Amended Transportation Investments

Draft for Public Comment - June 2014

CONNECTIONS 2040

PLAN FOR GREATER PHILADELPHIA

fostering sustainability, equity, and innovation

DELAWARE VALLEY dvrpc REGIONAL PLANNING COMMISSION

The Delaware Valley Regional Planning Commission is dedicated to uniting the region's elected officials, planning professionals, and the public with a common vision of making a great region even greater. Shaping the way we live, work, and play, DVRPC builds consensus on improving transportation, promoting smart growth, protecting the environment, and enhancing the economy. We serve a diverse region of nine counties: Bucks, Chester, Delaware, Montgomery, and Philadelphia in Pennsylvania; and Burlington, Camden, Gloucester, and Mercer in New Jersey. DVRPC is the federally designated Metropolitan Planning Organization for the Greater Philadelphia Region — leading the way to a better future.

DELAWARE VALLEY dvrpc REGIONAL PLANNING COMMISSION

The symbol in our logo is adapted from the official DVRPC seal and is designed as a stylized image of the Delaware Valley. The outer ring symbolizes the region as a whole while the diagonal bar signifies the Delaware River. The two adjoining crescents represent the Commonwealth of Pennsylvania and the State of New Jersey.

DVRPC is funded by a variety of funding sources including federal grants from the U.S. Department of Transportation's Federal Highway Administration (FHWA) and Federal Transit Administration (FTA), the Pennsylvania and New Jersey departments of transportation, as well as by DVRPC's state and local member governments. The authors, however, are solely responsible for the findings and conclusions herein, which may not represent the official views or policies of the funding agencies.

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INTRODUCTION

As the federally-designated Metropolitan Planning Organization for the nine-county Greater Philadelphia region, the Delaware Valley Regional Planning Commission (DVRPC) is responsible for prioritizing transportation investments for funding with federal and state dollars through a Long-Range Plan (Plan) and Transportation Improvement Program (TIP). A key function of the region's Long-Range Plan, *Connections 2040 Plan for Greater Philadelphia*, is to outline a vision and strategy for how the region will invest in transportation infrastructure through 2040. Since identified needs are greater than anticipated funding, the financial plan prioritizes projects for funding by developing forecasts of reasonably anticipated revenue, allocating the revenue to categories of projects based on need and policy, and evaluating and selecting specific major regionally significant projects for funding in the Plan.

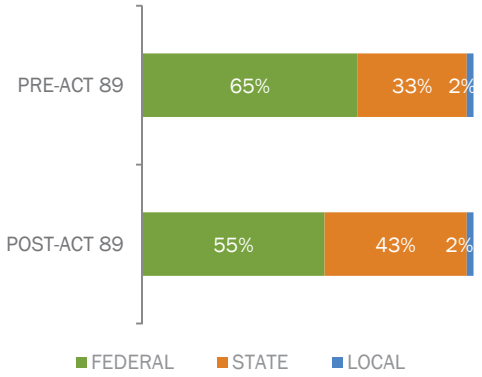
In November 2013, the legislature passed and Governor Corbett subsequently signed Act 89, which provides additional funding for transportation infrastructure in Pennsylvania. The funding provided by Act 89 will contribute an additional $10.1 billion for transportation investments in the Pennsylvania portion of the region over the life of the *Connections 2040* Plan. The Plan also assumes additional funding through the federal New Starts program (approximately $500 million) and that Act 89 will leverage an additional $300 to $400 million in local funding. The Executive Summary highlights the changes to the Transportation Investments chapter of the *Connections 2040* Plan as a result of Act 89. The Long-Range Plan maintains separate financial plans for the Pennsylvania and New Jersey portions of the DVRPC region. There are no changes to the financial plan or transportation investments in the New Jersey portion of the region.

REVENUE FORECAST

Act 89 will generate up to $2.3 billion annually in new transportation revenue statewide. This new revenue is primarily generated by eliminating the state's flat gas tax and rolling it into the Oil Company Franchise Tax, which is charged at the wholesale level. The artificial cap on the Oil Company Franchise Tax will be lifted over a five-year period. Additional revenue will also come from other sources, including indexing vehicle registration and driver's license fees to inflation. Act 89 will also support a multimodal fund to provide financial assistance for aviation, freight and passenger rail, ports and waterways, bicycle and pedestrian projects. Following the five-year phase in of Act 89, financial guidance from PennDOT assumes

flat state funding through 2040. Assumptions regarding revenue growth at the federal and New Jersey state level remain unchanged, except for the inclusion of approximately $500 million in Federal New Starts funding. The passage of Act 89 means that more of the region's transportation funding is coming from state sources, with 55% of the region's transportation funding coming from federal sources, 43% from state sources, and 2% from local sources. Previously, the percentage breakdown was 65% federal, 33% state, and 2% local.

FIGURE 1: **REGIONAL FUNDING BY SOURCE**



SOURCE: DVRPC

TABLE 1: **PENNSYLVANIA SUBREGION FUNDING BY SOURCE AND MODE (2014-2040)**

	MODE	FEDERAL	STATE	LOCAL	TOTAL
PRE-ACT 89	Roadway	$16.8 B	$3.3 B	$0.4 B	$20.6 B
	Transit	$7.4 B	$4.7 B	$0.5 B	$12.6 B
Total Pre-Act 89		**$24.2 B**	**$8.0 B**	**$1.0 B**	**$33.2 B**
POST-ACT 89	Roadway	$16.8 B	$8.4 B	$ 0.8 B	$26.0 B
	Transit	$8.0 B	$9.7 B	$0.5 B	$18.2 B
Total Post-Act 89		**$24.8 B**	**$18.1 B**	**$1.3 B**	**$44.2 B**
ADDITIONAL FUNDING		**$ 0.5 B***	**$ 10.1 B**	**$ 0.3**	**$11.0 B**

All figures are in Billions of Year-of-Expenditure (Y-O-E) Dollars, figures may not add up due to rounding

**Federal New Starts funding*

SOURCE: DVRPC

NEED

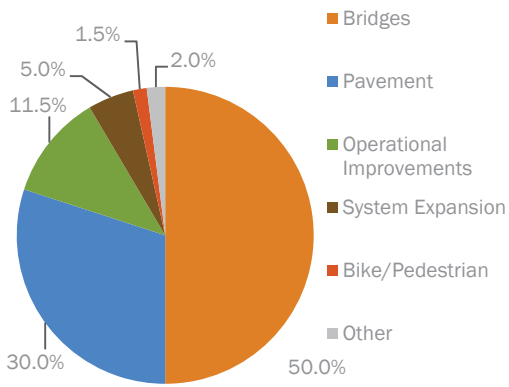
The *Connections 2040* Plan contains an in-depth needs assessment that was conducted to determine the investments that are necessary to achieve the goals outlined in the Plan. These include state of good repair, operational improvement, and system expansion needs. Regionally, the needs assessment identified more than $116 billion in transportation improvements, predominantly to preserve and maintain our existing network. These needs represent the region's desired investments, or the Vision Plan. Federal requirements mandate that a region's Long-Range Plan be fiscally-constrained. That means a region cannot include more projects in a Plan than can be reasonably completed with anticipated revenue over the life of the Plan. Costs for projects must also utilize year-of-expenditure dollars, rather than current year dollars. This is to insure that inflation is factored into the financial plan, and provides a more realistic accounting of true costs. Through consultation with federal and state planning partners, the *Connections 2040* Plan uses a 3 percent annual inflation rate from 2014 to 2024, a 3.5 percent annual inflation rate

from 2025 to 2030, and a 4 percent annual inflation rate from 2031 to 2040 to compute year-of-expenditure cost.

ALLOCATION

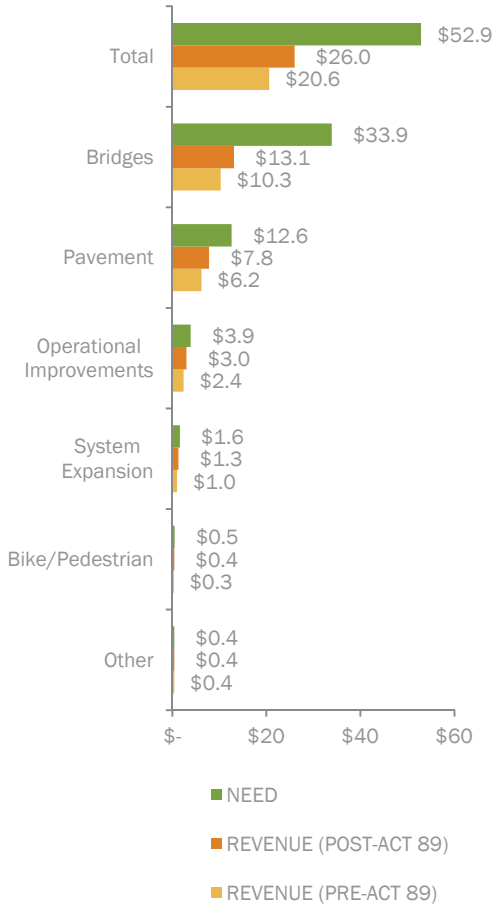
DVRPC staff worked with the Regional Technical Committee (RTC), Penn DOT, SEPTA, DRPA/PATCO, and other regional stakeholders to determine how transportation funding should be allocated to various funding categories in the Plan. The RTC recommended that roadway funding should be allocated at the same percentage as the current *Connections 2040* Plan. This will continue the Plan's emphasis on "fix it first" investments in our existing infrastructure before expanding the system. The 5 percent cap on roadway new system capacity will also be maintained, while allowing some critical investments at key bottlenecks in the region. Even with additional resources redirected toward bridges in recent years, the region's greatest need still remains the rehabilitation and replacement of bridges. While the additional funding provided by Act 89 will have a substantial impact on the region's ability to cut into the backlog of projects, there will still be a significant number of structurally-deficient bridges in 2040.

FIGURE 2: PENNSYLVANIA SUBREGION ROADWAY FUNDING ALLOCATION (2014-2040)



SOURCE: DVRPC

FIGURE 3: PENNSYLVANIA SUBREGION ROADWAY NEED VS. REVENUE (2014-2040)

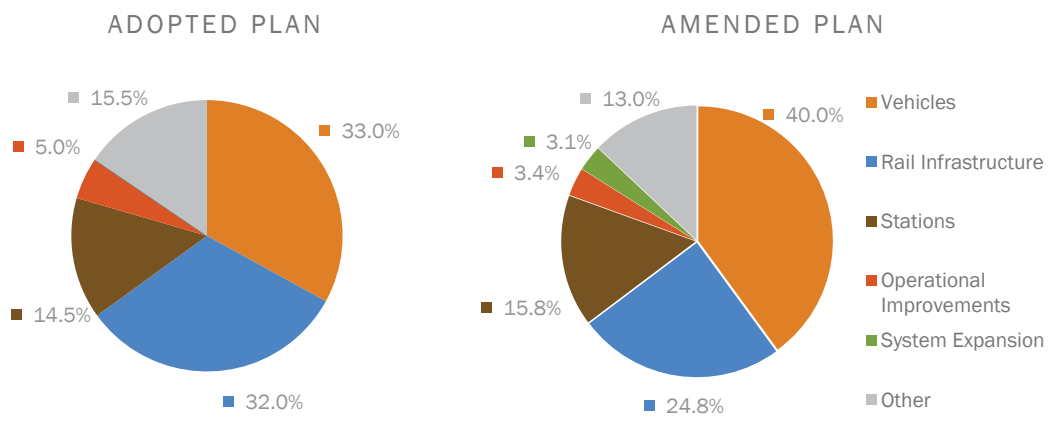


All figures are in Billions of Year-of-Expenditure (Y-O-E) Dollars

SOURCE: DVRPC

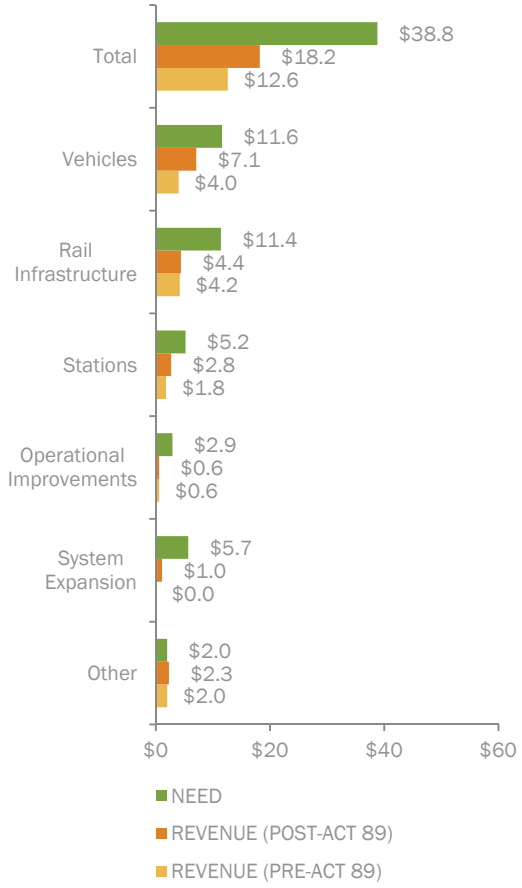
Prior to Act 89, SEPTA had a state-of-good-repair backlog of $5 billion. Act 89 doubled SEPTA's capital budget and will allow for meaningful progress on reducing the backlog of projects. Many deferred projects will be able to be completed in the coming years; moving from the unfunded Vision Plan into the fiscally-constrained financial plan. The vast majority of these projects will preserve and maintain rail infrastructure, stations, and rehabilitate and replace vehicles. However, there is also some funding that has been programmed to expand the system to serve growing ridership demand. Taken together, these additional investments will move the region closer to the *Connection 2040* Plan's goal of achieving a system wide state-of-good repair.

FIGURE 4: PENNSYLVANIA SUBREGION TRANSIT FUNDING ALLOCATION, ADOPTED AND AMENDED (2014-2040)



SOURCE: DVRPC

FIGURE 5: PENNSYLVANIA SUBREGION TRANSIT NEED VS. REVENUE (2014-2040)



All figures are in Billions of Year-of-Expenditure (Y-O-E) Dollars

SOURCE: DVRPC

The Long-Range Plan provides a blueprint for future transportation investments by allocating funding to roadway and transit project categories. It also identifies specific Major Regional Projects, which are large-scale, transformative projects that will have a significant impact on the region's transportation network. The majority of the Major Regional Projects expand the system because, by definition, such projects will have a significant impact on the region's travel patterns. They also will have the most impact on land use, natural resources, and the economic growth potential of the region. Therefore, they are scrutinized more thoroughly than preservation projects to assess their impact. Major Regional Projects are subject to a project screening and evaluation process that is outlined later in this chapter, to insure that they meet Long-Range Plan goals. Act 89 funding allows several Major Regional Projects to be added to the Plan, including two new transit expansion projects. Prior to Act 89 there were no new transit system expansion projects that were able to be funded in the Pennsylvania subregion. The first new project would extend service on the Media/Elwyn Regional Rail Line to Wawa.

This would serve riders on the expanding US 1 corridor in Delaware and Chester counties. The second project would construct a spur of the Norristown High Speed Line to King of Prussia to provide direct rail service to this large and growing shopping and employment center.

The projects in Table 2 and 3 were previously identified as part of the unfunded Vision Plan, or PennDOT's Decade of Investment list. In addition, several projects that were previously in the later years of the fiscally-constrained funded list, were able to move forward into the four-year Transportation Improvement Program (TIP), thereby saving money since projects constructed today are less expensive than projects constructed in the future due to the impact of inflation. Tables 2 and 3 represent only a small percentage of the additional investments that are able to be made due to the additional funding being provided by Act 89.

TABLE 2: MAJOR REGIONAL ROADWAY PROJECTS ABLE TO ADVANCE DUE TO ADDITIONAL FUNDING FROM ACT 89

FACILITY	AMENDED PLAN SCOPE CHANGES	COUNTY	TIMING	
			ADOPTED PLAN	AMENDED PLAN
Pavement & Bridge Preservation				
US 422	Reconstruct from Sanatoga interchange to Schuylkill River bridge east of Stowe interchange	Chester, Montgomery	Unfunded Vision	2019-2030
US 1	Reconstruct from Schoolhouse Road to Maryland state line	Chester	2025-2040	2019-2030
Darby Road Extension	Replace North Valley Road bridge over Amtrak, realign bridge to connect with Darby Boulevard	Chester	2025-2030	2014-2024
US 202	Rehabilitate (2) bridges over Amtrak	Chester	Unfunded Vision	2014-2018
I-95	Reconstruct from Queen Street to Girard Point Bridge	Philadelphia	Partial Funding	2031-2040
PA 611	Reconstruct bridge over Neshaminy Creek	Bucks	Unfunded Vision	2031-2040
US 1 Bypass	Reconstruct bridge over Norfolk Southern / Trenton Ave. & US 1	Bucks	Unfunded Vision	2031-2040
US 1	Reconstruct bridge over Delaware Canal & Conrail Line	Bucks	Unfunded Vision	2031-2040
Operational Improvements				
US 1 at PA 352	Reconstruction of cloverleaf interchange, addition of through lanes to remove lane drops	Delaware	2014-2030	2014-2024
Ridge Pike	Reconstruct from Butler Pike to I-276 (PA Turnpike) and widen to add center turn lane	Montgomery	2025-2040	2025-2030
US 422 “S-Curve”	Reconstruct from Berks County line to Schuylkill River bridge, reconfigure "S" curve in West Pottsgrove, and realign Stowe interchange	Chester, Montgomery	2025-2040	2019-2024
Bike / Pedestrian				
The Circuit	Construct an additional 40 miles of the Circuit regional trail network in Pennsylvania	Pennsylvania Subregion	Unfunded Vision	2014-2040
Major System Expansion				
US 1	Reconstruct from I-276 PA Turnpike to New Jersey state line, widen from PA Turnpike to PA 413, interchange improvements	Bucks	2025-2040	2014-2024
US 30 Coatesville-Downingtown Bypass	Reconstruct from Reeceville Road to PA 10, complete interchange at Airport Road	Chester	2025-2040	2019-2030
	Reconstruct from Exton Bypass to Reeceville Road, complete interchange at PA 113; and widening/operational improvements from PA 113 to PA 340		Unfunded Vision	2025-2040
PA 309 Connector	Phase 2: new road from Allentown Road to County Line Road; PA 309 interchange improvements	Montgomery	2025-2040	2019-2030
Minor System Expansion				
Henderson Road / South Gulph Road	Widen South Gulph Road from Crooked Lane to I-76 Gulph Mills interchange	Montgomery	2025-2040	2019-2030
	Widen Henderson Road from South Gulph Road to Shoemaker Road		Decade of Investment	2019-2030
Bridgewater Road	Road extension from Concord Road to PA 452/US 322	Delaware	2025-2040	2019-2030.
Bristol Road	Road extension from US 202 to Park Avenue	Bucks	2025-2040	2019-2030
Belmont Ave I-76 Interchange	Widen Belmont Avenue to provide additional lanes, intersection and streetscape improvements; modify I-76 and railroad overpasses	Montgomery	2025-2040	2019-2030
2nd Collegeville Bridge	Construct an additional bridge over the Perkiomen Creek between Ridge Pike and Germantown Pike to connect with PA 29	Montgomery	Decade of Investment	2019-2030
PA 23 and Trout Creek Road Bridge	Realign road and rehabilitate/replace bridge	Montgomery	Decade of Investment	2014-2024
Ridge Pike	Reconstruct from Butler Pike to Philadelphia city line, widen from 3 to 4 lanes from Church Lane to Philadelphia	Montgomery	Decade of Investment	2014-2030

SOURCE: DVRPC

TABLE 3: MAJOR REGIONAL TRANSIT PROJECTS ABLE TO ADVANCE DUE TO ADDITIONAL FUNDING FROM ACT 89

Facility	Amended Plan Scope Changes	Timing	
		Adopted Plan	Amended Plan
Rail Infrastructure			
Substation Rehabilitations	Rehabilitate 18th/12th Portal, Brill, Broad, Castor, Ellen, Lansdale, Louden, Neshaminy, Park, Ranstead, Wayne Junction static frequency converter, and Woodbourne substations	Unfunded Vision	2014-2030
Bridge Improvement Program	Rehabilitate Chestnut Hill East bridges	2025-2030	2019-2030
	Rehabilitate Chestnut Hill West bridges	2025-2030	2019-2030
	Media-Elwyn viaduct timber and painting	2025-2030	2014-2018
	Rehabilitate Norristown High Speed Line Bridge 0.15	2025-2030	2019-2024
	Rehabilitate Regional Rail mainline over Schuylkill River	2025-2040	2019-2030
	Rehabilitate Regional Rail stone arch bridges	2025-2030	2014-2018
Communications and Signals	Arsenal, Beth, and Hunt/Wayne interlockings;	Unfunded Vision	2014-2030
	Computer Aided Radio Dispatch (CARD) system replacement	Unfunded Vision	2014-2024
	Real time information	2025-2040	2014-2040
Catenary Improvements	Rehabilitate Chestnut Hill East, Media-Elwyn, and Airport lines, systemwide feeder lines, and various mainline facilities	Unfunded Vision	2014-2030
Vehicles			
Vehicle Acquisition	New locomotives, Bi-level coaches, Trolleys, and Silverliner VI vehicles; rehabilitate Broad Street Line vehicles	Unfunded Vision	2014-2040
Maintenance and Transportation Facility Improvements	Allegheny and Woodland fire suppression, roof replacements at various locations, boiler program, bus lift program, washer program, storage tank program, and steel wheel lift program.	Unfunded Vision	2014-2024
Stations			
City Hall	Rehabilitation	2019-2030	2014-2024
Station Accessibility / ADA upgrades	Improvements at Erie, Susquehanna/Dauphin, and Snyder on Broad Street Line; 40th Street on Market-Frankford Line; 33rd and 36th Street trolley stations, and other stations	2025-2040	2014-2040
Transit and Regional Rail Station Improvement Program	Renovate Villanova Station	2025-2040	2014-2024
	Renovate Levittown Station	2019-2030	2014-2018
	Paoli Transportation Center enhancements	2019-2030	2019-2024
	Renovate Exton Station	2025-2040	2014-2024
	Ardmore Transportation Center enhancements	2025-2040	2014-2040
	69th Street Transportation Center enhancements and parking garage	2025-2040	2014-2018
	Improvements at East Falls, Hatboro, Jenkintown, Lawndale, Marcus Hook, Roslyn, Willow Grove, Wyndmoor, Wynnewood, and Yardley Regional Rail stations	Unfunded Vision	2014-2030
	Improvements at 5th Street Station on Market-Frankford Line, Fairmount, Hunting Park, Margaret-Orthodox, and Wyoming Avenue stations on Broad Street Line; 19th Street Trolley Station; and bus loops	Unfunded Vision	2014-2024
	Rehabilitate Center City concourses	-	2014-2024
Regional Rail parking expansion	Including but not limited to: Lansdale Fern Rock, Gwynedd Valley, North Wales, Lansdale, Noble, Philmont, and Conshohocken	Unfunded Vision	2014-2030

SOURCE: DVRPC

Continued on next page

TABLE 3 CONTINUED

Facility	Amended Plan Scope Changes	Timing	
		Adopted Plan	Amended Plan
Operational Improvements			
Norristown Line	Addition of a 3rd track	Unfunded Vision	2019-2030
Roosevelt Boulevard Better Bus	Stations, signal prioritization, and painted bus only lane along Roosevelt Boulevard between Neshaminy Mall and both Hunting Park Station and Frankford Transportation Center	Unfunded Vision	2025-2030
Regional Rail operational improvements	Interlockings, sidings, flyovers, and freight separation projects to increase service frequency on Regional Rail lines	Unfunded Vision	2025-2040
System Expansion			
Elwyn Line	Extend to Wawa, PA	Unfunded Vision	2019-2024
Norristown High Speed Line*	New spur to King of Prussia	Unfunded Vision	2025-2040

** Assumes Federal New Starts funding*

SOURCE: DVRPC

SUMMARY

With the passage of Act 89, and funds leveraged from other sources, there will be an additional $11 billion to invest in multimodal transportation projects in the Pennsylvania portion of the DVRPC region. The additional funding, while a substantial amount, will not completely address the region's state-of-good-repair needs. Therefore, the overwhelming majority of the funding will continue to go toward roadway and transit projects that rebuild and maintain our existing system. However, Act 89 also allows the region to begin making critical improvements that improve the operation of the system and even allow a small expansion of the system to address bottlenecks on the road network and serve new growth demand on the transit network.

PUBLIC COMMENT

DVRPC is seeking your input and has opened a public comment period for its Draft Amended Transportation Investments chapter of the *Connections 2040 Plan for Greater Philadelphia*. The public comment period opens on June 16, 2014 and will close at 5:00 P.M. on July 18, 2014.

A public meeting and information session on the Draft *Connections 2040* Plan Amended Transportation Investments, Draft FY 2015 Pennsylvania Transportation Improvement Program (TIP), and Draft Conformity Finding of the Connections 2040 Plan, Pennsylvania TIP and New Jersey TIP will be held between the hours of 4:00 P.M. and 6:00 P.M on:

Thursday, June 26, 2014
DVRPC Conference Room
190 N. Independence Mall West, 8th Floor
Philadelphia, PA 19106

The public will be able to participate in this meeting remotely via web conferencing. Please register by June 24, 2014 by contacting 215-238-2871 or public_affairs@dvrpc.org if you are interested in using this option.

Written comments and questions should be addressed to:

Plan/TIP/Conformity Comments
c/o: DVRPC Public Affairs Office
190 N. Independence Mall West, 8th Fl.
Philadelphia, PA 19106

Or they can be e-mailed to tip-plan-comments@dvrpc.org, or faxed to 215-592-9125. Comments may also be submitted electronically at http://www.dvrpc.org/Connections2040/PublicComment/

PHOTO: J. FUSCO FOR GPTMC

AMENDED TRANSPORTATION INVESTMENTS

A key role of the Plan is to outline a vision and strategy for how the region will invest in transportation infrastructure over the next 27 years. This section lays out a vision for maintaining and improving the transportation system to achieve the future potential for Greater Philadelphia. Since we can't afford all identified needs, the financial plan prioritizes projects for funding by developing forecasts of reasonably anticipated revenue, allocating the revenue to project categories based on need and policy, and evaluating and selecting specific major regionally significant projects for funding in the Plan. This chapter reflects additional investments in Pennsylvania, funded by the passage of Act 89.

THE VISION FOR THE FUTURE

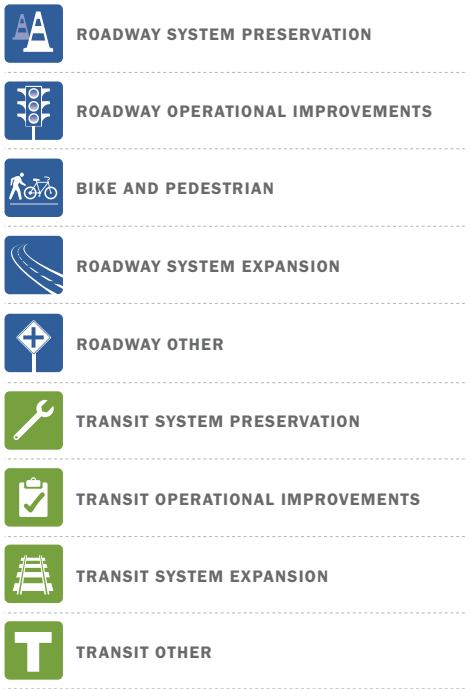
The vision for the future is to achieve and maintain a state-of-good repair for all existing transportation infrastructure, further improve the operation of existing facilities, and, where appropriate, expand the system. In short, maintaining and modernizing our transportation system.

DVRPC worked with PennDOT, NJ DOT, SEPTA, NJ Transit, PATCO/DRPA, and other regional stakeholders to determine what investments need to be made over the life of *Connections 2040* to maintain and modernize the region's transportation system. At the heart of this exercise was an in-depth needs assessment utilizing asset management systems that collect detailed data and monitor the various components of the network. The needs assessment identified what is required to bring the roadway and transit systems to a state-of-good repair, and also what types of operational and system expansion projects are necessary for the region to continue to grow and prosper in the future.

The reality is that we can't afford all of the identified needs. Therefore, *Connections 2040* outlines a Vision Plan and then identifies a Funded Plan, of projects that can be achieved over the life of the Plan.

Identifying Future Needs

The needs assessment determined the projects that are necessary to achieve the goals outlined in *Connections 2040*. Roadway, bike and pedestrian, and transit investments are grouped into the following categories:



Roadway System Preservation maintains existing roadway pavement and bridge infrastructure. Needs estimates for these categories were developed using the federally required Pavement Management System and Bridge Management System databases, which track the condition of each roadway lane mile and bridge. This estimate also includes what DVRPC forecasts as the needs for county and local roadways and bridges eligible for federal aid.

Roadway Operational Improvements use physical changes or technology to improve the efficiency of the existing network. Physical improvements include roundabouts, new turn lanes, and roadway realignment, to improve the functionality and safety of the roadway network. Technological improvements include the use of Intelligent Transportation Systems (ITS), incident management programs, or traffic signal upgrades. The region's 2009 *Transportation Operations Master Plan* is the basis for the needs assessment for this category. ITS and incident management programs have capital funding components, but also have substantial maintenance (e.g., hardware and software) and operations (e.g., personnel) costs associated with them.

Bike and Pedestrian needs are reflected by the region's desire to be more bike and pedestrian friendly. On-road needs are based on current funding levels in the Pennsylvania and New Jersey Transportation Improvement Programs (TIPs), as well as additional targeted funding levels to increase the region's investment in such facilities. Off-road needs are based on constructing all unbuilt, multiuse trails in The Circuit Regional Trail Network.

Roadway System Expansion projects add capacity to the roadway network by widening or extending existing facilities, or building new roads or interchanges. These projects have a significant impact on regional travel, and most projects in this category are listed in the Plan as Major Regional Projects. Minor new capacity projects are widenings of generally less than a few lane-miles in length on minor arterial and collector roads. The need for Major Regional Projects was based on the projects included in the *Connections 2035* Plan, a review of recent transportation and corridor studies, PennDOT's Decade of Investment list, and a call for projects from planning partners. All roadway system expansion projects are required to be consistent with the region's

Congestion Management Process (CMP) and are evaluated to be consistent with land use, environmental, economic development, and transportation goals.

Roadway Other includes needs for miscellaneous items, such as parking facilities, drainage, environmental mitigation, Transportation Management Associations (TMAs), engineering, regional and local planning, and debt service. These needs are forecasted using projects and costs that are included in the current TIP for Pennsylvania and New Jersey.

Transit System Preservation represents needs for existing rail infrastructure, vehicle fleets, and stations. Regular vehicle track, signal, catenary, power substations, signals, vehicle overhaul and replacement, station renovations, and ADA accessibility needs were used to develop the need for each of these three categories using asset management data.

Transit Operational Improvements reflects the need to improve the functionality of the existing system. Types of projects include real-time information systems, signal preemption, fare modernization, and double tracking and sidings to improve service frequency.

TABLE 4: **TOTAL TRANSPORTATION NEED (2014-2040)**

(BILLIONS OF Y-O-E $)

MODE	PROJECT CATEGORY	PENNSYLVANIA	NEW JERSEY
ROADWAY	**System Preservation**		
	Pavement Preservation	$ 12.6 B	$ 6.1 B
	Bridge Preservation	$ 33.9 B	$ 6.2 B
	Operational Improvements	$ 3.9 B	$ 2.6 B
	Bicycle and Pedestrian	$ 0.5 B	$ 0.2 B
	System Expansion	$ 1.6 B	$ 1.0 B
	Other	$ 0.4 B	$ 0.4 B
	ROADWAY SUBTOTAL	**$ 52.9 B**	**$ 16.4 B**
TRANSIT	**System Preservation**		
	Rail Infrastructure	$ 11.4 B	$ 0.9 B
	Vehicles	$ 11.6 B	$ 1.7 B
	Station Enhancements	$ 5.2 B	$ 0.1 B
	Operational Improvements	$ 2.9 B	$ 0.8 B
	System Expansion	$ 5.7 B	$ 3.9 B
	Other	$ 2.0 B	$ 0.9 B
	TRANSIT SUBTOTAL	**$ 38.8 B**	**$ 8.4 B**
	SUBREGION TOTAL	**$ 91.7 B**	**$ 24.8 B**

Totals may not add up due to rounding.

SOURCE: DVRPC

The estimated needs were developed by DVRPC and regional transit agencies.

Transit System Expansion identifies new transit facilities, routes, and lines that the region would like to pursue. Need for this category is based on a short list of projects developed by the Long-Range Plan Committee and includes projects listed in the *Connections 2035* Plan and DVRPC's *Long-Range Vision for Transit* report.

Transit Other is a miscellaneous category that includes safety, security, coordinated human services, and debt service. Need for this category is estimated by remaining debt obligation payments and accounting for outlays over the life of the Plan based on current and future expenditures.

Regionally, the needs assessment identified more than $116 billion in transportation improvements, predominantly to preserve and maintain our existing network. These needs represent the region's desired investments, or the Vision Plan.

The infrastructure in the Pennsylvania subregion is generally older and more expansive, and this is reflected in the total estimated need for the subregion. In Pennsylvania, there is an estimated $53 billion in roadway need, and almost $39 billion in transit need, over the life of the Plan. Total roadway need for the New Jersey subregion is estimated to be just over $16 billion, and total transit need for the New Jersey subregion over the life of the *Connections 2040* Plan is estimated to be more than $8 billion. These figures are in year-of-expenditure (Y-O-E) dollars to account for the impact of inflation over time.

THE VISION PLAN

The Vision Plan includes all of the identified improvements that are needed to attain the region's transportation goals outlined in the long-range plan. Since the Plan considers a 27-year planning horizon, there is a focus on Major Regional Projects. However, the needs assessment considers all sizes and types of projects that are critical to achieving our transportation goals.

Major Regional Projects are large-scale projects that will have a significant impact on regional travel. Almost all system expansion projects are Major Regional Projects, as are reconstruction projects on the region's freeways. Major Operational Improvement initiatives, such as SEPTA's fare modernization project, are also listed in the Plan. Smaller-scale projects were identified in the needs assessment, but for the sake of brevity, are not listed in the Plan document. The various funding categories in the Plan serve as placeholders for funding these smaller-scale projects, as they are included in future iterations of the Transportation Improvement Program (TIP).

FUNDING OUR FUTURE

Federal regulations require that regional long-range transportation plans be fiscally constrained. This means that total transportation expenditures identified in a long-range plan must not exceed the total revenues reasonably expected to be available for the region over the life of the plan. Federal requirements also dictate that fiscal constraint be determined using Y-O-E dollars so that inflation is accounted for when determining project costs.

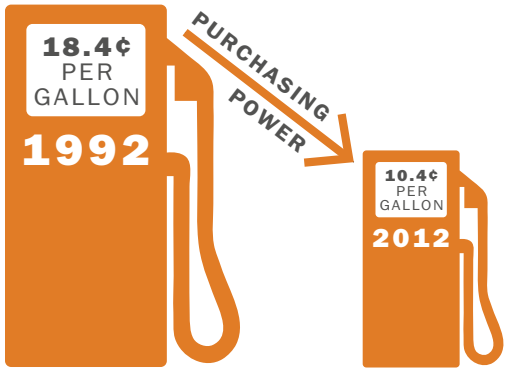
The Funded Plan represents the projects in the Vision Plan that are able to be afforded over the life of *Connections 2040*. Key decisions for the financial plan were considered by the Regional Technical Committee's Long-Range Plan Committee. All planning principles and financial assumptions in identifying federal and state financial resources and investment needs are developed with and reviewed by federal, state, and transit partners. Detailed documentation on the needs assessment that went into developing the financial plan can be found in the *Connections 2040*: *Technical Analysis* (DVRPC publication #13043).

TRANSPORTATION IMPROVEMENT PROGRAM

TIP TRANSPORTATION IMPROVEMENT PROGRAM

Inclusion in the *Connections 2040* Funded Plan means that a Major Regional Project has been identified as a regional priority for funding and is part of the region's financial plan. The Transportation Improvement Program (TIP) is the short-term implementation of the long-range financial plan and includes projects of all sizes and scope. The TIP is the regionally agreed-upon list of priority projects to be advanced during a three- to four-year timeframe. A project's presence in the TIP represents a critical step in the authorization of funding for a project. It does not, however, represent a commitment of funds, an obligation to fund, or a grant of funds.

THE IMPACT OF INFLATION ON THE FEDERAL GAS TAX



DATA SOURCE: PRODUCER PRICE INDEX; INPUTS TO CONSTRUCTION INDUSTRIES | GRAPHIC SOURCE: DVRPC

Where Will the Funding Come From?

DVRPC identified all federal, state, and local revenue sources that the region can reasonably expect to receive through the year 2040. Revenue estimates are for capital project expenditures. Preparation of this financial plan revenue estimate included a review of historical data and trends. The Plan anticipates $63.5 billion Y-O-E dollars in total federal, state, and local funding from 2014 to 2040.

FEDERAL FUNDING

Approximately 55 percent of the region's transportation funding comes from federal sources, principally the Highway Trust Fund, which is primarily funded through gas tax receipts. The federal gas tax of 18.4 cents per gallon has not been increased since 1993. Meanwhile, the Highway Trust Fund has required $53 billion in general fund infusions since 2008 to avoid insolvency. Poor economic conditions, rising fuel prices, and more fuel-efficient vehicles have meant less gas tax revenue. Inflation since the last gas tax increase has eaten away more than 40 percent of its purchasing power. Insolvency issues related to the Highway Trust Fund make it unlikely that the region can expect significantly higher federal transportation funding levels anytime soon.

STATE FUNDING

The second largest source of funding for transportation projects are the states of Pennsylvania and New Jersey, which contribute approximately 28 percent and 15 percent, respectively. The region faces similar funding issues at the state level as it does at the federal. New Jersey has the second-lowest gas tax in the nation, and it was last increased in 1988.

In December 2013, Pennsylvania Governor Corbett signed Act 89 generating up to $2.3 billion annually in new transportation revenue. This new revenue is generated by rescinding the state retail tax of 12 cents per gallon on gasoline and diesel fuels, and removing the $1.25 cap on the wholesale gas tax over a five year period, and increasing fees on vehicle registrations, drivers licenses, traffic violations, and

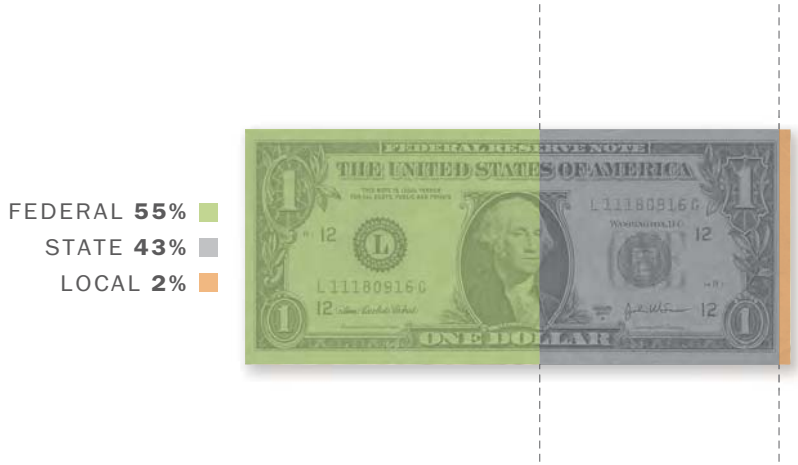
TABLE 5: **FUNDING BY SOURCE AND MODE (2014-2040)** *(BILLIONS OF Y-O-E $)*

STATE	MODE	FEDERAL	STATE	LOCAL	TOTAL
PENNSYLVANIA	Highway	$ 16.8 B	$ 8.4 B	$ 0.8 B	$ 26.0 B
	Transit	*$ 8.0 B	$ 9.7 B	$ 0.5 B	$ 18.2 B
	Subtotal	**$ 24.8 B**	**$ 18.1 B**	**$ 1.3 B**	**$ 44.2 B**
NEW JERSEY	Highway	$ 7.5 B	$ 5.0 B	$ 0.0 B	$ 12.6 B
	Transit	$ 2.3 B	$ 4.3 B	$ 0.2 B	$ 6.9 B
	Subtotal	**$ 9.8 B**	**$ 9.3 B**	**$ 0.2 B**	**$ 19.4 B**
DVRPC REGION TOTAL		**$34.6 B**	**$ 27.4 B**	**$ 1.5 B**	**$ 63.5 B**

Totals may not add up due to rounding.
**Includes Federal New Starts funding.*

SOURCE: DVRPC

FIGURE 6: **REGIONAL FUNDING BY SOURCE**



SOURCE: DVRPC

permits. This act will have a transformative effect on transportation infrastructure in the commonwealth.

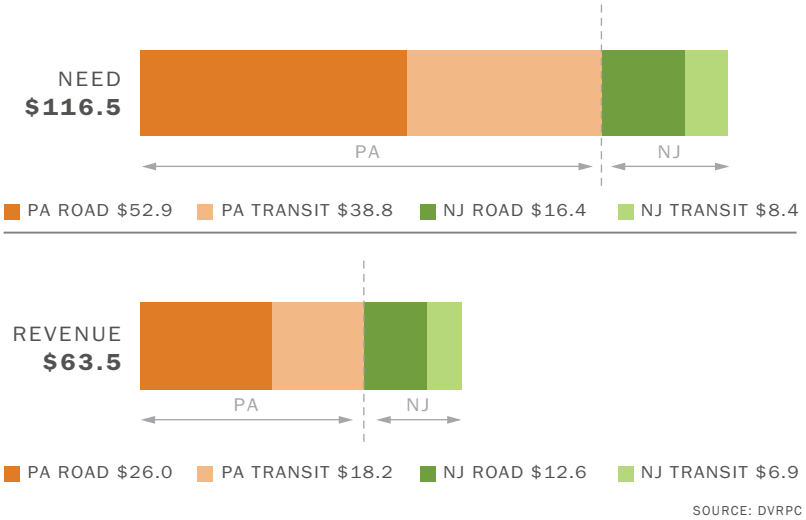
Following the five-year phase in of Act 89 in Pennsylvania, financial guidance from PennDOT assumes flat state funding through 2040. In New Jersey and at the federal level, DVRPC has assumed a growth rate of three percent per year compounded annually from 2025 to 2040, based on historic trends.

LOCAL FUNDING

Many regions around the country contribute a significant amount in local funding toward transportation projects. Local transportation funding is generally comprised of revenues derived locally, such as a dedicated sales tax or dedicated bonds. The Greater Philadelphia region provides very little transportation funding from local sources, compared to peer regions around the country. If federal funding decreases in the future, regions with a strong dedicated local source of transportation funding will be more competitive in maintaining their system and promoting economic growth.

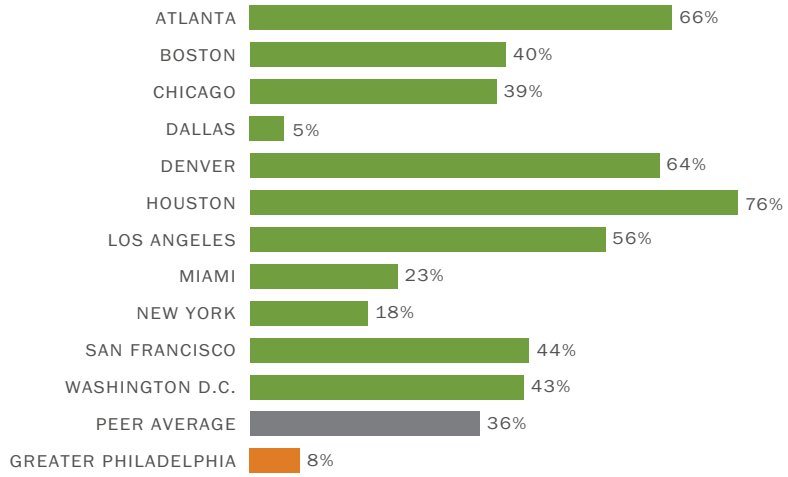
However, neither Pennsylvania nor New Jersey grants authority to raise revenues at the regional or local level. This means that local matches for state-maintained facilities must come from the municipal or county general funds. Not only do transportation projects have to compete with many other municipal budget needs, state-maintained facilities also have to compete with all the locally maintained roads and bridges that municipalities and counties manage. These local facilities are often in a worse state of repair than state roads and bridges.

FIGURE 7: **REGIONAL TRANSPORTATION NEEDS COMPARED TO AVAILABLE FUNDING** *(BILLIONS OF Y-O-E'S)*



SOURCE: DVRPC

FIGURE 8: **PERCENT OF TRANSIT CAPITAL FUNDING FROM LOCAL SOURCES**



SOURCE: DVRPC

AUTHORITY AND OTHER FUNDING

There are several transportation authorities in the region, such as the Pennsylvania and New Jersey turnpike authorities and the Delaware River Port Authority, which generate their own revenues, generally via tolling. Revenue generated by these authorities is not included as a revenue source in the Plan, although major regional externally funded projects are listed in Table 14.

THE FUNDING GAP

In the Pennsylvania subregion, based on forecasted revenue figures, there is a total estimated funding gap of $26.9 billion for roadway projects over the life of the Plan. Only about 49 percent of the total Plan vision is able to be funded. There is a total transit funding deficit of about $20.6 billion over the life of the Plan. Only about 47 percent of the total identified transit vision is able to be funded.

In the New Jersey subregion, on the roadway side, there is a total estimated funding deficit of $3.8 billion over the life of the Plan. About 77 percent of the total vision can be funded. On the transit side, there is a total funding deficit of about $1.5 billion over the life of the Plan.

The Funded Plan

The Funded Plan lists those Major Regional Projects in the Vision Plan that the region can reasonably anticipate completing by 2040. Project selection was based on the evaluation criteria and collaboration with the Long-Range Plan Committee.

Major regional project costs are broken out over several funding categories, since their scope can involve road reconstruction, replacing or rehabilitating bridges, operational or safety improvements, and system expansion components.

All critical Major Regional Projects are shown in the following tables. These tables identify the facility, project scope, county location, and either completion date by funding period for fiscally constrained projects, or identification as unfunded if the project is not included in the fiscally constrained plan. Projects that show a completion date are included in the fiscally constrained Funded Plan.

The Plan also sets aside funding for smaller-scale projects that will be identified in the current and future Transportation Improvement Programs.

TABLE 6: **FUNDING ALLOCATION TO PROJECT CATEGORIES**

MODE	PROJECT CATEGORY	PENNSYLVANIA		NEW JERSEY	
		TARGET ALLOCATION	ALLOCATED REVENUE	TARGET ALLOCATION	ALLOCATED REVENUE
ROADWAY	**System Preservation**				
	Pavement Preservation	30%	$ 7.8 B	40%	$ 5.0 B
	Bridge Preservation	50%	$ 13.1 B	38.5%	$ 4.8 B
	Operational Improvements	11.5%	$ 3.0 B	12%	$ 1.5 B
	System Expansion	5%	$ 1.3 B	5%	$ 0.6 B
	Bicycle and Pedestrian	1.5%	$ 0.4 B	1.5%	$ 0.2 B
	Other	2%	$ 0.4 B	3%	$ 0.4 B
	ROADWAY SUBTOTAL	100%	$ 26.0 B	100%	$ 12.6 B
TRANSIT	**System Preservation**				
	Rail Infrastructure	24.8%	$ 4.4 B	13%	$ 0.9 B
	Vehicles	40%	$ 7.1 B	23.5%	$ 1.6 B
	Station Enhancements	15.8%	$ 2.8 B	2%	$ 0.1 B
	Operational Improvements	3.4%	$ 0.6 B	8%	$ 0.5 B
	System Expansion	3.1%	$ 1.0 B*	40%	$ 2.7 B
	Other	13%	$ 2.3 B	13.5%	$ 0.9 B
	TRANSIT SUBTOTAL	100%	$ 18.2 B	100%	$ 6.8 B
	DVRPC REGION TOTAL	**100%**	**$ 44.2 B**	**100%**	**$ 19.4 B**

Totals may not add up due to rounding.
**Includes Federal New Starts funding.*

SOURCE: DVRPC

FIGURE 9: **PENNSYLVANIA SUBREGION SYSTEM PRESERVATION NEED VS. ALLOCATED REVENUE (2014-2040)** *(BILLIONS OF Y-O-E $)*

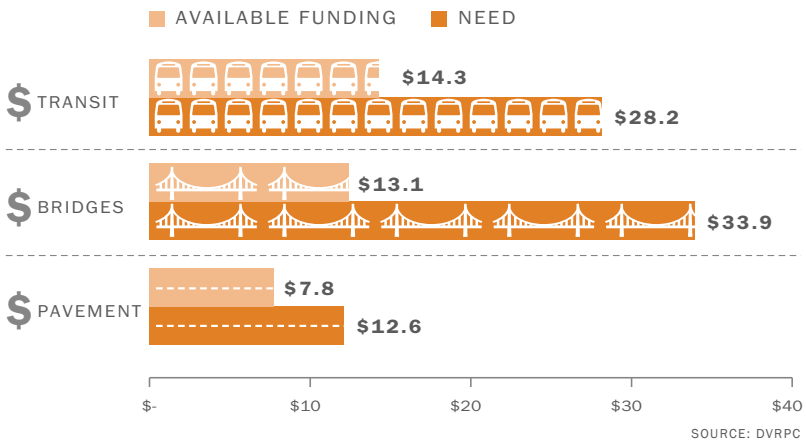
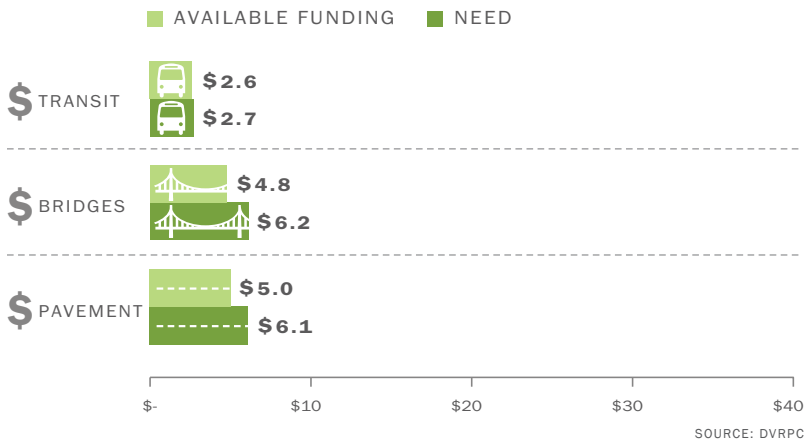


FIGURE 10: **NEW JERSEY SUBREGION SYSTEM PRESERVATION NEED VS. ALLOCATED REVENUE (2014-2040)** *(BILLIONS OF Y-O-E $)*



Funding Distribution by Category

Funding is allocated to each of the roadway and transit funding categories based on comparative need, as well as policy. Long-range plan policy prioritizes preservation and maintenance needs, followed by operational improvements, then system expansion projects. This approach follows the lead of federal and both state departments of transportation. This "fix-it-first" policy allocates more funding to preserving and maintaining existing roadway and transit networks. The goal is to achieve and maintain a state-of-good repair for existing transportation infrastructure.

Table 6 identifies the target allocations for each funding category and resulting revenue for each. Funding within each category is allocated to both Major Regional Projects, which are listed in the Plan, and to smaller-scale projects as they are programmed in the TIP.

Together, roadway maintenance and preservation categories (pavement reconstruction and bridge replacement) comprise 80 percent of total roadway expenditures in Pennsylvania and 78.5 percent in New Jersey. In Pennsylvania, the transit preservation and maintenance categories (rail infrastructure replacement, vehicle replacement, and station enhancement) account for 80.6 percent of transit expenditures; and in New Jersey, they account for 38.5 percent of transit expenditures. A higher percentage was allocated in Pennsylvania because it is a much larger and older system.

Even if all anticipated Plan revenues were directed toward preserving and maintaining the roadway and transit system, there would not be enough money to address the identified need. Furthermore, the region would not have funding for any other critical types of improvements to address congestion, safety, or mobility. With system

preservation needs on the rise, only five percent was allocated for roadway system expansion projects in Pennsylvania and New Jersey, primarily for eliminating choke points in the network and improved connections between facilities. A larger percentage of funding is reserved for operational improvements, which tend to have a higher return on congestion reduction than system expansion projects, per dollar spent. State-of-good-repair needs are a higher priority than system expansion for transit in Pennsylvania. All transit state-of-good-repair and operational improvement needs were met in New Jersey, with the remaining 40 percent of funding going to system expansion.

Major Regional Project Evaluation

With constrained available funding, it is imperative to select projects wisely, based on a quantitative assessment. Investments in the system need to support the core principles of *Connections 2040*: Manage Growth and Protect the Environment; Invest in Livable Communities; Build the Economy; and Establish a Modern Multimodal Transportation System. Investments also need to focus on modernizing the region's aging transportation system, while working toward other key goals, such as: rebuilding the existing system, reducing congestion, improving safety, increasing mobility options for people and goods, establishing a multimodal transportation network, and identifying additional funding.

EQUITY

COORDINATED HUMAN SERVICES TRANSPORTATION PLANNING AND FUNDING

Many lower-income and transportation-disadvantaged people have a difficult time reaching many of the region's employment centers, which tend to be scattered in auto-dependent suburban areas. In order to bridge this gap, DVRPC has developed a Coordinated Human Services Transportation Plan (CHSTP). The CHSTP seeks to help improve transportation options and provide better service to transportation-disadvantaged riders. It includes a range of strategies and services that can help make it easier for targeted populations to use transit.

FTA and our state and regional partners have invested dedicated funds to help implement the CHSTP. PennDOT and NJ DOT's Job Access and Reverse Commute (NJ JARC) program have helped fund transportation services and supportive activities that facilitate access to jobs for welfare recipients, lower-income persons, and reverse commuters. They have also supplemented the region's public transportation system, by expanding early morning and evening services and providing shuttles connecting transit stations to employment sites. The Section 5310 program has funded additional tools for senior mobility as well as disabled individuals seeking integration in the workforce and society. DVRPC will continue to work with our planning partners to ensure that these types of investments are made in a coordinated way.

To determine which potential major regional system expansion projects are ultimately included in the fiscally constrained Funded Plan, DVRPC and its planning partners developed a screening and evaluation process to assess whether they meet key objectives of the Plan. The first step in the analysis is a screening process to determine if a proposed project meets the key criteria of investing in areas that are currently developed or have been identified as areas appropriate for development over the life of the Plan.

Roadway projects have an additional screening criterion of being consistent with the region's Congestion Management Process (CMP). Consistency is determined by whether the subcorridor where a potential new highway capacity project is located has been identified in the CMP as appropriate for adding capacity. If a project fails the screening process, it is not considered for inclusion in the Plan.

Roadway projects that pass the screening are then further evaluated by the following criteria:

- Does the project serve the region's identified population and employment Centers?
- Are there significant environmental issues that will be impacted by a project, as measured by DVRPC's Environmental Screening Tool?
- Is the project located in a CMP Priority Subcorridor?
- What is the reduction in regional vehicle hours of travel (VHT) associated with this project?
- What is the average annual daily traffic multiplied by the peak-period volume-to-capacity (V/C) ratio within the project limits?
- What is the daily truck traffic on the facility?
- How far has the project advanced?

Transit system expansion projects are evaluated with the following criteria:

- Does the project serve areas that will support a high level of transit service, as measured by DVRPC's Transit Score Index?
- Does the project serve environmental justice communities with additional transit needs, as identified by DVRPC's Indicators of Potential Disadvantage (IPD, formerly known as Degrees of Disadvantage) analysis?
- What is the potential for transit-oriented development?
- What is the status of the project?
- Is the project located in a Congestion Management Process Priority Subcorridor?
- What is the project's anticipated farebox recovery rate?

System preservation and operational improvement projects were prioritized using asset management system condition data, use (vehicle and truck volumes, or transit ridership), detour length (for bridges), age, TIP status, speed impacts (for pavement), and functional class. DVRPC and it's planning partners worked to optimize investments that get the longest life and system use out of infrastructure for the least cost.

THE TRUE COST OF BAD ROADS

The transportation research group, TRIP, estimates that poor road conditions in the Greater Philadelphia region cost the average driver $572 per year in costs for accelerated vehicle depreciation, additional vehicle repair costs, increased fuel consumption, and tire wear. The basic maintenance involved in keeping a road in good condition costs anywhere from one-third to one-fourteenth of the cost of fixing a road that has fallen into disrepair. Thus, the more maintenance that is deferred now, the more disproportionately expensive it will become to eventually fix the problem. Meanwhile, poor road conditions continue to double tax drivers, where they must pay for the damage to their vehicles caused by poor road conditions, and then, again, to eventually repair the road.

Investing in the Future

This section identifies the Major Regional Projects that the region will need to undertake over the life of the Plan. There are separate tables for system preservation, operational improvements, and system expansion projects for both roadways and transit, as well as for bike and pedestrian investments. There is also a table for externally funded Major Regional Projects. Each project is identified by facility, project scope and location, and completion date based on the end of the funding period that the project is expected to be complete. Project costs are given in Y-O-E dollars for funded projects, and in current year dollars for the unfunded projects that are part of the Vision Plan. System expansion projects are given a MAP ID that corresponds with the Transportation Vision Major Regional System Expansion Projects map (Figure 11).

These projects represent the largest and most significant set of identified needs out of the total set of projects that will need to be addressed over the life of the Plan. Many smaller-scale projects are already identified in the current Pennsylvania and New Jersey TIPs, and future iterations of the TIPs will identify future projects, of all sizes, as their need arises.

MAJOR REGIONAL ROADWAY PRESERVATION PROJECTS

The Major Regional Preservation Projects identified in the Plan illustrate the scope and the scale of the effort to maintain the existing system. I-95 is a clear example of the difficult task of addressing the rebuilding of our infrastructure in a fiscally constrained environment. The focus right now is on reconstructing the portion between Race Street and State Street in Philadelphia. Starting in the 2030s, the next section of reconstruction will be in South Philadelphia between Queen Street to just north of the Girard Point Bridge. Much of this segment of I-95 is a viaduct bridge structure. While this project is in the Funded Plan, I-95 reconstruction will need to advance all the way from Girard Point Bridge to the Delaware state line. Much of the rest of the needed work is currently unfunded due to fiscal constraint.

New funding from Act 89 has allowed significant reconstruction projects to advance along US 422 in Chester and Montgomery counties, and US 1 in Chester County.

TABLE 7:

MAJOR REGIONAL ROADWAY PRESERVATION PROJECTS

FACILITY	PROJECT SCOPE	LOCATION	TIMING	FUNDED COST *(MILLIONS IN Y-O-E $)*	UNFUNDED COST *(MILLIONS IN 2013 $)*
PA 611	Reconstruct bridge over Neshaminy Creek	Bucks	2031-2040	$ 45.7	
US 1 Bypass	Reconstruct bridges over Norfolk Southern Line, and over Trenton Avenue and US 1	Bucks	2031-2040	$ 125.0	
US 1	Reconstruct bridge over Delaware Canal and Conrail Line	Bucks	2031-2040	$ 122.0	
PA 332 Newtown Bypass	Bridge over SEPTA	Bucks	2024-2030	$ 26.0	
Darby Road Extension	Replace and realign Valley Road Bridge to connect with Darby Road	Chester	2014-2024	$ 35.1	
US 1	Reconstruct from Schoolhouse Road to Maryland State Line	Chester	2019-2030	$ 183.5	
US 202	Reconstruct bridges over Amtrak	Chester	2014-2018	$ 17.6	
US 422	Reconstruct from Sanatoga Interchange to just East of Stowe Interchange and west of Schuylkill River bridge; realign from Porter to Park Road; improve acceleration lane for westbound on-ramp from Sanatoga Interchange; reconstruct bridge over Schuylkill River and provide Schuylkill River Trail crossing	Chester, Montgomery	2019-2030	$ 281.4	
I-95 Delaware County	Reconstruct bridges over Amtrak (northbound and southbound), over Chester Creek, over Bartram Avenue/Conrail, and over Sellers Avenue (northbound and southbound)	Delaware	Unfunded		$380.0
I-476	Reconstruct bridges over Avondale Road/Dicks Run (northbound and southbound); over Conestoga Rd. and Sproul Rd. (northbound and southbound); I-76 Schuylkill Expressway (northbound and southbound); and Conrail (northbound and southbound)	Delaware, Montgomery	Unfunded		$ 235.0
I-76	Reconstruct eastbound bridge over City Avenue	Montgomery	2025-2040	$ 27.6	
I-76	Reconstruct bridges over Norfolk Southern railway; City Avenue (westbound); South Gulph Road; and Arrowmink Creek	Montgomery	Unfunded		$ 160.0
Bridges over Vine Street Expressway	Reconstruct Spring Garden Street Bridges over I-76 and the Schuylkill River; reconstruct 18th, 19th, 20th, 21st, and 22nd Street bridges, and 2 pedestrian walkways over the Vine Street Expressway.	Philadelphia	2014-2024	$ 251.0	
US 1	Reconstruct bridge over Wayne Junction	Philadelphia	2019-2024	$ 88.8	
Langely Avenue	Reconstruct, realign, and new streetscaping from 26th Street to Broad Street	Philadelphia	2019-2024	$ 16.0	
I-676	Reconstruct bridge over Schuylkill River/CSX	Philadelphia	2025-2040	$ 146.0	
I-76	Reconstruct bridge from Arch Street to University Avenue; between 34th and Grays Ferry Avenue; and over Schuylkill River/CSX	Philadelphia	Unfunded		$ 470.0
I-95 South Philadelphia	Reconstruct from Queen Street to just north of Girard Point Bridge, including viaducts Christian to Mifflin Street, from Shunk Street to Mifflin Street; over CSX track east of Broad Street; from Stadiums to Navy Yard; and over Penrose Avenue/Mingo Creek (northbound and southbound), over Pattison Avenue, and over Terminal Avenue	Philadelphia	2031-2040	$ 4,450.0	
I-95 Girard Point Bridge	Reconstruct double-decker bridge	Philadelphia	Unfunded		$ 400.0
I-676	Reconstruct 7th Street and 8th Street ramps	Philadelphia	Unfunded		$ 35.0

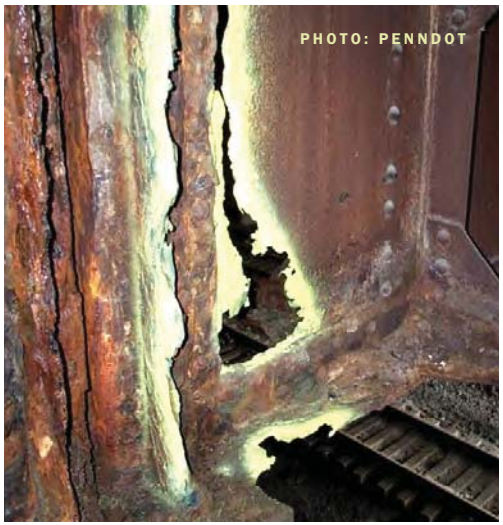
SOURCE: DVRPC

CONTINUED ON NEXT PAGE

TABLE 7 CONTINUED

FACILITY	PROJECT SCOPE	LOCATION	TIMING	FUNDED COST *(MILLIONS IN Y-O-E $)*	UNFUNDED COST *(MILLIONS IN 2013 $)*
NJ 38	Reconstruct bridge over NJ Turnpike	Burlington	2024-2040	$ 151.3	
NJ 70	Reconstruct from MP 0 to MP 7.7	Camden	2014-2023	$ 33.1	
I-676	Reconstruct from CR 537 to US 30	Camden	2024-2040	$ 47.5	
I-76	Reconstruct from I-676 to I-295	Camden	2024-2040	$ 85.8	
I-676	Rehabilitate viaduct over local streets in Camden City south of US 30	Camden	2024-2040	$ 103.5	
I-676	Rehabilitate bridge over Conrail	Camden	2024-2040	$ 83.4	
US 1	Rehabilitate bridge over D & R Canal	Mercer	2024-2040	$ 74.5	

SOURCE: DVRPC



Other significant regional roadway reconstruction projects will occur on I-76 and I-676 in Camden County.

MAJOR REGIONAL ROADWAY OPERATIONAL IMPROVEMENT PROJECTS

Operational improvements will make the existing transportation system work more efficiently. In many cases, these projects make interchange improvements that will improve the flow of traffic, or directly connect facilities, and help to remove traffic from local streets. Examples of this type of project are the I-95 and I-476, and I-476 and I-76 interchange improvements. The intersection improvement at US 202 and PA 926 is the result of 'right-sizing' a former widening and grade-separated interchange project into an affordable short-term project that can improve safety and reduce congestion right now.

The conversion of the NJ 29 Freeway into an urban boulevard will improve walkability, increase safety, enhance access to the Delaware River, and promote redevelopment in the City of Trenton.

Major Regional Operational Improvement Projects focus on physical changes to the roadway system. DVRPC and its planning partners developed a *Transportation Operations Master Plan* (TOMP) that details specific Intelligent Transportation Systems (ITS), traffic management, and signal improvement projects. About 72 percent of the projects identified in the TOMP are able to be funded in the Plan.

TABLE 8:

MAJOR REGIONAL ROADWAY OPERATIONAL IMPROVEMENT PROJECTS

FACILITY	PROJECT SCOPE	LOCATION	TIMING	FUNDED COST *(MILLIONS IN Y-O-E $)*	UNFUNDED COST *(MILLIONS IN 2013 $)*
US 202	Intersection improvements at PA 926	Delaware	2014-2018	$ 2.2	
I-95 and I-476	One new lane in each direction on I-95 through interchange. Addition of lane on ramp from SB I-476 to SB I-95 and addition of lane on ramp from NB I-95 to NB I-476	Delaware	2025-2040	$ 214.3	
US 1 at PA 352	Reconstruction of cloverleaf interchange, eliminate lane drops	Delaware	2014-2024	$ 168.1	
US 202 (Section 500) Markley Street	Reconstruction from Main St. to Johnson Highway; Add center turn lane between Marshall St. and Johnson Highway	Montgomery	2014-2018	$ 40.0	
Ridge Pike	Reconstruct from Butler Pike to I-276 PA Turnpike; Add center turn lane	Montgomery	2025-2030	$ 60.8	
I-476 and I-76	Interchange modifications	Montgomery	2025-2040	$ 20.0	
I-76 at PA 23 Matsonford Road	Interchange modifications	Montgomery	2025-2040	$ 20.0	
US 422 at Sanatoga Interchange	Interchange modifications	Montgomery	2025-2040	$ 18.0	
US 422	Reconstruct from Berks County line to west of Schuylkill River Bridge; Reconfigure "S" curve in West Pottsgrove; and realign Stowe interchange	Montgomery	2019-2024	$ 90.3	
I-276 at PA 611 Willow Grove	Interchange modifications	Montgomery	2025-2040	$ 40.1	
I-95 Philadelphia North	Reconstruct from Race Street to State Street; Interchange improvements at Vine, Girard, Allegheny, Betsy Ross Bridge, Bridge, and Cottman interchanges	Philadelphia	2014-2024	$ 2,140.0	
South Pemberton Road (CR 530)	Add new center turn lane and shoulder from Hanover St. (CR 616) to US 206	Burlington	2014-2017	$ 27.0	
NJ 70	Operational/safety improvements from NJ 38 to NJ 73; Intersection improvements at Kingston Rd. and Covered Bridge Rd.	Burlington, Camden	2024-2040	$ 390.5	
US 130 & CR 551 (Brooklawn Circle)	Redesign intersection at Brooklawn Circle	Camden	2014-2017	$ 4.5	
NJ 29	Convert to an urban boulevard from US 1 to Sullivan Way	Mercer	2024-2040	$ 346.0	
Princeton-Hightstown Road Improvements (CR 571)	Widening, reconstruction and signals from Wallace-Cranbury Rd. to Clarksville Rd.	Mercer	2014-2023	$ 10.7	

SOURCE: DVRPC

TABLE 9:

MAJOR REGIONAL BIKE AND PEDESTRIAN PROJECTS

FACILITY	PROJECT SCOPE	LOCATION	TIMING	FUNDED COST *(MILLIONS IN Y-O-E $)*	UNFUNDED COST *(MILLIONS IN 2013 $)*
The Circuit in Pennsylvania	Complete 272 multiuse trail miles	Pennsylvania Subregion	2014-2040	$ 161.9	$ 13.6
The Circuit in New Jersey	Complete 140 multiuse trail miles	New Jersey Subregion	2014-2040	$ 99.7	$ 19.7

SOURCE: DVRPC

MAJOR REGIONAL BIKE AND PEDESTRIAN PROJECTS

Bike and pedestrian improvements in *Connections 2040* focuses on completing The Circuit, a 750-mile regional trail network. About 250-miles of this system are complete, and 50-miles are under construction. The Schuylkill River Swing Bridge, which will connect the Bartram's Garden Trail with the Greys Ferry Crescent Trail, is a project that has advanced with additional funding from Act 89 and is scheduled for completion by 2021. While it does not appear The Circuit will be completely finished with public funding by 2040, the region may be able to leverage private funding in order to advance the entire vision by 2040, or earlier.

MAJOR REGIONAL ROADWAY SYSTEM EXPANSION PROJECTS

Though limited in scope, the system expansion transportation investments included in the Plan support its land use, environmental, and economic development goals. Many of these projects will also help to rebuild the system, such as the US 1 reconstruction in Bucks County. This is one of several projects that will be completed sooner with the additional funding from Act 89.

A number of the Major Regional Projects improve roadway operations by eliminating bottlenecks or bridging gaps. The new I-95 and Pennsylvania Turnpike Interchange (Map ID 2) addresses the missing movement between these two critical facilities in the region's highway system. The Adams Avenue Connector (Map ID 29) provides a connection between I-95 and the Betsy Ross Bridge. Similarly, the I-295 and I-76/NJ 42 direct connection (Map ID 33) and missing movements (Map ID 34) projects complete this critical interchange and improve the functionality and safety of the network. Each of these will also help to facilitate goods movement.

Other system expansion projects improve the region's economic competitiveness. The North Delaware Avenue extension (Map ID 28) provides access to planned residential and recreational facilities.

The extension of Lafayette Street in Norristown and the Lafayette/Ridge interchange (Map ID 20) will provide direct access from the Pennsylvania Turnpike to Norristown, one of the region's Town Centers. Improved movements and new exits along the Pennsylvania Turnpike are proposed to give better access to a number of key regional business centers. Though not funded in the Plan, these projects would support the redevelopment of these areas and make the Turnpike into more of a regional beltway. These projects have the potential to become a public-private partnership between PennDOT, the Pennsylvania Turnpike, and property developers.

TABLE 10:

MAJOR REGIONAL ROADWAY SYSTEM EXPANSION PROJECTS

MAP ID	FACILITY	PROJECT SCOPE	LOCATION	TIMING	SYSTEM EXPANSION COST *(MILLIONS IN Y-O-E $)*	TOTAL FUNDED COST *(MILLIONS IN Y-O-E $)*	UNFUNDED COST *(MILLIONS IN 2013 $)*
1	County Line Road	Widen and reconstruct from PA 309 to PA 611	Bucks	2014-2018	$ 16.4	$ 34.1	
2	I-95 at PA Turnpike	New partial interchange at I-276 (PA Turnpike); Widen PA Turnpike from US 1 to New Jersey; Widen I-95 from PA 413 to PA Turnpike	Bucks	2014-2024	$ 113.4	$ 166.8	
3	US 1	Reconstruct from I-276 (PA Turnpike) to NJ State Line; Widen from PA Turnpike to PA 413; Interchange improvements	Bucks	2014-2024	$75.7	$ 303.5	
4	I-95 Bucks County Hard Shoulder Running	Southbound from Street Road (Exit 37) to Cornwell Heights SEPTA station	Bucks	Unfunded			$ 1.6
5	PA 309 Connector Road (Phase 2)	Construct new road between Allentown Road and County Line Road; Interchange improvements at PA 309	Bucks, Montgomery	2019-2030	$ 55.2	$ 79.6	
6	French Creek Parkway	Construct new road between PA 23 and PA 29	Chester	2025-2040	$ 67.0	$ 67.0	
7	PA 100	Widen from Shoen Road to Gordon Road	Chester	2014-2018	$ 6.5	$ 10.6	
8	US 202 (Section 300)	Widen and reconstruct from PA 252 to US 30	Chester	2014-2018	$ 20.2	$ 77.8	
9	US 30/Coatesville-Downingtown Bypass	Reconstruct from Reeceville Road to PA 10; complete interchange at Airport Road	Chester	2019-2030	$ 33.1	$ 338.1	
		Reconstruct from Exton Bypass to Reeceville Road; complete interchange at PA 113; potential addition of through lanes and capacity enhancements between PA 113 and PA 340 (as determined by traffic analysis)		2025-2040	$ 134.8	$ 539.2	
10	US 202 (Section 100)	Widen from West Chester to Delaware State Line; Grade-separated interchange at US 1	Chester, Delaware	Unfunded			$ 300.0
11	US 322	Widen and reconstruct from US 1 to I-95	Delaware	2014-2024	$102.5	$ 262.2	
12	I-476 Hard Shoulder Running	From PA 3 to I-95	Delaware	2025-2040	$ 34.1	$ 34.1	
13	I-95/US 322/Highland Avenue Interchange	Realign I-95 and add new movements at interchange to 322, Bethel Road, and Highland Avenue	Delaware	2025-2040	$ 22.1	$ 147.2	
14	I-95 Delaware County Hard Shoulder Running	Southbound from I-476 to US 322 (Exit 7 to Exit 4), and northbound Delaware State Line to US 322 West (Exit 3)	Delaware	Unfunded			$ 6.5
15	Lafayette Street	Roadway extension from Barbadoes St. to Diamond Avenue	Montgomery	2014-2024	$ 30.5	$ 61.0	
16	US 202 (Section 600)	Widen and reconstruct from Johnson Highway to PA 309	Montgomery	2014-2024	$ 121.1	$ 216.3	
17	US 422 at PA 363 Interchange (River Crossing)	Add full movements	Montgomery	2014-2018	$ 3.2	$ 12.6	
18	US 422 Bridge at PA 23 Interchange (River Crossing)	Bridge replacement and widening over Schuykill River - existing bridge is 5 lanes, new bridge will have 6 lanes; Intersection/interchange improvements	Montgomery	2014-2024	$ 72.9	$ 145.8	
19	US 422 Mainline Widening (River Crossing)	Widen from 4 to 6 lanes from US 202 to PA 363	Chester, Montgomery	2025-2040	$ 33.8	$ 67.7	

SOURCE: DVRPC

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TABLE 10 CONTINUED

MAP ID	FACILITY	PROJECT SCOPE	LOCATION	TIMING	SYSTEM EXPANSION COST *(MILLIONS IN Y-O-E $)*	TOTAL FUNDED COST *(MILLIONS IN Y-O-E $)*	UNFUNDED COST *(MILLIONS IN 2013 $)*
20	I-276 at Lafayette Street/ Ridge Avenue	New interchange	Montgomery	2025-2040	$ 22.4	$ 28.0	
21	I-276/I-76 Valley Forge Interchange	Interchange modifications	Montgomery	Unfunded			$ 20.0
22	I-276 at Virginia Drive	Add full movements	Montgomery	Unfunded			$ 45.0
23	I-276 at Henderson Road	New interchange	Montgomery	Unfunded			$ 40.0
24	US 202 Dannehower Bridge and Lafayette Street	New interchange	Montgomery	Unfunded			$ 53.7
25	I-276 at PA 611	Interchange modifications	Montgomery	Unfunded			20.0
26	US 422 Hard Shoulder Running	From PA 363 to PA 29	Montgomery	Unfunded			$ 6.8
27	I-276 at PA 63 (Welsh Road)	New interchange	Montgomery	Unfunded			$ 40.0
28	North Delaware Avenue	Extend road from Lewis Street to Bridge Street	Philadelphia	2014-2018	$ 17.5	$ 17.5	
29	Adams Avenue Connector	Extend road to new ramps at I-95 and Aramingo Avenue	Philadelphia	2019-2024	$ 23.6	$ 23.6	
30	I-95 Philadelphia Hard Shoulder Running	Southbound From Woodhaven Road to Cottman/Princeton Avenue (Exit 35 to Exit 30); Northbound from I-76 to I-676 (Exit 19 to Exit 22); and I-76 to Broad Street (Exit 19 to Exit 17)	Philadelphia	Unfunded			$ 10.8
31	I-76 Hard Shoulder Running	I-676 to Girard Avenue	Philadelphia	Unfunded			$ 0.6
32	I-295 at NJ 38	Add missing movements to interchange at NJ 38	Burlington	Unfunded			$ 126.5
33	I-295 (Direct Connect)	Direct connection of I-295 through interchange at I-76/NJ 42	Camden	2014-2023	$ 255.0	$ 543.8	
34	I-295 at I-76/NJ 42	Add missing movements to interchange at I-76/NJ 42	Camden, Gloucester	2014-2023	$ 67.0	$ 133.9	
35	US 322	Widen from US 130 to NJ Turnpike	Gloucester	2024-2040	$ 45.8	$ 91.7	
36	US 1 - Penns Neck Area	New connector road, interchanges and widening in vicinity of Penns Neck	Mercer	Unfunded			$ 177.4
37	Vaughn Drive Connector	Extend Vaughn Drive to Princeton Hightstown Road (CR 571)	Mercer	2024-2040	$ 57.8	$ 57.8	
-	*Minor System Expansion - Pennsylvania	New roads, roadway extensions, and widenings on minor arterial and collector roads	Pennsylvania Subregion	2014-2040	$ 188.0	$ 242.1	
-	Minor System Expansion - New Jersey	New roads, roadway extensions, and widenings on minor arterial and collector roads	Mercer	2025-2040	$ 44.4	$ 44.4	

**See Table 2 for amendments to Minor System Expansion projects in Pennsylvania. A full list of minor system expansion projects is included in the Connections 2040 Plan for Greater Philadelphia Technical Analysis (DVRPC publication number 13043).*

SOURCE: DVRPC

MAJOR REGIONAL TRANSIT SYSTEM PRESERVATION PROJECTS

Major Regional Transit Preservation Projects will occur on the Atlantic City Rail Line (vehicles, stations, and rail infrastructure), and a number of key SEPTA bridges and power substations, which are critical to the long-term viability of the regional rail system. A major renovation of City Hall Station is planned. Significant station upgrades are envisioned at Villanova, Paoli, Exton, Ardmore, Levittown, and Fern Rock. Americans with Disabilities Act (ADA) compliance will be enhanced at a number of stations along the Broad Street and Market-Frankford lines, and the 33rd and 36th Street trolley stations. Critical trolley and Regional Rail vehicle replacements will begin to occur over the life of the Plan, while the Broad Street Line vehicles will be rehabilitated in the later years of the Plan. Act 89 allows a larger procurement of trolley and Regional Rail vehicles than is in the existing fleet, which will help to reduce system overcrowding.

TABLE 11:
MAJOR REGIONAL TRANSIT SYSTEM PRESERVATION PROJECTS

FACILITY	PROJECT SCOPE	LOCATION	TIMING	FUNDED COST *(MILLIONS IN Y-O-E $)*	UNFUNDED COST *(MILLIONS IN 2013 $)*
SEPTA Regional Rail Lines	Positivie Train Control	Pennsylvania Subregion	2014-2018	$ 72.8	
Norristown, Warminster, Fox Chase, Chestnut Hill East, Airport, and Media-Elwyn lines and various mainline projects	Catenary and catenary structure replacement projects	Bucks, Delaware, Montgomery, Philadelphia	2014-2030	$ 113.0	
Chestnut Hill East Line	Rehabilitate bridges	Philadelphia	2019-2030	$ 30.0	
Chestnut Hill West Line	Rehabilitate bridge 0.35	Philadelphia	2014-2018	$ 7.6	
Chestnut Hill West Line	Rehabilitate bridges	Philadelphia	2019-2030	$ 35.0	
Media-Elwyn Line	Bridge timber replacement and painting	Delaware	2014-2018	$ 43.3	
Regional Rail Stone Arch Bridges	Rehabilitation	Philadelphia	2014-2018	$ 8.8	
Media-Elwyn Line	Reconstruct Crum Creek Viaduct	Delaware	2014-2018	$ 80.0	
Norristown High Speed Line	Rehabilitate Bridgeport Viaduct over Schuylkill River	Montgomery	2019-2024	$ 30.5	
Norristown High Speed Line	Rehabilitate bridge 0.15 near 69th Street Transportation Center	Delaware	2019-2024	$ 15.5	
Substations at Ambler, Bethayres, Chestnut Hill East, Hatboro, Jenkintown, Lansdale, Lenni, Morton, Wayne Junction Static Frequency Converters, Wood, 18th/12th/Portal, Brill, Doylestown, Neshaminy, Yardley, Castor, Clifton, Market and along the Market-Frankford Line and Broad Street Line	Substation replacements and rehabilitations	Pennsylvania Subregion	2014-2030	$ 285.7	

SOURCE: DVRPC

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TABLE 11 CONTINUED

FACILITY	PROJECT SCOPE	LOCATION	TIMING	FUNDED COST *(MILLIONS IN Y-O-E $)*	UNFUNDED COST *(MILLIONS IN 2013 $)*
Trenton, Wilmington, and Paoli-Thorndale Lines	Amtrak lease agreements for trackage rights	Pennslyvania Subregion	2014-2040	$ 1,762.1	
Routes 11 and 36	Track improvements	Philadelphia	2019-2030	$ 5.7	
Trolley tunnels	Track rehabilitation	Philadelphia	2014-2018	$ 6.6	
Mainline-Schuylkill Bridge Program	Bridge rehabilitations between 30th St. and Suburban stations	Philadelphia	2019-2030	$ 56.0	
NJ Transit Buses	Procure 358 40' transit buses and 288 45' cruiser buses	New Jersey Subregion	2014-2040	$ 539.4	
Midvale	New rail shop	Philadelphia	2025-2040	$ 222.8	
Atlantic City Rail Line	Replace rail cars and locomotives, rehabilitate Cherry Hill, Atco, and Lindenwold stations	Camden, Philadelphia	2025-2040	$ 284.6	
New Jersey Transit Northeast Corridor Rail Vehicles	Replace 42 commuter rail vehicles	Mercer	2025-2040	$ 470.1	
SEPTA Buses	Normal replacement of vehicles	Pennsylvania Subregion	2014-2040	$ 1,325.4	
Berridge; Callowhill; 69th Street Transportation Center; Overbrook; Fern Rock; Comly; Woodland; Frontier; Roberts; Powelton; Frazer; Courtland; 5800 Bustleton; Southern; and others facilities	Roof replacements	Delaware, Philadelphia	2014-2040	$ 106.3	
New Rail Vehicles	Purchase of new Locomotives, Bi-Level Coaches, Trolleys, Silverliner VI's and rehabilitate Broad Street Line vehicles	Pennsylvania Subregion	2014-2040	$ 3,887.5	
Computer Aided Radio Dispatch (CARD) System	Signal and communication system upgrades and replacements	Pennsylvania Subregion	2014-2024	$ 32.5	
Real Time Information	New passenger information at rail and transit stations	Pennsylvania Subregion	2014-2040	$ 30.1	
Regional Rail	Rehabilitate Hunt/Wayne, Arsenal, and Beth interlockings	Bucks, Delaware, Montgomery, Philadelphia	2014-2030	$ 55.0	
Cynwyd Line	Signals, specialwork, and right-of-way	Montgomery, Philadelphia	2014-2018	$ 4.4	
40th Street, Erie, Snyder, Susquehanna-Dauphin, 33rd/36th Street, and others to be determined	Station accessibility improvements	Philadelphia	2014-2040	$ 149.5	
City Hall and 15th Street stations	Renovation	Philadelphia	2014-2024	$ 122.1	
Exton Station	Renovation	Chester	2014-2024	$ 57.2	
Paoli Station	Transportation center enhancements	Chester	2019-2024	$ 55.7	
Ardmore Station	Transportation center enhancements	Montgomery	2014-2040	$ 23.8	
Fern Rock Station	Transportation center enhancements	Philadelphia	2019-2030	$ 99.5	
Levittown Station	Renovation	Bucks	2014-2018	$ 37.1	
Villanova Station	Renovation	Delaware	2014-2024	$ 30.6	
Noble Station	Station improvements, new parking garage, and storage track	Montgomery	2019-2030	$ 53.0	
Center City Concourses	Rehabilitation	Philadelphia	2014-2024	$ 53.5	
Broad Street Spur	Signal replacements	Philadelphia	2014-2018	$ 6.5	

SOURCE: DVRPC

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TABLE 11 CONTINUED

FACILITY	PROJECT SCOPE	LOCATION	TIMING	FUNDED COST *(MILLIONS IN Y-O-E $)*	UNFUNDED COST *(MILLIONS IN 2013 $)*
Gwynedd Valley, North Wales, Philmont, and Lansdale stations, and along the Norristown Line	Regional rail parking expansions	Montgomery	2014-2030	$ 56.5	
Roslyn, Hatboro, East Falls, Conshohocken, Yardley, Jenkintown, Wyndmoor, Lawndale, Marcus Hook, Devon, Wynnewood, Secane, and Willow Grove	Regional rail station enhancements	Bucks, Delaware, Montgomery, Philadelphia	2014-2030	$ 201.4	
69th Street Transportation Center	Transportation center enhancements and parking garage	Delaware	2014-2018	$ 16.3	
Margaret/Orthodox, 5th Street, Wyoming Ave, 19th Street, Fairmount, and Hunting Park stations	Transit station enhancements	Philadelphia	2014-2024	$ 83.3	
61st & Pine, Wycombe, Bethlehem Pike, and Rising Sun & Olney	Bus and trolley loop program	Delaware, Philadelphia	2014-2024	$ 8.8	
SEPTA Routes 101 and 102	Signals and interlocking improvements, grade crossings	Delaware	2014-2024	$ 38.6	
Norristown High Speed Line*	Tie and signal replacements; slope stability projects	Delaware, Montgomery	2014-2024	$ 44.0	
Broad Street and Market-Frankford Lines*	Communications systems	Delaware, Philadelphia	2019-2024	$ 26.6	
Vehicle Maintenance Facilities	Steel wheel lift program and wheel truing program, washers,	Pennsylvania Subregion	2014-2024	$ 45.2	
Building Maintenance Program	Boiler program, tank program, emergency generators, fire suppression	Pennsylvania Subregion	2014-2024	$ 44.4	
Rail Yard Storage*	Expansion program	Pennsylvania Subregion	2019-2024	$ 34.5	
Regional Rail*	Slope stability at Media, Mainline, Limekiln, Ardsley, and Chestnut Hill East cuts	Delaware, Montgomery, Philadelphia	2019-2024	$ 26.5	

SOURCE: DVRPC

**In spring of 2014, SEPTA submitted a discretionary application to the Federal Transit Administration (FTA) for funding consideration under Section 5324 of the Emergency Releif Program (Sandy Resiliency) which included these projects. Funding source and year of construction cannot be determined until a decision on that application has been made by FTA.*

MAJOR REGIONAL TRANSIT OPERATIONAL IMPROVEMENT PROJECTS

Operational improvements along the Atlantic City Line including new sidings, additional vehicles, and station enhancements will allow for increased service frequency. SEPTA's fare modernization will give the region the most advanced payment system in the country. Postitive train control (PTC) will meet federal rail safety requirements. The West Trenton Line freight separation is part of the PTC project, while the Arsenal and Hunt-Wayne interlockings, and Norristown Line third track can increase service frequency. Bus and trolley enhancements on Roosevelt Boulevard and other routes will help to speed up service, which will encourage ridership and should reduce operating expenses.

NEW PAYMENT TECHNOLOGY

PHOTO: SEPTA

TABLE 12:

MAJOR REGIONAL TRANSIT OPERATIONAL IMPROVEMENT PROJECTS

FACILITY	PROJECT SCOPE	LOCATION	TIMING	FUNDED COST *(MILLIONS IN Y-O-E $)*	UNFUNDED COST *(MILLIONS IN 2013 $)*
Atlantic City Rail Line Service Frequency Improvements	Siding and station improvements, new vehicles for increased service frequency	Camden	2025-2040	$ 152.4	
Fare Modernization	New fare payment technologies at SEPTA for all modes	Pennsylvania Subregion	2014-2018	$ 203.3	
Regional Rail Operational Improvements	Interlockings, sidings, flyovers, and freight separation projects to increase the speed and frequency of the regional rail system	Bucks, Delaware, Montgomery, Philadelphia	2025-2040	$ 210.0	
Route 23 and 56 Trolley Restoration	Trolley vehicle purchase and improvements for entire routes	Philadelphia	Unfunded	$ 2.0	$ 317.0
Roosevelt Boulevard Better Bus	Stations, signal prioritization, and painted bus only lane along Roosevelt Boulevard between Neshaminy Mall and both Hunting Park Station and Frankford Transportation Center	Bucks, Philadelphia	2025-2040	$ 40.0	
West Trenton Line	CSX/West Trenton separation project	Bucks	2014-2018	$ 5.8	
Norristown Line	3rd Track	Montgomery	2019-2030	$34.5	

SOURCE: DVRPC

AIR QUALITY CONFORMITY

The Environmental Protection Agency (EPA) has established health-based standards for six criteria air pollutants, referred to as the National Ambient Air Quality Standards (NAAQS). Air quality in the DVRPC region does not meet the standards for two of these pollutants: ground level ozone and fine particulate matter ($PM_{2.5}$). Therefore, the Clean Air Act requires DVRPC to demonstrate that the transportation projects contained in the TIPs and Plan do not make the region's air quality worse or impede the region's progress toward meeting the NAAQS. The process of this demonstration is referred to as transportation conformity.

DVRPC demonstrates transportation conformity by using a travel demand model to estimate the motor vehicle emissions from all of the major regional projects in the TIPs and Plan and comparing those emissions against budgets or limits established by the states. This process is conducted in close coordination with an interagency consultation group, which is comprised of state and federal regulatory environmental, transportation, and transit agencies. DVRPC has successfully demonstrated the transportation conformity of *Connections 2040* and the Pennsylvania and New Jersey TIPs in accordance with the corresponding state implementation plans and Clean Air Act requirements.

MAJOR REGIONAL TRANSIT SYSTEM EXPANSION PROJECTS

With the passage of Act 89, the Pennsylvania subregion was able to fund two new system expansion projects. The Media-Elwyn Line extension to Wawa is funded in the TIP's 12-year program, and will open by 2026. The Norristown High Speed Line Spur to King of Prussia is funded in the Plan and will open in the later years of the Plan.

In New Jersey, the Plan funds two new bus rapid transit (BRT) lines and begins construction on one rail line. The South Jersey BRT (Map ID 50) will run along NJ 42 and NJ 55 in Gloucester County into Center City, Philadelphia. The US 1 BRT (Map ID 52) contains a number of new bus routes in Mercer County. The Glassboro-Camden line (Map ID 51) would be under construction, but not operational, in 2040.

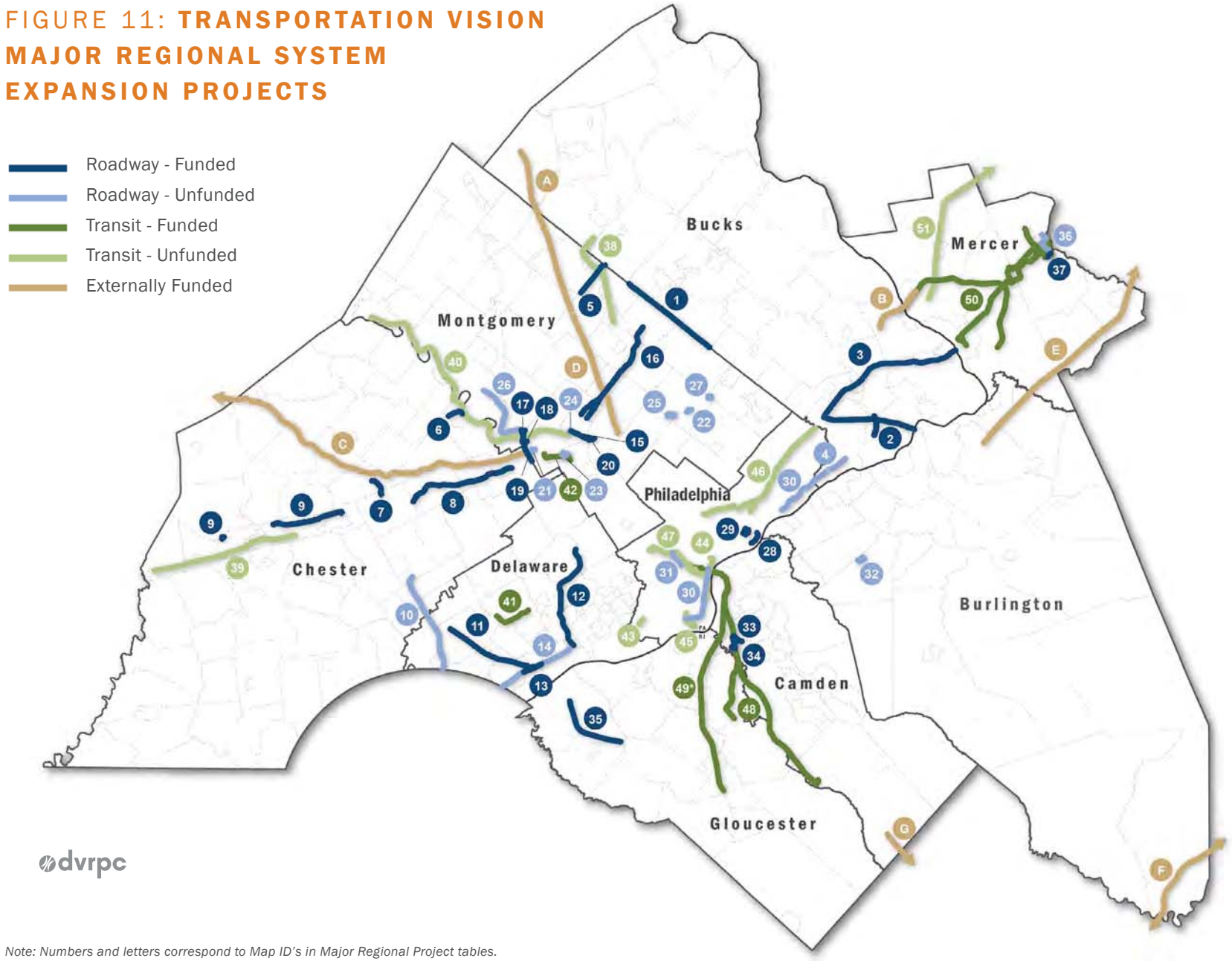
TABLE 13:
MAJOR REGIONAL TRANSIT SYSTEM EXPANSION PROJECTS

MAP ID	FACILITY	PROJECT SCOPE	LOCATION	TIMING	FUNDED COST *(MILLIONS IN Y-O-E $)*	UNFUNDED COST *(MILLIONS IN 2013 $)*
38	Lansdale Line	Extension to Pennridge, PA	Bucks, Montgomery	Unfunded		$ 182.0
39	Thorndale Line	Extension to Atglen, PA	Chester	Unfunded		$ 55.0
40	Norristown Line	Extension to Pottstown, PA	Chester, Montgomery	Unfunded		$ 500.0
41	Elwyn Line	Extension to Wawa, PA	Delaware	2019-2024	$ 105.9	
42	Norristown High Speed Line*	Rail line extension from Hughes Park to King of Prussia	Montgomery	2025-2040	$ 488.3	
43	Airport Line/Route 36	New Airport Line Station at Eastwick and extend Route 36	Philadelphia	Unfunded		$ 36.0
44	Delaware Ave. Line	New transit line within Philadelphia	Philadelphia	Unfunded		$ 850.0
45	Broad Street Line	Broad Street Line extension from AT&T Station to the Navy Yard	Philadelphia	Unfunded		$ 429.0
46	Roosevelt Boulevard Line	New transit line along Roosevelt Boulevard from Lower Bucks County to Frankford Transportation Center and Broad Street	Philadelphia	Unfunded		$ 200.0
47	Cultural Connector	New transit line along City Branch to Centennial District	Philadelphia	Unfunded		$ 258.0
48	South Jersey BRT	New BRT from Avandale Park and Ride and Delsea Drive to Center City Philadelphia	Camden, Gloucester, Philadelphia	2014-2023	$ 46.0	
49	Glassboro-Camden Line	New transit line from Camden to Gloucester County	Camden, Gloucester	Under construction, not operational in 2040	$ 2,084.9	$ 528.0
50	US 1 BRT	New bus rapid transit service in central New Jersey along US 1 Corridor	Mercer	2025-2040	$ 494.3	
51	West Trenton Line	New line from West Trenton Station to Bridgewater, NJ; Relocate West Trenton Station to near Parkway Avenue TOD	Mercer	Unfunded		$ 110.0

SOURCE: DVRPC

**SEPTA is applying for Federal New Starts grant for this project. Funded Cost represents the state and local 50 percent match.*

FIGURE 11: TRANSPORTATION VISION MAJOR REGIONAL SYSTEM EXPANSION PROJECTS



Note: Numbers and letters correspond to Map ID's in Major Regional Project tables.
** Project is partially funded in the fiscally constrained plan. It will be under construction but not operational in 2040.*

1. County Line Road
2. I-95 at PA Turnpike
3. US 1
4. I-95 Bucks County Hard Shoulder Running
5. PA 309 Connector Road
6. French Creek Parkway
7. PA 100
8. US 202 (Section 300)
9. US 30/Coatesville-Downingtown Bypass Interchange Improvements and Widening
10. US 202 (Section 100)
11. US 322
12. I-476 Hard Shoulder Running
13. I-95 / US 322 / Highland Avenue Interchange
14. I-95 Delaware County Hard Shoulder Running
15. Lafayette Street
16. US 202 (Section 600)
17. US 422 at PA 363 Interchange (River Crossing)
18. US 422 Bridge at PA 23 Interchange (River Crossing)
19. US 422 Mainline Widening (River Crossing)
20. I-276 at Lafayette Street/Ridge Avenue
21. I-276/I-76 Valley Forge Interchange
22. I-276 at Virginia Drive
23. I-276 at Henderson Road
24. US 202 Dannehower Bridge and Lafayette Street
25. I-276 at PA 611
26. US 422 Hard Shoulder Running
27. I-276 at PA 63 (Welsh Road)
28. North Delaware Avenue
29. Adams Avenue Connector
30. I-95 Philadelphia Hard Shoulder Running
31. I-76 Hard Shoulder Running
32. I-295 at NJ 38
33. I-295 (Direct Connect)
34. I-295 at I-76/NJ 42
35. US 322
36. US 1 - Penns Neck Area
37. Vaughn Drive Connector
38. Pennridge Line
39. Atglen Line
40. Pottstown Line
41. Wawa Line
42. Norristown High Speed Line
43. Airport Line/Route 36
44. Delaware Avenue Line
45. Broad Street Line
46. Roosevelt Boulevard Line
47. Cultural Connector
48. South Jersey BRT
49*. Glassboro-Camden Line
50. US 1 BRT
51. West Trenton Line
A. I-476 (PA Turnpike Northeast Extension)
B. I-95 at Scudder Falls Bridge
C. I-76 (PA Turnpike)
D. I-476 (PA Turnpike Northeast Extension)
E. New Jersey Turnpike
F. Garden State Parkway
G. Atlantic City Expressway

SEPTA REGENERATIVE BRAKING

Transit service is inherently sustainable by emitting less pollution per passenger mile than cars, and by supporting denser, more efficient development patterns. The region's transit operators have demonstrated a commitment to become even more sustainable by reducing energy use through a number of innovative efforts.

Most significantly, SEPTA has developed an aggressive program to utilize regenerative braking technologies to feed energy back into its vehicle fleets. Hybrid buses, trains, and trolleys all now utilize regenerative braking for auxiliary power (monitors, displays, lighting, heating, and cooling) and vehicle acceleration. Of note, SEPTA's hybrid electric buses are 40 percent more energy-efficient than its diesel buses, in large part because they perform particularly well in the stop-and-go driving that comprises much of the SEPTA service area. On the rails, new Silverliner Vs are much more energy efficient (99.5 percent power transmission capture) than the Silverliner II and III fleets they replaced (76.5 percent power transmission capture). Overall, SEPTA estimates that the vehicle energy-efficiency efforts have reduced energy costs by nearly $7 million per year.

SEPTA is now taking regenerative braking to the next level by capturing and storing it for other uses — namely, feeding it back into the energy grid. By reselling energy through the demand response and frequency regulation markets, SEPTA created new revenue streams to support its operations. One of these devices has already been installed at a substation along the Market-Frankford Line, and a second is on the way. There are more than two dozen other substations where this technology could be applied in the future.

TABLE 14:

EXTERNALLY FUNDED MAJOR REGIONAL PROJECTS

MAP ID	FACILITY	PROJECT SCOPE	LOCATION	TIMING	COST *(MILLIONS IN 2013 $)*
A	I-476 (PA Turnpike Northeast Extension)	Widen to 6 lanes from Lansdale to Quakertown	Bucks, Montgomery	2025-2040	$ 665.0
B	I-95 at Scudder Falls Bridge	Widen I-95 from PA 332 to the Delaware River Bridge; Replace and widen the Delaware River Bridge; Reconfigure I-95 interchanges at Taylorsville Road and NJ 29; and repave I-95 from PA 332 to CR 579 (Bear Tavern Road)	Bucks, Mercer	2014-2018	$ 328.6
C	I-76 (PA Turnpike)	Widen to 6 lanes from Morgantown, Berks County to Valley Forge	Chester, Montgomery	2019-2024	$ 300.0
D	I-476 (PA Turnpike Northeast Extension)	Widen to 6 lanes from Mid-County to Lansdale interchanges	Montgomery	2014-2018	$ 246.5
E	New Jersey Turnpike	Widen from Exit 6 to Exit 9	Burlington, Mercer	2014-2017	$ 2,500.0
F	Garden State Parkway	Widen to 6 lanes from Interchange 30 to Interchange 63; Improvements to the Bass River and Mullica River crossings	Burlington	2014-2017	$ 540.0
G	Atlantic City Expressway	Widen to 6 lanes from Route 73 to Atlantic County	Camden	2014-2017	$ 150.0
H	Atlantic City Expressway	All electronic tolling	Camden, Gloucester	2014-2017	$ 50.0
I	Pennsylvania Turnpike	All electronic tolling	Bucks, Chester, Montgomery	2014-2024	$ 257.0

SOURCE: DVRPC

CLOSING THE FUNDING GAP

The additional funding from Act 89 will lead to a substantial reduction in the region's funding gap. However, current funding levels are still not enough to meet the region's transportation needs. DVRPC's transportation infrastructure needs assessment found a minimum regional funding gap of over $53 billion between the Vision Plan and the Funded Plan over the life of *Connections 2040*. Failure to maintain and improve the transportation system reduces the region's economic competitiveness, as it becomes a less attractive location for business investment; the environment is degraded due to increased congestion; more vehicular damage is caused due to poor road conditions; and vehicular crashes increase due to less-safe driving conditions.

The majority of the funding that the region currently uses to build, maintain, and repair its road and transit infrastructure currently comes from the federal and state governments. Local funding for transportation capital projects in the region remain well below peer region averages. This restricts Greater Philadelphia's ability to fulfill the Vision Plan and puts the region at a competitive disadvantage when compared to its peers across the nation and around the world. The region does not have the power to control the level of federal or state funding that it receives. Given the large set of needs that will remain unmet at currently available funding levels, the region should continue to explore ways to close its funding gap. This can be through project right-sizing, better program management, and innovative project delivery on the expenditure side, and raising additional revenues, with a focus on local funding options or public-private partnerships on the revenue side.

INNOVATION

RUTGERS CAIT BRIDGE INSPECTION ROBOT

It may come as a surprise that bridge inspections create one of the greatest opportunities for innovation and cost savings. Current inspections require a team of engineers and technicians several hours to perform, and the results come largely from their visual analysis. The Rutgers Center for Advanced Infrastructure and Transportation (CAIT) has developed a robot that can perform a much more detailed bridge inspection in a fraction of the time that it currently takes. Bridge inspections often require lane, or even full bridge, closures, tying up traffic in the process. By shortening inspection time, congestion is reduced.

Not only are the time savings substantial, but the data collected is much more detailed and informative about the bridge's actual condition. By using ground penetrating radar, the CAIT robot is able to quantitatively assess internal bridge deck conditions that currently can only be determined with practices that further degrade bridge quality and have safety risks (such as loading the bridge with heavy amounts of weight to test whether it can handle design loads). With a better understanding of bridge conditions, projects that can extend bridge lifespan can be more accurately timed, maximizing our public investments.

Project Right-Sizing

Right-sizing and seeking efficiencies throughout the transportation system are a key component of the ongoing "smart transportation" programs at both PennDOT and NJDOT. Smart transportation works to resolve transportation problems with solutions that are context sensitive, affordable, supported by the communities involved, and implementable in a reasonable timeframe. Right-sizing means the DOT will consider reduced scale alternatives like transportation system management before developing alternatives, such as new or widened roadways. If safety, and not congestion, is the problem, the DOT will consider focused solutions that can improve safety without increasing capacity. However, safety must be considered in all projects.

Local Funding Options

Additional funding is needed if the region wants to realize the transportation vision set forth in this Plan. New funds will most likely need to be generated at all levels, including locally. To do this, the region needs to find ways to translate the growth in its economic vitality into improvements in the transportation system. Options could include bonds, dedicating taxes or fees to transportation programs, or new or increased tolls. Ideally, any new local transportation funding sources should be easy to implement, stable and sustainable over time, equitable both for system users and over geographic areas, should further the policies of the Plan, and not yield unintended negative economic impacts.

Most of these funding options require state-enabling legislation before the region could pursue them any further. It is not likely that any single option could fill the funding gap on its own. DVRPC has not identified any of the options as a preferred alternative. Rather, the hope is to generate discussion and develop consensus on the optimal funding mechanisms to help the region achieve its transportation goals. Various options for raising additional revenue are discussed below and have been grouped into three major categories: bonds and other financing programs; taxes and fees; and public-private partnerships.

Many economists and transportation experts recognize that congestion pricing can be used for travel demand management and to increase system efficiency. In many ways they are similar to, or dependent upon tolling.

BONDS

Large transportation projects cause spikes in expenditures, and bonds can help to fill the resulting short-term funding gaps created by implementing major system improvements. When construction costs are rising faster than interest rates, issuing bonds can speed up project development and reduce expenses. Smart transportation investments can generate positive economic returns through increased efficiency. This should increase general revenues, which can help to pay off bonds. While bonds are a useful tool for financing projects, they are not a source of revenue, and there still needs to be a mechanism that can eventually retire them.

From 2008 to 2010, Pennsylvania issued $600 million in bonds to fund repairs on more than 1,100 bridges. This represented a change in philosophy, as the commonwealth had long relied exclusively on pay-as-you-go funding for transportation improvements following a bond related debt crisis in the 1970s. The New Jersey Transportation Trust Authority (NJTTA) is holding $13.4 billion in outstanding transportation bonds, and a total of $27.4 billion in outstanding debt. Annual service on this debt amounts to roughly the same amount that is collected every year in state gas tax receipts.

TRANSPORTATION INFRASTRUCTURE FINANCE AND INNOVATION ACT (TIFIA)

The current federal transportation bill, MAP-21, expanded funding for the TIFIA program to $750 million in FY 2013 and $1 billion in FY 2014. This program provides supplemental or subordinate financing for surface transportation projects (highway, transit, intercity passenger rail, some freight rail, and intermodal freight transfer facilities). This funding can offer a line of credit to a public or private project sponsor of up to 33 percent of the total project cost; a loan of up to 49 percent of the project cost; or a combination of a loan and a line of credit. The maximum TIFIA loan amount is $50 million for most types of projects.

STATE INFRASTRUCTURE BANKS

The Pennsylvania Infrastructure Bank (PIB) provides low-interest loans to help fund transportation projects in the commonwealth. Eligibility for these loans extends to: local governments, transportation authorities, economic development agencies, nonprofits, and corporations. The PIB can loan up to $30 million per year and has funded aviation, roadway, rail freight, and transit capital projects. Upper Merion Township recently received a $3.5 million PIB loan to fund the widening of Henderson Road.

The PIB helps to break large transportation project expenditures down into more affordable chunks, with up to a 10-year repayment period. However, like bonds and other alternative financing options, the PIB helps to advance project delivery and leverage state and federal funds, but is not a funding source on its own. New Jersey does not currently have a state infrastructure bank, but a recent proposal to create one appears to be moving in the New Jersey legislature.

TAXES AND FEES

DVRPC has reviewed more than two dozen potential different taxes or fees for applicability to fund the region's transportation system as part of the ongoing discussion of how to fund transportation investments. *Connections 2040* turns the focus to direct user fees, which are widely considered to be the fairest way to pay for system improvements. These fees are related to the use of the transportation system and can include vehicle miles traveled fees, tolling, gas taxes, or transit fares, amongst others.

Tolling options include existing 'free' highways and adding regional toll surcharges to facilities that are already tolled. Congestion-based pricing varies the cost of using a road by time of day to reduce peak-period demand. This is considered one of the most effective ways to reduce congestion. Adding tolls to interstate highways is not allowed under current regulations and would require federal government approval. To be equitable, the cost of paying for transportation improvements should be spread amongst various facilities to reduce the impact on users throughout the region, as opposed to on fewer facilities, which unfairly burdens only a portion of the region's transportation system users.

PUBLIC-PRIVATE PARTNERSHIPS

Public-private partnerships (PPPs) are a way to have the private sector implement one or more portions of project delivery, from design, to build, finance, maintain, or even operate. These arrangements allow some of the risk to be undertaken by the private sector, in return for the opportunity for financial gain. PPPs generally do not create new revenues for transportation, but allow for streamlined project delivery, innovative financing approaches, and leveraging of public sector funds. Private investments in infrastructure will still need to be repaid, whether through direct tolling or lease agreements that use transportation trust fund or general fund revenues.

TABLE 15: **REGIONAL USER FEES SUMMARY**

FUNDING OPTION	PROPOSED RATE	% INCREASE*	ANNUAL REVENUE *(MILLIONS IN 2012 $)*	IMPACTS
Carbon Tax	$15 per ton of transportation generated CO_2	1.3%	$ 350.0	Likely to increase use of alternative fuel or energy efficient vehicles, and may encourage alternative modes of transportation
Congestion Pricing	(a) Cordon line - $5 per car per day entering Center City Cordon Line (Callowhill St. to South St. and Schuylkill River to Delaware River) (b) Interstate Highways - Average 20 cents per mile during peak period	(a) 25.0% (b) 36.0%	(a) $ 110.0 (b) $ 660.0	(a) May have negative impacts on Center City, but this area of the region has the most transportation options; high administration costs (b) Option with most congestion reduction; high administration costs
Fuel Sales Tax	6.0% of consumer price	2.0%	$ 420.0	Likely to increase use of alternative fuel or energy efficient vehicles, and may encourage alternative modes of transportation
Regional Toll Surcharge	(a) $1.00 surcharge on 12 regional turnpike exits (b) $1.00 surcharge on 9 toll bridges over Delaware River	(a) 18.7% - 23.7% (b) 20% - 100%	(a) $ 100.0 (b) $ 100.0	Many trips lack transportation alternatives
Sales Tax	Increase existing rate by 0.25 percent	0.25%	$ 170.0	Little impact on transportation system use and development patterns
Toll Existing Highways	$0.10 (avg.) per VMT on major regional highways	18.7%	$ 560.0	May shift traffic onto local roads, high administration costs; may encourage transit use
Transit Fare Increases	Increase all fares by 1 percent	1%	$ 1.5	May reduce transit ridership and increase VMT
Vehicle Miles Traveled Fee	$0.01 per mile	1.8%	$ 380.0	Likely the largest decline in VMT
Vehicle Registration Fee	Increase $10 per vehicle	0.2%	$ 33.0	Very little impact on transportation system use and development patterns

SOURCE: DVRPC

** Percent increase determined by comparing per-mile cost to $0.555 federal reimbursement rate for all fees, except: cordon line toll (average cost of vehicle trip to Center City); regional toll surcharge (average toll paid); sales tax (increase in cost of goods and services); transit fares (existing fares); and vehicle registration fees (average annual auto costs).*

Pennsylvania formally legalized PPPs in Act 88 of 2012. This Act created a Public Private Transportation Partnership Board to approve potential PPP projects. Regional public entities such as PennDOT, the Pennsylvania Turnpike, and SEPTA can solicit a Request for Proposal (RFP) through this board. Responses to the RFP go to the board, which then selects the private respondent whose proposal offers the highest value and meets the best interests of the commonwealth and its residents. Potential projects can build new facilities or improve the capacity or performance of existing facilities.

New Jersey does not currently have state-enabling legislation for transportation PPPs, although the River LINE was designed and built, and is still operated and maintained by a private entity.

Time for Action

The transportation investments outlined in *Connections 2040* help further the regional transportation, land use, environmental, and economic competitiveness goals contained in the Plan. A top priority in the region is the rebuilding and maintenance of the transportation infrastructure, and almost 80 percent of projected available funding will be allocated to rebuild the roadway and transit system. By focusing growth and development in Centers, the region will have less demand for new roadway facilities. This will reduce the amount of infrastructure needed to be maintained in the future.

Placing development near existing transit routes will help increase ridership. This will improve the operating cost recovery of our transit system, making it more self-sufficient on the operating side, and allow for more capital funding for system improvements.

The next largest amount of funding is allocated toward improving the operation of the system. Finally, new roadway capacity funding is capped at five percent of total anticipated roadway revenue. This funding structure follows the prioritization of needs for both the roadway and transit systems that were outlined as strategic policies.

Transit, bicycle, and pedestrian projects reflect a significant funding commitment in the Plan. This reflects the goal of constructing a multimodal transportation network.

The *Connections 2040* Plan creates a vision of a more sustainable region. Modernizing transportation infrastructure is a major component to achieving sustainability. Act 89 provides a significant increase in transportation investment in the Pennsylvania subregion. However, additional investment is still needed to make the vision a reality. Transportation infrastructure shapes land use, impacts the environment, and affects our global competitiveness.

The Plan seeks to create more transportation choices for retirees and young people, many of whom are already showing a preference for smaller housing units located in dense, vibrant communities with easy access to transportation alternatives. Drivers will benefit from the provision of better information, improved safety, and reduced congestion. In a world of increasing scarcity, uncertain energy costs, growing concern about climate change, and intense global competition; the provision of mixed-use, transit-oriented communities are critical for reducing CO_2 emissions, attracting skilled workers, and providing for a high quality of life.

To achieve this vision, we all need to make the choices that support it. Locating households and businesses in Centers, using alternative transportation, and supporting funding options to pay for the transportation improvements are all needed to make the Plan a reality. The Plan continues the dialogue and consensus building on finding the optimal funding solutions. It is likely that a combination of several funding mechanisms, with help from all levels of government, is needed in order to fully fund the region's identified needs.

The region's local funding contribution is low compared to other large metropolitan areas. This will become a signficant issue if, as expected, federal transportation dollars continue to decline. This Plan issues a challenge to the region's leaders, stakeholders, and citizenry to reach consensus on new local and regional means of maintaining and modernizing the region's critical transportation infrastructure, which improves our standard of living, economic competitiveness, and sustainability.

CONNECTIONS 2040

PLAN FOR GREATER PHILADELPHIA

dvrpc

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ABSTRACT:

The *Connections 2040 Plan for Greater Philadelphia* assesses regional trends and forecasts and sets forth a vision for the future. The Plan establishes goals and identifies strategies to achieve its core principles: managing growth and protecting natural resources, creating livable communities, building the economy, and establishing a modern, multimodal transportation system. The Plan identifies a set of transportation investments that are needed to preserve and maintain the existing system, as well as other critical improvements that make the system operate more efficiently and expand capacity. The passage of Act 89 in November 2013 will provide additional funding for transportation investments in the Pennsylvania portion of the DVRPC region. The Plan is being amended to include additional projects in the Pennsylvania subregion.

STAFF CONTACT: Michael Boyer
Manager, Office of Long-Range Planning and Economic Coordination
Phone: 215.238.2848 | Email: mboyer@dvrpc.org

DELAWARE VALLEY dvrpc REGIONAL PLANNING COMMISSION

190 N. Independence Mall West, 8th Floor
Philadelphia PA 19106 | Phone: 215.592.1800
Fax: 215.592.9125 | Internet: www.dvrpc.org

DELAWARE VALLEY
dvrpc
REGIONAL
PLANNING COMMISSION

190 N. Independence Mall West, 8th Floor
Philadelphia, PA 19106-1520

Telephone 215.592.1800
Fax 215.592.9125
www.dvrpc.org