
The Value of Connections

The Economic Impact of the Proposed Pennsylvania Turnpike and
Interstate 95 Interchange

Prepared by

Pennsylvania Economy League and
Economic Development Research Group

April 2000

To download a copy of the executive summary, please go to the project website at
www.paturnpike.com/i95

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I. Summary of Key Findings

Building a direct interchange between the Pennsylvania Turnpike and Interstate 95 in Lower Bucks County could result in increased economic activity for the Greater Philadelphia region, Bucks County, and the communities located in close proximity to the interchange itself. In particular, the construction of the interchange, when compared to not building the interchange, could provide an infusion of new construction dollars into the economy; reduce the costs of doing business through a more efficient transportation network; and increase the attractiveness of Lower Bucks County as a business location and the region as a tourist destination. These differences are translated into increased levels of net economic impact, through the use of the REMI economic model as follows:

Construction Spending Impact -- The 15-year, \$553¹ million construction project would support:

- an average of over 500 jobs in the region during the construction project, with the peak year of employment exceeding 800 jobs; Bucks County could realize an average of over 300 jobs with a peak year of 500; Bensalem, Bristol, and Middletown townships could be expected to capture nearly one-third of the Bucks County employment;
- nearly \$630 million in total regional business sales during the construction project, with nearly two-thirds staying in Bucks County and almost \$340 million in regional personal income, with \$150 million going to Bucks County residents.

Travel Cost-Savings Impact -- Once completed, the connection between the two highways is projected to reduce the distances traveled and amount of time spent on the region's roads and highways, when compared to the option of not building the connection. The resulting travel cost-savings due to the completed interchange could support:

- almost 1,200 new regional jobs in existing industries by 2025, with Bucks County projected to gain approximately 178, Burlington County adding 218, and Philadelphia picking up 315; the three Lower Bucks townships could be expected to gain over 50 more jobs;
- over \$125 million in increased regional business sales by 2025, with over 60% going to businesses in the Bucks, Burlington, and Philadelphia counties; as well as nearly \$50 million in regional personal income by 2025, with just over half going to Bucks, Burlington, and Philadelphia county residents.

Market Attractiveness Impact -- Connecting the Pennsylvania Turnpike and I-95 also provides the potential of more attractive markets for office development and tourism in Bucks County and the region. By capturing an increased share of regional office employment growth, Bucks County could realize:

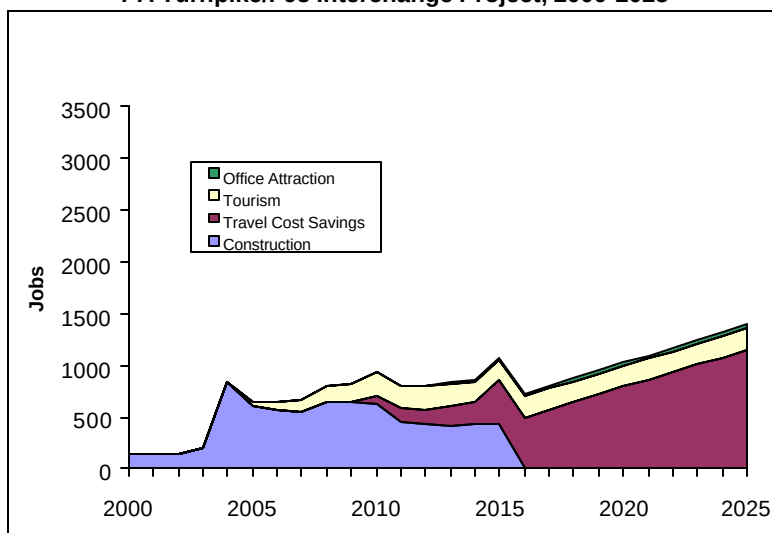
- total employment growth of over 2,700 jobs by 2025;
- over \$375 million in new business sales by 2025 and nearly \$75 million in personal income by 2025.

The new connection could also increase the region's attractiveness as a tourism destination, particularly for day-trip and Northeast Corridor visitors who now could have the attractive option of a direct route past the numerous attractions of Bucks County and the City of Philadelphia. With a slight increase in new day-trip visitors, and the conversion of a small percentage of those visitors into overnight visitors, there is the potential for 230 new regional jobs by 2025 (with over 50 in Bucks County), \$12 million in regional business sales and nearly \$9 million in regional personal income in 2025.

Total Economic Impact -- Combining the various types of impact, the proposed PA Turnpike/I-95 Interchange has the potential to support close to 1,400 jobs in the region by 2025. Locally, Bucks County has the potential for a gain of almost 3,000 jobs by 2025 (equal to approximately 1% of projected 2025 Bucks County total employment), as a result of capturing a higher proportion of regional office sector growth than it is projected to without the interchange.

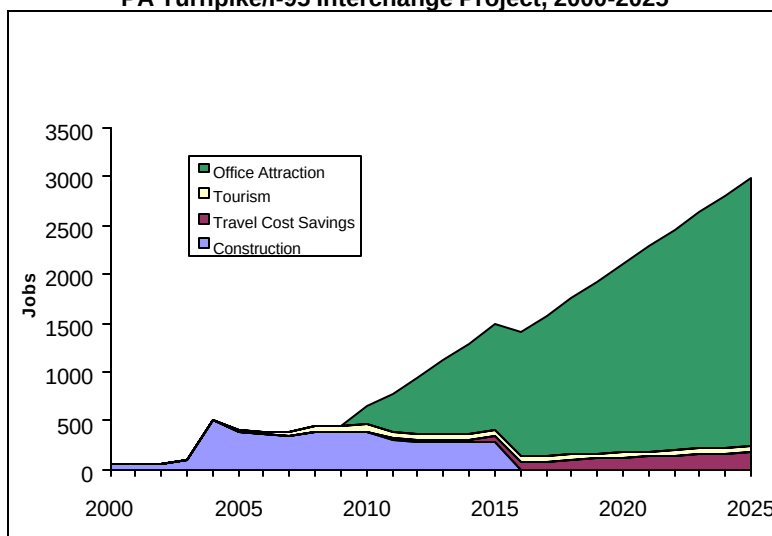
¹ All spending in constant 1999 dollars

**Figure 1: Regional Employment Changes
PA Turnpike/I-95 Interchange Project, 2000-2025**



Source: PEL, EDRG, and REMI

**Figure 2: Bucks County Employment Changes
PA Turnpike/I-95 Interchange Project, 2000-2025**



Source: PEL, EDRG, and REMI

Figure 3: Summary of Economic Impacts as a Result of Building PA Turnpike/I-95 Interchange

	2005	2010	2015	2020	2025
9 County Region					
Jobs	647	932	1074	1025	1392
Business Sales	\$57M	\$74M	\$90M	\$97M	\$158M
Personal Income	\$29M	\$38M	\$41M	\$33M	\$49M
Bucks County					
Jobs	398	655	1499	2104	2977
Business Sales	\$37M	\$62M	\$168M	\$260M	\$401M
Personal Income	\$12M	\$17M	\$38M	\$55M	\$85M

Source: PEL, EDRG, REMI

Business sales and personal income in constant 1999 dollars

II. Introduction

This report contains an analysis of the potential economic impacts of the proposed I-95/Pennsylvania Turnpike interchange. The analysis first details the potential impacts associated with the construction of the interchange, a new Delaware River bridge, and associated roadway and infrastructure improvements. It then describes the impacts associated with cost-savings due to reduced travel times and distances, as a result in changes and shifts in the traffic patterns, mileage, and speed of the movement of goods and services along the reconfigured roadway system. Finally, it describes the potential business attraction and tourism impacts that the new interchange could cause, as a result of improved access, visibility, and image for local communities and markets.

The Pennsylvania Economy League (PEL) has led this effort, with the support and assistance of the Economic Development Research Group (EDRG)². The Pennsylvania Turnpike Commission and the Pennsylvania Department of Transportation commissioned the project, which has been managed by the Turnpike Commission's project manager, KCI Technologies. In addition, the opinions and insights of the Community Economic Impact Review Group (CEIRG) have guided the work, under the leadership of Chair Garney Morris, Chairman of the Board of the Bucks County Enterprise Zone and President of Garney Morris, Inc. The CEIRG is a group of local stakeholders and community leaders convened for the purpose of reviewing and monitoring the work of the economic impact project team. The CEIRG met monthly throughout the course of the economic impact study process.

Project Background

Since the late 1960's, there has been an ongoing debate and discussion regarding the potential connection of the Pennsylvania Turnpike (I-276) and I-95 where they cross in Lower Bucks County. Currently, such a connection is being studied and planned by the PA Turnpike Commission (PTC), in cooperation with the Federal Highway Administration (FHWA) and the Pennsylvania Department of Transportation (PennDOT), under prime consultant KCI Technologies. KCI is in the midst of preparing the required Environmental Impact Statement (EIS). As part of that process, a number of community leaders, led by the Bucks County Enterprise Zone and the office of Congressman James Greenwood, requested that an Economic Impact Analysis be conducted for the project. The goal of the economic impact analysis is to better document and explain how the project would affect the economies of the Greater Philadelphia region, Bucks, Philadelphia, and Burlington counties, and three Lower Bucks County townships, Bensalem, Bristol, and Middletown. For more information on the interchange project, please see the project website at www.paturnpike.com/i95.

In-depth, quantitative economic impact analyses are not always a part of the EIS for a federally funded highway project. In this case, the economic impact analysis will serve as a stand-alone document to be included as a technical-basis report supporting the EIS, and a summary of its findings will be incorporated into the Draft and Final EIS reports. Providing the economic impact information in the Draft EIS will allow all interested parties to officially comment and have their comments addressed in the Final EIS.

The PEL team's role in this project has been to provide information to local, state and national officials who will be making the final decisions as to the viability and advisability of this project. The report is designed to document the economic differences between the no-build option (a base-case scenario utilizing existing projections of economic growth for the region and the local communities) and a "build" scenario, where an interchange, expanded PA Turnpike and new Delaware River bridge crossing are constructed. Thus, the economic impacts presented in this report represent the net difference between the two fundamental options – to build or not build the proposed interchange and associated projects.

² See Appendix 2 for more information about PEL and EDRG.

In addition to its economic impact findings, PEL will also present some suggested actions that might be utilized to maximize the potential economic benefits of the proposed interchange. These are based upon the knowledge gained from interviews, case studies, and past experiences of the project team. These opinions and observations are solely those of PEL and EDRG, and do not reflect the opinions of the PTC, FHWA, PennDOT, or KCI Technologies.

Scope of Work

PEL was asked to specifically provide the following economic information:

The change in economic activity between the “build” and “no-build” scenarios of the proposed PA Turnpike/I-95 Interchange for the following three elements (which are described in more detail in Chapter III):

- Construction Spending
- Traffic Cost Savings
- Market Attractiveness

Over the following time periods:

- The duration of the construction project (approximated as 2000-2015)
- 2010, representing a point in time after which the interchange connection is completed but prior to total completion of the project
- 2025, representing the project “build-year”, or the year for which the EIS must plan for environmental impacts

And for the following specific economic impacts:

- Employment
- Personal Income
- Business Sales

The economic impacts described above correspond to a set of geographic areas within the Greater Philadelphia region, as detailed in the following figure:

Figure 4: Geographic Regions Utilized in Economic Impact Analysis

GEOGRAPHIC AREA	DESCRIPTION
Greater Philadelphia Region, or Region	The nine-county Delaware Valley Regional Planning Commission (DVRPC) planning area, including the Pennsylvania counties of Bucks, Chester, Delaware, Montgomery and Philadelphia, and the New Jersey counties of Burlington, Camden, Gloucester, and Mercer.
Bucks, Burlington, and Philadelphia counties	The three counties in closest proximity to the proposed project
Rest of Region	The remaining 6 counties of the DVRPC planning region
Bensalem, Bristol, and Middletown Townships	The three Lower Bucks County townships in closest proximity to the project

III. Methodology

The PEL and EDRG team used a variety of methods to develop the information and analysis contained in the Executive Summary and full report. These included:

- Interviews
- Background Research
- Case Studies
- Economic Modeling

Interviews

Some of the most important research conducted for this project came from the over 70 meetings and interviews conducted by PEL staff with public officials, local and regional business owners, and real estate industry analysts and observers.³ The interviews and meetings were conducted in order to provide the PEL staff with insights, observations, and concerns that are simply not available in newspaper accounts or dry market analyses. PEL thanks the members of the CEIRG for taking the time to both participate in and arrange many of the meetings used for this analysis.

In addition, PEL was fortunate to have the opportunity to meet with the CEIRG on a regular basis during the course of the project. These meetings also served as information gathering periods for the PEL staff, as many questions were raised, comments offered, and observations noted that helped PEL organize its research and point the research in the right direction.

In order to guarantee frank and open conversations, PEL does not conduct its interviews for attribution. Rather, it uses them to provide background, insight, and summary findings that inform the analysis. These interviews, conducted either as one-on-one phone or personal interviews or as group meetings, provided the PEL team with information and knowledge that can only come from people involved in the local community. The opinions and analysis expressed in this report are those of PEL and EDRG, and reflect both their own experiences with the local economy and projects of this nature and the knowledge gained from the interviews and the case studies conducted as part of this project.

Background Research

PEL conducted extensive background research for this project, in the form of literature searches of newspaper and periodical articles, as well as reviews of public documents, financial analyses of local and county governments, and local real estate and economic development projections. This information was used to supplement the direct observations gained through interviews, the insights gleaned from case studies, and the quantitative analysis provided by the economic models.

Case Studies

One of the most effective predictors for future activity is the history available from comparable or similar situations or projects. For this project, the PEL and EDRG team selected seven case studies for comparison, including three interchanges in the Greater Philadelphia region and four national examples. The case studies were chosen for a number of reasons, including:

- **Similarity of projects** (i.e. connection of two existing highways)
- **Similarity of regions** (i.e. suburban interchanges in major metropolitan areas; older industrial areas with new highway access or connections)
- **Availability of information** (i.e. there is someone able to tell the story from the beginning of the new highway project).

³ A complete list of interviewed individuals is attached in **Appendix 3: Interview List**

Obviously, no case study will exactly parallel the situations that will be encountered as a result of this potential project. However, the experiences and economic changes that occurred provide a glimpse of potential outcomes that might be expected as a result of the completion of this project. The case studies provide the reader with an opportunity to better understand how highway projects can change local communities, either good or bad, as well as the economic and governmental actions that were taken in those communities to affect the economic outcomes.

The Case Study analyses can be found in **Appendix 1: Case Studies of Interchange Connections**.

Transportation Analysis

PEL utilized projections of changes in the region-wide (9 county) transportation system and local road network that were produced by the Delaware Valley Regional Planning Commission (DVRPC) for this project. The DVRPC projections modeled the differences between the current situation and the future situation with an interstate to interstate interchange, and the future without an interchange. PEL requested and used three specific studies:

1. **Systemwide⁴ changes by trip purpose** – This study showed the differences in systemwide trip travel time and distances traveled by workers and commuters, trucks, and individual travelers. This analysis is used as a portion of the calculation of traffic cost-savings.
2. **Systemwide changes by local/regional benefit category** -- This analysis identified the changes in time and travel distance based upon where the trip begins and ends. This allows identification of purely local trips, local trips to and from other parts of the region, trips from one part of the region to another but through the new interchange, trips between the local area or rest of the region and the rest of the country, and trips that begin and end outside of the region but travel through the project area. This analysis helps to break down the cost-savings benefits by specific areas within the region.
3. **Systemwide changes by directional category** -- This analysis identified specific points on the transportation network and the time and cost savings that would occur for trips between those points. This analysis is used to identify the benefits that the project might have in terms of connecting markets to each other and thus changing market accessibility and attractiveness.

Economic Modeling

PEL and EDRG utilized all of the above information to compare two basic scenarios -- the "build" and "no-build" options currently being considered. There are two fundamental types of impacts that result in changes in economic activity as the result of connecting I-95 with the Pennsylvania Turnpike. These are:

- **Transportation user impacts** – changes in travel distance, travel time, and accidents for travelers;
- **Economic impacts** – changes in jobs, income and business sales resulting from spending on facility construction and operation, and from changes in business productivity and market expansion and household living costs (all resulting from user impacts).

The direct economic effects are split into four fundamental classes:

- **Construction Spending Effects** – reflecting the job, income and business sales effects of construction and ongoing operation and maintenance of the facility;
- **Traveler Cost Savings Effects** – reflecting cost savings for existing business and households, due to changes in travel distances, times and safety. This also leads to changes in patterns of spending for fuel, vehicle maintenance and medical care;
- **Market Attractiveness Effects** – reflecting changes in the shopper and customer markets which local businesses can serve (or access) from surrounding areas, due to the improvements between east-west and north-south routes. The greater market access can improve the economic productivity and scale of

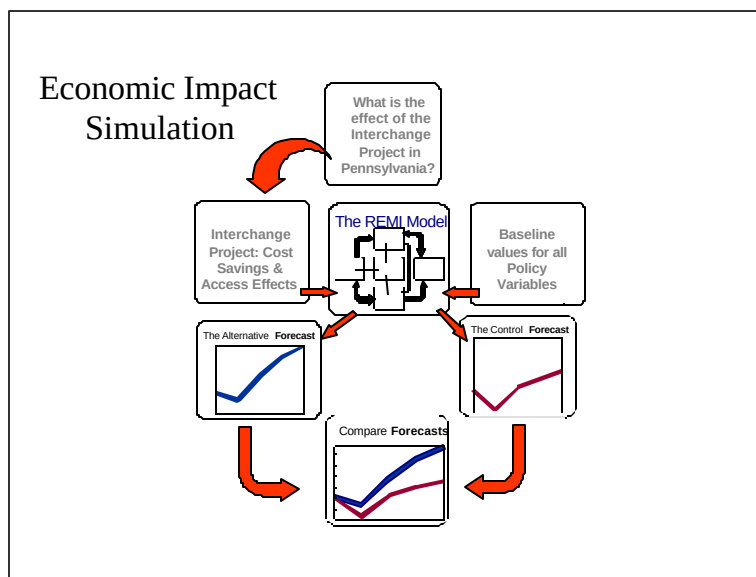
⁴ Systemwide refers to the transportation network within DVRPC's 9 county region.

businesses in the affected area, thus expanding the area's capture of tourism (from new outside visitors) and regional office development. Some of these effects redistribute activity within the region, while others are net growth for the region.

- **Quality of Life Effects** – reflecting changes in travel times for personal trips as well as changes in ambient noise and air quality levels (all are non-money benefits which nevertheless can make an area more or less attractive place to live and work).

The four classes of direct effects lead to broader impacts on the economies of Bucks County and the rest of the Delaware Valley region through the following mechanisms:

- **Indirect effects** – changes in business sales (and associated jobs and wages) at other businesses that supply materials, equipment, and supporting services to the directly affected businesses.
- **Induced effects** – changes in other business activity (and associated jobs and wages) as a result of consumer spending of the additional wages of direct and indirect workers; and
- **Dynamic effects** – Creating additional jobs and income as a result of other long-run changes predicted by the economic model (in business investment, population migration, labor markets, and relative costs of living and doing business in the region).



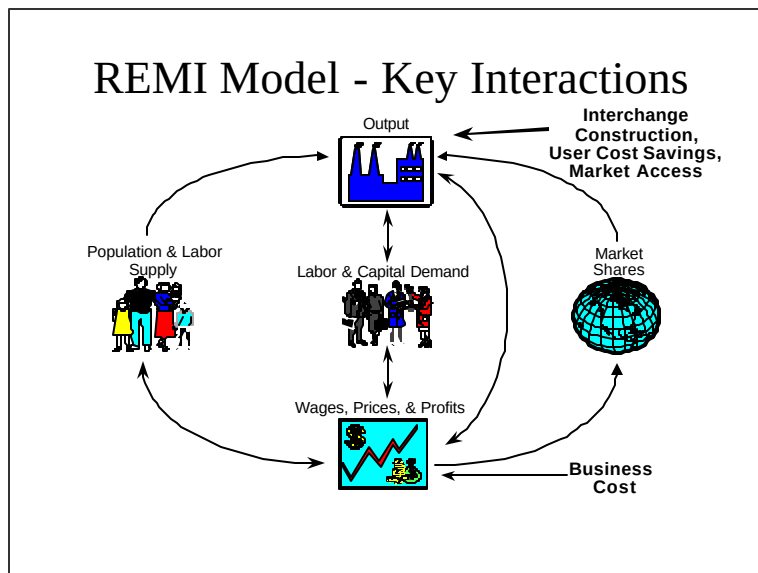
Model Application – To estimate the magnitude of these additional economic effects, PEL and EDRG utilized the REMI⁵ economic model for the Delaware Valley region (described below). The application of that model was done at two levels:

- **estimation of overall effects on relatively definite impacts** – i.e., construction spending and distance/time savings for existing travel;
- **estimation of overall effects for strong potential impacts** – i.e., tourism and office market changes;

The REMI model is widely acknowledged to be the premier economic simulation and forecasting system specifically designed for project and policy impact analysis within the U.S. For this study, a model was custom calibrated by REMI for the Greater Philadelphia region. The model predicts future annual levels of employment and business output for each of 53 industry categories and 94 detailed occupational categories. The model also predicts other variables, such as changes in personal income, population, business competitiveness, wage rates, and value added at a similar detailed level. The version developed for this study also separately forecast impact for Bucks County, Burlington County, Philadelphia County and the rest of the region. The primary advantage of the REMI model is that it provides these forecasts for a base case scenario (i.e. without the new interchange) and

⁵ Regional Economic Models, Inc.

for a project scenario (in which the interchange is assumed to be built). This makes it possible to calculate the change in economic activity attributable to the interchange project by inputting the difference between the build and no-build scenarios into the REMI model as changes to the local and regional economy. REMI then is utilized to simulate the difference that the changes would have on the local economy, utilizing past and projected levels of economic activity and interaction.



The REMI model effectively combines four model features that interact to form a singular model system. They are the following:

- **Forecasting Element.** This tracks historical changes in population, employment, business sales, and profits for the county for each year over the 1969 through 1998 period, and then estimates or projects future changes for each year over the 1999 through 2035 time period.
- **Input-Output Element.** This accounts for the inter-industry flows of dollars and the associated indirect and induced economic effects.
- **Policy Impact Element.** Estimates how policies and projects change business costs and profitability in each industry in the region, and their effects on the region's competitive position and share of national growth.
- **Population Element.** Estimates changes in population migration in response to changes in demand for labor, wage levels, living costs and quality of life.

The population, forecasting, and policy elements of the model lead to additional effects of a large number of *dynamic* economic feedback relationships. These include substitution among factors of production in response to changes in relative factor costs, migration in response to changes in expected income, wage responses to changes in labor market conditions, and changes in the share of local and export markets in response to changes in regional profitability and production costs.⁶

⁶ A more complete overview of the REMI model is provided in the article: "Policy Analysis Applications of REMI Economic Forecasting and Simulation Models," *International Journal of Public Administration*, Version 18, Number 1, pages 13 through 42, 1995.

IV. Construction Spending Impact

Summary of Key Findings

- Constructing a direct interchange between I-95 and the Pennsylvania Turnpike in Lower Bucks County will result in approximately \$553 million of construction spending over a 15 year period, with an estimated \$466 million being spent in Greater Philadelphia.⁷
- The construction spending would support over 800 jobs in the region during the peak year of construction and an average of over 500 jobs annually during the 15-year construction period
- In Bucks County, the construction spending would support over 500 jobs in the peak year and an average of 300 jobs during the construction period.
- Based upon historic shares of county employment, one-third of the jobs in Bucks County are likely to be located in Middletown, Bristol, and Bensalem Townships.
- Construction activity would stimulate nearly \$630 million in total regional business sales and \$340 million in total personal income in the region over the course of the project.
- During the construction period, there will be periodic dislocations for local businesses and residents due to local road closings. While it is too early to know how the construction process will be planned and implemented, the total economic impacts are likely to be negligible over the long-term as consumer spending shifts from one local area to another and back over the course of the construction project. Advance planning and coordination, however, could alleviate and mitigate some of the potential negative consequences of the construction project.

Construction Spending

The proposed connection of the Pennsylvania Turnpike and I-95 is a \$553 million project spread out over a fifteen-year construction horizon.⁸ The project is planned in five phases, subject to the availability of federal funding:

Figure 5: I-95/PA Turnpike Connection Construction Project Costs

PROJECT PHASE	TIME FRAME	COST
Split Toll Plaza and I-276 Widening	2000-2010	\$89.3 million
Interchange Construction and I-276 and I-95 Widening	2000-2010	\$285.5 million
Bridge Toll Plaza and I-276 Widening	2011-2015	\$42.2 million
Delaware River Bridge	2011-2015	\$135.9 million
Total	2000-2015	\$553 million

Source: KCI Technologies
All figures are in constant 1999 dollars.

The spending on construction of transportation facilities and services will lead to additional jobs (and hence income) through two mechanisms:

- Design and project engineering-- Hiring engineers and related workers (including archaeologists and planners) to design and plan the facilities, both prior to and during construction.
- Construction -- Hiring construction contractors to build the facilities (including roads, buildings, excavation, landscaping, lighting, signage, etc.). In addition, the construction costs include the necessary materials and

⁷ All of the construction spending and impact figures are calculated in current (1999) dollars.

⁸ PEL arrived at the \$553 million construction cost estimate by taking the average costs for each of the alternative options (toll plaza, interchange designs, bridge configuration). The total of \$553 million is in constant 1999 dollars, and the cost is subject to change depending upon project design, actual construction schedule, economic conditions, or unforeseen factors. The final decisions on design alternatives will be a part of the Final Environmental Impact Statement.

products, such as concrete, structural steel, and electrical equipment that are utilized in the construction project.⁹

Not all of the projected spending will occur within the 9 county region. Thus, PEL applied the regional purchasing averages¹⁰ for typical construction projects to determine the likely amount that will be spent within the region for this project. Based upon those estimates, PEL calculated that nearly \$466 million of the total \$553 million would be spent in the 9 county region.¹¹

Figure 6: Expected Regional Shares of Construction Spending

CATEGORY	TOTAL SPENDING	REGIONAL SHARE	TOTAL REGIONAL SPENDING (\$MIL)
Construction	\$415.9M	82%	341.5M
Manufacturing	\$7.9M	9%	0.7M
Professional Services (Engineering, Archaeology, Planning)	\$108.7M	98%	106.8M
Finance, Insurance and Real Estate (FIRE), Legal Services	\$18.6M	85%	15.8M*
Transportation and Utilities	\$1.9M	46%	.9M*
Total	\$553M	84%	\$465.6M

All figures in constant 1999 dollars

* Not included in economic impact analysis. See footnote 9 for more information.

The REMI model is then utilized to capture the cumulative effect of all of these elements, based upon the projected spending requirements for completion of these projects. The amount of economic impact depends on a number of factors, including:

- the source of the funding (the more that comes from outside the region, the more impact);
- the location of the spending;
- the availability of those goods and services locally; and
- the nature of the local economy (is a service or good produced locally, or must it be purchased from outside).¹²

PEL further broke down the regional spending by county (see Figure 7), based upon both placement of the project (the construction project will occur in Bucks County), and by the county shares of spending for each sector. Due to the location of the interchange project itself, the majority of the local project spending is expected to occur in Bucks County.¹³

⁹ In addition to the spending noted here, funds will be utilized to purchase property and right of way, and finance relocation of displaced property owners. This funding is not included as it represents transfers of ownership and location rather than new sources of income or jobs.

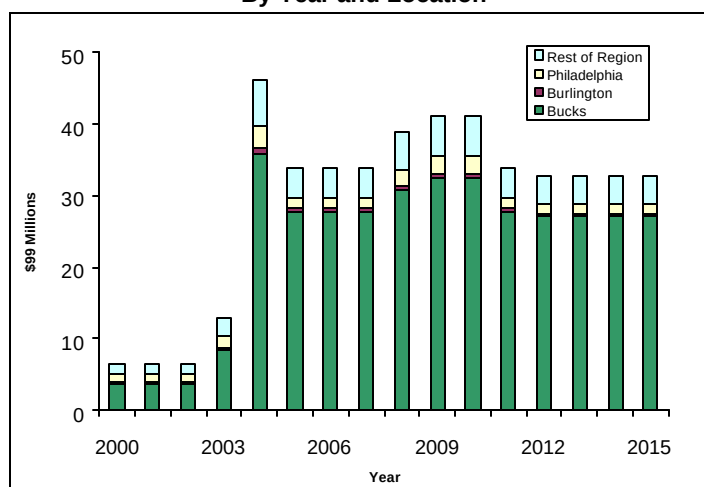
¹⁰ Provided by REMI model, and based upon typical construction projects in the 9 county region.

¹¹ These figures are estimates and can obviously vary according to the results of the competitive contracting process used for PTC highway projects. In some cases, training and education programs have been developed to encourage local participation in major public projects. The most recent example of this practice is being undertaken with the Kvaerner Shipyard development at the Philadelphia Naval Business Center.

¹² The model is based upon a series of economic assumptions, including past economic history, projections of future economic performance, and interactions both in the local and national economy.

¹³ While the construction job, and therefore the spending will happen in Bucks County, that does not mean that all of the firms will be current Bucks County firms. However, the work that they complete will occur in Bucks County.

Figure 7: Potential PA Turnpike/I-95 Interchange Construction Spending By Year and Location



Source: KCI Technologies, PEL, and EDRG. All figures in constant 1999 dollars and approximate

Economic Impact

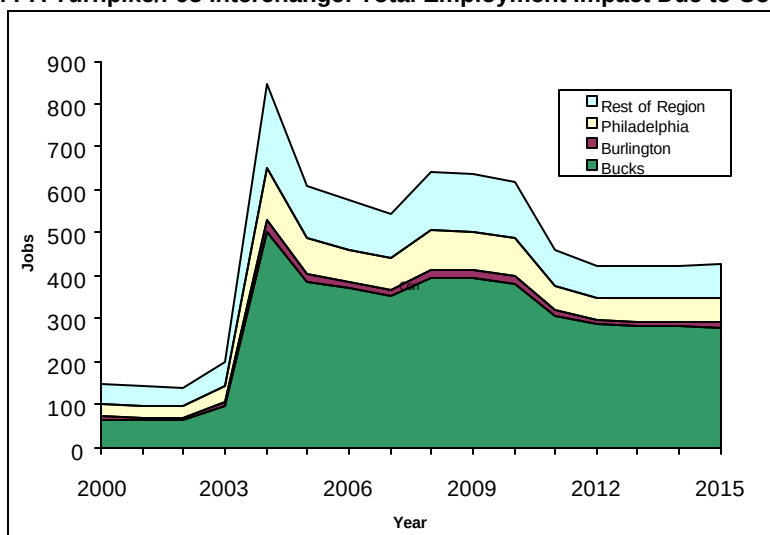
Spending \$466 million in the region on any construction project is going to bring economic benefits to the local economy. For this analysis, PEL is examining three specific kinds of economic impacts -- the employment supported by local spending on the project; the increase in worker income; and the increase in business sales.

While these benefits last only for the duration of the project, and end following the project completion, these are benefits that would not otherwise be available to the region save for completing this project. The I-95/PA Turnpike Connection project is a largely federally funded project, and the Interstate Completion funds are available solely for the purpose of completing the National Interstate Highway System. The funds are also important as they represent new dollars coming into the region from both the federal government and the PA Turnpike commission. Almost no local funds are required to construct this project.

Employment Impact

Regional Employment -- Construction spending on the I-95/PA Turnpike Connection would support over 800 jobs in the region during the peak year of construction and an average of over 500 jobs over the 15 year construction period.

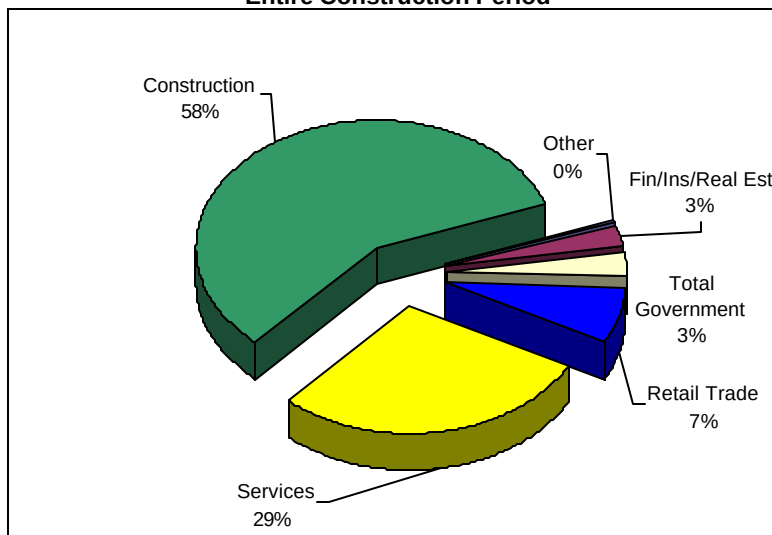
Figure 8: PA Turnpike/I-95 Interchange: Total Employment Impact Due to Construction



Source: KCI, Regional Economic Models, Inc., PEL, and EDRG

Local Employment -- In Bucks County, the construction spending would support over 500 jobs in the peak year and an average of 300 jobs for the entire project period. Not surprisingly, 43% of the employment (nearly 350 in the peak year, and an average of 200 jobs per year over the 15 years of construction activity) supported by the construction project is projected to go to people in the construction industry.

**Figure 9: Total Construction Employment Impact by Sector (Regional Totals)
Entire Construction Period**



Source: KCI, Regional Economic Models, Inc., PEL, and EDGR

About one third of the Bucks County jobs are likely to be located in Middletown, Bristol, and Bensalem Townships, based upon historic shares of employment. This is likely a conservative estimate, given that proximity to the project might dictate an increased likelihood of firm location in the project area.

**Figure 10: Estimated Employment Supported by Construction Spending,
Lower Bucks County Townships**

TOWNSHIP	PEAK YEAR EMPLOYMENT	AVERAGE EMPLOYMENT (FROM 2000-2015)
Bensalem Township	68	38
Bristol Township	39	22
Middletown Township	44	26
Total	152	86

Source: KCI, Regional Economic Models, Inc., PEL, EDGR, and Bucks County Planning Commission

Business Sales and Personal Income Impact

In addition to employment, the construction spending supports increased business sales and personal income in the local economy. The approximately \$466 million in direct project related sales translates into a total economic impact of over \$627 million for the region, with over \$415 million of that amount expected to go to Bucks County businesses. Personal income would grow by almost \$340 million during the fifteen-year project, with Bucks County residents bringing home almost \$150 million. (All sales and income figures are presented in constant 1999 dollars.)

Figure 11: Business Sales and Personal Income Supported by Construction Spending

REGION	TOTAL BUSINESS SALES (2000-2015)	TOTAL PERSONAL INCOME (2000-2015)
Bucks County	\$415M	\$149M
Burlington County	\$16M	\$16M
Philadelphia	\$81M	\$55M
Rest of Region	\$115M	\$119M
Regional Total	\$627M	\$340M

Source: KCI, Regional Economic Models, Inc., PEL, and EDRC
Business Sales and Personal income presented in constant 1999 dollars.

Additional Considerations

Throughout the interviews and meetings conducted for this project, a number of issues were raised about the construction project and process.

Will construction detours and closings hurt local businesses?

One concern that was voiced by a number of those interviewed by PEL was the potential loss or diversion of business that would come as a result of the construction project itself. A number of local road improvements are required (such as bridge reconstruction or highway widening) in order to build the interchange and widen the necessary highway segments.

This is a legitimate concern, but it is too early to know how the construction will be planned and implemented, what road closings will be necessary, and thus how specific local businesses will be affected. From an economic perspective, there is little net impact -- when traffic is diverted via a detour from one area, it is directed to another local area that will realize an increase in business during that period. Over time the exchange of economic benefits cancel each other out. As a result, no estimate is provided of potential job or dollar loss due to construction project displacements.

One advantage that the area has due to the foresight of local officials is the presence of the Bucks County Transportation Management Association (BCTMA). The BCTMA is well positioned as an employer organization concerned about local transportation issues to work with the PA Turnpike Commission and local officials to design an effective strategy for dealing with impacts of construction. A good example of this process in action is the current work of the Valley Forge TMA and its coordination of the response to the ongoing Route 202 reconstruction in Chester County. Their work with PennDOT has helped reduce the potential problems that such a major project could cause local residents and businesses, effectively utilizing flexible work schedules, vanpools, and public information strategies to reduce the negative impacts of construction work.

Will local companies get construction contracts?

As a corollary to the previous concern, there was also a concern that no matter the size of the construction project that local companies will not be the prime beneficiaries of the construction contracts.

Bucks County appears to be well positioned to benefit from this project. It has the base of workers and companies to service much of the project requirements. In addition, however, it is important to remember that in a project of this size and length, companies are involved over a long-enough period of time that they will be hard-pressed to avoid opening or expanding a local office to service the project. Just as important, even a non-local contractor is likely to utilize local labor and where possible, supplies, on a project. From a cost perspective, it is impractical to transport or house workers off-site when there are available workers in the immediate project

area. Finally, jobs have no boundaries. Many Bucks County residents work for firms in Philadelphia, Montgomery County, or Burlington County, and vice-versa. Thus, even if a company is not located in the immediate project area, the jobs they place may go to local residents.

Despite all of that, it remains in the interest of local, state, and federal officials to do everything possible to ensure that the construction benefits of this project stay in the local community. One approach to maximize those benefits would be to emulate the effort undertaken by city and state officials to train and educate potential contractors and suppliers of the Kvaerner Shipyard project. Without compromising the competitive bidding process, such a program makes every effort to identify, inform, and educate local companies about the opportunities and bidding requirements for contractors. With at least four years until actual construction could begin, there should be enough time to put such a program in place.

Wouldn't the money be better spent elsewhere?

While there are many projects worthy of funding consideration in Lower Bucks County, it is important to understand that the funding source designated for this project -- federal Interstate Completion funds -- are not available for other uses, and are solely available for the purpose of completing the National Interstate Highway System. However, a number of local road improvements are being added or considered as part of this project, including the widening of the Route 1 Expressway in the area around Interchange 28 of the PA Turnpike. It is also important to understand that the funding for this project represents new dollars coming into the region from the federal government and the PA Turnpike Commission, as almost no local funding is required.

V. Travel Cost-Savings Impact

Summary of Findings

- Connecting I-95 and the Pennsylvania Turnpike should reduce the overall distances driven and amount of time spent on the region's roads. By 2025, there will be a daily saving of 166,600 "vehicle-miles of travel" and 10,068 "vehicle-hours of travel". The reduced time spent on the region's roads and highways should also reduce the number of accidents.
- The transportation user value of the mileage and time saving is estimated to rise from almost \$6 million per year in 2010 to almost \$39 million by 2025. Those savings are in the form of reductions in the business costs of truck deliveries, the costs to businesses of "on-the-clock trips" by employees, the business share of commuting costs, and household expenditures on gasoline, car repairs, and accident costs.
- These savings result in increased productivity for regional firms due to reduced business costs, allowing them to improve their profitability, invest in their businesses, and increase employment. The REMI forecasting results project that by 2025, existing firms in the region should have added almost 1,200 new jobs as a result of the completion of the new interchange, with the most growth occurring in the cost-conscious service and retail sectors.
- By 2025, total Bucks County employment due to the travel cost savings is expected to grow by 178 jobs; Burlington County will add 218 jobs; and Philadelphia will add 315.
- Concerns about the possible loss of business due to traffic bypassing the region appear to be unfounded. While through-travelers will now have the option to stay on the Interstate Highway system rather than travel on local roads, traffic is still expected to grow, although at a slower rate, after construction of the interchange. Local businesses will have the opportunity to attract new business from local residents, employees of local businesses as the traffic levels rise at a somewhat slower rate.

Transportation User Impacts

There are three fundamental types of impacts that arise from the connection of I-95 and the PA Turnpike:

- changes in travel distance** – due to more direct highway routes for some travelers (depending on their origin-destination patterns). DVPRC's regional traffic forecasting model indicates that there will be a *daily* savings of roughly 20,800 "vehicle-miles of travel" (VMT) when facilities open in 2010, rising to 166,600 VMT in 2025. (The increases over time are due to projected growth of traffic in the future.)
- changes in travel time** – due to higher average travel speeds, as well as the shorter distances, for some trips. DVPRC's regional traffic forecasting model indicates that there will be a *daily* savings of roughly 1,258 "vehicle-hours of travel" (VHT) when facilities open in 2010, rising to 10,068 VHT in 2025. (The increases over time are due not only to projected growth of traffic, but also due to forecasts of greater future traffic congestion and delay without this project.)
- changes in accident rates** – due to a reduction in vehicle-miles of travel. Data from the Federal Highway Administration indicates an average of 1.26 accidents per million miles of VMT for urban freeways and even higher on local arterials, so a reduction in VMT can translate into reductions in fatalities, injuries and personal damage costs.

**Figure 12: 2025 Systemwide Mileage and Travel Time Changes
Comparison of Build and No-Build Scenarios**

	VEHICLE MILES TRAVELED	VEHICLE HOURS TRAVELED
No-Build	122,436,254	4,273,722
Build	122,269,651	4,263,654
Savings	166,603	10,068

Source: DVRPC

Economic Analysis of Transportation Impacts -- To calculate the value of any improvements in transportation system efficiency, transportation planners calculate the total value of time, expense and accident cost savings for all affected travelers using the region's transportation network. These valuations are based on studies of how people value time and what expenses they incur from traffic accidents. For this study:

- **Total vehicle costs** (including fuel and regular maintenance) were estimated at 45 cents/mile for large trucks and 35 cents per mile for cars, representing an average of \$12.60 per hour for trucks and \$9.80 per hour for cars. (All values adjusted to 1999 dollars.)
- **Total business costs** for driver time (including overhead) were valued at \$25/hour and personal time savings were valued at \$9.50/hour.
- **Average costs for property damage accidents** were \$1,270 and **for personal injury accidents** were \$14,200.¹⁴

Impact of Reduced Costs for Travelers. The transportation impacts described in the preceding section lead to further changes in direct expenses for individuals and businesses, through four mechanisms:

- **Business costs of truck deliveries** -- associated with savings in vehicle operating time, accident costs and driver time for truck trips. Based on DVRPC's data on trip origins and destinations, 83% of the truck trip origins and/or destinations were found to be within the region, thus representing cost savings to area businesses.
- **Business costs of "on-the-clock" car trips** -- associated with savings in vehicle operating time, accident costs and worker time for deliveries of professional services by car.
- **Business share of commuter costs** -- a portion of the excess time and expense of commuting which businesses absorb. (This reflects the findings of research studies that businesses within competitive urban labor markets pay slightly higher wages to workers in compensation for differences in commuting costs.)
- **Household expenses** -- savings in vehicle operating costs and accident costs for households, which are not reimbursed by firms. This includes costs associated with personal (not work-related) trips.

The total value of these cost savings to businesses is estimated to be \$5.9 million in the opening year (2010), rising to \$38.7 million in 2025. The additional value of the direct "out-of-pocket" expense savings to households is estimated to be \$1.4 million in the opening year (2010), rising to \$11.6 million in 2025. (All values are in constant 1999 dollars.)

There are additional redistributions of spending associated with these cost savings. This includes reductions in sales at gas stations and vehicle repair shops throughout the region, as well as activity at medical care facilities. These changes provide additional money to be spent on other types of purchases.

Travel Cost Savings Economic Impacts

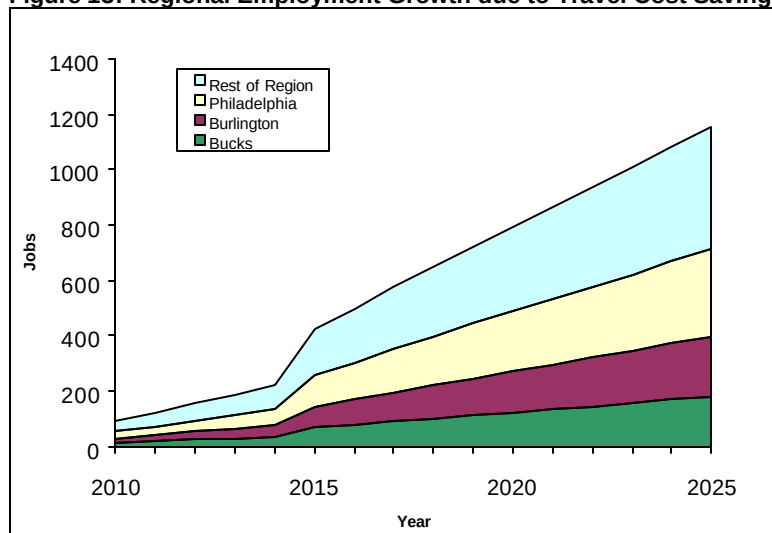
The traffic impacts provide a basis for calculating the economic benefits to *existing industries* of an improved transportation network. The time and mileage savings result in increased productivity for regional firms, allowing them to expand their profitability and employment base with their improved competitiveness. The REMI model then calculates the changes in relative competitiveness of businesses in the region versus elsewhere in the United States, and forecasts the resulting business growth.

¹⁴ Federal Highway Administration's 1997 Highway Economic Requirements System (HERS) report (with all values adjusted from 1995 to 1999 dollars).

Employment Impact

The REMI forecasting results indicate that by 2025, the region will have added almost 1,200 new jobs, with the service sector (46%) and the retail trade sector (17%) leading the way. The local benefits from cost savings are more dispersed across the region than for construction, with Bucks County expected to gain 178 jobs, Burlington County adding 218, and Philadelphia picking up 315.

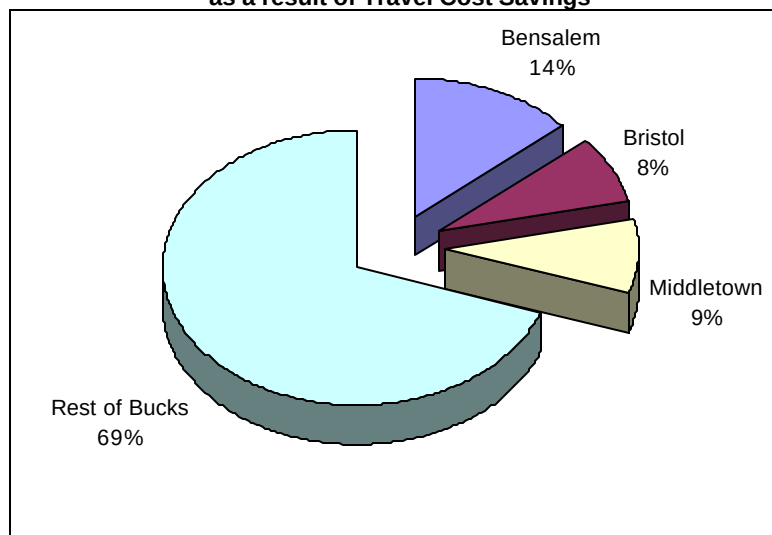
Figure 13: Regional Employment Growth due to Travel Cost Savings



Source: DVRPC, Regional Economic Models, Inc., PEL, and EDRG

Applying fair share employment estimates, it could be expected businesses that Bensalem, Bristol, and Middletown Township combined would add 54 more jobs as a result of travel cost savings from to the completed interchange.

Figure 14: 2025 Lower Bucks Township Shares of Increased Employment as a result of Travel Cost Savings



Source: PEL, EDRG, and REMI

Business Sales and Personal Income Impacts

Both income and business sales will grow at a similar pace as the travel cost savings grow and regional competitiveness improves. The cost savings will be responsible for \$125 million in regional business sales by 2025, and just over \$49 million in new additional personal income.

Figure 15: 2010 and 2025 Business Sales and Personal Income Impacts of Travel Cost Savings

GEOGRAPHIC AREA	2010 BUSINESS SALES	2010 PERSONAL INCOME	2025 BUSINESS SALES	2025 PERSONAL INCOME
Bucks	\$1.2M	\$0.4M	\$19.8M	\$7.7M
Burlington	\$1.2M	\$0.4M	\$21.18M	\$7.8M
Philadelphia	\$2.1M	\$0.6M	\$35.8M	\$10.2M
Rest of Region	\$3.3M	\$1.4M	\$48.7M	\$23.5M
Total	\$7.9M	\$2.8M	\$125.3M	\$49.2M

Source: PEL, EDGR, and REMI. All figures in constant 1999 dollars.

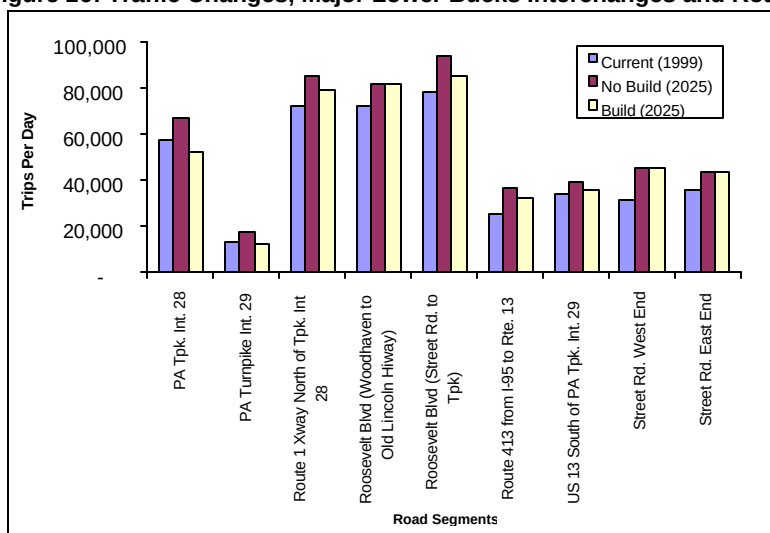
Additional Considerations

Will the new interchange remove traffic (and customers) from local roads?

While connecting I-95 and the PA Turnpike has cost savings impacts for both local and regional businesses, concern was voiced by individuals and businesses throughout the course of this project as to whether the new interchange would divert traffic from major existing thoroughfares like the Route 1 Expressway, Route 413, and Route 13 and take customers from existing businesses. The greatest concerns were for the viability of retailers and hotels that rely upon business generated by the traffic that flows on those roads. There was also a concern that the length of the process and the uncertainty about the project has left businesses in a position where it is difficult to adequately plan for the future.

There will be change and loss of certain types of business as a result of this project. However, the improvements in local economic conditions that should occur as a result of this project (described in the following chapter) have the potential to provide local businesses with more than enough new business to make up for the losses that might come from reductions in through trips. This new activity might provide a local business owner with new options – new markets to tap, investment possibilities, or even the opportunity to convert their property to another use with greater economic potential. Local and state officials should work closely with local business leaders like the Chamber of Commerce to minimize dislocations and assist business owners in any transitions that might be necessary.

Figure 16: Traffic Changes, Major Lower Bucks Interchanges and Roads



Source: DVRPC Traffic Projections, Comparison of Current Levels to 2025 Build and No-Build Scenarios

One of the most significant concerns encountered in the interviews was that traffic would fall from current levels on the major local roadways as a result of this project. In fact, the places where there are reductions from current traffic loads are at the places where reductions are desirable -- the two Turnpike interchanges, 28 (at US 1) & 29 (at US 13). For the other major local roads, traffic under the build scenario increases from current levels, but at a slower pace than under the no-build scenario. However, in the build scenario the increases are likely to come from local drivers using local roads, or drivers with specific destinations in the local area, rather than from travelers merely moving from one interstate to another.

VI. Market Attractiveness Impact

Summary of Findings

- The connection of I-95 and the Pennsylvania Turnpike could improve the accessibility of the project area by reducing travel time between markets and by reducing traffic growth and congestion on local roads.
- Real estate market observers feel that the interchange will improve the image of Lower Bucks County as an office market and accelerate the redevelopment of existing and vacant properties
- Lower Bucks County could capture a greater share of regional office employment than it has historically or is expected to gain. As a result of the increased attractiveness of its real estate market, Lower Bucks County could increase its direct office sector employment by almost 1,800 jobs from 2010 to 2025 over current projections.
- As a result of the office market expansion, Bucks County could realize a total employment gain of over 2,700 jobs by 2025.
- The interchange will also provide tourism benefits to the region and the project area by eliminating the incentive for travelers to completely bypass the Pennsylvania side of the Delaware River. The increased visits to Bucks County and the region's tourist attraction and hotels could support as many as 230 additional jobs per year by 2025.
- Finally, there are non-monetary quality of life impacts that arise because of the new interchange, including personal travel time savings, property value changes, and health care and environmental changes. Some homeowners may see decreases in property value due to their closeness to the expanded highway, although many of these impacts are already present because of the existing highways. Meanwhile, other local homeowners might see increased values due to improved access to highways, noise reduction from warranted sound barriers, and increased demand for housing.

Increased Market Attractiveness and Accessibility

In addition to the benefits to existing businesses due to cost savings from improved transportation flows, the new connection of I-95 and the PA Turnpike has the potential to impact the local and regional economies in three ways:

- Expanding the reach and attractiveness of project area office markets
- Increasing the flow of tourism dollars through Bucks County and the region
- Increasing the quality of life in the local area

To calculate the potential economic benefits that each of the above can bring to the project area and the region, three primary sources of information were utilized:

- Traffic projections, showing the changes in travel time between local and regional market areas;
- Case studies of national and regional interchange areas; and
- Interviews with local and regional business, real estate, and tourism experts.

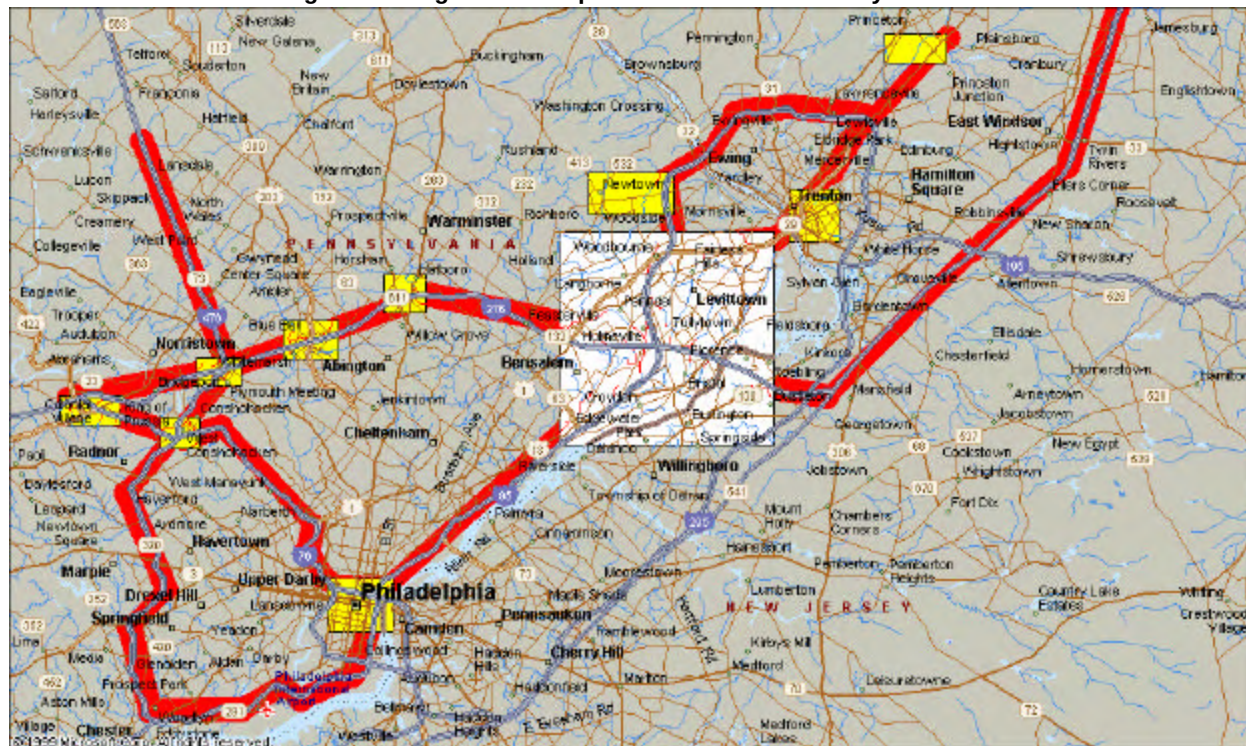
The combination of the traffic projections and informed opinions are then used to specify how market conditions may change, and what economic benefits might arise from those changes.

Improved Connections

An interchange between I-95 and the Pennsylvania Turnpike could improve transportation access, both for the region and for the local communities. Traffic projections show that the interchange would result in reduced travel time for people traveling from the local markets to the growing business markets to the east and west along the New Jersey and Pennsylvania Turnpikes. In addition, the new interchange has the potential to help

slow the growth of traffic and congestion on the local highway network, and the resulting pressures on local roads that are currently being used by residents as a means to avoid congestion on the local highway grid.

Figure 17: Regional Transportation Network and Key Markets



Connections to markets -- In its transportation information request, PEL asked the DVRPC to produce projections of changes in travel times and distances between market areas, in order to determine whether the new interchange would improve the accessibility of local markets to other markets, both in and out of the region. The new interchange proves to improve the speed for all travelers who utilize the interchange -- that is, those who travel from a point on one of the interstate highways to a point on the other, even in cases where the mileage traveled actually increases. In addition, speed increases for those traveling from points east and west to the project area. The speed actually decreases for those traveling purely east and west or north and south, due to the increased traffic on I-95 and the PA Turnpike as a result of the new interchange.

**Figure 18: Differences in Speed between Markets for Build and No-Build Scenarios
2025 DVRPC Traffic Projections**

MARKET CONNECTIONS	SPEED IMPROVEMENT
East -- South (NJ Tpk. #6 to Woodhaven Rd./I95)	8.6%
West -- South (Ft. Wash./I276 to Woodhaven Rd./I95)	10.0%
East -- North (NJ Tpk. #6 To Newtown/Yardley/I95)	4.0%
West -- North (Ft. Wash./I276 to Newtown/Yardley/I95)	3.8%
West -- Local (Ft. Wash./I276 to project area)	3.5%
East -- Local (NJ Tpk. #6 to project area)	5.1%
South -- Local (Woodhaven Rd./I95 to project area)	-1.3%
North -- Local (Newtown/Yardley/I95 to project area)	-0.3%
West -- East (Ft. Wash./I95 to NJ Tpk. #6)	-0.1%
North -- South (Newtown/Yardley/I95 to Woodhaven Rd./I95)	-1.3%

Source: DVRPC 2025 projection

This information demonstrates that one of the potential benefits of the interchange between the Turnpike and I-95 is the potential for reduced travel time between local markets and the rest of the region. The traffic cost savings analysis showed how reducing the time spent on the region's highways would have real benefits to the local economy, resulting in improved regional competitiveness. Just as important, the new interchange would

mean that existing local interchanges along the I-95 corridor will now be closer to growth markets in the region, whether in Montgomery and Chester Counties to the west or in Burlington, Mercer, and Gloucester Counties to the East, thus improving their competitiveness as business locations.

Reducing congestion and traffic growth – Anyone who drives Lower Bucks’ major roads has witnessed growing traffic and congestion. At rush hour, commuters using Street Road, Woodhaven Road, the Route 1 Expressway, and Routes 413 and 13 to get from one interstate to another make the commute that much longer and more difficult for local residents trying to get home from work. Over 90 percent of the employed residents in Bensalem, Bristol and Middletown Townships use a car to get to and from work,¹⁵ and the extra traffic these roads carry as connections between interstates can force residents and local businesses to move from the four-lane highways to two lane roads which were never designed as commuter highways.

Utilizing the 2025 DVRPC traffic projections, KCI Technologies calculated the speed improvements on local roads, reflecting reductions in congestion. For the major segments that are the primary business markets in the Lower Bucks County region, congestion is expected to be lower under the build scenario than the no-build, reflecting shifts of traffic from local roads to I-95 and the Turnpike.

Figure 19: 2025 Congestion Changes, Build vs. No-Build Scenarios

ROAD SEGMENT	2025 NO-BUILD SPEED (MPH)	2025 BUILD SPEED (MPH)	% IMPROVEMENT
Woodhaven Rd (PA 63) US 1 to I-95	51	53	1.9%
Street Rd (PA 132) US 1 to I-95	33	34	2.9%
US 1 Expressway North of I-276	45	48	6.3%
US 1 (Roosevelt Blvd.) PA 63 to I-276	32	40	20.0%
US 1 Business North of US 1 Expressway	35	36	2.8%
Bristol Pike (US 13) South of I-276	36	38	5.2%
North of I-276	33	35	5.7%
New Rodgers Road (PA 413) South I-95 spur	34	37	8.1%
North of I-95 spur	35	37	5.4%

Source: DVRPC, KCI Technologies

The congestion data demonstrates that building the interchange will reduce the rate of congestion growth on the local road network. This is important because in cases where the local road network becomes overly congested, it can actually inhibit business growth and development for destination retail stores (department stores, malls, and sit-down restaurants), as potential customers avoid traffic and find a more convenient location. Local residents may shift to back roads or cut through developments, taxing the capacity of minor local roads, and creating new traffic problems on primarily residential roads. (See

Case Study Findings

The economic effects of constructing an interchange between Interstate 95 and the Pennsylvania Turnpike are difficult to predict without comparing the current project to historical examples elsewhere. Therefore, PEL and EDRG selected several case studies to offer insight into the potential impacts of the project. They include four areas outside Greater Philadelphia and Pennsylvania, and three within the Philadelphia region:

¹⁵ Source: Bucks County Planning Commission, US Census Bureau

Figure 20: Case Study Locations

NATIONAL	REGIONAL
Houston, Texas	Plymouth Meeting, Pennsylvania
Albany, New York	Conshohocken, Pennsylvania
Springfield, Massachusetts	King of Prussia, Pennsylvania
Bloomington, Minnesota	

Each of these major highway interchanges had varying impacts on their surrounding communities. Some were clearly essential in turning around distressed areas and encouraging economic growth. Others did little to stimulate growth and revive a struggling economy, and some had a mix of significant positive and negative impacts.

No two situations are ever identical. There are, however, important lessons to be learned from the experiences of communities elsewhere with major highway infrastructure projects. In general, the following was found:

- Interchanges between two highways most notably have an effect on an area's access to nearby business and commercial markets. Likewise, the area around a new interchange is more readily accessible from other regional markets. Improved accessibility can generate development pressures; natural and other land use limitations, as well as zoning regulations, can channel where and if such development occurs.
- The effects of an interchange on an industrial area can vary. Such areas often remain industrialized, as in parts of Houston, and opportunities for warehousing and distribution can be increased. In cases where there is a strong demand for space in nearby communities, such as in the case of Plymouth Meeting, old industrial sites are often re-developed for commercial and office use.
- Areas that are severely distressed will not necessarily experience an economic upswing as a result of an interchange. Some interchanges give developers a reason to build heavily in the area. Others have no effect on economic growth in struggling areas. But if underlying socio-economic factors like crime and blight go unaddressed, an interchange by itself will make little difference.
- The design of an interchange itself can have important implications for development potential in its vicinity. Sites adjacent to an interchange may suffer due to a particularly large, poorly designed, or poorly located interchange.
- Combining increased highway access with government incentives, such as the Enterprise Zones in West Conshohocken, can lead to sweeping redevelopment and investment in commercial properties.

More details on the case studies can be found in **Appendix 1: Case Studies of Interchange Connections** at the end of this report.

Perceptions of Opportunities

The third element of understanding the potential for market expansion consisted of interviews with local and regional observers of the commercial real estate market and economy of the project area. In the course of the interviews, PEL encountered many individuals and businesses with a great sense of optimism for the positive effect that the I-95/PA Turnpike Connection project could have on the local economy, particularly at key points of the highway network. Regionally and among many local business leaders and observers, there is a sense that the lower half of Bucks County from Bensalem through Bristol and Middletown Townships to the Newtown/Lower Makefield area is positioned (and in some cases already moving) to take a step forward as a business location. The interchange project was viewed as a crucial piece of the puzzle for improving the competitiveness of Lower Bucks County.

Increase attractiveness of Lower Bucks as a premiere office location

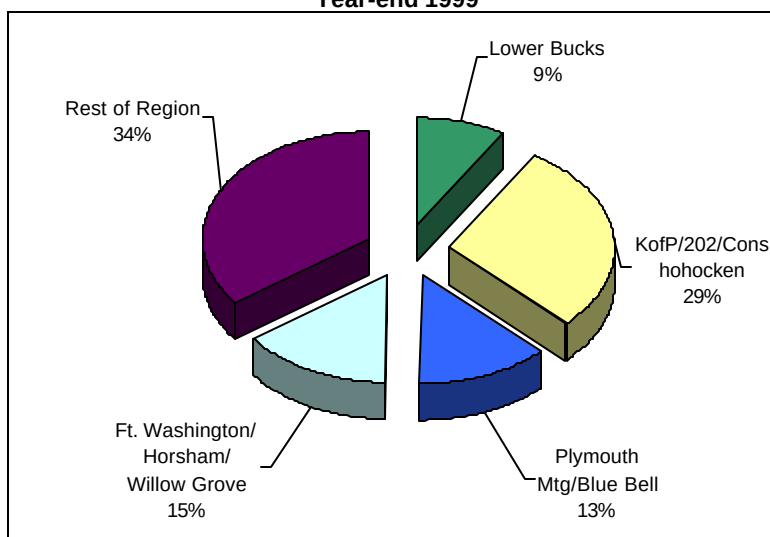
One of the first things real estate developers look at when picking locations for major office, hotel, or retail developments is proximity to an interstate highway network. The connection of the Turnpike and I-95 will

increase the attractiveness of key exits on I-95 and the Turnpike (Business Route 1 in Middletown, 413 in Bristol, Turnpike Interchange 28 in Bensalem and Turnpike Interchange 29 in Bristol) by providing them with direct, limited access links to two interstate highways. In addition, extended markets like Newtown/Yardley, Burlington County, and the Woodhaven Road area of Philadelphia will now be able to tout the advantages of proximity and connections to new interstate highways traveling all directions, as well as multiple options for high-speed connections through both local and interstate highways.

There was general consensus that Lower Bucks has lagged the region in developing as an office center, and that while there are a number of projects planned, they will be greatly enhanced by connecting the two interstates. If exciting new projects like the one planned by O'Neill Properties for the former Eastern State School site are to be successful and not just drain tenants from nearby or adjacent office locations, Lower Bucks must increase its share of office employment in comparison to other suburban locations. Increased demand, coupled with the current tightness of the office market are likely to trigger higher office rents, increasing the financial feasibility of the numerous planned projects in the County. That new development will then help Bucks County compete with new and improved properties for the region's premiere office tenants.

Currently, Bucks County has difficulty competing with the western suburbs of Greater Philadelphia. The comparison of the size of suburban office markets is stark. The Lower Bucks market has significantly lagged behind the region's western suburbs in the development of first class office space. While there are a number of projects planned that would help to close this gap, it is important that the attractiveness of the market be enhanced to move those projects from ideas into realities. Taken together, the King of Prussia/Conshohocken/Plymouth Meeting triangle has 42% of the suburban office inventory. With pressures for growth management in those markets, there is an opportunity for the Lower Bucks County market to increase its share of the inventory.

**Figure 21: Comparison of Proportion of PA Suburban Office Space
Year-end 1999**



Source: Insignia ESG, Inc.

There was general consensus that an improved interstate highway connection in Lower Bucks will help accelerate its development as a prime business location. It will improve connections to the Princeton Corridor and the Philadelphia's northern and western suburbs, all of which are struggling with major traffic headaches and community pressures to slow the pace of business growth. One point that was continually reinforced was that tenants and developers are becoming increasingly aware of the need to consider the ability to find enough good workers when considering the location of facilities. There was a sense that the improved interchange offered employers the ability to broaden their labor market, which with the interchange could now more easily include the growing residential areas of Burlington County and the northern and western suburbs of

Philadelphia. In a like manner, the new interchange could also mean more job opportunities for local residents. If the new interchange reduces travel time between the local markets and other employment centers in the region (particularly those along the PA Turnpike), it could allow local residents to stay in their homes and communities rather than moving to new suburban communities.

Obviously, transportation access is not the only factor in location or development decisions. However, the interviews indicated that the lack of adequate transportation connections has been a major factor in making Lower Bucks County a comparatively less attractive suburban market in Greater Philadelphia. Combining the improved transportation connection with the traffic problems and pressures to slow growth in currently hot markets, there is an opportunity for Lower Bucks County to capture a greater share of regional employment growth than it has or is expected to capture.

Accelerate redevelopment/repositioning of industrial parks and aging retail locations

Real estate observers pointed to the recent activity occurring around the new I-95 exit at Route 413 as evidence of the value of better connections in redeveloping and repositioning industrial properties in Lower Bucks County. At the same time, some pointed out that the full value of that interchange would only be realized with a direct highway connection to the Turnpike, providing east-west access in addition to the new connection from the North. Thus, an interchange connecting I-95 and the Pennsylvania Turnpike would be likely to increase the value of existing properties, allow for repositioning and redevelopment of existing industrial properties into a broader range of uses (including light industrial/research or back-office operations), and increase the market potential for new development.

In addition, there will be increased opportunities and options for the redevelopment and repositioning of aging or vacant retail properties close to the interchange (particularly in Middletown and Bristol Twps.). The improved highway access created by the interchange is perceived as an advantage to potential investors and tenants and may allow for some diversification of the property mix.

Finally, there was a sense that if truck and car traffic using local roads like Routes 13 and 413, Street Road, and the Route 1 Expressway and Interchange 28 of the PA Turnpike merely to travel from one interstate highway to another were removed, new growth and business opportunities would emerge along or close to those corridors. The removal of some traffic allows for better access for those with a specific destination along those roadways. This could assist in the remaking of the image of these corridors, as well as opening up opportunities for higher and better uses of some vacant, aging or undesirable properties.

Market Attractiveness Economic Impact

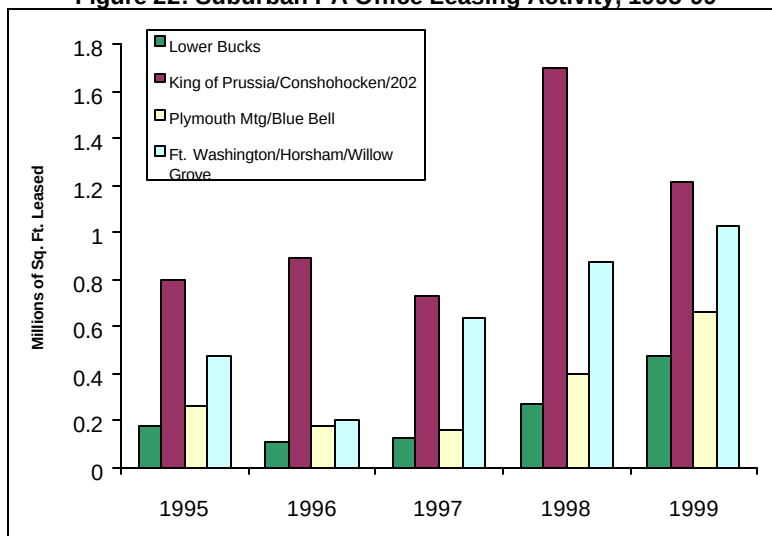
As the traffic data, case studies and the interviews showed, the new interchange and bridge will change the market reach and competitiveness for some businesses, and affect the attractiveness of the area for business activity. In addition, greater accessibility can also make the entire lower half of Bucks County more attractive as a place to locate new office activity. The Bucks County growth could come from two primary sources – a greater share of projected regional office employment or new businesses locating in the region from somewhere else in the country.

In this case, it is likely that most of the new development in Bucks County would be shifted from elsewhere in the region. That would be a benefit to Bucks County but a small loss of some portion of potential future growth elsewhere in the region. However, a portion of this office attraction could potentially represent business growth moving into the area from other parts of the country. Based on the expected traffic improvements and an analysis of regional and local office development (and discussions with real estate professionals), it is estimated that the additional office attraction to Bucks County could grow from additional 100 jobs in 2010 to over 1800 more jobs in 2025.

Methodology for Estimating New Office Employment -- Developers and real estate experts suggest that it would be reasonable to expect that lower Bucks County, if it had better access, should be more competitive with other suburban Philadelphia markets for office development and location. In fact, as shown in Figure 22, Lower

Bucks County (from Newtown through Bensalem) is currently lagging other regional office markets in leasing activity. At least part of the reason for this has to do with limited interstate highway access.¹⁶

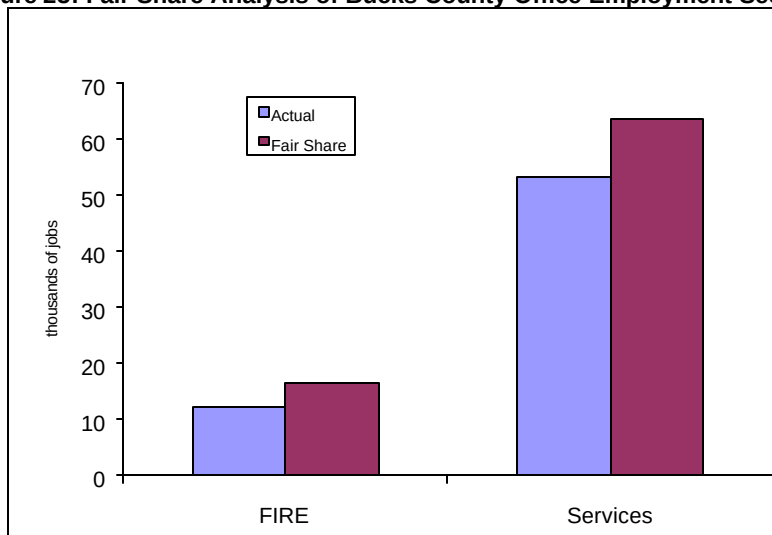
Figure 22: Suburban PA Office Leasing Activity, 1995-99



Insignia/ESG Real Estate

If Bucks County is to increase its share of regional office growth, it must increase its share of employment in the two largest categories of office tenants -- Finance, Insurance and Real Estate (FIRE) and Services companies. The following graphs show that lower Bucks County has trailed other suburban communities in these areas, that it has been lacking for many years and that it is not projected to catch up in the future. Figure 23 compares actual employment in Bucks County to what we refer to as Bucks' "fair share" employment level. "Fair share" is what would be expected if Bucks had employment in FIRE and Services proportional to its share of regional population.

Figure 23: Fair Share Analysis of Bucks County Office Employment Sectors

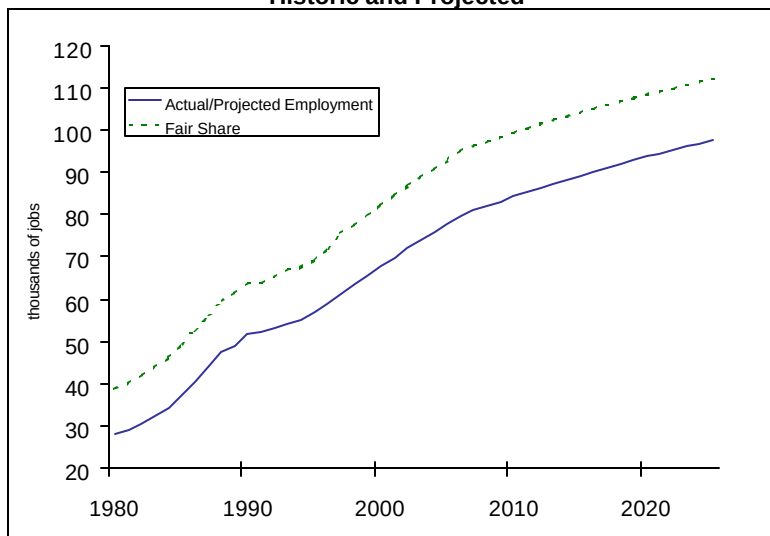


Source: Bureau of Labor Statistics

¹⁶ The impact area of the interchange for business attraction is most of the lower half of Bucks County, which is defined as stretching from Bensalem to the growing Newtown/Lower Makefield area. Together, this part of the county represents about 50% of the office-based employment in Bucks County.

Historically, Bucks County has lagged the rest of the region in attracting office-based employers. Figure 24 compares the past and projected future gap between actual and fair share employment in FIRE and Services for lower Bucks County.

**Figure 24: Actual vs. Fair Share of Office Employment
Historic and Projected**



Source: BLS, REMI

Once the shortfall of jobs in the F.I.R.E. and Services sectors was identified, the number of jobs per year that are needed in those sectors in order for Bucks County to "catch up" between 2010 and 2025 was calculated. While it is possible that Bucks County could completely close the office employment gap, a conservative estimate of the portion of the gap that will be closed because of greater access was taken to be 1/3. Thus, 1/3 of the number of jobs per year needed to catch up, for the years 2010 - 2025, was calculated. That amount is then reduced by one-half, representing the proportion of office sector employment found in the extended project impact area from Bensalem to Newtown. The direct employment gain for Bucks County as a result of the increased growth rate is calculated as an increase of approximately 115 jobs per year, evenly split between FIRE and services from 2010 through 2035.¹⁷ This would represent an annual increase in the net absorption¹⁸ of office space of about 25,000 square feet – which in 1999 would have represented about a 20% increase for Lower Bucks.

While the interchange makes a difference in improving *Lower Bucks County's* competitive position compared to other Philadelphia suburban office markets, it does not significantly improve *Greater Philadelphia's* competitive position against the rest of the country. As a result, it was estimated that only 10% of the new jobs located in Bucks County would come from outside the Greater Philadelphia region because of the lure of a more competitive market. It then follows that the remaining 90% of the increased employment in Bucks County in the FIRE and Services sectors projected to result from the interchange would come from the surrounding counties. REMI inputs for the six counties outside of the project area in the metropolitan region had to be calculated. This was done by taking 90% of the increase in jobs projected in Bucks County (discussed in the previous paragraph) and, for the rest of the region, multiplying it by that portion of the regional employment in these sectors and reducing growth in those counties by that amount. The rationale for this is that each county is likely to lose employment to lower Bucks County in these sectors at a level proportional to that area's original (1999) share of the region's employment in the sectors.

This is a conservative estimate of the potential impact of this project. This does not include any major shifts in the region's attractiveness for employment. Nor does it include any wild-card events -- for example the

¹⁷ As a percentage of the employment levels in 2025, the jobs added to services in that year are .04% of services employment and the jobs added to FIRE in that year represent 0.22% of FIRE employment.

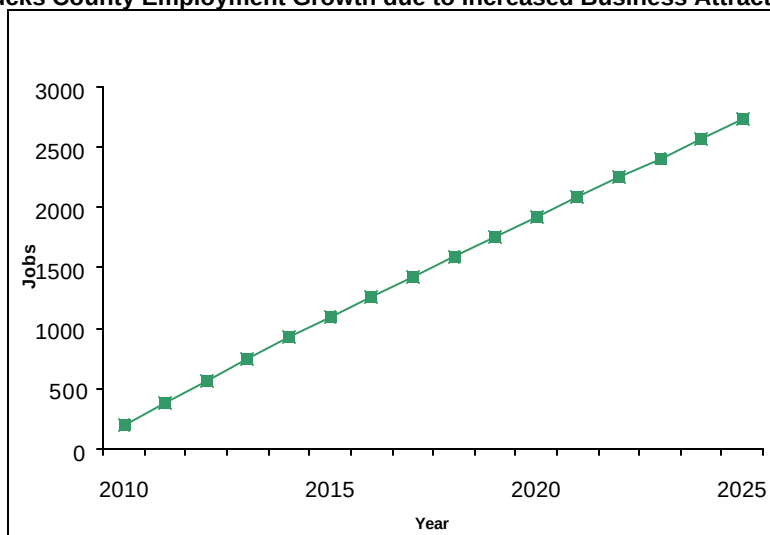
¹⁸ Absorption is the net amount of space newly leased versus that vacated during a year.

attraction of a major corporate campus or headquarters location. Finally, it does not increase employment in the manufacturing sectors, despite some new competitive advantages. If any of these were to break positively, it would be reasonable to expect that the employment projections would be much higher.

Employment Impact

The estimates for office sector growth in Bucks County show that just by capturing a slightly larger proportion of the region's office growth, Bucks County employment could grow by over 2700 jobs in 2025. 90% of the job growth will be in the services and finance industries, with 5% in retail jobs.

Figure 25: Bucks County Employment Growth due to Increased Business Attraction: 2010-2025



Source: PEL, EDGR, and REMI

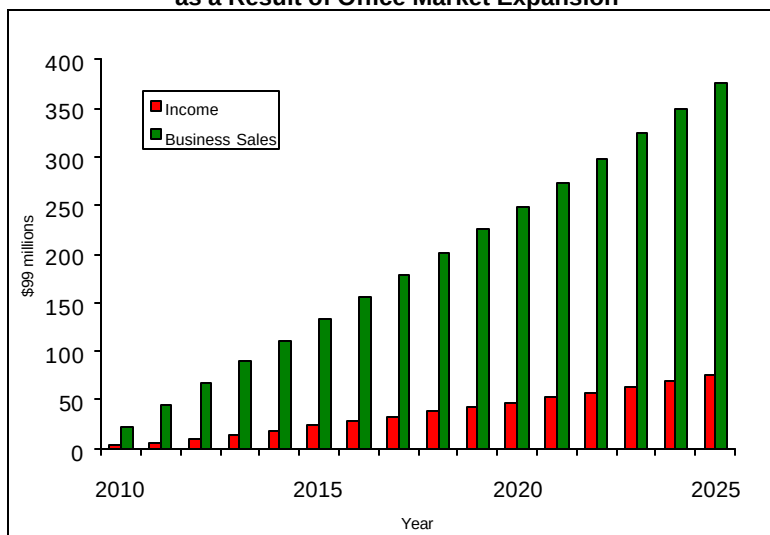
On a regional base, a much slower rate of growth is projected, as the interchange is a smaller factor in the *region's* attractiveness as an office location. Thus, the only new employment for the region as a result of the interchange is the relatively small proportion attracted from outside the region due to the interchange. As a result, the regional employment growth due to this project is much smaller.

Locally, while it is not possible to accurately project the total amount of new employment in Bensalem, Bristol, and Middletown Townships, it is reasonable to expect that a large majority of the new office-based employment will be located in the townships. In addition, local residents will have a dramatic increase in office-based employment opportunities close to their homes.

Business Sales and Personal Income

The increased business attractiveness in Bucks County will also mean an expansion of business sales and income, growing to nearly \$75 million in income and just over \$375 million in new business sales to the county by 2025.

Figure 26: Business Sales and Personal Income Changes in Bucks County as a Result of Office Market Expansion



Source: PEL, EDRG, and REMI

Increased Tourism Activity

The lack of a connection between the region's two major interstate highways has hampered Greater Philadelphia's development as a tourist destination. It has been relatively easy for potential visitors from the Northeast or Middle Atlantic areas to completely bypass the tourist attractions of the City of Philadelphia and Bucks County via the New Jersey Turnpike or Interstate 295. The new interchange should result in more opportunities to attract visitors to existing local tourist attractions like Washington's Crossing, Sesame Place, and Pennsbury Manor; new attractions like the Bucks County Tourism Center and the Saint Drexel shrine; and shopping attractions like Peddler's Village, the Neshaminy and Oxford Valley Malls, and one of the region's top visitor destinations, the Franklin Mills Mall. While the interchange is not the only factor in visitor decisions, providing a connection between the two routes will provide potential visitors with at least the option of traveling through Pennsylvania on their travels along the East Coast.

New Visitors to the Region -- With the improved interchange, PEL expects tourist visits to increase, primarily in the form of day-visitors.¹⁹ Taking just marketable visitors – those not coming for specific business reasons or to visit friends or relatives -- there are approximately 15 million day-visitors to the region annually.²⁰ Of those, about half go to the City of Philadelphia and the other half visit the Pennsylvania suburbs. Because of the new connection between I-95 and the Pennsylvania Turnpike, PEL projects that there will be a slow but steady increase in those day visitors, beginning at a one quarter of one percent increase after completion of the interchange, and continuing to increase by an additional one quarter of one percent per year through 2010, where the increase would stay steady at 1.5% annually, or an additional 225,000 day visitors to the region per year (or about 600 per day). The suburban growth should be more heavily weighted toward Bucks County, given the fact that the connection would draw people into and through Bucks County.

¹⁹ Day-visitors are those visitors who drive to regional attractions and do not stay overnight, either returning home or continuing on their trip to and from another destination point.

²⁰ Regional tourism figures come from the Greater Philadelphia Tourism Marketing Corporation's (GPTMC) Travel Year Research Results.

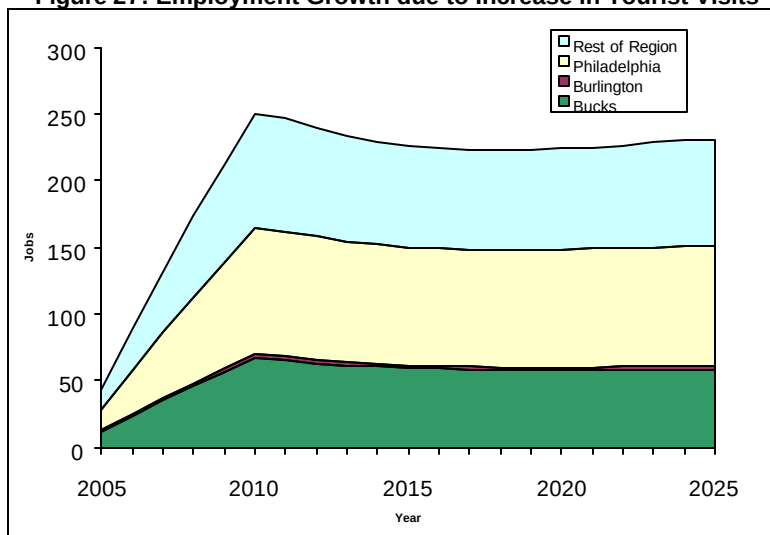
In addition, a number of those day-visitors will make future decisions to come back to the region and stay overnight. PEL expects that on average, 5% of the day visitors will return the following year and stay overnight, resulting in an increase of about 11,000 overnight visitors per year by 2010. Taken together, the ability of travelers to use the interchange between the Turnpike and I-95 will make it more attractive for travelers to utilize that interchange and access attractions in lower and central Bucks County. This can have the effect of enhancing tourism and increasing spending from outsiders who visit the area.

According to GPTMC, day-visitors spend an average of \$46 dollars per day at local restaurants, retailers and tourist destinations. If those visitors decide to stay overnight on a future trip, they spend close to \$200 dollars per visitor in the local economy. The dollars spent by visitors to the region translate into jobs for residents, and investments in hotel and retail facilities. Using those estimates, and transforming the spending into shares on retail, hotels, transportation, sightseeing and other activities, it is estimated that the additional tourism spending in Bucks County could be in the range of \$3.7 million/year, and regional spending would increase by almost \$13 million per year by 2025 as a result of increased visits due to the improved interchange.

Economic Impact of Increased Tourism Spending

The expected increase in visitor days translates into an increase of 230 new regional jobs by 2025 in the region, with over 50 in Bucks County. The visitor increase will also support \$12 million in regional business sales and nearly \$9 million in regional personal income.

Figure 27: Employment Growth due to Increase in Tourist Visits



Quality of Life

Potential Impacts

Finally, there are additional impacts for people that do not directly affect the flow of dollars, in terms of disposable household income or business profitability and competitiveness. These include:

- Changes in personal travel time
- Changes in government tax revenues
- Changes in residential property values
- Impact on health care costs and environmental quality

These factors may not necessarily change income or spending patterns, but they still affect the quality of life and hence make the region more or less attractive as a place to live. The value of these changes can have the same sort of effect on net “in-migration” of population as a change in relative housing prices or cost of living. Any

additional in-migration of people can directly affect the region's economy by also increasing total consumer spending.

Personal travel time savings

The interchange project results in reductions in travel time for non-work (shopping, recreation and personal) trips²¹, which is clearly a benefit for people, although it does not necessarily change the amount of money they have to spend. While there is no actual change in the flow of dollars in the economy, this time savings has a value to people equivalent to \$3.5 million in the opening year (2010), rising to \$24.5 million in 2025. (All values in constant 1999 dollars.) Of more importance, people will spend less time on the roads completing their normal every day activities if the interchange is constructed than if it is not built, resulting in intangible benefits that cannot be measured in an economic study.

Impact on Tax Revenues

From the governmental perspective, there is a great deal of concern as to how local governments would be able to replace any lost property tax revenues that would occur as the result of property condemnation and clearing to make way for new and expanded highway facilities. There was little local hope for replacing those revenues in communities already strapped for every tax dollar. However, as this project is a connection of two existing highways with significant right of ways allowing for expansion, the actual loss of property tax ratables is astonishingly small (see Figure 28). While not guaranteed, the likelihood is that increased investment in existing properties and new development tied to the connection of I-95 and the Turnpike will more than make up for the shortfall.

Figure 28: Assessed Value of Wholly Displaced Properties by Jurisdiction

MUNICIPALITY OR SCHOOL DISTRICT	TOTAL MARKET VALUE (1999)	TOTAL ASSESSED VALUE (1999)	MAXIMUM 1999 ASSESSED VALUE OF DISPLACEMENT FOR RIGHT OF WAY	MAXIMUM PERCENTAGE OF 1999 ASSESSED VALUE LOST
Bucks County	\$39,319,424,542	\$1,887,332,378	\$370,740	0.020%
Bensalem Twp. & SD	\$3,335,938,542	\$160,125,050	\$86,080	0.054%
Bristol Twp. & SD	\$2,434,936,979	\$116,876,975	\$259,370	0.222%
Middletown Twp.	\$2,880,976,979	\$138,286,895	\$25,300	0.018%
Neshaminy SD	\$4,295,686,146	\$206,192,935	\$25,300	0.012%
Burlington County	\$2,195,044,840	\$2,195,044,840	\$230,000	0.010%
Burlington Twp. & SD	\$971,194,559	\$971,194,559	\$230,000	0.024%

Source: KCI Technologies, County Boards of Assessment

The key to making up any lost revenue is to focus on doing those things locally which, combined with the new interchange, will make the area a prime business destination. The increases in assessed values that have been seen in West Conshohocken since the opening of the Blue Route clearly demonstrate the value of the interchange to local taxpayers.

**Figure 29: Changes in Assessed Value, 1987-1997
Lower Bucks County Jurisdictions, Conshohocken and West Conshohocken Boroughs**

	TOTAL ASSESSED VALUE OF REAL ESTATE			TOTAL MARKET VALUE OF REAL ESTATE		
	1987	1997	% Change	1987	1997	% Change
Conshohocken Borough	\$13,944,000	\$15,346,000	10.05%	\$114,849,000	\$284,185,000	147.44%
West Conshohocken Borough	\$3,946,000	\$9,145,000	131.75%	\$28,021,000	\$169,352,000	504.38%
Bensalem Township	\$134,209,000	\$138,209,000	2.98%	\$1,148,621,000	\$2,879,354,000	150.68%
Bristol Township	\$18,239,000	\$18,996,000	4.15%	\$132,748,000	\$395,750,000	198.12%
Middletown Township	\$102,855,000	\$117,269,000	14.01%	\$858,156,000	\$2,443,104,000	184.69%

Source: Local Government Statistics, PA DCED

²¹ Source: DVRPC traffic projections

Increasing the attractiveness of the local business community can increase the value of homes in a community by reducing the property tax burden borne by residents and shifting it to commercial taxpayers. The loss of commercial activity in Lower Bucks County has placed an additional strain on local homeowners, who are asked to help local governments and school districts keep up with nearby competitor communities and districts. Without a growing commercial base, any school funding increases are directly financed by residential property taxes. When a potential homebuyer considers that tax burden, it makes the home less attractive and even less valuable from a total cost of ownership perspective.

Impact on Residential Property Values

This project results in relatively few displacements as a result of the new interchange, toll plazas, road widening or new bridge. History shows that property values increase with increased access to highway interchanges, although they go down for properties abutting highways. In this case, however, the highways are already in place and most of the affected properties are already abutting them. As a result, the primary changes associated with the project would be positive effects since many local residents and businesses, including those closest to the interchange, would have improved accessibility as a result of new proximity to one or the other major interstates or reductions in local congestion. Other factors in property value changes include:

- **Design of the projects.** Design should be a key consideration of the project planning, and every effort should be made by local, state and federal officials to ensure that appropriate aesthetic sensitivity and mitigation of impacts are among the considerations in the design of the project.
- **Placement of sound barriers.** Studies indicate that each decibel of noise above a threshold of 50 to 55 dBA reduces the value of a home by 0.2% to 1.3%. According to the project engineers, however, the installation of sound barriers as a result of this project will result in **reduced** noise levels for all but a few properties in 2025 over current levels, despite an overall increase in traffic flow on I-95 and the Turnpike and additional lanes on the PA Turnpike. One important consideration when comparing the build and no-build scenarios for this project is that the sound barriers will only be constructed if the project is ultimately built. However, with the no-build scenario, highway noise will continue to increase on the interstates and local highways due to growing traffic levels.
- **Removal of traffic.** One of the difficulties in calculating the economic effect of localized pollution and noise impacts is that the focus is only on those properties in direct proximity to the project. Little attention is paid the potential benefits for other residents of the local community. In fact, the project shifts through-traffic off of local roadways and onto the interstate highway system, potentially reducing the build-up of congestion and traffic -- and the associated noise and pollution -- on many local roads.
- **Local property tax rates.** An increased commercial property tax base could lower the proportion of local property taxes that are paid by homeowners. In addition, it can help to diversify the tax base paying for schools and local government services, a key factor in evaluating the attractiveness of communities for residents.

Health care and environmental costs

Concerns have been expressed that increased pollution arising from the traffic flowing through the completed project area would result in increased health care problems, and therefore costs, for local residents. While a detailed economic analysis of environmental and health care costs was beyond the scope of this study, here are a few points to consider:

- **Health insurance premiums** are not determined by street address, and therefore localized impacts do not come into consideration. Some health care costs may actually be reduced by the project -- particularly those involving vehicle accidents. The reduction in time traveled due to the new interchange is likely to reduce traffic accidents and their associated health care costs.
- **Regional air quality** is determined by a wide range of factors, including ozone and other pollutants that are generated outside of the region and transported via air currents into the region. Research varies as to the economic value of the improvement in regional air quality that occurs as a result of improved traffic flow.

In addition, there is no specific regional data available for this project by itself. It is included as part of the Regional Transportation Improvement Program (TIP) prepared by DVRPC. The TIP, which includes the proposed interchange, is projected to improve regional air quality. While there are estimates of regional pollution changes, there is wide disparity in the economic value they represent. Available literature supports a possible value range of regional cost savings for the TIP of from as little as \$12,000 annually to over \$4 million annually from reduced Carbon Monoxide (CO) emissions; between \$38,000 and \$480,000 from reductions in Volatile Organic Compounds (VOC); and between \$18,000 and \$270,000 from reductions in Nitrogen Oxide (NO).^{22 23}

- **Local air quality.** The project team is required to perform a Microscale (“Hot Spot”) carbon monoxide (CO) analysis for areas along I-95 and the PA Turnpike in the project area to determine if localized concentrations increase over the 1-hour and 8-hour standards. These standards, which are conservative, health-based and established by the US Environmental Protection Agency (EPA), are not exceeded at any of the 22 air quality receptors modeled for the project.²⁴

In addition, the project team is not required to model the reduced CO levels along arterial roadways that experience less stop-and-go traffic because of the interchange construction. Thus, from an economic perspective, it is impossible to estimate the localized impacts, because of a lack of analysis related to those potential air quality improvements.

²² Delucci, Mark, “Summary of Non-monetary Externalities of Motor Vehicle Use”, Institute of Transportation Studies, University of California Davis, UCD-ITS-RR-96-3(9), 1998, p. 96. EDRG converted 1991 dollars to 1999 dollars.

²³ M.Q. Wang, D. J. Santini & S.A. Warinner, “Monetary Values of Air Pollutants in Various U.S. Regions”, *Transportation Research Record* 1475, 1995, pp. 33-41. EDRG calculations included converting 1989 dollars to 1999 dollars and converting tons to Kg.

²⁴ The noise and air studies cited here are based upon the 2020 traffic projections and are being re-run with the newer 2025 traffic projections.

VII. Local Opportunities

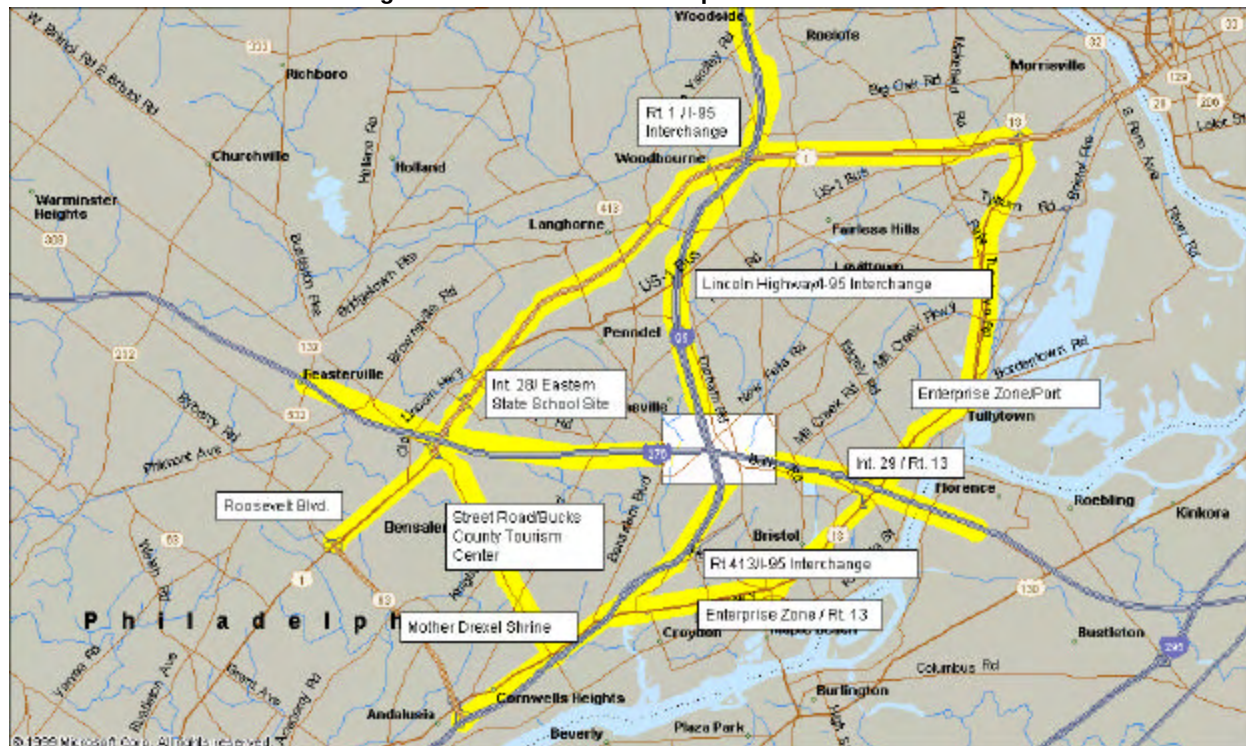
Connecting Communities to Economic Growth

The communities within the project area (Lower Bucks County, Burlington County, and Northeast Philadelphia) have faced significant challenges in making the transition from a manufacturing-based economy to today's New Economy of office-based professional and business services, just-in-time production and distribution, and technology-oriented research and development. In many ways, their success as manufacturing centers, reliant upon heavy transportation networks of railroads, deep-water ports, and connections to interstates left them relatively unprepared for the major shift in economic fortunes.

The result? In the mid 1980's to the early 1990's, these were communities without a lot of hope. On both sides of the river and across county borders, aging communities struggled to remake themselves and link to the broader forces affecting the regional and national economies. Faced with crumbling infrastructure, without the means or resources to improve their own lot, local officials were often left with vacant or underutilized properties, with little hope of renovation or revitalization.

Today, however, there are glimmers of hope. In Bucks County, strong governmental and business leadership has created a sense of opportunity. Bensalem took the lead in remaking and rethinking their infrastructure, leading the charge to rebuild and modernize Street Road and think comprehensively about how to broaden the base of their economy and take advantage of key strategic advantages. In Bristol Township, the long-awaited connection of Route 413 to I-95 from the north has been completed, providing a new doorway into Bristol Township complete with the promise and potential of a remade Route 413 South. The former USX site is now brimming with potential, complete with the highly successful Novolog port that is bringing new business into the community. The Bucks County Enterprise Zone is up and running, bringing promise and potential into once-distressed communities. Coupled with the leadership and energy of the Lower Bucks Chamber of Commerce, the Bucks County Economic Development Corporation, and the Bucks County Transportation Management Association, the community appears to have the civic and governmental resources available to pursue and attract new businesses. In Burlington County, the new connection of the New Jersey Turnpike to Route 130 has spurred massive development and redevelopment projects, and reinforced the area as a new market for commuter suburbs. And in Philadelphia, there is great interest and activity in re-thinking and re-imagining the Roosevelt Boulevard corridor from the Bucks County border to Woodhaven Road, including the hoped-for redevelopment of the Byberry Hospital site.

The connection of I-95 and the Turnpike could be the final piece of what will be one of the region's most advanced multi-modal transportation systems. The core will be the connection of two major interstate highways with the Route 1 expressway to form a high-speed triangle that, at worst, is competitive with the I-476/I-76/PA Turnpike Corridor in the western suburbs. The Lower Bucks County highway network is supplemented by an improving local network, with four-lane roads cutting through the core, serving local residents and businesses and also offering alternative routes during periods of construction, accidents, or major traffic tie-ups. Finally, these roads and the local markets are connected to the rest of the country (and the world) by rail (Amtrak and freight rail lines), port (the deepwater Novolog port) and even air (Northeast Philadelphia and Mercer County airports).

Figure 30: Lower Bucks Transportation Network

The changes in the market's competitive position present some very real opportunities for local communities. As was described in the previous chapter, the new highway interchange could help make the area become a more attractive location for service and finance-oriented firms, most typically occupying office buildings close to interstates and other highways in order to maximize their range for attracting employees and their connections to other office locations. In addition, the area's industrial properties near the interchanges should continue to see subtle changes, as facilities are built or redeveloped into flexible buildings that can serve the needs of a variety of tenants – industrial, distribution, or even back-office operations.

As the local economy grows as a result of increased attractiveness of the area, new opportunities and customers will be available for retail, restaurant and hotel operators, although they will also see new and increased competition. As a result, they will be forced to closely examine their business strategies, to ensure that they are well positioned to take best advantage of the changing local economy. Rather than serving the through traffic that might happen to stop at their store, they will have the opportunity to serve new business customers that will be working in their communities and local residents who have returned to the major local highways.

As is demonstrated in the case studies, new development is not guaranteed, and is highly dependent upon the actions and attitudes of local and regional governmental officials. However, given both the built (roads, rails, port, and buildings) and the organizational (local, county and state government economic development officials, the Enterprise Zone, the Lower Bucks Chamber of Commerce, the Transportation Management Association and others) infrastructure present, there is no reason for Lower Bucks County, Northeast Philadelphia, and Western Burlington County not to become preferred business locations in the Greater Philadelphia region. This is not an area starting from nothing, as is the case in building in greenfield locations. Nor is it a community that has plunged to the deepest depths, as was the case in West Conshohocken. Rather, it is an area that has been hampered by underinvestment and an image of decline. The interchange presents an opportunity to change those two factors, and allow the project area to capture its share of the suburban growth in the region.

Local Opportunities

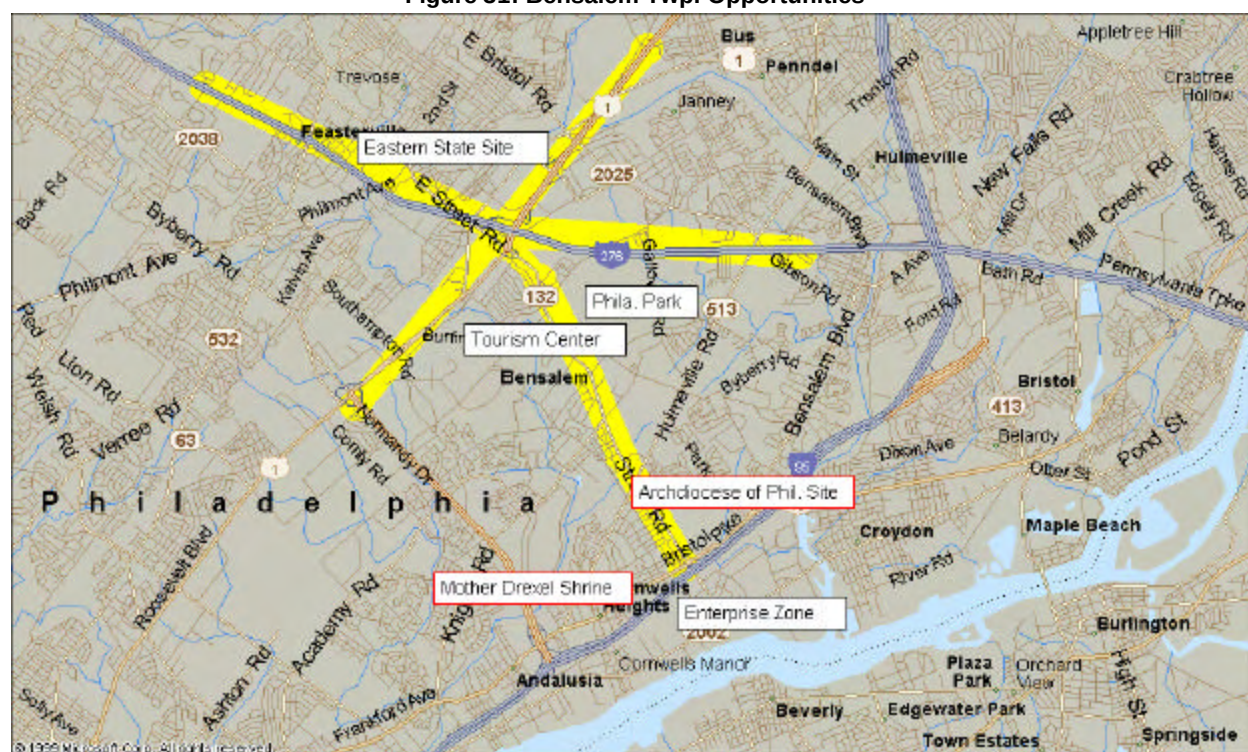
The expectations of new economic growth projected earlier are made very real by the opportunities for growth that are present throughout the project area and the extended region. The connection of the two highways present state and local officials, planners, and economic development leaders with an opportunity to plan and build a strategy that will create lasting value and quality within the region. As the case studies clearly demonstrate, it is up to local leaders to make things happen. Following are some specific examples of the types of growth that we are projecting through the modeling.

Bensalem Township

Bensalem Township has followed an aggressive strategy to make the township more attractive as a business location, hoping to broaden and diversify its tax base. The Township's strategy has been paying off, and investors are poised to position the area around Interchange 28 of the Pennsylvania Turnpike as an emerging edge city for the Philadelphia region. However, heavy traffic congestion and a confusing set of connections between the area's highways are combining to slow down the pace of development and have the potential to limit the scope, nature and quality of the proposals unless addressed.

In addition, Bensalem is positioning itself as a visitor destination, particularly along the Street Road corridor. There are high hopes that slot machines will be approved for Pennsylvania racetracks, increasing the potential drawing power of Philadelphia Park. In addition, the upcoming canonization of Mother Katherine Drexel will increase visits to her shrine at the Convent of the Blessed Sacrament. And, finally, the new Bucks County Visitor's Center will be located in the Philadelphia Park vicinity, with its expected lure for visitor traffic.

Figure 31: Bensalem Twp. Opportunities



Eastern State School Development Site

The interchange's prime economic development benefit for Bensalem comes from the removal of traffic and congestion from Interchange 28. By reducing the number of cars with no local business that are using the interchange, the planned mixed-use complex at the Eastern State School site being proposed by O'Neill Properties has the potential to be the centerpiece of a regional business center. The office complex will have the

potential to draw companies with employees from all parts of the region both to that location and to surrounding office properties

The site is made more competitive by the planned interchange for two reasons. First, it is imperative that the flow of vehicles through the slow-speed Interchange 28 be reduced, to both eliminate the current multi-mile backups at rush hours and to handle the expected increase in traffic due to the new development. Second, the widening of Route 1 that accompanies the project will remove the bottleneck that currently exists at the interchange location, allowing for better access and egress to the Neshaminy Mall and Eastern State sites, as well as Street Road.

The Eastern State development, if it meets its ambitious goals, has the potential to remake the image of Lower Bucks County as an office location. Currently, Lower Bucks office locations tend to be smaller sales or sub-offices of local firms, drawing upon a local employee base and the tax advantages of not being in the City of Philadelphia, rather than the area's attractiveness as a business location for any firm. Rents are lower, which means that the new developments must be slower or of lower quality in order to meet financial requirements. As a result, there are no major corporate campuses or headquarters locations, particularly when compared to activity in other Greater Philadelphia suburban office markets. The Eastern State project has the potential to change that, while also pushing the bar higher for the area in general. It will produce immediate dividends for Bensalem, perhaps pushing forward the plans for the Youth Development Center and Archdiocese of Philadelphia sites, along with existing projects along Street Road.

Increased business activity has repercussions for other industries, particularly the retail centers and hotels in that area. It can translate into new customers, filling hotels on weeknights, using meeting space, and patronizing restaurants and retail centers at weekday lunchtime. In addition, the increased attractiveness of the area as a business center can stimulate residential property demand as employees try to live closer to their work location. In a built environment like Lower Bucks County and Bensalem, that largely translates into increased real estate values for local properties.

Tourism hopes and plans

A recent Bucks County Courier article highlighted Bensalem's hopes and ambitions in increasing its role as a tourism destination. Utilizing the soon-to-be-built Bucks County Tourism Center on Street Road as an anchor, Bensalem expects to be a magnet for visitors. The key sites – a Philadelphia Park with slot machines (pending state approval), the shrine to the soon to be canonized Mother Drexel, and a revitalized waterfront. If the interchange can assist in making Bucks County a more attractive destination for visitors, Bensalem and its hotel market are well positioned to capitalize on that growth.

The Tourism Center is expected to be a jumping-off point for other Bucks County destinations, including those along the Delaware River (Washington Crossing, New Hope), Central Bucks (Doylestown and the Michener and Mercer Museums) and elsewhere in the county.

Bristol Township

Bristol Township has a long history as a working class bedroom community. Its residents have served as the foundation of the Lower Bucks industrial workforce, and its fortunes have closely tracked the success and downfall of those workers and their employers. Today, the township is focusing on utilizing the Bucks County Enterprise Zone designation as a tool to increase investment and interest in its existing industrial parks and properties. There is increased optimism since the opening of the new southbound I-95 ramp to Route 413, which has stimulated development and redevelopment in the Keystone Industrial Park. The next focal point for the township is the expansion of Route 413 south to Route 13, and potential redevelopment of that corridor.

Bristol Township is positioned as the focal point of the proposed interchange. The actual interchange ramps will be in Bristol Township, and the Route 413 exit from I-95 will be the first exit to the south of the proposed interchange. The Township benefits in a number of ways. First, the connection increases the value of the new 413 ramp, by adding new east-west Turnpike access to the improved southbound access from I-95. Next, the

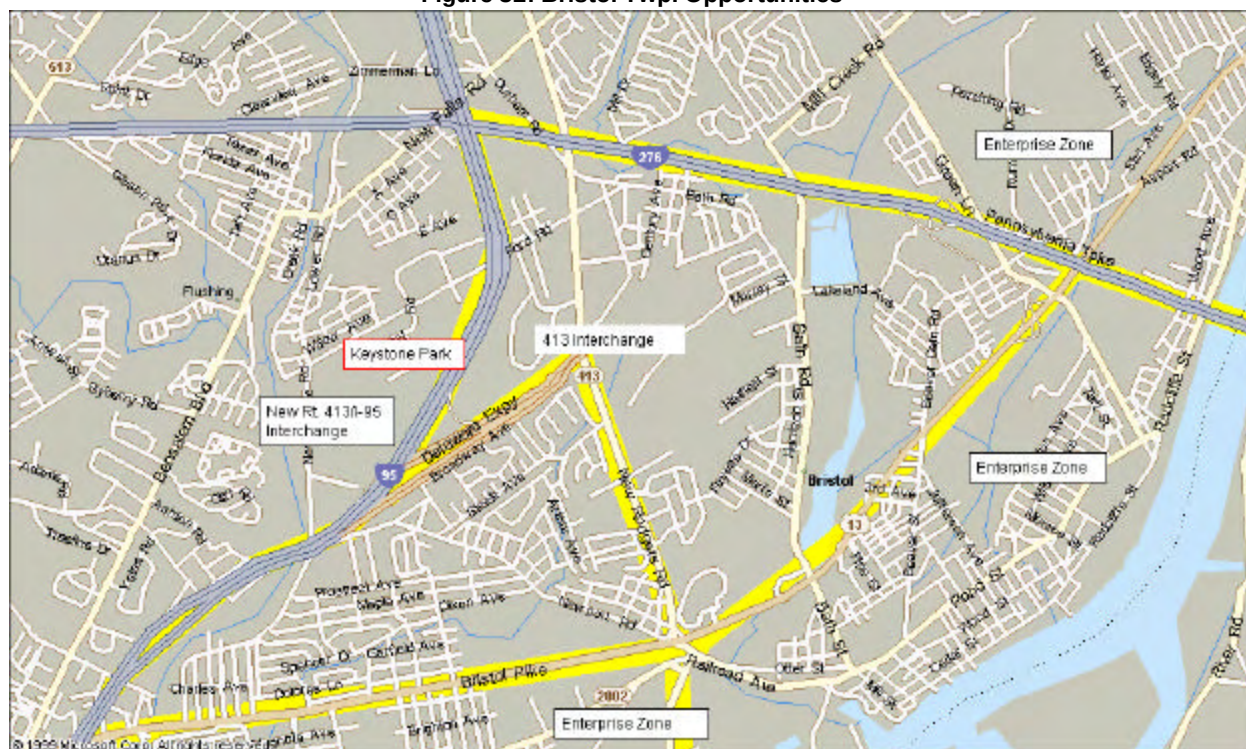
interchange is projected to reduce traffic growth on key local roads, reducing local congestion and increasing the area's attractiveness and capacity for business development. Bristol's residents will now have greater connections to job opportunities throughout the region via the newly improved highway links available from the interchange.

Focus on the Enterprise Zone and Industrial Properties

The proposed connection of I-95 and the Pennsylvania Turnpike will provide new and improved access to the Bucks County Enterprise Zone via both Route 413 and Route 13. From the 413 exit ramp at I-95, there will now be improved access to markets to the East and West via the Pennsylvania Turnpike. From Route 13, there will be a number of improvements. First, traffic will be reduced through Interchange 29 of the Turnpike, increasing travel speed for businesses using that interchange. The improvement will be evident in the reduction of through car and truck traffic currently utilizing Route 13 as a connection between the Turnpike and I-95. Removing unnecessary traffic from both 13 and 413 will increase the efficiency of the roadways for local business and residential traffic. With planned improvements for both roads in the works, there is a real opportunity to completely remake the image of Bristol Township.

What will this mean? While the new interchange does not open up or create new land for development, it will open up new possibilities for existing buildings or underutilized properties. Older warehouses and industrial facilities will have new potential for redevelopment as flex space, usable by either office or light industrial users. Existing properties will have increased value, with increased demand for locations at the center of Bucks County's multi-modal transportation network. Key locations will be located closest to the Turnpike and I-95 entrances, but with the improved local road network the entire area's competitiveness will be improved.

Figure 32: Bristol Twp. Opportunities



The 413 Corridor

Bristol Township is currently debating the future of the Route 413 corridor between the new I-95 exit ramp and Route 13. PennDOT will be expanding the highway to a four-lane highway with center turning lanes, causing local officials to consider how the improved highway can remake the image of Bristol Township's commercial

gateway. Whether the area is redesignated as a town center or overlay zoning is applied allowing for expanded uses, the new interchange between the Turnpike and I-95 will enhance the marketability of that area for a variety of uses. The I-95/Route 413 exit will be positioned as the first southbound exit from the newly connected I-95 and the PA Turnpike, providing the township with an opportunity to significantly upgrade the image of this corridor. The increased value of those properties are likely to result in new uses, with older and outdated properties being replaced by enterprises looking to take advantage of the community's new image.

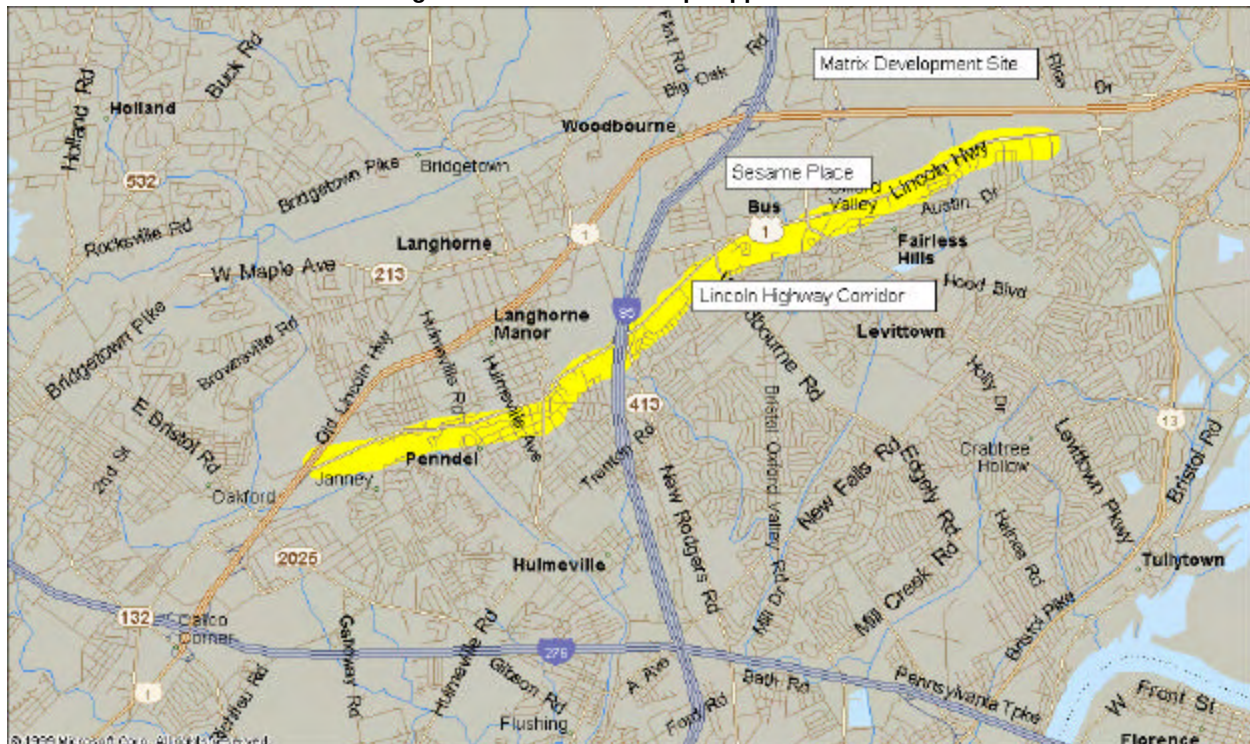
Middletown Township

Befitting its name, Middletown Township has been at the center of economic activity in Lower Bucks County. Spreading from borders with Bristol Township at one end and Newtown Township at the other, Middletown has been a bridge between the old and new Bucks County economies. Befitting that central role, Middletown has served as a collector location, attracting and accumulating the Bucks County region's largest concentration of retail development and car dealers, supplemented by small office sites and the Sesame Place amusement park. Middletown has thrived because of its location, utilizing its Route 1 and I-95 connections to allow it access to a broad base of potential customers and workers.

Yet in recent years, there have been signs that Middletown must begin to consider the future of its major commercial corridor, Business Route 1. As the Newtown/Yardley area has grown, new retail development has begun to drift in that direction. The major new strip and big-box developments in Falls and Lower Makefield Townships along Oxford Valley Road are in direct competition with older Middletown retail centers, and vacancies in the Township's major strip and shopping centers have increased as the competition has grown.

At the same time, the retail car business is changing rapidly, with the Internet driving significant changes in how cars are marketed and sold. Middletown's position as a center for car retailing should remain strong, but the nature of the automobile industry is likely to change significantly. When Auto Nation pulled out of its proposed development on Business Route 1, it left a major gap that was formerly filled by car lots and is now uncertain.

Figure 33: Middletown Twp. Opportunities



Diversification of Market and Rethinking the Lincoln Highway Corridor

Business Route 1 will be positioned as the closest interchange to the north of the proposed connection of I-95 and the PA Turnpike. There is an opportunity to look carefully at the corridor, and craft a strategy and vision for its future as a major entranceway to the Township. With the uncertainty surrounding Middletown's dominant retail industry, the additional market access provided by the location of the I-95/PA Turnpike interchange two miles to the south, there is an opportunity to both stabilize the existing retail market and to reposition the Business Route 1 Corridor. Opportunities for diversification of the Middletown commercial mix are presented, particularly if the Lower Bucks area sees growth in its office and tourism markets. The long-term future of the Middletown market, with the expanded highway access, proximity as the centerpoint between the future growth projected at Bensalem and the ongoing growth in Newtown/Yardley, and the existing retail and entertainment elements in Oxford Valley, should suggest an increased office presence in the long term and more immediate opportunities in potential hotel developments. A model of local activity to consider here has been the revitalization and market repositioning currently ongoing in the Plymouth meeting area due to the activity generated by the Blue Route and the Turnpike. Plymouth Meeting's aging retail and office base is being remade due to the increased demand for property and space in that part of the region, and that development activity is now spreading to long-dormant vacant and former industrial sites.

Other Project-Area Opportunities

Newtown/Yardley/Lower Makefield area

The Newtown/Yardley/Lower Makefield area, centered at the intersection of Route 332 and I-95 (Exit 30), has become a hot office and research market, exemplified by the location of the Lockheed Martin campus. With its proximity to the Princeton Corridor and the growth of the high-end residential communities in the Central Bucks area, this market is well positioned for continued office and research growth. The new interchange between I-95 and the Turnpike only helps this market. The new interchange provides a direct, toll-free connection to the Central New Jersey markets via the Turnpike. It also provides an alternative to the Route 1 Expressway as a means for accessing the Pa. Turnpike; and increased access to a broader pool of workers who might not be able to afford the housing in the Newtown area. The growth of this market remains important to the future of the Lower Bucks market as well; real estate observers noted that the market needs multiple hot spots to help encourage development throughout all of Lower Bucks County.

Rest of Lower Bucks

Clearly, many of the same benefits that will flow to Bensalem, Bristol, and Middletown Townships will be seen to varying degrees in adjacent and nearby Lower Bucks communities. Some key opportunities should include:

- Access to an improved Interchange 29 and reductions in the growth of traffic of Route 13 should increase the potential for the commercial redevelopment of the languishing Levittown Shopping Center (a model is the redevelopment of the Willingboro Shopping Center as a pharmaceutical distribution center, taking advantage of new connections via Route 130 and the NJ Turnpike extension);
- Business growth in the Enterprise Zone should assist the continued redevelopment of the Bristol waterfront;
- The completion of an integrated transportation system and removal of through traffic from Route 13 should result in improved competitiveness for the Novolog Port operations, as well as the rest of the Enterprise Zone and USX properties in Falls Township.

Burlington County

In Burlington County, the value of improved connections and direct connections to Interstate highways is already in evidence. The recent opening of a new interchange between the New Jersey Turnpike and Route 130 has spurred massive investment and development of warehouse and distribution facilities in the immediate area. The County has also become a center of residential development and investment, due to its access to the NJ

Turnpike (and its connection to the Pennsylvania Turnpike) and I-295. Burlington County's position as a center of activity is enhanced by the new interchange, as there will now be a direct interstate connection between Burlington County and I-95 north and south.

Philadelphia

The City of Philadelphia stands to benefit in a number of ways from this project:

- Eliminating the automatic bypass of the Philadelphia region for North-South travelers, increases the City's tourism potential, particularly for day visitors;
- Improved access to the New Jersey and western suburb markets via interstate connections for the I-95/Woodhaven Road exit area will help both the retail and office/industrial complexes located in that area;
- The redevelopment of the Roosevelt Boulevard corridor, and the future of the Byberry Hospital site will be enhanced by the significant speed improvement on Rte. 1 from Woodhaven to the Turnpike (20% improvement in speed)
- The new interchange might also present an opportunity to better utilize the new Cornwells Heights Park and Ride lot on I-95. With Amtrak's new Acela high-speed service, this lot could serve as an important suburban Philadelphia stop. The I-95/ PA Turnpike interchange will allow potential users from the northern and western suburbs direct access to this station.

VIII. Concluding Comments

PEL's role in this project was to provide analysis of the economic potential of the proposed interchange between I-95 and the Pennsylvania Turnpike without taking a position on whether the project should happen or not. That required looking far into the future, both in the build and no-build scenarios, and attempting to understand the implications for the region and the project area in either case. Too often, projects like these are judged purely on the immediate impact, with little consideration of how local and regional economies change over time, changes in transportation patterns and usage, and the influence of local officials to direct and encourage change. If this project is built, there is an opportunity for Lower Bucks County and its neighboring counties to plan for and adjust to a changed transportation system. Some actions that could enhance or support economic growth include:

Need for effective planning and zoning -- While the improved access that connecting I-95 and the Pennsylvania Turnpike is likely to provide can improve the competitiveness of local communities in the project area, there is a need for effective planning and zoning in order to best take advantage of potential opportunities. In the case studies, it was clear that forward-thinking communities were better able to utilize new interchanges to improve their local economies. And those that worked best, planned for tomorrow's economy, not yesterday's. The New Economy values connections, talent, and flexibility. Any strategies should take these into consideration, and also look at broader economic trends in the office, retail, hospitality and industrial sectors.

Opportunities for cooperative marketing -- The build up to construction offers an opportunity to develop joint economic development marketing and planning strategies, touting and marketing the transportation and market access connections of the area. Examples in other areas demonstrated that connections between highways can connect local markets and growth can radiate from key points within the network to adjacent markets.

Build on organizational strengths -- Lower Bucks County has a wealth of business and transportation organizations, and there is an opportunity to utilize these existing organizations to reduce potential negative project impacts and to maximize project benefits. This could include the Bucks County Transportation Management Association working with the construction managers, local and state government officials and employers to minimize the impacts of road closings and detours during the construction period. Or it could mean the Enterprise Zone officials crafting a strategy similar to that devised for the Kvaerner shipyard to increase the number of local contractors being aware of and bidding competitively on pieces of the construction project.

Anti-sprawl implications -- Many highway projects are criticized because they are believed to be major factors in creating the conditions that encourage suburban sprawl -- leading people and businesses away from established communities and planting them in greenfields far from urban neighborhoods. This project could have the reverse effect. Not only would it direct resources and investment into established communities, making them more competitive, it would do so at a time when many suburban communities are putting limits on the amount of growth they will accept. There are potential state government incentives available that could help the Lower Bucks County communities maximize the benefits of the infrastructure investment in the community. By working together, the Lower Bucks County communities could have an opportunity to capture a greater share of the region's employment and business growth and redirect it into the built infrastructure of established communities, rather than pushing the edges of the region further and further outward.

More help needed -- Advocate for additional transportation improvements that could be moving along parallel tracks with the interchange construction. Local road improvements, combined with better regional connections, would likely increase the economic development benefits described in this report. There was some concern raised, particularly among local government officials, that no matter what the traffic benefits from the new interchange, that it would still not address the primary traffic choke points in the Lower Bucks region. In

particular, it was felt that major improvements were needed at the following locations in order to encourage business growth and attraction:

- Interchange 28 of the Pennsylvania Turnpike (including the connections to the Route 1 Expressway and Street Road);
- Exit 25 of I-95 at Street Road;
- Route 13 (upgrade and modernize highway);
- Route 413 south of the I-95 exit ramp.

Some are in the process of being addressed – the Route 413 widening, I-95/Street Road interchange redesign and Route 13 signal upgrades are all in design or pre-construction by PennDOT-- and others are under consideration. Improvements are clearly needed at both ends of Street Road (I-95 and the Turnpike), at the Turnpike Interchange 28, and on I-95 north of Route 1. Further reduction in traffic flowing through the Turnpike Interchanges (perhaps through localized slip-ramps and increased use of electronic toll collection) will help to ensure a bright future for the Eastern State School site. These are all separate projects from the interchange project, and come from different funding pools. But if Lower Bucks is going to build an economy based upon its connections, it needs to ensure that those connections are as effective as possible in order to fully maximize the benefits of the new interchange.

Appendix 1: Case Studies of Interchange Connections

The outcomes of an interchange between Interstate 95 and the Pennsylvania Turnpike are difficult to predict without comparing the current project to historical examples elsewhere. Therefore, PEL and EDRG selected several case studies to offer insight into the potential impacts of the project. They include four areas outside Greater Philadelphia and Pennsylvania, and three within the Philadelphia region:

Each of these major highway interchanges had varying impacts on their surrounding communities. Some were clearly essential in turning around distressed areas and encouraging economic growth. Others did little to stimulate growth and revive a struggling economy, and some had a mix of significant positive and negative impacts.

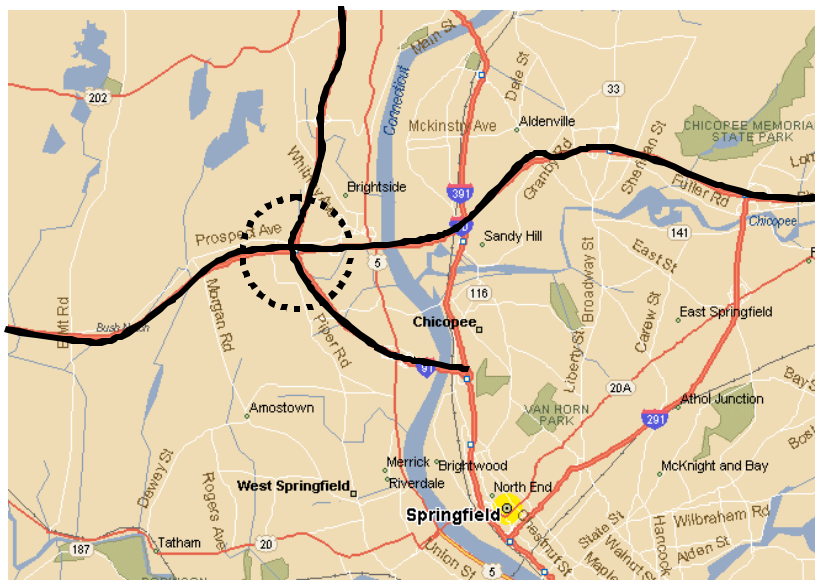
No two situations are ever identical. There are, however, important lessons to be learned from the experiences of communities elsewhere with major highway infrastructure projects. In general, the following was found:

- Interchanges between two highways most notably have an effect on an area's access to nearby business and commercial markets. Likewise, the area around a new interchange is more readily accessible from other regional markets. Improved accessibility can generate development pressures; natural and other land use limitations, as well as zoning regulations, can channel where and if such development occurs.
- The effects of an interchange on an industrial area can vary. Such areas often remain industrialized, as in parts of Houston, and opportunities for warehousing and distribution can be increased. In cases where there is a strong demand for space in nearby communities, such as in the case of Plymouth Meeting, old industrial sites are often re-developed for commercial and office use.
- Areas that are distressed will not necessarily experience an economic upswing as a result of an interchange. Some interchanges give developers a reason to build heavily in the area. Others have no effect on economic growth in struggling areas.
- The design of an interchange itself can have important implications for development potential in its vicinity. Sites adjacent to an interchange may suffer from aesthetic harm caused by a particularly large or poorly located interchange.

None of these examples is an exact replica of the situation in the project area. Some, however, share important characteristics with the current project, while others differ from it in equally important ways. For instance, the case of Conshohocken was selected in part because of the existence of an Enterprise Zone – a business incentive also in place in Lower Bucks. The experience in Houston, by contrast, demonstrates the implications for development in the absence of zoning regulations. The accounts that follow offer insight into several possible outcomes of the proposed interchange between I-95 and the Turnpike.

National Case Studies

Interchange between Interstate 91 and the Massachusetts Turnpike (Interstate 90) – Springfield, Massachusetts

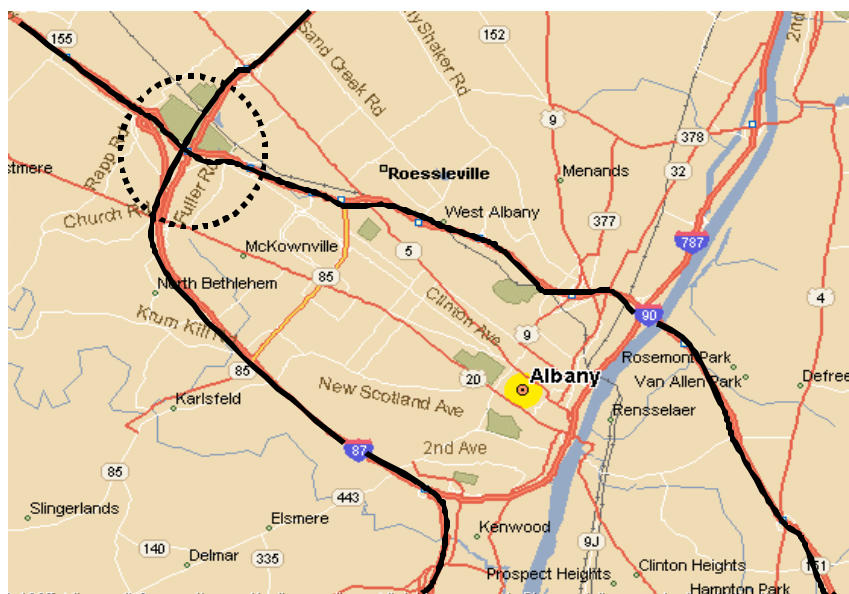


The connection between the Massachusetts Turnpike (east-west route) and I-91 (north-south route) is located in West Springfield, MA, near the Holyoke border. The Turnpike was built in the late 1950s-early 1960s. Interstate 91 was built in the late 1960s. There is actually no direct interchange between the Turnpike and I-91. Rather, the Turnpike exit puts the traveler onto a limited access connector road that goes for approximately one-half mile between the Turnpike and I-91. Prior to the construction of I-91, Route 5 (Riverdale Road) was the major north-south road in this area. Riverdale Road remains an active commercial road, and is easily accessed directly from the I-91, Exit 14 interchange.

Because of the limited access nature of the connector road, there is no major development directly along it. The mega-regional Holyoke Mall is located at Exit 15 off I-91, which is the first exit north of the Turnpike connector (Exit 14). The mall was built in the late 1970s, has expanded once, and has plans for a second expansion. It was clearly located at its current site because of direct freeway access to the area. The mall can now be accessed from I-90 via I-91 at its own exit (I-91, Exit 15) or from Riverdale Road (via I-91, Exit 14).

Overall, it appears that freeway access and market growth has driven development in this area. The local interchange with I-91 is the major source of access to the mall. While the Turnpike connector road was not the key motivation for the mall location, and there is no sign about the mall on the Turnpike, there is no doubt that this connection expands access to these and other businesses along the north-south I-91 corridor from points east and west. Planners also consider this connection to be important for future planned office / industrial development. In addition, the connection is undoubtedly important to continued commercial development along Riverdale Road south of I-90, which has direct access from I-90 at the interchange with I-91, and also has access from I-91 south of the Turnpike.

Interchange between New York State Thruway and Interstate 87 (The Northway) – Albany, New York



This interchange and associated access ramps are located within the City of Albany, NY, northwest of the central business district. The New York State Thruway was constructed as a toll facility prior to the establishment of the toll-free Interstate system. The original uptown interchange (Exit 24), which opened in the mid-1950s, connected to the Washington Avenue, a major commercial thoroughfare. When the first section of the Adirondack Northway (I-87) opened in 1960, a new interchange was constructed at this location to connect the Thruway with the Northway. The interchange was reconfigured in the mid-1980s.

The Thruway / I-87 interchange was constructed in an area then characterized by mixed uses. There are several conservation lands and parks near the interchange (north and west). A large municipal golf course (now the site of the State University campus) was located directly east of the interchange. Washington Street and Fuller Road housed a mix of commercial uses. Several large vacant, developable parcels were located to the south, west and east. The Albany County Airport, located several miles north of the interchange, was accessible from the site.

The interchange has influenced some of the land uses within several miles of its location. Most notably, Crossgates Mall is located directly southwest of the interchange. This super-regional shopping center opened circa 1980. The mall was named “Crossgates” because it is located at the Crossgates of the city – the interchange between I-87 and the Thruway. It is unlikely that the mall would have located at this site without the access provided by the interchange (as well as the availability of a large, undeveloped parcel of land). The mall advertises that one can come from Buffalo, Montreal, New York City, and Boston without hitting a traffic light until arriving at the mall. This mall has expanded since it was first constructed.

Colonie Center shopping mall is located one exit north on I-87, and is also accessible from the Thruway / I-87 interchange via local roads. This is another regional shopping center (although it has been superseded in importance by Crossgates). This mall also developed because of its proximity to the interstate. There is substantial commercial development along the local roads between the malls, including retail and office uses. Much of this development has occurred during the past forty years, since construction of the interchange and Interstate system.

One of the access roads leading to the interchange is characterized by warehousing facilities. Planners surmise that these businesses chose this spot because of proximity to the interchange and the highway network. Several hotels are located along Washington Avenue, which runs parallel to the Thruway in this area. The hotel owners have pressured the city to allow large signs (not in keeping with the zoning code) that could be read from the

Thruway. This interest in large signs visible from the highway suggests that these hotels believe that visibility from the Thruway and proximity to the interchange is a location advantage that will help them market their facilities. To date, the city has not allowed these signs.

The interchange is located in close proximity to the State University campus and a complex of state office buildings, and the Albany County Airport is located about five to ten miles from the interchange. These trip generators, as well as the commercial development and malls, all benefit from proximity to the interstate system and the major interchanges that serve them. However, the presence of the interchange was not considered instrumental in the decision of where to site the university, state office park, or airport.

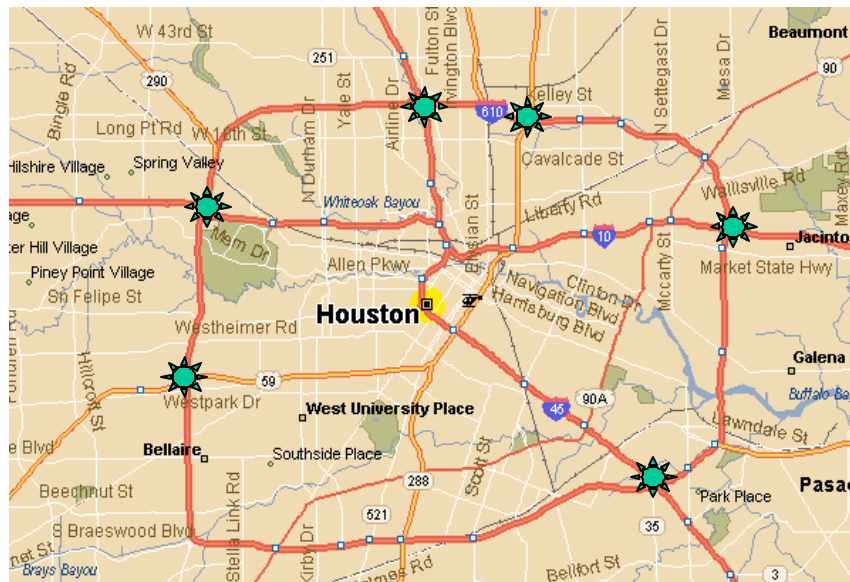
The extent of the land use impacts of this interchange has been tempered by several factors. First, there are several areas of sensitive environmental lands in close proximity to the interchange. Cook Park (city-owned) and Rensselaer Lake are located directly northwest of the interchange. The Pine Bush Preserve, a state natural area, occupies several hundred acres north and west of the site. These areas are all conservation lands that cannot be developed. Moreover, the City landfill is located just northwest of the interchange, and represents another large parcel of undevelopable land.

The City of Albany has not marketed this area aggressively. No changes have been made to land use policies in an effort to encourage development in close proximity to this interchange. Redevelopment efforts in the City are focused on the downtown area.

Conclusions from Springfield and Albany Case Studies

- Without an effective marketing campaign, an interchange is not enough to spur development.
- Major facilities, such as airports, government facilities, or recreation areas can limit the development opportunities that might otherwise be spurred by a new interchange.
- Adjacent access roads can become prime business locations, trading on proximity to the new interchange or connected highways.

Interchanges with the Sam Houston Toll Road – Houston, Texas



The Sam Houston Toll Road (SHTR) is a limited-access toll facility that forms a ring road around the City of Houston. It intersects with I-10 on both the east and west sides of the city, I-45 on both the north and south sides of the city, and US 59 on both the north and south sides of the city. All of the interchanges with these interstates and the toll road have been built since 1986.

Houston is a city of approximately 1.7 million people that encompasses 539.9 square miles. Much of its growth has occurred in the past twenty-five years, and it is characterized by a pattern of low-density sprawl. Houston does not have zoning; therefore, it is difficult for the city to direct growth through land use regulations.

Interstate 10 / SHTR – Interchange at East Side of the City

Interstate 10 intersects with the SHTR on both the east and west sides of the City of Houston. Prior to construction of the interchange on the city's east side, the location of the interchange was an area characterized by warehousing and industrial land uses.

The area in the vicinity of the I-10 / SHTR interchange on the east side of the city has not experienced notable new development since construction of the interchange. The area continues to be characterized by warehousing and industrial land uses, which likely utilize the interchange. The city and economic development associations have not focused any efforts on development of this area.

Interstate 10 / SHTR – Interchange at West Side of the City

Prior to construction of the interchange on the city's west side, the location of the interchange was characterized as a commercial area. Several strip malls, car dealerships, and office buildings were located immediately adjacent to the site where the interchange was subsequently built. This type of mixed commercial, auto-oriented land use is typical of the land uses on the west side of the city. Development is not dense, and development parcels were available within a several mile radius of the interchange, and accessible from the interchange via local and arterial roads.

The interchange between I-10 and the SHTR on the west side of the city was completed in 1986. Land uses around the interchange, which is located 10 miles from the central business district, remain primarily commercial. Frontage roads serve all the land around the interchange. The commercial area located in the southeast quadrant of the interchange, which includes retail shops, a theater, and other commercial uses, has grown substantially since construction of the interchange, and is thriving. The Katy Mills mall (a major regional mall) opened on October 28, 1999, about three miles from the interchange. The city believes the proximity of the interchange contributed to the site location for this mall.

In contrast to the positive impacts on commercial land uses described for the above-mentioned sites, a small commercial strip mall located in the southwest quadrant of the interchange closed soon after the interchange was constructed. City planners think that the multi-story concrete interchange created an uninviting environment for this strip mall, located immediately adjacent to, and in the shadow of, the interchange.

Interstate 45 / SHTR – North Side of the City

Interstate 45 intersects with the SHTR on both the north and south sides of the City of Houston. The interchange on the north side of the city is located within several miles of the Houston airport. Prior to construction of the interchange, land uses in that area were characterized by auto-oriented commercial uses, including strip malls, car dealerships, and low density office.

The interchange between I-45 and the SHTR on the north side of Houston is surrounded by commercial uses similar to those found near I-10 west. A strip mall, several car dealerships, and several offices are also located in close proximity to the interchange, and these uses are thriving. One of the car dealerships was located in the area prior to construction of the interchange, while another has opened since the interchange was built. The city credits the success of these commercial uses to improvements to the major thoroughfares serving these uses.

One small shopping mall experienced substantial decline after the interchange opened, and, despite efforts by a local business association to foster business growth there and elsewhere in North Houston, it remains only one-third occupied. The interchanges and connecting bridges overshadow this mall.

Interstate 45 / SHTR – South Side of the City

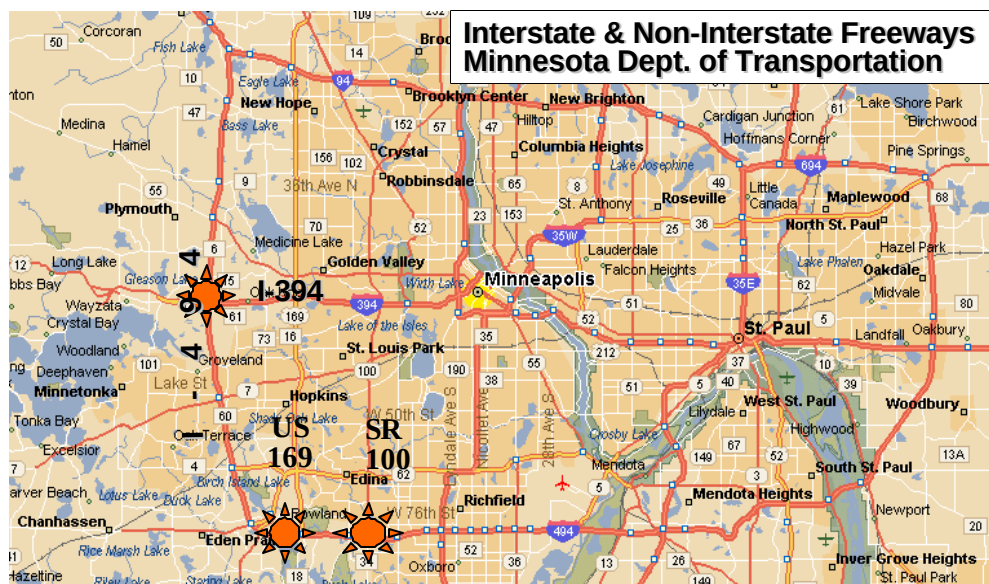
Prior to construction of the interchange on the city's south side, the area in the vicinity of the interchange between I-45 and the SHTR south of the city was characterized by limited commercial development.

On the south side of Houston, the I-45 / SHTR interchange is located in a warehousing area. Several office buildings in the vicinity of the interchange have been converted to warehouse facilities within the last decade. There has not been significant change in land uses since the interchange was constructed in 1996.

Conclusions from Houston Examples

- Planners in Houston do not believe the interchanges and access ramps have had significant impacts on land uses, but instead believe the interchanges and ramps support the continuation and growth of established commercial development patterns.
- The interchanges do appear to have influenced the siting of at least one major regional mall. There is some feeling that some retail uses directly adjacent to the interchange may suffer because the interchanges are large, unattractive structures that creates shadows and a generally unpleasant environment.
- Because there is no zoning, the city has no ability to impact development patterns.
- Houston Metro has located park and ride lots at each of these interchanges, but these do not seem to impact surrounding land uses.

Interchanges with Interstate 494 – Bloomington, Minnesota



The City of Bloomington, MN is located eight miles south of downtown Minneapolis. The city has a population of 86,000, while the population of the metropolitan area is 2.7 million. Bloomington is a community of above-average income levels.

I-494 goes around the south and west of Minneapolis, and together with I-694 forms part of a ring road around the Twin Cities. I-494 was built in the 1960s. At the time of its construction, interchanges were built with both State Route 100 and US 169, which are the two case study sites. The interchange with US 169 is currently undergoing reconstruction. Major improvements are also planned for the SR 100 interchange, including the addition of a lane on SR 100 and construction of a new bridge over I-494. New interchanges were also built in 1991 at the intersections of I-494 with State Trunk Highway 77 and 24th Avenue. Those interchanges were built specifically to serve the Mall of America.

I-494 / US 169 Interchange

The area in the vicinity of the I-494 / US 169 interchange was developed prior to construction of the interchange. Land uses are somewhat constrained by natural features – there are several lakes within a short distance of the interchange. A large golf course has been in the northeast quadrant of the interchange for many decades. Training fields and offices of the Minnesota Vikings football organization occupy the northwest quadrant. (Its training facilities, playing fields, and headquarters predate the interchange as they have been located here since the team came to Minneapolis.) In the southwest quadrant, older single family homes oriented toward Anderson Lake also predate the construction of the interchange. An elderly housing campus (including townhouses, assisted living units and nursing home facilities) is located in the southeast quadrant, and has been there for several decades. Single family housing dominates the land uses within one to two miles south of the interchange. There also are several hundred acres of parkland south of I-494 in the vicinity of this interchange.

The US 169 interchange was built when Interstate 494 was constructed. No notable change in mix of land uses has occurred since its construction, although some are anticipated. The interchange currently is being reconstructed and upgraded to better accommodate traffic on I-494 and the six-lane SR 169. The golf course and Vikings training facilities are both large, stable land uses that significantly limit new development opportunities north of the interchange.

Lakes and parkland to the south limit land use options south of the interchange. The elderly housing campus in the southeast quadrant has expanded in recent years. The degree to which its expansion is due to the interchange is unclear, although access to the site from throughout the metropolitan area is important to residents of the facility and their families, so in that sense it was a positive factor for the expansion decision.

The interchange (especially with the new design to accommodate more traffic) has had an impact on the single-family residential neighborhood in the southwest quadrant. The city does not believe this area is a good location for residential uses, and many of the residents of the neighborhood have expressed concern about the negative impacts of the interchange on their community. A private sector developer is interested in redeveloping this area as an office park. The developer believes the combination of the location near the interchange and on the lake is ideal for an office park. The city agrees that office would be a better use for this site, but is not taking steps to redevelop the area. The city plans to let the residents take the lead on any redevelopment initiative, but has expressed a willingness to help land owners who would be displaced by such a redevelopment. The city does not expect this land use change to occur for at least ten years, due to the sensitivity involved with relocating residential uses.

I-494 / SR 100 Interchange

The area between the SR 100 interchange and the France Avenue interchange to the east was historically a commercial / industrial corridor. All of the land in the corridor was developed for office or manufacturing uses prior to construction of the SR 100 interchange. Single family residential neighborhoods have characterized the area south of the interchange for decades. There are several parks and playgrounds south of I-494 in this area.

The area in close proximity to this interchange and adjacent to the interstate to the east was historically, and remains, predominantly commercial. As a result of planning and zoning policies, retail and service land uses are located immediately adjacent to the interchange (including auto dealerships, hotels, and restaurants), while office uses predominate between the SR 100 interchange and the France Avenue interchange to the east. (These policies have not changed as a result of the interchange. The only modifications that have been made to zoning have been to allow planned unit commercial development to provide some flexibility with density and site coverage.)

While the existing land uses mirror the land uses that were in this corridor when the interchange was built in the early 1960s, the area has undergone substantial redevelopment. The Bloomington city planner stated that there has been substantial developer interest in this area, and that a combination of strong market forces and the

interchange are driving redevelopment in this area. (There are no vacant lots in this corridor – all new development is a result of redevelopment.) The city is not promoting the area, but is working with the development community on redevelopment efforts. Two new office buildings are under construction, and the city is working with a developer interested in constructing a third office park. Near France Avenue, a 300,000 square foot industrial building was demolished and replaced with three new office buildings in recent years. Assessed valuation and property tax revenues have accordingly increased.

I-494 / Trunk Highway 77 Interchange

This interchange is located adjacent to the Minneapolis international airport (to the northwest). Older single family homes are located to the northwest of the interchange. Commercial and industrial uses are immediately adjacent to I-494 to the southwest, with older single family residential land uses further southwest. The southeast quadrant included a mix of uses prior to construction of the interchange. A large eighty-acre site one block from the interchange housed the sports arena where the Vikings and Twins played formerly. There is a small residential neighborhood south of this site. Lake Hennepin and Lake Dakota are located to the southeast.

Until 1991, no interchange existed between I-494 and Trunk Highway 77. In the past, the City of Bloomington had approached the state about providing an interchange, but the state claimed that traffic levels did not justify the expenditure. In the late 1980s, a retail developer approached the city about using the old stadium site for a major super-regional shopping center – the Mall of America. The plans called for 4.2 million square feet of retail, hotel and entertainment uses. The city was interested, but the developer would not proceed with his development plans without an interchange between I-494 and Trunk Highway 77. An agreement for construction of an interchange was reached between the state, the city and the developer. The city floated municipal bonds worth \$80 million to finance the interchange, as well as other infrastructure investments. The state agreed to repay the city \$5 million per year for 10 years, for a total of \$50 million. The developer paid nothing, and refused to break ground on the mall until the infrastructure was in place. The interchange was finished in 1991, and the mall in 1992. The mall has been an international success, and the city and state have more than recouped their investments in the form of real estate and sales taxes, and spin-off impacts. A second phase of development at the mall is planned, which will add an additional 3 million square feet of office, retail, hotel and entertainment uses at the site.

Both the airport and natural features limit additional development in the vicinity of this interchange. The safety zone for the new north-south runway at the airport limits what can be built south of the airport. Large lakes limit development to the southeast.

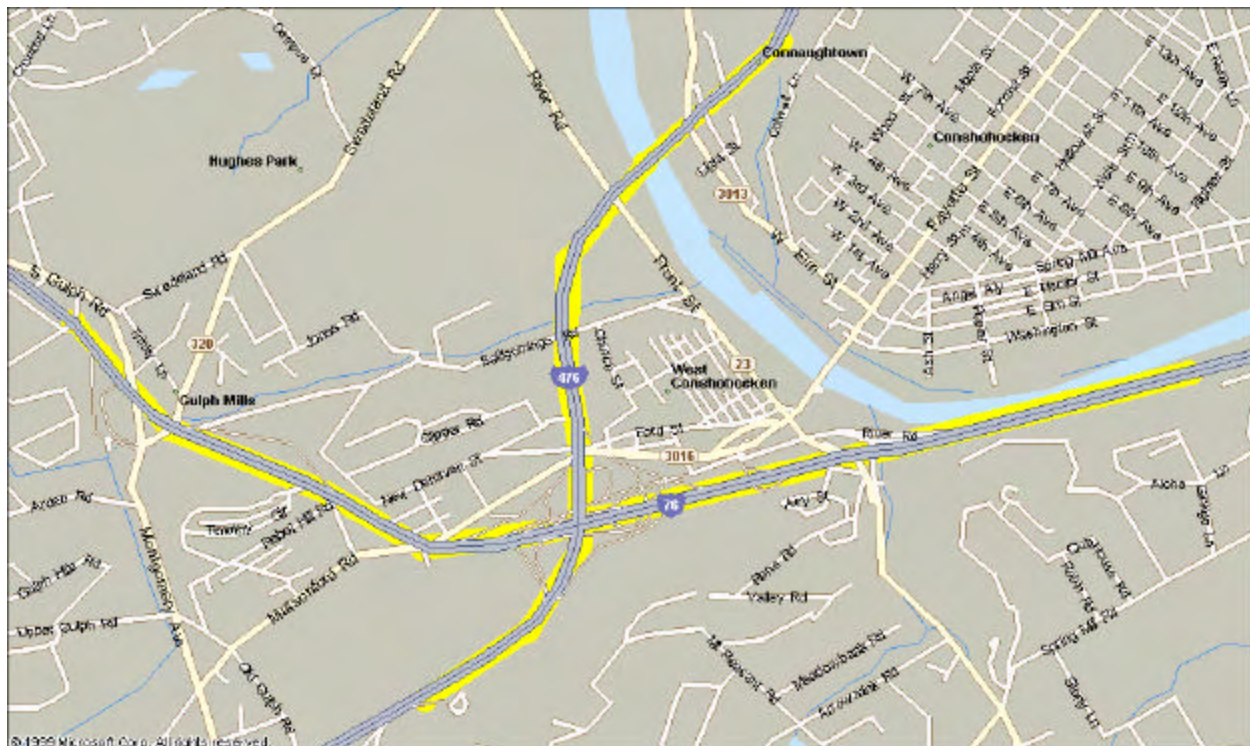
Conclusions from the Minneapolis Examples

- Numerous factors influence the land use impacts of interchanges. Areas characterized by large, stable uses will be less likely to experience land use impacts than areas with substantial parcels of undeveloped land, or land available for redevelopment. Topographic and environmental characteristics of the surrounding area also can limit development potential.
- Market forces will drive development – without market demand and competitive sites, land use impacts will be limited, while a strong market combined with the improved access provided by an interchange can result in substantial development opportunities.
- Finally, public policies ranging from zoning to infrastructure investment can influence how an interchange will impact land uses.

Greater Philadelphia Regional Case Studies



Interchange between Interstate 476 (The Blue Route) and Interstate 76 (The Schuylkill Expressway) – Conshohocken, Pennsylvania



In the mid-1960s, the Montgomery County Planning Commission warned that Conshohocken's commercial and industrial bases were failing, and that the borough would need to undergo considerable redevelopment to

sustain its economy. As Conshohocken suffered from a decline in jobs and an aging population, Council officials sought to revitalize the area.

Redevelopment projects were proposed almost immediately. One project – a mix of retail, office, hotel, and residential space – did not receive funding from the Department of Housing and Urban Development until eight years after the borough applied for it. By that point, in 1974, the redevelopment plan was outdated and the King of Prussia and Plymouth Meeting malls had already been constructed.

Nevertheless, the borough cleared land for the designated redevelopment area, displacing many households and businesses. Another plan for development proposed a shopping center on the vacant parcel, but the project could not be realized because of inflation and high interest rates. Twenty-four acres of space remained undeveloped for several years.

Both Conshohocken and West Conshohocken Boroughs were by the early 1980s considered to be in a state of hopeless decay. Their economies had long relied on heavy industry located along the Schuylkill River, and the gradual closing of their once-thriving steel and tire plants came at the expense of more than 4,000 local jobs. The prospect of an interchange between the Schuylkill Expressway and the Blue Route was therefore generally embraced as a crucial element to the survival of Conshohocken. The Expressway already existed as an east-west route through West Conshohocken Borough and ran south of Conshohocken Borough. The Blue Route, however, was a proposed major north-south highway that would connect to the east-west Pennsylvania Turnpike and its Northeast Extension at the northern end, and to Interstate 95 at the southern end.

Impacts of the Interchange on Land Use

Upon completion of the Blue Route, a development boom was already well under way in Conshohocken. The area's first major office park, the Pleasant Valley Business Center, had been constructed by Meehan-Weinmann in 1983 and was almost fully occupied by 1987. In 1987, Acorn Development began construction on the Four Falls Corporate Center, and Oliver Tyrone Pulver began its enormous, ten-year Tower Bridge project. The construction cost for each of these projects was about \$70 million, \$60 million, and \$300 million, respectively.

This construction boom was spurred by the expected completion of the Blue Route. While most people involved in real estate could not envision the Conshohocken area as much more than dying industrial boroughs, these three developers invested heavily in the designated redevelopment area, insisting that the opening of the Blue Route would result in a transformation of the town. The president of Meehan-Weinmann said: "Six years ago, a real estate friend of mine came to Conshohocken and he laughed at us.... What we saw was a town that was ideally situated between Philadelphia and King of Prussia, and we saw that with the possibility of the Blue Route being finished, we'd be in the heart of a major interchange." Indeed, his firm began construction two years before a federal court ensured once and for all that the highway would be completed. The principal of Pulver, referring to that court decision, said: "The week it happened, we started to acquire property.... It will succeed because the location is so incredibly great." Both Pulver and Acorn characterized their redevelopment projects as the first steps toward creating a "city in the suburbs."

Development around the interchange has taken place primarily on old steel plant sites and brownfields. While West Conshohocken Borough has enjoyed most of the redevelopment boom, development is beginning to stretch eastward along the river, into Conshohocken Borough.

It is generally agreed that construction of the Blue Route was the main reason for Conshohocken's economic turnaround. However, growth was accelerated in part because of the area's proximity to the booming real estate markets of King of Prussia and Radnor. Business growth, moreover, was strongly encouraged with the establishment of an Enterprise Zone.

Financial Statistics

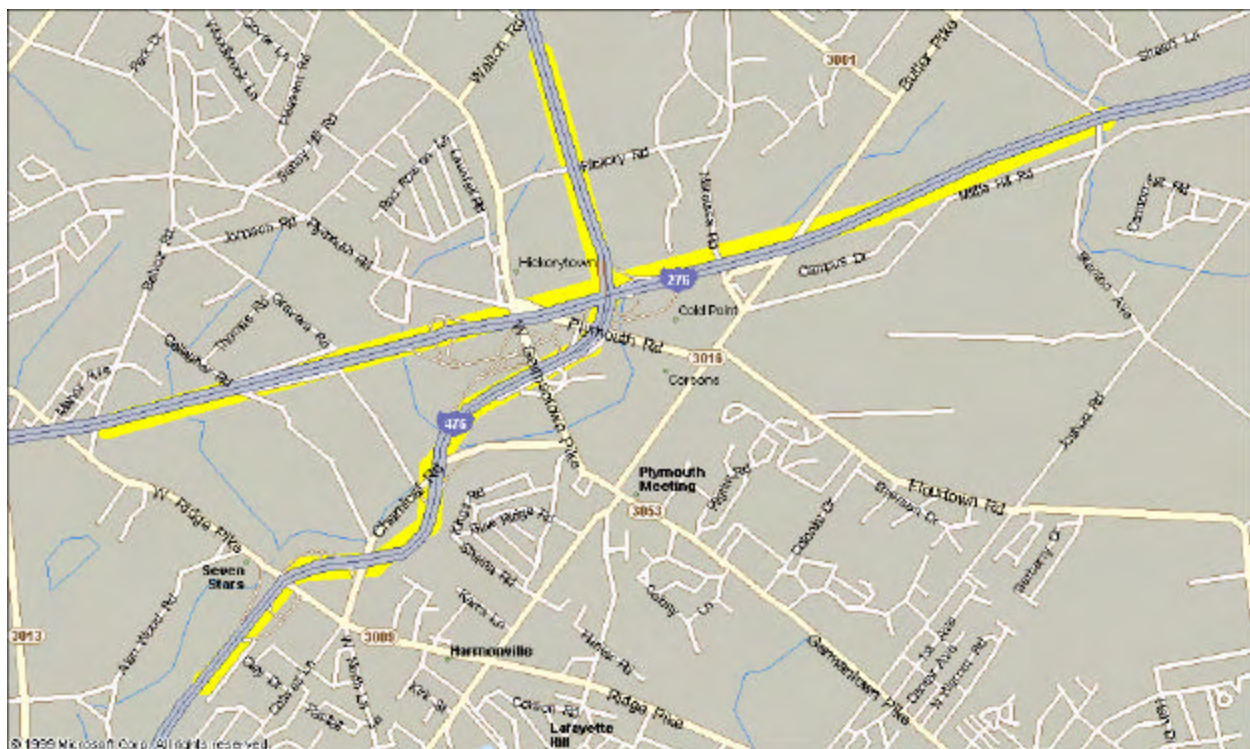
Although assessment figures do not typically undergo rapid change over time within a jurisdiction, real estate in West Conshohocken experienced unusually explosive growth in assessed valuation between 1987 and 1997. Its

increase of 131.8% in that borough far outpaced assessment growth in the other municipalities included in these local case studies. This remarkable rate of growth is primarily attributable to almost constant construction on projects such as Tower Bridge, and therefore the steady addition to the borough of new property to be assessed. By contrast, real estate in Conshohocken Borough, which had not yet experienced the same level of construction, did not increase greatly in assessed value over that ten-year time period.

Market value of real estate in West Conshohocken also increased rapidly, at a rate of over 500%. Market value per capita, furthermore, increased at a greater rate in the borough than in any of the other local case study jurisdictions.²⁵ Conshohocken Borough also experienced significant growth in these statistics, but at a much slower pace. As mentioned, development has only recently begun to spread across its border from West Conshohocken.

Revenues collected by both boroughs, particularly West Conshohocken, increased significantly between 1987 and 1997. By far, the most notable increase in Conshohocken's revenues was in the amount collected from its business privilege tax. For West Conshohocken, the greatest increase was in its earned income tax; however, it experienced considerable increases in almost all of its other tax revenues as well, except for its real property transfer tax.

Interchange between Interstate 476 (The Blue Route / Northeast Extension) and Interstate 276 (The Pennsylvania Turnpike) – Plymouth Meeting, Pennsylvania



The area around the interchange between the Pennsylvania Turnpike, the Blue Route, and the Turnpike's Northeast Extension (now re-designated as I-476, along with the Blue Route) is located within Plymouth Township and adjacent to the border of Whitemarsh Township. It was once characterized by commercial use north of the Turnpike and by industrial and intended residential use south of the Turnpike. In the northwest quadrant of the interchange was the Plymouth Meeting Mall, which is still in existence. Some vacant parcels

²⁵ Source: PA Department of Community and Economic Development (formerly Department of Community Affairs), Local Government Financial Statistics, 1987, 1997

south of the Turnpike, though zoned for residential use, remained undeveloped. On the other side of Plymouth Road was the George Washington Inn. Chemical Road was a heavy industrial district, long in decline and formerly occupied by the Kaiser Aluminum Company and Victory Metals plants.

Impacts of the Interchange on Land Use

Before completion of the Blue Route, the Turnpike and its Northeast Extension already converged in Plymouth Meeting. The lack of access to and from the south, however, was a deterrent to growth until there was a sense that the Blue Route project would indeed be completed. As Plymouth Township's old industrial base declined, developers in the 1980s began to purchase land for re-use as retail, office, and hotel space, hoping that the area would eventually become a "mini-King of Prussia." An Ikea furniture store opened in 1985, presumably anticipating the Blue Route's completion. Plymouth has since made many changes to zoning patterns within the township in order to accommodate the demand for commercial property.

The most ambitious and anticipated project in this area to date is the Metroplex at Plymouth Meeting, an enormous complex at Chemical and Gallagher Roads featuring big box retail and hotel and office space. The project was delayed for years by zoning problems, and further delayed because of the need for an environmental cleanup, but it is currently under construction.

Elsewhere in the vicinity of the interchange, vacant residential parcels north of Plymouth Road have been re-zoned for mixed uses. South of Plymouth Road, the former George Washington Inn has been replaced by office space. The site of the former Victory Metals plant has also been re-zoned, with office space under construction. A Wal-Mart and Sam's Club have been proposed at the intersection of Butler Pike and Plymouth Road. That area, originally zoned for residential use, has been re-zoned to accommodate retail and office space.

Since the opening of the Blue Route, the Plymouth Meeting Mall, once financially distressed, has undergone considerable renovation and revived itself. A large movie theater opened there recently, and Ikea continues to thrive. As one major developer remarked, "Plymouth Meeting looks like King of Prussia twenty-five years ago."

Although the completion of the Blue Route was a major reason for the current development boom in Plymouth Meeting, other factors contributed to the area's growth as well. For instance, one reason for its appeal to developers was its proximity to the mostly-built-up King of Prussia. Excess demand for real estate in King of Prussia has forced developers to look for the "next best" area, and they have begun to focus much of their attention on places such as Devon and Plymouth Meeting. Moreover, the general trend toward sprawl in the Philadelphia region has attracted jobs and residents to the suburbs, and the booming economy of the last several years has resulted in explosive growth.

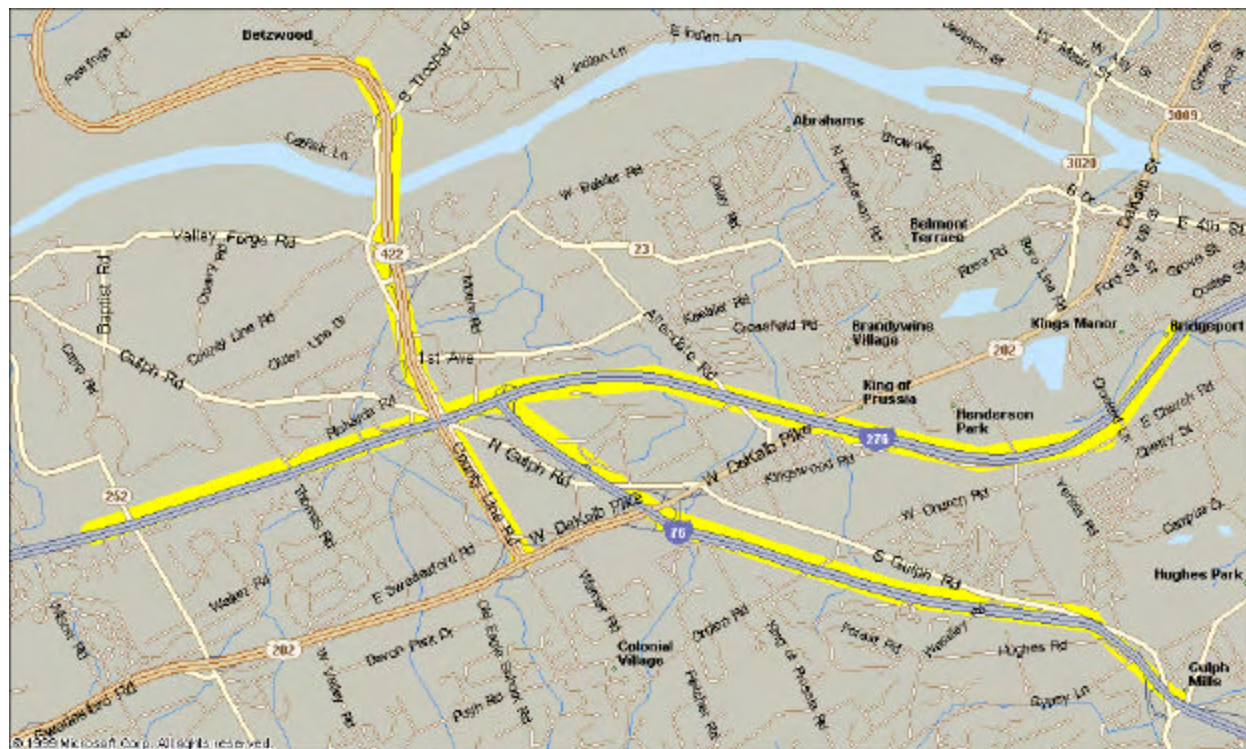
Financial Statistics

The area known as Plymouth Meeting comprises parts of two townships, Plymouth and Whitemarsh. These two jurisdictions displayed very similar rates of growth in assessed and market valuation of real estate between 1987 and 1997. However, Metroplex and the long list of other development projects underway in the interchange area will all be located entirely within the limits of Plymouth Township. This large-scale construction, only recently begun, will add considerably and rapidly to the assessed value of real estate in the township.

Between 1987 and 1997, Plymouth began to collect an earned income tax, raising its revenues significantly. Whitemarsh did not levy such a tax, thereby lagging behind Plymouth in growth of revenue collection. The slight decline in Plymouth of real estate taxes is associated with a decrease in the property tax rate, from 32.5 to 30 mills. Conversely, real estate taxes collected in Whitemarsh rose by almost 60%, with a concurrent increase in millage from 26.44 to 36.²⁶

²⁶ PA Department of Community and Economic Development (formerly Department of Community Affairs), *Local Government Financial Statistics*, 1987, 1997

Interchange between Interstate 76 (The Schuylkill Expressway) and I-276 (The Pennsylvania Turnpike) – King of Prussia, Pennsylvania



The Pennsylvania Turnpike and Schuylkill Expressway are old highways, having run through the Philadelphia region for four decades. The interchange between these highways – as well as Routes 202 and 422, two other major thoroughfares – is located in King of Prussia, part of Upper Merion Township. Several hundred acres of farmland once occupied the current interchange area.

Impacts of the Interchange on Land Use

The confluence of these highways is now a major regional hub characterized by explosive commercial growth. Development around the interchange has taken place over several decades, since the highways involved have existed for a long period of time.

The arrival of superhighways and major roads in the area led to a steady transformation of King of Prussia from farmland into the “edge city” it has become. Located in Upper Merion Township, a jurisdiction that has not traditionally opposed or planned for growth, King of Prussia has developed a dense concentration of retail space, hotels, and office parks, most notably the Court and the Plaza which constitute the mall. Like Conshohocken and Plymouth Meeting, but to a greater extent, its growth has been accompanied by heavy traffic congestion. As early as 1983, residents had begun lobbying against further development. A *Philadelphia Inquirer* article from that year wrote:

As crowded as it is, as huge as its mega malls are, as choked as its roads have become, the current zoning laws in Upper Merion Township would permit nearly twice the existing retail and commercial business and almost three times the existing office and industrial space.

Throughout the 1980s and through the boom of the 1990s, however, development persisted, particularly at the mall.

King of Prussia has long been well-situated for growth. Having been located at an established interchange of major roads for many years, its growth has been sustained by its accessibility to other important business markets, such as Plymouth Meeting, Radnor, and Philadelphia.

Financial Statistics

Because King of Prussia has been located at a major interchange for many years, growth in the area has been spread out over a long period of time. Upper Merion Township is the sole municipality to encompass the interchange area. The table includes statistics for the years 1977 and 1997, to reflect the protracted nature of growth in the area relative to Conshohocken and Plymouth Meeting, whose interchanges are considerably newer.

However, despite the long-term existence of the King of Prussia highway interchange, the area has continued to demonstrate rapid growth. Over this latest twenty-year period, market value of real estate in Upper Merion rose significantly (591.6%). Total assessed value did not grow at a particularly high rate, but its absolute increase of over \$50 million is nevertheless significant. Both total assessed and market value of real estate in the township are much greater in absolute terms than in any of the other local case study jurisdictions, because development there has taken place over many decades.

Revenues, too, have grown steadily in Upper Merion over the years, particularly from the business privilege tax. Indeed, all tax revenues increased greatly between 1977 and 1997. The township did not collect an earned income tax, but it raised its property tax rate from 11 to 31.5 mills.²⁷

Conclusions from Greater Philadelphia Case Studies

- The combination of Enterprise Zone incentives and a new interchange can significantly alter the economic trajectory of a declining community, as is the case in Conshohocken and West Conshohocken.
- Markets linked by a network of high-speed interstates and connections, as in this area, will fuel development and growth in each other. The success of one market can lead to increased activity in adjacent markets, including infill and redevelopment of older properties.
- An over-taxed local road network, putting increased pressure on the interstates and major highways, can limit growth potential.
- The growth of the Philadelphia economy is in the suburbs, and new developments in a suburban location can attract high-quality tenants willing to pay more for an office in a premiere location.

²⁷ Source: PA Department of Community and Economic Development (formerly Department of Community Affairs), *Local Government Financial Statistics*, 1977, 1997

Appendix 2: Project Team

Pennsylvania Economy League

The Pennsylvania Economy League-Eastern Division is an independent, nonprofit public policy and economic development research organization. Founded in 1936, its mission is to provide critical information and support to the business, civic, and governmental leadership of Southeastern Pennsylvania in their efforts to promote better government and a more competitive region.

PEL is supported by a network of Greater Philadelphia's business community -- leaders in their industries and in their communities -- who understand how sound public policies and an effective government support the region's economic growth. On behalf of those private sector leaders, and working in partnership with civic organizations, local governments, and civic organizations throughout the region, PEL provides regional leaders with informed analysis of regional government and economic issues and a blueprint with which to move that analysis into action.

Over the past few years, PEL staff and its working private sector task forces have carried out a number of economic development projects highly relevant to this project in both their substance and in the process managed by PEL staff:

- Economic Value of SEPTA to the Southeastern Pennsylvania Economy -- PEL worked with Glen Weisbrod (while at Cambridge Systematics) and the DVRPC on an analysis of the economic value SEPTA provided to the Southeastern Pennsylvania economy. The study proved valuable in the development of a strategy for annual state support of public transit.
- Greater Philadelphia's Challenge: Capitalizing on Change in the Regional Health Care Economy -- PEL staff worked with a task force of private sector experts, and interviewed over 90 health care leaders in the process of completing this study of the region's health care economy. This report has become the definitive report on the current state and future of Philadelphia's health care sector.
- Economic Impact of the Pennsylvania Convention Center -- Over the past five years, PEL has worked with the Pennsylvania Convention Center to estimate the economic benefits provided to the state and the city as a result of the construction of the new convention center.
- Regional Arts and Culture Economic Initiative -- PEL, working with the Greater Philadelphia Chamber of Commerce, its Arts&Business Council, Greater Philadelphia First, the Pennsylvania Convention Center Authority, and the Greater Philadelphia Cultural Alliance, completed a project in 1998 which estimates the economic value of the region's cultural assets. The project focused on three crucial topics: the economic impact of cultural activity in the region; the linkages between cultural and other economic assets; and the fiscal threats and opportunities facing the region's cultural community. Working with a task force of 21 business and cultural leaders, PEL's work helped outline an agenda for supporting and enhancing the role of the cultural community in the region's economy.
- Economic Impact of the Regional Performing Arts Center -- PEL worked with RPAC to develop an economic impact analysis of the proposed performing arts center, helping to document its benefits to the City of Philadelphia. The report is being used in planning and fundraising efforts.
- Regional Economic Development Benchmarking -- PEL has been heavily immersed in several comparative analysis of the region's economy. Over the past three years, PEL has provided Greater Philadelphia First with two sets of benchmark analyses for the five economic clusters included in their economic development strategy process

David Thornburgh is the Executive Director of the Pennsylvania Economy League -- Eastern Division. He is responsible for all fundraising and business development, hiring and training professional policy research staff, developing project proposals, developing and carry out public relations and marketing plans, representing PEL

at public meetings, government hearings, and on task forces and commissions, and managing staff support for board leadership.

Steve Wray is the Deputy Director and Director of Research for the Pennsylvania Economy League, Eastern Division. He is responsible for managing and conducting the League's research projects and managing its research staff. Prior to joining the Economy League in April of 1995, Mr. Wray was a Special Assistant and Policy Director for Lt. Governor Mark Singel. Mr. Wray also served as a consultant for the Allegheny Conference on Community Development in Pittsburgh, and as an associate in the investment research and real estate consulting divisions of Jones Lang Wootton USA in New York. Mr. Wray received his undergraduate degree from Duke University's Sanford School of Public Policy and his Masters degree in Public Management and Policy from Carnegie Mellon University's H. John Heinz III School of Public Policy and Management.

Economic Development Research Group

Economic Development Research Group is a consulting practice focusing specifically on measuring and maximizing economic development benefits associated with public policies and investments in transportation.

EDRG provides specialized services to governments, private firms and other consulting firms around the US and overseas. EDRG customizes state-of-the-art analytic models & information collection to forecast and assess economic development benefits and opportunities. EDRG's work includes both advisory services and full-scale research projects.

Glen Weisbrod heads the Economic Development Research Group. For the past 20 years, he has worked to further the state of the art of economic impact analysis, and he has conducted research on the relationship of economic development to transportation, as well as energy and technology development. He is assisted by a set of highly experienced associated consultants, each of which has worked with him for many years.

Mr. Weisbrod was formerly a member of the Board of Directors of the Council for Urban Economic Development, Sr. Vice President of Cambridge Systematics, Inc. and director of the Boston office of HBRS / Hagler Bailly Consulting. He is the author of over 30 published articles on economic development impacts of public policies and projects, and authored the National Research Council/ Transportation Research Board guide for assessing the economic impacts of transportation projects. An appointed member of the TRB Committee on Transportation and Economic Development, Mr. Weisbrod holds an MCP in Urban Studies & Planning from MIT, MS in Civil Engineering (Transportation) from MIT, and BA in Economics from Brandeis University. His experience includes:

- Highway Corridor Projects: conducted the assessment of economic development benefits and opportunities associated with major highway corridor projects in Wisconsin, Kentucky, Indiana, Louisiana, Virginia, Minnesota & Massachusetts.
- Metropolitan Plans: evaluated the economic development implications of regional highway and transit plans, including most recently the 2020 Capital Plan for the Los Angeles area. He also did similar studies for the Philadelphia and New York regions.
- National Transportation Programs: contributed to the evaluations of economic development impacts of national transportation programs for the US (FHWA), Scotland, Finland and Netherlands.
- Airports: worked extensively on the relationship of airports to economic development and surrounding area land development opportunities, including projects ranging from Japan (Osaka/Kansai Airport) to the U.K. (Edinburgh Int. Airport), as well as around the US (including statewide assessments for Wisconsin and Massachusetts).
- Other Transportation Modes: evaluations of the economic development impacts of high speed rail in the Northeast Corridor and in California, seaports in Florida, and urban congestion reduction in Chicago and Philadelphia.

Appendix 3: Interview List

Aniloff, Mike, Legislative Aide, Rep. DiGirolamo
 Bannon, Michael, Neshaminy Mall
 Benbow, Maury, Bucks County Office Center
 Burstein, Janie, Korman (Neshaminy Interplex)
 Bickel, Richard, Delaware Valley Regional Planning Commission
 Brady, Bill, PECO
 Bromley, Wayne, Giles and Ransom
 Carll, Esq., Jim, Archer & Greiner
 Claypool, John, Greater Philadelphia First
 Cope, Craig, Liberty Property Trust
 Cormack, Bob, Bucks County Economic Development
 DeVito, Bill, Senator Santorum
 DeVuono, Jeff, Brandywine Realty Trust
 DiGirolamo, Gene, State Representative
 DiGirolamo, Joseph, Mayor, Bensalem
 DiMucci, Dan, Pennoni & Associates
 Durkin, Dennis, Insignia ESG
 Epstein, Esq., Donna, Buchanan Ingersoll, P.C.
 Etzrodt, Mike, Bensalem business owner
 Fenton, Samuel, Mayor, Bristol Township
 Flocco, George, Bensalem EDC
 Fuhr, Peter M., Bristol & Taylor Garage
 Gandy, Julia C., Burlington County
 Golden, Joseph, Middletown Township
 Goldstein, Joan, Coldwell Banker, Bensalem
 Gougler, Al, Al's Auto
 Green, Patrick, Insignia ESG
 Greenwood, James, US House of Representatives
 Haab, Fred, F.C. Haab Co.
 Harris, Bob, Lower Bucks Hospital
 Healy, James, Insignia ESG
 Jaggard, Thomas, Burlington County
 Johnson, Dave, Bucks County Planning Commission
 Jones, Richard, Jackson Cross
 Korngold, Leon, Korngold Realty (Keystone Industrial Park)
 Krauss, Pete, Rep. Greenwood's office
 Kraeuter, Kim, Penjerdel Council
 Leone, Robert, Citizens at Risk
 Lewis, Esq., H. Craig, Norfolk Southern
 Longstreth, The Honorable W. Thacher, City Council, City of Philadelphia
 McNeil, Collin F., Executive Director, Penjerdel Council
 Mealey, Dan, Mealey's Furniture
 Morris, Garney, Bucks County Enterprise Zone/Garney Morris
 Newsome, Suzanne, Managing Director, Bristol Township
 Nichols, Gene, Nichols Pools
 Oswald, Harold, First Federal Savings & Loan of Bucks County
 Piscopo, Edward, Insignia ESG
 Quinn, Michael, Bucks County Housing Development Corporation
 Raddi, Carmen, Bucks County Enterprise Zone
 Ravelli, Bob, City of Philadelphia

Redding, Joann, Bensalem realtor
 Remsa, Mark, Burlington County
 Rickett, Bill, Bucks County TMA
 Roberts, Bill, Wallace, Roberts & Todd
 Roddy, Frank, Roddy Realty
 Sanborn, Jim, Polaris Associates
 Sengson, John, Equity Investment Group (Bristol Plaza)
 Seymour, George, Chairman, Bensalem Planning Commission
 Shanis, Don, Delaware Valley Regional Planning Commission
 Sheehan, James, Insignia ESG
 Sutter, Al, Senator Tomlinson's Office
 Tarlini, Lew, Patch Management
 Thomas, Carol Ann, Burlington County
 Tukey, Carolyn, Middletown Township
 Tuthill, William, Councilman, Bristol Township
 Udowenko, Alex, CEIRG member
 Vicente, Vitor, Bucks County Planning Commission
 West, Gregory, Insignia ESG
 Westfield, Jim, Modern Group
 White, Bob, Bucks County Redevelopment Authority
 Worthington, Ken, Councilman, Bristol Township