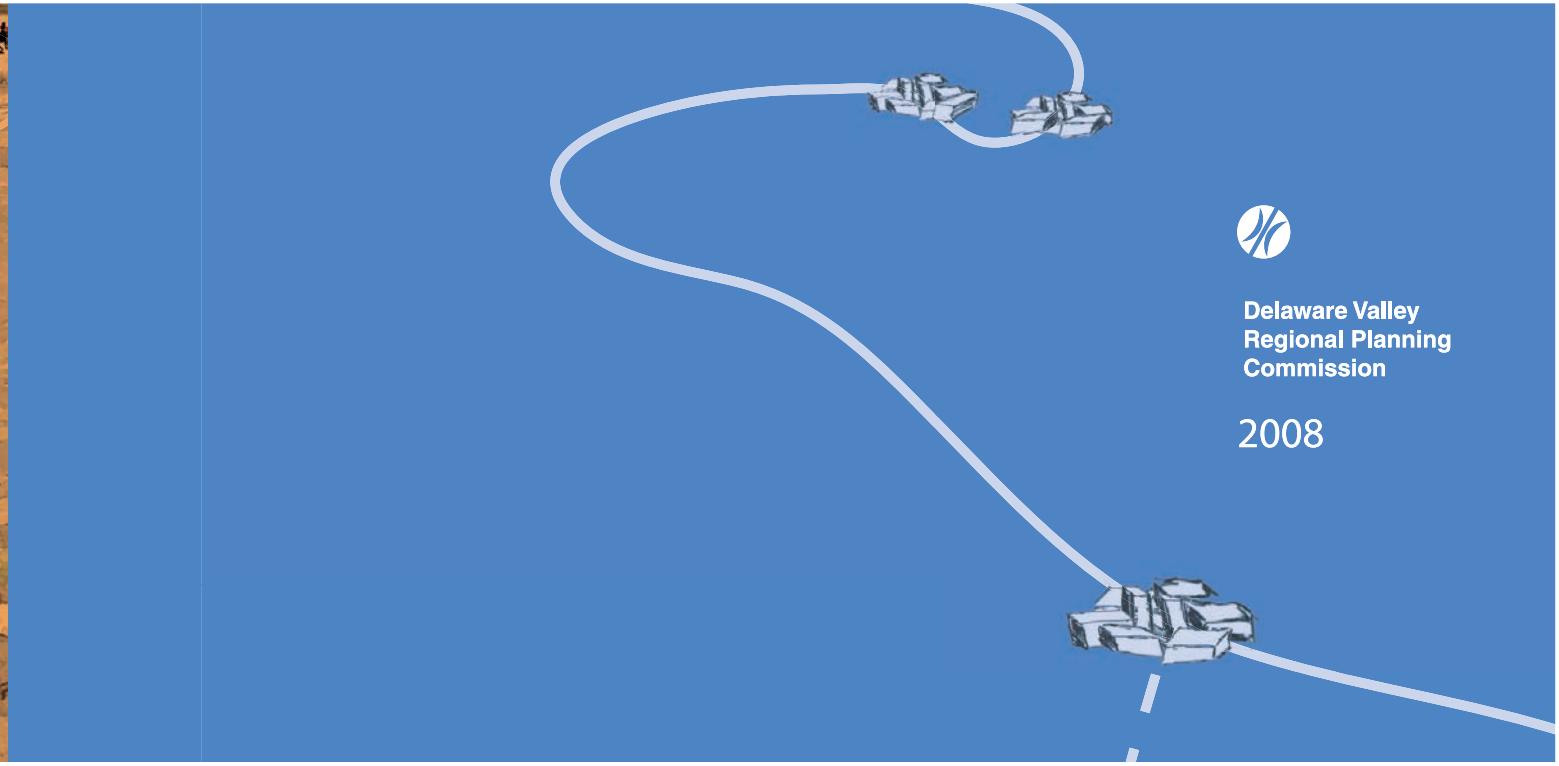


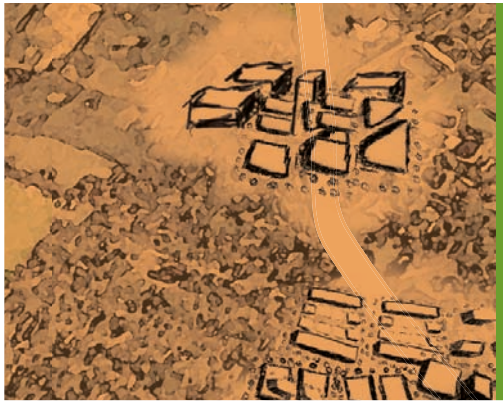
Delaware Valley
Regional Planning
Commission

2008

CONNECTIONS
THE REGIONAL PLAN FOR
A SUSTAINABLE FUTURE

DVRPC

LONG-RANGE VISION for TRANSIT



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.

The DVRPC logo is adapted from the official seal of the Commission 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 flowing through it. The two adjoining crescents represent the Commonwealth of Pennsylvania and the State of New Jersey. The logo combines these elements to depict the areas served by DVRPC.

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 this report's findings and conclusions, which may not represent the official views of policies of the funding agencies.

DVRPC fully complies with Title VI of the Civil Rights Act of 1964 and related statutes and regulations in all programs and activities. DVRPC's website may be translated into Spanish, Russian, and Traditional Chinese online by visiting www.dvrpc.org. Publications and other public documents can be made available in alternative languages or formats, if requested. For more information, please call (215) 238-2871.

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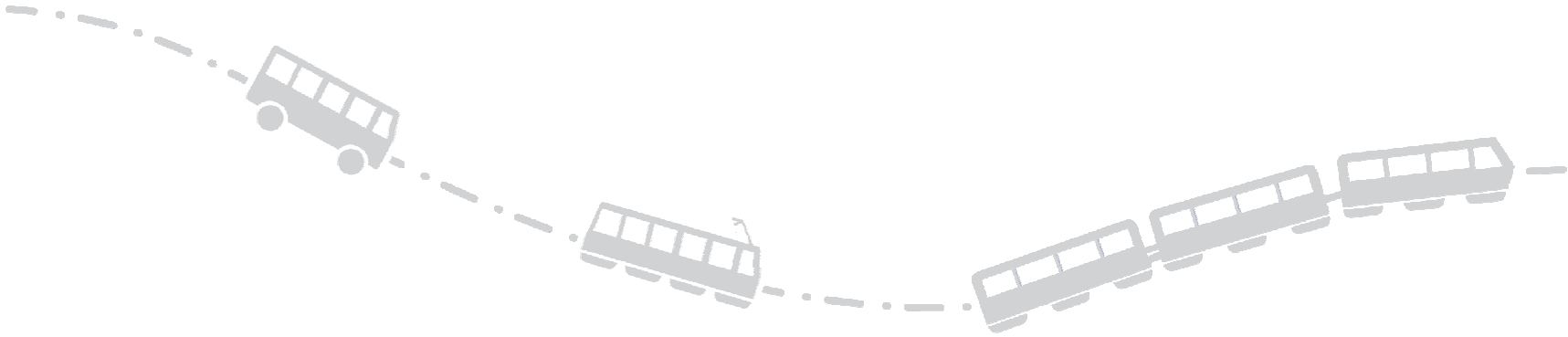
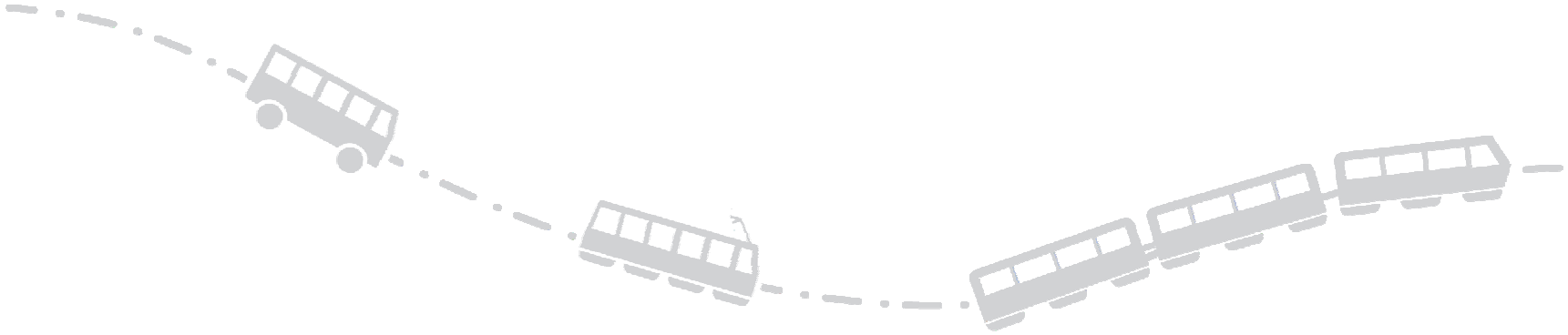




Executive Summary

This Long-Range Transit Vision highlights the potential benefits of an improved transit network on the DVRPC region in the coming decades. The region's current transit assets already represent a significant competitive advantage amid rising energy costs and concerns about climate change. That said, the region is not yet one in which transit can be taken for granted by passengers throughout the region as a fact of life, where riding is easy, seamless, and accessible.

The purpose of this transit vision report is to highlight the long-term benefits of a modernized, integrated transit network that is coordinated with land development. This document assembles a handful of transit expansion and enhancement projects into **a series of four vision narratives**. *These narratives do not represent our exclusive regional priorities*, nor do they seek to identify the projects that are most feasible, or closest to advancement. Instead, the narratives provide a way of illustrating the future regional benefits of a modernized transit system operating at its full potential.

The projects and priorities highlighted in the vision narratives are drawn from public and stakeholder outreach as well as ongoing analysis by DVRPC, NJ TRANSIT, PATCO, SEPTA, and others to identify operational improvements and new transit service options. Most of these proposals for new service have completed or are undergoing detailed study to assess their feasibility and cost-effectiveness, although no firm commitments to proceed are yet in place.

Systemwide operational improvements and investment emphases

These improvements, which are generally agreed-upon as goals by transit agencies and other policymakers, will allow the region to realize additional benefits from the existing transit network and may proceed independently of expansion projects as near- to mid-term priorities. In contrast to the expansion projects that follow, progress toward each of these policies and priorities can be made incrementally as funding becomes available.

- Fare modernization with interoperability across carriers (SEPTA, NJ TRANSIT, PATCO)
- Higher levels of transit service
  - Higher frequencies and extended hours
  - Faster and more effective transit service

- Improved and more seamless passenger information systems, including real-time service information
  - Schedule and route information for all of our regional transit carriers should be presented together
- Investments in stations with coordinated transit-oriented development (TOD)

Corridor/line/route system expansion projects (in alphabetical order)

1. Broad Street Subway Extension from Pattison Avenue to Navy Yard
2. Northeast Corridor Intercity Rail Improvements (including “one seat ride” commuter rail to New York City)
3. Northeast Philadelphia Rapid Transit Line (Roosevelt Boulevard Line)
4. Paoli Transportation Center
5. PATCO Center City/Delaware Riverfront Expansion (Delaware Avenue Line)
6. PATCO South Jersey Expansion
7. Pennsauken Transportation Center (Connecting RiverLINE & Atlantic City Rail Line)
8. Quakertown Rail Restoration
9. R6 Regional Rail Extension
10. Route 100 Extension from Hughes Park to King of Prussia

The above projects and investment priorities are grouped in this report into four narrative sections that illustrate how these investments would relate to one another and to the existing regional transit network.

Transit as an Integral Element of DVRPC's Long-Range Plan for the Region

DVRPC's designation as the Metropolitan Planning Organization (MPO) for this region and the regulations of the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991, as well as subsequent federal transportation authorizations, have given the Commission an expanded and stronger role in planning to link transportation, land use and the environment. These federal regulations mandate that DVRPC prepare and maintain a long-range plan with a minimum 20-year planning horizon.

DVRPC's Long-Range Plan serves as the basis for the Transportation Improvement Program (TIP), a capital program of highway, bridge, and public transit projects, as well as separate plans for regional airports, goods movement, operations, and bicycle/pedestrian activities. Proposed projects must be included on the TIP if they are to receive federal funding. The Long-Range Plan is also used to evaluate the consistency of sewer and water projects in the New Jersey and Pennsylvania portions of the region, as well as relating regional plans to ongoing, concurrent planning at the municipal, county, and state levels.

DVRPC is developing an updated Long-Range Plan for the 2035 planning horizon, called *Connections: The Regional Plan for a Sustainable Future*. *Connections* will focus on strengthening the linkages between land use, the environment, economic development, and the transportation system. Recent long-range planning policies have emphasized sustainable growth, redeveloping existing regional centers, and funding transportation projects which support the plan's goals. *Connections* will additionally address new focus areas such as climate change and energy needs.

The *Connections* regional plan seeks to connect people in the cities, suburbs, and rural communities throughout the Delaware Valley; to connect planning at the state, regional, and local levels; to connect transportation, land use, the economy, and the environment in a comprehensive way; and to connect the past, present, and future to create a competitive, efficient, equitable, and sustainable region. Our extensive regional public transit network is a significant asset and represents a competitive advantage for the DVRPC region in an era of rising energy costs and concerns about climate change. The region's many rail stations and other transit facilities provide a frame around which existing developed centers and classic towns can be reinforced and new development centers can form. In turn, these transit-oriented developments (TODs) reduce development pressures in the rural fringe, helping to preserve the region's natural areas and farmlands for future generations.

DVRPC's long-range plan *Connections* will focus on strengthening the linkages between land use, the environment, economic development, and the transportation system.

Our extensive regional public transit network is a significant asset and represents a competitive advantage for the DVRPC region in an era of rising energy costs and concerns about climate change.

Introduction to the DVRPC Long-Range Vision for Transit

Over the past two decades, a host of major transit projects have been proposed and studied within the Delaware Valley Regional Planning Commission (DVRPC) region. Of all these projects, however, only one–New Jersey Transit's RiverLINE–has been built. The fact that so many transit projects in our region have been proposed and generated public interest and excitement, yet were deemed unfeasible or set aside, is instructive: it is very difficult to turn a major transit project from a good idea into an operating line.

This fact reflects the reality that local governments and transit agencies have multiple priorities and often severe funding constraints. Maintenance and upkeep of the existing transit network, along with roads and bridges, are themselves a significant funding challenge. There is simply not enough money to fund the multitude of proposed expansion projects without a dramatic rethinking of funding priorities at every level of government.

Because of the enormously high construction costs for new rail lines, cities and regions in the United States typically rely on federal New Starts funding for a significant portion of their cost (in recent years, up to 50%). The Philadelphia region has had difficulty competing for New Starts funding because of relatively modest population and employment growth and because the current transit network is already a tremendous asset that provides comprehensive service compared to most other regions. New project proposals would shift some riders from existing lines with little new ridership, whereas projects proposed in cities with no or comparatively little transit would generate entirely new riders.

Once transit projects are built, operation and maintenance require a funding commitment by governments and transit agencies. Annual operating subsidies can be very high for some projects, and cost recovery can be particularly poor during a line's early years, as riders and businesses adjust their transportation and location choices to take advantage of the new transit service.

Despite all these challenges, **the reality is that every one of the region's "wish list" projects has the potential to be successful** in terms of transportation benefits for the region. They can also each be successful in terms of economic development and in supporting the smart, transit-oriented development the region desires to become more sustainable. The projects that advance, or that become "hot" priorities from time to time, often have as much to do with political will and project leadership as with real merit over other competing projects. **The key ingredient for success is local leadership with the financial commitment to shepherd a project through to**

It is very difficult to turn a major transit project from a good idea into an operating line.

Every "wish list" project can be a successful project, with local development planning and financial commitment.

construction and service maturity, coupled with supportive land use planning by local governments. New Jersey Transit's RiverLINE was regarded by some as a costly boondoggle with limited ridership potential during its development, even in certain planning circles. Yet today–four years after its opening–ridership has exceeded forecasts and continues to climb, and the line has been an economic development engine in the river communities along its route. Contributing to this success were sound transit-supportive planning in each of the communities along its route (many of which already had walkable, transit-supportive development patterns that reflected their historic development around rail service), coordination by active county and regional planning organizations, and leadership and financial commitment by New Jersey DOT and New Jersey Transit.

DVRPC strongly supports investments in the regional transit network, including system enhancements and network expansions that are consistent with the central tenets established in the currently adopted Long-Range Plan, *Destination 2030*:

1. To link transportation investments with economic development and use them as a foundation and catalyst to affect positive community change;
2. To "fix it first" (i.e., prioritize maintenance and investment in the existing system over expansion);
3. To make investments that generate growth in already-developed places, reinforcing existing development and maintaining centers; and
4. To focus investments in multimodal corridors, where they are well integrated with automobile, bicycle, and pedestrian access.

Any transit expansion proposal that is consistent with these goals would be supported by DVRPC, provided the existing transit network is in a state of good repair and the proposed expansion would not place undue financial burdens on local governments or transit agencies.

In the coming decades, issues such as climate change and rising oil costs will likely continue to make public transit an increasing priority in the DVRPC region, as well as the broader northeast corridor and nation. We are fortunate that the region has a tremendous transit network already in place, from which we can realize even greater benefits through investments in operational improvements and higher levels of service.

We expect that rising energy prices will continue to make transit service more desirable to new groups of riders. This new interest in transit among previously disinterested communities often results in demands for service and

DVRPC PRIORITIES FOR TRANSIT INVESTMENTS

First priority
Ensure the existing network is in a state of good repair.

Second priority
Investments in operational improvements to realize additional benefits from the existing system.

Third priority
Network expansions that reinforce existing or planned developed places.

Public transit will play an ever-increasing role in shaping the DVRPC region in the coming decades.

trips in locations that are difficult or impossible to effectively serve, owing to auto-oriented development patterns. DVRPC will continue to undertake regional land use planning and policy coordination that will be necessary to address these challenges in the coming decades.

Project Purpose and Approach

Planners typically use "vision" statements, narratives, or illustrations to present what a given community or location would be like if it were to develop according to a proposed plan. In the case of local land use planning, vision narratives turn often arcane ordinance language and policy statements into images and ideas that residents and other stakeholders can relate to.

The purpose of this transit vision report is to highlight the long-term benefits of a modernized, integrated transit network that is coordinated with land development. This document assembles a handful of transit expansion and enhancement projects into a series of four vision narratives. *These narratives do not represent our exclusive regional priorities*, nor do they seek to identify the projects that are most feasible, or closest to advancement. Instead, the narratives provide a way of illustrating the future regional benefits of a modernized transit system with coordinated land use planning.

These narratives represent four windows into many possibilities for a more transit-focused DVRPC region. These expansion and improvement projects serve as examples for similar benefits that would be achieved through any project that is developed consistent with the Long-Range Plan tenets summarized above. Along with investments in operational improvements like "smart card" fare payment, these four vision snapshots showcase the ability of expansion projects to support the types of sustainable development that will retain and enhance the competitiveness and livability of the DVRPC region well into the 21st century.

In combination with other planning and outreach, this document will help to inform transit policies and guide project selection for DVRPC's next Long-Range Plan *Connections: The Regional Plan for a Sustainable Future,* which extends to 2035.

The vision narratives provide a way of illustrating the future regional benefits of a modernized transit system with coordinated land use planning: a region where transit's pervasiveness and ease of use can be taken for granted.

Included projects, drawn from public and agency outreach, are used to illustrate the benefits of "best practices" on the DVRPC region.

Priorities Included in the Vision

The projects and priorities highlighted in the vision narratives are drawn from public and stakeholder outreach as well as ongoing analysis by DVRPC, NJ TRANSIT, PATCO, SEPTA, and others to identify operational improvements and new transit service options. Most of these proposals for new service have been completed or are undergoing detailed study to assess their feasibility and cost-effectiveness, although no firm commitments to proceed are yet in place.

Systemwide operational enhancements and investment emphases

These improvements, which are generally agreed-upon as goals by transit agencies and other policymakers, will allow the region to realize additional benefits from the existing transit network and may proceed independently of expansion projects as near- to mid-term priorities. In contrast to the expansion projects that follow, progress toward each of these policies and priorities can be made incrementally as funding becomes available.

- Fare modernization with interoperability across carriers (SEPTA, NJ TRANSIT, PATCO)
- Higher levels of transit service:
  - Higher frequencies and extended hours
    If a passenger knows that along every transit route at every time of day, a transit vehicle or train will arrive within a reasonable amount of time, transit becomes much more convenient to use.
  - Faster and more effective transit service
    Strategies should be pursued to move passengers faster by transit, including signal priority for buses and trolleys at select traffic signals.
- Improved and more seamless passenger information systems, including real-time service information
  - Schedule and route information for all of our regional transit carriers should be presented together. When combined with fare interoperability, this coordination of passenger information will allow a truly seamless regional transit network, where the divisions between SEPTA, NJ TRANSIT, and PATCO services are invisible to the passenger.
- Investments in stations with coordinated transit-oriented development (TOD)
  - Major transportation centers and intermodal facilities represent major opportunities for coordinated development. One need look no further than 30th Street Station, its neighboring Cira Center, and additional pending development in the station vicinity.
  - Mixed-use TOD in local station or facility areas can generate two-way transit trip flows, reconnect stations with surrounding neighborhoods, and provide an anchor for local commerce.

Corridor/line/route system expansion projects (in alphabetical order)

- Broad Street Subway Extension from Pattison Avenue to Navy Yard
- Northeast Corridor Intercity Rail Improvements (including “one seat ride” commuter rail to New York)
- Northeast Philadelphia Rapid Transit Line (Roosevelt Boulevard Line)
- Paoli Transportation Center
- PATCO Center City/Delaware Riverfront Expansion (Delaware Avenue Line)
- PATCO South Jersey Expansion
- Pennsauken Transportation Center (Connecting RiverLINE & Atlantic City Rail Line)
- Quakertown Rail Restoration
- R6 Regional Rail Extension
- Route 100 Extension from Hughes Park to King of Prussia

Introduction to the Transit Vision Narratives

The above projects and investment priorities are grouped in this report into four narrative sections which illustrate how these investments would relate to one another and to the existing regional transit network. Map 1 depicts the locations of highlighted expansion projects throughout the region. Where projects have multiple possible alignments and/or modes (i.e., Northeast Philadelphia Rapid Transit, PATCO extensions), the vision narrative will focus on one alignment for purposes of illustration, with the other possibilities being summarized in a sidebar annotation. The focus alignment is the one with the broadest consistency with the systemwide priorities that are highlighted and with the smart growth and smart transportation tenets of DVRPC’s Long-Range Plan. Within each narrative, where the specific projects from the above list are mentioned, they are highlighted in red.

The vision narratives are supplemented with “nuts & bolts” that highlight specific project components, investments, choices, and linkages, as well as challenges to be overcome if the vision is to be attained. For example, several recent transit network expansion projects have been found to be uncompetitive for Federal New Starts funding (typically the largest public funding source for new passenger rail projects), a fact that may hold true for other, similar efforts. The New Starts rules and framework then become a challenge that needs to be addressed through project design, future revisions to the New Starts rules, or the use of increased private sector or local funding in order for such projects to be implemented. The four narrative sections of this report are as follows:

Where proposed projects have multiple alignments, the focus alignment here is the one that is most consistent with DVRPC’s Long-Range Plan.

- **Service extensions in the urban core**
  Vision for the Broad Street Subway corridor
  This narrative reflects extensions of the Broad Street Subway south to the Navy Yard and northeast along the Roosevelt Boulevard Corridor. The latter is presented as a rail transit project, but a Bus Rapid Transit (BRT) possibility is also described. This narrative emphasizes the benefits of transit supportive land use, particularly in the form of a built-out Navy Yard co-developed with the southern extension.

- **Transit as an anchor for waterfront development**
  Vision for an urban Delaware River waterfront
  This narrative describes the impact of new rail transit along the Delaware River in Philadelphia, as well as its connections with other rail and bus service in the city. Connecting city bus services are described as having Transit First (BRT elements) features. New passenger information systems and fare modernization/interoperability are also emphasized.

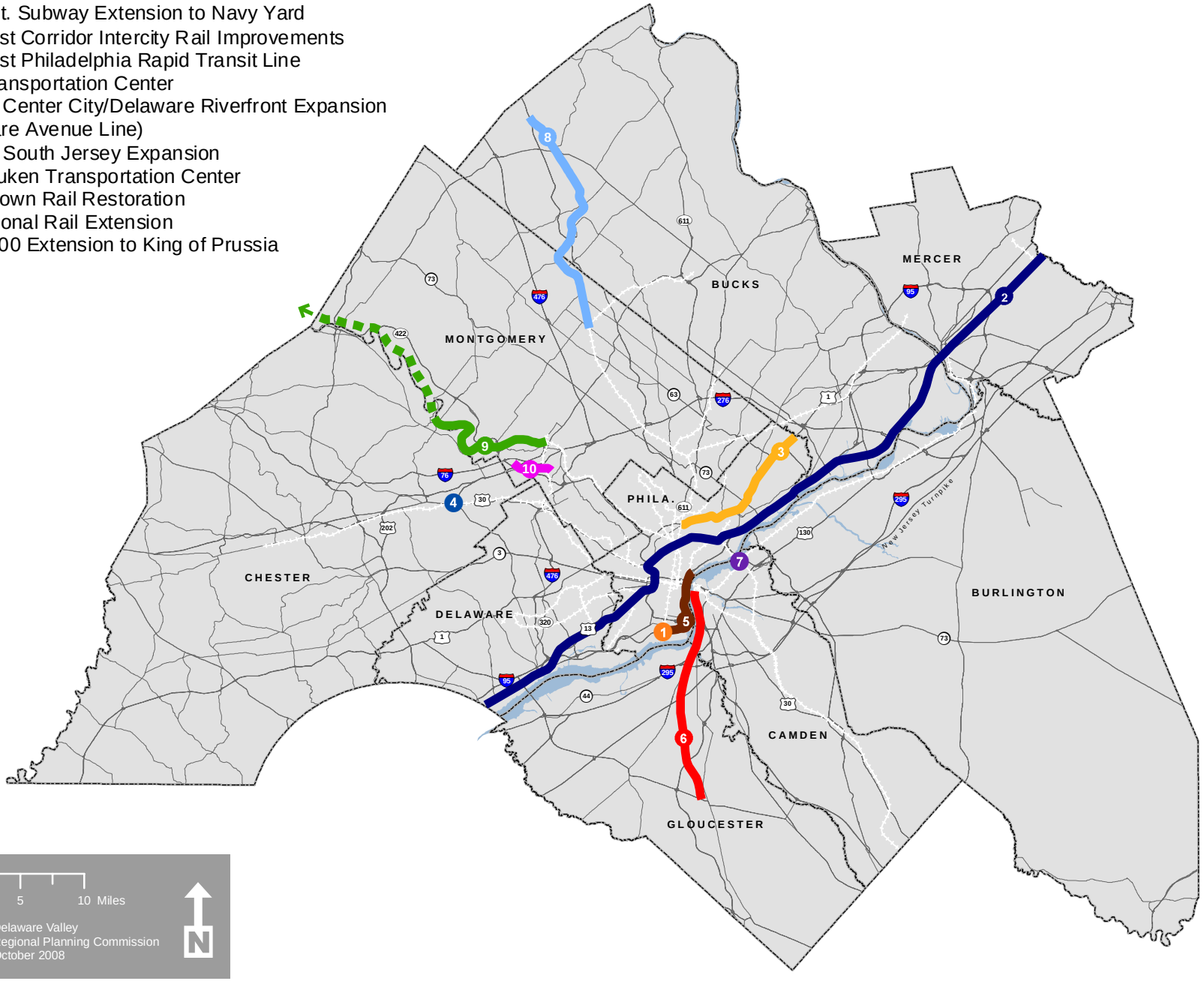
- **Reconnecting and reinforcing older suburbs**
  Vision for transit connectivity between South Jersey and the northeast megaregion
  This narrative reflects the presence of a PATCO extension to Glassboro, emphasizing supportive land use at Gloucester County station areas. Connections via the NJ Transit RiverLINE to Trenton and to Atlantic City (through a transfer at a new Pennsauken Transportation Center) are also highlighted, as are improved intercity rail connections to places outside the DVRPC region.

- **Improving traditional, reverse, and intersuburb commutes**
  Transit commutes: Center City traditional & reverse, and suburb to suburb
  This narrative showcases the benefits of systemwide improvements on Center City commutes (one traditional, one reverse) and commutes between suburban centers, and in the process highlights four other major capital projects: the Paoli Transportation Center, the extension of the Route 100 High Speed Line to King of Prussia, an extension of the R6 Regional Rail line to Phoenixville, and the restoration of rail service to Quakertown. This section particularly emphasizes supportive land use (at Paoli and Phoenixville, specifically), and new passenger information systems.

Map 1 shows the locations of highlighted expansion projects throughout the region.

MAP 1: SYSTEM EXPANSION PROJECTS HIGHLIGHTED IN DVRPC LONG-RANGE VISION FOR TRANSIT

1. Broad St. Subway Extension to Navy Yard
2. Northeast Corridor Intercity Rail Improvements
3. Northeast Philadelphia Rapid Transit Line
4. Paoli Transportation Center
5. PATCO Center City/Delaware Riverfront Expansion (Delaware Avenue Line)
6. PATCO South Jersey Expansion
7. Pennsauken Transportation Center
8. Quakertown Rail Restoration
9. R6 Regional Rail Extension
10. Route 100 Extension to King of Prussia



THE VISIONS

Service extensions in the urban core

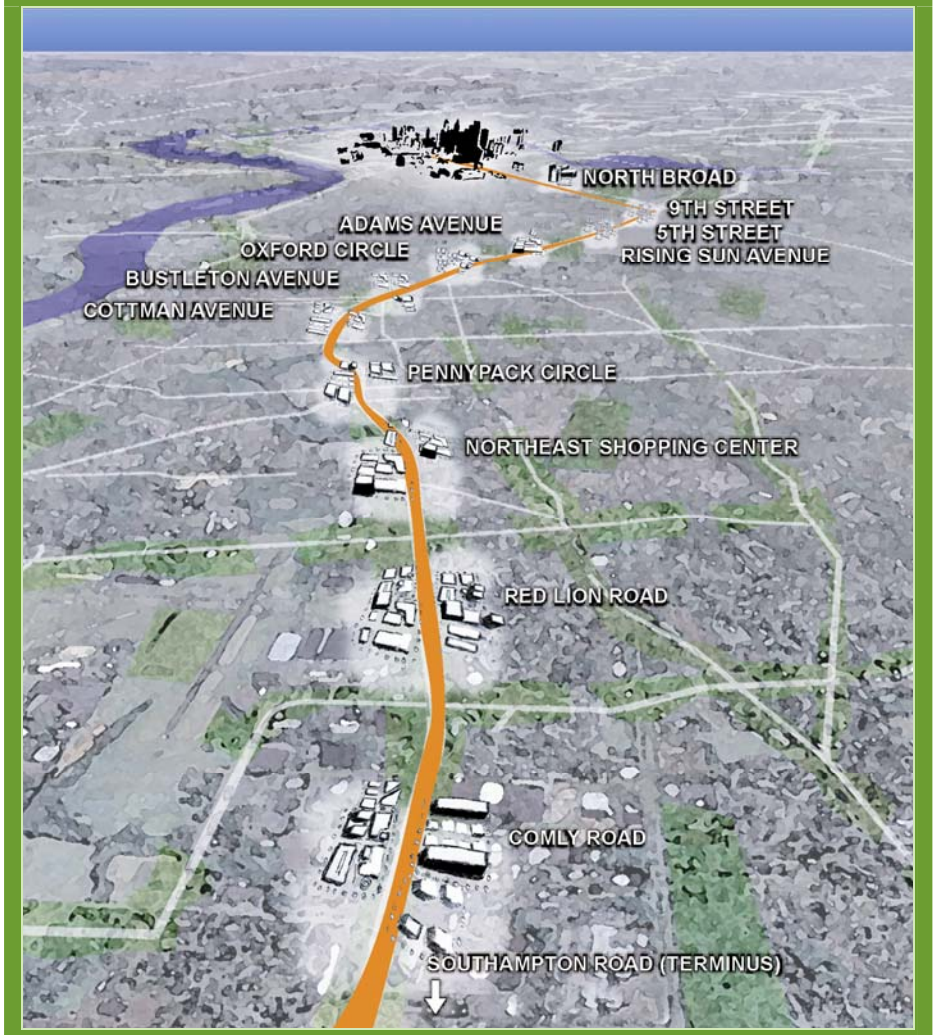
Vision for the Broad Street Subway corridor

The Broad Street Subway has been critical to the region's transportation network from its opening in 1928. Since that time, several extensions have expanded the line's role in the region and made it useful for new groups of riders. Most recently, an extension to Pattison Avenue in 1973 greatly increased the ability of riders to get to South Philadelphia's sports complex.

In the future, two new extensions will further expand the subway's importance as a regional anchor for residential and employment growth. The Roosevelt Boulevard Line is a subway and elevated line that will extend from Broad Street northeast along Roosevelt Boulevard to near the boundary with Bucks County. The Navy Yard extension will add two stations south of Pattison–one at the Navy Yard's commercial center, and one at the Marina District residential area.

The subway's increased regional role will be aided by fare modernization for our region's largest transit carriers, enabling transfers between PATCO, NJ TRANSIT, and SEPTA services to be made much more conveniently using a single fare card.

NUTS & BOLTS



Alignment of the Roosevelt Boulevard Subway Extension viewed from the Northeast near the Southampton Road terminus. Stations are from the preferred alternative in the Philadelphia City Planning Commission's 2003 *Roosevelt Boulevard Corridor Study.*

THE VISIONS

Proposed Northeast Town Center at Cottman Avenue Station, Roosevelt Boulevard Line (Source: Philadelphia City Planning Commission's 2003 *Roosevelt Boulevard Corridor Study*).

Since extended service will be similarly fast and frequent to current subway service, the two extensions will support the types of fully urban, mixed-use development in station areas that has always represented the best of the Broad Street corridor.

In the case of the northern extension, much of the development along Roosevelt Boulevard has a suburban-style strip development character, and the Boulevard itself is a predominantly high volume, high speed traffic artery that splits northeast Philadelphia in two. Supported by the rail extension, the Roosevelt Boulevard corridor will become a mixed use urban corridor that works for pedestrians, bicyclists, buses, and rail transit: a place where residents and workers can comfortably walk or bicycle to and from new stations. New park-and-ride facilities at the line's Southampton Road northern terminus and at several other stations along Roosevelt Boulevard will allow convenient car access from Bucks County and broader Northeast Philadelphia. By expanding transportation options, the rail extensions will

NUTS & BOLTS

CONSENSUS PROJECTS

Both Broad Street Subway extensions were identified as consensus priority projects by DVRPC's LUTED (integrating Land Use, Transportation, and Economic Development Planning) process, conducted among various DVRPC stakeholder groups, standing committees, and the DVRPC Board in the fall of 2007. Both projects were also supported as high priorities by participants in DVRPC's Dots & Dashes public outreach process. In addition, both extensions were identified as priority capital projects in the University of Pennsylvania's Spring 2008 Planning Studio report *Transportation Visioning Plan for the Philadelphia Region.*

ROOSEVELT BOULEVARD PROJECT DETAILS

Various concepts for a Northeast Philadelphia extension of the Broad Street Line were explored in the City of Philadelphia's 2003 *Roosevelt Boulevard Corridor Transportation Investment Study.* That study resulted in a preferred alignment that would branch from the subway's express tracks at Pike Street and continue along Roosevelt Boulevard. Between Broad Street and Blue Grass Road, it would operate in a tunnel, and north of Blue Grass Road as an elevated line. According to simulations conducted for that study, transit travel times between the far northeast and City Hall would be roughly halved by the project, from 60 to 32 minutes.

Proposed Northeast Town Center at Cottman Avenue Station (Source: Philadelphia City Planning Commission's 2003 *Roosevelt Boulevard Corridor Study*).

THE VISIONS

allow more people to travel with ease throughout the corridor, relieving traffic congestion in the process.

Many of the Boulevard Line's passengers will transfer from feeder bus services, and these transfers will be made more convenient through fare modernization. This makes transfers between the bus and subway intuitive and seamless for both regular commuters and occasional riders. The feeder bus routes will themselves be part of a broader rapid transit network; along with other bus routes throughout the city, these routes will benefit from Transit First improvements. Transit First is a package of strategies to make bus and trolley service faster and more efficient, and includes giving buses green signal priority at traffic lights.

The Roosevelt Boulevard and Navy Yard extensions will provide a catalyst for the entire Broad Street corridor. Access to and between Amtrak, Regional Rail, and Broad Street Subway services at North Philadelphia Station will be surrounded by a newly rejuvenated commercial and residential center. Mid- and high-rise office and residential development will extend from City Hall, through the Temple University and medical campuses, north to the area of North Philadelphia Station. Now an island among disadvantaged and distressed parts of the city, Temple University will anchor a continuous north-south extension of Center City along Broad Street, with revitalization and economic benefits for the surrounding North Philadelphia communities.

Trains every six minutes for the Roosevelt Boulevard extension will merge with six-minute trains for traditional express service along the Broad Street Subway. This means that between Erie Station and Walnut-Locust Station, express trains will arrive every three minutes during peak periods. These

NUTS & BOLTS

BOULEVARD LINE RIDERSHIP

Simulations conducted for the 2003 *Roosevelt Boulevard Corridor Transportation Investment Study* estimated that development of the preferred alternative would generate 124,500 weekday boardings, which compares favorably to 178,715 and 114,816 boardings for the Market-Frankford El and Broad Street Subway, respectively, in 2005 (*Source:* SEPTA Fiscal Year 2007 Annual Service Plan).

BOULEVARD LINE COSTS

Construction costs for the Roosevelt Boulevard Extension were estimated at $2.5 Billion to $3.5 Billion in 2000 dollars (roughly $3.2 – $4.4 Billion in 2008 dollars). Annual operating and maintenance (O&M) costs were estimated at $56 million in 2000 dollars, or roughly $71 million in 2008 dollars. This compares to $87 million and $66 million for the Market-Frankford El and Broad Street Subway, respectively, in 2005 (*Source:* SEPTA Fiscal Year 2007 Annual Service Plan).

Navy Yard development according to Master Plan. View southeast down diagonal boulevard. Surface parking would be developed with a subway extension (Source: Robert A.M. Stern Architects).

THE VISIONS

extraordinary levels of service through the city's north-south core will further reinforce its accessibility by transit from points throughout the region. Thanks to fare modernization, PATCO commuters from New Jersey arriving at 12th/13th Street Station may transfer seamlessly to Broad Street trains at Walnut-Locust Station. Three-minute peak express subway frequencies will ensure a nearly continuous trip to City Hall and more northern express stations.

Proposed elevated alignment north of Blue Grass Road (Source: Philadelphia City Planning Commission's 2003 *Roosevelt Boulevard Corridor Study*).

The subway's new southern terminal at the Navy Yard will anchor a fully developed and built out center of activity. Recent office renovation, development, and redevelopment will anchor a built out, walkable commercial center–a real part of the city, rather than apart from it. Surface parking lots for early Navy Yard office developments will be filled in with new buildings that face sidewalks and streets rather than parking areas, contributing to a comfortable urban pedestrian environment.

NUTS & BOLTS

Navy Yard development according to Master Plan. View northwest from Corporate Center, which would be one of two proposed subway stops. Surface parking would be developed with a subway extension (Source: Robert A.M. Stern Architects).

BOULEVARD BUS RAPID TRANSIT (BRT) ALTERNATIVE

An alternative to the Roosevelt Boulevard rail extension is a BRT. Such a project, which is also recommended in DVRPC's 2007 report *Small Starts Feasibility* (pub. no. 07016), would be dramatically less expensive to construct and operate than the subway/elevated rail project described here, while generating some of the same transportation and land development benefits. One concept for such a project would be a linear "rail lite" service along the boulevard, requiring passengers to transfer from feeder bus routes just as they would for a new rail service. Alternatively, a busway could be installed along the corridor, which would be shared by many bus routes without requiring passengers to transfer. A BRT project along the boulevard could be pursued as a stepping stone to a longer-term rail project, demonstrating the effectiveness of rapid transit in the corridor while building a broader transit constituency.

THE VISIONS

Navy Yard development according to Master Plan. Marina District residential development in foreground, with view down diagonal boulevard to Broad Street. (Source: Robert A.M. Stern Architects).

Street-level retail uses including grocery stores, restaurants, and shops will serve employees during the day and residents at night. The Navy Yard, with its "Marina District" residential center, will be a vibrant, 24-hour neighborhood. This is made possible by the extension of the Broad Street Subway to the Navy Yard, which will provide the opportunity for workers to arrive quickly and affordably from throughout the region, and for residents to make the same trips in reverse.

NUTS & BOLTS

NAVY YARD EXTENSION PROJECT DETAILS

Early planning for the Navy Yard extension by the Philadelphia Industrial Development Corporation (PIDC) calls for an alignment that would continue down Broad Street past Pattison Avenue, and then veer southeastward along the Navy Yard's central "Diagonal Boulevard." Two stations would be developed: one at the center of the Navy Yard's commercial core, the Corporate Center, and one in the "Marina District" residential area at the southeastern end of the diagonal boulevard.

NAVY YARD EXTENSION RIDERSHIP

Sketch modeling conducted as part of the PIDC project estimates that the two Navy Yard stations would have roughly 8,000 weekday boardings combined, or an average of 4,000 each. This compares with an average of 4,784 boardings for each of the subway's 24 operating stations (*Source:* SEPTA Fiscal Year 2007 Annual Service Plan).

NAVY YARD EXTENSION COSTS

Construction costs for the Navy Yard Extension were estimated as part of the PIDC project at $400 million in 2008 dollars. Annual operating and maintenance (O&M) costs for the extension have not been estimated. A $400 million capital cost places the extension above the $250 million threshold for FTA Small Starts funding, meaning that any federal share would have to be through New Starts. PIDC and its partners are planning to explore various funding alternatives for entirely local funding or for the local share of a proposed New Starts project. Ideas being explored include value-capture concepts like Transit Revitalization Investment Districts (TRID) and Tax Increment Financing (TIF), which borrow against the future land values generated by the proposed project to help fund the project itself.

COST CHALLENGES

For either extension project, federal funding in the form of New Starts dollars would likely be sought to pay for significant portions of construction costs. New Starts funding is difficult to obtain, requiring rigorous cost effectiveness analyses, and typically only amounts to a maximum of 50% of total project costs. In the case of the Roosevelt Boulevard project, this would mean that roughly $2 billion in construction funding would need to be generated locally, unless New Starts rules for funding are changed in the future.

THE VISIONS

Transit as an anchor for waterfront development

Vision for an urban Delaware River waterfront

The Delaware River waterfront in Philadelphia has been no stranger to change, and has completely reinvented its character several times during the city's history. From its roots as the city's maritime heart, soul, and commerce engine to one of its industrial backbones, the importance of the waterfront to the city has always been paramount. The postindustrial late 20th and early 21st century is a transitional time for the riverfront, during which its character has been alternately suburban and urban, natural and decayed, residential and commercial.

In the coming decades, the riverfront corridor will have a newly defined character–as an integrated place consisting of a series of walkable and bikable mixed-use urban spaces where vibrant city streets, commerce, and neighborhoods meet the river in a model for 21st century sustainability. This future urban waterfront is in some ways defined by its transportation infrastructure and the resulting connections with the broader city and region. Two assets will hold the corridor together as a model for sustainability: a continuous bicycle and pedestrian greenway and a new Delaware Avenue Rail Line linked to the broader regional transportation network.

The connectivity benefits provided by the rail line and greenway will reconnect the waterfront with Center City and other adjacent neighborhoods, helping to overcome the psychological and physical barrier of I-95 and as a result attract significant residential and commercial development.

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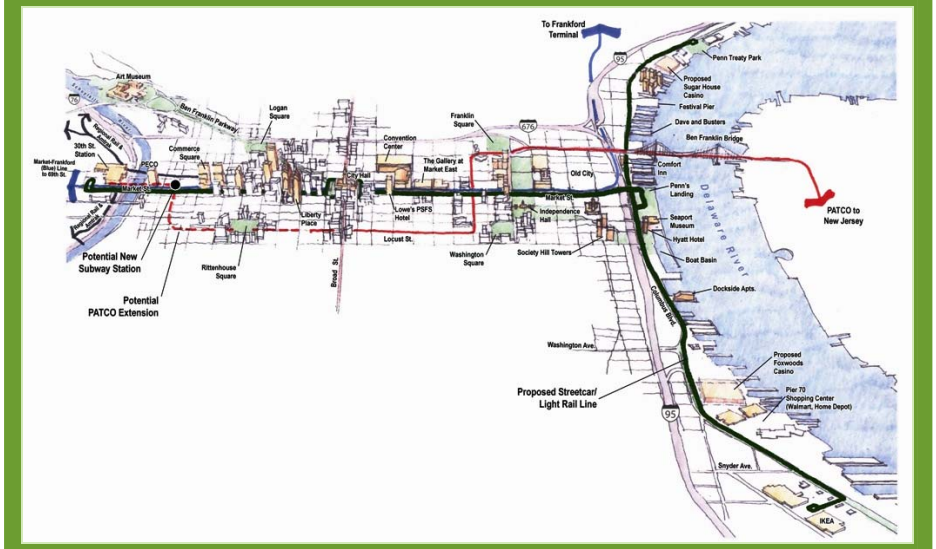
CONSENSUS PROJECT
The Delaware Avenue rail line was identified as a priority project by DVRPC's LUTED (integrating Land Use, Transportation, and Economic Development Planning) process, conducted among various DVRPC stakeholder groups, standing committees, and the DVRPC Board in the fall of 2007. In addition, the project was identified as a high priority of participants in DVRPC's Dots & Dashes outreach process, and was also identified as a priority capital project in the University of Pennsylvania's Spring 2008 Planning Studio report *Transportation Visioning Plan for the Philadelphia Region*, in which it comprised part of the first phase of a proposed "R0" loop line around Philadelphia.

PENN PRAXIS WATERFRONT VISION
The vision narrative here is consistent with the Penn Praxis *Civic Vision for the Central Delaware*, a conceptual master plan for the Delaware riverfront completed in November 2007 after large-scale public engagement.



Possible alignment for Delaware waterfront rail service, integrated with other rail lines (Source: Penn Praxis *Civic Vision for the Central Delaware*, 2007).

ALIGNMENT ALTERNATIVES:
DRPA / PATCO is presently studying a variety of alternatives for rail transit along the Delaware Avenue corridor as part of an Alternatives Analysis project seeking

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As a modern light rail line rather than a streetcar or trolley line, the Delaware Avenue Line will be a truly rapid transit service. Stations will be spaced roughly every half mile (or every 4-5 blocks along the corridor), and it will operate in its own dedicated lane. This combination means that the transit line can carry riders along Delaware Avenue with speeds that are competitive with automobile traffic.

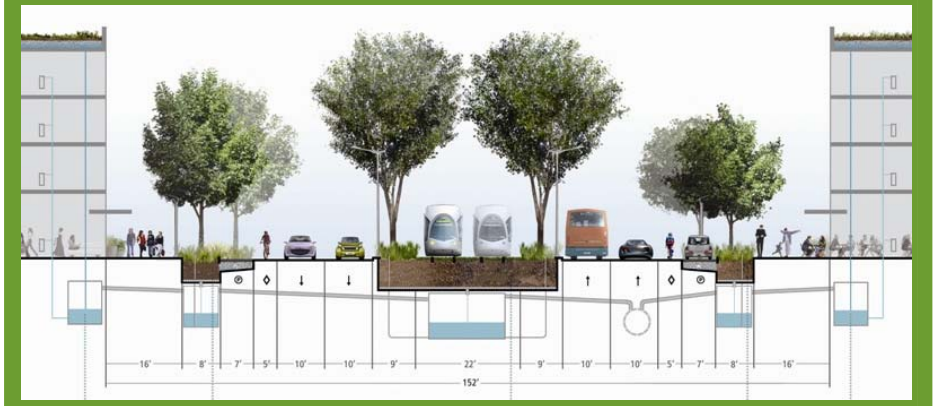
Transit-supportive Delaware River waterfront development (Source: Penn Praxis *Civic Vision for the Central Delaware,* 2007).

Passenger information systems at the new line's stations (along with rail stations and bus routes throughout the region) will be dramatically improved in the coming years. Through dynamic displays at stations, passengers will be constantly aware of where the next vehicle is, whether it is on time, and how long it will take to arrive. This information and more (such as personalized information for a passenger's complete trip, including all transfers) will also be available to passengers through an ever-expanding group of wireless devices.

For example, passengers might use their networked phone to find the fastest transit route between points A and B, anywhere in the region. This

NUTS & BOLTS

federal New Starts construction funding. Each of these alternatives would operate along Delaware Avenue from Penn Treaty Park in the north to Pier 70 in the south, but differ in how they would interface with other SEPTA and PATCO rail service and connect with Center City. Under consideration are surface and underground alignments along Market Street to City Hall, surface alignments that would connect with a reopened PATCO Franklin Square Station, and surface and underground alignments that would connect with SEPTA service via streets other than Market Street. The vision narrative here reflects alternative PA-2, which provides a continuous underground connection with SEPTA subway-surface routes along Market Street. Each alternative includes a Phase 2 option for an extension to the Navy Yard and sports complex.



Possible street section for Delaware Avenue, accommodating all modes with rail in the median(Source: Penn Praxis *Civic Vision for the Central Delaware,* 2007).

WATERFRONT FERRY SERVICE

The Penn Praxis *Civic Vision for the Central Delaware* envisioned expanded ferry service along the waterfront, with terminals at Washington Avenue, Market Street, Spring Garden Street, Girard Avenue, and Allegheny Avenue, along with broader connections to waterfront points further north and south on both sides of the river (including Gloucester City, Chester, and Bristol).

RIDERSHIP ESTIMATES

DRPA / PATCO's prior Alternatives Analysis examined two slightly different variations of the Delaware Avenue rail project, extending from Pier 70 in the south to Spring Garden Street (whereas newer versions extend past Spring Garden to Penn Treaty Park). Long-range (year 2025) ridership estimates were 4,900 for service connecting at Franklin Square and 7,900 for an extension of the SEPTA subway-

THE VISIONS

information would be pulled from an online database with dynamically-updated schedule data for every regional and intercity bus and rail route, regardless of carrier (SEPTA, NJ TRANSIT, or PATCO). Since fare modernization will make fare instruments compatible with every carrier, the boundaries between carriers and service areas will become invisible to the passenger. This personalization of transit trip planning means that passengers will be constantly aware of the quickest route to their destination via any of our regional transit services on any given day, updated to account for incidents, delays, and detours along the route.

The new higher level of transit service and transit use along the Delaware Avenue corridor will generate very high levels of walking in station areas, since people will have very different arrival and trip patterns than they would if they were arriving by car. While anchored by the rail line, these new urban, walkable development patterns along the corridor will be made possible by an extension of the city street grid to the river's edge.

Much of the corridor's current land use has the character of large-scale, automobile-oriented strip commercial development. Such developments are characterized by enormous expanses of surface parking which assume that everyone will be arriving by car and take up space that could otherwise be used for residential and commercial developments. In the future a dense, interconnected street grid will allow for smaller scale development with a finer grain mix of uses, oriented toward each of these new streets for pedestrian rather than auto access.

In order to function as a mixed-use development center with large numbers of jobs as well as residents, a place's transportation infrastructure must allow for high numbers of trips in both directions, and be very well

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surface lines along Market Street. These estimates compare to an average of 10,500 weekday riders for SEPTA's five subway-surface lines in 2007.

Urban, walkable development along the Delaware Avenue corridor, viewed from the south (Source: Penn Praxis *Civic Vision for the Central Delaware,* 2007).

COST ESTIMATES

DRPA / PATCO's prior Alternatives Analysis estimated construction costs of $700 Million (in 2005 dollars) or $160 million per mile for service connecting at Franklin Square, and $1.0 billion or $200 million per mile for an extension of the SEPTA subway-surface lines along Market Street. Annual operating and maintenance costs were estimated at $7.3 and $8.6 million, respectively (in 2005 dollars), which compare to an average of $10.1 million for SEPTA's five subway-surface lines in 2007.

COST CHALLENGES

DRPA / PATCO is preparing an Alternatives Analysis and will be seeking federal New Starts funding for significant portions of construction costs. New Starts funding is difficult to obtain, requiring rigorous cost effectiveness analyses as part of the Alternatives Analysis, and typically only amounts to a maximum of 50% of total project costs. Based on the cost estimates prepared in 2005, this means that roughly $500 million in construction funding would need to be generated locally, unless New Starts rules for funding are changed at some point in the future.

LAND USE CHALLENGES

To enable the sorts of urban, transit-supportive development envisioned here and in the Penn Praxis *Civic Vision for the Central Delaware*, the City of Philadelphia would

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connected with the rest of the region's transit network. Helped along by regional fare modernization, the Delaware Avenue Line will be very well connected to other transit services, and short headways, high frequencies, and 24-hour service (or nearly so) will make using transit in the corridor seamless and easy for passengers.

An extension of the subway-surface tunnel east of City Hall will directly connect Delaware Avenue rail service and the new centers of development along the corridor with University City, West Philadelphia, and other areas served by SEPTA's subway-surface routes. This connection will expand regional and local mobility in both directions, giving South Jersey commuters better access to University City and the West Market Street corridor (via seamless transfers at 8th and Market using the same fare instrument) and enhancing access by University City and West Philadelphia residents to the new waterfront centers of development and to South Jersey. This direct connection between the Delaware Avenue corridor and City Hall means that in addition to continuous connections with the subway-surface lines, the new rail service will also be seamlessly connected with the newly-expanded Broad Street Subway, the Market-Frankford Line, and SEPTA's Regional Rail lines. The Delaware Avenue Line will also allow passengers to transfer to the Broad Street Subway at the Navy Yard, completing a rail loop around the city's southeastern quadrant.

Modernized fare systems also mean that the service will effectively be connected with the city's broad network of enhanced bus services, which have benefited from Transit First improvements. These improvements will give buses green signal priority at traffic lights, along with other strategies to make service faster and more efficient.

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need to make substantive policy changes along the Delaware Avenue corridor. The current work of the city's Zoning Code Commission provides an opportunity for this cohesive vision of the Delaware Avenue corridor to be reflected in the city's new comprehensive plan and zoning & development regulations. The Penn Praxis plan recommends that the extension of the city's street grid through the riverfront corridor be adopted as city policy in the comprehensive plan.

Shelter / station with dynamic passenger information display (Source: *Characteristics of Bus Rapid Transit for Decision Making*, Federal Transit Administration, 2004).

Japanese PASMO contactless fare payment, compatible with numerous modes and carriers (Source: http://pasmo.co.jp, 2008).

THE VISIONS

Reinforcing and reconnecting older suburbs

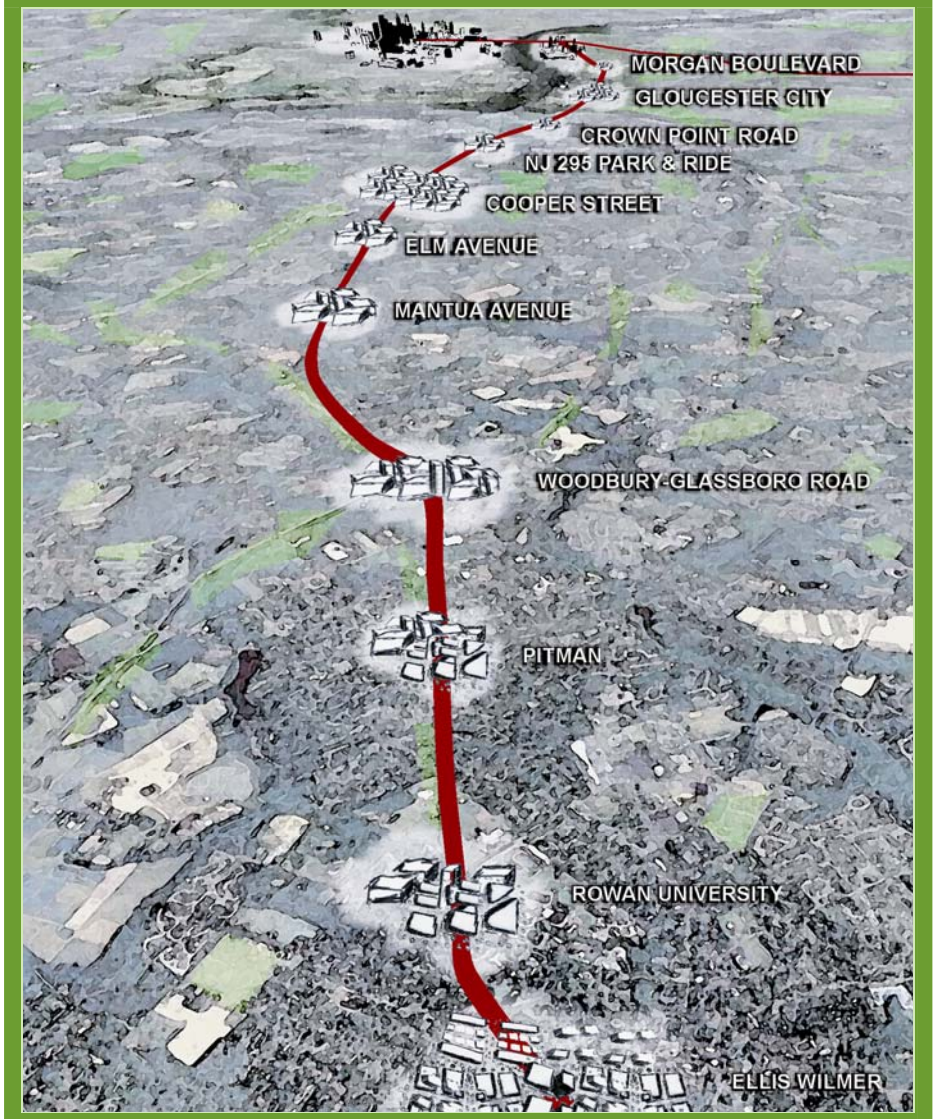
Vision for transit connectivity between South Jersey and the northeast megaregion

Gloucester County is presently the only county in the DVRPC region with no commuter rail service. This fact has severely limited the potential for transit-friendly smart growth at a time when portions of the county have been growing at among the fastest rates in the nation.

In the coming years, the PATCO South Jersey Expansion (an extension of PATCO rail service to Glassboro) will fill this gap in our regional rail network, and in the process revitalize the core older suburbs along its route. PATCO service will provide a catalyst for development in communities that are already walkable, including Glassboro, Pitman, Woodbury, and Gloucester City. An infill and economic development boom will reinforce these communities' already pedestrian-friendly and well-connected street grids. New development will supplement their traditional character, and stronger concentrations of residents and jobs will make these communities true regional centers.

Guided by local planning, each station area's surrounding communities will develop according to their own local character. Some may experience population growth, some may become job centers, and some may develop with a mix of the two, as mixed-used 24-hour communities.

NUTS & BOLTS



Alignment of the PATCO South Jersey Extension viewed from the Glassboro terminus. Stations and alignment reflect alternative NJ-3 from the DRPA / PATCO Alternatives Analysis.

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Example of walkable development adjacent to a rail line, along with a park-and-ride lot (Source: Myhre Group Architects, CNU.org, 2008).

Feeder transit services, park-and-ride facilities, and a county trail network will mean that the new line is accessible by foot, bike, car, or bus transit from throughout Gloucester County and points further south, providing economic and connectivity benefits for all of South Jersey.

Regional fare modernization including "smart card" fare payment with compatibility between PATCO, SEPTA, and NJ TRANSIT services will permit easy and convenient connections with SEPTA in Philadelphia for service throughout the city and Pennsylvania suburbs. Since transit connections from throughout the region will be easier and more convenient (combined with service extensions like the PATCO Glassboro line), many previously distressed areas in our urban core will be among the most easily and rapidly accessible locations in the region.

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CONSENSUS PROJECT

The PATCO South Jersey Expansion was identified as a priority project by DVRPC's LUTED (integrating Land Use, Transportation, and Economic Development Planning) process, conducted among various DVRPC stakeholder groups, standing committees, and the DVRPC Board in the fall of 2007. In addition, the project was identified as a high priority by participants in DVRPC's Dots & Dashes outreach process. The project was also identified as a priority capital project in the University of Pennsylvania's Spring 2008 Planning Studio report *Transportation Visioning Plan for the Philadelphia Region*.

ALIGNMENT ALTERNATIVES

DRPA / PATCO is presently studying three alternatives for rail service expansions south of the current PATCO alignment as part of an Alternatives Analysis project seeking federal New Starts construction funding. Alternative NJ-1 would operate along the Camden/Gloucester County boundary, primarily in the median of the Atlantic City Expressway, and would terminate in Williamstown. Alternative NJ-2 would extend south from Camden along Routes 42 and 55, operating largely in the Route 55 median, and would terminate in Glassboro. Alternative NJ-3, which is described in the vision narrative here, would operate along an existing Conrail right-of-way between Camden and Glassboro, providing service to existing developed places including Gloucester City, Pitman, Woodbury, and Glassboro. Both alternatives NJ-2 and NJ-3 include a possible longer-term second phase extension further south into Salem and Cumberland Counties.

DVRPC TRANSIT SCORE ON ALIGNMENTS

DVRPC's 2007 report *Creating a Regional Transit Score Protocol* (pub. no. 07005) established a framework for evaluating the transit supportiveness of places, based on their population and employment densities. Alignment NJ-3 is the focus here because among the three alternatives, it is strongest in terms of reinforcing existing development and centers, a key tenet of the DVRPC long-range plan. Transit Score mapping illustrates this – of the three alignments, NJ-3 connects the greatest number of census tracts with medium-high scores (and even high, in Gloucester City), indicating already-existing support for rail transit.

RIDERSHIP ESTIMATES

In an earlier (2005) study, DRPA / PATCO conceptually evaluated the same three expansion alternatives. In that study, long-range (year 2025) ridership estimates were 17,600–26,600 for Alternative NJ-2 and 20,700–31,100 for NJ-3 (ridership was not estimated for NJ-1 at that time). These estimates compare with roughly 34,000 daily boardings for the existing PATCO line in 2006.

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As a result, many of these areas will be revitalized as centers of residential and job growth. The areas around 30th Street and North Philadelphia Stations in Philadelphia, for example, will become critical regional centers of 24-hour activity. Gloucester County residents will be able to reach both by train much more quickly than by car.

Example of the type of walkable urban streetscape that will surround Gloucester County PATCO stations (Source: RTKL Associates, CNU.org, 2008).

The Gloucester County extension will also improve transportation options for trips between South Jersey suburbs. An easy connection with the PATCO Camden County line will let Gloucester County residents conveniently use transit to access jobs in Camden County's core communities, and Camden County residents to just as easily make the reverse trip to new job centers along the Gloucester County line.

A quick transfer to NJ TRANSIT's RiverLINE in Camden will also connect residents of both counties to a new direct transfer facility between

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COST ESTIMATES

DRPA / PATCO's prior study estimated construction costs of $1.5 billion (in 2005 dollars) or $78.9 million per mile for Alternative NJ-1, $1.4 billion or $88.1 million per mile for NJ-2, and $1.4–1.8 billion or $77.2–96.0 million per mile for NJ-3, depending on partial or full grade-separation. Annual operating and maintenance costs were estimated to be similar for each of the three alternatives, ranging from $33.5–38.0 million (in 2005 dollars). This compares to roughly $37 million in annual O&M costs for the current PATCO line.

Town Square adjacent to rail station, Rockville, MD (Source: JBG Companies, Torti Gallas and Partners, CNU.org, 2008).

COST CHALLENGES

DRPA / PATCO is preparing an Alternatives Analysis and will be seeking federal New Starts funding for significant portions of construction costs. New Starts funding is difficult to obtain, requiring rigorous cost effectiveness analyses as part of the Alternatives Analysis, and typically only amounts to a maximum of 50% of total project costs. Based on the cost estimates prepared in 2005, this means that roughly $700–900 million in construction funding would need to be generated locally, unless New Starts rules for funding are changed.

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RiverLINE and Atlantic City Line service at Pennsauken. This means that riders boarding PATCO trains at Glassboro, for example, will have the ability to easily reach Philadelphia, Camden, Trenton (and New York via Trenton), and Atlantic City by rail, as well as Burlington County communities along the RiverLINE. This new transit ease of use will result in much higher transit ridership, freeing up highway capacity for South Jersey drivers. As a result, transportation options and overall mobility will be improved for all residents and workers.

Intercity rail options for connections to locations outside the region will also be improved. For example, new "One Seat Ride" commuter rail service between Philadelphia and New York City will make the Northeast Corridor connection much more affordable than Amtrak service and just as convenient. As a result, it will be much easier for Delaware Valley residents (including Gloucester County residents by virtue of the PATCO extension) to quickly and conveniently move about the northeastern US "megaregion" for business or pleasure.

Although such transfers within and outside the region can be cumbersome and inconvenient in the present day, in the coming decades they will become intuitive to riders through fare modernization and dramatically improved passenger information systems.

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LAND USE CHALLENGES

The sorts of transit-oriented development (TOD) envisioned here are necessary for the new line to maximize its ridership, economic development, and mobility benefits. However, with the exceptions of developed places like Gloucester City, Glassboro, and Pitman, most municipalities along the new line would likely need to adjust their zoning and development regulations to permit walkable mixed-use developments in station areas. Boroughs and townships should also consider reducing parking requirements in station areas.

PHILADELPHIA–NEW YORK "ONE SEAT RIDE"

The 2003 DVRPC *Regional Rail Improvement Study, R7 Trenton Line, "One Seat Ride" to New York Analysis* (conducted by Systra Consulting) estimated a conservative demand floor for One Seat Ride commuter service to New York City of 1,924 one-way weekday riders. This assumed capturing a 20% share of current intercity bus riders, 90% of current SEPTA/NJ TRANSIT transferring riders, and 50% of current Amtrak riders. Induced demand among current drivers (including those who drive from Pennsylvania to New Jersey to board NJ TRANSIT trains to New York) was not considered, making the 1,924 estimate conservative. The trip was estimated to take 1 hour 40–50 minutes. Rail capacity constraints into New York and at New York Penn Station were indicated to be a limiting factor. The upcoming Access to the Region's Core (ARC) tunnel project should address some of these impediments.

Passenger information display in Nuess, Germany, and smart parking display in San Jose, California (Source: *Managing Success in Center City*, Center City District, 2008).

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Improving traditional, reverse, and intersuburb commutes

Transit commutes: Center City traditional and reverse, and suburb to suburb

Recent commuting patterns in the Delaware Valley are very different from how they were in the mid-20th century, when nearly all commutes were from the suburbs into the city. While Center City Philadelphia is still the region's most significant regional job center, as suburban growth has exploded, work commute trips between suburbs have become the dominant pattern throughout the region.

Since residential and commercial development in the suburbs is of a predominantly low-density, automobile-oriented character, many of these trips between suburbs are difficult or impossible to effectively serve by public transit. Also, while transit is still very effective for trips into Philadelphia and within the city, it is much less effective for city residents who need to commute to jobs in the suburbs.

In the coming decades, owing in part to rising fuel and energy prices, this dynamic will change. Market forces and careful planning will lead to more residential and commercial development being built in locations and configurations that support transit service. As a result, an improved regional transit network will more effectively serve a greater number of the region's commutes.

At present, King of Prussia is already one of the region's most important job and commercial centers, with excellent highway access. However, its accessibility by public transit is relatively poor. In the coming years, SEPTA's Route 100 High Speed Line Spur from Hughes Park to King of

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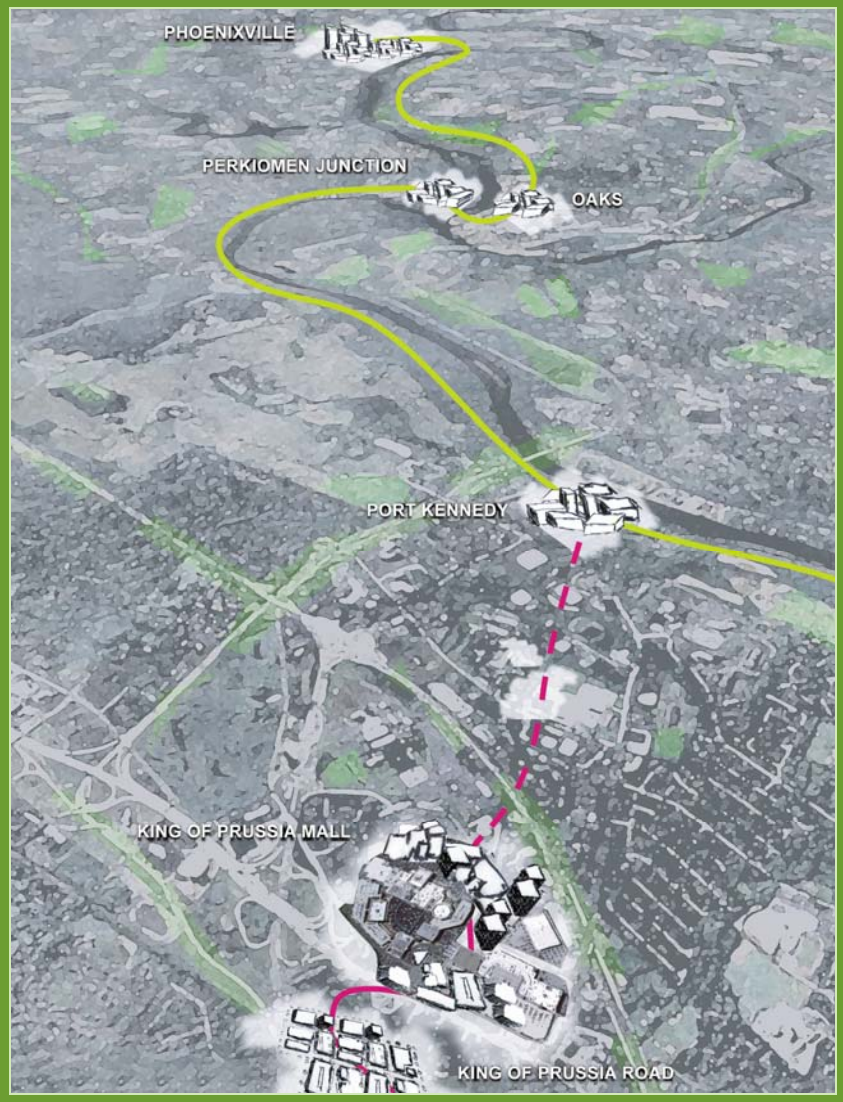

Foreground: Route 100 extension stations at King of Prussia Rd. and King of Prussia Mall. Dotted line indicates possible second phase connection at Valley Forge. Background: proposed R6 extension to Phoenixville, with intermediate stations.

THE VISIONS

Prussia will dramatically improve accessibility to King of Prussia from throughout the region. Along with the rail project, the site and surroundings of King of Prussia Mall will be transformed into a mixed-use, walkable center, with various types of housing integrated with new and existing commercial development. The Mall site will remain easily accessible by car, but surface parking will become garage parking, freeing up new land for new development.

The Route 100 extension will provide direct rapid rail access to this center from Norristown, and from Philadelphia and Delaware County through convenient transfers at 69th Street Station (transfers between rail lines and from feeder bus routes that will be easier after fare modernization). This new transit connection will accommodate high volumes of reverse commutes from Philadelphia to King of Prussia and also from the mall and its environs to Philadelphia.

New mixed use development integrated with rail station (Source: Elizabeth Moule, Stefanos Polyzoides, CNU.org, 2008).

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CONSENSUS PROJECTS

The Route 100 Extension, Schuylkill Valley Metro (SVM) / R6 Extension, Quakertown Rail Restoration, and Paoli Transportation Center were identified as priority projects by DVRPC's LUTED (integrating Land Use, Transportation, and Economic Development Planning) process, conducted among various DVRPC stakeholder groups, standing committees, and the DVRPC Board in the fall of 2007. Each of these projects also emerged as priorities in DVRPC's Dots & Dashes public outreach process, with the exception of the Quakertown Rail Restoration. The Route 100 Extension to King of Prussia was also identified as a priority capital project in the University of Pennsylvania's spring 2008 Planning Studio report *Transportation Visioning Plan for the Philadelphia Region*.

JOURNEY TO WORK TRIP TRENDS

Between 1980 and 2000, the number of jobs in each suburban county increased by amounts of 16.2% to 77.6% and decreased by 11.3% in Philadelphia during the same timeframe. In 2000, the number of workers who commuted from one Pennsylvania suburb in the DVRPC region to another was 897,400 per workday, and between New Jersey suburbs in the region was 540,500. In contrast, a total of only 339,400 workers commuted from suburban counties to Philadelphia or made the reverse trip. Work trips within Philadelphia remained high: 429,700 each workday (*source: Journey-to-Work Trends in the Delaware Valley Region, 1980–2000*; DVRPC pub. no. 05001; August 2005).

ROUTE 100 KING OF PRUSSIA EXTENSION ALIGNMENT

A preliminary Alternatives Analysis for the Route 100 Extension was completed in 2003. The proposed alignment would split from the current Route 100 alignment north of Hughes Park, and run west along Norfolk-Southern freight rights of way and elevated exclusive rights of way to King of Prussia Road, where the first extension station would be located. It would then turn northward, crossing over Route 202, with an elevated station terminus between the Court and Plaza sections of King of Prussia Mall. In the 2003 Alternatives Analysis, alternatives A2 and B2 terminated here. Alternatives A1 and B1 extended past King of Prussia along elevated rights of way to Valley Forge (Port Kennedy), connecting with the Schuylkill Valley Metro (SVM) or an R6 Regional Rail extension, with an additional intermediary station at First Avenue. Alternatives B1 and B2 would include a direct shuttle link between Norristown and King of Prussia, whereas A1 and A2 would not (requiring a transfer at Hughes Park). In this vision narrative, an extension only to King of Prussia is focused on, although closing the gap with a proposed R6 extension at Port Kennedy / Valley Forge is a sensible second phase. The Dots & Dashes and LUTED results included only the first phase extension to King of Prussia.

THE VISIONS

North of King of Prussia, the Route 422 corridor along the Schuylkill River has very high levels of traffic congestion, as a critical transportation link to centers and development in Montgomery County which have very limited transit service. In the coming years, an extension of SEPTA's R6 Regional Rail line to Phoenixville from Norristown will greatly improve transit connections to and from this part of the region. Phoenixville will become a thriving center of residential and commercial development.

New stations at Port Kennedy (Valley Forge), Perkiomen Junction, and Oaks are to be developed as transit hubs, surrounded by new residential and commercial transit-oriented development (TOD). Like Phoenixville and King of Prussia, these new centers of place will be well-connected by rail for trips to and from other parts of the region. It may even be possible that the success of the extension to Phoenixville will enable a second phase extension to Pottstown or even to Reading, supporting revitalization and economic development in these regional centers as well.

North of Lansdale in Montgomery and Bucks Counties, the restoration of rail service to Quakertown will also re-establish service to historic centers of place like Hatfield, Telford, and Perkasie Boroughs, along with Quakertown itself. These restored stations will support new mixed-use development within walking distance, complementing and reinforcing these communities' historic character.

Land use changes with similar results will also occur at Paoli in Chester County, where mixed-use commercial and residential development at Paoli Transportation Center will lead to even greater numbers of work commute rail trips to and from Paoli. An expansion of station parking along with select road improvements will also improve access to the station by car and bus,

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ROUTE 100 KING OF PRUSSIA EXTENSION RIDERSHIP AND COSTS

In the 2003 study, the two variations for extensions to King of Prussia were estimated to generate roughly 2,500 new daily Route 100 trips. The extensions further to Valley Forge were estimated to add roughly 2,800 additional trips. Current Route 100 ridership (FY2007) is 9,212 weekday trips. The two King of Prussia alternatives had average estimated construction costs in 2005 dollars of $140 million, and net operating cost increases (after accounting for bus route consolidation and revisions) of practically $zero to $2 million. The alternatives to Valley Forge would have higher total construction costs in 2005 dollars of roughly $260 million, and similar net operating cost changes.

HISTORY OF THE R6 EXTENSION AND SCHUYLKILL VALLEY METRO (SVM)

A rail extension along the Schuylkill River and Route 422 corridor has its roots in DVRPC's 1994 Transportation Improvement Program (TIP), as an R6 extension to Oaks. Since that time, plans and proposals for the corridor grew to the $2+ billion SVM line to Reading/Wyomissing, which was not deemed sufficiently cost effective to earn federal New Starts construction funding. More recent studies for rail in the corridor have focused on lower cost alternatives, including R6 extensions to Port Kennedy or Phoenixville. The 2002 SVM Major Investment Study / Draft Environmental Impact Statement (MIS / DEIS) included total daily boarding estimates for the four stations between Phoenixville and Norristown of 2,530 to 5,590 (depending on the specific alignment, service pattern, and type of rail) for year 2020. These estimates are likely conservative now, given higher gas prices and a longer planning horizon.

Conceptual design for commercial development with structured parking adjacent to a new Phoenixville Station (Source: *Schuylkill Valley Metro Corridor Station Area Planning and Implementation Study*, DVRPC, 2001).

QUAKERTOWN RAIL RESTORATION ALIGNMENT

The November 2007 *Quakertown Rail Restoration Alternatives Analysis* (TMA Bucks) detailed a preferred project that would include diesel rail service along the Bethlehem Branch between Lansdale and Shelly (north of Quakertown). Located

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allowing the station to serve an ever-increasing number of commuters from throughout Chester County for trips along the Main Line, to Philadelphia, and elsewhere. Sidewalk and bicycle facility improvements in the station area will make the station better connected with surrounding development, and as a result fewer Paoli area residents and commuters to Paoli will need to use cars or buses for the last leg of their journeys.

Rendering of land use integration with RiverLINE station at Roebling, New Jersey (Source: *Transit Village Design in Burlington County*, DVRPC pub. no. 02013, March 2002).

Higher demand for transit service by new residents and employees at these new development centers, and by residents around them and throughout the region will require higher transit frequencies and levels of transit service throughout the regional transit network in the coming years. An ever-increasing number of regional households will live their lives with fewer or no household automobiles, even in suburban development centers. These residents will rely on transit for regional trips, and higher ridership will lead to dramatic increases in transit capacity. Trains will have more cars with

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along Route 309, Shelly Station would attract park-and-ride trips from points north, including Lehigh and Northampton Counties. South of Shelly, stations would be located at historic station sites in Quakertown, Perkasie, Sellersville, Telford, Souderton, and Hatfield Boroughs. Passengers inbound to points beyond Lansdale would be required to transfer at Lansdale Station to SEPTA R5 service.

QUAKERTOWN RAIL RESTORATION RIDERSHIP AND COSTS

Ridership estimates for 2030 were prepared by DVRPC modeling staff for diesel service from Lansdale to Shelly. In total, roughly 3,500 new weekday passenger trips were projected for the seven proposed stations. The 2007 Alternatives Analysis included estimated construction costs in 2007 dollars of roughly $115 million, and estimated annual operating and maintenance costs of roughly $5.7 million.

PAOLI TRANSPORTATION CENTER LAND USE DEBATE

The Paoli Transportation Center site is located on the boundary of two municipalities – Tredyffrin and Willistown Townships. Residents and officials in Tredyffrin Township have supported and adopted zoning for higher levels of density in the station area, along with other transit-supportive requirements (structured parking, ground-floor retail, etc). Willistown Township has also adopted more transit-supportive zoning in the station area but has not gone as far as Tredyffrin. This policy difference on the desired character of the station area has contributed to delaying the Transportation Center project. Discussions continue with an interested developer, the two municipalities, Amtrak, and SEPTA on the nature of the project.

Conceptual site plan for development around a new Paoli Transportation Center (Source: Paoli Community Master Plan, 2001).

THE VISIONS

more seats, and both buses and trains will have much more frequent service both within peak periods and around the clock. Demand for faster, more frequent service will also require a number of capacity investments in the regional network. Where a number of regional rail corridors are currently single tracked, limiting train service to one direction at a time, many of these corridors will have sections with second tracks added, removing these bottlenecks.

Along suburban road corridors, demand for transit service will lead to dramatic improvements in the quality and efficiency of bus service. Throughout the region, priority for buses at traffic lights, exclusive bus lanes, and investments in bus shelters to make them more like rail stations will combine to make bus service a permanent, critical asset for communities throughout the DVRPC region. At shelters as at rail stations, improvements to passenger information systems including networked displays will keep riders updated with real-time information on bus arrivals, available transfers, and delay or detour information that may impact other parts of their trip. Fare modernization including contactless smart cards will allow riders to pay bus and rail fares by waving their cards at a sensor as they board, allowing them to board more quickly and keeping vehicles on the move.

These investments in bus and rail service will require development policy changes by local governments. In the coming years and across the region, zoning and development regulations for areas near transit facilities will require development to be oriented to transit. In addition, investments in sidewalks and bicycle lanes will ensure that transit stations and facilities are well integrated with their surrounding communities for safe and convenient access.

NUTS & BOLTS

COST CHALLENGES

The cost challenges for SVM are obvious – its high cost and inability to compete for federal New Starts dollars have led to it being shelved indefinitely, in favor of lower cost alternatives such as the R6 extension described here. Montgomery County is presently evaluating cost and ridership for R6 extension alternatives. If federal New Starts funds remain elusive for the project, significant local funding commitments would be required. In the case of the Route 100 Extension to King of Prussia, the comparative low construction cost makes additional funding options available. Depending on the alignment chosen, if the total construction cost is less than $250 million, the project may qualify for federal Small Starts funding of up to $75 million, as noted in DVRPC's 2007 *Small Starts Feasibility* report (DVRPC pub. no. 07016). Similarly, the relatively low estimated capital cost of the Quakertown Rail Restoration makes it a candidate for federal Small Starts funding, and the 2007 Alternatives Analysis anticipates roughly $65 million in capital funding from that source. For both projects, current FTA rules on cost-effectiveness present challenges in obtaining this funding, and a significant local funding commitment would be required in any case.

Metro Rapid bus shelter (with passenger information display) in Los Angeles (Source: Los Angeles Metropolitan Transportation Authority, 2007).

Summary: How To Get There

This Long-Range Transit Vision highlights the potential benefits of an improved transit network on the DVRPC region in the coming decades. The region's current transit assets already represent a significant competitive advantage amid rising energy costs and concerns about climate change. That said, the region is not yet one in which transit can be taken for granted by passengers throughout the region as a fact of life, where riding is easy, seamless, and accessible.

To get there, a number of significant challenges will need to be overcome:

- Local officials will need to affirmatively commit to transit supportive zoning and bike/ped connectivity in station and transit facility areas.
- When transit investments are made (both in the core system and for expansion projects), they should be codeveloped with private investment in order to leverage every available dollar and promote synergies between transit services and new development.
- Operating services at higher frequencies and with extended service hours is required before transit can be taken for granted by riders, but this is expensive and depends on the ability of transit agencies and local governments to absorb higher operating costs.
- In order to permit the sorts of fare interoperability and seamlessness of passenger information systems envisioned here, SEPTA, NJ TRANSIT, and PATCO will need to cooperate through data sharing and financial agreements.
- As federal and state transit policy continues to evolve, there may be more funding available to support projects such as these, or there may not be. Without significant new federal or state funding, a source of local or regional capital and operating funding may be required.

The good news is that some of these changes will be market-driven. Transit investments and better transit connectivity are increasingly demanded by residents throughout the Delaware Valley; the constituency for improvements to the region's transit network is growing larger and more diverse. Rather than "swimming upstream," achieving the vision of a region that is better integrated with its transit can be a matter of guiding the momentum already building.

Local Funding: Needs and Options

In October 2007 DVRPC published *Options for Filling the Region's Transportation Funding Gap*, noting that state and federal funding alone will likely be insufficient to meet our regional needs for transportation investments. For the 5-county Pennsylvania portion of the region, the Pennsylvania Legislature enacted Act 44 in 2007, which will provide roughly $1 billion in state funding annually for transportation including highways, bridges, and $500 million for transit, which is roughly the amount that the Pennsylvania Transportation Funding & Reform Commission (TFRC) estimated was needed to preserve our existing facilities and levels of service. For the DVRPC region, SEPTA anticipates that the additional funding from Act 44 will be sufficient to stabilize operating budgets and–in the coming years–allow deferred rehabilitation and modernization projects to be completed. However, this funding will be insufficient for any meaningful expansions of service.

The TFRC estimated that an additional $659 million would be needed annually statewide for "incremental improvements" to the transit network, and $820 million for "mobility expansion." Based on the roughly 63% share of state transit funding allocated to the DVRPC region in recent years, the corresponding gaps for our region would be $415 million and $517 million, respectively.

In New Jersey, the most recent estimates conducted on transit funding needs were prepared by the Alan M. Voorhees Transportation Center as part of the 2004 *Blue Ribbon Report* on the Transportation Trust Fund. That report estimated needs of $490 million annually for ten years to restore NJ TRANSIT facilities to a state of good repair, and $700 million annually to increase transit capacities and levels of service. Using the 10.4% of NJ TRANSIT systemwide ridership that occurred in the DVRPC region in 2005 as a proportional rule of thumb, the region's share of this need is roughly $51 and $74 million for maintenance and expansion, respectively, for a total of $125 million annually. This level of support generally corresponds with the higher "mobility expansion" level of investment estimated by the Pennsylvania TFRC.

In aggregate, then, roughly $642 million combined dollars annually are needed to modernize our regional transit network and enhance its levels of service to provide meaningfully improved mobility options. To achieve the full potential of this Long-Range Vision for Transit, the region would likely require still higher funding levels. To place this in perspective, though, SEPTA's operating and capital budgets for FY2009 are a combined $1.45 billion.

Drawing from analyses conducted by DVRPC staff and planning partners, DVRPC's 2007 *Options for Filling the Region's Transportation Funding Gap* explored a host of options for local and regional transportation funding solutions, with a focus on southeastern Pennsylvania. These included:

- New or increased special sales taxes (not vehicle related) including, for example, cigarette taxes, hotel room taxes, and liquor taxes;

- New or increased automobile use or ownership taxes and fees including, for example, fuel taxes, parking taxes, vehicle registration and title fees, vehicle lease taxes, tire taxes, car rental taxes, vehicle sales taxes, toll increases or new tolls, vehicle property taxes, and vehicle miles traveled (VMT) fees;

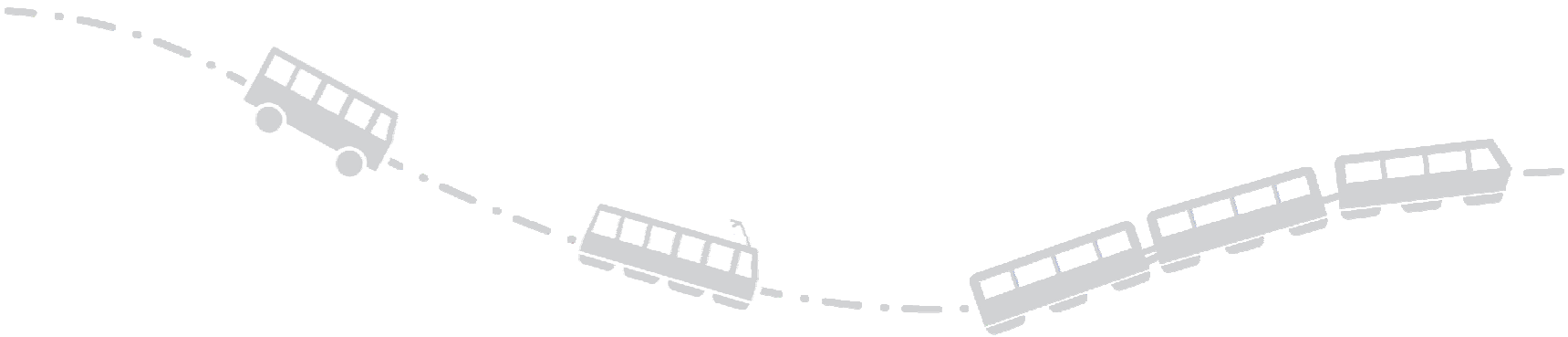
- General tax increases including sales tax surcharges, property taxes, real estate transfer taxes, impervious coverage fees/taxes, and earned income taxes;

- Strategies that capture the value generated by transportation facilities including special assessments near rail stations and highway exits (access fees) or Tax Increment Financing (TIF) where a portion of future tax revenues are leveraged to make a present-day investment; and

- Transit fare increases

Each of these funding options was evaluated in terms of ease of implementation, revenue yield and adequacy, stability and sustainability, fairness and equity, and economic efficiency (meaning whether the option would have negative economic externalities, in terms of leading to undesired development patterns). This menu of options is large and varied, but in aggregate has enormous potential, having a total estimated revenue generating capacity of nearly $2 billion annually. For example, a 0.26% surcharge on sales taxes regionally was estimated to generate $100 million annually, and a 1-cent fee on vehicle miles traveled (VMT), which would cost $120 per year for a household that drives 12,000 miles, would generate roughly $250 million annually.

Selecting a handful of preferred strategies such as these–either as a region or as individual counties–has the potential of meeting our funding needs for the public transit and broader transportation network we envision, regardless of future state and federal policies.



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ABSTRACT: This Long-Range Vision for Transit highlights the potential benefits of an improved transit network to the DVRPC region in the coming decades. The region's current transit assets already represent a significant competitive advantage amid rising energy costs and concerns about climate change. That said, the region is not yet one in which transit can be taken for granted by passengers throughout the region as a fact of life, where riding is easy, seamless, and accessible. The purpose of this Transit Vision report is to highlight the long-term benefits of a modernized, integrated transit network that is coordinated with land development.

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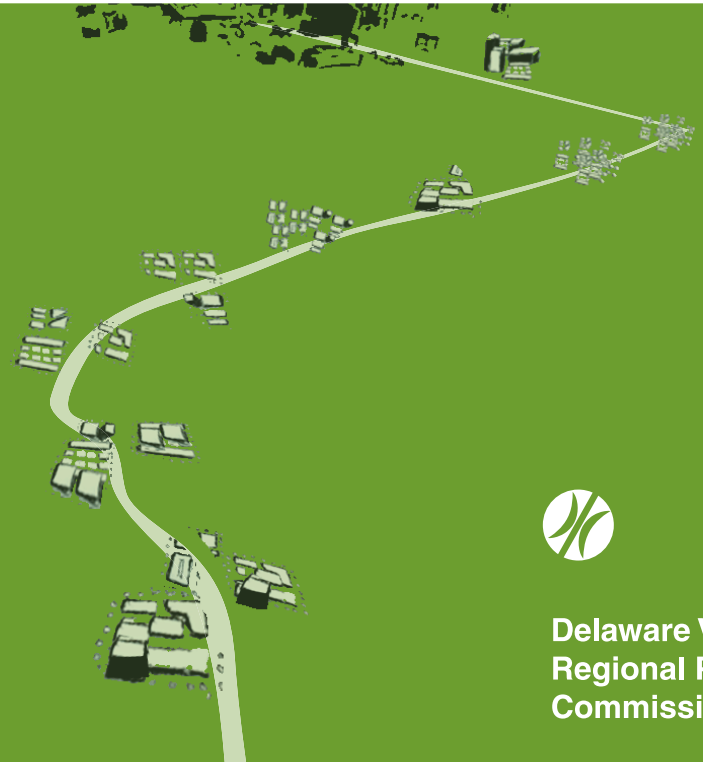

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