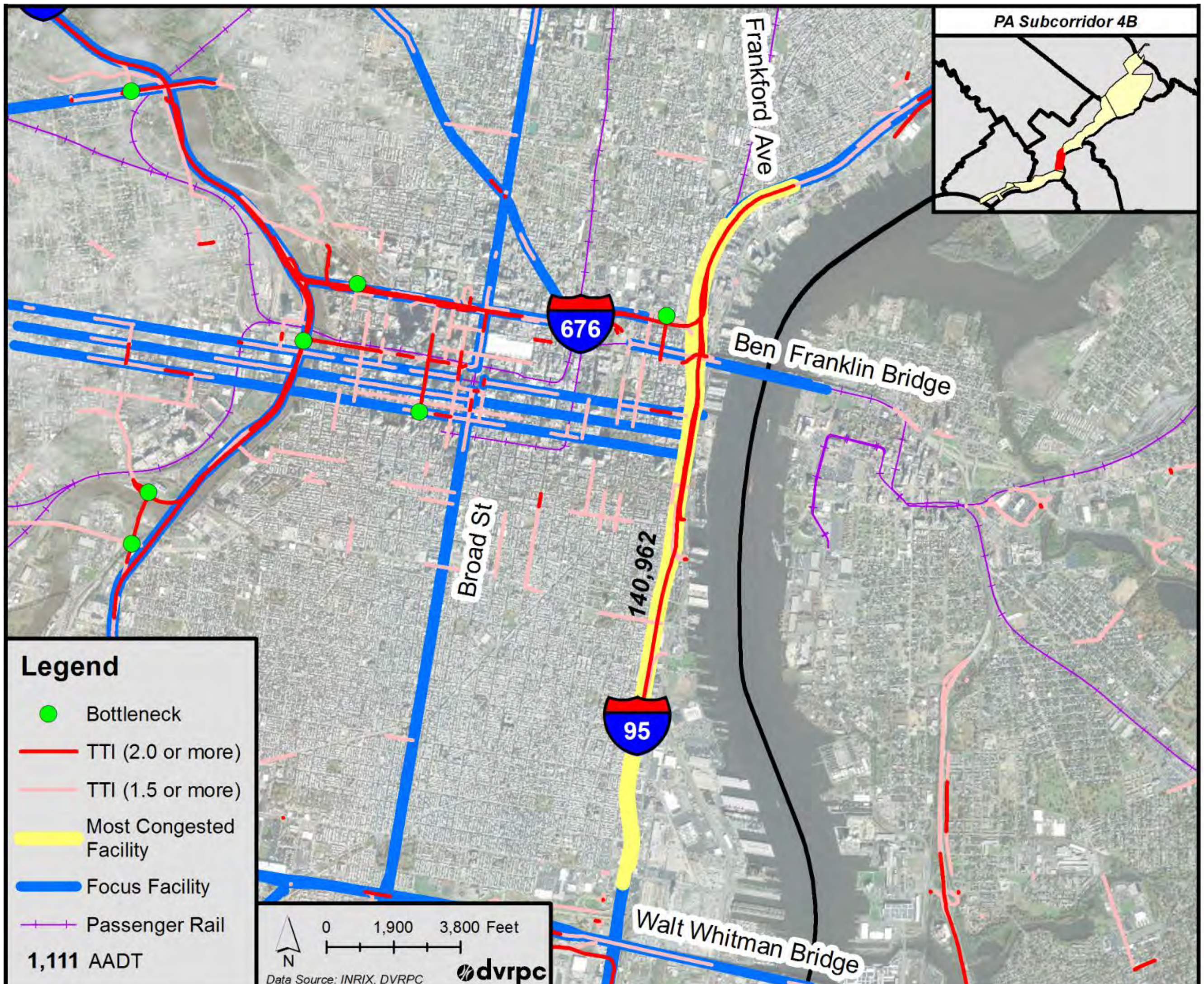
Very Appropriate Strategies

1) Active Traffic Management and Active Transportation and Demand Management
2) Integrated Corridor Management (ICM)
3) Incident Management
4) Transit Infrastructure Improvements
5) Expanded Parking for Existing Transit Stations (including remote, all modes)
6) Signal Improvements

Additional Factors

National Highway System:	Yes
DVRPC High Crash Frequency:	Yes
DVRPC High Crash Severity:	Yes
Transit Route:	Yes
Park and Ride:	No
Bottleneck Intersections, Segments:	0,12
Traffic Signals:	N/A
AADT:	155,524

Figure 20: Facility 28
I-95 from Frankford Ave to I-76 (Walt Whitman Bridge), Philadelphia PA



Summary of Conditions

I-95 from Frankford Avenue to I-76 (Walt Whiteman Bridge) in the City of Philadelphia is ranked **#23** and **#4** in peak travel time vehicle and volume delay, respectively, and **#37** and **#5** in peak planning time vehicle and volume delay, respectively. I-95 is a limited access interstate that contains four travel lanes in each direction.

Congestion Measures	
TT PM Peak Vehicle Delay (sec):	67.68
PT PM Peak Vehicle Delay (sec):	163:31
Facility Miles:	7.53
TT PM Peak Volume Delay (hr):	116:30:14
PT PM Peak Volume Delay (hr):	264:11:48
High Level of Travel Time Reliability:	Yes
High Truck Travel Time Reliability:	Yes
High Peak Hour Excessive Delay:	Yes
TDM Forecasted Congestion (miles):	0

Planned Improvements on 2045 LRP & FY 2019-22 TIP

* 2045 LRP: MRP #65-Road operation upgrade;#100-Road system preservation,V-Delaware Ave Transit
* FY 2019-22 TIP: MPMS #79828, 91490, 98207, 103553, 103554, 103556, 106264, 107709, 111511

Very Appropriate Strategies

1) Intelligent Transportation Systems (ITS)
2) Incident Management
3) Active Traffic Management and Active Transportation and Demand Management
4) Transit Infrastructure Improvements
5) Expanded Parking for Existing Transit Stations (including remote, all modes)
6) Modifications to Existing Transit Routes or Services

Additional Factors	
National Highway System:	Yes
DVRPC High Crash Frequency:	No
DVRPC High Crash Severity:	Yes
Transit Route:	Yes
Park and Ride:	No
Bottleneck Intersections, Segments:	0,4
Traffic Signals:	N/A
AADT:	140,962

Figure 21: Facility 27
I-95 from PA 90 (Betsy Ross Bridge) to Frankford Ave, Philadelphia PA

Summary of Conditions

I-95 from PA 90 (Betsy Ross Bridge) to Frankford Avenue in the City of Philadelphia is ranked **#31** and **#5** in peak travel time vehicle and volume delay, respectively, and **#80** and **#4** in peak planning time vehicle and volume delay, respectively. I-95 is a limited access interstate that contains four travel lanes in each direction.

Congestion Measures	
TT AM Peak Vehicle Delay (sec):	59.00
PT PM Peak Vehicle Delay (sec):	114.75
Facility Miles:	8.55
TT AM Peak Volume Delay (hr):	107:53:23
PT PM Peak Volume Delay (hr):	272:31:41
High Level of Travel Time Reliability:	Yes
High Truck Travel Time Reliability:	Yes
High Peak Hour Excessive Delay:	Yes
TDM Forecasted Congestion (miles):	0.61

Planned Improvements on 2045 LRP & FY 2019-22 TIP

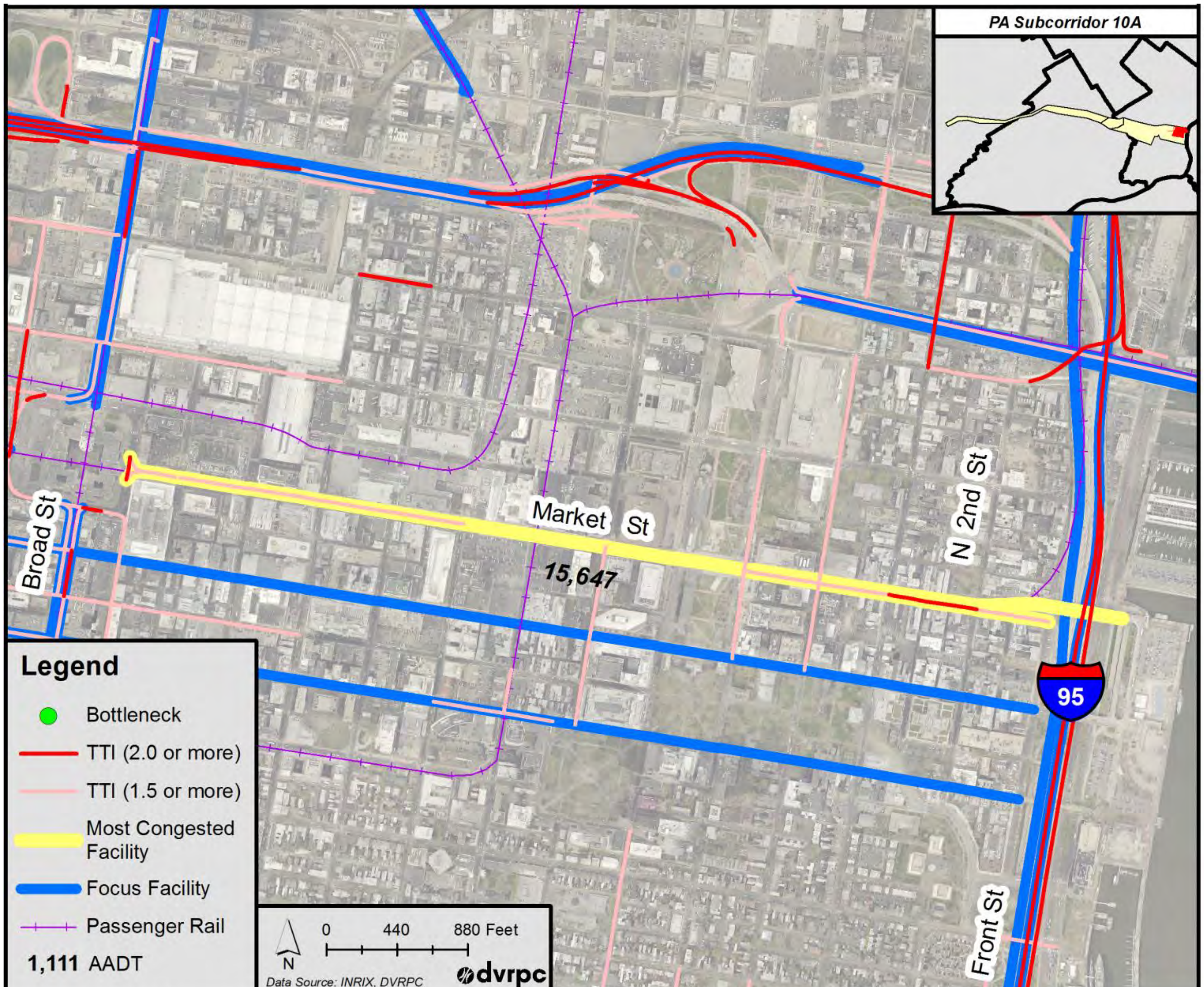
* 2045 LRP: MRP #65-Road operation improvements
* FY 2019-22 TIP: MPMS #17821,47811,47812,47813,79826,... 14 Major SOV Capacity Adding-Projects

Very Appropriate Strategies

1) Intelligent Transportation Systems (ITS)
2) Incident Management
3) Active Traffic Management and Active Transportation and Demand Management
4) Transit Infrastructure Improvements
5) Expanded Parking for Existing Transit Stations (including remote, all modes)
6) Modifications to Existing Transit Routes or Services

Additional Factors	
National Highway System:	Yes
DVRPC High Crash Frequency:	No
DVRPC High Crash Severity:	No
Transit Route:	Yes
Park and Ride:	No
Bottleneck Intersections, Segments:	0,5
Traffic Signals:	N/A
AADT:	188,704

Figure 22: Facility 78
Market St from I-95 (Penns Landing) to PA 611 (Broad St), Philadelphia PA



Summary of Conditions

Market Street from I-95 (Penns Landing) to Broad Street in the City of Philadelphia is ranked **#6** and **#36** in peak travel time vehicle and volume delay, respectively, and **#4** and **#34** in peak planning time vehicle and volume delay, respectively. This principal arterial roadway generally contains two travel lanes in each direction from 2nd Street to Broad Street, but separates into one-way, one-lane travel eastbound from 2nd Street to Front Street, and westbound from Penns Landing Road to 2nd Street. Curb-side parking is available at certain locations along travel lanes.

Congestion Measures

TT PM Peak Vehicle Delay (sec):	126.65
PT PM Peak Vehicle Delay (sec):	384.97
Corridor Facility:	2.28
TT PM Peak Volume Delay (hr):	31:09:23
PT PM Peak Volume Delay (hr):	80:01:56
High Level of Travel Time Reliability:	No
High Truck Travel Time Reliability:	N/A
High Peak Hour Excessive Delay:	Yes
TDM Forecasted Congestion (miles):	0

Planned Improvements on 2045 LRP & FY 2019-22 TIP

* 2045 LRP: MRP #164 - CAP/Waterfront Access; BO, BR - Concourse Upgrades; V - Delaware Av Transit
* FY 2019-22 TIP: MPMS #106264 - CAP/Waterfront Access; #107709 - I-95 bridge repairs

Very Appropriate Strategies

1) Signal Improvements
2) Transit Infrastructure Improvements
3) Loading and Deliveries
4) Transit-First Policy
5) More Frequent Transit or More Hours of Service
6) Transportation Services for Specific Populations

Additional Factors

National Highway System:	Yes
DVRPC High Crash Frequency:	Yes
DVRPC High Crash Severity:	No
Transit Route:	Yes
Park and Ride:	No
Bottleneck Intersections, Segments:	0,0
Traffic Signals:	14
AADT:	15,647

Figure 23: Facility 160
PA 3 (Chestnut St) from Broad St to 23rd St, Philadelphia PA

Summary of Conditions

Chestnut Street from Broad Street to 23rd Street in the City of Philadelphia is ranked **#2** and **#19** in peak travel time vehicle and volume delay, respectively, and **#5** and **#38** in peak planning time vehicle and volume delay, respectively. This principal arterial roadway is one-way eastbound, and contains two travel lanes, and another dedicated parking lane. The right most-travel lane contains pavement markings for bicyclists and bus transit.

Congestion Measures	
TT PM Peak Vehicle Delay (sec):	217.45
PT PM Peak Vehicle Delay (sec):	370.37
Facility Miles	0.76
TT PM Peak Volume Delay (hr):	40:15:53
PT PM Peak Volume Delay (hr):	74:35:07
High Level of Travel Time Reliability:	No
High Truck Travel Time Reliability:	N/A
High Peak Hour Excessive Delay:	Yes
TDM Forecasted Congestion (miles):	0

Planned Improvements on 2045 LRP & FY 2019-22 TIP

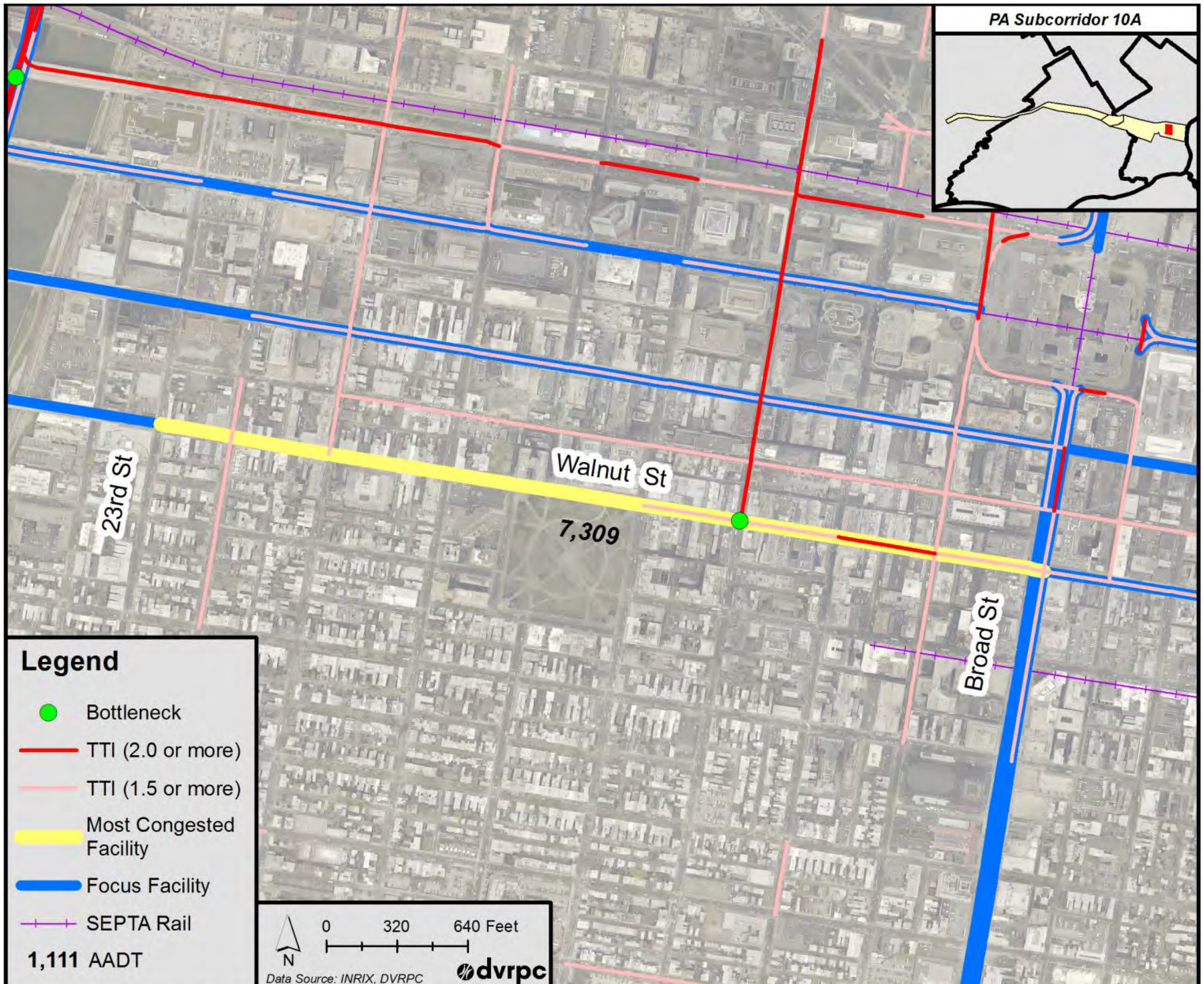
* 2045 LRP: No projects
* FY 2019-22 TIP: No projects

Very Appropriate Strategies

1) Signal Improvements
2) Transit Infrastructure Improvements
3) Loading and Deliveries
4) Transit-First Policy
5) More Frequent Transit or More Hours of Service
6) Transportation Services for Specific Populations

Additional Factors	
National Highway System:	Yes
DVRPC High Crash Frequency:	No
DVRPC High Crash Severity:	Yes
Transit Route:	Yes
Park and Ride:	No
Bottleneck Intersections, Segments:	0,0
Traffic Signals:	9
AADT:	8,068

Figure 24: Facility 163
PA 3 (Walnut St) from Broad St to 23rd St, Philadelphia PA



Summary of Conditions

Walnut Street from Broad Street to 23rd Street in the City of Philadelphia is ranked **#1** and **#17** in peak travel time vehicle and volume delay, respectively, and **#1** and **#20** in peak planning time vehicle and volume delay, respectively. This principal arterial roadway is one-way westbound, and contains two travel lanes, and another dedicated parking lane.

Congestion Measures	
TT PM Peak Vehicle Delay (sec):	221.92
PT PM Peak Vehicle Delay (sec):	631.60
Facility Miles:	0.77
TT PM Peak Volume Delay (hr):	41:27:03
PT PM Peak Volume Delay (hr):	116:52:26
High Level of Travel Time Reliability:	No
High Truck Travel Time Reliability:	N/A
High Peak Hour Excessive Delay:	Yes
TDM Forecasted Congestion (miles):	0

Planned Improvements on 2045 LRP & FY 2019-22 TIP

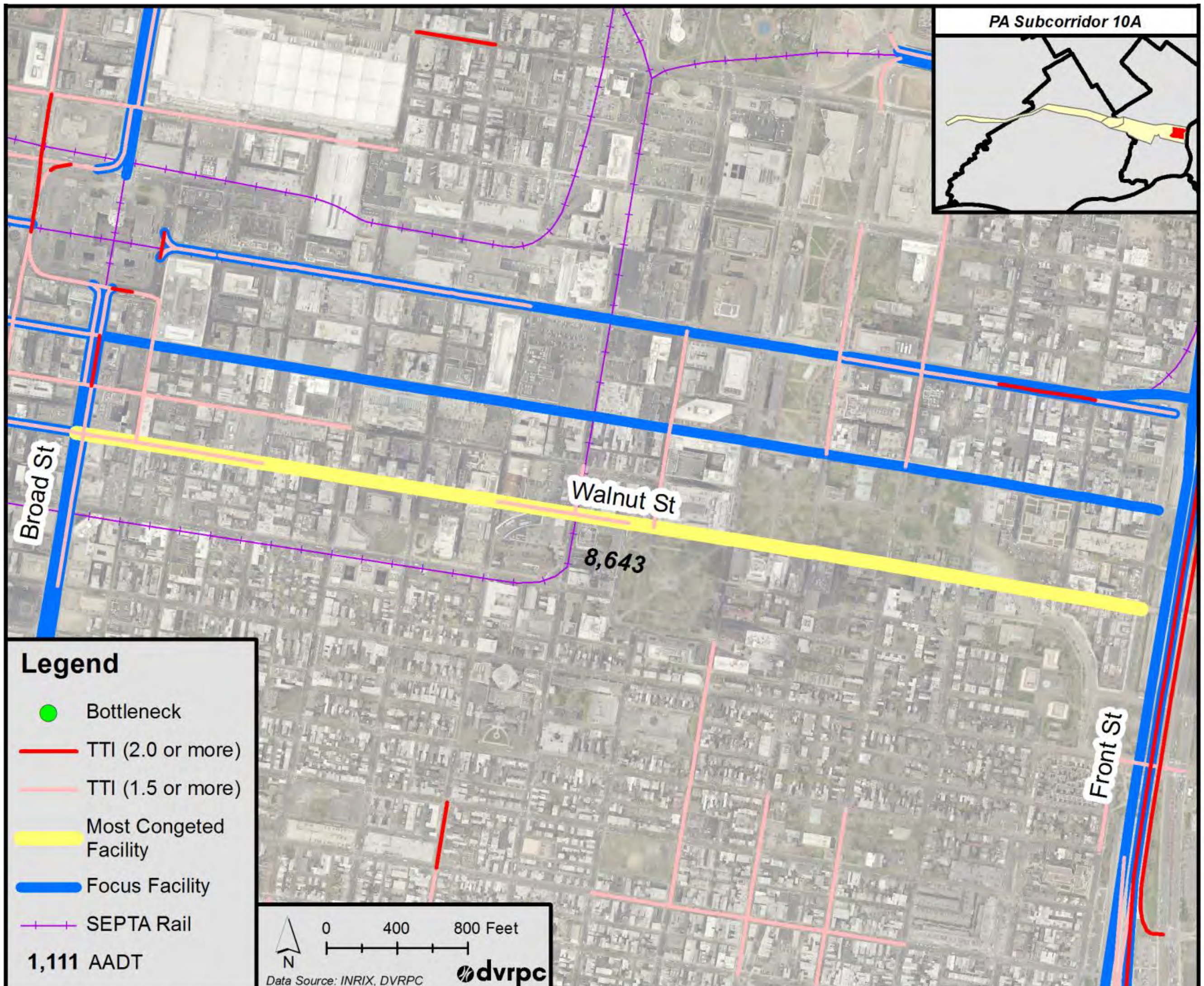
* 2045 LRP: No projects
* FY 2019-22 TIP: No projects

Very Appropriate Strategies

1) Signal Improvements
2) Transit Infrastructure Improvements
3) Loading and Deliveries
4) Transit-First Policy
5) More Frequent Transit or More Hours of Service
6) Transportation Services for Specific Populations

Additional Factors	
National Highway System:	Yes
DVRPC High Crash Frequency:	Yes
DVRPC High Crash Severity:	No
Transit Route:	Yes
Park and Ride:	No
Bottleneck Intersections, Segments:	1,0
Traffic Signals:	9
AADT:	7,309

Figure 25: Facility 162
PA 3 (Walnut St) from Front St to Broad St, Philadelphia PA



Summary of Conditions

Walnut Street from Front Street to Broad Street in the City of Philadelphia is ranked **#5** and **#29** in peak travel time vehicle and volume delay, respectively, and **#3** and **#25** in peak planning time vehicle and volume delay, respectively. This principal arterial roadway is one-way westbound, and contains two travel lanes, and another dedicated parking lane.

Congestion Measures	
TT PM Peak Vehicle Delay (sec):	131.04
PT PM Peak Vehicle Delay (sec):	410.09
Corridor Miles	1.16
TT PM Peak Volume Delay (hr):	31:09:23
PT PM Peak Volume Delay (hr):	96:53:07
High Level of Travel Time Reliability:	No
High Truck Travel Time Reliability:	N/A
High Peak Hour Excessive Delay:	Yes
TDM Forecasted Congestion (miles):	0

Planned Improvements on 2045 LRP & FY 2019-22 TIP

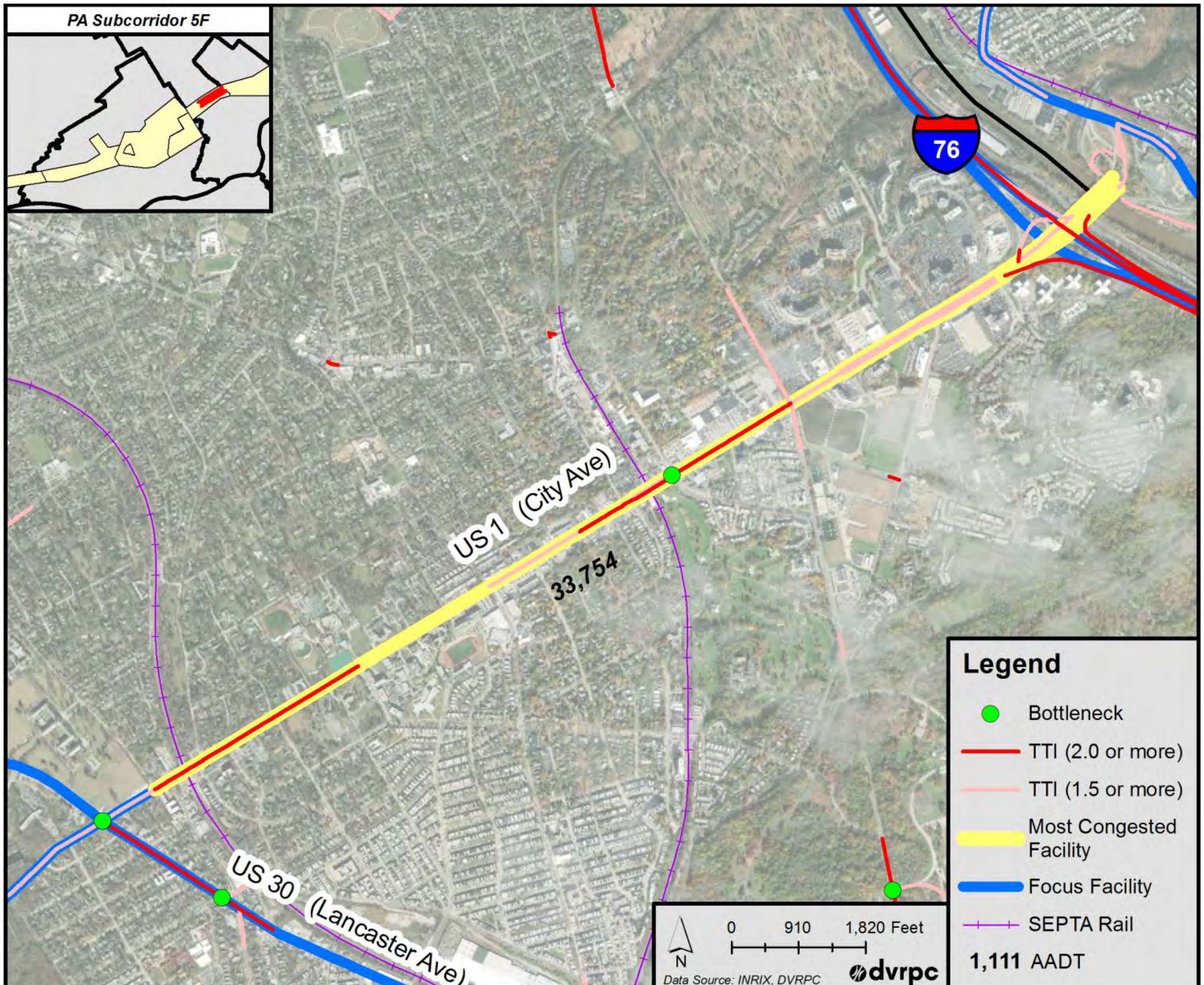
* 2045 LRP: No projects
* FY 2019-22 TIP: No projects

Very Appropriate Strategies

1) Signal Improvements
2) Transit Infrastructure Improvements
3) Loading and Deliveries
4) Transit-First Policy
5) More Frequent Transit or More Hours of Service
6) Transportation Services for Specific Populations

Additional Factors	
National Highway System:	Yes
DVRPC High Crash Frequency:	No
DVRPC High Crash Severity:	No
Transit Route:	Yes
Park and Ride:	No
Bottleneck Intersections, Segments:	0,0
Traffic Signals:	13
AADT:	8,643

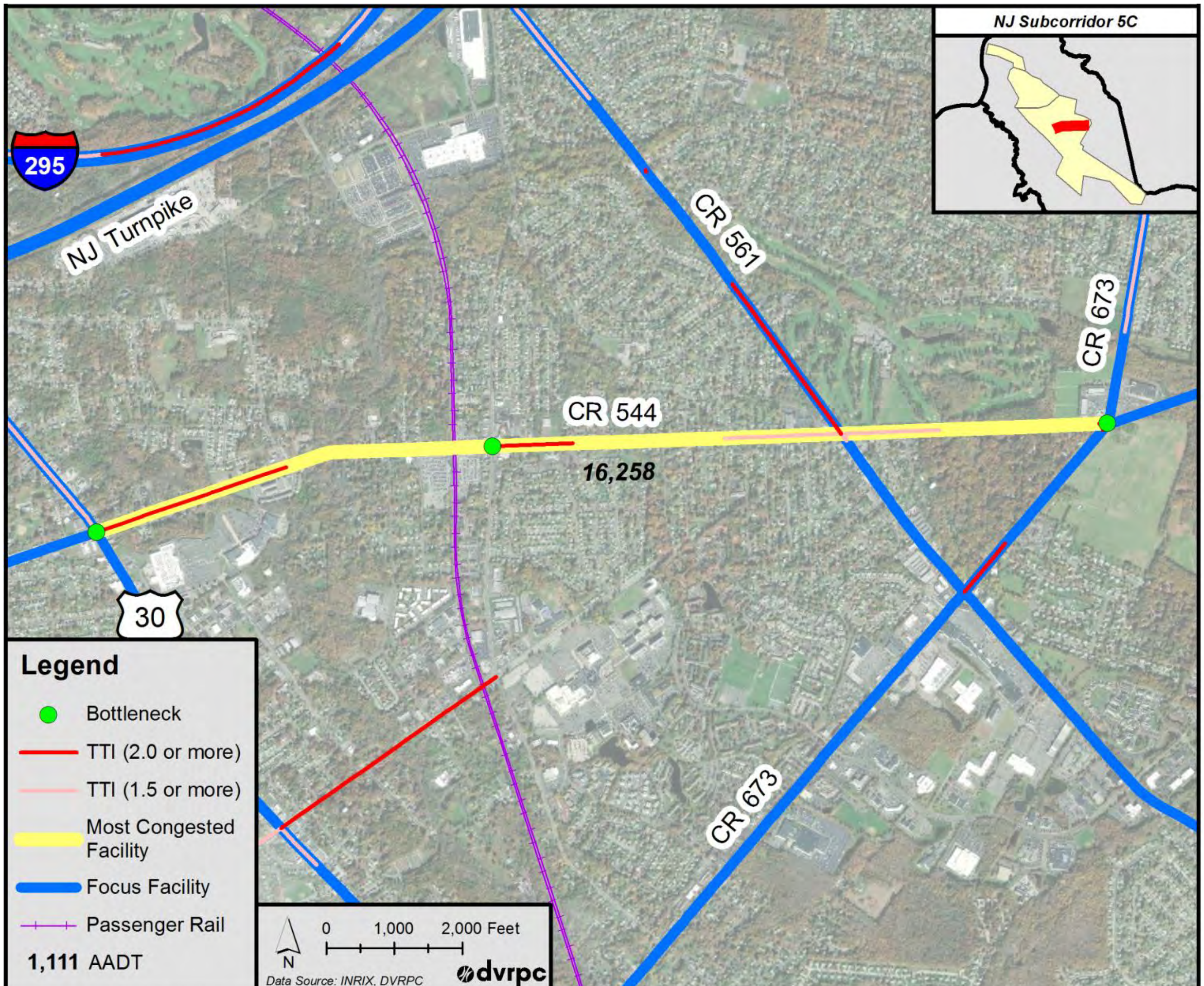
Figure 26: Facility 40
US 1 (City Ave) from US 30 (Lancaster Ave) to I-76, Philadelphia and Montgomery Counties PA



Summary of Conditions	Congestion Measures	
US 1 (City Ave) from I-76 to US 30 (Lancaster Ave) shares a boundary with both the City of Philadelphia and Montgomery County and is ranked **#4** and **#15** in peak travel time vehicle and volume delay, respectively, and **#2** and **#11** in peak planning time vehicle and volume delay, respectively. This is a principal arterial road, with largely two travel lanes in each direction with additional left-turn lanes at major intersection approaches.	TT PM Peak Vehicle Delay (sec):	133.35
	PT PM Peak Vehicle Delay (sec):	427.35
	Facility Miles:	5.91
	TT PM Peak Volume Delay (hr):	56:33:10
	PT PM Peak Volume Delay (hr):	181:06:20
	High Level of Travel Time Reliability:	Yes
	High Truck Travel Time Reliability:	N/A
	High Peak Hour Excessive Delay:	Yes
	TDM Forecasted Congestion (miles):	0.56

Planned Improvements on 2045 LRP & FY 2019-22 TIP	Additional Factors	
* 2045 LRP: No projects	National Highway System:	Yes
* FY 2019-22 TIP: MPMS #111509 - Bicycle/Pedestrian upgrades; MPMS #17511-Bridge Repair/Replace	DVRPC High Crash Frequency:	No
Very Appropriate Strategies	DVRPC High Crash Severity:	Yes
1) Signal Improvements	Transit Route:	Yes
2) Enhanced Transit Amenities and Safety	Park and Ride:	No
3) Turning Movement Enhancements	Bottleneck Intersections, Segments:	2,3
4) Improvements to Pedestrian and Bicycle Access to Transit Stations and Bus Stops	Traffic Signals:	16
5) More Frequent Transit or More Hours of Service	AADT:	33,754

Figure 27: Facility 287
CR 544 (Evesham Rd) from US 30 to CR 673, Camden County NJ



Summary of Conditions

CR 544 (Evesham Rd) from US 30 to CR 673 in Camden County is ranked **#3** and **#36** in peak travel time vehicle and volume delay, respectively, and **#1** and **#31** in peak planning time vehicle and volume delay, respectively. This principal arterial road contains one travel lane in each direction.

Congestion Measures	
TT PM Peak Vehicle Delay (sec):	56.98
PT PM Peak Vehicle Delay (sec):	195.16
Facility Miles:	5.70
TT PM Peak Volume Delay (hr):	9:45:34
PT PM Peak Volume Delay (hr):	34:32:15
High PM3 LOTTR (Unreliable):	Yes
High PM3 TTTR ((Unreliable):	N/A
High PM3 Peak Hour Excessive Delay:	Yes
TDM Forecasted Congestion (miles):	0

Planned Improvements on 2045 LRP & FY 2020-23 TIP

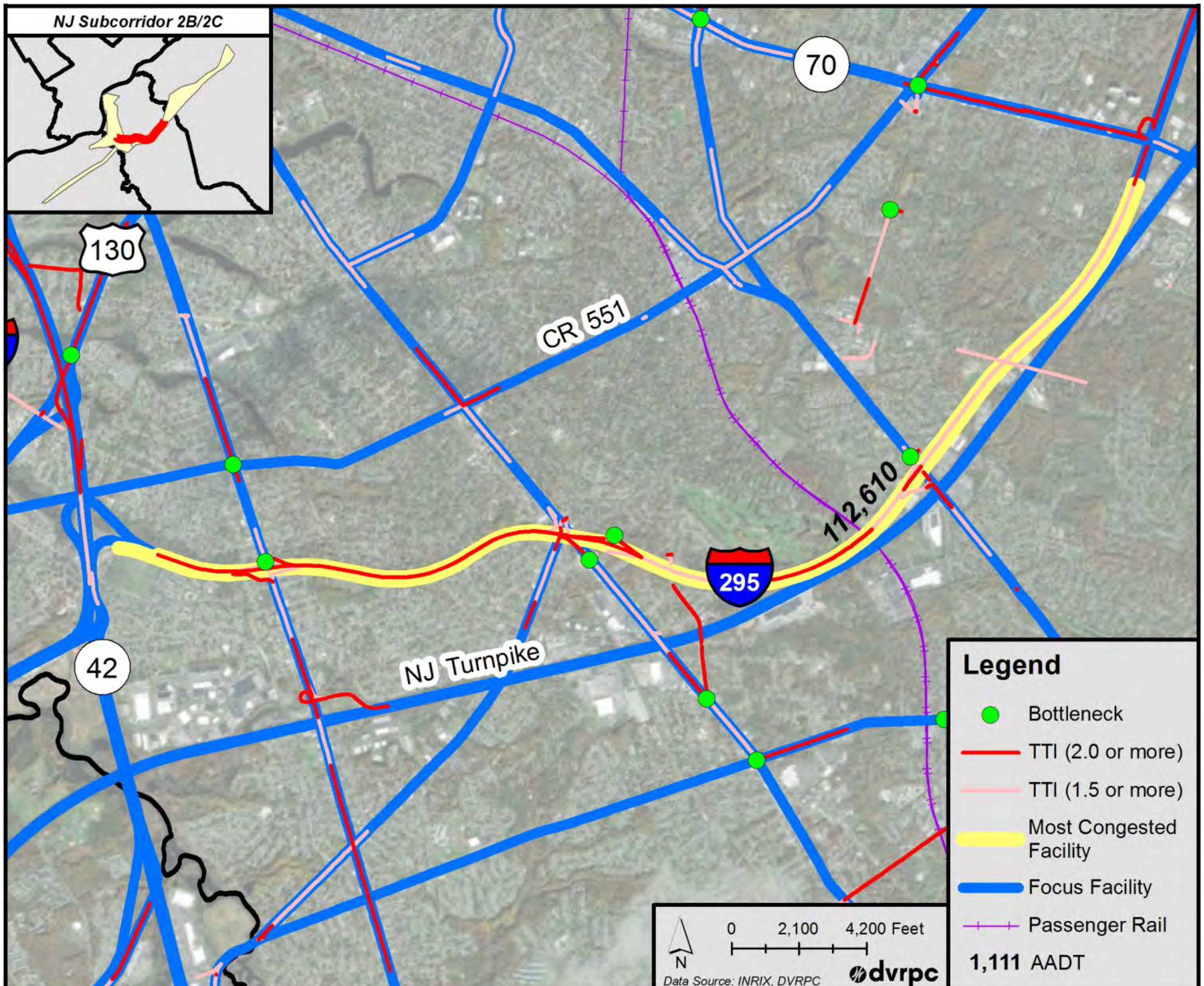
* 2045 LRP: No projects
* FY 2020-23 TIP: No projects

Very Appropriate Strategies

1) Signal Improvements
2) Turning Movement Enhancements
3) Transit Infrastructure Improvements
4) Transit-Oriented Development (TOD)
5) Walking and Bicycling Improvements

Additional Factors	
National Highway System:	Yes
DVRPC High Crash Frequency:	No
DVRPC High Crash Severity:	No
Transit Route:	No
Park and Ride:	No
Bottleneck Intersections, Segments:	3,3
Traffic Signals:	4
AADT:	16,258

Figure 28: Facility 208
I-295 from NJ 42 (Exit 26) to NJ 70 (Exit 34), Camden County NJ



Summary of Conditions

I-295 from NJ 42 (Exit 26) to NJ 70 (Exit 34) in Camden County is ranked **#19** and **#3** in peak travel time vehicle and volume delay, respectively, and **#32** and **#3** in peak planning time vehicle and volume delay, respectively. This limited access interstate roadway contains three travel lanes in each direction.

Congestion Measures	
TT PM Peak Vehicle Delay (sec):	39.22
PT PM Peak Vehicle Delay (sec):	100.55
Facility Miles:	14.24
TT PM Peak Volume Delay (hr):	55:26:58
PT PM Peak Volume Delay (hr):	142:05:01
High PM3 LOTTR (Unreliable):	Yes
High PM3 TTTR ((Unreliable):	Yes
High PM3 Peak Hour Excessive Delay:	Yes
TDM Forecasted Congestion (miles):	1.27

Planned Improvements on 2045 LRP & FY 2020-23 TIP

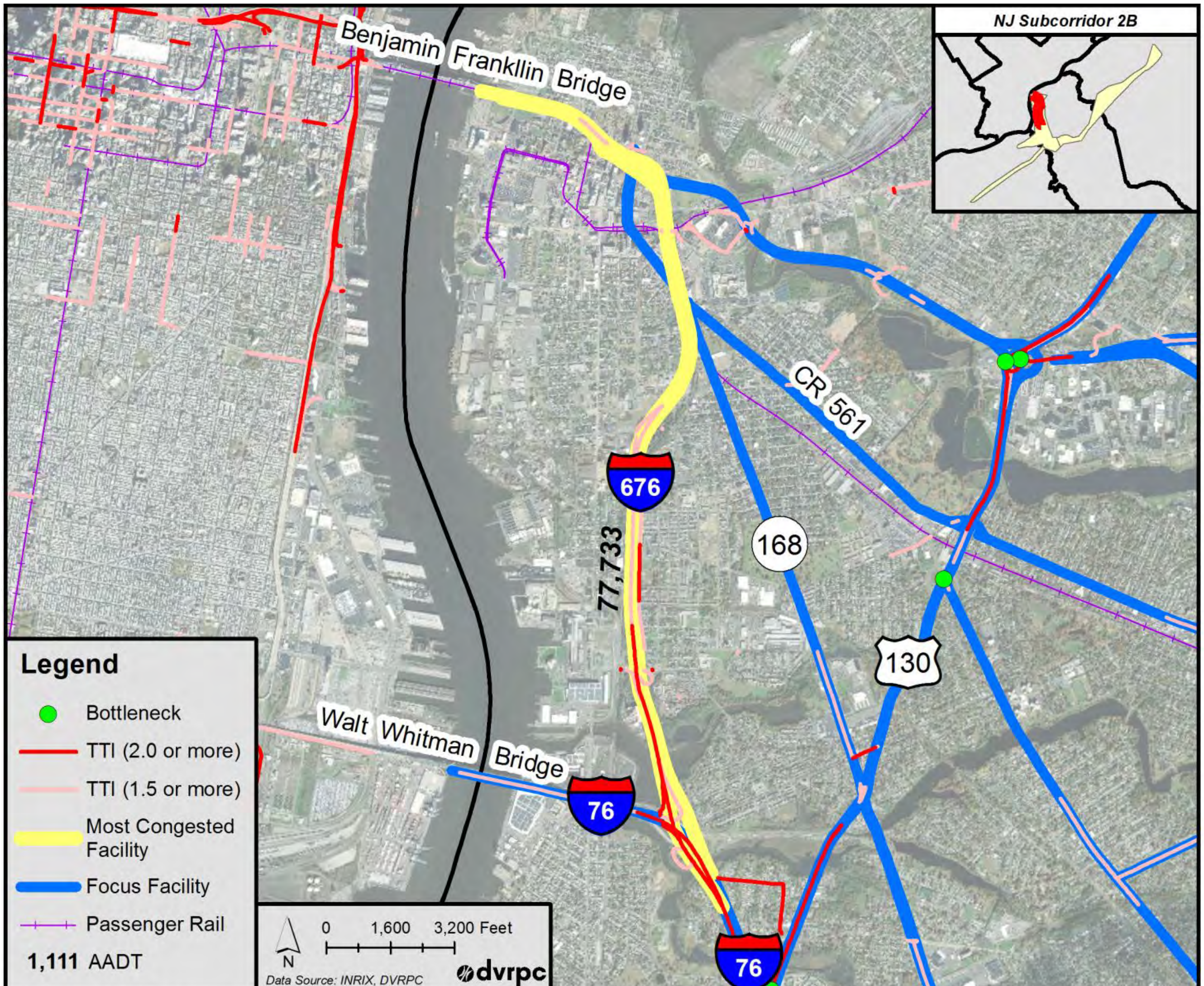
* 2045 LRP: MRP #77 - I-295 Direct Connect
* FY 2020-23 TIP: DB #355E - Route 295/42/I-76, Direct Connect

Very Appropriate Strategies

1) Intelligent Transportation Systems (ITS)
2) Integrated Corridor Management (ICM)
3) Park and Ride Lots
4) Modifications to Existing Transit Routes or Services
5) Major Reconstruction with Minor Capacity Additions

Additional Factors	
National Highway System:	Yes
DVRPC High Crash Frequency:	No
DVRPC High Crash Severity:	No
Transit Route:	No
Park and Ride:	No
Bottleneck Intersections, Segments:	0,6
Traffic Signals:	N/A
AADT:	112,610

Figure 29: Facility 227
I-676 from Benjamin Franklin Bridge to I-76 (Walt Whitman Bridge), Camden County NJ



Summary of Conditions

I-676 from the Benjamin Franklin Bridge to I-76 (Walt Whitman Bridge) in Camden County is ranked **#12** and **#4** in peak travel time vehicle and volume delay, respectively, and **#20** and **#4** in peak planning time vehicle and volume delay, respectively. This limited access interstate contains three travel lanes in each direction.

Congestion Measures	
TT PM Peak Vehicle Delay (sec):	44.60
PT PM Peak Vehicle Delay (sec):	120.78
Facility Miles:	8.83
TT PM Peak Volume Delay (hr):	51:04:52
PT PM Peak Volume Delay (hr):	127:53:14
High PM3 LOTTR (Unreliable):	Yes
High PM3 TTTR ((Unreliable):	Yes
High PM3 Peak Hour Excessive Delay:	No
TDM Forecasted Congestion (miles):	0

Planned Improvements on 2045 LRP & FY 2020-23 TIP

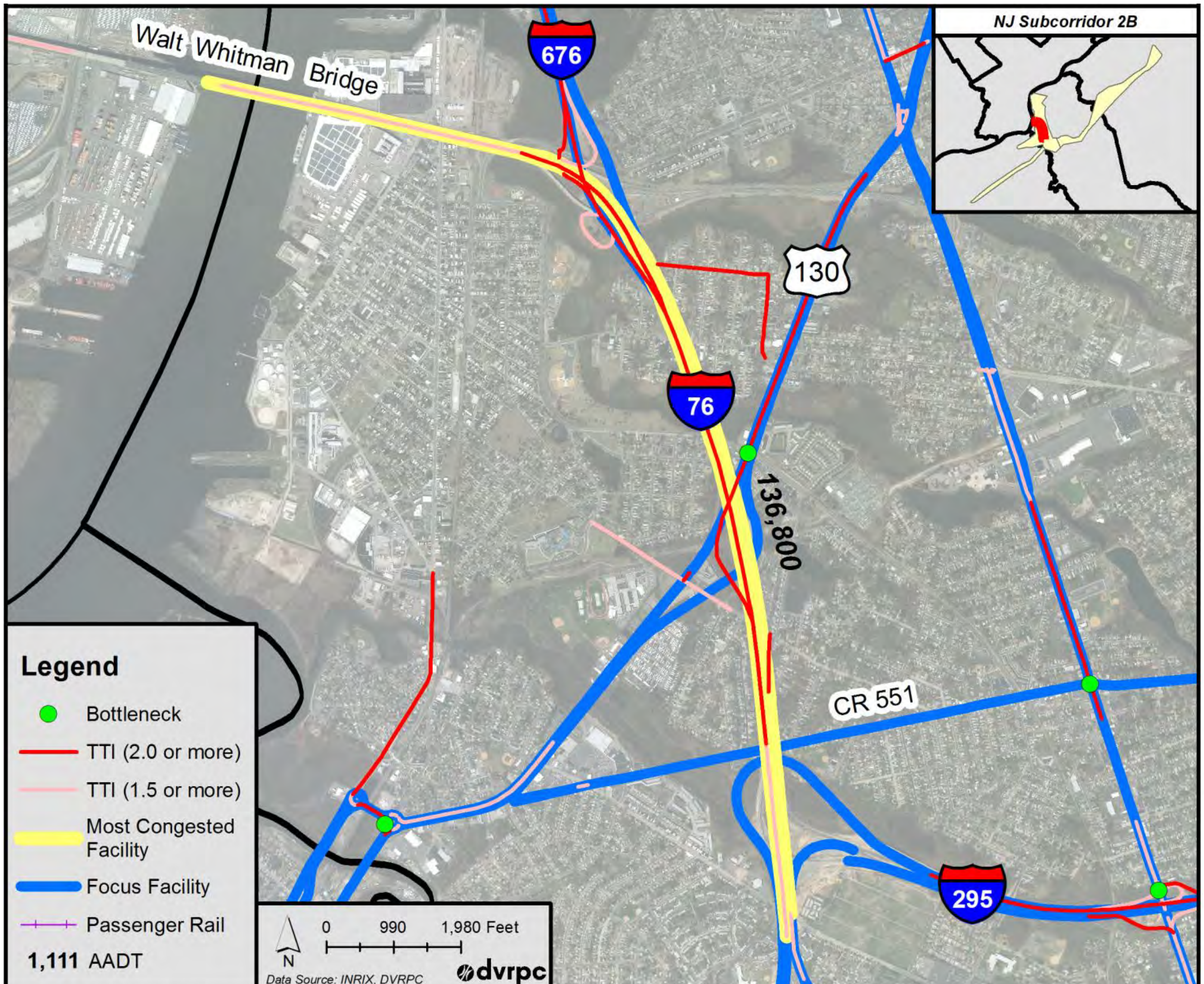
* 2045 LRP: MRP #141-Roadway preservation;T-Glassboro-Camden Line, X-South Jersey BRT
* FY 2020-23 TIP: DB #355E - Route 295/42/I-76, Direct Connect

Very Appropriate Strategies

1) Intelligent Transportation Systems (ITS)
2) Integrated Corridor Management (ICM)
3) Incident Management
4) Modifications to Existing Transit Routes or Services

Additional Factors	
National Highway System:	Yes
DVRPC High Crash Frequency:	No
DVRPC High Crash Severity:	Yes
Transit Route:	Yes
Park and Ride:	No
Bottleneck Intersections, Segments:	0,3
Traffic Signals:	N/A
AADT:	77,733

Figure 30: Facility 228
I-76 from Walt Whitman Bridge to I-295, Camden County NJ



Summary of Conditions

I-76 from the Walt Whitman Bridge to I-295 in Camden County is ranked **#18** and **#1** in peak travel time vehicle and volume delay, respectively, and **#31** and **#1** in peak planning time vehicle and volume delay, respectively. This limited access interstate contains three travel lanes in each direction from the Walt Whitman Bridge to the I-676 interchange, and then four lanes in each direction to I-295.

Congestion Measures

TT PM Peak Vehicle Delay (sec):	39.54
PT PM Peak Vehicle Delay (sec):	101.17
Facility Miles:	6.53
TT PM Peak Volume Delay (hr):	64:46:53
PT PM Peak Volume Delay (hr):	160:29:55
High PM3 LOTTR (Unreliable):	Yes
High PM3 TTTR ((Unreliable):	Yes
High PM3 Peak Hour Excessive Delay:	No
TDM Forecasted Congestion (miles):	0.45

Planned Improvements on 2045 LRP & FY 2020-23 TIP

* 2045 LRP: MRP #77 - I-295 Direct Connect;#142 - Reconstruct from I-676 to I-295, X - South Jersey BRT
* FY 2020-23 TIP: DB #11326 - Bridge deck replacements; #355E - Route 295/42/I-76, Direct Connection

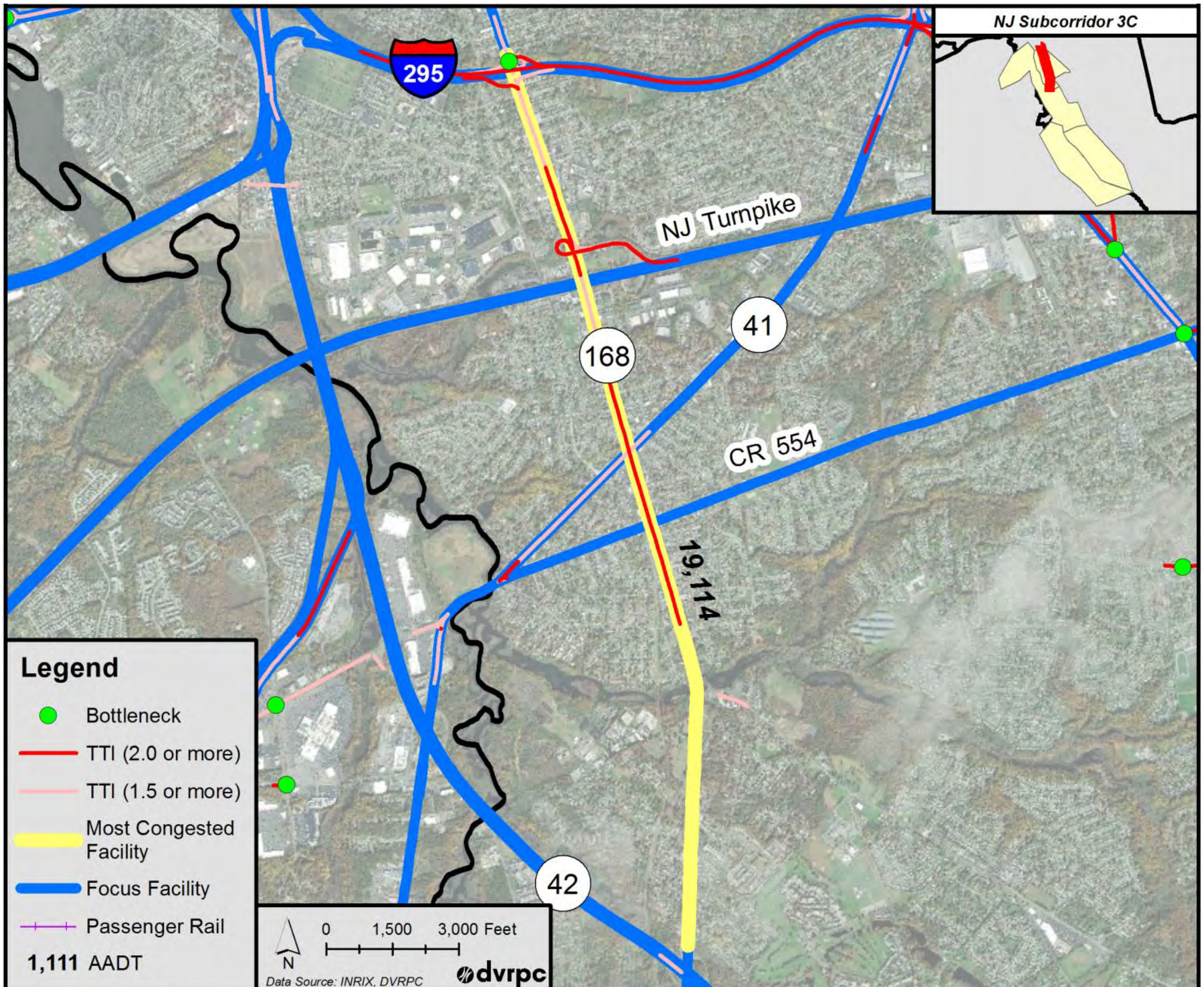
Very Appropriate Strategies

1) Intelligent Transportation Systems (ITS)
2) Integrated Corridor Management (ICM)
3) Incident Management
4) Modifications to Existing Transit Routes or Services

Additional Factors

National Highway System:	Yes
DVRPC High Crash Frequency:	No
DVRPC High Crash Severity:	No
Transit Route:	Yes
Park and Ride:	No
Bottleneck Intersections, Segments:	0,3
Traffic Signals:	N/A
AADT:	136,800

Figure 31: Facility 212
NJ 168 (Black Horse Pk) from I-295 to NJ 42, Camden County NJ



Summary of Conditions

NJ 168 (Black Horse Pike) from I-295 to NJ 42 in Camden County is ranked **#2** and **#20** in peak travel time vehicle and volume delay, respectively, and **#5** and **#26** in peak planning time vehicle and volume delay, respectively. This principal arterial road contains predominately one travel lane in each direction with a middle turning lane, and dedicated left-turn lanes on major approaches to signalized intersections.

Congestion Measures	
TT PM Peak Vehicle Delay (sec):	66.24
PT PM Peak Vehicle Delay (sec):	166.58
Facility Miles:	7.91
TT PM Peak Volume Delay (hr):	17:06:42
PT PM Peak Volume Delay (hr):	43:07:30
High PM3 LOTTR (Unreliable):	Yes
High PM3 TTTR ((Unreliable):	N/A
High PM3 Peak Hour Excessive Delay:	Yes
TDM Forecasted Congestion (miles):	0.22

Planned Improvements on 2045 LRP & FY 2020-23 TIP

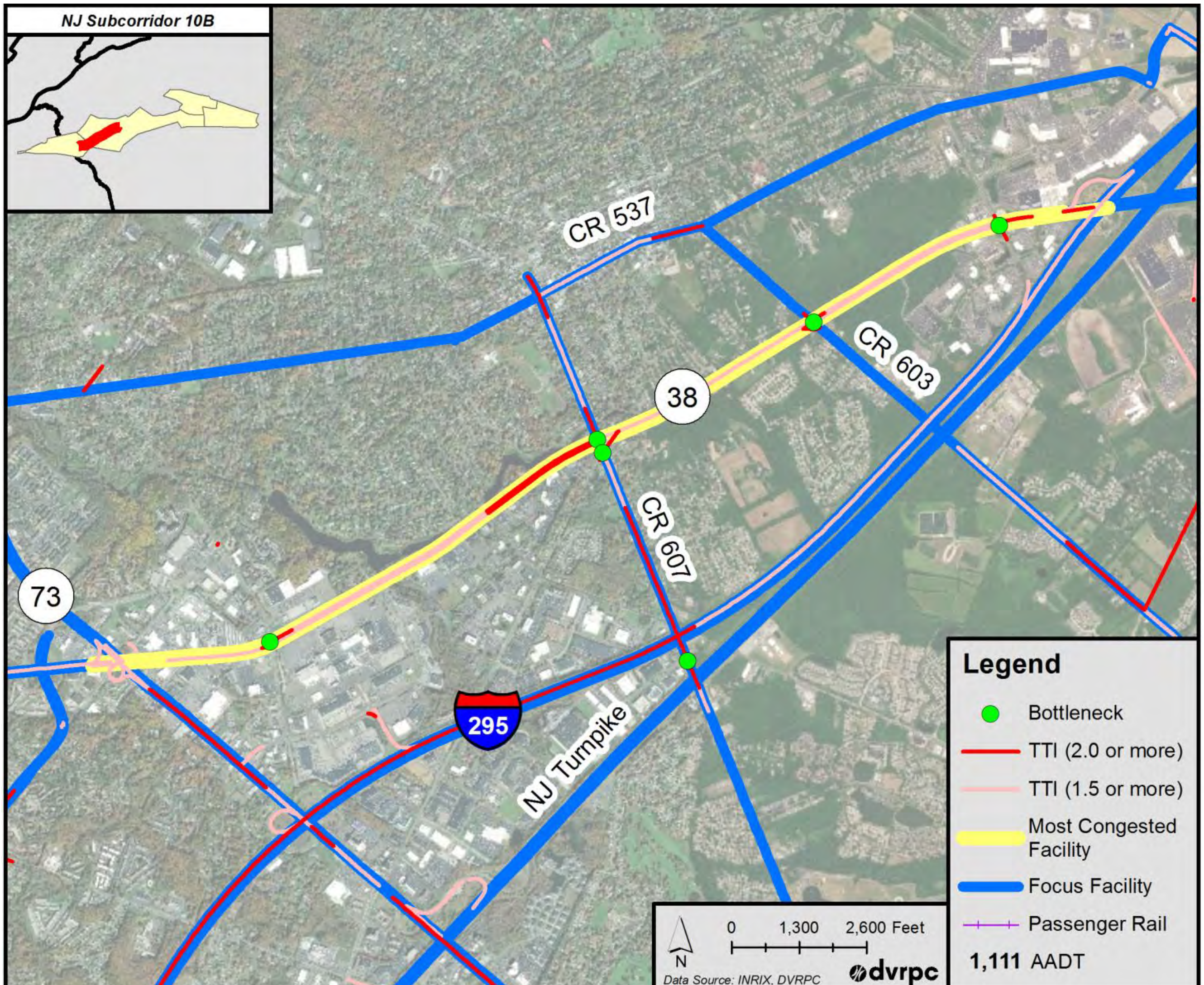
* 2045 LRP: No projects
* FY 2020-23 TIP: DB #15936 - Roadway resurfacing

Very Appropriate Strategies

1) Signal Improvements
2) Transit Infrastructure Improvements
3) Turning Movement Enhancements
4) Context-Sensitive Design
5) Transit-First Policy
6) Modifications to Existing Transit Routes or Services

Additional Factors	
National Highway System:	Yes
DVRPC High Crash Frequency:	No
DVRPC High Crash Severity:	No
Transit Route:	Yes
Park and Ride:	No
Bottleneck Intersections, Segments:	1,1
Traffic Signals:	10
AADT:	19,114

Figure 32: Facility 253
NJ 38 from NJ 73 to I-295, Burlington County NJ



Summary of Conditions

NJ 38 from NJ 73 to I-295 in Burlington County is ranked **#4** and **#9** in peak travel time vehicle and volume delay, respectively, and **#7** and **#9** in peak planning time vehicle and volume delay, respectively. This principal arterial divided road contains two travel lanes in each direction.

Congestion Measures	
TT PM Peak Vehicle Delay (sec):	54.90
PT PM Peak Vehicle Delay (sec):	152.46
Facility Miles:	8.20
TT PM Peak Volume Delay (hr):	30:39:10
PT PM Peak Volume Delay (hr):	85:23:56
High PM3 LOTTR (Unreliable):	Yes
High PM3 TTTR ((Unreliable):	N/A
High PM3 Peak Hour Excessive Delay:	Yes
TDM Forecasted Congestion (miles):	0

Planned Improvements on 2045 LRP & FY 2020-23 TIP

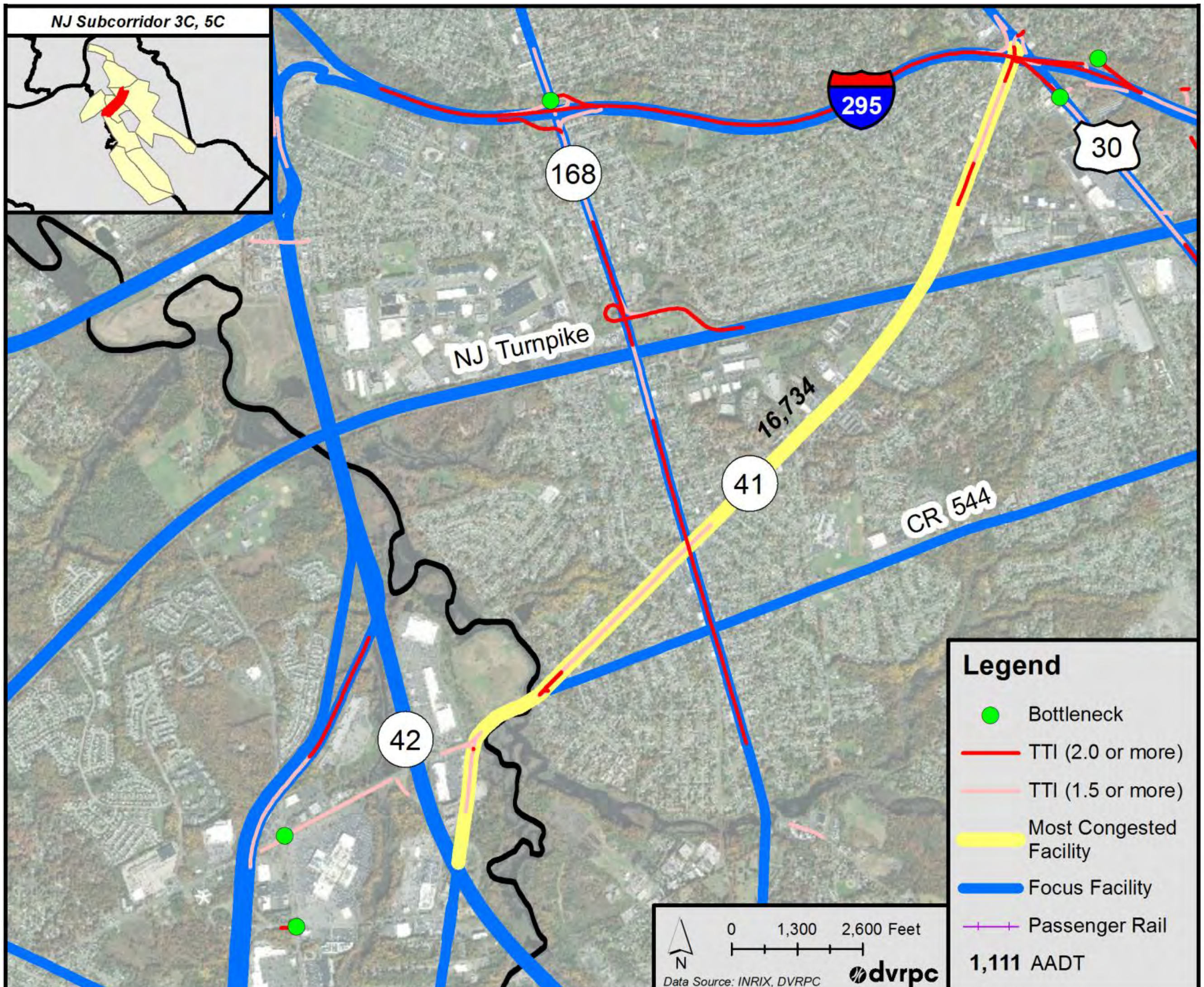
* 2045 LRP: #191A Route 295/38 Missing Moves
* FY 2020-23 TIP:DB #15353 - Rt 38 & Lenola Rd; DB #12307 - Rt 38 & S Church St; DB #15385, DB #191A

Very Appropriate Strategies

1) Signal Improvements
2) Transit Infrastructure Improvements
3) Turning Movement Enhancements
4) Bottleneck Removal of a Limited Scale for Cars and Trucks
5) Marketing/Outreach for Transit and TDM Services
6) Comprehensive Policy Approaches

Additional Factors	
National Highway System:	Yes
DVRPC High Crash Frequency:	Yes
DVRPC High Crash Severity:	No
Transit Route:	Yes
Park and Ride:	No
Bottleneck Intersections, Segments:	3,3
Traffic Signals:	8
AADT:	45,027

Figure 33: Facility 285
NJ 41 from NJ 42 to US 30, Camden and Gloucester Counties NJ



Summary of Conditions

NJ 41 from NJ 42 to US 30 in Camden and Gloucester Counties is ranked **#5** and **#35** in peak travel time vehicle and volume delay, respectively, and **#3** and **#28** in peak planning time vehicle and volume delay, respectively. NJ 41 is primarily a minor arterial road, with the exception of a section between NJ 168 and CR 544 that is a principal arterial. There is one lane of travel in each direction from US 30 to CR 544, and multiple lanes of travel in each direction south of CR 544.

Congestion Measures	
TT PM Peak Vehicle Delay (sec):	50.39
PT PM Peak Vehicle Delay (sec):	192.99
Facility Miles	7.87
TT PM Peak Volume Delay (hr):	9:56:35
PT PM Peak Volume Delay (hr):	37:27:35
High PM3 LOTTR (Unreliable):	Yes
High PM3 TTTR ((Unreliable):	N/A
High PM3 Peak Hour Excessive Delay:	No
TDM Forecasted Congestion (miles):	0

Planned Improvements on 2045 LRP & FY 2020-23 TIP

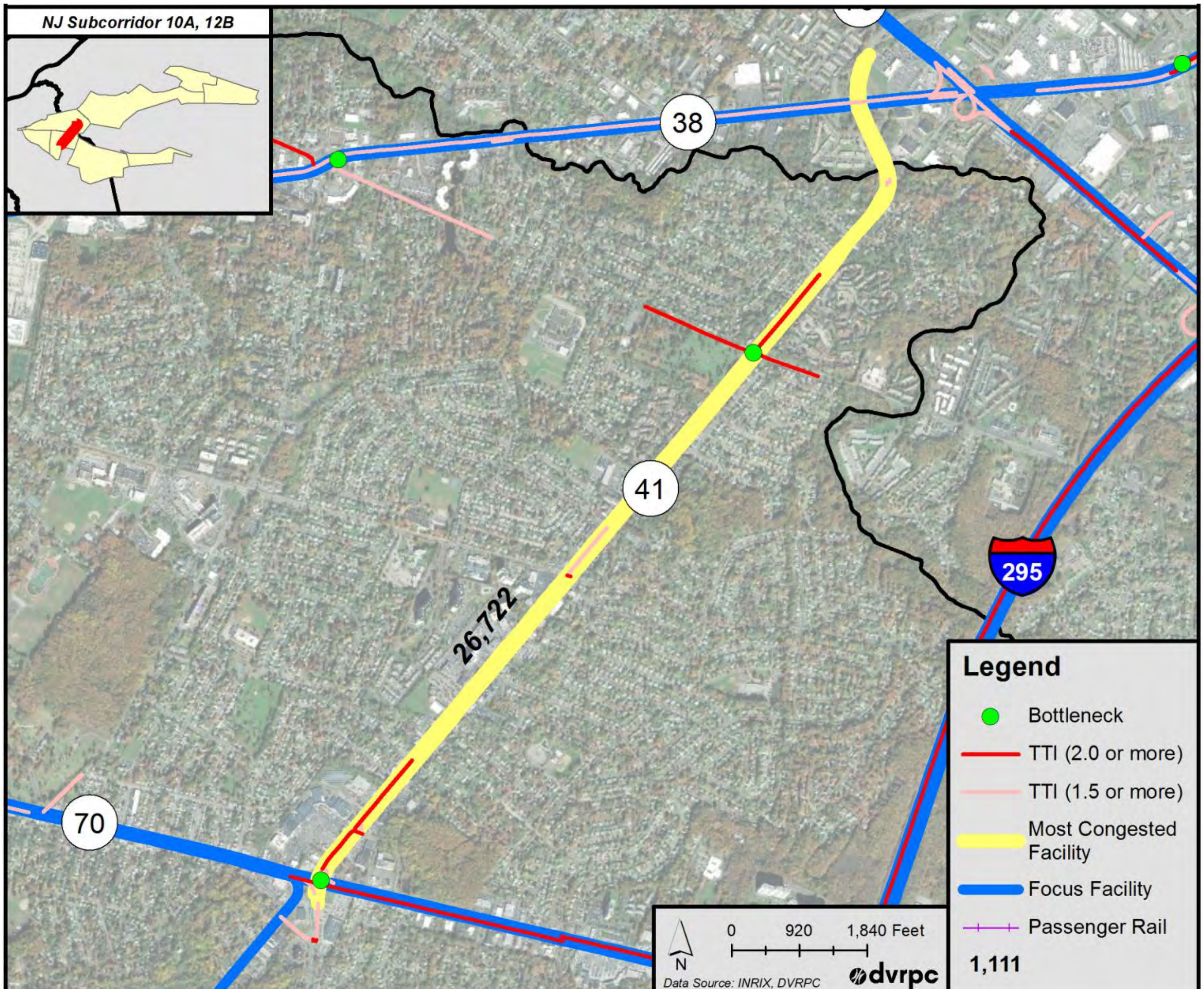
* 2045 LRP: No projects
* FY 2020-23 TIP: No projects

Very Appropriate Strategies

1) Transit Infrastructure Improvements
2) Turning Movement Enhancements
3) Signal Improvements
4) Park and Ride Lots
5) Walking and Bicycling Improvements

Additional Factors	
National Highway System:	Yes
DVRPC High Crash Frequency:	No
DVRPC High Crash Severity:	No
Transit Route:	Yes
Park and Ride:	No
Bottleneck Intersections, Segments:	0,0
Traffic Signals:	9
AADT:	16,734

Figure 34: Facility 294
NJ 41 from NJ 70 to NJ 38, Camden and Burlington Counties NJ



Summary of Conditions

NJ 41 from NJ 70 to NJ 38 in Camden and Burlington Counties is ranked **#8** and **#21** in peak travel time vehicle and volume delay, respectively, and **#4** and **#17** in peak planning time vehicle and volume delay, respectively. This is a minor arterial road with two travel lanes in each direction, and a center turning lane.

Congestion Measures	
TT PM Peak Vehicle Delay (sec):	47.76
PT PM Peak Vehicle Delay (sec):	172.18
Facility Miles:	5.43
TT PM Peak Volume Delay (hr):	16:43:25
PT PM Peak Volume Delay (hr):	60:30:07
High PM3 LOTTR (Unreliable):	No
High PM3 TTTR ((Unreliable):	N/A
High PM3 Peak Hour Excessive Delay:	No
TDM Forecasted Congestion (miles):	0.03

Planned Improvements on 2045 LRP & FY 2020-23 TIP

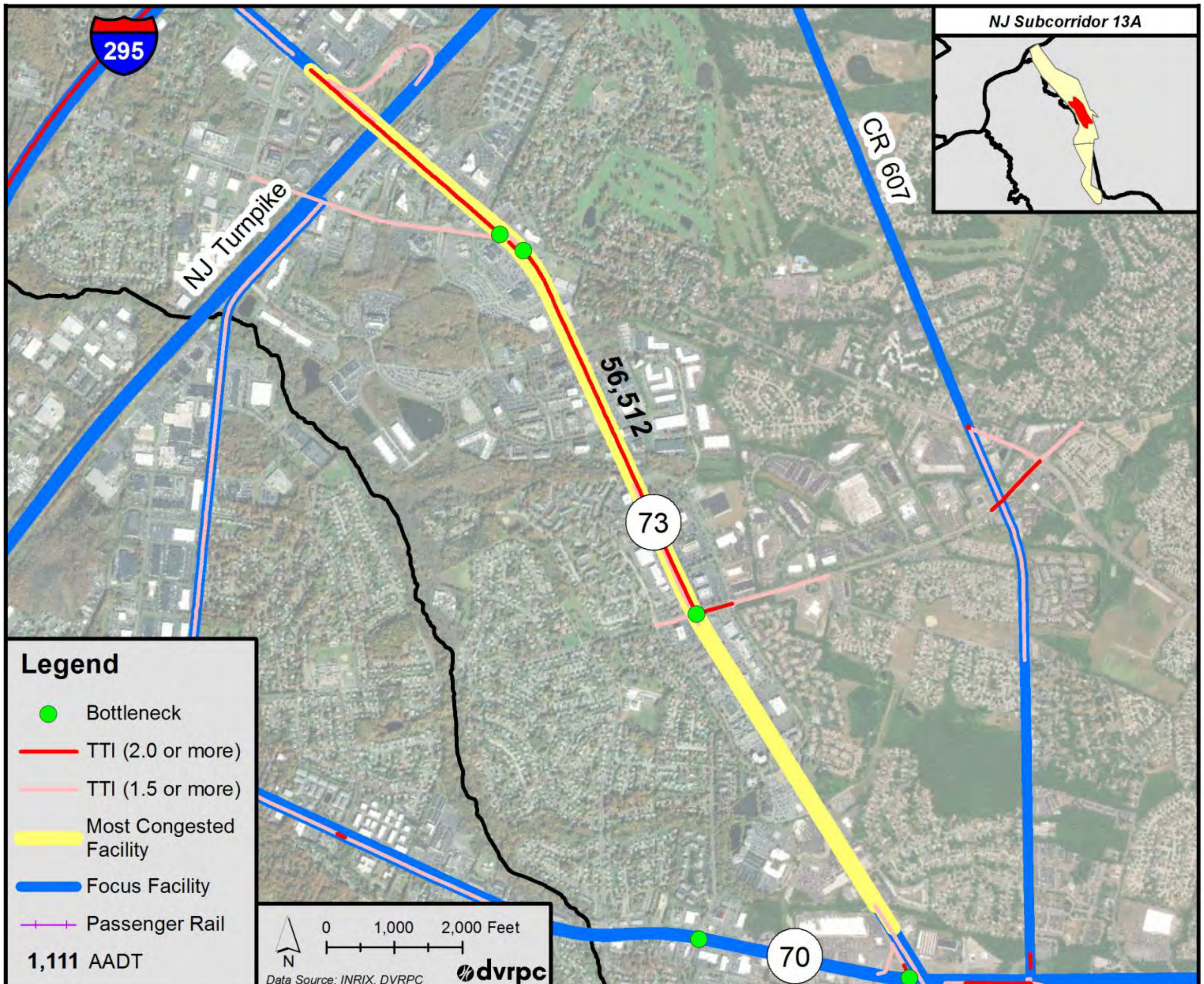
* 2045 LRP: No projects
* FY 2020-23 TIP: No projects

Very Appropriate Strategies

1) Signal Improvements
2) Transit Infrastructure Improvements
3) Park and Ride Lots
4) Transit-First Policy
5) Walking and Bicycling Improvements

Additional Factors	
National Highway System:	Yes
DVRPC High Crash Frequency:	No
DVRPC High Crash Severity:	Yes
Transit Route:	Yes
Park and Ride:	No
Bottleneck Intersections, Segments:	2,3
Traffic Signals:	7
AADT:	26,722

Figure 35: Facility 272
NJ 73 from NJ Turnpike (Exit 4) to NJ 70, Burlington County NJ



Summary of Conditions

NJ 73 from the NJ Turnpike (Exit 4) to NJ 70 in Burlington County is ranked **#1** and **#2** in peak travel time vehicle and volume delay, respectively, and **#2** in both peak planning time vehicle and volume delay, respectively. This principal arterial, and divided roadway contains two travel lanes in each direction.

Congestion Measures	
TT PM Peak Vehicle Delay (sec):	78.77
PT PM Peak Vehicle Delay (sec):	194.61
Facility Miles:	5.73
TT PM Peak Volume Delay (hr):	63:01:45
PT PM Peak Volume Delay (hr):	148:52:20
High PM3 LOTTR (Unreliable):	Yes
High PM3 TTTR ((Unreliable):	N/A
High PM3 Peak Hour Excessive Delay:	No
TDM Forecasted Congestion (miles):	0

Planned Improvements on 2045 LRP & FY 2020-23 TIP

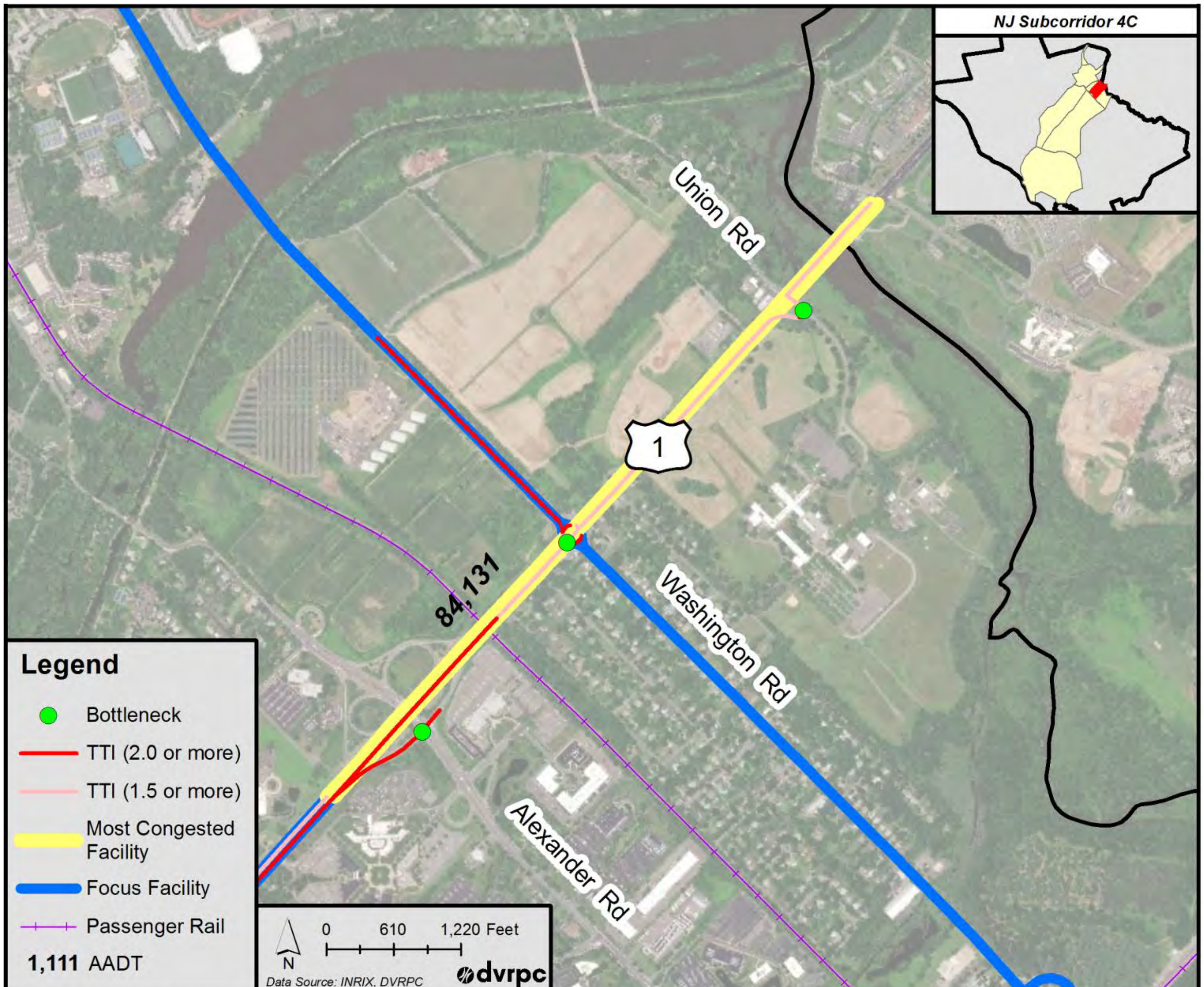
* 2045 LRP: MRP #210 - NJ 73 at Church Rd and Fellowship Rd
* FY 2020-23 TIP: DB #12380-NJ 73 at Church Rd and Fellowship Rd (New Capacity)

Very Appropriate Strategies

1) Signal Improvements
2) Outreach and Marketing
3) Comprehensive Policy Approaches
4) Parking Supply-and-Demand Management
5) Modifications to Existing Transit Routes or Services

Additional Factors	
National Highway System:	Yes
DVRPC High Crash Frequency:	No
DVRPC High Crash Severity:	Yes
Transit Route:	Yes
Park and Ride:	Yes
Bottleneck Intersections, Segments:	3,4
Traffic Signals:	8
AADT:	56,512

Figure 36: Facility 218
US 1 from Alexander Rd to County Line, Mercer County NJ



Summary of Conditions

US 1 from Alexander Rd to the Mercer County and Middlesex County Line is ranked **#15** and **#5** in peak travel time vehicle and volume delay, respectively, and **#49** and **#8** in peak planning time vehicle and volume delay, respectively. This divided and principal arterial roadway contains three travel lanes in each direction.

Congestion Measures	
TT PM Peak Vehicle Delay (sec):	43.71
PT PM Peak Vehicle Delay (sec):	91.03
Facility Miles:	2.76
TT PM Peak Volume Delay (hr):	46:58:36
PT PM Peak Volume Delay (hr):	97:15:37
High PM3 LOTTR (Unreliable):	Yes
High PM3 TTTR ((Unreliable):	N/A
High PM3 Peak Hour Excessive Delay:	No
TDM Forecasted Congestion (miles):	0

Planned Improvements on 2045 LRP & FY 2020-23 TIP

* 2045 LRP: MRP #84 - US 1 Roadway System expansion; S - US 1 BRT
* FY 2020-23 TIP: DB #17419 - Roadway System Expansion

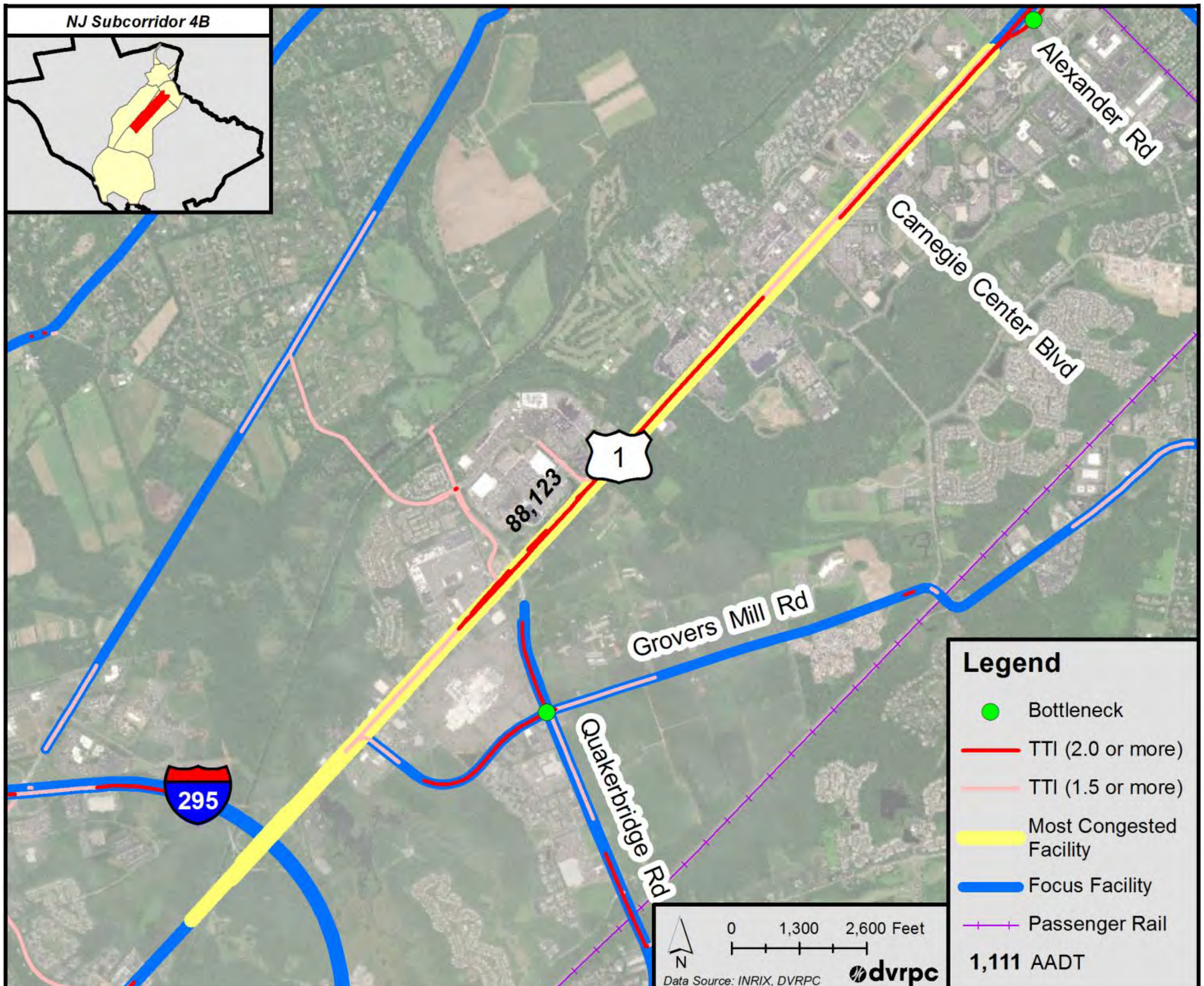
Very Appropriate Strategies

1) Signal Improvements
2) Transit Infrastructure Improvements
3) Encourage Use of Few Cars
4) Comprehensive Policy Approaches
5) Walking and Bicycling Improvements
6) Bus Rapid Transit (BRT) or Exclusive Right-of-Way Bus Lanes

Additional Factors	
National Highway System:	Yes
DVRPC High Crash Frequency:	No
DVRPC High Crash Severity:	Yes
Transit Route:	Yes
Park and Ride:	No
Bottleneck Intersections, Segments:	3,1
Traffic Signals:	3
AADT:	84,131

Figure 37: Facility 217

US 1 from I-295 to Alexander Rd, Mercer County NJ



Summary of Conditions

US 1 from the I-295 interchange to Alexander Rd in Mercer County is ranked **#28** and **#6** in peak travel time vehicle and volume delay, respectively, and **#30** and **#5** in peak planning time vehicle and volume delay, respectively. This divided and principal arterial roadway contains three travel lanes in each direction, and includes one signalized intersection at US 1 and Carnegie Center Boulevard.

Congestion Measures	
TT PM Peak Vehicle Delay (sec):	34.44
PT PM Peak Vehicle Delay (sec):	101.58
Facility Miles:	8.68
TT PM Peak Volume Delay (hr):	37:58:40
PT PM Peak Volume Delay (hr):	115:53:06
High PM3 LOTTR (Unreliable):	Yes
High PM3 TTTR ((Unreliable):	N/A
High PM3 Peak Hour Excessive Delay:	No
TDM Forecasted Congestion (miles):	0.00

Planned Improvements on 2045 LRP & FY 2020-23 TIP

* 2045 LRP: No LRP projects
* FY 2020-23 TIP: No TIP projects

Very Appropriate Strategies

1) Signal Improvements
2) Transit Infrastructure Improvements
3) Encourage Use of Few Cars
4) Comprehensive Policy Approaches
5) Walking and Bicycling Improvements
6) Bus Rapid Transit (BRT) or Exclusive Right-of-Way Bus Lanes

Additional Factors	
National Highway System:	Yes
DVRPC High Crash Frequency:	No
DVRPC High Crash Severity:	No
Transit Route:	Yes
Park and Ride:	No
Bottleneck Intersections, Segments:	0,5
Traffic Signals:	1
AADT:	88,123

4.3 Selecting Focus Intersection Bottlenecks

Some roadway facilities may not indicate significant levels of congestion, but one or two intersections along the facility may experience reduced mobility and result in a bottleneck. The focus of the bottleneck analysis is along arterials and other non-controlled access roadway facilities, typically occurring at signalized intersections. This analysis does not consider bottlenecks on limited-access roadways, since these locations are considered as part of the focus roadway facility analysis.

The most congested bottleneck locations (or focus intersection bottlenecks) in the region are identified as ones that contain a roadway segment approach to an intersection with a high TTI of 2.5 or more (highest delay bottleneck segment approach). A few other bottlenecks are identified using the CATT Lab PDA Bottleneck Ranking Tool. For each bottleneck, peak travel time vehicle and volume delay measures are calculated for the highest congestion bottleneck segment approach, the remaining approach segments that touch the intersection, and any trailing segments with a TTI of 1.4 or more. There were a total of 189 focus intersection bottlenecks identified: 109 and 80 in the Pennsylvania and New Jersey portions of the DVRPC region, respectively (see Figure 38).

Tables 6 and 7 contain a list of bottlenecks in the Pennsylvania and New Jersey portions of the DVRPC region, respectively, sorted by intersection name. They are ranked by both peak travel time vehicle and volume delay with a rank of one being the most delayed. Most bottlenecks are more delayed during the PM peak hour, but there are a few that are more delayed during the AM peak hour, which are highlighted in gray in the "AM/PM Highest Delay" column. Vehicle and volume delays are measured in seconds and hours, respectively. The delay rankings are color coded by quartiles from the most to least in delay, with brown being the most delayed and yellow the least. The number of intersection legs included in the peak hour calculation is listed for each intersection, since some leg approaches are omitted from the analysis because they do not contain traffic volumes or travel time data, and as a result may significantly under-represent congestion. Also, the percentage of total delay on the leg with the most delay is listed for each intersection.

The focus intersection bottlenecks should be considered in DVRPC corridor and other planning studies, and could be added to the TIP and Long-Range Plan evaluation criteria. They will need to be weighed against regional priorities and the region's extreme funding constraint.

Figure 38: Focus Intersection Bottlenecks

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Table 6

Focus Intersection Bottlenecks in the Pennsylvania Portion of the DVRPC Region: Peak Travel Time Vehicle and Volume Delay (Sorted by Intersection Name)

				Peak Vehicle Delay						Peak Hour Volume Delay						
MAP ID	Intersection Name	Municipality	County	AM Peak Vehicle Delay (sec)	PM Peak Vehicle Delay (sec)	Highest Vehicle Delay (sec)	Time of Day with Highest Delay	% of Delay on Leg with Most Delay	Rank	Rank	Intersection Legs included in Peak Hour Volume Delay	Peak Hour Volume	AM Peak Volume Delay (Hr)	PM Peak Volume Delay (Hr)	Highest Volume Delay (Hr)	Time of Day with Highest Delay
104	Baltimore Pk @ Sproul Rd	Springfield Township	Delaware	53.6	103.3	103.3	PM	56%	94	71	3/4	2,854	11:00:55	27:21:07	27:21:07	PM
96	Belmont Ave @ Georges Hill Dr	Philadelphia	Philadelphia	98.6	170.2	170.2	PM	46%	62	35	3/3	3,567	27:17:52	57:43:12	57:43:12	PM
74	Bustleton Pk @ Bristol Rd	Northampton Township	Bucks	33.8	159.5	159.5	PM	45%	67	90	4/4	989	3:04:53	19:48:39	19:48:39	PM
42	Byberry Rd @ Davisville Rd	Upper Moreland Township	Montgomery	94.7	225.1	225.1	PM	34%	42	56	4/4	2,509	12:25:46	37:53:24	37:53:24	PM
66	Byberry Rd @ Evans St	Philadelphia	Philadelphia	208.4	311.9	311.9	PM	49%	19	23	3/3	1,889	41:52:42	72:30:35	72:30:35	PM
34	Byberry Rd @ PA 532 (Bustleton Ave)	Philadelphia	Philadelphia	148.2	414.4	414.4	PM	31%	4	7	4/4	4,613	34:30:57	127:55:36	127:55:36	PM
54	Callowhill St @ 3rd St	Philadelphia	Philadelphia	26.1	83.5	83.5	PM	80%	100	95	2/2	4,126	6:55:46	17:33:35	17:33:35	PM
55	County Line Rd @ Lower State Rd/Kulp Rd	Warrington Township	Bucks	51.3	177.3	177.3	PM	43%	59	76	3/3	1,357	5:47:36	25:46:57	25:46:57	PM
25	County Line Rd @ PA 292 (2nd St)	Lower Moreland Township	Montgomery	103.0	281.7	281.7	PM	44%	27	22	4/4	2,724	22:33:27	83:36:59	83:36:59	PM
88	Darby Rd @ Eagle Rd	Haverford Township	Delaware	108.3	250.7	250.7	PM	58%	33	49	4/4	2,690	16:07:57	44:52:32	44:52:32	PM
15	Grays Ferry Ave @ S 34th St	Philadelphia	Philadelphia	120.3	333.1	333.1	PM	40%	13	15	4/4	4,831	29:22:10	107:19:05	107:19:05	PM
45	Haverford Rd @ Wynnewood St/E Eagle Rd	Haverford Township	Delaware	105.0	177.5	177.5	PM	43%	57	74	4/4	2,451	21:40:35	26:52:28	26:52:28	PM
95	I-295 SB Exit 8 @ PA 332 (Newtown Bypass)	Lower Makefield Township	Bucks	15.0	64.2	64.2	PM	52%	105	87	3/3	3,062	4:27:28	20:26:13	20:26:13	PM
72	I-476 NB @ US 1 (Media Bypass)	Marple Township	Delaware	23.5	53.6	53.6	PM	93%	106	101	2/2	1,646	4:16:28	13:53:04	13:53:04	PM
90	I-676 (Vine St Expy) WB off ramp @ N 22nd St	Philadelphia	Philadelphia	56.4	178.7	178.7	PM	81%	56	55	2/2	1,345	8:50:11	38:08:40	38:08:40	PM
94	I-76 EB Conshohocken Exit @ Matsonford Rd	West Conshohocken Borough	Montgomery	51.1	186.2	186.2	PM	56%	52	52	3/3	3,280	10:39:47	39:43:06	39:43:06	PM
75	I-76 EB Exit @ Montgomery Dr	Philadelphia	Philadelphia	65.8	127.7	127.7	PM	79%	79	61	3/3	4,133	15:00:59	36:13:09	36:13:09	PM
13	I-76 EB on/off ramp @ US 30 (Girard Ave)	Philadelphia	Philadelphia	78.1	187.9	187.9	PM	82%	51	24	3/3	2,909	22:20:46	71:19:38	71:19:38	PM
59	I-76 WB Exit @ Montgomery Dr	Philadelphia	Philadelphia	79.8	77.5	79.8	AM	78%	101	82	3/3	4,083	16:59:40	22:17:17	22:17:17	PM
101	I-95 NB Exit 6 @ PA 352 (Edgemont Ave)	Chester City	Delaware	33.2	35.8	35.8	PM	52%	109	107	3/3	1,032	2:27:44	3:24:57	3:24:57	PM
85	JFK Blvd @ Schuylkill Ave	Philadelphia	Philadelphia	89.4	271.5	271.5	PM	72%	30	14	2/2	3,757	27:58:45	108:05:02	108:05:02	PM
26	Kelly Dr @ Falls Rd	Philadelphia	Philadelphia	158.3	295.6	295.6	PM	40%	23	17	4/4	4,955	45:11:14	105:10:48	105:10:48	PM
20	Matsonford Rd @ New Gulph Rd	Lower Merion Township	Montgomery	68.8	185.3	185.3	PM	65%	53	83	4/4	1,629	6:09:01	22:09:28	22:09:28	PM
24	Matsonford Rd @ PA 320 (S Gulph Rd)	Lower Merion Township	Montgomery	120.7	232.2	232.2	PM	69%	39	40	4/4	2,417	19:37:27	50:59:59	50:59:59	PM
23	Mortonville Rd/Saw Mill Rd @ Misty Patch Rd	East Fallowfield Township	Chester	92.4	113.1	113.1	PM	100%	86	109	2/3	10	0:05:08	0:06:37	0:06:37	PM
21	N Providence Rd @ Bishop Hollow Rd	Upper Providence Township	Delaware	91.9	330.9	330.9	PM	56%	14	63	4/4	1,404	8:24:11	35:21:59	35:21:59	PM
82	Newtown Bypass (PA 332) Woodbourne Rd/Penns Trl	Newtown Township	Bucks	12.4	53.3	53.3	PM	80%	107	103	4/4	4,090	1:18:22	9:38:44	9:38:44	PM
89	Old Baltimore Pk @ N Jennersville Rd	Penn Township	Chester	43.6	87.0	87.0	PM	64%	99	105	4/4	1,271	2:32:04	6:24:10	6:24:10	PM
43	PA 100 (Pottstown Pk) @ Howard Rd	West Whiteland Township	Chester	69.5	200.6	200.6	PM	68%	47	10	3/3	6,659	25:56:35	118:03:54	118:03:54	PM
33	PA 100 (Pottstown Pk) @ PA 401 (Conestoga Rd)	West Vincent Township	Chester	39.4	116.9	116.9	PM	77%	84	91	4/4	1,751	3:58:01	19:36:16	19:36:16	PM
79	PA 113 (Kimberton Rd) @ Pothouse Rd	East Pikeland Township	Chester	18.7	104.3	104.3	PM	85%	91	94	3/3	1,655	2:31:13	17:45:35	17:45:35	PM
102	PA 132 (Street Rd) @ Trevose Rd	Bensalem Township	Bucks	68.6	189.5	189.5	PM	41%	50	25	4/4	5,511	22:51:02	71:16:37	71:16:37	PM
73	PA 152 (Limekiln Pk) @ County Line Rd	Montgomery Township	Montgomery	119.1	152.8	152.8	PM	35%	70	77	4/4	2,104	15:01:34	24:42:47	24:42:47	PM
109	PA 152 (Limekiln Pk) @ Susquehanna Rd	Upper Dublin Township	Montgomery	149.7	113.0	149.7	AM	86%	71	86	2/3	884	20:51:40	20:03:28	20:51:40	AM
106	PA 23 (Front St) @ Matsonford Rd	West Conshohocken Borough	Montgomery	180.9	405.7	405.7	PM	38%	6	12	4/4	4,863	52:56:44	113:44:26	113:44:26	PM
83	PA 23 (Valley Forge Rd) @ PA 422 EB Exit	Upper Merion Township	Montgomery	25.9	112.2	112.2	PM	95%	87	75	3/3	2,287	5:07:59	25:58:06	25:58:06	PM
28	PA 232 (Huntingdon Pk) @ Red Lion Rd	Lower Moreland Township	Montgomery	155.8	269.2	269.2	PM	56%	31	39	3/3	2,423	24:58:40	52:56:35	52:56:35	PM
52	PA 132 (Street Rd) @ Old Lincoln Hwy	Bensalem Township	Bucks	76.2	287.3	287.3	PM	45%	24	16	4/4	4,919	20:09:56	106:15:49	106:15:49	PM
50	PA 252 (Leopard Rd) @ Sugartown Rd/Darby Rd	Easttown Township	Chester	44.9	123.1	123.1	PM	56%	81	98	4/4	2,008	4:38:37	14:50:53	14:50:53	PM
19	PA 29 (Gravel Pike) @ PA 113 (Bridge Rd)	Perkiomen Township	Montgomery	255.0	285.6	285.6	PM	43%	25	62	4/4	1,769	23:51:40	35:42:19	35:42:19	PM
62	PA 29 (Starr St) @ Bridge St	Phoenixville Borough	Chester	74.4	204.7	204.7	PM	42%	45	65	3/3	1,610	9:23:27	30:40:37	30:40:37	PM
107	PA 3 (West Chester Pk) @ Eagle Rd	Haverford Township	Delaware	175.7	300.7	300.7	PM	68%	20	6	4/4	4,238	54:10:43	129:57:13	129:57:13	PM
103	PA 3 (West Chester Pk) @ Springfield Rd	Marple Township	Delaware	165.4	330.4	330.4	PM	73%	15	8	3/4	3,257	41:57:13	126:40:06	126:40:06	PM
86	PA 3 @ PA 352 (Chester Rd)	Westtown Township	Chester	40.4	74.4	74.4	PM	52%	103	89	3/4	3,133	8:35:08	19:55:00	19:55:00	PM
12	PA 309 (Bethlehem Pk) @ Line Lexington Rd	Hatfield Township	Montgomery	118.2	473.9	473.9	PM	49%	2	2	4/4	3,970	28:22:08	149:19:47	149:19:47	PM
17	PA 309 (Bethlehem Pk) @ PA 463 (Horsham Rd/Cowpath Rd)/US 202 Bus	Montgomery Township	Montgomery	77.0	118.3	118.3	PM	47%	83	64	5/5	4,294	15:46:47	31:55:47	31:55:47	PM
99	PA 309 @ PA 313/PA 663	Quakertown Borough	Bucks	94.9	234.7	234.7	PM	40%	37	21	4/4	4,468	26:06:13	85:10:02	85:10:02	PM
48	PA 309 @ Tollgate Rd	Richland Township	Bucks	67.7	129.3	129.3	PM	58%	78	38	4/4	3,776	18:46:20	53:40:08	53:40:08	PM
87	PA 309 NB Exit @ PA 73 (Church Rd)	Springfield Township	Montgomery	37.7	17.2	37.7	AM	60%	108	108	3/3	983	2:55:21	1:49:55	2:55:21	AM
3	PA 309/Ogontz Ave @ Cheltenham Ave	Cheltenham Township, Philadelphia	Montgomery, Philadelphia	180.9	357.7	357.7	PM	64%	10	5	4/5	3,552	48:13:23	130:52:09	130:52:09	PM
44	PA 313 @ N Easton Rd	Doylestown Township	Bucks	52.0	129.8	129.8	PM	59%	77	88	4/4	2,285	6:29:39	20:17:26	20:17:26	PM
18	PA 320 (Spruce Rd) @ Bryn Mawr Ave	Radnor Township	Delaware	134.6	368.4	368.4	PM	34%	9	48	4/4	1,990	14:46:24	46:05:21	46:05:21	PM
10	PA 352 (Middletown Rd) @ PA 452 (N Pennell Rd)	Middletown Township	Delaware	139.9	283.8	283.8	PM	68%	26	34	4/4	2,543	22:46:18	57:57:52	57:57:52	PM
16	PA 363 (Ridge Pk) @ S Park Ave	Lower Providence Township	Montgomery	91.7	300.4	300.4	PM	59%	21	36	4/4	2,953	15:22:37	57:09:36	57:09:36	PM
30	PA 363 (S Trooper Rd) @ PA 422 WB Ramp	West Norriton Township	Montgomery	144.8	25.3	144.8	AM	95%	72	57	3/3	3,774	37:44:19	9:32:26	37:44:19	AM
76	PA 363 (Valley Forge Rd) @ Allentown Rd	Upper Gwynedd Township	Montgomery	131.0	153.6	153.6	PM	62%	69	78	4/4	2,237	16:49:35	24:23:42	24:23:42	PM
40	PA 401 (Conestoga Rd) @ Valley Hill Rd	Charlestown Township	Chester	71.2	161.9	161.9	PM	91%	65	73	2/4	1,137	8:18:00	27:04:42	27:04:42	PM
80	PA 463 (Horsham Rd) @ PA 152 (Limekiln Pk)	Horsham Township	Montgomery	130.5	246.8	246.8	PM	54%	34	47	4/4	2,326	17:54:10	46:33:18	46:33:18	PM

Table 6
Continued

				Peak Vehicle Delay						Peak Hour Volume Delay						
MAP ID	Intersection Name	Municipality	County	AM Peak Vehicle Delay (sec)	PM Peak Vehicle Delay (sec)	Highest Vehicle Delay (sec)	Time of Day with Highest Delay	% of Delay on Leg with Most Delay	Rank	Rank	Intersection Legs included in Peak Hour Volume Delay	Peak Hour Volume	AM Peak Volume Delay (Hr)	PM Peak Volume Delay (Hr)	Highest Volume Delay (Hr)	Time of Day with Highest Delay
53	PA 52 (Lenape Rd) @ S Creek Rd	Birmingham Township	Chester	124.2	165.7	165.7	PM	89%	63	92	3/3	931	10:48:27	18:40:02	18:40:02	PM
97	PA 532 (Buck Rd) @ Old Bristol Rd	Northampton Township	Bucks	40.3	107.7	107.7	PM	83%	89	100	2/3	969	4:03:46	13:54:42	13:54:42	PM
9	PA 611 (Easton Rd) @ Blair Mill Rd	Upper Moreland Township	Montgomery	163.5	333.2	333.2	PM	49%	12	20	3/4	3,806	36:30:28	87:50:01	87:50:01	PM
46	PA 611 (Easton Rd) @ Bristol Rd	Warrington Township	Bucks	129.2	236.9	236.9	PM	40%	35	37	4/4	3,731	19:35:30	53:58:23	53:58:23	PM
38	PA 611 (Easton Rd) @ County Line Rd	Horsham Township	Montgomery	78.8	177.4	177.4	PM	46%	58	33	4/4	4,505	18:11:14	58:25:01	58:25:01	PM
92	PA 611 (Easton Rd) @ Dresher Rd	Horsham Township	Montgomery	62.1	103.7	103.7	PM	46%	92	72	4/4	3,547	11:13:18	27:08:54	27:08:54	PM
67	PA 611 (Easton Rd) @ Stump Rd	Plumstead Township	Bucks	42.0	141.9	141.9	PM	73%	74	79	4/4	1,486	4:28:56	23:54:41	23:54:41	PM
69	PA 63 (Red Lion Rd) @ Pine Rd	Lower Moreland Township	Montgomery	53.7	134.6	134.6	PM	47%	76	85	4/4	2,118	6:18:49	20:58:42	20:58:42	PM
91	PA 63 (Welsh Rd) @ US 202	Montgomery Township	Montgomery	56.7	103.5	103.5	PM	47%	93	80	4/4	3,424	10:47:19	23:47:33	23:47:33	PM
60	PA 73 (Skippack Pk) @ Bethlehem Pk	Whitemarsh Township	Montgomery	107.1	200.0	200.0	PM	71%	48	59	4/4	2,475	12:57:30	36:56:45	36:56:45	PM
51	PA 73 (Skippack Pk) @ Butler Pk	Whitpain Township	Montgomery	92.1	143.8	143.8	PM	48%	73	84	4/4	2,158	10:40:13	21:41:31	21:41:31	PM
36	Pawlings Rd/S Park Av @ Egypt Rd	Lower Providence Township	Montgomery	109.4	215.2	215.2	PM	39%	43	54	4/4	2,609	13:52:09	38:50:55	38:50:55	PM
5	Philmont Ave/Tomlinson Rd @ Pine Rd	Lower Moreland Township	Montgomery	155.1	412.5	412.5	PM	45%	5	31	5/5	2,490	15:44:31	62:57:49	62:57:49	PM
77	Plymouth Rd @ W Germantown Pk	Plymouth Township	Montgomery	99.9	175.7	175.7	PM	48%	60	45	4/4	5,248	20:37:08	48:02:33	48:02:33	PM
41	Ridge Ave @ Ferry Rd	Philadelphia	Philadelphia	55.1	122.7	122.7	PM	64%	82	93	3/3	1,604	6:35:37	17:53:10	17:53:10	PM
35	Ridge Ave @ Midvale Ave	Philadelphia	Philadelphia	37.6	90.0	90.0	PM	58%	97	102	3/4	1,381	4:16:40	13:06:41	13:06:41	PM
49	Ridge Pk @ Barren Hill Rd	Whitemarsh Township	Montgomery	19.2	351.8	351.8	PM	60%	11	28	3/3	2,397	3:22:36	66:21:26	66:21:26	PM
71	S 17th St @ Walnut St	Philadelphia	Philadelphia	75.1	231.4	231.4	PM	60%	40	41	2/2	1,465	13:04:22	50:50:42	50:50:42	PM
63	S University Ave @ I-76 EB Exit	Philadelphia	Philadelphia	36.2	77.0	77.0	PM	78%	102	69	3/3	3,786	9:42:03	27:43:45	27:43:45	PM
68	S Warner Rd @ Croton Rd	Upper Merion Township	Montgomery	28.0	159.0	159.0	PM	87%	68	99	4/4	991	1:42:42	13:54:56	13:54:56	PM
14	Strasburg Rd @ Mortonville Rd	East Fallowfield Township	Chester	136.6	87.4	136.6	AM	99%	75	106	2/4	286	5:25:22	4:27:41	5:25:22	AM
61	Torresdal Av @ Frankford Ave	Philadelphia	Philadelphia	59.2	174.9	174.9	PM	58%	61	70	4/4	1,467	7:03:43	27:25:32	27:25:32	PM
98	US 1 (Baltimore Pk) & US 202 (Wilmington Pk)	Concord Township	Delaware	189.3	297.0	297.0	PM	28%	22	3	4/4	6,606	67:17:51	136:01:46	136:01:46	PM
31	US 1 (City Ave) @ PA 23 (Conshohocken State Rd)	Lower Merion Township, Philadelphia	Montgomery, Philadelphia	108.1	327.3	327.3	PM	61%	16	4	4/4	4,517	32:50:06	132:12:35	132:12:35	PM
8	US 1 (City Ave) @ US 30	Lower Merion Township, Philadelphia	Montgomery, Philadelphia	102.8	320.3	320.3	PM	71%	18	11	4/4	3,740	19:08:05	114:27:41	114:27:41	PM
57	US 1 (Roosevelt Blvd) @ Rising Sun Ave	Philadelphia	Philadelphia	116.5	109.4	116.5	AM	54%	85	68	3/3	2,642	27:54:34	26:43:47	27:54:34	AM
70	US 1 (S State Rd) @ West Springfield Rd	Springfield Township	Delaware	284.4	323.0	323.0	PM	42%	17	13	4/4	4,849	65:56:39	108:26:47	108:26:47	PM
2	US 1 (W Baltimore Pk) @ PA 452 (S Pennell Rd)	Middletown Township	Delaware	146.5	378.1	378.1	PM	56%	7	9	4/4	4,255	33:27:49	126:34:29	126:34:29	PM
93	US 13 (Bristol Pk) @ Newportville Rd	Bristol Township	Bucks	36.8	90.1	90.1	PM	65%	96	97	3/3	1,504	4:44:21	14:57:49	14:57:49	PM
78	US 13 (Chester Pk) @ PA 420 (Lincoln Ave)	Prospect Park Borough	Delaware	193.8	208.5	208.5	PM	49%	44	32	4/4	3,979	37:28:43	62:21:16	62:21:16	PM
65	US 13 (W Roosevelt Blvd) @ West Hunting Park Ave	Philadelphia	Philadelphia	52.0	160.3	160.3	PM	60%	66	60	3/4	1,722	9:28:28	36:15:27	36:15:27	PM
22	US 202 (Butler Ave) @ PA 152 (N Main St)	Chalfont Borough	Bucks	70.8	226.5	226.5	PM	65%	41	53	3/3	1,789	8:02:55	39:42:52	39:42:52	PM
7	US 202 (Dekalb Pk) @ Sumneytown Pk	Lower Gwynedd Township	Montgomery	242.6	462.3	462.3	PM	38%	3	19	4/4	3,107	42:15:49	95:13:18	95:13:18	PM
32	US 202 (Markley St) @ W Main St	Norristown Borough	Montgomery	324.9	374.2	374.2	PM	39%	8	29	4/4	2,758	42:26:03	64:55:49	64:55:49	PM
105	US 202 (Wilmington Pk) @ PA 491 (Naamans Creek Rd)/Beaver Valley Rd	Concord Township	Delaware	28.7	107.2	107.2	PM	81%	90	46	4/4	4,151	5:04:39	46:49:25	46:49:25	PM
39	US 202 (Wilmington Pk) @ PA 926 (Street Rd)	Thornbury Township	Chester	149.2	236.7	236.7	PM	36%	36	18	4/4	5,176	45:47:41	101:05:20	101:05:20	PM
108	US 202 (Wilmington Pk) @ Smithbridge Rd	Haverford Township	Delaware	52.3	184.5	184.5	PM	68%	54	30	3/3	2,292	4:32:57	64:49:44	64:49:44	PM
4	US 202 @ PA 263 (Old York Rd)	Buckingham Township	Bucks	43.8	88.9	88.9	PM	51%	98	96	3/3	1,844	5:11:15	16:24:01	16:24:01	PM
27	US 202 @ PA 413 (Durham Rd)	Buckingham Township	Bucks	67.5	53.9	67.5	AM	52%	104	104	4/4	2,180	7:15:59	7:39:29	9:18:20	PM
64	US 202 West Chester Bypass @ S Matlack St	West Goshen Township	Chester	47.9	96.3	96.3	PM	65%	95	27	4/4	6,800	26:57:43	69:33:04	69:33:04	PM
29	US 30 (Lancaster Av) @ Woodbine Av	Philadelphia	Philadelphia	91.3	180.5	180.5	PM	53%	55	67	3/4	1,200	11:12:03	27:55:30	27:55:30	PM
58	US 30 (Lancaster Ave) @ PA 252 (Bear Hill Rd)	Tredyffrin Township	Chester	164.2	272.7	272.7	PM	29%	29	26	4/4	3,397	33:28:12	71:07:14	71:07:14	PM
56	US 30 (Lancaster Ave) @ Sprowl Rd	East Whiteland Township	Chester	41.3	251.1	251.1	PM	64%	32	44	3/3	1,905	5:40:19	48:19:39	48:19:39	PM
81	US 30 (Lancaster Ave) @ Sugartown Rd	Radnor Township	Delaware	80.8	201.7	201.7	PM	54%	46	58	4/4	2,803	11:46:06	37:37:49	37:37:49	PM
6	US 30 (Lancaster Ave) @ US 322 (Brandywine Ave)	Downingtown Borough	Chester	91.6	274.7	274.7	PM	67%	28	50	3/4	1,681	10:43:05	41:58:24	41:58:24	PM
1	US 322 (Conchester Hwy) @ Bethel Ave	Upper Chichester Township	Delaware	390.9	662.1	662.1	PM	76%	1	1	2/4	2,323	92:53:25	194:53:50	194:53:50	PM
100	US 322 (Conchester Hwy) @ US 1 (Baltimore Pk)	Concord Township	Delaware	83.6	124.3	124.3	PM	71%	80	43	3/4	4,299	21:53:59	49:26:39	49:26:39	PM
11	US 322 (Horseshoe Pk) @ US 30 Bypass SB Off Ramp	Caln Township	Chester	164.2	14.0	164.2	AM	94%	64	66	3/3	1,257	30:02:35	1:45:02	30:02:35	AM
37	W Germantown Pk @ Butler Pk	Whitemarsh Township	Montgomery	187.0	234.6	234.6	PM	52%	38	42	4/4	2,042	22:35:06	50:12:11	50:12:11	PM
84	Wayne Ave @ Roberts Av/W Berkley St	Philadelphia	Philadelphia	35.8	108.7	108.7	PM	73%	88	81	3/4	2,125	5:48:20	23:33:42	23:33:42	PM
47	Woodbourne Rd @ Bristol Oxford Valley Rd	Middletown Township	Bucks	57.9	197.4	197.4	PM	70%	49	51	4/4	2,246	7:27:05	40:17:20	40:17:20	PM

Most Delayed
Somewhat Delayed
Somewhat Not Delayed
Least Delayed

AM Delay

Table 7

Focus Intersection Bottlenecks in the New Jersey Portion of the DVRPC Region: Peak Travel Time Vehicle and Volume Delay (Sorted by Intersection Name)

				Peak Vehicle Delay						Peak Hour Volume Delay						
MAP ID	Intersection Name	Municipality	County	AM Peak Vehicle Delay (sec)	PM Peak Vehicle Delay (sec)	Highest Vehicle Delay (sec)	AM/PM Highest Delay	% of Delay on Leg with Most Delay	Rank	Rank	Intersection Legs included in Peak Hour Volume Delay	Peak Hour Volume	AM Peak Volume Delay (Hr)	PM Peak Volume Delay (Hr)	Highest Volume Delay (Hr)	AM/PM Highest Delay
252	CR 533 (Quaker Rd) @ CR 583 (Mercer Rd)	Princeton	Mercer	20.05	14.37	20.05	AM	80%	77	75	4/4	1,281	1:01:45	1:44:50	1:44:50	PM
209	CR 533 (Quakerbridge Rd) @ Clarksville Rd	Lawrence Township	Mercer	48.45	215.10	215.10	PM	45%	15	18	4/4	4,277	12:27:14	64:33:27	64:33:27	PM
208	CR 535 (Old Trenton Rd) @ CR 526 (Edinburg Rd)	West Windsor Township	Mercer	102.83	313.55	313.55	PM	37%	1	35	3/3	1,824	10:31:24	42:45:26	42:45:26	PM
259	CR 544 (Clements Bridge Rd) @ Almonesson Rd	Deptford Township	Gloucester	17.44	91.44	91.44	PM	69%	49	46	4/4	3,617	3:28:43	29:53:59	29:53:59	PM
219	CR 544 (Evesham Rd) @ Burnt Mill Rd	Cherry Hill Township	Camden	40.63	76.98	76.98	PM	76%	57	58	2/3	1,284	5:47:52	12:33:10	12:33:10	PM
258	CR 544 (Evesham Rd) @ CR 673 (White Horse Rd)	Voorhees Township	Camden	19.20	34.57	34.57	PM	51%	72	59	1/3	4,154	4:13:10	11:00:14	11:00:14	PM
266	CR 571 (Princeton Highstown Rd) @ Windsor Center Dr	East Windsor Township	Mercer	6.80	16.82	16.82	PM	83%	80	68	4/4	3,113	1:18:23	4:36:36	4:36:36	PM
264	CR 607 (Church St) @ CR 673 (Fellowship Rd)	Moorestown Township	Burlington	52.73	173.13	173.13	PM	60%	23	39	4/4	1,238	4:50:20	37:30:30	37:30:30	PM
262	CR 607 (Church St) @ Gaither Dr	Mount Laurel Township	Burlington	5.44	83.26	83.26	PM	83%	56	57	2/3	1,249	0:43:44	14:30:16	14:30:16	PM
261	CR 620 (Main St) @ Evans Rd	Evesham Township	Burlington	55.72	146.02	146.02	PM	83%	30	48	5/5	2,260	5:55:42	23:04:24	23:04:24	PM
248	CR 621 (Almonesson Rd) @ Deptford Center Rd	Deptford Township	Gloucester	11.97	84.38	84.38	PM	36%	54	53	4/4	2,617	1:56:40	15:50:40	15:50:40	PM
227	CR 622 (Olden Ave) @ Brunswick Ave	Trenton City	Mercer	42.06	84.37	84.37	PM	48%	55	49	4/4	2,674	7:12:40	22:19:07	22:19:07	PM
263	CR 635 (Centerton Rd) @ CR 636 (Creek Rd)	Mount Laurel Township	Burlington	20.73	37.39	37.39	PM	72%	69	74	4/4	1,647	1:56:52	3:02:51	3:02:51	PM
260	CR 673 (Springdale Rd) @ CR 671 (Kresson Rd)	Cherry Hill Township	Camden	112.32	50.69	112.32	AM	75%	43	56	4/4	3,435	25:08:01	14:50:56	25:08:01	AM
212	CR 677 (W Somerdale Rd) @ CR 669 (Warwick Rd)	Somerdale Borough	Camden	59.15	294.79	294.79	PM	87%	2	25	4/4	2,433	7:00:01	50:37:18	50:37:18	PM
229	CR 686 (Hartford Rd) @ Old Marlton Pk	Medford Township	Burlington	27.34	106.00	106.00	PM	78%	46	78	2/4	1,056	1:32:17	0:58:30	1:32:17	AM
203	Hickstown Rd @ Little Mill Rd	Gloucester Township	Camden	132.18	4.99	132.18	AM	95%	34	79	3/3	925	0:39:11	0:38:24	0:39:11	AM
268	I 295 SB Exit 10 @ CR 620 (Center Square Rd)	Logan Township	Gloucester	18.48	57.13	57.13	PM	100%	60	64	3/3	1,061	2:05:35	7:22:39	7:22:39	PM
226	I 295 WB Exit @ CR 666 (Copley Rd)	Barrington Borough	Camden	8.58	43.64	43.64	PM	90%	66	80	2/3	1,534	0:09:00	0:18:45	0:18:45	PM
230	I 295 WB Exit 28 @ NJ 168 (Black Horse Pk)	Haddon Heights Borough	Camden	229.51	225.27	229.51	AM	83%	10	24	3/3	2,506	42:36:51	54:53:44	54:53:44	PM
247	I-295 SB Exit 32 @ CR 561 (Haddonfield Berlin Rd)	Cherry Hill Township	Camden	16.02	17.22	17.22	PM	85%	79	67	3/3	3,424	3:16:02	5:05:55	5:05:55	PM
205	Kresson Rd @ Cropwell Rd	Cherry Hill Township	Camden	59.99	198.15	198.15	PM	64%	19	32	4/4	2,615	9:46:15	45:03:52	45:03:52	PM
246	NJ 154 (Brace Rd) @ Pearlcroft Rd	Cherry Hill Township	Camden	58.69	74.05	74.05	PM	84%	58	71	1/3	1,185	0:00:00	3:50:58	3:50:58	PM
269	NJ 168 (Black Horse Pk) @ 551 Spur	Mount Ephraim Borough	Camden	73.39	175.14	175.14	PM	63%	22	30	4/4	3,649	12:28:56	45:32:08	45:32:08	PM
277	NJ 29 @ CR 576 (Sullivan Way)	Trenton City	Mercer	18.99	38.89	38.89	PM	67%	68	65	2/2	2,536	2:27:03	6:58:07	6:58:07	PM
225	NJ 29 @ S Warren St	Trenton City	Mercer	93.16	222.79	222.79	PM	64%	11	14	4/4	5,225	34:39:17	74:25:37	74:25:37	PM
251	NJ 29 Exit @ Calhoun Street Bridge	Trenton City	Mercer	57.96	110.16	110.16	PM	52%	45	70	1/3	783	8:39:43	4:16:55	8:39:43	AM
278	NJ 38 @ Briggs Rd	Mount Laurel Township	Burlington	9.26	20.04	20.04	PM	60%	78	63	4/4	4,502	3:12:57	8:02:26	8:02:26	PM
253	NJ 38 @ CR 603 (Moorestown Mt Laurel Rd)	Moorestown Township	Burlington	26.94	88.98	88.98	PM	45%	51	34	4/4	4,663	6:48:32	43:05:22	43:05:22	PM
237	NJ 38 @ CR 607 (Church St)	Moorestown Township	Burlington	70.61	267.10	267.10	PM	41%	5	5	4/4	4,925	20:31:53	105:16:43	105:16:43	PM
274	NJ 38 @ CR 616 (Church Rd)/CR 627 (Cooper Landing Rd)	Cherry Hill Township	Camden	58.23	207.30	207.30	PM	39%	18	12	6/6	6,582	12:36:37	82:52:05	82:52:05	PM
257	NJ 38 @ CR 686 (Hartford Rd)	Mount Laurel Township	Burlington	14.03	27.95	27.95	PM	38%	74	61	4/4	4,249	1:45:13	8:54:36	8:54:36	PM
243	NJ 38 @ Lenola Rd	Maple Shade Township	Burlington	6.73	127.02	127.02	PM	82%	36	16	2/4	4,044	2:53:30	70:13:32	70:13:32	PM
240	NJ 38 @ Marter Ave	Mount Laurel Township	Burlington	37.09	88.29	88.29	PM	44%	52	41	4/4	4,975	10:27:22	35:17:43	35:17:43	PM
218	NJ 41 (Kings Hwy N) @ CR 616 (Church Rd)	Cherry Hill Township	Camden	51.61	169.16	169.16	PM	34%	24	37	4/4	3,813	9:08:37	40:16:44	40:16:44	PM
210	NJ 42 @ CR 536 Spur (Sicklerville Rd)	Monroe Township	Gloucester	36.16	145.15	145.15	PM	79%	31	42	4/4	3,329	6:17:00	34:15:16	34:15:16	PM
238	NJ 42 @ CR 655 (Fries Mill Rd)	Washington Township	Gloucester	25.95	84.66	84.66	PM	66%	53	45	3/3	4,061	3:48:40	31:34:47	31:34:47	PM
242	NJ 42 @ Ganttown Rd	Washington Township	Gloucester	57.03	220.83	220.83	PM	74%	13	11	3/4	4,706	15:00:45	84:28:55	84:28:55	PM
214	NJ 45 (N Broad St) @ CR 644 (Red Bank Ave)	Woodbury City	Gloucester	139.59	210.04	210.04	PM	40%	17	28	4/4	3,184	23:56:14	47:14:41	47:14:41	PM
245	NJ 47 (Delsea Dr) @ NJ 41 (Hurfville Rd)	Deptford Township	Gloucester	41.11	148.81	148.81	PM	77%	28	38	4/4	3,547	7:50:36	38:47:17	38:47:17	PM
244	NJ 55 NB Exit 53 @ CR 553 (Woodbury Glassboro Rd)	Mantua Township	Gloucester	17.14	35.81	35.81	PM	74%	70	77	3/4	1,662	0:44:22	1:07:05	1:07:05	PM
228	NJ 70 (Marlton Pk) @ CR 644 (Haddonfield Rd/Grove St)	Cherry Hill Township	Camden	41.60	137.39	137.39	PM	55%	32	23	4/4	7,130	14:10:33	57:07:15	57:07:15	PM
224	NJ 70 (Marlton Pk) @ NJ 41 (Kings Hwy)	Cherry Hill Township	Camden	29.12	112.45	112.45	PM	75%	42	27	3/4	6,147	9:42:29	48:56:26	48:56:26	PM
236	NJ 70 @ CR 673 (Springdale Rd)	Cherry Hill Township	Camden	74.18	158.48	158.48	PM	57%	26	21	4/4	7,357	23:01:00	59:53:39	59:53:39	PM
272	NJ 70 @ N Cropwell Rd	Evesham Township	Burlington	45.31	122.43	122.43	PM	76%	39	19	2/4	3,618	15:27:02	61:00:48	61:00:48	PM
204	NJ 70 @ N Elmwood Rd	Evesham Township	Burlington	86.91	253.62	253.62	PM	62%	8	13	4/4	3,338	16:19:50	81:48:31	81:48:31	PM
201	NJ 73 @ Brick Rd	Evesham Township	Burlington	55.30	185.11	185.11	PM	90%	21	3	2/4	4,580	27:21:35	117:45:16	117:45:16	PM
200	NJ 73 @ Church Rd E	Mount Laurel Township	Burlington	92.66	287.11	287.11	PM	90%	3	1	3/3	4,707	48:45:57	230:53:26	230:53:26	PM
254	NJ 73 @ CR 534 (Jackson Rd)	Berlin Township	Camden	28.70	40.14	40.14	PM	70%	67	60	4/4	4,107	5:11:40	8:57:03	8:57:03	PM
235	NJ 73 @ CR 544 (Marlton Pkwy/Evesham Rd)	Evesham Township	Burlington	82.75	95.73	95.73	PM	50%	48	36	4/4	6,454	31:21:50	40:53:08	40:53:08	PM
275	NJ 73 @ CR 674 (Greentree Rd)	Evesham Township	Burlington	35.95	89.90	89.90	PM	40%	50	44	4/4	5,754	6:58:40	32:23:57	32:23:57	PM
217	NJ 73 @ CR 675 (Cooper Rd)	Voorhees Township	Camden	104.81	189.67	189.67	PM	39%	20	20	4/4	4,896	28:09:50	60:43:10	60:43:10	PM
206	NJ 73 @ Ramblewood Pky/Church Rd	Mount Laurel Township	Burlington	51.22	219.69	219.69	PM	59%	14	4	4/4	6,164	21:03:51	117:26:54	117:26:54	PM
265	NJ 73 SB Exit @ NJ 70 (Marlton Pk)	Evesham Township	Burlington	34.21	32.52	34.21	AM	65%	73	66	3/3	3,234	3:11:32	6:27:59	6:27:59	PM
232	US 1 (Brunswick Pk) @ CR 571 (Washington Rd)	West Windsor Township	Mercer	74.80	222.21	222.21	PM	68%	12	2	4/4	8,754	36:47:36	180:59:25	180:59:25	PM
231	US 1 @ CR 546 (Franklin Corner Rd)/Bakers Basin Rd	Lawrence Township	Mercer	98.76	160.25	160.25	PM	49%	25	17	4/4	7,287	33:55:52	67:05:10	67:05:10	PM
233	US 1 NB Exit @ Alexander Rd	West Windsor Township	Mercer	27.83	105.62	105.62	PM	82%	47	8	1/3	579	17:49:45	95:48:33	95:48:33	PM
267	US 1 SB Exit @ CR 629 (Union Rd)	West Windsor Township	Mercer	32.02	47.14	47.14	PM	91%	65	40	2/2	574	8:30:24	37:16:10	37:16:10	PM
250	US 1 SB Exit @ New Warren St	Trenton City	Mercer	18.67	35.15	35.15	PM	47%	71	73	2/3	2,703	3:57:12	3:10:09	3:57:12	AM

Table 7
Continued

MAP ID	Intersection Name	Municipality	County	Peak Vehicle Delay: AM Peak Vehicle Delay (sec)	PM Peak Vehicle Delay (sec)	Highest Vehicle Delay (sec)	AM/PM Highest Delay	% of Delay on Leg with Most Delay	Rank	Peak Hour Volume Delay: Rank	Intersection Legs included in Peak Hour Volume Delay	Peak Hour Volume	AM Peak Volume Delay (Hr)	PM Peak Volume Delay (Hr)	Highest Volume Delay (Hr)	AM/PM Highest Delay
223	US 130 (Crescent Blvd) @ Klemm Ave	Gloucester City	Camden	2.11	124.84	124.84	PM	100%	37	9	1/2	2,668	1:12:50	92:31:25	92:31:25	PM
273	US 130 (Crescent Blvd) @ US 30 (White Horse Pk)	Collingswood Borough	Camden	27.01	115.85	115.85	PM	85%	41	10	4/4	5,410	6:40:18	87:07:33	87:07:33	PM
249	US 130 @ Church Rd/Cinnaminson Ave	Cinnaminson Township	Burlington	34.42	54.17	54.17	PM	72%	61	54	4/4	6,668	9:43:10	15:43:49	15:43:49	PM
255	US 130 @ CR 528 (Crosswicks Rd)	Bordentown City	Burlington	25.04	25.21	25.21	PM	73%	76	69	4/4	4,133	1:55:24	4:18:53	4:18:53	PM
276	US 130 @ CR 571 (Stockton St)	East Windsor Township	Mercer	39.22	123.79	123.79	PM	35%	38	33	4/4	4,235	10:18:17	44:01:24	44:01:24	PM
241	US 130 @ CR 656 (Florence Columbus Rd)	Florence Township	Burlington	76.74	118.95	118.95	PM	53%	40	50	4/4	3,173	8:52:58	18:52:12	18:52:12	PM
279	US 130 @ Keim Blvd	Burlington City	Burlington	48.41	34.37	48.41	AM	70%	64	72	4/4	3,585	3:18:51	3:37:46	3:37:46	PM
234	US 130 @ Klockner Rd	Hamilton Township	Mercer	28.57	53.62	53.62	PM	37%	62	52	4/4	4,196	6:22:40	16:03:33	16:03:33	PM
222	US 130 @ NJ 38 (Kaighns Ave)	Pennsauken Township	Camden	34.35	111.71	111.71	PM	62%	44	6	4/4	7,746	24:43:19	101:26:35	101:26:35	PM
221	US 130 @ NJ 47 (Broadway St)	Brooklawn	Camden	48.61	214.32	214.32	PM	76%	16	31	4/4	3,650	9:20:06	45:29:06	45:29:06	PM
220	US 206 (Stockton St/Bayard Ln) @ NJ 27 (Nassau St)	Princeton	Mercer	93.43	258.65	258.65	PM	52%	7	26	3/3	2,187	14:44:09	50:33:45	50:33:45	PM
211	US 206 @ NJ 38 (S Pemberton Rd)	Southampton Township	Burlington	103.41	274.36	274.36	PM	66%	4	22	4/4	3,293	18:31:55	58:28:23	58:28:23	PM
213	US 206 @ NJ 70	Southampton Township	Burlington	111.51	148.19	148.19	PM	63%	29	43	4/4	3,336	21:12:52	33:03:29	33:03:29	PM
271	US 206 @ Tuckerton Rd	Tabernacle Township	Burlington	26.04	9.29	26.04	AM	49%	75	76	4/4	1,703	1:33:20	1:13:51	1:33:20	AM
256	US 30 (Admiral Wilson Blvd) @ US 130 (S Crescent Blvd)	Pennsauken Township	Camden	44.61	149.16	149.16	PM	91%	27	7	2/2	5,614	23:25:52	100:55:17	100:55:17	PM
239	US 30 (White Horse Pk) @ Copley Rd	Barrington Borough	Camden	61.47	51.10	61.47	AM	84%	59	55	3/3	3,628	17:19:47	15:00:36	17:19:47	AM
207	US 30 (White Horse Pk) @ Laurel Rd	Stratford Borough	Camden	32.82	129.63	129.63	PM	79%	35	51	4/4	3,899	7:02:06	17:03:46	17:03:46	PM
202	US 30 (White Horse Pk) @ W Evesham Ave	Magnolia Borough	Camden	151.07	230.93	230.93	PM	55%	9	29	4/4	3,688	21:24:49	47:03:34	47:03:34	PM
215	US 30 (Whitehorse Pk) @ N Warwick Rd	Magnolia Borough	Camden	195.77	259.00	259.00	PM	63%	6	15	4/4	4,094	37:09:39	74:05:10	74:05:10	PM
216	US 322 (Glassboro Rd) @ Fries Mill Rd	Monroe Township	Gloucester	59.62	136.68	136.68	PM	72%	33	47	4/4	2,493	7:57:42	24:15:52	24:15:52	PM
270	US 322 @ CR 653 (Paulsboro Rd)	Woolwich Township	Gloucester	41.51	50.48	50.48	PM	47%	63	62	4/4	1,931	4:28:55	8:26:11	8:26:11	PM

Most Delayed
Somewhat Delayed
Somewhat Not Delayed
Least Delayed

AM Delay

4.4 Most Congested Focus Intersection Bottlenecks

The top five focus intersection bottlenecks with the highest peak vehicle delay and volume delay were identified separately for the Pennsylvania and New Jersey portions of the DVRPC region. Some bottlenecks were in the top five for both delay measures, which resulted in eight bottlenecks each for the Pennsylvania and New Jersey portions of the DVRPC region (16 in all). See Table 8 for a listing of these bottlenecks in ascending order by intersection name with the associated map identifier, and the municipality and county in which they are located. Similar to the most congested focus roadway facilities, the most congested bottlenecks are limited due to the importance of targeting locations with the most traffic congestion and due to funding availability. Some of these locations are programmed on the Pennsylvania TIP (FY 2019–22) and New Jersey TIP (FY 2020–23), and others are on the DVRPC Long-Range Plan (*Connections 2045*) programming list. Bottlenecks not identified as the most congested should still be considered for improvements, but weighed against other regional priorities and the region's extreme funding constraint.

Focus Intersection Bottleneck Summaries

The following pages include a map summary of each of the most congested bottlenecks in the order listed in Table 8, along with a map title indicating the bottleneck map identifier and name. Each summary page provides the following information:

Main Map
Shows the location of the bottleneck, along with the road segments that show high congestion indicated by the TTI measure.

Summary of Conditions
Provides information on delay measure rankings, and other roadway intersection characteristics related to congestion.

Congestion Measures
Lists the congestion performance measures that exist for the most congested focus intersection bottleneck. The peak travel time vehicle and volume delay measures are derived from the INRIX speed data. The peak hour volume delay measures are based, in part, on PennDOT, NJDOT and DVRPC collected traffic volumes. The PM3 LOTTR, and PHED measures are from the NPMRDS dataset, and high growth V/C forecasted congestion is from the DVRPC regional Travel Demand Model.

Planned Improvements on the Long-Range Plan and TIP
Indicates existing projects on the bottleneck that are programmed on the Pennsylvania TIP (FY 2019–22), New Jersey TIP (FY 2020–23), and the DVRPC Long-Range Plan (*Connections 2045*). Long-Range Plan projects indicated with a letter designate transit projects, and ones with a number designate road projects.

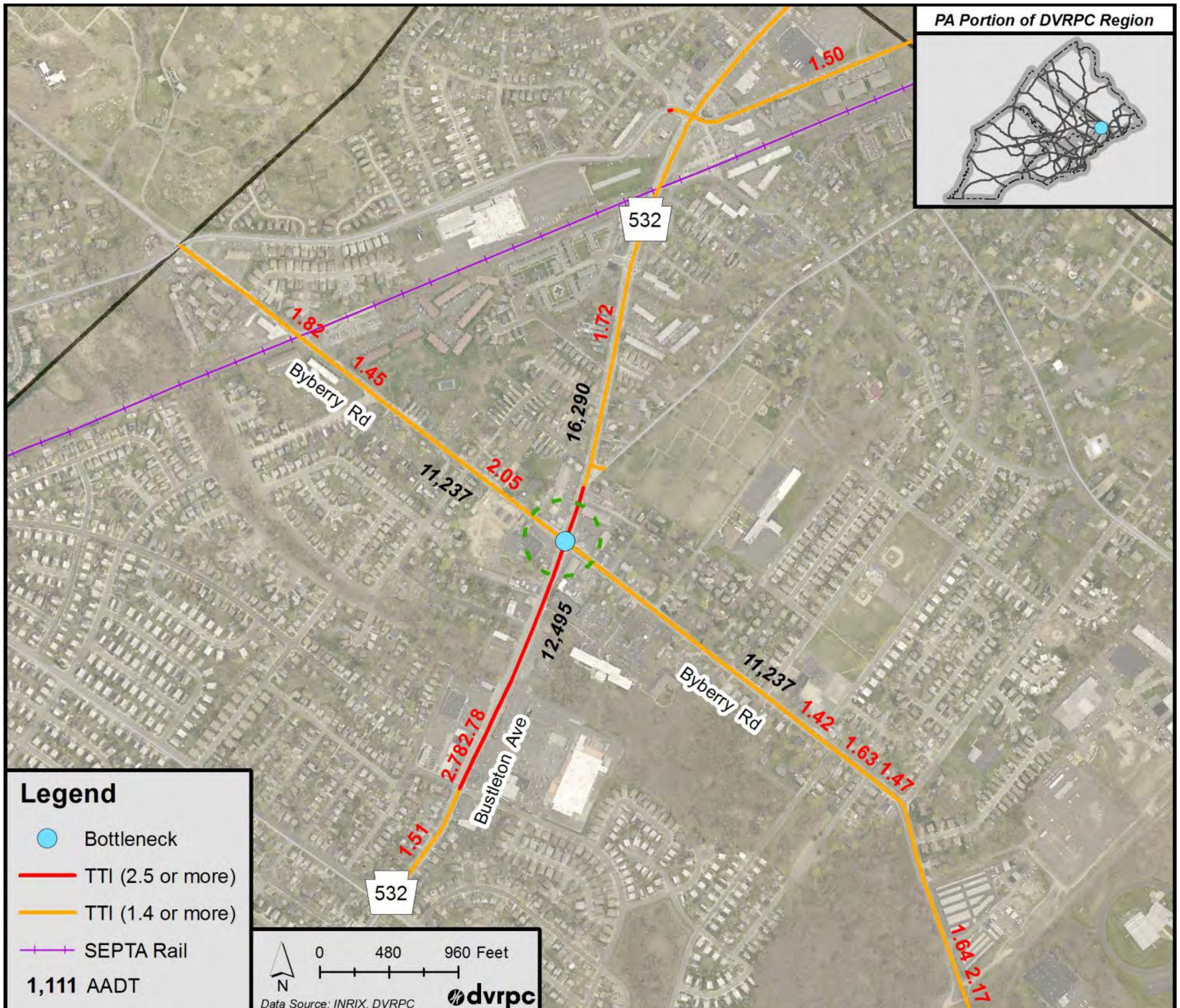
Very Appropriate Strategies
Indicates the most appropriate strategies to mitigate congestion at the bottleneck.

Additional Factors
Provides additional information at the bottleneck location that may affect mitigation strategies, and investment decisions. This includes whether the bottleneck is on the NHS, along a bus transit route, associated with high crash frequency or severity, part of a traffic signal system, along a focus roadway facility, or within a CMP congested corridor and subcorridor area.

Table 8: Most Congested Focus Intersection Bottlenecks

Map ID	Intersection Name	Municipality	County
Pennsylvania			
34	Byberry Rd @ PA 532 (Bustleton Ave)	Philadelphia	Philadelphia
12	PA 309 (Bethlehem Pk) @ Line Lexington Rd	Hatfield Township	Montgomery
3	PA 309/Ogontz Ave @ Cheltenham Ave	Cheltenham Township, Philadelphia	Montgomery; Philadelphia
5	Philmont Ave/Tomlinson Rd @ Pine Rd	Lower Moreland Township	Montgomery
98	US 1 (Baltimore Pk) @ US 202 (Wilmington Pk)	Concord Township	Delaware
31	US 1 (City Ave) @ PA 23 (Conshohocken State Rd)	Lower Merion Township, Philadelphia	Montgomery; Philadelphia
7	US 202 (DeKalb Pk) @ Sumneytown Pk	Lower Gwynedd Township	Montgomery
1	US 322 (Conchester Hwy) @ Bethel Ave	Upper Chichester Township	Delaware
New Jersey			
208	CR 535 (Old Trenton Rd) @ CR 526 (Edinburg Rd)	West Windsor Township	Mercer
212	CR 677 (W Somerdale Rd) @ CR 669 (Warwick Rd)	Somerdale Borough	Camden
237	NJ 38 @ CR 607 (S Church St)	Moorestown Township	Burlington
201	NJ 73 @ Brick Rd	Evesham Township	Burlington
200	NJ 73 @ Church Rd E	Mount Laurel Township	Burlington
206	NJ 73 @ Ramblewood Pkwy/Church Rd	Mount Laurel Township	Burlington
232	US 1 (Brunswick Pk) @ CR 571 (Washington Rd)	West Windsor Township	Mercer
211	US 206 @ NJ 38 (S Pemberton Rd)	Southampton Township	Burlington

Figure 39: Bottleneck 34
Byberry Rd @ PA 532 (Bustleton Ave), Philadelphia PA



Summary of Conditions

The signalized intersection of PA 532 (Bustleton Avenue) and Byberry Road in Philadelphia is ranked **#4** and **#7** in peak travel time vehicle and volume delay, respectively. The highest vehicle delay occurs on the PA 532 northbound approach (31%). PA 532 is a principal arterial roadway and Byberry Road is a minor arterial.

Congestion Measures	
AM Peak Vehicle Delay (sec):	148.2
PM Peak Vehicle Delay (sec):	414.4
% of Total Delay on Leg with Most Delay:	31%
Peak Hour Volume:	4,613
AM Peak Volume Delay (Hr):	34:30:57
PM Peak Volume Delay (Hr):	127:55:36
High PM3 LOTTR ((Unreliable):	Yes
High PM3 Peak Hour Excessive Delay:	Yes
TDM Forecasted Congestion:	No

Planned Improvements on 2045 LRP & FY 2019-22 TIP

* 2045 LRP: No Projects
* FY 2019-22 TIP: No Projects

Very Appropriate Strategies

1) Signal Improvements
2) Transit Infrastructure Improvements
3) County and Local Road Connectivity
4) Parking Supply-and-Demand Management
5) Shuttle Service to Stations

Additional Factors	
National Highway System:	Yes
DVRPC High Crash Frequency:	No
DVRPC High Crash Severity:	No
Transit Route:	Yes
Traffic Signal Type:	System
Focus Roadway Facility:	No
Corridor/Subcorridor Area:	12A

Figure 40: Bottleneck 12

PA 309 (Bethlehem Pk) @ Line Lexington Rd, Hatfield Twp, Montgomery County PA

Summary of Conditions

The signalized intersection of PA 309 (Bethlehem Pike) and Line Lexington Road in Hatfield Township, Montgomery County is ranked **#2** in both peak travel time vehicle and volume delay. The highest vehicle delay occurs on the PA 309 northbound approach (49%). PA 309 and Line Lexington Road east of the intersection serve as principal arterial roadways.

Congestion Measures

AM Peak Vehicle Delay (sec):	118.2
PM Peak Vehicle Delay (sec):	473.9
% of Total Delay on Leg with Most Delay:	49%
Peak Hour Volume:	3,970
AM Peak Volume Delay (Hr):	28:22:08
PM Peak Volume Delay (Hr):	149:19:47
High PM3 LOTTR ((Unreliable):	Yes
High PM3 Peak Hour Excessive Delay:	Yes
TDM Forecasted Congestion:	Yes

Planned Improvements on 2045 LRP & FY 2019-22 TIP

* 2045 LRP: No Projects
* FY 2019-22 TIP: No Projects

Very Appropriate Strategies

1) Signal Improvements
2) Turning Movement Enhancements
3) County and Local Road Connectivity
4) Modifications to Existing Transit Routes or Services
5) Placemaking for Non-Motorized Transportation

Additional Factors

National Highway System:	Yes
DVRPC High Crash Frequency:	No
DVRPC High Crash Severity:	No
Transit Route:	No
Traffic Signal Type:	System
Focus Roadway Facility:	107
Corridor/Subcorridor Area:	14C

Figure 41: Bottleneck 3
PA 309/Ogontz Ave @ Cheltenham Ave, Cheltenham Twp, Montgomery and Philadelphia Counties PA

Summary of Conditions

The signalized intersection of PA 309/Ogontz Avenue, Cheltenham Avenue and Upsal Street in Cheltenham Township, Montgomery County, and the City of Philadelphia is ranked **#10** and **#5** in peak travel time vehicle and volume delay, respectively. The highest vehicle delay occurs on the PA 309 southbound approach (64%). PA 309 and Cheltenham Avenue are principal arterial roadways, and Ogontz Avenue and Upsal Street are minor arterial roadways.

Congestion Measures	
AM Peak Vehicle Delay (sec):	180.9
PM Peak Vehicle Delay (sec):	357.7
% of Total Delay on Leg with Most Delay:	64%
Peak Hour Volume:	3,552
AM Peak Volume Delay (Hr):	48:13:23
PM Peak Volume Delay (Hr):	130:52:09
High PM3 LOTTR ((Unreliable):	Yes
High PM3 Peak Hour Excessive Delay:	Yes
TDM Forecasted Congestion:	No

Planned Improvements on 2045 LRP & FY 2019-22 TIP

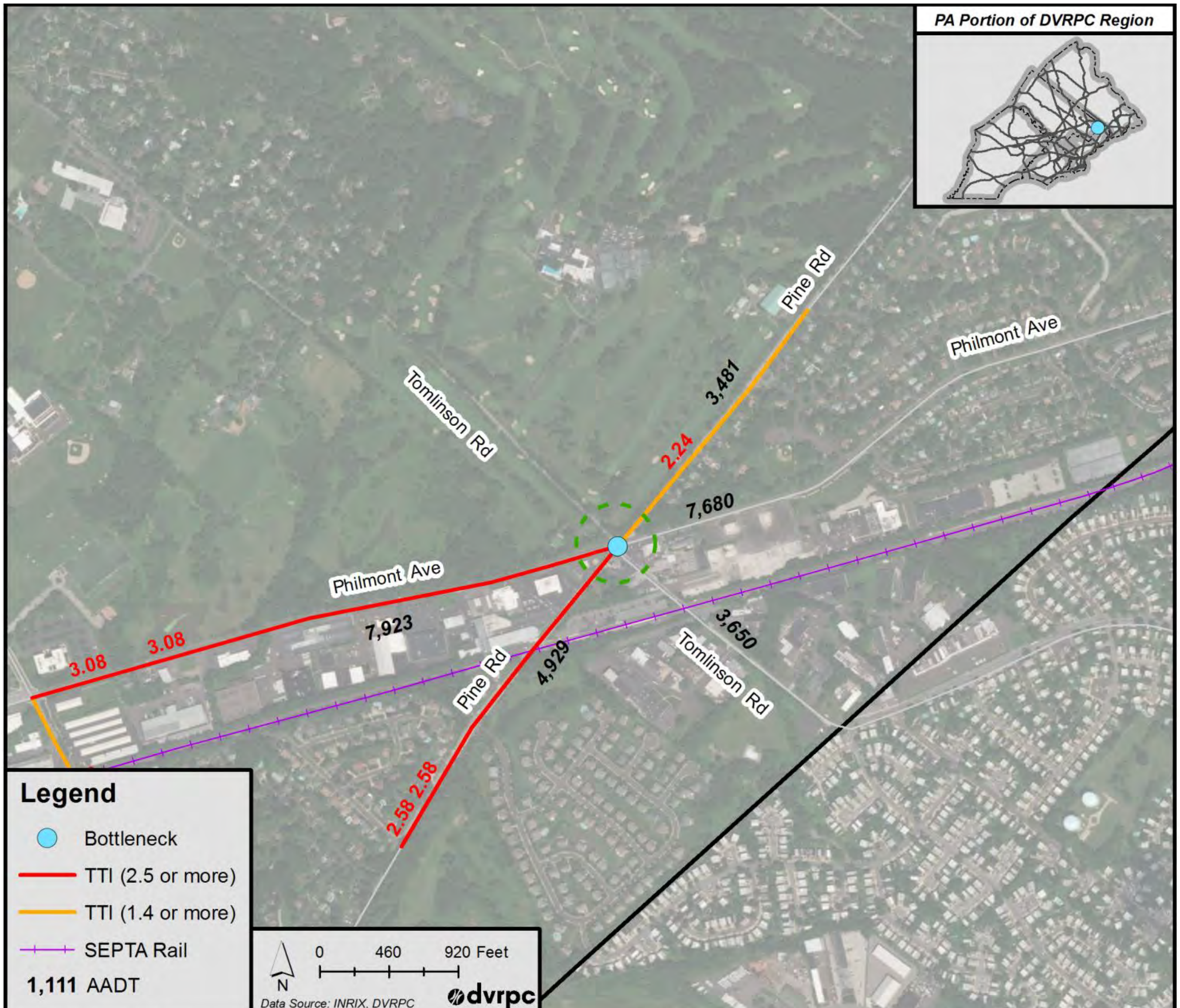
* 2045 LRP: No Projects
* FY 2019-22 TIP: MPMS #108090 - Citywide resurfacing

Very Appropriate Strategies

1) Signal Improvements
2) Transit Infrastructure Improvements
3) Expanded Parking for Existing Transit Stations (including remote, all modes)
4) Economic Redevelopment-Oriented Transportation Policies
5) Walking and Bicycling Improvements

Additional Factors	
National Highway System:	Yes
DVRPC High Crash Frequency:	No
DVRPC High Crash Severity:	Yes
Transit Route:	Yes
Traffic Signal Type:	System
Focus Roadway Facility:	105
Corridor/Subcorridor Area:	14A

Figure 42: Bottleneck 5
Philmont Ave/Tomlinson Rd @ Pine Rd, Lower Moreland Twp, Montgomery County PA



Summary of Conditions

The six point signalized intersection of SR 2013 (Philmont Avenue), SR 2050 (Pine Road), and Tomlinson Road in Lower Moreland Township, Montgomery County is ranked **#5** and **#31** in peak travel time vehicle and volume delay, respectively. The highest vehicle delay occurs on the Philmont Avenue eastbound approach (45%). Philmont Avenue is a principal arterial roadway, and both Pine Road and Tomlinson Road (south of intersection) are minor arterials, and Pine Road north of the intersection is a major collector.

Congestion Measures	
AM Peak Vehicle Delay (sec):	155.1
PM Peak Vehicle Delay (sec):	412.5
% of Total Delay on Leg with Most Delay:	45%
Peak Hour Volume:	2,490
AM Peak Volume Delay (Hr):	15:44:31
PM Peak Volume Delay (Hr):	62:57:49
High PM3 LOTTR ((Unreliable):	Yes
High PM3 Peak Hour Excessive Delay:	Yes
TDM Forecasted Congestion:	No

Planned Improvements on 2045 LRP & FY 2019-22 TIP

* 2045 LRP: MRP BS - Regional rail parking expansions, and new storage track at Noble station
* FY 2019-22 TIP: MPMS #110315 Philmont Ave/Tomlinson Rd/Pine Road Improvements

Very Appropriate Strategies

1) Signal Improvements
2) Transit Infrastructure Improvements
3) County and Local Road Connectivity
4) Parking Supply-and-Demand Management
5) Shuttle Service to Stations

Additional Factors	
National Highway System:	Yes
DVRPC High Crash Frequency:	No
DVRPC High Crash Severity:	No
Transit Route:	Yes
Traffic Signal Type:	System
Focus Roadway Facility:	No
Corridor/Subcorridor Area:	12A

Figure 43: Bottleneck 98

US 1 (Baltimore Pk) @ US 202 (Wilmington Pk), Concord Twp, Delaware County PA

Summary of Conditions
The signalized intersection of US 1 (Baltimore Pike) and US 202 (Wilmington Pike) in Concord Township, Delaware County is ranked **#22** and **#3** in peak travel time vehicle and volume delay, respectively. The highest vehicle delay occurs on the US 1 eastbound approach (28%). US 1 and US 202 are both principal arterial roadways.

Congestion Measures	
AM Peak Vehicle Delay (sec):	189.3
PM Peak Vehicle Delay (sec):	297.0
% of Total Delay on Leg with Most Delay:	28%
Peak Hour Volume:	6,606
AM Peak Volume Delay (Hr):	67:17:51
PM Peak Volume Delay (Hr):	136:01:46
High PM3 LOTTR ((Unreliable):	Yes
High PM3 Peak Hour Excessive Delay:	Yes
TDM Forecasted Congestion:	Yes

Planned Improvements on 2045 LRP & FY 2019-22 TIP

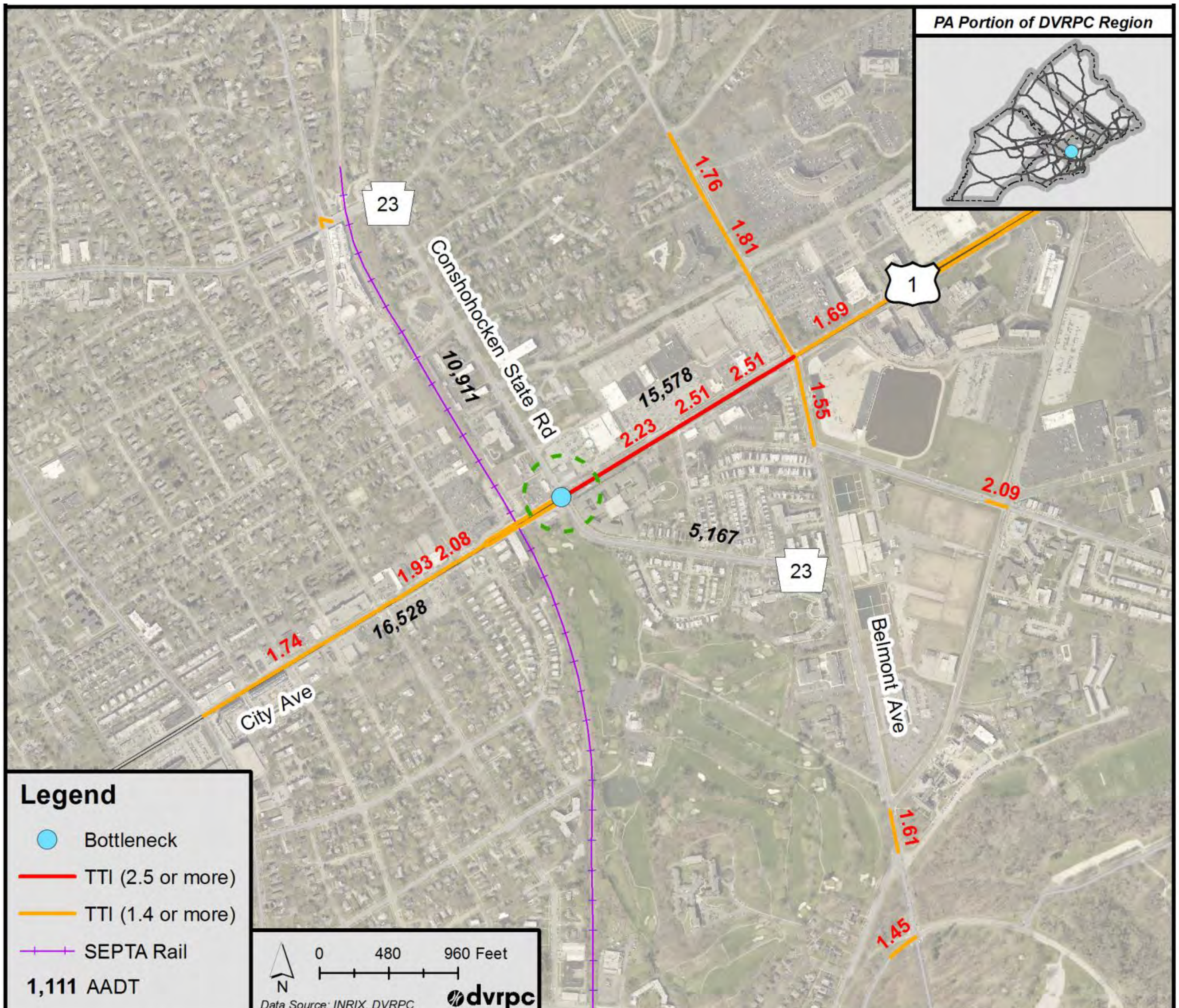
* 2045 LRP: MRP #39 - Roadway system expansion on US 202 (Section 100)
* FY 2019-22 TIP: MPMS #95429-US 202 & US 1 Loop Rd; #88400-Upgrade; #107652-Signal/ITS

Additional Factors	
National Highway System:	Yes
DVRPC High Crash Frequency:	No
DVRPC High Crash Severity:	Yes
Transit Route:	Yes
Traffic Signal Type:	System
Focus Roadway Facility:	34,35,64,153
Corridor/Subcorridor Area:	5B,8A

Very Appropriate Strategies

1) Signal Improvements
2) Turning Movement Enhancements
3) Improve Circulation
4) Marketing/Outreach Transit and TDM Services
5) Modification of Existing Transit Routes or Services
6) County and Local Road Connectivity

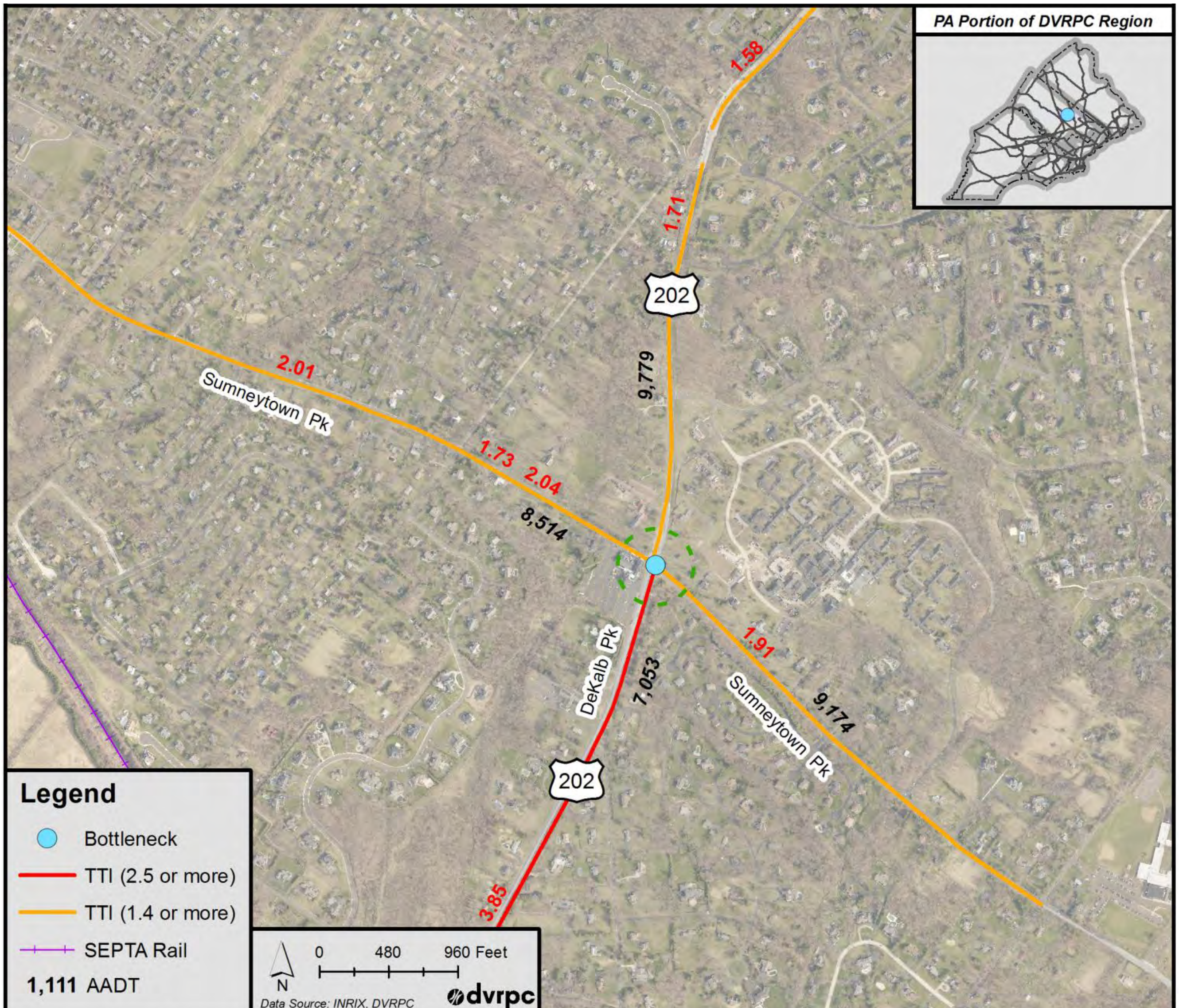
Figure 44: Bottleneck 31
US 1 (City Ave) @ PA 23 (Conshohocken State Rd) Lower Merion Twp, Montgomery and Philadelphia Counties PA



Summary of Conditions	**Congestion Measures**	
The signalized intersection of US 1 (City Avenue) and PA 23/Conshohocken State Road in the City of Philadelphia and Lower Merion Township, Montgomery County is ranked **#16** and **#4** in peak travel time vehicle and volume delay, respectively. The highest vehicle delay occurs on the US 1 westbound approach (61%). US 1 serves as a principal arterial roadway, and PA 23 north of intersection as a principal arterial, and south of intersection as a minor arterial.	AM Peak Vehicle Delay (sec):	108.1
	PM Peak Vehicle Delay (sec):	327.3
	% of Total Delay on Leg with Most Delay:	61%
	Peak Hour Volume:	4,517
	AM Peak Volume Delay (Hr):	32:50:06
	PM Peak Volume Delay (Hr):	132:12:35
	High PM3 LOTTR ((Unreliable):	Yes
	High PM3 Peak Hour Excessive Delay:	Yes
	TDM Forecasted Congestion:	Yes

Planned Improvements on 2045 LRP & FY 2019-22 TIP	**Additional Factors**	
* 2045 LRP: No Projects	National Highway System:	Yes
* FY 2019-22 TIP: No Projects	DVRPC High Crash Frequency:	No
Very Appropriate Strategies	DVRPC High Crash Severity:	Yes
1) Signal Improvements	Transit Route:	Yes
2) Enhanced Transit Amenities and Safety	Traffic Signal Type:	System
3) Turning Movement Enhancements	Focus Roadway Facility:	40
4) Improve Circulation	Corridor/Subcorridor Area:	5F
5) Improvements to Pedestrian and Bicycle Access to Transit Stations and Bus Stops		
6) More Frequent Transit or More Hours of Service		

Figure 45: Bottleneck 7
US 202 (DeKalb Pk) @ Sumneytown Pk, Lower Gwynedd Twp, Montgomery County PA



Summary of Conditions

The signalized intersection of US 202 (DeKalb Pike) and Sumneytown Pike in Lower Gwynedd Township, Montgomery County is ranked **#3** and **#19** in peak travel time vehicle and volume delay, respectively. The highest vehicle delay occurs on the US 202 northbound approach (38%). US 202 and Sumneytown Pike are both principal arterial roadways.

Congestion Measures	
AM Peak Vehicle Delay (sec):	242.6
PM Peak Vehicle Delay (sec):	462.3
% of Total Delay on Leg with Most Delay:	38%
Peak Hour Volume:	3,107
AM Peak Volume Delay (Hr):	42:15:49
PM Peak Volume Delay (Hr):	95:13:18
High PM3 LOTTR ((Unreliable):	Yes
High PM3 Peak Hour Excessive Delay:	Yes
TDM Forecasted Congestion:	No

Planned Improvements on 2045 LRP & FY 2019-22 TIP

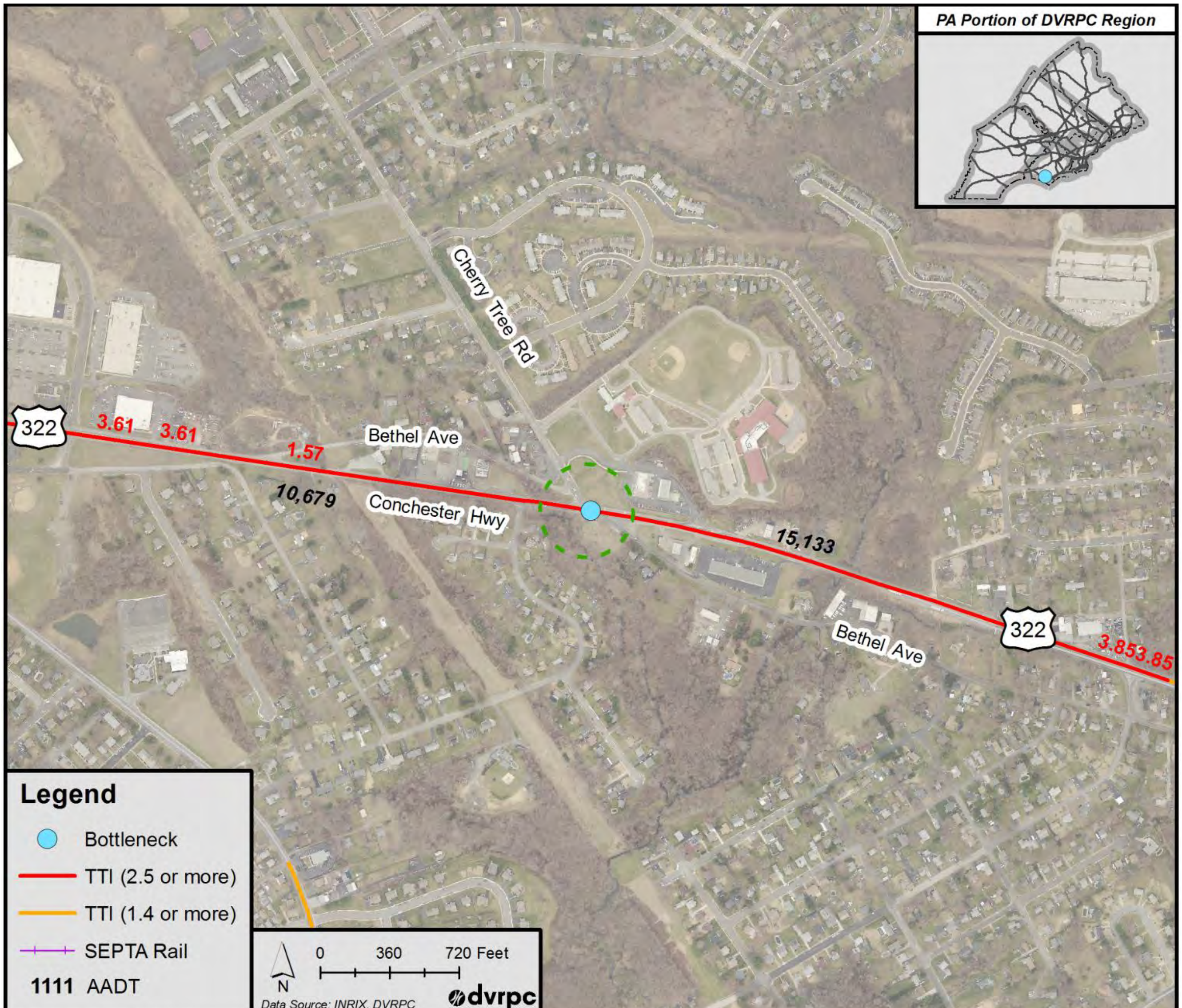
* 2045 LRP: MRP 56 - Adding road capacity on US 202 (Section 600)
* FY 2019-22 TIP: MPMS #63491-Adding road capacity on US 202 from Morris Rd to Swedesford Rd

Very Appropriate Strategies

1) Signal Improvements
2) Placemaking for Non-Motorized Transportation
3) Turning Movement Enhancements
4) County and Local Road Connectivity
5) Transit-Oriented Development (TOD)
6) Modifications to Existing Transit Routes or Services

Additional Factors	
National Highway System:	Yes
DVRPC High Crash Frequency:	Yes
DVRPC High Crash Severity:	Yes
Transit Route:	Yes
Traffic Signal Type:	System
Focus Roadway Facility:	70, 130, 131
Corridor/Subcorridor Area:	8F

Figure 46: Bottleneck 1
US 322 (Conchester Hwy) @ Bethel Ave, Upper Chichester Twp, Delaware County PA



Summary of Conditions

The signalized intersection of US 322 (Conchester Highway) and Bethel Avenue in Upper Chichester Township, Delaware County is ranked **#1** in both peak travel time vehicle and volume delay. The highest vehicle delay occurs on the US 322 westbound approach (76%). US 322 serves as a principal arterial roadway and Bethel Avenue as a major collector.

Congestion Measures	
AM Peak Vehicle Delay (sec):	390.9
PM Peak Vehicle Delay (sec):	662.1
% of Total Delay on Leg with Most Delay:	76%
Peak Hour Volume:	2,323
AM Peak Volume Delay (Hr):	92:53:25
PM Peak Volume Delay (Hr):	194:53:50
High PM3 LOTTR ((Unreliable):	Yes
High PM3 Peak Hour Excessive Delay:	Yes
TDM Forecasted Congestion:	No

Planned Improvements on 2045 LRP & FY 2019-22 TIP

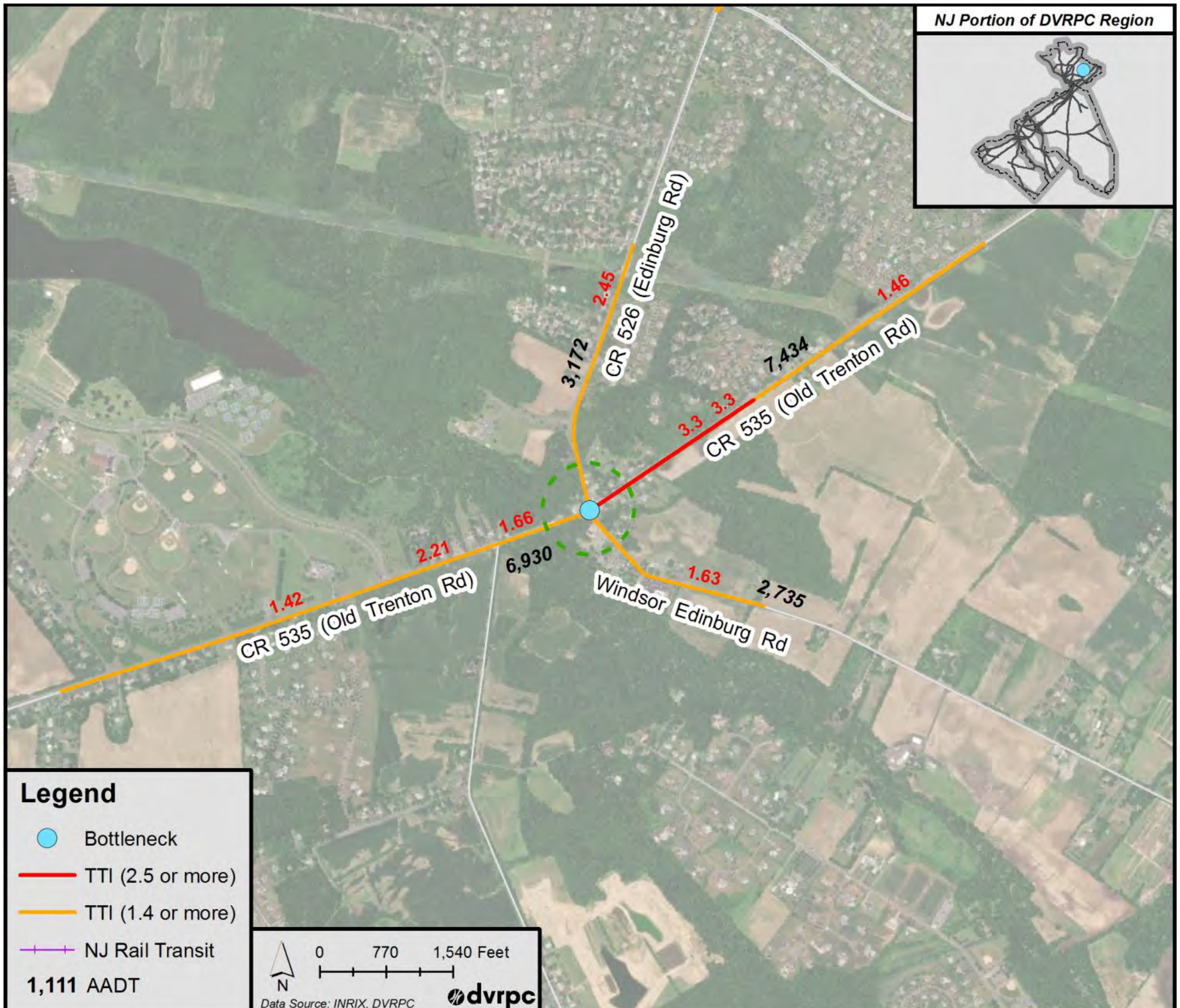
* 2045 LRP: MRP #50 - Roadway system expansion
* FY 2019-22 TIP:MPMS #69817-New road capacity on US 322 from Featherbed Ln to I-95(Sect. 102)

Very Appropriate Strategies

1) Signal Improvements
2) Intelligent Transportation Systems (ITS)
3) Planning and Design for Non-Motorized Transportation
4) Turning Movement Enhancements
5) Marketing/Outreach for Transit and TDM Services

Additional Factors	
National Highway System:	Yes
DVRPC High Crash Frequency:	No
DVRPC High Crash Severity:	No
Transit Route:	No
Traffic Signal Type:	System
Focus Roadway Facility:	60
Corridor/Subcorridor Area:	8A

Figure 47: Bottleneck 208
CR 535 (Old Trenton Rd) @ CR 526 (Edinburg Rd), West Windsor Twp, Mercer County NJ



Summary of Conditions

The intersection of CR 535 (Old Trenton Rd) and CR 526 (Edinburg Rd) in West Windsor Township, Mercer County is ranked **#1** and **#35** in peak travel time vehicle and volume delay, respectively. The highest vehicle delay occurs on the Old Trenton Road westbound approach (37%). All of Old Trenton Road and Edinburg Road north of the intersection serve as minor arterial roadways, while Windsor Edinburg Road south of the intersection is a major collector.

Congestion Measures

AM Peak Vehicle Delay (sec):	102.83
PM Peak Vehicle Delay (sec):	313.55
% of Total Delay on Leg with Most Delay:	37%
Peak Hour Volume:	1,201
AM Peak Volume Delay (Hr):	10:31:24
PM Peak Volume Delay (Hr):	42:45:26
High PM3 LOTTR ((Unreliable):	N/A
High PM3 Peak Hour Excessive Delay:	N/A
TDM Forecasted Congestion:	No

Planned Improvements on 2045 LRP & FY 2020-23 TIP

* 2045 LRP: No Projects
* FY 2020-23 TIP: No Projects

Very Appropriate Strategies

1) Signal Improvements
2) Turning Movement Enhancements
3) Improve Circulation

Additional Factors

National Highway System:	No
DVRPC High Crash Frequency:	No
DVRPC High Crash Severity:	No
Transit Route:	No
Traffic Signal Type:	Isolated
Focus Roadway Facility:	N/A
Corridor/Subcorridor Area:	N/A

Figure 48: Bottleneck 212
CR 677 (W Somerdale Rd) @ CR 669 (Warwick Rd), Somerdale Bor, Camden County NJ

Summary of Conditions

The intersection of CR 677 (W Somerdale Road) and CR 669 (Warwick Road) in Somerdale Borough, Camden County is ranked **#2** and **#25** in peak travel time vehicle and volume delay, respectively. The highest peak vehicle delay occurs on the Somerdale Road westbound approach (87%). Warwick Road serves as a minor arterial and Somerdale Road as a major collector.

Congestion Measures	
AM Peak Vehicle Delay (sec):	59.15
PM Peak Vehicle Delay (sec):	294.79
% of Total Delay on Leg with Most Delay:	87%
Peak Hour Volume:	2,433
AM Peak Volume Delay (Hr):	7:00:01
PM Peak Volume Delay (Hr):	50:37:18
High PM3 LOTTR ((Unreliable):	No
High PM3 Peak Hour Excessive Delay:	No
TDM Forecasted Congestion:	No

Planned Improvements on 2045 LRP & FY 2020-23 TIP

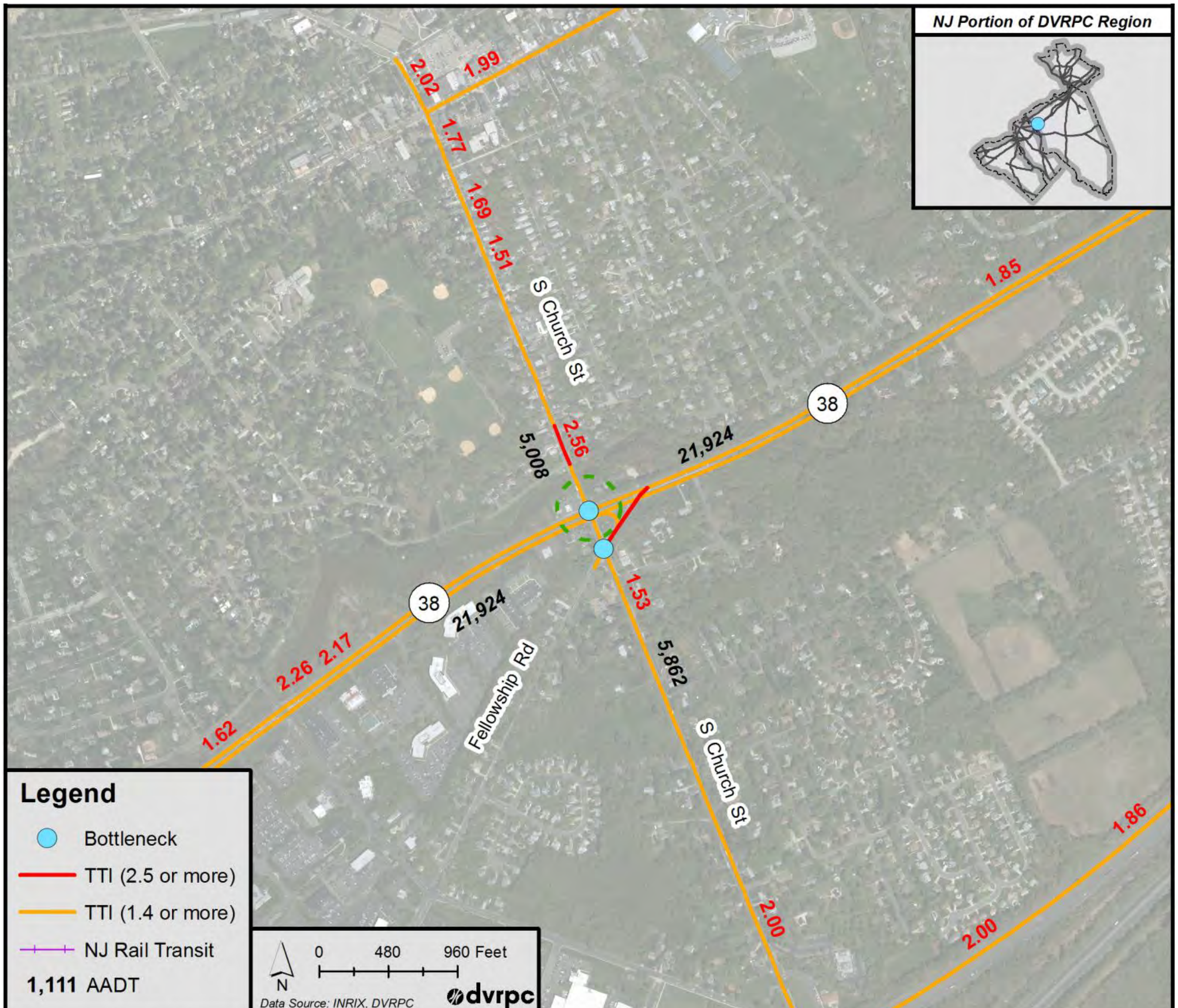
* 2045 LRP: No Projects
* FY 2020-23 TIP: No Projects

Very Appropriate Strategies

1) Signal Improvements
2) Turning Movement Enhancements
3) Improve Circulation
4) Walking and Bicycling Improvements

Additional Factors	
National Highway System:	No
DVRPC High Crash Frequency:	No
DVRPC High Crash Severity:	No
Transit Route:	No
Traffic Signal Type:	Isolated
Focus Roadway Facility:	N/A
Corridor/Subcorridor Area:	5C

Figure 49: Bottleneck 237
NJ 38 @ CR 607 (S Church St), Moorestown Twp, Burlington County NJ



Summary of Conditions

The intersection of NJ 38 and CR 607 (S Church Street) in Moorestown Township, Burlington County is ranked **#5** in both peak travel time vehicle and volume delay. The highest vehicle delay occurs on the NJ 38 eastbound approach (41%). NJ 38 serves as a principal arterial, and S Church Street as a minor arterial. Fellowship Road intersects just south of the intersection.

Congestion Measures	
AM Peak Vehicle Delay (sec):	70.61
PM Peak Vehicle Delay (sec):	267.10
% of Total Delay on Leg with Most Delay:	41%
Peak Hour Volume:	4,925
AM Peak Volume Delay (Hr):	20:31:53
PM Peak Volume Delay (Hr):	105:16:43
High PM3 LOTTR ((Unreliable):	Yes
High PM3 Peak Hour Excessive Delay:	Yes
TDM Forecasted Congestion:	No

Planned Improvements on 2045 LRP & FY 2020-23 TIP

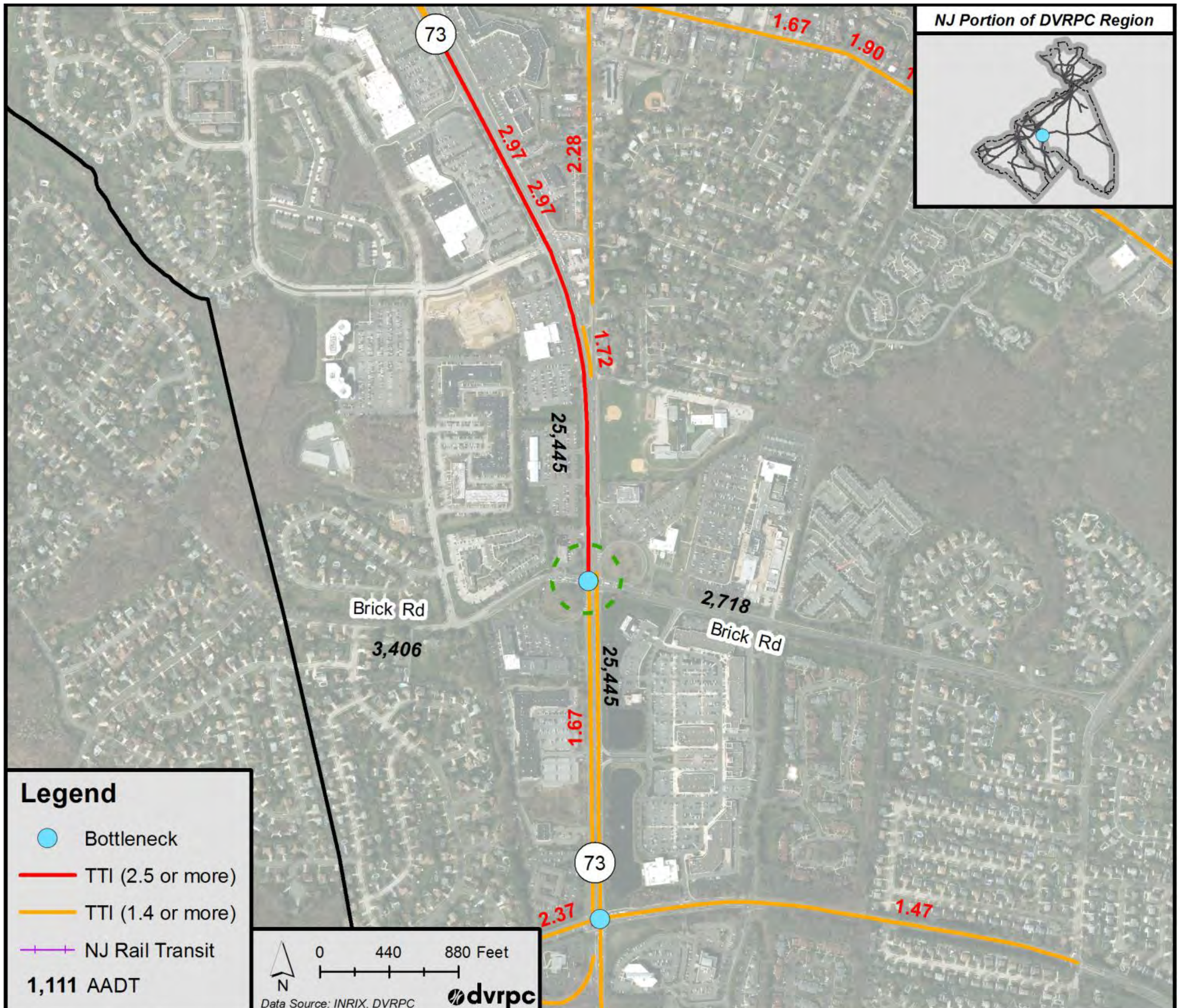
* 2045 LRP: No Projects
* FY 2020-23 TIP: DB #12307 - Operational and Safety Improvements

Very Appropriate Strategies

1) Signal Improvements
2) Improve Circulation
3) Transit Infrastructure Improvements
4) Turning Movement Enhancements
5) Comprehensive Policy Approaches

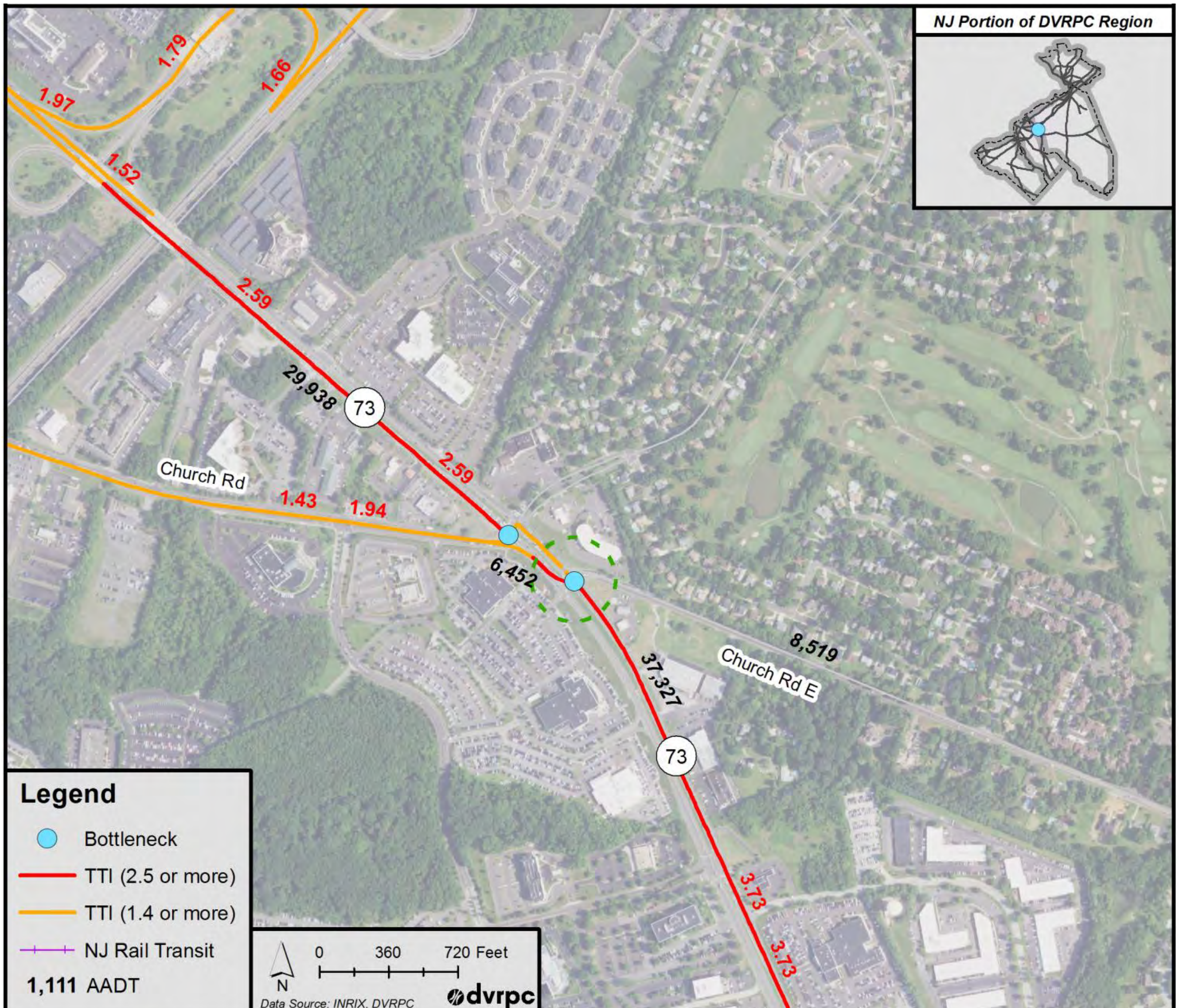
Additional Factors	
National Highway System:	Yes
DVRPC High Crash Frequency:	Yes
DVRPC High Crash Severity:	No
Transit Route:	Yes
Traffic Signal Type:	System
Focus Roadway Facility:	253,304
Corridor/Subcorridor Area:	10B

Figure 50: Bottleneck 201
NJ 73 @ Brick Rd, Evesham Twp, Burlington County NJ



Summary of Conditions	Congestion Measures	
The intersection of NJ 73 and Brick Road in Evesham Township, Burlington County is ranked **#21** and **#3** in peak travel time vehicle and volume delay, respectively. The highest delay occurs on the NJ 73 southbound approach (90%). NJ 73 is a principal arterial road, and Brick Road is a local muncipal road that serves as a major collector.	AM Peak Vehicle Delay (sec):	55.30
	PM Peak Vehicle Delay (sec):	185.11
	% of Total Delay on Leg with Most Delay:	90%
	Peak Hour Volume:	4,580
	AM Peak Volume Delay (Hr):	27:21:35
	PM Peak Volume Delay (Hr):	117:45:16
	High PM3 LOTTR ((Unreliable):	No
	High PM3 Peak Hour Excessive Delay:	Yes
	TDM Forecasted Congestion:	No
Planned Improvements on 2045 LRP & FY 2020-23 TIP	**Additional Factors**	
* 2045 LRP: MRP #209 - Major Roadway System Expansion * FY 2020-23 TIP: DB #17612 - Signal/ITS Improvements (prior TIP)	National Highway System:	Yes
Very Appropriate Strategies	DVRPC High Crash Frequency:	No
1) Signal Improvements	DVRPC High Crash Severity:	No
2) Improve Circulation	Transit Route:	Yes
3) Outreach and Marketing	Traffic Signal Type:	System
4) Comprehensive Policy Approaches	Focus Roadway Facility:	273
5) Parking Supply-and-Demand Management	Corridor/Subcorridor Area:	13A
6) Modifications to Existing Transit Routes or Services		

Figure 51: Bottleneck 200
NJ 73 @ Church Rd E, Mount Laurel Twp, Burlington County NJ



Summary of Conditions

The intersection of NJ 73 and Church Road E in Mount Laurel Township, Burlington County is ranked **#3** and **#1** in peak travel time vehicle and volume delay, respectively. The highest vehicle delay occurs on the NJ 73 northbound approach (89%). NJ 73 serves as a principal arterial roadway, and Church Road E as a minor arterial.

Congestion Measures	
AM Peak Vehicle Delay (sec):	94.06
PM Peak Vehicle Delay (sec):	288.65
% of Total Delay on Leg with Most Delay:	89%
Peak Hour Volume:	4,707
AM Peak Volume Delay (Hr):	49:30:42
PM Peak Volume Delay (Hr):	231:56:55
High PM3 LOTTR ((Unreliable):	Yes
High PM3 Peak Hour Excessive Delay:	Yes
TDM Forecasted Congestion:	No

Planned Improvements on 2045 LRP & FY 2020-23 TIP

* 2045 LRP: MRP 210 - NJ 73 at Church Road and Fellowship Road
* FY 2020-23 TIP: DB #12380-Operational/Safety Upgrades on NJ 73 @ Church & Fellowship Roads

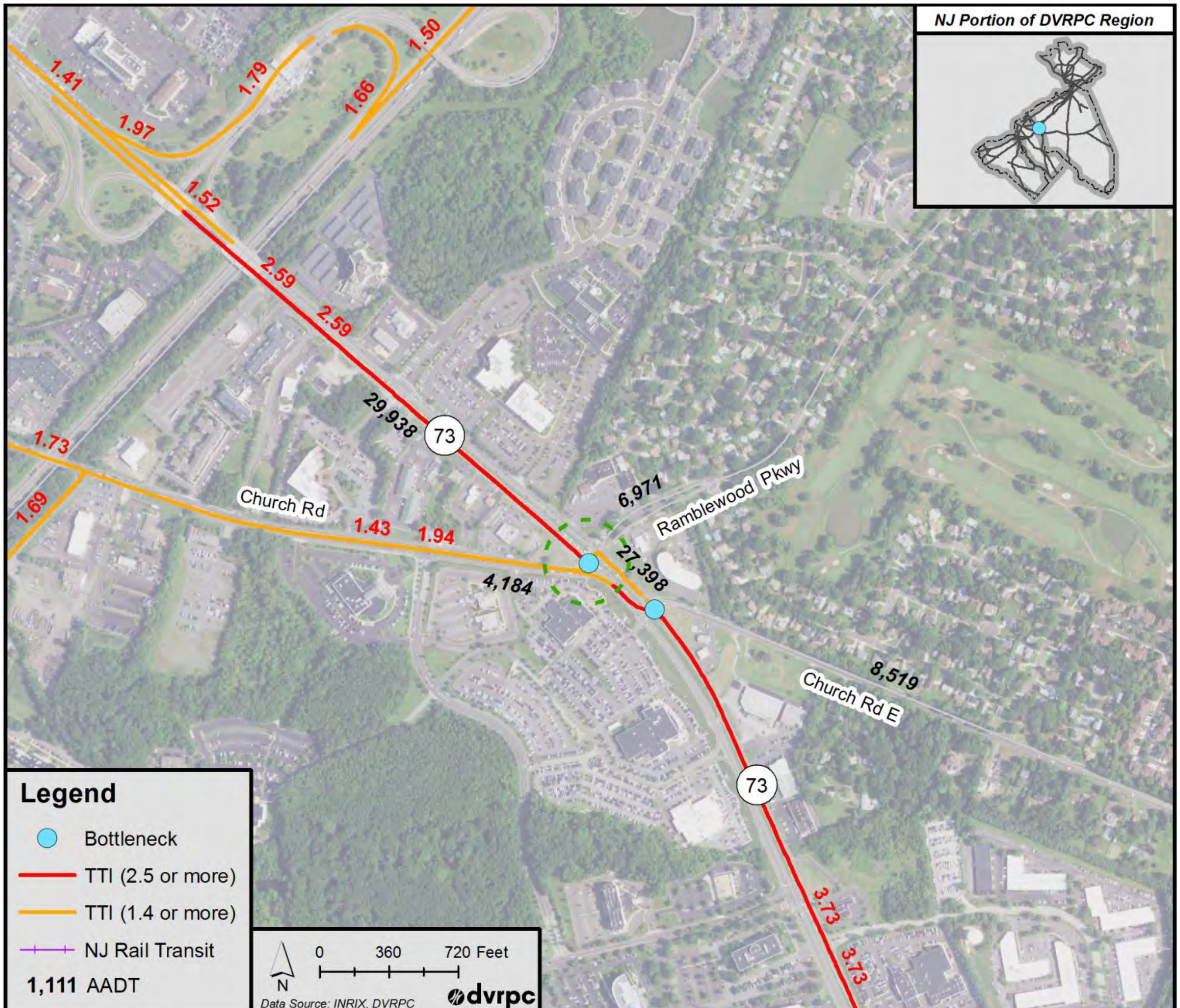
Very Appropriate Strategies

1) Signal Improvements
2) Intersection Improvements of a Limited Scale
3) Outreach and Marketing
4) Comprehensive Policy Approaches
5) New Bus Services

Additional Factors	
National Highway System:	Yes
DVRPC High Crash Frequency:	No
DVRPC High Crash Severity:	No
Transit Route:	No
Traffic Signal Type:	System
Focus Roadway Facility:	272
Corridor/Subcorridor Area:	13A

Figure 52: Bottleneck 206

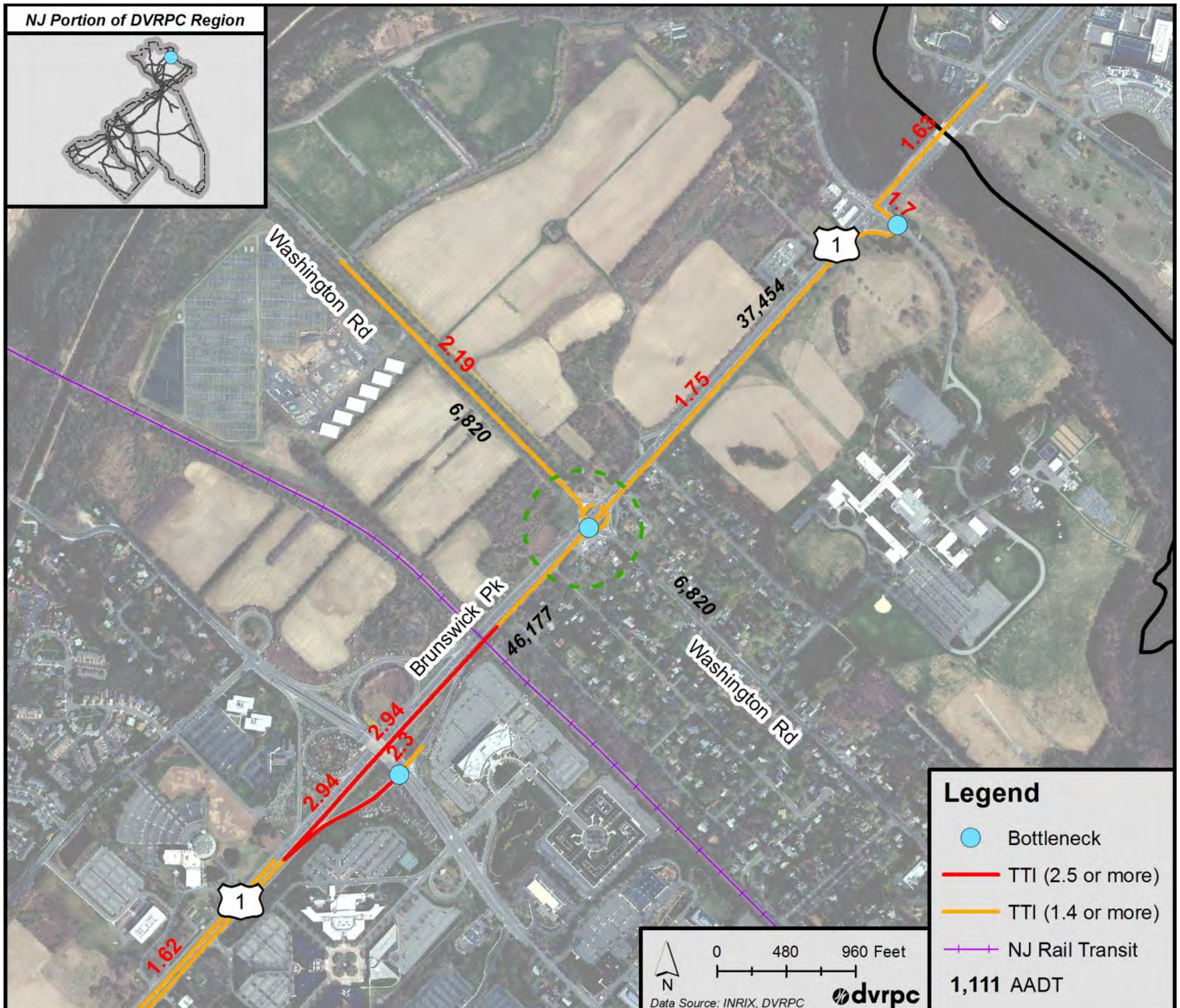
NJ 73 @ Ramblewood Pkwy/Church Rd, Mount Laurel Twp, Burlington County NJ



Summary of Conditions	Congestion Measures	
The intersection at NJ 73 and Ramblewood Pkwy/Church Road in Mount Laurel Township, Burlington County is ranked **#14** and **#4** in peak travel time vehicle and volume delay, respectively. The highest vehicle delay occurs on the NJ 73 eastbound approach (58%). NJ 73 serves as a principal arterial, and Church Road as a minor arterial roadway.	AM Peak Vehicle Delay (sec):	52.62
	PM Peak Vehicle Delay (sec):	221.24
	% of Total Delay on Leg with Most Delay:	58%
	Peak Hour Volume:	5,537
	AM Peak Volume Delay (Hr):	21:48:35
	PM Peak Volume Delay (Hr):	118:30:23
	High PM3 LOTTR ((Unreliable):	Yes
	High PM3 Peak Hour Excessive Delay:	Yes
	TDM Forecasted Congestion:	No

Planned Improvements on 2045 LRP & FY 2020-23 TIP	Additional Factors	
* 2045 LRP: MRP 210 - NJ 73 at Church Road and Fellowship Road	National Highway System:	Yes
* FY 2020-23 TIP: DB #12380-Operational/Safety Upgrades on NJ 73 @ Church & Fellowship Roads	DVRPC High Crash Frequency:	No
Very Appropriate Strategies	DVRPC High Crash Severity:	No
1) Signal Improvements	Transit Route:	Yes
2) Outreach and Marketing	Traffic Signal Type:	System
3) Comprehensive Policy Approaches	Focus Roadway Facility:	272
4) New Bus Services	Corridor/Subcorridor Area:	13A

Figure 53: Bottleneck 232
US 1 (Brunswick Pk) @ CR 571 (Washington Rd), West Windsor Twp, Mercer County NJ



Summary of Conditions

The Penns Neck two-lane traffic circle intersection at US 1 (Brunswick Pike) and CR 571 (Washington Road) in West Windsor Township, Mercer County is ranked **#12** and **#2** in peak travel time vehicle and volume delay, respectively. The highest vehicle delay occurs on the US 1 northbound approach (68%). US 1 and Washington Road both serve as principal arterial roadways.

Congestion Measures	
AM Peak Vehicle Delay (sec):	74.80
PM Peak Vehicle Delay (sec):	222.21
% of Total Delay on Leg with Most Delay:	68%
Peak Hour Volume:	8,754
AM Peak Volume Delay (Hr):	36:47:36
PM Peak Volume Delay (Hr):	180:59:25
High PM3 LOTTR ((Unreliable):	Yes
High PM3 Peak Hour Excessive Delay:	No
TDM Forecasted Congestion:	No

Planned Improvements on 2045 LRP & FY 2020-23 TIP

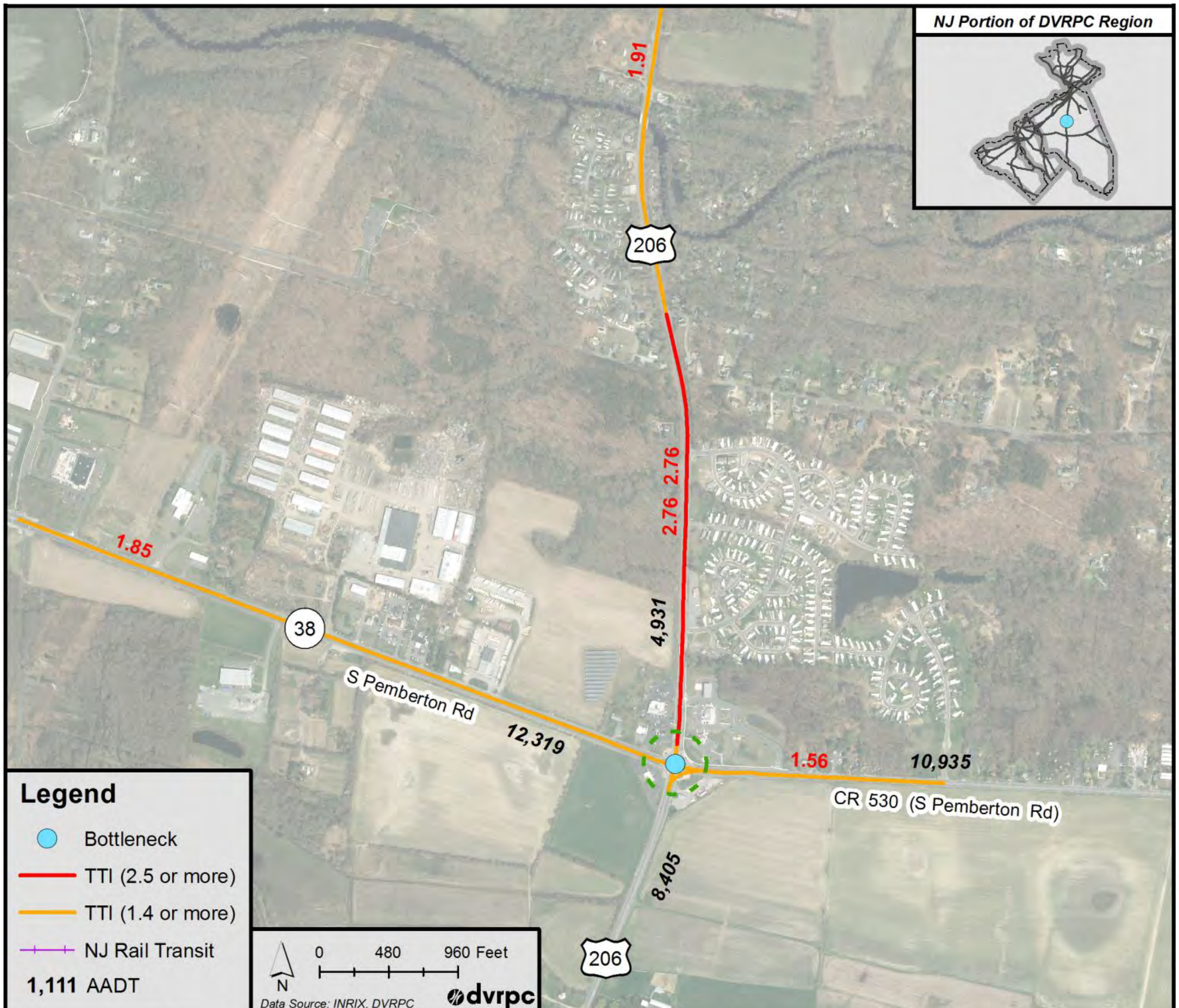
* 2045 LRP: MRP 84 - US 1 Roadway System expansion; S - US 1 BRT
* FY 2020-23 TIP: DB #17419 - US 1 from Alexander Road to Mapleton Road

Very Appropriate Strategies

1) Signal Improvements
2) Transit Infrastructure Improvements
3) Park and Ride Lots
4) Transit-Oriented Development (TOD)
5) Walking and Bicycling Improvements
6) Bus Rapid Transit (BRT) or Exclusive Right-of-Way Bus Lanes

Additional Factors	
National Highway System:	Yes
DVRPC High Crash Frequency:	Yes
DVRPC High Crash Severity:	No
Transit Route:	Yes
Traffic Signal Type:	System
Focus Roadway Facility:	218
Corridor/Subcorridor Area:	14A

Figure 54: Bottleneck 211
US 206 @ NJ 38 (S Pemberton Rd), Southampton Twp, Burlington County NJ



Summary of Conditions

The intersection of US 206 and NJ 38/CR 530 (S Pemberton Rd) in Southampton Township, Burlington County is ranked **#4** and **#22** in peak travel time vehicle and volume delay, respectively. The highest peak vehicle delay occurs on the US 206 southbound approach (66%). US 206 and NJ 38/CR 530 serve as principal arterial roadways.

Congestion Measures	
AM Peak Vehicle Delay (sec):	103.41
PM Peak Vehicle Delay (sec):	274.36
% of Total Delay on Leg with Most Delay:	66%
Peak Hour Volume:	3,293
AM Peak Volume Delay (Hr):	18:31:55
PM Peak Volume Delay (Hr):	58:28:23
High PM3 LOTTR ((Unreliable):	Yes
High PM3 Peak Hour Excessive Delay:	No
TDM Forecasted Congestion:	Yes

Planned Improvements on 2045 LRP & FY 2020-23 TIP

* 2045 LRP: No Projects
* FY 2020-23 TIP: No Projects

Very Appropriate Strategies

1) Signal Improvements
2) Intersection Improvements of Limited Scale
3) Turning Movement Enhancements
4) Growth Management and Smart Growth
5) Access Management Policies

Additional Factors	
National Highway System:	Yes
DVRPC High Crash Frequency:	No
DVRPC High Crash Severity:	No
Transit Route:	Yes
Traffic Signal Type:	System
Focus Roadway Facility:	254
Corridor/Subcorridor Area:	10D

4.5 Congested Corridor, Subcorridor, and Emerging Growth Corridor Areas

The DVRPC region is segmented into CMP congested corridor and subcorridor areas to help prioritize congested locations and to assist in developing focused strategies to mitigate congestion. The region is too large to prioritize congested locations and develop mitigation strategies for all roadways and intersections separately, so the subcorridor areas provide at a regional planning level a framework for analysis. There are 17 corridor areas each, in the Pennsylvania and New Jersey portions of the DVRPC region. They are then further divided into 64 and 63 subcorridors in the Pennsylvania and New Jersey portions of the DVRPC region, respectively, where at a regional planning level, generally similar strategies to manage congestion are established. For example, corridor area 5 (US 1) in Pennsylvania comprises nine subcorridor areas starting in western Chester County and ending at the Pennsylvania and New Jersey state boundaries. Corridor area 6 (US 130) in New Jersey includes 12 subcorridor areas starting in Gloucester County and ending at the Mercer County and Middlesex County boundary. Additionally, emerging regionally significant growth corridor areas are identified where traffic congestion is not a major concern yet, but may be in the future given existing land use and travel trends. Figures 55 and 56 show the congested corridor, subcorridor, and emerging growth corridor areas by interstate and non-interstate, respectively. The location and extent of the areas are based on various factors, such as existing and forecasted traffic congestion, land use, roadway functional classification, parallel roadways, transit facilities, and input from the CMP Advisory Committee.

4.6 Selecting Priority Congested Corridor and Subcorridor Areas

Congestion and other CMP objective measures are used to select priority congested corridor and subcorridor areas for making investment decisions to manage traffic congestion (see Figure 57). Priority areas are used in the TIP and Long-Range Plan project evaluation criteria, which help to focus where investments need to be made to support the goals of the DVRPC Long-Range Plan, including improving livability, economic vitality, safety, and multimodal accessibility.

The measures are based on CMP objectives and criteria that are derived from goals of the Long-Range Plan (see Chapter 2). Points are assigned to congested roadway segments that meet CMP objective criteria, and locations that meet more criteria receive more points and indicate a greater need for managing congestion, which are shown in brown and red on the mapping (see Figure 15). For example, congestion on a NHS roadway near passenger rail stations with high crash frequency, and within a Long-Range Plan land use center, will receive greater priority than congestion locations where these factors are not present. The locations that meet more CMP objective criteria are used to help select priority congested corridor and subcorridor areas along with input from the CMP Advisory Committee.

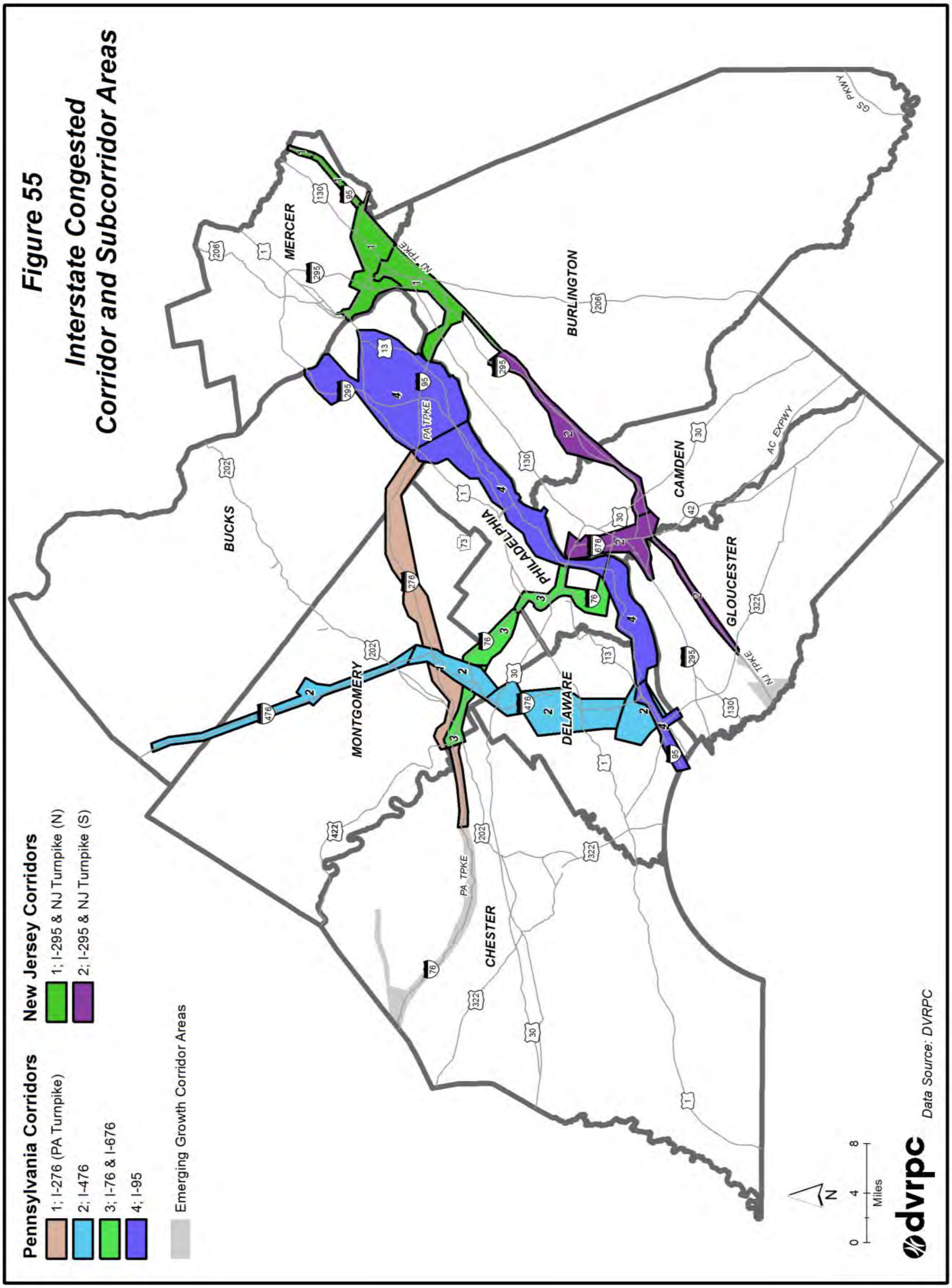


Figure 55
Interstate Congested Corridor and Subcorridor Areas

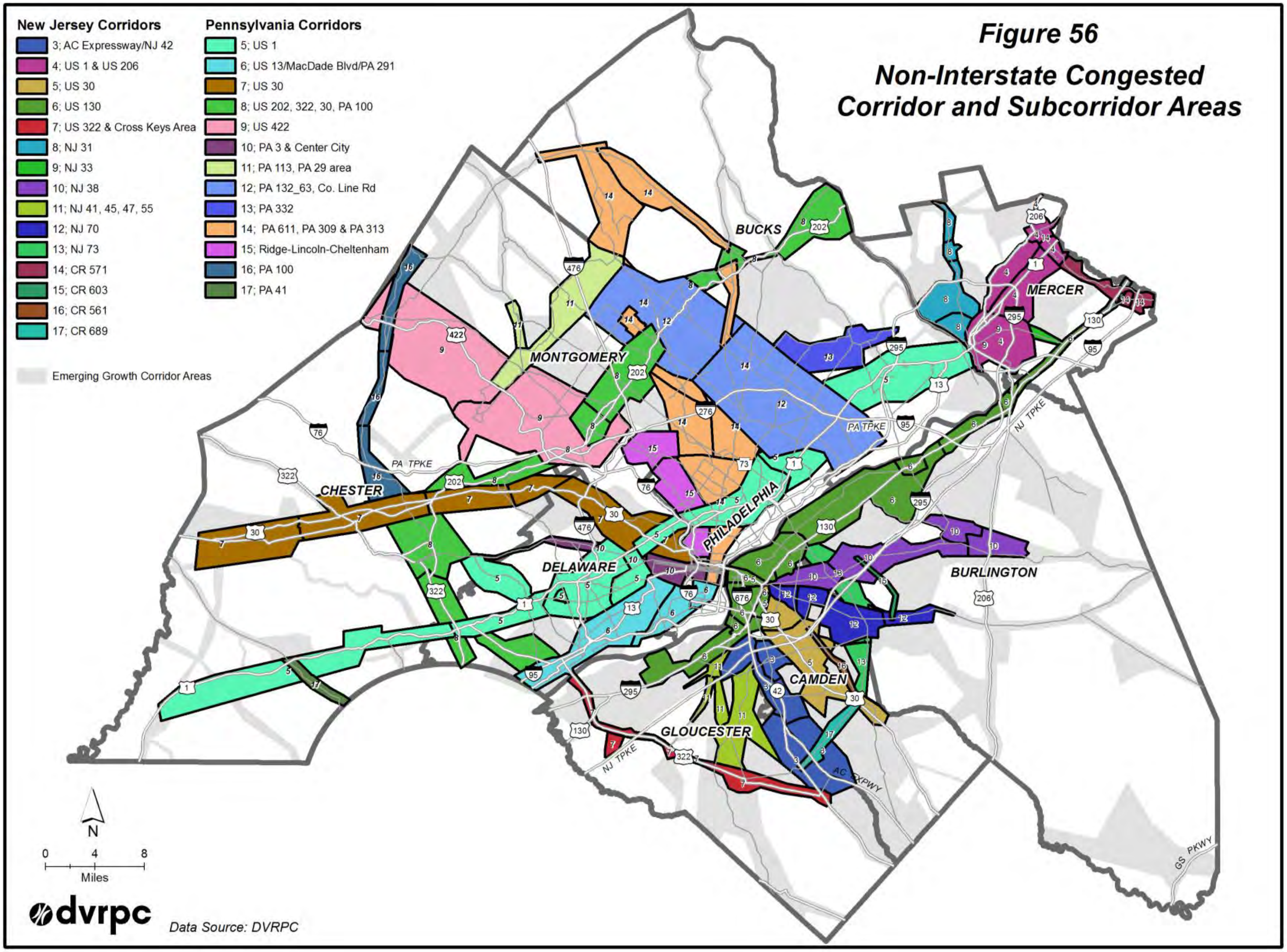


Figure 56
Non-Interstate Congested Corridor and Subcorridor Areas

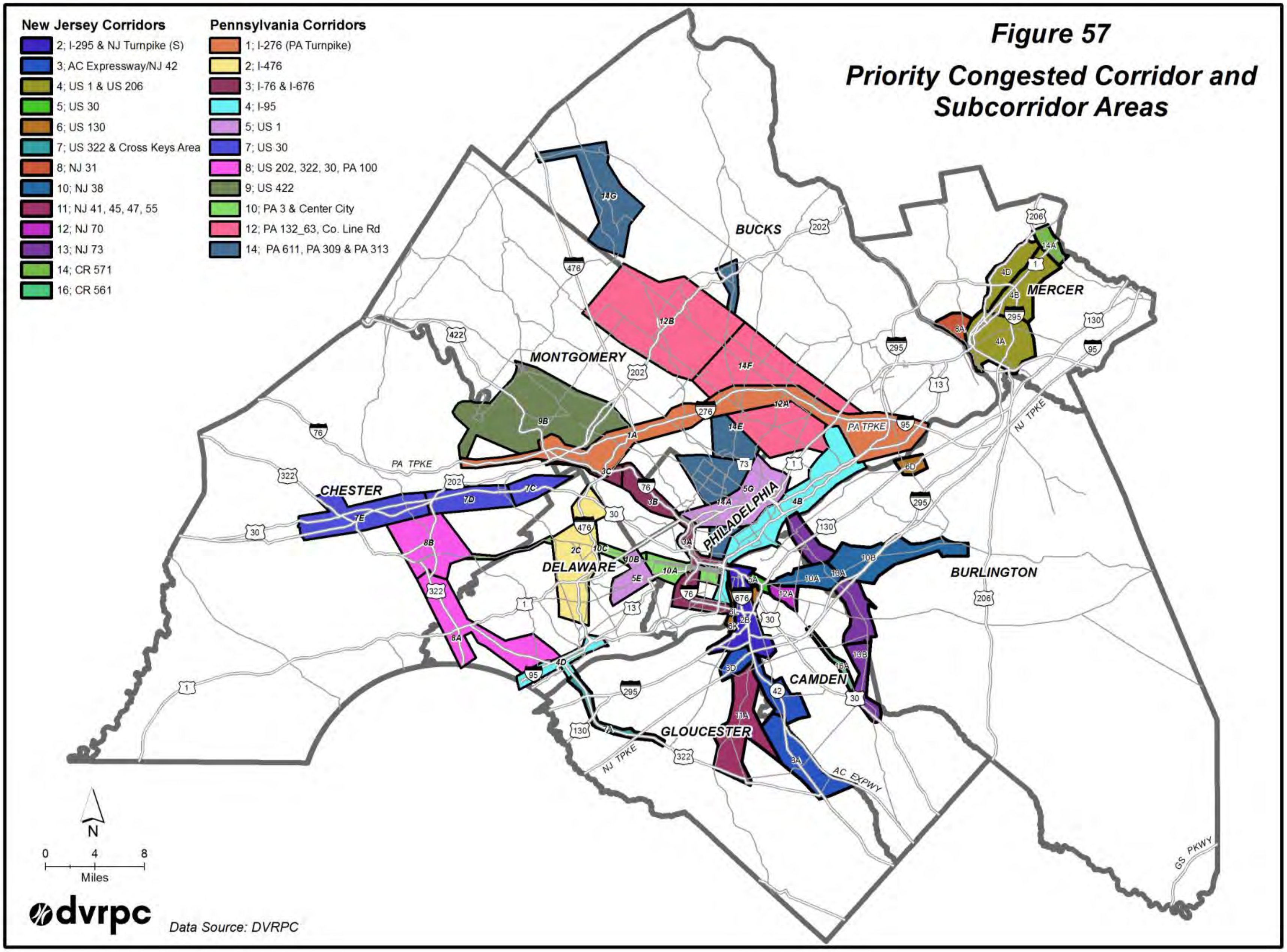


Figure 57
Priority Congested Corridor and Subcorridor Areas

4.7 Advancing from CMP Objective Measures to Strategies

A main component of the CMP is to provide an appropriate mix of strategies to mitigate congestion by congested corridor and subcorridor area that will improve the mobility of people and goods traversing the regional transportation system, and at the same time address other CMP objectives as applicable, such as improving safety, accessibility, security, and supporting Long-Range Plan principles.

CMP objective measure criteria helps drive the process of identifying which strategies are more appropriate than others by corridor and subcorridor area using Long-Range Plan goals and CMP objectives. Every subcorridor in the region presents its own unique mobility challenges, so care should be taken to select the strategies that best fit the conditions, goals, and character of the area under consideration. For example, high congestion on a bus transit facility may warrant strategies such as Transit Signal Priority (TSP), ITS for transit, and modifications to existing transit routes and services. High congestion on limited-access roadways may warrant ITS and Incident Management, Active Traffic Management (ATM) and Active Transportation Demand Management (ATDM) strategies. High congestion with high crash frequency or severity may warrant safety improvement strategies. A guide to advancing from CMP objective measures to strategies is listed in Table 9. Although each strategy for a particular measure may not necessarily be the most appropriate, the table provides a network screening of measures that starts the process of identifying appropriate strategies.

Table 9: Advancing from CMP Objective Measures to Strategies to Reduce Congestion

LRP Goal	CMP Objective	Performance Measure	Guide to Advancing from Objectives and Criteria to Strategies
Increase Mobility and Reliability, Reduce Congestion, and Improve TSMO	Minimize growth in recurring congestion. Improve the reliability of the transportation system	1. TTI to identify usual recurring congestion 2. High anticipated growth in V/C in the peak period using Travel Demand Model (2015 to 2045), reflecting Board-adopted population and employment forecasts 3. PTI to identify nonrecurring congestion 4. LOTTR to identify nonrecurring congestion according to PM3 measures 5. PHED to identify excessive person hours of delay, as compared to vehicle delay, according to PM3 measures	• **High TTI, *or* High PHED**—Review strategies for operations (road and transit). o Where transit exists: TSP, ITS Improvements for Transit, Modifications to Existing Transit Routes or Services, Transit Infrastructure Improvements o On limited access highways: ITS, ATM, ATDM • **High Growth in V/C**—Improve Circulation and Comprehensive Policy Approaches (Growth Management and Smart Growth, Complete Streets), Revisions to Existing Land Use/Transportation Regulations, Access Management policies and projects • **High PTI *or* High LOTTR**—Incident Management o Freeways: ITS family (especially Traveler Information Services) o Arterials: Signal Improvements family (especially Coordinated Traffic Signal Systems) • **Highly Congested (High TTI *or* PHED) *and* (High PTI *or* High LOTTR)—**Bus Rapid Transit (BRT) or Exclusive Bus Lanes, New Passenger Rail Investments, Adding Capacity to Existing Roads (especially Interchange with Related Road Segments), Hard Shoulder/Flex Lanes, General Purpose Lanes
Integrate Existing and New Modes into an Accessible Multimodal Network	Provide transit where it is most needed for accessibility	1. Assess transit score and population near rail stations to understand where transit could reasonably help improve accessibility	• **High Transit *and* Rail Station Score**—Walking and Bicycling Improvements, Modifications to Existing Transit Routes or Services, New Bus Services (especially Shuttle Service to Stations, Transportation Services for Specific Populations) Consider Economic Redevelopment Oriented Transportation Strategies where poverty is a major issue o Review with IPD and Equity
Rebuild and Maintain the Region's Transportation Infrastructure	Maintain existing core transportation network	1. NHS, Primary Highway Freight System (PHFS), including Critical Urban Freight Corridors; rail lines (passenger and freight); major Freight Centers and Philadelphia International Airport 2. Roads with substantial bus or trolley service, which are essential infrastructure for transit riders (three or more runs during peak in urban locations and two or more runs in suburban); roads near substantial train station boardings	• **NHS, PHFS, and Critical Urban Freight Corridors and Freight Centers**—Goods Movement strategies • **Roads with Substantial Transit Bus Service *or* High Train Station Boardings**—Review Transit Infrastructure Improvements, TSP, ITS Improvements for Transit, Shuttle to Station, Transit-Oriented Development (TOD), Modifications to Existing Transit Routes or Services • **Substantial Transit *and* Highly Congested**—Review if appropriate: Passenger Intermodal Center or Garage for Transit Riders, Express Transit Routes, BRT
Move Toward Zero Transportation Deaths	Improve safety and reduce nonrecurring congestion by reducing crashes	1. Crash Rate Index by comparing actual crash rate to average crash rate for a type of roadway (urban or rural, divided or undivided, limited access or no access control, and roadway width and AADT thresholds) 2. Severity Index, including kills and major injuries	• **High Crash Rates *or* High Severity**—Emphasize Safety Improvements and Programs o On Interstates: Incident Management • **High Crash Rates *and* High Severity**—Emphasize Incident Management.
Facilitate Goods Movement	Maintain movement of goods by truck	1. TTTR Index on interstate system to identify truck nonrecurring congestion according to PM3 measures 2. TTTI on NHS roadways to identify recurring truck congestion	• **High TTTR *or* High TTTI**—Goods Movement strategies (especially overnight truck parking, due in part to changes for driver hours-of-service regulations, and short-term parking for various types of urban deliveries)
Create a More Secure Transportation Network	Maintain transportation preparedness for major events, especially ones that call for inter-regional movements far beyond normal; this also serves routine needs	1. Areas where high population density makes evacuation a regional concern 2. Most heavily used bridges and passenger transit stations 3. Nuclear Power Plant Emergency Planning Zone (EPZ) 4. General location of largest military bases in the region Note: Infrastructure measures are also considered in security planning.	• **High densities**—Evacuation Planning • **Most heavily used transit stations**—TSP • **Nuclear power plant EPZ**—Coordinate within the Nuclear Emergency Planning Zone (EPZ) • **Most heavily used bridges**—Bridge Security • **Military facilities**—Coordinate with Military Bases
Ensure Transportation Investments Support Long-Range Plan Principles: 1. Sustain the Environment 2. Develop Livable Communities 3. Advance Equity and Foster Diversity 4. Expand the Economy 5. Create an Integrated, Multimodal Transportation Network	1. Prioritize transportation investment in less-sensitive environmental areas 2. Invest to support Centers first, then Infill and Redevelopment areas, then Emerging Growth areas 3. Identify Environmental Justice and Equity population transportation needs 4 & 5: All CMP objectives work toward expanding the economy and creating an integrated, multimodal transportation network	1. Environmental Screening Tool score (less harm to environment) 2. Centers, Infill and Redevelopment areas, Emerging Growth areas 3. Assess Indicators of Potential Disadvantage (IPD) and equity indicators	• **Environmental impact high**—Environmentally Friendly Transportation Policies, Context-Sensitive Design, Growth Management and Smart Growth • **Long-Range Plan Centers**—Review for strategies, such as Improve Circulation, Placemaking for Non-motorized Transportation, Context-Sensitive Design o **Long-Range Plan Centers with Transit**—Shuttle Service to Stations, TOD, TSP, Transit Infrastructure Improvements o **Infill and Redevelopment/Emerging Growth Areas *and* High PTI *or* High LOTTR**—Signal Improvements, Improve Circulation (especially Access Management Projects and County and Local Road Connectivity), Intersection Improvements of a Limited Scale, Transit-First Policy, Modifications to Existing Transit Routes or Services, New Bus Services, New Passenger Rail Investments, Minor Road Expansions o **Infill/Redevelopment with transit**—TSP, ITS Improvements for Transit, Modifications to Existing Transit Routes or Services, Transit Infrastructure Improvements • **IPD, Environmental Justice and Equity**—Walking and Bicycling Improvements, Modifications to Existing Transit Routes or Services, New Bus Service; consider Economic Redevelopment-Oriented Transportation Strategies where poverty is a major issue

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5. Traffic Congestion Mitigation Strategies

The CMP includes a list of over 100 strategies to mitigate congestion (see Chapter 5, section 4). These strategies are applied at the congested corridor, subcorridor, and emerging growth corridor levels, or at a regional planning scale, where a set of strategies is most appropriate. Corridor and subcorridor strategies are subdivided into very appropriate and secondary strategies, and strategies appropriate everywhere (or region wide strategies). The region wide strategies should be considered for all corridor, subcorridor, and emerging growth corridor areas. The very appropriate strategies, as the name implies, are the most important strategies to consider first, given the context of the area, and they are purposefully limited in number to emphasize their importance. The secondary strategies should be considered after the very appropriate ones, and they cover a range of TSMO, TDM, transit, and roadway strategies based on the context of the area.

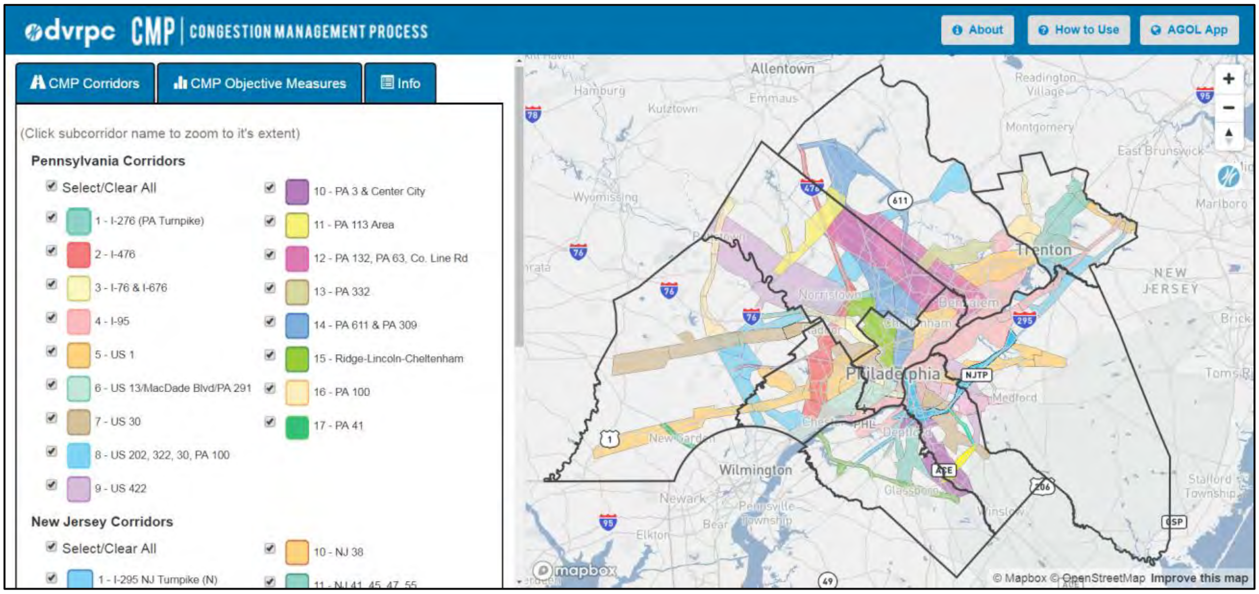
The very appropriate and secondary strategies are listed in order from top to bottom and the top strategies should be considered first. For example, adding new capacity should be a last resort and shows at the bottom of the strategy lists. The order for prioritizing strategies is: (1) to maintain, optimize, and modernize the existing transportation system, and rights-of-way, including optimizing the services delivered by the system to provide for mobility options and convenience for transferring between modes; (2) manage demand for transportation by fostering land use patterns, encouraging Non-SOV options, and other strategies that reduce the need for and length of trips; (3) and increase capacity of the existing multimodal transportation system as appropriate. These very appropriate and secondary strategies provide a starting point for planners and project managers to take a deeper dive into the appropriate mitigation measures for a particular location. New major SOV capacity-adding projects may be appropriate when other strategies do not reasonably reduce congestion further up the very appropriate and secondary strategy list, but these projects must be developed in an appropriate way, and be incorporated with supplemental strategies.

5.1 Strategies by Congested Corridor and Subcorridor Area

The specific strategies for a congested corridor and subcorridor area are identified by the CMP Advisory Committee and DVRPC staff using various sources, including adopted planning studies, and CMP objective measures (see Chapter 4, section 7). For example, the Pennsylvania subcorridor 14E (PA 611 from North of Cheltenham Avenue to I-276) contains five very appropriate strategies, including signal improvements, expanded parking and improved access to stations (including remote, all modes), park and ride lots, TOD, and walking and bicycling improvements.

A map of the congested corridor and subcorridor areas, along with the very appropriate and secondary strategies, is available on the CMP website at **www.dvrpc.org/webmaps/CMP2019** (see Figure 58). Other information included by congested corridor and subcorridor area include, strategy notes, programmed major SOV capacity-adding TIP projects, and references to any adopted corridor studies. Strategy notes include any Long-Range Plan projects in the subcorridor area, specific strategies that may be recommended for a facility, or more detail on a specific strategy.

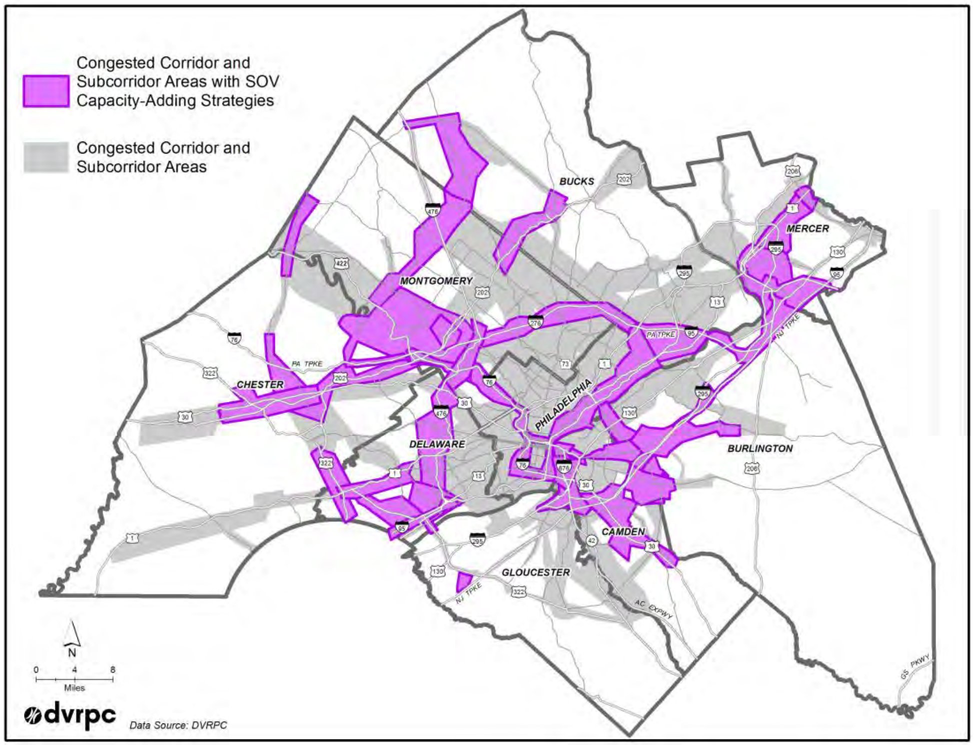
Figure 58: CMP Congested Corridor and Subcorridor Area Web Mapping



5.2 Adding Road Capacity as a Strategy

The CMP helps decision makers assess where and how to make transportation investments by identifying very appropriate and secondary strategies to mitigate congestion by subcorridor. One of the ways this is accomplished is by considering certain subcorridor areas for limited additional road capacity, realizing that some areas have experienced or are forecasted to experience increased development, and some additional capacity may be necessary. The CMP does not encourage development in these areas, but it may be appropriate. Approximately one-third of the subcorridor areas in each of the Pennsylvania and New Jersey portions of the DVRPC region contain capacity-adding strategies (see Figure 59). Adding SOV capacity may be appropriate when major congestion problems cannot be adequately addressed by a set of other strategies, but should be coordinated with multimodal supplemental strategies to get the most long-term value from the investment. Project screening criteria in the Long-Range Plan includes whether new roadway capacity-adding projects are located in CMP subcorridors designated for limited additional road capacity. If the project fails the screening process, it is not considered for inclusion in either the Vision or Funded Plan. CMP strategies to add capacity to existing roads include: general purpose lanes, flex lanes/hard shoulder running, adding movements at interchanges with related road segments, or large intersection projects with associated road segments. Strategies to add capacity by building new roads include: arterial or collector roads, bypass roads, or limited-access highways. Procedures for how additional road capacity may be added as a strategy with additional supplemental strategies are described in the next section.

Figure 59: Congested Corridor and Subcorridor Areas with Adding Road Capacity as a Strategy



5.3 Projects and the CMP

Major SOV capacity-adding project strategies may be appropriate when other strategies do not reasonably reduce congestion, but these projects must be developed in an appropriate way to get the most long-term value from investments and meet federal requirements. Final engineering for major SOV capacity-adding projects should not be listed on the TIP without a table of multimodal supplemental strategies. DVRPC staff is available to provide technical and process support to project managers, including helping to set up stakeholder meetings or providing maps and analysis to advance the supplemental strategies. DVRPC has developed CMP Supplemental Project Status Memorandum reports that list project commitments. See the biennial **Supplemental Projects Status Memorandum** reports on the DVRPC web site at **www.dvrpc.org/CongestionManagement/NewsAndTech** to track the progress of strategy implementation. The latest update is the 2015–16 CMP Supplemental Projects Status Memorandum.

Table 10 provides a small sample of a long list of multimodal supplemental strategy commitments to reduce congestion for I-95 reconstruction and widening projects. The projects include, in part, five sections in central and north Philadelphia. Construction is underway and will continue over the coming decades. The projects include roadway widening to eliminate lane drops, interchange improvements, and upgrades to the street network in the City. These comprehensive, multimodal commitments will allow the I-95 projects to maximize the investment of over $2 billion in federal and state transportation funds. Although this overall project is one of the most major capacity-adding in the region, it provides a great example of how a coordinated set of supplemental commitments can be made to help reduce congestion and add value.

Table 10: I-95 Supplemental Commitments

Sample of Commitments	Lead Agency/Organization
Upgrade equipment and/or retime signals at over two dozen intersections	PennDOT, City of Philadelphia
Install or upgrade traffic systems, including cameras, variable message signs, and detectors along I-95 and other major roads	PennDOT
Expand park and ride lots	SEPTA, PennDOT
Construct bike lanes, sidewalks, trails, and other infrastructure for bicyclists and pedestrians	PennDOT, City of Philadelphia, Delaware River Waterfront Corporation, Delaware River City Corporation
Purchase new double-decker rail cars for SEPTA's Trenton Line; reconstruct SEPTA Route 15 Trolley on Richmond Street, including new stops/platforms	SEPTA, PennDOT
Conduct outreach in Bucks, Delaware, and Philadelphia counties to encourage and implement Transportation Demand Management strategies	PennDOT, DVRPC, TMA Bucks, Delaware County TMA, Central Philadelphia TMA, Clean Air Council

The process of identifying the most appropriate strategies for a transportation improvement project is necessary as part of the CMP. See Figure 60 for how a project moves through the CMP. For a more detailed version of the flowchart, see *CMP Procedures* (DVRPC Publication #TM09029). It includes instructions for project sponsors on how to be consistent with the CMP.

Figure 60: How a Project Moves through the CMP

Is the problem in a congested subcorridor? Is the problem in an emerging/regionally significant corridor?	**if YES...** Document.	**if NO...** It may not matter, depending on the project.*
Can the problem be addressed without building more road capacity?	**if YES...** DVRPC is available to help evaluate strategies.	**if NO...** Document this initial research.
If new road capacity is an alternative, is it likely to be Major SOV Capacity?**	**if YES...** Go to the next question.	**if NO...** Keep the project description current in TIP listings; DVRPC is available to help.
Is the new Major SOV Capacity consistent with the CMP?	**if YES...** Start considering supplemental strategies and contact DVRPC CMP staff.	**if NO...** A different SOV Capacity-adding strategy was listed – *Include that strategy in an alternative, include other CMP strategies as alternatives.* Adding Major SOV Capacity was not listed – *Use the CMP Very Appropriate, Secondary, and Strategies Appropriate Everywhere to develop alternatives.* The project is not in a congested subcorridor – *See instructions for "Evaluating Projects Outside of Congested Corridors" and checklist.** Contact DVRPC CMP staff.
Are the supplemental strategies set?	**if YES...** Stakeholders agree on strategies, implementation, and timeline, DVRPC RTC has adopted table.	**if NO...** DVRPC remains available to help.

** For a more detailed version of the flow chart about how a project moves through the CMP, see CMP Procedures (DVRPC Publication #TM09029). It includes instructions for project sponsors on how to proceed from the beginning of a project.*

*** Clarification of which projects qualify as Major SOV Capacity-Adding is also included in the CMP Procedures document.*

5.4 Range of Strategies to Reduce Congestion

Below is a list of strategies to address traffic congestion that can be used for specific CMP congested corridor and subcorridor areas. Each area presents its own unique mobility challenges, so typically different very appropriate and secondary strategies are recommended by subcorridor. The strategies also serve as a reference source for planners, engineers, and others thinking about ways to effectively address congestion problems across multiple modes of transportation while considering fiscal constraints.

The five categories below summarize the range of strategies, and some of them should be considered in virtually all situations, known as region wide strategies (**highlighted in green**).

A. **Transportation System Management, and Operations (TSMO), and Intelligent Transportation Systems (ITS):**
projects that maintain, optimize, and modernize the existing transportation system (roads, transit, other), including maintaining and improving safety;

B. **Transportation Demand Management (TDM), Policy Approaches, and Smart Transportation:**
programs and projects that encourage the use of alternative modes of transportation, other than driving alone, and that otherwise focus on the demand side of trip making through physical or policy approaches, often also advancing other quality-of-life, environmental, and economic development goals;

C. **Public Transit Improvements and New Investments:**
programs and projects to increase the capacity of existing services and facilities first, but to add capacity if necessary;

D. **Goods Movement:**
policies, strategies, and projects to maintain and optimize the safe and efficient movement of freight;

E. **Road Improvements and New Roads:**
projects that increase the capacity of existing roads or build new capacity on new right-of-way.

A. Transportation System Management and Operations (TSMO), and Intelligent Transportation Systems (ITS)

Strategies in this category address traffic congestion problems through the improved management of existing roads and transportation facilities. Operational improvements may address such issues as better coordinating traffic signals or more safely managing combinations of through and local vehicles, primarily through engineering-based approaches. TSMO is an even broader range of ways to maximize the use of the entire transportation system while minimizing the expense and impacts of building major new capacity. Although ITS addresses many of the same goals, it focuses on integrating new technologies and coordinating data for these purposes.

1. **Signage** – Improvements to clearly communicate location and direction information, including adding or removing signs (to reduce clutter), redesigned signs, “trailblazing” to key locations, maintenance of signs and line of sight to them, and pavement markers to provide information.

2. **Safety Improvements and Programs** – A significant component of frustration with congestion is from unexpected delays, such as those caused by crashes. Safety strategies can cover a range of generally low-cost improvements to improve safety in areas where there is high crash frequency or severity, by evaluating deficiencies and addressing them by use of improved guide rails, lane dividers, signage, line-of-sight clearances, lighting, enhanced enforcement of speed limits, educational programs, and if necessary, minor engineering projects.

3. **Work Zone Management –** Strategies to minimize congestion caused by maintenance and construction activities. ITS is often used to alert drivers, or to manage the work area. This is already part of the planning done by various implementing agencies for all federal-aid highway projects as part of their Traffic Management Plan.

Turning Movement Enhancements – Strategies to reduce congestion and crashes through turning movements.

4. **Channelization** – Strategy used in optimizing the flow of traffic for making right turns, usually using concrete islands or pavement markings.

5. **Left-Turn Lanes** – This strategy installs left-turn lanes to decrease left-turning traffic causing friction with through traffic.

6. **Center-Turn Lanes** – This strategy is used in conditions where there are many vehicles turning left midblock to reduce the impact on the movement of through traffic.

7. **Jughandles** – These are at-grade ramps provided at or between intersections to permit motorists to make indirect left turns and/or U-turns.

Improve Circulation – Strategies designed to move more vehicles through the existing road system, often using engineering approaches.

8. **Street Circulation Patterns** – Changing and/or restricting the direction of travel or separating two-way traffic on roadways. This can involve changing the designation of roadways from two-way travel to one-way, or vice versa.

9. **Vehicle Use Limitations and Restrictions** – The outright or time-of-day restrictions of vehicles to increase roadway capacity. This also includes turn restrictions during peak hours to eliminate conflicting movements. Freight demand management strategies can be explored for corridors experiencing issues with freight loading and deliveries blocking travel lanes. See also Freight Operations Improvements.

10. **Access Management Projects** – This refers to the engineering side of controlling access primarily to and from arterial roadways. Access is controlled through the number and design of driveways, medians, and median lanes. See also Access Management Policies, below.

11. **Parking Operations** – Changes to parking intended to improve the operation of roadways, such as relocating parking spaces nearest to dangerous intersections if line-of-sight is a problem; incentives to keep short-term parking used as such; and time-of-day limitations on parking.

12. **County and Local Road Connectivity** – This is a range of ways to encourage local traffic to use the local road network in order to maximize use of highways for through traffic. It can be encouraged through enhanced signage, additional connections within the local road network, and state policies.

13. **Bottleneck Removal of a Limited Scale for Cars and Trucks** – Removal or correction of short isolated and temporary lane reductions, substandard design elements, and other physical limitations that form a capacity constraint. See also Bottleneck Removal for Passenger Rail,

Bottleneck Removal for Freight Rail, Making Transfers Easier for Passengers, and Improvements for Walking and Improvements for Bicycling, below.

14. **Roundabouts** – These are circular intersections with specific design and traffic-control features. Key features include yield control of entering traffic, channelized approaches, and appropriate geometric curvature to slow speeds. Roundabouts provide substantially better operational and safety characteristics than older traffic circles and rotaries and are safer than comparable signalized intersections.

Signal Improvements – Strategies, ranging from basic to sophisticated, that improve the efficiency of signals individually and in systems. This includes specific applications, such as for pre-emption for emergency vehicles or buses.

15. **Basic Upgrading of Traffic Signals** – Adjustments and maintenance of signal timing and phasing, including installation of new signals as warranted, to improve flow and reduce congestion. This also includes equipment update, traffic signal removal, and pre-timed signal plans.

16. **Coordinated Traffic Signal Systems** – Linked traffic signal closed-loop systems, time-based systems, and responsive and adaptive systems that change based on traffic conditions. Using detectors, a centralized computer will periodically sample traffic flow and determine the most appropriate timing plan and signal phasing. This may be employed for corridors or interconnected areas.

17. **Signal Pre-emption for Emergency Vehicles** – Use of technology in vehicles and within signal infrastructure to preempt the signal timing to create green signals for ambulances and other high-priority response vehicles through the existing road system.

18. **Transit Signal Priority (TSP)** – Use of technology in vehicles and/or at signalized intersections to temporarily extend green time or otherwise expedite buses, light rail, or trolleys through the existing road system.

Intelligent Transportation Systems (ITS) – Strategies that encompass a broad range of technologies to relieve congestion and improve safety. Includes the dissemination of 511 real-time travel information to the public when integrated into the transportation system's infrastructure.

19. **Traveler Information Services** – Provision of real-time pre-trip and en-route information to travelers on current traffic and other conditions. This includes advisory services to warn of traffic or transit delays, and dynamic message signs to inform motorists of traffic conditions. It is especially relevant to special-event generators and roadways with significant concentrations of travelers unfamiliar with the transportation system.

20. **Integrated Corridor Management (ICM)** – Building upon ITS technologies, ICM coordinates the individual network operations between parallel facilities to create an interconnected system. A corridor is defined as a combination of parallel surface transportation networks (e.g., freeway, arterial, transit networks) that link the same major origins and destinations. A coordinated effort between networks along a corridor can effectively manage the total capacity in a way that will result in reduced congestion. ICM uses many other strategies in this list, such as Coordinated Traffic Signal Systems, TSP, Incident Management, and Traveler Information Services. Often, these efforts are done from a Transportation Management Center.

21. **Incident Management –** These are programs to effectively manage incidents by reducing the time for incident detection/verification, response, and clearance. They usually include improved institutional coordination.
22. **Automated Toll Collection –** This includes various existing and developing strategies that reduce congestion and delays at tollbooths, including by shifting to all-electronic tolls, such as E-ZPass. The Pennsylvania Turnpike's goal is to have all cashless toll booths by the fall of 2021.

23. **Commercial Vehicle Operations –** Utilization of ITS technologies to improve efficiency and effectiveness of commercial vehicles. This includes weigh station pre-clearance, automated safety inspections, and onboard safety monitoring.

Active Traffic Management (ATM) and Active Transportation and Demand Management (ATDM) – ATM is the ability to dynamically manage recurring and nonrecurring congestion on the mainline based on prevailing traffic conditions. Focusing on trip reliability, it maximizes the effectiveness and efficiency of the facility and increases throughput and safety through the use of integrated systems. ATM strategies include variable speed displays, dynamic lane assignment (DLA), hard shoulder/flex lanes, junction control, and queue warning. ATM can be combined with travel demand management and other operational strategies to create ATDM, which refers to the collective approach for dynamically managing travel and traffic demand and available capacity of transportation facilities, based on prevailing traffic conditions, using one or a combination of operational strategies that are tailored to real time and predicted conditions in an integrated fashion. This strategy includes traditional traffic management and ITS technologies as well as new technologies and nontraditional traffic management technologies, such as ATM, managed lanes, ramp management, TDM, and ICM among others.

24. **Dynamic Lane Assignment –** The use of lane control signals on gantries to provide advance notice that a lane is closed ahead, and to start the merge process into available other lanes well in advance of the actual closure. DLA is often installed in conjunction with variable speed displays and also supports the ATM strategies of flex lanes/hard shoulder running, queue warning, and junction control.

25. **Junction Control –** A strategy that dynamically changes lane allocation at interchanges based on mainline, and entering or exiting ramp volumes. Junction control is useful for situations with a varying relationship between mainline demand and ramp demand. This strategy allows a ramp to have one or two lanes, depending on the demand, on the ramp and the mainline volume. Through use of signs (and possibly lighted pavement markers), junction control can close a mainline lane and create a second lane on the ramp for entering or exiting traffic. For entrance ramps, the right lane at the entrance would become an add lane by closing this lane to mainline traffic upstream of the ramp. For exit ramps, the right mainline lane approaching the ramp would become a drop lane. At other times of the day, when ramp demand is not as high or when mainline volumes are such that a mainline lane cannot be closed, the ramp would operate as a single lane and the right mainline lane would operate as a through lane through the interchange.

26. **Queue Warning –** The use of technologies such as warning signs, flashing lights, or in-vehicle devices, to alert motorists of downstream queues. Goals include effectively utilizing available roadway capacity and reducing the likelihood of collisions related to queuing. In some applications, the cause of the queue (crash, maintenance activities, congestion) is also displayed on dynamic message signs.

27. **Variable Speed Displays –** The intent of variable speed systems, often used in conjunction with DLA, is to regulate the speeds or advise motorists of downstream conditions, incidents, or congestion, providing advance warning to motorists and the need to reduce speeds prior to an incident or congestion, and the ability to merge out of lanes that are closed downstream in an orderly manner. Additionally, by stabilizing traffic speeds, variable speed displays and lane control systems work to reduce flow breakdown and the onset of stop-and-go driving behavior. This results in more uniform traffic flow and safer driving conditions and reduces both primary and secondary incidents and their severity. Variable speed displays may be advisory or regulatory. If they are regulatory (e.g., variable speed limits), they are legal speed limits for which a motorist can receive a citation if they exceed the posted limit. If they are advisory, a motorist cannot be cited for a speed limit violation, unless in the officer’s judgment, they are driving too fast for the prevailing conditions. Also called “Speed Harmonization.”

28. **Dynamic Rerouting –** The use of variable destination signing to make better use of available roadway capacity by directing motorists to less congested facilities. Dynamic rerouting signs are

often intended for the nonlocal traveler wishing to travel through a metropolitan area. As a result, dynamic routing is often used to divert traffic around central business districts or other activity centers and is most effectively applied to interstate corridors.

29. **Ramp Metering –** Time-differentiated metering that acts as a traffic signal for vehicles entering freeways in order to control access to the highway and assist in maintaining vehicle flow.

Transportation Security – Improvements and programs designed to reduce negative transportation impacts of major events of all types. An all-hazards approach prepares the transportation system for events, including severe weather, major crashes, terrorist or criminal activities, or very large-scale events; any of which can create massive congestion.

30. **Coordinate with Military Bases** – Coordinate transportation planning in the vicinity of military bases with their security and access needs.

31. **Coordinate within the Nuclear Emergency Planning Zone (EPZ**) - Coordinate transportation planning in EPZs with nuclear plant and county/local evacuation plans.

32. **Freight Rail Bridge Security** – Enhance security on and around the limited number of key freight rail bridges, in particular the eight crossings of the Schuylkill and Delaware rivers.

33. **Passenger Rail Bridge Security** – Enhance security on and around the limited number of key bridges that carry passengers by rail. There are four major rail river crossings, two of which are part of the Northeast Corridor Amtrak Line.

34. **Road System Bridge Security** – Enhance security on and around road system bridges. This is especially important for the interstate system bridges in the region that carry over 100,000 vehicles on average per day.

35. **Transit Station Security** – Enhance security at and around transit stations, with particular attention to the most heavily used ones in each county that could become a focus in an evacuation situation.

36. **Evacuation Planning** – Coordinate with and enhance how transportation would serve dense and at-risk populations if they needed to leave the area, such as people without access to a private vehicle.

37. **Cyber Security** – Enhance transportation systems so that they can be protected from outside interference.

B. Transportation Demand Management (TDM), Policy Approaches, and Smart Transportation

These are a wide range of policy and planning strategies that serve to get people and goods to their desired locations, while minimizing congestion and also advancing other quality-of-life, environmental, and economic development goals. They generally make the transportation system more efficient and sustainable, often at less cost than building new capacity, although often requiring education and outreach efforts. By improving the quality of life and sustainability of communities, they make it possible for more people to have a range of nonauto transportation options. By reducing the length and number of car trips, they reduce congestion. These approaches reflect the goals of the DVRPC Long-Range Plan, and of partner states, counties, and many municipalities.

This category serves to "level the playing field" by creating conditions whereby alternative transportation can thrive.

38. **Park and Ride Lots –** These are facilities that serve as a transfer terminal between modes. They may be served by public transportation or can be used for transferring to carpools and vanpools. This strategy may cover agreements for use of existing spaces, adding additional spaces to existing facilities, or building new lots that do not primarily serve transit (see also Expanded Parking for Existing Transit Stations, including remote, all modes; and Improvements to Pedestrian and Bicycle Access to Transit Stations and Bus Stops in the Transit Improvements section, below).

39. **Economic Redevelopment-Oriented Transportation Policies –** These are transportation strategies that serve the goals of redevelopment, revitalization, renewal, and recentralization of the region in keeping with adopted plans and programs. Such approaches are generally more efficient ways for a region to manage congestion while retaining or increasing employment, than developing in previously undeveloped areas. Examples may include actively redeveloping brownfields in CMP subcorridors as appropriate for investment of federal transportation funds. Brownfields are often sited near rail or other major transportation facilities and may be ideal for mixed-use, transit-oriented development (TOD) or freight intermodal centers.

40. **Environmentally Friendly Transportation Policies –** These are transportation strategies that seek to minimize the impacts of transportation on the natural environment in keeping with adopted plans and programs. Included are approaches to minimize stormwater runoff; conserve fuel; improve air quality; and preserve farmland, natural features, and open spaces. These strategies often shorten trip lengths, which helps manage congestion. They may include "Green Streets" programs or projects that help reduce flooding to prevent roads from closing or becoming unsafe during rain storms or other weather events.

41. **Inter-regional Transportation Coordination –** Although part of many other strategies, this is explicit recognition that people and goods travel across regional boundaries, and that congestion management is made more effective by addressing the need to coordinate and communicate beyond strict geographic lines. This includes coordination of MPOs, transit authorities, and departments of transportation, as well as outreach to key stakeholders, such as the freight community. The strategies include continued strengthening of the transportation planning process.

Encourage Use of Fewer Cars – Strategies that encourage fewer cars on the road by reducing the number of SOVs, providing options for commuters, and promoting the use of transit and other modes rather than driving alone. Outreach and marketing are important to the success of these strategies and are included in the strategy by that name.

42. **Carpool/Vanpool Programs –** Carpooling is sharing a ride with one or more other people for at least most of a trip on a regular basis. Vanpooling is sharing a ride with a larger group of riders going to the same destination. These alternative forms of transportation save time and money, and are beneficial for the environment.

43. **Car Sharing and Bike Sharing –** This is an organized program that facilitates sharing vehicles among multiple users without each incurring the fixed cost and maintenance obligations of ownership. A charge is associated with each trip, or on a subscription basis. Examples include the Enterprise Car Share and Zipcar programs, and the Indego bike share system in Philadelphia, which could expand regionally in the future. Some communities are also experimenting with shared Neighborhood Electric Vehicles or fleets of informally shared bicycles.

44. **Emergency Ride Home –** Serves as a safety net for employees who car/vanpool or use transit service by providing a reliable backup ride to get them to their destination if they have to work unusual hours, or if an emergency arises.

45. **Ride Matching –** Any range of ways to help match people willing to coordinate their trip making. This is most often done with regard to work commutes. There are public services available, as well as services provided by specific employers. DVRPC has a program called Share-A-Ride. It is a free service that matches commuters with transit services, carpools, vanpools, and walking/bicycling opportunities in the five-county southeastern Pennsylvania region. The Share-A-Ride program also partners with local employers to provide these services for employees. Transportation Management Associations (TMAs) also provide related programs.

46. **Local Delivery Service –** Encouraging businesses to deliver their products to customers can reduce SOV trips and provide goods, especially in communities where car ownership is low.

47. **Bicycle to Work –** Programs to encourage employees to commute to work by bicycle. Supportive strategies may also include the provision of bicycle amenities by employers, such as bike racks (especially weather protected), bike maintenance stations (e.g., air pumps), and shower access.

Shift Peak Travel – Strategies that encourage employers to allow employees to work from home or shift their schedules to reduce the number of travelers during peak hours.

48. **Telecommute –** This involves the elimination of a commute, either partially or completely, to a conventional office through the use of computers and telecommunication technologies (phone, personal computer, modem, fax, email, etc.). It can involve either working at home or at a satellite work center that is closer to an employee’s home than the conventional office.

49. **Alternate Work Hours –** These are strategies that reduce vehicle trip demand on highway facilities by shifting it to less congested time periods. This may include work schedules that spread the hours in which trips to and from the workplace occur or the complete elimination of trips to the workplace on some days, such as through compressed work weeks.

Outreach and Marketing – Strategies that promote and advertise existing services to encourage increased participation and/or general use of transit and TDM strategies, such as carpool, vanpool, and ridesharing programs, alternate work hours, telecommuting, emergency ride home, promotion of a regional commuter benefit, and car- and bike-sharing programs. Also included are strategies for effectively communicating with transportation-disadvantaged populations.

50. **Outreach/Marketing for Transit and TDM Services –** This covers outreach, education, planning, and other ways of encouraging use of transit services and TDM programs. This is applicable to employers, public entities, and the general public. This includes carpool, vanpool, and ridesharing programs; alternate work hours; emergency ride home; promotion of a regional commuter cost benefit; car sharing; bike sharing; and other TDM strategies.

51. **Environmental Justice and Equity Outreach for Decision Making** – Although general outreach includes the range of groups that have a history and/or likelihood of being adversely affected or not adequately involved in decisions about transportation services, it has tended not to be effective in reaching these populations. Focused outreach may include meetings in different locations, times, or formats than are often used in the process of preparing recommendations or making decisions, and offering translated materials or translators as needed for people to participate.

52. **Multilingual Communication –** As part of the environmental justice and equity outreach, provide basic information in language-neutral signs where reasonable or in the languages used in communities with significant populations that speak English as a second language. This includes bus schedules and wayfinding signs. In addition to increasing access, this reduces the number of travelers confused for a range of reasons, including speed of reading and vision.

53. **Promotion of a Regional Commuter Cost Benefit –** A commuter benefit program allows employers to offer their employees a cost-saving way to help pay for commuting on transit or vanpools. It

saves employers and commuters money because the program takes advantage of federal legislation that allows tax-free dollars to pay for transit fares.

Comprehensive Policy Approaches – Policy approaches that reduce congestion and help get people and goods where they need to go.

54. **Growth Management and Smart Growth –** These are ways to encourage the use of land in a manner that reduces overall congestion and transportation costs. These approaches recognize that transportation and land use decisions form a cycle, with many implications for communities. Managed and balanced development can reduce trip length by creating a better job/housing balance and by making it more feasible to get to places by means other than driving alone. This range of ideas includes locating neighborhood schools where students can walk to them and regional schools on transit lines to reduce the duplicative need for buses and congestion from drivers.

55. **Complete Streets –** Development and implementation of policies that require streets to be designed for all users. The design standards for such streets would serve bicyclists, pedestrians, disabled persons, transit users, trucks, and passenger vehicles. A municipality may be able to adopt such standards for future roads and roads under rehabilitation. Note that this is an adopted policy of the New Jersey Department of Transportation but is not appropriate everywhere in Pennsylvania.

56. **Transit-First Policy –** Implementation and enforcement of policies that give preferential treatment to transit to increase its attractiveness in comparison to SOV travel. See also Transit-Oriented Development (TOD), TSP, above; and other Policy Approaches.

57. **Railroad/Linear Right-of-Way Preservation –** Preservation of abandoned railroad rights-of-way for potential future rail service or other transportation uses before other development occurs. In addition, other linear rights-of-way should be preserved, such as those for utilities.

Financial Incentives – Policy approaches that reduce congestion and help get people and goods where they need to go.

58. **Pricing Policies –** Various policies that use pricing to shape transportation include gas taxes, insurance structures, VMT taxes, or other approaches. These approaches may be used to shape transportation behavior or raise funds. The funds may be used for transportation in general, or for paying for a specific project. See also specific applications, such as Tolls/Congestion Pricing, and Parking Supply-and-Demand Management, below.

59. **Tolls/Congestion Pricing –** This is a method of reducing congestion by charging for roadway use based on time and/or location of travel. This strategy may encourage travelers to shift to alternative times, routes, or modes during peak traffic periods, or may help offset costs of maintaining the roadway. Higher fees apply during the periods of greatest demand. This also covers changes to the toll structure for different types of trucks and how this compares to tolls for cars.

60. **Parking Supply-and-Demand Management –** These are actions taken to alter the supply and/or demand of a parking system to further the attainment of transportation objectives. They can include parking cash-out/transportation allowances, preferred parking areas for carpools or for people who only drive a few times a week, or changes in pricing.

Land Use/Transportation Policies – Strategies that reduce congestion by changing land use and development patterns to encourage mobility options and limit new trip generation.

61. **Revisions to Existing Land Use/Transportation Regulations –** Revise and better coordinate existing regulations, such as zoning, to reduce future traffic congestion. This can be facilitated using GIS or travel simulation modeling, programs such as UrbanSim, or buildout analysis. It is desirable that

zoning ordinances, subdivision regulations, and other rules reflect master plans and other community goals, such as maintaining reasonable accessibility and quality of life. They can also incorporate access management (see Access Management Projects in the TSMO section, above; and Access Management Policies in the TDM section).

62. **Transit-Oriented Development (TOD) –** This includes pedestrian-friendly, mixed-use development focused around transit stations. TOD encourages residents and workers to rely on modes other than the automobile. See also Transit-First Policy, above.

63. **Trip Reduction Ordinances –** These are ordinances that use a municipality's regulatory authority to limit trip generation from development sites. They usually cover an entire local political subdivision rather than just an individual project; they spread the burden more equitably between existing and future development; and they may be less vulnerable to legal challenges than conditions imposed on development approvals. Also known as Employee Trip Reduction, such approaches may be voluntary or mandatory.

Engineering for Smart Growth – Strategies to promote and enable smart growth using engineering solutions.

64. **Access Management Policies –** Adoption of the right to share access, provide cross access, regulate driveways, or other regulatory authority. This can also include the development of model ordinances and adoption of an access code by itself or as part of other regulations. Access management codes may cover corner-lot requirements, continuity of sidewalk/bike networks and pedestrian/transit rider access, and land use (trip making) intensity controls in specific areas. Refer to Access Management Projects in the TSMO section, above.

65. **Context-Sensitive Design –** Engaging local stakeholders early in the process to ensure that projects reflect community goals, such as PennDOT Connects. Context-sensitive design also encourages designers to consider nontraditional approaches to designing projects for the community context while maintaining basic design standards. This is also known as context-sensitive solutions.

66. **Road Diets –** Road diets involve a reduction in the number of through lanes, typically reducing a four-lane undivided road to three lanes, to encourage alternate modes of transportation, calm traffic, reduce crashes for all road users, and, in some cases, increase on-street parking. Studies indicate that in conditions where the average daily traffic is under 20,000 vehicles, there is minimal effect on road capacity or travel time.[1]

67. **Traffic Calming –** Specific actions intended to slow vehicular traffic to improve safety or meet other community goals. These goals can include improving pedestrian safety, making roads and streets more hospitable for bicycling and walking, and enhancing the livability of a neighborhood. In a commercial setting, traffic-calming can be part of a set of strategies to encourage a more walkable commercial district and to encourage investment. In a residential area, traffic-calming strategies, such as speed tables or speed humps, are sometimes used to reduce the speed and amount of through traffic cutting across local streets. This can be paired with improvements on larger roads to better manage the flow of traffic.

Walking and Bicycling Improvements – Strategies to reduce congestion and promote livability by making it safer and more convenient to travel by walking and bicycling.

68. **Improvements for Walking –** Improve safety and convenience for all pedestrians, but especially for ones who rely on walking for accessibility. These improvements should be selected to fit the level of development and population. Examples include sidewalk improvements, crosswalk

[1] *Corridor Planning Guide: Towards a More Meaningful Integration of Transportation and Land Use (Publication No. #07028). Philadelphia, PA: Delaware Valley Regional Planning Commission, 2007, p.29.*

improvements, signals, and markings giving pedestrians the right-of-way. This can include pedestrian countdown type signals.

69. **Improvements for Bicycling –** Improve safety and convenience for bicyclists, especially for people using bicycles for transportation. Examples include provision of sharrows, bike lanes, cycletracks, multiuse trails, and bicycle storage facilities to promote bicycles as an alternative to automobiles.

70. **Placemaking for Non-Motorized Transportation –** This covers the general work to make an area more conducive for modes other than driving alone, including landscaping, streetscaping, and development of regional bicycling and walking plans and maps.

71. **Create New Connections to Help Complete the Circuit Regional Trail Network –** The Circuit trail system takes advantage of opportunities to build and connect trails across the region. In addition to providing access to the region's rivers, creeks, and streams, the Circuit will also serve as the backbone for a network of "bicycling highways" that will allow safe and efficient travel by bicycle between homes, businesses, parks, schools, and institutions, free from motorized traffic. This strategy includes identifying connections that will help complete the Circuit or improve access to existing or planned segments of the regional trail network.

C. Public Transit Improvements and New Investments

This group of strategies deals with ways to make existing transit services more convenient. This may include bus, rail, or other conveyance—either publicly or privately owned—providing general or special service (but not including school buses, charter, or sightseeing services) on a regular and continuing basis.

ITS Improvements for Transit – Strategies to make existing transit services more convenient and reliable through ITS technologies.

72. **Electronic Fare Payment Improvements –** This involves automatic trip payment through the use of noncash media, such as magnetically encoded or radio frequency identification enabled fare cards. Increasingly, this method coordinates with other systems so that one medium works across various transit systems, or even for both transit and toll roads. An example of this is the "SEPTA Key" program.

73. **Advanced Transit System Management –** Use of Automatic Vehicle Locator systems on buses to communicate with people riding transit (such as information about transfers) or considering riding it (such as when the next vehicle is expected at a stop). This is sometimes called Intelligent Transit Stops. Advanced Transit System Management may be coordinated through transit centers to be able to make real-time adjustments to schedules. Additionally, it may include the use of ITS technologies for bus, train, and coordinated transit management, including train signals and power grids. See also TSP, above.

Modification to Existing Routes or Services – Strategies to make existing transit services more convenient and reliable; includes the use of ITS technologies.

74. **Express Transit Routes or Stop Consolidation –** This involves having select or all service on a route stop only at major stops in order to transport people more rapidly. It can be done by dropping less heavily used stops from peak-hour scheduled runs or by adding additional express service.

75. **Extensions or Changes in Bus Routes –** This includes review of where bus service is provided, seeking ways to provide better or more efficient service using existing resources. For bus or other services, it may include minor extensions in existing routes to provide service to a broader area.

76. **More Frequent Transit or More Hours of Service (Span of Service**) – This involves providing additional service on an existing transit route. It can be done for increased peak service, increased service throughout the day, or to provide earlier or later service.

77. **Flexible Routing/Route Deviation Service** – This is an approach that increases passenger convenience for fixed-route bus riders by building in the ability for buses to deviate within a defined distance, such as a quarter-mile from a fixed route. This may require advance arrangement and is generally used more in rural areas.

78. **Making Transfers Easier for Passengers –** Focused improvements to make it more possible and convenient to fully use all available modes of transportation for their best purposes. Examples might include minor changes in schedules to better align bus and train schedules, or improved information and amenities at intermodal centers. These improvements may also be between two providers of one mode, such as convenient walking connections between different train lines or coordination of schedules. For new intermodal centers, see Passenger Intermodal Center or Garage for Transit Riders, below.

Transit Infrastructure Improvements – Strategies that make it more convenient, safe, and desirable to use transit services.

79. **Enhanced Transit Amenities and Safety –** This is the broad range of ways to make transit use more comfortable, safe, and convenient. It includes, but is not limited to, onboard features and improvements at transit stops. Improvements at transit stops may include lighting, bus pull-off areas, shelters for passengers, real-time information, and making it safer for passengers walking to and from stops. Safety may be addressed for the people traveling, and also for the vehicles and bicycles left at stations. See also Advanced Transit System Management, above.

80. **Expanded Parking for Existing Transit Stations (including remote, all modes) –** Access to stations can be a limiting factor for use of the services that stop at them. There is a range of ways that access can be improved (see also TOD, above, or Shuttle Service to Stations, Passenger Intermodal Center or Garage for Transit Riders, and Improvements to Pedestrian and Bicycle Access to Transit Stations and Bus Stops, below). Within the category of increasing parking capacity to existing facilities, this may be done through added surface lot capacity or agreements with nearby sources of parking. An inexpensive example is assessing whether existing parking lots can be restriped in part or whole with smaller stalls to fit more vehicles in the same space. This could also be assessed in parking requirement regulations.

81. **Passenger Intermodal Center or Garage for Transit Riders –** This can range from extensive new facilities such as a landmark building with a range of services and structured parking, to parking decks for transit stations, to major new surface lots. For a smaller scale, see Park and Ride Lots, and Expanded Parking for Existing Transit Stations (including remote, all modes), above.

82. **Improvements to Pedestrian and Bicycle Access to Transit Stations and Bus Stops –** Biking, walking, and public transit work together to help residents and workers reduce SOV trips. Enabling safer bicycle and pedestrian connections between transit stations, neighborhoods, and employers, and improving bicycle accommodations at transit facilities can expand a rail station's catchment area at a lower cost than parking expansion. It can alternatively help ensure that station parking capacity is used by riders traveling from farther distances. DVRPC's Level of Traffic Stress maps (**www.dvrpc.org/webmaps/bikestress**) identify the level of stress comfort for cyclists along streets, and DVRPC's RideScore tool (**www.dvrpc.org/webmaps/ridescore**) can help prioritize rail stations for bike improvements. Additionally, *SEPTA Bus Stop Design Guidelines* (DVRPC Publication #12025) illustrates how a bus stop can be effectively connected with the development it is intended to serve.

83. **At-Grade Rail Crossing Safety Improvements –** Improvements to the rail system and/or the crossing road or trail system to increase safety, while reducing delays and other impacts. This may include improved coordination and warning systems. A related strategy is to equip a priority set of vehicles (such as school buses, hazardous material haulers, and emergency vehicles) with in-vehicle devices warning of approaching trains, potentially with real-time information on train position.

New Bus Services – Strategies that provide new bus or shuttle routes or services.

84. **Bus Route –** New regular bus service in an area not served by existing routes.

85. **Bus Rapid Transit (BRT) or Exclusive Right-of-Way Bus Lanes –** At the heart of such strategies is making bus service more competitive with private automobiles where transit ridership is at its highest. Both of these approaches allow buses to bypass road congestion so they can reach destinations more quickly. BRT systems may also include streamlined fare payments, enhanced use of ITS and traveler communication services, high-end vehicles, and distinctive marketing. Exclusive bus lanes may be part of existing roads or on new rights-of-way.

86. **Demand Response Transit Services (Microtransit) –** Transit set up by appointment, available to the general public using smaller vehicles, such as vans, 30-foot buses, transportation network companies (e.g., Uber or Lyft), or sometimes taxis. This may be most applicable in areas where transit demand is low or development is very dispersed.

87. **Shuttle Service to Stations –** Shuttle services may be added to make existing services more accessible or to efficiently expand their reach in less dense areas. Smaller vehicles can provide loops or demand-responsive services to train stations, bus stops, or other multimodal transportation transfer centers. This is sometimes referred to as shuttle bus to line-haul transit or last-mile service.

88. **Transportation Services for Special Events –** Shuttle services and other approaches can be provided to get people to and from sporting events, concerts, or other major gatherings. This can be an efficient way to reduce what is generally referred to as nonrecurring congestion, as well as reducing need for expensive investments in infrastructure. These services usually serve outlying parking lots and/or transit stops.

89. **Transportation Services for Specific Populations –** This is the provision of services that addresses specific needs or populations, and includes employer-supported shuttles for employees. It also includes services oriented toward senior citizens and handicapped people.

New Passenger Rail Investments – Strategies that provide new passenger rail routes, stops, stations, or services.

90. **Intercity Rail Service –** This is longer-distance new rail service connecting to cities outside the region on new track or track previously not used for this specific service. Such service may be fueled and operated in a variety of ways, including electric or diesel power.

91. **Fixed-Rail Service (new, extensions, or added stations) –** This is generally, although not always, oriented to commuter rail movement within one region, often with linkages to intercity transportation. It can be provided in many ways, including trolley, subway, elevated rail, light-rail, or other approaches. This may include enhancements of existing services or new services.

92. **Bottleneck Removal for Passenger Rail –** Investing in new bridges, tunnels, double-decker cars, switch, or other communication systems significantly increases the capacity of the rail system with limited need for right-of-way. This is also related to Bottleneck Removal for Freight Rail and Making Transfers Easier for Passengers, above.

D. Goods Movement

Managing congestion on roads generally helps trucks move freight. Beyond that, additional strategies can increase the efficient and safe movement of goods by various modes (and the points of intermodal transfers). See also strategies in the TSMO and ITS categories, above.

Freight Operations Improvements – Strategies to make truck, freight rail, and other means of moving goods function more efficiently by themselves or in combination with each other.

93. **Loading and Deliveries –** The provision of loading and delivery spaces on- and off-street is essential in central business districts or urban areas. Ensuring adequate capacity for freight loading and delivery reduces lane obstructions and other unsafe short-term parking behavior. These curbside management improvements coupled with freight demand management strategies, such as off-hours deliveries, can improve safety and traffic flow.

94. **Truck Parking (overnight) –** With trucking remaining the predominant mode of domestic freight transportation, the supply of overnight truck parking has emerged as an important consideration in the supply chain. Recent changes to reporting requirements for hours-of-service regulations have exacerbated the issue and highlighted the need for additional truck capacity.

95. **Bottleneck Removal for Freight Rail –** Investing in needed upgrades to bridges, tunnels, switches, or other communication systems significantly increases the capacity of the rail system with limited need for new right-of-way. See also Bottleneck Removal for Passenger Rail, and Freight Centers and Intermodal Facilities, above.

96. **Making Intermodal Transfers Easier for Freight –** Improvements to make it more feasible and convenient to fully use all available modes of transportation for their best purposes. Examples might include “last-mile” minor improvements to roads needed for truck access to rail sidings or improved communications/ITS approaches. See also Freight Centers and Intermodal Facilities in this section, below; and Making Transfers Easier for Passengers in the Transit Improvements section, above.

97. **Freight Rail (rehabilitation or reconstruction) –** Existing rail infrastructure requires routine maintenance and periodic upgrades. Both Pennsylvania and New Jersey have statewide, competitive programs that fund rail freight maintenance projects, with short-line railroads often being the beneficiaries.

Freight Capacity Investments – Strategies to make truck, freight rail, and other means of moving goods function more efficiently by themselves or in combination with each other.

98. **Grade-Crossing Separations –** Highway-railroad crossings that are at-grade create delay for both freight rail operations and the driving public. In instances of high usage, it may be desirable to grade separate the crossing to create free-flow conditions and improve safety for both the rail and vehicular traffic.

99. **Freight Rail (new or expanded) –** New rail lines or improvements of existing facilities built to industry standards will help meet the needs of moving freight efficiently by rail.

100. **Freight Centers and Intermodal Facilities –** This strategy focuses on investment that supports growth and efficiency at designated freight centers and major intermodal terminals. Freight centers are clusters of freight-related activities that are often served by common infrastructure across multiple modes. Intermodal activities can focus on transfer between modes, such as rail to truck.

Investment in these centers provides benefits, such as improved management, lower transport costs, value-added activities, and increased reliability.

101. **Port Facility Expansion –** The expansion of existing marine terminals and the creation of new ones helps maximize the use of the region's waterways for freight transportation purposes. At present, there are several major proposed expansions of port facilities along the Delaware and Schuylkill rivers.

E. Road Improvements and New Roads

These strategies address the area between minor operational improvements and building major new road facilities on new alignments.

Minor Road Expansions – Strategies that, although adding some capacity, intend to address a variety of goals; they should be carefully coordinated with other appropriate strategies and be reviewed for whether they change travel patterns in the corridor (e.g., intersection improvements at multiple, contiguous intersections).

102. **Frontage or Service Roads –** Road strategies that maintain access to local land uses, while generally increasing the throughput of regional roads. This relates to and would be done with other access management strategies.

103. **Intersection Improvements of a Limited Scale –** Minor isolated intersection widening and lane restriping to increase intersection capacity and safety. This may include auxiliary turn lanes (right or left) and widened shoulders. Intersection design should be context sensitive. Geometries should reflect the types and levels of expected truck activity, especially for designated truck routes.

104. **Major Reconstruction with Minor Capacity Additions –** Major reconstruction focuses on the basic use of a roadway, but may increase capacity, safety, and access for other modes. For example, reconstructing a facility so that it meets current design standards may include wider lanes and shoulders, which result in higher actual safe operating speeds. Major new bridge or bridge replacement projects and interchange reconfigurations may fit into this category.

105. **High-Occupant Vehicle Treatments –** Improvements that reduce congestion by increasing the person throughput capacity of critically congested corridors. This also includes supporting policies and constructing facilities to encourage the use of high occupant vehicles. An assumption is that such a project will inherently include a range of TDM and safety improvements, and be coordinated with community needs.

Adding Capacity to Existing Roads – Strategies that add capacity to make the existing transportation system function better. They should be carefully coordinated with appropriate supplemental strategies to get the most long-term value from the investment.

106. **General Purpose Lanes –** The addition of one or more through lanes to an existing road.

107. **Interchange with Related Road Segments –** These are projects at a scale that is expected to change regional transportation patterns (e.g., adding new movements at existing interchanges). They increase the capacity of the existing road network by increasing interconnection opportunities, and capacity. Large intersection projects with related roads that will add major capacity would be included in this strategy.

108. **Flex Lanes/Hard Shoulder Running –** Temporary use of the shoulder as an additional traffic lane during peak and congested periods. This is implemented in conjunction with complementary ITS

and ATM strategies to indicate when the shoulder may legally be used for travel. In some instances, only transit buses are allowed to use the shoulder lane.

New Roads – Strategies that add capacity to make the existing transportation system function better. They should be carefully coordinated with appropriate supplemental strategies to get the most long-term value from the investment.

109. **Arterial or Collector Road –** New road or substantial extension of an existing road (usually over a mile), generally built with many access points and designed to fit local conditions.

110. **Bypass –** A bypass adds new capacity on a new alignment. Such roads may tend to be short to medium in length and address a variety of transportation and other issues.

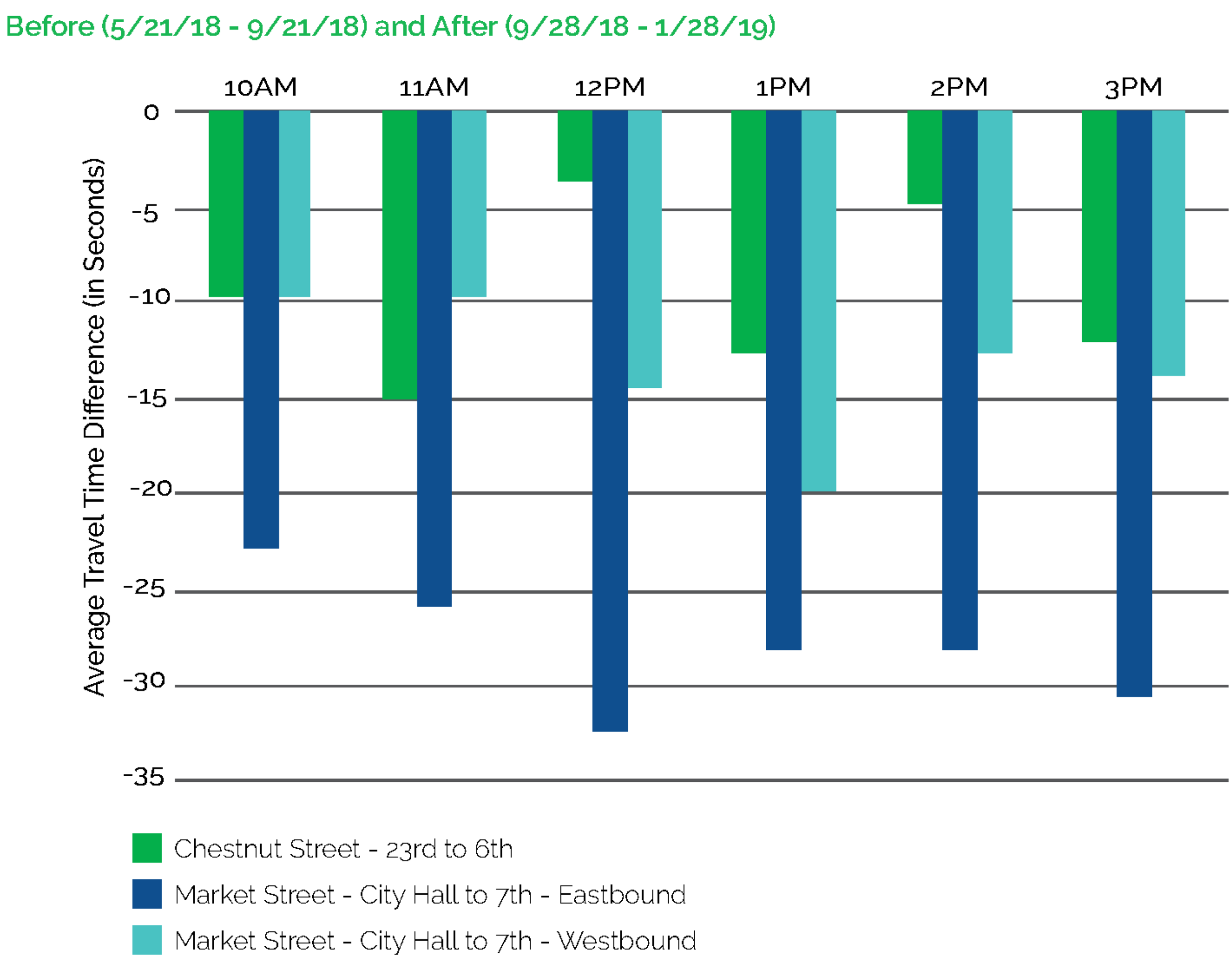
111. **Limited-Access Highway –** The addition of a new facility or extension of existing facilities with accompanying ramps, tolls if included, signage, and other related improvements.

6. Evaluate Effectiveness of Implemented Strategies

The CMP provides analysis about the performance of the transportation system, in part, to establish multimodal strategies to mitigate congestion. However, additional types of analysis are important to effectively evaluate the implementation of strategies. Before-and-after analysis of projects is important to help understand the effectiveness of implemented strategies to mitigate congestion in the region. Too often, improvements are made to reduce congestion but a follow-up evaluation is not completed to determine whether congestion has been reduced. Some of this has to do with the lack of staff time to perform a post-analysis of congestion and compare the before-and-after results, and some of it has to do with the inability to compare like data to make a sound planning and engineering judgement. There are many factors that affect the intensity and extent of traffic flows, which makes it sometimes difficult to assess how effective strategies are working to mitigate congestion. It is important to understand the anticipated effectiveness of proposed improvement strategies in order to develop transportation projects with maximum impact, see *CMP Strategy Evaluation: Testing Short-Listed Programs* (DVRPC Publication #12042).

The I-95 Corridor Coalition CATT Lab PDA Suite software, and the archived operations data it uses, provides an effective tool to evaluate strategy effectiveness. For example, the City of Philadelphia has experienced major downtown traffic congestion in recent years, and there is a concerted effort to develop strategies to mitigate congestion. The city recently published a report titled *Limiting our Potential: How Center City Congestion Impacts all Philadelphians* that identifies the consequences of congestion, including social and economic losses. Some strategies, as indicated in the CMP, can help reduce congestion and improve multimodal access and mobility, by increasing the efficiency and attractiveness of transit. The City of Philadelphia currently has two major bus lane corridors: Chestnut Street (from 23rd to 6th streets) and East Market Street (from City Hall to 7th Street) to make transit more efficient, but congestion is occurring in the bus lanes, causing delays. To improve efficiencies, several strategies were implemented with hopes to reduce congestion. The city updated the lane infrastructure with upgraded lane markings, SEPTA developed education materials to warn drivers not to park in bus lanes, and enforcement partners worked to regulate and ticket drivers parked in travel lanes. DVRPC used the PDA Suite software to analyze travel times, speeds, and other congestion measures four months before and after the strategies were implemented. The results indicated that both bus lane corridors experienced reductions in travel times, and increases in speeds during the enforcement periods, 10:00 AM to 3:00 PM (see Figure 61). These improvements occurred despite the fact that the city as a whole, over the same time period, experienced increased travel times and slower speeds. Additional analysis may need to be conducted to conclude that the congestion reduction strategies led to improved travel times, but this is an example of comparing travel times and speeds before and after improvements to identify the potential effectiveness of strategies. A greater effort to evaluate improvements to mitigate congestion using archived operations data should be performed as an ongoing process, and the availability of archived operations data makes this more possible. Moving forward, the INRIX data will be used to analyze travel times and speeds to perform before-and-after evaluations of improvements to determine their effectiveness in reducing congestion.

Figure 61: Bus Lane Corridor Improvement Travel Time Differences



Source: City of Philadelphia, Office of Transportation, Infrastructure, and Sustainability

7. Conclusions

The DVRPC CMP serves as an essential component to the overall transportation planning and programming process. It assists decision makers to make choices for transportation improvements with a better understanding of congestion issues in the region.

The CMP includes analysis of the multimodal transportation network, identifies and prioritizes congested locations given multimodal performance measures, identifies strategies by subcorridor that minimize costs and advance regional goals, helps projects be consistent with the CMP and Long-Range Plan, and finally evaluates the effectiveness of implemented strategies.

The CMP is useful for transportation project managers, policy makers, municipal and county officials, businesses, and citizens concerned about transportation solutions. Addressing congestion is an ongoing process and it is most effective with participation from everyone.

7.1 Next Steps

In order to ensure that the DVRPC CMP is flexible and evolving to meet current conditions, it is suggested that some next steps be implemented. They include:

1. Review the most congested focus roadway facilities and intersection bottlenecks, and other facilities and bottlenecks with planning partners to further prioritize and provide a more detailed assessment of congestion mitigation strategies. This could include making short- and long-term recommended improvements, and developing estimated costs.

2. Analyze congestion in more detail on the limited-access roadways, (e.g., I-95, I-76, I-476, I-276, I-295, I-195, US 422, US 30 Bypass) in the region. Analyze locations from interchange to interchange and between interchanges using peak period travel time delay, volume delay, and other performance measures. Identify any deficient on- or off-ramps that could be improved to manage congestion.

3. Perform additional multimodal and transit data analysis. Most CMPs rely heavily on roadway data to measure congestion based on data availability, but it is important to know how other modes of transportation are performing. For example, SEPTA's real-time passenger information system can be used to better analyze peak congestion ridership at bus and rail stop locations.

4. Improve on the integration of the new national performance management measures in the CMP, specifically, the NHS performance reliability and traffic congestion measures, known as PM3. For example, calculate the PHED measure for the entire DVRPC region, not just the UZAs, which omits the nonurbanized portions of the counties—except the City of Philadelphia—and excludes Mercer County, New Jersey, since it is part of another UZA that is under the one-million-population measure criteria threshold. The PHED measure identifies person hours of delay, rather than vehicle hours of delay, which is important to capture in this region due to the extensive use of public transit, and other mode share options. Also, calculate the TTTR measure for non-interstate roadways, not just interstates, as the current PM3 measure requires. The reliable movement of goods is important to measure on all roadways, including the last-mile delivery ones.

5. Start collecting 2018 and subsequent yearly travel time data to provide complete year-to-year comparisons of congestion and reliability performance measures that enable the identification of trends. This should help to evaluate the impact of mitigation strategies targeted to improve congestion, and influence future strategies and investment decisions.

6. Develop a list of roadway congestion mitigation improvements that recently occurred, and use the archived travel time data to perform before-and-after evaluations using travel times, and other congestion measures to determine the effectiveness of improvements for improving mobility and reliability.

7. Better understand the causes of congestion to help determine the most appropriate strategies to manage congestion. Incorporate INRIX, StreetLight, or other similar data sources to determine trip origin and destination patterns, and where long and short trips are occurring. Utilize the CATT Lab PDA Suite and TRANSCOM's Regional Integrated Multi-Modal Information Sharing system to determine the location, type, and intensity of nonrecurring congestion, such as traffic incidents, work zones, bad weather, and special events, and their impacts on congestion in the region.

8. Integrate truck vehicle delay and volume delay into the focus roadway facility and bottleneck analysis. Limited truck volume counts on roadways, especially in the New Jersey portion of the DVRPC region, made this analysis more difficult. Work with NJDOT and the New Jersey counties within the DVRPC region to collect more class counts to determine truck volumes.

9. Continue to develop the Supplemental Project Status Memorandum reports that identify supplemental strategy commitments for major SOV capacity-adding TIP projects, and track the progress of strategy implementation.

10. Develop improvements to the web mapping to integrate the focus roadway facilities and focus intersection bottlenecks and the associated congestion measures and strategies to mitigate congestion.

7.2 Advisory Committee

The CMP Advisory Committee was critical in developing the CMP update. The committee met five times in person and exchanged many emails to reach consensus on the 2019 update. It will continue to meet to address ongoing matters, but more frequently during update periods. Participating organizations are listed below.

- DVRPC Member Governments;
- PennDOT and NJDOT;
- Transit Agencies;
- Federal Partners;
- Transportation Management Associations;
- Other DVRPC Committees, including the Transportation Operations Task Force and Goods Movement Task Force;
- Other MPOs;
- Other participants as invited or who asked to join.

ABSTRACT

Title: 2019 Congestion Management Process

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Geographic Area Covered: The nine-county Philadelphia metropolitan area, which includes the counties of Bucks, Chester, Delaware, Montgomery, and Philadelphia in Pennsylvania; and Burlington, Camden, Gloucester, and Mercer in New Jersey

Key Words:
Congestion Management Process (CMP), Traffic, Multimodal, Goods Movement, Transportation, Corridors, Strategies, Single-Occupant Vehicle (SOV), Capacity, Long-Range Plan, Transportation Improvement Program (TIP), Regional Transportation Planning, Criteria, Operations.

Abstract:
A Congestion Management Process (CMP) is a systematic process for managing congestion. It identifies specific multimodal strategies for all locations in the region to minimize congestion and enhance the ability of people and goods to reach their destinations. The CMP advances the goals of the Delaware Valley Regional Planning Commission Long-Range Plan and strengthens the connection between the Plan and the Transportation Improvement Program. The 2019 DVRPC CMP is an update of the 2015 CMP.

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