Prepared for

Delaware Valley Regional Planning Commission

June 1991

Final Report

Public Transportation Renewal as an Investment:

The Economic Impacts of SEPTA on the Regional and State Economy

Prepared by

The Urban Institute

and

Cambridge Systematics, Inc.

with

The Pennsylvania Economy League

Table of Contents

Table of Contents
(continued)

Preface

This study was undertaken to evaluate the economic and social impacts of rehabilitating vs. closing the Southeastern Pennsylvania Transportation Authority (SEPTA) public transportation system. The evaluation considers the economic and social impacts on the Delaware Valley Region and the State of Pennsylvania of different future options, including the rehabilitation of SEPTA facilities and continuation of SEPTA services, or not rehabilitating SEPTA's facilities and allowing all or part of it to close.

This study was conducted by The Urban Institute and Cambridge Systematics, Inc., with the assistance of the Pennsylvania Economy League. The Urban Institute managed the study and was primarily responsible for analyzing transportation costs. Cambridge Systematics was primarily responsible for analyzing impacts on the overall economy. The Pennsylvania Economy League was primarily responsible for analyzing fiscal and tax impacts.

The authors wish to acknowledge the sound advice and suggestions by the staff of the Delaware Valley Regional Planning Commission, and by the Advisory Committee of this study. The analysis also benefitted from the cooperation and assistance of the Southeastern Pennsylvania Transportation Authority, the Greater Philadelphia Economic Development Coalition, and representatives of corporations and social service organizations. Any errors or omissions are solely the responsibility of the authors themselves.

■ Advisory Committee for the Economic Impacts of SEPTA Study

John A. Miller
(Chairman of the Advisory Committee)
Chairman and CEO
Provident Mutual Life Insurance Company

Edward G. Boehne
President
Federal Reserve Bank of Philadelphia

Patrick Gillespie
Business Manager
Philadelphia Building and Construction Trades Council

Ernest Jones
Executive Director
Greater Philadelphia Urban Affairs Coalition

Samuel D. Ross
Chief Executive Officer
Pennsylvania Blue Shield

Andrew L. Warren
Chairman
Bucks County Commissioners

Gilbert A. Wetzel
Director
Greater Philadelphia Economic Development Coalition

■ Liaison

Kyra McGrath
Southeastern Pennsylvania Transportation Authority

John Garrity and Paul Verchinski
Urban Mass Transportation Administration

Lynn Martin Haskin
Greater Philadelphia Economic Development Coalition

■ Contracting Agency: Delaware Valley Regional Planning Commission

W. Wilson Goode, Mayor of Philadelphia
Chairman

John J. Coscia, Executive Director

Executive Summary

■ Study Overview

This report provides an evaluation of the impacts of SEPTA's services and proposed capital investments on transportation costs and on the overall economy of the Philadelphia metropolitan area, the State of Pennsylvania as a whole, and the rest of Pennsylvania outside the metropolitan area. This study is intended to provide a first evaluation, at a regional and state level, of whether transit rehabilitation programs "pay off" as investments, and thus justify expenditures by state and local governments.

This study was commissioned by the Delaware Valley Regional Planning Commission (DVRPC), and funded through a grant from the Urban Mass Transportation Administration to DVRPC. It was conducted by The Urban Institute and Cambridge Systematics, Inc., with the assistance of the Pennsylvania Economy League.

An important aspect of this study is that it is comprehensive in terms of estimating how alternative levels of investment in SEPTA would affect travel times and travel costs for individual travellers, and how those changes would end up affecting the cost-of-doing-business, individual spending patterns, and the economy of the region and the State of Pennsylvania.

The economic evaluation was conducted for four alternative courses of action:

- rehabilitation of SEPTA, and the continuation of SEPTA services;
- a 50 percent reduction of SEPTA services within five years, and rehabilitation of the remainder of the system;
- a gradual shutdown of all SEPTA services within ten years;
- an immediate permanent shutdown of all SEPTA services.

The alternative of rehabilitating SEPTA would be associated with increased funding for capital expenditures on SEPTA to a level of the ten year capital program proposed by SEPTA. That program calls for $4.5 billion in capital expenditures over ten years, including contingencies and inflation or $450 million per year. In terms of constant 1991 dollars, the cost of that program is approximately $350 million per year. The gradual or immediate elimination of SEPTA would involve no capital program expenditures. The partial reduction would involve about half the level of capital expenditures per year as would rehabilitating all of SEPTA.

Currently committed capital funding levels are about midway between the gradual shutdown or the 50 percent reduction alternatives. Thus, these two options must be considered to be very realistic. The alternative of immediate shutdown is included in order to develop information about the maximum impacts of reducing SEPTA. Therefore, this alternative is not considered to be as likely an option as the other (50 percent reduction or gradual shutdown) scenarios.

Each of these alternatives was quantitatively defined in terms of annual SEPTA ridership, revenues, capital costs, and operating costs. The consequent impacts on highway costs, the economy, and other social concerns were then assessed through an integrated set of economic models, augmented by interviews with key leaders of businesses and social service agencies.

Impacts of the three scenarios for reduction or elimination of SEPTA services were then compared to the base case scenario of "adequate" investment to rehabilitate SEPTA.

The analysis process involved six steps: (1) evaluation of future scenarios in terms of transit and road capacity and service levels, (2) a transportation analysis model to forecast impacts on regional transportation costs, (3) an economic analysis model to forecast impacts on metropolitan and state economic growth, (4) a fiscal model to forecast impacts on government finance, (5) energy consumption and air pollution estimation processes, and (6) interviews with businesses, economic development professionals and representatives of affected population groups.

■ Study Findings

Transportation Cost Impacts

Each scenario examined showed that reducing investment in SEPTA and reducing SEPTA service would cost more than it saved. The analysis showed that there was likely to be no possible scenario of a partial or gradual elimination of SEPTA which would have lower costs than the rehabilitation alternative.

Figure ES.1 shows that the rehabilitation costs plus the excess costs to transportation users are lowest for the rehabilitation alternative, and increase as more SEPTA services are eliminated. There are no excess costs associated with rehabilitation. The alternative of a 50 percent reduction costs about $1 billion per year more, while the complete elimination costs $3 billion per year more.

The excess transportation user costs associated with not rehabilitating SEPTA fall both on those who do not now use SEPTA and those who do use SEPTA:

- Current auto and truck users in the region would suffer about half the excess travel costs, due to greater congestion costs, higher vehicle operating costs, and higher accident costs without SEPTA.

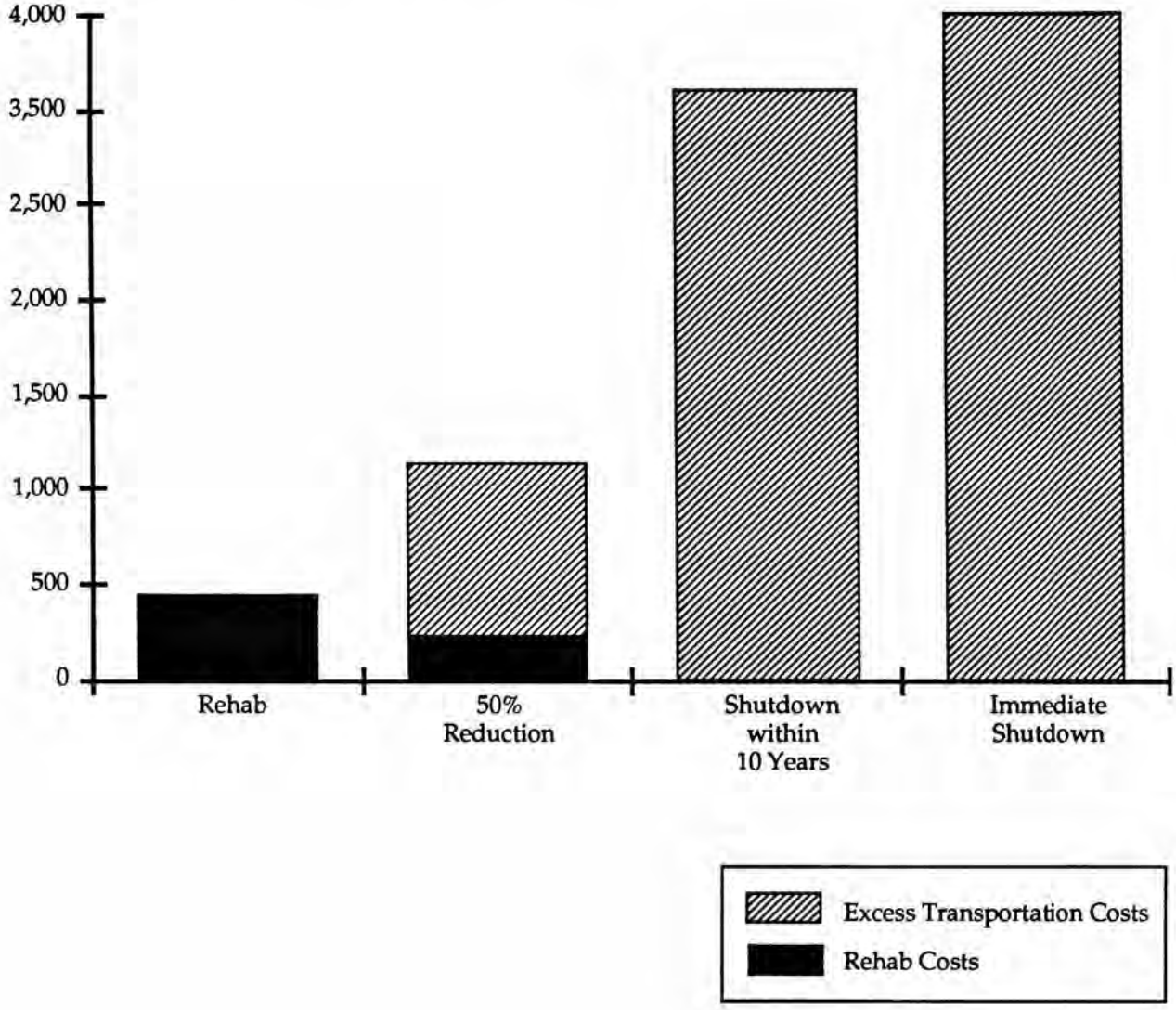
- It would cost SEPTA users themselves more per year in additional costs, for auto travel, which would occur under more congested conditions.

- The energy and environmental impacts of not rehabilitating SEPTA would include an increase of up to 6 percent in gasoline consumption and emissions. In the case of air quality, this would reduce the likelihood that Clean Air Act standards will be met, which could lead to much higher costs for emissions controls.

Also, with a 50 percent reduction or gradual shutdown, the operating cost reductions would not be proportional to service reductions, since many costs of public transportation are fixed costs rather than variable costs. In addition, ridership losses would result in losses of farebox revenues at a faster rate than operating costs could be reduced, thus increasing the subsidy required per passenger.

Figure ES.1 Comparative Annual Costs of Scenarios

Annual Costs in Current Year 2000 Dollars (Millions)



Traffic Impacts

Traffic impacts of eliminating or reducing SEPTA would be substantial in the short term and in the long term. While traffic impacts are adverse throughout the region, they will be particularly bad in the central business area. If SEPTA services were all eliminated, the number of autos attempting to enter the central area in the morning would be approximately double from the southern direction, triple from the north, and quadruple from the west. Since many of the streets and highways are already congested, eliminating all or a portion of SEPTA's services would have a very severe impact on travel speeds. The peak accumulation of vehicles in the central area would increase by 85,000 autos.

Loss of Mobility

The loss of mobility for the low income population, the elderly, and the handicapped would be significant if SEPTA were eliminated or reduced. Currently, about 22 percent of households in the region do not own automobiles. We estimate that nearly one-third of the current population without cars today could not afford to own cars, and would lose their mobility. The others would suffer a loss of income due to the higher costs of auto transportation.

Senior citizens would lose over 30,000 trips per day: a significant decrease in their ability to get around. Many might lose their jobs, and others might cease going outside of their homes. Students of schools, colleges, and universities would suffer a loss of access, as would users of religious, social, and cultural resources. About 80,000 trips made on SEPTA per day by school children would have to be made by other means.

Economic Impacts

The excess transportation costs and loss of mobility due to eliminating or reducing SEPTA services would affect the regional economy through seven primary means:

- increased cost of doing business;
- reduced business access to labor markets;
- increased cost of living;
- reduced "quality of life";

- loss of SEPTA jobs;
- shifts in personal spending patterns, with more money spent on purchases from outside the region (autos, fuel); and
- reduced attraction of visitors.

The resulting effect of these factors would be to reduce business sales, jobs, disposable personal income and population in the Philadelphia metropolitan area. Additional "spin-off" impacts would result in a loss of business sales, jobs, personal income and population in the rest of Pennsylvania.

Over time, the loss of income and business sales would grow to far exceed the value of direct travel impacts and transportation costs. The greater cost of doing business would make the Philadelphia metropolitan area less competitive for "basic industries" (i.e., businesses that serve regional or national markets, which don't have to locate in the Philadelphia metropolitan area), such as manufacturers. The reduced access to clerical labor would make Philadelphia less attractive for banking and insurance offices. The reduced "amenity level" (quality of life) would make the metropolitan area less attractive as a place to live. Businesses that select locations to expand or to open new branches would be more likely to pass over the Philadelphia area and select sites in competing metropolitan areas.

The distinguishing characteristic of all the economic impacts of all the alternatives except rehabilitation is that all impacts are negative. In every case, the scenarios other than rehabilitation result in negative short term impacts and the impacts become worse over time. It is therefore reasonable to consider the long term results for the purpose of comparing scenarios.

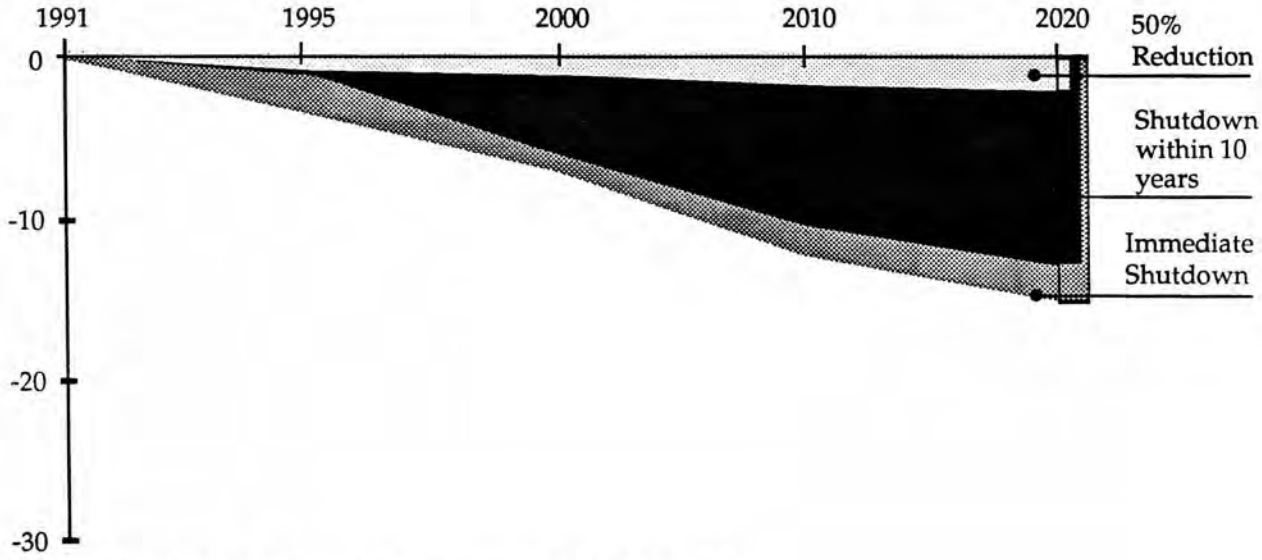
Metropolitan Economic Impacts

The impacts on the metropolitan economy (five counties in Pennsylvania and three counties in New Jersey) associated with not rehabilitating SEPTA would be substantial in the long term. The detrimental impacts would get worse over time as some existing businesses move out and as other outside businesses choose not to locate in the metropolitan area. Figures ES.2 and ES.3 show impacts on business sales within the Delaware Valley Region over time, in both constant 1990 dollars (Figure ES.2) and future year dollars (Figure ES.3). The impacts grow continuously over time in both constant and future year dollars.

The estimated losses in business sales for each alternative other than rehabilitating SEPTA are described in total dollars and in dollars per current resident. By way of comparison, the annual costs of rehabilitating SEPTA are $100 per current resident in the metropolitan area, and $30 per current resident in the State of Pennsylvania as a whole.

Figure ES.2 Impact on Annual Metropolitan Business Sales (Relative to Rehabilitating SEPTA)

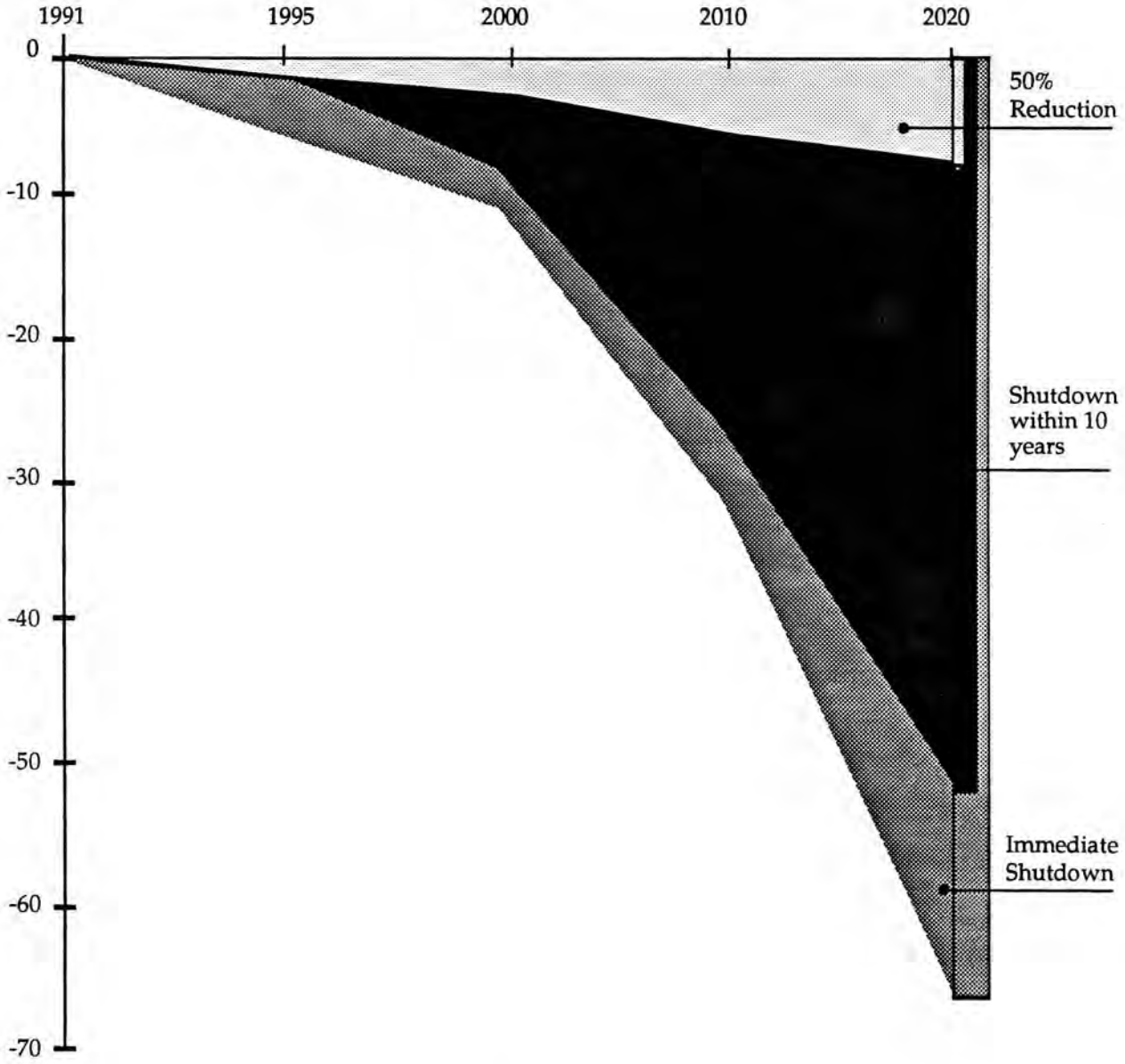
In Constant 1990 Dollars ($ Billions)



Source: Cambridge Systematics, Inc., using the REMI Model

Figure ES.3 Impact on Annual Metropolitan Business Sales (Relative to Rehabilitating SEPTA)

In Inflated Future-Year Dollars ($ Billions)



Source: Cambridge Systematics, Inc., using the REMI Model

Business Sales - Metropolitan Area

In comparison to the alternative of rehabilitating SEPTA, the annual loss of metropolitan area business sales by the year 2020 would be:

- $2 billion less business sales in 1990 dollars if SEPTA services are cut in half: $400 per current resident ($8.5 billion in future year dollars: $1,700 per current resident)
- $13 billion less business sales in 1990 dollars if SEPTA is gradually shutdown: $2,600 per current resident ($56 billion in future year dollars: $11,000 per current resident)
- $15 billion less business sales in 1990 dollars if SEPTA is shutdown immediately: $3,000 per current resident ($64 billion in future year dollars: $13,000 per current resident)

Jobs

In comparison to the alternative of rehabilitating SEPTA, the cumulative loss of metropolitan area employment by the year 2020 would be:

- 26,000 fewer jobs if SEPTA services are cut in half;
- 144,000 fewer jobs if SEPTA is gradually shutdown within ten years;
- 170,000 fewer jobs if SEPTA is immediately shutdown.

Personal Income

In comparison to the alternative of rehabilitating SEPTA, the annual loss of metropolitan area personal income by the year 2020 would be:

- $1.1 billion less personal income per year in 1990 dollars if SEPTA services are cut in half ($4.6 billion less in future year dollars)
- $8.8 billion less personal income per year in 1990 dollars if SEPTA services are gradually shutdown ($37.6 billion less in future year dollars)
- $9.6 billion less personal income per year in 1990 dollars if SEPTA services are immediately shutdown ($41 billion less in future year dollars)

Population

In comparison to the alternative of rehabilitating SEPTA, the cumulative loss of metropolitan area population by the year 2020 would be:

- 58,000 loss in population if SEPTA services are cut in half;
- 281,000 loss in population if SEPTA services are gradually shutdown;
- 313,000 loss in population if SEPTA services are immediately shutdown.

Statewide Economic Impacts

The impact of business losses for the Philadelphia metropolitan area would bring additional spillover losses for the rest of the State of Pennsylvania. The spillover impacts of SEPTA shutdown alternatives on the rest of the State (outside of the Philadelphia metropolitan area) are very adverse.

Total Pennsylvania statewide impacts were calculated by adding impacts in the Philadelphia metropolitan area and the rest of the state, and deleting impacts on the New Jersey part of the metropolitan area.

Business Sales

In comparison to the alternative of rehabilitating SEPTA, the annual loss of statewide business sales by the year 2020 would be:

- $2.3 billion less business sales if SEPTA services are cut in half: $200 per current resident ($9.5 billion in future year dollars: $800 per current resident)
- $14 billion less business sales in 1990 dollars if SEPTA is gradually shutdown within ten years: $1,200 per current resident ($62 billion in future year dollars: $5,000 per current resident)
- $16 billion less business sales in 1990 dollars if SEPTA is shutdown immediately: $1,300 per current resident ($70 billion in future year dollars: $5,700 per current resident)

Jobs

In comparison to the alternative of rehabilitating SEPTA, the cumulative loss of statewide jobs by the year 2020 would be:

- 26,000 fewer jobs if SEPTA services are cut in half;
- 150,000 fewer jobs if SEPTA is gradually shutdown;
- 175,000 fewer jobs if SEPTA is shutdown immediately.

Personal Income

In comparison to the alternative of rehabilitating SEPTA, the annual loss of statewide personal income by the year 2020 would be:

- $1.3 billion less personal income per year in 1990 dollars if SEPTA services are cut in half ($5.5 billion less in future year dollars)
- $9.0 billion less personal income per year in 1990 dollars if SEPTA services are gradually shutdown ($38.0 billion less in future year dollars)
- $10.1 billion less personal income per year in 1990 dollars if SEPTA services are immediately shutdown ($44 billion less in future year dollars)

Population

In comparison to the alternative of rehabilitating SEPTA, the cumulative loss of statewide population by the year 2020 would be:

- 59,000 loss in population if SEPTA services are cut in half;
- 291,000 loss in population if SEPTA services are gradually shutdown;
- 325,000 loss in population if SEPTA services are immediately shutdown.

Rest of Pennsylvania Economic Impacts

It is also noteworthy that outside the Philadelphia metropolitan area, in the rest of the State, the economic impacts of eliminating or reducing SEPTA would be adverse compared to the economic impacts of rehabilitating SEPTA.

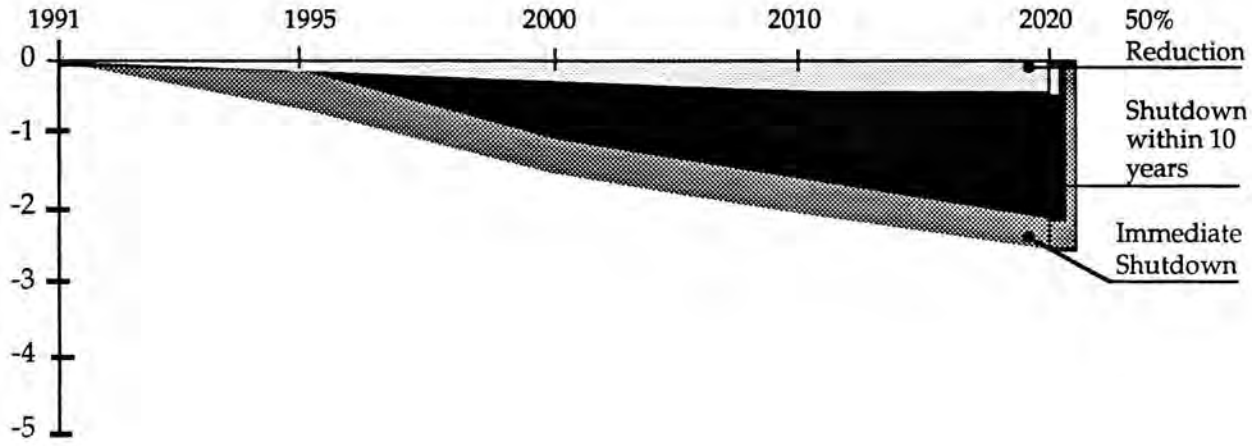
Business Sales

Business sales impacts are shown in Figures ES.4 and ES.5 for the rest of the State of Pennsylvania. In comparison to the alternative of rehabilitating SEPTA, the annual loss of business sales in the rest of Pennsylvania by the year 2020 would be:

- $500 million less business sales in 1990 dollars per year in 2020 if SEPTA services are cut in half: $60 per current resident ($2 billion in future year dollars: $300 per current resident)
- $3 billion less business sales in 1990 dollars per year in 2020 if SEPTA is gradually shutdown within ten years: $400 per current resident ($13 billion in future year dollars: $1,600 per current resident)
- $3 billion less business sales in 1990 dollars per year in 2020 if SEPTA is immediately shutdown: $400 per current resident ($13 billion in future year dollars: $1,600 per current resident)

Figure ES.4 Impact on Business Sales in Pennsylvania Outside of the Delaware Valley Region (Relative to Rehabilitating SEPTA)

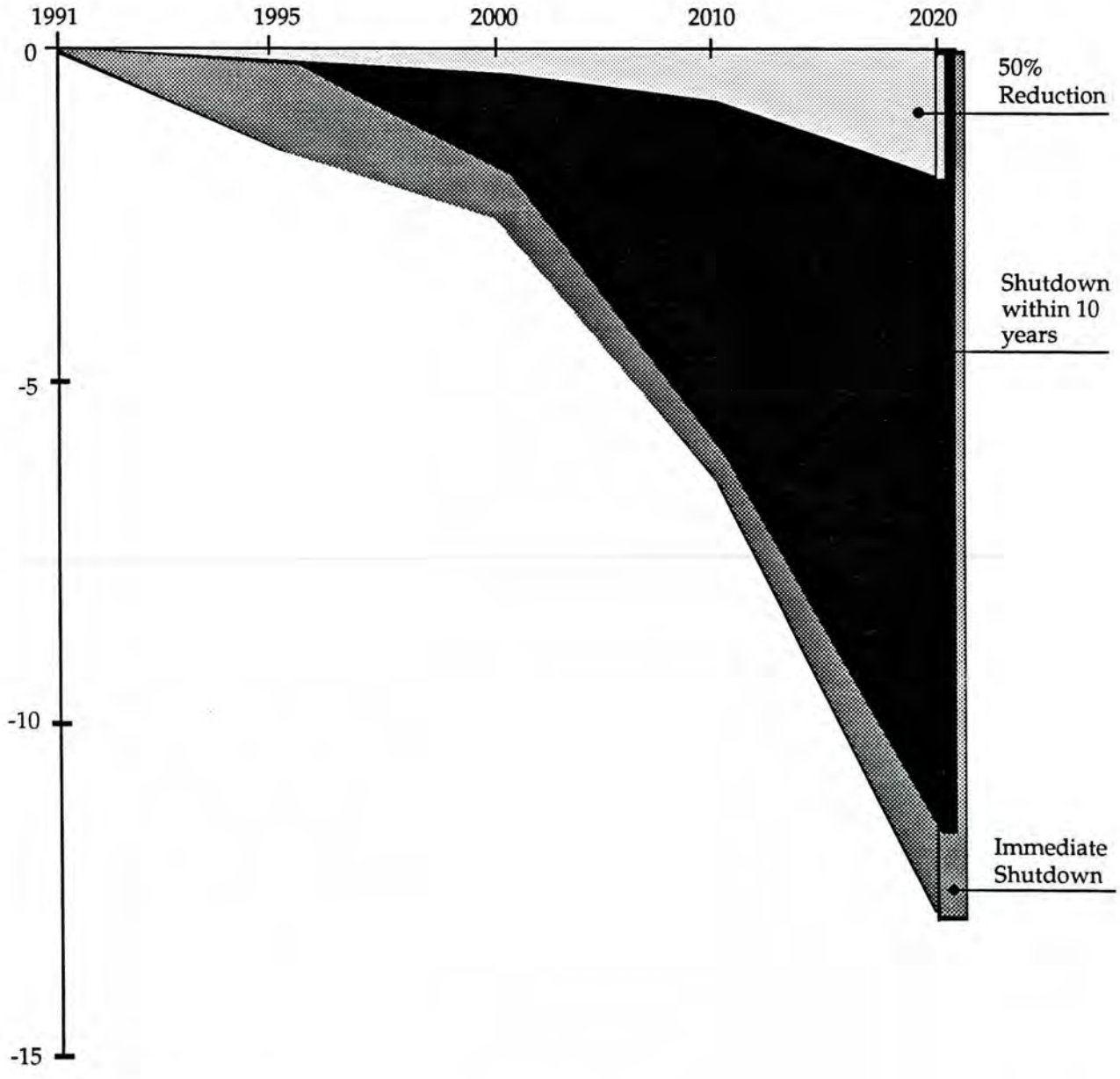
In Constant 1990 Dollars ($ Billions)



Source: Cambridge Systematics, Inc., using the REMI Model

Figure ES.5 Impact on Business Sales in Pennsylvania Outside of the Delaware Valley Region (Relative to Rehabilitating SEPTA)

In Inflated Future-Year Dollars ($ Billions)



Source: Cambridge Systematics, Inc., using the REMI Model

Jobs

In comparison to the alternative of rehabilitating SEPTA, the cumulative loss of jobs in the rest of the State of Pennsylvania by the year 2020 would be:

- 4,000 fewer jobs if SEPTA services are cut in half;
- 22,000 fewer jobs if SEPTA is gradually shutdown;
- 24,000 fewer jobs if SEPTA is immediately shutdown.

Personal Income

In comparison to the alternative of rehabilitating SEPTA, the annual loss off personal income in the rest of the State of Pennsylvania by the year 2020 would be:

- $300 million less personal income per year in 1990 dollars in SEPTA services are cut in half ($1.4 billion less in future year dollars)
- $2.8 billion less personal income per year in 1990 dollars if SEPTA services are gradually shutdown ($12.0 billion less in future year dollars)
- $3.1 billion less personal income per year in 1990 dollars in SEPTA services are immediately shutdown ($13 billion less in future year dollars)

Population

In comparison to the alternative of rehabilitating SEPTA, the cumulative loss of statewide population by the year 2020 would be:

- 7,000 loss in population if SEPTA services are cut in half;
- 42,000 loss in population if SEPTA services are gradually shutdown;
- 47,000 loss in population if SEPTA services are immediately shutdown.

Impacts on Government Finances

Although the elimination or reduction of SEPTA services would reduce or eliminate government expenditures for SEPTA, the adverse impacts on the economy would also reduce state and local tax revenues. Combined state and local revenues per year would be reduced by the year 2020 by:

- $88 million in 1990 dollars if SEPTA services are cut in half;
- $555 million in 1990 dollars if SEPTA is gradually shutdown;
- $632 million in 1990 dollars if SEPTA is immediately shutdown.

In addition, government expenditures would be affected in several ways. The reduction in jobs and income would increase government expenditures for welfare assistance programs. Offsetting that effect, the loss of population would decrease government expenditures on education. These two impacts offset each other in the long run, although in the early years welfare cost increases would exceed education cost savings by over $100 million if SEPTA is immediately eliminated.

■ Conclusion

Benefit/cost analysis was used to assess the net public benefits of the SEPTA reduction alternatives, relative to the base case of rehabilitating and continuing to operate SEPTA. It compared:

- The economic "benefit" of reducing or eliminating SEPTA, which would be the savings in public spending to rehabilitate SEPTA and continue services.
- The economic "cost" of reducing or eliminating SEPTA, which would be the loss of personal income due to contraction of the state economy as a result of the degraded transportation system.

The benefit/cost analysis showed that investment in SEPTA facilities and services at the levels of the proposed ten year capital program would have substantial economic benefits that outweigh the public subsidy costs for residents of Pennsylvania. It specifically showed that rehabilitation and continued operation of SEPTA would return 3 dollars to the region and the State for every dollar spent on SEPTA, just in transportation benefits alone. In terms of total economic impact, the return to the region and the State would be over 9 dollars for every dollar spent on SEPTA.

The analysis conclusively showed that the economic costs of shutting down or reducing SEPTA services would far outweigh the savings for residents of all areas of Pennsylvania. It showed that all three alternatives for reducing or eliminating services would have negative impacts on both the metropolitan area and the rest of the State of Pennsylvania:

- Considering only the transportation impacts themselves, the "benefits" of shutting down SEPTA would be only one-third of the detrimental transportation system costs that would be incurred.

- Considering all economic impacts, the "benefits" of not rehabilitating SEPTA are only one-ninth of the overall economic costs (income losses) which would be incurred.

- In terms of benefit-cost ratios, all the options of reducing or shutting down SEPTA are highly undesirable public policies.

Fully rehabilitating SEPTA, and continuing to operate SEPTA services, thus has a very high economic payoff for the region and for the State of Pennsylvania as a whole. Rehabilitating SEPTA is a desirable investment even if it cost several times what is now estimated. Investment levels currently available for SEPTA rehabilitation (about $100 million to $120 million annually) are inadequate. Investment levels of at least $450 million per year are strongly justified in terms of returns to the economy.

Many organizations are assisting and promoting economic growth in the Delaware Valley Region and the State of Pennsylvania. These include State, County and local agencies, and many private groups. Their effectiveness in reaching the aims of economic development will depend on maintaining the Philadelphia metropolitan area's reputation for providing good transportation accessibility to residents and good business access to labor.

Current estimated rehabilitation costs for SEPTA include reasonable allowances for inflation and contingencies. Even with such allowances, the rehabilitation expenditures of SEPTA represent a sound investment to strengthen the economy of the metropolitan region and the State of Pennsylvania.

1.0 Introduction

1.1 Objectives of the Study

The economy of the Delaware Valley region and the State of Pennsylvania is built upon, and depends upon, effective access connecting businesses with their workers and customers, and connecting people with their jobs, shopping and recreation opportunities. The Southeastern Pennsylvania Transportation Authority (SEPTA) provides public transportation services for over 1.2 million trips daily in the Delaware Valley region. As such, it plays a significant role in supporting the health and growth of the metropolitan economy, as well as the overall economies of Pennsylvania and New Jersey.

Nevertheless, the long term future for public transportation services in the metropolitan area is far from clear. Critical facilities, including buses, trains, tracks, bridges, tunnels and viaducts are aging, and require continued and increasing capital investments just to maintain service. Additional funds for operating and capital costs will be required to serve a growing economy in the long term. The availability of funding to maintain SEPTA services is not certain.

For a number of decades, SEPTA has not received funding for rehabilitation expenditures at levels consistent with long run maintenance of service. Service quality has not only suffered, but a further serious consequence is that service cannot be maintained as more and more of the facilities become

non-functional or unsafe. As a result of the lack of rehabilitation projects, speeds are slowed until services are useless to customers. Aged and unreliable vehicles further drive away users, leading to a spiral of lost revenue and further decay.

Despite having lower operating costs, higher cost effectiveness, and higher support out of the fare box than comparable systems, SEPTA faces a financial crisis. (see: Report of Elected Officials of Bucks, Chester, Delaware, Montgomery and Philadelphia Counties: Improving Mobility in Southeastern Pennsylvania – A Public Transportation Solution, 1990.) There is not adequate funding now identified at a level which would fund SEPTA's current rehabilitation needs and bring the system back to a condition of good repair. Overall levels of Federal funding for transit rehabilitation projects have been insufficient to allow major urban areas to rely on Federal funds for most rehabilitation expenditures. While the importance of urban transit to the nation dictates that the Federal government should make a fair contribution, substantial investments of non-Federal funds will be necessary to rehabilitate most major transit systems.

This report was commissioned to provide the first regional and state evaluation of whether state and local transit rehabilitation programs "pay off" as investments. While the lack of past rehabilitation programs in the Delaware Valley region has been more serious than in other urban areas, the same analysis procedure could be applied elsewhere.

This study provides an objective answer to the question of whether it is worth it to the State and the region to fund SEPTA's program of rehabilitation at the level recommended by SEPTA and local officials for years 1992 to 2001. (see: Report of Elected Officials of Bucks, Chester, Delaware, Montgomery and Philadelphia Counties: Improving Mobility in Southeastern Pennsylvania – A Public Transportation Solution, 1990.)

This report addresses the issue by comparing the benefits and costs to the state and regional economy associated with four alternative scenarios:

- rehabilitation of SEPTA, and the continuation of SEPTA services;
- a 50 percent reduction of SEPTA services within five years, and rehabilitation of the remainder of the system;
- a gradual shutdown of all SEPTA services within ten years;
- an immediate permanent shutdown of all SEPTA services.

An important aspect of this study is that it is comprehensive in terms of estimating how alternative levels of investment in SEPTA would affect travel times and travel costs for individual travellers, and how those changes would end up affecting the costs-of-doing-business and individual spending

patterns, and ultimately, the economy of the region and the State of Pennsylvania.

This study was commissioned by the Delaware Valley Regional Planning Commission (DVRPC), and funded through a grant from the Urban Mass Transportation Administration to DVRPC. An Advisory Committee of public officials and private business and civic leaders defined the scope of the study and provided guidance and suggestions. Both DVRPC and SEPTA provided data, previous studies, and suggestions.

■ 1.2 Description of the Study Area

This study focuses on the economy of the Philadelphia Metropolitan Area and the economy of the State of Pennsylvania. The metropolitan area is defined by the U.S. Census as consisting of five counties in Pennsylvania and three counties in New Jersey. (See Figure 1.1.) They are:

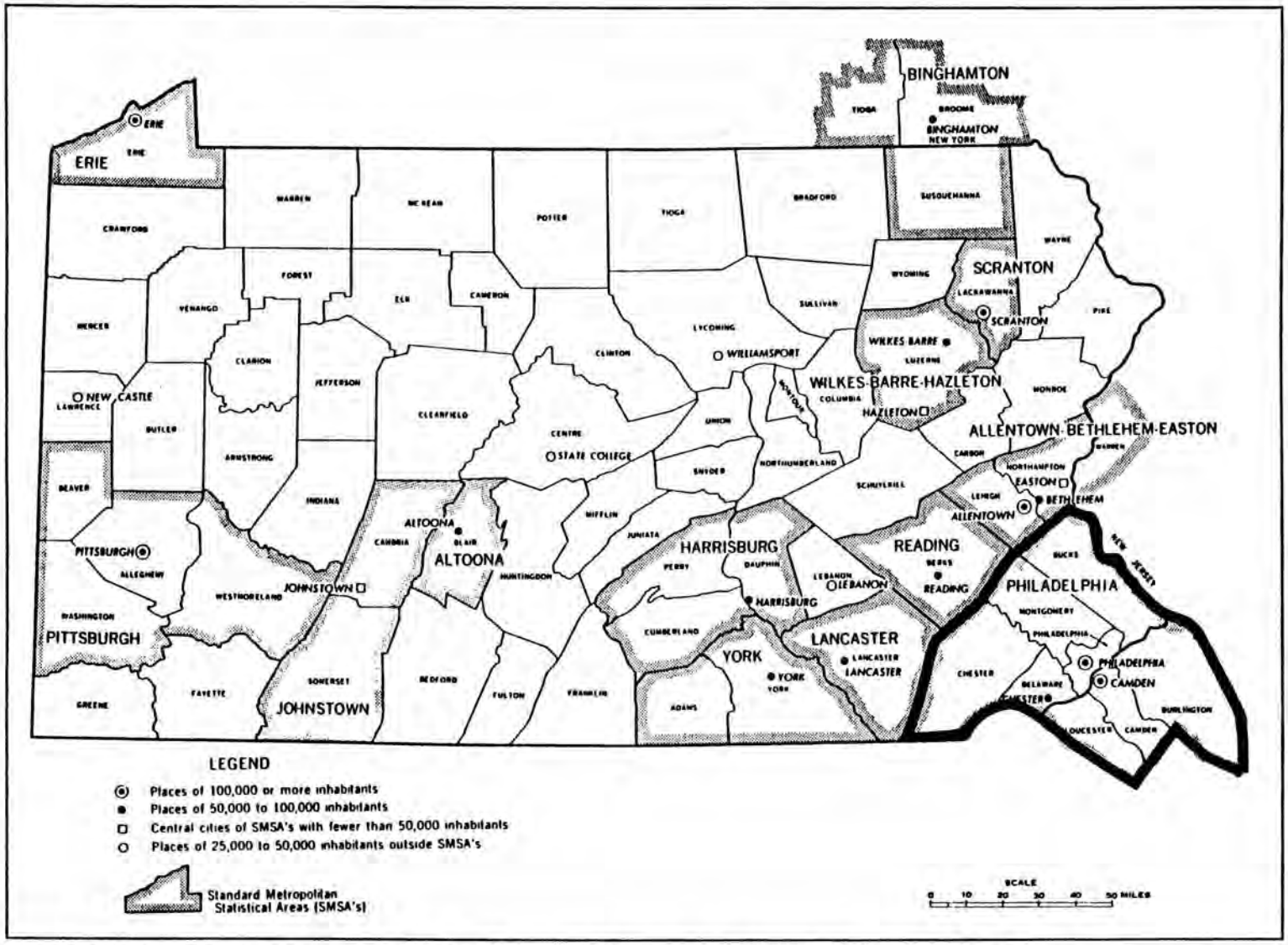
Pennsylvania Counties: Bucks, Chester, Delaware, Montgomery, Philadelphia.

New Jersey Counties: Camden, Gloucester, Burlington.

SEPTA (Southeastern Pennsylvania Transportation Authority) serves the five Pennsylvania counties and reaches into Delaware and New Jersey, while New Jersey Transit and PATCO provide service between the New Jersey area and Center City, Philadelphia. This study, however, considers the economic impact of SEPTA on all eight counties of the Philadelphia Metropolitan Area, and on the State of Pennsylvania as a whole. The Delaware Valley Regional Planning Commission area includes Mercer County, New Jersey, which was not included within the economic study area.

SEPTA services are described in Section 2.2 of this report.

Figure 1.1 Study Area



Source: U.S. Department of Commerce, Social and Economic Statistics Administration, Bureau of the Census

1.3 Alternative Scenarios

Description of Scenarios

SEPTA's public transportation service is one of many inter-dependent resources and factors which together support the health and growth of the regional economy. As such, it is difficult to isolate the particular contribution of SEPTA service to the regional economy. One way to better understand the contribution of SEPTA is to compare how the regional economy would differ under alternative scenarios. This is the approach taken in this study.

The economic evaluation was conducted for four alternative public policies:

- rehabilitation of SEPTA and the continuation of SEPTA services;
- a 50 percent reduction of SEPTA services within five years;
- a gradual shutdown of all SEPTA services within ten years;
- an immediate permanent shutdown of all SEPTA services.

Each of these alternatives was quantitatively defined in terms of annual SEPTA ridership, revenues, capital costs, and operating costs. The SEPTA operating costs, capital costs, ridership, and total costs in each year for each scenario are shown in Figure 1.2 and Table 1.1. The table gives a quantitative picture of how each alternative evolves over time in terms of SEPTA expenditures and ridership.

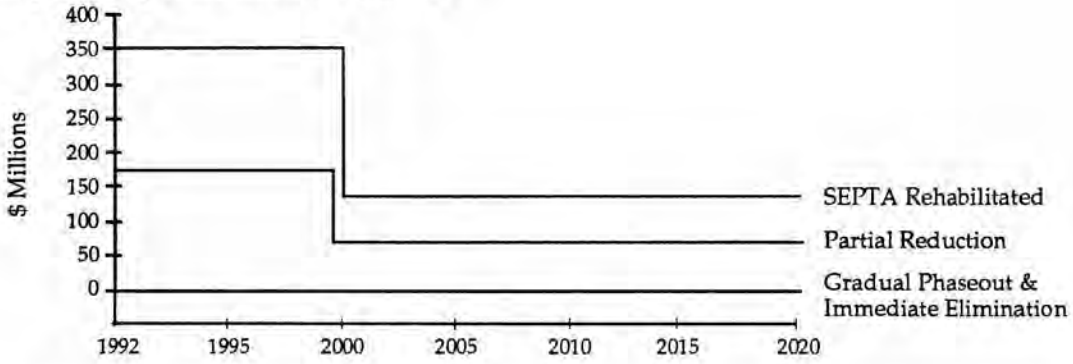
The consequent impacts on highway costs, the economy, and other social concerns were then assessed through an integrated set of economic models, augmented by interviews. It is important to note that no analysis was made of the discontinuance of any specific SEPTA service, by area or mode, and no conclusions should be drawn with regard to the impacts of potential discontinuance of any specific service or mode.

Rehabilitation

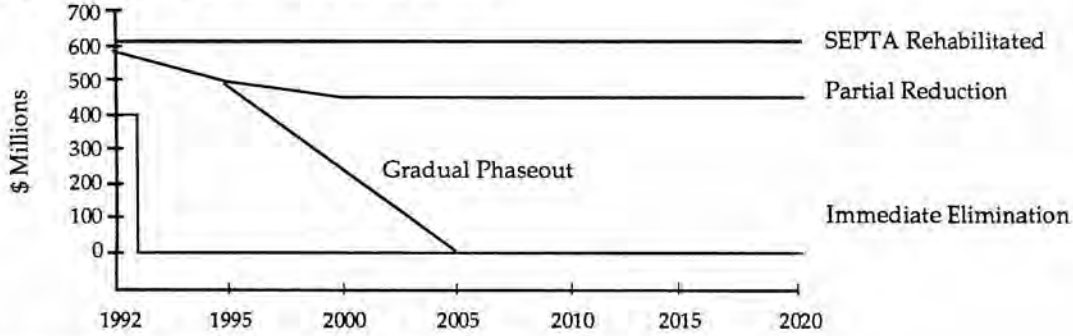
Under this scenario, the program of rehabilitation projects and minor expansions proposed by SEPTA, local officials, and many other groups would be funded at an adequate enough level for the ten years (1992-2001) to bring the system to a state of good repair and good service quality for all modes. Considering inflation and contingencies, the cost estimate for this

Figure 1.2 Public Expenditures on SEPTA, by Scenario (All Amounts in Millions of 1990 Dollars)

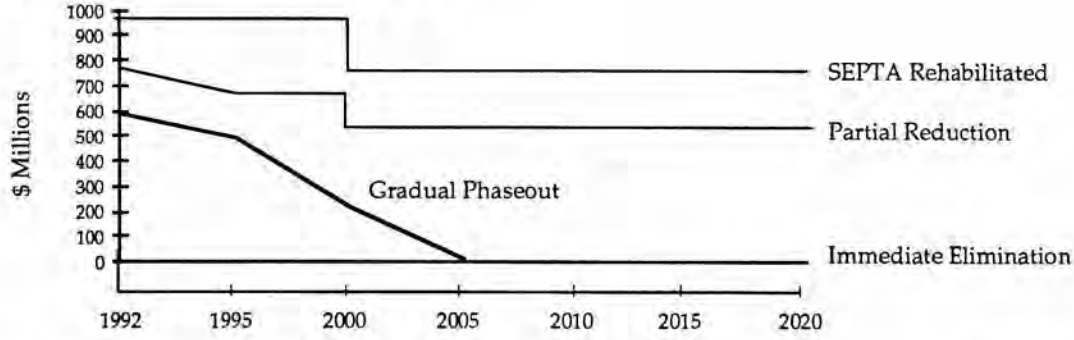
A. Annual Capital Expenditures on SEPTA



B. Annual Operating Expenditures on SEPTA



C. Annual Total Expenditures on SEPTA



D. Net Public Investment on SEPTA (Total Expenditures Less Farebox Revenue)

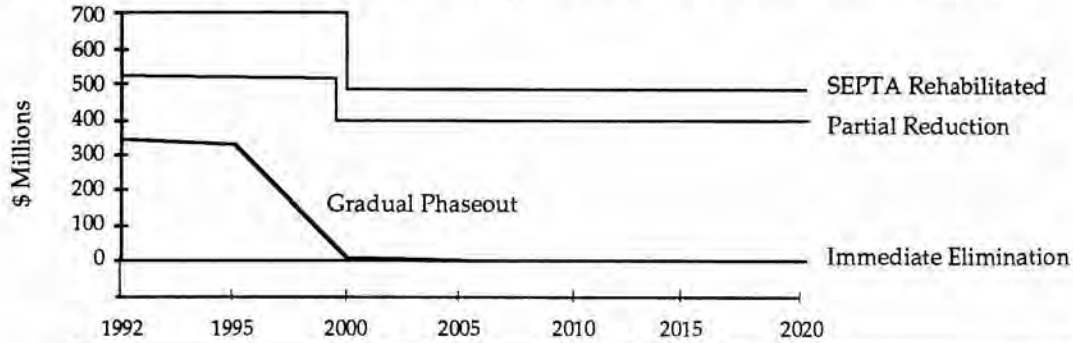


Table 1.1 SEPTA Expenditures and Ridership, by Scenario

Scenario	All Amounts in Millions of 1990 Dollars													
	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	-->	2020
SEPTA Rehabilitated														
Capital Cost	352	352	352	352	352	352	352	352	352	352	139[1]	139		139
Operating Cost	619	619	619	619	619	619	619	619	619	619	619	619		619
Ridership Factor[1]	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0
Immediate Shutdown														
Capital Cost	0	0	0	0	0	0	0	0	0	0	0	0		0
Operating Cost	320	0	0	0	0	0	0	0	0	0	0	0		0
Ridership Factor[2]	0	0	0	0	0	0	0	0	0	0	0	0		0
Gradual Phaseout														
Capital Cost	0	0	0	0	0	0	0	0	0	0	0	0		0
Operating Cost	588	557	526	495	464	402	340	279	217	155	93	31		0
Ridership Factor[2]	0.90	0.80	0.70	0.60	0.50	0.35	0.20	0.10	0.05	0	0	0		0
Partial Reduction														
Capital Cost	176	176	176	176	176	176	176	176	176	176	70	70		70
Operating Cost	588	557	526	495	464	464	464	464	464	464	464	464		464
Ridership Factor[2]	0.90	0.80	0.70	0.60	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50		0.50

[1] Only a first phase, ten year program is evaluated; other programs may be proposed for future improvements.
[2] Ridership as a proportion of 1990 levels.

scenario is about $4.5 billion in inflated dollars over the next ten years. In uninflated (constant 1990) dollars, this scenario has capital project costs of $352 million per year for ten years. After the rehabilitation projects are completed in 2001, only $139 million per year in uninflated dollars is estimated to be necessary to maintain the system. Further improvements may be proposed in future years.

Under the rehabilitation scenario, ridership is forecast to stabilize, and operating costs to increase at the rate of inflation. This means that operating costs are estimated to remain the same in uninflated dollars as current operating costs. Fare revenues and deficits are estimated to remain the same in uninflated dollars as well. As with all of the scenarios, viewing future dollar values in inflated dollars will simply increase the reported values, but will not change any of the forecasts or the results.

It is generally found that rehabilitation projects and new vehicles result in increases in ridership. Reasonable projections could be made that ridership will increase when SEPTA facilities are rehabilitated. We have chosen, however, for the purposes of this analysis to estimate the economic impacts under the assumption that ridership under the rehabilitation alternative will remain the same. This assumption avoids the potential criticism that the negative economic impacts of not rehabilitating SEPTA could be overstated due to overstating the impacts of rehabilitation on ridership. Any increase in ridership after rehabilitation would indicate that the economic benefits of rehabilitating versus not rehabilitating SEPTA would be greater than what has been calculated in this study.

Immediate Elimination

The immediate elimination scenario assumes that SEPTA services close down immediately, and that no public policy decision is ever made to start up services. Even under an immediate shutdown, all current operating costs cannot be avoided. SEPTA is responsible for paying, for example, unemployment benefits. In addition, under current collective bargaining agreements, SEPTA has a "no layoff" policy. It is assumed that under this alternative, state and local governments would not have to pay labor protection costs after SEPTA is abolished. However, there is a risk that some such costs would have to be paid, and therefore there is some risk that this alternative may be worse than is shown here.

After an immediate shutdown, it is assumed that all further capital costs could also be avoided. Some contractual agreements may, however, be difficult to cancel in the short run. Also, lease payments would still be due. The possibility also exists of the need for a "payback" of recent UMTA capital expenditures. These risks in the area of capital costs also indicate that this alternative may be worse than is depicted here.

Gradual Elimination

While there are literally unlimited numbers of ways in which a gradual shutdown could take place, in terms of year-by-year declines in services, ridership, and revenues, one representative scenario for a gradual shutdown is presented here. Under that scenario, a public policy decision would be made that only the operating costs of SEPTA would be funded, and that the system would be allowed to go out of service as riders abandoned it and as services were cut.

With the gradual elimination, no expenditures are assumed to be made for rehabilitation projects, and as facilities become unsafe or unusable, they would be closed, with resulting loss of service. As ridership and fare revenues drop, service is further curtailed. Ridership and fare revenues, however, drop faster than costs, because a large proportion of transit operating costs are fixed costs, and cannot be reduced in proportion to reductions in service.

Under the gradual elimination scenario, ridership loss accelerates after a number of years, as service levels become unacceptable to larger and larger proportions of remaining riders. Then, the last few years of service see a more gradual decline in ridership, since the only riders left are those still using the services because they are desperate and have no choice no matter what the level of service, and those who will be left on the few remaining routes with good service.

Partial Reduction

The partial reduction is estimated to proceed generally the same as the gradual shutdown for the services which are being cut. However, it is assumed that one-half the services would be maintained under this scenario, and that the deterioration of services and ridership ends when SEPTA reaches about half its current size. Because of fixed costs, however, operating costs are more than half as much to run half the service levels. Thus, although under this option transit services are still provided, their cost-effectiveness will be less than the cost-effectiveness of current service levels. This has been the historical experience with shrinking services for all urban transit modes.

The partial reduction scenario, and the gradual elimination scenario are the most consistent, in terms of capital funding levels, with the level of funding committed to the capital program at the current time.

For purposes of discussion and analysis, the scenarios of eliminating or reducing investment in SEPTA are compared to the baseline assumption that SEPTA is rehabilitated and SEPTA services are continued at current levels over the period 1992 to 2020.

Reasonableness of the Alternatives

Public Transit Alternatives

The impact of reducing or eliminating SEPTA services is a reduction in transportation capacity through either a greatly reduced or zero level-of-service for public transportation. The gradual or partial losses of SEPTA's public transportation services are not impossible scenarios, and even a sudden long-term loss of all service is not impossible.

While a complete shutdown or a shutdown of half of SEPTA's services may at first seem to be unrealistic scenarios, in fact they are quite real possibilities. No element of infrastructure will last forever if it is not periodically rehabilitated and regularly maintained. For virtually every type of infrastructure and vehicle, deterioration is gradual at first and then more and more rapid after the normally planned years of service of the facility or vehicle have been accumulated.

The SEPTA system has now gone through the decades during which underinvestment resulted in gradual declines in service quality or safety, and is now at the stage where major rehabilitation is necessary to forestall extremely rapid degradations, safety hazards, and potential shutdown of services.

The gradual decline scenario is realistic because it represents a continuation of current trends and only somewhat reduced funding levels. If a decision is made at some later point, rather than today, to stop the decline, then the partial shutdown scenario may be realistic. However, as that scenario indicates, substantial investment in rehabilitation is necessary to preserve even a portion of the system.

Highway Investment Alternatives

It is possible to define other alternatives, whereby additional investments are made to increase the region's highway system capacity, by some combination of widening existing highways and roads, and building new highways and roads. As Philadelphia is a mature and developed city, there is little or no land capacity for new highway construction or highway widenings along SEPTA's service corridors, and such actions would therefore require massive and infeasible land takings and building demolitions. For this reason, it was felt by the Pennsylvania Department of Transportation (PennDOT) that it would not be useful to define scenarios whereby construction of additional highway system capacity is available to make up for a loss of SEPTA's transportation capacity.

In addition, it was also assumed that the lack of funding for SEPTA would be symptomatic of a general lack of funding for transportation infrastructure.

1.4 Scope of Regional and State Economic Impact Analysis

This study examines the impacts of a potential lack of rehabilitation of public transportation services relative to a base case of making the necessary expenditures to keep the system in service. Several categories of impacts are addressed:

1. Transportation Impacts: additional out-of-pocket cost and additional travel time incurred by former SEPTA riders who have to switch to car or other modes of travel, and incurred by existing automobile and truck users who are slowed by increasing traffic congestion.

2. Regional and State Economic Impacts: changes in business sales, employment, personal income, and population which result from increases in local costs and expenditures for businesses and residents.

3. Fiscal Impacts: changes in local and state government costs and revenues that would occur as a result of population and employment losses.

4. Social Impacts: changes in mobility, differentially affecting specific segments of our society.

5. Environmental Impacts: changes in energy consumption and air quality resulting from increasing car ownership and reliance.

Each of these forms of impact can be compared to the costs incurred by maintaining SEPTA services, or costs saved by reducing expenditures on SEPTA. The methodologies for estimating these impacts are discussed in detail in Sections 3.0 to 7.0 of this report.

2.0 Profile of Current Conditions

■ 2.1 SEPTA Services

The Southeastern Pennsylvania Transportation Authority (SEPTA) operates the fourth largest public transportation system in the U.S., as measured by the number of peak vehicles and passengers.

SEPTA's current services include:

- 113 bus, trackless trolley, and surface streetcar routes requiring nearly 1,350 peak vehicles;
- 7 subway/surface and light rail lines requiring nearly 130 peak cars, operating on 45 route-miles;
- 3 rapid transit lines requiring over 270 peak cars, operating on 38 route-miles;
- 8 regional rail lines, serving 13 branches, requiring 270 peak cars, operating on 285 route-miles;
- Demand responsive paratransit service which serves passengers unable to ride conventional public transportation vehicles.

SEPTA operates an extensive bus network within the City of Philadelphia and in the close-in suburbs. Buses also serve an important role as feeders to the region's extensive rail and subway network. Figure 2.1 shows the SEPTA regional rail network, covering the City of Philadelphia, the four suburban Pennsylvania counties, and small parts of New Jersey and Delaware. Figure 2.2 shows the trackless trolley, light rail/streetcar, rapid transit, and core regional rail routes focused on Philadelphia.

In addition to SEPTA's services, there are many small transit services operated by social service agencies and private and county-sponsored paratransit organizations throughout the region. These services are typically targeted to specific agency clients, including handicapped and elderly riders.

Usage of public transportation in Southeastern Pennsylvania is very high. On a typical weekday in 1989, SEPTA carried more than 1.2 million trips. About 70% of the people holding the 285,000 jobs in Center City use public transportation to travel to work. This is one of the highest levels of transit use in the country. Only New York and Chicago have a higher percentage of work trips by public transportation to the central business district.

Another important market served by public transportation is the off-peak travel market. As summarized in Table 2.1, more people use SEPTA in the off-peak weekday periods and on weekends than during the weekday peak periods. Some of this travel includes trips to work (i.e., second and third shift workers), while the balance includes shopping and other trip purposes.

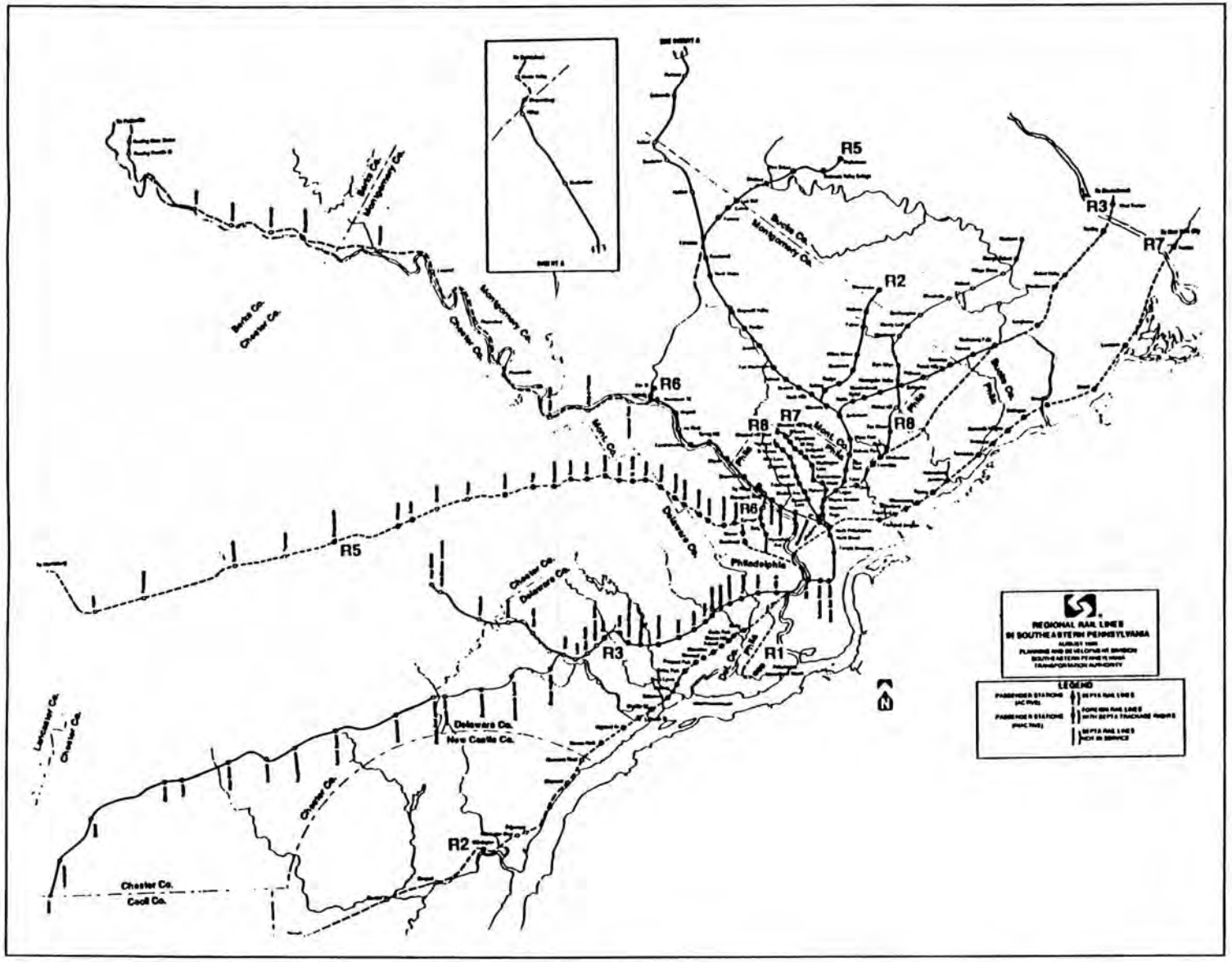
■ 2.2 Regional Economy

In order to understand the importance of SEPTA to the regional economy, it is first necessary to understand the special nature of the Philadelphia metropolitan area economy.

Current Profile

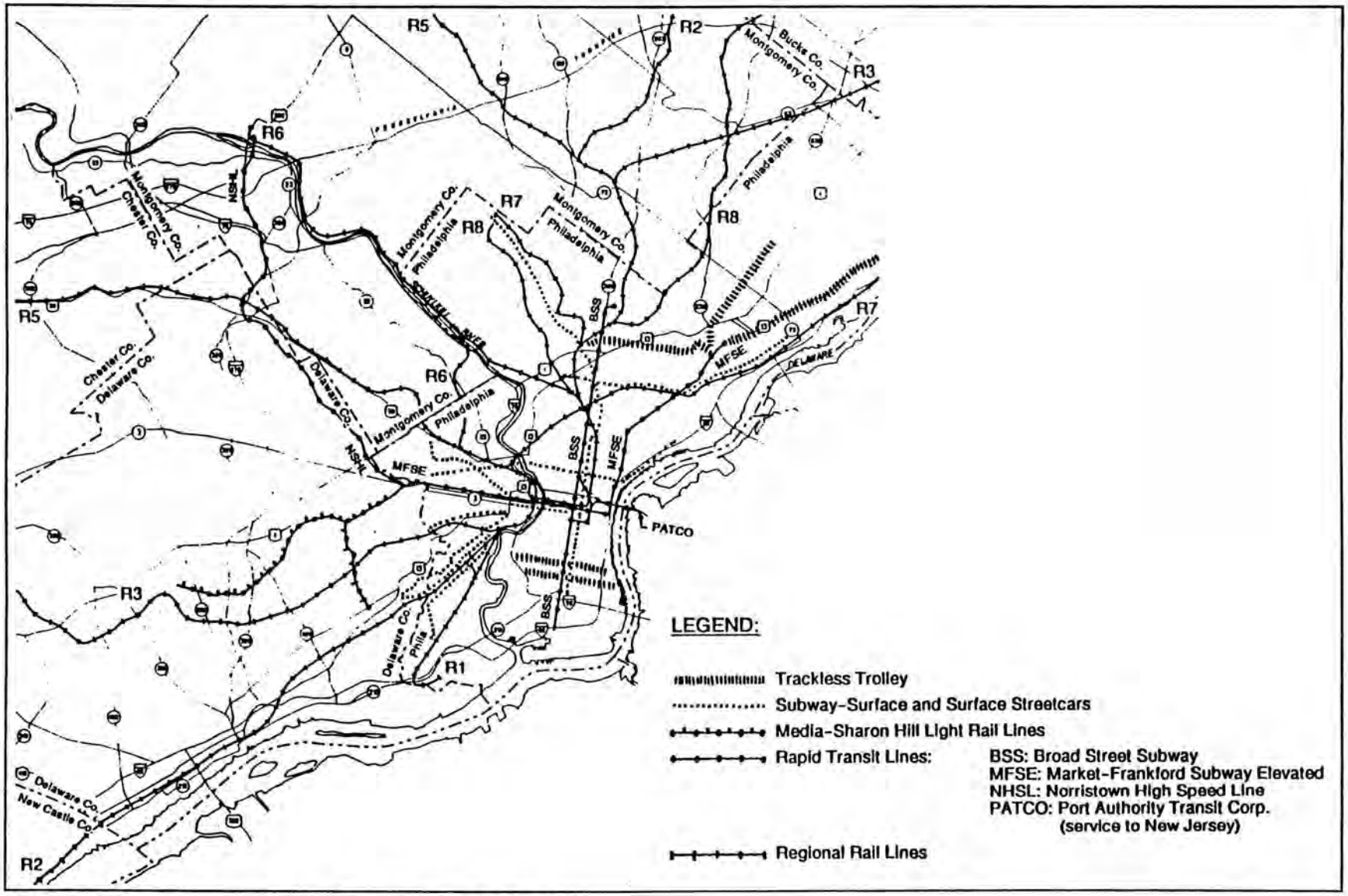
The Philadelphia Metropolitan Area is today ranked fifth in the U.S., in terms of total population (4.9 million) and employment (2.6 million). Figure 2.3 shows a profile of metropolitan area employment, by type of business. Like all major metropolitan areas today, over half of all employment in the Philadelphia area is in services, retail and wholesale trade.

Figure 2.1 SEPTA Regional Rail Network



Source: Southeastern Pennsylvania Transportation Authority

Figure 2.2 SEPTA Trackless Trolley, Street Car/Light Rail, Rapid Transit, and Core Regional Rail Network



Source: Southeastern Pennsylvania Transportation Authority

Table 2.1 SEPTA Ridership in FY89

	Ridership (Thousands)					
	Bus	Trackless Trolley	Streetcar/ Light Rail	Rapid Transit[1]	Regional Rail	Total
Average Daily Boardings						
Weekday						
Peak	323	21	69	187	69	669
Off-Peak	322	24	83	133	27	589
Weekday Total	645	45	152	320	96	1,258
Saturday	347	22	96	160	38	663
Sunday	193	12	58	80	19	362
Annual Boardings[2]						
Weekday Peak	82,688	5,376	17,664	47,872	17,664	171,264
Total	194,358	13,360	47,268	94,880	27,654	377,520
Percent Weekday Peak	43%	40%	37%	50%	64%	45%
Percent Weekday Off-Peak, Saturday and Sunday	57%	60%	63%	50%	36%	55%

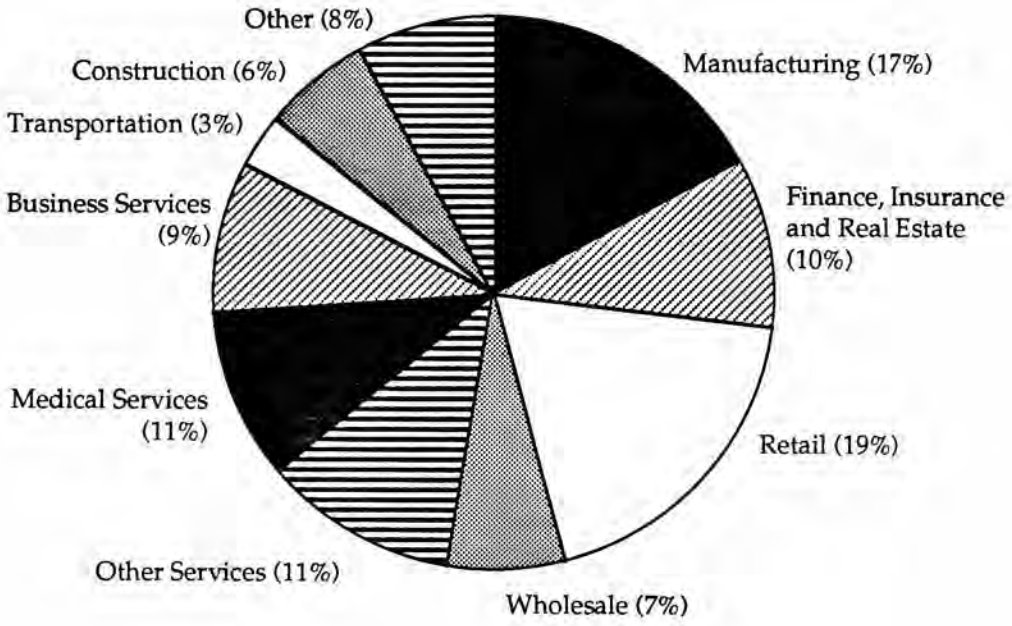
1 Rapid transit includes Broad Street Subway, Market Frankford Subway Elevated, and Norristown High Speed Line.

2 Annual estimate based on 256 weekdays, 52 Saturdays, and 58 Sundays operated.

Note: Total annual boardings for FY90 are: bus - 171,366; trackless trolley - 13,120; streetcar/light rail - 29,007; rapid transit - 93,464; regional rail - 24,381; total - 331,338. Source: SEPTA, Ridership Statistics Report, Fiscal Year 1990.

Source: Southeastern Pennsylvania Transportation Authority.

Figure 2.3 Profile of Employment in the 8-County Philadelphia Metropolitan Area (1990)



Source: U.S. Bureau of Economic Analysis and Regional Economic Models, Inc.

Relative to the national average, the Philadelphia area features notably high concentrations of employment in education, insurance, petroleum refining and manufacturing of pharmaceutical and chemical products (see Figure 2.4). This reflects locational advantages which make the Philadelphia area able to successfully compete for those business sectors, and provide their products and services to serve many customers outside of the Philadelphia area. These advantages include factors such as a skilled workforce and accessible labor market, good transportation system and proximity to other major markets (that have relatively higher costs for labor and land). The ability of the Philadelphia metropolitan economy to sustain its position of importance for these industries depends upon maintaining those workforce and transportation accessibility advantages. This is particularly important because the Philadelphia metropolitan area already has costs of fuel and raw materials that are typically 6-10% higher than the United States average for manufacturing industries.

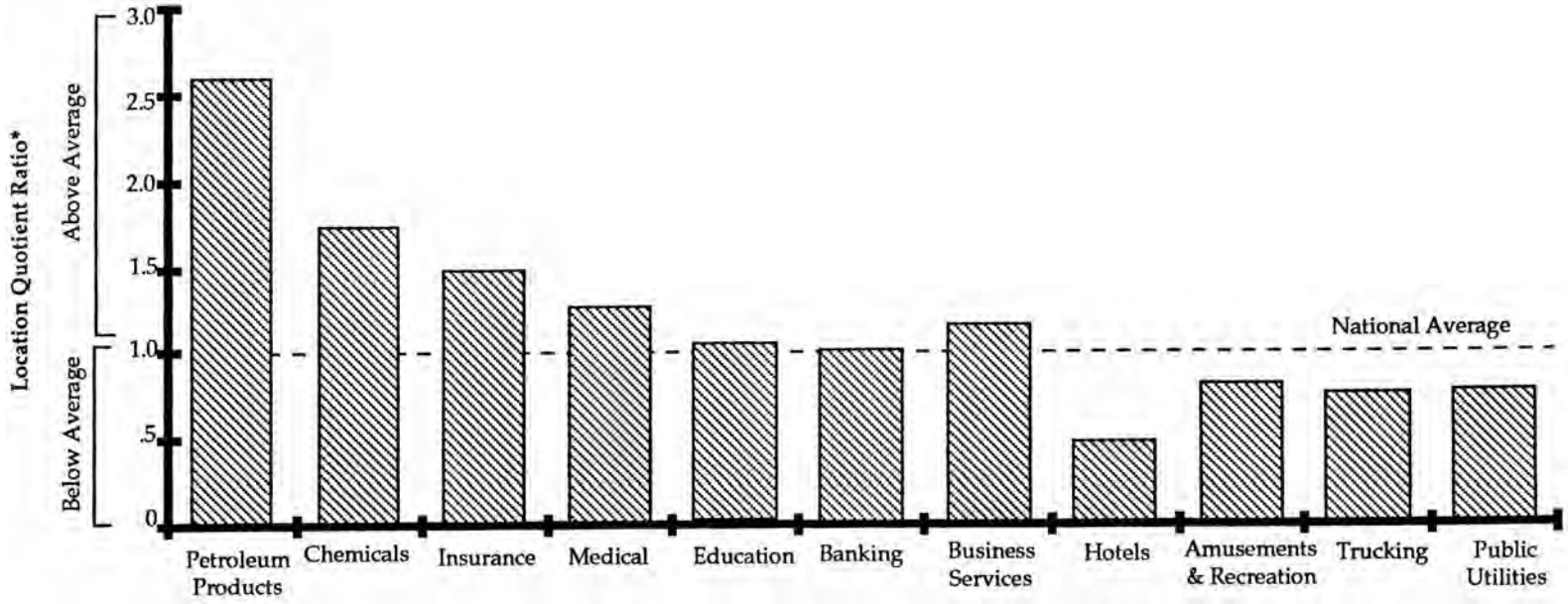
Past Trends

Between 1970 and 1990, employment in the Philadelphia metropolitan area grew by 1.5% annually from 1.8 million to 2.3 million. It also underwent dramatic changes in its composition (see Table 2.2). In keeping with national trends, the Philadelphia area lost 173,000 jobs in traditional manufacturing industries. These included employment losses in industries that were formerly local strengths, such as petroleum refining and chemical products, as well as metals, manufacturing of electrical equipment and fabricated metals manufacturing. Also consistent with national trends, the Philadelphia area's service industries added jobs. Of particular importance for the Philadelphia area was its growth in key emerging industries: the medical services industry grew by 132,000 jobs and business services grew by 139,000 jobs. There were also increases in air transportation, communications, banking, insurance, finance and real estate, as well as construction, wholesale and retail trade. These trends reflect transformations in the area's economic base towards an "advanced services economy". The changes reflect declines in factory jobs and increases in office jobs.

Future Prospects

Forecasts for the Philadelphia metropolitan area economy are provided by the Delaware Valley Regional Planning Commission (DVRPC), the U.S. Bureau of Economic Analysis (BEA), and the REMI Model of Regional Economic Models, Inc. All three essentially agree on expectations that the Philadelphia metropolitan area will continue to grow over 1990-2020, but at a slower rate. (The REMI Model and DVRPC forecast future growth averaging 0.4% annually, compared to 1.5% annually from 1970 to 1990).

Figure 2.4 Employment Concentration in the Philadelphia Metropolitan Area Relative to U.S. Average for Selected Sectors, 1990



* Ratio defined as $\frac{\text{\% of Philadelphia metropolitan area employment in this industry}}{\text{\% of U.S. employment in this industry}}$

Source: U.S. Bureau of Economic Analysis and Regional Economic Models, Inc.

Table 2.2 Philadelphia Metropolitan Area Employment: Past Trends and Future Forecasts

Sector	Employment in Thousands			
	1970 Actual	1990 Estimated	2010 Forecast	2020 Forecast
Manufacturing	555.4	382.5	345.0	306.7
Durables	294.5	206.4	174.7	151.5
Non-durables	260.9	176.0	171.3	155.2
Non-manufacturing	1227.2	1928.2	2304.7	2309.0
Mining	1.8	2.7	3.2	3.2
Construction	103.6	136.8	150.6	147.9
Transport., Public Util. & Communications	112.5	115.9	118.8	111.7
Finance, Insurance & Real Estate	128.9	222.9	228.8	212.4
Retail Trade	321.0	440.4	500.8	488.5
Wholesale Trade	112.4	156.8	162.5	151.2
Services	439.8	834.2	1116.7	1170.9
Agriculture, Forestry & Fishing Services	7.3	18.6	23.2	23.4
Total Government	357.3	345.6	343.4	346.9
State and Local Government	185.8	217.2	219.1	224.6
Federal Government - Civilian	91.1	81.3	79.0	76.3
Federal Government - Military	80.5	47.2	45.3	46.0
Farm Employment	15.4	14.2	10.9	9.9
Total Employment*	2155.4	2670.5	3004.0*	2972.5
Population*	4830.1	4954.0	5127.2*	5298.4

* Corresponding projections for the 8-county area by the Delaware Valley Regional Planning Commission, for year 2010 are 2745.8 for employment and 5333.4 for population. (Source: DVRPC, July 1988 projections.) No DVRPC forecasts are available for year 2020. The REMI forecast shows higher employment growth and lower population growth than the DVRPC forecast because it is based on updated (1990) BEA data which shows trends toward higher labor force participation rates than anticipated in earlier estimates.

Source: Regional Economic Models, Inc.

This continued growth will mean continued expansion of traffic congestion for the existing system of local transportation. The forecasts also indicate expectations of more structural adjustment for the Philadelphia area economy (see Figure 2.5). Petroleum refining is forecast to grow nationally by 2010, but decline even faster for the older facilities in the Philadelphia area. Production of chemicals is also expected to grow nationally, but decline in the Philadelphia area due to a weaker competitive cost structure. Future expansion of the Philadelphia area's economic base is expected to be concentrated in medical, conventions and hotels, education and business services. The expected future of continued growth and change in the Philadelphia metropolitan economy will bring about changing business location decisions for expansion and new facilities, and increasing burdens on the local transportation systems to provide businesses with access to workers and customer markets.

■ 2.3 SEPTA's Importance for Regional Business

Business

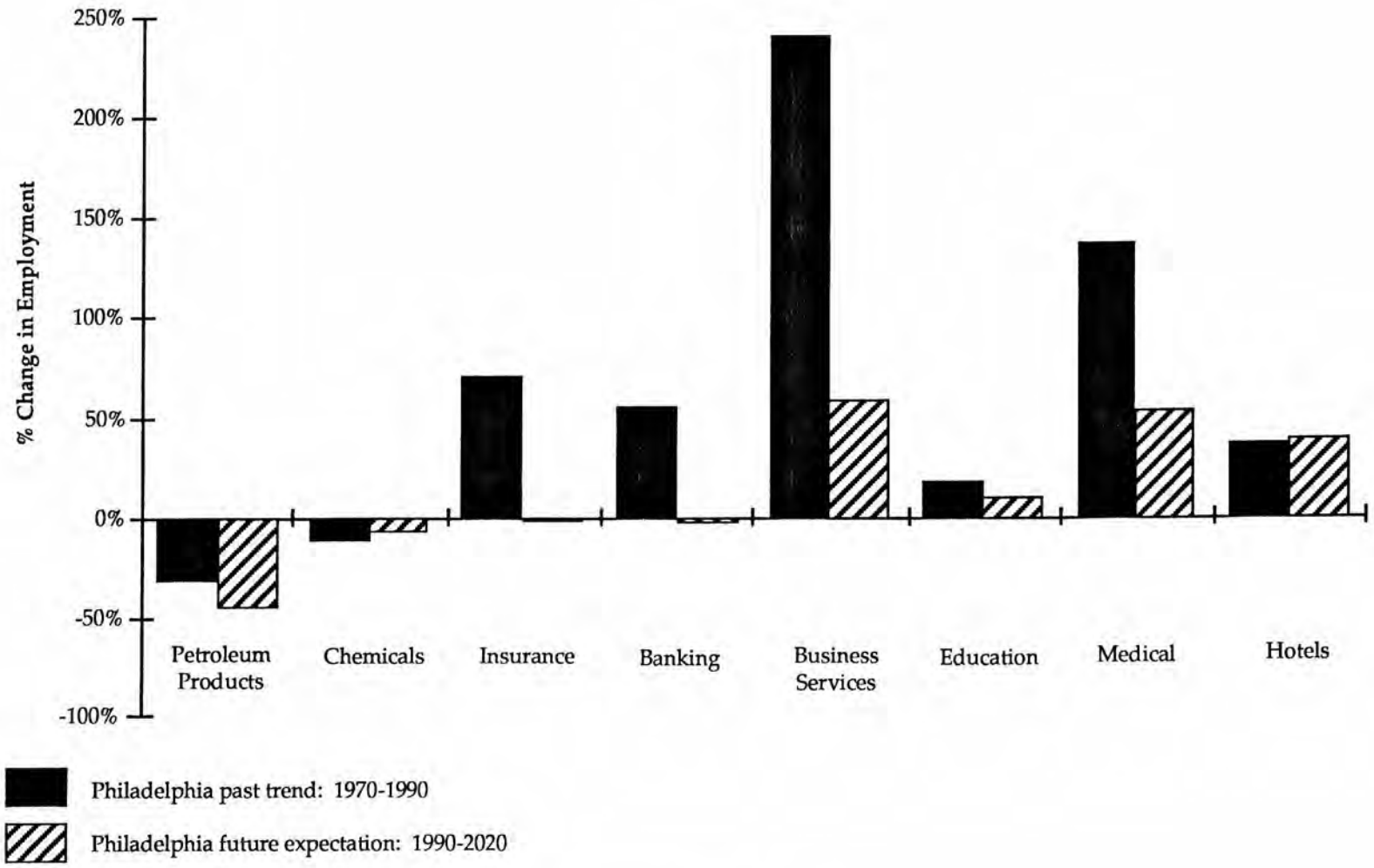
An important aspect in understanding the role of SEPTA in the regional economy is the extent to which different types of businesses depend on SEPTA services for their operations. There are three ways that businesses can rely on SEPTA: to transport workers to and from their jobs, to transport workers while performing their jobs, or to transport customers.

A series of interviews was conducted with area businesses to better understand the extent to which businesses depend on SEPTA. In addition to services, business and insurance, and educational enterprises, there are also specialized examples.

Given the characteristics of the regional economy previously described, which includes a heavy portion of service sector businesses as well as retail and finance/insurance industries, it is clear that the labor force access provided by SEPTA is critical. Centralized access to a large labor pool is a key advantage of Center City locations for clerical offices and professional services, and it is a key reason why Philadelphia's Central Business District is home to a high concentration of regional and national offices for banking and insurance companies, as well as specialized professional and business services (see Table 2.3).

The importance of transit service is further demonstrated by figures compiled in a recent study of Philadelphia residents; only 23% of Philadelphia residents reported that they rarely or never used transit versus

Figure 2.5 Past Trend and Future Forecast for Changes in Employment in the Philadelphia Metropolitan Area, for Selected Sectors



Source: U.S. Bureau of Economic Analysis and Regional Economic Models, Inc.

Table 2.3 Profile of Philadelphia Downtown and Metropolitan Employment

	Central Business District	Philadelphia Metro Area
Construction	2%	6%
Manufacturing	5%	16%
Transportation, Public Utilities & Communications	6%	4%
Wholesale	3%	7%
Retail	13%	19%
Finance, Insurance & Real Estate	19%	10%
Services	35%	30%
Government, Other	16%	8%
TOTAL	**100%**	**100%**

Source: Delaware Valley Regional Planning Comission, 1990.

29% who rarely or never used a car, truck or van (City of Philadelphia, "Philadelphia Travels: Technical Paper: City Transportation Survey", 1988). That same survey indicated that 60% of all city residents used transit to get to work. Of those going to the Central Business District, 80% used transit.

National data from the U.S. Census illustrates the relationship of transit usage to white collar and service occupations (see Figure 2.6).

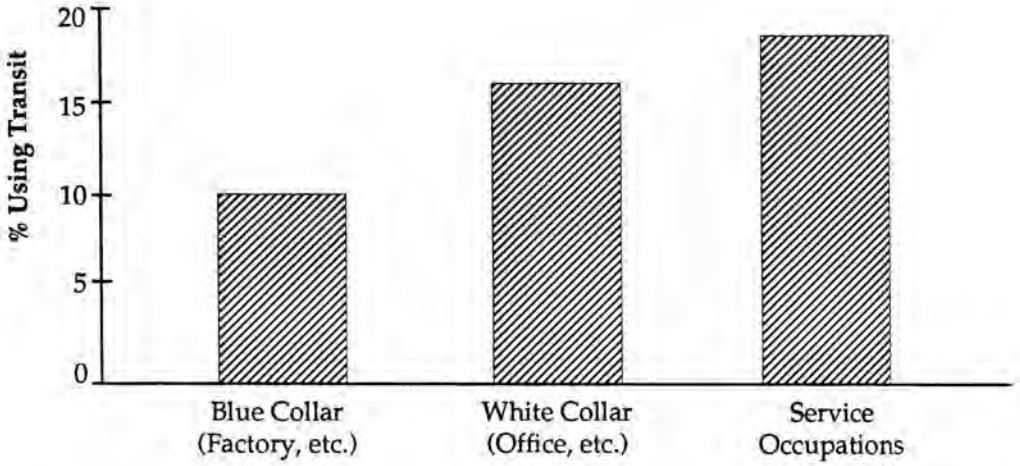
Interviews with area businesses confirm that downtown Philadelphia locations are maintained for regional and national offices or banks and insurance companies specifically because of their access to a large labor pool of clerical workers. SEPTA service is a major reason for that advantage of downtown, which is not provided elsewhere in the metropolitan area. This is supported by recent moves or expansions into downtown by major employers such as CIGNA and Conrail, which were largely due to considerations of access and availability of labor.

Many suburban businesses also have workers who use SEPTA services to get to and from work. The importance of SEPTA to suburban locations has increased considerably over recent years, with some downtown residents commuting out to jobs at suburban office and retail mall locations. Retailers, both downtown and in the suburbs, rely very heavily on SEPTA for their workers. One retailer interviewed who has stores in both downtown and in suburban locations reported that reverse commuting was extremely important for keeping their suburban stores operating, as well as relying on SEPTA access for providing for their downtown location. Interviews with SEPTA, on patterns of demand for service, support the fact that employers throughout the region are increasingly relying on SEPTA for worker access, as evidenced by the increase in "reverse commuting". The 200 series bus routes, which SEPTA instituted to carry people from suburban rail stops to various surrounding employment centers, have experienced a strong interest and ridership increase.

Shipping companies such as UPS rely on SEPTA to transport their large pool of part-time student employees. Retailers also rely heavily on SEPTA for their sales force, both in downtown and suburban locations. The overall importance of SEPTA services for labor market access was noted in the final report of the Regional Labor Market Task Force (Keeping the Competitive Edge, A Joint Initiative of The Urban Affairs Partnership and the Greater Philadelphia Economic Development Coalition, 1989.)

Another aspect of SEPTA support of workers is in the context of carrying out their jobs. The types of uses during the day may include deliveries, visiting clients or customers, or attending meetings. The major delivery functions of regional businesses tend to be conducted by truck. One job support function provided by SEPTA is transporting the Philadelphia Electric Company's (PECO) meter-readers to read meters throughout their service area. The ability of meter readers to use SEPTA is very important to

Figure 2.6 Dependence on Public Transportation, by Occupation (Average of 25 Largest Urbanized Areas, 1980 Census)



Source: Demographic Change and Worktrip Travel Patterns, UMTA Technical Assistance Program, 1985, using 1980 Census, Public Use Sample

PECO, because without SEPTA, the company would have to provide automobiles to the meter-readers to conduct their jobs, or move to automatic meter-readers, either of which would result in added expense. An insurance company interviewed also emphasized workers use of SEPTA during the day between their main office, their record storage facility and other buildings.

Some types of businesses rely on SEPTA to bring customers or clients to their establishments. Retail stores, particularly downtown, have a large portion of customers coming to shop using SEPTA. Health care clinics, and personal services such as shoe repair and cleaners, also have customers come via public transportation. This is particularly true for the elderly, the handicapped and the poor, which is discussed in more detail in Chapter 4.0.

Tourism

An important part of the Philadelphia region economy is tourism and visitor activity and SEPTA plays an important role in supporting tourism in the region. In 1989, tourism directly contributed approximately $115 million to the region's economy. During 1989, over 3.7 million visitors came to the region. This includes three "market segments" of visitors (each of which rely on SEPTA in different ways): tourists or pleasure travelers, business travelers, and attendees of convention/trade shows and special events. Table 2.4 shows the breakdown of the visitors by market segment and by type of accommodations used (hotels, staying with friends or relatives, or day trippers).

Tourists or pleasure travelers are those who come to the Philadelphia region primarily to visit area attractions, shops and other activities. They make up 50% of all visitors. Tourists use SEPTA services to come into the city from the airport, and to come in from other locations outside of the eight-county region. In 1988, 33% of tourists came to the Philadelphia region by bus or train. Within the region, SEPTA carries many visitors to and from different attractions. For example, the Ben Franklin bus loop links the Independence National Historic Park with the museums and other attractions. Even more importantly, many local visitors, or day trippers, also use SEPTA to visit museums, as well as the zoo and other activities.

Business Travelers come to the Philadelphia region primarily to conduct business, either for the day or to stay overnight. They make up 16% of visitors to the region. Business travelers also use SEPTA, but to a lesser degree than tourists or local visitors. The primary use of SEPTA for business travelers is access from the airport. In addition, many business travelers arrive in the region by Amtrak train, and then access other parts of the region using SEPTA. Access from the airport and train station to business locations outside downtown is also provided by SEPTA.

Table 2.4 Visitors to the Philadelphia Region (1989)

	Type of Accommodations			
		Overnight		
	Hotel	Visits to Friends and Relatives	Day Trippers	Total
Tourists	493,000	322,263	1,058,361	1,873,624
Business	590,000	NA*	NA*	590,000
Convention**	364,000	107,870	774,788	1,246,658
	1,446,000	**430,133**	**1,833,149**	**3,709,282**

* These figures not compiled by the Philadelphia Convention and Visitors Bureau.
** Includes conventions, trade shows, and special events.

Source: Table compiled by Cambridge Systematics, Inc. using visitation and hotel data collected by the Philadelphia Convention and Visitors Bureau.

Convention/Trade Show/Events Visitors come to the Philadelphia area primarily to attend meetings, sports events, trade shows and other local, regional and national events which take place there. They comprise 34% of all visitors. They rely on SEPTA for access into and throughout the region. Sporting events, trade shows, and conventions all bring in people from outside the region, as well as day trippers within the region. Those who attend conventions often come by bus and train. SEPTA also provides transportation to sports events and shows for local residents.

The new Philadelphia Convention Center is currently under construction. It includes 1,300,000 square feet of total space, including a main exhibit hall with 320,000 square feet of space, as well as additional exhibit and meeting space, a ballroom, and additional facilities. The Convention Center will be constructed adjacent to the Reading Terminal Market on Market Street in Center City. The SEPTA Market Street East Rail Station is located directly beneath the complex. In addition, a 1,100 room Marriott will be constructed adjacent to the Convention Center and is scheduled to be completed by 1994. Within 10 years, after the scheduled opening of the Convention Center in late 1992, the Center is expected to generate 6,000 new permanent jobs and $234 million in new city taxes. The Convention Center will be linked to the airport, hotels and area attractions by SEPTA. Convention Center planners view the SEPTA link with hotels and other activities as critical in the future success of the Convention Center and in being able to attract conventions to the region.

Interviews with the Greater Philadelphia Convention and Visitors Bureau and the National Park Service's Visitors Center underscore the importance of SEPTA for tourism access to and within the city. The airport link and bus access to attractions within the city in particular are marketed to visitors in promotional literature and once they reach the city, and play a role in attracting these visitors.

■ 2.4 SEPTA's Role in Supporting Regional Economic Growth

As the previous section indicates, SEPTA plays an important role in supporting regional business. The future growth of business in the region is similarly dependent on SEPTA. Interviews were conducted with economic development professionals in the Philadelphia region to understand SEPTA's role in supporting future growth.

The path of future economic growth is dependent on a set of factors, all of which contribute in different ways, and SEPTA plays a role in supporting each of them. Future growth will be affected by the availability of an adequate labor force, the cost of doing business, ability and cost of

shipping/receiving goods, and the attractiveness of the region for workers to live there.

Site location specialists and business leaders who were interviewed point out the importance of SEPTA to the region in making it an attractive place to do business. As discussed earlier, SEPTA plays an important role in providing access to labor. One of the major factors businesses look for in selecting a business location is access to labor, and if in the Philadelphia region it becomes difficult (or impossible) for businesses to get workers, businesses will be likely to move outside of the region to where they can get labor. A particular strength of the region's "accessibility" noted by several site selection consultants was the **regional** accessibility provided by SEPTA – not only downtown, but throughout the suburbs, businesses can have access to labor, to each other, and to the airport. As the interviews stressed, the loss of SEPTA would likely drive businesses to relocate entirely outside the region, not just elsewhere within the region.

Businesses which do not rely heavily on SEPTA for labor access still find SEPTA important for future economic growth. The congestion on the roads which would result from the loss of SEPTA would impact on businesses' ability to send and receive deliveries in a timely and cost-effective manner. Manufacturers and services which make deliveries within the region would experience increased costs, as well as problems in making time-sensitive deliveries. A major food manufacturer with a suburban plant serving a regional (3-state) market emphasized the need for maintaining access of delivery trucks. Without SEPTA, the manufacturer feared that congestion would be serious enough to cause delays and increased costs for making shipments within the region. Those who can relocate, might do so once the costs were too high and shipping their products too inconvenient. Shipping and delivery firms, such as UPS or Federal Express, cannot leave, since their business is delivery. However, costs would have to be absorbed in some way, and some costs would be absorbed by area businesses and residents.

It would also make it more difficult and expensive for workers who currently drive to work (and don't use SEPTA) to continue to drive amidst increased congestion.

The future of tourism growth in the Philadelphia region is also supported by SEPTA. The future of the Convention Center currently under construction relies very heavily on access by SEPTA to the rest of the city and the region. Philadelphia Convention Center planners have found the lack of SEPTA access to the existing Civic Center to be detrimental in attracting convention activity to the region. In booking events at the new Convention Center, event coordinators have emphasized the attractiveness and importance of a public transportation system for making Philadelphia a viable convention city.

Future patterns of business moves from one location to another will be due to factors including issues of organizational realignment, technological change and changes in the market, including globalization of business activity. The metropolitan regions that benefit from these long term trends are those which offer the most attractive environment for businesses. For all businesses, important advantages will include operation costs, quality and availability of labor, and cost of labor. For future office businesses, adequate telecommunications infrastructure and air access will become increasingly critical. Industrial firms will be increasingly concerned with labor productivity, infrastructure and transportation access into and out of a region. Advanced computer networks and telecommunications increasingly allow clerical and records processing activities to locate elsewhere. Whether or not they remain will depend critically on the extent to which the quality and accessibility of the labor force is maintained.

All of these trends in business needs serve to highlight the importance of SEPTA for the future of Philadelphia as a business location. Philadelphia currently enjoys lower operating costs than its major competitors like New York, Washington, DC, Chicago, Atlanta, Boston and other major U.S. cities. If SEPTA services were lost, then the cost of doing business in the Philadelphia region would increase, causing Philadelphia to lose an important advantage. It would also become more difficult to access a large, quality labor force, which would further deter businesses from locating in the region.

Another issue for future business attraction is the ability of Philadelphia to build its reputation as a "world class city" which can compete in the global marketplace. Cities like New York, Paris, Washington, DC, Atlanta, and Boston are all "world class cities" which have made substantial investments in public transit systems, and are considered the most important centers of business. As business becomes more global in nature, being able to compete with other "world class cities" becomes increasingly more important for the future of Philadelphia. Loss of an extensive public transit system could make Philadelphia a second-tier city in the eyes of international business.

Many programs are aimed at assisting and promoting economic growth of the Philadelphia metropolitan area. Their effectiveness in reaching those aims will depend in part on maintaining the Philadelphia metropolitan area's reputation as an area providing good transportation accessibility to residents and good business access to labor.

3.0 Analysis Process

■ 3.1 Overview of Analysis Process

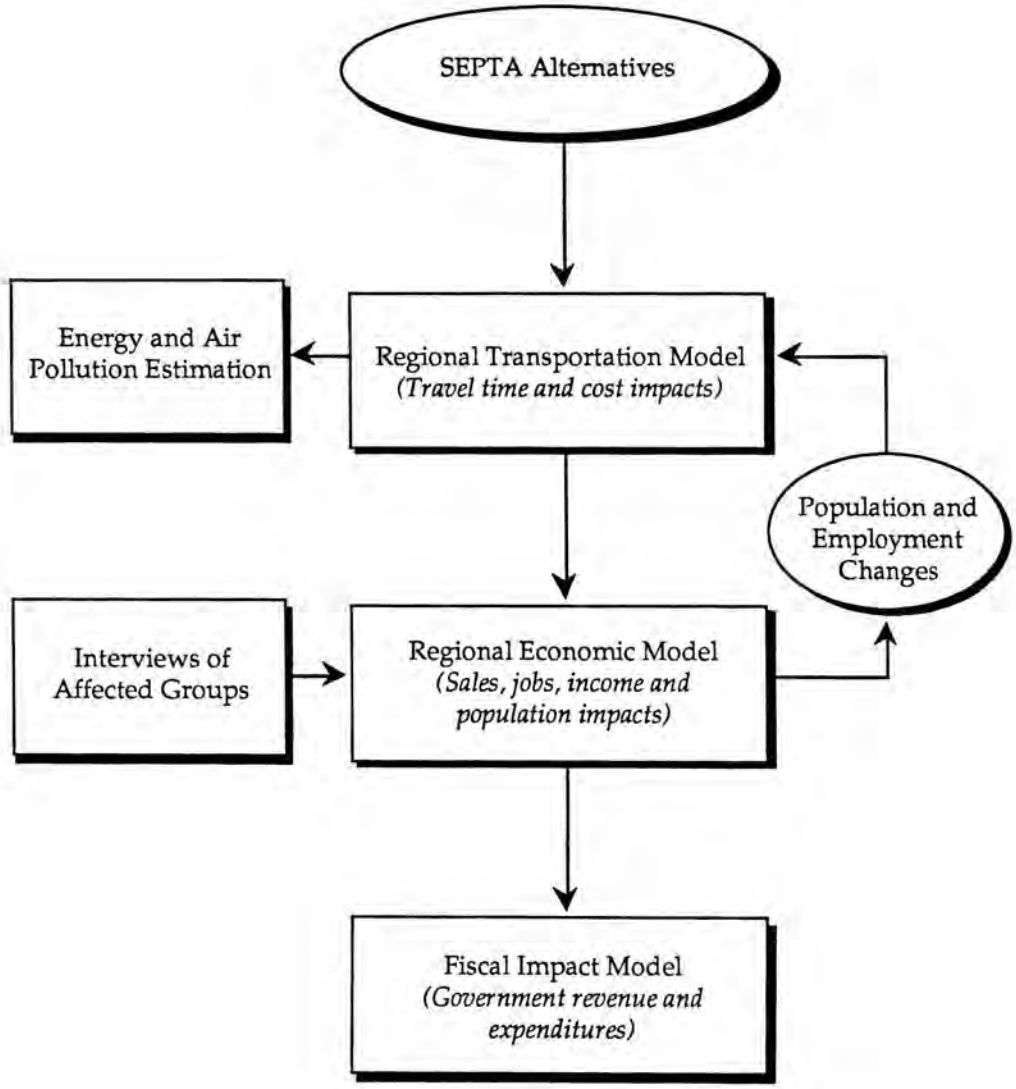
The analysis process involves a series of steps, which are outlined below and summarized in Figure 3.1. These steps are:

1. **Define Transportation System Changes** – The SEPTA Future Scenarios are defined in terms of changes in transportation supply (capacity) and level-of-service (travel time) for public transit, car and truck travel, for each year over the period 1992 to 2020.

2. **Transportation Model** – A computer model of regional transportation impacts is applied to estimate the impacts of transportation system changes on travellers, in terms of changes in operating costs, travel time costs, safety costs, and out-of-pocket costs and travel times incurred. These are estimated separately by mode of travel (public transit, car and truck), for each year over the period 1992 to 2020.

3. **Economic Model** – Economic simulation models for the Philadelphia metropolitan region and State of Pennsylvania are applied to estimate the impacts of travel cost and time changes on the economy, in terms of business sales, employment, income and population. These impacts are estimated for each type of business and occupation group, for each year over the period 1992 to 2020.

Figure 3.1 Analysis Process



4. **Fiscal Model** – Fiscal models for the Pennsylvania state government and for the Philadelphia region's local governments are applied to estimate the impacts of business sales, employment, income and population changes on government revenues and expenditures. These impacts are estimated in terms of net revenue changes for each year over the period 1992 to 2020.

5. **Energy and Air Pollution Estimation** – Energy and Emissions models are applied to estimate the impacts of changes in vehicle-miles of travel by public transit, car and truck on consumption of gasoline and emissions of air pollutants. These impacts are estimated for each year over the period 1992 to 2020.

6. **Interviews** – Findings from interviews with businesses, economic development professionals and representatives of elderly, handicapped, low income and minority groups are used to supplement the economic model analysis (Step 3, above), and to better distinguish the differential impacts on particular groups in the population.

■ 3.2 Data Collection

A wide variety of data sources were tapped to provide information for this study. They are:

1. Data on public transportation budgets, ridership and revenue patterns, provided by the Southeastern Pennsylvania Transportation Authority.

2. Data on population, employment, highway volumes, and levels of service, provided by the Delaware Valley Regional Planning Commission.

3. Data on regional economic competitiveness, provided by the Greater Philadelphia Economic Development Coalition.

4. Data on local, state and national economic growth/decline trends and national industry forecasts, provided by the US Department of Commerce, Bureau of Economic Analysis.

5. Data on local and state government revenues and expenditures, provided by the Pennsylvania Department of Revenue, and the Pennsylvania Economy League.

6. Interviews with businesses, social agencies, economic development organizations and tourism promotion organizations concerning the nature of their dependence on, or sensitivity to, public transit services.

■ 3.3 Estimates of SEPTA Financial Requirements

The estimates of SEPTA capital and operating expenditures for each scenario are presented in Section 1.3 "Description of Alternative Scenarios". The basis for estimates of SEPTA rehabilitation costs is the currently proposed SEPTA capital program. The basis for estimates of SEPTA operating costs is the current operating budget, with minor adjustments for items which would be shifted to the capital program in the future.

All of the economic analysis is conducted in constant dollars, so the proposed capital program of SEPTA was adjusted for inflation, with the result that the ten year capital program is estimated to cost $352 million per year in uninflated dollars.

The costs of rehabilitating SEPTA are estimated to be the costs included in SEPTA's Fiscal Year 1991 Capital Budget and Fiscal Year 1991-2000 Capital Program (June 1990). Ten year capital program costs are estimated to total $4.5 billion, much of which SEPTA has identified as necessary due to "years of decay, deferred maintenance and lack of capital reinvestment". In the longer term, keeping the capital stock in good condition is expected to cost much less on an annual basis than the rehabilitation program analyzed here, much of which represents "catch-up" expenditures. SEPTA has identified the capital program as being comprised of the expenditures shown in Table 3.1.

Using the assumptions about inflation in Table 3.1, the expenditure of $4.5 billion in current year (inflated) dollars over the ten year period 1991-2000 is equivalent to $352 million dollars per year in 1990 dollars which has been assumed to be the amount of capital expenditures per year necessary to carry out SEPTA's rehabilitation program. Much less than this – about one-third – has been spent on capital projects in recent years.

Operating expenses at a desired level of service also need to be added in order to develop a total annual cost for SEPTA. The projected Fiscal Year 1991 SEPTA operating expenses total $677.3 million. (SEPTA, Fiscal Year 1991 Operating Budget Proposal, p. 5.3.) This amount is used for analysis purposes, even though budget adjustments may reduce it below this amount.

Table 3.1 SEPTA Fiscal Years 1991-2000 Capital Program

Expenditure Category	Amounts in Thousands of Dollars		
	Infrastructure	Vehicles	Total
FY 1991 Budget	$ 281,800	$ 26,000	$ 307,800
FY 1992-2000 Program	1,825,400	960,500	2,785,900
Contingency and Inflation	984,438	421,862	1,406,300
TOTALS 1991-2000	**$ 3,091,638**	**$ 1,408,362**	**$ 4,500,000**

Notes: 1. Inflation assumed at 4.4 percent per annum escalated to mid point of ten years.

2. Infrastructure contingency is estimated at 30 percent and vehicle contingency at 20 percent of estimated costs.

Source: Southeastern Pennsylvania Transportation Authority, "FIscal Year 1991 Capital Budget, Fiscal Years 1990-2000 Capital Program", August 1990 (subject to revision).

Included in this amount are $31.1 million in vehicle and facility rentals and $31.5 million in depreciation charges. Although vehicle facility rentals are a transfer payment and could be capitalized in future budgets, they are continued in the operating budget for analysis purposes. Depreciation expenses of $31.5 million are subtracted out of the amounts necessary for this economic analysis, since the capital rehabilitation program in the long run is expected to cover such economic costs. The depreciation charges are, of course, a legitimate fiscal expense in the FY 1991 operating budget.

The estimated net operating budget for purposes of the economic analysis is $646 million in FY 1991 terms or $619 million in 1990 dollars. These figures yield a total capital plus operating cost requirement of $971 million per year in 1990 dollars, in order to rehabilitate and operate SEPTA. In order to place this figure in context, it is about $255 per person for residents of the Pennsylvania portion of the DVRPC region.

These expenditures are projected to grow with inflation and with the service assumptions built into SEPTA's operating and capital program projections for FY 1992 to FY 2000. Over the fiscal years from FY 1992 to FY 2000, the relative relationship between the transportation costs of rehabilitating SEPTA and not rehabilitating SEPTA will be comparable to that for FY 1991.

After FY 2000, the annual costs of rehabilitating SEPTA will decline, the costs of continuing to rehabilitate and operate SEPTA will be much less than for Fiscal Years 1991 to 2000. The SEPTA rehabilitated alternative will then compare more favorably to the SEPTA elimination alternatives than for the years 1991 to 2000. One estimate of the annual capital costs of long term rehabilitation expenditures necessary to keep the system in a state of good repair after the rehabilitation program is completed is $139 million per year. (Elected Officials of Bucks County, Delaware County, Chester County, Montgomery County, and City of Philadelphia, Improving Mobility in Southeastern Pennsylvania: A Public Transportation Solution, October 1989.) On this basis, the costs of continuing to operate and rehabilitate SEPTA will be about $758 million per year in 1990 dollars after the year 2001. In order to keep improving service and to generate more benefits for the local and state economies, it is likely to be desirable to fund much more than minimal improvements. There will most likely be other programs of improvements proposed if the ten year program is implemented and if SEPTA serviced continued. An additional ten year program should be identified and evaluated to address desirable investments after the year 2001.

3.4 Transportation Model: Direct User Impacts

Process to be Modeled

The direct user impacts of eliminating SEPTA services are:

- increased travel by car, at greater personal cost for former SEPTA users; and
- more traffic congestion, bringing longer travel times and greater out-of-pocket operating costs for existing car and truck users.

These impacts will differ by trip purpose. For essentially all "on-the-clock" business travel, most home-work commuting trips, and most other shopping/ social/ recreation trips in the Philadelphia area, it is likely that most SEPTA riders would switch to car travel. Some SEPTA users already have access to a car; others do not currently have a car but could save up and acquire one. This option entails substantial additional costs of car ownership and car operating costs, as well as insurance and parking costs, which far outweigh the transit fares formerly paid. Other SEPTA users would be unable to afford a car and would have to carpool, with more inconvenience than today. About one-third would be unable to afford purchasing a car. A small fraction of SEPTA users could also find alternative means of travel via rides from friends or social service agencies (elderly/handicapped). It is also expected that a small fraction of the worktrip commutes and some of the non-work-related trips would no longer occur. In the case of trips to work, this represents a potential loss of income; in the case of other trips, it represents a loss of public welfare.

The impacts of the reduction scenario are similar to those of the elimination scenario, but impacts are less dramatic. SEPTA services will remain a viable means of travel for many, but not all, existing SEPTA users. Remaining SEPTA users will face increasingly crowded vehicles, with slower travel times and less frequent service (increasing wait times). Those that shift to car travel will face car ownership costs, car operating costs, insurance and parking costs as previously described.

Description of the Computerized Transportation Model

To estimate the nature of these changes, a computerized transportation impact model was developed and applied for this study. The transportation model includes estimates of costs for both SEPTA users and highway users. Under the scenarios which involve a shutdown of SEPTA services, former users of SEPTA are removed from the SEPTA system, and their transit user

costs subtracted, and added to the highway system, with the highway user costs recalculated based upon the higher traffic volumes.

Most of the impacts modeled are highway user impacts, because each scenario removes some transit users and results in additional highway users, with increased highway costs not only for current SEPTA users, but also for current auto users and current truck users.

SEPTA User Costs

In-vehicle travel times for SEPTA riders were estimated using data on transit speeds from SEPTA's Section 15 Report, an annual compilation of transit statistics required to be reported to the Urban Mass Transportation Administration. During Fiscal Year 1989, SEPTA carried 1.4 billion passenger miles at an average speed of 13.6 miles per hour. In-vehicle travel time was valued at $7.22 per hour, the value of time from the HERS Model. (The Highway Economic Requirements System Task D Report: Documentation of Model Structure, Federal Highway Administration, January 1990.)

During Fiscal Year 1989, SEPTA carried 249 million linked trips. (Transfers are ignored in counting linked trips. Thus, a home-to-work trip with one transfer is counted as one linked trip or as two unlinked trips.) For the rehabilitation alternative, an average walk-and-wait time of 14 minutes per linked trip was estimated for transit travel. An average walk-and-wait time of 5 minutes per linked trip was assumed for auto travel. In both cases, walk-and-wait time was valued at $10.83 per hour, consistent with the observation that travelers appear to find walk-and-wait time about 1.5 times more onerous than in-vehicle time.

Highway costs were estimated by gathering data on current traffic and reviewing forecasted of population and employment, to develop estimates of future year highway levels of service under the assumption that SEPTA is rehabilitated and remains in service. Additional traffic which would be added due to a shutdown of SEPTA services was then added to arterials and freeways in order to estimate the traffic consequences of a shutdown.

For the immediate shutdown of SEPTA, SEPTA riders who were forecast to shift to being auto drivers were reassigned to streets and highways in the corridors served by SEPTA. Estimated congestion levels, speeds, and auto and truck costs were then calculated for the conditions under which SEPTA riders switched to auto. Auto and truck costs were calculated in three categories:

- auto and truck travel time and delay costs;
- auto and truck operating costs; and
- auto and truck accident costs.

Motor vehicle operating costs and travel times were estimated using a highway user cost simulation model based on the following key elements:

- Relationships between speeds and volume-to-capacity ratios from the Highway Capacity Manual. (Transportation Research Board, Special Report 209, 1985.)
- Tables of operating costs as a function of posted speed and operating speed adapted from the New York State Department of Transportation Highway User Cost Accounting Micro-Computer Package.
- Past and projected volume-to-capacity ratios for different types of facilities reported by the Year 2000 Transportation Plan for the Delaware Valley Region, May 1982.

Accident costs were estimated on a per vehicle mile basis, using a rate of 12.9 cents per vehicle mile from the HERS Model. These costs include insurance costs and uncompensated costs of accidents.

Parking costs for current SEPTA users were estimated to average $10 for work trips and $4 for non-work trips. These correspond to the parking charges for new spaces. The model provides for parking costs to be a function of parking demand.

For current highway users, auto and light truck travel time was valued at $7.22 per person hour and truck travel time was valued at $26.69 per vehicle hour, based on the HERS model.

Automobile ownership costs occur as some persons will need to purchase additional new or used vehicles to maintain accessibility without SEPTA. Based on vehicle ownership levels for households in urbanized areas with extensive transit systems vs. households in all areas of the U.S., it has been estimated that vehicle ownership would increase by about 0.3 vehicles per household in the Pennsylvania counties if there were no public transportation available on the Pennsylvania side of the region. In percentage terms, required expenditures for auto ownership might increase by 21%, if proportional to the estimated need for vehicles.

It has also been estimated that only two-thirds of those households who required additional vehicles would actually be able to purchase them, due to income limitations for the poorest households who would need new vehicles. Ownership cost (net purchase cost) averages $1,300 per vehicle per

year (U.S. Depart. of Labor, Consumer Expenditure Survey, 1988) additional ownership outlays will total $314 million per year. The additional ownership cost works out to 13 cents per mile. Thus, total costs of auto ownership and costs of auto operations add up to 26 cents per mile, exclusive of accident related costs. Those who cannot afford additional vehicles will suffer some mobility losses, which are addressed in Chapter 4.0.

Adding together the various facets of direct user benefits, the model provides estimates of total regional changes in expenditures on public transit, car ownership costs, car operating costs, safety costs and travel times. These data also form inputs used in the economic impact model, described next.

■ 3.5 Economic Model: Overall Regional Impacts

Process to be Modeled

The regional economic impacts of eliminating or reducing SEPTA services occur as a result of seven factors:

- Increased "cost of doing business" in the region, resulting from the longer time cost and out-of-pocket cost of business delivery, shipping and "on-the-clock" individual business travel on congested roads;
- Reduced business access to labor markets;
- Increased "cost of living" in the region, resulting from the greater out-of-pocket cost of personal travel on congested roads, and additional cost of car ownership and usage by some former SEPTA users;
- Loss of jobs for SEPTA employees;
- Decreased "attractiveness" or quality of life, resulting from the greater travel times of personal travel on congested roads, and reduced options for non-car travel;
- Shifts in personal spending patterns, with increased purchases of cars, petroleum products, insurance, parking and repair services in place of transit fares and other expenditures;
- Reduced attraction of visitors.

The first, third and fifth items above represent direct shifts in dollar costs and spending patterns, which will reduce population and business growth by making the region a less attractive location. The second, fourth and sixth items above cause shifts in population and business activity, specifically:

- decreased in-migration and greater out-migration of population (above and beyond the higher cost-of-living);
- decreased attraction of convention and tourism activity; and
- decreased attraction of business in-moves, and increased losses from business out-moves, due to reduced access to labor markets (above and beyond the impact of higher cost-of-doing-business, item number 2 above).

These "direct" regional economic impacts will reduce business sales and jobs to some extent. To the extent that such direct losses occur, they will also lead to additional "indirect" impacts on the regional economy, as business orders to suppliers are reduced, causing additional losses of business sales and jobs. They will also lead to further "induced" impacts, as there is decreased consumer purchasing due to fewer workers and less disposable income remaining.

The rest of the State of Pennsylvania will also be affected. On the one hand, the rest of the State of Pennsylvania could gain some of the business activity that moves out of the Philadelphia region. On the other hand, a significant share of business activity in the rest of the state depends on business customers and suppliers in the Philadelphia area. Therefore, the rest of the State will lose some business activity if the economy of the Philadelphia region is significantly reduced.

Description of the Computerized Economic Model

The magnitude of economic impacts described above were estimated using a regional economic simulation model. The REMI forecasting and simulation model, developed by Regional Economic Models, Inc., was specifically calibrated for two regions: 1) the 8-county Philadelphia metropolitan area, and 2) the State of Pennsylvania excluding the Philadelphia area.

The REMI model system is a nationally-renowned economic simulation and forecasting system specifically designed for policy analysis. Developed by Dr. George Treyz of the University of Massachusetts-Amherst, it is a highly sophisticated computer model system, the result of over ten years of development. It has been documented and reviewed in a variety of professional journals. Key aspects of the REMI simulation are its sensitivity to factors such as population migration, effects of business operating costs

on the location of industry, detailed changes in wages by occupation, business mix shifts, technological changes and inter-industry trade flows.

The REMI Forecasting and Simulation Model includes all of the inter-industry interactions among 49 private sectors in the economy. It also includes the trading flows by industry between the Philadelphia metro area and the rest of the state of Pennsylvania.

In addition to containing a complete inter-industry and trade flow structure, the model also includes key aspects of the economy that are regarded as important for policy evaluation. These include the effect on the location of industry, in the present and future, of changes in the relative cost of doing business. This relative cost of doing business is built up for each industry based on tax costs, fuel costs, wage costs, and costs of all the intermediate inputs in the area. The model allows for substitution among capital, labor and fuel, based on shifts in relative cost in these factor inputs. It has a wage determination response for each of 94 occupations based on shifts in relative demand for labor in each occupational category. These wage changes, by occupation, affect costs for each industry. The model includes a migration response to employment conditions in the area.

The model is calibrated specifically to the study areas. This calibration starts with the detailed analysis of the economy at the level of 500 separate industries. At that level, the proportion of local use supplied locally for each industry is estimated using results from quantitative work done across all states and state specific adjustments derived from direct observation in the Census of Transportation.

The model makes a forecast for over 2000 variables (including Gross Regional Product by final demand sectors and by industries and employment and cost of doing business for 53 industries) with a complete history of forecast for all of these variables from 1969 through 2035. Using any of over 700 policy variables it is possible to introduce changes that the region may experience due to policy initiatives.

Overall impacts on the State of Pennsylvania are estimated by adding together impacts on the Philadelphia metropolitan area and impacts on the rest of the State, and then subtracting a portion of the Philadelphia area impact which is attributable to the three New Jersey counties. Since SEPTA services are essentially limited to the Pennsylvania part of the metropolitan area, impacts on New Jersey residents and workers would be limited. New Jersey residents would be primarily affected when commuting to/from Philadelphia, where travelers would be affected by increased road congestion and loss of public transit services.

The modeling and analysis process is dynamic: transportation cost impacts and overall economic impacts for each scenario are modelled year-by-year. The transportation model estimates transportation related costs for each

year. These are used in the economic model to estimate changes in economic activity over the year. The change in economic activity is then input to the transportation model for the next year, and this analysis process is carried on through the year 2020 in order to estimate long-term changes.

■ 3.6 Fiscal Models

The changes in business sales, employment, personal income and population at the metropolitan and statewide levels are predicted by the economic model. These changes will, in turn affect revenues and expenditures for local governments and state governments. Specifically, the decreases in business sales, employment and income will bring proportional reductions in some sources of government revenue. The decreases in employment and population will also bring reductions in demand for services, but government expenditures will not necessarily be reduced proportionally to the change in demand, as there are some fixed costs of maintaining existing facilities.

To estimate the impacts of economic changes on local and state levels of government, the Pennsylvania Economy League (PEL) applied its Fiscal Impact Models. These models were developed by, and are maintained by PEL. The general models are described in more detail in the report: Local Fiscal Issues in the Philadelphia Metropolitan Area by Thomas Luce and Anita Summers; University of Pennsylvania Press, 1987.

Local Government Impact

The model of local government impact represents the overall impact on all municipal governments within the metropolitan area. It was constructed based on detailed analysis of revenues and expenditures of the City of Philadelphia and typical communities in each county of the metropolitan area.

The analysis of local government revenues takes into account the fact that there is great variation in taxes among municipalities in the metropolitan area. In Philadelphia, the wage tax accounts for 69% of local revenue, while real estate taxes account for 30% of local revenues. Outside of Philadelphia, the real estate tax, applied to resident and business property, is the principal tax. It is the only local tax on the New Jersey side. On the Pennsylvania side, non-property taxes collected by municipalities also include wage and occupation taxes, per capita taxes, mercantile or business privilege taxes, and real estate transfer taxes. Future collections of these local revenues from

all sources will reflect changes in regional employment, income and population.

The model assumes that revenue from residential real estate taxes would decline with reduced demand for housing or shifts to lower housing prices, both of which would occur as regional income drops. It further assumes that income from commercial and industrial real estate taxes, as well as other business taxes, and occupation taxes, would fall with declining employment. Revenue from per capita taxes and local non-tax revenues would be proportional to changes in population.

The analysis of local government expenditures is based on the fact that local government spending supports a variety of activities. These include: education (public schools), safety services (police, fire and jail), public works (roads, sewer system, etc.), public housing development, parks and recreation, public welfare, health and hospitals, and administration and finance.

The model takes into account the fact that reductions in population and employment would cause some savings in local government spending, but that there are significant fixed costs for infrastructure, administration and maintenance that do not decline with population change.

State Government Impact

The model of state government impact indicates how state government revenues and expenditures would be affected by reduction or elimination of SEPTA services. State government revenue sources include the personal income taxes, corporate profit taxes, the sales tax, motor fuel tax, lottery and various fees. Revenue from these sources would change proportionally to changes in population, employment and personal income. State government expenditures go for a wide variety of programs, ranging from highways to health care to public welfare. For purposes of this study, the PEL model projects changes in four key categories of state government expenditures. These are: SEPTA, unemployment compensation, income maintenance programs, health and human service programs.

State expenditures on SEPTA reflect the alternative scenarios. Costs of many state programs, including unemployment compensation, income maintenance, health and human services, are affected by unemployment rates and population changes. Costs increase as greater numbers of jobs are lost (and unemployment increases), but go back down as some people eventually move out of the state. The nature of these changes in government expenditures are predicted by the fiscal impact model, based on regression studies of relationships of expenditures to changes in population, employment and income changes over time.

4.0 Transportation Impacts

■ 4.1 Overall Transportation Impacts

This study found that the direct regional transportation costs of not rehabilitating SEPTA are about $2 billion more per year in user costs. This impact by itself would be so adverse that rehabilitation of SEPTA is a desirable investment, even if there were to be no other adverse impacts. However, the other adverse impacts of not rehabilitating SEPTA on the overall regional and State of Pennsylvania economies are even worse than the transportation impacts.

While the costs of keeping a major public service such as SEPTA would be high – about $971 million per year for the next ten years in 1990 dollars, the direct additional user costs of not rehabilitating SEPTA would be even higher – $1.963 billion per year higher. For a complete shutdown, these additional costs are about $517 per year per person, or $1,291 per year per household, when averaged across the population of the Pennsylvania portion of the metropolitan area.

The excess transportation user costs associated with not rehabilitating SEPTA fall both on those who do not now use SEPTA and those who now use SEPTA. For example, with a complete shutdown, current auto and truck users in the region would suffer nearly $988 million more per year in excess travel costs, due to higher congestion costs, vehicle operating costs, and

accident costs without SEPTA. It would cost SEPTA users themselves nearly $975 million more per year in additional costs.

Under the partial reduction scenarios, with only a portion of the SEPTA system rehabilitated, total user costs also increase substantially. For the partial shutdown alternative which was examined in this study, the increase in net user costs was still substantial, leading to a conclusion that there was likely to be no possible partial reduction scenario which saved more money than it costs.

The transportation cost estimates were developed under the assumption that most current SEPTA users can and would switch to autos, and that a sufficient number of parking spaces can be constructed to accommodate these autos at their destinations.

The gradual phaseout and partial reduction scenarios have different impacts at different periods of time. However, the transportation cost impacts of the gradual phaseout also approach $2 billion per year, and the partial reduction excess costs are over $500 million per year (in 1990 dollars).

The direct transportation impacts of a complete shutdown of SEPTA are summarized in Figure 4.1.

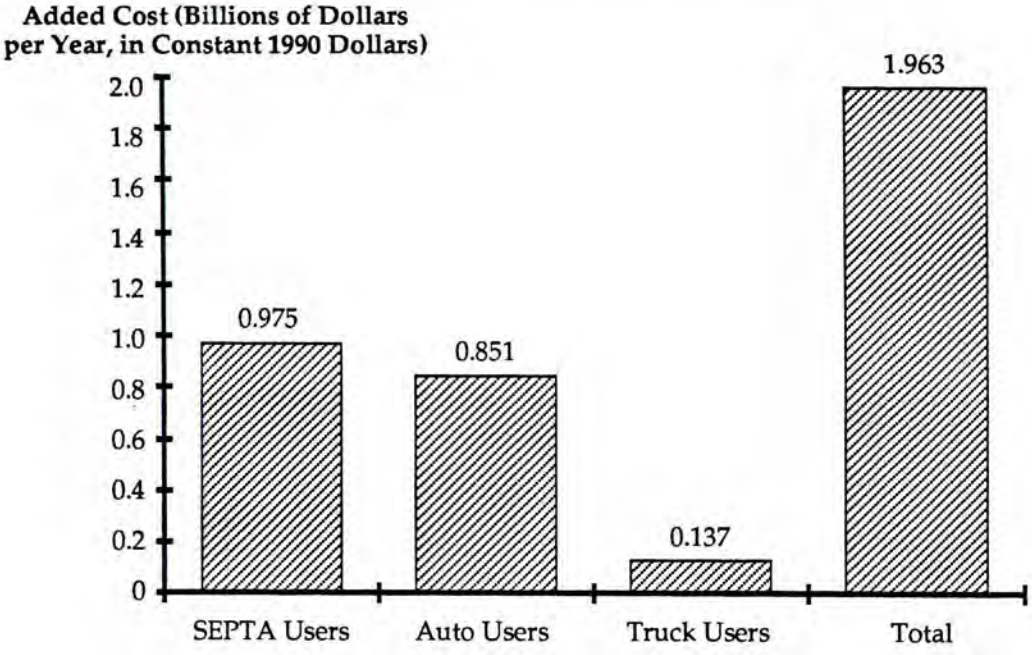
- A $975 million per year increase in travel costs for current SEPTA users switching to automobiles.
- A $851 million per year increase in travel costs for current users of autos, taxis, and light trucks, as a result of increased congestion.
- A $137 million per year increase in travel costs for current users of trucks with six or more tires, as a result of increased congestion.
- Overall, a $1,963 million per year increase in travel costs for travelers using highways in the Delaware Valley region.

The gradual phaseout and partial reduction scenarios have different impacts at different periods of time. However, the transportation cost impacts of the gradual phaseout also approach $2 billion per year, and the partial reduction excess costs are over $500 million per year (in 1990 dollars) when those alternatives are phased in.

The direct transportation impacts change over time due to interactions in economic activity. All the changes together are illustrated in Section 5.0.

The following sections discuss how reducing or eliminating SEPTA would affect traffic and parking, and describe the impacts on current highway users and SEPTA users in more detail.

Figure 4.1 Direct Transportation Impacts of SEPTA Shutdown



Source: The Urban Institute and Cambridge Systematics, Inc.

■ 4.2 Traffic Impact Analysis

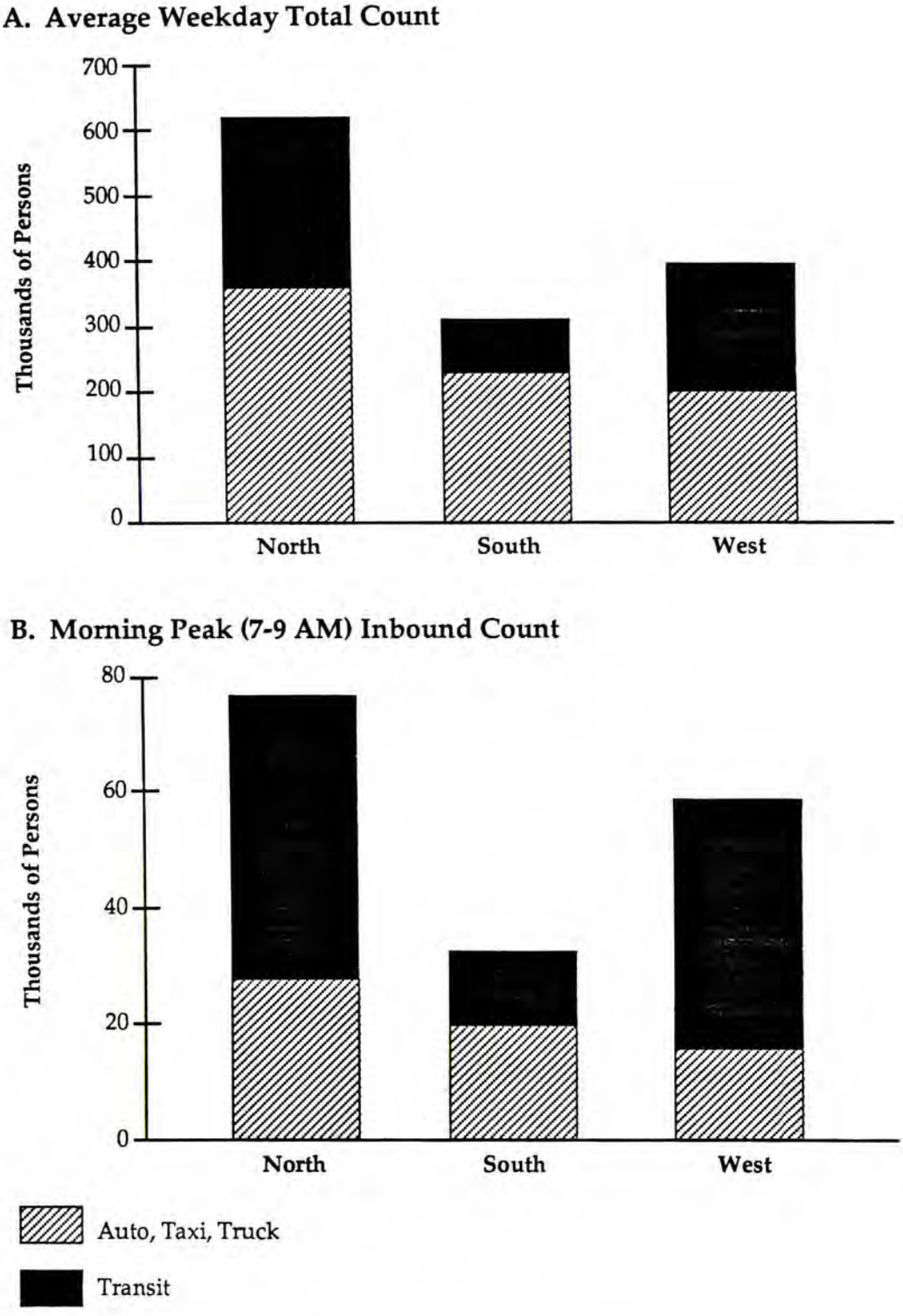
The traffic impacts of closing SEPTA on congestion would be severe all over the region, and particularly severe on the streets and highways in and near the Philadelphia Central Business District (CBD). (The Philadelphia CBD is conventionally defined as the area bounded on the north by Vine Street, on the south by South Street, on the east by the Delaware River, and on the west by the Schuylkill River.) Figure 4.2A shows the number of people crossing three CBD screenlines (In the Delaware Valley Regional Planning Commission traffic counting program, the North screenline is just north of Vine Street, the South screenline is just north of South Street, and the West Screenline is the Schuylkill River. The East Screenline is not examined in this report because SEPTA does not provide transit service across the Delaware River (except to the North). On an average weekday, transit accounts for 41% of people crossing the North screenline, 24% of people crossing the South screenline, and 50% of people crossing the West screenline. However, transit accounts for a much greater share of screenline crossings during peak periods, as shown in the Figure 4.2B.

As shown in Figure 4.3, more than 20% of transit trips into the CBD occur in just one hour (8:00 to 9:00 a.m.) and more than 20% of transit trips leaving the CBD occur in just one hour (5:00 to 6:00 p.m.). In contrast, auto travel is much more evenly distributed over the day. During the period from 7:00 to 9:00 a.m., transit carries 64% of people entering the CBD across the North screenline, 39% across the South screenline, and 75% across the West Screenline. Thus, if SEPTA services are shut down and current SEPTA users switch to autos, the number of autos attempting to enter the CBD from the north would triple and the number of autos attempting to enter the CBD from the west would quadruple during the morning peak. Given that many of the streets and highways leading to the CBD from the north and west are already congested during peak periods, closing SEPTA would have a severe impact on travel speeds on these routes. Congestion would also increase for travel to the CBD from the south, though not to the degree expected for travel from the north and west.

■ 4.3 Parking Impact

Eliminating SEPTA services would greatly increase the demand for parking in and near the CBD. To estimate the amount by which demand would increase, the accumulation of transit riders in the CBD over the course of an

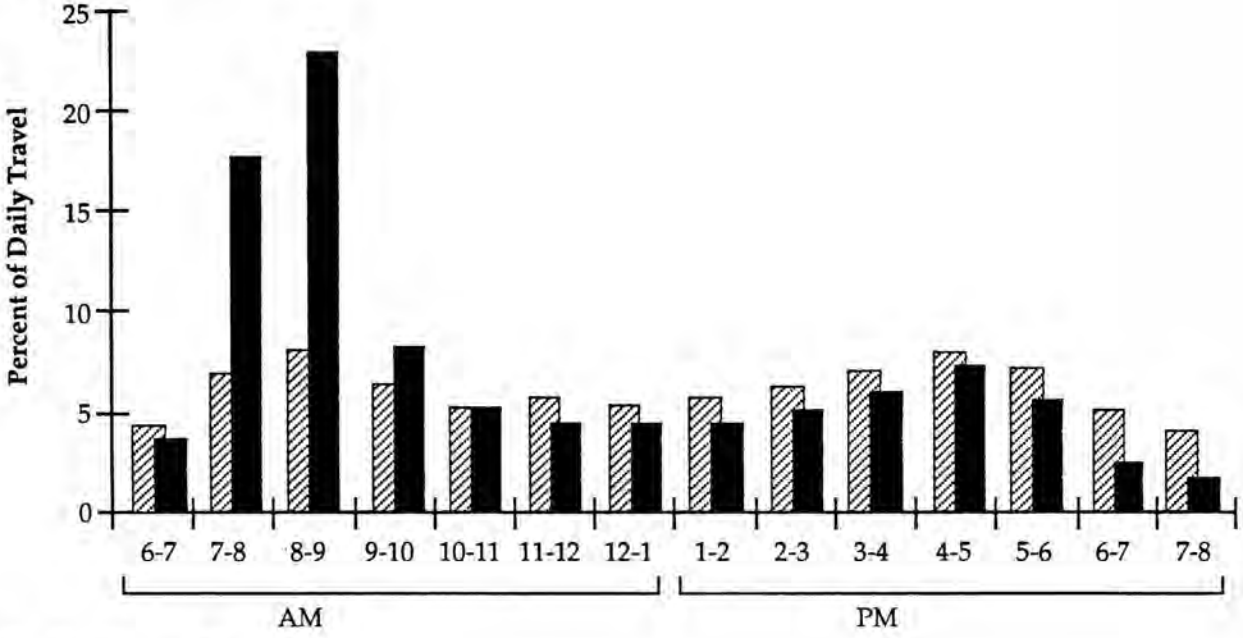
Figure 4.2 Philadelphia CBD Daily Traffic (Screenline Crossings)



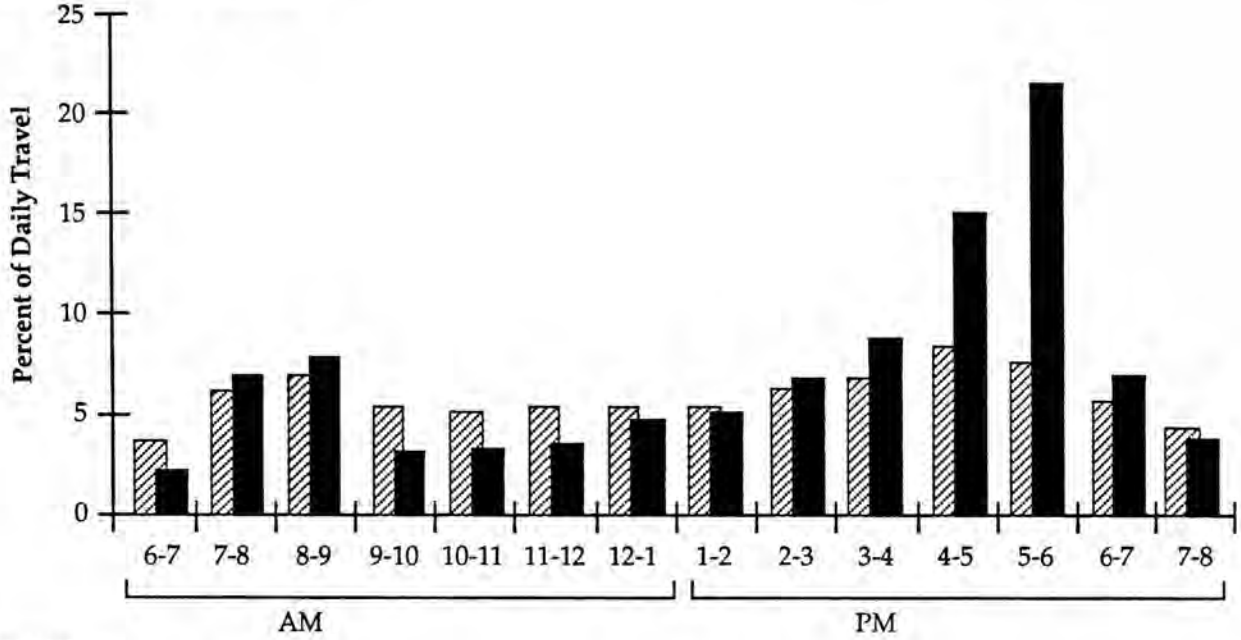
Soruce: DVRPC, Screenline Counts, 1985

Figure 4.3 Daily CBD Traffic (Screenline Crossings) by Time of Day

A. Inbound Travel



B. Outbound Travel



Car, Taxi, Truck

Transit

Source: DVRPC, Screenline Counts, 1985

average weekday was examined. (The number of transit riders accumulating in the CBD was estimated by subtracting outbound screenline crossings from inbound screenline crossings.) As shown in Figure 4.4, by 10:00 a.m. almost 90,000 transit riders have accumulated in the CBD. This figure increases to almost 100,000 by 12:00 noon and then decreases over the rest of the day. Currently, average occupancy for autos crossing the CBD screenlines is 1.16 persons per vehicle. If current SEPTA users switch to autos with this occupancy rate, the peak accumulation of vehicles in the CBD will be about 85,000 added vehicles on an average weekday. Because of turnover, not all spaces are occupied at any given time (currently, about 80 to 90% of off-street spaces are occupied at peak accumulation on an average weekday). Hence, we estimate that about 100,000 new parking spaces would be required to accommodate all current SEPTA users if these users switched to autos, more than tripling the number of off-street spaces in the CBD.

In Year 2000 Transportation Plan for the Delaware Valley Region, the Delaware Valley Regional Planning Commission estimated the capital cost for new off-street parking spaces in the CBD as $8,500 in 1977 dollars, which is $18,000 in 1990 dollars. Hence, a capital outlay of $1.8 billion dollars would be required to provide parking spaces in the CBD for current SEPTA users if all of SEPTA were closed. The costs of parking will increase for all parkers as the demand for parking increases. These costs were included in the user costs reported in Section 4.0.

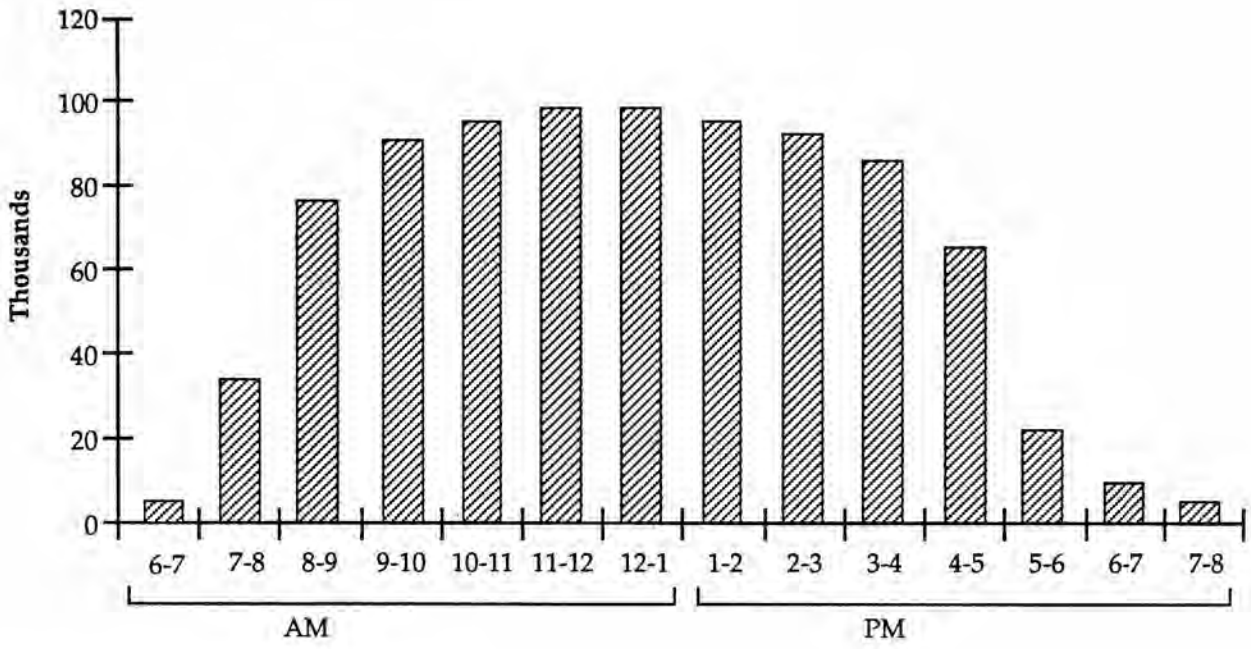
■ 4.4 Reduced Mobility Impacts

Currently about 22% of households in SEPTA's service areas do not own or have access to a car. If SEPTA services were to be eliminated, then most of these people would have to incur considerable expense to acquire a car or access to one. Some others would have to find alternative means of rides from friends or social agencies. Some would lose their jobs, or be completely unable to travel.

It is estimated that, with SEPTA services eliminated, 4% of work commute trips and 35% of non-work trips formerly made by transit would no longer be made. This represents a potential loss of jobs for some of those formerly commuting by SEPTA, and a loss of activity and well-being for some of those formerly using SEPTA for shopping, social or recreation trips.

The potential lost mobility is also supported by findings of the recent Philadelphia survey which found that 30% of the lowest income residents traveled less due to fare increases. (City of Philadelphia, "Philadelphia Travels: Technical Paper: City Transportation Survey," conducted in 1988,

Figure 4.4 Daily Transit Riders in the CBD, by Time of Day



Source: DVRPC, Screenline Counts, 1985

page 22.) The increased cost due to purchasing and operating an auto would be much greater than the increased cost of any fare increase. The concern with costs was also highlighted by the fact that controlling transit fares was given the highest rating by persons in that survey.

■ 4.5 Impacts on Current SEPTA Users

The direct transportation impacts (of shutting down SEPTA) on current SEPTA users, calculated as the difference between user costs before shutdown and user costs after shutdown, are $975 million per year (in constant 1990 dollars). This is broken down in Table 4.1.

■ 4.6 Impacts on Current Highway Users

The direct transportation impacts (of shutting down SEPTA) on current highway users are calculated using the highway cost simulation model described in Chapter 3.0. The costs include additional travel time, operating and accident costs for autos and trucks. These costs are estimated to total $987 million per year (in constant 1990 dollars). This is broken down in Table 4.2.

■ 4.7 Impacts on Specific Population Segments

Although users of SEPTA span all aspects of the regional population, there are some groups which rely more heavily on SEPTA for access, because they have no other option to get to jobs, school, health care, shopping, recreation and other activities. These specific, transit dependent population segments include the elderly, the handicapped, low income residents, and school children. Interviews were conducted with representatives of these groups to understand how the different scenarios for the future of SEPTA would impact these groups.

Findings from these interviews indicate that a total loss or curtailment of SEPTA services would have much worse impacts than the transportation and economic models indicate. There would be a loss of basic mobility for many persons, with profound social consequences.

Table 4.1 Impact of SEPTA Shutdown on Current SEPTA Users (Millions of 1990 Dollars Per Year)

	Travel Cost
Before SEPTA Shutdown	
In-Vehicle Travel Time	$ 741.5
Out-of-Vehicle Travel Time	630.0
Fares	272.0
TOTAL	**$1,643.5**
After SEPTA Shutdown (switch to automobile)	
In-Vehicle Travel Time	722.5
Out-of-Vehicle Travel Time	225.0
Motor Vehicle Operating Costs	211.8
Motor Vehicle Ownership Costs	314.1
Accident Costs	155.3
Parking Costs	989.7
TOTAL	**$2,618.4**
Net Impact of Closing SEPTA	**$ 974.9**

Source: The Urban Institute and Cambridge Systematics, Inc.; see text for description of analysis methods.

Table 4.2 Impacts of SEPTA Shutdown on Current Highway Users (Millions of 1990 Dollars Per Year)

	Added Travel Cost ($Millions/Year)		
	Autos and Light Trucks	**Heavy Trucks***	**All Vehicles**
Travel Time and Schedule Delay	$ 698.4	$ 117.2	$ 815.6
Motor Vehicle Operating Costs	153.0	19.3	172.3
TOTAL	**$ 851.4**	**$ 136.5**	**$ 987.6**

* Trucks with six or more tires.

Source: The Urban Institute and Cambridge Systematics, Inc.; see text for description of analysis methods.

Elderly and Handicapped

The elderly and handicapped population segments would be the most severely impacted of the transit dependent population segments. These groups overall tend to have a more severe difficulty with mobility. Some of them rely on SEPTA for almost all contact with the outside world. Many cannot drive an automobile even if they could afford to buy one, and without SEPTA might simply cease going outside their homes.

For the handicapped, SEPTA services, including paratransit, provide a vital link to jobs, health care, recreation, church, shopping, and visiting. Approximately one third of the handicapped population is so severely disabled that their only option for transportation is paratransit, a service which offers door-to-door service on demand, and includes assistance into and out of the vehicle. This group is incapable of using the regular SEPTA services. Because of the severity of their handicaps, this group has virtually no opportunity for contact with the outside world without transportation assistance. In Fiscal Year 1989, 289,280 total trips were taken on paratransit, and the number rose to 324,888 in Fiscal Year 1990.

Another third of the handicapped population uses both paratransit and the other services SEPTA offers. Many of these people can use the other services, and would use them more with encouragement. The remaining third is capable of using regular SEPTA services.

The handicapped use these SEPTA services for every activity which involves leaving their home, including working, going to church, attending classes, health services, and other activities. Without SEPTA, there is currently no other option for this group. Under such a scenario, many handicapped people could not get to work, travel to health care, and would not be able to leave their homes. Ultimately, this would result in mental and physical deterioration, and a much greater need for more expensive institutionalized care. The loss of jobs would also result in a loss of income tax dollars and other dollars spent in the economy, which would add to the financial burden of increased institutional care for disabled people.

The situation of many elderly persons is similar to that of the disabled or handicapped. Because of their mobility problems and their lack of ability to drive and/or to afford a car, many elderly persons use SEPTA to go to work, to recreational activities, to church and to health care. Because many cannot walk as far, many senior citizens use SEPTA to take much shorter trips than more mobile people might, and therefore use it even more.

Such people would be less able to care for themselves without SEPTA services and would therefore be more susceptible to deteriorate mentally due to the isolation. This would increase the financial burden on an already over-stretched elderly care institutional system. The loss of the ability of

some senior citizens to go to work would not only result in loss of some additional tax revenue, as well as a larger loss of the volunteer workforce. This is particularly true in the health care field, where senior citizens staff many clinics and other facilities during the day, when no one else is available to donate their time. The loss of these volunteers would be felt by a much larger portion of the population than just the elderly.

In Fiscal Year 1990, senior citizens accounted for an average of 31,101 trips daily on SEPTA (2,482 peak period and 28,619 off-peak trips). Seniors ride free during off-peak, and their rides (12% of all off-peak trips) are subsidized by the Pennsylvania lottery. With the senior citizen population likely to grow very rapidly, the impacts on senior citizens will increase over time.

Low Income Groups

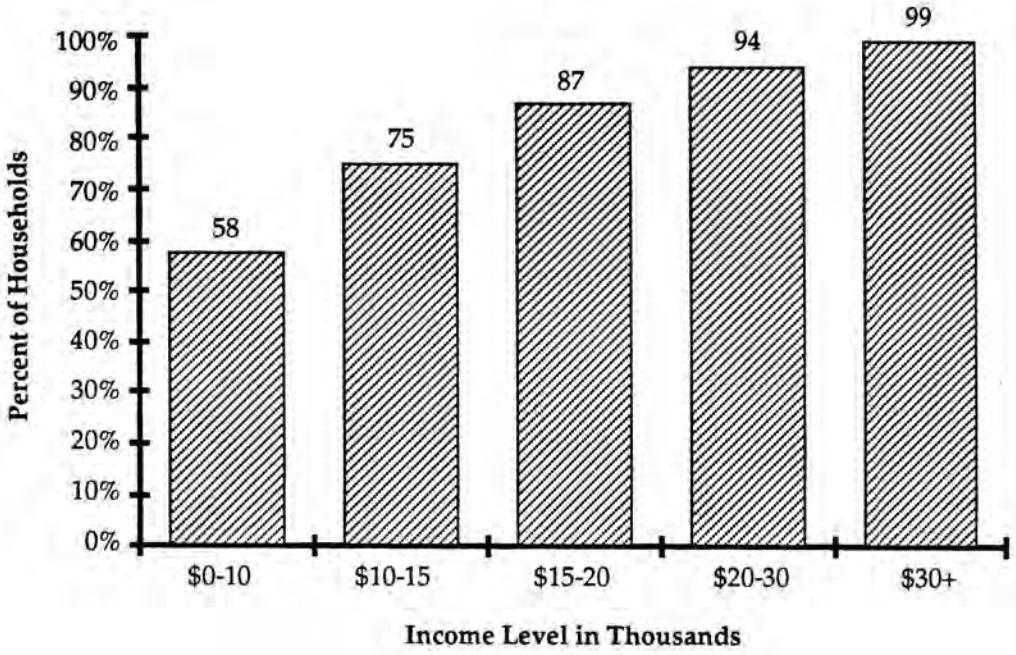
Lower income groups tend to rely more heavily on SEPTA than the population at large for access to all of their activities. This is particularly true in the Philadelphia metropolitan area, where SEPTA provides services over an extensive area. (See Figure 4.5.) SEPTA plays a critical role in providing access to jobs, which is very important to this population. A loss of these jobs would prove a severe economic hardship to a group already struggling. Some low income people have no other means of attending church, school or other social activities. Without SEPTA, the further isolation of low income people would restrict job opportunities and contribute to discouragement, and increased mental stress. This could indirectly contribute to a corresponding possible rise in crime and self-destructive behavior.

School Populations

Public and parochial school children in the Philadelphia region rely heavily on SEPTA to bring them to and from school. Approximately 36,000 public and non-public students ride SEPTA to and from school every day during peak hours. An additional 37,500 tokens are given out during off-peak hours, for students to attend extracurricular activities, bilingual classes, special education and other programs.

The loss of SEPTA services would financially hurt the Philadelphia public school system. Additional yellow bus service would have to be provided at great cost to the school system. They would have to reduce overall service in order to cope with increased cost. Priorities would have to be changed to cover more of a service area. Some possible cuts would include mainstreaming of a number of learning disabled students so they would not have to provide bus service for them, increasing the distance from the school

Figure 4.5 Percent of Households Owning a Car in 5-County Pennsylvania Portion of the Metropolitan Area



Source: Delaware Valley Regional Planning Commission, 1988 Home Interview Travel Survey, unpublished tabulations, 1990

children would be required to walk, and the reduction or elimination of the desegregation program. Safety of school children is also of concern to the school system, and an increase in students walking to school will increase the possibility of exposure to danger of a number of types, which would require an increase in security. An increase in congestion due to the loss of SEPTA would also affect the time schedules. There is concern that a reduction in services to bring students to school will discourage borderline students from attending school and increase the drop-out rate. Parents cannot be expected to make up the difference by driving students to school, because many work, and many do not have cars.

Students at the region's colleges and universities also use SEPTA to go to classes, to work and for recreation. Colleges and universities located in the Philadelphia region are listed in Table 4.3. Some of these schools have no housing or very limited housing available for students. Without SEPTA, they would experience a loss of students, because many students would not easily be able to get to classes. Many of the other institutions offer limited housing, and a smaller portion of their student bodies would not be able to get to school. It is important to note that even schools such as University of Pennsylvania, which provide housing, have a number of students, particularly graduate students, living off-campus.

In addition, many students work part time for service companies, and are dependent on SEPTA to transport them to and from work.

■ 4.8 Energy and Air Quality Impacts

Energy usage and emissions were estimated for each scenario based upon speeds and vehicle miles of travel. The Characteristics of Urban Transportation Systems manual was the source for forecasts of future year energy and emissions factors.

Energy usage and air quality impacts of a reduction or elimination of SEPTA are adverse for two reasons:

- More vehicle miles of travel involve added energy usage and emissions;
- The deterioration of highway levels of service, including more stop-and-go travel, generates more energy usage and emissions per mile of travel.

Impacts on gasoline consumption and air pollution are shown in Tables 4.4 and 4.5. The immediate shutdown scenario would lead to additional consumption amounting to nearly 100 million additional gallons of gasoline annually consumed in the Philadelphia metropolitan area (by the year 2015).

Table 4.3 Philadelphia Region Higher Educational Institutions*

Institutions	On-Campus Housing Provided	Commuting
University of Pennsylvania	Housing available	Low
Medical College of Pennsylvania	Limited housing	Medium
Pennsylvania College of Optometry	Some on-campus housing	Medium
Philadelphia College of Art	None	High
Philadelphia College of Pharmacy and Science	Some housing	Medium
Temple University	Housing available	High
St. Joseph's University	Undergraduate housing only	Medium
West Chester University of Pennsylvania	Limited housing	Medium
Thomas Jefferson Medical University	Available	Medium
The Dropsie University	Undergraduate housing only	Medium
Drexel University	Housing available	High
Hahnemann College	Housing available	Medium
Bryn Mawr College	Housing available	Low
Haverford College	Housing available	Low
Villanova University	None	High
Swarthmore College	Housing available	Low
Lincoln University	Housing available	Low
Immaculata College	Housing available	Low

* Institutions offering four year programs or more. None of the community and junior colleges offer housing, and they are scattered throughout the region.

Source: Guide to American Graduate Schools.

Table 4.4 Impacts of SEPTA Alternatives on Metropolitan Area Energy Consumption

	Additional Consumption of Gasoline (millions of gallons/year)		
	Auto	**Truck**	**Total**
Immediate Elimination Scenario			
1995	79.14	11.26	90.40
2005	81.76	11.91	93.67
2015	84.37	12.56	96.93
Gradual Phaseout Scenario			
1995	19.02	2.17	21.19
2005	81.76	11.91	93.67
2015	84.37	12.56	96.93
Partial Reduction Scenario			
1995	19.02	2.17	21.19
2005	26.44	3.25	29.69
2015	27.45	3.47	30.91

Source: The Urban Institute and Cambridge Systematics, Inc.; see text for description of analysis methods.

Table 4.5 Impacts of SEPTA Alternatives on Metropolitan Area Air Pollution

	Additional Emissions of Air Pollution (millions of kg/year)		
	CO	**NMHC**	**NO_x**
Immediate Elimination Scenario			
1995	62.29	3.98	1.38
2005	64.46	4.12	1.40
2015	66.64	4.26	1.43
Gradual Phaseout Scenario			
1995	14.11	0.89	0.55
2005	64.46	4.12	1.40
2015	66.64	4.26	1.43
Partial Reduction Scenario			
1995	14.11	0.89	0.55
2005	19.90	1.26	0.70
2015	20.72	1.32	0.72

Source: The Urban Institute and Cambridge Systematics, Inc.; see text for description of analysis methods.

The air pollution impacts of immediate shutdown include additional annual emissions of over 66 million kg. of carbon monoxide (CO), over 4 million kg. of non-methane hydrocarbons (NMHC) and over 1.4 million kg. of nitrogen oxides (NOx) by the year 2015.

These results represent increases in gasoline consumption and air pollution emissions in the metropolitan area of over 6%. In the case of air pollution, these impacts would complicate the ability of the region to meet EPA air quality standards.

The gasoline consumption and air pollution impacts differ over time and by scenario. The magnitude of added energy usage in 1995, by scenario, varies from 20 million added gallons of fuel consumption for the partial shutdown scenario, to 90 million added gallons per day for the immediate shutdown scenario. Energy usage added in later years increases over 1995 due to the increased congestion under each scenario. Similar relations hold for emissions, with greater emissions in each year under the gradual or full shutdown than under the partial shutdown. Emissions also become worse for each scenario after 1995 due to the increase in congestion in future years.

5.0 Overall Economic Impacts

■ 5.1 Competitive Position of the Regional Economy

The direct transportation impacts of eliminating or reducing SEPTA services, described in Chapter 4.0, would be increased traffic congestion, with longer travel times and higher costs for all car travelers and current public transit users. These direct transportation impacts would affect the regional economy through seven primary means:

- increased business costs for shipping and delivery
- reduced business access to labor markets
- increased cost of living
- reduced "quality of life"
- loss of SEPTA jobs
- reduced attraction of visitors

These six factors are discussed below. The resulting effect of these factors would be to reduce business sales, jobs, disposable personal income and population in the Philadelphia metropolitan area. Additional "spin-off"

impacts, which would occur throughout the metropolitan area and rest of the State of Pennsylvania, are also discussed and estimated.

Other impacts of eliminating or reducing SEPTA services which have not been accounted for in the economic analysis include: costs of institutionalization for additional elderly and handicapped persons, possible increases in costs of social services and criminal justice services, or possible additional costs associated with increased energy conservation and air pollution.

Business Shipping Cost

The increased congestion of roads and highways in the Philadelphia metropolitan area would bring additional time costs and operating costs for businesses that depend on delivery trips and truck shipments. The additional costs for business travel are estimated to be $400 million per year if SEPTA services were eliminated in 1992. These impacts particularly affect the cost of doing business for specific types of business:

- trucking
- wholesaling
- food products
- chemical and pharmaceutical products
- stone, glass, clay and concrete products
- lumber, furniture and wood products

Table 5.1 summarizes the percentage of total business output value which is made up by truck shipping costs, for selected industry sectors in Philadelphia metropolitan area. Figure 5.1 shows the distribution of total additional transportation costs incurred by area businesses as a result of SEPTA shutdown, broken down by industry sector.

Partial reduction of SEPTA services would bring smaller increases in transportation costs, proportional to the increase in congestion delay, for business shipping and delivery.

These additional business shipping costs represent an increased cost of doing business. They would adversely affect the relative position of the Philadelphia region in terms of how its business costs compare to the costs of operating similar businesses elsewhere. For affected business sectors, the REMI economic model estimates changes in regional productivity and

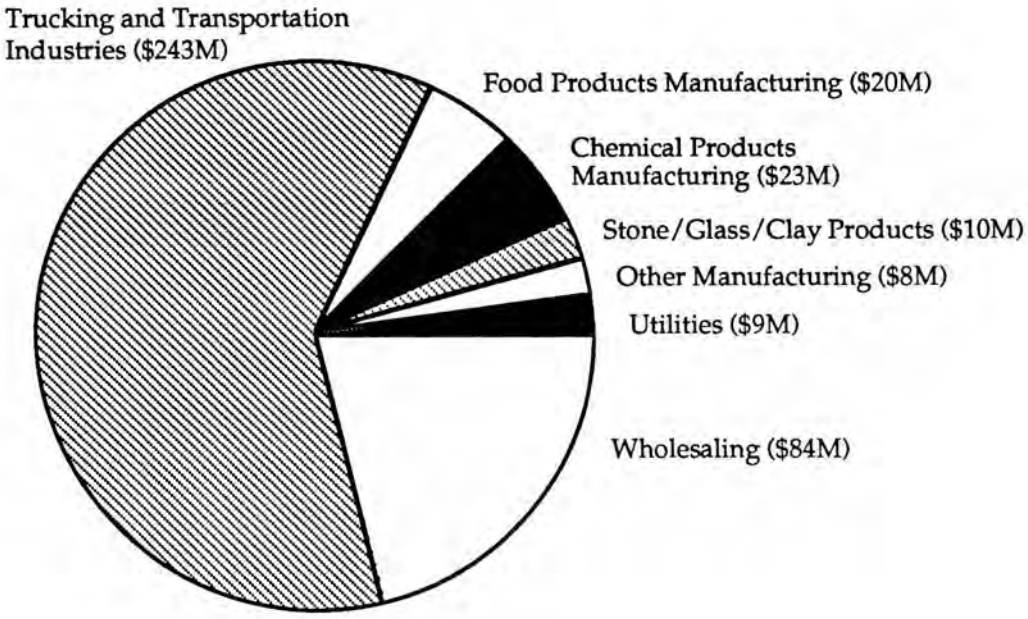
Table 5.1 Shipping and Delivery Cost* as a Percentage of Cost of Doing Business

	Trucking Cost as a % of Total Product Cost		Trucking Cost as a % of Total Product Cost
(Manufacturing)		**(Non-Manufacturing)**	
Food (20)	1.7	Mining (10-14)	7.0
Tobacco (21)	2.0	Construction (15-17)	2.5
Textiles (22)	2.5	Railroads (40)	1.1
Apparel (23)	0.5	Public Transport. (41)	0.6
Lumber (24)	1.7	Trucking (42)	29.6
Furniture (25)	1.4	Water Transport. (44)	0.7
Paper (26)	4.7	Air Transport. (45)	1.0
Printing (27)	1.0	Other Transport. (46,47)	0.7
Chemicals (28)	2.0	Communications (48)	0.2
Petroleum Prod. (29)	15.0	Utilities (49)	0.8
Rubber (30)	2.2	Wholesale (50,51)	3.4
Leather (31)	0.9	Eating & Drinking (58)	1.0
Stone, Clay, Glass (32)	6.1	Other Retail (52-59)	0.6
Primary Metals (33)	1.7	Hotel & Pers. Servs. (70-74)	0.2
Fabricated Metals (34)	1.7	Car & Truck Repair (75)	1.1
Machinery (35)	0.8	Business Services (76)	0.5
Elec. Equip. (36)	0.6	Recreation (78,79)	0.7
Trans. Equip. (37)	0.8	Medical & Educ. (80-89)	0.4
Instruments (38)	0.7		
Misc. Manuf. (39)	1.4		

* Defined as cost of trucks, drivers and vehicle operations, including both in-house fleets and purchases of trucking services from other firms.

Source: Cambridge Systematics, Inc., based on inter-industry purchases from input-output model, business expenditure profiles and state industry-occupation tables.

Figure 5.1 Impact of Eliminating SEPTA on Additional Truck Shipping Cost, by Industry, within the Philadelphia Region



Source: Calculated by Cambridge Systematics, Inc., including business purchases of truck services from shipping companies, as well as in-house truck driver and vehicle costs for in-house fleets (based on regional industrial output patterns from U.S. Department of Commerce, regional inter-industry input-output purchasing patterns from U.S. Bureau of Economic Analysis, industry-occupation patterns from U.S. Census and vehicle costs from IRS industry cost budgets)

profitability for the affected business sectors. It then forecasts a reduction in the business growth rate, or an increase in the business shrinkage rate, within the Philadelphia region. The overall magnitude of this reduction is discussed in Section 5.2.

Access to Labor

Elimination of SEPTA services would discourage business location and investment within the Philadelphia region for reasons beyond just higher shipping costs. Another key impact would be on access to professional and clerical labor. SEPTA's radial bus and commuter rail services provide centralized access to a large labor pool for clerical workers. Without SEPTA, business activities that are most dependent on this labor pool access will be most affected. They are:

- bank offices
- insurance company offices
- credit and finance companies
- professional services (e.g., law firms, accounting, engineering, architecture, etc.)
- business services (e.g., advertising, credit reporting, data processing, public relations, etc.)

With increasing use of telecommunications and computer technology, many clerical office functions of banks and insurance companies are already becoming footloose, as they are no longer required to be located near headquarters. Without SEPTA services, such activities are likely to eventually move or expand out of the Philadelphia area, or in the future choose to avoid moving into the area.

Evidence of the importance of centralized labor market access for office industries is provided by recent employment trends. While most of the growth of manufacturing, wholesale, retail and other industries have shifted to the suburbs, the City of Philadelphia has maintained its major share of metropolitan-wide employment growth in banking, insurance and professional services. This is due in part to the centralized labor market access provided by SEPTA. The forecast growth in these business sectors over the 1992-2020 period (discussed earlier in Chapter 2.0) is expected to be partially at risk to the extent that a consistent share of that growth requires a Center City type of locational access. Without SEPTA service, the new employment growth in those sectors is projected to slow down (from a 37% increase over 1990-2020 to a 26% increase over that period). On the other

hand, maintenance of some SEPTA service to all parts of the metro area (even if only at reduced frequencies) would prevent the loss of labor market access for the partial reduction scenario. These estimated impacts on business attraction are also input into the REMI economic model to forecast further spin-off impacts on the economy.

Shifts in Personal Spending Patterns and Cost of Living

With reduction or elimination of SEPTA services, households living in the Philadelphia region would experience higher costs of living. For transit users, the higher cost of acquiring and operating a car (including fuel, insurance and parking costs) would far outweigh the former cost of transit fares. For car users, higher fuel costs due to slower, longer work trips and higher parking costs would raise the cost of commuting. Disposable income left over for other discretionary trips would be reduced. Direct impacts on metropolitan area spending patterns, if SEPTA services were eliminated in 1992 would be:

Spending on fuels and other car operating costs	+	$ 322 million
Spending on car purchases	+	$ 238 million
Spending on automobile insurance services	+	$ 118 million
Spending on parking services	+	$ 769 million
Spending on public transit	-	$ 291 million
Net Increase in Personal Spending		- $1,156 million

Partial reduction of SEPTA services would bring smaller increases in transportation-related spending costs, proportional to the mode shift from transit to car use.

These estimated impacts on household spending patterns are input into the REMI economic model to estimate impacts on aggregate local demand for various products, and for local production output. They are also represented in the REMI economic model as a reduction in remaining disposable income available for other types of discretionary purchases.

Quality of Life: Impacts on Population Attraction

Longer travel times to get around the metropolitan area by car reduce the attractiveness of the Philadelphia metropolitan area for people (as well as businesses) considering where to relocate.

The additional travel time for personal (non-business) travel if SEPTA services were shut down would total 84 million hours per year. The reduced "amenity value" of living in the Philadelphia area, if SEPTA services were

eliminated in 1992, would be valued at $522 million (based on studies of people's "willingness to pay" to save time). This travel time impact is in addition to the increased cost of living and increased cost of doing business, both previously discussed. Partial reduction of SEPTA services would bring smaller impacts on travel time, gradually rising to 25 million hours per year. These estimated changes in travel times represent an impact on the level of local "amenity" (quality of life). The REMI economic model utilizes these estimates of amenity value to forecast changes in metropolitan population in- and out-migration patterns.

SEPTA Jobs

SEPTA currently has approximately 9,700 employees. The immediate shutdown or gradual elimination of SEPTA would mean the layoffs of all of those employees. The partial reduction scenario is estimated to lead to a loss of over 3,000 SEPTA jobs. These direct impacts are one input into the REMI economic model, which then forecasts further spin-off impacts.

Impacts on Visitors

The loss of SEPTA service will also affect the visitor population in Greater Philadelphia. As described earlier in Section 2.1, different segments of the visitor population rely on SEPTA in different ways for access to their various activities.

Tourists

Tourists, or pleasure travelers, use SEPTA to get to the city. Of those coming to the region from outside the metropolitan area, 33% use the bus and train to come to the city and are thus limited to public transportation, auto rentals, or taxis for movement within the region. This third of the visitor population, or approximately 618,000 visitors, are at risk for being affected by a loss in SEPTA services. It is not likely that this entire "at risk" group will be lost, however. The degree to which tourists are likely to be affected depends on the type of accommodation they use in Philadelphia. The three types are those staying in hotels, those visiting friends and relatives, and day trippers. These are described earlier in Section 2.1 in more detail.

Those visiting friends and relatives who use SEPTA are unlikely to be deterred from coming to Philadelphia, as long as their friends and/or relations continue to live in the region and own automobiles. The other two groups are more vulnerable, because they are pleasure travelers, with discretion as to where they travel. Some day trippers who use SEPTA to come to the city to go to museums, exhibits, zoos and other activities, could and would drive if they had no other option. It is likely that half of those day trippers who use SEPTA would not come, because of congestion,

parking difficulty and expense, and lack of access to automobiles. This represents a loss of approximately 175,000 day tripper tourists.

Those tourists who stay overnight in hotels and use SEPTA are also sensitive to being deterred from travel to Philadelphia, although to a somewhat lesser degree than day trippers. Many overnight hotel travelers come via air, then take SEPTA into the city. These travelers might more easily substitute taxis or rental cars if they could not use SEPTA. A number of hotel stays are via train, however, and so a smaller group of approximately one third of those using SEPTA would likely be impacted, or a loss of around 54,000.

Business Travelers

Business travelers, those visiting Philadelphia to conduct business, are unlikely to be directly affected by the loss of SEPTA service. If it is necessary for people to come to the Philadelphia region to reach their business destination, then they will continue to come, regardless of how they have to get there. Therefore, the extent to which there is an impact in the number of business travelers depends on whether businesses remain in Philadelphia and the local economy remains strong, as opposed to changes in travel options.

Convention Travelers

Convention travelers, those attending conventions, trade shows, and other special events, are sensitive to the loss of SEPTA service. Approximately 42%, or around 524,000, of convention visitors use buses and trains to come into the Philadelphia region, and these are at risk of being affected by the loss of SEPTA. As with the tourist segment, both day trippers and those staying overnight at hotels are likely to be impacted. Approximately half of day tripper convention visitors, including those coming to day meetings, sporting events and consumer shows, would be likely to find other methods of access, but approximately 325,000 would be likely to be deterred by the loss of SEPTA. Those convention visitors staying at hotels will also be impacted, but to a lesser degree than day trippers, similar to the tourists. Of the approximately 153,000 convention visitors staying at hotels who use SEPTA, it is likely that one-third, or 51,000, would be deterred from coming to events in Philadelphia, due to congestion, costs and lack of other modes of access.

The final component of potential tourism loss is the impact on the convention center currently under construction. An important component to marketing the new convention center is its linkage to the airport and area hotels and attractions via SEPTA. Translating projections for activity taking place at the convention center made by the Convention and Visitors Bureau, it is estimated that 350,000 to 400,000 visitors will be generated by the convention center, of which 200,000 will be new visitors attributable to the new convention center. Because of the importance of SEPTA to the

attraction of these new visitors staying at hotels, it is estimated that half, or around 100,000, will be lost due to the loss of SEPTA.

The total estimated loss of visitors due to the loss of SEPTA is 541,473, or approximately 12% of the total visitor population. This impact is input into the REMI economic model to forecast further changes in local hotel sales and retail purchases.

Overall Impacts

The REMI economic simulation model is used to forecast how a loss of transit jobs, an increase in cost of doing business, an increase in cost of living, a decrease in amenity (or "quality of life") and reductions in business attraction and tourism would affect business trends in the Philadelphia metropolitan area. The economic model also forecasts the further "spin-off" impacts that affect all sectors of the economy. There are three kinds of spin-off effects:

- **Indirect Effects**: The shrinkage of business sectors directly affected by loss of SEPTA services leads to reduced orders to other businesses that supply their equipment, materials and services (e.g., business machines, office furniture, and janitorial services).

- **Induced Effects**: The loss of population, jobs and personal income leads to reduced sales of consumer goods and services (e.g., clothing, restaurants, stores, and movies).

- **Trade Effects**: The loss of Philadelphia metropolitan area business activity leads to further losses in the rest of the State of Pennsylvania.

Overall impacts on the metropolitan area economy are described in Section 5.2-5.5; impacts on the rest of the state are described in Section 5.5.

Intra-Regional Relocations

One type of potential change which would take place if SEPTA were curtailed or eliminated is the relocation of job locations within the metropolitan area. This study did not explicitly model how activities remaining within the metropolitan area would relocate in response to higher transportation costs and greater congestion.

The critical issue for this study is whether or not such relocations could be accomplished more cheaply than the total estimated additional transportation costs which would be incurred without SEPTA. Net new

transportation costs without SEPTA were estimated at about $2 billion per year.

In order for activities to reorganize, new job locations (offices) would have to be constructed and new infrastructure facilities (road capacity, sewer capacity, etc.) would have to be provided. It cannot be assumed that relocated jobs would simply fill up otherwise vacant office buildings, or that trips to those jobs would fill up otherwise empty highways. The costs of new office buildings and new infrastructure would have to be less than the estimated transportation costs, or else the region would face at least the same increased costs as shown in this analysis. The adverse impacts of curtailing or eliminating SEPTA cannot be avoided through relocations of regional activities unless the direct costs of such relocations are less than the direct (transportation) costs of eliminating SEPTA.

Even making the most modest estimates of new office, and infrastructure construction costs, those costs might be very large, and thus, relocations of business locations within the region are not likely to provide a cheap solution through which the adverse impacts of eliminating or curtailing SEPTA could be avoided. In fact, the necessity of locational adjustments for some types of business may mean that actual economic costs to business are even greater than those estimated here. In any case, although the costs of reorganizing are likely to be very large, a precise estimate is infeasible within the scope of work of this study. Further research on the costs of reorganizing urban areas, with and without transit, will be necessary before intra-regional reorganization can be fully addressed. For purposes of this study, business impacts are thus limited to those previously discussed in this section.

■ 5.2 Regional Business Sales Impacts

Immediate Shutdown Scenario

Changing Impacts Over Time

The elimination of SEPTA would have immediate and dramatic impacts on travelers, who would experience additional travel time and out-of-pocket costs of travel. The magnitude of congestion impacts would continue to increase over time.

Impacts on the economy of the Philadelphia metropolitan area, however, would not be immediate. If we assume that nearly all SEPTA riders can manage to get to work by car, walking, bicycle or riding with others, then the immediate employment impacts would be limited to the 9,000 SEPTA

workers who lose their jobs. The longer travel times and higher travel costs would not immediately drive away businesses. The additional spending on cars, car repair, fuel, parking and insurance would even increase sales for some area businesses.

Over time, however, the greater cost of doing business would make the Philadelphia metropolitan area less competitive for "basic industries" (i.e., businesses that serve regional or national markets, which don't have to locate in the Philadelphia metropolitan area), such as manufacturers. The reduced access to clerical labor would make Philadelphia less attractive for banking and insurance offices, and specialized export services. The reduced "amenity level" (quality of life) would make the metropolitan area less attractive as a place to live. Sales for businesses now within the metropolitan area would grow slower (or shrink) due to a less competitive cost structure. Businesses that select locations to expand or open new branches would be more likely to pass over the Philadelphia area and select sites in competing metropolitan areas.

Over time, the loss of regional income and business sales would grow to far exceed the value of direct travel impacts. The Philadelphia metropolitan area REMI model forecasts that the loss of business sales associated with immediate (1992) shutdown of SEPTA. In terms of constant 1990 dollars, the loss of sales would be $5 billion/year by 1995, rising to $7 billion/year in the year 2000, $9 billion in the year 2010, and $15 billion/year in the year 2020. In terms of future-year inflated dollars, the numbers are even larger: amounting to $11 billion/year in the year 2000, $30 billion/year in the year 2010 and $60 billion/year in the year 2020 (see Figure 5.2). The loss of business sales by the year 2020 represents 4% of forecast total business sales.

Distribution of Impacts by Business Type

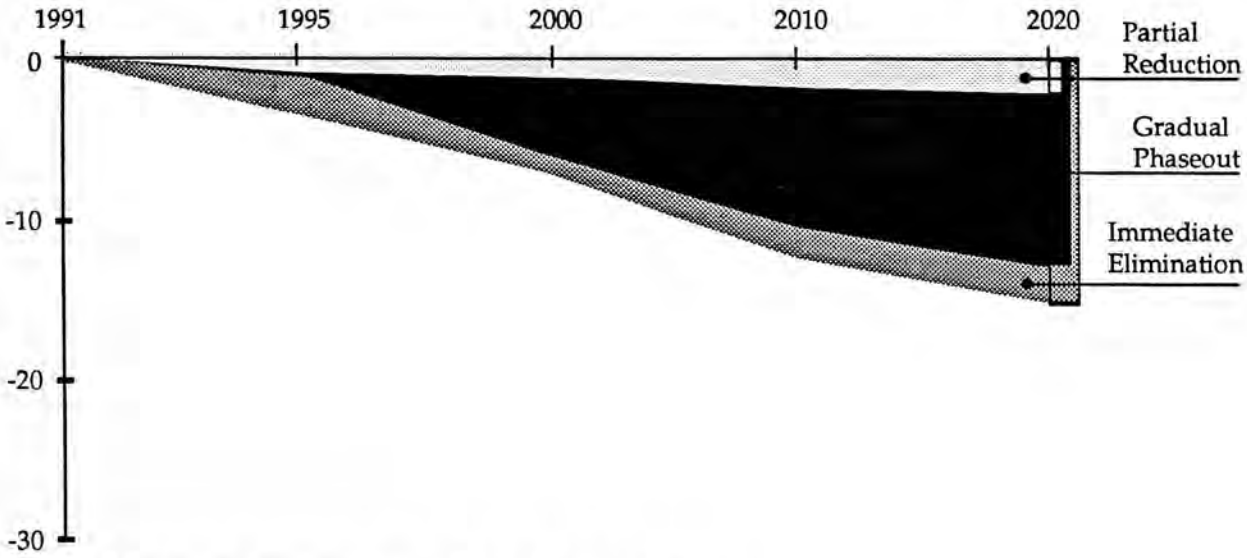
The loss of business sales would particularly hit the manufacturing, transportation, finance/insurance and service sectors of the economy. The loss of jobs, income and business orders will have ripple effects on other sectors of the economy including construction, wholesale, retail and government employment. Overall impacts, then, would affect all sectors of the economy. A breakdown of business sales impacts, by type of business and by year, is shown in Table 5.2.

Gradual Phaseout and Partial Reduction Scenarios

With gradual disinvestment in (and phaseout of) SEPTA services, the level of public transportation services offered would be reduced over time until all services are eventually eliminated. Figure 5.2 shows the magnitude of business output losses resulting from continuing the long-term trend of gradual elimination. The negative impacts of gradual phaseout would ultimately be nearly the same as those occurring with immediate shutdown;

Figure 5.2 Impact of SEPTA Alternatives on Annual Metropolitan Business Sales (Relative to Rehabilitating SEPTA)

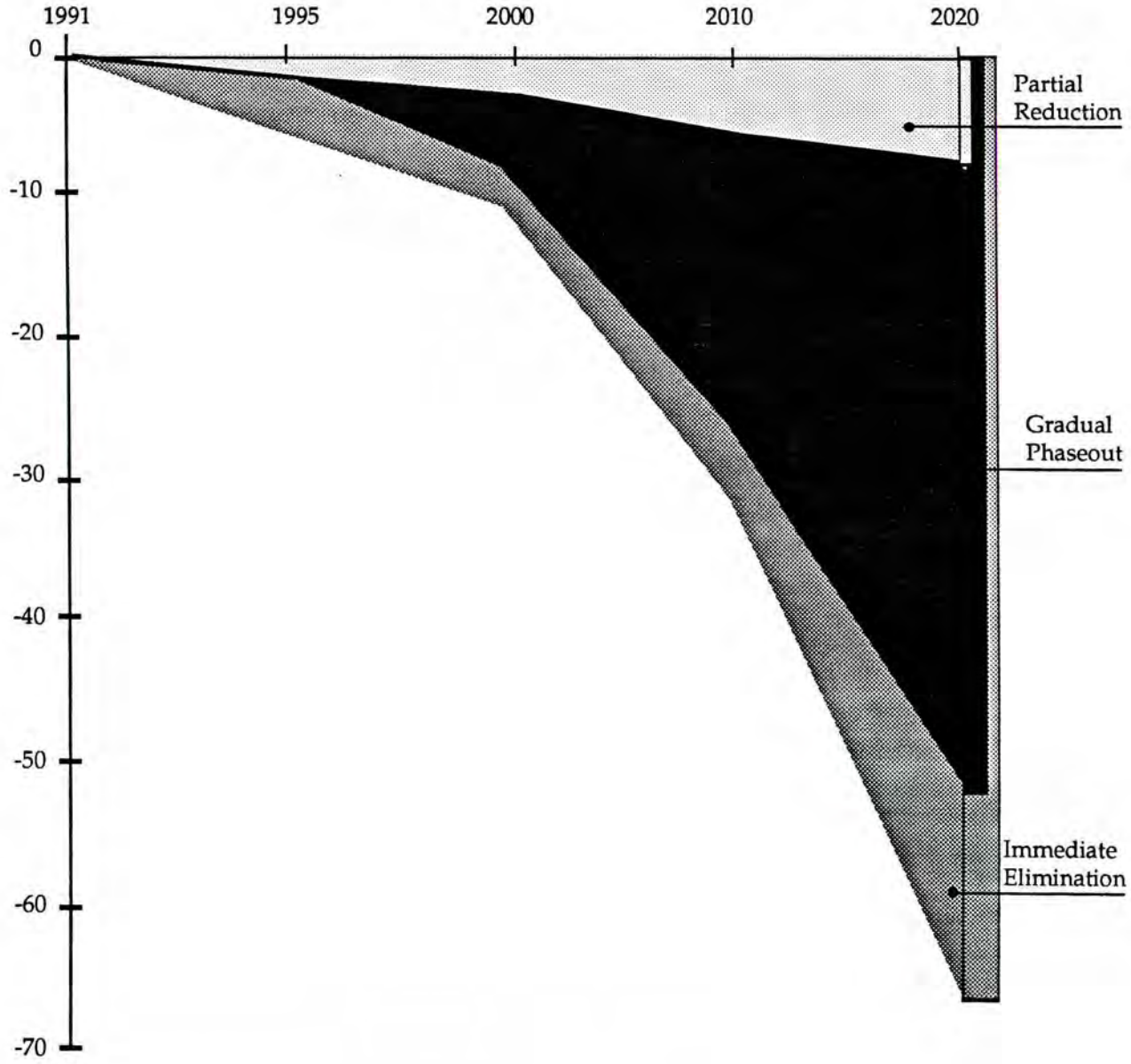
A. In Constant 1990 Dollars ($ Billions)



Source: Cambridge Systematics, Inc., using the REMI Model

Figure 5.2 Impact of SEPTA Alternatives on Annual Metropolitan Business Sales (Relative to Rehabilitating SEPTA) (Continued)

B. In Inflated Future-Year Dollars ($ Billions)



Source: Cambridge Systematics, Inc., using the REMI Model

Table 5.2 Impact of SEPTA Alternatives on Annual Metropolitan Business Sales, by Type of Business

Industry	Sales in Millions of Constant 1990 Dollars (compared to Rehabilitated SEPTA) 1995	2000	2010	2020
Immediate Shutdown Scenario				
Durables Mfg.	-201	-326	-518	-534
Non-Durables	-346	-621	-970	-862
Construction	-399	-610	-916	-1,080
Transportation and Utilities	-805	-1,040	-1,377	-1,594
Finance, Insur. & Real Estate	-1,176	-1,789	-2,825	-3,880
Retail Trade	-346	-533	-820	-1,002
Wholesale Trade	-407	-642	-1,004	-1,218
Services	-1,010	-1,841	-3,260	-4,407
Other	-17	-29	-51	-62
TOTAL	**-4,709**	**-7,433**	**-11,744**	**-14,902**
Gradual Phaseout Scenario				
Durables Mfg.	-25	-243	-608	-658
Non-Durables	-40	-367	-872	-1,045
Construction	-73	-487	-842	-1,012
Transportation and Utilities	-78	-753	-1,288	-1,522
Finance, Insur. & Real Estate	-238	-1,232	-2,200	-3,157
Retail Trade	-59	-412	-738	-924
Wholesale Trade	-70	-500	-939	-1,161
Services	-150	-960	-2,418	-3,568
Other	-3	-22	-47	-59
TOTAL	**-726**	**-4,980**	**-9,954**	**-13,107**
Partial Reduction Scenario				
Durables Mfg.	-25	-42	-118	-133
Non-Durables	-40	-75	-149	-180
Construction	-73	-111	-170	-194
Transportation and Utilities	-76	-103	-161	-191
Finance, Insur. & Real Estate	-238	-308	-394	-428
Retail Trade	-59	-92	-146	-172
Wholesale Trade	-70	-111	-187	-224
Services	-150	-230	-372	-440
Other	-3	-5	-10	-12
TOTAL	**-726**	**-1,078**	**-1,708**	**-1,974**

Source: Cambridge Systematics, Inc., using the REMI Model.

they would merely be delayed. The business sales impact of gradual phaseout would be $13 billion/year by the year 2020. With immediate shutdown, this same impact level would occur ten years earlier. (These figures are in constant 1990 dollars.)

The business sales impact under the partial reduction scenario would be $2 billion/year by the year 2010. The negative impact of reducing SEPTA service would be much less pronounced than the impacts of SEPTA shutdown for two reasons. One is that the transportation congestion impacts would increase exponentially with increases in traffic volumes. In other words, eliminating all of SEPTA would cause traffic delays more than double the severity of what would occur with SEPTA services cut in half. This would occur since traffic slowdowns get worse quickly only after a threshold of road capacity is exceeded.

The other reason is that labor market access patterns could be maintained as long as some SEPTA service remains. SEPTA commuters might have to walk longer to access service, wait longer for it, and endure uncomfortable "standing room only" conditions, but they could still get to their same jobs if SEPTA service was cut in half. On the other hand, a total and permanent shutdown would have much more dramatic impacts on labor market access, business attraction and tourism.

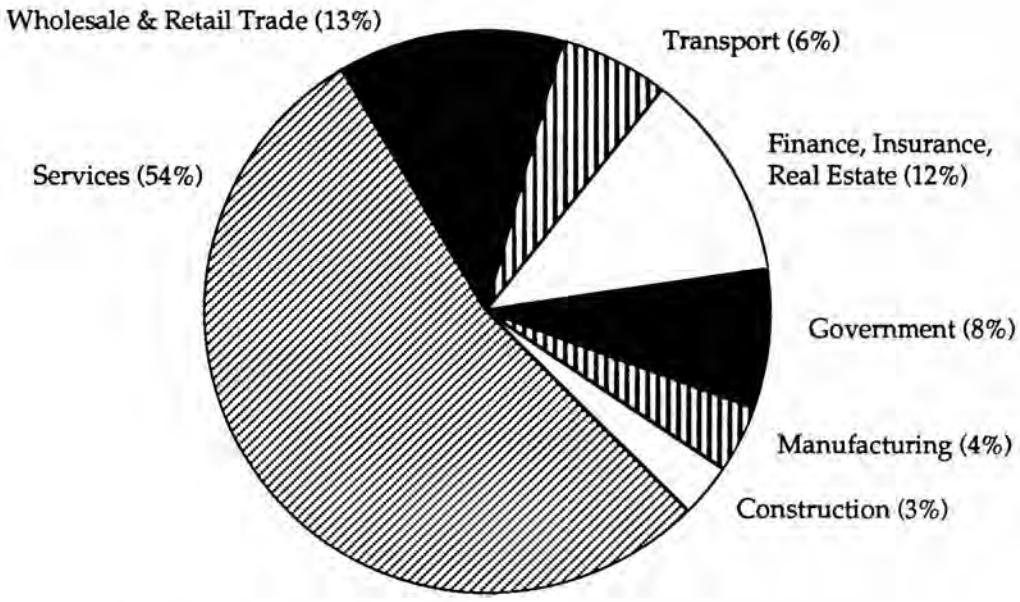
■ 5.3 Regional Employment and Occupation Impacts

Immediate Shutdown Scenario

Along with loss of business activity is a loss of jobs. With immediate shutdown of SEPTA (e.g., in 1992), the impact on employment is that there would be nearly 91,000 fewer jobs in the metropolitan area in the year 2000 (compared to the number of jobs that would otherwise be expected with SEPTA rehabilitated). By the year 2020, the figure rises to over 170,000 fewer jobs in the metropolitan area (compared to the number of jobs that would otherwise be expected).

The mix of jobs lost is broken down by industry in Table 5.3 and Figure 5.3. The key industries losing jobs would be office industries such as business services, finance and insurance, plus traffic-dependent industries such as trucking, transportation services and wholesaling. Consumer sectors of the economy (e.g., retail trade) would lose employment due to the loss of population and income.

Figure 5.3 Mix of Metropolitan Area Job Loss Resulting from Immediate Elimination of SEPTA, by Industry*



*Average mix over 1993-2020 period

Source: Cambridge Systematics, Inc., using the REMI Model

Table 5.3 Impact of SEPTA Alternatives on Metropolitan Employment, by Type of Business

Industry	Change in Total Metropolitan Employment (compared to Rehabilitated SEPTA) 1995	2000	2010	2020
Immediate Shutdown Scenario				
Durables Mfg.	-1,092	-1,530	-1,931	-1,787
Non-Durables	-1,715	-2,524	-3,140	-3,092
Construction	-3,511	-5,025	-6,879	-7,449
Transportation and Utilities	-10,518	-11,594	-12,602	-12,803
Finance, Insur. & Real Estate	-5,296	-9,735	-16,811	-22,607
Retail Trade	-8,786	-13,100	-18,646	-21,029
Wholesale Trade	-3,785	-5,502	-7,421	-7,736
Services	-19,289	-35,000	-60,507	-79,697
Government	-3,330	-6,326	-10,338	-13,279
Other	-456	-727	-1,031	-1,150
TOTAL	**-57,778**	**-91,029**	**-139,294**	**-170,628**
Gradual Phaseout Scenario				
Durables Mfg.	-112	-1,118	-2,191	-2,064
Non-Durables	-280	-1,708	-2,902	-2,938
Construction	-837	-3,997	-6,324	-6,973
Transportation and Utilities	-1,123	-8,621	-12,017	-12,388
Finance, Insur. & Real Estate	-1,154	-4,053	-10,811	-16,676
Retail Trade	-1,931	-10,090	-16,720	-19,295
Wholesale Trade	-849	-4,263	-6,918	-7,364
Services	-3,843	-18,103	-44,769	-64,392
Government	-542	-3,704	-8,121	-11,224
Other	-118	-567	-957	-1,098
TOTAL	**-10,788**	**-56,224**	**-111,729**	**-144,410**
Partial Reduction Scenario				
Durables Mfg.	-112	-249	-596	-607
Non-Durables	-280	-451	-670	-684
Construction	-837	-1,183	-1,662	-1,730
Transportation and Utilities	-1,123	-1,219	-1,516	-1,607
Finance, Insur. & Real Estate	-1,154	-1,421	-1,786	-1,785
Retail Trade	-1,931	-2,931	-4,310	-4,685
Wholesale Trade	-849	-1,238	-1,791	-1,855
Services	-3,843	-5,701	-8,973	-10,256
Government	-542	-1,025	-1,726	-2,047
Other	-118	-175	-268	-298
TOTAL	**-10,788**	**-15,592**	**-23,239**	**-25,554**

Source: Cambridge Systematics, Inc., using the REMI Model.

The mix of jobs lost is broken down by occupation in Figure 5.4. The principal losses would be in clerical jobs, business professionals and service occupations.

Gradual and Partial Scenarios

The loss of jobs associated with the gradual phaseout scenario would be similar to the impact of immediate elimination, but would take place more gradually. The resulting impact would be 144,000 fewer jobs in the metropolitan area (than would otherwise be expected) by the year 2020.

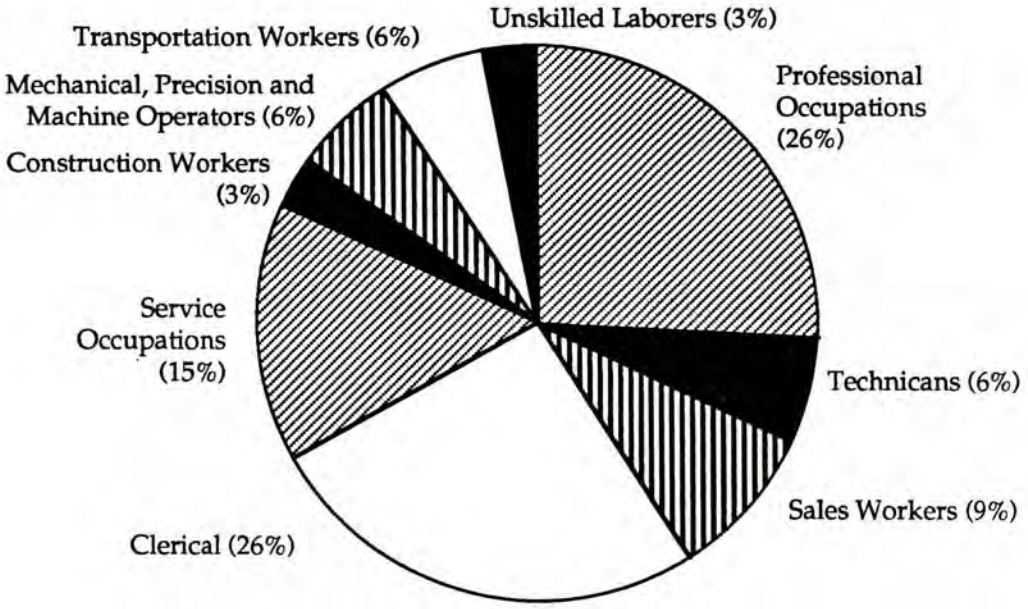
The loss of jobs associated with the partial reduction scenario would be still less dramatic. The impact would be 26,000 fewer jobs in the metropolitan area (than would otherwise be the case) by the year 2020. Job impacts of the partial reduction scenario differ from the other two total reduction scenarios in that the office industries and occupations would be less hard hit, since some level of transit service would be maintained for clerical worker access to office jobs.

■ 5.4 Regional Household Income Impacts

The loss of jobs due to elimination or reduction of SEPTA services would cause a loss of overall personal income in the metropolitan area. A depressed labor market, in which average wages are reduced, would lead to further reductions in personal income. The impact, in terms of net disposable (after-tax) household income, would be $4.4 billion/year by the year 2000, rising to $9.6 billion/year by the year 2020. These figures are expressed in constant 1990 dollars. In terms of future-year inflated dollars, the year 2020 impact on income would be $41 billion.

The income losses associated with the gradual phaseout and partial reduction scenarios are proportionally smaller, reflecting lesser losses of jobs. The corresponding loss of income by the year 2020 would be $8.8 billion under the gradual phaseout scenario and $1.1 billion under the partial reduction scenario. (These figures are in constant 1990 dollars.) Changes over time in the income impacts of all three SEPTA scenarios are shown in Figure 5.5.

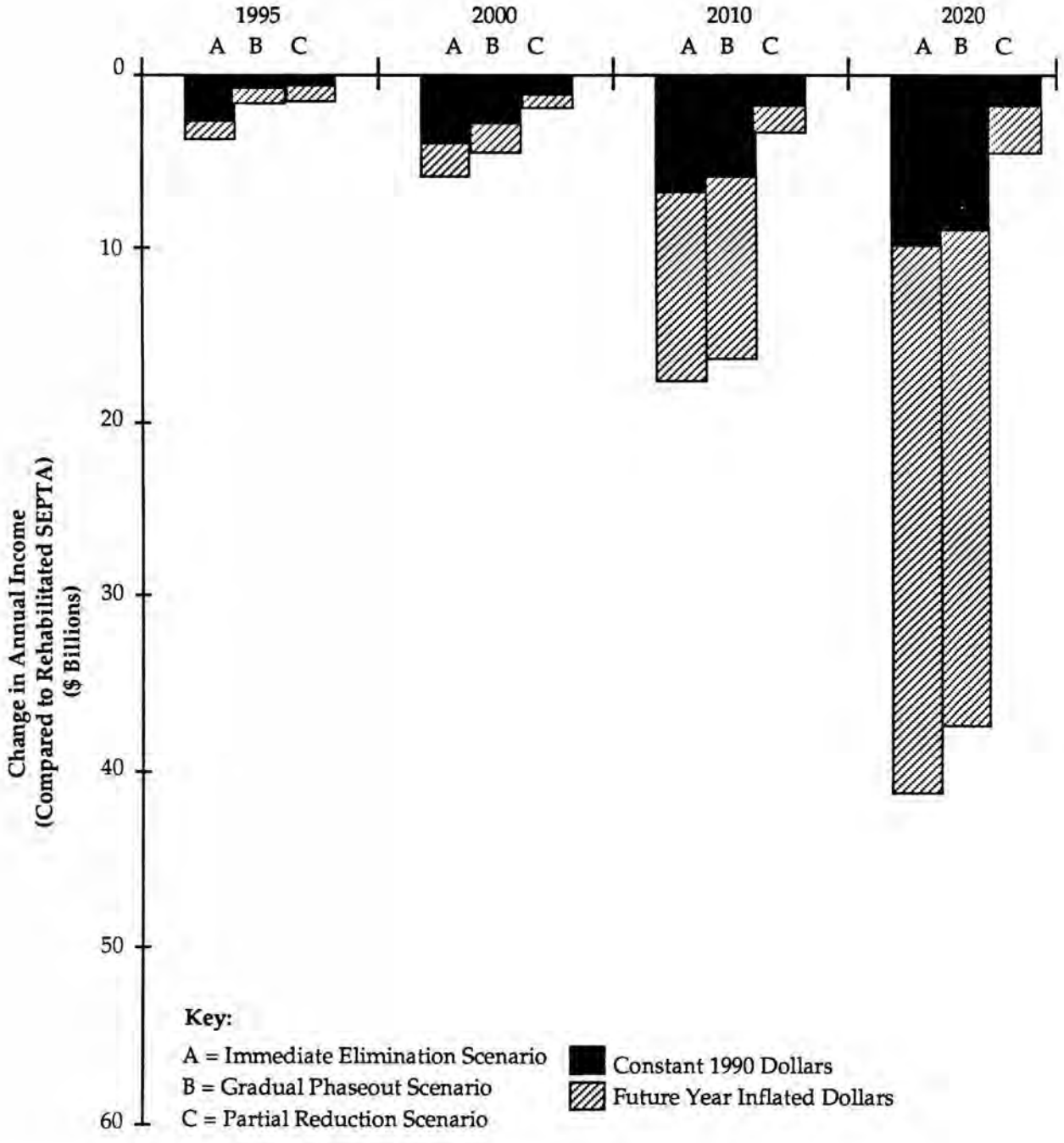
Figure 5.4 Mix of Metropolitan Area Job Loss Resulting from Immediate Elimination of SEPTA, by Occupation*



*Average mix over 1993-2020 period

Source: Cambridge Systematics, Inc., using the REMI Model

Figure 5.5 Impact of SEPTA Alternatives on Metropolitan Household Income Over Time



Source: Cambridge Systematics, Inc., using the REMI Model

■ 5.5 Regional Population Impacts

One consequence of the loss of jobs would be that some households would move away from the Philadelphia metropolitan area. The REMI model forecasts the changes in population based on the relationship of population change to forecast changes in employment. With immediate shutdown of SEPTA services, it forecasts 91,000 fewer people living in the metropolitan area by the year 2000 (compared to the population that would otherwise be expected with SEPTA rehabilitated). By the year 2020, this difference increases to 313,000 fewer people living in the metropolitan area (compared to what otherwise would be expected with SEPTA rehabilitated). The REMI model forecast of metropolitan population, assuming continued reinvestment in SEPTA, is for an additional population increase of 344,400 between 1990 and 2020. (Refer back to Table 2.2 for REMI and DVRPC base case forecasts.) Thus, immediate elimination of SEPTA services would effectively halt regional population growth.

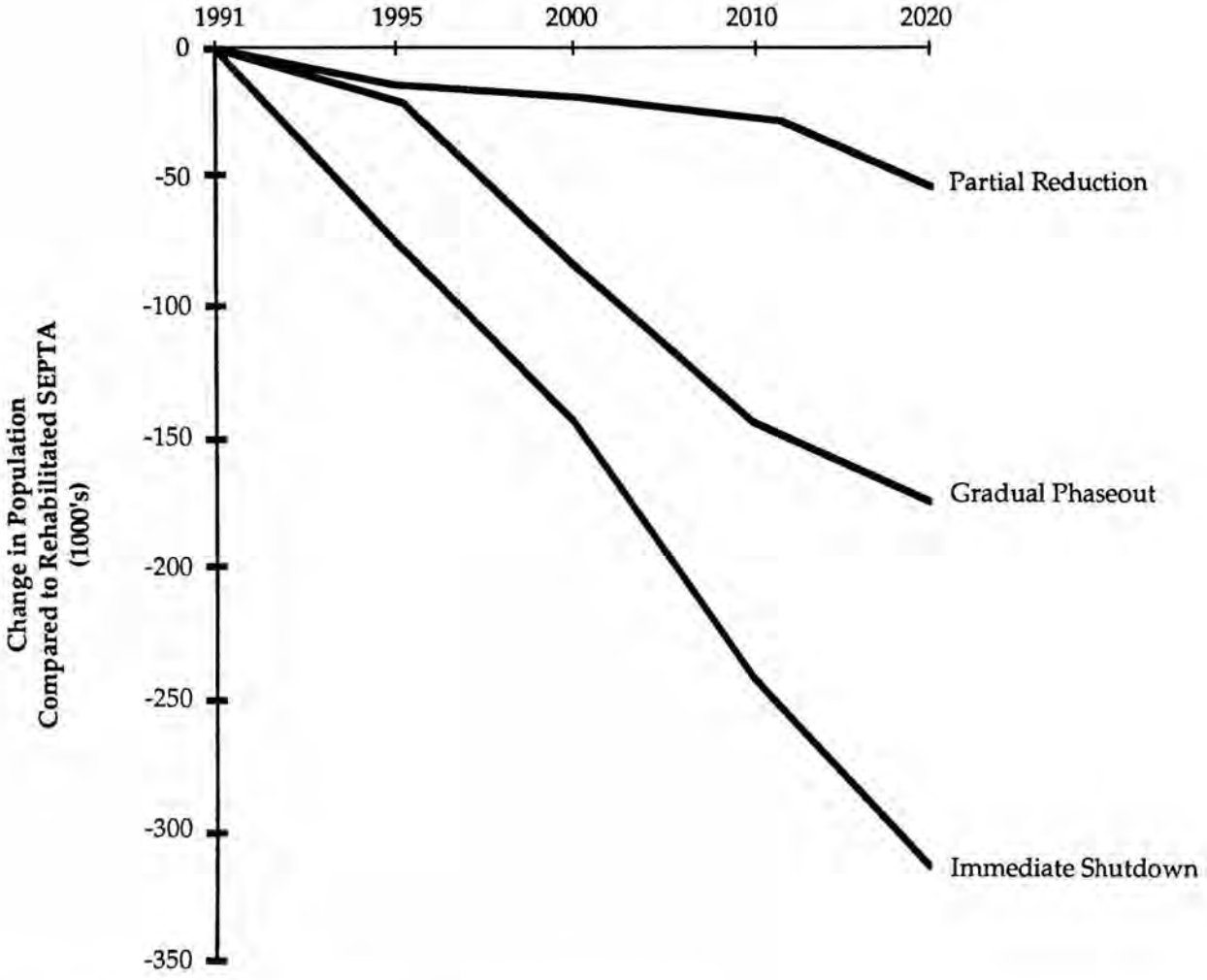
Impacts of the gradual phaseout and partial reduction scenarios would be smaller. Under the gradual phaseout scenario, metropolitan population would be 280,000 less by the year 2020 (than would otherwise be expected). Under the partial reduction scenario, metropolitan population would be nearly 58,000 less by the year 2020 (than would otherwise be expected). Changes over time in the population impacts of all three SEPTA scenarios are shown in Figure 5.6. Overall impacts are summarized in Table 5.4.

■ 5.6 Statewide Economic Impacts

Impacts on Rest of the State

The Philadelphia metropolitan area is a major generator of economic activity for the rest of the State of Pennsylvania. Business elsewhere in the state produces goods and services for users in the Philadelphia area. In the long run, losses of specialized business activity in the Philadelphia metropolitan area would largely be made up by business shifts to other major metropolitan areas outside of Pennsylvania. This would be particularly true for industries that require access to large labor markets or large consumer markets: finance and insurance industries, petroleum refining, chemical and pharmaceutical manufacturing; and specialized office activities. Thus, the impact of business losses for the Philadelphia metropolitan area would bring additional losses for the State of Pennsylvania.

Figure 5.6 Impact of SEPTA Alternatives on Metropolitan Population Over Time



Source: Cambridge Systematics, Inc., using the REMI Model

Table 5.4 Summary of Economic Impacts of SEPTA Alternatives on the Philadelphia Metropolitan Area (including both Pennsylvania and New Jersey portions)

Industry	Annual Impact (compared to Rehabilitated SEPTA) 1995	2000	2010	2020
Immediate Shutdown Scenario				
Business Sales (billions)				
Constant 1990 $	-4.7	-7.4	-11.7	-14.9
Inflated future $	-6.1	-11.6	-30.4	-63.7
Personal Income (billions)				
Constant 1990 $	-3.0	-4.4	-7.0	-9.6
Inflated future $	-3.9	-6.9	-18.2	-41.0
Employment (thousands)	-57.8	-91.0	-139.3	-170.6
Population (thousands)	-75.9	-143.1	-241.9	-313.2
Gradual Phaseout Scenario				
Business Sales (billions)				
Constant 1990 $	-0.7	-5.0	-10.0	-13.1
Inflated future $	-0.9	-7.8	-26.0	-56.0
Personal Income (billions)				
Constant 1990 $	-0.2	-3.0	-6.1	-8.8
Inflated future $	-0.3	-4.7	-15.9	-37.6
Employment (thousands)	-10.8	-56.2	-111.8	-144.4
Population (thousands)	-14.8	-88.8	-201.5	-280.6
Partial Reduction Scenario				
Business Sales (billions)				
Constant 1990 $	-0.7	-1.1	-1.7	-2.0
Inflated future $	-0.9	-1.7	-4.4	-8.5
Personal Income (billions)				
Constant 1990 $	-0.2	-0.5	-0.8	-1.1
Inflated future $	-0.3	-0.8	-2.2	-4.6
Employment (thousands)	-10.8	-15.6	-23.2	-25.6
Population (thousands)	-14.8	-27.8	-48.5	-57.9

Source: Cambridge Systematics, Inc., using the REMI Model.

The spillover impacts for each alternative on the rest of the state (outside of the Philadelphia metropolitan area) are summarized in Table 5.5. The impacts of immediate shutdown in 1992 would be a change in employment in the rest of the state amounting to 15,000 fewer jobs as of the year 2000, and 24,000 fewer jobs as of the year 2020. The gradual elimination scenario would have nearly equal impacts on the rest of the state. The partial reduction scenario would lead to 3,600 fewer jobs in the rest of the state (than would otherwise be expected under base case conditions of SEPTA rehabilitated).

Statewide Impacts

Overall impacts on the State of Pennsylvania reflect:

- impacts on the Philadelphia metropolitan area
- plus impacts on the rest of the State of Pennsylvania
- minus a portion of the Philadelphia metro area impacts occurring in the New Jersey side of the metro area

The Pennsylvania side of the metropolitan area has about 70% of total metropolitan area population. However, the Pennsylvania side is expected to account for 89% of the metropolitan area's economic impact. That is because all SEPTA services lost (except for Trenton and West Trenton) are confined to the Pennsylvania side, and the primary traffic congestion impacts are focused on arterials in and out of Philadelphia's central business district. Overall impacts on the State of Pennsylvania are displayed in Table 5.6, and summarized in the following text.

Immediate Shutdown

Statewide impacts of immediate shutdown of SEPTA would increase over time to represent, by the year 2020:

- a loss of over $16 billion/year of business sales, expressed in 1990 dollars, (or $70 billion/year in future inflated dollars)
- a loss of over $10 billion/year in income, expressed in 1990 dollars (or $44 billion in future year inflated dollars)

Table 5.5 Economic Impacts of SEPTA Alternatives on the Rest of Pennsylvania Outside of the Philadelphia Metropolitan Area

Industry	Annual Impact (compared to Rehabilitated SEPTA) 1995	2000	2010	2020
Immediate Shutdown Scenario				
Business Sales (billions)				
Constant 1990 $	-1.0	-1.6	-2.5	-3.1
Inflated future $	-1.3	-2.5	-6.5	-13.3
Personal Income (billions)				
Constant 1990 $	-0.5	-0.8	-1.2	-1.6
Inflated future $	-0.6	-1.3	-3.1	-7.3
Employment (thousands)	-10.1	-15.3	-21.5	-24.1
Population (thousands)	-12.1	-22.8	-37.7	-46.6
Gradual Phaseout Scenario				
Business Sales (billions)				
Constant 1990 $	-0.1	-1.5	-2.2	-2.8
Inflated future $	-0.2	-2.3	-5.8	-12.0
Personal Income (billions)				
Constant 1990 $	-0.1	-0.4	-0.8	-1.1
Inflated future $	-0.1	-0.7	-1.9	-4.7
Employment (thousands)	-1.5	-13.9	-19.3	-21.7
Population (thousands)	-1.8	-20.8	-34.0	-41.9
Partial Reduction Scenario				
Business Sales (billions)				
Constant 1990 $	-0.1	-0.2	-0.4	-0.5
Inflated future $	-0.2	-0.4	-1.0	-2.0
Personal Income (billions)				
Constant 1990 $	-0.1	-0.1	-0.2	-0.3
Inflated future $	-0.1	-0.2	-0.4	-1.4
Employment (thousands)	-1.5	-2.3	-3.2	-3.6
Population (thousands)	-1.8	-3.4	-5.7	-7.0

Source: Cambridge Systematics, Inc., using the REMI Model.

Table 5.6 Economic Impacts of SEPTA Alternatives on the Entire State of Pennsylvania

Industry	Annual Impact (compared to Rehabilitated SEPTA) 1995	2000	2010	2020
Immediate Shutdown Scenario				
Business Sales (billions)				
Constant 1990 $	-5.2	-8.2	-12.9	-16.3
Inflated future $	-6.7	-12.8	-33.5	-69.8
Personal Income (billions)				
Constant 1990 $	-3.2	-4.7	-7.4	-10.1
Inflated future $	-4.1	-7.4	-19.2	-43.6
Employment (thousands)	-61.4	-96.0	-145.0	-175.3
Population (thousands)	-79.7	-150.2	-253.0	-325.3
Gradual Phaseout Scenario				
Business Sales (billions)				
Constant 1990 $	-0.7	-5.9	-11.1	-14.4
Inflated future $	-1.0	-9.2	-28.8	-61.6
Personal Income (billions)				
Constant 1990 $	-0.2	-3.1	-6.2	-9.0
Inflated future $	-0.3	-4.9	-16.0	-38.0
Employment (thousands)	-11.1	-63.7	-118.4	-149.7
Population (thousands)	-15.0	-99.8	-213.3	-290.6
Partial Reduction Scenario				
Business Sales (billions)				
Constant 1990 $	-0.7	-1.2	-1.9	-2.3
Inflated future $	-1.0	-1.9	-4.9	-9.5
Personal Income (billions)				
Constant 1990 $	-0.2	-0.6	-0.9	-1.3
Inflated future $	-0.3	-0.9	-2.3	-5.5
Employment (thousands)	-11.1	-16.5	-23.8	-26.3
Population (thousands)	-15.0	-28.0	-48.7	-58.5

Source: Cambridge Systematics, Inc., using the REMI Model.

- an employment loss of nearly 175,000 jobs
  (2.8% of base case forecast employment)

- a population loss of over 325,000 people
  (2.8% of base case forecast population)

Gradual Phaseout

Statewide impacts of the gradual phaseout scenario are similar to those of the immediate shutdown scenario, but take place in a more delayed fashion. Thus, year 2020 impacts under the gradual phaseout scenario are nearly the same as the statewide impact level five years earlier (year 2010) under the immediate elimination scenario. They are:

- a loss of over $14 billion/year of business sales (1990 dollars)
  (or $62 billion/year in future year inflated dollars)

- a loss of $9 billion/year in personal income (1990 dollars)
  (or $38 billion/year in future year inflated dollars)

- an employment loss of 150,000 jobs
  (2.4% of base case forecast employment)

- a population loss of 290,000 people
  (2.4% of base case forecast population)

Partial Reduction

Statewide impacts of the partial reduction scenario are less severe than impacts of the gradual elimination or immediate shutdown scenarios, but are still large. By the year 2020, statewide impacts of partial reduction of SEPTA services are:

- a loss of $2.3 billion/year of business sales (1990 dollars)
  or $9.5 billion/year in future year inflated dollars)

- a loss of $1.3 billion/year personal income (1990 dollars)
  (or $5.5 billion/year in future year inflated dollars)

- an employment loss of 26,000 jobs
  (0.5% of base case forecast employment)

- a population loss of 58,000 people
  (0.5% of base case forecast population)

5.7 Fiscal Impacts

Overall Impacts

The Pennsylvania Economy League's Fiscal Impact Models are used to forecast how the predicted losses in jobs, population and income would affect the finances of local and state governments. This includes both losses of revenues and reductions in expenses.

On the revenue side, the decreased tax revenues would closely follow the economic and population decline, with the exception of real estate taxes, which could have a time lag before the economic decline is fully reflected in lower real estate values.

On the expenditure side, there would be some reduction in school expenses as population declines, as well as reductions in (or elimination of) the SEPTA subsidy. School costs are only partially sensitive to the small-scale enrollment decreases projected in the scenarios, since some of the costs of local education are fixed costs. The reduction in school costs (impacting both local and state expenditures) would occur primarily in the metropolitan area.

Offsetting the reductions in school costs would be increases in state costs for income maintenance programs (both for AFDC and General Assistance), which would increase as jobs are lost in the state.

Overall impacts on revenues and costs of local governments and state government are summarized in Table 5.7 and 5.8, and are discussed below.

Immediate Shutdown Scenario

By the year 2000, the tax losses to state and local governments combined would be $313 million. Two areas of cost reductions would also occur; lower education costs ($33 million) and elimination of the SEPTA subsidy ($259 million). (This SEPTA subsidy figure is the combined operating subsidy, of which $65 million is local and the remainder is state.) A large cost increase (in the magnitude of $75 million) would be expected to occur in state costs for welfare and income maintenance. The overall impact for state and local governments combined would be a net annual loss of approximately $96 million. By the year 2020, the net impact would grow to an annual loss of $364 million, in constant 1990 dollars. That is equivalent to $1.5 billion in future year inflated dollars.

Table 5.7 Fiscal Impacts of SEPTA Alternatives on Government Revenues
(in millions of constant 1990 dollars)

	1990 Base	2000	2010	2020
Immediate Shutdown Scenario				
Metro Area Local Tax Revenue				
Real Estate Taxes	2,950	-102	-156	-191
Wage/Earnings Taxes	1,015	-47	-75	-106
Business Taxes	300	-10	-16	-20
Other Taxes	165	-7	-11	-14
Total Metro Area Tax Revenue	**4,430**	**-166**	**-258**	**-331**
State Tax Revenue				
Sales & Consumption Taxes	4,582	-76	-120	-152
Corporation Taxes	2,866	-42	-65	-75
Personal Income Taxes	3,294	-24	-45	-62
Other Taxes	676	-5	-9	-12
Total State Tax Revenue	**11,418**	**-147**	**-239**	**-301**
Total Tax Revenues	**15,848**	**-313**	**-497**	**-632**
Gradual Phaseout Scenario				
Metro Area Local Tax Revenue				
Real Estate Taxes	2,950	-63	-125	-162
Wage/Earnings Taxes	1,015	-31	-62	-89
Business Taxes	300	-7	-13	-17
Other Taxes	165	-4	-8	-12
Total Metro Area Tax Revenue	**4,430**	**-105**	**-208**	**-280**
State Tax Revenue				
Sales & Consumption Taxes	4,582	-55	-102	-132
Corporation Taxes	2,866	-29	-52	-66
Personal Income Taxes	3,294	-19	-37	-64
Other Taxes	676	-3	-7	-13
Total State Tax Revenue	**11,418**	**-107**	**-199**	**-275**
Total Tax Revenues	**15,848**	**-212**	**-407**	**-555**

Source: Pennsylvania Economy League and Cambridge Systematics, Inc.

Table 5.7 Fiscal Impacts of SEPTA Alternatives on Government Revenues (continued)
(in millions of constant 1990 dollars)

	1990 Base	2000	2010	2020
Partial Reduction Scenario				
Metro Area Local Tax Revenue				
Real Estate Taxes	2,950	-19	-28	-31
Wage/Earnings Taxes	1,015	-5	-8	-10
Business Taxes	300	-1	-2	-2
Other Taxes	165	-1	-2	-2
Total Metro Area Tax Revenue	**4,430**	**-26**	**-40**	**-46**
State Tax Revenue				
Sales & Consumption Taxes	4,582	-9	-16	-20
Corporation Taxes	2,866	-8	-12	-14
Personal Income Taxes	3,294	-3	-5	-7
Other Taxes	676	-1	-1	-1
Total State Tax Revenue	**11,418**	**-21**	**-34**	**-42**
Total Tax Revenues	**15,848**	**-48**	**-75**	**-88**

Source: Pennsylvania Economy League and Cambridge Systematics, Inc.

Table 5.8 Fiscal Impacts of SEPTA Alternatives on Government Costs
(in millions of constant 1990 dollars)

	2000	2010	2020
Immediate Shutdown Scenario			
SEPTA subsidy cost	-259	-259	-259
Education costs*	-33	-56	-72
Welfare costs (state)	75	106	64
Change in Government Expenses	**-217**	**-209**	**-268**
Change in Government Revenues (from Table 5.7)	**-313**	**-497**	**-632**
Gradual Phaseout Scenario			
SEPTA subsidy cost	-168	-259	-259
Education costs*	-19	-44	-61
Welfare costs (state)	57	113	62
Change in Government Expenses	**-130**	**-190**	**-258**
Change in Government Revenues (from Table 5.7)	**-212**	**-407**	**-555**
Partial Reduction Scenario			
SEPTA subsidy cost	-65	-65	-65
Education costs	-6	-10	-12
Welfare costs (state)	13	19	6
Change in Government Expenses (from Table 5.7)	**-58**	**-56**	**-71**
Change in Government Revenues	**-48**	**-75**	**-88**

* Education costs are borne by local governments, a portion of which are covered by state aid.

Source: Pennsylvania Economy League and Cambridge Systematics, Inc.

Gradual Phaseout Scenario

Government impacts of the gradual phaseout scenario would take effect over a longer period of time. By the year 2000, the tax revenue losses to state and local governments would be $212 million. The estimated increase in state welfare and income maintenance costs would be $57 million, more than offsetting the $19 million savings in school costs. The overall impact (including savings of SEPTA subsidy) would still be a net loss of approximately $82 million annually. By the year 2020, the total annual government impact would grow to a loss of $297 million, in constant 1990 dollars. That is equivalent to $1.2 billion in future year inflated dollars.

Partial Reduction Scenario

The partial reduction scenario would have less severe impacts. By the year 2000, the revenue tax losses to state and local governments would be $48 million. Savings of school costs ($6 million) would be more than offset by increases in state welfare and income maintenance costs ($13 million). The overall result (including savings of part of SEPTA's subsidy cost) would be a negligible impact on state and local government, over the period through the year 2020.

6.0 Conclusions

6.1 Benefit/Cost Comparison

Definitions

Benefit/cost analysis provides a means of assessing the net public benefits of the SEPTA reduction alternatives, relative to the base case of rehabilitating and continuing SEPTA. The comparison is made in terms of the "net benefit" (defined as benefits minus costs) and the "benefit/cost ratio" (defined as the ratio of benefits divided by costs).

The costs and benefits associated with SEPTA alternatives are defined by the fact that all of the alternatives are negative changes in transit services, compared to the base case. Thus:

- The economic "benefit" of reducing or eliminating SEPTA is a savings in public spending now going to subsidize the price of providing public transportation services.

- The economic "cost" of reducing or eliminating SEPTA is a loss of personal income due to contraction of the state economy as a result of the degraded transportation system.

Thus, the benefit/cost comparison effectively compares the benefit of added money in the pockets of Pennsylvania residents to the cost of money lost

from the pockets of Pennsylvania residents. This is a clear and straightforward way of assessing economic impacts on the state economy.

In order to evaluate each of the three SEPTA alternatives (relative to the base case alternative), it is necessary to compare streams of costs and benefits generated during each year of the 30-year study period from 1991 through 2020. Each future year cost and benefit is estimated in terms of (inflation-adjusted) constant 1990 dollars, and then further discounted to its equivalent "present value". Discounting reflects the "time value of money", the fact that a dollar available in the future has less present value than a dollar available right now (over and above the effect of inflation). The further into the future a cost or benefit occurs, the more heavily it is discounted and, thus, the lower its equivalent present value.

Discounting is important because the attractiveness of one transit service alternative over another is determined by both the size and timing of its costs and benefits. It is typical of transportation projects that capital expenditures are experienced early on, while regional and state economic impacts do not start to accrue until later on. The present value of costs and benefits provides a consistent and fair basis for comparing alternatives. The discount rate adopted for project evaluation purposes by state and federal transportation agencies ranges from 4% to 10%. We use both discount rates for this study.

Findings

Results of the benefit/cost analysis are shown for alternative discount rates in Tables 6.1 and 6.2. It is clear that all three alternatives for reduction or elimination of SEPTA services have a negative net benefit regardless of the discount rate used. The partial reduction scenario shows a much smaller magnitude of negative net benefit than the other two alternatives, but that is only because it also has both a much smaller cost and a much smaller benefit.

In terms of benefit/cost ratios, all three alternatives are soundly rejected. In each case, the benefit/cost ratio is 0.35 or lower considering only the transportation costs themselves, which mean that the benefits (in terms of public expenditures saved) are no more than one-third of the cost in terms of traveler impacts. Considering all impacts on the economy of the State of Pennsylvania, the benefit/cost ratios of the elimination or reduction of SEPTA are all below 0.2 which means that the so-called public expenditure benefits of not rehabilitating and continuing to operate SEPTA are less than 20% of the income losses which this brings to the State economy. The benefit/cost analysis clearly demonstrates that none of the alternatives for reduction or elimination of SEPTA are cost-effective from the public point of view.

Table 6.1 Net Present Value of Statewide Benefits and Costs of SEPTA Alternatives (at 4% Discount Rate)

	Impacts Relative to Rehabilitated SEPTA (all values are net present values in billions of constant 1990 dollars)		
	Immediate Shutdown	**Gradual Elimination**	**Partial Reduction**
Present Value of Benefit (Savings in SEPTA Subsidy)			
Net Public Spending on SEPTA	$10.1	$7.7	$2.4
Net Present Value of Cost (Loss of Income Value)			
Value of Direct User Impacts	$37.2	$27.2	$8.8
Value of Personal Income Change	94.1	88.9	12.0
Present Value of Net Benefit (Benefit-Cost)			
Based on Direct User Impacts	$-27.1	$-19.5	$-6.4
Based on Personal Income Change	-84.0	-81.2	-9.6
Benefit/Cost Ratio			
Based on Direct User Impacts	0.27	0.28	0.27
Based on Personal Income Change	0.11	0.10	0.20

Source: The Urban Institute and Cambridge Systematics, Inc.; see text for description of analysis methods.

Table 6.2 Net Present Value of Statewide Benefits and Costs of SEPTA Alternatives (at 10% Discount Rate)

	Impacts Relative to the Rehabilitated SEPTA (all values are net present values in billions of constant 1990 dollars)		
	Immediate Shutdown	**Gradual Elimination**	**Partial Reduction**
Present Value of Benefit (Savings)			
Net Public Spending on SEPTA	$5.9	$4.0	$1.5
Net Present Value of Cost (Loss of Income Value)			
Value of Direct User Impacts	$17.6	$11.8	$4.3
Value of Personal Income Change	$48.5	$33.2	$7.4
Present Value of Net Benefit (Benefit-Cost)			
Based on Direct User Impacts	-$24.7	-$7.8	-$2.8
Based on Personal Income Change	-$42.6	-$29.2	-$5.9
Benefit/Cost Ratio			
Based on Direct User Impacts	0.36	0.34	0.34
Based on Personal Income Change	0.12	0.12	0.20

Source: The Urban Institute and Cambridge Systematics, Inc.; see text for description of analysis methods.

The cost/benefit findings can also be viewed another way. They indicate that public expenditures to continue SEPTA operations return three dollars of transportation benefit to the region and the state for every dollar spent on SEPTA. In terms of total economic impact, the return to the region and the State represents at least five dollars of income for every dollar spent on SEPTA.

■ 6.2 SEPTA Investment as an Element of Regional and State Economic Development

The economy of the Philadelphia metropolitan area is undergoing a transformation which will accelerate in coming years. The ability of the area to continue to attract and keep major businesses will depend on maintaining and upgrading many factors including: labor force training, labor market access, "quality of life", and business access to provide goods and services to other major markets. The provision of an effective local transportation system is one requirement for continued economic growth. The analysis in this report clearly demonstrates that a shutdown or major reduction of SEPTA services would have a substantial detrimental impact on metropolitan area road congestion, household spending patterns, labor market access and costs of doing business. The impacts on long-term metropolitan growth would be dramatic.

At the same time, shutdown or reductions of SEPTA services would have many other human impacts which cannot be readily quantified. The hardship to transit-dependent persons, particularly lower income persons that lack access to a car, the elderly and the handicapped, would be severe, but does not affect the estimates of metropolitan area economic change provided in this report. Consequential impacts on costs of social services and institutionalized care are also likely to add to the severity of the ultimate economic impacts for the metropolitan area and the entire State of Pennsylvania.

This report finds that the detrimental economic impacts of shutting down or reducing SEPTA services would outweigh the savings for residents of Pennsylvania. These findings also mean that continued investment in SEPTA facilities and services at recommended levels would have substantial statewide economic benefits that outweigh the public subsidy costs for residents of Pennsylvania.