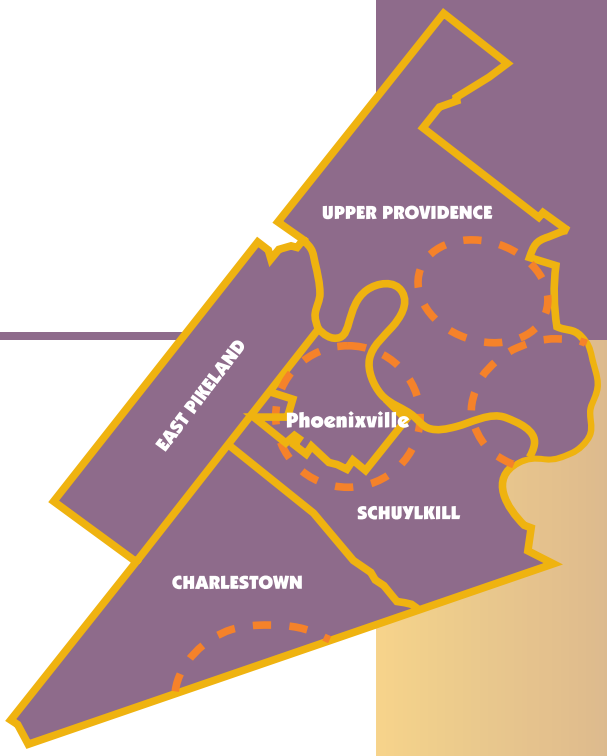

Phoenixville Area Intermodal Transportation Study

HORIZONS

YEAR 2025 PLANNING CORRIDORS

JANUARY 2003

REPORT 7

DELAWARE VALLEY REGIONAL PLANNING COMMISSION

Phoenixville Area Intermodal Transportation Study

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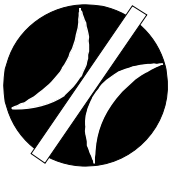
REPORT 7

DELAWARE VALLEY REGIONAL PLANNING COMMISSION

Created in 1965, the Delaware Valley Regional Planning Commission (DVRPC) is an interstate, intercounty and intercity agency that provides continuing, comprehensive and coordinated planning to shape a vision for the future growth of the Delaware Valley region. The region includes Bucks, Chester, Delaware, and Montgomery counties, as well as the City of Philadelphia, in Pennsylvania; and Burlington, Camden, Gloucester and Mercer counties in New Jersey. DVRPC provides technical assistance and services; conducts high priority studies that respond to the requests and demands of member state and local governments; fosters cooperation among various constituents to forge a consensus on diverse regional issues; determines and meets the needs of the private sector; and practices public outreach efforts to promote two-way communication and public awareness of regional issues and the Commission.



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 its findings and conclusions, which may not represent the official views or policies of the funding agencies.

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1 EXECUTIVE SUMMARY

This report presents the results of a comprehensive transportation evaluation addressing regional development and travel in five municipalities in the Greater Phoenixville Area located in the region's Pennsylvania suburbs.

The effort was undertaken as a by-product of the long range transportation and land use plan guiding the region (*HORIZONS 2025*). The long range plan recommends that high priority areas / corridors facing emerging problems – such as rapid suburbanization, inadequate public transportation and increasing traffic congestion – be subjected to more refined evaluations with the participation of local governments within the study area.

In early 2000 the Delaware Valley Regional Planning Commission's (DVRPC) Board of Commissioners directed staff to conduct an assessment of the area within and transportation systems serving Greater Phoenixville. The detailed study area was defined to include: the Borough of Phoenixville, and Charlestown, East Pikeland and Schuylkill townships in Chester County, and Upper Providence Township in Montgomery County.

The study area is varied in character. Mature and dense urban conditions exist in and nearby the Borough. Pastoral settings are prevalent in and adjacent to Charlestown and the Valley Forge National Historical Park. Established and developing suburban landscapes typify the remainder of the study area. Levels of public transportation services also vary considerably in the study area. Despite the differences in ambience traffic congestion is prevalent and a common concern of the study area's municipalities. Developing a unified method to address that common concern was the ultimate objective of the study, and required both technical and committee work.

In conducting this study DVRPC staff augmented local independent planning initiatives to identify mobility improvements and additional infrastructure needed to support orderly growth throughout the study area. To do this, staff:

- systematically examined the study area's existing transportation situation;
- estimated demographic changes associated with growth forecasted for the study area, and;
- performed regional travel simulations for a 1997 Base Year condition and three future Year 2025 transportation improvement investment scenarios (Committed, PLAN and Full-Build).

A multi-jurisdictional Study Steering Committee was established to guide the work. Representatives (elected, appointed and/or staff) from each study area municipality, the Chester County and Montgomery County planning commissions, the Transportation

Management Association of Chester County (TMACC), the Greater Valley Forge Transportation Management Association (GVFTMA), the Valley Forge National Historical Park, the Pennsylvania Department of Transportation (PennDOT) and the Southeastern Pennsylvania Transportation Authority (SEPTA) directed the technical activities performed by DVRPC staff.

In addition to the governmental and agency members, the study's Steering Committee also included representation from the Phoenixville Area Chamber of Commerce, the Phoenix Property Group (the developer of the French Creek Center – a proposed multi-use development in the Borough) and DVRPC's Regional Citizens Committee. Members serving on the Steering Committee are listed in Appendix E to this report. Midway through the study an open house and public meeting was held, at the direction of the Steering Committee, to gage public reaction to the study's approach and obtain citizen comments.

In the study particular attention was given to determining municipal forecasts for growth in population and employment by the year 2025. As a result of that work, an approximate gain of 30,000 people (+66%) and 38,000 jobs (+222%) were estimated for the overall study area. The largest combined gains are forecasted to occur in the Borough of Phoenixville and Upper Providence Township – the municipalities with the highest existing levels of population and employment. The demographic surcharges were applied as inputs in the Year 2025 travel simulation exercises conducted in the study.

The initial future year travel simulation test assumed that a set of committed transportation improvements are implemented in the detailed study area (Year 2025 Committed Scenario). Committed projects were defined as projects which are in, or are imminent for, construction – or are programmed for construction on the regional TIP (covering federal fiscal years 2001 - 2004). As such, the Committed Scenario represents the lowest order improvement set anticipated for the study area. Projects of consequence within the broad study area are few. Those worth mentioning are: constructing the French Creek Parkway, widening PA 29 between the Great Valley Parkway and Phoenixville Pike, and; installing a closed-loop traffic signal system along Bridge Street, in the Borough, and along PA 23 across the study area.

Performance statistics and traffic volumes emanating from the Year 2025 Committed Scenario simulation were tabulated and reviewed. The assessment of the data indicated that, compared with the simulated 1997 Base Year condition, a 56 percent increase in total daily vehicle miles of travel (VMT) would occur over the entire study area. That growth occurred equally across limited access and locally accessible highway facilities. As a consequence, traffic congestion along freeways and local highways increased in line with VMT since there wasn't a corresponding increase in the supply of facilities (e.g., capacity or services).

Additional assessments indicated that multi-modal solutions should be investigated along with strategies which: yield travel demand reductions; revise travel patterns, and; provide a wider application of traditional traffic engineering techniques (i.e., more highway capacity). A significant inventory of improvements which can deliver these types of benefits are contained in the DVRPC long range transportation plan and in the comprehensive plans of the municipalities, counties and public transportation providers. These transportation improvements were subsequently added to the committed set – and modeled – to determine the sub-regional effects of the long range plan within the study area.

Noteworthy improvements added to the study area's modeled transportation network and tested within the Year 2025 PLAN Scenario included: the Schuylkill Valley and Cross County metros, widening US 422 between US 202 and Lewis Road, widening selected locally accessible roadway segments, isolated intersection improvements, and extensions to closed-loop traffic signal systems.

Performance data emanating from the Year 2025 PLAN Scenario's simulation were tabulated and reviewed. The assessment of that data, compared with the outputs from the Year 2025 Committed Scenario, indicates that travel increases can be expected in the overall study area. However, a disproportionate share of the increase takes place along limited access highways while decreases are forecasted on the locally accessible highway system. In the final analysis, the combination of capacity improvements plus traffic volume reduction – as a consequence of diversion to rail and higher order highways – results in improved local road traffic performance for the PLAN Scenario versus the Committed Scenario. Network-wide daily congestion indicators show favorable changes: travel times decrease, speeds increase and volume / capacity ratios decline. Conversely, peak hour traffic conditions at selected monitoring intersections, within the study area, show no appreciable change from the Committed Scenario.

DVRPC staff, subsequently advanced a third travel simulation – the Year 2025 Full-Build Scenario – to address the remaining shortcomings. In coordination with the Steering Committee, a supplementary set of improvements were identified in comprehensive plans of the municipalities, counties and operators, and combined with the previously tested improvements. The Full-Build Scenario provides an indication of the benefits of a more widely distributed, and locally applied set of mobility improvements which are deemed to be desirable and reasonable, but which are not part of the formal project development process. Significant among these were:

- Widening the PA Turnpike to six lanes, between Valley Forge and Downingtown;
- A full electronic-toll slip ramp interchange at PA 29 and the Turnpike;
- The "Northern Relief Route" - two lane circumferential improvements (including new and upgraded alignments) around Phoenixville's business district;

- A two lane Chester-Montgomery County connecting bridge and roadway, linking PA 113 and PA 29 north of the business district;
- Widening PA 29 for an added travel lane in each direction from the connector through the US 422 interchange;
- Interchange reconfiguration at US 422 and PA 29;
- Adding a partial interchange at US 422 and Pawlings Road which provides ramps to/from the east along US 422;
- Interchange completion at US 422 and PA 363 (Trooper Road) which provides ramps to/from the west;
- An additional complement of local road and intersection improvements;
- Relocating TMACC's Phoenixville Phlyer service to operate between Phoenixville and Exton via Eagleview and Lionville (i.e., along PA 113 in the study area, and PA 100 outside), and;
- Instituting SEPTA bus service between Phoenixville and West Chester via Glenloch (i.e., replacing Phlyer service along PA 29 in the study area).

The performance data emanating from the simulation of the Full-Build Scenario indicated that an increase in study area travel would again ensue versus the PLAN Scenario, but that the volume would be more optimally distributed throughout the study area. New ramp connections included in the Full-Build alternative provided for more optimal traffic distribution and reduced reliance on local highways in the study area. Furthermore, local level transportation improvements in concert with transit and other regional highway improvements provided a more widely distributed and balanced set of multi-modal travel options than the previously tested scenarios. In turn, study area congestion measures (speed, delay and v/c ratios) are improved and public transportation ridership is fostered over the previously tested 2025 scenarios. On a micro level localized intersection traffic operations at selected monitoring locations are restored to very near current conditions.

As a final step in the futures testing and technical analyses phase, a set of additional local improvements were identified. These would deliver improved intersection operations at the monitoring locations if compared to current conditions. These improvement suggestions were provided to the Steering Committee for its consideration in formulating the final recommendations.

As a result of the technical and committee work, 66 capital, operating and service improvement projects and five additional transportation and land use studies are recommended for the study area. The recommendations largely adopt the set of improvements identified, tested and evaluated in the Year 2025 Full-Build Scenario as the most appropriate set to accommodate existing conditions and future growth and travel needs. The projects are subdivided into highway improvements (50 projects), rideshare and transportation demand management improvements (7 projects,

encompassing TMA services and park-and-ride lots), expansions to public transportation services within the study area (5 projects), and four multi-use trail improvements. The recommendations are consistent with Steering Committee and public expressions of values vis-à-vis planning goals and objectives developed through the study.

The recommendations are arrayed into a Mobility Improvement Plan (MIP). The Plan includes staging and cost information for the multi-modal set improvements which will best provide for travel to the year 2025. Project priorities and funding elements are framed within four stages (short, near, medium and long terms) to coincide with regional, state and federal transportation planning and financial-aid programming mechanisms. A summary of the study area's recommended $173.5 million MIP is shown below.

SUMMARIZED STUDY AREA
MOBILITY IMPROVEMENT PLAN (MIP)

STAGING / COST ESTIMATE (000'S)

IMPROVEMENT CATEGORY	Short Term (0-6 yrs)	Near Term (7-10 yrs)	Medium Term (11-14 yrs)	Long Term (15-25 yrs)	Totals
Highway	$ 59,925	$ 11,190	$ 51,710	$ 28,630	$ 151,455
Rideshare / TDM	$ 686	$ 141	$ 241	$ 250	$ 1,318
Transit	$ 2,001	$ 1,334	$ 2,834	$ 3,669	$ 9,838
Multi-use Trails	$ 4,406	$ 5,000	—	—	$ 9,406
Additional Studies	$ 700	$ 250	$ 500	—	$ 1,450
Totals	$ 67,718	$ 17,915	$ 55,285	$ 32,549	$ 173,467

Short term improvements consist of projects which are in or are imminent for construction, are on the current regional TIP (covering federal fiscal years 2001 - 2004), or are candidates for inclusion in DVRPC's proposed 2003 - 2006 TIP update. The near term set of improvements include projects, or phases thereof, which coincide with the second four years of the PennDOT's proposed Twelve Year Program (STIP) update.

Medium term improvements coincide with the remaining program years of PennDOT's proposed Twelve Year Program update. The long term program of improvements rounds-out the completion and update of DVRPC's long range transportation plan for the region (*Horizons 2025*).

Funding commitments have been identified for almost 80 percent of the short term program needs. The remainder of the improvement Plan (i.e., years 7 through 25) is virtually unfunded. More detail on project breakdowns and the financial aspects of the mobility improvements can be obtained by reviewing Table 8 – the MIP – in the main report (see pages 91 & 92).

The study area's improvement program (as summarized above) is bolstered by a set of important regional transportation improvements. The regional level improvements deliver benefit to the study area by drawing travel from local highway systems – in turn reducing local road congestion. These projects are in varying stages of development, and fall under the sponsorship of other municipalities or agencies to implement. Notable among these are:

- constructing and operating the Schuylkill Valley and Cross County metros;
- widening the PA Turnpike between Valley Forge and Downingtown, and providing electronic toll slip ramp interchanges throughout the region;
- widening US 422 to three lanes in each direction between US 202 and Lewis Road, and;
- providing western oriented ramps at the PA 363 / US 422 interchange.

Complementing the recommended area-wide Mobility Improvement Plan are a broad set of management actions which emphasize transportation demand management and growth management as tools to extend mobility within and beyond the study area. Roles and responsibilities are identified for a full range of programmatic and institutional actions to be implemented regionally, locally, publicly and privately – very often as part of regular governing or business practices.

Together the mobility improvements and the management measures represent a comprehensive and unified implementation strategy – to accommodate Greater Phoenixville's growth and travel needs. □

2 INTRODUCTION

The Greater Phoenixville Area is currently subject to substantial levels of traffic and congestion. Traffic generated in the Borough of Phoenixville, and its neighboring municipalities, are afforded just two continuous east-west arterial highways. Similarly, only two continuous north-south highways serve the study area. Three of the four highway facilities converge within the Borough where only two, two-lane bridges carry traffic over the Schuylkill River. The broad area is experiencing substantial development activity, indicating that existing traffic and circulation problems will intensify. Coincidentally, redevelopment opportunities within the borough cannot be fully realized without an improved transportation infrastructure.

The need to conduct an over-arching study of Greater Phoenixville was identified in the *Phoenixville Strategic Plan: French Creek Corridor & Downtown Business District* prepared by the Chester County Planning Commission (May 2000). That effort examined constraints and opportunities, within the natural and human environments, to facilitate circulation surrounding a proposed 124 acre redevelopment project – the French Creek Center. The French Creek Center will redevelop the former Phoenix Iron and Steel plant into a mixed residential-commercial development adjacent to the borough's business district. The development – the crown jewel of the Borough's revitalization plan – will also incorporate a station along the proposed Schuylkill Valley MetroRail line, and integrate planned multi-use trails.

The Strategic Plan also foresaw that conditions on a wider basis needed to be explored to account for the effects of regional growth and plans. As such, the *Plan* recommended that a sub-region, defined as the Borough, and its immediate neighbors (Charlestown, East Pikeland and Schuylkill townships, in Chester County, and Upper Providence Township, in Montgomery County) be subject to an area-wide study to assess growth and development in the context of a regional transportation study.

Acting upon the recommendation, the Board of Commissioners of the Delaware Valley Regional Planning Commission (DVRPC) directed staff to conduct the broad area transportation study. Technical and committee work for the Phoenixville Area Intermodal Transportation Study was conducted through the auspices of the DVRPC's regional long-range land use and transportation plan. *HORIZONS 2025* recommends that high priority areas / corridors facing emerging problems – such as rapid suburbanization, inadequate public transportation and increasing traffic congestion – be subject to more refined evaluations with the direct participation of local governments and key stakeholders in the study area.

The area and municipalities comprising the study area of the Phoenixville Area Intermodal Transportation Study are quite diverse. Current build-out levels, rates of

suburbanization and levels of transit service vary considerably, yet traffic congestion is a common concern. Opinions and efforts to ameliorate the traffic situation are as varied as the study area's setting. This study provided a means to address the expected benefits of current transportation planning and improvement programming efforts in the Greater Phoenixville Area. The work also furnished the ability to test additional actions which might be pursued to better accommodate study area growth.

Major planning issues which contributed to formulating the initial work program and defining the Study's Steering Committee were:

1) To investigate north-south travel conditions in consideration of the French Creek Center in Phoenixville and ongoing growth in Upper Providence Township, to the north, and in Great Valley, to the south.
2) To assess east-west travel opportunities by testing regional improvements, such as the Schuylkill Valley MetroRail, and widening US 422 and the Pennsylvania Turnpike through the study area.
3) To examine the possible effects of enhanced access between the local roadway system and the regional highway network via: the proposed electronic toll slip ramps proposed by the Turnpike at PA 29 (and other regional locations), and; additional interchanges with US 422.
4) To advance the state of planning for non-traditional modes of travel (e.g., expanded bus services and multi-use trails), and travel demand management options within the study area.
5) To incorporate independent transportation, traffic and land use planning initiatives that have been undertaken within the study area.
6) To provide those services within the study area to municipalities which have not recently undertaken them.
7) To conduct the work with consideration of ongoing planning efforts of the Valley Forge National Historical Park.

In conducting this study, DVRPC augmented local planning efforts by examining the Greater Phoenixville Area sub-region in a comprehensive fashion. Additionally, DVRPC used regional planning initiatives and evaluation procedures in the effort. The study draws from the findings of *Horizons*, the Year 2025 Plan for the Delaware Valley, and in-house planning efforts such as the Pennsylvania Congestion Management Systems (PA CMS), and the Mobility Alternatives Program (MAP) so that land use-transportation linkages and multi-modal perspectives are integrated into the evaluation.

The Phoenixville Area Intermodal Transportation Study employed the regional travel demand forecasting model. A variety of performance statistics were obtained from the regional model's output, and these were used to measure the effectiveness of the transportation network for each of four tested alternatives – a current year condition, which established the baseline, and three Year 2025 scenarios, which assessed the

consequences of introducing progressively higher transportation investment upon the study area's infrastructure.

To guide the work, DVRPC established a collaborative steering committee composed of representatives from governmental jurisdictions, key operators and institutional entities located within the study area.

Ultimately, the Phoenixville Area Intermodal Transportation Study resulted in a recommended Mobility Improvement Plan (MIP). The MIP represents a comprehensive and unified implementation strategy – consisting of capital, service and operating improvements and where needed additional studies – to serve sub-regional needs. Elements of the MIP can be used as inputs to parent plans and programs (e.g., long range plans, PA CMS, MAP, planning work programs, and the region's Transportation Improvement Program – TIP) for implementation. Lastly, the study identifies and discusses management measures which should be practiced regionally and locally, publicly and privately to extend the serviceability of the recommended improvement plan.

WORK PROGRAM

The following activities were performed to complete the Phoenixville Area Intermodal Transportation Study.

1) Obtained instruction from the DVRPC Board of Commissioners regarding the appropriate study area for consideration.
2) Established and provided administrative and technical support for a study area planning steering committee.
3) Used recommendations of the various management systems (as available), land use and transportation planning efforts and steering committee input to critique and supplement the recommendations of the regional plan.
4) Developed a focused transportation network to perform travel simulation / modeling within the detailed study area.
5) Prepared and evaluated alternate land use conditions (versus the population and employment forecasts of *Horizons 2025*) as the basis for modeling future travel conditions within the study area.
6) Tested alternate future travel scenarios to determine the set of facilities needed to serve the study area.
7) Developed a final set of recommended land use conditions and transportation improvements for the study area.
8) Coordinated the area-wide plan with affected local governments, operating agencies, the public and other groups as was needed.

THE REPORT

This report presents the undertakings and findings of the work program. An overview of the remaining chapters is listed below.

- Chapter 3 describes the regional setting surrounding the study area
- Chapter 4 presents existing conditions within the study area
- Chapter 5 details the steps taken and results produced in simulating and evaluating 1997 Base Year and future Year 2025 travel demands
- Chapter 6 presents the improvement plan recommended as a result of the technical and committee work
- Chapter 7 addresses implementation practices available to achieve the plan.

Five appendices, which compress important details to more useable formats and streamline the narrative, follow the report's main body. They are:

- Appendix A provides tabular comparisons of existing and forecasted travel demands
  - A1 includes daily highway traffic volumes (AADTs)
  - A2 includes daily transit boardings
- Appendix B summarizes the assessment of peak hour traffic operations for existing and simulated future conditions at 20 selected monitoring intersections in the study area
- Appendix C presents highway performance data obtained from the simulation of existing and future transportation networks
  - C1 includes data for the complete highway system (i.e., freeways, expressways, arterial highways, collectors and local highways)
  - C2 includes data for the "locally accessible" highway network (i.e., just the arterial highways, collectors and local highways in the modeled network)
- Appendix D identifies transportation improvement projects considered and used in the future scenarios' testing
- Appendix E lists the Study Steering Committee members. □

3 REGIONAL SETTING

The Greater Phoenixville Area is situated in the northwestern suburbs of the region (Figure 1). The detailed study area is comprised of the Borough of Phoenixville, Charlestown, East Pikeland and Schuylkill townships, in Chester County, and Upper Providence Township, in Montgomery County, Pennsylvania.

The character of the 51 square mile study area varies considerably. Aged and densely developed settings exist at the study area's core (in Phoenixville Borough, and in the Mont Clare section of Upper Providence). Density decreases radiating outward from the core, giving way to newer suburban settings (single family residential subdivisions, shopping centers and office parks / corporate headquarter facilities). On the fringes of the study area agricultural and wooded tracts, and the Valley Forge National Historical Park dominate the landscape – conveying a rural atmosphere.

Regional development centers[1] that influence travel within and through the study area include:

- Phoenixville's central business district;
- the Oaks interchange area at Egypt Road and US 422, in Upper Providence;
- the PA 29 and US 422 interchange area, in Upper Providence;
- Great Valley, in East Whiteland;
- Chesterbrook, in Tredyffrin;
- King of Prussia, in Upper Merion, and;
- Center City Philadelphia.

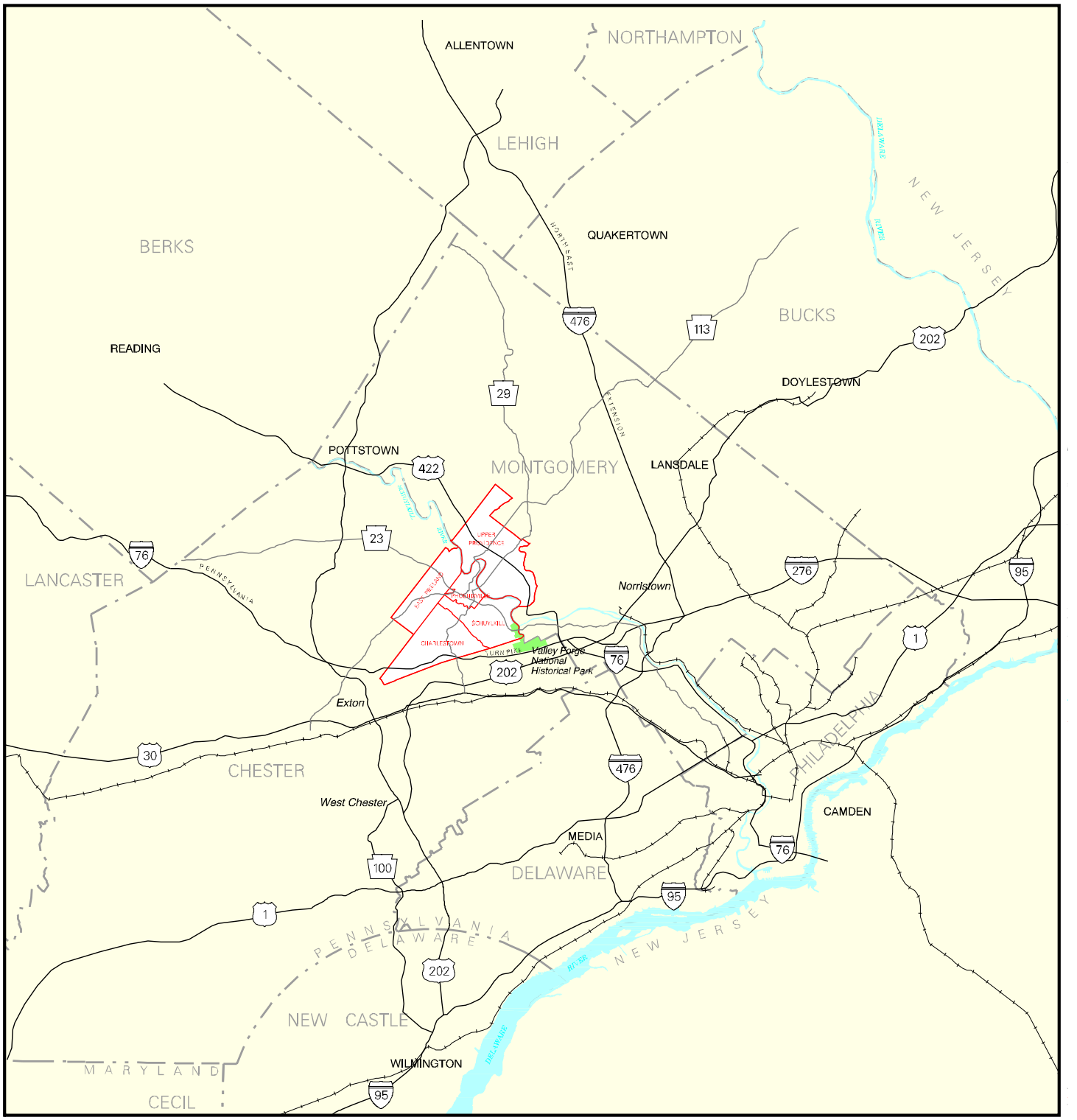
Access to and beyond these activity centers is afforded by a network of highways, public bus routes, and regional rail lines.

HIGHWAY FACILITIES

Freeways and expressways providing mobility in the vicinity of the study area include the Pottstown Expressway (US 422), the Pennsylvania Turnpike's east-west main line (I-76), and US 202. Principal arterial highways include substantial portions of PA 23 and PA 29 through the study area, and PA 113 / Bridge Street through the borough's downtown district.

[1] Development centers are concentrations of and foci for dense development, typically, offering and mixing opportunities for living, shopping, working, entertainment, etc..

PHOENIXVILLE AREA
INTERMODAL TRANSPORTATION STUDY



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DELAWARE VALLEY
REGIONAL PLANNING COMMISSION
JANUARY 2003

FIGURE 1:
REGIONAL SETTING

STUDY AREA

The Pottstown Expressway (US 422) serves as the western extension of the Schuylkill Expressway (I-76). The highway offers high levels of mobility on the north side of the Schuylkill River connecting US 202 in King of Prussia, on the east, with Pottstown on the west. Two eastbound and two westbound travel lanes are provided. Interchanges between this regional highway and the study area's local highway network are located at PA 29 and Egypt Road.

The Turnpike is a toll highway, providing high levels of mobility for long distance trips to/from the east, west and north (via the northeast extension, I-476). Presently the Turnpike offers two travel lanes in each direction through the extreme southern limits of the study area. There are no interchanges provided between the study area's local highway network and the Turnpike. The nearest interchanges are located approximately seven miles to the east (at the Valley Forge interchange), and seven miles to the west (at the Downingtown interchange).

Widening to provide an additional (third) lane in each direction, between the Norristown and the Downingtown interchanges (e.g., west of Norristown) and between the Norristown and the Lansdale interchanges (e.g., north of Norristown) is being evaluated by the Turnpike Commission. The Turnpike Commission is also evaluating providing electronic toll, slip ramp interchanges with its facility at various locations throughout the region, including PA 29 in the study area.

US 202 is a limited access four lane freeway located just beyond the study area's southern boundary. The highway is most readily accessed from the study area by interchanges at: PA 401, PA 29 (Great Valley) and PA 252 (Devon and Chesterbrook). North of the study area, US 202 connects with King of Prussia and the Schuylkill Expressway (I-76). Exton and West Chester are conveniently accessed from the study area via US 202 southbound.

US 202 is currently being widened to provide an additional travel lane in each direction between PA 252 and I-76. Engineering activities are also in progress to continue that widening southward to the Exton Bypass (US 30) interchange. It is anticipated that the continuous widening and reconstruction of US 202 between US 30 and the Schuylkill Expressway will be completed by or during 2008.

PA 23 travels an west-east path paralleling the Schuylkill River through northern Chester County, Valley Forge National Historical Park and southeastern Montgomery County. Designated as Nutt Road and Valley Forge Road, through the heart of the study area, PA 23 offers one travel lane in each direction with uncontrolled driveway access. East Pikeland, Phoenixville and Schuylkill are partnering in implementing a closed-loop (interconnected, coordinated and responsive) traffic signal system along the arterial to facilitate traffic movement through these adjoining municipalities.

PA 29 provides for north-south travel through central Chester and Montgomery counties. The highway traverses development / activity centers in Great Valley, Phoenixville and at the US 422 / PA 29 interchange. It provides one of the three Schuylkill River bridge crossings within the study area. PA 29 provides interchanges with US 202 and US 422, and aside from those interchange areas, offers one travel lane in each direction. Through the study area, PA 29 is designated along Phoenixville Pike (in Charlestown and Schuylkill townships); Main, Starr and Bridge streets (through the Borough and Mont Clare), and; Phoenixville-Collegeville Road (in Upper Providence).

Steps are underway to widen PA 29 to provide a consistent four lane cross section (for through traffic) from the Charlestown Road / Phoenixville Pike intersection to the US 202 interchange in association with commercial office developments located in Great Valley (East Whiteland, Tredyffrin and Charlestown townships).

PA 113 also travels a north-south path through Chester and Montgomery counties, and the study area. PA 113 connects the Phoenixville and Lionville (Uwchlan Township) development centers and provides a Schuylkill River bridge crossing in the study area. The one lane by direction highway is designated circuitously along Chester Springs and Kimberton roads (in East Pikeland), Nutt Road, and Bridge, Gay, Emmett and Freemont streets, and Black Rock Road (through the borough) and Trappe Road (through Upper Providence Township).

PennDOT is taking steps to replace the Gay Street Bridge (over the French Creek in the Borough). Portions of PA 113 (in East Pikeland, and along Bridge Street in the Borough) are included in the multi-municipal closed-loop traffic signal system taking shape in the study area.

PASSENGER RAIL FACILITIES

There are no passenger rail services currently operating within the detailed study area. However, within a wider view SEPTA operates the R5 regional rail line between Thorndale / Paoli and Center City Philadelphia with station stops located south of the study area, and the R6-Norristown Line terminating east of the study area.

SEPTA is presently preparing financial, environmental and engineering analyses in support of:

- renewing radial rail services directly within the study area via the Schuylkill Valley MetroRail (between Central Philadelphia, Norristown and Reading — along the US 422 corridor), and;
- establishing circumferential rail service, south of the study area, via the Cross County MetroRail (between Thorndale in Chester County, Norristown and Trenton, NJ — along the US 202 / PA Turnpike corridors).

The Schuylkill Valley MetroRail will provide three station stops in the study area:

- Perkiomen Junction (in Schuylkill Township);
- Oaks (in Upper Providence Township), and;
- Phoenixville (integrated with the proposed French Creek Center multi-use development in the Borough). □

4 EXISTING AREA-WIDE CONDITIONS

Subjects detailed in this chapter include:

- study area demographics and trends for 1980, 1990 and 2000;
- existing land use patterns;
- existing highways and public transportation services;
- journey-to-work characteristics according to the 1990 Census;
- an assessment of existing transportation conditions within the study area, and;
- an overview of the projects contained within the current transportation improvement program encompassing the study area.

DEMOGRAPHICS

The study area experienced a nominal increase in population between 1980 and 1990 (+5%), and a substantial increase (+23%) between 1990 and 2000 (see Table 1). Most of the more recent growth took place in Upper Providence Township.

TABLE 1
STUDY AREA DEMOGRAPHIC CHARACTERISTICS: 1980, 1990 and 2000

		Population			Employment		
Municipality	**Area (mi^2)**	**1980**	**1990**	**2000**	**1980**	**1990**	***2000***
Charlestown Twp.	12.5	2,770	2,754	4,051	1,074	1,151	*1,350*
East Pikeland Twp.	8.8	4,410	5,825	6,551	695	950	*950*
Phoenixville Borough	3.6	14,165	15,066	14,788	8,086	5,942	*5,850*
Schuylkill Twp.	8.6	5,993	5,538	6,960	1,649	2,818	*3,050*
Upper Providence Twp.	17.8	9,551	9,682	15,398	5,830	3,781	*6,800*
Phoenixville Area Study Area	**51.3**	**36,889**	**38,865**	**47,748**	**17,334**	**14,642**	***18,000***
Chester Co.	756.0	316,641	376,396	433,501	134,265	197,752	*230,350*
Montgomery Co.	487.5	643,371	678,111	750,097	360,399	457,500	*491,200*

sources: Population statistics from US Census. Employment statistics for 1980 and 1990 from US Census. Year 2000 employment data are DVRPC estimates per: *Year 2025 County & Municipal Population & Employment Forecasts, (DVRPC, April 2000, Publication No. 00007)*.

In contrast, employment within the study area declined between 1980 and 1990 (-15%) with substantial reduction in jobs occurring in the Borough of Phoenixville and in Upper Providence. Between 1990 and 2000 study area employment increased by 23 percent, mostly in Upper Providence, making up the loss experienced in the preceding decade.

With respect to the most recent data, the Borough of Phoenixville has the highest levels of population and jobs within the Chester County portion of the study area, and the highest densities of these demographics for the entire study area. Upper Providence Township outpaced the Borough's growth during the 1990's, and currently contains the highest levels of population and employment for the overall study area.

LAND USE

Figure 2 illustrates 1995 land use conditions for the broad study area which are characterized by light development densities. The predominant land use forms are agricultural and wooded tracts, and single family residential use.

Removing lower intensity use(s) from the view, as is accomplished in Figure 3, reveals concentrated nodes of commercial, industrial and high density residential use. Accordingly, Figure 3 displays the activity or development centers in and around the study area.

There are three development centers contained within the study area:

- the Borough of Phoenixville;
- the US 422 and PA 29 interchange area, in Upper Providence Township, and;
- the Oaks interchange area (i.e., US 422 and Egypt Road), in Upper Providence.

Great Valley (in East Whiteland Township, immediately north of the US 202 and PA 29 interchange), and the Chesterbrook community (in Tredyffrin Township, surrounding PA 252's offset interchanges with US 202) are important development centers located adjacent to the study area's southern boundary.

Figure 3 also displays the location of major employers that were present in the study area environs during 1995. These are described in Table 2.

PHOENIXVILLE AREA
INTERMODAL TRANSPORTATION STUDY

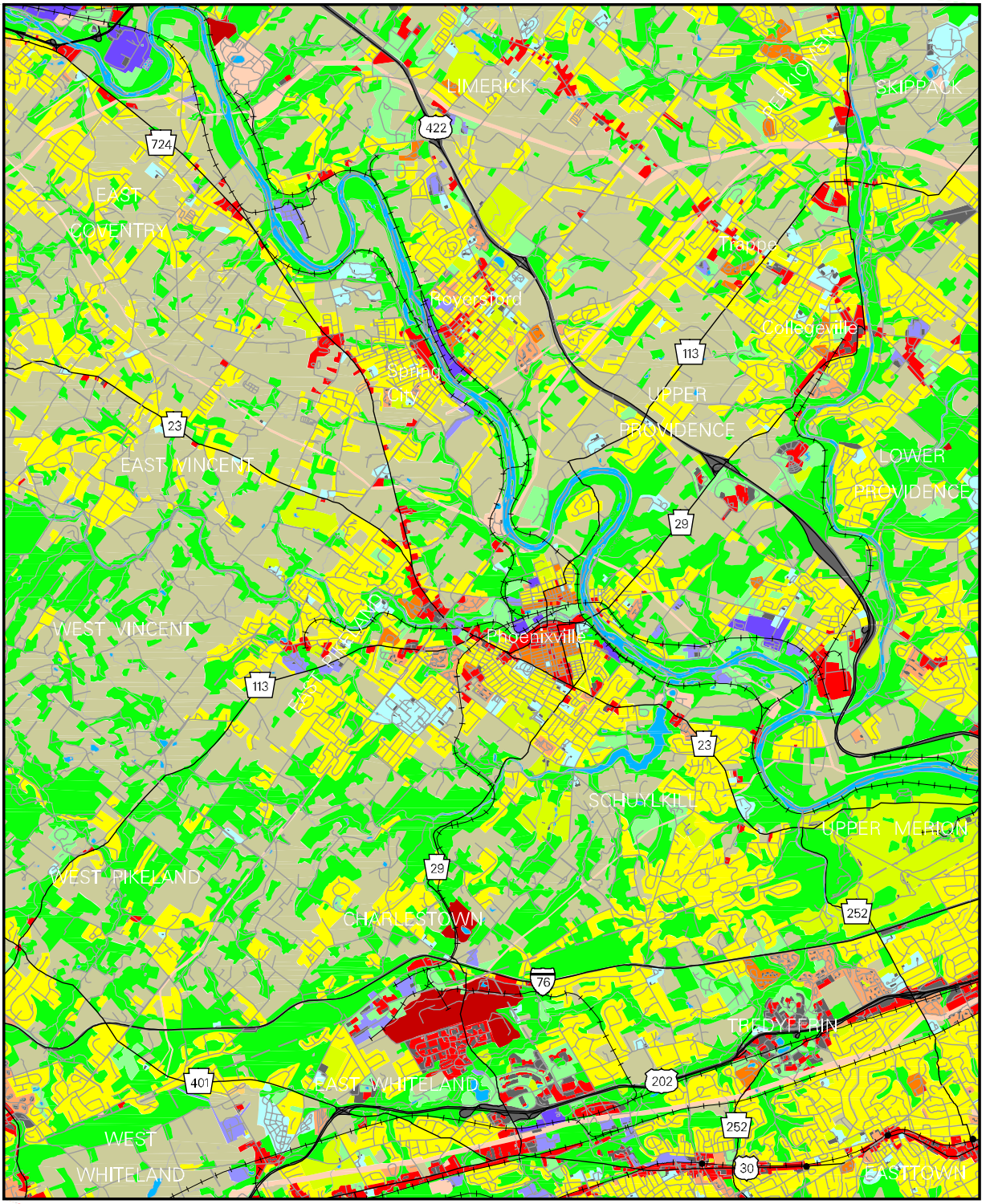

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FIGURE 2 :

1995 LAND USE

- SINGLE FAMILY (DETACHED)
- MULTI FAMILY
- ROW HOMES
- MOBILE HOMES
- LIGHT MANUFACTURING
- MANUFACTURING
- TRANSPORTATION
- UTILITY
- COMMERCIAL / SERVICES
- COMMUNITY SERVICE
- MILITARY
- RECREATION
- AGRICULTURE
- MINING
- VACANT
- WOODED
- WATER

PHOENIXVILLE AREA
INTERMODAL TRANSPORTATION STUDY

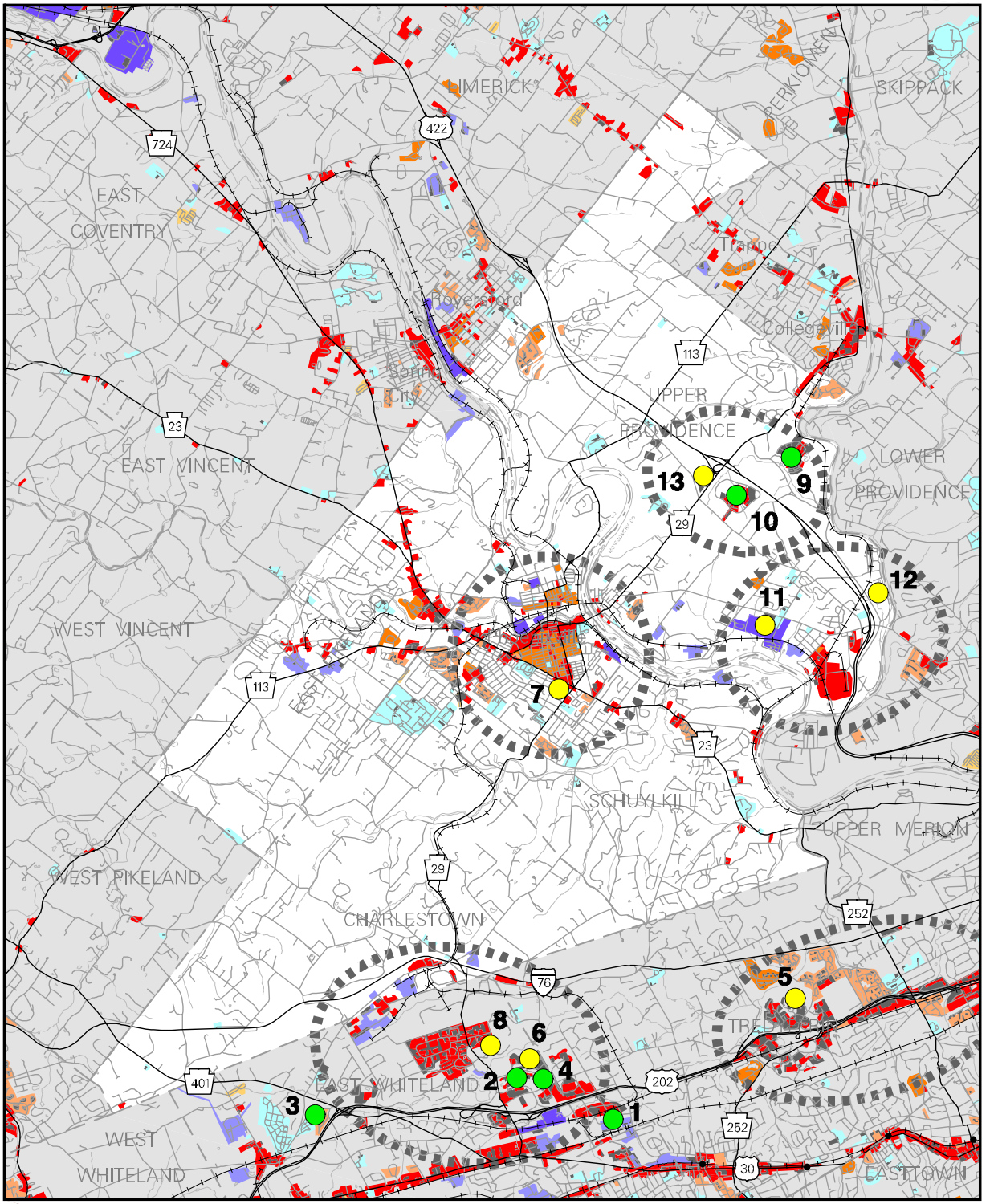

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FIGURE 3 :

DEVELOPMENT CENTERS - 1995

Development Center

Employers With Over 1000 Employees

Employers With 500-1000 Employees

EXISTING LAND USE (1995)

- Light Manufacturing / Industrial
- Manufacturing / Industrial
- Community Service
- Commercial / Services
- Multi Family
- Row Homes
- Mobile Homes
- Transportation

TABLE 2
MAJOR EMPLOYERS IN THE STUDY AREA (1995)

Fig. 3 ref. #	Company	Services	Local, Full Time Employees
CHESTER COUNTY			
1	The Vanguard Group	mutual fund and financial services provider	5,800
2	Shared Medical Systems Corp.	provider of information systems and services to the health care industry	3,200
3	Providian	provider of diversified financial services	1,400
4	DecisionOne Corp.	computer maintenance and technology support services	1,000
5	Astra Merck Inc.	biotechnology product development and marketing	600
6	Acme Markets	retail food chain	586
7	Phoenixville Hospital of the University of Pennsylvania Health System	106-bed community hospital	500
8	Systems & Computer Technology Corp.	supplier of information systems, services and software to educational institutions, local governments and utilities	500
MONTGOMERY COUNTY			
9	Rhone-Poulenc Rorer, Inc.	human pharmaceuticals	2,000
10	SmithKline Beecham Pharmaceuticals Research and Development	health care products, clinical research	1,000
11	Fleming Company	wholesale food distribution	871
12	SEI Investments	financial services	860
13	SmithKline Beecham Pharmaceuticals Clinical Laboratories, Corp. HQ	pharmaceutical research and development	650

sources: *Largest Chester County Private Sector Employers*, The Business Lists - 1998. p. 99, "1999 Book of Business Lists", Philadelphia Business Journal, Vol. 17 / No. 46., December 25, 1998.

Montgomery County Community Profiles, 1996-1997 Edition, Montgomery County Department of Commerce and Economic Development.

HIGHWAYS

Major highways consist of expressways, freeways and principal arterial highway facilities which completely traverse the study area. These facilities serve varying levels of local and through travelers, and are subject to the highest traffic loadings. The major highway network within the Greater Phoenixville study area is: the Pennsylvania Turnpike (I-76), US 422, PA 23, PA 29, PA 113 and Bridge Street as it traverses the borough's business district.

The Turnpike and US 422 are four lane expressways with entry / exit movement occurring only at interchanges. US 422 has interchanges at PA 29 and Egypt Road. There are no interchanges along the Turnpike in the limits of the study area.

The remaining highways in the study area generally provide only one through travel lane in each direction, and have uncontrolled driveway access with at-grade intersections. Traffic signals and auxiliary turning lanes are usually present at major intersections and posted speed limits are 45 miles per hour or less. Exceptions exist. PA 29 – through the US 202 interchange to its intersection with the Great Valley Parkway, and from Black Rock Road through the US 422 interchange to Mennonite Road – is four lanes wide. Similarly, Egypt Road provides two travel lanes by direction in its vicinity with US 422.

Table 3 summarizes selected attributes for some of the study area's highways.

TABLE 3
CHARACTERISTICS OF SELECTED STUDY AREA HIGHWAYS

Highway	Limits	Ownership	Functional Classification	Posted Speed (mph)
Ridge Pk	Twp Line Rd to Linfield-Trappe Rd	PennDOT (SR 4031)	Principal Arterial	45
Linfield-Trappe Rd	Twp Line Rd to Ridge Pk	PennDOT (SR 4017)	Collector	45
US 422	Walnut Rd Trooper Rd	PennDOT (SR 0422)	Expressway	55
Black Rock Rd	PA 113 to Egypt Rd	PennDOT (SR 4003)	Minor Arterial	40-45
Second Av	Main St to PA 113	PennDOT (SR 4015)	Collector	40
Egypt Rd	PA 29 to New Mill Rd	PennDOT (SR 4002)	Minor Arterial	35-45
Filmore Rd	Twp Line Rd to Franklin Av	Municipal	Collector	25
Mowere Rd	PA 23 to Twp Line	Municipal	Local	25
PA 724	Pikeland Rd to PA 23	PennDOT (SR 0724)	Minor Arterial	45
PA 23	Pikeland Rd to Bridge St	PennDOT (SR 0023)	Minor Arterial	35-45
	Bridge St to PA 29	PennDOT (SR 0023)	Principal Arterial	35
	PA 29 to PA 252	PennDOT (SR 0023)	Minor Arterial	35-45
Pawlings Rd	PA 23 to Schuylkill River	PennDOT (SR 1018)	Minor Arterial	40

TABLE 3
CHARACTERISTICS OF SELECTED STUDY AREA HIGHWAYS

Highway	Limits	Ownership	Functional Classification	Posted Speed (mph)
Pothouse Rd	PA 113 to Whitehorse Rd	PennDOT (SR 1036)	Collector	35-45
Valley Park Rd	Whitehorse Rd to PA 23	PennDOT (SR 1036)	Collector	35-40
Coldstream Rd	Kimberton Rd to Charlestown Rd	PennDOT (SR 1028)	Collector	35
Pikeland Rd	PA 113 to Charlestown Rd	PennDOT (SR 1026)	Local	40
Yellow Springs Rd	West Pikeland line to Hollow Rd	PennDOT (SR 1024)	Collector	35
	Hollow Rd to Phoenixville Pk	Municipal	Local	35
	PA 29 to East Whiteland line	PennDOT (SR 1016)	Collector	40
PA 401	Newcomen Rd to Spring Valley Rd	PennDOT (SR 0401)	Minor Arterial	45
PA Turnpike (I-76)	Downingtown int. (PA 100) to Valley Forge int. (I-276)	PA Turnpike Commission	Expressway	65
Township Line Rd	Wartman Rd to Walnut Rd	PennDOT (SR 4014)	Minor Arterial	45
Lewis Rd	Borough Line Rd to Main St	PennDOT (SR 4013)	Collector	40
PA 113	Ridge Pk to Bridge St	PennDOT (SR 0113)	Minor Arterial	25-45
	Gay St to PA 23	PennDOT (SR 0113)	Principal Arterial	25
	Bridge St to PA 401	PennDOT (SR 0113)	Minor Arterial	45
Franklin Ave	Filmore Rd to Emmett St	Municipal	Collector	25
Hares Hill Rd	PA 724 to Kimberton Rd	PennDOT (SR 1045)	Collector	35
	Kimberton Rd to PA 113	Municipal	Local	35
Township Line Rd	Filmore Rd to Coldstream Rd	Municipal	Collector	35
Phoenixville Pk	Yellow Springs Rd to PA 29	PennDOT (SR 1003)	Minor Arterial	35
Charlestown Rd	Pothouse Rd to PA 29	PennDOT (SR 1019)	Collector	35
PA 29	Ridge Pk to Pothouse Rd	PennDOT (SR 0029)	Principal Arterial	35-45 (25 thru Mont Clare & the Boro)
	Pothouse Rd to Yellow Springs Rd	PennDOT (SR 0029)	Minor Arterial	45

TABLE 3
CHARACTERISTICS OF SELECTED STUDY AREA HIGHWAYS

Highway	Limits	Ownership	Functional Classification	Posted Speed (mph)
	Starr St to Gay St	PennDOT (SR 1040)	Principal Arterial	25
Bridge St	PA 23 to Pothouse Rd	PennDOT (SR 1019)	Collector	35
Whitehorse Rd	PA 23 to PA 29	PennDOT (SR 1003)	Collector	35-45
Country Club Rd	PA 23 to Clothier Springs Rd	PennDOT (SR 1005)	Local	35
Ferry Ln	Pawlings Rd to PA 23	PennDOT (SR 1005)	Collector	35

NOTE: *Italicized* and **Bolded** cells in the foregoing table denote highway segments which are National Highway System (NHS) roadways. NHS routes aim to enhance personal mobility, serve commerce, support economic growth and increase the Nation's competitiveness.

Traffic Volumes

Figure 4 illustrates current daily traffic levels occurring throughout the study area according to traffic counts performed by DVRPC between 1997 and 2001. Table A1 in Appendix A contains a listing for some of these locations.

Limited access expressways carry the highest traffic volume. The PA Turnpike (I-76) carries in excess of 40,000 vehicles per day between the Valley Forge and Downingtown interchanges. US 422 carries between 51,000 and 54,000 vehicles per day through the study area.

Along the "local" highway network, volume is considerably lower. Examples follow:

- PA 29
  - 6,800 to 17,300 vehicles per day near the Turnpike in Charlestown Township
  - 16,300 vehicles per day crossing the Schuylkill River between the Phoenixville business district and Mont Clare in Upper Providence Township
  - 19,000 vehicles per day north of US 422 in Upper Providence.
- PA 113
  - 11,100 to 14,100 vehicles per day south of the Borough in East Pikeland Township
  - 7,100 to 11,900 on the western edges of the Borough
  - 6,000 vehicles cross the Schuylkill River bridge between Phoenixville and Upper Providence
  - 13,000 vehicles south of US 422 in Upper Providence
  - 7,800 vehicles per day north of US 422 in Upper Providence.
- PA 23
  - 16,800 vehicles per day west of the Borough
  - 18,400 to 24,100 vehicles per day through the Borough
  - 13,700 to 20,500 vehicles per day east of the Borough in Schuylkill Township.

PHOENIXVILLE AREA
INTERMODAL TRANSPORTATION STUDY

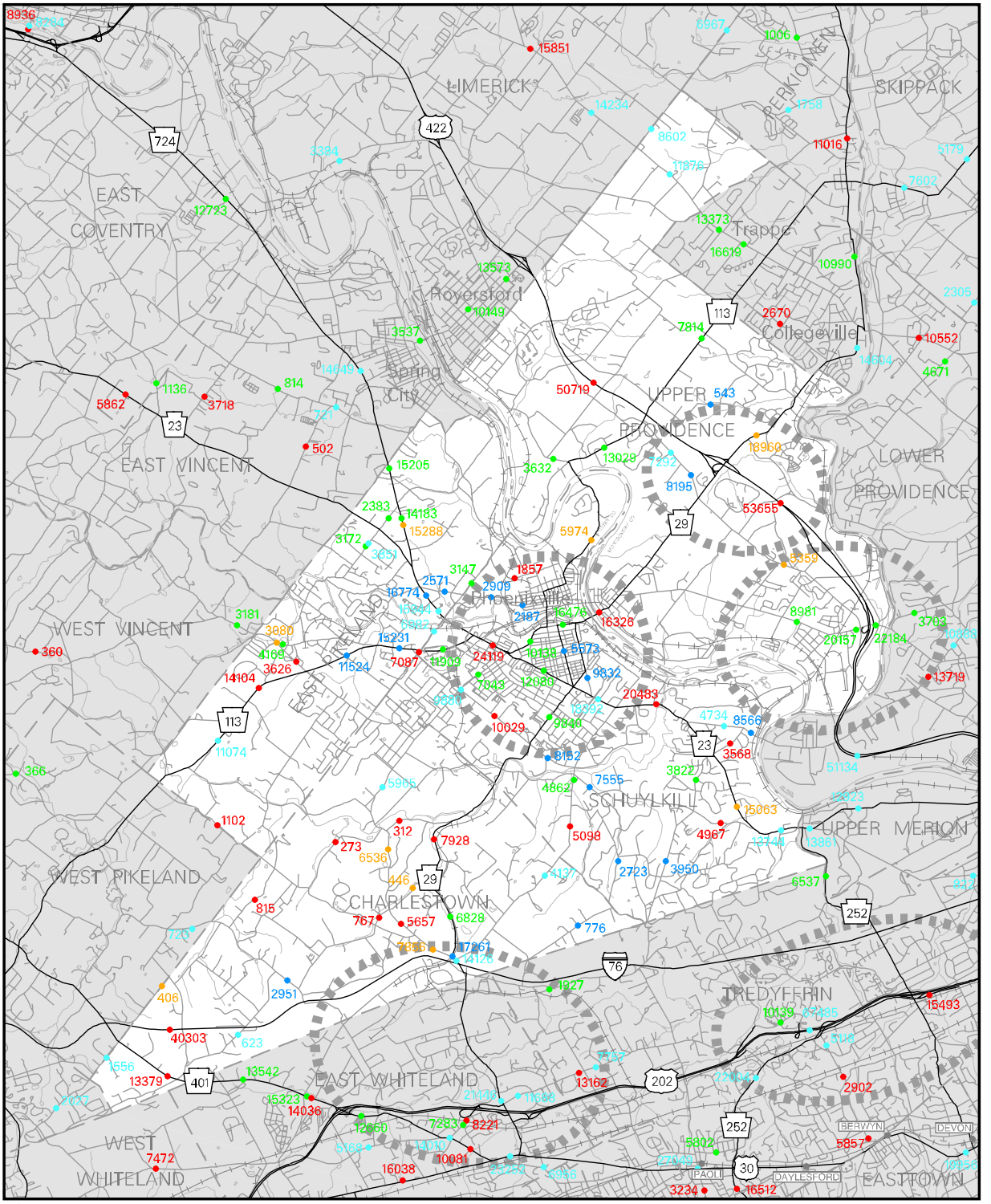

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FIGURE 4 :
CURRENT TRAFFIC VOLUMES

- Traffic Count Location (approximate)
- 8152 2001 Traffic Count (AADT)
- 6536 2000 Traffic Count (AADT)
- 6321 1999 Traffic Count (AADT)
- 4917 1998 Traffic Count (AADT)
- 2823 1997 Traffic Count (AADT)

Development Center

- Bridge Street
  - 10,100 to 16,500 vehicles per day through the Borough's business district.

PUBLIC TRANSPORTATION SERVICES

Figure 5 illustrates existing public transportation services provided within and adjacent to the study area during 2000, when this study was initiated. Table A2 in Appendix A provides ridership summaries for the public transit services.

Bus

Within the study area SEPTA operates two regularly scheduled bus routes – Route #93, and Route #99. Two additional routes have more recently been introduced to the area to spur return-to-work initiatives and serve reverse ridership to suburban employment centers. The Phoenixville Phlyer is operated by the Transportation Management Association of Chester County (TMACC). The Suburban Link service is operated by the Greater Valley Forge Transportation Management Association (GVFTMA). All of the study area municipalities, development centers and major employers receive some service.

Currently both SEPTA's bus routes operate east to west, between Pottstown and the Norristown Transportation Center. The #93 bus operates via Ridge Pike, serving Collegeville and the "neck" of Upper Providence. Full scheduled service is offered six days a week at 60 minute headways. Sunday service is provided only between Norristown and Collegeville. The #99 bus serves King of Prussia, Phoenixville, Spring City and Royersford, and operates more centrally within the study area – via Egypt Road, Bridge Street, PA 23 and PA 724. Service provided within the study area is scheduled at 30 minute headways during weekday peak periods, and hourly during the midday and on Saturdays. Bus Route #99 did not operate on Sundays. Sunday service was instituted in 2001.

The TMAs' bus services provide north-south transit accessibility in the study area. TMACC's Phoenixville Phlyer (instituted in 2000) operates between Spring City and the Exton Square Mall, via Phoenixville and the Great Valley Corporate Center. On weekdays, four southbound trips are provided during the morning and early afternoon hours, while the return trips are provided between the afternoon and late evening. Three round trips are provided on Saturday and there is no Sunday service. The TMACC is currently evaluating relocating its Phlyer bus service to operate between Phoenixville and Exton via PA 113 and PA 100.

GVFTMA's Suburban Link route (instituted in 2001) operates between Collegeville and King of Prussia, via Phoenixville. The schedule provides for three round trips during the weekday morning peak, and three round trips during the weekday evening peak.

PHOENIXVILLE AREA
INTERMODAL TRANSPORTATION STUDY

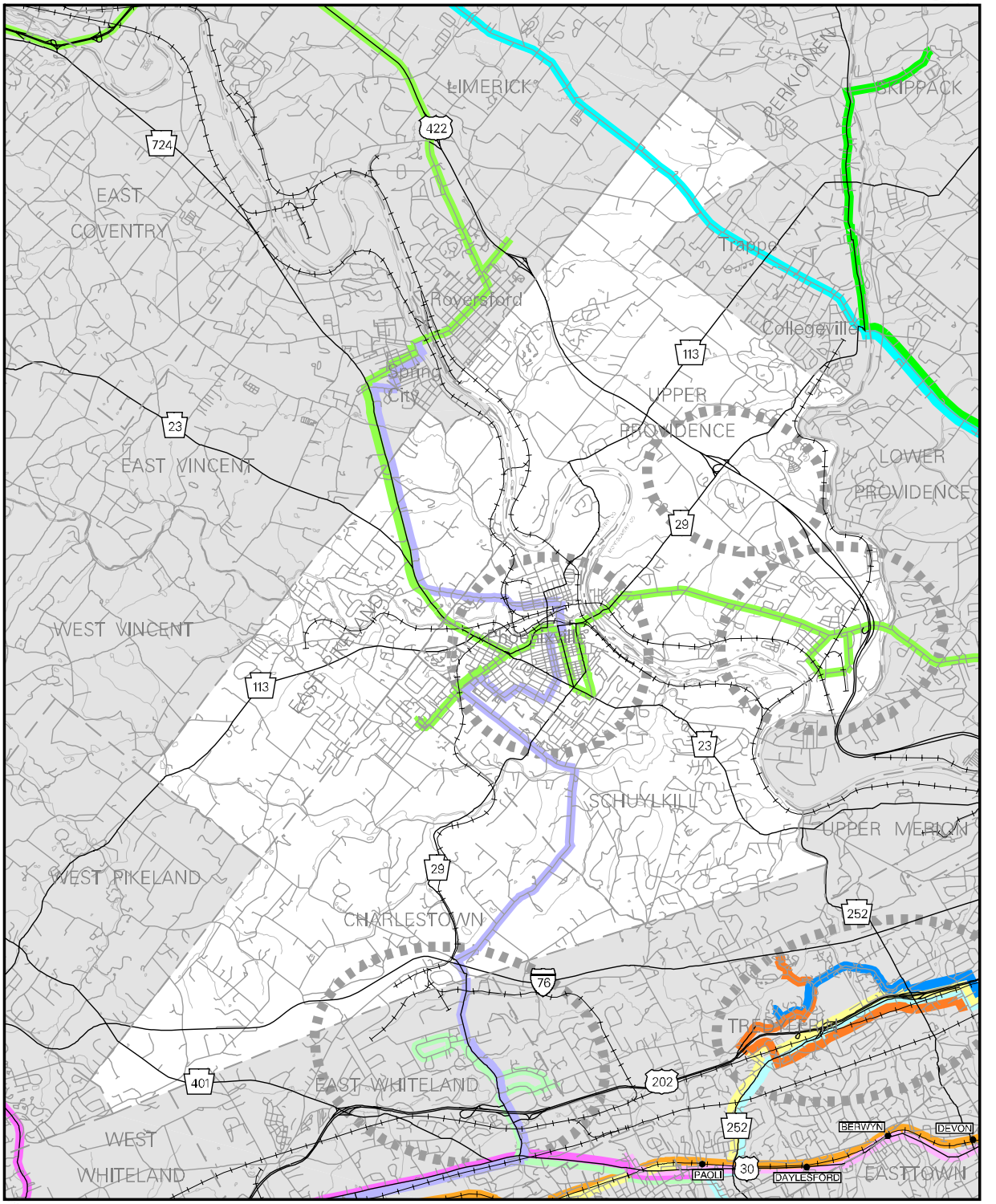

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FIGURE 5 :

CURRENT PUBLIC TRANSPORTATION SERVICES - 2000

- SEPTA Bus Route 91 (Norristown to Eagleville Graterford, Saturday only)
- SEPTA Bus Route 133 (King of Prussia to Exton Square Mall)
- SEPTA Bus Route 93 (Norristown to Pottstown via Collegeville)
- SEPTA Bus Route 99 (Norristown to Pottstown via King of Prussia and Phoenixville)
- SEPTA Bus Route 105 (69th St. Terminal to Paoli or Ardmore via Lankenau Hospital)
- SEPTA Bus Route 118 (Chester to King of Prussia via Media, Newtown Square, Paoli)
- SEPTA Bus Route 124 (Philadelphia to King of Prussia, Chesterbrook via Schuylkil Exwy)
- SEPTA Bus Route 204 (Philadelphia to Frazer, Exton, and Lionville via Paoli Station)
- SEPTA Bus Route 206 (Paoli Station to Great Valley Corp Ctr via Lancaster Pike)
- SEPTA Bus Route 208 (Chesterbrook to Philadelphia, via Stafford Station)
- TMACC PHLYER (Spring City to Phoenixville, Great Valley Corp Ctr, and Exton Square)
- SEPTA R5 Regional Rail Line (Central Philadelphia to Paoli / Thorndale)

Development Center

Total daily boardings within the study area for the SEPTA routes are shown below.

Bus Route	Daily Boardings	Year
93	7	2000
99	182	2000

MULTI-USE TRAILS

Both Chester County and Montgomery County have been actively engaged in planning and implementing interconnected trail and bikeway networks which also serve local and regional attractions.

Figure 6 shows the extent of this effort in relation to the study area. The functional hierarchy of the trail network mimics and augments highway systems. Long distance hiking / biking is provided along the regional multi-use trails (the green lines in Figure 6). For local distribution and access on-street bike routes or off-street paths are identified (the tan lines on the figure). Where municipal networks are being considered (not shown on the figure), county planners are advocating connection with the higher order system(s).

The importance of the spine network is preeminent within the region and the study area. The 19 mile long Perkiomen Trail, bordering the study area's eastern boundary in Montgomery County, is slated for completion by the end of 2003. Funds to develop stages of each of the remaining multi-use trails in the study area are programmed on the current regional TIP (covering federal fiscal years 2001 - 2004). Three line items in the TIP make use of local and state funds, to match federal congestion mitigation and air quality (CMAQ) program funds. Project design, property acquisition and construction – to extend the Schuylkill River Trail westward from the Valley Forge National Historical Park, through the study area, to the Berks County line – are included. An additional project on the TIP seeks to better integrate the Schuylkill River Trail with: the proposed French Creek Center development; the proposed Schuylkill Valley MetroRail station in Phoenixville, and; cultural and recreational amenities taking shape in Mont Clare and along the French Creek in the Borough.

The county and municipal bikeway networks will be implemented as opportunities are presented. Funding to accomplish these systems can be provided through their own project related funding (in the TIP), or in sequence with adjacent roadway improvements or land development construction.

Existing and proposed footpaths (brown lines on Figure 6) primarily serve a recreational function and are referenced for information only.

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INTERMODAL TRANSPORTATION STUDY

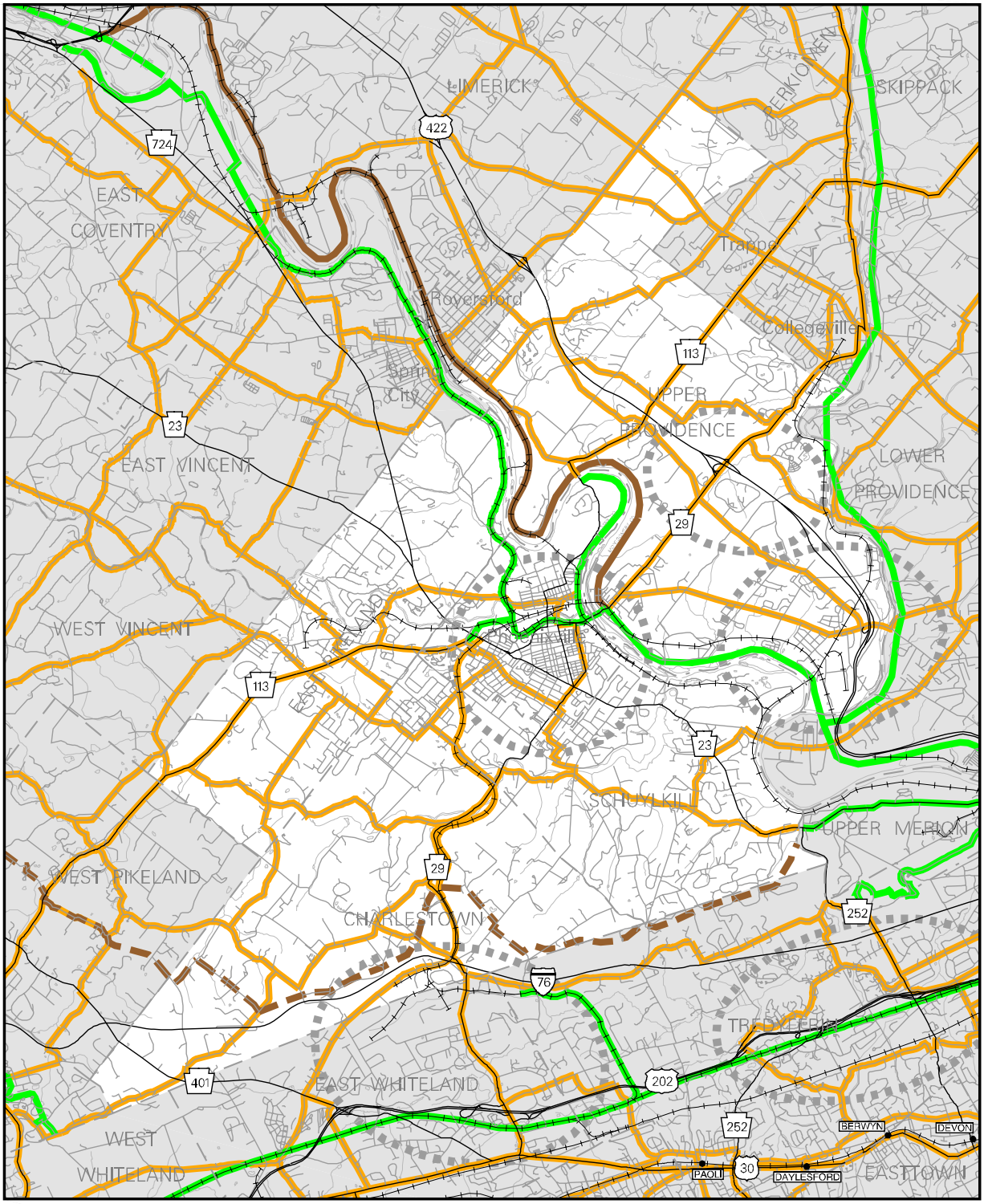

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FIGURE 6 :

PLANNED TRAIL AND BIKEWAY NETWORK

- REGIONAL MULTI-USE TRAILS
- PROPOSED BICYCLE ROUTES
- PROPOSED FOOTPATH
- EXISTING FOOTPATH
- DEVELOPMENT CENTER

1990 JOURNEY-TO-WORK TRAVEL

A significant share of all trips made on an average weekday are those involving commuting to and from work (approximately 20 to 25 percent of total trips). Typically work trips are compressed into just two to three hours in the morning and two to three hours in the evening on any given workday. The inclination to use public transportation in completing work trips is higher than for any other trip purpose. As a result, travel to and from work creates a high temporal demand on highway and transit facilities and contributes significantly to the degree of congestion and delay encountered on those facilities.

Examining work trip origin-destination pairings is useful in understanding a very significant component of trip making which affects the study area on a daily basis. In order to gain a better understanding of these conditions, detailed evaluations of Journey-to-Work data from the 1990 Census were conducted. While the data is somewhat dated, it remains the most recent of its caliber available for this study. Moreover, while trip magnitudes may have changed in the intervening decade, patterns and trends are still worthy of consideration. Where appropriate, separate attention of trip making characteristics associated with the Borough is presented to highlight its uniqueness.

At the time the Census was conducted (April 1990) there were about 35,800 work trips made to, from and within the study area. A little more than one-half of the work trips were outbound to job sites (20,400), and a little less than one-half were inbound (15,400). The highest trip productions and attractions within in the study area occurred within the municipalities with the highest population and number of jobs (Phoenixville and Upper Providence).

About 82 percent of the study area's total worker trips were accomplished by driving alone to work in single occupant vehicles (SOVs), 14 percent in carpools or vanpools, two percent via public transportation, and four percent by other means. In the Borough, 79 percent commuted in SOVs (meaning that for the remainder of the study area, 85% of the work trips were completed in SOVs).

Major work trip origin-destination pairings (desire lines) to / from the municipalities in the study area were determined from the top ten origins and destinations associated with the each study area municipality (accounting for 57 percent of total worker trips). From that data "major" work trip pairings between municipalities were identified. For this analysis major trips were defined when a threshold of 200 or more one-way worker trips, between municipal pairs, was equaled or exceeded. These were mapped and are shown in Figures 7 and 8.

PHOENIXVILLE AREA
INTERMODAL TRANSPORTATION STUDY

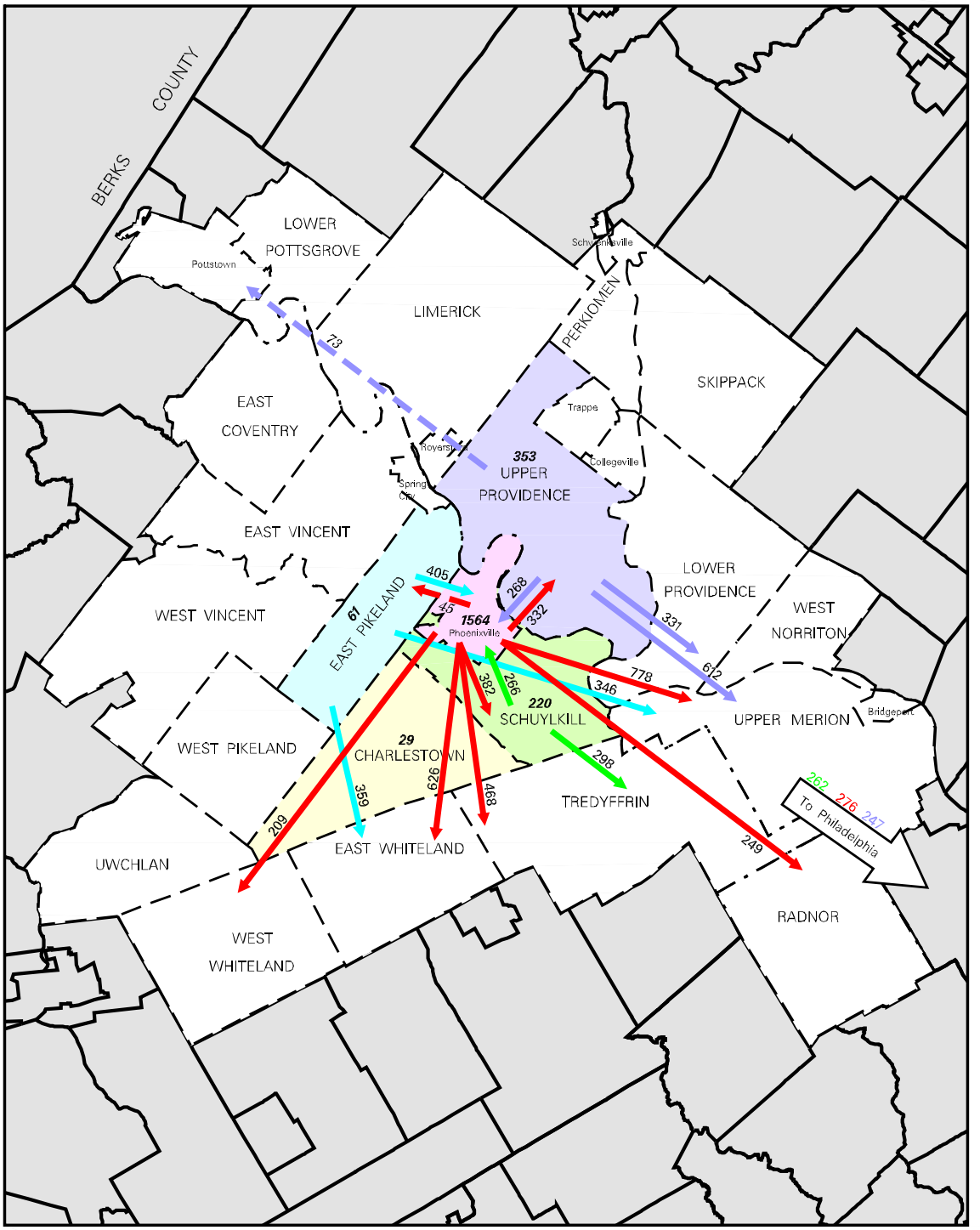

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FIGURE 7 :
SELECTED MAJOR JOURNEY-TO-WORK TRAVEL PATTERNS
(FROM STUDY AREA MUNICIPALITIES)

- Major work trip flows
- Complementary reverse work trip flows
- *353* Total number of internal trips
- 405 Total number of trips
- *73* Total number of complementary reverse work trips

PHOENIXVILLE AREA
INTERMODAL TRANSPORTATION STUDY

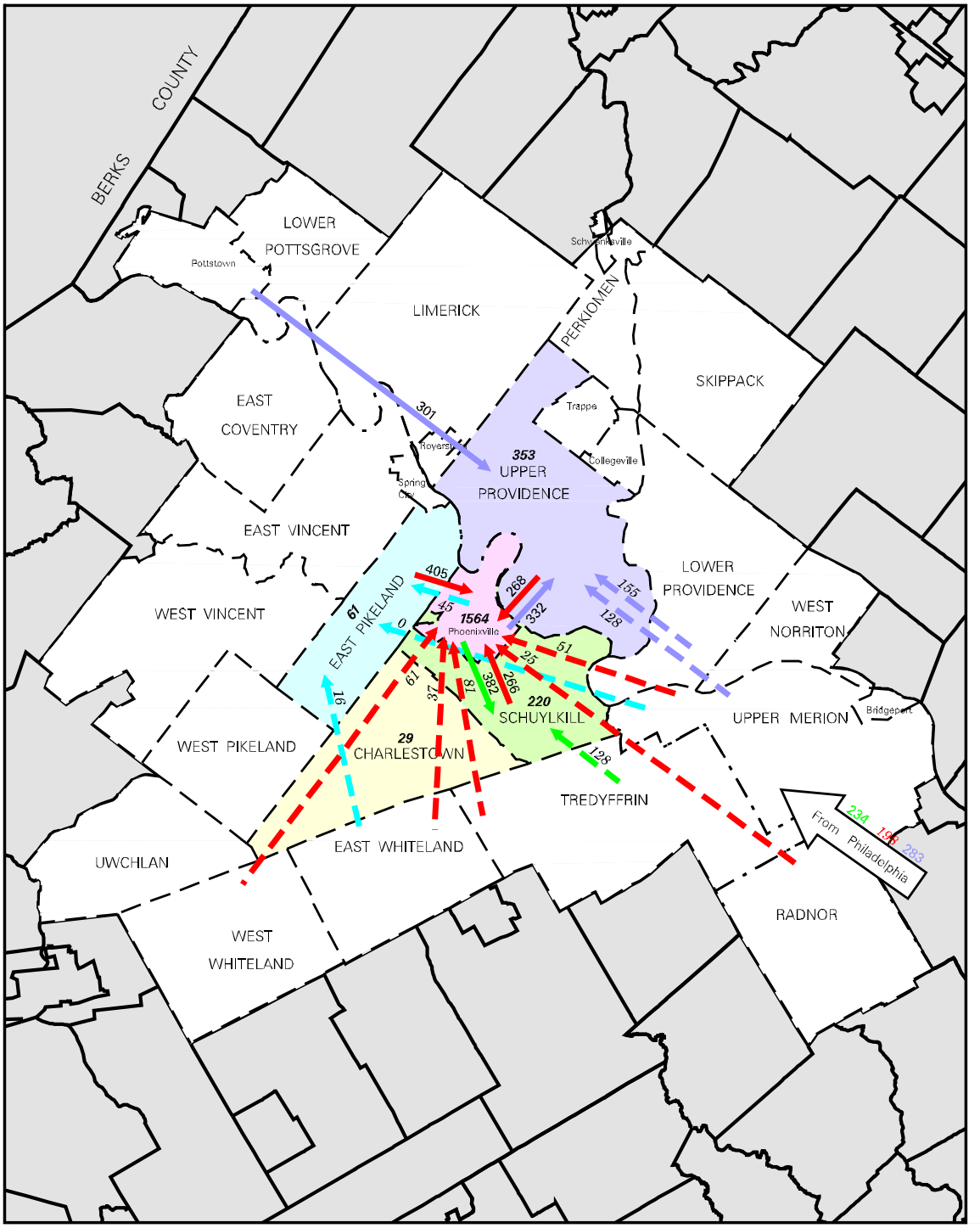

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FIGURE 8 :
SELECTED MAJOR JOURNEY-TO-WORK TRAVEL PATTERNS
(TO STUDY AREA MUNICIPALITIES)

- Major work trip flows
- Complementary reverse work trip flows
- ***1564*** Total number of internal trips
- 268 Total number of trips
- *45* Total number of complementary reverse work trips

Figure 7 shows outbound work trips and Figure 8 illustrates inbound work trips. On each figure, the major work trip desire lines (i.e., those equaling or exceeding 200 one-way work trips) are represented by arrows with solid lines. A complementary reverse direction trip, if less than 200, is shown by arrows with dashed lines. The value in the center of the municipality, which is common to both figures, is the number of worker trips that began and ended in the same municipality. As a consequence of its relatively small population and employment base, no work trips are displayed on either graphic for Charlestown Township.

Observations about the desire lines shown on the figures, include:

1. Work trips radiate throughout the sub-region to/from the Borough of Phoenixville, and there is a gravitation to other municipalities containing regional activity centers – Upper Providence, Upper Merion, Tredyffrin and East Whiteland townships, and the City of Philadelphia.

2. "Corridor-like" travel patterns are apparent along:
   a. US 422 - Pottstown to Upper Providence (374 worker trips), and; Upper Providence to Lower Providence & Upper Merion (1,226 worker trips).
   b. PA 29 - Phoenixville to Upper Providence (600 worker trips), and; Phoenixville & East Pikeland to East & West Whiteland (1,308 worker trips).
   c. PA 23 - East Pikeland to Phoenixville (450 worker trips), and; Phoenixville & Schuylkill, to Radnor, Upper Merion & Tredyffrin (3,266 trips).

3. Excluding pairings with the City of Philadelphia (1,500 total worker trips), trips are relatively short (less than ten airline miles in length). Frequently work trips are completed entirely within municipal boundaries (average for all study area municipalities = 11% of all work trips; within the Borough = 23%) or between adjacent municipalities.

4. Only about 700 worker trips to the study area are "reverse" commuters from the City of Philadelphia. Of this total, trips are evenly distributed to jobs located in the Borough of Phoenixville, and Schuylkill and Upper Providence townships.

Transit Trips

Approximately 750 worker trips, or two percent of the study area total, were accomplished using a public transportation mode. About half were outbound from the study area and half were inbound to the study area. The Borough of Phoenixville was the largest generator of worker trips completed using transit (288 total worker trips).

The majority of outbound trips were accomplished via commuter rail and were destined to the City of Philadelphia. Inbound transit trips were largely accomplished by bus. The City of Philadelphia was the main origin of inbound bus trips destined to the

Chester County municipalities. The main origin for the bus trips taken to Upper Providence were Pottstown and Royersford.

Commuting by Other Means
About 1,650 worker trips were accomplished by walking, riding a bicycle, or taking a taxi. Of these 1,025 worker trips (62%) took place in the Borough.

Work-at-Home
Approximately 400 study area workers worked at home at the time of the 1990 Census.

MUNICIPALITY	PERSONS WORKING AT HOME
Charlestown	42
East Pikeland	38
Phoenixville	110
Schuylkill	94
Upper Providence	111

Conclusions: Work Trip Travel
The Borough is a hub for trip making throughout the study area. Given the diversity and density of land use activities, work trips are accommodated by transit and non-traditional modes in larger proportions (and volume) in the Borough of Phoenixville than in the other study area municipalities.

Transit coverage within the study area was lower at the time of the 1990 Census. For example, neither the Phlyer or the Suburban Link services were operating at the time. As such, utilization of transit for commuting was lower and generally limited to the municipalities which had service (Upper Providence, Schuylkill and Phoenixville).

Substantial volume along the study area highway network may be attributable to worker trips based within the study area (potentially as high as 20% to 30%). This suggests that part of the solution to local traffic congestion lies within the study area municipalities' ability to better manage journey-to-work travel.

ASSESSMENT OF EXISTING TRANSPORTATION CONDITIONS
A current, but generalized, status report on the adequacy of the transportation infrastructure serving Greater Phoenixville has been drawn from a series of sources. These include: documented deficiencies cited within published municipal, county and/or regional traffic and transportation studies, input from the Study Steering Committee members, and; analyses conducted by DVRPC staff for this study.

Documented Existing Transportation Deficiencies
Figure 9 illustrates the set of deficiencies in and around the study area which were assembled from published municipal, county and regional transportation studies, and from input by the Steering Committee.

An overview of the categories, with some examples, is listed below:

- Isolated intersection congestion - throughout the study area.
- Roadway congestion: PA 29 - through the US 422 interchange, through Phoenixville and near the Turnpike; PA 113 - through the Borough; PA 23 - through the Borough and Schuylkill Township; Pothouse Road - the length.
- Diverted through traffic volumes - secondary and tertiary north-south roadways through Charlestown and Schuylkill townships.
- Poor roadway alignment - various locations throughout the study area.
- Inadequate transit service - within the US 422 corridor.
- Rail station parking constraints - along the SEPTA R5 - Thorndale / Paoli Line.

Assessment of Current Peak Hour Traffic Conditions
Analyzing peak traffic conditions at key intersection locations provided multiple benefits for the study. First, it provided a reality-check with rush hour travel conditions experienced by residents and commuters on a day-to-day basis. Secondly, the results provided an indication of the adequacy of the number of through lanes serving the study area, and the value that potential improvements, such as adding turning lanes, or revising methods of traffic control would yield at the locations. Lastly, the work provided a basis for directing the subsequent technical work to be conducted as part of the Year 2025 futures testing.

Twenty (20) locations, comprising 24 individual intersections, were selected within the study area to serve as the monitoring points for the planning purposes (Figure 9 shows the locations relative to the overall study area). Figure 10 illustrates current intersection lane group geometry, traffic control and peak hour traffic volume conditions at the 20 monitoring locations. The peak hour turning movement traffic volumes were obtained from recent traffic studies conducted in the study area or were conducted by DVRPC staff for this study. Intersection geometry and traffic control were ascertained through field recognizance performed by DVRPC.

The peak hour traffic analyses were conducted using the planning methodology for evaluating signalized and stop sign controlled (unsignalized) intersections per the

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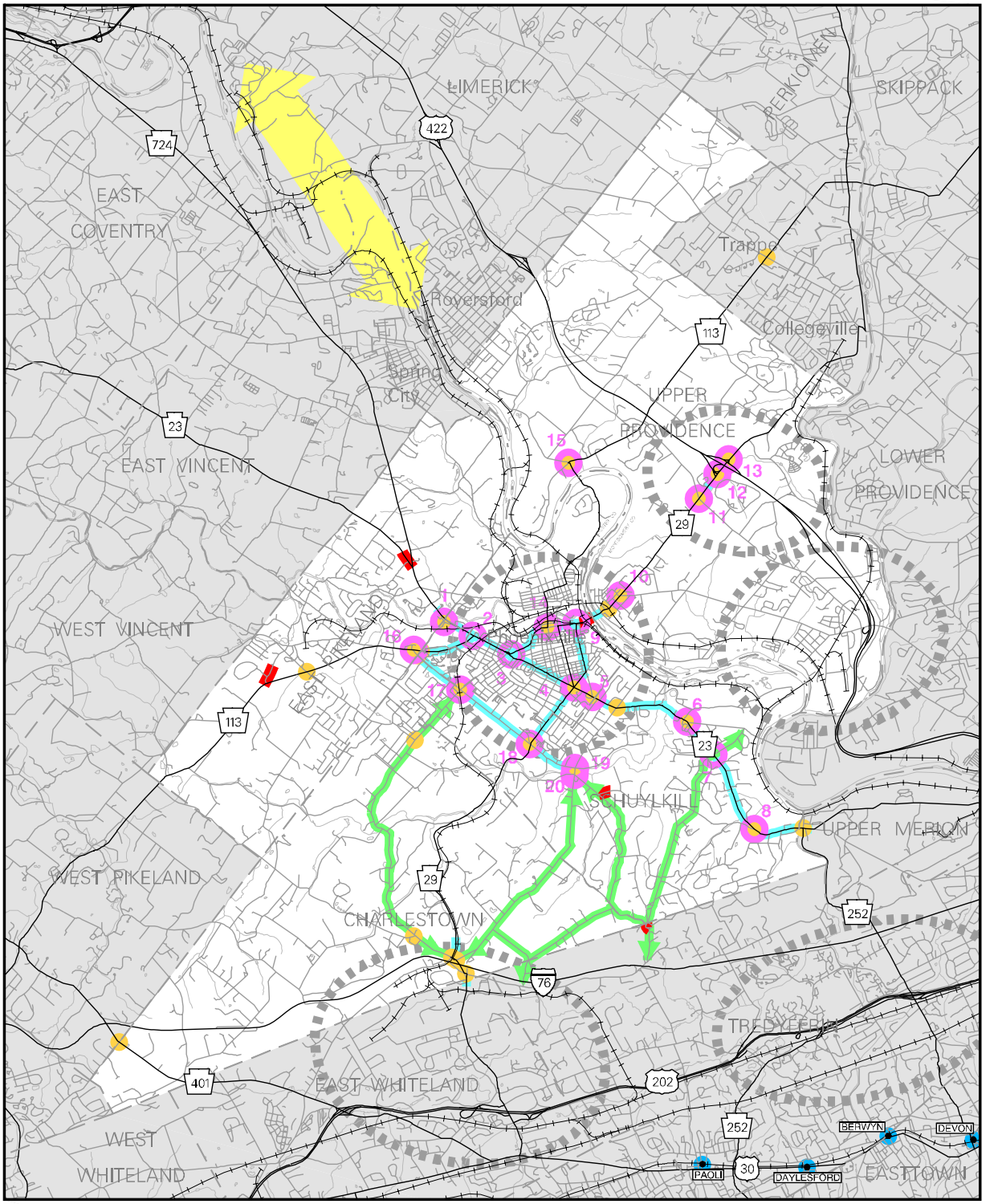

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FIGURE 9 :

CURRENT DOCUMENTED TRANSPORTATION DEFICIENCIES

- INTERSECTION CONGESTION
- ROADWAY CONGESTION
- DIVERTED THROUGH TRAFFIC VOLUME
- POOR ROADWAY ALIGNMENT
- INADEQUATE TRANSIT SERVICE
- RAIL STATION PARKING CONSTRAINT
- MONITORING INTERSECTION & ID#

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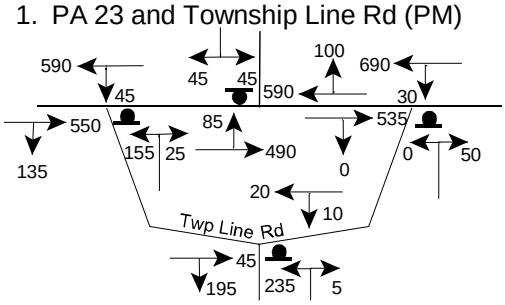
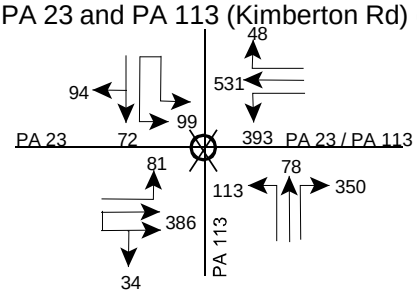
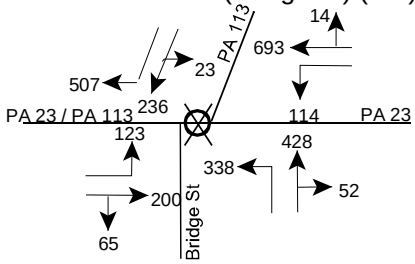
1. PA 23 and Township Line Rd (PM)



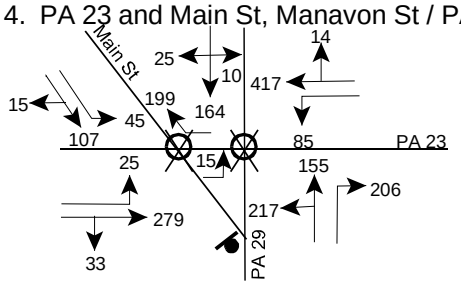
2. PA 23 and PA 113 (Kimberton Rd) (PM)



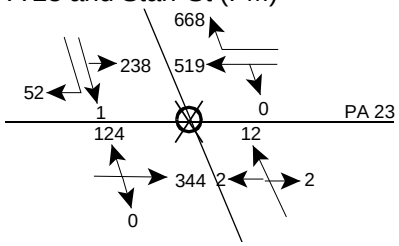
3. PA 23 and PA 113 (Bridge St) (PM)



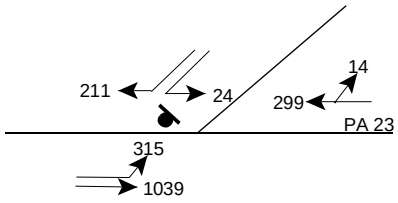
4. PA 23 and Main St, Manavon St / PA 29 (PM)



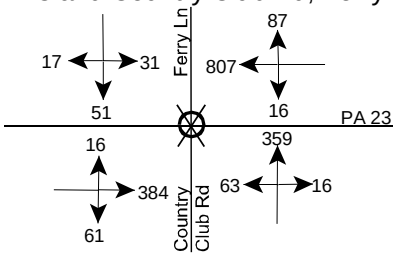
5. PA 23 and Starr St (PM)



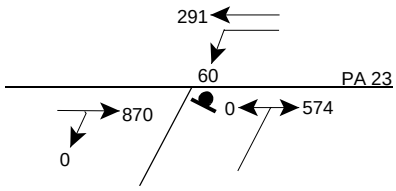
6. PA 23 and Pawlings Rd (AM)



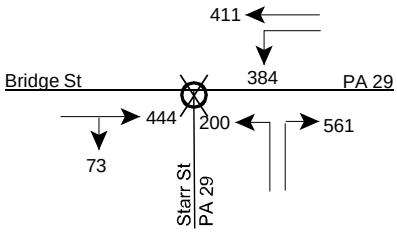
7. PA 23 and Country Club Rd, Ferry Ln (PM)



8. PA 23 and Valley Park Rd (AM)



9. PA 29 and Starr St (PM)



10. PA 29 and Egypt Rd, Fegley St (PM)

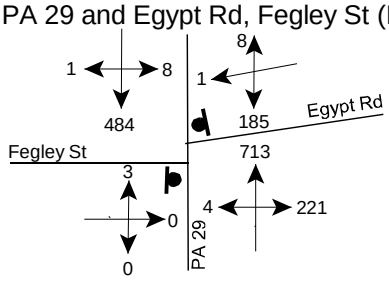


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FIGURE 10
CURRENT PEAK HOUR TRAFFIC CONDITIONS AT SELECTED MONITORING LOCATIONS

250 - Peak Hour Traffic Volume

- Traffic Signal

- Lane Group

- Stop / Yield Sign

PHOENIXVILLE AREA
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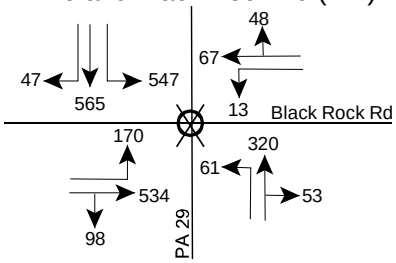
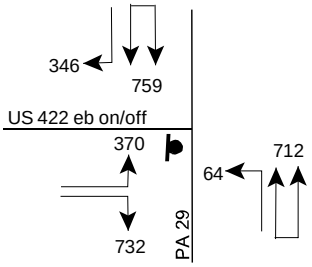
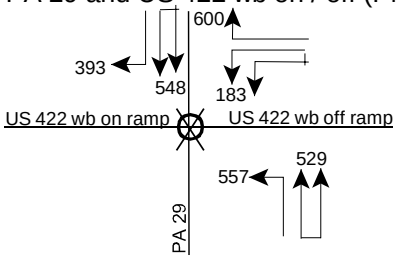
11. PA 29 and Black Rock Rd (AM)



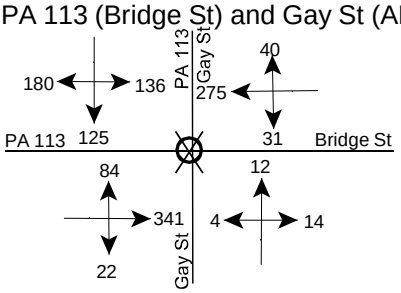
12. PA 29 and US 422 eb on/off (AM)



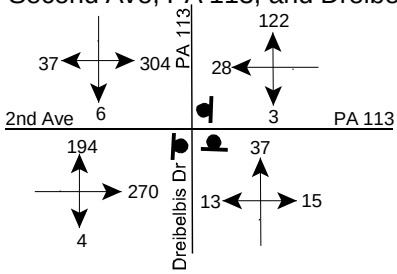
13. PA 29 and US 422 wb on / off (PM)



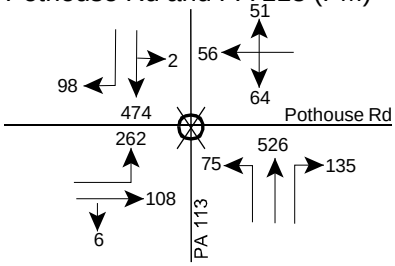
14. PA 113 (Bridge St) and Gay St (AM)



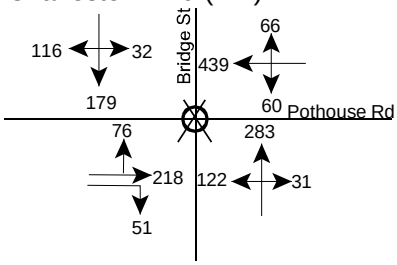
15. Second Ave, PA 113, and Dreibelbis Dr (AM)



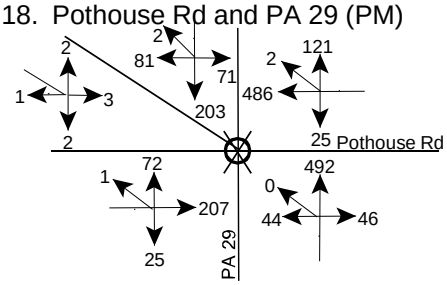
16. Pothouse Rd and PA 113 (PM)



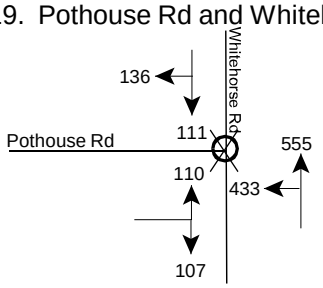
17. Pothouse Rd and Bridge St, Charlestown Rd (PM)



18. Pothouse Rd and PA 29 (PM)



19. Pothouse Rd and Whitehorse Rd (PM)



20. Whitehorse Rd and Valley Park Rd, Creek Rd (PM)

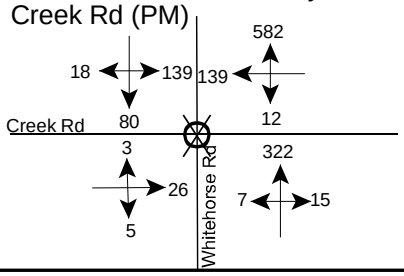


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FIGURE 10

CURRENT PEAK HOUR TRAFFIC CONDITIONS AT SELECTED MONITORING LOCATIONS

250 - Peak Hour Traffic Volume

- Traffic Signal

- Lane Group

- Stop / Yield Sign

Highway Capacity Manual [2] and companion Highway Capacity Software[3]. DVRPC's choice in using the planning procedure for evaluating the monitoring intersections was expedient. It allowed an assessment of the individual intersections with a minimum of information. Generally, just volumes and geometry are all that are necessary to conduct the analysis. In the methodology the computed sum of an intersection's critical lane volume is used as an indicator of the ability of the intersection's geometry and control to accommodate the traffic demand. The output of the procedures are provided in generally accepted traffic engineering descriptors (e.g., delay, v/c ratio, level of service) which rate the intersection's performance.

The method has been found to be a reasonably accurate procedure for describing, in a simplified manner, intersection traffic operations – where no special or unusual circumstances exist (e.g., clear-out phases at signalized intersections[4]). Finally, the planning procedure provides a uniform method for judging the value of potential intersection improvements within a given traffic volume scenario, and/or evaluating the consequences of revised traffic volumes or improved intersection geometry between travel testing scenarios.

Table B, in Appendix B, includes the results of the traffic operations planning work. At the present time – nine intersections are experiencing undesirable traffic operations during the peak hour (intersection #s: 1b, 3, 6, 8, 9, 10, 11, 12 and 13).

- Conditions at four locations can be ameliorated by changing traffic control from stop signs to traffic signals (intersection #s: 1b, 6, 10 and 12).
- Adding a second northbound left turn lane at the PA 29 and US 422 westbound on-ramp intersection (intersection #13) will remedy existing deficiencies at that location.
- Traffic conditions at four intersections would remain unimproved if identifiable "low-cap" traffic engineering techniques were implemented there – indicating that rectifying existing traffic conditions along PA 23 from Bridge Street eastward (i.e., intersection #s: 3 & 8), and along PA 29 from Starr north to Black Rock (intersection #s: 9 & 11), are not readily deliverable.
- Conversely, in both corridor segments (PA 23 and PA 29) additional improvements were identified through technical and Steering Committee work

[2] *Highway Capacity Manual - HCM 2000*, Transportation Research Board, National Research Council, Washington, D.C., 2000.

[3] Highway Capacity Software - Version 4.1, McTrans Center - University of Florida, Gainsville FL, Copyright 2000.

[4] The signal timing plan for the PA 23 & Main Street / Manavon Street intersection (monitoring location #4) provides for a clear-out phase. As such, actual conditions experienced at the intersection during the peak travel hour are somewhat worse than calculated and reported herein.

which offered promise for ameliorating conditions, by: delivering more improvements to the location, and/or; diverting traffic from the segments.

In general the above cited set of improvements: are more capital intensive, will require more time to develop, may duplicate or even conflict with another identified improvement, may result in revised traffic patterns, and/or may not be politically acceptable. As such, they were presented to and discussed with the Steering Committee as candidate improvements for the study's subsequent future testing work.

Conclusions: Analyses of Current Conditions

Existing travel conditions, along portions of the corridors serving the study area, are impaired (PA 23 through Phoenixville and Schuylkill, and; Bridge Street / PA 29 from the northern end of the Borough, through Mont Clare, to Black Rock Road in Upper Providence). Opportunities to improve these segments are present in regional and local transportation improvements which will directly impact or will alter travel patterns along the highways paralleling these segments (including: the French Creek Parkway aligned through the proposed French Creek Center development, a "Northern Relief Route" circumventing the Borough's downtown on the west and north – à la the former Chester-Montgomery County Connector, PA Turnpike widening with regional slip ramp access, US 422 widening and/or adding the Schuylkill Valley Metro).

These and other improvements may deliver long term benefit to the area and as such are worthy of testing in the futures analyses. In preparing that work, care was given to considering the interest, support, viability and staging of the improvements to be modeled in the travel testing.

CURRENT IMPROVEMENT PROPOSALS

Independent initiatives have been advanced at various levels to rectify existing deficiencies and accommodate study area growth. The efforts range from: traffic and transportation studies sponsored by the Pennsylvania Turnpike Commission and the Valley Forge National Historical Park at the fringes of the study area – to designing and implementing physical and operational improvements in its core. With the support of the county planning commissions, and the assistance of PennDOT and SEPTA – public funding streams are being used. Private contributions (funding or in-kind services) obtained through the land development application process are also being utilized.

Figure 11 illustrates about 50 multi-modal improvement projects distributed throughout the Greater Phoenixville sub-region which are currently in development and/or moving toward implementation using public funds – as part of the current regional TIP (covering Federal Fiscal Years 2001 - 2004), Pennsylvania Turnpike Commission funding – and/or via private sector commitments.

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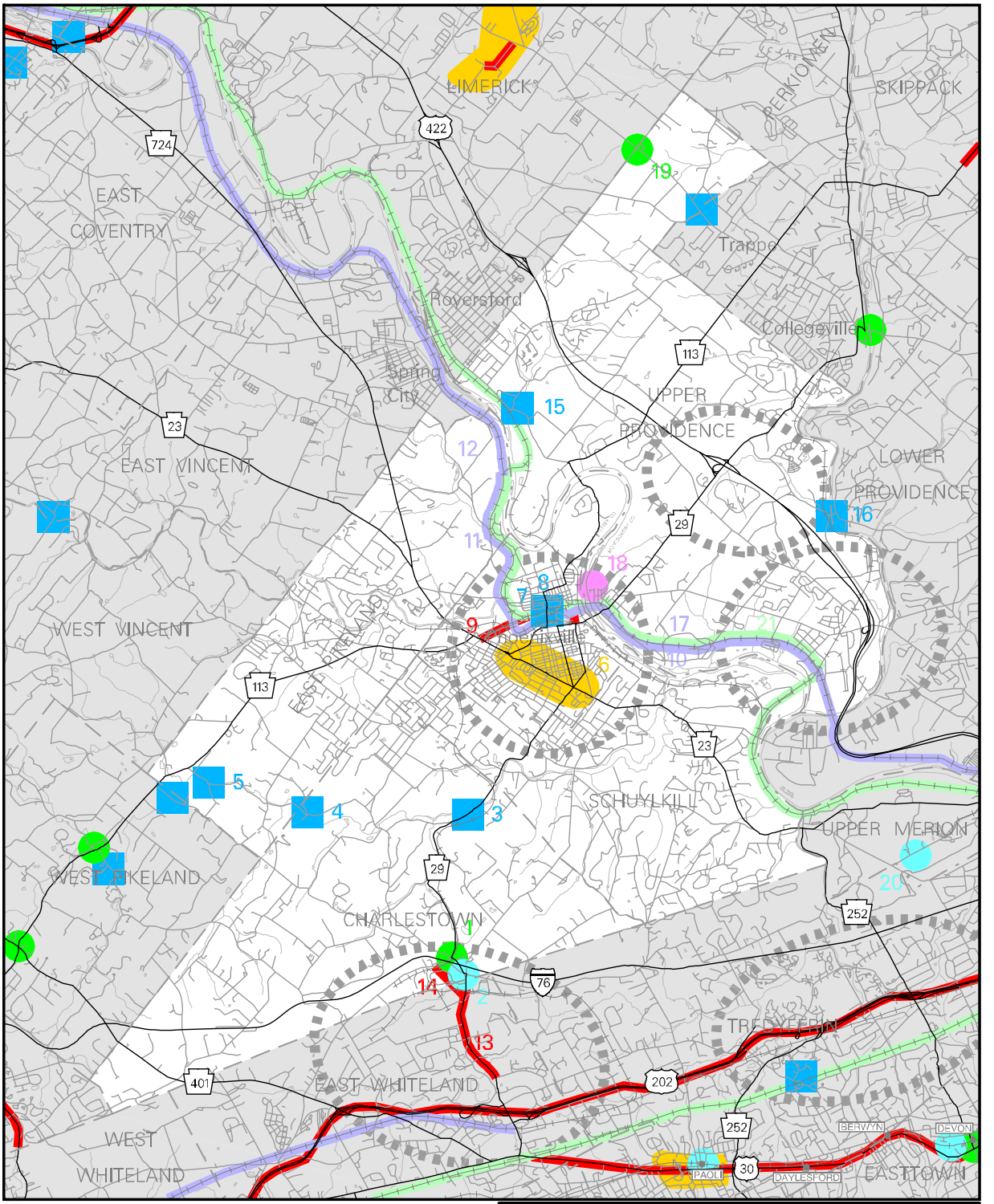

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FIGURE 11 :

CURRENT TRANSPORTATION IMPROVEMENT PROGRAM 2001 - 2004

- ROADWAY IMPROVEMENT
- INTERSECTION IMPROVEMENT
- BRIDGE IMPROVEMENT
- IMPROVEMENT AREA
- BICYCLE PATH / TRAIL
- TRANSPORTATION STUDY
- NEW TRANSIT FACILITY
- ENHANCEMENT

Development Center

Table 4 provides some details for the 21 improvement projects which are located within the immediate study area. The list includes: a new transit facility (Schuylkill Valley Metro), a new collector highway (French Creek Parkway), roadway widening along PA 29 south of Charlestown Road (including a roadway extension to more completely distribute traffic), improvements at two intersections, a multi-municipal coordinated and responsive (closed-loop) traffic signal system in the center of the study area, four multi-use trails, seven bridge improvements, two transportation studies focused at the eastern and southern fringes of the study area, and a transportation enhancement project (Lock 60).

TABLE 4
CURRENT AREA-WIDE TRANSPORTATION IMPROVEMENT PROGRAM (2001 - 2004)

ref # (see fig. 11)	Description
CHESTER COUNTY	
1	PA 29 & Charlestown Rd intersection (Charlestown) - Add left turn lanes on all approaches (TIP # 6624)
2	PA 29 & PA Turnpike (Charlestown & East Pikeland) - Conduct study of electronic slip ramp connection (PA Turnpike Funded)
3	Phoenixville Pk (PA 29) over Pickering Cr (Charlestown) - Bridge replacement (TIP # 6735)
4	Pickering Rd over Pickering Cr (Charlestown) - Bridge replacement (TIP # 6889)
5	Pickering Rd over Pickering Cr (East Pikeland) - Bridge Replacement (TIP # 6934)
6	Phoenixville closed-loop traffic signal system (Phoenixville, East Pikeland & Schuylkill) - Install interconnected traffic signal system along portions of PA 23, Bridge Street and PA 113 (TIP # 6912)
7	PA 113, Gay St Bridge over French Cr (Phoenixville) - Bridge replacement (TIP # 6923)
8	Phoenix Column Truss Bridge over French Cr (Phoenixville) - Bridge rehabilitation (TIP # 6936)
9	French Cr Pkwy (Phoenixville) - Construct new 2 lane collector-distributor roadway through French Creek Center development from PA 23 - at Paradise St to Bridge St - at PA 29 / Starr St (TIP # 6937)
10	Schuylkill River Trail along south bank of French Cr (Phoenixville) - Construct multi-use trail (TIP # 6944)
11	French Cr Recreational Trail along the north bank of the French Cr (Phoenixville) - Construct multi-use trail (TIP # 6961)
12	Schuylkill River Trail between PA 29, in Phoenixville, and to Berks Co Line (various) - Construct multi-use trail (TIP # 0587)
13	PA 29 from Great Valley Pkwy to Charlestown Rd / Phoenixville Pk (East Whiteland & Charlestown) - widen to provide two continuous travel lanes in each direction, and install interconnected traffic signals and auxiliary turning lanes at key intersections (Developer Funded)
14	Warner La Extension (Charlestown) - Construct new two lane roadway alignment between PA 29, at Yellow Springs Rd, and Phoenixville Pk, south of the Pennsylvania Tpke (Developer Funded)
MONTGOMERY COUNTY	
15	Second Av over Mingo Rn (Upper Providence) - Bridge & culvert replacement (TIP # 8569)
16	Arcola Rd over Perkiomen Cr (Upper Providence & Lower Providence) - Bridge replacement (TIP # 8672)
17	Schuylkill River Tr from Betzwood Park to PA 29, in Mont Clare (Upper Providence & Lower Providence) - Construct multi-use trail (TIP # 8703)
18	Schuylkill Navigation Lock 60 (Upper Providence) - Restoration of historically significant navigation lock (TIP # 8796)
19	Township Ln & Ridge Pk intersection - Add turn lanes and signal upgrade (TIP # 8827)
20	Valley Forge National Historical Park Area (Upper Merion, West Norriton, & Lower Providence townships, in Montco, and Schuylkill Twp, in Chesco) - Conduct area-wide transportation study (Co-sponsored by the National Park Service, FHWA and PennDOT)
CHESTER COUNTY AND MONTGOMERY COUNTY	
21	Schuylkill Valley Metro (various municipalities through Berks, Montgomery & Chester counties, and the City of Philadelphia) - Financial and environmental studies & preliminary engineering activities for new rail service between Reading and Central Philadelphia (TIP # S074)

The current area-wide transportation improvement program includes projects which will address many of the existing mobility deficiencies documented in the Borough of Phoenixville (e.g., closed-loop traffic signal systems to improve flow along PA 23, PA 113 and Bridge Street in the core of the study area, and the Schuylkill Valley Metro for

expanded transportation options). The current improvement program also includes funding to develop and construct the French Creek Parkway in support of the circulation needs of the planned French Creek Center multi-use development in the downtown district. On the other hand, deficiencies located outside the borough are largely unaddressed by projects on the current TIP.

Bridges

The integrity and improvement of study area bridges are a major concern amongst the municipal members on the Steering Committee. To address that matter the forthcoming TIP (2003 - 2006) and PennDOT District 6-0 Bridge Program were investigated for the most up to date information:

- PA 29 over Pickering Creek, TIP #6735 (#3 in Table 4, above) - re-built and open
- Pickering Road over Pickering Creek, TIP #6889 (#4 in Table 4) - not included in the proposed TIP update
- Pickering Road over Pickering Creek, TIP #6934 (#5 in Table 4) - slated for construction in 2004
- Gay Street over French Creek, TIP #6923 (#7 in Table 4) - engineering activities and right-of-way acquisition through 2004, construction slated after 2006
- Phoenix Column Bridge, TIP #6936 (#8 in Table 4) - construction slated for 2004
- Second Avenue over Mingo Run, TIP #8569 (#15 in Table 4) - re-built and open
- Arcola Rd over Perkiomen Creek, TIP #8672 (#16 in Table 4) - not included in the proposed TIP update
- Hare's Hill Road over French Creek, in East Pikeland Township, historic bridge improvement - engineering slated for 2005
- White Horse Road over Pickering Creek, in Schuylkill Township, bridge replacement - engineering slated for 2005.

CONCLUSIONS: ANALYSES OF EXISTING CONDITIONS

Observations reached in assessing the current transportation situation include:

1) There is a good overlap between the study area's development centers, major employers and existing public transportation services.
2) The Borough of Phoenixville is a working model of the travel savings offered by diverse and compact land forms (i.e, activity / development centers).
3) Both travel and congestion are widely dispersed throughout the study area. Work trip travel based within the study area contributes substantially to traffic volume and congestion experienced in the study area.
4) The current area-wide transportation improvement program includes a modally balanced set of improvement projects which address traffic congestion in the core of the study area. The majority of transportation deficiencies documented throughout the remainder of the study area are not, however, adequately addressed by projects on the TIP.

5) A wider application of transportation improvements and travel demand management strategies will be required to successfully address study area needs.

There is a substantial inventory of additional transportation improvement proposals, which: have been identified through traffic planning activities of the municipalities; are being considered by the counties for addition to the TIP as part of its regular biennial update, and/or have been ascertained through assessments conducted in this study.

Funding for some of these projects is not clearly defined, nor are the benefits they might be expected to deliver. Therefore, consideration of these, as they may address current conditions, is inappropriate. On the other hand, some warrant travel testing for future Year 2025 conditions. Where appropriate these are detailed in the following chapter. □

5 TRAVEL DEMAND ANALYSES

In this study four travel simulations were conducted using DVRPC's regional travel demand forecasting model. These included: the 1997 Base Year scenario – to establish the study area's baseline, and; three future year (Year 2025) alternatives – the Committed, PLAN and Full-Build scenarios – to evaluate future conditions and test improvement recommendations assuming differing levels of capital investment.

For each model run, travel demands and system-wide performance statistics were calculated. In addition, assessments of peak traffic operations were prepared within each future scenario to provide a micro-level report on traffic operating conditions at 20 monitoring locations throughout the study area.[5]

FOCUSED SIMULATION PROCESS

DVRPC maintains a personal computer-based highway and public transportation travel simulation model that estimates travel behavior for a typical weekday and provides related travel data for different transportation network and demographic conditions[6]. A schematic portrayal of the four-step focused travel simulation process is shown on Figure 12.

The regional travel model can be used to locate problem areas, identify future trends and travel conditions, and consider various alternative improvement strategies to address existing and emerging problems. By "focusing" DVRPC's regional travel forecasting model, enhancements are accomplished within a detailed study area while a regional level of detail is maintained elsewhere.

Application of the focused modeling process provided the opportunity to obtain performance data (listed below) and perform selected link analysis as part of the study.

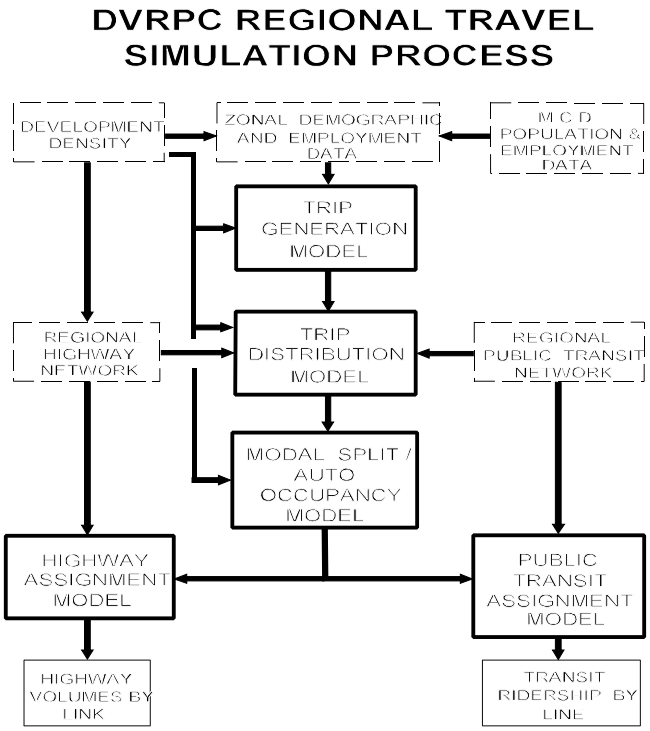
- highway link daily traffic volumes (AADTs);
- daily transit ridership (boardings) by line, and;
- the following network performance statistics:
  - vehicle miles of travel (VMT),
  - vehicle hours of travel (VHT),
  - network highway speeds,
  - network volume / capacity ratios,
  - fuel consumption (using fleet average fuel consumption rates applied to VMT per highway functional class), and

[5] The evaluation of current conditions was presented in the previous chapter.

[6] DVRPC's travel simulation is performed on desktop micro-computers running the Windows NT version of TRANPLAN.

- mobile source emissions (using the model's VMT and speed estimates as inputs to Mobile5a_H emissions software).

FIGURE 12



1997 BASE YEAR CONDITIONS

The first step in preparing the Phoenixville Area Intermodal Transportation Study simulation involved updating, focusing and then calibrating the regional model to reflect 1997 demographic and transportation conditions within the study area.

Focusing to improve the level of detail within the study area involved the following activities:

- Splitting DVRPC's transportation analysis zone (TAZ) structure. For example, the Phoenixville Area Intermodal Transportation Study area contains 28 TAZs for study area analyses – compared with 18 zones per the 2000 Census. The finer analytical "grain" provided by the study's TAZs structure, supported by a denser highway network, provides a

greater accuracy in the highway assignment within the focused study area.

- Disaggregating DVRPC's 1997 zonal demographic data to "fit" the study's TAZ structure for population and employment.
- Updating characteristics of the modeled highway network so that 1997 highway geometry is accurately reflected in the simulation.
- Adding key highway facilities to the model to more closely represent the study area's hierarchical and interconnected roadway system. (Note: local neighborhood and subdivisions streets / driveways are generally not included in the modeled network.)
- Updating the transit network to coincide with the 1997 route and operating configurations of SEPTA's services in the study area. (Note: the SEPTA route structure in effect during 1997 was different from that currently operating, and neither TMACC's Phoenixville Phlyer or GVFTMA's Suburban Link bus services were in operation during 1997.)

The final highway network and TAZ structure emanating from the focusing steps are shown on Figure 13.

Selected Link Analyses

Once calibrated to the 1997 Base Year condition, the regional travel model was used to estimate the geographic distribution of highway trips within the study area. Knowing the distribution and magnitude of vehicle trips traveling to, through and within the study area can be a very useful indicator. For example, it can help quantify the reliance on a facility by local traffic versus long distance travelers. As a consequence, it can be valuable in defining appropriate strategies to pursue in combating congestion within the study area.

For this study a "selected link analysis" was performed for seven highway links in and surrounding the Borough of Phoenixville. Table 5 lists and describes the locations, shows the magnitude of the daily vehicle trips traversing the link, and identifies major market areas of the trips. The table also identifies potential travel reduction strategies that may be implemented in the study area and/or tested in futures evaluations.

The following tabulation shows the distribution of trip origins relative to the overall study area.

DIRECTION (FROM)	PERCENT
North	20%
East	28%
South	19%
West	14%
Internal	19%

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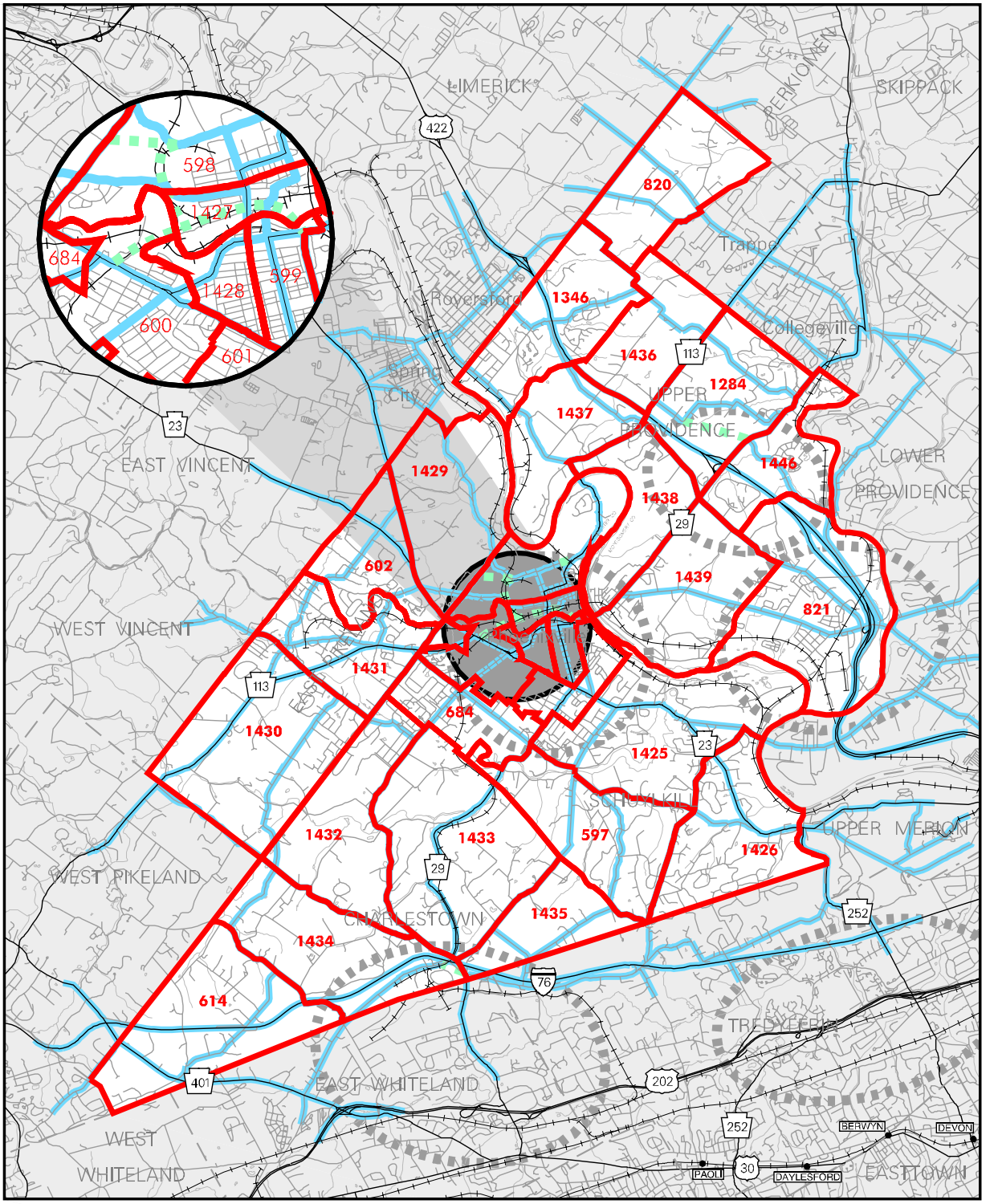

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FIGURE 13 :

FOCUSED NETWORK FOR TRAVEL SIMULATION

- EXISTING HIGHWAY
- NEW ROADWAY ALIGNMENT
- STUDY TAZ Boundary
- 763 STUDY TAZ Number
- Development Center

TABLE 5
FINDINGS OF SELECTED LINK ANALYSES - 1997 BASE YEAR SCENARIO

Link	AADT	Significant Trip Origin Sheds	Avg. Airline Distance to the Link	Potential Strategy(s)
PA 29 between Arcola Rd and Mennonite Rd	18,968	**East** - Upper Providence Eastern Neighbors (36%) and Upper Merion, Bridgeport (8%) **Internal** - Phoenixville (9%)	5.6 miles	Sch Vly Metro, widen US 422 Rdesharing / park-and-ride lots internal to the study area
PA 29 between Starr St and Egypt Rd	16,326	**North** - Northern Bucks / Montgomery Counties (10%) **East** - Upper Providence Eastern Neighbors (12%) **Internal** - Phoenixville (21%) and Upper Providence (13%)	5.6 miles	PA Tpke / NE Extension widening and slip ramps at PA 113 and PA 29 Sch Vly Metro, widen US 422 Ridesharing / park-and-ride lots internal to the study area
PA 29 between Charlestown Rd and Pothouse Rd	7,928	**North** - Northern Bucks / Montgomery Counties (10%) **South** - East Whiteland (17%) and South and Western Chester County (17%) **Internal** - Phoenixville (16%) and Upper Providence (8%)	9.6 miles	PA Tpke / NE Extension widening and slip ramps at PA 113 and PA 29 TMACC Phlyer service enhancement, ridesharing / park-and-ride lots Ridesharing / park-and-ride lots internal to the study area
PA 29 between Whitehorse Rd and Charlestown Rd	17,261	**South** - East Whiteland (22%) and Southeastern Chester County (9%) **Internal** - Phoenixville (10%) and East Pikeland (8%)	6.0 miles	TMACC Phlyer service enhancements, ridesharing / park-and-ride lots, highway improvement Ridesharing / park-and-ride lots internal to the study area
PA 23 between Mowere Rd and Township Line Rd	16,774	**North** - Pottstown and Berks County (11%) **West** - Northern Chester County (29%) **Internal** - Phoenixville (11%) and East Pikeland (8%)	6.5 miles	Sch Vly Metro, park-and-ride lots, widen US 422 Sch Vly Metro, widen US 422 Ridesharing / park-and-ride lots internal to the study area, Northern relief route
PA 23 between Whitehorse Rd and Pawlings Rd	20,483	**South** - Tredyffrin (11%) **East** - Upper Merion, Bridgeport (13%) **West** - Northern Chester County (11%) **Internal** - Phoenixville (26%)	5.2 miles	Ridesharing Sch Vly Metro, Suburban Links service, ridesharing, widen US 422, PA 23 impr Sch Vly Metro Ridesharing / park-and-ride lots internal to the study area
PA 23 between Country Club / Ferry Rd and Valley Park Rd	13,744	**South** - Tredyffrin (15%) **East** - Upper Merion, Bridgeport (18%) **West** - Northern Chester County (13%) **Internal** - Phoenixville (27%)	6.4 miles	Ridesharing Sch Vly Metro, Suburban Links service, ridesharing, widen US 422, PA 23 impr Sch Vly Metro Ridesharing / park-and-ride lots internal to the study area

Overall, vehicular trips traveling to, through and within the study area average 11.6 miles in length. Other findings of the selected link analyses are also consistent with the journey-to-work evaluation. Upper Providence Township and the Borough of Phoenixville are the major origins or destinations in the study area, otherwise trips are widely dispersed. Considerable levels of traffic volume are locally based (i.e., 19% of study area travel has both trip ends within the study area). As such, traffic management and transportation control strategies implemented within the study area can have a meaningful influence on study area mobility. Conversely, the majority of study area travel is shown to have one or both trip ends outside of the study area. Therefore, regionally applied travel demand management strategies and traffic control measures (i.e., beyond the study area boundaries) are also important to internal conditions.

1997 Base Year Performance Statistics

Performance statistics emanating from the simulated 1997 highway network were obtained by manipulating outputs of the base year travel simulation using geographic information system (GIS) software[7]. The results are important for establishing the study area's baseline.

Aggregated area-wide highway performance measures were computed on two levels:

1) to show the relative efficiency of the complete highway network (e.g., freeways and expressways, arterial and collector highways, and local streets); versus
2) the relative efficiency of the locally accessible highway network (i.e., just the arterials, collectors and local streets).

The rationale for the dual analyses is that inclusion of the expressway data with its correspondingly high traffic volumes and mobility levels may conceal conditions along the local highway network – which are more often experienced and more readily understood by the study area population.

Table C1, in the Appendix, shows the performance statistics for the complete network. Table C2, in the Appendix, summarizes the same set of performance data for the locally accessible highway network (i.e., I-76 and US 422 are excluded from the calculations).[8]

The information contained in Table C2 indicates that:

- Generally good traffic conditions are exhibited for the study area's 1997 "local" highway system.

[7] DVRPC used ESRI's ArcView software for this work.

[8] Note: the emissions data shown in Table C2 does incorporate expressways in its calculations, and therefore is the same information which is shown in Table C1.

- Congestion (volume/capacity ratio) is highest in the Borough of Phoenixville and in Schuylkill Township.
- Travel speeds are lowest in the Borough.
- The amount of travel (VMT) is highest in Upper Providence, yet Upper Providence also experiences the highest network travel speeds and second lowest congestion levels.

In comparing Table C1 with Table C2, observations reveal that congestion levels in Upper Providence Township decline if US 422 is removed from the computations – suggesting that the Pottstown Expressway is (marginally) more congested than the remainder of the highway network serving the township.

FUTURE LAND USE AND DEMOGRAPHICS

Special effort was devoted in the study to determining / estimating additional population and employment levels anticipated for the study area municipalities. Once determined, the data served as demographic inputs to the regional model for Year 2025 futures testing.

The Chester County set of study area municipalities have devoted considerable effort in this regard through a working relationship involving representatives of the Chester County Planning Commission and the municipalities comprising the Citizen Advisory Committee (CAC) to the Pennsylvania Turnpike's study of the PA 29 slip ramps. From that effort, total Year 2020 municipal population and employment forecasts were developed. For this study, DVRPC staff worked with municipal representatives and/or consultants to review and amend those estimates, as necessary, to formulate a planning set representative of the Year 2025 for the study area. It was also necessary to work with the municipal contacts to determine where the population and employment growth would likely occur within the municipality, and subsequently assign that growth to the appropriate TAZ.

For Upper Providence Township (Montgomery County), information regarding proposed and potential developments (e.g., size, use and location) were provided by the township's Steering Committee representative and subsequently tabulated. "Typical densities" (i.e., average residents per dwelling type; employees per 1,000 gross square feet or acre, for office, light industry, retail; etc.) were obtained from published references [9] [10] [11], Steering Committee members and/or professional judgement.

[9] *Trip Generation* (5th & 6th Editions), Institute of Transportation Engineers, Washington, D.C., 1991 and 1997.

[10] *The Fiscal Impact Handbook*, The Center for Urban Policy Research, New Brunswick, NJ, 1978.

[11] *The New Practitioner's Guide to Fiscal Impact Analysis*, The Center for Urban Policy Research, New Brunswick, NJ, 1985.

In turn, the appropriate densities were applied to the various uses to obtain estimates of population and/or employment for a given development. The population and employment increments associated with the pending developments were subsequently assessed for reasonableness with the Township's and Montgomery County Planning Commission's representatives to the Study Steering Committee, and modified where appropriate. Subsequently, the increments were aggregated to the Phoenixville Area Intermodal Transportation Study TAZ structure, summed with 1997 demographics, and – used as inputs for future Year 2025 modeling activities.

The estimates serving the detailed study area are summarized in Table 6. The remaining CAC derived municipal forecasts and DVRPC's official Year 2025 demographic forecasts for population and employment were used for the balance of the region.

TABLE 6
DEMOGRAPHIC PROJECTIONS: 1997 and 2025

		Population				Employment			
				Change vs. 1997 (Projected)				Change vs. 1997 (Projected)	
Municipality	Area (mi^2)	1997	Year 2025	Abs.	%	1997	Year 2025	Abs.	%
Charlestown	12.5	3,138	7,500	4,362	139	1,344	7,900	6,556	488
East Pikeland	8.8	6,815	9,860	3,045	45	986	1,300	314	32
Phoenixville	3.6	15,457	19,881	4,424	29	5,746	15,572	9,826	171
Schuylkill	8.6	6,155	11,503	5,348	87	2,893	3,200	307	11
Upper Providence	17.8	12,139	24,800	12,661	104	6,126	27,100	20,974	342
Total Study Area	**51.3**	**43,704**	**73,544**	**29,840**	**68**	**17,095**	**55,072**	**37,977**	**222**

An approximate gain of 30,000 people and 38,000 jobs are estimated for the overall study area. The largest combined gains are forecasted to occur in the Borough of Phoenixville and Upper Providence Township – the municipalities with the highest existing levels of population and employment, and those containing the regional activity centers (i.e., Development Centers).

Figures 14 and 15, respectively, illustrate the locations that the population and employment growth is expected to occur – relative to the study's TAZ structure. The deeper the hue the larger the change in the demographic. Inspection of the graphics reveals the following:

- For the majority of the study area, increases in population and employment are projected to occur in separate zones – a reflection of current zoning.
- Substantial mixing of additional population and employment is anticipated for the zones comprising the study area's three Development Centers (e.g., in the Borough of Phoenixville's CBD and "Thumb" - TAZ #s 1427 and 598, and in Upper Providence Township's Oaks interchange area - TAZ # 821, and in its PA 29 interchange area - TAZ #s 1284 and 1439), and in Upper Providence's "Neck" (TAZ # 820).
- Intensification of employment opportunities are forecasted in Charlestown's TAZs bordering the Great Valley Development Center, in East Whiteland Township (i.e., TAZ #s 1434 and 1435).

These demographics served in modeling each of the three future travel demand scenarios tested in the study.

FUTURES TESTING

The travel testing conducted in this study incrementally evaluated three future Year 2025 transportation scenarios. Each scenario used the same set of Year 2025 demographic forecasts as inputs for trip generation and trip distribution. On the other hand, the networks were altered (i.e., built upon) in each scenario to reflect differing investment levels – as would likely occur through the project development and improvement process or as required to meet the needs of the study area.

The work was accomplished in a sequential fashion such that network improvements were initially defined for testing – with the Steering Committee's direct participation. Subsequently, modeling and technical analyses were performed by DVRPC staff. Upon completion of that work, findings were reported and reviewed in detail with the Steering Committee whereupon additions, deletions or revisions to the network for the next model run were suggested. The set of improvements to be added in the ensuing model test(s) were therefore influenced / refined by the outcome of the completed work.

It should be noted that through the study process certain improvements were identified as desirable and important, although they were not modeled (for example: park-and-ride lots, trails, etc.). Secondly, certain projects were qualitatively evaluated as part of the committee work and subsequently removed from consideration prior to testing. (One such example was an interchange between PA 113 and US 422.)

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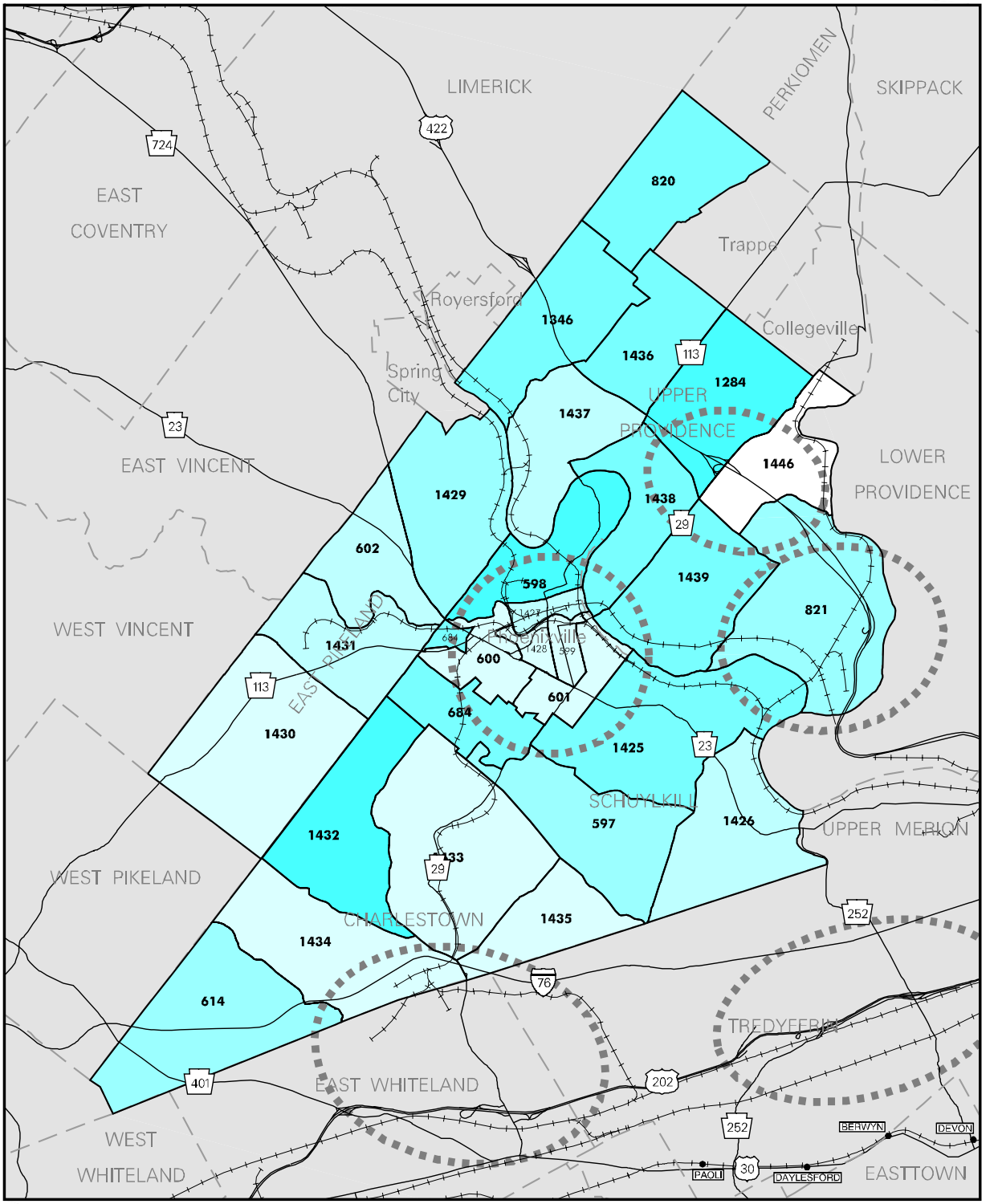

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FIGURE 14 :

PROJECTED CHANGE IN STUDY AREA POPULATION 1997 - 2025

- 0 (no change)
- 1 - 500
- 501 - 1,000
- 1,001 - 1,500
- 1,501 - 2,000
- 2,000 +

Development Center

623 Study Area TAZ Number

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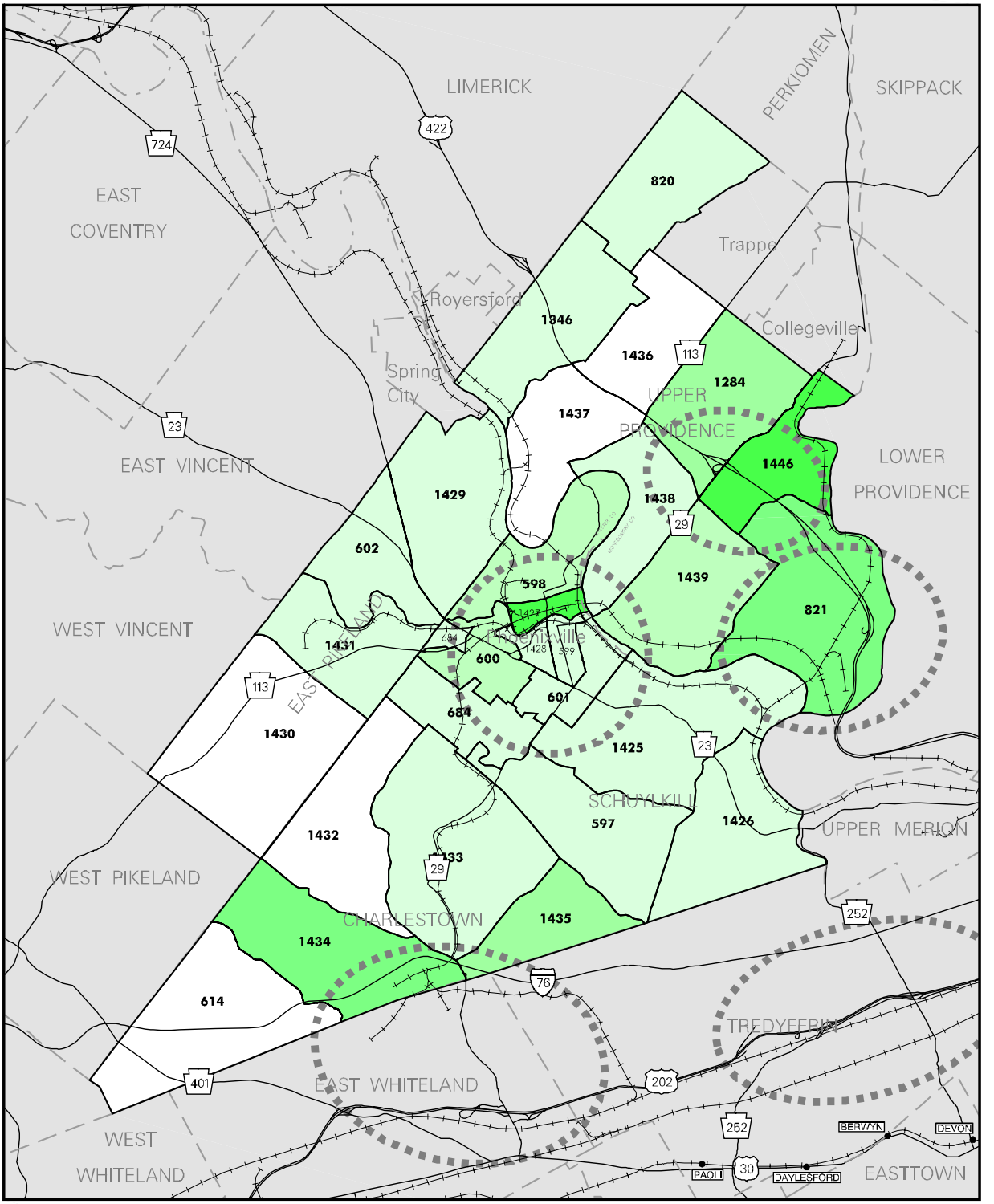

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FIGURE 15 :

PROJECTED CHANGE IN
STUDY AREA
EMPLOYMENT 1997 - 2025

- 0 (no change)
- 1 - 1,000
- 1,001 - 2,000
- 2,001 - 3,000
- 3,001 - 4,000
- 4,000 +

Development Center

623 Study Area TAZ Number

Figure 16 presents a graphical overview of the Year 2025 travel testing scenarios. Enlargements of each "window" and narrative descriptions of the improvements considered in the travel testing exercises are contained in Appendix D.

2025 COMMITTED CONDITIONS

By definition the Committed Scenario reflects improvements which are in or imminent for construction. Following a comprehensive review of potential transportation improvements and strategies applicable to the study area, the scenario was formulated to include those projects on the current regional TIP for construction between FFY 2001 and 2004, projects which will be delivered locally (as part of annual budgets, development approvals, etc.) and those improvements otherwise identified by the Study Steering Committee. Improvements emanating from the assessment of current traffic conditions were also considered for inclusion in the scenario.

The Committed Scenario represents the lowest order improvement set which is expected for the study area. The scenario serves as a base condition for determining the value and benefits to be delivered by current investments proposed for the study area. The scenario also serves as a starting point for identifying whether further investments in the study area are necessary.

Activities undertaken to prepare the Year 2025 Committed Scenario's travel simulation are described below.

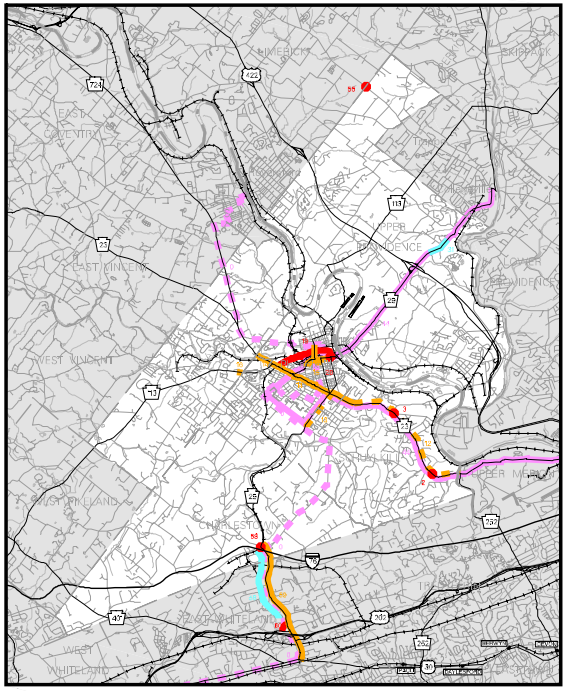
- Future year demographics, described in an earlier section, were input to the regional model for trip generation and trip distribution purposes.
- The regional model's transportation network was updated to reflect a minimum set of "committed" transportation improvements for which funding (public or private) is reasonably assured and for which implementation is expected within five or six years. Table D, in Appendix D, lists the set of study area mobility improvements which were incorporated into the modeling of the Year 2025 Committed Scenario.

The full set of set of mobility improvements assumed in the scenario's modeling are listed in Appendix D, including the following major projects:

- the French Creek Parkway;
- Widening PA 29 between the Charlestown Road / Phoenixville Pike intersection to Great Valley Parkway;
- Closed-loop traffic signal systems along PA 23 through East Pikeland, Phoenixville and Schuylkill, and along Bridge Street in the Borough, and;
- two bus routes which were initiated in the study area after 1997 (i.e., the Phoenixville Phlyer in 2000, and the Suburban Link service in 2001).

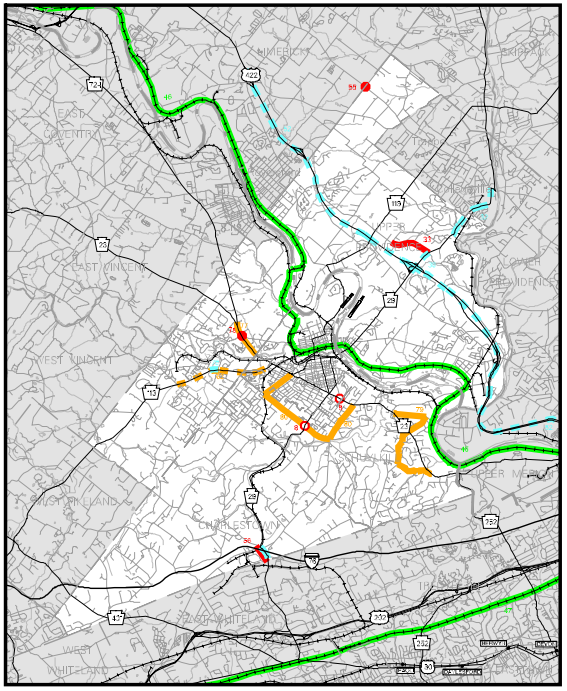
IMPROVEMENT SCENARIOS FOR YEAR 2025 TRAVEL TESTING

Scenario I: *Committed*



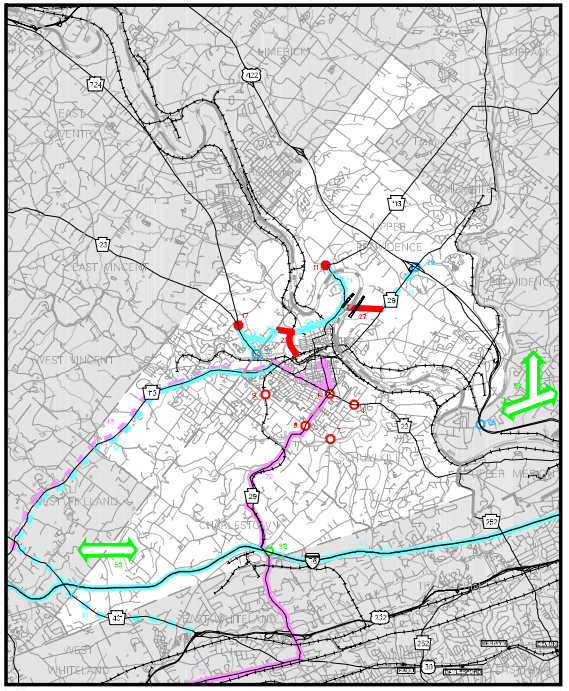
Other Inputs:
Demographics: Year 2025 Population & Employment Estimates

Scenario II: *PLAN*



Other Inputs:
Demographics: Year 2025 Population & Employment Estimates
Transportation: Scenario I Network & Improvements

Scenario III: *Full-Build*



Other Inputs:
Demographics: Year 2025 Population & Employment Estimates
Transportation: Scenario I and II Network & Improvements

FIGURE 16:

PROPOSED / POTENTIAL IMPROVEMENTS

- NEW ROADWAY ALIGNMENT
- INTERCHANGE IMPROVEMENT
- PA TURNPIKE SLIP RAMP
- ROADWAY WIDENING / RECONSTRUCTION
- INTERSECTION IMPROVEMENT
- TRAFFIC SIGNAL COORDINATION
- NEW RAIL SERVICE
- NEW BUS SERVICE

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NOTES: Enlargements of each "window" are shown on Figures D1,D2 & D3 in Appendix D.
Project reference #s are keyed to descriptions in Table D in Appendix D.

It should also be noted that SEPTA's bus service was realigned in the modeled scenario to the route structure which is presently provided in the study area. Outside of the study area, all improvements included in the region's adopted Long Range Transportation Plan were assumed in the simulation.

Figure 17 displays the daily traffic forecasts from the Year 2025 Committed Scenario's travel modeling for the planning purposes of this study. Table A1, in Appendix A, lists these and provides a comparison with current counts. A very brief tabulation of some of the key study area's local roads is provided below.

	CHANGES IN AADT 1997 BASE YEAR TO 2025 COMMITTED	
ROADWAY & SEGMENT	ABSOLUTE	%
French Creek Parkway, varies	+ 11,000 to +19,800	N.A.
PA 23, west of Twp. Line	+ 6,700	40
PA 23, PA 113 to Fr. Cr. Pkwy	+ 9,900	41
PA 23, Fr. Cr. Pkwy to Bridge St	+ 2,200	9
PA 23, thru Schuylkill Twp.	+ 6,600 to + 9,300	40 to 50
PA 113, south of PA 23	+ 6,500	55
PA 113 (Bridge St), PA 23 to Gay	+ 100 to + 800	1 to 8
PA 113, 2nd Av to Black Rock	+ 5,400	41
PA 29, Whitehorse to Charlestown	+ 9,400	55
PA 29, Charlestown to Pothouse	+ 4,400	55
PA 29, Starr to Egypt	+ 9,900	60
PA 29, Arcola to Mennonite	+ 9,500	50
PA 29, Mennonite to Ridge	+ 3,800 to + 5,300	34 to 36

Traffic volumes will increase substantially throughout the study area by the year 2025. The French Creek Parkway will provide a valuable relief route to PA 113 and PA 23 through Phoenixville's business district.

Table A2 in Appendix A provides a listing of the scenario's simulated daily transit boardings. Resulting from forecasted area-wide population and employment growth, the addition of the Phlyer and Links bus services, and the existing alignment of SEPTA bus services – study area transit activity increases to a total of 435 bus boardings per the Year 2025 Committed Scenario.

Year 2025 Committed Scenario Performance Statistics

Highway network performance statistics were computed and aggregated from the Committed Scenario's travel simulation, and are shown in Appendix C. Table C1 contains information related to the complete network, and Table C2 contains the performance data for just the local highways.

A review of the Committed Scenario's performance data tables is summarized below:

- Vehicle Miles of Travel increases about 56% from the 1997 Base Year to the Year 2025 Committed Scenario. The increase occurs equally across the

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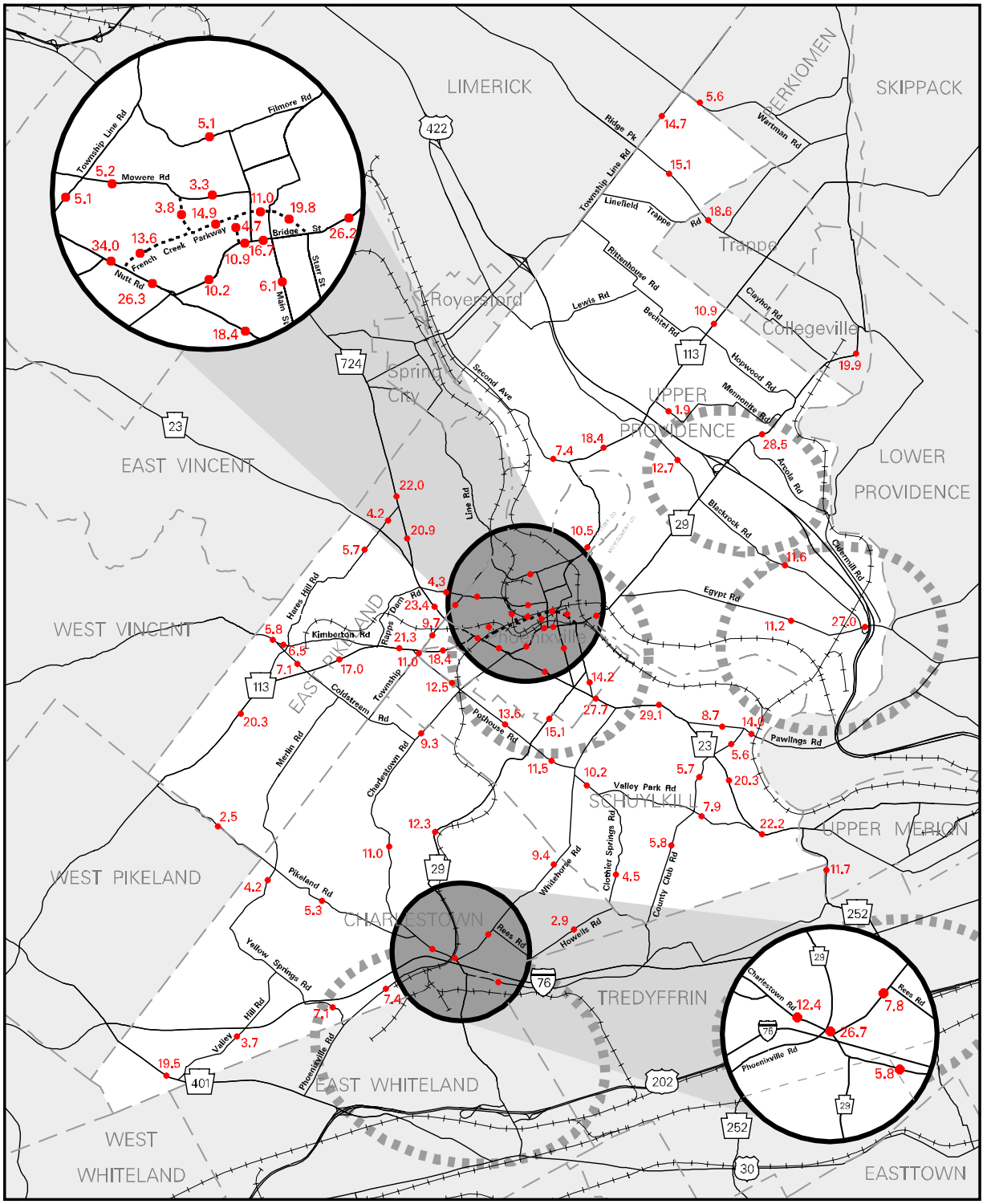

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FIGURE 17:

YEAR 2025 COMMITTED SCENARIO SIMULATED TRAFFIC VOLUMES

- Traffic Volume Monitoring Location (AADT)
- 40.0 Total Daily Traffic Volume (in thousands)
- Development Center

complete and local networks. In both the 1997 Base Year and Year 2025 Committed scenarios approximately 62% of study area highway travel takes place on "local" facilities. The greatest absolute gains in travel take place in Upper Providence.

- Speeds decline between testing scenarios across the complete and local networks (-11 to -12 mph across the study area). Speeds within Schuylkill Township decline the most (-15 mph), and will be the lowest in the study area by the horizon year.
- Area-wide volume / capacity ratios increase from approximately 50% in 1997, to 75% in the Year 2025 Committed Scenario. The marked increase in traffic volume in the future scenario is not matched by increases in capacities. As a consequence, this congestion index rises in line with the growth in travel. Increases in congestion will be uniform across the study area's municipalities. Phoenixville and Schuylkill retain the most congested status, but trade places for primacy.
- Fuel consumption increases in line with VMT (i.e., +56%), assuming current vehicle-type characteristics and fuel efficiencies are carried forward to the horizon year.
- Future year 2025 emissions estimates assume that mandated improvements in vehicle design and re-formulated fuels will result in decreased emissions per vehicle traveled. Variable changes in emission estimates are forecasted (i.e., CO = +15%, NMHC = -11%, NO_x = +11%).

Assessment of Year 2025 Committed Scenario Peak Hour Traffic Conditions

Peak hour traffic volumes at the 20 monitoring intersections were estimated for the Committed Scenario and assessed to determine the through-lane requirements for the study area's main thoroughfares (Figure 9, in the preceding chapter, identifies the locations of the monitoring intersections). The results of the analyses provided an interim indication of the value of the committed improvements, and helped define the direction for subsequent futures testing.

To conduct the assessment, projected Year 2025 Committed Scenario AADTs were converted to peak hour turning movement traffic volumes at each monitoring intersection. Furthermore, committed intersection geometry and control conditions (or the existing geometry and control type where no traffic improvements had been proposed / suggested) were identified.

Figure 18 illustrates the initial set of intersection conditions (volume and geometry) assumed in the operational analyses of Year 2025 Committed conditions. In the scenario, the most significant change to the existing network was adding the French Creek Parkway and its corollary improvements at Bridge Street / PA 29 and Starr Street (intersection #9). These are also the sole physical improvements affecting the set of monitoring intersections in the Year 2025 Committed Scenario analyses. On the other

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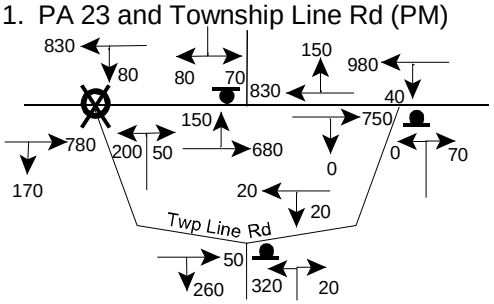
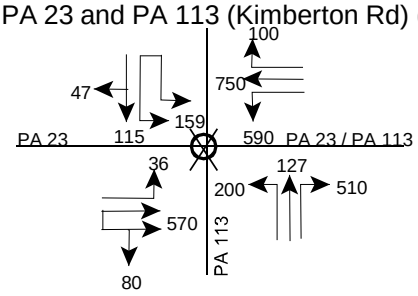
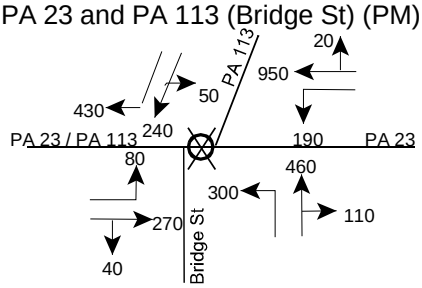
1. PA 23 and Township Line Rd (PM)



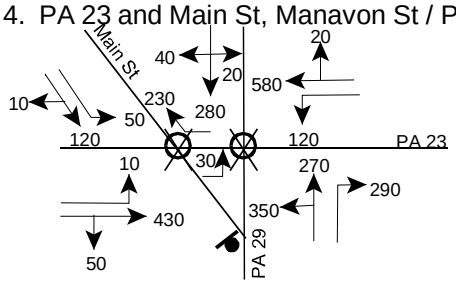
2. PA 23 and PA 113 (Kimberton Rd) (PM)



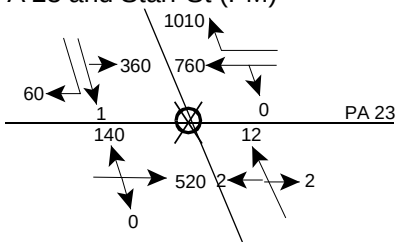
3. PA 23 and PA 113 (Bridge St) (PM)



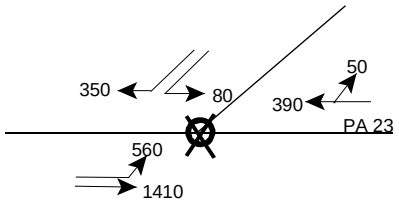
4. PA 23 and Main St, Manavon St / PA 29 (PM)



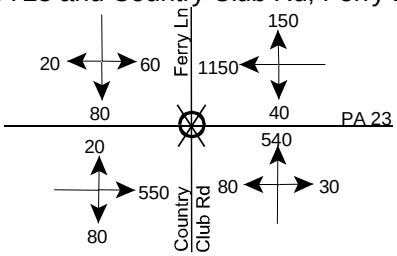
5. PA 23 and Starr St (PM)



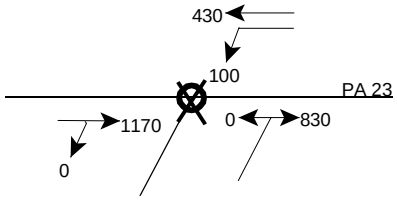
6. PA 23 and Pawlings Rd (AM)



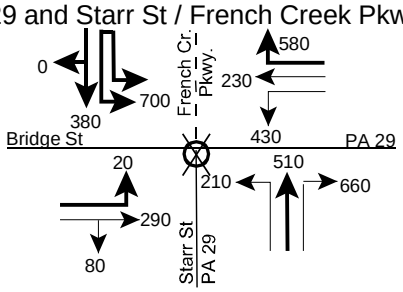
7. PA 23 and Country Club Rd, Ferry Ln (PM)



8. PA 23 and Valley Park Rd (AM)



9. PA 29 and Starr St / French Creek Pkwy (PM)



10. PA 29 and Egypt Rd, Fegley St (PM)

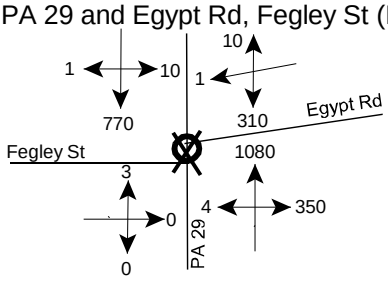


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FIGURE 18

YEAR 2025 COMMITTED SCENARIO PEAK HOUR TRAFFIC CONDITIONS AT SELECTED MONITORING LOCATIONS

250 - Peak Hour Traffic Volume

- Traffic Signal

- Lane Group

- Stop / Yield Sign

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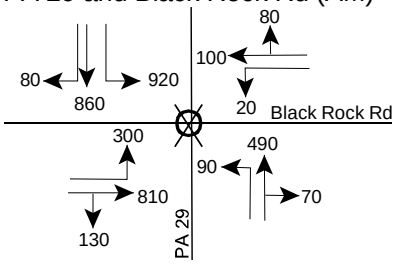
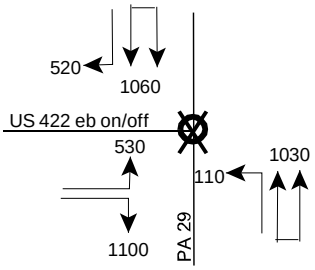
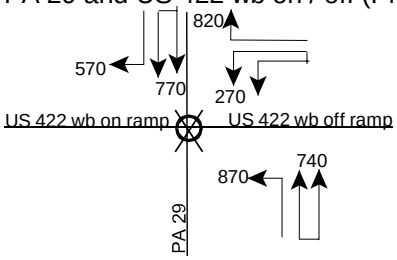
11. PA 29 and Black Rock Rd (AM)



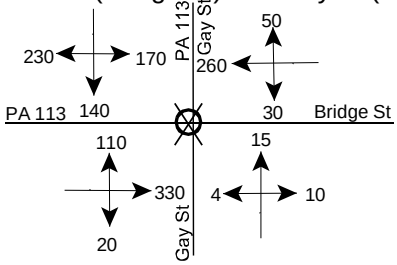
12. PA 29 and US 422 eb on/off (AM)



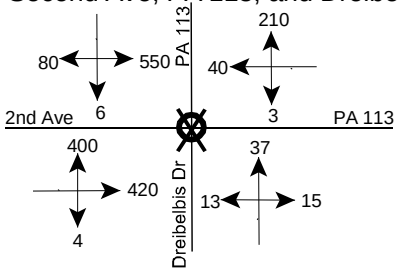
13. PA 29 and US 422 wb on / off (PM)



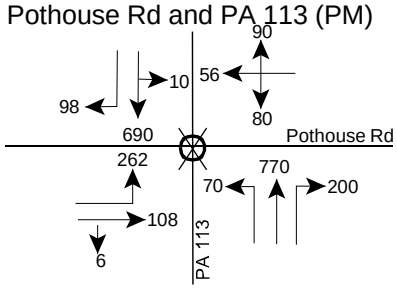
14. PA 113 (Bridge St) and Gay St (AM)



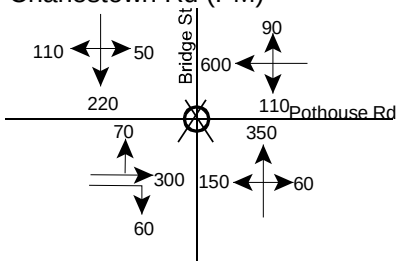
15. Second Ave, PA 113, and Dreibelbis Dr (AM)



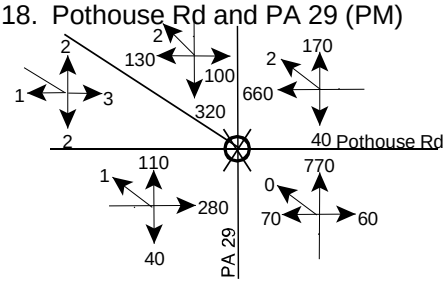
16. Pothouse Rd and PA 113 (PM)



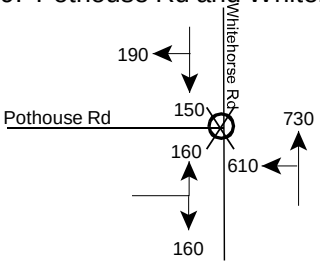
17. Pothouse Rd and Bridge St, Charlestown Rd (PM)



18. Pothouse Rd and PA 29 (PM)



19. Pothouse Rd and Whitehorse Rd (PM)



20. Whitehorse Rd and Valley Park Rd, Creek Rd (PM)

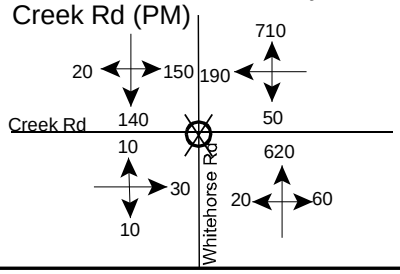


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FIGURE 18

YEAR 2025 COMMITTED SCENARIO PEAK HOUR TRAFFIC CONDITIONS AT SELECTED MONITORING LOCATIONS

250 - Peak Hour Traffic Volume

- Traffic Signal

- Lane Group

- Stop / Yield Sign

hand, revisions to traffic control from stop signs (present) to traffic signals (future), were assumed at intersections: #1b, #6, #8, #10, #12 and #15. Table B (in Appendix B) contains the summary of the Year 2025 Committed Scenario's traffic operations planning work.

Thirteen intersections (of 20 evaluated) are shown to experience undesirable traffic operations during the peak hour. Eight of the nine intersections which exhibited deficiency in the 1997 Base Year analysis repeat in the most recent work (i.e., #3, #6, #8, #9, #10, #11, #12 and #13), and are joined by intersections #1c , #2 , #7 , #17 and #20 in the Year 2025 Committed Scenario's analyses.

Improvement concepts were identified, and in some cases applied to the Committed volumes, which could deliver further improvements at the intersections and/or divert traffic volume from the segments. All of the foregoing matters, and the following observations of Year 2025 Committed Scenario's traffic assessments were discussed with the Steering Committee, and taken into account in determining the direction to proceed for modeling the next future improvement scenario.

Generalized observations related to the analysis of the Committed Scenario's peak hour traffic operations are as follows:

- Conditions west of the Borough, on PA 23 in East Pikeland (including location #3), would likely benefit from:
  - the Schuylkill Valley Metro;
  - widening portions of PA 23;
  - constructing a Northern Relief Route around the Borough's business district, including an upgrade to Mowere, connection to US 422 via an interchange at PA 113, or a new bridge and roadway between PA 113 and PA 29, à la the Chester-Montgomery County Connector, and;
  - possible grade separation of PA 23 at Township Line Road.
- Conditions east of the Borough, on PA 23 through Schuylkill (including locations #6, #7, and #8), would probably benefit from:
  - the Schuylkill Valley Metro;
  - diverting traffic to US 422 via a Northern Relief Route and Chester-Montgomery County Connector, and;
  - widening US 422 with provision for an interchange at Pawlings Road.
- In the Borough (#9) traffic diversions can be expected with:
  - the Schuylkill Valley Metro;
  - a Northern Relief Route in concert with a Chester-Montgomery County connector bridge and roadway linking PA 29 and PA 113, and/or a direct interchange between US 422 and PA 113.
- North of the Borough, along PA 29 through Upper Providence (intersections #11, #12 and #13), traffic diversions / improvements could be anticipated with the following strategies:

  - providing a PA 113 / US 422 interchange and/or widening PA 29 between Mennonite and Ridge may rein-in some of the traffic demand;
  - physical improvement to PA 29 through the US 422 interchange area in association with the Chester-Montgomery County Connector, and;
  - interchange re-configuration as proposed by Upper Providence Township.
- South of the Borough (at #18) improvement opportunities are indirectly provided in the futures options via circumferential bypass routes:
  - on the west - via the PA 113 / PA 401 upgrade, and;
  - on the east and west - as provided through PA Turnpike widening complemented with full slip ramp access at PA 29.

Many of the above-cited improvements are elements of the region's current long range transportation plan and/or have been in consideration by the area municipalities for some time. Generally, however, the improvements are capital intensive in nature and will require more time to develop. Some projects may duplicate or even conflict with another identified improvement. Others, may result in revised traffic patterns, and/or may not be politically acceptable. These matters were directly addressed with the Steering Committee for the purpose of defining or staging the set(s) of improvements to be included in subsequent travel tests.

Conclusions: Analyses of Year 2025 Committed Scenario

The Committed Scenario models future transportation conditions assuming improvement projects which are in or are imminent for construction have been implemented. Additional low capital improvements emanating from the assessment of existing conditions, and suggestions from the Steering Committee members were also incorporated into the future's test.

Sub-regional growth, estimated to occur by the year 2025, will result in substantial traffic loading throughout the study area's highway network. At the same time, currently active improvement proposals – which are reasonably certain to be implemented within the near-term – are not sufficient to deliver benefit much beyond the Borough's business district. In turn, travel speeds will decrease and congestion will widen throughout the study area (e.g., 13 of 20 monitoring locations will be deficient in 2025 vs. 9 of 20 currently deficient).

Improvement proposals which are included in the region's long range transportation plan (with minor modifications / additions) contain elements which may rectify conditions and improve mobility throughout the wider study area. Anticipated travel demand reductions, revised travel patterns and traffic congestion relief are probable with projects like the Schuylkill Valley Metro, selected freeway and roadway widenings, new highway alignments and connections – as remain in the potential improvements inventory – and were worthy of further testing in the context of this study.

These improvements were reviewed with and ultimately endorsed for travel simulation in the Year 2025 PLAN Scenario by the Study Steering Committee, which is discussed in detail in the next section.

2025 PLAN CONDITIONS

To prepare the Year 2025 PLAN Scenario travel simulation a second tier of transportation improvements in the study area were added to the modeled committed set. The "PLAN" improvement set contains projects which:

- emanated from the assessment of Committed conditions;
- are included in the region's long range transportation plan (*HORIZONS 2025*);
- are recognized elements of local municipal comprehensive plans, and/or;
- were otherwise suggested by the Steering Committee membership.

Testing of the additional layer of improvements sought to provide an understanding of the improvement set's long term effects and/or the benefits of the region's long range plan within the study area. Table D, in Appendix D, lists the set of transportation improvements which were added to the Committed Scenario, and assumed as part of the Year 2025 PLAN Scenario's highway and transit travel simulation network.

The most significant improvements added to prepare the PLAN Scenario's modeled network are listed below (the full complement is included in Appendix D).

- the Schuylkill Valley Metro;
- US 422 widening to six lanes between US 202 and Lewis Road[12], and;
- extensions of closed-loop traffic signal systems.

It should be noted that the Year 2025 PLAN Scenario travel simulation assumes the same future year population and employment demographic data used in the Committed Scenario's travel testing.

Figure 19 illustrates the simulated daily traffic volumes (AADTs) which emanated from the Year 2020 PLAN Scenario model run, and which were used for the planning purposes of this study. Table A1, in Appendix A, lists these and provides a comparison with current counts and previously modeled traffic forecasts.

A brief tabulation of traffic volume changes occurring within the study area if compared with the Year 2025 Committed Scenario follows.

[12] It should be noted that project containing US 422's physical widening was removed from the region's long range plan subsequent to conducting this study's modeling work. A formal study to evaluate the 422 widening remains on the LRP.

PHOENIXVILLE AREA
INTERMODAL TRANSPORTATION STUDY

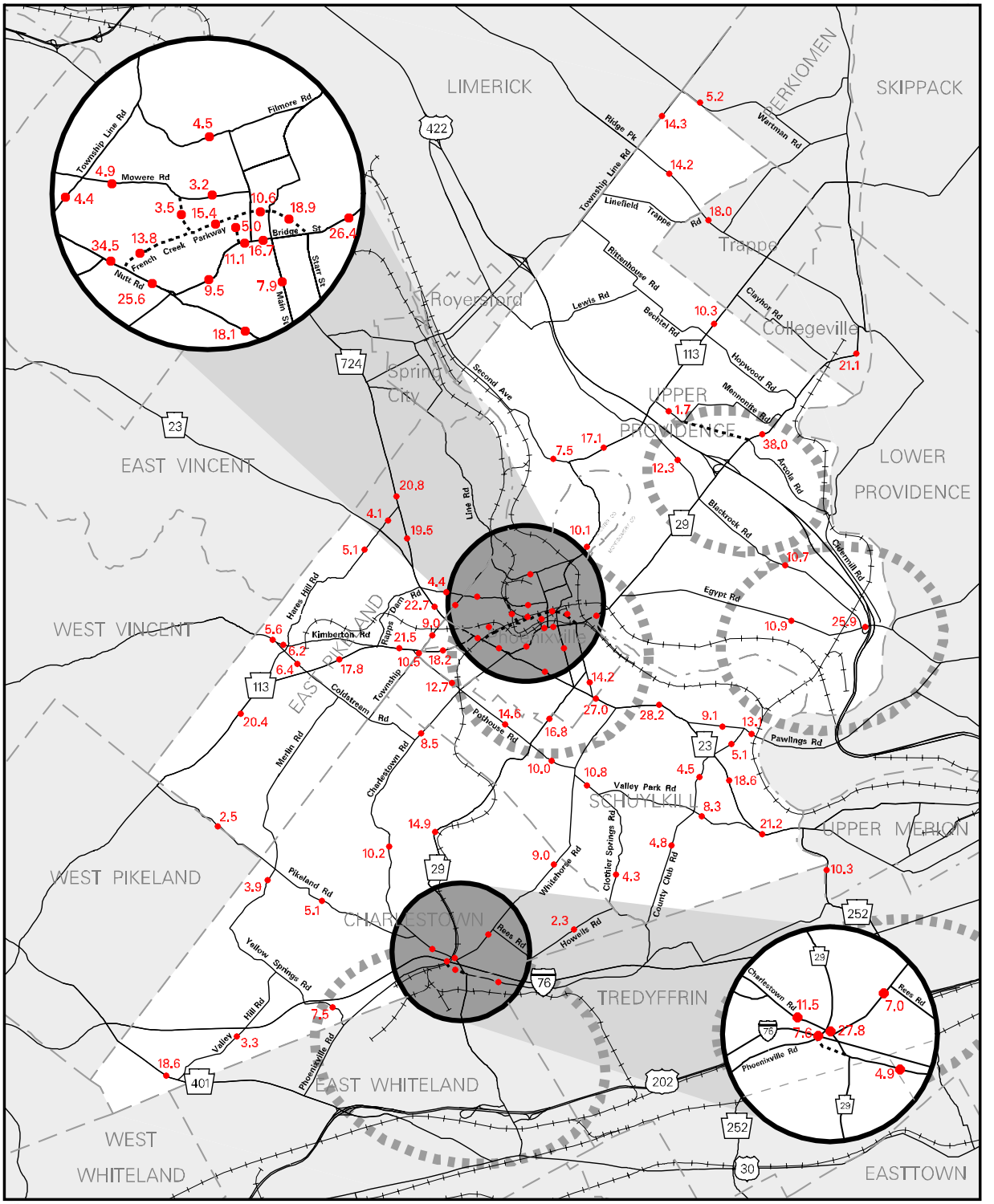

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FIGURE 19:
YEAR 2025 PLAN SCENARIO
SIMULATED TRAFFIC VOLUMES

Traffic Volume Monitoring Location (AADT)

40.0 Total Daily Traffic Volume (in thousands)

Development Center

ROADWAY & SEGMENT	CHANGES IN AADT 2025 COMMITTED TO 2025 PLAN ABSOLUTE	%
French Creek Pkwy, PA 23 to Bridge St conn	+ 200 to + 500	1 to 3
French Creek Pkwy, Bridge St conn to Starr	- 400 to - 500	- 4 to - 5
PA 23, west of Twp. Line	-1,200	- 5
PA 23, PA 113 to Fr. Cr. Pkwy	+ 500	1
PA 23, Fr. Cr. Pkwy to Bridge St	- 700	- 3
PA 23, thru Schuylkill Twp.	- 700 to - 1,700	- 3 to - 8
PA 113, south of PA 23	- 200	- 1
PA 113 (Bridge St), PA 23 to Fr Cr Pkwy conn	- 700	- 7
PA 113 (Bridge St), Fr Cr Pkwy conn to Gay	+ 200	2
PA 113, 2nd Av to Black Rock	- 1,300	- 7
PA 29, Whitehorse to Charlestown	+ 1,100	4
PA 29, Charlestown to Pothouse	+ 2,600	21
PA 29, Starr to Egypt	+ 200	1
PA 29, Arcola to Mennonite	+ 9,500	33
PA 29, Mennonite to Ridge	+ 1,200	6

Marginal changes in daily traffic volumes occur along principal highways, still some patterns are evident. Outside of the Borough – PA 23 shows a decline and PA 29 shows an increase in daily traffic. PA 23's reduced demand is attributed to parallel service enhancements afforded by the Schuylkill Valley Metro and widening US 422. Other parallel secondary routes are similarly affected (e.g., Egypt and Black Rock roads. PA 29's volume increases are due to capacity enhancements. Secondary roads paralleling PA 29 demonstrate a reduction in traffic (e.g., Country Club, Whitehorse and Charlestown roads).

Table A2, in Appendix A, provides a listing of the scenario's simulated daily transit boardings. Overall transit utilization increased because of improved mobility afforded by the Schuylkill Valley Metro – 2,400 total boardings are forecasted at the three stations within the study area. On the other hand, compared to the Committed Scenario, bus boardings decreased by 15 percent (to 370 daily boardings) due to the greater attractiveness of the Schuylkill Valley Metro mode.

Year 2025 PLAN Scenario Performance Statistics

As conducted previously, area-wide highway performance measures were computed from the Year 2025 PLAN network on two levels. The information is summarized in tables contained in Appendix C. Table C1 summarizes the data for the complete system (including freeways, expressways, arterials, collectors and local streets and roadways). Table C2 includes the data for the local highway network (i.e., just the arterials, collectors and local streets).

A review of the changes in the performance data which took place between the Year 2025 Committed Scenario and the Year 2025 PLAN Scenario is summarized below:

- Vehicle Miles of Travel increased 1% over the complete study area highway network. Reduced travel along arterial highways (-1%) and collector / local highways (-6%) are slightly offset by travel increases on freeways and expressways (+7%). The largest increase in travel along limited access highways took place in Upper Providence (i.e., along US 422).
- The PLAN Scenario illustrated a 2% reduction in travel demand occurring along the locally accessible highway network as compared with the 2025 Committed Scenario. That is to say, in the Committed Scenario 62% of study area highway travel takes place on "local" facilities, while in the PLAN Scenario the estimate was 60%).
- Because of increased study area highway capacity, the diversion of local highway travel, and the availability of the Schuylkill Valley Metro – congestion indicators, on both the complete and local highway networks, show favorable changes. For example: vehicle hours of travel decreased (-11% to -12%), network-wide speeds increased (marginally, +1.5 to +3.0 mph) and volume / capacity ratios declined (on the order of 10%).
- Fuel consumption changed in line with total VMT (i.e., +1%).
- Future year 2025 emissions estimates changed little between scenarios (i.e., CO = <+1%, NMHC = no change, NO_x = <+1%).

Assessment of Year 2025 PLAN Scenario Traffic Conditions

Projected Year 2025 PLAN Scenario AADTs were converted to peak hour turning movement traffic volumes, and modeled network improvements were translated to intersection geometry to conduct the planning assessment of the PLAN Scenario's peak hour traffic operations.

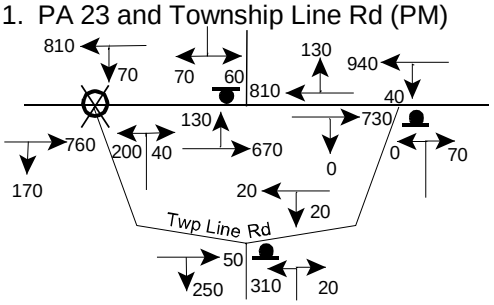
Figure 20 illustrates intersection lane group geometry, traffic control and peak hour traffic volume conditions assumed for the 20 monitoring intersections. As a reminder, the analyses and its results were conducted as an aid in determining the adequacy of through lanes serving the broader study area, the value that the scenario's additional improvements may add, and together to judge the direction that the Study's subsequent modeling exercises should follow.

Table B, in Appendix B, summarizes the traffic operations planning work assuming the Year 2025 PLAN Scenario's modeling assumptions. The analysis builds upon the improvements assumed in the evaluation of Year 2025 Committed conditions. No revisions to traffic control were assumed in the initial analysis, and the only physical improvements assumed in the Year 2025 PLAN Scenario analyses of the monitoring locations were:

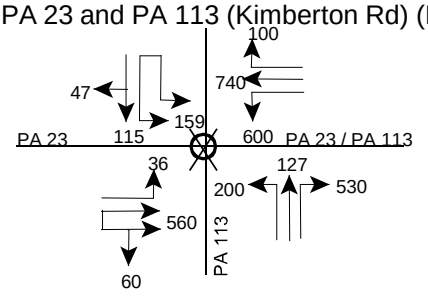
- the addition of separate left turn lanes on PA 23 at Starr Street (intersection #5), and;
- the addition of separate left turn lanes on PA 29 at Pothouse Road (intersection #18).

PHOENIXVILLE AREA
INTERMODAL TRANSPORTATION STUDY

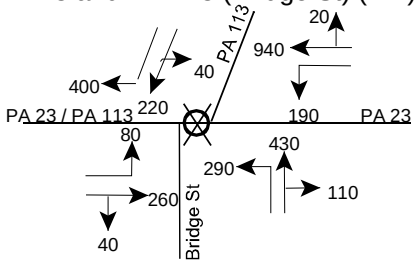
1. PA 23 and Township Line Rd (PM)



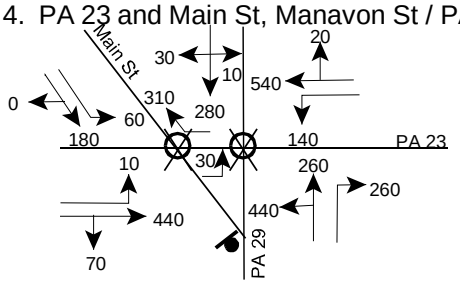
2. PA 23 and PA 113 (Kimberton Rd) (PM)



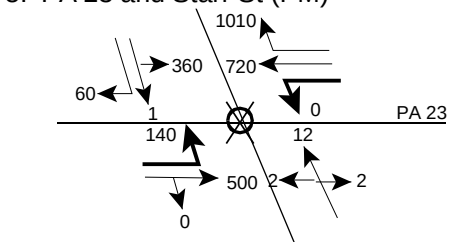
3. PA 23 and PA 113 (Bridge St) (PM)



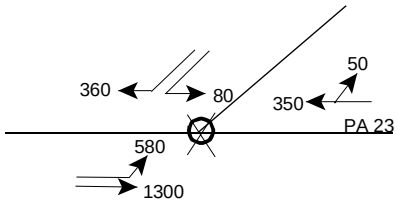
4. PA 23 and Main St, Manavon St / PA 29 (PM)



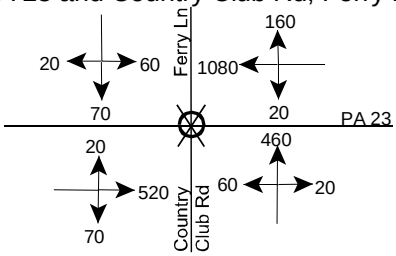
5. PA 23 and Starr St (PM)



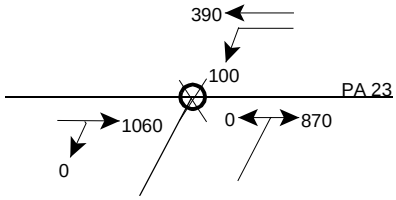
6. PA 23 and Pawlings Rd (AM)



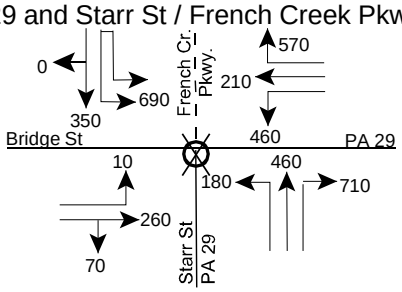
7. PA 23 and Country Club Rd, Ferry Ln (PM)



8. PA 23 and Valley Park Rd (AM)



9. PA 29 and Starr St / French Creek Pkwy (PM)



10. PA 29 and Egypt Rd, Fegley St (PM)

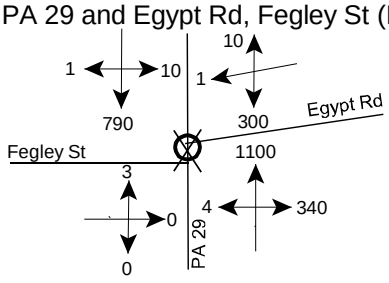


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FIGURE 20

YEAR 2025 PLAN SCENARIO PEAK HOUR TRAFFIC CONDITIONS AT SELECTED MONITORING LOCATIONS

250 - Peak Hour Traffic Volume

- Traffic Signal

- Lane Group

- Stop / Yield Sign

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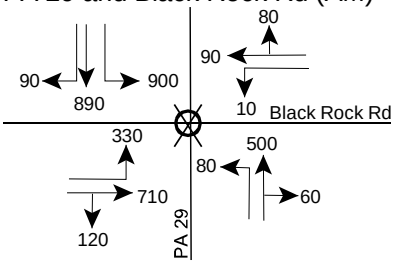
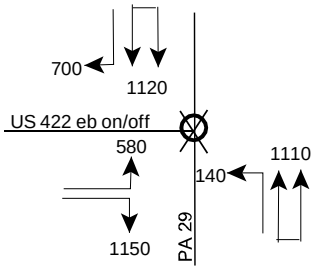
INTERMODAL TRANSPORTATION STUDY

11. PA 29 and Black Rock Rd (AM)



12. PA 29 and US 422 eb on/off (AM)



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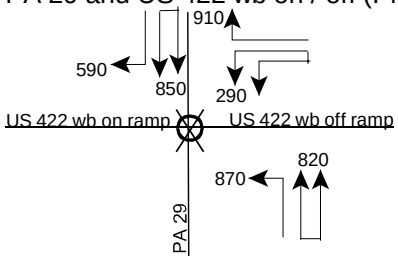

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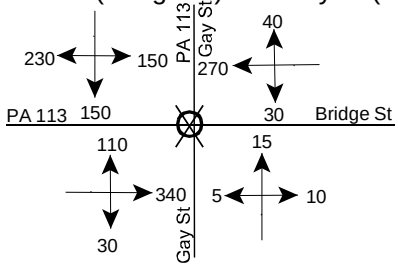
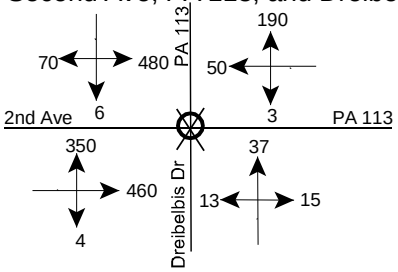
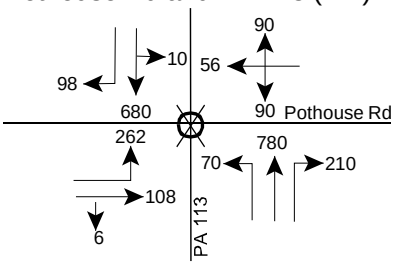


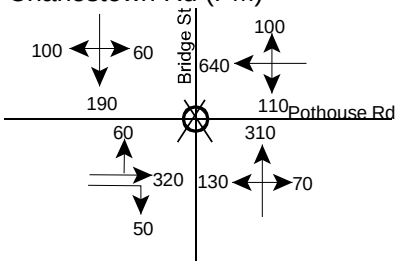
15. Second Ave, PA 113, and Dreibelbis Dr (AM)



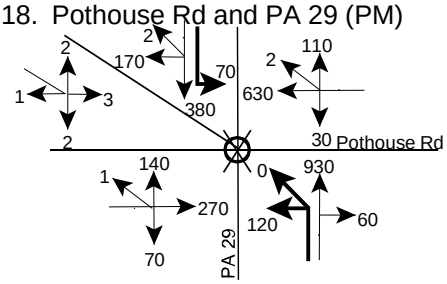
16. Pothouse Rd and PA 113 (PM)



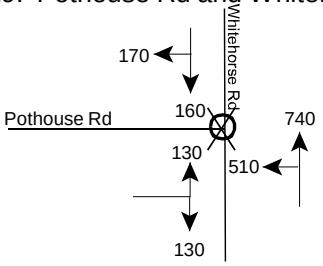
17. Pothouse Rd and Bridge St, Charlestown Rd (PM)



18. Pothouse Rd and PA 29 (PM)



19. Pothouse Rd and Whitehorse Rd (PM)



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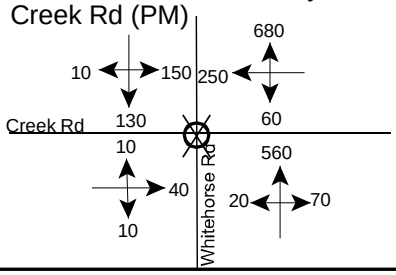

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FIGURE 20

YEAR 2025 PLAN SCENARIO PEAK HOUR TRAFFIC CONDITIONS AT SELECTED MONITORING LOCATIONS

250 - Peak Hour Traffic Volume

- Traffic Signal

- Lane Group

- Stop / Yield Sign

Fourteen intersections (of 20 evaluated) will experience undesirable traffic operations during the peak traffic hour. All 13 of the intersections which exhibited deficiency in the 2025 Committed Scenario analysis repeat in the PLAN's evaluation and are joined by the Pothouse and Charlestown / Bridge intersection (#17).

Improvement opportunities emanating from the detailed evaluation of the PLAN's peak hour traffic volumes, and others identified earlier in the committee process, were reviewed in detail with the Steering Committee in defining the next testing scenario.

A summary of PLAN Scenario's traffic evaluation (as contained in Table B) and the available modeling strategies to mitigate them further (as shown in Table D) are listed below.

- Conditions west of the Borough, on PA 23 in East Pikeland (including locations #1 - #3):
  - exhibit improved traffic conditions versus those estimated at the conclusion of the Committed Scenario's analysis;
  - the segment may further benefit from: widening selected portions of PA 23; constructing a Northern Relief Route with supporting upgrades to Mowere and Township Line and grade separation of Township Line Road at PA 23, and a connection to US 422 via the Chester-Montgomery County Connector.
- Conditions east of the Borough, on PA 23 through Schuylkill (i.e., locations #6 - #8):
  - are all improved versus the traffic operating conditions computed at the conclusion of the analysis of the Committed volume scenario;
  - the segment will likely be impacted by providing an interchange between Pawlings Road and US 422, and may benefit from: diverting traffic to US 422 via a Northern Relief Route and Chester-Montgomery County Connector, and; traffic diversion to a widened Turnpike - fitted with slip ramps at PA 29.
- In the Borough and through Mont Clare – along Bridge Street and PA 29 (locations #9, #14 and #10):
  - varied operational changes take place after the introduction of the modeled PLAN improvements;
  - traffic diversions can be expected with: a Northern Relief Route in concert with the Chester-Montgomery County connector, and/or; a direct interchange between US 422 and PA 113.

- North of the Borough, along PA 29 in the vicinity of the US 422 interchange, in Upper Providence (intersections #11, #12 and #13):
  - a general decline in traffic operations occurs under the PLAN Scenario;
  - diversions associated with a PA 113 / US 422 interchange may rein-in some of the traffic demand;
  - additional opportunities appear reasonable via physical improvement to PA 29 through the US 422 interchange area in association with the Chester-Montgomery County Connector, and; interchange re-configuration as proposed by Upper Providence Township.
- South of the Borough:
  - along PA 29, modeled PLAN improvements yield better traffic operations versus those delivered through the Committed set at Pothouse Road (location #18) – although they are still projected at undesirable levels;
  - at the Main / Manavon intersection (#4) traffic operations are worse under the PLAN Scenario. Improvement opportunities, which divert volume to improved circumferential "bypass" routes, remain in the inventory of potential modeling improvements to address these conditions.
    a) on the west - via the PA 113 / PA 401 upgrade, and/or a slip ramp interchange between the Turnpike and PA 29 if ramps to and from the west are provided.
    b) on the east - as provided through PA Turnpike widening complemented with regional slip ramp access, including PA 29. These improvements may have the potential of diverting traffic from PA 29 through the length of the study area.

Some of the above-cited improvements may duplicate or even conflict with other identified improvements, may result in revised traffic patterns, and/or may not be desirable or politically acceptable. These matters were discussed in detail and finalized with the Steering Committee prior to conducting the modeling for the third study future.

Conclusions: Analyses of Year 2025 PLAN Scenario

The Plan Scenario's modeling exercise included transportation improvement projects which are part of the region's current long range transportation plan and/or long range plans of the study area municipalities; recommendations emanating from the assessment of committed conditions, and; suggestions from the Steering Committee.

Thus far in the travel demand analyses for the study, the incremental planning and travel testing process mimicked the official transportation improvement project development process for the Greater Phoenixville study area. As part of that process problem locations will be targeted for improvement over the next 25 years in a logical and comprehensive fashion.

The introduction of regional level transportation improvements included in the [then] current Long Range Plan (i.e., US 422 widening and the Schuylkill Valley MetroRail) and other local level improvements modeled in the Year 2025 PLAN Scenario, boosted transit ridership, and diverted traffic volume from and redistributed traffic within the locally accessible roadway network. In turn, improvement in future congestion was forecasted across the Greater Phoenixville study area as a consequence of modeling the PLAN's improvement program.

Conversely, on a micro level, traffic operating conditions do not change appreciably as a result of the added modeled improvements. Generally, the same set of deficient monitoring locations identified in the Year 2025 Committed Scenario repeat in the PLAN Scenario.

Traffic improvements remaining in the menu of identified strategies (i.e., the Full-Build Scenario, per Table D) include selected highway and roadway widening and upgrades; new highway alignments, and/or; new connections between highways. The potential these offered to ameliorate deficient monitoring locations and deliver improved mobility levels throughout the wider study area – through travel demand reductions, revised travel patterns and traffic engineering opportunities – were discussed in detail with the Steering Committee for the purpose of defining the assumptions for the final model run (i.e., the Year 2025 Full-Build Scenario).

2025 FULL-BUILD CONDITIONS

DVRPC staff, subsequently advanced the travel simulation for the Year 2025 Full-Build Scenario for the Phoenixville Area Intermodal Transportation Study. At the conclusion of the Full-Build Scenario's travel testing, the study seeks to determine the transportation and travel benefits / consequences offered through a widely applied set of additional mobility improvements which are judged to be desirable and reasonable, but which are not currently part of the formal project development process.

Table D, in Appendix D, lists the set of transportation improvements which were added to the PLAN Scenario, and assumed as part of the Year 2025 Full-Build Scenario's highway and transit travel simulation network. The most significant improvements added to modeled network to comprise the Full-Build Scenario are:

- Widening the PA Turnpike to six lanes between the Valley Forge and Downingtown interchanges;
- Full slip ramp, electronic toll interchange construction at PA 29 and the Turnpike (and selected other locations in the region);
- A "Northern Relief Route" - providing two lane circumferential improvements (including new and upgraded alignments) around Phoenixville;
- A two lane Chester-Montgomery County connecting bridge and roadway, between PA 113 and PA 29;

- Widening PA 29 for an added travel lane in each direction from the Chester-Montgomery Connector through the US 422 interchange;
- Interchange reconfiguration at US 422 and PA 29;
- Adding a partial interchange at US 422 and Pawlings Road, which provides ramps to/from the east along US 422;
- Interchange completion at US 422 and PA 363 (Trooper Road), which provides ramps to/from the west along US 422;
- Relocating TMACC's Phoenixville Phlyer service to operate between Phoenixville and Exton via Eagleview and Lionville (i.e., along PA 113 in the study area, and PA 100 outside), and;
- Instituting SEPTA bus service between Phoenixville and West Chester via Glenloch (i.e., replacing Phlyer service along PA 29 in the study area).

Figure 21 illustrates the AADTs which emanated from the Year 2020 Full-Build Scenario simulation. Table A1, in Appendix A, lists these and provides a comparison with current counts and the previously modeled traffic forecasts.

A brief tabulation of traffic volume changes which occurred within the study area, if compared with the Year 2025 PLAN Scenario, is provided below.

	CHANGES IN AADT 2025 PLAN TO 2025 FULL-BUILD	
ROADWAY & SEGMENT	ABSOLUTE	%
Chester-Montgomery County Bridge	7,800	---
French Creek Pkwy, PA 23 to Starr	- 1,800 to -1,900	- 12 to - 17
PA 23, Mowere to Twp. Line	- 2,000	- 9
PA 23, PA 113 to Fr. Cr. Pkwy	- 2,300	- 7
PA 23, Fr. Cr. Pkwy to Bridge St	- 1,200	- 5
PA 23, Starr to Pawlings	- 200 to + 700	- 1 to + 2
PA 23, east of Pawlings	- 3,000 to - 4,000	- 14 to - 22
Pawlings, east of PA 23	5,700 to 7,100	44 to 78
PA 113, Township Line to PA 23	- 1,300	- 7
PA 113 (Bridge St), PA 23 to Fr Cr Pkwy conn	- 800	- 8
PA 113 (Bridge St), Fr Cr Pkwy conn to Gay	- 500	- 5
PA 113, north of connector bridge	+ 1,500	15
PA 29, Whitehorse to Charlestown	+ 700	3
PA 29, Charlestown to Pothouse	- 800	- 5
PA 29, Starr to Egypt	- 800	- 3
PA 29, Arcola to Mennonite	- 3,400	- 9
PA 29, Mennonite to Ridge	no change	---

Marginal changes in daily traffic volumes occurred along principal highways as diverted traffic is replaced by additional volume entering the system. Along PA 23, immediately west of the Borough through Bridge Street, a moderate decline in volume took place due to diversion to the Northern Relief Route. East of Pawlings Road, PA 23 reflects a substantial reduction in traffic volume which was diverted to Pawlings Road to access the interchange at US 422.

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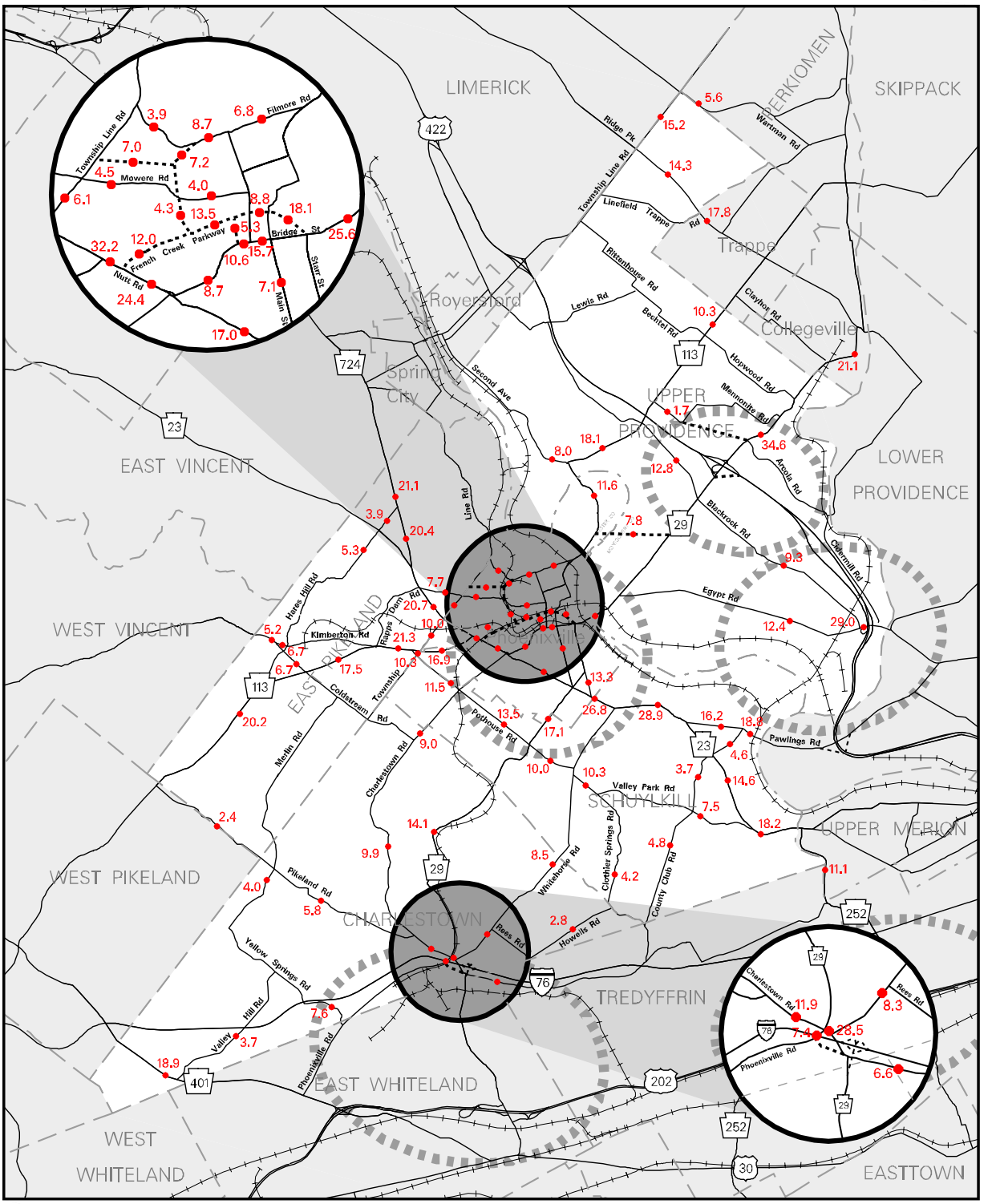

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FIGURE 21:
YEAR 2025 FULL-BUILD SCENARIO
SIMULATED TRAFFIC VOLUMES

Traffic Volume Monitoring Location (AADT)

40.0 Total Daily Traffic Volume (in thousands)

Development Center

Moderate changes (up and down) were exhibited along PA 29. The greatest traffic increase was forecasted just north of the US 422 interchange due to improved access to and through the interchange area. Traffic levels crossing the Mont Clare Bridge decline marginally.

Traffic levels along secondary routes responded variably to the mobility improvements and/or parallel service improvements provided in the alternative.

Table A2, in Appendix A, provides a listing of the scenario's simulated daily transit boardings. Total daily Year 2025 bus boarding estimates for the Full-Build Scenario are 655. Gains were registered over the previously tested futures as a consequence of expanded coverage within the study area and serving new markets beyond it.

Selected Link Analyses

The regional model was used to estimate the geographic distribution of highway trips assuming the simulated Year 2025 Full-Build transportation network. The analyses were performed for the same links as the 1997 Base Year Scenario and the results are shown on Table 7.

In comparison with the selected link analyses performed for the 1997 Base Year Scenario, the Year 2025 Full-Build Scenario results indicated:

- slightly longer overall trip lengths will be taken in the horizon year (12.8 miles vs. 11.6 miles in the base year) reflecting the mobility improvements on the expressways;
- an increase in the proportion of trips completed internally within the study area (18.6% in the base year vs. 21.0% in the horizon year), and:
- a noticeably higher share of trip making oriented between the study area and the west (14.3% currently vs. 21.0% forecasted in the Year 2025 Full-Build).

DIRECTION (FROM)	PERCENT
North	15%
East	28%
South	15%
West	21%
Internal	21%

TABLE 7
FINDINGS OF SELECTED LINK ANALYSES - YEAR 2025 FULL-BUILD SCENARIO

Link	2025 AADT	Significant Trip Origin Sheds	Avg. Airline Distance to the Link	Potential Strategy(s)
PA 29 between Arcola Rd and Mennonite Rd	34,600	**East** - Upper Providence Eastern Neighbors (25%) and Upper Merion, Bridgeport (7%) **Internal** - Phoenixville (8%) and Upper Providence (19%)	5.5 miles	Sch Vly Metro, widen US 422 Rdesharing / p-n-r lots internal to the study area
PA 29 between Starr St and Egypt Rd	25,600	**North** - Northern Bucks / Montgomery Counties (7%) **South -** East Whiteland (8%) **East** - Upper Providence Eastern Neighbors (10%) **Internal** - Phoenixville (23%) and Upper Providence (20%)	4.9 miles	PA Tpke / NE Extension widening and slip ramps at PA 113 and PA 29 Ridesharing / p-n-r lots, hwy impr'ts Sch Vly Metro, widen US 422 Ridesharing / p-n-r lots internal to the study area
PA 29 between Charlestown Rd and Pothouse Rd	14,100	**North** - Northern Bucks / Montgomery Counties (5%) **South** - East Whiteland (29%) and South and Western Chester County (10%) **Internal** - Phoenixville (14%) and Upper Providence (8%)	7.6 miles	PA Tpke / NE Extension widening and slip ramps at PA 113 and PA 29 TMACC Phlyer service enhancement, ridesharing / p-n-r lots Ridesharing / p-n-r lots internal to the study area
PA 29 between Whitehorse Rd and Charlestown Rd	28,500	**South** - East Whiteland (27%) **Internal** - Charlestown (15%), Phoenixville (7) and East Pikeland (6%)	5.2 miles	TMACC Phlyer service enhancements, ridesharing / p-n-r lots, hwy impr'ts Ridesharing / p-n-r lots internal to the study area
PA 23 between Mowere Rd and Township Line Rd	20,700	**North** - Pottstown and Berks County (12%) **West** - Northern Chester County (26%) **Internal** - Phoenixville (15%) and East Pikeland (8%)	6.7 miles	Sch Vly Metro, park-and-ride lots, widen US 422 Sch Vly Metro, widen US 422 Ridesharing / p-n-r lots internal to the study area, Northern Relief Route
PA 23 between Whitehorse Rd and Pawlings Rd	28,900	**South** - Tredyffrin (10%) **East** - Upper Merion, Bridgeport (13%) **West** - Northern Chester County (10%) **Internal** - Phoenixville (28%)	5.4 miles	Ridesharing Sch Vly Metro, Suburban Links service, ridesharing, widen US 422, PA 23 impr Sch Vly Metro Ridesharing / p-n-r lots internal to the study area
PA 23 between Country Club / Ferry Rd and Valley Park Rd	14,600	**South** - Tredyffrin (18%) **East** - Upper Merion, Bridgeport (17%) **West** - Northern Chester County (11%) **Internal** - Phoenixville (30%)	5.8 miles	Ridesharing Sch Vly Metro, Suburban Links service, ridesharing, widen US 422, PA 23 impr Sch Vly Metro Ridesharing / p-n-r lots internal to the study area

Year 2025 Full-Build Scenario Performance Statistics

Area-wide highway performance measures were computed from the output of the Year 2025 Full-Build modeling. In Appendix C – Table C1 summarizes the data for the complete system, and Table C2 includes the data for just the "locally accessible" highway network.

A review of the changes in the performance data between the Year 2025 PLAN Scenario and the Year 2025 Full-Build Scenario is summarized below.

- Vehicle Miles of Travel increased about 4% for the complete study area highway network in the Full-Build Scenario. Increased travel is noted along the expressway and arterial components (each increase about 5% versus the PLAN), while reduced travel occurs along the collector / local highways in the study area (-3% versus the PLAN).
- The Full-Build Scenario illustrated a reduction in travel demand along the "locally accessible" highway network in Charlestown Township (-1%) and Schuylkill Township (-5%) versus the PLAN Scenario. The changes in Charlestown are associated with the Turnpike widening and slip ramps at PA 29. The change in Schuylkill Township is attributed to the diversion of traffic from PA 23 to Pawlings Road.
- Travel increased above the PLAN Scenario estimates along locally accessible highways serving East Pikeland (+4%), Phoenixville (+7%) and Upper Providence (+8%). The attractiveness of the Northern Relief Route produced these increases.
- Congestion indicators, on both the complete and local highway networks, showed favorable changes. Because of the increase in study area highway capacity and the diversion of local highway travel – vehicle hours of travel decreases (-6% to -7%), network-wide speeds increase (+2.0 mph) and volume / capacity ratios decline (-3% to -4%).
- Fuel consumption changed in line with total VMT.
- Future year 2025 emissions estimates experienced increases on the order of 4% – in line with total VMT changes.

Assessment of Year 2025 Full-Build Scenario Traffic Conditions

Figure 22 illustrates intersection lane group geometry, traffic control and peak hour traffic volume conditions estimated for the 20 monitoring intersections assumed in the initial analysis of Year 2025 Full-Build Scenario traffic operations. The information is used in a planning assessment of projected peak hour traffic operations at these key locations, and as an indication of the adequacy of the number of through lanes throughout the broader study area. The results of the analyses provides an indication of the value of proposed or potential additional improvements, and heretofore has aided in judging the direction of the Study's modeling exercises.

Table B, in Appendix B, summarizes the traffic operations planning work assuming the Year 2025 Full-Build Scenario's modeling assumptions. The analysis built upon the

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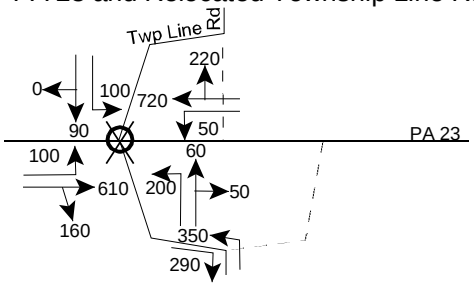
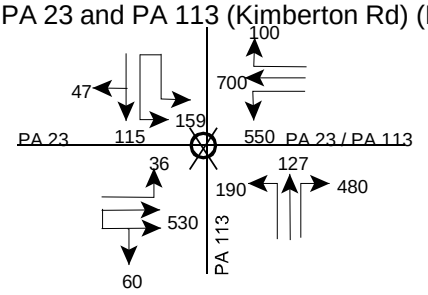
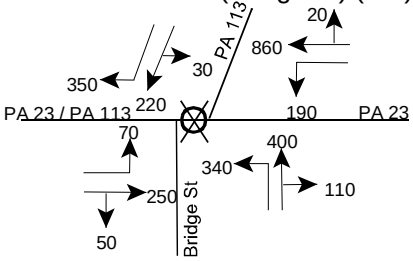
1. PA 23 and Relocated Township Line Rd (PM)



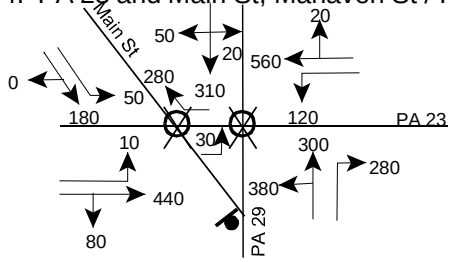
2. PA 23 and PA 113 (Kimberton Rd) (PM)



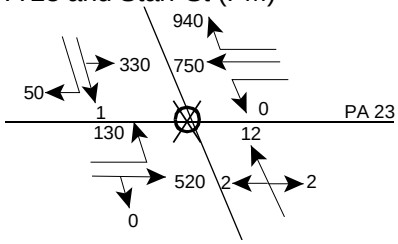
3. PA 23 and PA 113 (Bridge St) (PM)



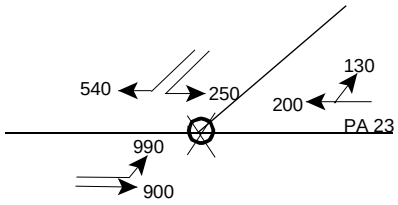
4. PA 23 and Main St, Manavon St / PA 29 (PM)



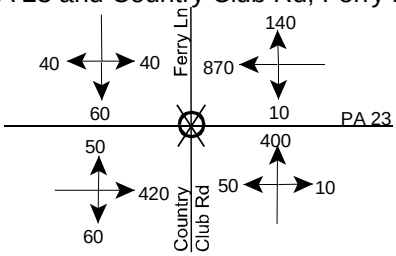
5. PA 23 and Starr St (PM)



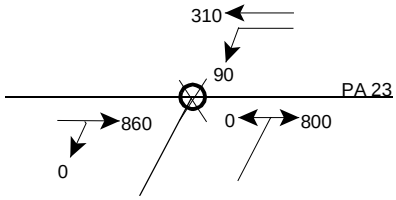
6. PA 23 and Pawlings Rd (AM)



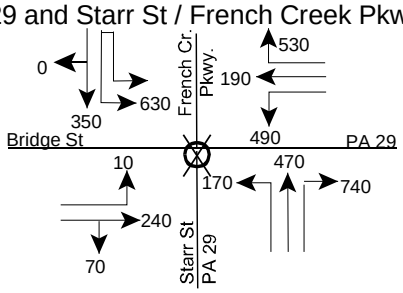
7. PA 23 and Country Club Rd, Ferry Ln (PM)



8. PA 23 and Valley Park Rd (AM)



9. PA 29 and Starr St / French Creek Pkwy (PM)



10. PA 29 and Egypt Rd, Fegley St (PM)

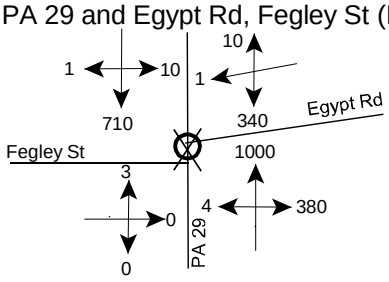


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FIGURE 22

YEAR 2025 FULL-BUILD SCENARIO PEAK HOUR TRAFFIC CONDITIONS AT SELECTED MONITORING LOCATIONS

250 - Peak Hour Traffic Volume

- Traffic Signal

- Lane Group

- Stop / Yield Sign

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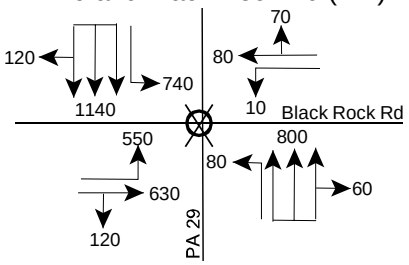
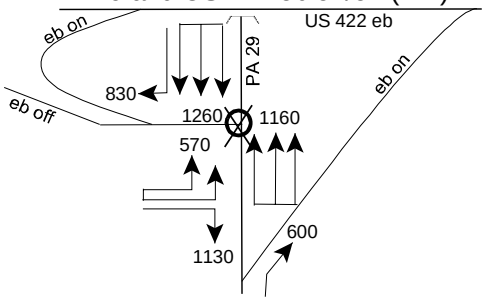
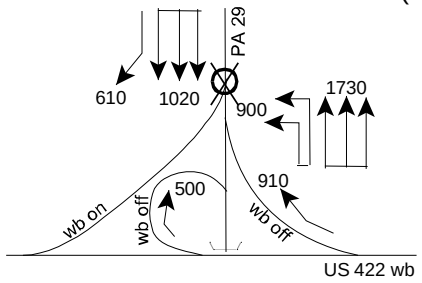
11. PA 29 and Black Rock Rd (AM)



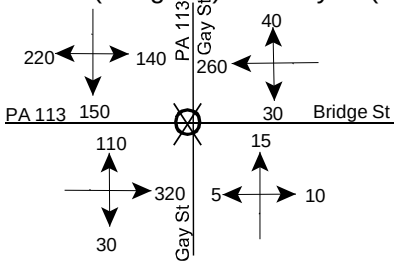
12. PA 29 and US 422 eb on/off (AM)



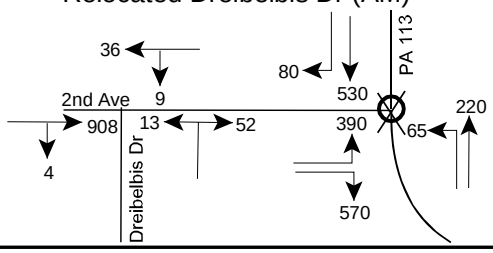
13. PA 29 and US 422 wb on / off (PM)



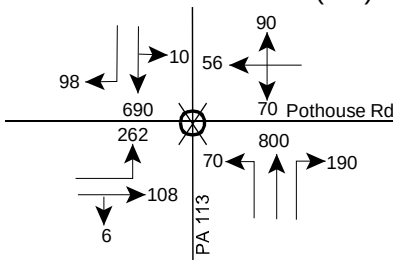
14. PA 113 (Bridge St) and Gay St (AM)



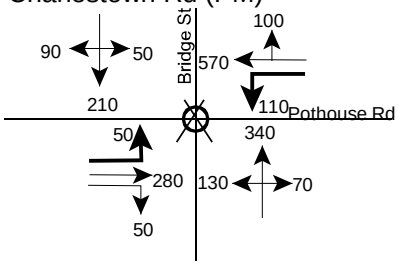
15. Second Ave Realigned, PA 113, and Relocated Dreibelbis Dr (AM)



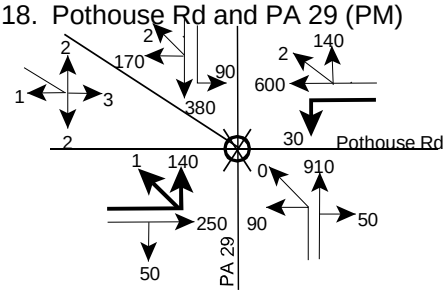
16. Pothouse Rd and PA 113 (PM)



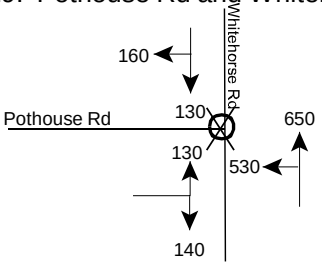
17. Pothouse Rd and Bridge St, Charlestown Rd (PM)



18. Pothouse Rd and PA 29 (PM)



19. Pothouse Rd and Whitehorse Rd (PM)



20. Whitehorse Rd and Valley Park Rd, Creek Rd (PM)

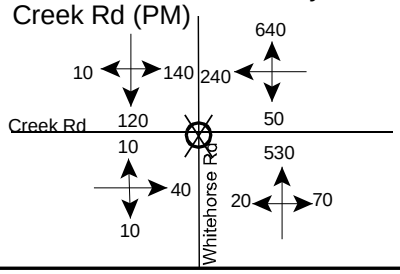


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FIGURE 22

YEAR 2025 FULL-BUILD SCENARIO PEAK HOUR TRAFFIC CONDITIONS AT SELECTED MONITORING LOCATIONS

250 - Peak Hour Traffic Volume

- Traffic Signal

- Lane Group

- Stop / Yield Sign

improvements assumed in the evaluation of Year 2025 PLAN Scenario, and assumes the physical and traffic control improvements listed in Table D changes are implemented. The significant changes at the monitoring locations assumed in this round of analysis were:

- relocating Township Line Road's north leg intersecting PA 23 to align with the west leg and closing the eastern intersection's leg, traffic signal control and separate left turn lanes on all approaches were also assumed at intersection #1;
- widening PA 29 to three lanes in each direction from south of the Black Rock Road intersection through the US 422 interchange, and reconfiguring ramps and signalizing intersections throughout the interchange area (addressing locations - #11, #12 & #13);
- realigning PA 113 through the Second Avenue intersection, relocating Dreibelbis Drive from the intersection, and providing separate turn lanes on all approaches to intersection #15, and;
- providing separate left turn lanes along Pothouse Road approaching: Bridge Street / Charlestown Road (location #17), and; PA 29 (intersection #18).

The analyses concluded with ten intersections (of 20 evaluated) experiencing undesirable traffic operations during the peak traffic hour. Compared to the results of the PLAN's analysis, acceptable traffic operating conditions will be restored or provided at four locations as a result of physical improvement at the intersection and/or traffic diversion from the intersection. These included intersections: #1 (PA 23 and Township Line); #7 (PA 23 and Country Club / Ferry); #13 (PA 29 and US 422's westbound ramps), and; #17 (Pothouse and Charlestown / Bridge).

A generalized summary of the Full-Build Scenario's traffic evaluation is listed below.

- Conditions west of the Borough, on PA 23 in East Pikeland (including locations #1 - #3) exhibit improved conditions versus the PLAN Scenario results – as traffic is drawn to the Northern Relief Route.
- Conditions east of the Borough, on PA 23 to Pawlings Road (location #6) worsen as traffic is drawn toward the interchange between Pawlings Road and US 422. East of Pawlings (i.e., locations #7 and #8, and through the Valley Forge Park area), traffic volume reductions occurred along PA 23 which yielded improved traffic operations.
- In the Borough and through Mont Clare (locations #: 9, 10 and 14), projected traffic operations remain largely unchanged versus the Plan Scenario. Diverted traffic is replaced along the route.
- North of the Borough, along PA 29 in and through the US 422 interchange (i.e., locations #11, #12 and #13) traffic operating indicators improved with the capacity enhancements, but congestion is still predicted for most locations.
- South of the Borough, nominal traffic volume reductions and operating improvements at intersections #18, #19 and #20 are forecasted due to traffic diversions to higher order highways.

The set of monitoring intersections were subjected to a final analytical step in the Full-Build Scenario's evaluation. A set of additional localized improvements were identified and applied in the analyses as opportunities to address the remaining substandard locations (see the last set of columns in Table B). As a consequence, four more intersections could be improved to acceptable operating conditions.

The following improvement suggestions and their effects were presented and discussed with the Steering Committee members as candidates for inclusion in the study's recommendations.

- #2 PA 23 & PA 113 (Kimberton Rd): Convert northbound PA 113 approach to incorporate a double right turn lane.
- #10 PA 29 & Egypt / Fegley: Add northbound right turn lane on PA 29.
- #12 PA 29 & US 422 eastbound ramps: Provide double right turn lane on off ramp.
- #20 Whitehorse & Valley Park / Creek: Add southbound left turn lane on Whitehorse Rd. Bridge replacement with lane widening would likely be necessary. Add a northbound through lane on Whitehorse Rd and a westbound right turn lane on Valley Park Rd.

Carrying the improvement identified at intersection #20 (above) northward provided an opportunity to deliver further improvement to intersection #19 in a logical and coordinated fashion – as follows:

- #19 Whitehorse & Pothouse: Consequent with the bridge replacement and widening associated with improving intersection #20 – add a northbound left turn lane on Whitehorse Rd and eastbound left turn lane on Pothouse, and add a southbound through lane on the Whitehorse Rd approach to the intersection.

Further inspection of the monitoring intersections' analyses indicated that particular attention be given to the following additional / alternative improvements in support of the study area's long term conceptual circulation plan.

- #6 PA 23 and Pawlings: Widen the eastbound PA 23 approach to provide a double left turn to facilitate movement toward the assumed partial interchange between US 422 and Pawlings Road (continuous widening along Pawlings Road, between PA 23 and the interchange, was also discussed), and provide a separate right turn lane on the westbound PA 23 approach.
- #11 PA 29 and Black Rock: Consider alternate intersection geometry which attends to heavy turning movements in addition to the through traffic on PA 29 at the intersection. As such, provide: double left turn lanes on the eastbound and southbound approaches, two through lanes and a separate right turn lane on the southbound approach, and three through lanes with separate left turn lane on the northbound approach.

Conclusions: Analyses of Year 2025 Full-Build Scenario

The Full-Build Scenario's travel testing measured the benefit of an additional layer of transportation improvements – a set of projects which are not currently part of the official transportation improvement project development process, but which were considered to be of value to the study area's mobility and of interest to the Study Steering Committee. The Full-Build Scenario assumed that the projects contained in the current TIP (i.e., the Committed Scenario) and the region's long range transportation plan (i.e., the PLAN Scenario) are also implemented, and that the Year 2025 demographics are realized.

The Full-Build Scenario provided a more widely distributed and balanced set of multi-modal travel options than the previously tested scenarios. Added public transportation bus services within the study area (by TMACC and SEPTA) fosters the greatest transit utilization. Enhanced capacity along key corridors (e.g., widening the PA Turnpike, providing a Northern Relief Route and supporting improvements) improves mobility. Accessibility is promoted by adding or upgrading connections between local and regional highway facilities (via new or reconfigured interchanges along US 422 at PA 363, Pawlings Road and PA 29, and; an electronically tolled slip ramp interchange serving all movements between the Pennsylvania Turnpike and PA 29). In turn more optimal travel indicators are predicted.

The Full-Build Scenario improvements continued the improvement of local road travel conditions initiated in the PLAN Scenario's testing. While some municipalities experienced travel increases (East Pikeland, Phoenixville and Upper Providence), travel and fuel consumption in the overall study area declined between the Committed Scenario and the Full-Build Scenario. Vehicle hours of travel and volume-capacity ratios decreased in all municipalities, and speeds increased in all municipalities as a consequence of the additional improvement set. In contrast mobile source pollutant emissions increased (+4%) as a consequence of the Full-Build improvement program versus the PLAN Scenario.

The completed analyses of the monitoring intersections, under Full-Build traffic loadings, indicated that peak hour traffic operations can be ameliorated such that only ten (10) intersections remain at deficient conditions – versus 14 at the conclusion of the PLAN Scenario's analyses, and 13 at the conclusion of the Committed Scenario testing. Further improvements were identified which could reduce the number to six deficient locations.

FINDINGS OF THE TRAVEL DEMAND ANALYSES

The major findings of the "futures" analyses emanating from the study, are listed below.

1. The planning and travel testing process prepared for this study has evaluated the Greater Phoenixville study area in a logical, comprehensive and sequential fashion. As a consequence of the technical work – implementing a multi-modal and widely distributed transportation improvement program will be necessary and should be recommended to offset forecasted increases (+57%) in local highway travel associated with the addition of 30,000 residents and 38,000 jobs by the year 2025.

2. Within the Greater Phoenixville study area the stepped implementation of transportation improvements included in the region's current TIP and Long Range Plan, complemented by other desirable improvements (both regional and local in scale), will divert traffic volume from and/or redistribute traffic within the locally accessible roadway network. In turn, system-wide performance measures, derived through the analyses of the "Full-Build" Scenario, indicate that public transit ridership will be fostered the most, and local highway congestion reduced the most – versus lesser investment plans currently on the books for the study area.

   Similarly, on a micro level, localized traffic operating conditions (assuming the Full-Build Scenario traffic forecasts) are indicated to be the most successful of all the tested alternative futures. Providing an additional and logical set of complementary traffic improvements at the monitoring locations can even yield improvement over existing conditions That is, only six (6) intersections would remain at operationally deficient conditions – versus nine (9) in the current situation.

3. The need is now present, and becomes stronger as the future is examined, to advance transportation control measures and travel demand management strategies as integral elements of the study area's improvement program.

   Implementing park-and-ride lots and ridesharing programs, promoting non-traditional transportation modes (e.g., building multi-use trails for commuting on foot or by bicycle), and cooperating on land use issues and initiatives (e.g., instituting multi-municipal comprehensive planning and zoning ordinances, etc.) are actively being pursued in the study area.

   The Phoenixville Area Intermodal Transportation Study recommends continuing and expanding these programmatic and institutional efforts, and has identified related strategies through its technical and committee work.

CONCLUSION

Through the completion of the travel modeling and traffic assessment exercises it is concluded that the Full-Build Scenario's complement of traditional and non-traditional improvements are the appropriate strategies to pursue to accommodate future growth and travel in the Greater Phoenixville Area. Similarly, the recommendations of the Phoenixville Area Intermodal Transportation Study should consist of a modally balanced and widely distributed set of capital, service and operating transportation projects, augmented with traffic control measures (TCM) and travel demand management (TDM) actions, and coordinated land use decisions.

The processes through which DVRPC staff developed a mobility improvement program to incorporate these attributes, and the steps taken to garner its support by the Study Steering Committee, are described in the next chapter. □

6 RECOMMENDATIONS

The technical analyses concluded that a widely distributed set of multi-modal transportation improvements would be most effective in accommodating the growth and travel needs of the Greater Phoenixville study area. The candidate improvements contain capital, service and operating improvements which directly address current problems and provide for area-wide travel to the Year 2025. Several transportation and land use studies are also identified to provide more detailed information for selected topics. The improvement set represents a significant addition to the supply of transit, traffic and non-traditional transportation (e.g., trails, park-and-ride lots) infrastructure presently included in plans and programs covering the study area.

An additional category of recommendations are also necessary to complement and extend the serviceability of the infrastructure improvements – management measures. These involve programmatic steps and institutional actions which are implemented regionally, locally, publicly and/or privately. They represent strengthening or refining activities which are already commonly performed by the agencies, firms and governments represented on the Study Steering Committee.

EVALUATION CRITERIA AND PUBLIC OUTREACH

To function effectively as an implementation tool to navigate the future, the candidate infrastructure improvements should be jointly supported by the affected / involved governments and agencies. To garner that support, the candidate improvements should be arranged into an improvement plan which advances a correct and affordable set of transportation improvements, in proper sequence, to promote and protect the communities' values.

Through the study's committee work and public outreach process, two important steps were taken to finalize the study recommendations. First, the Steering Committee requested that staff prepare a set of planning goals and objectives to use as a guide while determining the recommendations.

Second, the Steering Committee directed DVRPC staff to conduct an open house and public meeting[13] to seek citizen comments and gage public reaction to the study, and some of its initial findings. DVRPC staff took that meeting as an opportunity to distribute the set of goals and objectives in the form of a questionnaire to the attendees. Figure 23 summarizes the highlights of the public meeting (attendance, comments, etc.). Figure 24 illustrates the expression of values, represented in the returned surveys, relative to the study's planning goals and objectives.

DVRPC staff subsequently arranged the various improvements, emanating from the technical work, into a (draft) staged implementation plan, with cost estimates, for review and consideration by the Study Steering Committee.

Ultimately, copies of the draft improvement plan, citizen comments and values ratings were provided to each Steering Committee member, in a variety of formats, to consider privately, with its boards, and/or its citizenry. Subsequently, the draft improvement plan was reviewed in its entirety before the Study Steering Committee. In this last step projects, priorities and costs were reviewed, adjusted and finalized with the participation of the complete Study Steering Committee. After completing that review, the resultant schedule of projects represents the recommended Mobility Improvement Plan (MIP). It serves as the endorsed, unified and supported implementation Plan for the sub-region.

MOBILITY IMPROVEMENT PLAN (MIP)

Table 8 illustrates the endorsed MIP emanating from the technical and committee work. It generally mirrors the Full-Build Scenario's complement of modeled improvements, expanded to include non-traditional projects and services. The Plan includes 71 improvement elements.

- 50 highway improvement projects
- 5 public transportation service improvement projects
- ridesharing and travel demand management programs, including:
  - funding to continue the work of the TMACC and GVFTMA,
  - funding to develop and construct 5 park-and-ride lots
- 4 multi-use trails in Chester and Montgomery counties which are part of a larger, planned network between Berks and Philadelphia counties, and
- 5 transportation and land use studies.

Figure 25 illustrates the Phoenixville Area Intermodal Transportation Study's recommended set of highway improvements. Figure 26 shows the recommended set of transit and travel demand management strategies, and multi-use trails for the study area. Figure 27 displays the recommended set of transportation and land use studies.

[13] The Open House & Public Meeting was held on the evening of Thursday, September 20, 2001 at Columbia Station, in downtown Phoenixville.

FIGURE 23

PHOENIXVILLE AREA INTERMODAL TRANSPORTATION STUDY

SUMMARY OF SEPTEMBER 20, 2001 OPEN HOUSE & PUBLIC MEETING

❑ **Attendance:** 65 people signed in. Distribution (according to post offices cited on sign-in sheets): Phoenixville - 42; Malvern - 3; Spring City, Trappe, Charlestown, Kimberton, Upper Merion, Chesterbrook, and Paoli -1 each; others - 13.

❑ **Where do you live / work?** (according to push pin locations on aerial photograph):

Municipality	Live	Work
Charlestown	5	0
East Pikeland	2	0
Schuylkill	8	1
Phoenixville	12	8
Upper Providence	0	3
East Whiteland	0	2
Tredyffrin	1	1
Upper Merion	1	1
Spring City	1	0
Trappe	1	1
Total	**31**	**17**

❑ Comments provided on the **"Existing Documented Transportation Deficiencies"** display generally coincided with the information already shown on the graphic.

❑ **Comments and Suggestions:** (varied considerably, few repeats)

Project Related:

- support original Intercounty Spur with interchanges [i.e., at: PA 23 / PA 724]
- not in favor of Northern Relief Route / redesignating PA 113 out of Boro's CBD
- not in favor of bikeways or trails
- coordinate study with other studies in area
- strengthen trail system
- fast track Schuylkill Valley Metro, using existing infrastructure
- what is status of the Intercounty connector
- project #27 and #34 cut through Schuylkill River Natural Area
- layout a realistic time line
- Devault Line [i.e., shuttle] should be examined now, before the Schuylkill Valley Metro
- will Schuylkill Valley Metro have enough parking
- consider rail from Oaks to Collegeville or Schwenksville, by either extending Schuylkill Valley Metro or extending Rt. 100 line if it were built to Port Kennedy
- most important improvements are too far back in the evaluation steps (i.e., PA Tpk. slip ramps, US 422 ramps)
- build a SEPTA R5 station at Frazer
- traffic should be improved inside the Borough before outside changes
- Royersford and Spring City were left out
- slip ramps will only work if in conjunction with road widening
- favors widening of PA 113 and PA 401 with increased transit along those corridors
- foster retention of community character
- change scenario name from "No-Build" to "Committed"

Traffic Operations:

- Egypt Rd. is congested during peak, making it difficult to enter/exit Audubon School
- no more traffic on US 422
- what amount of traffic is coming to Phoenixville; are they using the Borough to go from point A to point B through the Borough

Meeting Conduct:

- information presented was confusing, especially for laymen
- presentation visual was hard to see
- present what you are doing, what changes are being implemented
- well done
- station maps and people explaining details were excellent
- add Questionnaire to web site
- have another meeting at study's conclusion

FIGURE 24

Questionnaire

Your views will help shape the future of the Greater Phoenixville Area. Please take a moment to complete and submit this survey. For each of the following 9 issue areas, please rank the policies in priority order. If a category has 4 action items, assign a "1" to the highest priority and a "4" to the lowest priority.

Summarized Results

(39 questionnaires submitted and tabulated as of 3/20/02)

RANK 1-9

3 PHYSICAL FORM — RANK 1-4

Concentrate mixed-use development within centers and corridors	2
Maintain rural character of portions of the region	1
Provide sufficient public open and recreational space	3
Upgrade or expand public services and infrastructure in appropriate growth areas	4

1 TRAFFIC CONGESTION — RANK 1-3

Provide more non-auto options for commuters	1
Use Transportation Demand Management for planning	3
Optimize efficiency of existing transportation systems	2

2 ENVIRONMENT — RANK 1-4

Encourage safe and efficient waste management and reduction programs	4
Protect, maintain and improve water quality and supply	2
Protect and preserve critical natural resources	1
Use energy efficiently	3

4 AIR QUALITY — RANK 1-3

Facilitate compliance with the Clean Air Act Amendments	2
Encourage alternative transportation modes	1
Encourage the use of Transportation Control Measurers	3

6 ECONOMIC DEVELOPMENT — RANK 1-3

Expand regional market for labor and goods	3
Preserve and promote historical and cultural resources	1
Preserve and promote agricultural land and activities	2

8 FREIGHT MOVEMENT — RANK 1-4

Increase investment in regional freight movement facilities	3
Create opportunities for new freight movement businesses	4
Create efficient intermodal freight facilities	2
Emphasize / support existing freight facilities	1

5 MOBILITY — RANK 1-3

Promote coordination and integration of transportation systems	1
Provide system accessibility for all population groups	2
Ensure safety and security of highway and transit users.	3

7 HOUSING — RANK 1-3

Develop an ample supply of all housing types	2
Improve and maintain quality of housing stock	1
Provide housing affordable to all income groups	3

9 REGIONAL COMMUNICATION/COORDINATION — RANK 1-2

Advocate appropriate owners, operators and funding partners to implement elements of the Plan	1
Reconvene the study Steering Committee to regularly review, amend or update the Plan	2

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TABLE 8
PHOENIXVILLE AREA INTERMODAL TRANSPORTATION STUDY
STUDY AREA MOBILITY IMPROVEMENT PLAN

PROJECT SCHEDULING

PROJECT COST ESTIMATES *
(Order of magnitude costs, typically accounting for Eng and Constr only. 2002 Dollars in 000's)

#	*Improvement Project Description*	*Constr. Durat'n (yrs)*	Current TIP (FY 2001-2004) and/or in construction '01	'02	1st 4 years of PennDOT's next 12 Yr. Prog. (i.e., next TIP: FY 2003-2006) '03	'04	'05	'06	2nd 4 years of PennDOT's next 12 Yr. Prog. '07	'08	'09	'10	3rd 4 years of PennDOT's next 12 Yr. Prog. '11	'12	'13	'14	Completion of Subregion's Long Rang Plan '15	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	1 - 6 years funded	1 - 6 years unfunded	7 - 10 years funded	7 - 10 years unfunded	11 - 14 years funded	11 - 14 years unfunded	15 - 25 years funded	15 - 25 years unfunded	PROJECT SPONSOR(S)***
HIGHWAY IMPROVEMENTS (see Figure 25)																																		
PA 23																																		
2	Valley Park Rd: install traffic signal	1				E, R	C																					$100						S, CC, PDT
3a	Pawlings Rd: install traffic signal	1				E, R	C																					$100						S, CC, PDT
3b	Pawlings Rd: widen for eb double left turn and wb separate right turn lanes	2																	E, R	C	C											$1,650	S, CC, PDT
4	Whitehorse Rd: add separate right turn lanes on PA 23 approaches	1				E, R	C																					$300						S, CC, PDT
5	Starr St: add center left turn lanes on PA 23 approaches	1			E	E, R	C																					$550						P, CC, PDT
6	PA 29 / Main St: add separate right turn lane on PA 23 eb approacl	1			E	E, R	C																					$150						P, CC, PDT
12	Moorehall Dr to PA 252: extend proposed closed-loop traffic signal syster	1												E	E, R	C															$720			S, CC, PDT
14	Mowere Rd to Moorehall Dr: install closed-loop traffic signal systen	2	E	E	E, R	C	C																					$1,681						EP, P, S, CC, PDT
17a	PA 724 to relocated Township Line Rd: provide consistent three lane cross sectio	2						E	E	E, R	C	C																		$540					EP, P, S, CC, PDT
18	PA 724: realign intersection, install and interconnect traffic signa	1							E	E	E, R	C																		$550					EP, CC, PDT
36	Township Line Rd: realign & consolidate at-grade, install and interconnect traffic signa	2			E	E, R	C	C																					$1,500						EP, P, S, CC, PDT
77	Mowere Rd to PA 724: extend proposed closed-loop traffic signal syster	1								E	E, R	C																		$360					EP, CC, PDT
78	Mowere / Rapps Dam: add separate left turn lanes on PA 23 approache	1								E	E, R	C																		$550					EP, CC, PDT
79	Ferry & Pawlings, and Valley Park & Country Club intersections: integrate with PA 23 Closed-Loop Syster	1																				E	E, R	C										$240	S, CC, PDT
																												$1,681	**$2,700**	**$0**	**$2,000**	**$0**	**$720**	**$0**	**$1,890**	**sbttl**
Pothouse Road / Whitehorse Road																																		
7	Whitehorse Rd: add separate left turn lane on Pothouse Rd approacl	1																				E, R	C										$150	S, CC, PDT
74	Whitehorse Rd, through the Pothouse Rd and Valley Park / Creek Rd intersections: add a through lane in each direction on Whitehorse; add a separate right turning lane on Valley Park. (Necessitates replacing bridge over Pickering Creek.)	1															E	E	E, R	C	C											$3,700	S, CC, PDT
8a	Pothouse Rd & PA 29: add center left turn lanes on PA 29 approaches	1											E	E, R	C															$550			S, CC, PDT
8b	Pothouse Rd & PA 29: add center left turn lanes on Pothouse approaches	1												E	E, R	C														$450			S, CC, PDT
9	Pothouse Rd & Bridge St / Charlestown Rd: add center left turn lanes on the Pothouse approache	1												E	E, R	C														$650			P, S, CC, PDT
80	Charlestown / Bridge & Pothouse; Pothouse & Whitehorse, and; Valley Park / Creek & Whitehorse intersections: integrate with PA 23 and PA 29 (Main St) closed-loop systems	2									E	E	E, R	C	C															$480		P, S, CC, PDT
																												$0	**$0**	**$0**	**$0**	**$0**	**$2,130**	**$0**	**$3,850**	**sbttl**
PA 113																																		
11	Second Av & Dreibelbis Dr: realign intersection, relocate Dreibelbis, and signaliz	1									E, R	C																		$1,500					UP, MC, PDT
16	Rapps Dam Rd to Township Line Rd: install closed-loop traffic signal systen	2	E	E	E, R	C	C																					$354						EP, P, S, CC, PDT
51	PA 113 & PA 401, from Rapps Dam Rd, in E Pikeland, & through W Pikeland, Charlestown & E Whiteland to US 202: add auxiliary turn lanes, and signalize key intersections (14 assumed	continuous							>	>	>	>	>	>	>	>	>	>	>	>	>	>								$2,200		$2,200		$3,300	EP, C, WP, EW, CC, PDT
																												$354	**$0**	**$0**	**$3,700**	**$0**	**$2,200**	**$0**	**$3,300**	**sbttl**
Bridge Street																																		
15	Church to Starr: install closed-loop traffic signal system	2	E	E	E, R	C	C																					**$471**						P, CC, PDT
French Creek Parkway																																		
19 & 20	PA 29 (at Starr St) to PA 23 (at Paradise St): construct two lane collector / connector highway on new alignment, and intersection improvemnents at Bridge (PA 29) & Starr	3	E	E	E	R	C	C	C																			**$10,000**	**$6,200**						P, D, CC, PDT
PA Turnpike																																		
53b	Valley Forge to Downingtown interchanges: widen to three lanes in each directio	3				E	E, R	C	C	C																		*****	*****	*****	*****	*****	*****	*****	*****	PTC, CC, MC, PDT
53c	PA 29: provide full movement slip ramp connectior	2		E	E, R	C	C																					$25,000							C, EW, CC, PTC, PDT
																												$25,000	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**sbttl**
US 422																																		
35	Pawlings Rd: construct new partial interchange (ramps to/from the east	1																				E	E, R	C									$6,800	LP, S, MC, CC, PDT
52	Lewis Road to US 202: widen to three lanes in each directior	5															E	E	E	E, R	R	C	C	C	C	C	C	****	*****	*****	*****	*****	*****	*****	*****	MC, PDT
54	PA 363: complete interchange (not mapped	2			E	E	E	E	R	R	C	C																	****	*****	*****	*****	*****	*****	*****	*****	LP, MC, PDT
																												$0	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$6,800**	**sbttl**
Northern Relief Route - supported with access management																																		
85	Strategic NRR Alignment & Conceptual Engineering Study: determine locally preferred alignment and desired / necessary supporting improvements	2			>	>																							$100						EP, P, UP, CC, MC, PDT
17b	Mowere Rd, from PA 23 to Township Line Rd: reconstruct two lane highwa	1													E, R	C															$440			EP, P, CC, PDT
21a	On new alignment, from Township Line Rd to Filmore Rd: construct two lane collector / connector highwa	1													E, R	C															$2,200			EP, P, D, CC, PDT
21b	On new alignment, between new "Northern Relief Route" and proposed French Creek Parkway: construct two lane collector / connector highway	2												E	E, R	C	C														$6,100			P, D, CC, PDT
22	Township Line Rd, from Mowere to proposed "Northern Relief Route": reconstruct two lane highway in association with Northern Relief Route	1													E, R	C															$220			EP, P, CC, PDT
23	Filmore Rd, from proposed "Northern Relief Route" to PA 113 (Freemont St): resurface existing cartway, and reconstruct / extend two lane road to PA 113 in association with the "Northern Relief Route	1													E, R	C															$120			P, D, CC, PDT
24	PA 113 / Filmore Rd (extended) to Second Ave / Dreibelbis Dr: resurface in association with the "Northern Relief Route"	1														E, R	C															$180		P, UP, CC, MC, PDT
27	"Chester - Montgomery County Connector": construct two lane connector roadway & bridge from PA 113, in Phoenixville, to PA 29, in Upper Providence	3											E	E, R	C	C	C														$20,000			P, UP, CC, MC, PDT
28a	PA 29, from proposed "Chester - Montgomery County Connector" to Black Rock Rd: reconstruct & widen to consistent four lane cross section	2												E	E, R	C	C														$2,580			UP, MC, PDT
28b	PA 29, from Black Rock through the US 422 interchange: reconstruct & widen to three lanes in each directior	3													E	E, R	C	C	C													$2,660		UP, MC, PDT
29	PA 29 and US 422 interchange: reconfigure interchange ramps	2											E	E, R	C	C															$15,000			UPT, MC, PDT
																												$0	**$100**	**$0**	**$0**	**$0**	**$46,660**	**$0**	**$2,840**	**sbttl**

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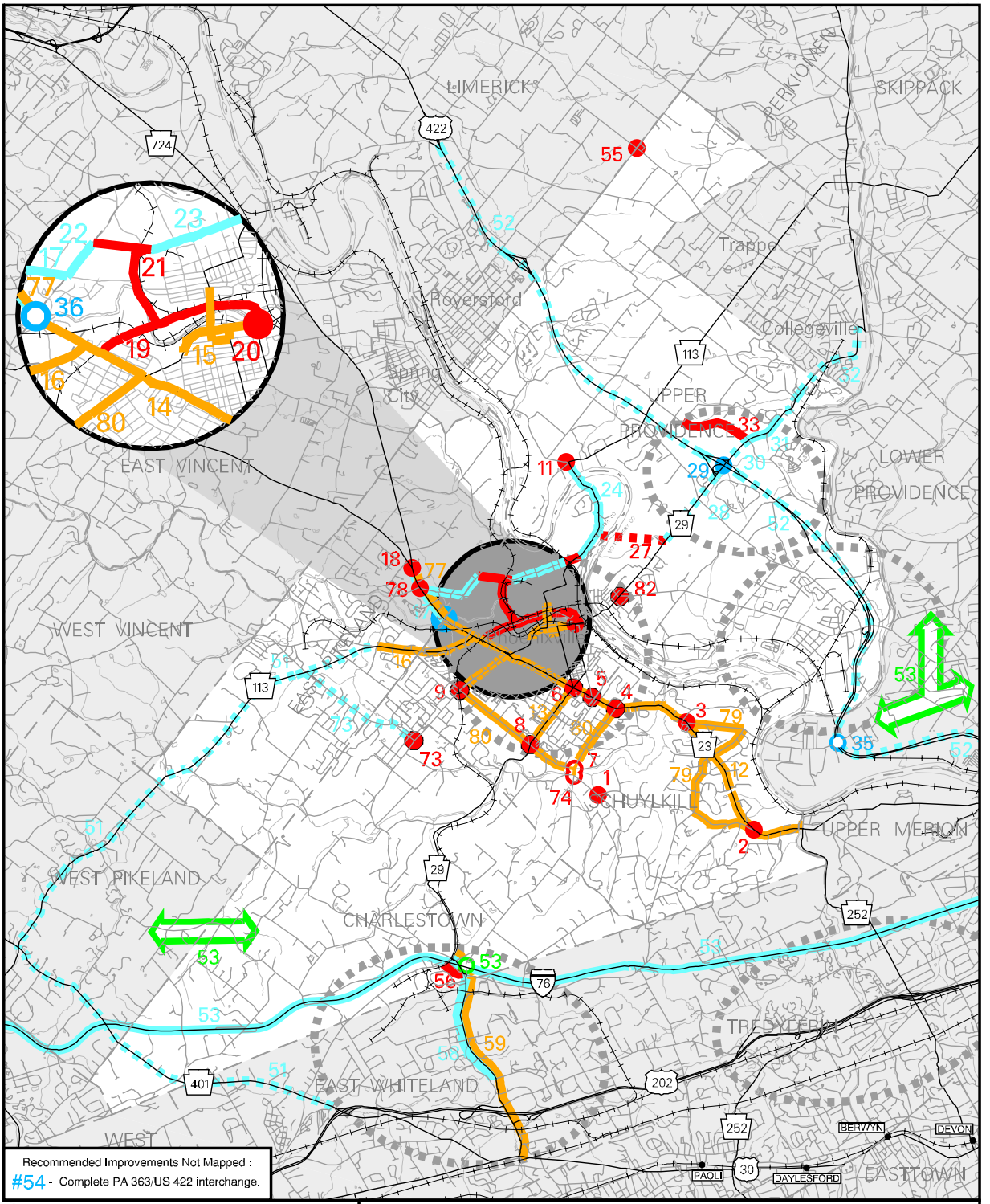
#	*Improvement Project Description*	*Constr. Durat'n (yrs)*	Current TIP (FY 2001-2004) and/or in construction '01	'02	1st 4 years of PennDOT's next 12 Yr. Prog. (i.e., next TIP: FY 2003-2006) '03	'04	'05	'06	2nd 4 years of PennDOT's next 12 Yr. Prog. '07	'08	'09	'10	3rd 4 years of PennDOT's next 12 Yr. Prog. '11	'12	'13	'14	Completion of Subregion's Long Rang Plan '15	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	1 - 6 years funded	1 - 6 years unfunded	7 - 10 years funded	7 - 10 years unfunded	11 - 14 years funded	11 - 14 years unfunded	15 - 25 years funded	15 - 25 years unfunded	PROJECT SPONSOR(S)***
PA 29																																		
13	Main St (PA 29), from PA 23 to Pothouse Rd: extend proposed closed-loop traffic signal systen	1							E, R	C																			$360					
82	Egypt: install traffic signal and separate nb right turn lane	1																E, R	C														$300	
30	Between ramps on the north side of US 422 through Arcola Rd: reconstruct & widen to consistent six lane cross section	1															E	E, R	C														$1,570	
31	PA 29, from Arcola Rd to Mennonite Rd: reconstruct & widen to consistent four lane cross sectior	1	E	E, R	C																						$1,420							
32	PA 29, from Mennonite Rd to Ridge Pk: reconstruct & widen to consistent four lane cross sectior	4															E	E	E, R	R	C	C	C	C									$7,580	
56, 58 & 59	Great Valley Pkwy to Charlestown Rd: widen to provide consistent 5 lane cross section with traffic signals and auxiliary turning lanes at the Charlestown, Whitehorse, & Yellow Springs. Construct Warner Ln extension: construct two lane extension S. of Turnpike from PA 29, at Yellow Springs, to Phoenixville Pk. Install closed-loop signal syster along PA 29, from US 30 to Charlestown Rd	5	E	E, R	E, R	C	C	C	C	C																	$7,399							C, EW, D, CC, PDT
																											$8,819	**$0**	**$0**	**$360**	**$0**	**$0**	**$0**	**$9,450**	**sbttl**
Other Highway Improvements in the Study Area																																		
1	Valley Park & Clothier Springs Rds: realign intersectior	1																E	E, R	C													$500	
33	Arcola Rd extension: construct two lane extension from PA 29 to Mennonite	2							E, R	C	C																		$3,630					
55a & b	Ridge Pk & Township Line Rd: provide double left turn lanes, two through lanes and separate right turn lanes on all approaches, and; upgrade traffic signa	2		E	E	E	R	R	C	C																	$1,400	$3,300						UP, L, MC, PDT
73	Coldstream Rd: re-align and upgrade between PA 113 and Charlestown Rd, add traffic signal at Charlestown R	1									E, R	C																	$1,500					C, EP, CC, PDT
																											$1,400	**$3,300**	**$0**	**$5,130**	**$0**	**$0**	**$0**	**$500**	**sbttl**
																											$47,725	**$12,300**	**$0**	**$11,190**	**$0**	**$51,710**	**$0**	**$28,630**	**Total Highway**
RIDESHARE / TDM IMPROVEMENTS (see Figure 26)																																		
Area-wide Mobility Alternative Programs - Transportation Management Associations annual contracts - prorated for services rendered within the immediate study area																																		
83	TMA of Chester County (TMACC)	ongoing	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	$18		$12		$12		$33		TMA, CC, SPT, PDT
84	Greater Valley Forge TMA (GVFTMA)	ongoing	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	$118		$79		$79		$217		TMA, CC, MC, SPT, PDT
																											$136	**$0**	**$91**	**$0**	**$91**	**$0**	**$250**	**$0**	**sbttl**
Park-and-Ride Lots																																		
38	PA Turnpike & PA 29 slip ramp interchange: construct park-and-ride lot (80 sp	1					E, R	C																				$250						C, EW, D, CC, PTC, PDT, SPT, TMA
39	PA 23 & Starr St intersection (at Acme Market): negotiate / construct shared use park-and-ride lo	1			E, R	C																						$50						P, CC, PDT, SPT, TMA
41	US 422 & PA 29 interchange: construct park-and-ride lot (80 sp)	1					E, R	C																			$250							UP, MC, PDT, SPT, TMA
43	865 So. Main Street (at First United Methodist Church): negotiate / construct shared use park-and-ride lo	1							E, R	C																			$50					P, CC, PDT, SPT, TMA
75	PA 23 & PA 113: construct park-and-ride lot (40 sp)	1											E, R	C																	$150			EP, P, S, CC, PDT, SPT, TMA
																											$250	**$300**	**$0**	**$50**	**$0**	**$150**	**$0**	**$0**	**sbttl**
																											$386	**$300**	**$91**	**$50**	**$91**	**$150**	**$250**	**$0**	**Total Rideshare**
PUBLIC TRANSPORTATION SERVICE IMPROVEMENTS (see Figure 26)																																		
44	"Suburban Links" Bus Route: Collegeville to King of Prussia, via Phoenixville (GVFTMA)	opr'tng	O	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	$347	$694		$694		$694		$1,909	TMA, CC, MC, SPT, PDT
45	New "Phlyer" Bus Route via PA 113: Phoenixville to Exton Square Mall, via Lionville (TMACC)	1		O	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	$320	$640		$640		$640		$1,760	TMA, CC, SPT, PDT
46	Schuylkill Valley MetroRail: Central Phila to Reading, via Norristown & K of P (SEPTA)	3			E	E	E	R	R	C	C	C	O	>	>	>	>	>	>	>	>	>	>	>	>	>	*****	*****	*****	*****	*****	*****	*****	*****	SPT, MC, CC, PDT, TMA
47	Cross County MetroRail: Glenloch to K of P, connecting with the SVM (SEPTA)	4				E	E	E, R	C	C	C	C	O	>	>	>	>	>	>	>	>	>	>	>	>	>	*****	*****	*****	*****	*****	*****	*****	*****	SPT, MC, CC, PDT, TMA
72	New Bus Route: West Chester to Phoenixville, via Glenloch (SEPTA)	1											O	>	>	>	>	>	>	>	>	>	>	>	>	>						$1,500			
																											$667	**$1,334**	**$0**	**$1,334**	**$0**	**$2,834**	**$0**	**$3,669**	**Total Transit**
MULTI-USE TRAIL IMPROVEMENTS (see Figure 26)																																		
63	Schuylkill River Trail extension between Betzwood Park & PA 29	1			E	E	R	C																			$1,113							UP, MC, CC, PDT
64	Schuylkill River Trail extension between PA 29 & Berks County Line	2		E	E	E	E, R	R	C	C																	$2,400			$5,000				P, EP, CC, MC, PDT
65	Schuylkill River Trail along south bank of French Creek	1		E	E	R	C																				$768							P, CC, MC, PDT
66	French Creek Trail along north bank of French Creek	1			E, R	C																					$125							P, CC, MC, PDT
																											$4,406	**$0**	**$0**	**$5,000**	**$0**	**$0**	**$0**	**$0**	**Total Trails**
TRANSPORTATION & LAND USE STUDIES- area-wide, new and continuing - See also item #85. (see Figure 27)																																		
34 & 70	Valley Forge National Historical Park Area-wide Transportation Planning Study: assess extension of PA 252 from PA 23 to Pawlings, via a new roadway alignment & bridge spanning the Schuylkill River, and other alternatives as developec	ongoing		>	>																						$600							VFP, PDT, MC, CC, UM
49 & 50	SVM & CCM Service Enhancement / Expansion Study: Upon successful operation of the Schuylkill Valley and Cross County metrorails, conduct study: 1) examining dedicated service along the SVM & CCM - between Reading & Great Valley, via Port Kennedy, or; 2) providing passenger rail shuttle service along NS' Phoenixville Industrial Track, between the SVM's Phoenixville Station & the Great Valley Corporate Center in E Whitelan	2													>	>																$500		SPT, MC, CC, PDT, TMA
53 & 67	PA Turnpike Slip Ramp Interchange Studies: continue examinations at PA 29 and other regional opportunities	ongoing	>	>	>																						*****							PTC
68 & 69	Phoenixville Area Regional Public Transportation & Partnership Study: conduct integrated transit and land use study. Issues for study include: integrating & expanding public transportation services to best serve area-wide development and proposed SVM stations; advancing transit oriented development surrounding the proposed Perkiomen Junction and Oaks stations, and incorporating public and private service providers, customers and funding stream	2									>	>																	$250			C, EP, P, S, UP, CC, MC, SPT, TMA
																											$600	**$0**	**$0**	**$250**	**$0**	**$500**	**$0**	**$0**	**Total Studies**
MOBILITY IMPROVEMENT PLAN MAINTENANCE - reconvene Steering Committee to review, amend & update MIP																																		
86	Regular Review / Amend MIP - Annually for maintenance, and in the Spring of every odd numbered year to coincide with developing biennial TIP	ongoing	>	●	>	●	>	●	>	●	>	●	>	●	>	●	>	●	>	●	>	●	>	●	>	●								CC, MC
87	Major Study Update - following the decennial Census	as req'd													▲										▲										CC, MC

notes:
* Estimated time to complete. Abbreviations: Engineering and environmental studies (E), Right-of-way acquisition and utility relocation (R), Construction (C), Operate Transit Service (O)
** Project reference #. See figures 25, 26 and 27 for the locations of most of the Mobility Improvement Plan's elements.
*** Abbreviations: C- Charlestown; EP- East Pikeland; P- Phoenixville; S- Schuylkill; UP- Upper Providence; D- Developer/property owner; CC- Chester Co; MC- Montgomery Co; PDT- PennDOT; SPT- SEPTA; TMA- TMA of Chester County & Greater Valley Forge TMA; PTC- PA Turnpike Comm; VFP- Valley Forge Nat'l Hist. Park; LP- Lower Providence; UM- Upper Merion; Co- Collegeville; L- Limerick; WP- West Pikeland; EW- East Whiteland
**** Cost estimates are staged totals, assuming prorated current contract amounts carried forward to the year 2025
***** Regional Improvement - no costs provided

STUDY AREA SUMMARY:

$53,784	**$13,934**	**$91**	**$17,824**	**$91**	**$55,194**	**$250**	**$32,299**	**Total funded / unfunded**
	$67,718		**$17,915**		**$55,285**		**$32,549**	**Total by stage**
							$173,467	**Total program**

PHOENIXVILLE AREA
INTERMODAL TRANSPORTATION STUDY



Recommended Improvements Not Mapped :
#54 - Complete PA 363/US 422 interchange.

1 0 1 2
MILES

DELAWARE VALLEY
REGIONAL PLANNING COMMISSION
JANUARY 2003

FIGURE 25 :

RECOMMENDED HIGHWAY IMPROVEMENTS

- NEW ROADWAY ALIGNMENT
- INTERCHANGE IMPROVEMENT
- PA TURNPIKE SLIP RAMP
- ROADWAY WIDENING / RECONSTRUCTION
- INTERSECTION IMPROVEMENT
- TRAFFIC SIGNAL COORDINATION
- DEVELOPMENT CENTER

Refer to Table 8 for project descriptions

PHOENIXVILLE AREA
INTERMODAL TRANSPORTATION STUDY

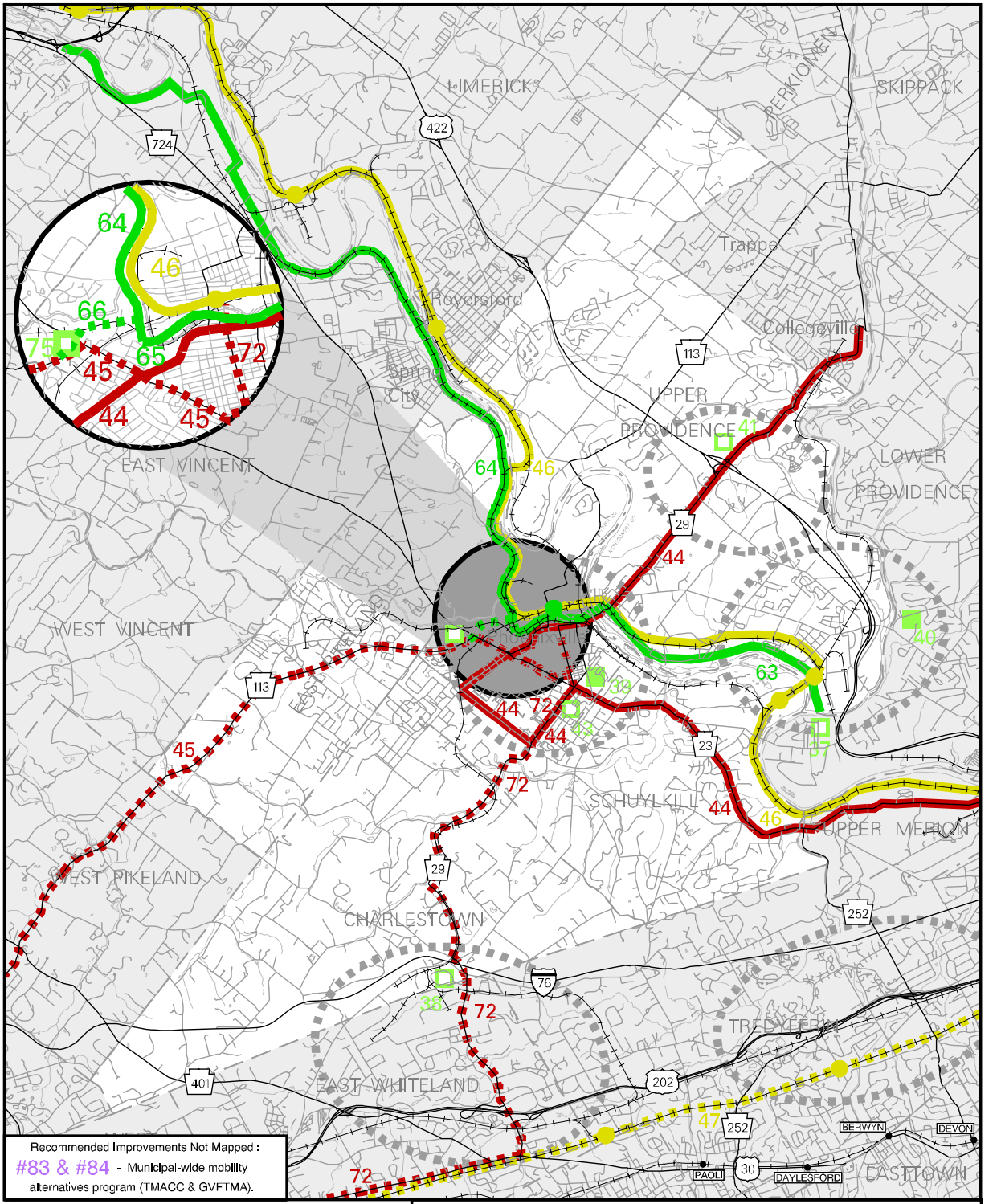
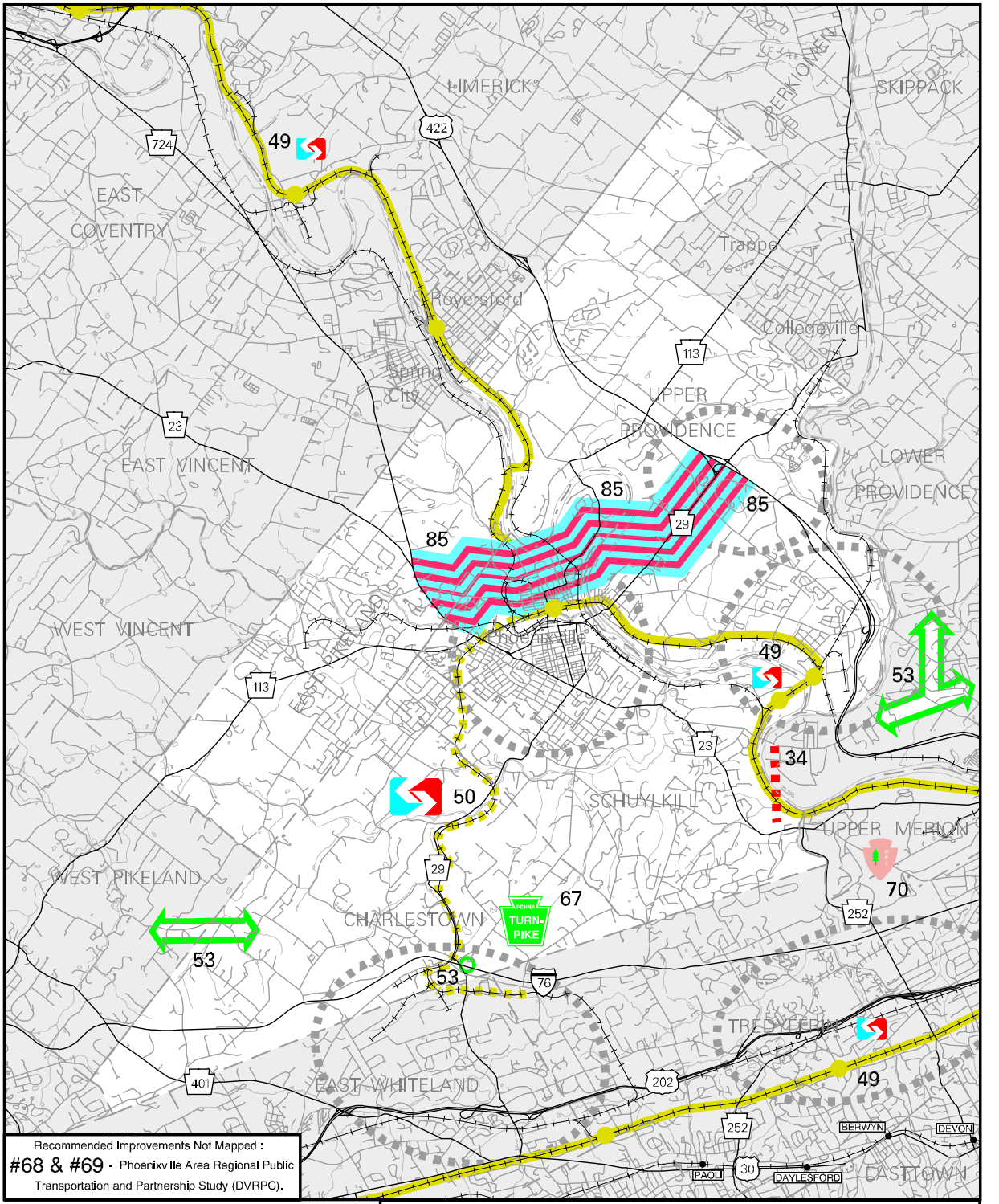


FIGURE 26 :

RECOMMENDED TRANSIT/ TDM/ TRAIL IMPROVEMENTS

DELAWARE VALLEY
REGIONAL PLANNING COMMISSION
JANUARY 2003

PHOENIXVILLE AREA
INTERMODAL TRANSPORTATION STUDY



Recommended Improvements Not Mapped :
#68 & #69 - Phoenixville Area Regional Public Transportation and Partnership Study (DVRPC).

1 0 1 2
MILES

DELAWARE VALLEY
REGIONAL PLANNING COMMISSION
JANUARY 2003

FIGURE 27 :

RECOMMENDED STUDIES

- UPGRADED ROADWAY ALIGNMENT
- NEW ROADWAY ALIGNMENT
- NEW RAIL SERVICE
- PA TURNPIKE SLIP RAMP
- DEVELOPMENT CENTER

Refer to Table 8 for project descriptions

The Plan, as represented by Table 8, lists projects and costs in priority fashion for possible inclusion in the regional Transportation Improvement Program (TIP), Long Range Plan (LRP), and/or for use in seeking alternative sources of financing. The project scheduling portion of Table 8 employs a time line to represent the beginning and duration of the engineering, right-of-way acquisition and construction phases. Order-of-magnitude project costs are shown, which were based upon project data in the TIP, the Twelve Year Program, municipal studies, and/or were estimated from projects of similar scope.

In addition to needs, staging and costs, the MIP identifies funding (programming) status and sponsors. Project sponsors are those entities with primary responsibility for advocating advancement of a project, not necessarily funding it.

In the table, projects have been grouped by improvement type and facility. Staging has been identified – taking need, deliverability, and other factors into account. The staging plan is overlaid by the lifetimes of the major funding "instruments" currently available within the region (i.e., TIP, 12 Year Program, Long Range Plan). Order of magnitude project cost estimates (generally excluding right-of-way) are provided, and are stratified (funded vs. unfunded) in the same time frames as the funding programs. Subtotals, by facility and improvement type, are provided throughout.

The staging of regional level improvements, which were incorporated into the modeling work and which are considered to be beneficial to the study area, are provided in the table without cost estimates. As such, a basis for sequencing related local-regional projects is provided, while the Plan's financial data stays focused on the study area.

In summary, the Plan for the study area totals approximately $173.5 million.

- The short term portion of the Plan (1 to 6 years out) includes projects which are in or are imminent for construction and those phases included in the current TIP for the Pennsylvania portion of the region or proposed for inclusion in the draft regional TIP (covering federal fiscal years 2003 - 2006). It totals $67.7 million (or 39% of the program total).
- The near term portion of the Plan (covering years 7 through 10) includes project stages which can coincide with the second four year portion of PennDOT's upcoming Twelve Year Program update. Near term needs total $17.9 million (or 10% of the total program).
- The mid-range future (11 to 14 years away) corresponds to the final four years of PennDOT's next Twelve Year Program), and will require $55.3 million to implement (32% of the program's total).
- The balance of the Plan (i.e., between 2015 and 2025) coincides with the remaining years of the region's long range plan and will require $32.5 million in improvement funding.

Seventy nine (79) percent of the program's short term needs (years 1 through 6) are "funded" (programmed). Conversely, the needs of the remaining stages (2007 through 2025) are virtually unfunded.

Region-wide Improvements

Regional improvements are, for the most part, located beyond the study area's boundaries. Still, as the modeling work has shown, they will have a significant impact on travel in the Greater Phoenixville study area. By and large, regional improvements fall under the sponsorship of other agencies or municipalities to initiate and implement.

For information purposes, however, those noteworthy projects are described below.

- PA Turnpike (I-76) widening - Widen cross section to provide an additional (third) lane in each direction between the Valley Forge and Downingtown interchanges. Total costs, estimated at $150 million, will be completely bourne by the Pennsylvania Turnpike Commission.
- US 422 widening - Widen the highway to provide three lanes in each direction between US 202 and Lewis Road. Reliable cost estimates of the improvement project are not available.
- US 422 and PA 363 (Trooper Road) - Complete interchange such that ramps serving traffic to and from the west along US 422 are provided. Total project costs are estimated at $25 million.
- Schuylkill Valley Metro (SVM) - Provide rail transit extension from Norristown: westward to Reading along the US 422 corridor. SVM service could cost as much as $1.8 billion to initiate. Final environmental and preliminary engineering studies are funded ($35 million) and are in progress.
- Cross County Metro (CCM) - Provide rail transit extension from Norristown: southward along the US 202 corridor. The previously prepared Major Investment Study and Draft Environmental Impact Statement documents are being updated to address new rolling stock technologies and revised limits of operation (Thorndale / Downingtown, in Chester County to Trenton, NJ), and should be completed by the end of the calendar year 2002. The CCM's costs have been estimated at $1.0 billion.

Further Study Requirements

The need to perform five additional transportation, traffic and land use studies has been identified as a consequence of the evaluations performed in this work, and as such are a part of the Plan.

1) Valley Forge National Historical Park Area-wide Transportation Planning Study - This study was initiated early in 2002. Jointly sponsored by the National Park Service, the Federal Highway Administration and PennDOT, the study's consultant is conducting a detailed examination of travel constraints and opportunities with particular attention paid to effects placed upon the Park's

assets. Deliverables will include multi-modal improvement recommendations which will simultaneously promote the mission of the park, and foster mobility in its environs.

2) SVM & CCM Service Enhancement / Expansion Study - A suggested study, which examines the feasibility and investments required to provide direct passenger rail transit service from the Reading area to the Devault area of Central Chester County. Technical matters to be addressed include ridership, and operating and capital costs.

   Three potential operating plans have been identified through this study:
   a) via a rail shuttle operating along Norfolk Southern's Phoenixville Industrial Track from the Phoenixville Station of the Schuylkill Valley Metro to a station in the Atwater development / Great Valley Corporate Center vicinity
   b) via dedicated service operating between Reading (along Schuylkill Valley Metro's alignment) and Glenloch (along the Cross County Metro's alignment) by means of an improved connection at the Port Kennedy Station
   c) the No-Build alternative.

   This study is suggested to be undertaken after service along the Schuylkill Valley and the Cross County metros is initiated.

3) PA Turnpike Slip Ramp Studies - The opportunities which "smart" technologies bring to transportation are being investigated and pursued by the Turnpike Commission. Initial traffic studies performed at the PA 29 and PA Turnpike crossing have been completed while this study was in progress. Activity is now being directed to completing environmental studies and final design steps related to a full movement electronically tolled – slip ramp – interchange.

   The Turnpike continues to examine the benefits of slip ramps interchanges throughout its system. Demand and preliminary engineering studies are being conducted, at the Turnpike's expense, at/in the vicinity of:
   a) the Northeast Extension (I-476) at: PA 113; Schultz Road and Union Meeting / Township Line Road, and;
   b) the east-west main line (I-276 & I-76) at: Conshohocken Road / Lafayette Street extended, and PA 113 (Vanguard).

4) Phoenixville Area Regional Public Transportation & Partnership Study - Proposes to examine, establish, integrate and refine public transportation routes and services throughout the Greater Phoenixville Area, in light of changing landscapes and proposed stations along the Schuylkill Valley and Cross County metros.

The study should involve operators and users, and municipal, corporate and citizen interests. Transit oriented / joint development opportunities should be explored and developed for the Perkiomen Junction and Oaks stations. Elements in this work could include land use planning and zoning studies, and traffic circulation and [shared] parking analyses – to integrate land use, promote transit ridership and capture value associated with the SVM transit investment. Station level evaluations could also incorporate themes, needs and opportunities presented by the Valley Forge National Historical Park and its area-wide study.

5) Strategic Northern Relief Route Alignment and Conceptual Engineering Study - The Phoenixville Area Intermodal Transportation Study incorporates a general examination of the traffic effects delivered by a highway alignment referred to as the: "Northern Relief Route". The route mimics the concept of the former "Chester-Montgomery County Connector Highway" – providing a bypass of Downtown Phoenixville while linking PA 23 in East Pikeland Township, Chester County, with PA 29 (and ultimately US 422) in Upper Providence Township, Montgomery County.

   The Northern Relief Route was introduced early in the study process. The likely alignment identified for study at the time suggested a two lane circumferential improvement, comprised of upgraded existing streets connected by short roadway extensions, plus a new bridge spanning the Schuylkill River. The modeled alignment included Mowere, Township Line, Fillmore (extensions and existing) and PA 113 as plausible segments on the Chester County side of the river. On the Montgomery County side, the right-of-way of the former connector highway and PA 29, northward to the US 422 interchange, were assumed.

   The benefits provided by the studied alignment indicated that traffic relief would result: along PA 23 through the borough, Schuylkill Township and Valley Forge Park; along the proposed French Creek Parkway, and; along Bridge Street through the borough and Mont Clare. The Northern Relief Route as modeled also provides additional opportunity to distribute traffic oriented to/from the proposed French Creek Center development.

   However, as the technical and committee work for the Phoenixville Area Intermodal Transportation Study were concluding, questions arose from the Steering Committee regarding the feasibility of the modeled alignment, and the likely effects of alternate alignments for the Northern Relief Route – with potentially less community impact. Identified alternatives included the original alignment for the Chester-Montgomery County Connector Highway (i.e., a separate right-of-way), and alternate local street alignments though East Pikeland and the Borough.

> Therefore, the Strategic Northern Relief Route Alignment and Conceptual Engineering Study was added to the Mobility Improvement Program (as item #85) to study, in closer detail, opportunities and constraints presented by the alignment modeled in this effort and some additional alternatives as defined by the affected municipalities. The study should involve the direct participation of each affected municipality along the alignment (East Pikeland, Phoenixville and Upper Providence), and include representatives of the counties and PennDOT – so that an effective and mutually supported solution can be reached and implemented.

SEPTA, or the counties, would most likely initiate the SVM / CCM service expansion study (i.e., item #2 above). SEPTA, the counties or DVRPC could lead the area-wide public transportation study (#4 above). PennDOT, the counties or DVRPC could shepherd the Northern Relief Route alignment study (#5 above). Financing the studies could be obtained through grants and services provided in DVRPC's annual planning work program[14] and/or funding provided through the TIP, among other avenues.

MANAGEMENT MEASURES

Management strategies account for a broad set of actions available to enhance travel throughout the study area. They are deemed important in the Phoenixville area since forecasted conditions are not on par with existing conditions – even following the MIP's substantial improvement investments. Management measures range from simple monitoring actions to improving existing institutional arrangements and programs. Alone, or in combination, they can incrementally affect travel within and beyond the study area.

Certain strategies are integral with growth management and/or are capable of implementation through the land development application, review and approval process. These actions generally fall within the purview of government. Others seek to modify commuting behavior, these tend to center on employers. The effectiveness of travel demand management (TDM) measures increases at locations where supportive land use and urban design characteristics also exist. Therefore, cooperation – even partnering – between the public and private sectors will be necessary to garner full effect of the strategies for improving travel throughout the Greater Phoenixville study area.

Interface between the public and private sectors is provided through the transportation management association (TMA) administered DVRPC Mobility Alternatives Program (MAP). MAP's purpose is to assist employers (in the five-county southeastern Pennsylvania portion of the region) in decreasing the number of single occupant

[14] The Phoenixville Area Intermodal Transportation Study was financed in this manner.

vehicles (SOVs) driven to their work site. In the Phoenixville study area, the Greater Valley Forge TMA and the TMA of Chester County are the key operatives in the improvement program.

Other services being rendered by the TMAs in the study area include: providing bus services, in areas not presently served, to promote access to jobs, and; "brokering" agreements between private property owners for the right to share existing parking lots for commuter use.

It is estimated that diligent attention to and successful partnering in aggressively implementing packages of the TDM strategies can reduce work trips by as much as 15 percent. Peak period travel along key highway segments serving commuters could be reduced by about 10 percent. Corresponding savings in travel time and fuel consumption can also be expected as a result of the measures.

Identification of appropriate roles and responsibilities across the range of management strategies is presented below.

Pennsylvania Department of Transportation (PennDOT)

1) Participate in ongoing meetings and planning dialogue regarding the study area.

2) Participate through DVRPC to prioritize the Phoenixville Area Intermodal Transportation Study recommendations with respect to other statewide and region-wide programs and projects.

3) Assign project managers to advance projects from this study as they become approved in the regional TIP.

4) Continue to implement elements of the Intelligent Transportation System program for freeways in this portion of the region, including closed circuit television cameras and variable message signs along US 422 and US 202.

Southeastern Pennsylvania Transportation Authority (SEPTA)

1) Participate in ongoing meetings and planning dialogue regarding the study area.

2) Evaluate the Phoenixville Area Intermodal Transportation Study's recommendations for transit improvement opportunities and management programs, and incorporate high priority projects into capital and operating programs and budgets.

3) Continue to implement its rail station parking expansion program particularly as it impacts the broader study area (included in SEPTA's current capital program are

proposed parking facilities at the Norristown Transportation Center and the Paoli Transportation Center).

4) Install modern bicycle parking facilities (e.g., modern design racks) at all rail stations and equip all buses with bike racks.

5) Continue to identify new markets and serve study area travel needs which support and/or result from operating the Schuylkill Valley and Cross County metros.

6) Conduct / support the additional planning studies cited in the MIP through the annual planning work program.

Pennsylvania Turnpike Commission

1) Participate in ongoing meetings and planning dialogue regarding the study area.

2) Review the recommendations of this study, and where possible expedite those warranting immediate action (e.g., performing the final design step for the slip ramps linking the Turnpike and PA 29; and, conducting feasibility, environmental and engineering studies examining the widening of the Turnpike between the Valley Forge and the Downingtown interchanges).

3) Pursue its “smart highways” program along its system, within the region and at PA 29 within the study area (including: slip ramp construction, electronic toll collection, highway advisory radio and variable message signs) as a means of reducing congestion at existing toll plazas, and optimizing traffic distribution throughout the study area and the region.

4) Complement slip ramp interchanges with park-and-ride lots where possible.

Delaware Valley Regional Planning Commission (DVRPC)

1) Monitor travel conditions and assess the study area’s efficiency as requested in comparison to the 20 intersection benchmarks contained within this study.

2) Participate in future Steering Committee meetings to maintain the study area Mobility Improvement Plan, and conduct major study updates as required.

3) Work with the counties to prioritize the recommendations and to seek approval for inclusion in the regional TIP and/or Long Range Plan.

4) In cooperation with PennDOT, arrange funding for specific projects and schedule in the TIP.

Chester County and Montgomery County

1) Work with neighboring counties, PennDOT and the Pennsylvania Turnpike Commission to advocate and implement a region-wide park-and-ride lot program. Major thoroughfares cited in this report which should be concentrated on are: US 422, the PA Turnpike, PA 23, PA 113 and PA 29.

2) Work with SEPTA and PennDOT to implement the Schuylkill Valley and Cross County metros and planned intermodal parking expansions within the broad study area, including the Norristown and Paoli transportation centers.

3) Conduct / support the additional planning studies cited in the MIP through the annual planning work program.

4) Advocate for advancement of the improvement projects included on the Mobility Improvement Plan in the region's Transportation Improvement Program (TIP), PennDOT's Twelve Year Improvement Program, and; DVRPC's long range transportation plan (*HORIZONS*, the Year 2025 Plan).

5) Continue to work with the study area municipalities to implement the recommendations of this study.

6) Reconvene the Study Steering Committee, annually, to review and revise the Mobility Improvement Plan to reflect new projects and priorities and/or revisit the entire study following the decennial Census, or at such time as conditions have been substantially altered (see projects #86 and #87 in the Mobility Improvement Plan).

TMA of Chester County (TMACC) and Greater Valley Forge TMA (GVFTMA)

1) Continue coordinated area-wide ridesharing activities and utilize Mobility Alternatives Program (MAP) resources to reach employers and commuters within and between their service areas – to reduce journey-to-work travel within and beyond the study area.

   For example, bus routes operated by the TMAs are continually scrutinized to ensure that optimal services are provided within the study area (e.g., relocating the Phlyer). Also, the TMAs provide coordinated schedules between the routes.

   The Cruise Line Service is one example of a successful partnership between PennDOT and employers to reduce congestion along US 202.

2) Coordinate actions with neighboring TMAs. Radnor Township represents a major destination of work trips associated with residents of the Borough of Phoenixville. Radnor is a member of the Delaware County TMA.

Study Area Municipalities

1) Continue to meet and discuss issues of common concern, including those addressed in this study. Coordinate and communicate with neighboring jurisdictions and county planning commission staff to explore flexible approaches to funding and implementation.

2) Participate actively in the TMAs, ensuring that your needs are known.

3) Make growth management planning (i) and implementation (ii) activities a basic part of the study area's development.

i Growth management planning

a) Promote higher density, mixed-use, pedestrian-friendly development through zoning, and subdivision and land development regulations for large (re)development tracts – particularly in the areas cited "development centers". Such development patterns can reduce site generated trips by as much as 25 percent, and foster transit ridership where it already exists or may be planned to exist.

It should be noted that Chester County's set of study area municipalities, along with East and West Vincent townships and the Borough of Spring City, are cooperating in creating a joint regional planning commission. Under the agreement – provided for in Public Law 483 - Act No. 67, and Public Law 485 - Act No. 68 amending the Pennsylvania Municipalities Planning Code – participating municipalities can work together to create a regional comprehensive plan. Through the regional plan municipalities may share zoning uses (and tax revenues) so that the optimum use of the land and infrastructure may be planned for while simultaneously maintaining quality of life and community values inherent to differing parts of the sub-region.

b) Since work trips are widely scattered in the study area, extensive provision of park-and-ride facilities would be beneficial. Integrate park-and-ride lots into proposed developments to lend more support to public / private transit services in the study area (SEPTA routes 93 & 99, the Phoenixville Phlyer, and Suburban Link service).

Certain uses are amenable to shared use of parking facilities for commuting purposes. Churches, synagogues, parks and movie theaters are land uses

which don't usually generate peak travel or parking demands during normal weekday business hours. The TMACC is pursuing the shared-use of a church parking lot, on Main Street in Phoenixville (see project #43 in the Mobility Improvement Plan). Dedication for the outright use of these lots for park-and-ride purposes during the development application process may also be considered.

Parking lots supporting other uses, even office and retail uses, can avail themselves to shared-use. However, the determination is best made on a case-by-case basis after full occupancy of the buildings. While negotiating with developers prior to development approval is suggested, the staff of the Chester County Planning Commission are negotiating with the existing Acme Markets' grocery store near the PA 23 and Starr Street intersection, in Phoenixville, to dedicate a portion of the existing parking lot for commuter use (see project #39 in the MIP).

c) Require pedestrian and bicycle design elements within land development and subdivision ordinances. The Schuylkill River Trail and the French Creek Trail are examples of regionally interconnected multi-use trails which are being implemented by Chester and Montgomery counties to foster non-motorized travel within and beyond the study area. Proposed land development projects in Phoenixville (French Creek Center) and Mont Clare (Schuylkill Canal Recreational Area) are integrating these trails into their land development plans.

   Advocate bikeways construction, consequent with major roadway improvements, where the planned networks of the counties are involved.

   Plan and implement local systems within and between jurisdictions – to integrate local generators (transportation hubs, development centers and major developments) with the broader county and regional networks. Guidance in this effort is available from staff of the Chester County and Montgomery County planning commissions.

d) Consider transit friendly design features within development review procedures where transit service exists or has the potential to. Items germane to vehicle access (lane width, turning radii, pull-out lanes) and transit user priority (bus stop signs, bus shelters, sidewalks) should be included.

e) Incorporate the findings of the Phoenixville Area Intermodal Transportation Study in the materials applicants should consider as part of their land development application process.

ii Growth management implementation

a) Prioritize / focus improvements where this study indicates they will generate the most benefit as part of a systemic approach to bettering transportation systems throughout Greater Phoenixville.

b) Require auxiliary turning lanes as part of development access designs and at signalized intersections along major thoroughfares to maximize the capacity of the through travel lanes.

c) Implement trip reduction ordinances requiring that alternate modes and/or flexible work arrangements be used to control the amount of trips generated by a development during the peak commuting hours.

d) Limit parking supply provided, by adopting maximum parking space requirements in municipal zoning ordinances, to discourage single occupant vehicle usage.

e) Adopt a Highway Corridor Zoning Overlay District (i.e., access management) – to reduce the number, or control the design and location of driveway access points and signalized intersections – and as such, prolong the serviceability of the highway facility. Improved access management practices yield savings in access related accidents and travel delay. Median barriers have been shown to reduce each by 30 percent.

   Driveway control and on-street parking management should be pursued along new or existing streets comprising the “Northern Relief Route”.

   Access management strategies are also recommended along the study area’s less developed two lane highways (i.e., PA 113 - south of Rapps Dam Road), and should be considered in the design of facilities where widening is envisioned (e.g., PA 29 - north of the Chester-Montgomery connector).

f) Incorporate bicycle friendly design elements (e.g., shoulders or wide curb lanes) into the design of roads and highways where widening or reconstruction is proposed.

g) Install modern bicycle parking facilities in commercial districts and major destinations within the development centers.

Employer / Developer

1) Participate actively in the TMA. TMA administered Mobility Alternatives Program (MAP) and Share-A-Ride services are effective measures in combating traffic congestion and increasing productivity.

   Carpooling at Merck & Co. facilities, in Central Montgomery County, involves 1,000 of its 5,700 total work force (18% participation). Ten percent of Boeing's Ridley Township, Delaware County, facility (6,100 total employees) use alternative commute options. Similarly, the UPS facility at the Philadelphia International Airport sees eight percent of its work force commuting via alternate modes.

2) Decrease the number of single occupant vehicles (SOVs) / increase vehicle occupancies by advancing transit planning and support (i), promoting non-motorized commute options (ii), supporting ridesharing activities (iii), and encouraging alternative commute options (iv) where transit service is not provided.

   i Transit planning

   a) Orient building entrances toward the street with transit service, incorporate shallow setbacks, and place parking "behind" the building to facilitate transit usage.

   b) Work with transit providers to establish new services, route deviations and/or optimized services. UPS has done this to facilitate commuting to its facility near the Philadelphia International Airport.

   c) Purchase TransitCheks to promote transit use. GlaxoSmithKline provides TransitCheks as a benefit to its employees using transit, in lieu of free / subsidized parking.

   d) Provide transit shelters, street lighting, sidewalks and street furniture to encourage transit ridership.

   ii Promoting alternate modes

   a) Provide access treatments for pedestrians and bikes. Merck & Co. sponsors a "Bike to Work" day each Spring, and an in-house cycling club motivates a number of employees to bike to work on a daily basis.

   b) Install bicycle storage facilities.

   iii Ridesharing actions

   a) Provide shuttles to transit stations. Vanguard provides an intercorporate shuttle service in the environs of its headquarters in Malvern.

b) Provide preferential parking for high occupancy vehicles (HOVs). Vanguard also provides preferred parking spaces to its ridesharing employees.

c) Establish in-house or third party vanpool programs. Wampler Foods, Inc. operates a subscription bus service between its site in Franconia, Montgomery County, and Center City Philadelphia.

d) Provide guaranteed ride home service. Merck & Co. practices this strategy so that in emergency situations employees are not stranded at the work place if they do not have a personal vehicle on site.

e) Participate in the Regional Ride Sharing program administered by DVRPC. Join with other regional employers to allow employees to stage carpooling activities.

f) Become an "Adopt-A-Lot" sponsor. Support ridesharing by assuming maintenance responsibilities for public park-and-ride facilities. GlaxoSmithKline supports the park-and-ride concept and provides landscaping services at the Matsonford Road Park-and-Ride Lot in West Conshohocken Borough.

iv Alternate commute options

a) Implement telecommuting, alternate work hours and/or flexible work schedules to reduce peak period trip making. Verizon, Cigna Corporation, First Union Bank and Thomas Jefferson University support telecommute options for their Center City Philadelphia employees.

PLAN REVIEW

A rank-ordered encapsulated review of the overall Plan follows. The review was conducted vis-à-vis the planning goals and objectives developed through the Steering Committee process. Ranking was established through the public outreach work (see Figure 24).

Rank Goal

1 *TRAFFIC CONGESTION* - The Plan, as represented and modeled by the Full-Build complement of improvements, affords the study area with the greatest congestion relief and transit ridership of any of the tested futures. The Plan incorporates current implementation efforts to extend trails, provide coordinated traffic signal systems, and traffic engineering solutions at isolated intersections. Other transportation modes and services are provided throughout the study area to provide more travel options and extend the serviceability of the traditional capital recommendations.

Rank ***Goal***

2 *ENVIRONMENT* - More energy consumption is predicted to satisfy future travel needs per the recommended Plan. Continued development and in-fill redevelopment in the Activity / Development Centers would produce less reliance on vehicular travel, result in shorter trips, and provide more opportunities for preserving land and energy resources.

3 *PHYSICAL FORM* - Plan improvements are concentrated at activity centers. Joint planning arrangements being formulated among the Chester County municipalities should work toward intensifying the density and variety of use(s) within the centers, and maintain lower density elsewhere.

4 *AIR QUALITY* - Air quality is the least favorable performance indicator associated with the recommended Plan. Strengthening density and the variety of land uses within the study area's Development Centers would reduce vehicular travel, and consequently emissions. Regional attainment of air quality standards will, in any case, be required by the Clean Air Act Amendments and TEA-21.

5 *MOBILITY* - Recommendations for bikeways, trails, park-and-ride lots at existing and new interchanges, new passenger rail facilities, expanded bus services, and improved highway facilities are incorporated into the Plan. The mix provides the study area with wider coverage and improved interconnections between modes and facilities. Additional studies are also identified, and included in the Plan, which would delve deeper into other specific challenges.

6 *ECONOMIC DEVELOPMENT* - Access and mobility improvements, and expanded public transportation services, provided through the recommended Plan, will support expanded markets for goods, employment and labor.

7 *HOUSING* - The forecasted levels of population and jobs within Greater Phoenixville portends a substantial increase in demand for housing. The joint municipal planning activities being pursued in the study area should examine the opportunities that revised zoning and building codes can play to serve the need and vary the use within the study area's Development Centers.

8 *FREIGHT MOVEMENT* - The betterment provided to improving the flow of persons and general traffic will be shared by the highway modes carrying goods and products. Evaluations are being conducted to ensure that freight rail operation is not compromised as a consequence of sharing rights-of-way with proposed passenger rail service through the study area.

Rank	***Goal***
9	*REGIONAL COMMUNICATION / COORDINATION* - Stakeholders will be responsible to advocate and implement the Plan. Regularly reconvening the Study Steering Committee to review and refresh the Mobility Improvement Plan is desirable. Major re-work of the Phoenixville Area Intermodal Transportation Study should be considered following periods of significant growth or substantial change to the transportation infrastructure, or at the very least following the release of key data from the decennial Census. Ongoing communication and collaboration between the Steering Committee members in implementing and updating the Plan will strengthen its momentum and enhance its meaningfulness to the funding agencies. □

7 IMPLEMENTATION

The recommendations of the Phoenixville Area Intermodal Transportation Study represent a unified implementation strategy to accommodate long term growth and travel needs of Greater Phoenixville. Plan elements consist of a multi-modal Mobility Improvement Plan (MIP) which recommends specific capital, operating and service improvements, and identifies additional technical studies that need to be undertaken. Management actions are also an important component in navigating the future. Implementation must take place on several fronts.

Technical studies may be undertaken directly with municipal funds, or by petitioning the owner / operators to conduct the work. The Chester and Montgomery county planning commissions can provide assistance either offering technical or financial assistance in conducting the study. The counties are also the appropriate agents to petition DVRPC to conduct the work as part of its annual planning work program, or with funds provided through the Transportation Improvement Program (TIP).

Management actions encompass growth management and travel demand management strategies which can be performed as part of regular governing or business practices. They can be implemented through requirements specified in municipal zoning and subdivision ordinances, and through partnerships between the private and public sectors as exemplified in the DVRPC administered Mobility Alternatives Program – delivered by the TMAs.

Capital financing for implementing improvements can be secured through local tax revenues, bonding, special assessment districts and/or impact fees. Traffic impact fees secured following the requirements of Pennsylvania's Act 209, are one example of the means available to raise the local share in a rational and equitable manner. Establishing a Transportation Development District, provided through Acts 47 and 75, is another. Very often local revenues are applied as a match to secure a larger share of project costs, taking advantage of state and federal-aid highway and transit funding programs in the TIP.

Some implementation guidelines, offered by PennDOT's District Planning and Programming Manager, are particularly relevant to implementing the recommended MIP (regardless of the funding process pursued) and warrant emphasis.

1) Cost efficiencies suggest that – where sensible and possible – individual smaller projects should be consolidated. Project funding and management activities can be undertaken more effectively if projects of a similar scope or geographical proximity are developed simultaneously.

2) Individual phases of the project's development should be undertaken in entirety to expedite the project. PennDOT would rather fund projects which are "ready to move", and not tie up its 12-Year Program with projects and funding that are not clearly defined. As an example, environmental and engineering studies for improvements to US 202 between PA 252 and US 30, were expedited by being funded outside of the normal PennDOT / federal-aid funding process. Once cleared environmentally, the widening project advanced to final design.
3) Project advancement requires participation and "buy-in" of all parties (developers / employers included). Long term benefits and cost efficiencies of the Mobility Improvement Plan must be emphasized versus individual, short term wants / needs.
4) The Mobility Improvement Plan must reflect the Steering Committee's priorities. The fact is "realities" will change over the course of time it will take to implement the Plan. This suggests that the Plan be flexible, and subject to review and revision on an ongoing and regular basis to ensure that implementation needs and support are reflected accurately.

FEDERAL-AID FUNDING GUIDELINES

Because of its complexity and importance, special discussion is made of the federal-aid funding / TIP process. Many of the implementation ingredients, as discussed above, are also found in the TIP process.

The TIP is the culmination of the regional transportation planning process. As a document it includes projects that are consistent with national, state, regional, county and municipal policies, plans and programs. The most relevant federal law which guides the current TIP is the Transportation Equity Act for the 21st Century (TEA-21) of 1998. It is the federal authorization bill for highways and transit.

The recommendations of the Phoenixville Area Intermodal Transportation Study have been reached paying special attention to the planning goals of TEA-21, DVRPC, Chester County, Montgomery County and the five study area municipalities. Furthermore, the study's recommendations (including the Mobility Improvement Plan and supporting management measures) contain five common ingredients with the planning objectives of the TIP, including:

1) supporting economic activity and vitality;
2) improving the accessibility and mobility of people and goods;
3) supporting land use plans and goals;
4) preserving and modernizing key elements of the existing system, and;
5) mitigating congestion.

Of the set of highways identified in the MIP, most are functionally classified at levels which provide for the use of federal highway funds. For example, the Pennsylvania Turnpike[15] and US 422 are National Highway System (NHS) roadways. NHS routes aim to enhance personal mobility, serve commerce, support economic growth, and increase the Nation's competitiveness. Projects on the NHS network are eligible for funding under a special category within the federal-aid program – also called the NHS program.

Other federal-aid funding categories / programs are available to the region, through the Federal Highway Administration and Federal Transit Administration, for implementing the recommended improvements.

In the final analysis, the biennial development of the TIP is a highly competitive and complex process. Project inclusion is a necessary initial step toward implementation where federal-aid funding is sought. Inclusion will depend upon funding availability, priority setting by local governments and regional bodies, and selection by the DVRPC Board of Commissioners. Ultimate fulfilment will require multi-jurisdictional support from both the public and private sectors.

More information about the TIP can be obtained by visiting DVRPC's web site (www.dvrpc.org/transportation/tip.htm). Guidance in the matters of securing federal-aid funding may be obtained by the contacting the Assistant Executive Director for Transportation Planning at DVRPC, transportation planning staff at the Chester County or Montgomery County planning commissions, and the PennDOT District 6-0 Planning and Programming Manager.

CONCLUSIONS: IMPLEMENTATION

Attainment of the plan is already being addressed through the independent initiatives of the study area municipalities and Chester and Montgomery counties. Public and private funding sources are being utilized to advance project engineering, right-of-way acquisition and construction. Continued vigilance will be necessary to procure unfunded capital program amounts. Ongoing communication and collaboration between the Steering Committee members in implementing and updating the plan will strengthen its momentum and enhance its meaningfulness to the funding agencies. □

[15] As a matter of practice the Pennsylvania Turnpike Commission does not typically apply for federal funding assistance to implement its improvements. Instead, it develops its projects with funds raised through revenue bonds.

APPENDICES

APPENDIX A

TRAFFIC VOLUMES AND TRANSIT BOARDINGS

TABLE A1
CURRENT AND SIMULATED YEAR 2025 AVERAGE DAILY TRAFFIC VOLUMES

				Simulated AADTs		
Highway	**Limits**	**Current AADTs**	**Year**	**2025 Committed**	**2025 PLAN**	**2025 Full-Build**
Wartman Rd	East of Twp. Line Rd	1,758	1997	5,600	5,200	5,600
Ridge Pk	Twp. Line to Linfield Trappe Rd	11,876	1997	15,100	14,200	14,300
	Linfield Trappe Rd to 7th	13,373	1998	18,600	18,000	17,800
Mennonite Rd	PA 113 to PA 29	543	2001	1,900	1,700	1,700
Black Rock Rd	PA 113 to PA 29	8,195	2001	12,700	12,300	12,800
	PA 29 to Egypt Rd	5,359	2000	11,600	10,700	9,300
Second Ave	Main St to PA 113	3,632	1998	7,400	7,500	8,000
Chester-Montgomery Connector	*PA 113 to PA 29*					*7,800*
Egypt Rd	PA 29 to Black Rock Rd	8,981	1998	11,200	10,900	12,400
	Black Rock Rd to US 422 wb ramps	20,157	1998	27,000	25,900	29,000
	US 422 wb ramps to New Mill Rd	22,184	1998	30,700	29,300	29,300
Filmore Rd	Twp Line Rd to Franklin Ave	1,857	1999	5,100	4,500	3,900
Northern Relief Route	*Twp Line Rd to new 1*					*7,000*
	new 1 to Filmore Rd					*7,200*
	Filmore Rd to Franklin Ave					*8,700*
	Franklin Ave to PA 113					*6,800*
Mowere Rd	PA 23 to Twp. Line Rd	2,571	2001	4,300	4,400	7,700
	Twp. Line Rd to High St	2,909	2001	5,200	4,900	4,500
High St	Mowere Rd to Gay St	2,187	2001	3,300	3,200	4,000

TABLE A1
CURRENT AND SIMULATED YEAR 2025 AVERAGE DAILY TRAFFIC VOLUMES

				Simulated AADTs		
Highway	**Limits**	**Current AADTs**	**Year**	**2025 Committed**	**2025 PLAN**	**2025 Full-Build**
French Creek Pkwy	*PA 23 to new rd (to High St)*			*13,600*	*13,800*	*12,000*
	new rd (to High St) to new rd (to Bridge St)			*14,900*	*15,400*	*13,500*
French Creek Pkwy (con't)	*new rd (to Bridge St) to Main St*			*11,000*	*10,600*	*8,800*
	Main St to PA 29			*19,800*	*18,900*	*18,100*
PA 724	Pikeland Rd to Hares Hill Rd	15,205	1998	22,000	20,800	21,100
	Hares Hill Rd to PA 23	15,288	2000	20,900	19,500	20,400
PA 23	Mowere Rd to Twp. Line Rd	16,744	2001	23,400	22,700	20,700
	PA 113 to French Creek Pkwy	24,119	1999	34,000	34,500	32,200
	French Creek Pkwy to Bridge St	24,119	1999	26,300	25,600	24,400
	Bridge St to PA 29	12,080	1998	18,400	18,100	17,000
	Starr St to Whitehorse Rd	18,393	1997	27,700	27,000	26,800
	Whitehorse Rd to Pawlings Rd	20,483	1999	29,100	28,200	28,900
	Country Club / Ferry Ln to Valley Pk. Rd	13,744	1997	20,300	18,600	14,600
	Valley Park Rd to PA 252	15,063	2000	22,200	21,200	18,200
Pawlings Rd	PA 23 to Ferry Ln	4,734	1997	8,700	9,100	16,200
	Ferry Ln to Schuylkill River	8,566	2001	14,000	13,100	18,800
Pothouse Rd	Twp Line Rd to Charlestown Rd	9,881	1997	12,500	12,700	11,500
	Charlestown Rd to PA 29	10,029	1999	13,600	14,600	13,500
	PA 29 to Whitehorse Rd	8,152	2001	11,500	10,000	10,000

TABLE A1
CURRENT AND SIMULATED YEAR 2025 AVERAGE DAILY TRAFFIC VOLUMES

				Simulated AADTs		
Highway	**Limits**	**Current AADTs**	**Year**	**2025 Committed**	**2025 PLAN**	**2025 Full-Build**
Valley Park Rd	Whitehorse Rd to Clothier Springs Rd	7,555	2001	10,200	10,800	10,300
	Country Club Rd. to PA 23	4,967	1999	7,900	8,300	7,500
Coldstream Rd	Kimberton Rd to Hares Hill Rd	3,080	2000	5,800	5,600	5,200
	Hares Hill Rd to PA 113	3,626	1999	7,100	6,400	6,700
Kimberton Rd	Coldstream Rd to Hares Hill Rd	4,169	1998	6,500	6,200	6,700
Clothier Springs Rd	Valley Park Rd to Howells Rd	2,723	2001	4,500	4,300	4,200
Howells Rd	Clothier Springs Rd to Rees Rd	776	2001	2,900	2,300	2,800
Pikeland Rd	PA 113 to Merlin Rd	1,102	1999	2,500	2,500	2,400
	Merlin Rd to Charlestown Rd	2,753	1996	5,300	5,100	5,800
Yellow Springs Rd	Valley Hill Rd to Phoenixville Pk	2,951	2001	7,100	7,500	7,600
	PA 29 to Howells Rd	2,681	1996	5,800	4,900	6,600
	Howells Rd To Valley Rd	1,927	1998	4,800	4,400	5,500
Warner Ln Ext.	*Yellow Springs Rd to Phoenixville Pk*				*900*	*1,600*
PA 401	Newcomen Rd to Valley Hill Rd	13,379	1999	19,500	18,600	18,900
	Valley Hill Rd to Phoenixville Pk	13,500	1999	19,200	18,400	18,800
	Phoenixville Pk to US 202	19,000	1999	25,900	24,700	24,300
Walnut Rd	Lewis Rd to US 422	13,573	1998	17,800	17,500	17,400
Township Line Rd	Ridge Ave to Wartman Rd	8,603	1997	14,700	14,300	15,200

TABLE A1
CURRENT AND SIMULATED YEAR 2025 AVERAGE DAILY TRAFFIC VOLUMES

				Simulated AADTs		
Highway	Limits	Current AADTs	Year	2025 Committed	2025 PLAN	2025 Full-Build
PA 113	Pikeland Rd to Hares Hill Rd	14,104	1999	20,300	20,400	20,200
	Coldstream Rd to Kimberton Rd	11,524	2001	17,000	17,800	17,500
	Rapps Dam Rd to Pothouse Rd	15,231	2001	21,300	21,500	21,300
	Twp Line Rd to PA 23	11,909	1998	18,400	18,200	16,900
(Bridge St)	PA 23 to new rd (to Fr. Cr. Pkwy)	10,138	1998	10,200	9,500	8,700
(Bridge St)	new rd (to Fr. Creek Pkwy) to Gay St	10,138	1998	10,900	11,100	10,600
	Chester-Montgomery Connector to Second Ave	5,974	2000	10,500	10,100	11,600
	Second Ave to Black Rock Rd	13,029	1998	18,400	17,100	18,100
	Hopwood Rd to Clayhor Ave	7,814	1998	10,900	10,300	10,300
Hares Hill Rd	Kimberton Rd to PA 23	3,172	1998	5,700	5,100	5,300
	PA 23 to PA 724	2,383	1998	4,200	4,100	3,900
Valley Hill Rd	PA 401 to Yellow Springs Rd	624	1997	3,700	3,300	3,700
Merlin Rd	Yellow Springs Rd to Pikeland Rd	815	1999	4,200	3,900	4,000
Township Line Rd	Pothouse Rd to PA 113	7,087	1999	11,000	10,500	10,300
	PA 113 to PA 23	6,983	1997	9,700	9,000	10,000
	PA 23 to Mowere Rd	3,147	1998	5,100	4,400	6,100
Phoenixville Pk	Yellow Springs Rd to PA 29	4,277	1996	7,400	7,600	7,400
Charlestown Rd	PA 29 to Pikeland Rd	7,856	2000	12,400	11,500	11,900
	Pikeland Rd to Coldstream Rd	6,356	2000	11,000	10,200	9,900

TABLE A1
CURRENT AND SIMULATED YEAR 2025 AVERAGE DAILY TRAFFIC VOLUMES

				Simulated AADTs		
Highway	Limits	Current AADTs	Year	2025 Committed	2025 PLAN	2025 Full-Build
Bridge St	Coldstream Rd to Pothouse Rd	7,043	1998	9,300	8,500	9,000
PA 29	Whitehorse Rd to Charlestown Rd	17,261	2001	26,700	27,800	28,500
	Charlestown Rd to Pothouse Rd	7,928	1999	12,300	14,900	14,100
	Pothouse Rd to PA 23	9,840	1998	15,100	16,800	17,100
	Starr St to Egypt Rd	16,326	1999	26,200	26,400	25,600
	Arcola Rd to Mennonite Rd	18,968	2000	28,500	38,000	34,600
	Clayhor Ave to Ridge Pk	14,604	1997	19,900	21,100	21,100
Bridge St	Gay St to Main St	16,476	1998	16,700	16,700	15,700
Starr St	PA 23 to Manavon St	9,832	2001	14,200	14,200	13,300
Main St.	PA 23 to Bridge St	5,573	2001	6,100	7,900	7,100
Whitehorse Rd	PA 29 to Rees Rd	4,087	1996	7,800	7,000	8,300
	Rees Rd to Valley Park Rd	5,098	1999	9,400	9,000	8,500
Country Club Rd	Clothier Springs Rd to Valley Park Rd	3,950	2001	5,800	4,800	4,800
	Valley Park Rd to PA 23	3,822	1998	5,700	4,500	3,700
Ferry Ln	PA 23 to Pawlings Rd	3,568	1999	5,600	5,100	4,600
PA 252	Yellow Springs Rd to PA 23	6,357	1998	11,700	10,300	11,100

TABLE A2
CURRENT AND SIMULATED YEAR 2025 AVERAGE DAILY TRANSIT BOARDINGS

				Simulated Boardings		
Mode	**Routes**	**Current Boardings**	**Year**	**2025 Committed**	**2025 PLAN**	**2025 Full–Build**
Study Area Surface Routes	SEPTA's Route 93, 98, 99 (1997)	162	1997			
	SEPTA's Route 93, 99,TMACC Phlyer (relocated), GVFTMA Suburban Link, and New SEPTA Route (Phoenixville to West Chester)			435	370	655
SEPTA's Schuylkill Valley Metro*	Phoenixville				1,260	1,260
	Perkiomen Junction				680	680
	Oaks				460	460

* Year 2020 Boardings per SEPTA's MIS for the Schuylkill Valley Metro

APPENDIX B

PLANNING ASSESSMENT
OF
PEAK HOUR TRAFFIC OPERATIONS

TABLE B: PLANNING ASSESSMENT OF PEAK HOUR TRAFFIC OPERATIONS

Monitoring Location		Time Period	Existing Conditions: Traffic Control	Existing Conditions: V/C or Delay	Existing Conditions: Status	Modeled Conditions: 2025 Committed Scenario: Traffic Control	Modeled Conditions: 2025 Committed Scenario: V/C or Delay	Modeled Conditions: 2025 Committed Scenario: Status	Modeled Conditions: 2025 PLAN Scenario: Traffic Control	Modeled Conditions: 2025 PLAN Scenario: V/C or Delay	Modeled Conditions: 2025 PLAN Scenario: Status	Modeled Conditions: 2025 Full-Build Scenario: Traffic Control	Modeled Conditions: 2025 Full-Build Scenario: V/C or Delay	Modeled Conditions: 2025 Full-Build Scenario: Status	Potential additional or alternative localized improvements to serve Final Traffic Volumes: Description	Potential additional or alternative localized improvements to serve Final Traffic Volumes: V/C or Delay	Potential additional or alternative localized improvements to serve Final Traffic Volumes: Status
1. PA 23 & Township Line Rd.	East (a)	PM	stop	12.2 sec.	B	stop	15.4 sec.	C	stop	15.1 sec.	C						
	West (b)	PM	stop	105.9 sec.	F	**signal**	1.00	AT	signal	1.00	AT	signal	1.00	AT		1.00	AT
	Central (c)	PM	stop	28.3 sec.	D	stop	283.2 sec.	F	stop	156.1 sec.	F						
	South (d)	PM	stop	11.3 sec.	B	stop	13.8 sec.	B	stop	13.5 sec.	B						
2. PA 23 & PA 113 / Kimberton Rd.		PM	signal	0.97	AT	signal	1.23	OVER	signal	1.24	OVER	signal	1.15	OVER	dbl right turn lane on nb PA 113	1.00	AT
3. PA 23 & PA113 / Bridge St.		PM	signal	1.34	OVER	signal	1.35	OVER	signal	1.30	OVER	signal	1.24	OVER		1.24	OVER
4. PA 23 & Main St. / Manavon St.	PA 23 & Main St. (a)	PM	signal	0.78	UNDER	signal	0.96	AT	signal	1.00	AT	signal	1.00	AT	right turn lane on eb PA 23	1.00	AT
	PA 23 & Manavon St. (b)	PM	signal	0.76	UNDER	signal	1.00	AT	signal	1.03	AT	signal	1.02	AT		1.02	AT
5. PA 23 & Starr St.		PM	signal	0.64	UNDER	signal	1.00	AT	signal	0.94	NEAR	signal	0.87	NEAR		0.87	NEAR
6. PA 23 & Pawlings Rd.		AM	stop	123.5 sec.	F	**signal**	1.37	OVER	signal	1.29	OVER	signal	1.52	OVER	dbl left turn lane on eb PA 23, widen Pawlings Rd eb departure leg, and right turn lane on wb PA 23	1.11	OVER
7. PA 23 & Country Club Rd. / Ferry Ln.		PM	signal	1.00	AT	signal	1.46	OVER	signal	1.29	OVER	signal	1.04	AT	Add left turn lanes on PA 23	1.03	AT
8. PA 23 & Valley Park Rd.		AM	stop	319.2 sec.	F	**signal**	1.49	OVER	signal	1.45	OVER	signal	1.25	OVER		1.25	OVER
9. Bridge St. / PA 29 & Starr St.		PM	signal	1.20	OVER	signal	1.49	OVER	signal	1.53	OVER	signal	1.54	OVER		1.54	OVER
10. PA 29 & Egypt Rd. / Fegley St.		PM	stop	294.1 sec.	F	**signal**	1.31	OVER	signal	1.31	OVER	signal	1.30	OVER	right turn lane on nb PA 29	1.00	AT
11. PA 29 & Black Rock Rd.		AM	signal	1.16	OVER	signal	1.88	OVER	signal	1.78	OVER	signal	1.38	OVER	Alternative widening concept: eb - dbl left turn lane; sb - dbl left, two through and a right turn lane; nb - left turn lane and three through travel lanes	1.10	OVER
12. PA 29 & US 422 Interchange - EB		AM	stop	683.0 sec.	F	**signal**	1.40	OVER	signal	1.49	OVER	signal	1.22	OVER	dbl right turn lane on eb off-ramp	0.95	AT
13. PA 29 & US 422 Interchange - WB		PM	signal	1.17	OVER	signal	1.64	OVER	signal	1.74	OVER	signal	0.67	UNDER		0.67	UNDER
14. PA 113 / Bridge St. & Gay St.		AM	signal	0.81	UNDER	signal	0.97	AT	signal	0.96	AT	signal	0.91	NEAR		0.91	NEAR
15. PA 113, 2nd Ave. & Dreibelbis Rd.		AM	stop	21.53 sec. (4-way stop)	C	**signal**	1.00	AT	signal	1.00	AT	signal	1.00	AT		1.00	AT
16. PA 113 & Pothouse Rd. / Kimberton Shopping Center		PM	signal	0.84	UNDER	signal	1.00	AT	signal	1.00	AT	signal	1.00	AT		1.00	AT
17. Pothouse Rd. & Bridge St. / Charlestown Rd.		PM	signal	0.99	AT	signal	1.05	AT	signal	1.06	OVER	signal	1.00	AT		1.00	AT
18. PA 29 & Pothouse Rd.		PM	signal	0.93	NEAR	signal	1.57	OVER	signal	1.51	OVER	signal	1.48	OVER		1.48	OVER
19. Pothouse Rd. & Whitehorse Rd.		PM	signal	0.74	UNDER	signal	1.00	AT	signal	0.91	NEAR	signal	0.90	NEAR	left turn lane on Pothouse, sb thru/right lane & nb left turn lane on Whitehorse (requires bridge replacement and construction consequent with location #20)	0.72	UNDER
20. Whitehorse Rd. & Valley Park Rd. / Creek Rd.		PM	signal	1.00	AT	signal	1.42	OVER	signal	1.40	OVER	signal	1.33	OVER	right turn lane on Valley Park, nb thru/right lane & sb left turn lane on Whitehorse (requires bridge replacement and construction consequent with location #19)	1.00	AT
# of DEFICIENT LOCATIONS					9			13			14			10			6

APPENDIX C

MODELED HIGHWAY NETWORK PERFORMANCE MEASURES

TABLE C1
MODELED HIGHWAY NETWORK PERFORMANCE MEASURES - COMPLETE SYSTEM

MCD	Vehicle Miles of Travel	Vehicle Hours of Travel	Avg. Daily Speed (mph)	V/C Ratio	Fuel Consumption (gallons/day)	Mobile Source Emissions (kilograms / day in July)		
						Carbon Monoxide	Non-methane Hydro-carbons	Oxides of Nitrogen
1997 BASE YEAR CONDITION								
Charlestown	262,615	7,747	34	0.46	13,232	1,503	294	474
East Pikeland	111,620	4,401	25	0.42	5,598	892	160	199
Phoenixville	105,610	5,090	21	0.65	5,329	523	95	117
Schuylkill	164,712	6,339	26	0.63	8,269	1,215	229	336
Upper Providence	549,113	13,631	40	0.50	27,819	2,665	518	816
Total Study Area	**1,193,670**	**37,208**	**32**	**0.51**	**60,247**	**6,798**	**1,296**	**1,942**
2025 COMMITTED SCENARIO								
Charlestown	434,389	18,508	23	0.76	21,861	1,815	277	561
East Pikeland	185,232	10,034	18	0.71	9,280	1,104	151	237
Phoenixville	165,813	14,346	12	0.81	8,365	608	81	127
Schuylkill	227,306	20,984	11	0.82	11,405	1,390	200	369
Upper Providence	840,678	27,929	30	0.73	42,571	2,926	441	872
Total Study Area	**1,853,418**	**91,801**	**20**	**0.75**	**93,482**	**7,843**	**1,150**	**2,166**
2025 PLAN SCENARIO								
Charlestown	430,098	17,783	24	0.75	21,653	1,809	274	554
East Pikeland	178,686	8,067	22	0.67	8,955	1,111	148	233
Phoenixville	163,275	13,344	12	0.79	8,237	609	81	127
Schuylkill	222,090	16,444	14	0.77	11,145	1,367	197	367
Upper Providence	875,535	25,612	34	0.57	44,351	2,965	450	905
Total Study Area	**1,869,684**	**81,250**	**23**	**0.65**	**94,341**	**7,861**	**1,150**	**2,186**
2025 FULL-BUILD SCENARIO								
Charlestown	434,036	15,614	28	0.62	21,854	1,816	277	566
East Pikeland	185,980	8,594	22	0.67	9,325	1,115	150	238
Phoenixville	174,631	11,829	15	0.72	8,815	634	86	136
Schuylkill	210,543	14,698	14	0.73	10,567	1,459	214	414
Upper Providence	930,908	25,853	36	0.59	47,158	3,084	471	955
Total Study Area	**1,936,098**	**76,588**	**25**	**0.63**	**97,719**	**8,108**	**1,198**	**2,309**

TABLE C2
MODELED HIGHWAY NETWORK PERFORMANCE MEASURES - "LOCAL" SYSTEM
(Roadway / highway performance data excludes freeway and expressway information. Emissions reflect complete network.)

						Mobile Source Emissions (kilograms / day in July)		
MCD	Vehicle Miles of Travel	Vehicle Hours of Travel	Avg. Daily Speed (mph)	V/C Ratio	Fuel Consumption (gallons/day)	Carbon Monoxide	Non-methane Hydro-carbons	Oxides of Nitrogen
1997 BASE YEAR CONDITION								
Charlestown	129,532	5,275	25	0.48	6,471	1,503	294	474
East Pikeland	111,620	4,401	25	0.42	5,598	892	160	199
Phoenixville	105,610	5,090	21	0.65	5,329	523	95	117
Schuylkill	164,712	6,339	26	0.63	8,269	1,215	229	336
Upper Providence	221,416	7,493	30	0.43	11,172	2,665	518	816
Total Study Area	**732,890**	**28,598**	**26**	**0.50**	**36,839**	**6,798**	**1,296**	**1,942**
2025 COMMITTED SCENARIO								
Charlestown	214,972	14,956	14	0.78	10,715	1,815	277	561
East Pikeland	185,232	10,034	18	0.71	9,280	1,104	151	237
Phoenixville	165,813	14,346	12	0.81	8,365	608	81	127
Schuylkill	227,306	20,984	11	0.82	11,405	1,390	200	369
Upper Providence	359,650	19,007	19	0.63	18,135	2,926	441	872
Total Study Area	**1,152,973**	**79,327**	**15**	**0.73**	**57,900**	**7,843**	**1,150**	**2,166**
2025 PLAN SCENARIO								
Charlestown	213,935	14,318	15	0.77	10,672	1,809	274	554
East Pikeland	178,686	8,067	22	0.67	8,955	1,111	148	233
Phoenixville	163,275	13,344	12	0.79	8,237	609	81	127
Schuylkill	222,090	16,444	14	0.77	11,145	1,367	197	367
Upper Providence	341,910	17,789	19	0.55	17,244	2,965	450	905
Total Study Area	**1,119,896**	**69,962**	**16**	**0.68**	**56,253**	**7,861**	**1,150**	**2,186**
2025 FULL-BUILD SCENARIO								
Charlestown	211,204	12,385	17	0.75	10,534	1,816	277	566
East Pikeland	185,980	8,594	22	0.67	9,325	1,115	150	238
Phoenixville	174,631	11,829	15	0.72	8,815	634	86	136
Schuylkill	210,543	14,698	14	0.73	10,567	1,459	214	414
Upper Providence	367,952	17,477	21	0.54	18,560	3,084	471	955
Total Study Area	**1,150,310**	**64,983**	**18**	**0.65**	**57,801**	**8,108**	**1,198**	**2,309**

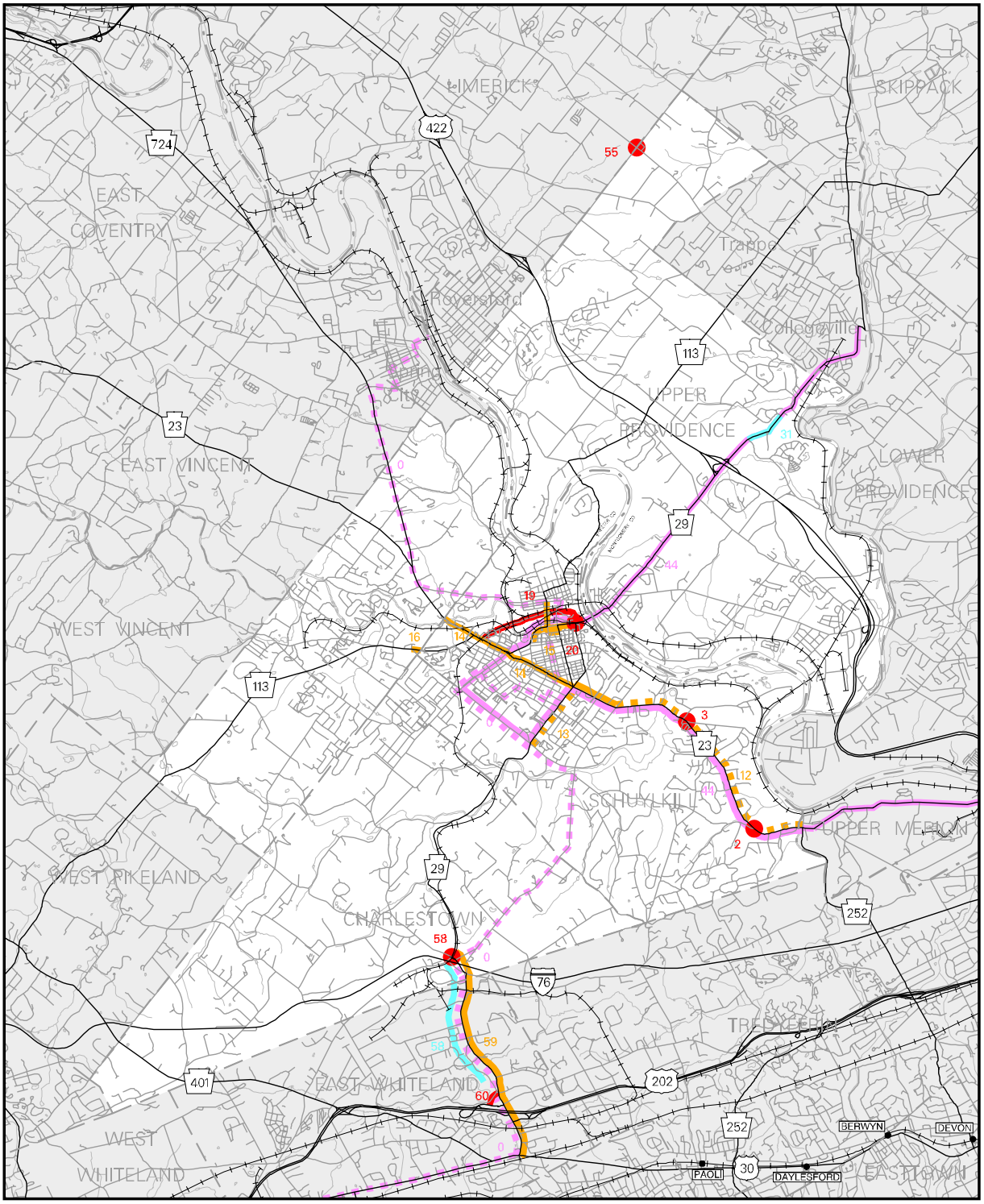
APPENDIX D

MODELED TRANSPORTATION IMPROVEMENTS

ILLUSTRATIONS: FIGURES D1, D2 & D3 (pages 135 - 137)

DESCRIPTIONS: TABLE D (pages 138 - 142)

Scenario I: Committed Improvements



Other Inputs:
Demographics: Year 2025 Population & Employment Estimates

FIGURE D1:
PROPOSED / POTENTIAL IMPROVEMENTS

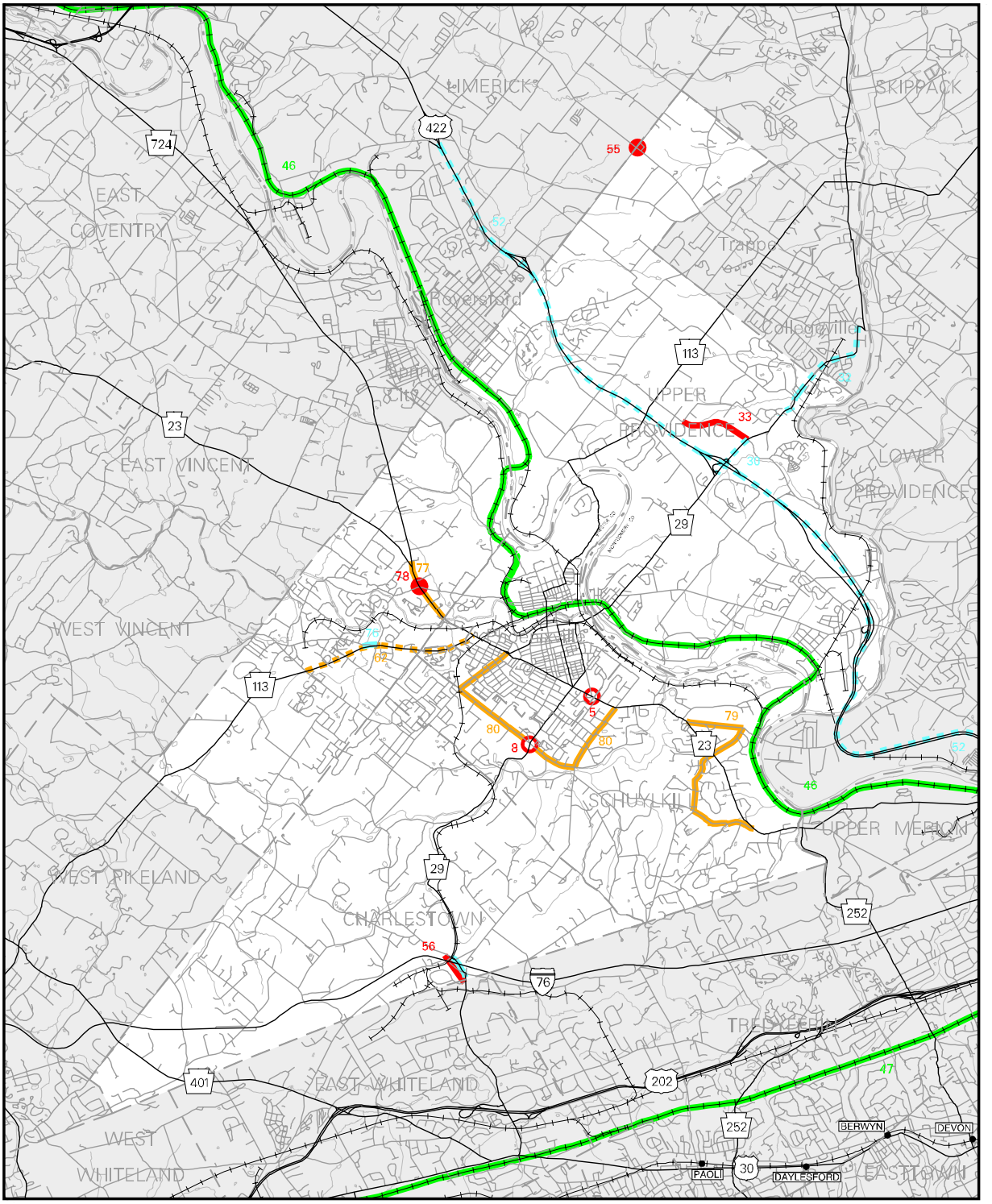
- NEW ROADWAY ALIGNMENT
- INTERCHANGE IMPROVEMENT
- PA TURNPIKE SLIP RAMP
- ROADWAY WIDENING / RECONSTRUCTION
- INTERSECTION IMPROVEMENT
- TRAFFIC SIGNAL COORDINATION
- NEW RAIL SERVICE
- NEW BUS SERVICE

DELAWARE VALLEY
REGIONAL PLANNING COMMISSION
JANUARY 2003

1 0 1 2
MILES

NOTE: Project reference #s are keyed to descriptions in Table D in Appendix D.

Scenario II: PLAN Improvements



Other Inputs:
Demographics: Year 2025 Population & Employment Estimates
Transportation: Scenario I Network & Improvements

DELAWARE VALLEY REGIONAL PLANNING COMMISSION
JANUARY 2003

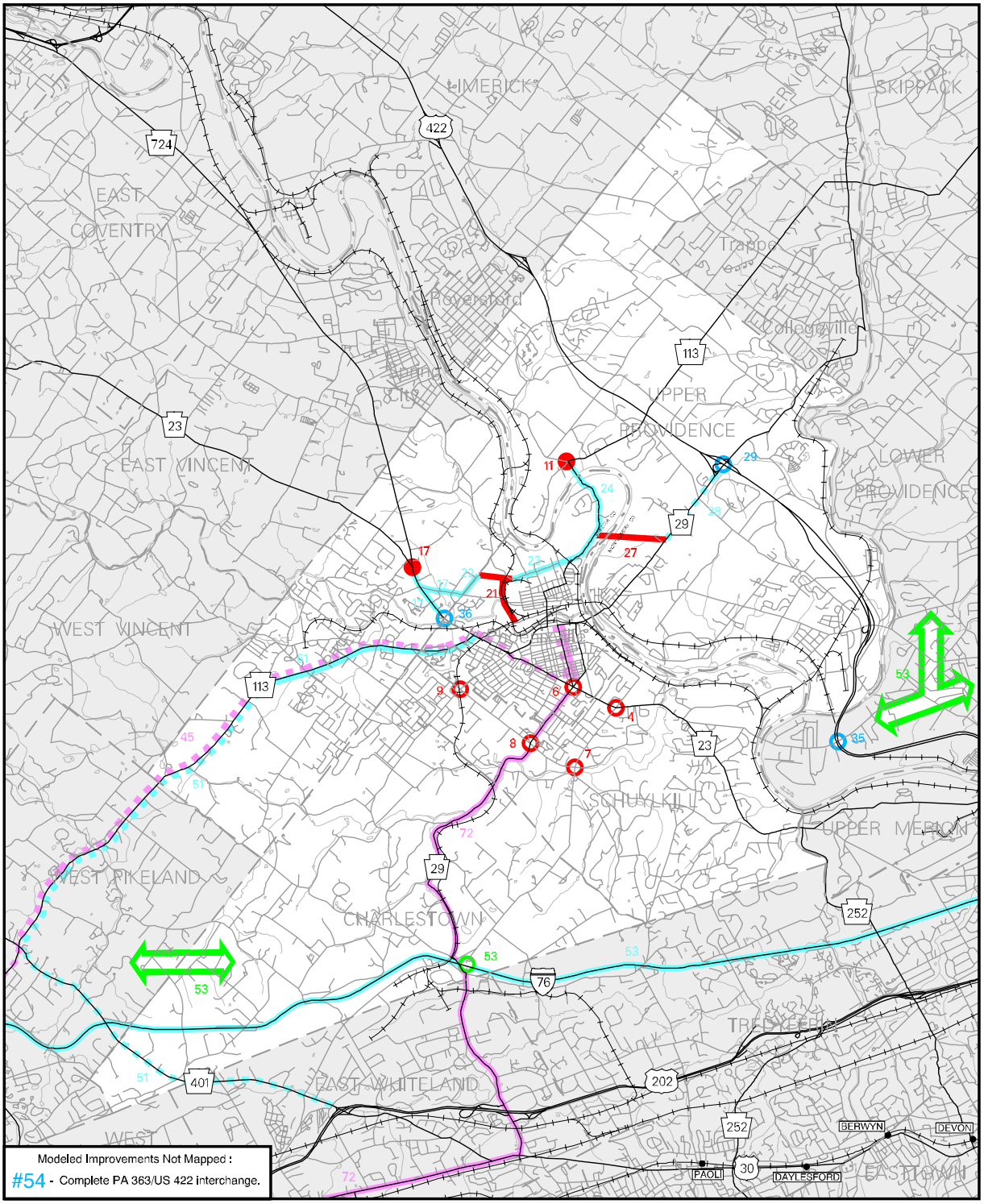
1 0 1 2
MILES

NOTE: Project reference #s are keyed to descriptions in Table D in Appendix D.

FIGURE D2:
PROPOSED / POTENTIAL IMPROVEMENTS

- NEW ROADWAY ALIGNMENT
- INTERCHANGE IMPROVEMENT
- PA TURNPIKE SLIP RAMP
- ROADWAY WIDENING / RECONSTRUCTION
- INTERSECTION IMPROVEMENT
- TRAFFIC SIGNAL COORDINATION
- NEW RAIL SERVICE
- NEW BUS SERVICE

Scenario III: Full-Build Improvements



Other Inputs:
Demographics: Year 2025 Population & Employment Estimates
Transportation: Scenario I and II Network & Improvements

FIGURE D3:
PROPOSED / POTENTIAL IMPROVEMENTS

- NEW ROADWAY ALIGNMENT
- INTERCHANGE IMPROVEMENT
- PA TURNPIKE SLIP RAMP
- ROADWAY WIDENING / RECONSTRUCTION
- INTERSECTION IMPROVEMENT
- TRAFFIC SIGNAL COORDINATION
- NEW RAIL SERVICE
- NEW BUS SERVICE

DELAWARE VALLEY REGIONAL PLANNING COMMISSION
JANUARY 2003

1 0 1 2 MILES

NOTE: Project reference #s are keyed to descriptions in Table D in Appendix D.

TABLE D
TRANSPORTATION IMPROVEMENTS assumed in FUTURES TESTING

Ref #	Improvement Project Description	2025 Scenario I Committed	II PLAN	III Full-Build
1	Valley Park Rd & Clothier Springs Rd intersection: realignment	No factor in simulation		
2	PA 23 & Valley Park Rd intersection: provide traffic signal	●	〉	〉
3	PA 23 & Pawlings Rd intersection: provide traffic signal	●	〉	〉
	Pawlings & PA 23 intersection: widen PA 23 for eb dbl left turn lane, and separate wb right turn lane; Widen Pawlings eb departure leg to accept two turning lanes			
4	PA 23 & White Horse Rd: construct right turn lanes on PA 23's approaches			●
5	PA 23 & Starr St intersection: provide eastbound left turn		●	〉
6	PA 23 & PA 29 / Main St: construct eastbound right turn lane			
7	Pot House Rd & White Horse Rd intersection: provide left turn lanes on Pot House Rd and White Horse Rd (see also #74)			
8	Pot House Rd & PA 29 intersection: provide left turn lanes on PA 29 approaches		●	〉
	Pot House Rd & PA 29 intersection: provide left turn lanes on Pot House Rd approaches			●
9	Pot House Rd & Bridge St / Charlestown Rd intersection: provide left turn lanes on Pot House Rd			●
~~10~~	~~Pot House Rd & Township Line Rd intersection: provide left turn lanes on Pot House Rd~~	Dropped		
11	PA 113, Second Ave, & Dreibelbis Dr intersection: realign intersection to remove Dreibelbis Dr and convert Second Ave to minor leg of intersection			●
12	PA 23, from White Horse Rd to PA 252: extend proposed closed-loop traffic signal system (see also #14)	●	〉	〉
13	Main St (PA 29), from PA 23 to Pot House Rd: extend proposed closed-loop traffic signal system (see also #14)	●	〉	〉
14	PA 23, from Kimberton Shopping Center to White Horse Rd: install closed-loop traffic signal system	●	〉	〉
15	Bridge St, Gay St, Main St, & Church St: install closed-loop traffic signal system	●	〉	〉
16	PA 113, from Pot House Rd to Township Line Rd: install closed-loop traffic signal system	●	〉	〉

✱ Regional facility included in travel modeling network — to conduct planning assessment of local road conditions.

NOTES: Strikeouts indicate projects (or elements thereof) which were deleted from consideration as part of the Study Steering Committee process.

TABLE D
TRANSPORTATION IMPROVEMENTS assumed in FUTURES TESTING

Ref #	Improvement Project Description	2025 Scenario I Committed	2025 Scenario II PLAN	2025 Scenario III Full-Build
17	~~PA 23, from Bridge St to Mowere Rd, and potentially to PA 724: widen to provide consistent four lane cross section~~	Dropped & Replaced		
rev	PA 23, from PA 724 to relocated Township Line Rd. provide consistent three lane cross section			●
rev	Upgrade Mowere Rd from PA 23 to Township Line Rd.			●
18	PA 23 & PA 724 intersection: intersection realignment	No factor in simulation		
19	French Creek Parkway: construct two lane collector / connector highway between PA 29 (at Starr St) and PA 23 (at Paradise St)	●	〉	〉
20	Bridge St (PA 29) & Starr St: construct intersection improvements associated with the French Creek Parkway and French Creek Center Development	●	〉	〉
21	"Northern Relief Route": construct two lane collector / connector highway between Township Line Rd and Filmore Rd			●
	"Northern Relief Route" / French Creek Parkway connection: construct two lane collector / connector highway between Northern Relief Route, at Filmore Rd, and (proposed) French Creek Pkwy			●
22	~~Township Line Rd, from PA 113 to "Northern Relief Route": reconstruct two lane highway in association with the "Northern Relief Route"~~	Dropped & Replaced		
rev	Township Line Rd, from Mowere to "Northern Relief Route" reconstruct two lane highway in association with Northern Relief route (see also #17 and #21)			●
23	Filmore Rd, from "Northern Relief Route" to PA 113 (Freemont St): reconstruct and extend two lane road to PA 113 in association with the "Northern Relief Route"			●
24	PA 113, from Filmore Rd (extended) to Second Ave / Dreibelbis Dr: reconstruct two lane highway in association with the "Northern Relief Route"			●
~~25~~	~~PA 113, from Second Ave / Dreibelbis Dr to US 422: reconstruct / potentially widen in association with the "Northern Relief Route"~~	Dropped		
~~26~~	~~US 422 at PA 113: construct new interchange (also see #42)~~	Dropped		
27	"Chester - Montgomery County Connector": construct two lane connector roadway and bridge from PA 113 to PA 29 in Upper Providence			●
28	PA 29, from (proposed) "Chester - Montgomery County Connector" to Black Rock Rd: reconstruct and widen to consistent four lane cross section			●
	PA 29, from Black Rock Rd through the US 422 interchange reconstruct and widen to three lanes in each direction (consider alternate intersection geometry at Black Rock which facilitates left turns)			●
29	US 422 & PA 29 interchange: reconfigure interchange ramps			✱
30	PA 29, from ramps on the north side of US 422 through Arcola Rd: reconstruct and widen to consistent six lane cross section		●	〉
31	PA 29, from Arcola Rd to Mennonite Rd: reconstruct and widen to consistent four lane cross section	●	〉	〉

✱ Regional facility included in travel modeling network — to conduct planning assessment of local road conditions.

NOTES: Strikeouts indicate projects (or elements thereof) which were deleted from consideration as part of the Study Steering Committee process.

TABLE D
TRANSPORTATION IMPROVEMENTS assumed in FUTURES TESTING

Ref #	Improvement Project Description	2025 Scenario I Committed	2025 Scenario II PLAN	2025 Scenario III Full-Build
32	PA 29, from Mennonite Rd to Ridge Pk: reconstruct and widen to consistent four lane cross section		●	〉
33	Arcola Rd extension: construct two lane extension of Arcola Rd from PA 29 to Mennonite Rd, west of PA 29		●	〉
34	PA 252 extension: construct two lane roadway and bridge from just west of the PA 252 / PA 23 intersection across Schuylkill River to Pawlings Rd	To be addressed in VFNHP Study, see improvement project #70		
35	US 422 at Pawlings Rd: construct new partial interchange, offering ramps to & from the East			✱
36	~~Grade separate PA 23 & Township Line Rd in association with the "Northern Relief Route"~~	Dropped & Replaced		
rev	Realign and consolidate PA 23 & Township Line Rd. intersection at-grade			●
37	US 422 & Pawlings Rd (potential) interchange: construct park-and-ride lot	**NOTE: project is constructed**		
38	PA Turnpike & PA 29 interchange: construct park-and-ride lot	No factor in simulation		
39	PA 23 & Starr St intersection: construct park-and-ride lot at Acme Market	No factor in simulation		
40	US 422 & Egypt Rd interchange: construct park-and-ride lot along north side of New Mill Rd	**NOTE: project is constructed**		
41	US 422 & PA 29 interchange: construct park-and-ride lot	No factor in simulation		
~~42~~	~~US 422 & PA 113 (potential) interchange: construct park-and-ride lot (see also #26)~~	Dropped		
43	865 So. Main Street at First United Methodist Church of Phoenixville (potential): share parking lot for commuter park-and-ride use (TMACC)	No factor in simulation		
0	TMACC's current Phlyer bus service and SEPTA's current bus routes in the study area {see also #45 & #72}	●	〉	
44	Proposed "Suburban Links" bus service between Collegeville and King of Prussia via Phoenixville (GVFTMA)	●	〉	〉
45	Potential "113" bus service between Phoenixville and Exton Square Mall via Lionville (i.e., relocated TMACC Phlyer)			●
46	Schuylkill Valley Metro: commuter rail service between Center City Philadelphia and Reading via Norristown and King of Prussia (SEPTA)		✱	〉
47	Cross County Metro: commuter rail service between Glenloch and King of Prussia, connecting with the Schuylkill Valley Metro (SEPTA)		✱	〉
48	"Western Relief Route": construct a new / upgrade existing highways as traffic relief route (located west of the study area)	Addressed in study area via improvement project #s: (49 & 50); (21, 22, 26, 36 & 51); (52 & 53)		

✱ Regional facility included in travel modeling network — to conduct planning assessment of local road conditions.

NOTES: Strikeouts indicate projects (or elements thereof) which were deleted from consideration as part of the Study Steering Committee process.

TABLE D
TRANSPORTATION IMPROVEMENTS assumed in FUTURES TESTING

Ref #	Improvement Project Description	2025 Scenario I Committed	II PLAN	III Full-Build
49	Provide dedicated service for selected trips along the Schuylkill Valley and Cross County metros between Reading and Great Valley (as a transit alternative to proj. #48)	Suggested as a separate study after completion and operation of the SVM		
50	New passenger rail service: initiate passenger rail shuttle service operating along Norfolk Southern's Phoenixville Industrial Track, from proposed Schuylkill Valley Metro Phoenixville Station to Devault development (an alternate option to direct rail service between Reading and Glenloch via the Schuylkill Valley and Cross County Metros – as a transit alternative to proj. #48)			
51	Provide auxiliary (left or right) turn lanes at key (signalized) intersections along PA 113 and PA 401 - from Rapps Dam Road in East Pikeland and through West Pikeland, Charlestown and East Whiteland to US 202. {In effect serving as the defined study area "Western Relief Route" (see proj. #48) in association with proj. #s 26, 21, 22 and 36.}			●
52	Widen US 422 from Lewis Road interchange to US 202. Taking advantage of the improvements being provided along US 202 from South Gulph Rd to the Exton Bypass (i.e., Sections 400 and 300) to serve as a project area "run-around route" to the east and south (in addn to Project #48).		*	〉
53	Widen the PA Turnpike to three lanes in each direction between the I-476 and the Lansdale interchanges, and between the I-476 and Valley Forge interchanges		*	〉
	Widen the PA Turnpike to three lanes in each direction between the Valley Forge and Downingtown interchanges			*
	Provide slip ramp connections along the Northeast Extension (e.g., in the vicinity of PA 113, Schultz Rd and Township Line Rd) and along the east-west main line (e.g., at Lafayette St in Norristown, at PA 29 in Charlestown {Full} and at PA 113 in Uwchlan {Partial}) to provide expressway alternative to local road (PA 29 and PA 113) bridge crossings through the Borough of Phoenixville.			*
54	Provide US 422 eastbound-off and westbound-on ramps at PA 363			*
55	Ridge Pk & Township Line Rd: provide left turn lanes on all approaches and upgrade traffic signal	●	〉	〉
	Construct more extensive intersection improvement per Recs of Twp Line Corridor Study		●	〉
56	Warner Ln extension: construct extension of Warner Ln between PA 29 (at Yellow Springs Rd) and Phoenixville Pk (south of PA Turnpike)		●	〉
~~57~~	~~PA 29 & Charlestown Rd: add left turn lanes on all approaches~~	Replaced with improvement #58		
58	PA 29, from Great Valley Pkwy to Charlestown Rd: widen to provide consistent 5 lane cross section and provide traffic signals and auxiliary turning lanes at the Charlestown Rd, White Horse Rd, and Yellow Springs Rd intersections	●	〉	〉
59	PA 29, from US 30 to Charlestown Rd: install closed loop traffic signal system	●	〉	〉
60	Liberty Blvd extension: construct extension of Liberty Blvd from PA 29 to Swedesford Rd	●	〉	〉
61	PA 113, from Hares Hill Rd to PA 23: reconstruct to provide center left turn lane {i.e., part of #51}			●

* Regional facility included in travel modeling network — to conduct planning assessment of local road conditions.
NOTES: Strikeouts indicate projects (or elements thereof) which were deleted from consideration as part of the Study Steering Committee process.

TABLE D
TRANSPORTATION IMPROVEMENTS assumed in FUTURES TESTING

Ref #	Improvement Project Description	2025 Scenario		
		I Committed	II PLAN	III Full-Build
62	PA 113, from Coldstream Rd to PA 23: extend proposed closed-loop traffic signal system (see #14 & #16)		●	〉
63	Construct Schuylkill River Trail extension between Betzwood Park and PA 29	No factor in simulation		
64	Construct Schuylkill River Trail extension between PA 29 and Berks County Line	No factor in simulation		
65	Construct Schuylkill River Trail along south bank of French Creek	No factor in simulation		
66	Construct French Creek Trail along north bank of French Creek	No factor in simulation		
67	PA Turnpike (I-76) at PA 29: conduct study of slip ramp interchange	By others, coordinate		*
68	Upper Providence Twp: conduct study of SEPTA bus routes	By others, coordinate		
69	Schuylkill Valley Metro Perkiomen Junction Station: conduct study of transit oriented development surrounding the proposed SEPTA station	By others, coordinate		
70	Valley Forge National Historical Park environs: conduct area-wide transportation planning study	By others, coordinate		
~~71~~	~~Hares Hill Road upgrade between PA 113 and Cold Stream Rd~~	Dropped		
72	New Bus Service - West Chester - Glenloch - Phoenixville (note: replaces, realigns and extends TMACC's Phlyer service)			●
73	Cold Stream Road upgrade between PA 113 and Charlestown Rd, including signal at Charlestown			
74	Valley Park / Creek Rds & White Horse Rd intersection: provide left turn lanes on White Horse Rd (necessitates replacing bridge over Pickering Creek, also see #7)			
75	PA 23 & PA 113: construct park-and-ride lot	No factor in simulation		
76	PA 113 & Rapps Dam Rd, and PA 113 & Kimberton Rd intersections - install traffic signals, coordinate and provide left turn lanes (see also proj. #s 16, 61 & 62)		●	〉
77	PA 23, west of Kimberton Shopping Center: extend proposed closed-loop traffic signal system to PA 724 (also see #14)		●	〉
78	PA 23 & Mowere / Rapps Dam intersection: provide separate left turn lanes on PA 23 approaches		●	〉
79	Integrate Ferry & Pawlings, and Valley Park & Country Club intersections with PA 23 Closed-Loop System project (also see #12)		●	〉
80	Integrate Charlestown/Bridge & Pothouse, Pothouse & Whitehorse, and Valley Park/Creek & Whitehorse intersections with PA 23 and PA 29 Closed-Loop System projects (also see #12 & #13)		●	〉
~~81~~	~~Widen Pawlings Road from PA 23 to US 422 (potential) interchange (or just local widening - see#3)~~	Dropped		
82	PA 29 & Egypt Rd: provide traffic signal and construct separate nb right turn lane			

* Regional facility included in travel modeling network — to conduct planning assessment of local road conditions.

NOTES: Strikeouts indicate projects (or elements thereof) which were deleted from consideration as part of the Study Steering Committee process.

APPENDIX E

STUDY STEERING COMMITTEE MEMBERSHIP

PHOENIXVILLE AREA INTERMODAL TRANSPORTATION STUDY STEERING COMMITTEE MEMBERS

LOUIS J. AMICI, COUNCIL MEMBER, Phoenixville Borough

ANTHONY DiGIROLOMO, Council Member, Phoenixville Borough

JOHN A. MESSINA, Council Member, Phoenixville Borough

CHARLES BERGER, Member, Phoenixville Borough Planning Commission

BILL SHERIDAN, Manager, Phoenixville Borough

DON EDWARDS, Director of Public Works, Phoenixville Borough

JEFFREY L'AMOREAUX, Vice President, Carroll Engineering Corp.

KENNETH YERGER, Vice President, Carroll Engineering Corp.

HUGH WILLIG, SUPERVISOR, Charlestown Township

KEVIN KUHN, SUPERVISOR, Charlestown Township

MICHAEL J. RODGERS, Supervisor, Charlestown Township

LINDA CSETE, Secretary, Charlestown Township

TIMOTHY CAHILL, Supervisor, East Pikeland Township

KIMBERLY B. MORETTI, Manager, East Pikeland Township

LEE LEDBETTER, Supervisor, Schuylkill Township

NORMAN VUTZ, Supervisor, Schuylkill Township

HERMAN JOHN, Advisor, Schuylkill Township

MARY R. BIRD, Secretary, Schuylkill Township

JOHN SARTOR, Vice President, Gilmore Associates

ERIC KAUFMAN, Project Engineer, Gilmore Associates

HOWARD P. HUBER, Supervisor, Upper Providence Township

GEORGE WATERMAN, Manager, Upper Providence Township

FRANK A. ZABAWSKI, Principal, FAZ Associates

KAREN MARTYNICK, Commissioner, Chester County

COLIN A. HANNA, Commissioner, Chester County

ANDREW DINNIMAN, Commissioner, Chester County

PHOENIXVILLE AREA INTERMODAL TRANSPORTATION STUDY STEERING COMMITTEE MEMBERS (continued)

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DELAWARE VALLEY REGIONAL PLANNING COMMISSION

Publication Abstract

Title:	**Phoenixville Area Intermodal Transportation Study**	**Date Published:**	January 2003
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Geographic Area Covered: the Greater Phoenixville Area – including the Borough of Phoenixville, and Charlestown, East Pikeland and Schuylkill townships in Chester County, Pennsylvania, and Upper Providence Township in Montgomery County, Pennsylvania

Key Words: development centers, intermodalism, journey-to-work, mobility alternatives, regional travel demand forecasting, capital improvement plan, transportation demand management, growth management, congestion management, transportation improvement program

ABSTRACT

This report documents the undertakings, findings and recommendations of a multi-municipal transportation planning study to accommodate regional development and travel in Greater Phoenixville to the year 2025. The work was performed with the direct participation of member governments and regional transportation providers. Public involvement was conducted formally and informally.

Transportation strategies and improvements were identified and evaluated to reduce congestion and promote travel options to single occupant vehicles. Improvement recommendations, emanating from the evaluations, support or augment those determined independently within the study area by: adopting multi-modal and area-wide perspectives; applying regional planning initiatives (PA Congestion Management Systems, Mobility Alternatives Programs, etc.), and; using regional evaluation procedures (the regional travel demand forecasting model).

A total of 66 highway, transit, travel demand management and multi-use trail improvement recommendations are enumerated to directly solve current and future mobility problems in the study area. Five technical studies are also recommended to promote intermodal opportunities and to strengthen transportation-land use linkages within the study area. The recommendations are enveloped into a staged Mobility Improvement Plan (MIP) totaling $173.5 million. As a complement to the MIP, the report also contains a comprehensive discussion of management measures which should be practiced to help deliver and maintain mobility throughout the study area.

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