

*Pennsylvania State
Transportation
Advisory Committee*

*The **Economic Impact**
of **Railroads** in
Pennsylvania*

**FINAL REPORT
JANUARY 2005**





THE PENNSYLVANIA STATE TRANSPORTATION ADVISORY COMMITTEE

The Pennsylvania State Transportation Advisory Committee was established in 1970 by Act 120 of the State Legislature, which also created the Pennsylvania Department of Transportation (PennDOT). The Committee consults with and advises the Secretary of Transportation and the State Transportation Commission and undertakes in-depth studies on key issues as appropriate. Through its public members, the Committee also serves as a valuable liaison between PennDOT and the general public.

The Advisory Committee consists of the following members:

The Secretary of Transportation; the heads or their designees from the Department of Agriculture, Department of Education, Department of Community and Economic Development, Public Utility Commission, Department of Environmental Protection, and the Governor's Policy Office; two members of the State House of Representatives; two members of the State Senate; eighteen public members; six appointed by the Governor, the President Pro Tempore of the Senate, and the Speaker of the House of Representatives.

Public members, with experience and knowledge in the transportation of people and goods, are appointed to represent a balanced range of backgrounds (industry, labor, academic, consulting, and research) and the various transportation modes. Appointments are made for a 3-year period and members may be reappointed. The Chair of the Committee is annually designated by the Governor from among the public members.

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1. REPORT SUMMARY

Serving small towns and large metropolitan areas, railroads provide service in all but 2 of Pennsylvania's 67 counties. With this coverage, the railroad industry affects nearly every Pennsylvanian through goods transported, jobs sustained, and electric power generated through rail transported coal. Railroads also help reduce highway traffic and repair. Railroads move a wide variety of commodities for manufacturing, mining, petroleum, food, and other industries to produce and supply goods that are needed by Pennsylvanians. Railroads also move people. This report does consider intercity passenger rail operations as it relates to the overall economic impact of railroads, but the primary focus is rail freight.

This study examines the impact of railroad operations on the Pennsylvania economy. Study results were derived through a combination of four case studies and through a macro economic analysis.

Study Objectives

- Prepare a statewide economic assessment
- Conduct four case studies to provide context
- Develop evaluation methods to estimate direct impacts of public railroad investment
- Provide other recommendations as beneficial

1.1 Purpose/Background

The Pennsylvania State Transportation Advisory Committee (TAC) has advanced this effort to better understand the impact railroads have on the state's economy. Although some economic benefit data exists, there has never been this type of comprehensive analysis. Public funding for rail has increased in recent years and raises legitimate questions concerning rail's economic benefits, and more particularly the public benefits that presumably justify public investment in private infrastructure.

The study objectives are to:

- Prepare an assessment of rail freight's economic benefits to Pennsylvania building on recent efforts such as the Statewide Rail Freight Plan, the Mid-Atlantic Rail Operations Study (MAROPS), and the Pennsylvania Rail Freight Properties Directory.
- Provide a context for the economic assessment through the development of four generally representative case studies demonstrating the diversity of the railroad industry within the state.
- Develop an evaluation method to gauge the economic impact of proposed publicly funded rail freight projects.
- Provide other related recommendations as beneficial.





Chapter 2 presents an assessment of rail's economic impact from a statewide perspective. Chapter 3 looks at the economic impact of rail from a regional/corridor perspective through the presentation of four case studies. Chapter 4 provides the framework for a tool, the Railroad Economic Assessment Tool (REAT), to estimate rail's economic impact at the local project level. REAT is simply a byproduct of this study's methodology that the Department and others may use to better estimate. Chapter 5 provides a summary of the study findings and recommendations.

1.2 Findings in Brief

Railroads Provide Highly Beneficial Employment

- Freight railroads paid their 7,565 Pennsylvania resident employees over \$409 million in wages in 2002 (average of \$54,100/employee) far more (54.5%) than the state average of \$34,000 per employee.
- There are a total of 3,040 intercity rail (passenger) employees residing in Pennsylvania. These workers were paid a total of over \$106 million in 2003.

Railroad Investments Provide Direct and Multiplier Impacts to Pennsylvania Businesses

- Railroads purchase an estimated \$586 million in goods and services annually from Pennsylvania based businesses.
- It is estimated that Class I railroads pay between \$32,500 and \$58,000 to maintain a track mile every year, which equates to between \$133 million and \$238 million of infrastructure investment annually within Pennsylvania.
- Each dollar of spending by the rail industry in 2001 is associated with another 37 cents in output by other Pennsylvania industries.
- The Pennsylvania Rail Freight Assistance Program grants and Capital Budget assistance directly correlate with an increase in carloadings.

Railroads Benefit Shippers

- Rail transportation costs shippers on average six cents less per ton-mile than truck. A 100-unit train carrying 4,000 tons of freight for 300 miles saves shippers an estimated \$72,000 in transportation costs compared to truck freight.





- Rail shipment of goods from Pennsylvania to other states exceeds intrastate movements, making rail particularly important for Pennsylvania shippers to serve more distant markets.
- Without the ability to ship or receive goods by rail, some Pennsylvania businesses would produce less or would go out of business. For example, Eagle Family Foods in Tioga County depends on the Wellsboro and Corning Railroad to deliver the large quantities of sugar it uses to make processed milk products. Eagle also depends on rail to deliver its finished product to its major markets in the Midwest, Texas, and the West Coast.¹

Railroads Benefit the Commonwealth in Other Ways



- Power plants receiving coal shipments by rail generate approximately 18.6 billion kilowatt-hours of electricity, worth roughly \$742 million.
- A 100-unit train carrying 4,000 tons of freight for 300 miles translates into an estimated \$3,600 in congestion-related travel time savings and an estimated \$3,600 in pavement replacement costs.
- Payroll taxes on rail employee wages yield an estimated \$21 million in annual state income tax and nearly \$8 million in income tax to local municipalities.

The Changing Face of Railroads Creates Dynamic Opportunities



- In 2003 rail intermodal traffic moves in the U.S. totaled 11,903,121, a 6.4% increase from 2002 total volumes.
- Container traffic represented approximately 79.8% of all rail intermodal moves in 2003, a 7.4% increase over the previous year.
- In 2003 trailer-on-flatcar moves totaled 2,400,558 and represented 20.1% of the total intermodal shipments. This is an increase of 2.4% from 2002.
- There is a need to educate local and regional planning officials on the options and procedures for rail project financing.

¹ Towards the end of this study in November 2004, Eagle Family Foods gave notice to the Wellsboro and Corning Railroad that they planned to close the plant in February 2005, which will result in a 28% loss of the WCOR's traffic revenue base.





1.3 Recommendations

The following is a summary of the study recommendations. Each one is intended to promote the economic benefits of rail freight to users, operators, and the Commonwealth.

Improve the practice of project specific economic impact analysis

There are many competing transportation needs within the state's transportation planning process. Developing a merited process for allocating funding and prioritizing projects is a monumental challenge. PennDOT, MPOs, and RPOs should continue to improve their economic impact evaluation of proposed rail projects. Tools for assessing the economic impact of potential rail projects should be incorporated and weighted within the overall transportation funding process.

Give greater consideration to rail in state and regional planning

The four rail freight corridor case studies demonstrate the growing importance of rail freight for local economic development. Some corridors are coordinating planning at the local, county, MPO/RPO, and state level as well as utilizing public and private parties to encourage investment of rail served industries. The Commonwealth is giving attention to state policies that reflect the importance of integrating land use and transportation planning. State and regional development and transportation planning would be well served by some common framework for preserving and improving rail assets.

Utilize incentives and coordinate rail related development and land use planning by public and private parties

Land use policies in and around rail serviceable sites should be compatible with industries that tend to benefit from rail service. Local and county comprehensive plans and ordinances should be consistent and incorporate compatible rail land uses near rail lines such as industrial, manufacturing, high-tech, and others as practicable and beneficial.





2. STATEWIDE ECONOMIC BENEFITS OF RAILROADS IN PENNSYLVANIA

2.1 Background/Methodology

The study research entailed a review of the literature on transportation economic impact techniques. A bibliography is presented in Appendix A. Several major themes from the review are summarized below.

Table 1. Literature Common Themes

| Themes | Description |
|---|--|
| There is general acceptance for using economic models/software for assessing the indirect ‘multiplier’ effects. | Economic models are used in almost all of the methods presented in the literature. They are used primarily to estimate the economic spin-off effects of investment. |
| Data from sources such as the Bureau of Transportation Statistics (BTS), the Association of American Railroads (AAR), Metropolitan Planning Organizations (MPOs) and Departments of Transportation (DOTs) are the most common. | All of the assessments reviewed used publicly available data such as the Federal Highway Administration (FHWA) Freight Analysis Framework (FAF), the travel demand model outputs from Metropolitan Planning Organizations (MPO), Census information, Bureau of Transportation Statistics (BTS) Commodity Flow Survey (CFS), etc. This information is readily available and can be used to estimate the approximate volumes of transportation movements by geographic area. |
| Identifying economic and other benefits helps provide a more complete picture of impacts. | The importance of economic indicators such as goods and services purchased is often supplemented with important non-economic, but pertinent, information such as local and state tax revenue, number of businesses served, and anecdotal evidence regarding the importance of rail to shippers. This provides context for the quantitative analysis and real world examples of success and failure. Some non-economic indicators such as environmental benefits and fewer trucks on congested highways also serve to define the broader benefit context. |

Interviews were conducted with industry experts to gain knowledge about common practices, data availability, and industry facts. The following organizations were contacted and representatives of these organizations were interviewed for this purpose:

- Association of American Railroads (AAR)
- The U.S. Bureau of Transportation Statistics (BTS)
- The U.S. Surface Transportation Board (STB)





- The Federal Railroad Administration (FRA)
- The American Short Line and Regional Railroad Association (ASLRRA)

The interviews yielded several common themes, including the following:

Table 2. Interviews – Common Themes

| Themes | Description |
|------------------------|---|
| Market Share | <ul style="list-style-type: none"> ▪ Access to the Northeastern United States market and growing congestion within the region's larger metropolitan areas is an important consideration vis a vis expansion of rail services in PA. ▪ Rail is generally used more for moving raw materials than for finished products. Rail is essentially the mode of choice for certain bulk commodities such as coal, wood, pulp, and chemicals. ▪ Several large manufacturers such as Air Products and Johnstown America are entirely dependent on rail for moving goods. Trucking their finished products (heat exchangers and rail cars) is not an option. |
| Partnerships | <ul style="list-style-type: none"> ▪ Trucking companies play a large role in enabling rail providers to offer lower cost intermodal packages to customers because of the relative efficiencies of each mode. ▪ Short line railroads are often the customer service linchpin in the rail network, providing direct service to companies not directly located along the Class I rail lines. These local railroads provide the customized services that provide a good option for shipping raw materials and finished goods to these companies. |
| Competitiveness | <ul style="list-style-type: none"> ▪ Reliability of rail service is just as, if not more, important than travel time. Knowing when shipments will arrive at their intended destination is especially important for just in time delivery. ▪ Canadian Pacific is attempting to increase its customer base within the state. Pennsylvania's robust climate of rail competition is particularly beneficial to shippers as a means of holding down their costs. |

Rail Expert Task Force Forum

In addition to the literature review and the background interviews, a forum was held with industry experts to review and critique the methods used and the results of the study. Panelists were also asked to provide their individual perspectives on the broader economic impact issues. The panel consisted of representatives from the following agencies:

- American Association of Railroads
- American Short Line and Regional Railroad Association





- Keystone State Railroad Association
- Norfolk Southern
- Great Lakes Transportation
- SEDA-COG Joint Rail Authority
- Pennsylvania Motor Truck Association
- PENNPORTS

Major themes discussed by the panel included the following.

Table 3. Industry Experts – Common Themes

| Themes | Description |
|-------------------------------------|--|
| Government Role | <ul style="list-style-type: none"> ▪ PennDOT efforts are critical to rail freight's future. ▪ There is a need (or role) for creating rail freight incentive programs to encourage development of sites with rail access and assisting with the transfer of goods from one mode to another. |
| Infrastructure and Equipment | <ul style="list-style-type: none"> ▪ Public sector support for rail freight transportation is important where rail freight improvements are in the public interest. ▪ Pennsylvania has the largest concentration of blue chip suppliers in the industry for rail-related supplies. ▪ There is a need for more innovative containers and devices to transfer commodities effectively and efficiently from one mode of transport to another. |
| Trends | <ul style="list-style-type: none"> ▪ Deregulation (Staggers Act) has been a catalyst for growth in the railroad industry. Rail freight traffic volumes are growing at significant rates. ▪ Rationalization has left regional railroads and short lines with distressed infrastructure, while rates of return to capital in the rail industry are often insufficient to attract adequate private capital to make the needed repairs and upgrades. ▪ Increases in goods movement volumes are forecasted for ship, truck, and rail. The issue is not “either-or”, because no one mode alone can accommodate the projected growth in the Commonwealth’s shipping demands. |
| Railroad Impacts | <ul style="list-style-type: none"> ▪ Short lines connect rural communities to the national and global market and can provide the customized service that low-density shippers need. ▪ Economic multiplier effects are key to telling the railroads' story. Many Pennsylvania railroad customers are manufacturing establishments. These enterprises typically pay higher than average wages. Also, their purchases from other Pennsylvania firms and spending by their employees supports further (multiplier) economic activity in the Commonwealth. |





Economic impacts were evaluated through the use of publicly available data, proprietary rail shipment data, the rail waybill data from the Surface Transportation Board, and a proprietary economic multiplier model. Direct impacts were determined through the collection of publicly available data from trade associations, railroad operators, and state and federal government including employment, wages, taxes, and value of goods. Economic multiplier impacts were determined through the use of IMPLAN, a widely recognized economic model that calculates the economic impacts associated with commodity flows from producers to intermediate and final consumers.

To measure the impact of railroads in Pennsylvania it is important to give the assessment context in terms of how rail fits within the Pennsylvania economy as a whole. There are five components to this analysis, as shown below.

Rail and Pennsylvania's Economy



The flowchart shown above and described below provides a general picture of how rail functions in the broader economy, and was the starting point for TAC's analysis.

1. **Pennsylvania's Economy** – An overview of the major features and performance of the state's economy.
2. **Goods Movement Within the State** – The amount, type, and value of goods originated and destined within the Commonwealth.
3. **Basis for Rail Choice** – The factors that determine whether a shipper benefits from shipping goods by rail.
4. **Rail Operations and Infrastructure** – A characterization of rail activity within the state in terms of operators' capital investment, employment, etc.
5. **Economic Benefits** – The direct and indirect economic impacts of rail, including economic development impacts and transportation system cost savings.





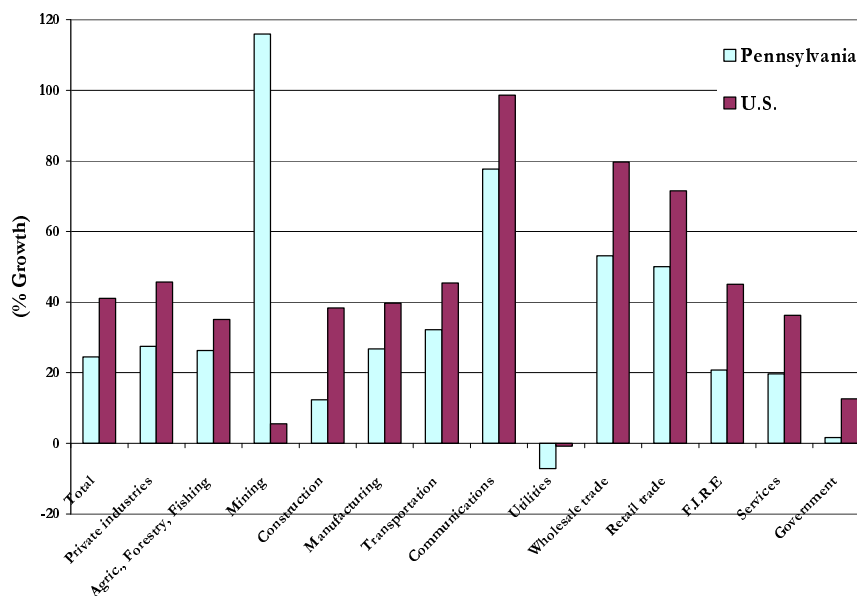
Pennsylvania's economy has shown positive but relatively slow growth during the last decade.

2.2 Pennsylvania's Economy

Pennsylvania's economy has shown relatively sluggish growth through the 1990's and early 2000's. The gross state product (GSP) is a measure of the state output of goods and services in terms of the value added in Pennsylvania. That is, it measures the total value of each type of good sold, minus the cost of inputs purchased. Pennsylvania's GSP grew by 28 percent in the ten years ending in 2001, while the gross national product (GNP) grew by over 40 percent. Only six state economies grew more slowly over this period. Despite its sluggish growth, Pennsylvania's economy remained the sixth largest in the nation in 2001, the same rank it held ten years earlier.

Figure 1 shows the comparison of Pennsylvania to the nation in terms of the growth in the various sectors of gross state product.

Figure 1. Gross State Product (GSP) Growth vs. Gross Domestic Product (GDP) Growth – 1991-2001



Source: U.S. Bureau of Economic Analysis. 2004

In Pennsylvania all sectors, except mining, substantially lag behind the national growth rates.

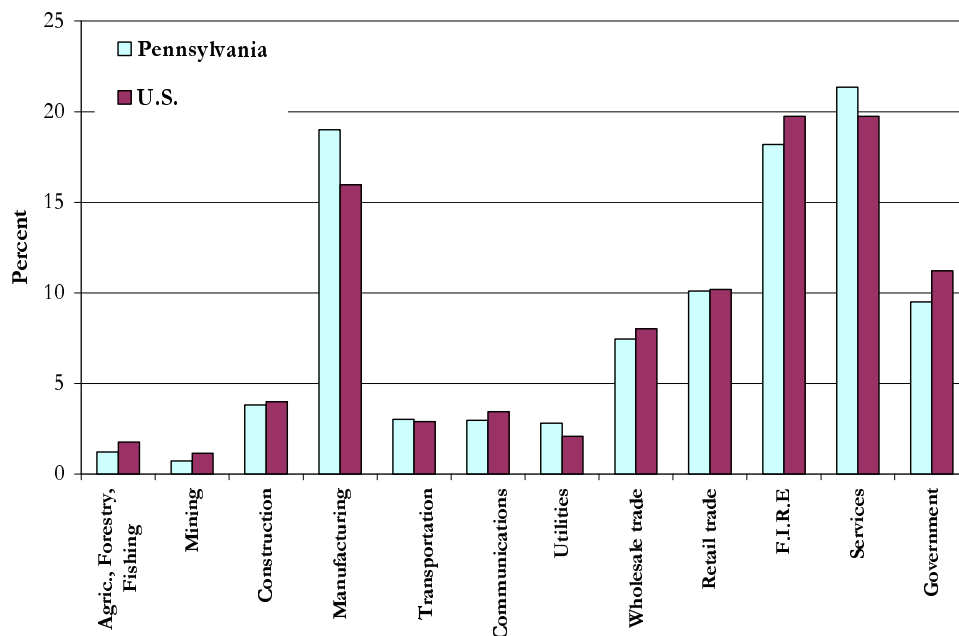
Pennsylvania's mining and communications sectors exhibited impressive growth rates, followed by wholesale trade and retail trade. All sectors except mining, however, substantially lag behind the nation in rates of growth. Because mining is such a small proportion of the state's economy, its high growth rate has only a minor effect on overall state growth.





Perhaps contrary to popular perception, manufacturing *output* grew faster than services. However, manufacturing employment and earnings did decline. Over 163,000 manufacturing sector jobs were lost over this period--a 16 percent decline. Likewise, earnings in the manufacturing sector declined by ten percent in inflation-adjusted dollars.

Figure 2. Sector Percentage of Gross State Product, 2001



Services, manufacturing, and finance, insurance, and real estate are the most significant economic sectors in the U.S. and Pennsylvania, in terms of output.

Source: U.S. Bureau of Economic Analysis. 2004

Both nationally and in Pennsylvania, services is the largest sector. Manufacturing and finance, insurance, and real estate are fairly close second and third in Pennsylvania. Pennsylvania's manufacturing sector is proportionately larger than that of the United States as a whole. Manufacturing accounted for 19 percent of output, 17 percent of wage and salary earnings, and 12 percent of employment in the state in 2001.

2.3 Goods Movement

Historically, rail freight has had a profound impact on the Pennsylvania economy. Trucks obviously have the dominant market share. Goods movement, by mode, for 1998 (the most recent year for which data are available), is presented in Table 4.





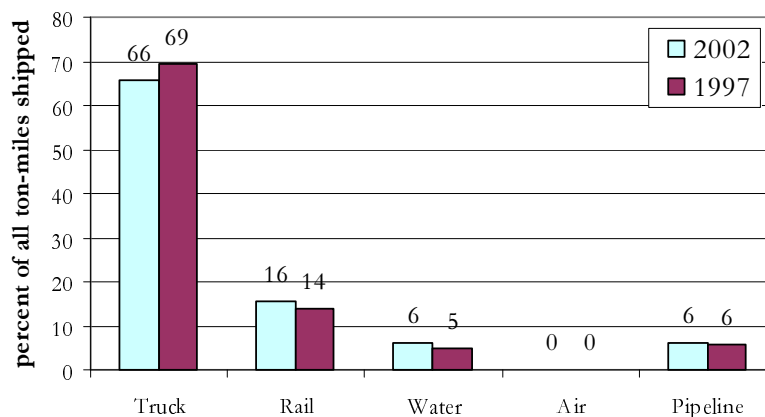
Table 4. Mode Shares in 1998.

| Mode | % of Tons Shipped (PA) | % of Tons Shipped (U.S.) |
|---------|------------------------|--------------------------|
| Highway | 68.8% | 71.1% |
| Rail | 13.2% | 15.1% |
| Air | 0.1% | 0.1% |
| Water | 8.2% | 8.0% |
| Other | 9.7% | 5.7% |

Source: *Freight Analysis Framework*. U.S. FHWA, 2004.

The U.S. Bureau of the Census' Commodity Flow Survey has preliminary 2002 data for United States totals, but has not released state level data from the 2002 Survey. Mode shares in 1997 and 2002 are compared in Figure 3 and Figure 4 on the next page. Figure 3 shows the dominance of truck-only in terms of tons shipped, with roughly two-thirds of all tons shipped in the U.S. in both 2002 and 1997. Rail-only ranks second, shipping nearly 16 percent of all tonnage in 2002 and 14 percent in 1997. Shipments reported as "multiple mode", which are not displayed in the figures due to the absence of data for rail-truck and rail-water modes, have decreased in their share of tons shipped from 1997 to 2002. The category "other and unknown" has increased its share from 1997 to 2002.

Figure 3. Mode Share for Single-mode Shipments, percent of all tons shipped in the U.S.



Source: U.S. Bureau of the Census. 2004. *2002 Commodity Flow Survey*

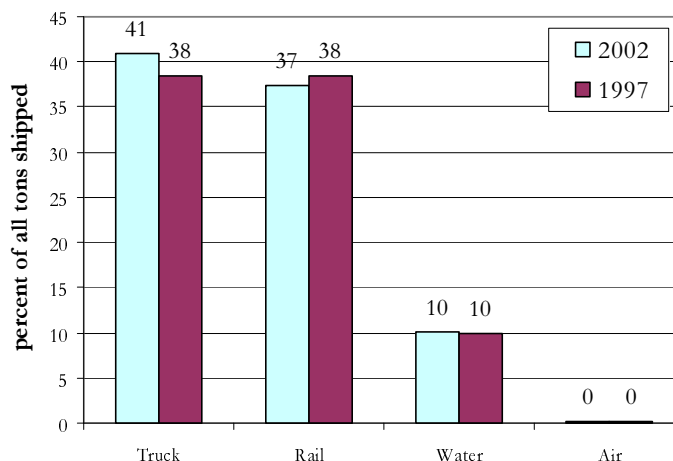
reveals that the share of rail-only on a ton-mile basis is considerably greater than its share on a tonnage basis, reflecting rail as a preferred





mode for longer hauls. Water transportation exhibits a similar phenomenon. Because trucks tend to be used for comparatively shorter hauls, the truck-only share on the basis of ton-miles is lower than its tonnage share.

Figure 4. Mode Share for Single-mode Shipments, percent of all ton-miles in the U.S.



Source: U.S. Bureau of the Census. 2004. *2002 Commodity Flow Survey*

Shipment trends on the national level are shown in Table 5 below.

Table 5. Shipment Characteristics by Mode, U.S. 1997 to 2002

| | Tons | | | Ton-miles | | |
|-------------------------|--------------------|--------------------|-----------------------|--------------------|--------------------|-----------------------|
| | 2002 (millions) | 1997 (millions) | % Change from 1997 | 2002 (billions) | 1997 (billions) | % Change from 1997 |
| All modes | 11,572.8 | 11,089.7 | 4.4 | 3,204.4 | 2,661.4 | 20.4 |
| Single Modes | 10,878.1 | 10,436.5 | 4.2 | 2,913.0 | 2,383.5 | 22.2 |
| Truck | 7,622.3 | 7,700.7 | -1.0 | 1,311.1 | 1,023.5 | 28.1 |
| Rail | 1,816.5 | 1,549.8 | 17.2 | 1,199.4 | 1,022.5 | 17.3 |
| Water | 713.9 | 563.4 | 26.7 | 323.1 | 261.7 | 23.4 |
| Air | 3.9 | 4.5 | -13.1 | 5.6 | 6.2 | -10.8 |
| Pipeline | 721.6 | 618.2 | 16.7 | S | S | S |
| Multiple modes | 198.5 | 216.7 | -8.4 | 214.8 | 204.5 | 5.0 |
| Parcel, USPS, courier | 26.4 | 23.7 | 11.6 | 20.5 | 18.0 | 14.1 |
| Truck and rail | S | 54.2 | S | S | 55.6 | S |
| Truck and water | 31.8 | 33.2 | -4.2 | 59.1 | 34.8 | 70.1 |
| Rail and water | S | 79.3 | S | S | 77.6 | S |
| Other multiple modes | 28.0 | 26.2 | 6.9 | 19.6 | 18.6 | 5.4 |
| Other and unknown modes | 496.2 | 436.5 | 13.7 | 76.6 | 73.4 | 4.3 |

Source: U.S. Bureau of the Census, *2002 Commodity Flow Survey*, 2004.

"S" means estimate does not meet publication standards because of high sampling variability or poor response quality.

Year 2002 values are preliminary.





Table 5 indicates that the tonnage moved by the truck-only modes has decreased slightly from 1997 to 2002, while the tonnages shipped by rail-only and water-only have increased considerably (17.2 and 26.7%). All modes, with the exception of air have seen an increase in ton-miles, reflecting a trend for increasingly longer hauls. Clearly these numbers point to the changing nature of a more global economy with its dispersed production and distribution patterns.

Rail does remain a vital part of the Pennsylvania shipping picture with nearly 62 million tons of goods originating in the state in 2002 and nearly 62 million tons of goods terminating in the state (Association of American Railroads 2004).

2.4 The Basis for Mode Choice

The basis for rail choice generally follows the same criteria as other forms of transportation. Each criterion is briefly highlighted below:

Cost: For most businesses, the most important factor in shipper mode choice is shipping cost. The only other mode in Pennsylvania that can offer a lower cost than rail is barge. Shipments of very large volume commodities (e.g., coal) over long distances can typically reap considerable savings by using rail. These transportation cost savings are particularly important for shipments of low unit value (price per ton) commodities such as coal and grain. Reducing these costs can greatly affect a company's bottom line, which is why transportation efficiency is so important to economic compensation.

Accessibility: A manufacturer receiving raw materials by rail must either have a rail siding on property or be able to cost-effectively have those inputs to production delivered by truck from a local transfer facility.

Distance: Rail is most cost-beneficial for longer-hauls. That is, the per mile costs are reduced dramatically the further the haul, due to relatively fixed costs such as loading and unloading at both ends of the haul and assembling and reassembling trains. The longer the haul, the greater the cost savings compared to trucking. For this reason, intermodal shipments are an increasingly attractive package, yielding the service levels of trucking at the loading and receiving ends combined with rail's cost savings for the long segment of the shipment's haul.

Bulk: Rail is conducive to shipping high bulk and low value commodities such as coal. However, an unlimited array of other





commodities are being shipped increasingly by rail using intermodal containers. The decision to ship a bulk commodity via rail relates largely to cost.

Commodity type: Other than the bulk of a commodity, there are other properties that may make it more conducive to rail shipping. The perishability or volatility of a commodity may require that a good be carried by one mode over another. Perishables typically move in refrigerated truck trailers, while volatile chemicals are often transported by rail.

Reliability: Over the past decade or two there has been a trend for manufacturers to store a limited or zero inventory. This business model requires shipments to arrive when they are expected so that the manufacturing process does not stop due to a shortage of raw materials. In many instances rail cannot achieve the reliability level of door-to-door trucking. However, rail carriers have been making efforts to improve reliability.

Visibility: Shippers are increasingly concerned with being able to track the location of their shipments. Trucking has outperformed rail freight in this respect, but railroads are becoming increasingly sophisticated in their use of technology and are narrowing the performance gap, particularly with respect to their intermodal customers. Information technology and transportation continue to blend.

2.5 Rail Operations and Infrastructure

The 62 freight railroads doing business in Pennsylvania operate 5,099 miles of track and handled over 185 million tons of freight in 2002. Short line and regional railroads are playing an increasingly prominent role in moving freight with nearly half of all track miles in the state. As of 2002, the breakdown in railroad size was as follows:

Table 6. PA Railroads and Miles Operated

| | Number of Railroads | Miles Operated* |
|---|------------------------|--------------------|
| Class I (NS, CSX, CP) | 3 | 2,607 |
| Regional (e.g., Buffalo and Pittsburgh) | 4 | 495 |
| Local | 29 | 1,549 |
| Switching & Terminal | 26 | 448 |
| Total | 62 | 5,099 |

Source: AAR 2004

*Excludes trackage rights





Pennsylvania railroad operators are primarily for-profit businesses. However, a number of railroads operate on trackage owned by public authorities such as the Delaware-Lackawanna, Nittany and Bald Eagle, and the South Western Pennsylvania. The 1980 Staggers Act deregulated the industry, allowing operators to determine routes and shipping rates. Deregulation also unleashed market forces for increasing efficiency by allowing railroads to compete for business on the basis of rates.

Railroads are capital intensive. Capital costs are non-recurring costs required to construct, improve, or operate the rail line. They include the purchase of vehicles, track improvements, station rehabilitation, design, and associated administrative costs. It is estimated that Class I railroads spend between \$32,500 and \$58,000 to maintain a track mile every year² which amounts to a statewide total of between \$133 million and \$238 million in annual maintenance costs. By applying this range of costs per track mile to short line and regional railroads, the estimated annual statewide total maintenance costs is between \$93 million and \$167 million.

In many respects, the financial outlook for freight rail is positive. Productivity and service quality have increased tremendously since deregulation under the Staggers Act as evidenced in the declining trend in revenue per ton-mile. Nationally, the Association of American Railroads reported a 60 percent decline in inflation-adjusted revenues per ton-mile among Class I railroads between 1981 and 2002 while tonnages, miles per shipment, and ton-miles increased.

The growth in intermodal shipments, an increasingly profitable market segment, is very important to the Class I railroads nationwide and in Pennsylvania. In the U.S., the number of intermodal movements has recently been growing at impressive rates. First quarter 2004 movements exceeded fourth quarter 2003 movements by 7.1%, while second quarter 2004 movements grew by another 8.5%. Figure 5 shows the annual trends in number of intermodal movements over the past several years, and indicates the recent increases in the number of container movements.

² Comprehensive Rail Freight Study, PennDOT, June 2003





Figure 5. US Intermodal Moves



One persistent obstacle is the high infrastructure cost of railroads. Railroads continue to struggle to earn a rate of return sufficiently high to raise the capital needed to maintain and upgrade the massive rail infrastructure.

Class I railroads respond to this challenge, in part, through a process termed “rationalization” -- selling off portions of the rail line to regional or short line railroads and/or outright abandonment or capacity reduction in order to focus on larger lanes of travel to increase its capacity for interstate travel. The positive aspect of this trend is that customers on the lower volume lines can often be served by new smaller railroad enterprises that are more flexible and in a better position to meet their unique needs. Many of Pennsylvania’s short line and regional railroads struggle to maintain and improve lines that did not get priority attention when owned by the Class I Railroads due to their relatively low traffic volumes.

2.5.1 Railroad Performance Factors

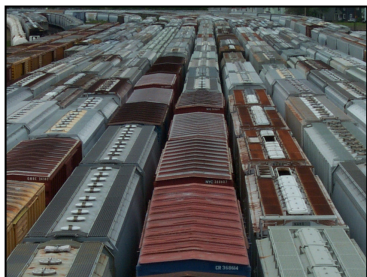
The performance of the railroads in supporting the state’s economy depends in large part on the following five factors:

Economies of Scale: Because railroads have high fixed costs, they can handle higher volume, the lower the unit cost of moving individual shipments. Lower unit costs, in turn, can translate into some combination of lower shipper costs and higher railroad profits. These economies can be applied in a variety of dimensions; longer distance trips, longer trains, greater numbers of carloads per track segment, and





other scale and density factors can contribute to the potential for economies of scale in the railroad industry.



Weight Limitations: The 286,000 pound gross weight limit freight railcar is replacing the old standard of 263,000 pounds. Upgrading rail lines to accommodate these heavier cars allows the railroads greater shipping capacity, flexibility, and efficiency. Conversely, larger weights also require better infrastructure.

Speed Limitations: Poor rail infrastructure limits train speed. In turn slower speeds create bottlenecks within the system.

Reliability: The reliability of a rail system is as important as, if not more important than, travel time. Knowing when a product will be delivered is important for just-in-time dependant manufacturers and for shippers to organize production schedules and delivery of inventory.

Connectivity: Short line and regional railroads provide the crucial link between many shippers and the nationwide system. In addition, intermodal operations at truck and port facilities allow shippers and receivers to be served by several modes with seamless operations.

2.6 Statewide Economic Development Benefits of Railroads

2.6.1 Direct Economic Role of Pennsylvania Railroads

Railroads have an important and direct economic impact in Pennsylvania. According to the Association of American Railroads, freight railroads paid their 7,565 Pennsylvania resident employees over \$409 million in wages in 2002. At \$54,100 average per employee, freight railroad pay was far above the state average of \$34,000. Wage and salary payments to freight rail employees comprised two-tenths of one percent of all Pennsylvania wage and salary payments in 2002.

Pennsylvania freight railroad employees paid approximately \$11.5 million in state income taxes and \$4.1 million in local income taxes on their earnings in 2002. Railroads in Pennsylvania also pay substantial amounts of taxes and fees through a variety of corporate income, excise, and other taxes, not the least of which are the local property taxes on their many miles of right of way.

U.S. Bureau of Economic Analysis' GSP tallies for the rail freight transportation sector show the relative prominence of Pennsylvania's

In 2001, Pennsylvania ranked 7th among the states in the amount of value-added services provided by the rail transportation sector.





rail industry. In 2001, Pennsylvania ranked 7th among the states in the amount of value-added services provided by the rail transportation sector. Pennsylvania had ranked 4th in 1991 (behind California, Texas, and Illinois), but its GSP for rail actually declined in real dollars over this period, allowing three other relatively fast-growing states to overtake it in rank.

Besides the freight railroads, Amtrak, the nation's intercity passenger rail service provider, is a major Pennsylvania employer, with 3,040 employees in 2003 earning \$106.3 million in wages and salaries.

2.6.2 Economic Impacts of Businesses Supporting Railroads

Railroads further impact the economy through their purchase of materials, supplies, and services. An examination of the state data in the IMPLAN proprietary database reveals the many economic sectors that benefit from spending by the freight railroads. Some of the top Pennsylvania input suppliers and the estimated annual sales to the freight railroad sector in 2001 are as follows:

- Wood preservation \$18 million
- Petroleum refineries \$33 million
- Motor vehicle parts \$11 million
- Railroad rolling stock \$11 million.

In addition, Pennsylvania service sector business (computer systems, management consulting, waste management, etc.) sold approximately \$112 million in services to freight railroads in Pennsylvania in 2001. Total annual purchases made that year by railroads from Pennsylvania businesses are estimated to be over \$586 million.

Some of the nation's leading suppliers to the rail industry are in Pennsylvania:

- RESCAR in DuBois
- GE Transportation in Erie
- Johnstown America in Johnstown
- Koppers in Pittsburgh

Railroad purchases from these Pennsylvania businesses comprise the first round in the "indirect" economic multiplier effect. Purchases by these suppliers with other Pennsylvania businesses make the second round, or ripple effect, and so on for subsequent rounds of the economic ripple. According to the IMPLAN model for Pennsylvania, each dollar of spending by the rail industry in 2001 is associated with another 37 cents in indirect multiplier output by other Pennsylvania industries.

Some of the nation's leading suppliers to the rail industry are in Pennsylvania, including RESCAR in DuBois, GE Transportation in Erie, Johnstown America in Johnstown, and one of the nation's largest rail tie producers (Koppers) in Pittsburgh. While the historical





prominence of rail in Pennsylvania may be a factor in why these businesses established in the state, their sales beyond the borders of the Commonwealth now far outstrip their sales within the state.

The total (i.e., direct and multiplier) output related to the rail transportation sector in 2001 was over \$3.3 billion.

The multiplier effect of Pennsylvania railroads is not limited to these “indirect” effects. There is also the multiplier effect of the spending of income earned by rail workers and owners. This “induced” effect multiplier is estimated as approximately 1.35. That is, for every dollar of output produced by the rail industry, another 35 cents in output by other Pennsylvania businesses can be traced to the spending of income paid to rail sector employees and owners.

The 5,100 rail freight jobs within the Commonwealth in 2001 supported another 8,160 jobs related to rail through multiplier effects.

The total output multiplier for the rail transportation sector in Pennsylvania is the sum of the indirect and induced effects, or 1.71. The total (i.e., direct and multiplier) output related to the rail transportation sector in 2001 was over \$3.3 billion, which comprises nearly one half of one percent (0.45%) of total state output in 2001. (MIG, Inc., 2004)

There are other measures of multiplier effect. For example, the total (indirect plus induced) employment multiplier of 2.6 means that, for every job in the rail industry, 1.6 jobs are supported in other Pennsylvania enterprises. As a result, the 5,100 rail freight jobs within the Commonwealth in 2001 supported another 8,160 jobs related to rail through multiplier linkages. (MIG, Inc., 2004)

Rail’s direct business effects work through one or all of three mechanisms:

- 1. Rail offers transportation cost savings**
- 2. Rail can extend the market reach of a business’ products**
- 3. Rail offers more supplier options**

2.6.3 Direct Economic Impacts of Rail-Served Businesses

The previous section outlined the railroad sector’s economic significance for Pennsylvania relating directly to the economic activity of the railroads (selling rail transportation services, compensating employees, and paying taxes, for example). The section also explored the multiplier effects of this railroad activity working backward up the supply chain.

The economic data presented above only begins to paint the picture of rail’s economic role in Pennsylvania. The most significant economic impacts are not associated with the rail transportation sector but through the businesses that depend on rail to deliver needed raw materials or to ship their products. Rail’s direct business effects relate to the following factors:

- 1) *Rail offers transportation cost savings.* These cost savings may accrue to one or all of the following: owners, employees, customers, and consumers.





- 2) *Rail can extend the market reach of products.* The lower rail transportation cost extends a firm's competitive market area, which allows the firm to produce at a larger scale. Some firms might also be unable to compete in any market without the rail shipment option.
- 3) *Rail offers more supplier options.* Lower rail transportation costs gives a company greater access to a number of different suppliers. This larger market area may give the firm access to lower priced and/or better quality raw materials. In fact, a firm's very existence may depend on the availability of rail to cost-effectively deliver a needed input.

Without the ability to ship or receive goods by rail, some Pennsylvania businesses would produce less or would not be in business at all. For example, Eagle Family Foods in Tioga County depends on the Wellsboro and Corning Railroad to deliver the large quantities of sugar it uses to make its processed milk products. Eagle also depends on rail to deliver its finished product to its major markets in Texas, the mid-west, and the west coast. Another example is Air Products in Allentown, a manufacturer of heat exchangers which are shipped to many countries around the world. Because of the heat exchanger's great weight and massive dimensions, rail is the only form of transportation able to accommodate this product. If rail were not available it is likely that Air Products and its 200 workers would relocate. Other anecdotal evidence of the importance of rail to various enterprises in Pennsylvania can be found in the case studies in Chapter 3.

Not all businesses that use rail are necessarily "rail dependent", in the sense that they would simply shut down if rail service ceased or became considerably more expensive. There are a few possible versions of a "no rail" scenario for any given producer:

- To reduce or eliminate output. (An analogous response is to not expand as much as would have been the case if rail service were available.).
- To incur the one-time cost of relocation to be closer to final markets in order to save on recurring transportation costs.
- To continue at the same output levels, simply earning lower profit. However, it is hard to think of many instances in which a firm can weather a cut in profits over the long term without having to make cuts in operations.





While it was not possible to tabulate all businesses that are *dependent* on rail, a proxy estimate of the role of rail was developed, beginning with Reebie Associates' *TRANSEARCH* data on the quantity and value of goods shipped by rail from Pennsylvania businesses in 2003. The Pennsylvania economic data from the IMPLAN model were then applied to identify the employment and value added elements associated with these rail-shipped goods. The results are summarized in Table 7.

The value of goods shipped by rail, originating in Pennsylvania in 2003, is estimated at over \$14.4 billion.

The value of goods shipped by rail, originating in Pennsylvania in 2003, is estimated at over \$14.4 billion (in year 2001 dollars). Nearly 52,000 jobs are associated with producing these goods and nearly \$4.5 billion in total value added (employee compensation, owner income, and indirect business taxes). These estimates are expressed in year 2001 dollars and exclude shipments of scrap, miscellaneous mixed freight, and the impacts of businesses that use rail only to receive production inputs.

Table 7. Direct Economic Impacts of Rail-Linked Output for Pennsylvania

| Industry Grouping (3-digit NAICS) | Rail-linked* | | |
|------------------------------------|---------------------|------------------------------------|--------------------------|
| | Output (\$ million) | Employee Compensation (\$ million) | Value-Added (\$ million) |
| Forestry and logging | 2 | 0 | 1 |
| Mining other than coal | 15 | 4 | 8 |
| Textile mill products | 19 | 5 | 6 |
| Crop farming | 22 | 3 | 11 |
| Electrical equipment and appl. | 35 | 10 | 14 |
| Lumber and wood products | 55 | 11 | 15 |
| Miscellaneous manufacturing | 62 | 19 | 32 |
| Nonmetal mineral products | 112 | 22 | 55 |
| Furniture and related products | 123 | 33 | 59 |
| Plastic and rubber products | 135 | 38 | 57 |
| Printed matter | 141 | 45 | 58 |
| Machinery manufacturing | 178 | 48 | 70 |
| Fabricated metal products | 239 | 78 | 117 |
| Apparel & other finished textiles | 337 | 72 | 117 |
| Pulp, paper, and allied | 337 | 58 | 115 |
| Food and kindred products | 474 | 51 | 135 |
| Coal mining | 980 | 166 | 430 |
| Petroleum and coal products | 1,010 | 241 | 277 |
| Transportation equipment | 1,265 | 316 | 317 |
| Computer & other electronic equip. | 1,366 | 497 | 756 |
| Chemical manufacturing | 2,283 | 250 | 692 |
| Primary metal manufacturing | 5,235 | 859 | 1,128 |
| Subtotal | 14,423 | 2,828 | 4,473 |

Sources: Output to employment, and output to value-added ratios from Minnesota Implan Group, Inc., for year 2001. Rail-linked values from Reebie Associates.

*"Rail-linked" output includes shipments originating in Pennsylvania in 2003, valued in 2001 dollars, with the following exceptions: scrap (2,284,504 tons), mail (336,980 tons), and miscellaneous unidentified freight (3,582,696 tons).





In 2003 rail was used to deliver 7.6 million tons of the total 30.6 million tons of coal to Pennsylvania electricity generating stations which yielded approximately 18.7 billion kilowatt-hours of electricity, valued at an estimated \$742 million.

A comparison to year 2001 state totals helps to place these estimates in context. The value of products shipped by rail and originating in Pennsylvania amounts to approximately 8% of the year 2001 total output of these economic sectors. Rail's importance for outputting primary metals and coal is striking, amounting to 38% and 31%, respectively, of year 2001 state output in these sectors. The value of rail shipments in the following sectors amounts to between 10 and 12 percent of year 2001 total output for the respective sectors: apparel and other finished textiles, petroleum and coal products, computer and other electronic equipment, and transportation equipment.

Firms that do not ship their products by rail, but that depend on rail to deliver raw materials, cannot be measured using the method described above. The most significant industrial sector that falls into this category is electric power generation. It is common for coal-fired generating stations to depend on rail to deliver the massive quantities of coal required. In fact, two of Norfolk Southern's largest Pennsylvania customers are coal-fired power plants.

According to data from the Department of Energy, rail was used to deliver 7.6 million tons (25%) of the total 30.6 million tons of coal delivered to Pennsylvania electricity generating stations in 2003. Other data from the DOE were used to estimate that these coal shipments would yield approximately 18.7 billion kilowatt-hours of electricity, worth roughly \$742 million.

2.6.4 Multiplier Economic Impacts of Freight Rail Users

The economic activities of firms that ship their products by rail ripple through the state's economy. Pennsylvania firms that provide goods and services to these businesses can be viewed as indirectly linked to rail, even when they do not use rail. And, Pennsylvania firms that provide goods and services to these supplying firms in turn can be viewed as having indirect economic links to rail transportation. This "indirect" multiplier effect was defined above with respect to the spending in support of the rail transportation sector. The other multiplier effect is termed "induced", and stems from the spending by the employees and owners of the businesses that ship product by rail.

The value of goods and services produced in Pennsylvania that are linked to rail via these combined multiplier effects was estimated using the IMPLAN model as nearly \$12.8 billion. The multiplier employment and employee compensation totals similarly linked to rail are estimated at approximately 106,800 employees and \$3.6 billion. The various

Pennsylvania employment and employee compensation linked to rail through the multiplier effect are estimated at approximately 106,800 employees and \$3.6 billion.





multiplier estimates for the state are presented in Table 8 and Figure 6 below.

Table 8. Economic Multiplier Linkages

Direct and Multiplier Economic Linkages of PA Origin Rail Shipments

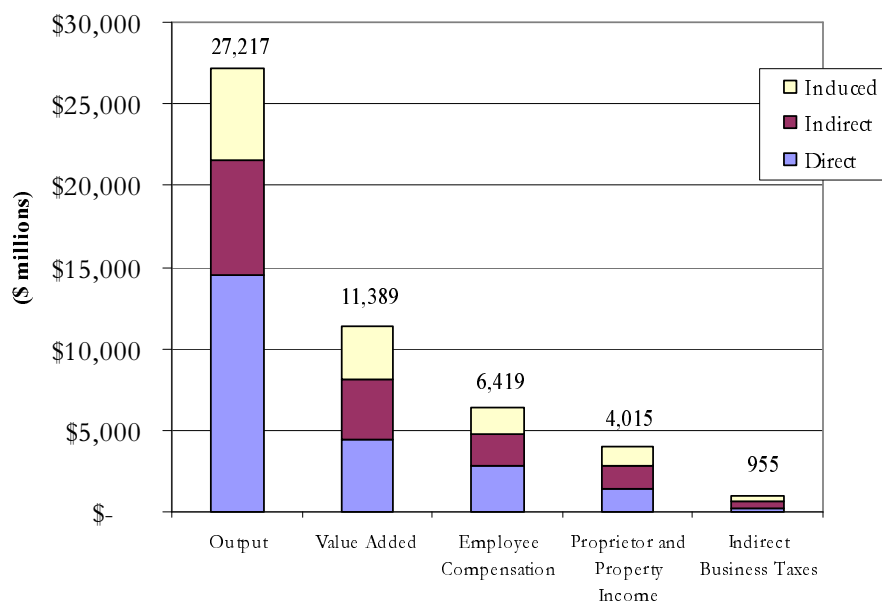
| | Economic Linkages of Rail-Shipped Goods | | | | State Totals in 2001 | |
|--------------------------------|---|--------------------|---------|---------|----------------------|---------------------------|
| | Direct | Multiplier Effects | | Total | Total | Rail-linked as % of total |
| | | Indirect | Induced | | | |
| Output (\$ million) | 14,423 | 7,046 | 5,705 | 27,174 | 737,709 | 3.7% |
| Value Added (\$ million) | 4,474 | 3,648 | 3,267 | 11,389 | 412,126 | 2.8% |
| Employee Comp. | 2,828 | 1,921 | 1,695 | 6,444 | 238,109 | 2.7% |
| Proprietor and Property Income | 1,420 | 1,332 | 1,249 | 4,001 | 143,538 | 2.8% |
| Indirect Business Taxes | 226 | 395 | 323 | 944 | 30,478 | 3.1% |
| Employment | 51,792 | 47,102 | 59,682 | 158,576 | 7,022,305 | 2.3% |
| Compensation per employee | 54,603 | 40,784 | 28,401 | 40,637* | 33,908* | |

Values are in year 2001 dollars.

* Average compensation per employee (i.e., total employee compensation divided by total employment)

Direct output of rail-shipped goods is from Reebie Associates estimates of values of shipments originating in Pennsylvania in 2003, valued in year 2001 dollars. Excludes scrap and unclassified mixed freight shipments, as well as output of firms only using railroads to receive inputs. Remaining measures are from IMPLAN model for Pennsylvania (MIG, Inc., 2004).

Figure 6. Direct and Multiplier Linkages of Rail Shipments Originating in Pennsylvania (year 2001 dollars)





The total (direct and multiplier) output linked to rail through the shipment of Pennsylvania goods by railroads is thus approximately \$27.2 billion, which amounts to 3.7% of total economic output in Pennsylvania in 2001. The total employment linked to rail is over 158,000, amounting to 2.3% of total employment in Pennsylvania in 2001. The total value added linked to rail is estimated as 11.3 billion dollars, which amounts to 2.8% of total value added in Pennsylvania in 2001.³

A noteworthy aspect of the rail-linked employment is the relatively high compensation rates. The average compensation (wages plus benefits) for directly-linked employees was over \$54,000, substantially higher than the state average compensation of 34,000, and even higher than the \$40,000 per employee average for the manufacturing sector. The relatively high average compensation for indirect effects reflects the fact that many of these jobs are in enterprises that support rail-using industries, such as manufacturing and professional services. The comparatively low compensation rate for the induced effects reflects the fact that these jobs are largely in the trade and services sectors that receive the income spent by households. It is notable that overall the average compensation per employee for direct and multiplier effects combined exceeds the state average compensation rate.

The total rail-linked state tax revenue:

- **\$819 million in the state share of indirect business taxes**
- **\$31 million corporate income tax**
- **\$195 million in household income taxes and misc. taxes and fees (e.g., licenses), and**
- **\$7 million in employee compensation-based social insurance taxes.**

The IMPLAN model also estimates the tax impacts for Pennsylvania associated with this direct and multiplier economic activity. The total rail-linked tax revenue for the state is over one billion dollars. This estimate is comprised of \$819 million in the state share of indirect business taxes, \$31 million dollars in tax on corporate income, \$195 million in household payments of income taxes and miscellaneous taxes and fees (e.g., licenses), and \$7 million in employee compensation-based social insurance taxes. Based on fixed tax revenue ratios, these estimates are fairly rough, but are useful in portraying an order of magnitude picture of the state tax impacts related to railroads through shipment of goods originating in Pennsylvania.

2.7 Transportation System Benefits

To the extent that shipments by rail replace truck movements, rail benefits not only the shippers through lower transportation costs, but all users and owners of the transportation system. As noted previously, it

³ These estimates tend to overestimate impacts to the extent that companies that both ship and receive by rail lead to some double-counting of multiplier effects. On the other hand, the estimates exclude nearly six million tons of scrap and mixed waste, as well as businesses that use rail only for receipt of inputs (e.g., power plants). On balance the estimates can be regarded as conservative.





is beyond the scope of this study to project which goods now moving by rail would no longer be produced (economic development impact) and which would shift to truck (transportation system impact). It is important to be mindful that the measures presented for the two different types of effects are not additive.⁴

2.7.1 Transportation Cost Savings for Rail Shippers

Railroads offer an efficient means for shipping heavy or bulk items and for long distance hauls. The cost advantage tends to be highest for freight hauled for long distances and/or dedicated unit trains between one origin and destination (e.g., unit coal trains from coal preparation plant to power plant). However, rail service also offers cost advantages for shorter-distance movements for some types of commodities.

An average 2001 shipping rate for intercity trucks is 9.76 cents per ton mile (U.S. Bureau of Transportation Statistics 2004). The commodity-weighted average rate for rail shipments in the eastern United States is 3.53 cents per ton-mile in year 2001 dollars (STB 2000 and AAR 2004). Thus, shipping by rail compared to truck saves on average roughly six cents per ton-mile. At these rates, a 100-unit train carrying 4,000 tons of freight for 300 miles would save shippers \$72,000 dollars in transportation fees.

2.7.2 Benefits to Highway Users

Each 20 tons of freight shipped by rail is the equivalent of approximately one less truck on the highway. Freight on rail helps reduce highway congestion and accidents. Based on marginal trucking cost data in the Federal Highway Administration's Federal Highway Cost Allocation Study, each ton-mile of freight added to the highway adds 0.3 cents in the value of time lost to additional traffic congestion. At this rate, the 4,000 ton/300 mile train example from above would save \$3,600 in congestion-related travel time savings.

An actual measure of rail use in ton-miles for Pennsylvania is not available. As a proxy, the preliminary measure of year 2002 national rail ton-miles (1,275 billion) is proportioned to Pennsylvania, based on the state's share (3.9 percent) of the Gross Domestic Product in the Rail Transportation sector. At 0.3 cents per ton-mile, if these 49.7 billion estimated state rail ton-miles were on the highways, Pennsylvania

If Pennsylvania's estimated 49.7 billion annual rail ton-miles were on the roadways, highway users would incur an additional \$149 million in congestion related travel time costs.

⁴ In fact, even if the two effects could be disentangled on a statewide basis, it would not be appropriate to simply sum the two dollar totals, because they measure different phenomena. Such a calculation would be analogous to adding "inches", where one measure is of an object's height, and the other measure is of another object's diameter.





highway users would incur an additional \$149 million in congestion-related travel time costs per year.

While the complete mode shift of rail to truck is not at all likely, this analysis does underscore that an effective rail network serves to make the highway system more efficient as well – both in terms of congestion and repair.

Shipping by rail also saves accident costs compared to trucks, through two mechanisms. One is direct, in that the accident rate for rail is lower than that of trucks. According to the American Association of Railroads (2004), rail's fatality rate (ton-mile basis) is one-fourth that of intercity motor carriers, while its hazardous materials release rate is one-sixteenth that of motor carriers. The other mechanism is indirect: the avoided congestion reduces the accident rate on the highways. As such, and as a general conclusion, greater use of rail has a tangible safety benefit.

2.7.3 Reductions in Highway Maintenance Costs

The Federal Highway Administration conducted comprehensive studies of the costs that various user classes impose on the federal highways. Its estimates of the marginal costs in terms of pavement replacement needs, by truck class, reflect the substantially higher pavement wear effects of heavy trucks. For this study, the estimated federal and state fuel tax collections were deducted from the marginal pavement replacement cost, yielding an estimated 0.3 cents per ton-mile publicly-funded replacement cost.

If the estimated 49.7 billion ton-miles of rail use were on the state highways, the marginal pavement replacement costs constitute an additional \$149 million in annual pavement replacement costs.

If the estimated 49.7 billion ton-miles of rail use were on the state highways, this marginal replacement rate would translate into an additional \$149 million in annual pavement replacement costs.⁵ Note that only pavement costs are estimated. Bridge maintenance costs would also be affected, but cost estimates for this consideration were not available. Thus the \$149 million can be viewed as the extreme low-end of the range of the additional annual highway system maintenance costs incurred if all of Pennsylvania's rail shipments were diverted to Pennsylvania highways.

⁵ The marginal rate would likely be an underestimate for such an extreme scenario, because the marginal rate is specific to the existing level of usage, and tends to increase at higher usage rates. The fact that the \$149 million in pavement replacement costs is the same as the travel time figure is merely a coincidence.





2.7.4 Benefits to Air Quality

Because rail transportation is more fuel-efficient than trucks, pollutant emissions are considerably lower. On a ton-mile basis, trucks emit three to thirteen times more pollutants than rail, depending on the particular pollutant. The exception is sulfur dioxide, which is emitted at comparable rates by the two modes. Emissions rates comparisons for several pollutants of interest are shown in Table 9.

Table 9. Rail to Truck Emissions Comparison

| | Carbon Dioxide | Nitrogen Oxide | Sulfur Dioxide | Carbon Monoxide | Hydrocarbons | Volatile Organic Carbons |
|--|-------------------|-------------------|-------------------|--------------------|--------------|--------------------------------|
| Rail emissions rates as a percentage of truck rates (grams per ton-mile basis) | 16% | 8% | 100% | 10% | 10% | 10% |

Source: Carpenter, T.G., *The Environmental Impacts of Railways*. New York: Wiley and sons. 1994.

2.8 Other Economic Benefits of Railroads

The discussion above captured some of the ways in which rail benefits Pennsylvania's economy. Listed below are several other benefits that are realized but are outside the quantitative measures of this study.

2.8.1 Rail Excursions

Passenger rail excursion trains, although barely registering in importance on a statewide scale, play an important economic role in several local areas. This rail service performs several functions: its fare revenues are crucial to the financial performance of a few local railroads, it provides institutional advertising and good public relations for the railroad and the rail industry in general, and it acts as an important tourism attractor in the areas served.

2.8.2 Brownfield Redevelopment

Railroads can have an important role in brownfields redevelopment. Because of the nature of past uses of these sites, it is common to find these sites with good access (or good potential for access) to rail lines. Support of rail service to these sites is another tool the state can use to further its goal of promoting sustainable growth through redevelopment of brownfields.

2.8.3 Rural Connectivity

Railroads can have an important role in rural connectivity. Historically existing rail connections outside of Pennsylvania's major metropolitan





areas are in some cases the best freight connection these areas have with the state, national, and world markets, and their best hope of continuing to be (or becoming) a provider to these markets.

2.8.4 Port Connectivity

Rail connections at the state's ports are essential to their competitiveness with other ports in the region. In fact both the Port of Philadelphia and the Port of Pittsburgh tout service by multiple rail carriers in its marketing efforts aimed at shippers. The extent to which rail can effectively and efficiently service port operations also helps to lessen the extent and complexity of truck movements in and near the ports.





3. CASE STUDIES

Case studies were conducted to determine the economic benefits of four diverse rail lines in Pennsylvania. The case studies illustrate both the qualitative and quantitative benefits of each railroad in order to understand the benefits of each railroad type, and demonstrate the diversity of the railroad industry in the state. The rail lines reviewed in the case studies were chosen for their unique characteristics and impact to their respective regions. The case studies chosen and the characteristics of each are shown below:

1. Norfolk Southern line from Pittsburgh to Philadelphia and the connection to Allentown
 - The most heavily traveled rail line in the state
 - The lifeline of the Class I system in Pennsylvania
 - The connection to the most heavily populated areas in the state
 - The numerous connections with short lines, ports, and intermodal facilities.
2. The Buffalo and Pittsburgh line from Bradford to Punxsutawney
 - Multi-state regional railroad
 - Direct access to two Class I railroads (CSX, NS)
 - Recipient of Pennsylvania RFAP and Capital Budget funding
 - Local interest in developing an intermodal facility.
3. The Delaware-Lackawanna Railroad in Lackawanna and Monroe Counties
 - A railroad that has grown a great deal in the past few years
 - Potential for passenger service to the New York metropolitan area
 - Direct access to two Class I railroads (CSX, CP)
 - Great deal of teamwork between the railroad, shippers, and local economic development agency has allowed the rail industry to grow.
4. The Wellsboro and Corning Railroad in Tioga County
 - A small railroad with few shippers
 - Passenger excursion service
 - Access to two Class I Railroads in New York State (NS, CP)
 - One of a larger family of railroads operated by the North Shore Railroad Company.





Quantitative and qualitative information was collected for each case study from a variety of interviews and available information. Analysis was then conducted and summarized for each in a format that would enable a comparison of the four. The primary economic indicators are the number of carloadings, number of industries served, and the number of employees among others.

3.1 Norfolk Southern: Pittsburgh-Philadelphia and Reading-Allentown



This case study examines the Norfolk Southern (NS) Mainline from Philadelphia to Pittsburgh and the connection from Reading to Allentown. It was chosen for its significant impact to the Pennsylvania rail transportation system and economy.

3.1.1 Background

NS is the primary Class I railroad within Pennsylvania. With its 2,500 miles of railroad lines NS serves nearly all urbanized areas within the state including:

- Allentown
- Altoona
- Erie
- Harrisburg
- Johnstown
- Lancaster
- Philadelphia
- Pittsburgh
- Reading
- Scranton
- Williamsport
- York

The NS mainline between Philadelphia and Pittsburgh serves 7 of these 12 cities and the rail line between Reading and Allentown provides an important connection to Northeast ports and consumer markets. This critical railroad serves many different industries throughout the state by connecting to Class I and short line railroads, as well as truck transfer facilities that make the movement of goods more reliable for shippers statewide.

Designated by PennDOT as strategic rail corridors, both the Philadelphia to Pittsburgh (strategic corridors 1a and 1b) and the Reading to Allentown (11) lines are critical to the movement of goods throughout the Commonwealth. The 436-mile line between Pittsburgh and Philadelphia also offers passenger (Amtrak) service.





Passenger service between Philadelphia and Harrisburg is provided via the Amtrak Keystone Corridor but on the NS right-of-way between Harrisburg and Pittsburgh. Norfolk Southern operates local freight service along Amtrak's Keystone Corridor and is focusing on the line as a growth area for freight operations. There are no passenger operations along the 58-mile Reading Line.



NS acquired the mainline after the divestiture of Conrail in 1998. Early on some operational and service issues occurred which NS has largely addressed. Today the railroad's service issues have been resolved and on-time performance has improved.

NS is a major economic factor in the Commonwealth.

- The railroad employs 5,300 Pennsylvanians which is 16 percent of its nationwide workforce, 70 percent of all rail freight employees in Pennsylvania, and more than any other state in which NS operates.
- The \$254 million in annual payroll yields approximately \$8.1 million in state and local payroll tax revenue.
- NS spends an estimated \$380 million annually on equipment and services from Pennsylvania businesses.

3.1.2 Railroad Use

Norfolk Southern is used by hundreds of rail shippers throughout the Commonwealth. The Pittsburgh, Harrisburg and Reading Lines are 286,000-pound railcar compatible and are cleared for double stack containerized freight. This accommodates the most demanding commodities and shipments.

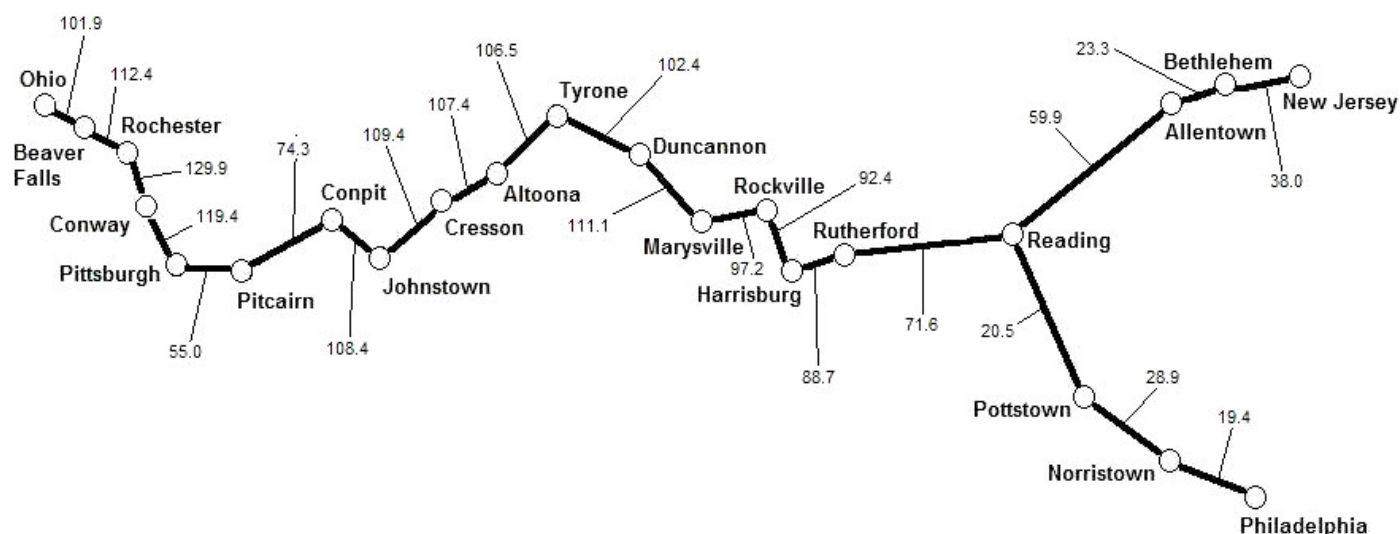
Certain segments of the Pittsburgh Line accommodate over 120 million gross tons annually. Nearly 90 million gross tons are carried between Philadelphia and Harrisburg and 60 million gross tons travel along the Reading Line between Reading and Bethlehem every year.

Figure 7 depicts the NS traffic volumes between major points along the Pittsburgh, Harrisburg, and Reading Lines.





Figure 7. Norfolk Southern Traffic Volumes in Million Gross Tons (MGT) Between Major Junctions (2003)



A drop in volumes between Conpit and Pittsburgh is a result of intermodal trains using an alternate route between these two points to avoid chokepoints.

The highest volumes are in western and central Pennsylvania along the Pittsburgh Line. These volumes are primarily coal and intermodal movements. The volumes between Conpit and Pittsburgh decrease as intermodal trains use an alternate route to avoid chokepoints.

NS has 256 "stations" or revenue-generating points in the Commonwealth. The company's top ten stations generate half of all NS' Pennsylvania revenue; five of the stations handle primarily intermodal shipments. The top ten stations are:

- Bailey Mine southwest of Pittsburgh (Ships Coal)
- Rutherford (Intermodal)
- Morrisville (Intermodal)
- Harrisburg (Intermodal)
- Pittsburgh (Merchandise)
- Clairton (Merchandise)
- Bethlehem (Intermodal)
- York Haven (Receives Coal)
- Philadelphia (Receives Coal)
- Strawberry Ridge (Receives Coal)





All goods destined for the Midwest and beyond use the mainline from Harrisburg to Pittsburgh.



Along with freight, intercity passenger service is offered along the line. Amtrak currently operates approximately 120 trains through Pennsylvania daily, serving over 4.5 million riders annually. The majority of these riders (3.6 million in FY 2003) board at Philadelphia's 30th Street Station where it serves both Northeast and Keystone Corridor riders. The boardings at stations along the Keystone Corridor and the Pittsburgh Line are shown below.

| Station | Annual Boardings | Station | Annual Boardings |
|---------------|------------------|--------------|------------------|
| Altoona | 29,750 | Lancaster | 273,578 |
| Ardmore | 38,421 | Latrobe | 2,647 |
| Coatesville | 4,038 | Lewistown | 7,557 |
| Downingtown | 23,429 | Middletown | 20,573 |
| Elizabethtown | 42,759 | Mount Joy | 20,101 |
| Exton | 32,254 | Paoli | 64,930 |
| Greensburg | 9,717 | Parkesburg | 19,769 |
| Harrisburg | 291,613 | Philadelphia | 3,569,551 |
| Huntingdon | 4,429 | Pittsburgh | 108,219 |
| Johnstown | 15,878 | Tyrone | 750 |

In addition to existing passenger service along the Keystone Line, the Southeastern Pennsylvania Transit Authority (SEPTA) has proposed inter-city passenger rail service from Philadelphia to Reading. The proposed alignment would use NS right-of-way between Norristown and Reading.

3.1.3 Shippers

There are many major shippers on the NS line. The hubs of Pittsburgh, Harrisburg, Allentown and Philadelphia serve as the centers of rail traffic generation for the railroad. The following are highlights from interviews conducted with shippers, Municipal Planning Organizations (MPOs), and industrial development organizations.

Pittsburgh

- The interaction between rail and port traffic is crucial for the survival of many business sectors such as gravel mining, coal mining, and the movement of scrap metal, which has increased dramatically in the past year as a result of China's growing demand for raw materials.





Coal movement in the area is the largest single traffic generator in the Pittsburgh area.

The Rutherford yard has increased volume beyond expectations and capacity is being stretched. Expansions of the facility are being planned.

The Allentown area is quickly becoming a warehousing and distribution hub for the Northeast and rail is an integral part of this operation.

- Currently, Amtrak is not an effective alternative to auto or air in the area due to limited scheduling of train departures and arrivals. However, within these constraints it does fulfill some travel needs.
- The shipment of iron ore and other materials to the remaining steel mills is crucial for their operations.
- Coal movement in the area is the largest single traffic generator.

Harrisburg

- Harrisburg is the intermodal hub of Pennsylvania.
- As volumes at the Rutherford yard have increased beyond expectations, capacity is being stretched. Expansions of the facility are being planned.
- Due to the confluence of interstates and railroad infrastructure, this area is geographically suited for goods movement transfers between modes.
- Passenger rail has a significant number of riders and the Keystone Corridor Development Project is being undertaken to improve service between Harrisburg and Philadelphia.

Allentown

- This area is growing as an intermodal hub for goods originating from and destined to the New York metropolitan area and New England.
- The area is quickly becoming a warehousing and distribution hub for the Northeast and rail is an integral part of this operation.
- Norfolk Southern has identified inadequate corridor capacity east of Harrisburg, including the lines through the Lehigh Valley, as contributing to the service disruptions.
- Adequate rail access is necessary for industries seeking to locate in the area. New industrial sidings are needed for greenfield sites abutting rail lines to take advantage of rail service. In some cases, improvements to existing sidings are needed for brownfield sites to accommodate redevelopment for industrial uses. Financial assistance would increase the feasibility of these development efforts.

Philadelphia

- Norfolk Southern is increasing its commercial presence in Philadelphia by adding a new yard in South Philadelphia in concert with the Port of Philadelphia.
- Partially owned by NS, Philadelphia is home to one of three “Shared Assets Areas” throughout the country which provides switching and dispatching services for both NS and CSX.



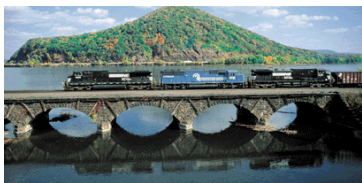


Norfolk Southern is increasing its commercial presence in Philadelphia by adding a new yard in South Philadelphia in concert with the Port of Philadelphia.

- Many of the shippers in the food distribution, chemicals, and manufacturing industries are dependent on Philadelphia's port for their raw materials.
- Sunoco receives 1.4 million barrels of crude oil by ship every 3 days. This oil is used for gasoline, plastics, heating oil, and other petroleum-based products. 13% of these products are shipped from the port by rail.
- Shippers in the food distribution industry use rail less than other industries but still find it important to their businesses. Dependable Distribution, a distributor of cocoa beans, ships via rail to Hershey Foods, Wilbur's Chocolates, and Nestle with 6 employees dedicated to making these movements by rail.
- Passenger rail is also crucial to the city because it provides frequent and rapid connectivity to New York, Washington, and Boston. The ability of intercity passenger rail to provide center-city to center-city travel is often preferable to less efficient air travel through the corridor. Amtrak has the second largest market share within the Northeast Corridor next to the auto.

3.1.4 Conditions, Operations and Financing

While NS reports that the conditions of the lines are considered to be some of the best in its system, maintenance and improvements are very expensive. There are 152 bridges on the 118-mile Harrisburg Line between Philadelphia and Harrisburg, 25 bridges on the 248-mile Pittsburgh Line from Harrisburg to Pittsburgh, and 49 bridges on the 58-mile Reading line between Reading and Allentown.



Norfolk Southern has identified 10 capacity adding projects along the Pittsburgh and Reading lines. These projects are necessary for the existing and projected increase in traffic. They are:

1. Lemoyne, PA – Connecting Track from the Lurgan Branch to the Enola Yard (Est. Improvement Cost: \$9.6 million)
2. Reading Line – Second track 4 miles between Blandon and Laurel, PA (Est. Improvement Cost: \$9.5 million)
3. Harrisburg, PA – Second track between Harris and CP Rockville (Est. Improvement Cost: \$3.5 million)
4. Keystone Corridor – Improve clearances and 286K upgrade for increased freight operations (Est. Improvement Cost: \$10 million)





5. Reading Line – Additional track on 4 miles of right-of-way between Penn Jct. and Bethlehem, PA (Est. Improvement Cost: \$16 million)
6. Philadelphia, PA – Zoo Interlocking Connection between the Amtrak Northeast Corridor and the Amtrak Keystone Corridor to the CSX “High Line” to permit greater freight use of both Amtrak corridors (Est. Improvement Cost: \$10 million)
7. Pittsburgh, PA – Improve downtown clearances for double-stack capabilities (Est. Improvement Cost: N/A)
8. Reading Line – Second Track for 1.5 mile segment and upgrade four bridges and four interlockings from Wyomissing Jct. to Valley Jct. (Est. Improvement Cost: \$15.6 million)
9. Pittsburgh, PA – Double track the Port Perry Branch a 3 mile track east of Pittsburgh (Est. Improvement Cost: N/A)
10. Altoona, PA – Fourth track 7 miles from CP “C” to Altoona for increase capacity. (Est. Improvement Cost: N/A)

In addition to projects identified by Norfolk Southern, there were several other projects identified in the Mid-Atlantic Rail Operations Study (MAROPS) conducted by the I-95 Corridor Coalition. That study was conducted in 2002 with five Mid-Atlantic States and three railroads to identify necessary investments in the rail transportation system from Virginia to New Jersey.

The Mid-Atlantic Rail Operations Study (MAROPS) identifies:

- 10 rail capacity chokepoints in Pennsylvania
- 4 connection chokepoints
- 45 clearance chokepoints, and
- 13 road crossing chokepoints.

The investment necessary to improve these chokepoints is expected to total over \$940 million over the next 20 years.

The MAROPS Study identifies 10 rail capacity chokepoints in Pennsylvania, 4 connection chokepoints, 45 clearance chokepoints, and 13 road crossing chokepoints. Some of the related projects are similar to those identified by NS above. The investment necessary to improve all of these chokepoints is expected to total over \$940 million over the next 20 years. A complete list of the MAROPS projects is shown in Appendix B.

The Delaware Valley Regional Planning Commission (DVRPC) has been proactive in recognizing the importance of rail in regional planning. The DVRPC has included 2 projects on its Transportation Improvement Program (TIP) for a total of \$5.4 million. They include:

- Funding for a new road connector to the new NS facility being built in South Philadelphia (\$4.2 million).
- Restoration of 2.1 miles of track for the development of an intermodal terminal at the former Navy Yard using CMAQ funding (\$1.2 million).



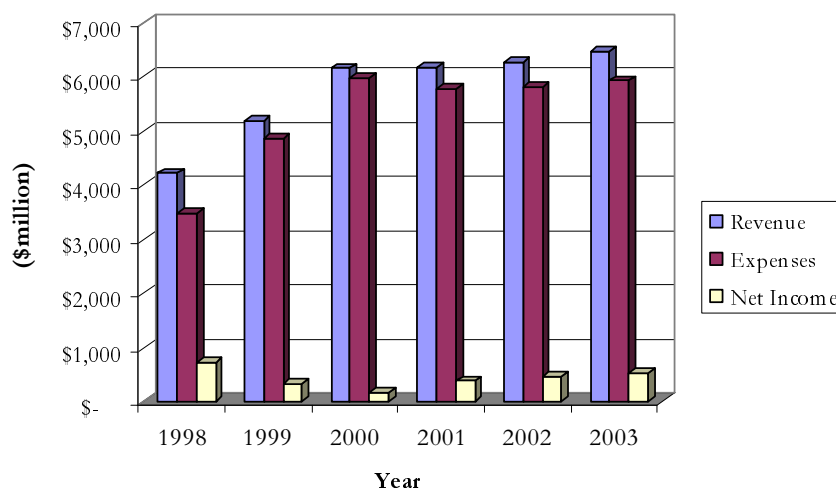


Norfolk Southern has seen a steady increase in revenue over the past six years and profitability has increased in the last four. Table 10 and Figure 8 below show the financial performance of NS since 1998.

Table 10. Norfolk Southern Revenues, Expenses and Net Income (\$million)

| | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|-------------------|----------|----------|----------|----------|----------|----------|
| Revenue | \$ 4,221 | \$ 5,195 | \$ 6,159 | \$ 6,170 | \$ 6,270 | \$ 6,468 |
| Expenses | \$ 3,496 | \$ 4,865 | \$ 5,987 | \$ 5,795 | \$ 5,810 | \$ 5,933 |
| Net Income | \$ 725 | \$ 330 | \$ 172 | \$ 375 | \$ 460 | \$ 535 |

Figure 8. Norfolk Southern Financial Performance



3.1.5 Rail and Intermodal Connectivity

NS serves a great number of shippers and receivers along the mainline and between Reading and Allentown. However, these customers don't necessarily need direct rail access. Intermodal and bulk transload facilities allow customers to ship by rail without this access. These facilities are located all along the line with the largest in Philadelphia, Bethlehem, Harrisburg, and Pittsburgh.

Rail Connections

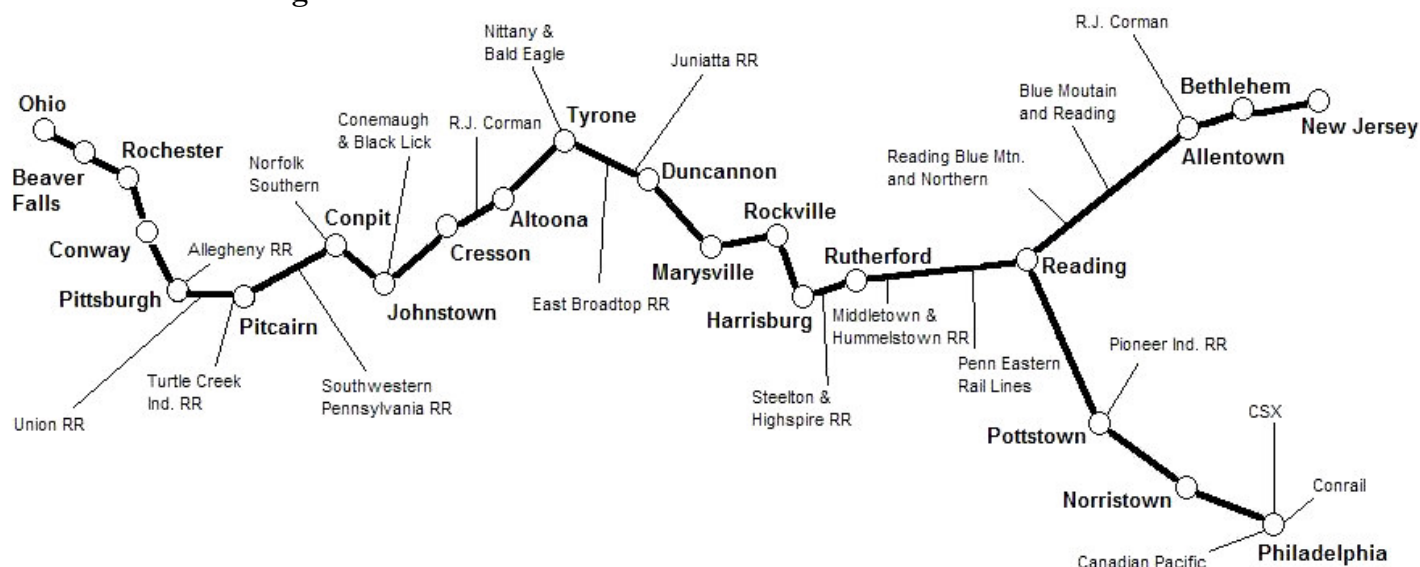
The Pittsburgh, Harrisburg, and Reading lines have 16 short line and 3 connecting Class I railroads, more than any other rail route in the state. Very few of these railroads have connections to any other Class I line. Figure 9 shows these connecting railroads.

The Pittsburgh, Harrisburg, and Reading lines have 16 short line connections, more than any other rail route in the state.





Figure 9. Norfolk Southern Rail Connections



Port Connections

The NS mainline connects to two of the three Pennsylvania water ports in Philadelphia and Pittsburgh. Each water port functions very differently but the rail connection is critical to the success of both.

Pittsburgh

The Pittsburgh Port District encompasses an eleven county area and 200 miles of commercially navigable waterways in southwestern Pennsylvania. The Port of Pittsburgh supports over 200 privately owned river terminals and barge industry service suppliers. The Port complex is served by the CSX and NS railroads and by four interstate highways. Over \$52 million of goods are shipped and received through port terminals each year, 78% of which is coal.

Philadelphia

As a sea port, the Port of Philadelphia terminals primarily receive break bulk and bulk commodities from other countries. The Port's facilities are serviced by three Class I railroads including Norfolk Southern, CSX, and CP Rail. Norfolk Southern provides double-stack intermodal service between Philadelphia and major Midwest destinations, CP Rail provides regular services between Philadelphia and major Eastern Canadian points of Montreal and Toronto, and CSX provides daily service between Philadelphia and major Midwestern, Southern and Southeastern U.S. destinations. The ports of the Delaware Valley (PA





and NJ) constitute the 5th largest deep water port in the country in terms of through tonnage.

Intermodal Connections

There are several intermodal facilities along the NS lines that work in tandem with trucks. These include intermodal, bulk transfer, and transload facilities. The larger facilities are described below.

Rutherford Yard

The Rutherford Yard is an intermodal container and trailer facility located in Harrisburg. The impacts of NS operations in Pennsylvania extend beyond the region. This facility is a crucial part of NS's "triangle" (which includes Chicago, IL and Atlanta, GA) allowing fast, efficient, and consistent service throughout the twenty-two states east of the Mississippi River directly served by NS. The Harrisburg Rutherford Yard:

| <u>Receives trains from:</u> | <u>Sends trains to:</u> |
|------------------------------|-------------------------|
| Atlanta, GA | Atlanta, GA |
| Huntsville, AL | Chicago, IL |
| Kansas City, MO | Kansas City, MO |
| Memphis, TN | Memphis, TN |
| Miami, FL | New Orleans, LA |
| St. Louis, MO | St. Louis, MO |

Other NS intermodal facilities within Pennsylvania include:

- Pitcairn – a Container on Flat Car (COFC)/Trailer on Flat Car (TOFC) intermodal facility located near Pittsburgh
- Beth Intermodal – a COFC/TOFC intermodal facility located in Bethlehem
- Morrisville – a COFC/TOFC intermodal facility located near Philadelphia

In addition to intermodal facilities, there are numerous transloading facilities throughout the Commonwealth that provide NS system access to shippers statewide.

3.1.6 Findings and Implications for the Commonwealth

Table 11 summarizes key findings and potential statewide implications based on the research, interviews, and analysis of the economic condition and potential opportunities along this rail line.





Table 11. Norfolk Southern Case Study Findings and Implications

| Finding | Implication |
|---|--|
| NS is the largest railroad in PA. The railroad's mainline between Philadelphia and Pittsburgh has more connections to short line railroads than any other line in the state, with 23 connecting short line and 3 connecting Class I railroads. | The performance of NS operations and access to it helps to connect short lines by providing a reliable connection to the national rail network. |
| The mainline and its connection to Allentown affect all modes of transportation throughout the state. | Intermodal facilities affect the movement of trucks; Amtrak service affects the movement of autos; and connections to the port affect trucks and autos, as well as waterborne vessels. |
| NS is investing in infrastructure to allow its hubs of Harrisburg, Bethlehem, and Philadelphia to operate more efficiently with greater capabilities. | The improvement of hubs allows for greater throughput resulting in more efficient operations, increased traffic, and greater interaction between modes. The hubs create opportunities for rail dependent businesses through more efficient rail transportation. |
| Investments in expansions and increased capacity will exacerbate other deficiencies within the system. | Investments in intermodal facilities will induce demand, increasing the number of rail movements in one location. This increase will be felt all along the rail line and as a result, deficiencies in the rail network will be magnified. Rail delays and conflict will result on the already near capacity rail lines and limit the railroad's ability to generate new business within the state. In addition expansions and increased capacity to the rail network will facilitate easier goods movements by rail and potentially reducing highway congestion as a result of truck traffic. |
| Norfolk Southern spends \$254 million in annual payroll to Pennsylvania employees. They also purchase approximately \$380 million annually in equipment and services from Pennsylvania based businesses. This annual investment equates to about 11% of Norfolk Southern's total expenses. | Pennsylvania is the crucial link to NS's network and profitability. The rail line operates in 22 states but invests disproportionately within the Commonwealth. This investment provides for 2,500 direct employees who live and work in the state. |





3.2 The Buffalo and Pittsburgh Railroad: Bradford-Punxsutawney



This case study examined the economic context of the Buffalo and Pittsburgh (B&P) railroad, a regional rail line in northwestern Pennsylvania, specifically from Punxsutawney to Bradford, which is approximately 90 miles in length. The rail line is owned by Genesee & Wyoming Inc., which operates more than twenty railroads around the world. Currently, there are 31 shippers or receivers located along this section of the railroad. Commodities that are shipped along the line include: lumber, plastic resins, packaged salt, pulpboard, chemicals, rail cars, paper, rock salt, minerals, coal, sand, oil, glass, specialty metal products, and waxes.

The major origins and destinations of products are as follows. The B&P has direct access to Class I railroads including CSX and Norfolk Southern. It also has direct access to the ports in Erie and Buffalo. Commodities are shipped to and from a variety of places including the Port of Baltimore, the Port of Norfolk, Eastern Pennsylvania, the West Coast, Chicago, and other locations nationwide. Train stations and/or stops are located at: Punxsutawney, Dubois, Falls Creek, Dellwood, Brockway, Ridgeway, Johnsonburg, Mt. Jewett, and Bradford.

3.2.1 Railroad Use

Shipments reported along this section of the B&P rail line have increased from 1998 to 2000 by 13% (8,000 carloads a year) as displayed Table 12 and Figure 10.

Table 12. B & P Historic Carloadings

| Year | 1998 | 1999 | 2001 | 2002 |
|----------|--------|--------|--------|--------|
| Carloads | 60,000 | 62,800 | 66,000 | 68,000 |

Although this shows a significant increase in the number of shipments directly received or shipped between Bradford and Punxsutawney, shipments have decreased slightly from 17,823 carloads in 2002 to 16,423 carloads in 2003.





Figure 10. B & P Historic Carloadings

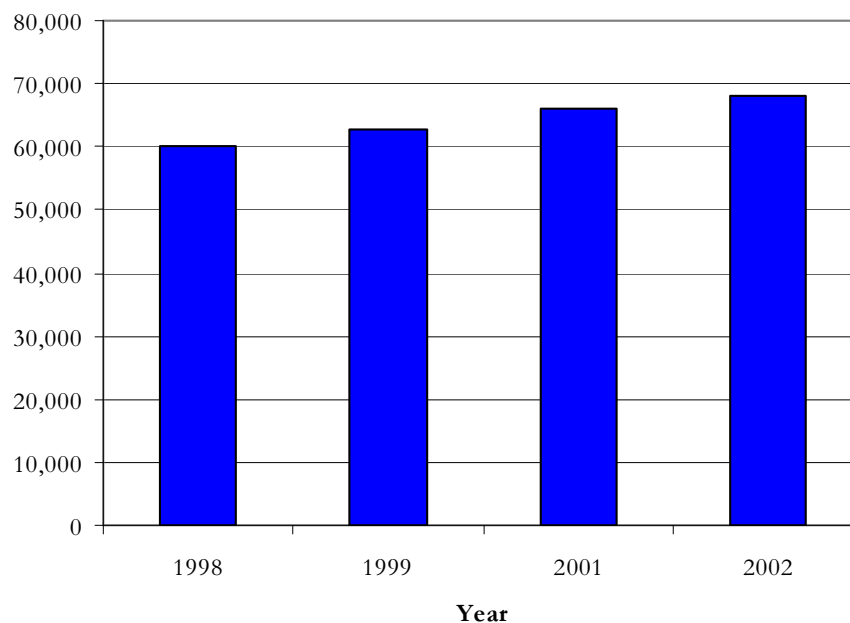


Table 13 lists the shippers and receivers along the rail line from Punxsutawney to Bradford, Pennsylvania. The list shows the wide range of economic activities served by the B & P railroad. This is especially significant in the context of rural economic development.





Table 13. B & P Customers

| Customers Served By Buffalo & Pittsburgh Railroad Between Punxsutawney and Bradford, PA | | | | |
|---|--------------------------|--|---------------|---------------|
| Customer | Town / City | Principal Products Handled | 2002 Carloads | 2003 Carloads |
| North American Carbon | Punxsutawney | petroleum coke | 4 | 4 |
| Timberlink LLC | Punxsutawney | pulpwood logs (new in 2004) | n/a | n/a |
| Unimin Corp. | Punxsutawney | silica sand | 173 | 214 |
| Walker's Farm Service | Punxsutawney | misc. fertilizers | 4 | 0 |
| Wampum Hardware | Punxsutawney | ammonium nitrate | 75 | 10 |
| Rescar | DuBois | rail cars | 3,339 | 3,201 |
| Nicholas Enterprises (Transload) | DuBois | Various (transload) (new in 2004) | n/a | n/a |
| Burke-Parsons-Bowlby | DuBois | treated railroad ties | 228 | 290 |
| DuBrook Concrete | DuBois | Aggregates | 221 | 291 |
| Lezzer Lumber | E. DuBois | Lumber | 2 | 0 |
| Weyerhaeuser (Rewinder) | E. DuBois | fine paper | 254 | 786 |
| Weyerhaeuser (Sheeter) | E. DuBois | printing paper | 457 | 1,571 |
| Lansbury Trucking (ARS) | E. DuBois | rock salt, misc. minerals (transloading) | 632 | 520 |
| Energy Resources | Brockway | Coal | 1,048 | 105 |
| Alpha Coal Sales | Brockway | Coal | 1,951 | 1,372 |
| Bob Cole Trucking | Brockway | rock salt, aggregates (transloading) | 363 | 50 |
| Owens Brockway (Plant 19) | Brockway (Crenshaw) | various minerals | 507 | 507 |
| Weyerhaeuser | Johnsonburg | printing paper, pulp, various chemicals | 1,625 | 2,232 |
| Temple Inland | Mt. Jewett (Hutchins) | particleboard, mdf | 1,356 | 469 |
| Borden Chemical | Mt. Jewett (Hutchins) | urea, formaldehyde | 628 | 271 |
| Aconcagua Timber (formerly Temple) | Mt. Jewett (Clarion) | Mdf | 0 | 0 |
| Highland Forest Products | Mt. Jewett (Marienville) | hardwood lumber | 5 | 5 |
| Empire Wholesale Lumber / Oches | Mt. Jewett (Lucinda) | Lumber | 33 | 66 |
| Bradford Forest Products | Bradford | hardwood lumber | 10 | 4 |
| Superior Well Service | Bradford | frac. Sand | 106 | 102 |
| Goodman Services | Bradford | scrap metal | 0 | 12 |
| Roger's Cartage | Bradford | sulfuric acid (transloading) | 83 | 74 |
| American Refining Group | Bradford | petroleum products | 3,417 | 2,864 |
| Georgia Pacific | Bradford | Pulpboard | 1,223 | 1,278 |
| Stewart Water Conditioning | Bradford | packaged salt | 34 | 60 |
| Graham Packaging | Bradford | plastic resins | 45 | 65 |
| Total Carloads | | | 17,823 | 16,423 |

The largest users of the Punxsutawney to Bradford section of the corridor include: Rescar, Energy Resources, Alpha Coal Sales, Weyerhaeuser, Temple Inland, American Refining Group, and Georgia Pacific. Table 14 provides a sampling of how the B&P is used by some of its customers. Additional observations are provided in Appendix C.





Table 14. Buffalo and Pittsburgh Rail User Highlights

| Shipper/Receiver | Products and Commodities | Rail Cars/Year | Product Origin or Destination by Rail | Employees/Jobs |
|-------------------------|--------------------------------|-----------------------|---------------------------------------|---------------------------|
| Alpha Coal Sales | Coal | ~ 2,000 cars/year | Ships by rail to Eastern PA, NJ, MD | 300 persons in the region |
| Bradford Forests | Lumber | minimal | -- | -- |
| American Refinery Group | Crude oil, petroleum additives | ~ 2100 tank cars/year | All over US | 230 persons at site |
| Rescar | Rail cars | -- | Receives train cars nationwide | 100 persons at site |

3.2.2 Conditions, Operations and Financing

This section of the Buffalo and Pittsburgh has been a recipient of Capital Budget and RFAP grant funding since 199 as follows:

2002 Capital Budget -- \$1,000,000
 2001 Capital Budget -- \$1,320,000
 1999 Capital Budget -- \$1,000,000
 1999 RFAP Grant -- \$225,000

“The rail line is imperative to our industry.”

-- Susan Lerch, Manager,
Transportation Logistics,
American Refinery Group

B&P engineers have identified the needs of the rail line to include: steel reinforcements in tunnels, brush cutting, ties and rail updating, new rail sidings, and ditching. The B&P railroad recently invested in two new rail sidings along the line and there are plans to build two additional rail sidings in the future.

Table 15 and Figure 11 display the trends in revenue, expenses, and profits of the rail line from 1998 to 2000.

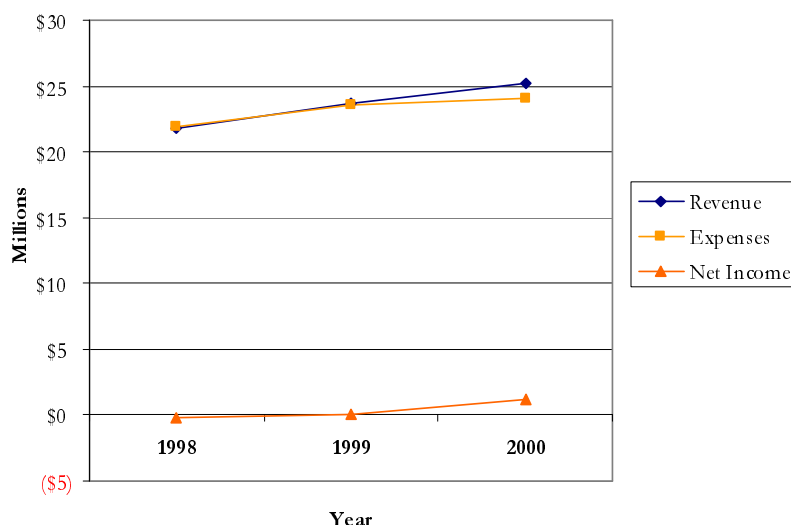
Table 15. B&P Revenue & Expenses

| | 1998 | 1999 | 2000 |
|--------------------------|--------------|--------------|--------------|
| Revenue | \$21,757,598 | \$23,705,322 | \$25,212,497 |
| Expenses | \$21,942,472 | \$23,608,263 | \$24,049,682 |
| Annual Profits or Losses | -\$184,874 | \$97,059 | \$1,162,815 |





Figure 11. B & P Revenue and Expenses



Since suffering losses in 1998, the B&P line obtained significant public investment from 1999 to 2000, and has increased its number of carloads (+8,000) and improving railroad profitability.

3.2.3 Other Economic Development Initiatives

Area public officials and economic development organizations were interviewed as part of the case study.



North Central Regional Development and Planning Commission & North Central Enterprises

The Director of Transportation and a Senior Transportation Planner were interviewed from the North Central Regional Development and Planning Commission, which functions as the area's rural planning organization (RPO). The Executive Director of North Central Enterprises was also interviewed, which is the economic development arm of the agency. The interviews focused on obtaining a perspective of how the B&P rail line impacts the regional economy. Below are highlights from the interviews concerning topics such as policy recommendations, factors that limit the rail line's effectiveness, and potential rail related economic opportunities that may lie ahead.

- RPO would like to have greater access to more rail related state and federal funding to develop a competitive process for rail related projects. Suggested developing selection criteria related





“There is a need to find ways for the rail industry to partner with the trucking companies.”

– Amy Kessler, Director of Transportation, North Central Regional Development & Planning Commission

A number of KOZ sites are located near the rail line but many of them do not have rail sidings which limits their potential for being utilized.

Use of the B&P rail line has been stable over the past five years.

to economic impact and movement of goods similar to MPO TIP process.

- The RPO has a positive relationship with the Buffalo and Pittsburgh railroad and with its parent, the Genesee and Wyoming.
- Companies considering locating to the region do not typically ask whether the sites have rail access.
- A limiting factor of using rail is the need for large volumes and regular shipments in order to make rail work. This makes many smaller companies shy away from using rail rather than trucking or the mix of modes. Rail is bulk and commodity driven and therefore not feasible for many businesses.
- Land use policies and planning in the region are either too weak or too broad to guide companies or the RPO to target areas for future development. Water and sewer infrastructure is not always coordinated with potential development sites that have access to rail.
- Many area Keystone Opportunity Zone (KOZ) sites are located near the rail line do not have rail sidings (program is not rail specific).
- The regional economic development approach is reactive and they respond to requests from potential companies and businesses.
- Their perspective is that most companies use trucks because they are more flexible with shipping time and delivery location coordination. Some of the unforeseen costs of using trucks include increased congestion and greater costs to maintain and upgrade road conditions.
- The agency intends to research the feasibility of developing an inland port in the North Central Pennsylvania region.
- Short line and regional railroads have created much more latitude for potential shippers and receivers.
- There has been an increase of shipping gravel and sand in the region.
- Use of the rail line has been stable over the past five years.

Jefferson County

The Jefferson County Director of Community and Economic Development was interviewed. Key points related to how the rail line correlates with economic development impacts and planning are highlighted below.





- The County receives four to five inquiries a month from potential businesses that are looking for sites with rail access and other site specific criteria.
- County has a comprehensive plan yet they are not targeting water and sewer infrastructure to potential development sites with rail access due to the site locations (would require very large extensions of water and sewer lines). This should be given consideration.
- KOZ program has been successful overall, but is not benefiting the rail sites.
- There is a larger need for the public sector to acquire and equip KOZ sites with the appropriate infrastructure to make them successful. Funding is an obstacle.
- The economic development potential of the rail lines is being limited by the recreational and environmental programs which are aiming to secure the lines for trails and greenways. Both are good, but the highest and best economic use of the lines is not being considered.

“If the rail line was not here ... it would be devastating to the area.”

-- Ray McMahan, Executive Director, City of Bradford Office of Economic and Community Development

City of Bradford

Officials from the City of Bradford were interviewed with regard to their perspective of how the B&P rail line impacts the local economy. Below are key points from the interview:

- There has been a noticeable increase in demand for finished and semi-finished lumber products.
- Several of the City's key employers would not exist if the rail line was not in operation. It is significant to the job base of Bradford.
- The City promotes being business friendly through their land use policies and zoning to ensure that economic opportunities at sites along the rail line are not missed.
- Noted a decrease in the manufacturing sector and greater use of the trucking industry by manufacturing related companies.
- The City was built at a time when rail was an important generator of community design. There is a need to redefine the community and sites with rail access as social and economic generators change.

DCED's Invent PA Website

- DCED's www.inventpa.com website is a statewide inventory of potential infrastructure ready sites that can be queried for sites that have access to rail. Incentives to encourage development are





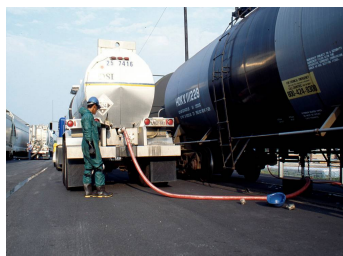
listed (e.g. KOZ designations). Two sites along the corridor are listed including:

- Flint Industries Property, Ridgeway, PA – KOZ site
- Falls Creek Property, Falls Creek, PA – KOZ site

3.2.4 Summary of Limiting Factors to Economic Viability/ Maintenance Issues

Following is a list of factors that limit the economic viability of the rail line and industries that use the rail line, developed from the key stakeholder interviews.

- Maintenance issues include steel reinforcements in tunnels, brush cuttings and clearings, ditching, updating rail and ties.
- Materials, commodity types, quantities, and location of transloading centers are all variables that determine feasibility of using rail line (railroad only allows large volumes).
- Many potential industrial and manufacturing sites do not have appropriate water and sewer infrastructure.
- Some rail lines are being turned into recreational uses which limit future opportunity for greater industrial development benefits.
- Need for additional transloading centers along the line.
- Need for additional rail cars and special types of rail cars to meet shipper needs.



3.2.5 Findings and Implications for the Commonwealth

Below are key findings and potential statewide implications based on the research, interviews, and analysis of the economic condition and potential opportunities along this rail line.

| Finding | Implication |
|---|---|
| RPO desires more rail related state and federal funding to develop a competitive process for rail related projects. Rail-freight projects are not incorporated within their overall transportation program. | Some RPOs are incorporating rail-freight projects within their overall transportation improvement programs, yet some MPOs and RPOs are not. The state should consider creating criteria and policies that require a minimum percentage of funding or other economic impact criteria that would allow rail-freight projects to be mainstreamed with LRTP and TIP projects. |
| Recent trends indicate that RFAP and Capital Budget assistance is correlated with an increase in carloads as well as railroad profits. | The state should consider researching the types of rail related projects that will provide the greatest economic impact for the overall state's economy (jobs, spin-off effects, etc.). |





| Finding | Implication |
|--|---|
| The economic development potential of the rail line is being limited by the recreational and environmental programs which are aiming to secure the lines for trails and greenways. | State departments including PennDOT, the Department of Community and Economic Development, and the Department of Recreation and Natural Resources need to have clear, integrated, and consistent policies and criteria for all programs to determine the highest and best use of rail lines, so that the programs and projects do not conflict with one another at the project level. |
| Many communities were built at a time when rail was important and a significant generator of the community design and function, yet those community visions are now outdated due to changing times. | State should continue supporting planning at the community level to redefine the community development visions and functions of corresponding sites with rail access as they relate to the overall community context, including community design and social and economic impacts. As times are changing, so are the economic needs and functions of rail and rail dependent industries. The highest and best use of rail and rail related sites needs to be examined closely. Coordination and consistency of state, county, and municipal land use planning and policies should continue to be supported by all levels of government. This also includes supporting water and sewer infrastructure to rail ready sites to increase their economic development potential. |
| Continue investigating and supporting innovative ways to transfer goods safely and efficiently from one mode to another (containers, double-stacking, etc). | State should support policies and research to ensure the market provides sufficient transporting products/containers that can be utilized to transfer commodities to and from a variety of modes, specifically ones that provide greatest economic impact potential |
| There is a need for greater information sharing regarding obtaining rail sidings, financing related rail projects, and costs to ship various goods certain distances and locations. | If viable rail projects are not funded as a result of an information gap economic benefits to the state and local economies may be lost. |
| There is a need to open lines of communication between rail industry, truckers, and large and small businesses (potential users). | If compatible interests are not able to germinate shipping relationships may go untapped. Regional freight task forces allow for the interaction between modal operators, local officials, and business partners in an effort to find the best transportation options. |





3.3 The Delaware-Lackawanna Railroad

3.3.1 Background

The Delaware-Lackawanna Railroad, a short line in Northeastern Pennsylvania, is a key economic generator for the Commonwealth. The corridor is 65.5 miles in length and traverses southeast through the counties of Lackawanna and Monroe. The line begins in Scranton, Pennsylvania and ends at Slateford, Pennsylvania. The Delaware-Lackawanna Railroad has a direct connection with Canadian Pacific and Norfolk Southern which allows businesses to access additional supply and demand markets for their goods. The rail line crosses through the towns of Elmhurst, Moscow, Gouldsboro, Tobyhanna, Pocono Summit, Mount Pocono, Cresco, Henryville, Analomink, East Stroudsburg, and the Delaware Water Gap.



This case study examined the economic conditions of the Delaware-Lackawanna Railroad, specifically from Scranton to Slateford Junction, which is also known as the Pocono Corridor. Besides handling rail freight, the Delaware-Lackawanna Railroad also offers tourist steam excursions. Passenger rail along the line to New York City is being studied (MIS and EIS have been completed and submitted to FTA). Since its inception in 1984, nine new industries have located along the corridor. The type of commodities that are shipped along the corridor is diverse and includes propane, wheat, flour, lumber, consumer products, plastics, military equipment and vehicles, shells, bricks, produce, pulp-board, steel, and recycled goods.

The Lackawanna County Railroad Authority (LCRA) was formed by the Lackawanna County Commissioners in November 1984 in order to save the Scranton-to-Carbondale rail line from liquidation. The operator of the line is the Delaware-Lackawanna Railroad, Inc. which guaranteed rail service to existing shippers and receivers and those who wished to expand or use the rail line in the future.

In 1991 the LCRA expanded as it obtained title to 33 miles of the former Delaware, Lackawanna and Western mainline trackage from Conrail between Scranton and Mount Pocono. They also obtained the Lackawanna and Wyoming Valley Railway Laurel Line tracks which provided service to two industries, Chamberlain Manufacturing and Poly Hi Plastics, which are still active today. The LCRA owns the lines and operates with five locomotives, which are housed and maintained in LCRA's South Scranton locomotive shop.





The Delaware-Lackawanna rail corridor is strategically located in the center of a large consumer market and provides easy access to major transportation networks. Points along the corridor offer shippers and receivers easy access to major Northeast cities such as New York (125 miles from Scranton), Boston (310 miles from Scranton), and Washington DC (185 miles from Scranton). Commodities are shipped to and from a variety of locations including western Canada, North Dakota, South Dakota, the Midwest, California, Texas, and the ports of Philadelphia and New York.

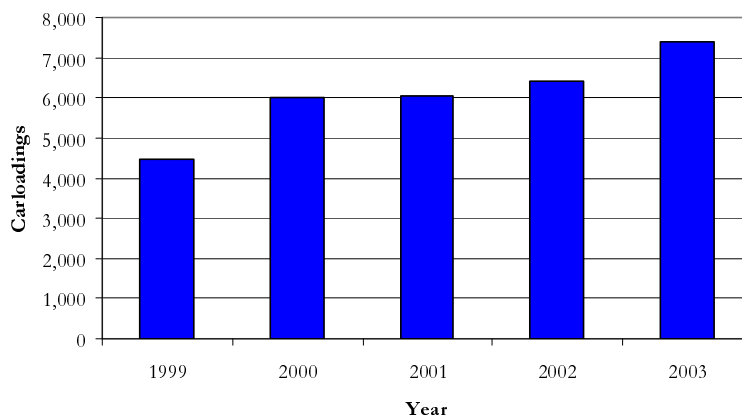
3.3.2 Railroad Use

The rail line has seen significant increases in volumes of goods and number of businesses over the past two decades. For example, in 1985 approximately 500 car loads were shipped along the line. In 1990 there were approximately 1200 carloads shipped along the railroad. In 2003, approximately 7500 carloads were shipped along the line. Projections for 2005 show the number of carloads increasing further. Table 16 and Figure 12 demonstrate the significant increase in carloads since 1999.

Table 16. Delaware-Lackawanna Railroad Carloadings

| Year | 1999 | 2000 | 2001 | 2002 | 2003 |
|----------|-------|-------|-------|-------|-------|
| Carloads | 4,453 | 6,014 | 6,054 | 6,418 | 7,398 |

Figure 12. Delaware-Lackawanna Railroad Carloadings



Since 1999, there has been an increase of 2,945 carloads, which is an increase of approximately 66%. Only 393 carloads were reported during





the railroad's first year of operation in 1985. By 2003 the number of annual carloads increased to 7,398 (an 18 fold).

3.3.3 Shippers

Significant shippers and receivers along the corridor include: Valley Distributing, Gress Company, and 7-D, Keystone Propane, Chamberlain Manufacturing, Poly Hi Plastics, Tobyhanna Army Depot, and the Horizon's Milling's Flour Mill. The businesses are rail customers and are closely linked with the rail line, being a key mode of transportation to move goods to and from their centers. Some businesses are more rail dependent than others.

Table 17 provides an overview of the shippers or receivers interviewed, their products, number of employees, and carloads shipped to or from their site per year.

Table 17. Delaware-Lackawanna Rail User Highlights

| Shipper/Receiver | Products and Commodities | Rail Cars/ Year | Product Origin or Destination by Rail | Employees/Jobs |
|----------------------------------|---|--------------------------------|---|--|
| Horizon's Flour Mill | Wheat | Receives ~ 3500 carloads/year | Receives wheat from North Dakota and South Dakota | 45 persons at site and produces 60 trucking jobs |
| Valley Distributing | Lumber, paper, consumer products | Receives ~3,600 carloads/year | Receives products from all over the US | Approximately 50 people |
| Keystone Propane | Propane | Receives ~ 7,000 carloads/year | Receives propane from western Canada | Approximately 10 people |
| Best Way Lumber | Lumber | Receives ~ 400 carloads/year | Receives lumber from Carolinas | Employs 18 people |
| Chamberlain Manufacturing | Steel bars, bullets, and army projectiles | Varies | Receives from Canton, OH Ship to Iowa | Employs 360 people |



Horizon's Flour Mill

The LCRA obtained title to the 42 acre former Chrysler Auto unloading facility in Mount Pocono, PA. This site is currently Horizon Milling's state-of-the-art Flour Mill, which opened in 1998. The \$40 million facility houses the LCRA/DL's largest customer and handled over 3500 carloads in year 2000. The company chose to locate in the region due to flour and pasta markets in New York City, New Jersey, and Eastern Pennsylvania. Those markets focused on the location of Italian restaurants, companies that make pasta, and bakeries.





Horizon's Flour Mill

- Receives ~ 3500 carloads of wheat by rail every year
- Employs 45 persons at site and produces 60 trucking jobs
- Invested in their own locomotive

The Lackawanna Country Railroad competed with the Class I railroad for the business. Horizon chose the Delaware-Lackawanna line and region due to its geographic location, flexibility of the line, customer service, and they provided them with a "Service Guarantee". The company receives wheat from North Dakota and South Dakota on the Canadian Pacific Railway. The industry employs 45 people itself at the site produces approximately 60 additional local trucking jobs. The company ships most of the flour from the site by truck because deliveries are bound for local destinations in smaller volumes. The company has a siding that is directly incorporated within their building and mill. They also own their own locomotive which carries the cars to the Delaware-Lackawanna rail line, which are then directly connected to transport to their destinations.

Valley Distributing

- Invested \$200,000 in an abandoned site to provide rail access
- Provides value-added services for its customers
- Utilizes indoor rail sidings and partners with trucking
- Receives 3,600 carloads per year

Valley Distributing

Valley Distributing has a total of eight facilities/distributing centers. The Scranton site and building was previously used for creating World War II military equipment and is located within the Delaware-Lackawanna Railroad corridor. The site was vacant until it was purchased in 1996 by Valley Distributing. Most of their products are lumber, paper, and consumer products. When Valley Distributing purchased the site, they invested \$200,000 in new equipment, specific to the rail industry and the distribution center.

Valley Distributing has over 2,000,000 square feet of warehouse space. They are a high volume custom packaging center and have a twelve-car indoor rail siding and strategically located in Northeastern Pennsylvania. Scranton offers easy access to major interstate highways, railroads, and airports.

Valley distributes products nationwide with their own trucking operation and third party trucking companies. They have seen growth since they purchased the property. This past year, they added another shift for workers due to increasing amounts of carloads. They typically receive 10 rail cars/day, which is 40 to 50 loads. The site currently employs approximately 50 persons, which varies during peak and slow seasons. In 2002, they received a RFAP grant and opened a rail siding within the plant. Since then, they have seen much more growth in their business as they transload many of the goods from rail to trucks within their facility.

Unlike many businesses located in major metropolitan areas, Valley Distributing's operating costs are lower and allow for more competitive





process due to its location. The space and services of the facility can be customized to meet seasonal and overflow needs of businesses and they allow flexibility. Their facility also meets FDA requirements and has the capability to distribute food products. Furthermore, the Valley Distributing facility is a value-added facility and has the capability to package materials and distribute them directly to consumers. Value-added services are convenient and cost effective for many of their suppliers. They strategically use rail and trucking to serve their clients in the most cost effective and efficient manner.

Keystone Propane

- Receives 30 carloads per week during the peak season
- Constrained by carload capacity of rail siding
- Relies on rail lines access Class I carriers

Keystone Propane

The company opened in July 1997 because they determined there was a market need for propane distribution in the region. They receive propane from western Canada and the site functions as a transloading center which distributes propane by truck within a 60 mile radius from the rail line. The site receives 10-12 carloads per week during the off season and over 30 carloads per week during the peak season. Due to the Delaware-Lackawanna's connection to two Class I rail lines, Keystone has more access to key destinations and providers. The company noted that access to additional Class I rail lines would be helpful to companies that use the line as well as providing additional rail sidings to increase the company's capacity for distributing their products.

Best Way Lumber

Best Way Lumber opened at the Cresco site in April, 2001. They operate a wood preserving facility and pressure treat lumber. They use the rail line for inbound shipments of lumber from North Carolina and South Carolina. During their peak seasons, they receive approximately 30-35 carloads per month. They use trucks to ship products out of the facility. Shipments are sent shorter distances and usually directly to stores like Home Depot or Lowes, which do not have rail sidings. Furthermore, stores usually request a variety of items, which can not be sent in large volumes on rail cars. The company has a good relationship with the Delaware-Lackawanna Railroad and is very pleased with the service. The company employs 18 people.

Chamberlain Manufacturing

The company has been located in the corridor for forty years. It ships steel bars to make bullets and projectiles for the Army. Many are shipped to the site from Canton, Ohio. They ship products out predominantly by rail. Many are shipped to Iowa. Inbound shipments vary by month. Overall, they use rail 90% of the time because it is more





“The work that has been done with this rail line has been great and is seen in a very positive light!”

– Steve Pitoniak, Senior
Transportation Planner,
Lackawanna County

cost effective and meets their logistics needs. The company employs 360 people at the site.

3.3.4 Economic Development Initiatives

Lackawanna County & the Role of the MPO

The Northeastern Pennsylvania Alliance is the MPO for the region. Through the long range transportation plan (LRTP) and the transportation improvement program (TIP), the MPO includes and funds rail-freight specific projects. Lackawanna County does not have a county comprehensive plan, yet it advises municipalities regarding their planning practices, including reviewing land development applications. It assists in targeting appropriate businesses to rail infrastructure ready sites. The County promotes using the rail line and coordinates with the Scranton Chamber of Commerce as well as the Delaware-Lackawanna Railroad.

Scranton Chamber of Commerce

Scranton Area Chamber of Commerce has developed a rail specific economic development program, website, and marketing materials which include: available sites and buildings, description of infrastructure, site cost, transportation access, and other site specific information. The Chamber proactively meets with potential rail related businesses and the region has emerged to be a key inland distribution hub in the Northeastern United States. Scranton has an intermodal terminal which is positioned for rapid access to the Eastern Seaboard. The Chamber promotes the following as part of their marketing outreach:

- Scranton is at the cross roads of two Class I rail carriers and two active shorelines;
- The Scranton intermodal hub ties directly into Norfolk Southern’s national intermodal system;
- Pennsylvania has no inventory or unitary taxes; and
- Shipping products via rail provides safe, efficient service while being environmentally sound.



DCED’s Invent PA Initiative

DCED’s www.inventpa.com website is a statewide inventory of potential infrastructure ready sites that can be queried for sites that have access to rail. Incentives to encourage development are listed (e.g. KOZ designations). Three sites are designated as KOZs along the corridor. One site is in use, one is under construction, and one is in the process of Phase II environmental clean-up.





The Tegawitha Site

The Tegawitha Site is a 500+ acre site along the Delaware-Lackawanna rail corridor. Many partners are taking a comprehensive and proactive approach to developing the site with focus on rail access. Key players include Lackawanna Railroad Authority, Monroe County Industrial Authority, and Arcadia Development, a private land development firm. The master site plan targets specific areas for light industrial, heavy industrial, and warehousing development. A conceptual site plan has been developed for the site, which outlines future uses for light industrial, heavy industrial, and warehousing facilities with direct lines to warehouses. The partners are proactively planning for the highest and best use of the land and will market the site to potential businesses.

3.3.5 Condition, Operations and Financing

The rail line overall is in very good condition. Stronger bridges, grade crossings, and rail infrastructure that support heavier carloads are the main needs of the rail line.

Table 18 and Figure 13 provide an overview of the Delaware-Lackawanna Railroad's revenue and expense history from 1997 to 2001. In recent years, the rail line's revenues have exceeded expenses, and discussions with the rail line indicate the trend continues.



Table 18. Delaware-Lackawanna Railroad Revenue and Expenses

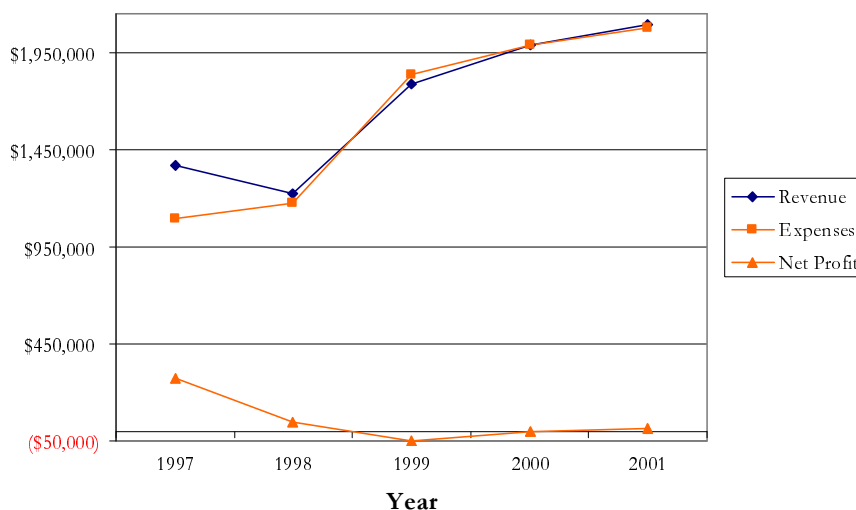
| | 1997 | 1998 | 1999 | 2000 | 2001 |
|---------------------------------|-------------|-------------|-------------|-------------|-------------|
| Revenue | \$1,366,669 | \$1,224,175 | \$1,788,092 | \$1,989,691 | \$2,091,092 |
| Expenses | \$1,094,678 | \$1,177,994 | \$1,837,070 | \$1,988,119 | \$2,080,445 |
| Annual Profits or Losses | +\$271,991 | +\$46,181 | -\$48,978 | +\$1,572 | +\$10,647 |

(Source: Delaware-Lackawanna Railroad Co.)





Figure 13. Delaware-Lackawanna Railroad Revenue and Expenses



The Lackawanna County Railroad Authority has secured over \$20 million in federal, state, and local grants in order to rehabilitate the rail line, refurbish railroad crossings, and provide new shippers and receivers with access to the rail line with additional sidings. The grant monies also provided for the construction of a diesel shop, new track lines, and a railcar scale.

The railroad, the Authority, and its constituents have proactively sought funding to invest in the railroad's future. They have worked with all levels of government and have secured the following public investments from the Rail Freight Assistance Program and from the Capital Budget. A significant amount of the grant money was used to provide additional sidings, replace bridges, and other strategic maintenance needs.

To the Delaware-Lackawanna Railroad:

2004 RFAP -- \$175,000
2003 RFAP -- \$233,610
2002 RFAP -- \$103,102
2000 RFAP -- \$223,869

To the Lackawanna County Railroad Authority

2001 RFAP -- \$209,025
2000 Capital Budget -- \$2,936,650
1998 RFAP -- \$220,787.54
1997 Capital Budget -- \$479,999.30





3.3.6 Findings and Implications for the Commonwealth

Below are key findings and potential statewide implications based on the research, interviews, and analysis of the economic conditions and potential opportunities along this rail line.

| Finding | Implication |
|--|---|
| Since its inception in 1984, nine new rail related businesses have located along the corridor. | An increase in the number of rail related businesses have a direct corresponding increase in rail related jobs for the region. |
| Proactive approach towards economic development along the corridor due to partnerships of various parties. A comprehensive and multi-modal approach provides more opportunities for economic success along the corridor. Transloading centers, intermodal hubs, and good relationships with trucking companies are a key variable as well as access to major highways. | Coordination of planning, economic development and private interests is the key to successful rail freight projects that benefit the community as a whole. This can be a model for the other regions of the state. |
| Railroad is successful from providing customer with a “service guarantee” to leverage business (e.g. Horizon Flour Mill). The Delaware-Lackawanna Railroad is working to achieve the three corridor functions of freight rail, passenger rail, and tourism excursions. They believe that this mixed rail use will lead to greater economic success in the region. | In addition to the costs, service is the most important factor in shipping goods via rail. Reliability of service is an important factor for a company to manage inventories, staff, and finished product. Intensive use of rail infrastructure will draw the most out of existing resources. Care should be taken to limit any incompatible uses that may diminish the effectiveness of the services offered. |



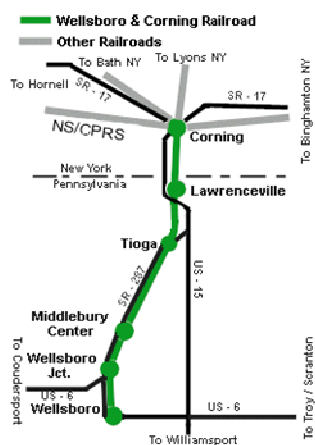


3.4 The Wellsboro and Corning Railroad

The Wellsboro & Corning Railroad (WCOR) is an important short line for industries and agriculture in Pennsylvania's Northern Tier. It serves as a switching carrier for both Norfolk Southern (NS) and the Canadian Pacific (CP). The only railroad in Tioga County, WCOR is 35 miles in length⁶ and connects the county seat of Wellsboro with NS's Southern Tier line and yard in Gang Mills, NY. The line is part of the North Shore family of railroads.

The WCOR line was constructed by the Wellsboro and Lawrenceville Railroad in 1872. The line saw several mergers and changes of ownership before becoming part of the New York Central in 1914, then part of the Penn Central Railroad Transportation Company in 1968. Conrail then operated the line from 1976 through December 31, 1992.

The line's current owner, Growth Resources of Wellsboro Foundation (GROW)⁷ acquired the line recognizing its transportation and economic value to the region. At that time, there were 3 major shippers using the rail line, including Osrarn (then GTE Sylvania), Eagle (then Borden) Family Foods (EFF) and Cornell Brothers. GROW purchased the line to preserve local rail service and the approximately 400 manufacturing jobs that were dependent on rail freight service. The Casey Administration provided \$500,000 in assistance for the line's acquisition.



3.4.1 Railroad Use

Figure 14 shows annual carloading trends for 1995 through 2003 for WCOR. Data provided by WCOR and PennDOT's Bureau of Rail Freight show that the line's annual carloadings typically vary between 650 and 750. Osrarn Sylvania is the railroad's largest customer. The glass maker's carloadings have historically constituted between two thirds to three quarters of all WCOR carloadings.

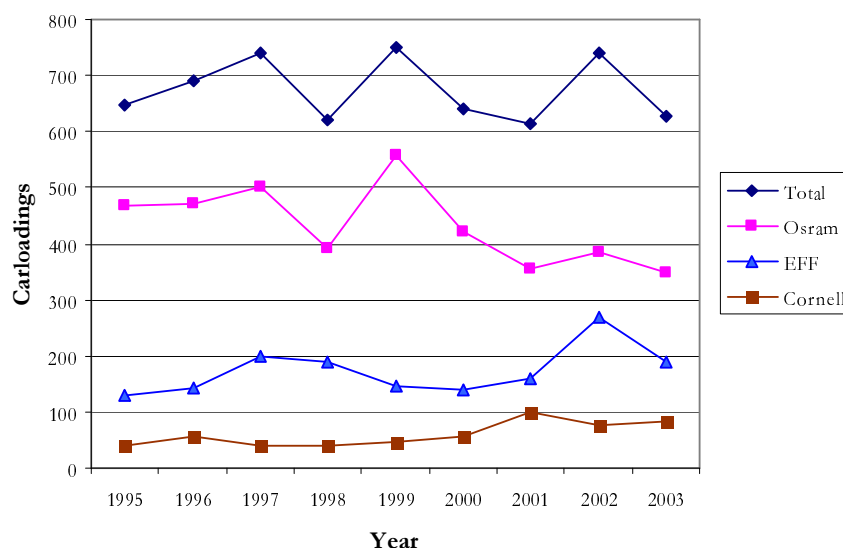
⁶ Eleven miles of trackage is in New York state.

⁷ GROW is a non-profit industrial development agency based in Wellsboro.





Figure 14. WCOR Annual Carloading Trends, 1995-2003



3.4.2 Shippers

In 2004, WCOR serves 3 primary shippers:

- Osram Sylvania
- Eagle Family Foods, and
- Cornell Brothers.

There is sporadic shipping by other companies including Dietrich Milk and Patterson Lumber. Patterson trucks hardwood near Wellsboro Junction to a loading dock for shipping to furniture makers in California. WCOR provides transportation services that support approximately 400 jobs. An overview of these shippers is summarized in Table 19 and highlighted in the paragraphs below:

Table 19. WCOR Major Customers

| Shipper | Location | Receiving | Product | Employees | Annual Railcar Loadings |
|--------------------|-------------------|---------------------------------|--------------------------|-----------|-------------------------|
| Osram Sylvania | Wellsboro | Sand, lime, soda ash | incandescent light bulbs | 225 | 422 |
| Eagle Family Foods | Wellsboro | Sugar, molasses, corn syrup | Sweetened condensed milk | 130 | 140 |
| Cornell Bros | Middlebury Center | Grain, fertilizer, soybean meal | Animal feed | 30 | 57 |

Source: Gannett Fleming shipper interviews. Annual Railcar Carloadings from PennDOT RFAP applications (2000).





Osram Sylvania is one of Tioga County's largest manufacturing employers with 225 employees. All of these jobs would cease without rail freight service.

Osram Sylvania

This maker of glass shells for incandescent light bulbs (formerly GTE Sylvania) is WCOR's largest customer. The plant's raw material is characteristically heavy bulk, consisting of sand, soda ash and lime. Its manufacturing inputs include 100 tons of sand daily and 100 tons of limestone weekly. One billion pieces of glass are produced annually at its Wellsboro plant.

Osram ships almost entirely by truck, for several reasons. The first is the reliability advantage that the motor carrier industry provides over rail freight. A second factor is the destination for its unfinished product. Osram's top shipping destination is its finishing plant in St. Marys, just 90 miles to east. The St. Marys plant receives material from plants in Warren, York and Towanda for final processing.

A third factor has been growth of Mexico as a significant destination for Osram Sylvania products. Over the past decade, Mexico has become the Wellsboro's plant's second-largest "customer." Receivers in Mexico prefer motor carrier over rail freight, and the short shelf life of Osram Sylvania glass⁸ also contributes to the decision to ship by truck.

The company's overhead costs have risen dramatically in recent years, due to an increase in natural gas prices. This has driven efforts to reduce overhead and transportation cost.

Osram Sylvania has received Rail Freight Assistance Program (RFAP) funding. State funds were used to restore the company's rail siding. Of the North Shore Railroad's 80-some customers, Osram is one of only three or four that has its own switching capability.

Rail freight figures prominently in Osram's profitability. The glass maker is one of Tioga County's largest manufacturing employers with 225 employees. All of these jobs would cease without rail freight service.

Eagle Family Foods (EFF)

EFF's most significant raw material is sugar, which is shipped from Louisiana and Florida to refineries in Baltimore en route to Wellsboro. EFF ships to destinations all over the United States using trucks to supply Northeast markets and rail freight to distant points such as the Midwest, Texas, and the West Coast. Shipping is accomplished through

⁸ A soda lime glass, if exposed to air will get weathering on it. Sitting in a rail siding, cooling and baking in Mexican heat can ruin the glass quality within three weeks.





a mix of rail freight and motor carrier modes. Incoming rail freight is approximately 130 cars of sugar annually, compared to 60-70 cars of finished product outbound.



The plant received RFAP funding in 1990 to rebuild a rail siding for car storage. EFF has three such rail sidings where it can store cars. This is especially helpful as the manufacturer does not have to incur storage costs -- the material is stored in the car on the siding until needed. The sidings ultimately provide EFF with more storage capacity than what it can process in a day. The excess capacity also ensures that any disruptions in rail freight service will not adversely impact the plant's production.

If rail freight service were not available, EFF estimates that the resultant costs would be in excess of \$1 million in additional transportation expenses and would be enough to make the plant's operations in Wellsboro unviable. The former Borden plant has been operating in Wellsboro since 1924 and provided manufacturing jobs for 130 employees.

Towards the conclusion of this study, in November 2004, the Wellsboro and Corning Railroad was notified by Eagle Family Foods stating their plans to close in February 2005. The loss of this business along the rail line will reduce the WCOR's traffic revenue base by 28%.

Cornell Brothers

In operation since 1949, this manufacturer of dairy feed is located just north of Wellsboro in the Village of Middlebury Center. The manufacturer's value-adding function includes mixing, rolling, grinding and adding vitamins to its meal. With 30 employees, Cornell is the smallest of WCOR's major users. Cornell uses rail freight primarily for receiving grain, liquid and dry fertilizers, and soybean meal from the mid-west. Trucks are also used for receiving local grain from within a 100-mile radius. Cornell's entire final product is shipped by truck. Cornell estimates its mode split for receiving at 67/33, rail/truck.

Cornell estimates its mode split for receiving at 67/33, rail/truck.

Of WCOR's three primary users, Cornell Brothers is best positioned to continue without rail freight service. The impact on its retail business, however, would be affected by as much as \$5-17/ton. Both rail and truck are key to Cornell's competitiveness. The plant processes 12,000 tons of feed annually and has averaged 46 carloadings a year between 1995 and 2000.





3.4.3 Conditions, Operations and Financing

WCOR typically operates on Mondays, Wednesdays and Fridays, as needed. Typical operation occurs two to three times a week. The North Shore Rail Company overall has 86 employees, yet only 2 are needed as part of operating and maintaining the WCOR line. These employees are on site three days a week, and also work at other locations such as Nittany & Bald Eagle or Lycoming Valley when not in Wellsboro. In terms of track maintenance, inspections, track programs, signal and locomotive maintenance are conducted on a contractual basis.

Since the mid-1970s, WCOR has been affected by the Army Corps of Engineers' construction of the Tioga-Hammond Lake and reservoir system. A segment of the line was relocated and has continued to be a maintenance challenge for the railroad ever since. A 2001 RFAP grant award, for example, was used to replace crossties in this area in order to maintain Class 2 speeds⁹.

WCOR's lines and bridges¹⁰ are 286 compatible, meaning it can accommodate the new increased weight standard for rail cars. Running 286,000 pound cars on a single track railroad such as the WCOR, however, can cause higher maintenance costs over time. Current users of the line such as Eagle Family Foods typically run cars that are 260,000 gross pounds on raw material and 210-220,000 pounds on outbound finished goods.

WCOR motive power consists of an 800 horsepower EMD SW8. NSRC typically uses a minimum of two power units on its lines in case of equipment failure, but that is not possible on the WCOR. In the case of the Wellsboro line, WCOR has an agreement with the Tioga Central Railroad to use one of the passenger carrier's locomotives in case of mechanical failure.

WCOR is part of a larger "family" that includes eight railroads organized under the banner of the North Shore Railroad Company (NSRC). Sister railroads include:

- Juniata Valley
- Lycoming Valley
- Nittany & Bald Eagle

⁹ Class 2 is an FRA track class associated with conditions for associated speeds: 25mph for freight/30 for passenger service.

¹⁰ There are 41 bridges on the line, according to the state rail plan.



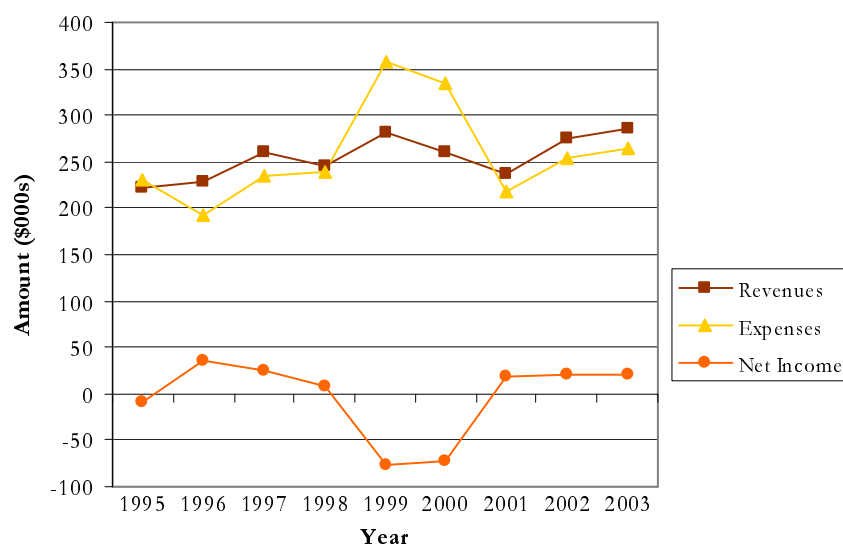


- North Shore
- Shamokin Valley
- Stourbridge
- Union County Industrial Railroad

WCOR is North Shore's second-smallest railroad, with 2003 revenues of only \$285,000 out of \$9,700,000 system-wide (or less than 3 percent of total). WCOR is so small that it operates on the margins of profitability. Rail freight operations the size of the WCOR's are difficult to maintain and show profit. It could not operate the railroad independently and its association with the larger North Shore organization helps to maintain its viability.

Figure 15 below shows the railroad's revenues and expenses between 1995 and 2003.

Figure 15. WCOR Revenues & Expenses



In addition, the NSRC subcontracts with the Tioga Central Railroad for excursion travel on its line.

The **Tioga Central Railroad** is an excursion service that operates on weekends, typically when freight isn't moving. Even when additional runs are added (such as during the popular fall foliage season), the excursions are second priority to freight movements. The passenger





excursion service has had a significant impact on area tourism since it began in May 1994. Ridership has grown from approximately 10,000 at its inception to over 20,000 during the 2002 season. The company's equipment includes three locomotives and a half dozen passenger cars. Total revenues in 2002 were \$181,026, which is comparable to the line's freight-generated revenues.

In the 12 years that GROW has owned the railroad, it has typically applied for state funding for restoration and rehabilitation most years. Table 20 below shows RFAP activity over the past seven years, as on file at the PennDOT Bureau of Rail Freight. WCOR's greatest need is maintenance, and much of the state assistance has helped keep the line in an acceptable operating condition and to preserve area manufacturing jobs.

Table 20. Recent RFAP Awards - WCOR

| Year | Award | Description of Work | Trucks Removed |
|-----------|----------|--|----------------|
| 2001 RFAP | \$71,174 | Crosstie and rail replacement | 83 |
| 2000 RFAP | \$67,728 | Upgrade turnouts, switch at Eagle Family Foods | 421 |
| 1998 RFAP | \$34,097 | Crosstie replacement, spot surfacing, rail joint welding repairs | 1,300 |

Source: PennDOT Bureau of Rail Freight, Ports and Waterways

"Now that rail freight [traffic] is picking up, innovation [in rail cars] is needed."

- WCOR shipper

WCOR's status as a bi-state line introduces some challenges with respect to public financing of support. Nearly a third of the line's trackage is in New York State, meaning that portion of the line is not eligible for RFAP or other Pennsylvania-sourced funding. State monies are typically related to jobs and the customers the railroad serves, and WCOR has no customers on the New York portion of its line. While New York State also taxes its railways, WCOR has received some assistance from New York in funding improvements to grade crossing signals. The State originally levied a tax of \$33,000 annually on GROW, but the owner was able to reach an agreement with the State to have the taxes reduced to just \$11,000 a year. The expense, of course, must be passed on to the shipper in the way of surcharges.

3.4.4 Rail and Intermodal Connectivity

WCOR connects its customers with Norfolk Southern's Southern Tier line at Gang Mills, New York. A second Class I carrier, Canadian Pacific, also has trackage rights to the line.





"Our main interest is in infrastructure preservation and creating public/private partnerships. That's the business we're in."

- NSRC

One of the most significant highway expansion projects in the Commonwealth includes the modernization of US 15 into a four-lane, limited access highway through Tioga County. The roadway will eventually become part of a new I-99, which will be the major north-south route through central Pennsylvania.

Recent corridor improvements have occurred to the south of the greater Wellsboro area towards Williamsport. The roadway became a two-lane expressway from Lambs Creek to north of Tioga in 1978, and by 1987 a bypass had opened around Mansfield on a "Super 2" alignment. The late 1990s have seen extensive investment in the corridor, with a new expressway opening between Sebring and Bloss Mountain in 1997 and the widening and dividing of the highway between Trout Run and Buttonwood in 1998. Since 2000, the expressway has been extended from Sebring to Blossburg and from Blossburg to the southern terminus of the Mansfield bypass (2004).

WCOR views the highway improvement favorably, as it offers the potential for generating additional manufacturing interest in the area. It is believed that the railroad could basically benefit by having an improved highway open up new industrial sites along the rail corridor. As such, an improved US 15 is viewed as a development that could enhance rail freight in Tioga County. As one shipper noted, "Both modes are important to our survival."

3.4.5 Finding and Implications for the Commonwealth

Below are key findings and potential statewide implications based on the research, interviews, and analysis of the economic conditions and potential opportunities along this rail line.

| Finding | Implication |
|--|--|
| The existence of WCOR has preserved 400 manufacturing jobs over the past 12 years. The single-most significant finding from the case study is that all three major WCOR shippers could not survive without rail freight service. | Tioga County in general enjoys low unemployment rates vis a vis Pennsylvania, although underemployment continues to be a problem. County economic development officials continue to try to attract higher-paying jobs, the kind that the manufacturing sector (i.e., rail dependent businesses) can sustain. Shipper profit margins are very tight, and transportation is one overhead cost that the line's shippers seek to keep low. |





| Finding | Implication |
|---|---|
| Rail provides the shippers with the ability to be a rolling warehouse. Raw material can sit in a rail car without the shipper having to pay inventory costs. | Having the inventory readily available this way guards against potential rail service disruptions and the resultant negative impact on the production line. Shippers have added additional sidings to accommodate greater rail car storage capacity. One WCOR customer in particular noted that it costs \$5,000 an hour just to keep the plant operating. Any service disruptions can thus be very costly. |
| Shortlines such as WCOR face ongoing struggles in maintaining lines inherited from Conrail after years of disinvestment. | The availability and use of such public sector funding programs such as the general fund Rail Freight Assistance Program and the Capital Budget Rail Freight Assistance Program are vitally important towards keeping smaller short lines operating and viable. In recent years, WCOR has received approximately \$175,000 in state assistance, which has gone towards maintaining the line at an acceptable operating condition. |
| The WCOR could not exist as an independent railroad. The sharing of resources with other railroads in the North Shore family - as well as the Tioga Central Railroad - helps keep WCOR on the margins of profitability. | WCOR shares employee resources with other NSRC railroads, and motive power with the Tioga Central. WCOR annual revenues in 2002-2003 averaged \$275,000, yet profits were in the neighborhood of \$20,000. WCOR has been deemed a "charity case" and would not be profitable were it not a part of a larger family of railroads. Revenues from the line's passenger excursions rival those of its freight carrier. |
| Rail freight service not only removes trucks from local roads, it reduces handling costs. Data from the RFAP applications show that - in 2002 alone - the WCOR removed approximately 3,000 trucks from state and local roads in Tioga County. In addition, shippers cited the benefit of receiving raw material by rail as it minimizes handling (overhead costs). | <p>Management of raw material is a significant challenge for a glass maker such as Osram Sylvania, which must test its raw materials before it is put into a silo. The sand used in glass making is very susceptible to impurities and contaminants, and tolerances are very tight. Processing a certificate of analysis for a single railroad car as opposed to monitoring a stream of truck drivers creates efficiencies for the shipper that only the railroad can provide. "Batch contamination" can cost upwards of \$100,000 if it is not caught in time, and has the potential to rob the manufacturer of a week's worth of production. Receiving raw material by rail greatly reduces this risk.</p> <p>One shipper noted that in order to accommodate truck deliveries, an unloading station would need to be built, costing upwards of a quarter to a half million dollars.</p> |
| A growing concern involves the shortage of rail cars. WCOR customers rely on NSRC in providing cars. NSRC in turn relies on CP and NS to supply cars and they have been "coming up short" lately. | As the demand for rail freight service has surged, the industry has gone from a rail car surplus to a shortage. Capacity has been tightening nationally, with 1.3 million railcars being put into service. Railroad analysts expect railcar builders to increase production through 2009 in order to meet growing demand. This lack of cars raises lease rates for shippers and forces moves by truck. |





3.5 Summary of Case Study Findings and Implications

The case studies have yielded several overall findings and implications which speak to the economic importance of rail to Pennsylvania. Table 21 outlines the case studies common findings and implications.

Table 21. Case Studies' Common Findings and Implications

| Findings | Implications |
|---|--|
| Each case study railroad significantly benefits its shippers and communities. | The local shippers and railroads provide economic value to the communities they serve. Pennsylvania rail users indicate they would not be as competitive without rail service. Companies such as Johnstown America (Johnstown, PA), Keystone Propane (Scranton, PA), and Alpha Coal Sales (Brockway, PA) would likely relocate or drastically alter production and pricing if rail service were not available. |
| Railroad carloadings and revenues have increased over the past five years. | <p>The railroad industry is increasing its total business throughout the Commonwealth. The magnitude of this increase differs among railroads but is the general trend in Pennsylvania and the U.S. The Delaware-Lackawanna Railroad, for example, has increased carloadings by 66 percent between 1998 and 2003.</p> <p>Rail industry stability is important to its customers. Many have come to rely on rail for their shipping needs and must factor service continuity into business planning.</p> |
| Passenger rail transportation complements a freight rail line's success and provides vital revenue. | Passenger rail is integral to the operations of the Wellsboro & Corning as well as the NS Mainline. The W & C line realizes about half of its annual revenue from passenger excursion travel. Intercity passenger rail service is also being pursued by the operators of the Delaware-Lackawanna Railroad. Local rail interests indicate that passenger rail transport is a benefit to the regional economy and in some cases may even improve mobility. |
| Without railroads, jobs would be eliminated and the competitive position of rail-served businesses would be greatly reduced. | <p>Some businesses, because of their commodity and final product needs, would:</p> <ul style="list-style-type: none"> ▪ have to spend more for shipping, making finished goods or services more expensive for consumers, and ▪ be less competitive within their industry. |





| Findings | Implications |
|---|--|
| Access to Class I carriers is extremely important to the viability of the short line and regional railroads. | <p>None of the rail lines could survive without access to a Class I railroad. Even the NS Pittsburgh Line relies on connections with Western Class I railroads for many of its intermodal trips. Access to more than one Class I railroad increases rail competition, the competitiveness of rail shippers, and the connecting short line. Multiple rail connections is a positive factor for economic development such as:</p> <ul style="list-style-type: none"> ▪ The B & P with several Class I connections in New York State. ▪ The Port of Philadelphia with service from 3 Class I railroads. |
| Local municipalities have the opportunity to shape land use policies to encourage development of rail served properties. | <p>Few businesses locate to a site solely on the basis of rail access. A majority of the businesses along the case study rail lines have the option to ship by other modes. As Pennsylvania is paying close attention to the land use-transportation linkage, consideration should be given to efforts to promote rail contiguous properties for rail uses. Such firms often provide higher paying jobs. Infrastructure planning as well could be particularly helpful including but not limited to water and sewer provision and Intermodal access roads.</p> |
| PennDOT's Rail Freight Assistance Program (RFAP) has enabled rail infrastructure improvements that would not otherwise occur. | <p>As a result of the RFAP it is estimated that the case study railroads have created approximately 150 jobs and preserved another 3,500.</p> <p>All case studies (except for Norfolk Southern) have benefited from the RFAP. A total of \$828,000 has been granted to these three railroads since 1998 for infrastructure improvements. This has resulted in an estimated increase of 4,900 annual carloads. If carried exclusively by truck, this would equate to additional 19,600 trucks annually.</p> |
| In efforts to increase efficiency, railroads attempt to maximize the use of all rail equipment. This has led to a shortage in rail cars and delayed shipments. | <p>Attempts to minimize the number of non-revenue generating assets means that railroads highly to ship each railcar fully loaded. This has resulted in logistical problems including a shortage in railcars in areas that ship but don't necessarily receive goods by rail. Delays and lost sales have resulted for businesses along the case study rail lines. The current rail car shortage is identified here for awareness purposes.</p> |
| Conrail disinvestment has caused maintenance and service issues, requiring new owners to make large investments for maintenance and repairs. | <p>The former Conrail system was highly capital intensive in terms of both equipment and infrastructure. Conrail did not maintain its low volume route infrastructure to the standards necessary for some shippers. As a result those shippers are moving to other locations or shipping by truck.</p> <p>Short lines and regional interests have purchased these locally important lines and are struggling to "catch-up" as a result of years of disinvestment.</p> |





4. RAILROAD ECONOMIC ASSESSMENT TOOL (REAT)

4.1 Purpose

The Railroad Economic Assessment Tool (REAT) is a by-product of this study. PennDOT, MPOs, regional economic development officials, and municipalities may use it to estimate the direct economic impacts of rail investment on local and state economies. The objective of REAT is not to supplant the evaluation and review process for Rail Freight Assistance Program Grants or Capital Budget funding, but to provide another important means for informing decision making. Currently, there are no tools being used for this type of analysis. The tool's utility is in its ability to quickly provide an estimate of economic benefit from a rail infrastructure investment.

REAT has not been designed to make funding decisions. There are many factors that must be weighed in addition to direct economic impacts, some of which include:

- The achievement of local or statewide planning goals
- Importance of the rail line for shippers outside the state
- Investment priorities for railroad operators
- Limitations on state and local decisions as they relate to privately held railroads.

4.2 Methodology

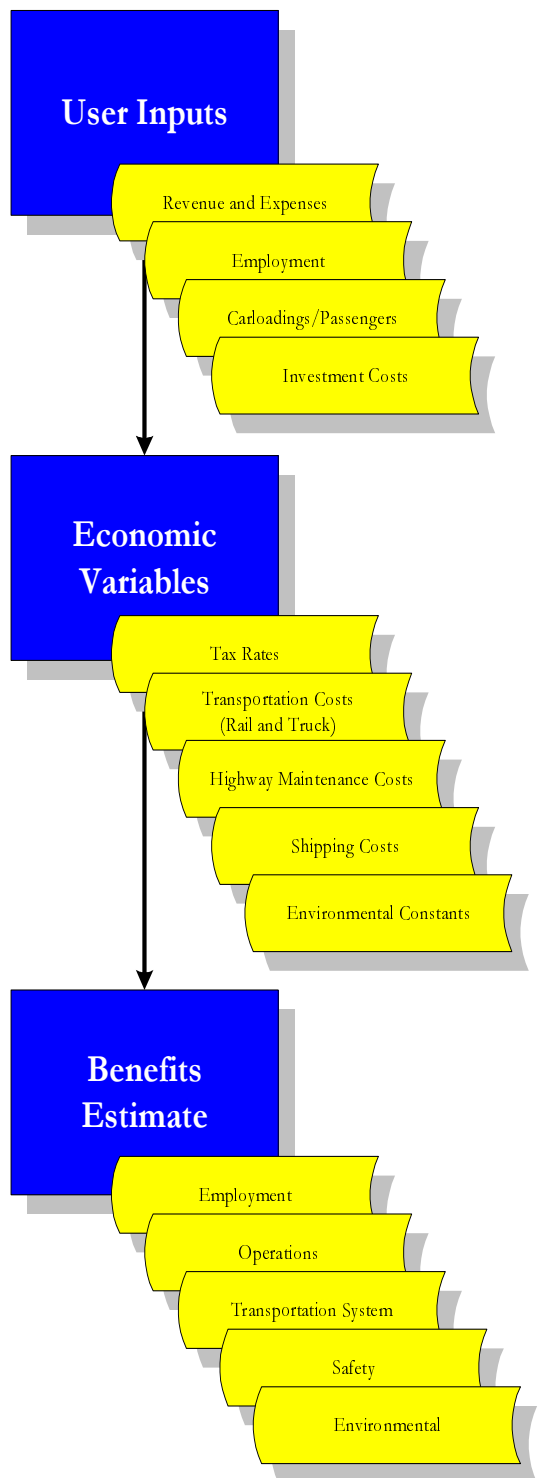
REAT uses a spreadsheet method to estimate truck reduction, roadway infrastructure cost savings, accidents reduced, state and local tax revenue generation, environmental benefits, and shipper cost savings.

Data is required from the user and similar to the information required to apply for grants from the Bureau of Rail Freight's Rail Freight Assistance Program. These inputs include:

- Improvement type (maintenance, construction)
- Revenues and expenses
- Current and future line miles
- Direct employment and employment at businesses served
- Current and future carloadings
- Capital cost of the proposed project.

The tool uses variables collected from various sources such as PennDOT, the Bureau of Labor Statistics, the Association of American





Railroads, and others to provide the information needed to make the assessment in tandem with the input information. These variables are shown in Appendix D.

The results will allow the user to show an estimate of the direct benefits of a rail investment. Those factors estimated include:

Employment Benefit

- Jobs Benefit
- Annual Local Tax Revenue Benefit
- Annual State Tax Revenue Benefit

Transportation System Benefit

- Trucks Removed
- Automobiles Removed
- Roadway Maintenance Cost Savings

Operations Benefit

- 3 Year Income Benefit
- 3 Year State Corporate Tax Benefit
- Vehicle Shipper's Cost Savings

Safety Benefit

- Accidents Avoided
- Fatalities Avoided

Environmental Benefit

- Carbon Monoxides reduced
- Carbon Dioxide reduced
- Nitrogen Oxides reduced
- Volatile Organic Compounds reduced
- Hydrocarbons reduced





4.3 Recommended Application of REAT

Railroad Economic Assessment Tool Input Worksheet

Railroad Name:
 Date:
 Improvement Type: Project Type:
 Indicate whether the improvement is maintenance, capital improvement, or new construction. Indicate whether the project includes costs for ROW, ties, rail, roadbed, other.
 Description:

Revenue and Expenses

| | Revenue | Expenses | Net Income |
|-----------|-------------|-----------|------------|
| 2003 | \$ 1,000.00 | \$ 800.00 | \$ 200.00 |
| 2004 | | | |
| 2005 | | | |
| Est. 2006 | | | |
| Est. 2007 | | | |
| Est. 2008 | | | |

Regional Economic Activity Levels

| | Railroad | Railroad Served Businesses |
|---|---------------|----------------------------|
| Employment | 2 | 4 |
| Total Annual Payroll | \$ 108,135.36 | \$ 119,390.10 |
| Annual Local Payroll Tax Revenue | \$ 1,081.35 | \$ 1,193.90 |
| Annual State Payroll Tax Revenue | \$ 3,027.79 | \$ 3,342.92 |
| 3 Year Income Benefit | \$ 2,400.00 | N/A |
| 3 Year State Corporate Income Tax Revenue | \$ 239.76 | N/A |

Transportation System Impacts

| | |
|--|--------------|
| Railroad Users' Cost Savings | \$ 33,747.02 |
| Highway Maintenance and Congestion Savings | |
| Number of annual truck trips avoided | 800 |
| Avoided annual pavement replacement costs | \$ 7,234.68 |
| Annual state diesel tax reductions | \$ 4,751.72 |
| Net annual pavement cost savings impact | \$ 2,482.95 |
| Highway Accidents Avoided | 0.29 |
| Net Air Emissions Reductions (tons) | |
| Carbon Dioxide | 164.91 |
| Nitrogen Oxides | 2.91 |
| Carbon Monoxide | 1.41 |
| Hydrocarbons | 0.35 |
| Volatile Organic Compound | 0.71 |

Line Miles

Current Line Miles:
 Future Line Miles:
 Line Miles Gained/Lost:

Employment

Before Improvement: RR Employment:
 Employment of Industries Served:
 After Improvement: RR Employment:
 Employment of Industries Served:
 Employment Change: RR Employment:
 Employment of Industries Served:
 Total Employment Gain/Loss:

As a by-product of this study, REAT was specifically designed to help project sponsors or funding organizations to demonstrate the direct economic impact of rail investment on the state and local economies.

Financial assistance is currently available on a matching grant basis to owners and users of rail freight infrastructure whose proposals, at a minimum, meet certain project eligibility requirements. PennDOT evaluates grant applications and the awarding of state financial assistance based upon an objective process that serves the legislative intent of the RFAP and promotes the public interest.

Eligible projects include maintenance, construction or a combination of both not to exceed \$250,000 in state funding or no greater than 70% of the total cost of the project, whichever is less.

It is important for a project sponsor to show that a project is in the public's interest in terms of economic benefits and other factors as well, namely transportation value. This tool will allow MPOs, the Bureau of Rail Freight, or railroad operator to provide the pertinent economic benefits to the public funding agency in order to show this impact.

Specifically, REAT is designed to be used by:

- Bureau of Rail Freight to show the economic impact of RFAP and Capital Budget project requests.
- MPOs, economic development officials, and municipalities to assess a project that requires a local match in order to acquire state funding.
- Rail operators to demonstrate the economic potential of a project in its effort to gain public funding.

Data integrity will always be an issue. The REAT output will only be as good as the integrity and reliability of the data entered. A complete REAT user's guide is provided in Appendix D.





5. CONCLUSIONS AND RECOMMENDATIONS

This study was oriented more towards findings rather than recommendations. The Transportation Advisory Committee is making three recommendations, however, based on the study's conclusions. The recommendations are as follows:

- Improve the practice of project specific economic impact analysis.
- Give greater consideration to rail in both state and regional planning.
- Utilize incentives and coordinate rail related development and land use planning by public and private parties.

The following matrix outlines the recommendations, their purpose, and a rationale for their support, based on the study's findings. Action items are noted to assist with next steps towards implementation.

Special Note: Role of the Rail Freight Advisory Committee

The Rail Freight Advisory Committee should continue to play an important and on-going role with respect to implementing the recommendations noted below. The committee has had a continuing role in helping to develop this study and is knowledgeable of the rationale that supports the findings and recommendations. The committee should continue to participate in the implementation of these recommendations in coordination with PennDOT and other State Departments to advance policies that will ensure rail's integration within the transportation and economic development programming.





| TAC Economic Impacts of Railroads in Pennsylvania Recommendations | |
|--|--|
| Recommendation | Synopsis, Rationale, Action Items |
| 1. Improve the practice of project specific economic impact analysis | <p>Synopsis: There are many competing transportation needs within the state's transportation planning process. The process for allocating funding and prioritizing projects is a monumental challenge. PennDOT, MPOs, and RPOs should continue to improve their economic impact evaluation of proposed rail projects. Tools for assessing potential rail project's economic impact should be incorporated and weighted within the overall transportation funding process.</p> <p>Rationale: Using economic impact as a criterion for prioritizing funding for transportation projects will provide a more comprehensive perspective for decision makers.</p> <p>Action Items:</p> <ul style="list-style-type: none"> ▪ Incorporate the REAT (Railroad Economic Assessment Tool) within the criteria and decision making process for Rail Freight Assistance Program Grants and Capital Budget funding. ▪ Identify a staff person within PennDOT's Bureau of Rail Freight to monitor and update the tool. ▪ Provide regular economic impact updates to the Secretary and STC consistent with the state's LRTP time frame. This will enable economic impact of transportation projects to be timely and incorporated within the state's overall transportation program. ▪ Develop a plan and schedule to provide REAT to MPOs and RPOs so that the tool becomes utilized and incorporated within regional planning and is consistent with statewide policies and criteria. ▪ Institutionalize economic impact within state and regional transportation planning. Develop a phased approach for institutionalizing economic impact. |





TAC Economic Impacts of Railroads in Pennsylvania Recommendations

| Recommendation | Synopsis, Rationale, Action Items |
|--|---|
| <p>2. Give greater consideration to rail in state and regional planning</p> | <p>Synopsis: The four rail freight corridor case studies demonstrate the growing importance of rail freight to encourage vibrant local economies. Some corridors are coordinating planning at the local, county, MPO/RPO, and state level as well as utilizing public and private parties to encourage investment of rail industries. The Commonwealth has been giving greater attention to creating state policies that reflect the importance of integrating land use and transportation planning. More specifically, this integration needs to broaden its approach by incorporating the economic development importance of rail freight transportation projects.</p> <p>Rationale: There is a need to develop and maintain a rail inventory for state and local officials involved in transportation and economic development decision-making. A credible and reliable inventory will help even the playing field as projects are evaluated across the state.</p> <p>Action Items:</p> <p><u>Consider rail in current and on-going state and regional planning efforts:</u></p> <ul style="list-style-type: none"> Assist regional planning partners in addressing Rail Freight in their planning process. Some MPOs are advanced and have institutionalized rail projects within their overall programs (e.g. DVRPC). Develop an MPO and RPO model which demonstrates how all modes are evaluated and incorporated into the LRTP and TIP process. Foster greater participation of railroads and rail authorities in the state and regional planning efforts. Proactively seek and incorporate their input into the state, MPO, and RPO planning processes. Expand upon the Pennsylvania Comprehensive Rail Freight Study and 2003 Pennsylvania State Rail Freight Plan by inventorying abandoned rail lines, reevaluating critical lines of statewide significance, and connections between short lines and Class I railroads. Develop clear statewide consensus on the highest and best use of strategic rail lines in the state. Incorporate consistent policies and criteria into PennDOT's RFAP and other related transportation programs, DCED, and DCNR grant programs, so that program policies do not conflict at the project level. Coordinate rail corridor planning efforts and capitalize on the synergy of multiple corridor functions such as commerce/goods movement, tourism, and commuting/passenger rail. <p><u>Collect rail data and develop policy models to inform state and regional planning decision making:</u></p> <ul style="list-style-type: none"> Build a statewide rail freight database similar in concept to the highway management system. Encourage updating and maintaining the database by the Bureau of Rail Freight and on-going communications with MPOs and RPOs to ensure it is current and useful. Determine the need for sharing rail data so that public funding decisions can be made on accurate and timely information. Coordinate this effort with the MPOs and RPOs through the Mobility planning process. Prioritize improvements for strategic rail lines and connections so that state and local funding decisions are consistent. The Rail Freight Advisory Committee should monitor rail line abandonment and proactively work with regions to recruit new railroad operators, especially if a line is designated as being strategic to the state's economy. Research the most appropriate range/distance to strategically locate transloading centers from rail freight stations and ports throughout the Commonwealth. |





TAC Economic Impacts of Railroads in Pennsylvania Recommendations

| Recommendation | Synopsis, Rationale, Action Items |
|---|--|
| <p>3. Utilize incentives and coordinate rail related development and land use planning by public and private parties</p> | <p>Synopsis: Land use policies in and around rail serviceable sites should be compatible with industries that service rail. Local and county comprehensive plans and ordinances should be consistent and incorporate compatible rail land uses near rail lines such as industrial, manufacturing, high-tech, and others.</p> <p>Rationale: Based on this study, rail served industries are shown to have significantly higher wages than the state average. The study also indicates that an increased use of rail may decrease the reliance on trucks and highways. Pennsylvania's dense rail network has proven to be an economic development asset and should be utilized, especially as trends indicate that industries may become more rail and intermodal dependent in the future to move goods.</p> <p>Action Items:</p> <p><u>Supportive, Integrated, and Consistent Land Use Planning</u></p> <ul style="list-style-type: none"> State should develop model concepts for well-designed rail oriented site developments (ROD – Rail Oriented Development), which would be based on best rail related land development practices around the state and nation. Model concepts should include: typical mix of land uses, average building footprints and building design characteristics, water and sewer capacity needed to support rail site land uses, and recommended distance from other modes of transportation such as ports, transloading centers, and highways. Encourage greater emphasis on rail freight and rail related sites within local municipal, multi-municipal, and county comprehensive planning. Target and integrate appropriate rail and economic development land uses to rail related sites. Incorporate consistent and context sensitive uses and design standards to ensure safe and healthy communities within local subdivision, land development, and zoning ordinances. <p><u>Incentives -- Rail Tax Abatement Zones</u></p> <ul style="list-style-type: none"> Consider developing rail tax abatement zones (similar to Keystone Opportunity Zones) that are directly served by rail. The rail tax abatement zone should be specific to rail industry needs. The incentive should be developed to target rail sites for the highest and best use of the land supported by rail freight service. The incentive should also incorporate a mechanism to encourage businesses to stay after the tax abatement period is over. <p><u>Support Public/Private Partnerships</u></p> <p>Rail authorities, rail operators, and Penn DOT should continue to work together. Initiatives such as the Lackawanna Rail Authority's should be referenced as a statewide model for other rail owners. Initiatives to foster cooperation include:</p> <ul style="list-style-type: none"> Encourage partnerships with area chambers of commerce to develop rail specific economic development programs, websites, and marketing materials (which describe location of potential sites, buildings available, infrastructure, cost, transportation access and other site specific information). Use the Scranton Chamber of Commerce rail specific economic development program as a model. Proactively market potential rail industries to locate to sites which may be a good market fit. Coordinate with economic development representatives and agencies to target large markets and potential rail users. Integrate and further develop a comprehensive approach to developing sites with a focus on rail access. Local rail authorities, county governments, economic development agencies, and private companies should coordinate on this effort. |





APPENDIX





A. Studies Reviewed

1. *Handbook for Assessing Economic Development Opportunities from Appalachian Development Highways*, Appalachian Regional Commission – March 2001
2. *Multi-Modal Benefit-Cost Analysis Using STEAM: Is Steam the Tool For You?*, Daniel R. Pitzler, CH2M Hill.
3. *Indiana Rail Plan*, Indiana Department of Transportation – Multi-Modal Transportation Division, October 2002.
4. *Procedures for Assessing Economic Development Impacts from Transportation Investments*, June 30, 2000 (NCHRP #290).
5. *Rural Inland Waterway Economic Impact Kit – Analysis Manual*, Institute for Economic Advancement-University of Arkansas at Little Rock, August 2000
6. *Transportation Improvements Grow Wisconsin's Economy: The Economic Benefits of Transportation Investments*, Transportation Development Association of Wisconsin, February 2003
7. *Assessing the Economic Impact of Transportation Projects: How to Choose the Appropriate Technique for Your Project*, October 1997, TRB, Transportation Research Circular 477
8. *The Economic Impacts of Pennsylvania Ports*, December 1998, PENNPORTS
9. *Economic Impact of Aviation*, June 2001, Pennsylvania Department of Transportation





B. Mid-Atlantic Rail Operations Study (MARPOS) Projects

Rail Capacity Chokepoints

1. Additional Tracks, Harrisburg-Mason Dixon Line – Identified as a near term priority (\$164 million)
2. 2nd Main Track, CP Wyomissing Jct.-CP Valley Jct. – Identified as a long term priority (\$16 million)
3. 2nd Main Track, CP Blandon-CP Laurel – Identified as a medium term priority (\$10 million)
4. 2nd Main Track Route around Allentown Yard, CP Bethlehem to CP Penn Jct. – Identified as a long term priority (\$16 million)
5. Add TCS CP Rock-CP Norris – Identified as a long term priority (\$3 million)
6. 2nd Main Track, Norristown-Morrisville – Identified as a long term priority (\$43 million)
7. 2nd Main Track Philadelphia-Trenton – Identified as a medium term priority (\$62 million)
8. 2nd Main Track Philadelphia Area – Identified as a near term priority (\$122 million)
9. Separate Freight Track, CP-Phil-CP Holly – Identified as a long term priority (\$350 million)
10. 2nd Main Track South Pennsylvania – Identified as a medium term priority (\$24 million)

Rail Connection Chokepoints

1. Lemoyne Connecting Track between Lurgan and Enola Branches – Identified as a near term priority (\$10 million)
2. Jersey Track and Berry Tracks-Zoo Interlocking (2 projects) – Identified as a long term priority (\$34 million)
3. CP Phil Interlocking Flyover from Airport – Identified as a long term priority (\$35 million)

Rail Clearance Chokepoints

1. 1 Clearance Project for 4 Overhead Bridges on Reading Line – Identified as a long term priority (\$24 million)
2. 33 Clearance Projects, Philadelphia-Trenton – Identified as a near term priority (\$28 million)
3. 11 Clearance Projects, Philadelphia Area – Identified as a near term priority (\$5 million)

Grade Crossing, Station, and Terminal Chokepoints

1. 13 Road Crossings, Harrisburg Line, Lebanon – Identified as a long term priority (Regulatory issue)





C. Additional B&P Observations

McKean County -- Number of Establishments and Employees – NAICS Survey Comparing 2001-2002

| Industry | 2001 Establishments | 2002 Establishments | Percent Change | 2001 Employees | 2002 Employees | Percent Change |
|---|------------------------|------------------------|-------------------|-------------------|-------------------|-------------------|
| Agriculture, Forestry, Fishing and Hunting | 34 | 25 | -26.5 | 69 | 73 | 5.8% |
| Mining | 35 | 34 | -2.9% | 304 | 323 | 6.3% |
| Utilities | 12 | 11 | -8.3% | 108 | 107 | -.9% |
| Construction | 97 | 91 | -6.2% | 789 | 741 | -6.1% |
| Manufacturing | 87 | 81 | -6.9% | 5,003 | 4,748 | -5.1% |
| Wholesale Trade | 65 | 58 | -10.8% | 426 | 392 | -8.0% |
| Retail Trade | 186 | 177 | -4.8% | 1945 | 2,010 | 3.3% |
| Transportation and Warehousing | 68 | 58 | -14.7% | 719 | 703 | -2.2% |

Elk County -- Number of Establishments and Employees – NAICS Survey Comparing 2001-2002

| Industry | 2001 Establishments | 2002 Establishments | Percent Change | 2001 Employees | 2002 Employees | Percent Change |
|---|------------------------|------------------------|-------------------|-------------------|-------------------|-------------------|
| Agriculture, Forestry, Fishing and Hunting | 28 | 23 | -17.9% | 67 | 35 | -47.8 |
| Mining | 5 | 5 | 0 | 65 | 50 | -23.1% |
| Utilities | 11 | 11 | 0 | 105 | 111 | 5.7% |
| Construction | 115 | 98 | -14.8% | 743 | 467 | -37.1% |
| Manufacturing | 160 | 155 | -3.1% | 7,316 | 6,984 | -4.5% |
| Wholesale Trade | 31 | 30 | -3.2% | 150 | 166 | 10.7% |
| Retail Trade | 152 | 134 | -11.8% | 1,598 | 1,499 | -6.2% |
| Transportation and Warehousing | 37 | 37 | 0 | 448 | 449 | .2% |





Jefferson County -- Number of Establishments and Employees – NAICS Survey
Comparing 2001-2002

| Industry | 2001 Establishments | 2002 Establishments | Percent Change | 2001 Employees | 2002 Employees | Percent Change |
|---|------------------------|------------------------|-------------------|-------------------|-------------------|-------------------|
| Agriculture, Forestry, Fishing and Hunting | 32 | 31 | -3.1% | 124 | 133 | 7.3% |
| Mining | 22 | 19 | -13.6% | 392 | 463 | 18.1% |
| Utilities | 14 | 14 | 0 | 118 | 107 | -9.3% |
| Construction | 120 | 118 | -1.7% | 624 | 670 | 7.4% |
| Manufacturing | 110 | 106 | -3.6% | 4,223 | 4,298 | 1.8% |
| Wholesale Trade | 44 | 48 | 9.1% | 365 | 352 | -3.6% |
| Retail Trade | 187 | 164 | -12.3% | 1,790 | 1,807 | .9% |
| Transportation and Warehousing | 92 | 89 | -3.3% | 586 | 585 | -.2% |





D. Railroad Economic Assessment Tool User's Guide

The Railroad Economic Assessment Tool (REAT) is a by-product of the Economic Impacts of Railroads in Pennsylvania Study. PennDOT, MPOs, regional economic development officials, and municipalities may use it to estimate the direct economic impacts of rail investment on the local and state economies. The objective of REAT is not to supplant the process for Rail Freight Assistance Program Grants or Capital Budget funding, but to provide another important means for informing decision making. Currently there are no tools being used for this type of analysis. The tool's utility is in its ability to quickly provide an estimate of economic benefit from a rail infrastructure investment.

This simple tool has not been designed to make funding decisions. There are many factors that must be weighed in addition to direct economic impacts, some of which include:

- The achievement of local or statewide planning goals
- Importance of the rail line for shippers outside the state
- Investment priorities for railroad operators
- Limitations on state and local decisions as they relate to privately held railroads.

REAT is a excel spreadsheet which consists of three worksheets:

1. The REAT Input Worksheet – developed to require limited information that is also required within PennDOT's Rail Freight Assistance grant application process. Other limited information may also be necessary for a full evaluation.
2. The Variables – a collection of data from publicly available sources and other estimated information which, in addition to the user inputs, provides the information necessary for the assessment.
3. The Impact Summary – a summary of the direct economic benefits of the proposed project.

REAT Input Worksheet

The input worksheet allows the project applicant to provide the necessary information for the assessment. The information required incorporates the scope of the project including the:

- Improvement type (e.g. maintenance, new construction, etc.)
- Project type (e.g. tie replacement, right-of-way, etc.)
- Railroad Revenues and Expenses (historical and future)





- Line miles (current and post project)
- Employment (railroad and industries served – before and after improvements)
- Annual carloadings (before and after improvements)
- Project capital costs (sources and amount to PA based businesses)

A sample screen capture of the input spreadsheet is shown below.

| | | | |
|---|---------------|--|---------------------|
| Railroad Name: | Test Railroad | | |
| Date: | 12/15/2004 | | |
| Improvement Type: | Maintenance | Project Type: | Replacement of ties |
| Indicate whether the improvement is maintenance, capital improvement, or new construction | | Indicate whether the project includes costs for ROW, ties, rail, roadbed, other. | |
| Description: | | | |

| Revenues and Expenses | Revenues | Expenses | Net Income |
|-----------------------|-------------|-------------|-------------|
| 2002 | \$ 1,000.00 | \$ 800.00 | \$ 200.00 |
| 2003 | \$ 2,000.00 | \$ 1,800.00 | \$ 200.00 |
| 2004 | \$ 3,000.00 | \$ 2,500.00 | \$ 500.00 |
| Est. 2005 | \$ 4,000.00 | \$ 3,500.00 | \$ 500.00 |
| Est. 2006 | \$ 5,000.00 | \$ 3,600.00 | \$ 1,400.00 |
| Est. 2007 | \$ 6,000.00 | \$ 5,500.00 | \$ 500.00 |
| Est. 2008 | \$ 7,000.00 | \$ 6,700.00 | \$ 300.00 |

| Line Miles | | Annual Carloadings | |
|--|----|-------------------------------------|--------------|
| Current Line Miles | 50 | Carloads before improvements | 550 |
| Future Line Miles | 55 | Carloads after improvements | 750 |
| Line Miles Gained/Lost | 5 | Change in Carloadings | 200 |
| Employment | | Average Mile per Carloading | |
| Before Improvements | | | 65 |
| RR Employment | 8 | Capital Costs | |
| Employment of Industries Served | 10 | Project Cost Federal | \$ 6,500.00 |
| After Improvements | | Project Cost State | \$ 3,500.00 |
| RR Employment (est.) | 10 | Project Cost Local | \$ - |
| Employment of Industries Served (est.) | 14 | Project Cost Private | \$ 50,000.00 |
| Employment Change | | Total Project Cost | \$ 60,000.00 |
| RR Employment | 2 | | |
| Employment of Industries Served | 4 | Amount to PA Businesses | \$ 1,500.00 |
| Total Employment Gain/Loss | 6 | % of Capital Costs to PA Businesses | 3% |





Variables Worksheet

The variables worksheet is provided and includes information from various sources. These variables are general and are able to be customized by the user. The economic impact calculations are built into the tool and changing these variables will result in differences in the assessment. Modifications to the variables worksheet should be done when new and reliable information is available. All changes should be scrutinized, documented, and provided to reviewers of the economic assessment.

The assessment is limited to these direct benefits but can be expanded to include additional benefits if additional user information is available. There are numerous variables provided which allow the user to include additional benefits.

The variables provided are shown in the table on the following page.





| Variable | | Value | Source | Notes |
|--|---|--------------|---------|--|
| Rail freight employment average wage | | \$ 54,067.68 | AAR | |
| Passenger employment average wage | | \$ 34,969.05 | Amtrak | FY03 3,040 PA residents employed with a total payroll of |
| Rail served business average wage | | \$ 29,848 | BLS | Bureau of Labor Statistics: Average wage for production |
| Local Income Tax Rate | | 1.0% | GF | |
| State Income Tax Rate | | 2.8% | PADR | PA Dept. of Revenue |
| Originated Tons per Carload | | 71.52 | AAR | |
| Destined Tons per Carload | | 64.06 | AAR | |
| Rail Cost per Ton Mile | Intermodal | \$ 0.032 | BNSF | |
| | Coal | \$ 0.026 | | |
| | Primary Metal | \$ 0.045 | | |
| | Petroleum (tank cars) | \$ 0.029 | | |
| | Nonmetallic Minerals | \$ 0.027 | | |
| | Mixed Freight | \$ 0.023 | | |
| | Chemicals | \$ 0.031 | | |
| | Food Products | \$ 0.041 | | |
| | Pulp & Paper | \$ 0.037 | | |
| | Average/Other | \$ 0.032 | | |
| Truck Cost per Ton Mile | | \$ 0.102 | BTS | Expenses per Mile for the Motor Carrier Industry, 1999. Inflated |
| Interstate truck accident rate per 1 million vehicle miles | | 0.28 | TRB | |
| Heavy Truck Impact (vs. Auto) | | 10,000 | PennDOT | One 80,000 lbs truck = 10,000 passes of an 8,000 vehicle (SUV, |
| Interstate auto accident rate per 1 million vehicle miles | | 0.79 | NTL | National Transportation Library: Accident Rates Using HSIS by |
| Truck to Railcar equivalency | | 4 | PennDOT | 4 trucks per rail car. Currently used in the RFAP application |
| Average Vehicle Occupancy | | 1.20 | | |
| State Corporate Tax | | 9.99% | PADR | PA Dept. of Revenue |
| Truck Congestion Delay (Cents per Ton Mile) | | \$ 0.003 | | |
| Truck Fatality Rate vs. Rail | | 4 | AAR | |
| Truck Air Pollution vs. Rail | | 5 | | 3-13 X emission rates of regulated pollutants, except SO2 |
| Environmental | Energy Consumption: (BTU/Veh-mile) | 22,046 | FTA | FTA New Starts Application Process |
| | Carbon Dioxide Consumption: (Rail vs. truck grams per ton-mile) | 143.85 | | Carpenter, T.G., The Environmental Impacts of Railways. New York: Wiley and sons. 1994 |
| | Nitrogen Oxide Consumption: (Rail vs. truck grams per ton-mile) | 2.53 | | Carpenter, T.G., The Environmental Impacts of Railways. New York: Wiley and sons. 1994 |
| | Carbon Monoxide: (Rail vs. truck grams per ton-mile) | 1.2 | | Carpenter, T.G., The Environmental Impacts of Railways. New York: Wiley and sons. 1994 |
| | Hydrocarbons: (Rail vs. truck grams per ton-mile) | 0.3 | | Carpenter, T.G., The Environmental Impacts of Railways. New York: Wiley and sons. 1994 |
| | Volatile Organic Compounds (Rail vs. truck grams per ton-mile) | 0.6 | | Carpenter, T.G., The Environmental Impacts of Railways. New York: Wiley and sons. 1994 |
| | Average Vehicle Trip Distance (mi) | 11.8 | | TRANSPORTATION ENERGY DATA BOOK: EDITION |
| Average ADT on Interstate | | 100,000 | GF | |
| Average ADTT on Interstate | | 15,000 | GF | 15% of ADT |
| Truck to Auto Highway Impact Equivalency | | 10 | GF | 10 trucks per Auto |
| Truck Shipper's Cost per ton mile | | \$ 0.099 | BTS | |
| Rail Shipper's Cost per ton mile | | \$ 0.03 | | |
| Pavement Replacement Costs | Weighted average marginal pavement replacement cost, year 2000 dollars (\$/mile) | \$ 0.21 | | |
| | Construction cost index ratio, 2003/2000 | 1.08 | ENR | Engineering News Record |
| | Marginal pavement replacement cost (\$/mile) | \$ 0.23 | | |
| | State tax on diesel fuel (\$/gal) | \$ 0.32 | | |
| | Truck fuel efficiency | 3.48 | FHWA | Federal Cost Allocation Study |
| | State tax on diesel fuel (\$/mile) | \$ 0.09 | | |
| | Marginal pavement replacement cost exceeding state diesel tax revenue (\$/mile) | \$ 0.14 | | |
| | Assumed average load per truck (tons/vehicle) | 20 | | |
| | Marginal pavement replacement cost exceeding state diesel tax revenue (\$/ton mile) | \$ 0.007 | | |





Impact Summary

REAT summarizes estimated direct economic impact based on the user inputs and the variables. The summary includes estimates of the following:

1. Regional Economic Activity Levels
 - Employment gain/loss (railroads and railroad served businesses)
 - Total annual payroll (railroads and railroad served businesses)
 - Annual local payroll tax revenue (railroads and railroad served businesses)
 - Annual state payroll tax revenue (railroads and railroad served businesses)
 - 3 year income benefit (railroad only)
 - 3 year state corporate income tax revenue (railroad only)
2. Transportation System Impacts
 - Railroad User's cost savings
 - Highway maintenance and congestion savings
 - Highway accidents avoided
 - Net air emissions reductions

| <i>Regional Economic Activity Levels</i> | | |
|--|---------------|-------------------------------|
| | Railroad | Railroad Served Businesses |
| Employment | 2 | 4 |
| Total Annual Payroll | \$ 108,135.36 | \$ 119,390.10 |
| Annual Local Payroll Tax Revenue | \$ 1,081.35 | \$ 1,193.90 |
| Annual State Payroll Tax Revenue | \$ 3,027.79 | \$ 3,342.92 |
| 3 Year Income Benefit | \$ 2,400.00 | N/A |
| 3 Year State Corporate Income Tax Revenue | \$ 239.76 | N/A |
| <i>Transportation System Impacts</i> | | |
| Railroad Users' Cost Savings | \$ 33,747.02 | |
| Highway Maintenance and Congestion Savings | | |
| Number of annual truck trips avoided | 800 | |
| Avoided annual pavement replacement costs | \$ 7,234.68 | |
| Annual state diesel tax reductions | \$ 4,751.72 | |
| Net annual pavement cost savings impact | \$ 2,482.95 | |
| Highway Accidents Avoided | 0.29 | |
| Net Air Emissions Reductions (tons) | | |
| Carbon Dioxide | 164.91 | |
| Nitrogen Oxides | 2.91 | |
| Carbon Monoxide | 1.41 | |
| Hydrocarbons | 0.35 | |
| Volatile Organic Compound | 0.71 | |





For assistance in modifying the spreadsheets for a customized assessment
please contact the PennDOT Bureau of Rail Freight.





E. Expert Panel – Rail Leadership Summary

Transportation Advisory Committee Task Force Work Order #5 Economic Impacts of Railroads in Pennsylvania (Meeting Summary – October 6, 2004)

Attendance:

- | | |
|---|--|
| • Mary Worthington, TAC Task Force Chair | • Jeff Stover, SEDA-COG Joint Rail Authority |
| • Larry King, PennDOT | • Jerry Vest, Bessemer/Canadian National |
| • Jim Arey, PennDOT | • Frank Hardesty, Association of American Railroads |
| • Bob Janecko, PennDOT | • Fred Treyz, REMI, Inc. |
| • Ran Marshall, PennDOT | • Ted Dahlberg, Delaware Valley Regional Planning Commission |
| • Larry Malski, Lackawanna Rail Authority and Rail Freight Advisory Committee Chairman. | • Bill Schafer, Norfolk Southern |
| • Rich Timmons, American Short Line and Regional Railroad Association | • Keith Chase, Gannett Fleming |
| • Herb Packer, PENNPORTS | • Kathy Malarich, Gannett Fleming |
| • Fred Wertz, PA Dept. of Agriculture, TAC | • Brian Funkhouser, Gannett Fleming |
| • Jim Runk, PA Motor Truck Association | • Erica Kagle, Gannett Fleming |
| • Michael Fesen, Norfolk Southern | • Patrick Anater, Gannett Fleming |
-

Call To Order

Task Force Chair Mary Worthington thanked the attendees for participating and called the meeting to order. She noted that the meeting's purpose was to review the data collection effort to date (including the case studies) and to hear from an 8-member expert panel on the subject of rail freight's economic impacts. Mary described her interest in rail freight issues, through her experience working with GROW (Growth Resources of Wellsboro) and the Wellsboro & Corning Railroad in Tioga County.

Study Results to Date

Gannett Fleming's Kathy Malarich provided an overview of Pennsylvania rail freight statistics and the framework for evaluating the statewide economic benefits of rail freight as it will be addressed in the upcoming draft report. Highlights of the rail freight statistics include the following:





- There are over 13,600 rail employees in Pennsylvania with wages in excess of \$765 million (2002 data).
- The state's railroads pay an estimated \$23.5 million in state payroll taxes and \$7.7 million local taxes.
- According to FHWA's Freight Analysis Framework, rail freight constitutes 13 percent of all freight shipped in Pennsylvania (compared to 15 percent nationally).
- The Commonwealth's intercity passenger rail (Amtrak) serves over 4.6 million rail passengers annually.

Patrick Anater discussed the recommended statewide rail freight economic assessment tool. The tool is being developed, in part, to estimate the direct benefits of prospective rail investments. As such, it is intended to be used as an investment tool by providing economic impact analysis. The tool uses a spreadsheet methodology based on the information gathered through this study to include potential employment, truck volume reduction, roadway infrastructure cost savings, and state and local tax revenues generated. Flow charts and schematics describing the tool were included as part of the meeting package. Recommendations by the TAC regarding the Department's use of the economic impact assessment tool are just that—it will be up to the Department whether and the extent to which it uses the analytical method developed through this study.

Erica Kagle presented initial highlights of four case studies that had been prepared as part of the TAC study. The case studies included:

- The NS mainline between Pittsburgh and Philadelphia and the connection to Allentown
- The Buffalo & Pittsburgh from Punxsutawney to Bradford
- The Delaware-Lackawanna Railroad, and
- The Wellsboro & Corning Railroad.

Cross-cutting findings and implications from the four case studies included the following:

- Finding: Railroads are not only a critical component of Pennsylvania's transportation system but increasing in importance for both development and transportation reasons.
- Finding: Each case study railroad significantly benefits its shippers and communities.
- Implication: Railroads help the competitive position of many businesses in the Commonwealth
- Finding: Railroad carloadings and revenues have increased over the past five years.
- Finding: Passenger rail transportation not only complements a freight rail line's success but appears to be increasingly valuable for tourism and economic development.
- Finding: Without the railroads, the competitive position of rail-served businesses would be greatly reduced and many jobs would likely be eliminated





- Finding: Access to Class I carriers is extremely important to the viability of the short line and regional railroads
- Implication: Access to more than one Class I railroad increases rail competition and the competitiveness of rail shippers. Future public investment may be better utilized for making these connections to improve the railroad system.
- Finding: Supportive land use policies and “infrastructure ready sites” provide greater opportunity to develop rail served properties
- Implication: Very few businesses locate to a site simply because they have access to rail. Access to other modes of transportation, water and sewer infrastructure, and targeted consumer markets are all critical variables to selecting a site.
- Finding: In efforts to minimize capital costs, railroads attempt to maximize the use of all rail equipment. This has led to the present shortages in rail cars and resulting delays in shipments.
- Finding: Years of Conrail disinvestment has caused maintenance and service deficiencies, requiring new owners to make large investments for maintenance and repairs.
- Finding: PennDOT's Rail Freight Assistance Program (RFAP) has allowed railroads and shippers to make infrastructure improvements that otherwise would not have been completed.
- Finding: State public investments are correlated with maintaining and enhancing economic opportunities.
- Finding: Partnerships with public and private rail-related parties can encourage more significant economic impacts.

Expert Panel Perspectives

Larry Malski served as moderator for the expert panel discussion on the economics of rail.

Panelists included:

- Richard Timmons, American Short Line and Regional Railroad Association (ASLRRA)
- Phil McFarren, Keystone State Rail Association (via written statement)
- Jeff Stover, SEDA-COG Joint Rail Authority
- Jim Runk, Pennsylvania Motor Truck Association (PMTA)
- Herb Packer, PENNPORTS
- Bill Schafer, Norfolk Southern (NS)
- Frank Hardesty, Asst VP, Association of American Railroads (AAR)
- Jerry Vest, Great Lakes Transportation (Canadian National Subsidiary)





Major Panelist Themes

- PennDOT efforts are critical to rail freight's future.
- Short lines connect rural communities to the national and global market and can provide the customized service that low-density shippers need.
- Public sector support for rail freight transportation is important where rail freight improvements are in the public interest.
- Deregulation (Staggers Act) has been a catalyst for growth in the railroad industry. Rail freight traffic volumes are growing at significant rates.
- Rationalization has left regional railroads and short lines with distressed infrastructure, while rates of return to capital in the rail industry are often insufficient to attract adequate private capital to make the needed repairs and upgrades.
- Multiplier economic effects are key to telling the railroads' story. Many Pennsylvania railroad customers are manufacturing establishments. These enterprises typically pay higher than average wages. Also, their purchases from other Pennsylvania firms and spending by their employees supports further (multiplier) economic activity in the Commonwealth.
- Public sector support for rail freight transportation is important where rail freight improvements are in the public interest.
- Increases in goods movement volumes are forecasted for ship, truck, and rail. The issue is not "either-or", because no one mode alone can accommodate the projected growth in the Commonwealth's shipping demands.
- Pennsylvania has the largest concentration of blue chip suppliers in the industry for rail-related supplies.
- There is a need for more innovative containers and devices to transfer commodities effectively and efficiently from one mode of transport to another.
- Discussions identified a need (or role) for creating rail freight incentive programs to encourage development of sites with rail access and assisting with the transfer of goods from one mode to another.

Highlights from each panelist were as follows:

RICHARD TIMMONS (American Short Line and Regional Railroad Association – ALRRA)

- Short lines and regional railroads now constitute 50,000 miles of the nation's rail network. Class I's continue to spin these railroads off, so the nation will continue to see more short lines and additional right of way available for short line expansion.
- One in four rail cars in the U.S. are handled by the short lines.





- Nationally, short lines served 12,000 customers in 2002 with additional growth since that time.
- Class I railroads garner 18-24 percent of their revenues from service to the short line industry.
- Short lines provide a valuable service. They generally have a good safety record, and are quick and responsive to shipper needs. A reduction in short line operations would cause significant problems nationwide.
- Pennsylvania has 59 short line and regional railroads, more than any other state. These short lines have 3,000 miles of right of way, or 40 percent of all right of way in the Commonwealth. They served 783 customer facilities in 2002. Short lines in Pennsylvania employ approximately 3,200 persons and pay roughly \$1.6 million annually in state and local taxes. The ASLRRRA estimates that short lines allow Pennsylvania to avoid \$67 million annually in pavement damage costs.
- The industry is experiencing year over year growth in carloads and revenues. It has been an enormous renaissance for the railroad industry. Benefits of the federal Staggers Act which deregulated railroads in are still being seen in railroad freight growth.
- Pennsylvania leads the nation in public support to railroads through the Rail Freight Assistance Program and state capital budget and in its readiness to participate in special projects.
- A central issue has been an increase in the industry standard car from the 263 to 286 thousand pounds. There is clear evidence that there are problems with interchanges, as the Class Is had not been investing in the infrastructure that they eventually began to spin off to short lines. It would require an estimated \$7 billion of investment nationwide to correct this deficiency. Short lines will pay the majority, but they may seek state and federal sources to help accomplish these needed upgrades.
- Some help is on the way. The RRIF program (Federal Railroad Rehabilitation and Improvement Financing Program) has funneled \$270 million into the small railroad industry with \$3 billion currently unallocated. RRIF's goal over time is to provide assistance to 2-3 railroads monthly.
- ASLRRRA is optimistic about the future for small railroads. USDOT statistics suggest that freight volumes will increase substantially in certain regions of the country.
- It is important for Pennsylvania to ensure that interstates do not become truck lanes. The Commonwealth must continue to invest in rail freight projects and promote industrial growth and development on its rail freight system.
- ASLRRRA suggests researching a tax credit program for sites with rail access.





PHIL MCFARREN (Keystone State Railroad Association – KSRRA) provided comments, which were read by Jerry Vest. Highlights included:

- There has been an increasing focus by Class Is on service to longer hauls and on intermodal and unit trains. Short lines and regional railroads, in contrast, excel in providing the customized attention that many low-density customers need.
- Restoring the Rail Freight Assistance Program to former budget levels was important progress and needed investment.
- The second-largest railroad in Pennsylvania based on trackage is not a Class 1, but the Buffalo & Pittsburgh. In addition, not all connections in the state are short line/regional to Class I; there is an instance of two different short lines/regionals working together.
- The rationalization of Class Is over the past 20 years has resulted in Pennsylvania rail users inheriting infrastructure that is greatly in need of upgrading.
- Pennsylvania has the largest concentration of “blue chip” suppliers in the industry for rail-related supplies, including hardwood tie suppliers, as well as the only new locomotive manufacturer in the United States. This is an important economic dimension of railroads in Pennsylvania.
- In recent years there has been a large increase in regional distribution centers in Pennsylvania
- Railroads are responding to the demand for new rail sidings throughout Pennsylvania.
- Planners must consider that if rail freight cannot accommodate the expected increase in freight flows sufficient money will not be there for highway construction.
- The Department of Transportation has a great rapport with railroads of all sizes and customers. Restoring the Rail Freight Assistance Program to former budget levels was important progress and a needed investment.
- Requiring shippers to project annual carloadings and their financial expectations over four years as part of the RFAP process was a good idea and should be continued. Volume, measured by tonnage and number of loads, needs to become more of a prominent factor in distributing financial assistance.
- Recent flood damage demonstrated how fragile some of the Commonwealth's rail infrastructure can be. There needs to be more concern about substantially upgrading current rail infrastructure, especially bridges.
- PennDOT's new four-year plan for rail is a great step forward but financing remains a serious concern. The Commonwealth is far better off than most states even though it has the most bridges and some of the nation's most challenging terrain for rail freight.

JEFF STOVER (SEDA-COG Joint Rail Authority)

- The railroad industry pays wages that are higher than the average state wage. Rail shippers, being typically in the manufacturing sector, generally pay above the average





wage for the particular county they are in. We need to look at them in terms of the family-sustaining jobs they provide.

- Rail access provides the basis for the growth in traffic. Without the access, companies along the WCOR would not have expanded nor any offers for new plant locations. There was one expansion along the line. As such, short lines can support companies to become rail customers and thus increase the importance of railroads in Pennsylvania.
- The list of rail customers is very dynamic; it has changed considerably over the years.
- A study of the economic impacts of rail should look not just to existing plants that use rail, but potential expansions and new plant locations.
- The Rail Freight Assistance Program (RFAP) brings great "bang for the buck" in terms of its economic development impacts. The program makes it easier for the short line to create economic development opportunities in working with local economic development officials.
- Pennsylvania's topography limits the availability of sites suitable for rail served development. Rail served warehouse facilities in the SEDA-COG region fill up very quickly. SEDA-COG is aggressive about developing these types of businesses and in lowering the barriers for rail customers.

JIM RUNK (Pennsylvania Motor Truck Association – PMTA)

- Pennsylvania employs 416,000 people in the motor carrier industry with an associated payroll of \$16.1 billion.
- The industry is experiencing problems in finding good drivers and rising insurance premiums.
- A loss of rail would be disastrous to Pennsylvania. There's no way the trucking industry could make up the difference if there were no rail freight service.
- The consumer ultimately decides how freight will be moved.
- Rail freight is a good partner for the motor carrier industry.
- Consider developing a Rail Freight Opportunity Zones (RFOZ) for the Commonwealth similar to KOZ programs but tailored to freight, intermodal centers, and transfer zones.
- Consideration needs to be given to how the internet will effect the rail freight industry.

HERB PACKER (PENNPORTS)

- Rail freight, trucks and waterways are complementary modes and are equally vital to the well-being of the Commonwealth. Rail has an integral role at the ports for freight and for military traffic. (There have been nine military deployments through the Port of Philadelphia, five more are scheduled for this year.) Intermodal is crucial to port viability and connectivity.





- US waterborne commerce accounts for 16 million jobs as of 2002. A quarter of domestic trade moves by inland water. US international trade will increase at a minimum of 100 percent by the year 2020, but it could be more like 150 percent or 200 percent.
- Ports are the engine of growth in the Commonwealth. Pennsylvania has three different types of ports (Deep water, Inland waterway, and Great Lakes), which makes it unique in the nation.
- An economic impact study commissioned by PENNPORTS concluded that approximately 280,000 jobs in Pennsylvania are dependent, directly and indirectly, on Pennsylvania ports.
- Pittsburgh was once the largest inland port waterway in the country, but now ranks second behind Tri-State (Huntingdon WV-OH-KY). In 2001, Pennsylvania was the 4th largest state in the nation in terms of waterborne volume coming into the country, trailing only Louisiana and the container ports at Los Angeles and Long Beach.
- Current projects include the establishment of freight ferry service in Erie, and container-on-barge in Pittsburgh. The port at Philadelphia has Operation Reset, which will see military equipment from overseas being returned to the Port of Philadelphia for repair. Most of this material will be transported by rail. This equipment will be coming back to five military bases, two of which are Letterkenny and Tobyhanna in Pennsylvania.
- Horizontal clearance to the Port of Philadelphia is another concern, as the Defense Department requires dual access.
- Over half of all frozen beef to the USA come in via Philadelphia. Oil and petroleum are also significant commodities to the port.
- Funding is another issue for intermodal connectivity and infrastructure. To illustrate, Herb noted that two piers at Philadelphia have fallen into the river.
- We must have a vibrant transportation system that includes not only rail and truck, but our ports as well.

BILL SCHAFER (Norfolk Southern – NS)

- The current TAC study is important as it should help us understand what railroads mean from an economic standpoint in Pennsylvania.
- Pennsylvania is the most rail-savvy state that NS serves.
- In 1999, Pennsylvania became NS' largest by different measures. The carrier has approximately 5,300 employees in the Commonwealth - more than in any other state NS serves. NS also makes more purchases in Pennsylvania for material and service than in any other state.
- NS' true growth area is in intermodal. Intermodal service saw 17% revenue growth in the past year and is projected to overtake coal as the company's top revenue earner.





- NS is “not bashful about spending money”, having spent three to four hundred million dollars in Pennsylvania since 1999.
- Mr. Schafer stated that the company is providing increasingly better and more reliable service and noted the great contrast from several years ago, when “service” was not yet part of their corporate culture.
- NS has 256 "stations" or revenue-generating points in the Commonwealth. The company's top ten stations generate half of all NS' Pennsylvania revenue; five of the stations handle primarily intermodal shipments. The top ten stations are:
 - Bailey Mine southwest of Pittsburgh (ships coal)
 - Rutherford (Intermodal)
 - Morrisville (intermodal)
 - Harrisburg (intermodal)
 - Pittsburgh (merchandise)
 - Clairton (merchandise)
 - Bethlehem (intermodal)
 - York Haven (receives coal)
 - Philadelphia (receives coal)
 - Strawberry Ridge

FRANK HARDESTY (Association of American Railroads – AAR)

- The rail freight industry is facing unprecedented demand for service.
- The rail industry is unique among transportation modes in that it is privately owned and financed.
- The Association's efforts have been aimed at preserving the regulatory freedoms first gained with the Staggers Act. Notwithstanding this financial and regulatory independence, there is now a tremendous amount of discussion of “public-private partnerships”.
- Intermodal is the largest segment of revenue business; much of that freight is moving through the nation's ports.

JERRY VEST (Great Lakes/Canadian National)

- Some statistics on Canadian National’s Bessemer Subdivision (which runs between Pittsburgh and Lake Erie) include:
 - 147 route miles
 - 172 employees
 - \$12 million in annual payroll





- The railroad purchases six million dollar's worth of supplies and equipment from 169 Pennsylvania firms.
- USX is the railroad's largest customer.
- The total number of customer jobs directly dependent upon Bessemer is approximately 8,000.
- Some comments on the TAC study include:
 - It is critical for the study to put value on the rail freight network and how it helps the Commonwealth.
 - The study should not consider the state's network in a static fashion. The attraction and ability to get new customers should be considered in the study.
 - The study should examine the development within the Commonwealth that has been lost because rail could not be provided. What role did rail play? Such an analysis might help in future PennDOT decision-making. There is a need to look at off-line customers as well and try to quantify their impacts in some direct sense.
 - The study should also consider the positive impacts of overhead rail traffic to Pennsylvania. The "Keystone State" may be a colonial term, but one that is still apropos today. Overhead rail freight traffic is a benefit.
 - The study should evaluate the impact of rail suppliers and recognize them.
 - The study should identify rail freight chokepoints throughout Pennsylvania.

Next Steps

The next TAC Task Force meeting will be held on Wednesday, October 27. At this meeting a draft report will be reviewed which will include a statewide economic impact assessment, a write-up of the four case studies, and a demonstration of the rail project assessment tool. The Task Force will also work with the consultant to solidify the schedule of activity through to the December 15, 2004 presentation to the full TAC.

Adjournment

There being no further business, Mary thanked everyone for attending and declared the meeting adjourned at 11:00.





F. List of Interviewees

Below is a list of those interviewed as part of this study. The Transportation Advisory Committee Task Force would like to thank them for their participation.

- Allied Tube and Conduit – Philadelphia, PA
- Alpha Coal Sales – Brockway, PA
- Altoona-Blair County Development Corporation – Altoona, PA
- American Refining Group – Bradford, PA
- American Short Line and Regional Railroad Association – Washington, DC
- Association of American Railroads – Washington, DC
- Best Way Lumber – Cresco, PA
- Brooks Provisions – Philadelphia, PA
- Buffalo and Pittsburgh Railroad – Rochester, NY
- Bureau of Transportation Statistics – Washington, DC
- Cambria County Industrial Development Corporation – Ebensburg, PA
- Cambria County Planning Commission – Ebensburg, PA
- Chamberlain Manufacturing – Scranton, PA
- City of Bradford Office of Economic and Community Dev. – Bradford, PA
- Cornell Brothers Agway – Middlebury Center, PA
- Delaware-Lackawanna Railroad – Scranton, PA
- Dependable Distribution, Philadelphia, PA
- Eagle Express Trucking – St. Marys, PA
- Eagle Family Foods – Wellsboro, PA
- Federal Railroad Administration – Washington, DC
- Great Lakes Transportation – Pittsburgh, PA
- Growth Resources of Wellsboro (GROW) – Wellsboro, PA
- Jefferson County Department of Development – Brookville, PA
- Johnstown American Corp. – Johnstown, PA
- Johnstown Area Regional Industries (JARI) – Johnstown, PA
- Keystone Propane – Scranton, PA
- L&S Sweeteners – Leola, PA
- Lackawanna County Planning Commission – Scranton, PA
- Norfolk Southern – Philadelphia, PA
- North Central Enterprises – St. Marys, PA
- North Central Regional Development and Planning Commission – Ridgeway, PA
- Northern Tier Regional Planning and Development Commission – Towanda, PA
- Osram Sylvania – Wellsboro, PA





- Owens Brockway Glass – Brockway, PA
- Pennsylvania Coal Association – Harrisburg, PA
- Pennsylvania Department of Transportation – Harrisburg, PA
- Philadelphia Industrial Development Corporation – Philadelphia, PA
- Proctor & Gamble – Mehoopany, PA
- Rescar, Inc. – DuBois, PA
- SEDA-COG Joint Rail Authority – Lewisburg, PA
- Smith Trucking – Altoona, PA
- Southwestern Pennsylvania Commission – Pittsburgh, PA
- Sunoco – Philadelphia, PA
- The Greater Scranton Chamber of Commerce – Scranton, PA
- Tioga County Development Corporation (TCDC) – Wellsboro, PA
- Tri-County Regional Planning Commission – Harrisburg, PA
- Valley Distributing – Wilkes-Barre, PA
- Westmoreland County Industrial Development Corporation – Greensburg, PA
- Weyerheyser – Johnsonburg, PA





G. List of References

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H. Coal, Pavement, and Air Emissions Calculations

Calculations Supporting Economic Impacts of Rail Shipments of Coal to Pennsylvania Utility Electric Plants

| | | |
|---------------|--|---------------------------------|
| 12,552 | Btu/pound | U.S. Department of Energy, EIA. |
| 2000 | pound/ton | U.S. Department of Energy, EIA. |
| 25,104 | mBtu/ton | |
| 10,226,000 | net Btu/MWh for fossil fuel plants | U.S. Department of Energy, EIA. |
| 10,226 | mBtu/MWh | |
| 2.45 | MWh/ton coal | |
| 7,560,000 | tons coal by rail to PA electric plants | U.S. Department of Energy, EIA. |
| 18,559,186 | MWh linked to coal-rail shipments in 2003 | |
| 112,402,037 | MWh generated in PA from coal | U.S. Department of Energy, EIA. |
| 1,149,423,230 | mBTU produced to generate this electricity | |
| 45,786,458 | tons coal to generate these mBTU | |
| 129.99 | cents per million BTU from coal | U.S. Department of Energy, EIA. |
| 0.010226 | mBTU/kwh | |
| 1.32927774 | cents per kwh coal cost | |
| \$0.04 | Assumed generation revenue per kwh | |
| \$742,367,456 | Electricity generation revenue linked to coal-rail shipments | |

Note: Calculated data are shaded.





Supporting Calculations for Pavement Replacement Cost Impacts of Trucks

Marginal Pavement Replacement Cost, from "Federal Highway Cost Allocation Study", Year 2000 Update, U.S. FHWA.

| | | |
|--------|--------------|---|
| 0.127 | \$/mile | Rural Interstate, 80 k 5-axle combination |
| 0.409 | \$/mile | Urban Interstate, 80 k 5-axle combination |
| 69% | | rural VMT as % of total VMT, 5 axle and larger vehicles, 1999 (PennDOT) |
| 31% | | urban VMT as % of total VMT |
| 1.0196 | | Construction cost index ratio, 2001/2000. From Engineering News Record (ENR). |
| 0.2186 | \$/mile | weighted average marginal pavement replacement cost, year 2001 dollars |
| 0.562 | \$/gal | federal and state tax on diesel fuel |
| 3.48 | miles/gallon | truck fuel efficiency (FHWA, FHCAS) |
| 0.1615 | \$/mile | federal and state tax on diesel fuel |
| 0.0571 | \$/mile | un-compensated marginal pavement replacement cost |
| 20 | tons/vehicle | assumed average load per truck |
| 0.0029 | \$/ton-mile | un-compensated marginal pavement replacement cost |

| | | |
|----------------|--|------------------------|
| 1.2752E+12 | | national ton-miles (1) |
| 0.039 | | PA percentage (2) |
| 49,732,605,000 | | PA ton-miles |

| | | |
|---------------|--|--|
| \$543,639,512 | | pavement replacement cost per year statewide |
| \$142,063,018 | | un-compensated pavement replacement cost per year, statewide |

(1) U.S. Department of Commerce, Bureau of the Census. Commodity Flow Survey.

(2) U.S. Bureau of Economic Analysis. State and National GSP for Rail Transportation, 2001.

Note: Calculated data are shaded.

Rail vs. Truck Pollutant emissions

Emissions rates (grams/tonne-km)

| | CO2 | NOX | SO2 | CO | HC | VOC |
|------------------|-----|-----|-----|-----|------|-----|
| All Road Freight | 250 | 4 | 0.3 | 2 | 0.5 | 1 |
| All rail freight | 40 | 0.3 | 0.3 | 0.2 | 0.05 | 0.1 |
| Difference | 210 | 3.7 | 0 | 1.8 | 0.45 | 0.9 |

Emissions rates (grams/ton-mile)

| | | | | | | |
|----------------------|--------|------|------|------|------|------|
| Difference (english) | 143.85 | 2.53 | 0.00 | 1.23 | 0.31 | 0.62 |
|----------------------|--------|------|------|------|------|------|

| | | | | | | |
|-----------|------|------|------|-----|-----|-----|
| Rail/Road | 16% | 8% | 100% | 10% | 10% | 10% |
| Road/Rail | 6.25 | 13.3 | 1 | 10 | 10 | 10 |

from Carpenter, T.G. *The Environmental Impact of Railways*. New York: Wiley and Sons. 1994.

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