



PENNSYLVANIA INTERCITY
**passenger
& freight**
RAIL PLAN

Appendix 7

Investment Plan

Appendix 7

Investment Plan

Introduction

The purpose of this Appendix is to provide Pennsylvania freight and passenger rail corridor development and investment recommendations, strategies, and evaluation criteria as a framework for the state to follow in order to achieve its vision.

The passenger rail system should be safe, comfortable, convenient, connected, and sustainable. To meet the plans, goals and objectives, the rail system should reinforce Pennsylvania's cultural and commercial centers, and allow for a better quality of life, improved mobility, and economic sustainability.

Intercity rail travel is unique in that passengers have the ability to move about the vehicle, to dine, relax, or work while the train is in motion. To achieve the vision of a comfortable rail system, the Pennsylvania system should offer universal access and a high degree of comfort for passengers of all types. This includes a focus on families, people with mobility needs, and business travelers, among other types of users. Amenities can include areas to work, areas to eat, and areas to socialize within the train environment. Stations, likewise, should offer amenities and services for passengers and serve as gateways to Pennsylvania's towns and cities. In terms of convenience, schedules should be arranged to offer competitive travel times and reasonable frequencies, and train equipment should be

designed to be comfortable and have the amenities of modern travel.

Passenger rail service in Pennsylvania should provide a network that connects the Commonwealth's cities with each other and the towns between

them. The network should also connect the Commonwealth with the economic centers of adjacent states, and indeed the entire country. The passenger transport network could also serve colleges and universities, natural areas, historic landmarks, and other popular destinations. Communities and locations that cannot be efficiently served by passenger rail should be integrated into the network via coordinated public transportation and intercity bus services. Car rental, car sharing, taxis, sidewalks, and bicycle networks will allow passengers to continue their journeys beyond the train station, to homes, workplaces, and other destinations.

The rail system should help foster sustainable growth and strong local economies. Land use planning in the Commonwealth should be coordinated with the rail system so that new growth can be served, thus helping to mitigate the impact on the highway network and conserve





agricultural and natural lands. A robust passenger rail network can help Pennsylvania achieve its land use goals of preserving natural resources and rural land, while focusing development in existing communities. Train stations in the centers of communities can help to attract investment in downtown areas with Transit-Oriented Development (TOD). By focusing development back into existing communities, development pressure can be reduced in sensitive areas such as agricultural land, forests, and natural zones. The rail service should help to recruit and retain businesses to the state, while also providing convenient access for commerce. The design of development adjacent to passenger stations will reinforce ridership and bolster the system.

Intercity Passenger Rail Implementation Strategies

Consideration should be given to application of the following strategies in development of the state’s passenger rail system.

- **Organize and communicate with the constituents.** The rail network has numerous constituents across the state. A forum and clearinghouse could be implemented in order to create a two-way flow of information about rail planning and operation, and to build capacity for implementation.
- **Coordinate rail planning with other states.** Many of Pennsylvania’s principal rail corridors connect with other states. Coordination of planning efforts and the forging of strong departmental ties across state lines may enhance existing lines and implement new rail services. Coordination within the region on projects is essential to ensure that all factors are accounted for in planning, design, and operations.
- **Improve transit agency interaction.** Communication and coordination among multiple transit carriers can facilitate more efficient and effective information, marketing, ticketing, and

Connections to the Future 2035

operations activities to allow for interlined service, through running, sharing of assets, and coordinated planning, marketing, and information systems. This helps to create a seamless system among carriers. This type of communication can overlap multiple transit agencies in order to integrate services.

- **Preserve and protect rail rights-of-way.** The state has a direct interest in preserving rail right-of-way intact so as to protect future transportation capacity and provide flexibility for increasing rail service in the future. The state could intervene to purchase, hold, improve, and protect rail rights-of-way that are abandoned or threatened with abandonment. The disposition and ownership of rail corridors should be considered in the context of public interest and strategy.

System optimization strategies for application of best practices in management and operation of the state intercity passenger rail system.

- **Achieve a state of good repair.** Pennsylvania’s existing passenger rail system has a large backlog of capital projects that are required to maintain assets in a fully functional and secure position. For example, infrastructure needs to be refurbished or replaced on an ongoing basis, and key stations need to be made fully accessible for passengers with disabilities. Eliminating the maintenance backlog and modernizing assets are priorities for investment.
- **Use the timetable-driven planning method for rail system planning.** The first action is to create a future timetable to serve as the basis for system planning. The timetable is focused on creating connections at pulse hubs (as opposed to simply maximizing average speeds). To make connections, services generally operate on a clock face schedule. After the timetable is prepared, the infrastructure and rolling stock is specifically



adapted to serve the timetable with sufficient capacity and speed. In this way, capital expenditures are optimized for the intended service plan.

- **Use technology before concrete.** Technological improvements to signaling and rolling stock can sometimes increase speeds as much as major right-of-way projects. For example, tilting trains can increase speeds without straightening curves. All available means to increase speeds and productivity should be examined, with a focus on cost-effective technologies to improve efficiencies of the existing network.
- **Optimize rail corridors.** Optimization is the process of maximizing efficiency and reliability. Typical investments include upgrades to infrastructure to ensure compatibility between safe freight and passenger operations, as well as removal of conflict locations and bottlenecks. Projects can include interlockings, station improvements, grade separations, superelevation of curves, upgraded signals, and other infrastructure investments that improve operations. These investments should be considered within the framework of the timetable to plan to gauge cost-effectiveness.
- **Work with local jurisdictions to prepare station plans.** Zoning updates, new station facilities, and master plans are needed at rail stations to prepare the sites for investment that would be associated with increased rail service. Many stations need multi-modal improvements (for example, bus transfer facilities). Some stations offer the opportunity for transit-oriented development.
- **Design stations as intermodal connection hubs that integrate all transportation modes.** All typologies of stations, from rural to big cities, require attention to maximize connections, including local transit, bicycles, pedestrians, and automobiles. The

overarching policy should be to convert stations into hubs that connect all the available transportation modes as seamlessly as possible for the transit user.

- **Implement new thruway bus connections.** Increased use of thruway bus connections could feed new ridership to existing and proposed train services. Thruway buses could be listed in the train timetable and offer an integrated connection to destinations not on the rail corridor, or during times of day without rail service. State College is an example of a major travel market that could benefit from thruway service from an intercity rail passenger station.
- **Integrate local and intercity rail systems.** Amtrak and commuter rail often operate as independent systems. If the systems were integrated, it could be possible to travel to a much greater number of rail stations—the commuter rail network also serves as a major feeder to intercity trains and vice versa. Furthermore, capacity of the network could be optimized by rationalizing train schedules.
- **Integrate airports and the passenger rail system.** Train to plane connections could improve mobility, lower travel costs, relieve congestion, and reduce environmental impacts. Several





opportunities exist to connect the rail system to Commonwealth airports.

- **Work with the federal government to implement initiatives such as electrification or green technology on the railroad network.** Electrifying the railroad network can possibly lower operating costs, improve customer service, reduce environmental impacts, and help reduce reliance on fossil fuels.

Network development strategies to build an intercity passenger rail network that connects the population centers of Pennsylvania and surrounding states.

- **High-Speed rail and conventional rail.** High-Speed rail has been identified by the federal government as an important travel mode for America’s future, with great potential to improve transportation. Conventional passenger rail can effectively serve many travel markets—especially where distances are short, which is typical in parts of Pennsylvania. The two passenger modes can work in tandem to create a connected and integrated system.
- **Prioritize a Core Network that serves the largest travel markets.** An interconnected core network is composed of high priority corridors. While strong as independent lines, when connected they tie together major population centers of the state. The focus should therefore be on a unified system plan, with connections among lines and an integrated approach to operations, infrastructure, and rolling stock. Some of the core network may be a candidate for High-Speed rail.
- **Allow for an extended network to connect smaller destinations.** The extended network may carry a lighter travel volume, but opportunities may exist for relatively low-cost implementation of

Connections to the Future 2035

feeder services to the core network. For example, partnerships with regional railroads and shortlines may allow initiating service on these lines.

- **Partner with host railroads.** The core passenger network largely overlaps the priority freight rail network. Investments in each form of rail can provide benefits to the other. In the future, passenger and freight operations may safely coexist on an upgraded national system that carries substantially more traffic than today. Other states are working on passenger rail programs in partnership with host railroads.
- **Move forward with necessary federal studies.** Certain rail corridors are largely “shovel ready” because they have substantial planning and design work completed. Other corridors are conceptual. To move forward with these corridors, the state may choose to perform the necessary studies to move the projects to “shovel ready” status.

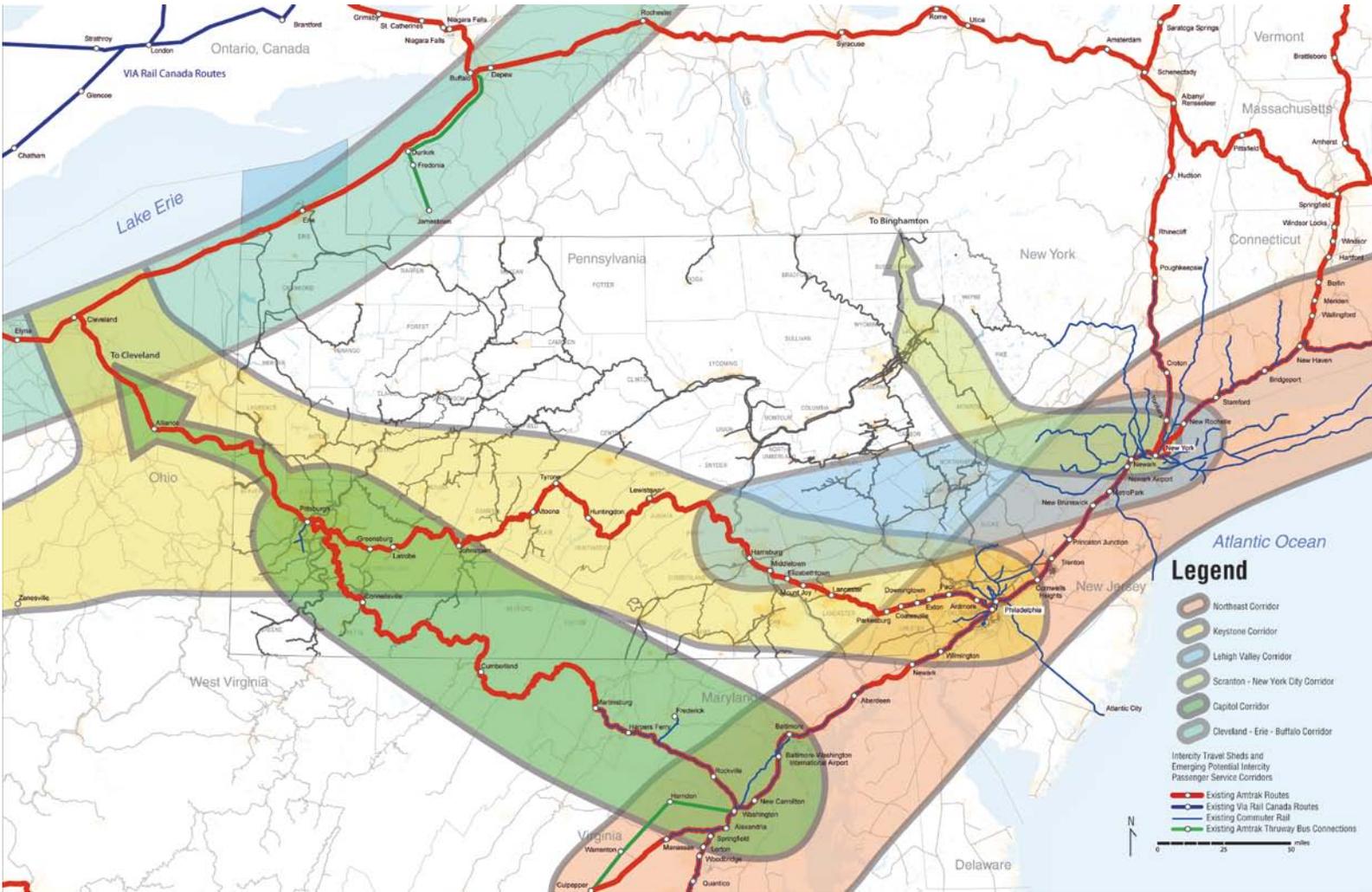
Travel Sheds and the Core Intercity Passenger Rail Corridors

As documented in Appendix 6 of this plan, Pennsylvania has a regional economy. It is composed of many centers that are interrelated and tied together by webs of commerce, culture, and community. The role of the transportation network is to reinforce the regional economy by providing mobility among the centers and extensions to surrounding state travel corridors.

Figure 7-1 represents the Priority Passenger Rail Corridors that connect the centers. The Commonwealth contains six intercity travel sheds that represent pairs of origins and destinations between population centers of the region.



Figure 7-1: Priority Passenger Rail Corridors





Pennsylvania should focus passenger rail investments in the following six priority corridors that comprise the core passenger rail network, including the implementation of High-Speed Rail:

- Northeast Corridor (Boston-New York-Philadelphia-Washington, D.C.)
- Keystone Corridor East (Philadelphia-Harrisburg) and West (Harrisburg-Pittsburgh) and possible future inclusion of the Pittsburgh-Cleveland Corridor (Pittsburgh-Youngstown-Cleveland)
- Lehigh Valley Corridor (Harrisburg-Reading-Allentown-Bethlehem-New York City)
- Scranton-New York City Corridor
- Capitol Corridor (Chicago-Cleveland-Pittsburgh-Washington, D.C.)
- Cleveland-Erie-Buffalo Corridor



Pennsylvania Passenger Rail Corridors Network

Priority Corridors

The Priority Corridors are a set of passenger rail routes connecting the major population centers of the state. These routes are likely to be the highest priority for implementation of improvements. These corridors:

- Perform well under the evaluation criteria described in the Plan.
- Overlay many of the priority freight rail corridors, offering a potential for coordinated investments.

Connections to the Future 2035

- Reflect the major passenger travel flows in Pennsylvania.
- Operate as an integrated system that creates a large matrix of origins and destinations.
- Integrate Megaregions (connect the Northeast Megaregion and the Great Lakes Megaregion).
- Connect Metropolitan Areas.
- Provide interconnectivity.

Corridor Descriptions

The following describes the priority passenger rail network described by this state intercity passenger rail plan.

The Northeast Corridor

Amtrak’s Northeast Corridor, which runs from Boston through New York City and Philadelphia to Washington, D.C., is the busiest and fastest rail corridor in the United States, with the maximum load



point between Philadelphia and New York City. Thus, Pennsylvania has an important stake in shaping the future of this corridor.

Keystone Corridor East

The Keystone Corridor East connects Philadelphia, Lancaster, Harrisburg and intermediate points. It is owned by Amtrak and serves Amtrak’s Keystone and Pennsylvanian service, SEPTA’s R5 Paoli-Thorndale, and minor freight operations.

There are many connections to public transportation along the corridor,



including bus service from SEPTA, Red Rose Transit Authority (RRTA), and Capital Area Transit (CAT). However, very few of the connecting bus routes are timed to meet Keystone trains.

The State of Pennsylvania has submitted an application to fund substantial upgrades to allow future operation at 125 mph that will reduce trip times between Harrisburg and Philadelphia to one hour and twenty minutes.

Key actions in the application include:

- Removal of three remaining at-grade road crossings.
- Reconstruction of interlockings and switches.
- Increased capacity and express tracks.
- Improved station facilities with 500-foot-long, high-level platforms at Exton and Ardmore.
- Improved signaling connected to Centralized Electric and Traffic Control (CTEC).

Keystone Corridor West

Traversing a sparsely populated and mountainous region, the Keystone Corridor West between Pittsburgh and Harrisburg is the passenger rail link between the cities of the Northeast Megaregion and the Great Lakes Megaregion. Nevertheless, the Keystone Corridor West provides critical mobility to the communities and natural attractions of central Pennsylvania, such as Greensburg, Altoona, and Johnstown, as well as connections to Penn State University and the multitude of state parks and other attractions in the Allegheny Mountains.

The Pennsylvania Railroad prided itself on high quality engineering. This pride is evident on the Keystone Corridor, with its multiple-track

configurations and tunnels. Norfolk Southern owns the line today and uses it as a major freight route between the Midwest and the East Coast. While Norfolk Southern has pared down portions of the line from four-track to double- and triple-track segments, the right-of-way remains to accommodate significant capacity increases and frequent passenger service.

The Keystone Corridor West could function as the spine for a passenger rail and bus network linking central Pennsylvania communities to each other and to the megaregions at either end of the state. Local transit and feeder bus services can extend the rail network to communities and destinations deep into the mountains.

The Pittsburgh to Cleveland corridor is a 140-mile corridor linking two very large metropolitan areas with several mid-sized communities along the way. At present, passenger rail service in this corridor is very poor. Only one Amtrak train per day operates this segment and its on-time performance is unreliable. This corridor could be considered as a future extension of the Keystone Corridor West.

Lehigh Valley Corridor

The Lehigh Valley Corridor runs from Harrisburg to New York City via Reading, Allentown, Bethlehem, and Easton. This corridor is a critical link that would tie together many of the individual corridors in the eastern Pennsylvania network and provide new service to the largest metropolitan area in the United States.

The existing rail line in this corridor is strategically important for Norfolk Southern and forms one branch of the railroad's Crescent Corridor. Much of the route is double-tracked and there are portions of right-of-way that are capable of accommodating triple-track configurations.



Scranton-New York City Corridor

This Scranton to New York City corridor has been identified by PennDOT and New Jersey Transit as a priority corridor for implementation of rail service in the near term. Some of the highest population growth rates in the state are found in this corridor as housing prices in the New York City market have pushed residents to peripheral areas in Monroe County and the Stroudsburg area.

The portion of the corridor proposed for rail service in Pennsylvania is an underutilized line owned by the Pennsylvania Northeast Regional Railroad Authority (PNRRA). The State of Pennsylvania has submitted an application to fund upgrades to the corridor which would allow for the reinstatement of passenger rail service to Hoboken, New Jersey, and New York City via transfers at Andover, New Jersey, and Secaucus Junction station. The service plan for the line envisions the eventual operation of nine round trips per day between Scranton and Hoboken.

Key actions in the application include:

- Construction of six passenger stations in Pennsylvania: Scranton, Tobyhanna, Mt. Pocono, Analomink, East Stroudsburg, and the Delaware Water Gap.
- Minor rehabilitation of existing bridge and right-of-way structures.
- Upgrading of track where necessary.
- Construction of a two-mile long siding east of East Stroudsburg station.

Capitol Corridor

The Capitol Corridor runs from Washington, D.C., to Pittsburgh and

extends to Cleveland and Chicago. The rail right-of-way presently exists with limited service from Washington, D.C., via Pittsburgh to Cleveland and Chicago.

An alternative travel path exists for this corridor. Frequent Amtrak service is available from Harrisburg to Washington, D.C., but passengers must travel to Philadelphia and change trains. This indirect route takes over five hours in spite of the fact that both links are on electrified lines with service over 100 mph.

However, the right-of-way options for such a service are limited. One potential route has had major segments abandoned or converted to a rail trail. Another route would follow Norfolk Southern's route along the Susquehanna River, which would bypass many population centers and not provide a significant travel time savings. Other issues that must be resolved include creating a high speed junction into the Northeast Corridor north of Baltimore and a lack of adequate track capacity at Baltimore Penn Station. The high volume of travel and lack of alternative modes in this corridor indicate that there may be sufficient ridership to warrant passenger rail service even if it requires some new right-of-way acquisition.

Cleveland-Erie-Buffalo Corridor

Located on the shores of Lake Erie, the City of Erie is well-positioned in an important transportation corridor between Buffalo, New York, and Cleveland, Ohio. Geographically isolated from most major population centers in Pennsylvania, much of Erie's future success will lie in its relationship to these other cities and the Great Lakes Megaregion.

Both Norfolk Southern and CSX own rail lines in this corridor that serve Erie. Current Amtrak service operates on the CSX line, with a station in



downtown Erie. As part of its Ohio HUB plan, the State of Ohio plans to support rail service to Erie with continuing service to Buffalo and connections to Toronto in the future. While Erie service would be the last phase of the Ohio HUB development program, the State of Pennsylvania could begin coordination efforts with Ohio to speed development of this service.

Extended Transportation Corridor Network

The extended transportation corridor network is a collection of routes with a potential for transit service but which are not a high priority due to generally lower travel demand, shorter distances, or other factors. In many cases infrastructure exists that could be utilized for passenger service, if sufficient resources were available. The extended transportation corridor network routes are:

- Pittsburgh-Columbus-Cincinnati
- Hazleton-Jim Thorpe-Allentown
- Pottsville-Reading
- State College connectors
- Binghamton-Scranton
- Martinsburg-Hagerstown-Chambersburg-Carlisle-Harrisburg
- Gettysburg-York-Lancaster-Reading
- Pittsburgh Airport Connector

High-Speed Rail Network

High-Speed rail is an evolutionary jump beyond conventional passenger trains. Around the world it is common for high-speed rail systems to operate in the range of 200 mph, almost double current maximum speeds in Pennsylvania. These systems often mingle with conventional trains on

existing tracks in congested urban cores, but operate on dedicated track systems in rural areas. Any proposed Maglev systems would be included in this category.

Pennsylvania High-Speed Rail in the National Context

Pennsylvania has two proposed high-speed rail corridors:

- **The Northeast Corridor** is perhaps the best candidate for high-speed rail in North America. The geographic conditions are highly favorable to high-speed operation and strong cost recovery.
- **The Keystone Corridor** connects Pittsburgh, Harrisburg, Philadelphia, and intermediate points. To attain truly high speeds west of Harrisburg, this corridor will require extensive new construction. However, it is probably the shortest and most effective route between the eastern seaboard and Chicago.



Applications for funding High-Speed rail improvements for these two corridors have been submitted to the federal government by the Commonwealth.

Corridor Evaluation

The passenger rail corridors previously identified are intended as a planning tool to be used by the state in making future passenger rail investment decisions. It is recognized that there are severe funding



constraints that significantly impact and make achieving the passenger rail—as described by the high-speed rail, core, and extended passenger rail networks—in this report by 2035 a virtual impossibility. An evaluation matrix is therefore necessary, to provide the state with guidelines to assess corridors in terms of established criteria in order to make informed investment plan decisions, moving forward toward achieving its 2035 passenger rail goals and objectives. Criteria were developed to evaluate potential corridor investment and were based on criteria developed earlier for the *2001 Statewide Passenger Rail Needs Assessment* and three developed by PennDOT for this Rail Plan. Similar criteria were developed to evaluate both passenger rail and freight rail corridors. In addition, Congress included considerations for rail investment under the Passenger Rail Investment and Improvement Act of 2008 (PRIIA). The list of nine evaluation criteria was compared to the seven federally-legislated considerations from PRIIA to ensure that all congressional concerns were addressed. It was determined that the nine criteria sufficiently addressed the considerations from PRIIA. Figure 7-2 demonstrates how the federal considerations and evaluation criteria relate to each other.

The evaluation criteria include:

- Infrastructure and Right-of-Way Availability
- Market Size and Trends
- Major Destinations and Trip Generators
- Transportation Patterns and Travel Demand
- System Connectivity and Intermodal Links
- Land Use Impact and Smart Growth
- Environmental Sustainability
- Other Public Benefits
- Financial Contributions

Each corridor should be evaluated using these criteria. Some of the marks may be determined based on available or projected data while others may be produced based on public input and professional judgment. Other criteria may not be fully evaluated without further study. A more detailed discussion of the factors is described below.

Infrastructure and Right-of-Way (ROW) Availability

It may not be feasible to purchase new right-of-way, or repurchase or reconstitute pieces of abandoned right-of-way. In some cases, right-of-way still exists, but it has been rail-banked or even become a rail-trail.

The factors for evaluation of infrastructure and right-of-way include:

- Infrastructure quality including completeness of the ROW and condition of existing rail infrastructure.
- Adequacy of the corridor for passenger rail service. Factors included directness of the line, existing and potential capacity, signal systems, train congestion, and the volume of grade crossings.
- Importance of the corridor to host railroads and existing freight operators on the line.

Market Size and Trends

This criterion evaluates the potential for rail ridership based on existing population and employment in the corridor as well as future growth trends for both based on projections for the year 2039.

The factors for evaluation of market size and trends include:

- Population density and trends in counties along the corridor.
- Job density and trends in counties along the corridor.



Figure 7-2: Potential Evaluation Criteria

Potential Evaluation Criteria

Federal Legislative Considerations (PRIIA)	• Infrastructure and ROW Availability	• Market Size and Trends	• Major Destinations & Trip Generators	• Transportation Patterns and Travel Demand	• System Connectivity and Intermodal Links	• Land Use Impact and Smart Growth	• Environmental Sustainability	• Other Public Benefits	• Financial Contributions
• Rail capacity and congestion effects	X				X				
• Effects on highway, aviation, and maritime capacity, congestion or safety		X	X	X	X	X		X	
• Regional balance		X			X			X	
• Environmental impact	X					X	X	X	
• Economic and employment impacts		X	X	X		X		X	
• Contributions made by non-Federal and non-State sources through user fees, matching funds or other private capital involvement						X			X
• Projected ridership and other service measures for passenger rail projects		X	X	X	X				



Major Destinations and Trip Generators

Population and employment trends are proxy factors to determine potential ridership. Another way to estimate potential ridership is to evaluate major destinations and trip generators. This criterion evaluated the presence of large trip generators along passenger rail corridors. The factors for evaluation of Major Destinations and Trip Generators include:

- Major urban centers in terms of their ability to generate large numbers of visitors and tourists.
- Major employment centers because of their ability to attract employees and new companies through economies of scale.
- Major mixed-use developments served.
- Tourist attractions such as historic sites, amusement parks, and ski areas.
- Sporting events, including collegiate and professional sports teams as well as the size of stadia.
- Colleges and universities served because of their high concentrations of car-free residents and the role they play in attracting visiting scholars, guest lectures, and special events.
- Cultural and entertainment venues such as amphitheaters, concert halls, theaters, and museums.
- Natural attractions such as state parks, forests, rail trails.

Transportation Patterns and Travel Demand

Existing travel patterns can provide some insight into the potential demand for passenger rail service in a corridor. This criterion was evaluated by a combination of factors including existing highway volumes as well as rail, bus, and air service in a corridor. However, existing service does not necessarily represent potential demand for rail because trains

may be able to provide better service at a lower cost than the existing alternatives, which would relieve pent-up demand. Nonetheless, this criterion is intended to give some idea of the potential demand for rail service in a corridor.

The factors for evaluation of Transportation Patterns and Travel Demand include:

- Traffic volume (AADT – Annual Average Daily Traffic) on major roads serving the corridor using PennDOT and Federal Highway Administration count data.
- Highway congestion on major roads serving the corridor. Sometimes congestion occurs outside of typical rush hours and this was taken into consideration where observed.
- Existing intercity bus service between cities.
- Existing air service between cities in the corridor. Primarily, this criterion evaluates air service from cities in the corridor to airports that are within a distance that could be adequately served by passenger rail. Generally, trips of about 200 to 300 miles in length can be time-competitive with air service when door-to-door travel times are considered.
- Existing ridership levels on intercity rail service where available.

System Connectivity and Multimodal Links

Connectivity between rail stations and a passenger’s starting point or final destination is a very important factor in a potential passenger’s decision to use the rail network. Long-distance connectivity to destinations far from the rail line and connectivity to bicycle and pedestrian networks are critical to providing transportation for the “last mile” of any trip. A corridor with a high degree of intermodal connectivity will have more success at attracting rail passengers than one where the only option to



get to and from the station is a private car.

The factors for evaluation of System Connectivity and Intermodal Links include:

- Connections to other intercity rail routes along the corridor.
- Connections to commuter rail, urban heavy rail, and light rail transit.
- Connections to intercity bus services.
- Connections to local transit or shuttle bus services.
- Quality of the pedestrian environment and sidewalks around stations in the corridor.
- The availability of car sharing and rental cars at stations in the corridor.
- The existence of a safe bicycle network around stations in the corridor, including bike lanes and paths, parking, bike rental, and bike sharing availability.

Land Use Impact and Smart Growth

Passenger rail service can have a profound impact on land use and urban development patterns. Increased access adds value to land and makes development more attractive. Unchecked, however, development can become undesired sprawl. It is important that communities have up-to-date land use plans in place in order to preserve community character and open space while benefiting from the new residents and jobs that rail service can bring. Beyond simple land use plans, there are many “Smart Growth” tools available to Pennsylvania communities to ensure that good intentions turn to actions.

The factors for evaluation of Land Use Impacts and Smart Growth include:

- Whether communities in the corridor have complementary and up-to-date plans in place. This includes land use plans with smart growth policies, transit-oriented development plans, redevelopment area plans, and economic development plans.
- Whether there is local government support for smart growth policies.

In addition, improved rail access could also provide residents with improved mobility and access to jobs in other areas, which could contribute to a decline in opportunities for local markets.

Environmental Sustainability

As the most efficient form of transportation, passenger rail service has the potential to provide many environmental benefits to Pennsylvania. For example, rail service could have positive impacts for the environment by reducing VMT and replacing flights. However, there are potential trade-offs. True High-Speed Rail service requires purchasing new ROW and disruptive civil works such as tunnels and large cuts. New rail construction can disrupt water flow in wetlands and divide wildlife habitat. Fast train service also creates high noise levels, which can be harmful to humans and animals.

The factors for evaluation of Environmental Sustainability include:

- Potential air quality impacts from rail service including carbon emissions and particulates.
- VMT effects.
- Noise pollution related to high speed rail service.
- Impacts to the natural and built environment including tunnels, bridges, and ROW acquisition.



Other Public Benefits

There are many potential benefits of passenger rail service that are intangible or not readily apparent in ridership statistics and revenue results. For example, rail service can reduce maintenance requirements on roadways and relieve air traffic congestion by shifting travel from cars and planes. By providing another travel option, passenger rail can create a more resilient transportation system during inclement weather or other events that limit the flow of roads and airports. Rail service can also improve regional balance by providing much needed service to communities that have been bypassed by highways or air service.

The factors for evaluation of Other Public Benefits include:

- Potential cost savings for construction and maintenance of highways and bridges due to reduced motor vehicle traffic.
- Potential for rail service to improve regional balance by providing transportation options and improved mobility for communities across the state.
- Ability of passenger rail service to create a more resilient transportation network by providing an alternative to other modes during severe weather and other events that hamper roads and air service.
- Potential for reduction in crashes and injuries by shifting travelers to rail service.

Financial Contributions by Non-Federal and Non-State Sources

While most funding for intercity rail transportation comes from federal and state sources, improved rail service offers opportunities to leverage private and local investment. This criterion evaluates the potential for private and local capital involvement and investment related to rail service.

The factors for evaluation of Financial Contributions by Non-Federal and Non-State Sources include:

- Potential interest in private-sector financing or operation of rail service.
- Opportunities for private real estate investment in the form of Transit-Oriented Development.
- Potential for local investment in station facilities, bicycle and pedestrian networks, and other local improvements related to passenger rail service.

Priority Freight Rail Strategies

Freight rail provides significant economic and environmental benefits, although it is a fixed system with mobility limitations and will not replace trucking and port facilities. Instead, freight rail should be an integral part of a multimodal freight transport system that is connected to major transport and receiving facilities such as shipping ports, truck loading, and industrial parks.

Pennsylvania should focus freight rail investments in the following six corridors that comprise the core freight rail network:

- Central
- Erie
- I-95
- Southwest
- I-81
- Harrisburg-Binghamton

Priority Freight Rail Corridors

Priority rail corridors were identified in the state of Pennsylvania as



depicted in Figure 7-3. Each of the corridors should be assessed using a set of evaluation criteria that ranges from travel demand to engineering feasibility to impact on local land use and smart growth. A description of the evaluation criteria is presented in the section that follows. The six corridors described below represent freight rail corridors which create the Pennsylvania's core network corridors for investment.

Corridor Descriptions

The following describes the core freight rail network envisioned by this Rail Plan.

Central Corridor

The Central Corridor is the largest corridor in the State and operated by Norfolk Southern (NS). It extends the length of Pennsylvania, beginning at the western end near Midland, and crosses east to Reading, where it splits northeast to Easton in the I-78 highway corridor and southeast to Philadelphia.

The Central Corridor is essentially portions of the former Pennsylvania Railroad and Reading Railroad mainlines through central Pennsylvania, and is one of the two major east-west rail links between the West Coast and the New York City metropolitan areas, as major termini. The freight rail traffic described in Appendix 5 makes this the most heavily traveled corridor in the Commonwealth. It is the longest of the six identified corridors.

Erie Corridor

The Erie Corridor consists of parallel mainline tracks operated by NS and CSX along Lake Erie in the northwest Pennsylvania. It provides a link in the second major east-west rail link between the West Coast and the New

York City metropolitan area. It connects the former New York Central route through central New York to Albany, then south to New York City with former Pennsylvania Railroad and Baltimore & Ohio main lines through Ohio and ultimately to Chicago. This route is currently operated by CSX Transportation. Also in this corridor is freight rail traffic operated by Norfolk Southern between Cleveland, Ohio, and Buffalo, New York, on former lines of the Nickel Plate and Norfolk & Western.

I-95 Corridor

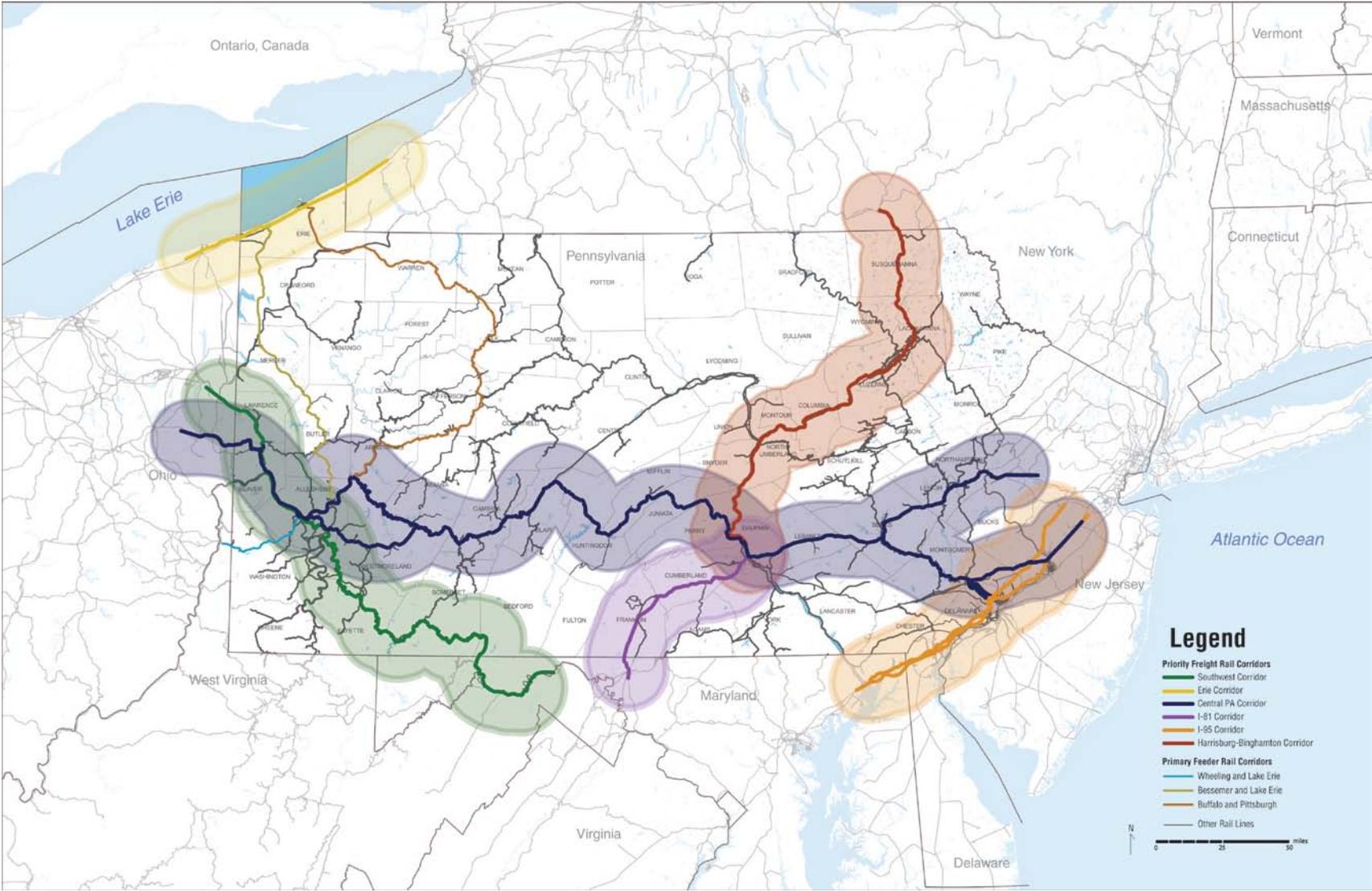
The I-95 Corridor is located in the southeastern portion of the Commonwealth and is the CSX mainline that parallels I-95 beginning at Chester, Pennsylvania, north through Philadelphia to the New Jersey/Pennsylvania border at Yardley, Pennsylvania.

Both Norfolk Southern and CSX Transportation operations are located in this corridor. While currently constrained by passenger operations, vertical clearance restrictions, and signal operations, this corridor potentially provides an alternative to truck congestion on the Interstate 95 roadway corridor and provides a portion of the rail corridor in the Boston-New York City-Philadelphia-Baltimore-Washington, D.C. megaregion.

The Department is currently funding vertical clearance improvement work on the Trenton Line corridor to provide for the movement of double-stack intermodal rail traffic.



Figure 7-3: Pennsylvania Priority Freight Corridors



Source: IHS Global Insight, 2009



Southwest Corridor

This corridor is operated by CSX Transportation and crosses the southwest portion of the state beginning at the Pennsylvania/Maryland border near Cumberland, Maryland, north through Pittsburgh to the Ohio border near New Castle, Pennsylvania.

The Southwest Corridor is essentially the former Baltimore & Ohio mainline. This corridor is the route of the The National Gateway Initiative that is being undertaken by CSX Transportation to improve vertical clearance and construct new intermodal terminals between East Coast port of Portsmouth, VA and the east-west mainline in central Ohio for connection to the west and Chicago. It also generally accesses the metropolitan areas of Richmond, Washington DC, Baltimore and Pittsburgh.

The Department has committed to participating in the funding of the proposed improvements for the National Gateway.

I-81 Corridor

This corridor, operated by Norfolk Southern, parallels I-81 in central Pennsylvania from the Pennsylvania/Maryland border near Hagerstown, Maryland to Harrisburg, Pennsylvania.

The I-81 Corridor roughly follows the route of the Interstate 81 highway corridor. It provides a rail route between Harrisburg and points south along I-81, and ultimately to New Orleans, Louisiana. This corridor is the route of the Crescent Corridor, an initiative identified by Norfolk Southern to capture the movement of domestic containers and trailers currently on I-81. The project involves the construction of new terminal and track capacity improvements to increase rail speeds and rail service

for the corridor. This corridor connects with the Central Corridor at Harrisburg for Norfolk Southern and connects with the Southwest Corridor just south of the Commonwealth in West Virginia. This corridor also contains relatively new major intermodal terminals at Rutherford and Chambersburg, with a new terminal planned for Greencastle.

The Department has committed to the Crescent Corridor initiative.

Harrisburg-Binghamton Corridor

This Corridor extends north from Harrisburg along the Susquehanna River to Scranton where it turns north to Binghamton, New York. The Canadian Pacific Railway (CP) operates this corridor between Sunbury, Pennsylvania, and Binghamton with Norfolk Southern operations between Sunbury and Harrisburg (with CP trackage rights).

The Harrisburg-Binghamton Corridor contains Class I carrier operations of Canadian Pacific and other shortlines. While serving the former coal regions of Pennsylvania, coal traffic is a relatively small component of the rail traffic currently. It does serve as a hub for intermodal traffic to and from Ohio, Canada, and New England. It is the smallest corridor with regard to density, but does serve major population areas in the state.



Corridor Evaluation

Freight rail corridors should be assessed based on a set of evaluation criteria similar to that used to assess the passenger rail corridors. Nine



criteria were developed to evaluate potential corridor investment and were based on six criteria developed for the *2001 Statewide Passenger Rail Needs Assessment* and three developed by PennDOT for this Rail Plan. The nine criteria sufficiently address the considerations from PRIIA.

The evaluation criteria include:

- Infrastructure and Right-of-Way Availability
- Market Size and Trends
- Major Destinations and Trip Generators
- Transportation Patterns and Travel Demand
- System Connectivity and Intermodal Links
- Land Use Impact and Smart Growth
- Environmental Sustainability
- Other Public Benefits
- Financial Contributions

Infrastructure and Right-of-Way Availability

This criterion judges whether rights-of-way and railroad infrastructure exists to support rail service within a corridor. In many places where a right-of-way once existed, it has now been sold or abandoned by the railroad. It may not be feasible to purchase new right-of-way, or repurchase or reconstitute pieces of abandoned ROW. In some cases, right-of-way still exists, but it has been rail-banked or even become a rail-trail.

The factors for evaluation of Infrastructure and right-of-way include:

- Infrastructure quality including completeness of the ROW and condition of existing rail infrastructure.

- Adequacy of the corridor for growth in freight rail service. Factors included geometric and weight restrictions, presence of bottlenecks, rail congestion and fluidity, presence of single- or double-tracks, sidings, and signals.
- Equipment availability suitable for the line.
- Availability of right-of-way for yards and terminals.
- Importance of the corridor to host passenger railroads on the line.

Market Size and Trends

This criterion evaluates the potential for increased freight rail operations along the line based on existing and future growth trends and projections for 2035.

The factors for evaluation of market size and trends include:

- Commodities and shipping trends along the corridor.
- Forecasted growth.
- Number of jobs created.
- Other impacts on the local and state economy.
- Financial viability measured by return on investment.

Major Destinations and Trip Generators

The presence of industrial and commercial centers is a proxy to determine the likelihood of current and future demand for shipping goods by rail. Another way to estimate potential goods movement is to evaluate major destinations and trip generators. This criterion evaluated the presence of large generators of freight rail demand along freight rail



corridors.

The factors for evaluation of Major Destinations and Trip Generators include:

- Industrial and manufacturing sites served.
- Urban centers served.
- Potential rail-oriented growth opportunities.
- Economic development potential.



Transportation Patterns and Demand

Existing travel patterns can provide some insight into the potential demand for freight rail service in a corridor. This criterion was evaluated by a combination of factors including existing highway volumes as an indicator of the potential for diverting long-distance truck traffic to the railroad.

The factors for evaluation of Transportation Patterns and Travel Demand include:

- Traffic volume (AADT) on major roads serving the corridor using PennDOT and Federal Highway Administration count data.
- Highway congestion on major roads serving the corridor. Sometimes congestion occurs outside of typical rush hours and this was taken into consideration where observed.
- Projected demand for freight rail service.
- Potential diversion opportunities.

System Connectivity and Intermodal Links

Connectivity between multiple freight rail carriers of varying classes is a very important factor when industry makes a decision to use the freight rail network. Long-distance connectivity to destinations far from the rail line and connectivity to major highways and intermodal facilities are critical to transporting goods for the “last mile” of any trip. A corridor with a high degree of intermodal connectivity will have more success at attracting business to the railroad than one that does not.

The factors for evaluation of System Connectivity and Intermodal Links include:

- Existing freight rail connections along the corridor.
- Existing connections to port and maritime facilities.
- Existing connections to airports.
- Presence of intermodal facilities and distribution centers.

Land Use Impact and Smart Growth

Freight rail service can have a profound impact on land use and urban development patterns. Increased access adds value to land and makes development more attractive. Unchecked, however, development can become undesired sprawl. It is important that communities have up-to-date land use plans in place in order to preserve community character and open space while benefiting from the new residents and jobs rail service can bring. Beyond simple land use plans, there are many “Smart Growth” tools available to Pennsylvania communities to ensure that good intentions turn to actions.



The factors for evaluation of Land Use Impacts and Smart Growth include:

- Whether communities in the corridor have complementary and up-to-date plans in place. This includes land use plans with smart growth policies, transit-oriented development plans, redevelopment area plans, and economic development plans.
- Whether there is local government support for smart growth policies.

Environmental Sustainability

As the most efficient form of transportation, freight rail service has the potential to provide many environmental benefits to Pennsylvania. For example, rail service could have positive impacts for the environment by reducing truck volumes and highway congestion. New track infrastructure construction can disrupt water flow in wetlands and divide wildlife habitat.

The factors for evaluation of Environmental Sustainability include:

- Potential air quality impacts from rail service including carbon emissions and particulates.
- Noise pollution related to freight rail service.
- Impacts to the natural and built environment including tunnels, bridges, and ROW acquisition.

Other Public Benefits

There are many potential benefits of freight rail service that are intangible or not readily apparent. For example, improved or increased freight rail service can reduce highway improvements or additional lane construction on roadways and relieve air traffic congestion by shifting travel from trucks. Improved freight rail service can also improve the cost of doing business in the Commonwealth by reducing the cost of transportation of goods.

The factors for evaluation of Other Public Benefits include:

- Potential cost savings for construction and maintenance of highways and bridges due to reduced truck traffic.
- Potential for rail service to improve regional balance by providing transportation options for citizens and businesses across the state.
- Ability of freight rail service to create a more viable transportation network by providing an economic alternative to other modes during severe weather and peak business periods.

Financial Contributions by Non-Federal and Non-State Sources

While most funding for freight rail infrastructure improvements comes from the railroads themselves, the potential for public-private partnerships provides significant funding for freight rail improvements that are beyond the sole funding capability of the freight railroad. Federal and state funding sources offer improved opportunities to leverage private and local investment. This criterion evaluates the potential for private and public capital involvement and investment related to rail service.



The factors for evaluation of Financial Contributions by Non-Federal and Non-State Sources include:

- Potential interest in private-sector financing or operation of rail service.
- Evaluate the opportunity to utilize multiple funding sources to benefit the business climate in the Commonwealth by facilitating increased economic growth.

Extended Freight Rail Corridor Network

Shortlines and regional railroads are an important part of the Pennsylvania railroad system, especially to rural shippers. By providing an alternative to the abandonment of low-traffic density, rural branch lines, the regional and shortline railroads have allowed rail service to continue to many rural communities. At times, the future of these lines has been questioned and evaluated. One of the factors affecting the viability of these shortlines and regional railroads is their dependence on their connectivity to Class I railroads, although the track infrastructure conditions may have an impact, as well.

Since the early 1970s, many shortlines and regional railroads have been formed that now operate on track previously abandoned by Class I railroads. Class I railroads were unable to operate these lines profitably and it was doubtful that new management could make them successful. However, many shortlines and regional railroads have successfully provided better service at lower cost than the previous Class I operator. Currently, shortlines operate upwards of 25 percent of the United States rail network.

Shortlines and regional railroads provide labor-intensive services on lower density branch lines that Class I railroads often cannot provide. However, shortlines, regional railroads, and Class I railroads work closely together. Shortlines and regional railroads collect, sort, and forward rail cars and interchange with Class I railroads on the identified Core Freight Rail Corridors.

As Class Is may have a better bargaining position with relation to shortlines, the rate splits between Class Is and shortlines, and may not allow for shortline and regional railroad track infrastructure investment. For this reason, consideration should be given to funding priorities on these rail lines that facilitate connection to Class I railroads or improve access to rail customers located in the Commonwealth.

