

Pennsylvania has 57 freight railroads covering 5127 miles across the state, ranking it 4th largest rail network by mileage in the U.S. By 2035, 246 million tons of freight is expected to pass through the Commonwealth of Pennsylvania, an increase of 22 percent over 2007 levels. Pennsylvania's railroad freight demand continues to exceed current infrastructure. Railroad traffic is steadily returning to near- World War II levels, before highways were built to facilitate widespread movement of goods by truck. Rail projects that could be undertaken to address the Commonwealth's infrastructure needs total more than \$280 million. Annual state-of-good-repair track and bridge expenditures for all railroad classes within the Commonwealth are projected to be approximately \$560 million. Class I railroads which are the largest railroad companies are poised to cover their own financial needs, while smaller railroads are not affluent enough and some need assistance to continue service to rural areas of the state.

BACKGROUND

A number of benefits result from using rail freight to move goods throughout the U.S. particularly on longer routes: congestion mitigation, air quality improvement, enhancement of transportation safety, reduction of truck traffic on highways, and economic development. Railroads also remain the safest and most cost efficient mode for transporting hazardous materials, coal, industrial raw materials, and large quantities of goods.

Since the mid-1800s, rail transportation has been the centerpiece of industrial production and energy movement. Specifically, in light of the events of September 11, 2001 and from a national security point of view, railroads are one of the best ways to produce a more secure system for transportation of dangerous or hazardous products. For example, the majority of spent nuclear fuel rods will likely be sent via rail to the newly established federal depository, and many of these shipments will pass through the Keystone State. By further improving the rail infrastructure, railroad operation can become even safer and more difficult to disrupt.

CONDITIONS AND CAPACITY

Pennsylvania is one of the nation's leaders in freight assessment, planning, and investment spurring from the Commonwealth's industrial heritage. Today, most railroads are privately owned. Class I and mid-sized railroads operating within the Commonwealth's borders are generally able to finance their own capital improvements. In addition to the larger railroads, the regional and short line railroads are the feeders and supporting players in Pennsylvania's overall transportation network. Problems arise with short line railroads, which have difficulty in making infrastructure investments to remain viable and competitive. The network is only as strong as its weakest link.

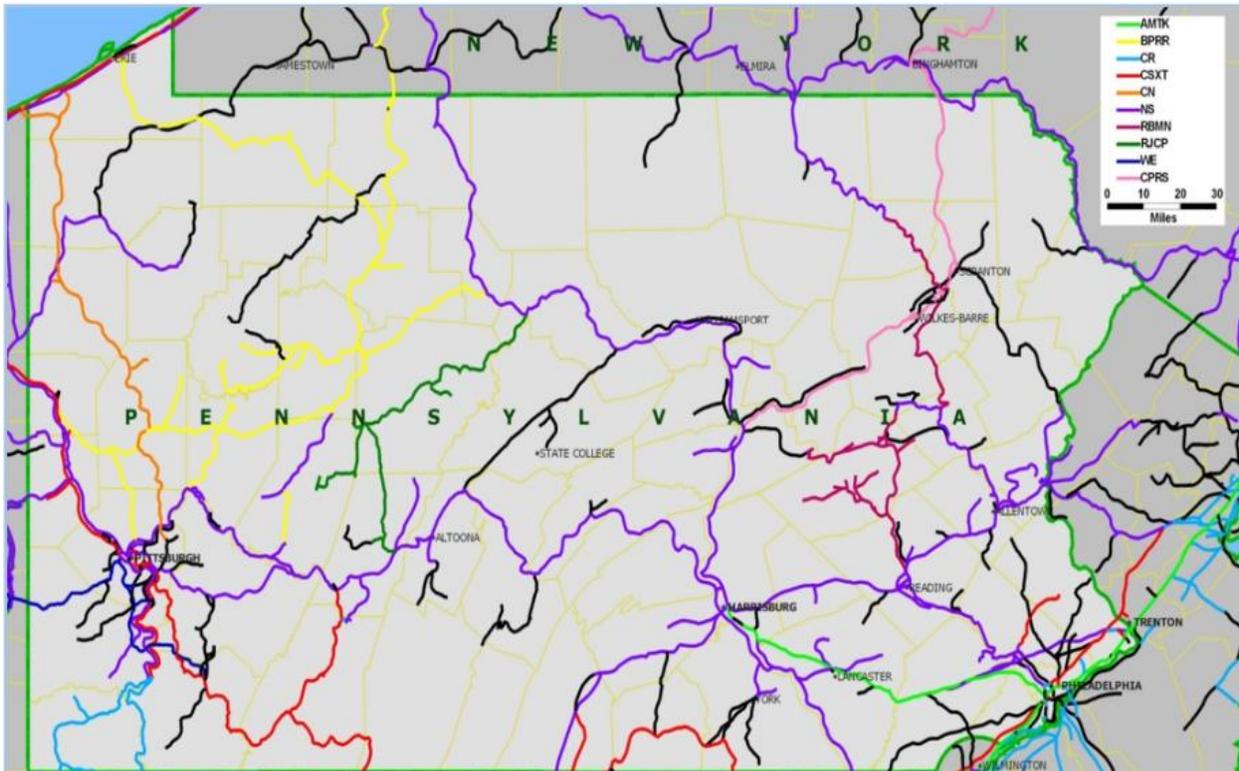
Pennsylvania has approximately 5,145 route-miles of freight railroad operated, and sixty-five freight railroads, more than any other state. They are summarized as follows:

- Four Class I Railroads: CSX, Norfolk Southern, Canadian Pacific (CP Rail), and Bessemer and Lake Erie Railroad Company (owned by Canadian National (CN))
- Two Class II Railroads: Buffalo and Pittsburgh Railroad, and Wheeling and Lake Erie Railroad
- Thirty-two Class III Railroads, also known as short line or local line haul railroads
- Twenty-seven local switching and terminal railroads.

Pennsylvania has the 5th largest rail system in the United States. Philadelphia, as the largest city in the Commonwealth, is the only major city on the East Coast to have connectivity to three Class I railroads. Railroads are a vital component of the Commonwealth's transportation system and very important to the state's economy. Commodities coming into and going out of Pennsylvania by rail are dominated by coal and intermodal freight. Coal is 69 percent of the total tons originating in Pennsylvania and 35 percent of terminating tons. Other important commodities include primary metal products, petroleum, chemicals, and food products.

Pennsylvania's core or strategic rail lines include some of the highest volume routes in the nation, such as the Norfolk Southern (former Pennsylvania Railroad) main line connecting Philadelphia, Harrisburg and Pittsburgh, and extending ultimately to Chicago. This line carries over 120 million gross tons (MGT) annually. Other very highly-trafficked rail lines in the Keystone State include CSX's east-west line through Erie, at 113 MGT; CSX's line through Connellsville, Pittsburgh and New Castle, 100 MGT; Norfolk Southern's Reading-Bethlehem-Easton-New Jersey line, 100 MGT; Norfolk Southern's Hagerstown, MD-Harrisburg line; and CSX's line from Chester to Yardley. Another important trunk line is Amtrak's Northeast Corridor, a portion of which passes through southeastern Pennsylvania, including Philadelphia. Some freight is moved on this predominantly passenger rail corridor. It should be noted that Pennsylvania is dominated by rail traffic moving through the state; more than half (approximately 57 percent) of all freight tons do not originate or terminate in the Commonwealth. See map below that illustrates all the freight rail lines that run through Pennsylvania.

Freight Rail Lines in Pennsylvania



Source: Federal Railroad Administration, 2006

At the other end of the spectrum, there are a number of rail lines in Pennsylvania considered at risk because of low traffic density (1). This means that these low traffic density lines may be abandoned because traffic revenue may not be sufficient to maintain the line. The rail lines at this end of the spectrum are normally the objects of publicly-funded rail preservation efforts when it is deemed that the rail line is capable of growth and development and where continuation of rail service provides public benefits. With annual traffic less than five MGT, 124 Pennsylvania rail lines are considered somewhat at risk of abandonment. Of these 124 lines, 96 rail lines are considered especially at risk because they carry annual traffic of less than one MGT.

Extrapolation of trends which characterize highway traffic over the past twenty-five years indicates an alarming increase of vehicle miles traveled, at a rate of four times population growth. In 2007, 201.6 million tons of freight and 4.2 million carloads passed through the Commonwealth. In 2035, that number is expected to be 246 million tons and 6.3 million respectively. The Pennsylvania Rail Network accounts for 10 percent of all freight tonnage and 13 percent of all carloads in the United States. Over the twenty-five year period spanning 2010-2035:

- State rail volume is expected to grow 1.2 percent annually
- State through rail freight is expected to grow 1.5 percent annually.

- State intermodal freight rail volume is expected to grow 1.8 percent annually.

Indicators of the health of the Commonwealth's existing rail freight infrastructure are as follows:

- **Physical infrastructure and bridge needs:** Approximately 60 percent of the short line and regional railroad physical infrastructure is in need of extensive rehabilitation, including 170 bridges. Bridge repairs are anticipated to be greater than \$ 1 million apiece.
- **Choke points:** There are some forty-five rail traffic choke points throughout the state. Most notable of locations needing capacity improvements include Norfolk Southern's Port Perry Branch and its Lemoyne Connector (linking NS's Lurgan Branch with its Port Road / Enola Branch at Lemoyne on the west bank of the Susquehanna River near Harrisburg).
- **Ability to handle heavy loads:** Excluding the Bessemer & Lake Erie (CN) and Delaware & Hudson Railroads (CP Rail), each of which has heavy load infrastructures, the short line and regional railroads are capable of handling the heavier 286,000 (286K) pound loads on only 70 percent of their infrastructure. In contrast, almost all new freight rail cars being manufactured today, outside of cars being manufactured for use in the transport of Powder River Basin (Wyoming) coal, many of which are the latest generation 315,000 pound capacity rail cars, are 286K capable.
- **Derailments:** Over the period from 2001 to 2005, there was an annual average of 80.4 derailments in Pennsylvania. In 2005, total derailments in the state were down 30.3 percent over the previous year (2004). It is estimated that more than 540,000 carloads of hazardous materials cross Pennsylvania's rail system each year.

KEY FREIGHT CORRIDOR STATUS

Central Corridor

The Central Corridor is the largest corridor in the state. It is operated by Norfolk Southern (NS) and extends the length of Pennsylvania, beginning at the western border near Midland and crossing east to Reading, where it splits northeast to Easton in the I-78 highway corridor and southeast to Philadelphia. There are four Norfolk Southern (NS) intermodal terminals on the corridor: Pittsburgh, Harrisburg, Bethlehem, and Morrisville. This corridor is double-stack cleared and 286K compliant.

Erie Corridor

The Erie Corridor consists of parallel mainline tracks operated by NS and CSX along Lake Erie in northwestern Pennsylvania for approximately 95 miles. This corridor is double-stack cleared and 286K compliant.

I-95 Corridor

The I-95 corridor, in southeastern Pennsylvania, contains the CSX mainline and parallels I-95 at Chester north through Philadelphia to the New Jersey/ Pennsylvania border at Yardley. The corridor contains the CSX intermodal terminal in South Philadelphia. While portions of the I-95 Corridor have been cleared for double-stack trains, sections of track have not, which causes the entire corridor to restrict regional transport. The main track in the corridor is 286K compliant, while feeder lines are not.

Southwest Corridor

This corridor, operated by CSX, crosses the southwestern portion of the state beginning at the Pennsylvania/Maryland border near Cumberland, Maryland, north through Pittsburgh to the Ohio border near New Castle. The Southwest Corridor is part of CSX's National Gateway Program to create an efficient rail route linking Mid-Atlantic ports to Midwestern markets. The corridor is 286K compliant but is not double-stack cleared. The corridor is also in need of additional intermodal yard capacity.

I-81 Corridor

This corridor, operated by NS, parallels I-81 in central Pennsylvania from the Pennsylvania/Maryland border near Hagerstown, Maryland, to Harrisburg. The NS Rutherford intermodal terminal in Harrisburg is on the I-81 corridor and is a part of the NS Crescent Corridor initiative. This corridor is double-stack cleared and 286K compliant. However, the corridor is in need of additional intermodal yard capacity, and track upgrades and speed improvements are needed.

Harrisburg-Binghamton Corridor

This corridor extends north from Harrisburg along the Susquehanna River to Scranton and turns north to Binghamton, New York. The Canadian Pacific Railway (CP Rail) has trackage rights between Harrisburg and Sunbury over NS tracks and operates on its own tracks between Sunbury and Binghamton. This corridor is double-stack cleared and 286K compliant. Track upgrades and speed improvements are needed.

National Gateway Project

The National Gateway project is an \$850 million public-private partnership (P3) that will upgrade tracks, equipment, and facilities, and provide double-stack intermodal clearance. Specifically in PA, the state provided \$35M in investment in 17 clearance projects in southwest PA. One of the 17 projects includes the J&L Tunnel project, located in Pittsburgh. This project will provide vertical clearance along the CSX rail lines through the Tunnel to allow trains carrying double-stack containers. In October of 2012, the project reached the midway point of the National Gateway Project Phase One.

After the completion of the J&L Tunnel, which will improve the access to the intermodal freight shipping options, there will be decrease in cost of doing business in and around the Pittsburgh region, and there will be a decrease of pressure on the regional highways. The J & L Tunnel is a very large part of the first phase of the National Gateway Project, and when it is finished it will help not only Pittsburgh freight traffic, but also freight movement throughout Pennsylvania.

CSX is exploring ways that the National Gateway Project can connect the ports in Virginia and North Carolina with manufacturing centers in the Midwest. The Project is a \$700 million P3 that will upgrade tracks, equipment, and facilities, and provide double-stack intermodal clearance. CSX estimates it will provide more than \$650 million in public benefits to Pennsylvania by:

- Reducing CO2 emissions by 250,000 tons;
- Expanding rail market access potential for the state;
- Enhancing rail transportation infrastructure, including new intermodal terminals in Chambersburg and Pittsburgh;
- Reducing the state's highway congestion by shifting freight from nearly one million trucks to rail, saving more than \$40 million in highway maintenance costs; and
- Saving \$35 million in logistics costs for the state.

Crescent Corridor

Norfolk Southern is focused on the development of its Crescent Corridor, stretching from the Northeast to New Orleans. The Corridor will include a series of infrastructure improvements which include straightening curves, adding passing tracks, improving signal systems, and building new terminals. Norfolk Southern estimates that the annual benefits to Pennsylvania from the Corridor will include:

- 700,000 long-haul trucks diverted to rail,
- 10 million gallons of fuel saved,
- Carbon dioxide reduction of 110,000 tons,
- More than \$9 million in traffic congestion savings,
- Avoidance of an estimated \$8.5 million in accident costs
- 26,000 jobs created or enhanced over the next 10 years.

In Pennsylvania there has been \$65M invested, \$45M in Franklin CO. and \$20M in Harrisburg. One specific project is Norfolk Southern's major coal line through Pennsylvania's Monongahela Valley has received \$22.6 million in improvements. The "Mon Line" moves millions of tons of coal to many electric utility plants and east coast export terminals. Because of such high use and the critical need for this line, work had

to be completed to keep the line safe and to make sure the rail line would be able to serve its customers efficiently.

The work that was completed along this 85-mile line includes:

- 26,904 ties
- 75,000 tons of ballast
- 13 miles of new rail
- Resurfaced 110 miles of rail
- Added 961 new bridge ties
- Replaced 22 culverts
- Cleaned and upgraded 40 road crossings
- Replaced a retaining wall
- Replaced a 140 foot timber bridge with a ballast deck structure
- Installed of new signals

As part of this project in Pennsylvania, Norfolk Southern's plans include:

- \$95 million for a new intermodal facility in Franklin County, near Chambersburg,
- \$52 million in improvements to its existing Harrisburg intermodal terminal, and
- \$27 million in track and signal upgrades in Berks, Chester, Cumberland, Dauphin, Franklin, Lebanon, Lehigh, Montgomery and Northampton Counties

Rail and Natural Gas

Pennsylvania's short-line rail has allowed for efficient movement of supplies needed for drilling the Marcellus Shale. These supplies include frack sand (70% to 75% of which is transported by rail), pipe, machinery, and a variety of chemicals that are used in the hydrofracking of the Marcellus Shale. Because there is such high use of rail in this industry, railroads have been buying special freight cars that are specifically designed to move frack sand. For example, CSX has purchased about 900 cube hoppers that are used for this purpose. With the vast use of rail in this industry, railroads are investing in their infrastructure to support the heavy loads. Natural gas drilling has resulted in tremendous growth in the freight rail industry, which has led rail companies to continue to invest in their infrastructure.

FUNDING AND FUTURE NEEDS

The Pennsylvania Department of Transportation (PennDOT) has funded rail freight infrastructure by means of the Rail Freight Assistance Program (RFAP) Capital Budget

Grants for doublestack projects (freight containers that are stack two high on rail cars) and clearance projects. The doublestack projects were completed and funded between 1991 and 1996. RFAP was created by the Commonwealth's Rail Freight Preservation and Improvement Act of 1984, No. 119, which provides funds to preserve essential rail freight service and stimulate employment through generation of new or expanded rail freight service. Capital Budget Grants have also been funded annually to help pay for freight infrastructure improvements. Act 89 of 2013 has provided PennDOT with a consistent funding source for future RFAP projects. Fiscal year 2013 authorized \$8M, with an increase to \$10M in fiscal year 2014 and beyond. Capital Budget funding has remained consistent at \$30M in 2012 and 2013. In 2011 XXXX(who added the funding??) added a recurring authorization of \$1M each year from the collection of Marcellus Shale drilling impact fees. Funds provided by the Act are reinvested in rail freight projects in the Marcellus Shale regions of the commonwealth.

PennDOT also established the Pennsylvania Infrastructure Bank (PIB) for rail freight projects and provided \$500,000 in initial seed capital to kick-start a program that provides low-interest loans to railroads and shippers for their use on railroad infrastructure projects. The PennDOT Freight Bureau periodically adds funds to PIB. Also, the bank does slowly grow its funding because when payments are made with interest they are able to provide a new loan with their slightly increased funds.

PennDOT is beginning to utilize other funding programs to complement their RFAP and capital budget programs. These include the Congestion Mitigation Air Quality (CMAQ), TIGER funding and various grants through the FRA. Additionally, Pennsylvania's Department of Community and Economic Development (PADCED) administers several economic development loan and grant programs that assist rail infrastructure expansions, including the Infrastructure and Facilities Improvement Program, the Tax Increment Financing Guarantee Program, the Business in Our Sites Program, and the Infrastructure Development Program.

As of the passing of a recent Capital Budget Act by the Pennsylvania Legislature (Act 40), statewide rail freight industry infrastructure need, as measured by projects contained in that legislation, totaled \$15 million in 2009 State Capital Budget dollars requested. In another study, annual track and bridge expenditures for all railroad classes within the state are projected to be approximately \$136 million. As stated earlier, the larger railroads are more able to cover their financial needs. Smaller railroads are not as affluent and need the most assistance. Clearly, increased state funding would be most helpful and a sound investment.

Much success has and can be accomplished with public-private innovative financing for maintenance and improvement of rail infrastructure. Following are some examples.

1. The Philadelphia Regional Port Authority (PRPA) received a large grant from the PennDOT Rail Freight Assistance Program for major improvements at Tioga Marine Terminal. Of the total project cost of \$475,000, PRPA's grant was \$332,500 or 30 percent. The rail improvements will allow larger and heavier rail cars to enter the facility and provide better at-grade crossings.

2. In November 2010, \$32.5 million was announced would be invested in rail freight. This large investment will go toward upgrading infrastructure and adding capacity of rail freight across the state as well as creating up to 2,500 jobs in 28 counties.
3. In February 2012, through the Capital Budget/Transportation Assistance Program, \$23 million in grants would help support 16 rail projects throughout the state. Most (if not all) of the 16 projects encompass the rehabilitation of infrastructure, which include rail track, bridges, and facilities improvements.
4. In 2012, the Pennsylvania State Transportation Commission approved almost \$18.6 million in grants for 24 rail projects across the state. With Pennsylvania having the highest number of short line railroads in the country, this large sum of grant money will help rehabilitate rail infrastructure throughout the state. The projects include rail track rehabilitation, rail bridge replacement, and terminal expansion. Similarly, in 2013, the state approved \$25.8 million in grants for freight rail.

Use of public funds to leverage private funding through a public-private partnership (P3) is one method of financing where there are both public and private benefits. Pennsylvania's Conrail double-stack project of the 1990s is a prime example, in which the state funded \$35.8 million of the \$100 million project. Other Pennsylvania projects now under consideration or which have been recently completed, include:

1. A \$30 million public/private initiative to improve 16 bridges in southeastern Pennsylvania to accommodate double-stack trains was announced in November 2009 with CSX.
2. \$11 million has been committed by Pennsylvania and Norfolk Southern to the railroad's Philadelphia Navy Yard Intermodal Facility. The investment of \$5 million by the state and \$6 million by Norfolk Southern will expand track and parking, nearly doubling the size of the rail yard. The investment is part of Norfolk Southern's multistate Crescent Corridor Initiative is aimed at establishing a high-speed intermodal rail-freight route between the Gulf Coast and the Northeast.

The state's \$5 million investment is part of a \$45 million commitment made by the Commonwealth in August 2009, which will be allocated over three years and will be matched with \$79 million by Norfolk Southern and an anticipated \$61 million in federal support. Pennsylvania partnered with Norfolk Southern and four other states in September to apply for \$300 million in American Recovery and Reinvestment Act (ARRA) funds for the Crescent Corridor.

3. Two Beaver County projects that received grants show how the program helps to preserve existing rail service and ensures the retention of industries and jobs in the community. Aliquippa and Ohio Railroad will use its \$357,000 grant to rehabilitate the seven-mile railroad on the former LTV Steel site outside Aliquippa to provide service to existing and new customers who are experiencing increased cargo volume. One of these new customers is Wolfpac Technologies, a manufacturer of extruded plastic products, which is receiving a grant of \$82,527 to rehabilitate a rail siding to service its new facility.

4. In addition to grants that preserve existing service, many grants help establish new or expand existing rail freight service. In Huntingdon County, for example, New Enterprise Stone and Lime will receive \$537,000 to reinstate rail service and expand rail infrastructure to increase aggregate shipments from its Union Furnace Quarry.
5. Another grant recipient is Kinder Morgan, the operator of the port at the Keystone Industrial Port Complex along the Delaware River in Bucks County. A \$700,000 grant will be used to replace and repair existing track and for the relocation and new construction of an outbound train loading yard. The upgrades will ease the movement of cargo from ships to freight rail cars.

The following table summarizes the benefits of rail freight assistance.

Rail Freight Assistance Benefits 2008-2014

Fiscal Year	Grant Type	State Investment	Total Project Cost	Number of Projects Funded	Jobs Created	Trucks Removed
2012	RFAP	\$6,122,099.00	\$8,745,855.00	18	440	124796
2012	CB	\$44,430,080.00	\$63,471,542.00	21	2165	854136
2012	Act 13	\$523,000.00	\$747,143.00	1	0	6251
Total		\$51,075,179.00	\$72,964,540.00	40	2605	985183
2013	RFAP	\$5,871,022.00	\$8,440,895.00	15	848	64272
2013	CB	\$27,442,141.00	\$39,203,059.00	14	3615	138232
2013	Act 13	\$1,307,000.00	\$1,867,143.00	4	197	18604
Total		\$34,620,163.00	\$49,511,097.00	33	4660	221108

Key: RFAP = PA State Rail Freight Assistance Program

Capital Budget (CB) – Portion specifically for Rail Freight

A widely held and strongly felt opinion, recorded in a recent survey of Pennsylvania's Metropolitan Planning Organizations (MPOs) and public rail authorities, resulted in a finding that there is widespread approval of Pennsylvania's funding of rail freight programs and that more RFAP and Capital Budget funding is required. Also, most states regularly look to Pennsylvania as a leader with respect to rail freight government support and regularly seek its advice.

POLICY OPTIONS

Solutions that would ease the increasing demands on Pennsylvania's heavy rail transportation system and improve freight conditions, capacity, and safety are multi-faceted. The four Pennsylvania sections of the American Society of Civil Engineers (ASCE) urge the legislature to:

Continue its model of excellence. The Commonwealth must continue to build on its excellent model, increase transportation investment at all levels of government, and make use of the latest technology.

Support multi-modal transportation. Cities and communities should not be short-sighted concerning freight planning and should also look at statewide planning and connectivity to maximize their own intermodal options. Freight planning in the Commonwealth should include consideration of all transportation modes and should be developed as an outgrowth of the new Mobility Plan.

Link planning efforts. The Commonwealth's freight planning effort should dovetail with both the new National Freight Plan and the freight plans of Pennsylvania's neighbor states (New Jersey, New York, Ohio, Maryland, Delaware, Virginia, and West Virginia).

Recognize the connection between railroads and highways. There also needs to be awareness at the national and state levels that diverting freight movements from our highways can best be accomplished by expanding the rail infrastructure and by mitigating or eliminating existing choke points. Government entities must be able to accept the rationale that allocating more public funds will help reduce this pressure on the highway side.

RECOMMENDATIONS

The four ASCE sections in Pennsylvania recommend the following:

- Provide additional state and national rail funding to meet current needs. This includes being able to fund larger projects that can be supported over multiple contract years.
- Upgrade small railroads to 286,000-pound railcar capability where merited.
- Promote more double-stack intermodal clearance projects where required.
- Support freight movement projects facilitating intermodal growth such as transfer facilities.
- Mitigate existing congested areas to improve capacity.
- Support innovative, public-private financing agreements for freight projects.
- Help to preserve Rights-of-Way wherever possible and not allow rail property to be sold for non-commerce use.
- Inventory and aggressively market freight connections in land packages to prospective business owners looking to bring business to Pennsylvania.

- Facilitate the use of freight trackage to support passenger rail use where practical.
- Continue to advance the efforts to promote freight planning at the local/MPO level and, thereby, continue to improve coordination between local levels and the State planning agency, and add to the noteworthy inroads that have already been made in freight planning at many of Pennsylvania's MPOs/RPOs.
- Seek new, innovative sources of federal and state funding for rail freight investment to specifically reduce highway congestion and improve the overall level of transportation safety in the Commonwealth.

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ASCE POLICY STATEMENTS

- ASCE Policy Statement 149: Intermodal Transportation Systems (PS 149)
- ASCE Policy Statement 496: Innovative Financing for Transportation Projects (PS 496)
- ASCE Policy Statement 521: Rail Infrastructure Investment (PS 521)
- ASCE Policy Statement 532: National Infrastructure Bank (PS 532)