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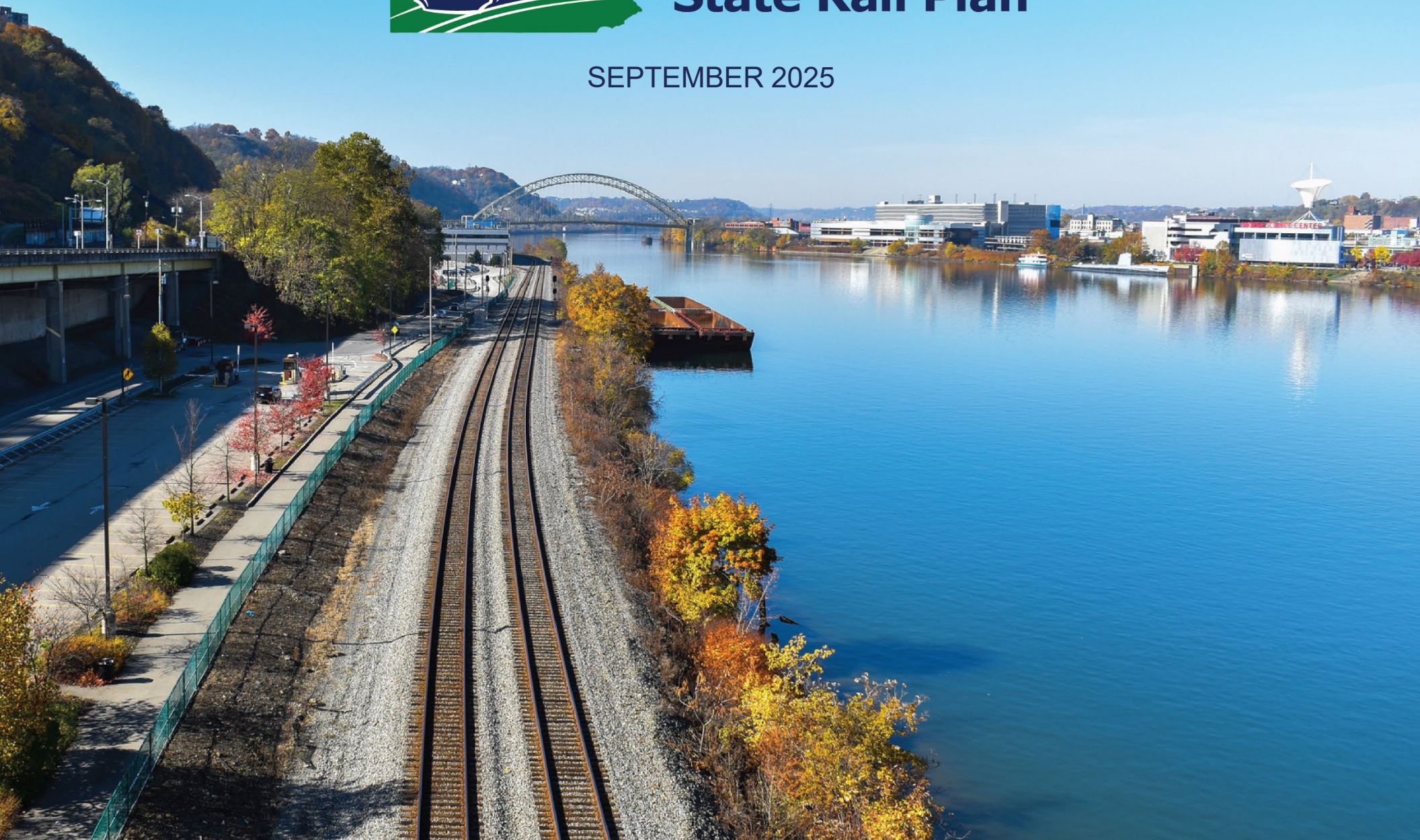
PENNSYLVANIA State Rail Plan

SEPTEMBER 2025



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Acronyms and Abbreviations

1935 Act	Municipality Authorities Act of 1935
ABS	Automatic Block Signaling
ADA	Americans with Disabilities Act of 1990
ATRI	American Transportation Research Institute
B&O	Baltimore and Ohio Railroad
BRFPW	PennDOT's Bureau of Rail, Freight, Ports, and Waterways
BTU	British thermal unit
BUILD	U.S. DOT's Better Utilizing Investments to Leverage Development Grant Program
CID	Corridor Identification and Development
CN	Canadian National
CNYK	Central New York Railroad
CO_2	carbon dioxide
COG	Council of Governments
CO GCU	Central Office Grade Crossing Unit
CRISI	Consolidated Rail Infrastructure and Safety Improvements
CTC	Centralized Traffic Control
D&L	Delaware & Lehigh National Heritage Corridor
DCED	Pennsylvania Department of Community and Economic Development
DOT	Department of Transportation
DVRPC	Delaware Valley Regional Planning Commission
EMU	Electric Multiple Units
FAF	Freight Analysis Framework
FHWA	Federal Highway Administration
FRA	Federal Railroad Administration
FSP	Federal-State Partnership
FTA	Federal Transit Administration
FY	Fiscal year
GDP	Gross Domestic Product
IIJA	Infrastructure Investment and Jobs Act of 2021
INFRA	U.S. DOT's Infrastructure for Rebuilding America
JRA	Joint Rail Authority
LiDAR	Light detection and ranging
LNG	liquified natural gas
LRTP	Long Range Transportation Plan
MEGA	National Infrastructure Project Assistance
MPO	Metropolitan Planning Organization
MPH	miles per hour
MTF	Multimodal Transportation Fund
NEC	Northeast Corridor
NS	Norfolk Southern
NYP	New York Penn
NYSW	New York, Susquehanna & Western
P3	public-private partnership
P3 Office	Office of Public-Private Transportation Partnerships
PA	Pennsylvania
PEMA	Pennsylvania Emergency Management Agency
Penn Central	Penn Central Transportation Company

PennDOT	Pennsylvania Department of Transportation
PhilaPort	Port of Philadelphia
PHMSA	Pipeline and Hazardous Materials Safety Administration
PIB	Pennsylvania Infrastructure Bank
PNRRA	Pennsylvania Northeast Regional Rail Authority
PRIIA	Passenger Rail Investment and Improvement Act
PTC	Positive Train Control
PUC	Pennsylvania Public Utility Commission
RBMN	Reading, Blue Mountain & Northern Railroad
RFAP	Rail Freight Assistance Program
ROW	Right-of-way
RPO	Rural Planning Organization
RTAP	Rail Transportation Assistance Program
RWT	Rails-With-Trails
SAP	State Action Plan
SDP	Service development plan
SEDA	Susquehanna Economic Development Association
SEPTA	Southeastern Pennsylvania Transportation Authority
SOGR	State of good repair
SPC	Southwestern Pennsylvania Commission
SRC	Strasburg Rail Road
SRPRA	Schuylkill River Passenger Rail Authority
STB	Surface Transportation Board
STRACNET	Strategic Rail Corridor Network
TIP	Train Inspection Portal
TOC	Transit-Oriented Communities
TOD	Transit-oriented development
USDOT	U.S. Department of Transportation
VMT	Vehicle miles traveled
WNYP	Western New York and Pennsylvania
ZOO	Zoo Interlocking

1. Role of Rail in Statewide Transportation

1.1 INTRODUCTION

The Pennsylvania Department of Transportation (PennDOT) produced its last federally mandated state rail plan in 2020. The plan established the vision for freight and passenger rail transportation in the Commonwealth. The 2020 State Rail Plan was prepared between fall 2019 and fall 2020 as the coronavirus 2019 (COVID-19) pandemic struck the world. To the extent possible at that time, the plan identified the anticipated short- and long-term impacts of COVID-19 on freight and passenger rail transportation and rail traffic patterns. The timing of the Plan, however, did not allow for a detailed analysis of these potential impacts on freight and passenger rail.

Much has occurred that affects both freight and passenger rail transportation since the publication of the 2020 State Rail Plan. COVID-19 came under control, but its impacts lingered. While population mobility constraints of the COVID-19 period ended, some new travel patterns remained. The movement of freight has likewise been affected as supply chains were disrupted. Government energy policies and competitive energy sources continued the decline in coal transportation. These and other drivers of changes in rail transportation shape this plan.

On the positive side, long-needed federal funding for freight and passenger rail transportation improvements became available with the passage of the Infrastructure Investment and Jobs Act of 2021 (IIJA). Passenger rail network expansion became a priority of the federal government. Funding for freight rail infrastructure improvements expanded well above historic levels. Safety has taken on a new priority following the February 2023 East Palestine derailment, with nine safety-related legislative bills introduced across the U.S. House and Senate.

This includes the Railway Safety Act (S 576 / H.R. 1674, reintroduced in 2025 as H.R. 928), which would mandate new safety regulations for rail carriers and trains transporting hazardous materials.

The 2025 State Rail Plan serves as a guide for the advancement of the Pennsylvania freight and passenger rail system. It describes the rail development activity since the 2020 rail plan and provides information to support further investment in the rail system. The State Rail Plan update provides a current assessment of the state's rail needs along with recommendations for policies, programs, processes, and projects to improve rail safety and service, and serves as a practical roadmap for future rail investment and policies.

The 2025 State Rail Plan update has also been prepared by PennDOT to meet the requirements of the Passenger Rail Investment and Improvement Act (PRIIA) of 2008, as well as the subsequent Federal Railroad Administration (FRA) State Rail Plan Guidance. While the primary purpose of PRIIA is to provide for improved passenger rail service in the United States, the Act required each state to have an approved rail plan as a condition for receiving future rail funding. While state rail plans are no longer a requirement, they are encouraged and help position stakeholders for federal funding.

The 2025 State Rail Plan reflects the input of a wide cross-section of stakeholders, including the railroads, key freight shippers, government officials, regional planning entities, rail interest groups, economic development officials, and the state's ports. **Table 1.1** summarizes the content of the Pennsylvania State Rail Plan by chapter.

Table 1.1 Content of the PennDOT 2025 State Rail Plan

CHAPTER/TITLE	DESCRIPTION OF CONTENT
Executive Summary	
The Role of Rail in Statewide Transportation	Describes the role of rail within the Commonwealth's transportation system and how Pennsylvania's state and local government entities are organized to support rail development. Identifies existing initiatives and plans.
The State's Existing Rail System	Describes the Pennsylvania rail system, its current condition, and environmental and economic impacts on the state. Identifies past and future trends that have impacted or will impact the Pennsylvania rail system.
Proposed Passenger Rail Improvements and Investments	Identifies passenger rail service needs and opportunities. Describes improvements and investments that have been put forward to address passenger rail service needs and opportunities.
Proposed Freight Rail Improvements and Investments	Identifies freight rail service needs and opportunities. Describes improvements and investments that have been put forward to address freight rail service needs and opportunities.
The State's Rail Service and Investment Program	Presents PennDOT's vision for railroad transportation, projects and strategies to meet that vision, summary of impacts that would result from the projects and strategies, and a discussion of probable financing scenarios.
Coordination and Review	Descriptions of outreach and coordination efforts in developing the State Rail Plan.
Technical Appendices	

Per federal guidelines, the plan covers three rail transportation modes:

- Freight rail
- Intercity passenger rail
- Commuter rail

Each of the modes covered by the plan use the general national rail network and does not operate on dedicated rights-of-way that are unconnected to the rest of the network. To distinguish between commuter rail and other fixed guideway rail transit modes, the National Transit Database defines commuter rail as:

> "an electric or diesel propelled railway for urban passenger train service consisting of local travel which operates between a central city and outlying areas. Service must be operated on a regular basis by or under contract with a transit operator for the purpose of transporting passengers within urbanized areas, or between urbanized areas and outlying areas. Commuter rail is generally characterized by multi-trip tickets, specific station-to-station fares, railroad employment practices, relatively long distance between stops, and only 1-2 stations in the central business district."

In addition, the National Transit Database notes that "intercity rail service is excluded from commuter rail, except for that portion of such service that is operated by or under contract with a public transit agency for predominantly commuter services for which more than 50 percent of the average daily ridership makes a return trip on the same day."

1.2 PENNSYLVANIA'S GOALS FOR THE MULTIMODAL TRANSPORTATION SYSTEM

The Pennsylvania State Rail Plan is one of the modal functional plans that support the statewide 2045 Pennsylvania Long Range Transportation Plan (LRTP). These plans include:

- State Rail Plan
- Aviation System Plan
- Freight Movement Plan
- Strategic Highway Safety Plan
- Regional Operations Plans

Figure 1.1 Pennsylvania Transportation Planning Process

Source: 2045 Pennsylvania Long Range Transportation Plan

Each of the plans, including the State Rail Plan, is developed to address the LRTP's goals, summarized in **Table 1.2**.

Table 1.2 2045 Pennsylvania Long Range Transportation Plan Goals

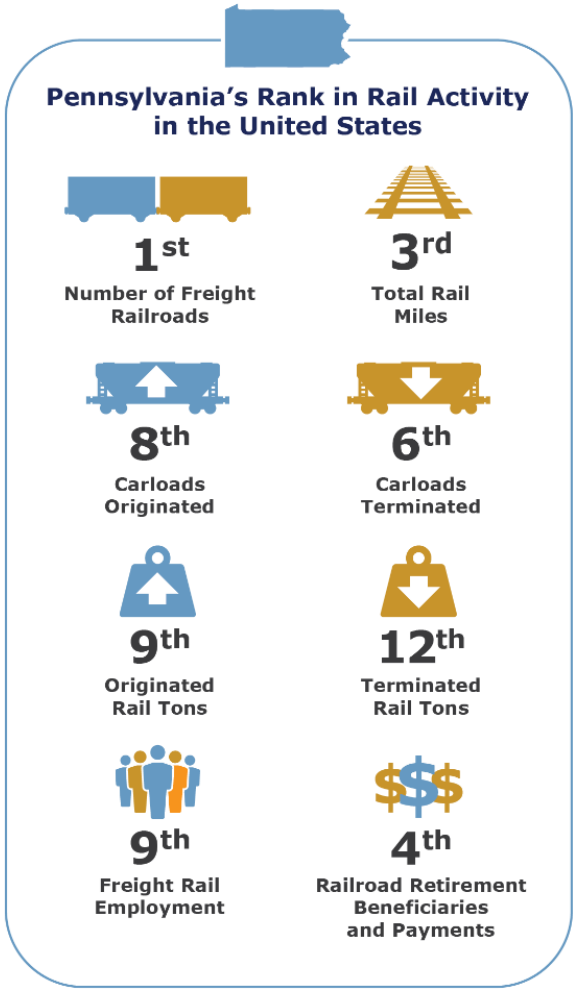
CATEGORY	GOAL
Safety	Enhance safety and security for both motorized and non-motorized modes throughout Pennsylvania's transportation system
Mobility	Strengthen transportation mobility to meet the increasingly dynamic needs of Pennsylvania residents and businesses
Equity	Improve transportation access and equity throughout Pennsylvania
Resilience	Strengthen Pennsylvania transportation resilience to climate change and other risks and reduce the environmental impacts associated with transportation improvement
Performance	Improve the condition and performance of transportation assets
Resources	Structure transportation funding and finance approaches that allocate sufficient resources for system safety, maintenance, preservation, and improvement

Source: 2045 Pennsylvania Long Range Transportation Plan

As prescribed by the FRA State Rail Plan Guidance, Pennsylvania's rail-specific goals and their respective objectives are discussed in Chapter 5.

1.3 ANALYSIS OF RAIL'S ROLE IN PENNSYLVANIA'S TRANSPORTATION SYSTEM

Figure 1.2 Pennsylvania Rail Rankings



Source: Association of American Railroads 2021 State Rankings

Rail's Role in Pennsylvania's Freight Transportation System

Rail plays an important role in Pennsylvania's freight system. Freight networks are critically important to the supply chain that moves both essential raw materials and finished goods and is a key economic driver in the Commonwealth. Pennsylvania ranks among the nation's top states for a range of metrics of rail activity, including the number of freight railroads, miles of rail, volume of goods moved, and railroad employment (**Figure 1.2**). This section highlights the various commodities moved by rail in Pennsylvania and describes the overall modal share of rail, which has been assessed using the Federal Highway Administration (FHWA) Freight Analysis Framework (FAF) version 5.6.

In general, rail is used for shipping products over longer distances. Although rail's modal share of tonnage hauled to, from, and within Pennsylvania is 8 percent of freight tonnage shipped by all modes, rail is a key modal option for specific shippers hauling certain commodities. Rail tends to be used to transport heavy, dense commodities with low value per ton. For example, rail has a 73 percent modal share of hauling metallic ores, and 37 percent of coal moves by rail, as does 29 percent of newsprint or paper to, from, and within Pennsylvania. Many of the metallic ore shipments to Pennsylvania are from distant locations, such as Texas or Arizona. Metallic ores are heavy, and rail is most often the only feasible mode for shipping heavy products. As shown in **Table 1.3** below, rail has a 1 percent modal share for shipments less than 100 miles but a 37 percent modal share for shipments over 1,000 miles.

Table 1.3 2022 Rail Modal Share by Commodity and Mileage Range Originating or Terminating in Pennsylvania (by Tonnage)

COMMODITY	RAIL TONS (000S)	PENNSYLVANIA RAIL MODAL SHARE					
		0–99 Miles	100–249 Miles	250–499 Miles	500– 999 Miles	1,000+ Miles	All Mileage Ranges
Coal	22,734	0%	30%	80%	97%	94%	37%
Natural gas and other fossil products	5,054	0%	0%	9%	51%	78%	2%
Metallic ores	3,563	1%	5%	38%	4%	95%	73%
Plastics/rubber	3,559	17%	10%	17%	28%	32%	22%
Base metals	3,433	2%	1%	19%	31%	9%	11%
Other foodstuffs	2,891	1%	0%	3%	12%	43%	6%
Newsprint/paper	2,695	3%	5%	26%	34%	65%	29%
Crude petroleum	2,339	2%	0%	0%	2%	56%	23%
Gravel	2,244	2%	1%	63%	33%	73%	3%
Natural sands	2,231	0%	7%	43%	85%	11%	14%
Waste/scrap	1,979	0%	5%	16%	46%	18%	5%
Gasoline	1,641	0%	0%	14%	83%	23%	4%
Other	13,293	1%	1%	6%	15%	24%	4%
TOTAL	**67,656**	**1%**	**3%**	**18%**	**30%**	**37%**	**8%**

Source: Analysis of FAF5.6, WSP

Because rail tends to be used for longer-distance freight moves, it has a higher modal share when expressed in ton-miles (each ton-mile is the movement of one ton of freight one mile) than when expressed in tons. The total ton-mile modal share of rail is 21 percent (**Table 1.4**), compared to 8 percent for tonnage shown in **Table 1.3**.

Table 1.4 2022 Rail Modal Share by Commodity and Mileage Range Originating or Terminating in Pennsylvania (by Ton-Miles)

COMMODITY	RAIL TON-MILES (MILLIONS)	PENNSYLVANIA RAIL MODAL SHARE					
		0–99 Miles	100–249 Miles	250–499 Miles	500–999 Miles	1,000+ Miles	All Mileage Ranges
Coal	8,085	0%	28%	76%	97%	93%	54%
Crude petroleum	4,098	11%	0%	0%	1%	56%	52%
Metallic ores	3,697	2%	5%	42%	5%	93%	87%
Natural gas and other fossil products	3,556	0%	0%	9%	54%	78%	9%
Other foodstuffs	3,546	2%	0%	3%	13%	38%	20%
Other ag products	3,308	0%	1%	2%	13%	62%	45%
Plastics/rubber	2,910	8%	10%	18%	30%	30%	28%
Newsprint/paper	2,368	3%	5%	27%	34%	65%	44%
Base metals	2,051	1%	1%	21%	33%	10%	18%
Wood products	1,567	0%	0%	17%	35%	44%	27%
Gasoline	1,444	0%	0%	18%	87%	21%	23%
Waste/scrap	1,122	0%	5%	16%	44%	19%	17%
Other	12,277	1%	1%	9%	20%	20%	13%
TOTAL	**50,029**	**1%**	**3%**	**19%**	**31%**	**36%**	**21%**

Source: Analysis of FAF5.6, WSP

Rail helps to connect Pennsylvania shippers with global markets. Rail has a higher modal share of export tonnage and import tonnage, 31 percent and 19 percent, respectively, as shown in **Table 1.5**, than rail's overall share of 8 percent. Rail has a particularly high modal share of exports of energy products, including coal and natural gas. For example, 99 percent of Pennsylvania's exported crude petroleum moves by rail, and 60 percent of other petroleum products (propane and butane) move by rail. Some of Pennsylvania's energy products are shipped to Canada or Mexico, but most are shipped overseas. Most of the imported tonnage shipped by rail (78 percent) moves by direct rail, while 22 percent moves by truck/rail intermodal.

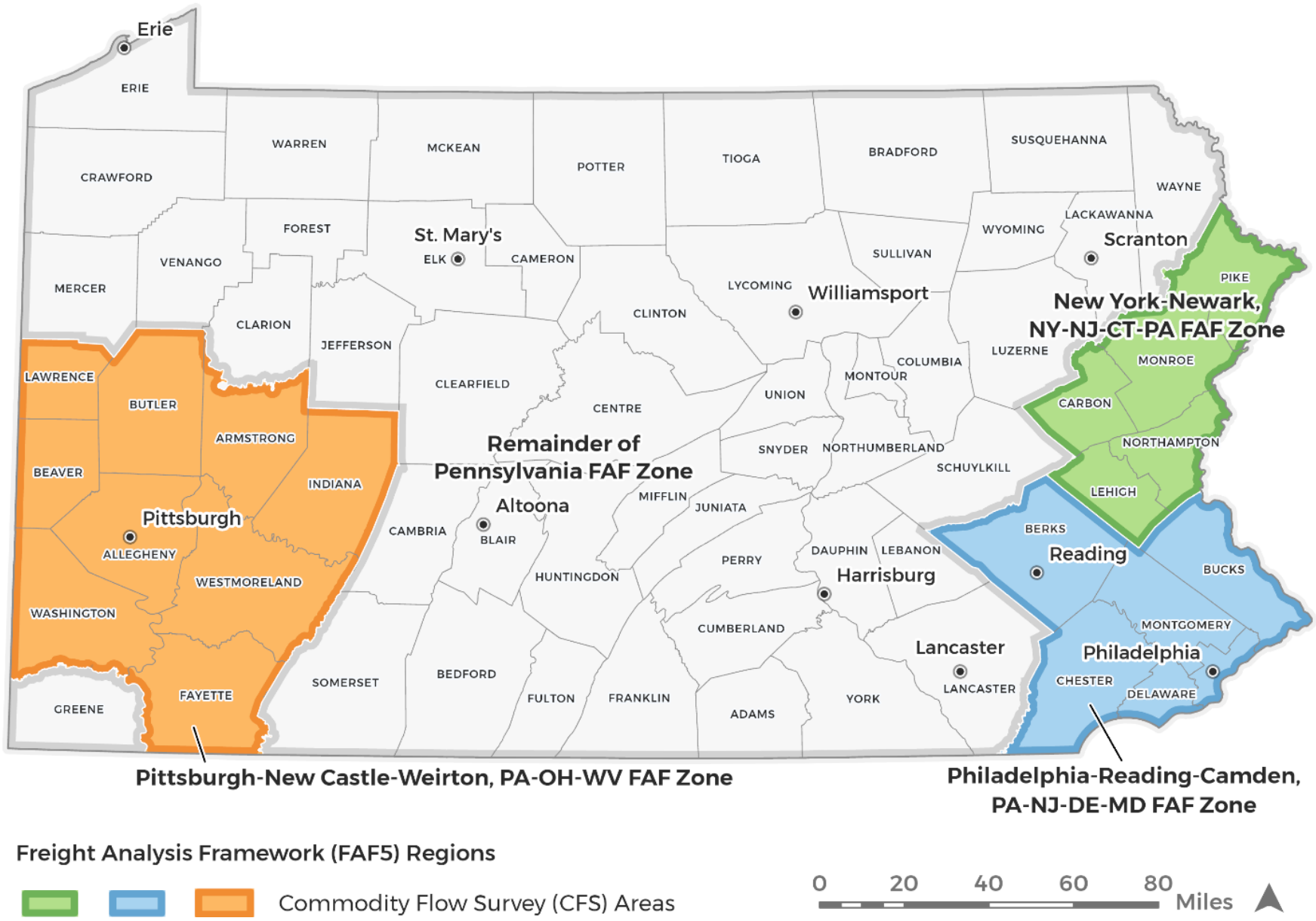
Table 1.5 2022 Rail Modal Share of International Imports and Exports (by Tonnage)

COMMODITY	EXPORTS FROM PENNSYLVANIA			IMPORTS TO PENNSYLVANIA		
	RAIL		TOTAL	RAIL		TOTAL
	Tons (000s)	Share of Commodity Tons	Commodity Tons – All Modes (000s)	Tons (000s)	Share of Commodity Tons	Commodity Tons – All Modes (000s)
Coal	2,658	36%	7,390	0	0%	1
Natural gas and other fossil products	3,000	60%	4,961	297	60%	497
Crude petroleum	38	99%	38	0	0%	4,003
Nonmetal mineral products.	31	4%	761	373	19%	2,008
Other ag products	67	9%	731	525	36%	1,446
Base metals	143	14%	991	490	45%	1,099
Wood products	94	9%	1,100	370	52%	711
Basic chemicals	158	23%	691	182	16%	1,117
Other foodstuffs	46	7%	647	146	13%	1,106
Plastics/rubber	28	14%	209	615	47%	1,311
Machinery	99	10%	1,011	188	45%	417
Newsprint/paper	9	2%	395	69	7%	1,028
Other	445	13%	3,349	1,554	15%	10,695
TOTAL	**6,817**	**31%**	**22,274**	**4,809**	**19%**	**25,438**

Source: Analysis of FAF5.6, WSP

Rail's modal share differs within regions of Pennsylvania, reflecting the different characteristics of regional economies. The FAF5.6 database identifies four regions within Pennsylvania, three of which correspond to the Pennsylvania portion of metropolitan areas, as identified by the U.S. Census Bureau Combined Statistical Area designations. The remaining FAF region covers the remainder of Pennsylvania. The regions are as shown in **Figure 1.3**.

Figure 1.3 FAF Zones in Pennsylvania



Source: Oak Ridge National Laboratory, FAF-5 Documentation.[1]

Generally, rail's modal shares vary among regions by the extent to which regional industries ship rail-intensive products originating or terminating in regions. For example:

- The Pittsburgh FAF region accounts for about a third of all rail tons originating or terminating in Pennsylvania, and at 11 percent modal share, has an above-average rail market share. Coal is by far the highest tonnage commodity originating or terminating in the Pittsburgh FAF region by rail, accounting for 43 percent of tonnage, followed by metallic ores at 14 percent.
- Coal also accounts for nearly half of the tonnage originating or terminating in the Remainder of the Pennsylvania FAF region.
- In the Philadelphia FAF region, rail has a modal share similar to its overall share for the state, at 8 percent. Approximately 40 percent of rail tonnage shipped to, from, and within the Philadelphia FAF zone consists of petroleum products, reflecting the region's petrochemical industry.
- Rail has a relatively low market share in the New York FAF zone (Pennsylvania part), with only 3 percent of tonnage shipped to, from, or within the region. No coal is shipped to or from the region, and other industries that elsewhere are significant rail users are not as prominent, such as those related to petroleum or metals.

Table 1.6 2022 Rail Modal Share Originating or Terminating in Pennsylvania by Commodity by Region (by Tonnage)

NEW YORK FAF ZONE			PHILADELPHIA FAF ZONE			PITTSBURGH FAF ZONE			REMAINDER OF PENNSYLVANIA FAF ZONE		
Commodity	Rail Tons (Thousand)	Rail Modal Share	Commodity	Rail Tons (Thousands)	Rail Modal Share	Commodity	Rail Tons (Thousands)	Rail Modal Share	Commodity	Rail Tons (Thousands)	Rail Modal Share
Other foodstuffs	526	4%	Natural gas and other fossil products	3,507	15%	Coal	10,479	33%	Coal	14,783	45%
Natural gas and other fossil products	406	8%	Crude petroleum	2,302	37%	Metallic ores	3,370	91%	Natural gas and other fossil products	2,280	2%
Cereal grains	235	9%	Plastics/rubber	1,527	34%	Base metals	2,055	15%	Other foodstuffs	1,666	6%
Animal feed	212	7%	Other ag prods.	1,257	26%	Natural sands	1,303	25%	Newsprint/paper	1,592	28%
Newsprint/paper	130	20%	Newsprint/paper	794	28%	Natural gas and other fossil products	1,297	2%	Natural sands	1,104	20%
Milled grain prods.	119	4%	Base metals	658	10%	Plastics/rubber	947	24%	Plastics/rubber	1,008	15%
Plastics/rubber	117	6%	Gravel	618	4%	Gasoline	945	11%	Gravel	849	2%
Nonmetallic minerals	111	5%	Other foodstuffs	613	5%	Waste/scrap	911	9%	Animal feed	797	7%
Wood prods.	91	5%	Waste/scrap	579	4%	Gravel	782	3%	Base metals	702	6%
Other ag prods.	89	4%	Wood prods.	414	8%	Articles-base metal	485	14%	Wood prods.	684	6%
Base metals	66	6%	Gasoline	413	2%	Nonmetal min. prods.	315	2%	Fuel oils	643	11%
Basic chemicals	64	2%	Nonmetal min. prods.	384	2%	Wood prods.	251	10%	Chemical prods.	577	8%
Other	240	1%	Other	2,694	4%	Other	1,094	3%	Other	4,654	3%
Total	**2,406**	**3%**	**Total**	**15,759**	**8%**	**Total**	**24,234**	**11%**	**Total**	**31,340**	**7%**

Source: Analysis of FAF5.6, WSP

Rail's Role in Pennsylvania's Passenger Transportation System

Because only specific locations in Pennsylvania are served by rail, rail's role in intercity passenger travel in Pennsylvania is focused on these corridors. Rail is a key transportation option for specific markets. In 2015, the Northeast Corridor Commission prepared the *Northeast Corridor Intercity Travel Survey*, which found that in 2015, the share of trips by passenger rail included:

- 29 percent of trips between the Philadelphia area and New York City
- 7 percent of trips between the Philadelphia area and the Newark area
- 19 percent of trips between the Philadelphia area and the Greater Baltimore/DC area
- 5 percent of trips between the Philadelphia area and central New Jersey
- 5 percent of trips between the Philadelphia area and Greater Boston/Providence

These trends from 2015 changed dramatically as a result of the COVID-19 pandemic, which reduced passenger travel demand for rail as remote work practices and isolation mandates created new mobility paradigms. Since then, ridership levels have been recovering. As of federal fiscal year 2023 compared to 2019:

- Amtrak Keystone Service® between Philadelphia and Harrisburg had recovered 71 percent of ridership
- Amtrak Pennsylvanian® service between Philadelphia and Pittsburgh had recovered 90 percent of ridership
- Amtrak Northeast Corridor service between Washington, DC, and Boston, Massachusetts, had recovered 97 percent of ridership
- Southeastern Pennsylvania Transportation Authority (SEPTA) ridership had recovered 51 percent of its ridership

Similar to intercity passenger rail, SEPTA ridership is focused on specific markets and represents a key transportation option within those markets.

1.4 INSTITUTIONAL GOVERNANCE STRUCTURE OF STATE RAIL PROGRAMS

Several state and regional agencies in Pennsylvania have jurisdiction over various aspects of the state's rail system. State agencies include:

- Pennsylvania Department of Transportation (PennDOT)
- Pennsylvania Public Utility Commission (PUC)
- Pennsylvania Department of Community and Economic Development (DCED)

Regional agencies include:

- Regional rail authorities
- Transit agencies, port authorities
- Metropolitan and rural planning organizations

These agencies and their responsibilities are described in the following pages.

Pennsylvania Department of Transportation

LEGISLATIVE AUTHORITY

PennDOT is the designated agency to conduct statewide rail planning and conforms to the requirements of Section 22102. Several Pennsylvania state legislative acts enable PennDOT to engage in activities related to rail, including:

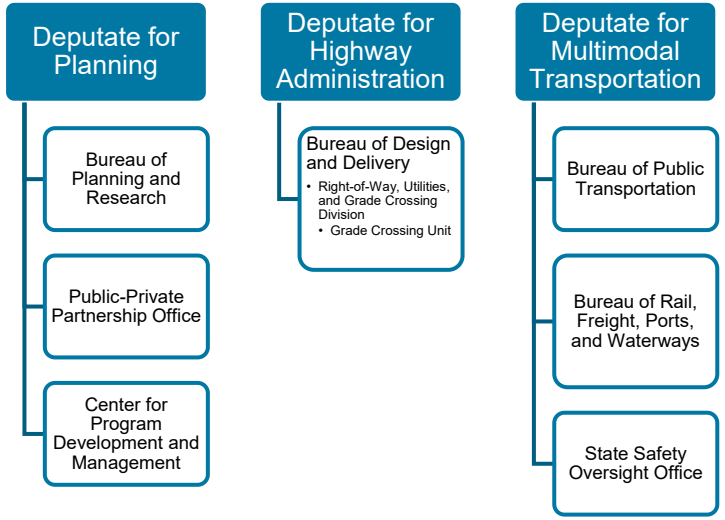
1) Act 119 (PA House Bill 865 of 1983, amended in 1984), which gave PennDOT the authority to assist with freight rail projects;

2) Act 65 (PA Senate Bill 1095 of 2006), which further empowered PennDOT to participate in freight rail projects;

3) Act 13 (PA House Bill 1950 of 2011), which directed a portion of revenues earned from natural gas fees to rail freight assistance; and

4) Act 89 (PA House Bill 1060 of 2013), which created a Multimodal Fund that boosted funding for non-highway modes, including freight, intercity passenger, and commuter rail. PennDOT's internal organization in relation to rail is shown in **Figure 1.4**.

Figure 1.4 Organizations in PennDOT with a Role in Rail



Source: PennDOT

OFFICES SUPPORTING RAIL

Several PennDOT offices and bureaus are involved in rail planning. As per Title 74 of Act 89 of 2013, local and public transportation, rail freight, ports and waterways, and aviation and airports are considered multimodal transportation and fall under PennDOT's Deputy Secretary for Multimodal Transportation. The Deputy Secretary for Multimodal Transportation is the voting representative for Pennsylvania on the Northeast Corridor Commission, with SEPTA as the alternate voting member.

- **Bureau of Rail, Freight, Ports, and Waterways (BRFPW) –** The bureau is primarily responsible for advancing rail transportation throughout the Commonwealth, including developing this State Rail Plan. BRFPW has three primary functions:
  - Rail Freight (Engineering, Planning, and Grants) – Provides technical engineering assistance to freight railroads and administers state rail funding through the Rail Freight Assistance Program (RFAP) and Rail Transportation Assistance Program (RTAP). Bureau engineers provide project management and oversight for RFAP and RTAP projects to verify that design standards and relevant regulations are met. BRFPW is also responsible for maintaining the Pennsylvania railroads system map.
  - Passenger Rail (Capital Projects and Service Planning/Coordination) – Develops capital projects in support of intercity passenger rail across Pennsylvania through state and federal investments. Bureau staff also provide planning, oversight, and management of the Amtrak-operated state-supported services, including the Keystone and the Pennsylvanian service.
  - Ports – Oversees and administers the allocation of state funds to the Port of Philadelphia (PhilaPort), the Port of Pittsburgh, and the Port of Erie. Additionally, through the Pennsylvania Intermodal Cargo Growth Incentive Program, the bureau serves as an advocate for Pennsylvania's ports. Port activities are relevant to rail, given that ports often rely on rail and provide opportunities for freight rail traffic.
- **Bureau of Public Transportation (BPT) –** PennDOT BPT oversees operating and capital investments for 32 fixed route (scheduled local bus, light rail, and commuter rail) systems, 42 community transportation systems, and 10 intercity bus routes provided by two intercity bus companies.
- **State Safety Oversight –** This office serves as the Federal Transit Administration (FTA)-certified State Safety Oversight Agency responsible for overseeing rail fixed guideway public transportation systems not subject to oversight by the FRA. The office oversees safety management system implementation and standards for SEPTA, Pittsburgh Regional Transit, and the Johnstown Inclined Plane (operated by CamTran).
- **The Center for Program Development and Management –** The center prepares the state's multimodal Long Range Transportation Plan (LRTP) and the Statewide Freight Plan, both of which impact rail planning. The center also reviews and updates FAF data and supports the Freight Work Group.
- **Bureau of Planning and Research –** The bureau manages big data and visualization tools, researches new products, and maintains GIS data.
- **Public-Private Transportation Partnership Office and Public-Private Partnership Transportation Board** (see the Public-Private Partnerships section later in this chapter).
- **Highway Administration Grade Crossing Unit –** The unit performs engineering and administrative liaison between PennDOT's 11 engineering districts, the Public Utility Commission, and the railroads that operate within Pennsylvania. The unit provides guidance and direct support to the engineering districts for both Section 130 safety improvement projects and department highway/bridge projects involving railroad facilities.

Pennsylvania Public Utility Commission

The Pennsylvania Public Utility Commission (PUC) regulates electricity, natural gas, pipeline, motor carriers, water and wastewater, telecommunications, and rail services in Pennsylvania. Under Chapter 33 of the Public Utility Law, PUC railroad regulations cover: train operations, at-grade crossings, incident responses, clearances, sanitary,

safety facilities and equipment, among others. The PUC has jurisdiction over highway-rail grade crossings and must approve any changes to crossings.

OFFICES SUPPORTING RAIL

The PUC's Rail Safety Section processes applications for changes to public highway-railroad crossings, including elimination, alteration, suspension, and construction. The Rail Safety Section also receives reports from railroads when a reportable accident involving its facilities or operations has occurred and handles FRA regulatory compliance complaints as they relate to track, motive power, and equipment, hazardous materials, operating practices, and grade crossings. Through the PUC, Pennsylvania participates in the FRA safety inspector program, whereby states can augment FRA's safety inspection functions and help to enforce FRA safety regulations by providing FRA-trained inspectors. The PUC employs 10 inspectors.

Pennsylvania Department of Community and Economic Development

The Department of Community and Economic Development supports good stewardship and sustainable development initiatives across the Commonwealth. As of June 2024, DCED offers more than 120 funding programs.

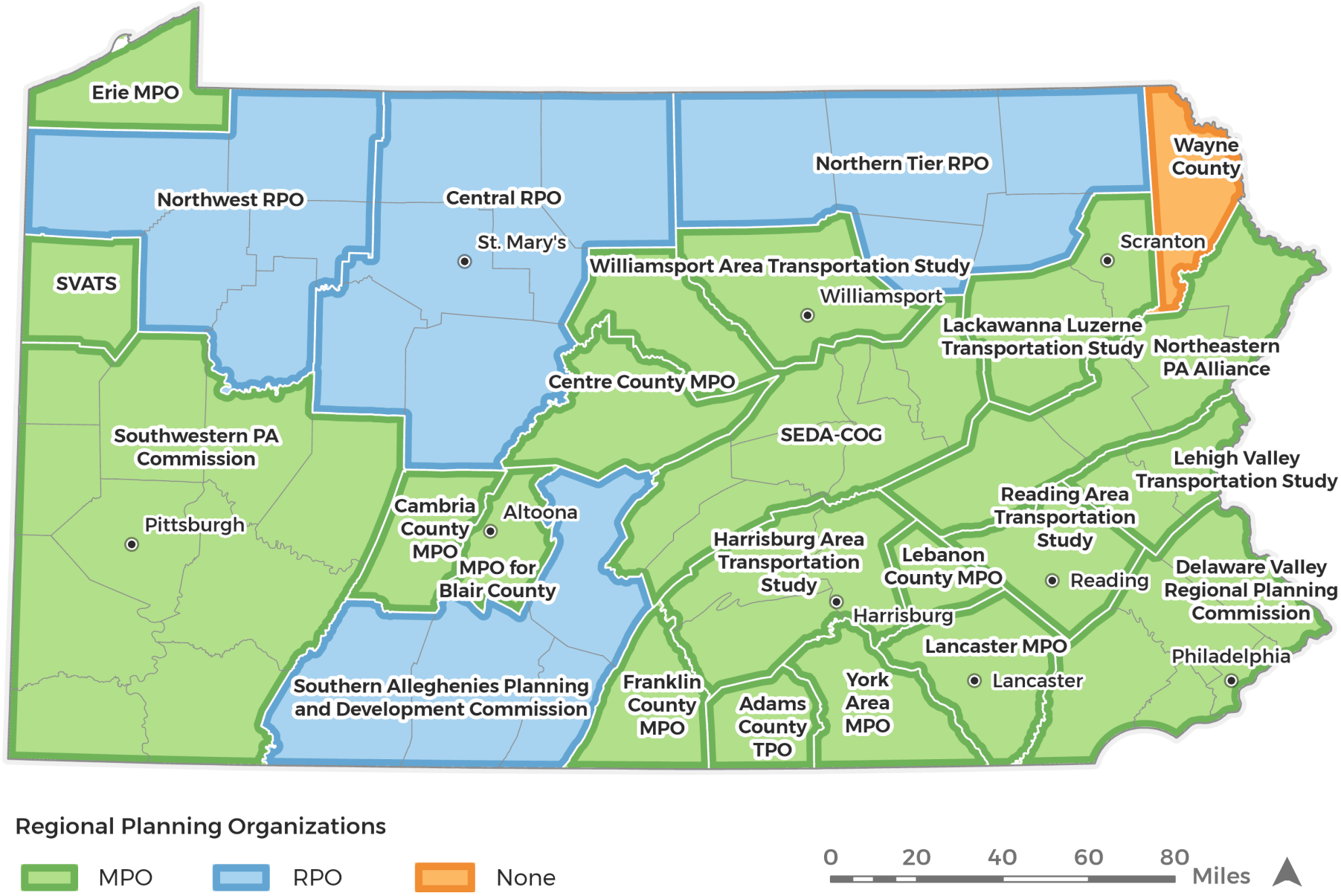
The BRFPW coordinates annually with the DCED as part of the freight grant cycle and for major initiatives through the Pennsylvania Governor's Office.

Regional Agencies

METROPOLITAN AND RURAL PLANNING ORGANIZATIONS (MPOS/RPOS)

MPOs and RPOs are responsible for regional planning and programming for all transportation modes. They evaluate the performance of regional transportation systems and develop Long-Range Transportation Plans every four to five years. As per federal legislation, MPOs are required to represent localities in all urbanized areas with populations above 50,000, as determined by the U.S. Census. The Pennsylvania 2045 Long-Range Transportation plan states that RPOs "can be designated as a method for formalizing the engagement of officials from areas with a population size of less than 50,000 as they incorporate rural transportation needs in the statewide transportation planning process." MPOs/RPOs self-certify that they have met all federal requirements. MPOs/RPOs are mapped in **Figure 1.5** and listed in **Table 1.7**.

Figure 1.5 MPO and RPO Planning Regions



Source: WSP

Table 1.7 List of MPOs/RPOs in Pennsylvania

NAME	PRIMARY MUNICIPALITY	COUNTIES	DOCUMENTATION OF THE MPO/RPO'S ROLE IN RAIL PLANNING
Adams County Transportation Planning Organization (ACTPO)	Gettysburg	Adams	Addressed in 2022 LRTP section
MPO for Blair County (Altoona MSA)	Altoona	Blair	None
Cambria County MPO	Ebensburg	Cambria Part of Somerset	Addressed in 2024 LRTP section
Centre County MPO (CCMPO)	State College	Centre	Addressed in 2020 LRTP section
Delaware Valley Regional Planning Commission (DVRPC)	Philadelphia	Bucks Chester Delaware Montgomery Philadelphia	Discussion of rail throughout the 2021 LRTP
Erie MPO	Erie	Erie	Addressed in 2022 LRTP section
Franklin County MPO	Chambersburg	Franklin	None
Harrisburg Area Transportation Study (HATS MPO)	Harrisburg	Cumberland Dauphin Perry	LRTP section (LRTP ongoing as of 2024)
Lackawanna Luzerne Transportation Study (LLTS MPO)	Scranton	Lackawanna Luzerne	Addressed in 2021 LRTP section
Lancaster MPO	Lancaster	Lancaster	Addressed in 2020 LRTP section
Lebanon County MPO (LEBCO MPO)	Lebanon	Lebanon	Addressed in 2024 LRTP section
Lehigh Valley Transportation Study (LVTS)	Allentown	Lehigh Northampton	Lehigh Valley Passenger Rail Feasibility Analysis was released in 2024 by PennDOT Eastern Pennsylvania Freight Plan is ongoing (as of 2024)
North Central Pennsylvania Regional Planning and Development Commission (North Central RPO)	St. Mary's	Cameron Elk Jefferson McKean Potter	Addressed in 2022 LRTP section
Northeastern Pennsylvania Alliance (NEPA MPO)	Pittston	Carbon Monroe Pike Schuylkill	Addressed in 2024 LRTP section
Northern Tier Regional Planning and Development Commission (Northern Tier RPO)	Sayre	Bradford Sullivan Susquehanna Tioga Wyoming	2020 LRTP section

NAME	PRIMARY MUNICIPALITY	COUNTIES	DOCUMENTATION OF THE MPO/RPO'S ROLE IN RAIL PLANNING
Northwest Rural Planning Organization (Northwest RPO)	Meadville	Clarion Crawford Forest Venango Warren	2024 LRTP section
Reading Area Transportation Study (RATS)	Reading	Berks	2022 LRTP section
Shenango Valley Area Transportation Study (SVATS)	Hermitage	Mercer	None
Southern Alleghenies Planning and Development Commission (SAP&DC)	Altoona	Bedford Blair Cambria Fulton Huntingdon Somerset	2022 LRTP section
Southwestern Pennsylvania Commission (SPC MPO)	Pittsburgh	Allegheny Armstrong Beaver Butler Fayette Greene Indiana Lawrence Washington Westmoreland	None
Susquehanna Economic Development Association Council of Governments (SEDA-COG)	Lewisburg	Clinton Columbia Juniata Mifflin Montour Northumberland Snyder Union	2021 LRTP section
Wayne County	Honesdale		2024 Comprehensive Plan section
Williamsport Area Transportation Study (WATS)	Williamsport	Lycoming	2023 LRTP section
York Area MPO (YAMPO)	York	York	None

Regional Rail Authorities

Three major public regional rail authorities operate in Pennsylvania, as described in the following sections. The Pennsylvania General Assembly's Municipal Authorities Act of 1945 enables the establishment of authorities, including those focusing on transportation, with "the purpose and intent…to benefit the people of the Commonwealth by, among other things, increasing their commerce, health, safety and prosperity…" Municipalities and counties can create authorities that are authorized to construct, improve, maintain and operate rail projects, to borrow money and issue bonds, to develop revenue streams to repay the bonds, to enter into contracts, and accept grants from the federal government.

SUSQUEHANNA ECONOMIC DEVELOPMENT ASSOCIATION COUNCIL OF GOVERNMENTS (SEDA-COG) JOINT RAIL AUTHORITY (JRA)

The SEDA-COG JRA owns five short-line railroads comprising 220 miles. Freight service to over 100 customers is provided under contract by a private operator. The JRA serves Centre, Clinton, Columbia, Lycoming, Mifflin, Montour, Northumberland, Snyder, and Union counties. The Authority was formed in July 1983 by the SEDA-COG Board of Directors in pursuit of public ownership of rail lines that Conrail had decided to abandon.

PENNSYLVANIA NORTHEAST REGIONAL RAIL AUTHORITY (PNRRA)

The Pennsylvania Northeast Regional Rail Authority was founded in 2006 and provides 100 miles of rail for freight and passenger excursions south from Carbon to Scranton, and east to East Stroudsburg and the Delaware Water Gap. Previously, Monroe and Lackawanna counties had separate rail commissions. Rail freight services are provided by the private rail operator, the Delaware-Lackawanna Railroad Co. Inc. under contract with the PNRRA, which owns the rail assets and properties. PNRRA currently serves approximately 25 active rail industries. The PNRRA is the sponsor of the Pennsylvania portion of a project to restore passenger rail commuter service between Scranton and New York City, in partnership with New Jersey Transit (NJ TRANSIT). The PNRRA is a partner with PennDOT and NJ TRANSIT under a PennDOT grant from the FRA to develop a service development plan for the corridor under the Corridor Identification and Development (CID) Program.

SCHUYLKILL RIVER PASSENGER RAIL AUTHORITY (SRPRA)

Formed in 2022, the SRPRA aims to work with various rail companies, local governments, and state and federal agencies to facilitate the return of passenger rail service connecting Reading, Pottstown, Phoenixville, and Philadelphia. The SRPRA is supported with equal representation and funding from Berks, Chester, and Montgomery counties. The SRPRA is primarily focused on partnering with Amtrak as the proposed operator for the Reading to Philadelphia corridor under the FRA CID Program.

Transit Agencies

As per federal guidance on State Rail Plans, for passenger rail service, only commuter (or regional) rail service is considered. Two agencies operate commuter rail service in Pennsylvania: the Southeastern Pennsylvania Transportation Authority (SEPTA) and NJ TRANSIT.

SEPTA

SEPTA is the primary provider of public transportation in the Philadelphia region, operating rapid transit, light rail, bus, and commuter rail (called "regional rail") service. Thirteen regional rail routes are served, with some overlap among portions of routes. Two of the lines terminate in New Jersey (at Trenton and West Trenton), and one line terminates in Newark, Delaware, while the remaining routes are entirely within Pennsylvania. As per the April 2022 *State of the System and Peer Systems Review* document by SEPTA, the 13 lines include 155 stations and 280 one-way track miles and carry 132,000 riders per day (pre-COVID). SEPTA's Regional Rail system is shown in **Figure 1.6**.

NJ TRANSIT

NJ TRANSIT operates 10 commuter rail lines. Of these, one line, the Atlantic City Line, enters Pennsylvania, terminating at 30th Street Station in Philadelphia. It is the only Pennsylvania station served. SEPTA's Trenton Line and NJ TRANSIT also interchange at the Trenton Transit Center in Trenton, New Jersey.

Figure 1.6 SEPTA Regional Rail System

Source: SEPTA

Port Authorities

Pennsylvania's location and proximity to major markets and metropolitan areas has enabled the Commonwealth to be a major regional freight center. Pennsylvania's three major ports provide access to the Atlantic Ocean (Port of Philadelphia), the inland river system, including the Mississippi River via the Ohio, Allegheny, and Monongahela Rivers (Port of Pittsburgh), and the Great Lakes (Port of Erie). More than 67 million tons of goods travel through these ports annually, representing nearly $50 billion in value. The three ports and their relation to rail are summarized below.

PORT OF PHILADELPHIA (PHILAPORT)

PhilaPort is an independent agency of the Commonwealth of Pennsylvania charged with the management, maintenance, marketing, and promotion of port facilities along the Delaware River in Pennsylvania. The Authority was created under the Philadelphia Regional Port Authority Act in July 1989.

PhilaPort's facilities are served by two class-one railroads: CSX and Norfolk Southern (NS). CSX provides daily service between Philadelphia and major midwestern, southern, and southeastern domestic destinations. NS provides double-stack intermodal service between Philadelphia and major Midwest destinations. Service is also available to Canada.

PORT OF PITTSBURGH

The Port of Pittsburgh was created by the Pennsylvania Legislature under Law 1992-133, the Port of Pittsburgh Commission Act. The Port district covers 13 counties and over 200 miles of commercially navigable waterways. The Port of Pittsburgh supports more than 200 river terminals and barge industry service suppliers. The Port complex is served by CSX and NS railroads. The Port of Pittsburgh is the fifth busiest inland port in the country and 39th busiest overall, handling 15.5 million tons of cargo in 2020. Several Class II railroads and switching carriers serve the Port district.

PORT OF ERIE

The Port of Erie, operated through the Erie Western PA Port Authority, provides 750 jobs and more than $110 million in annual economic activity. The Port's Carmeuse Terminal features 1,400 feet of dockage, two warehouses, outside storage space, and a rail connection.

Public-Private Partnerships

Act 88 of 2012 allows Pennsylvania to enter into public-private partnerships (P3). PennDOT defines a P3 as "a contractual agreement between a public entity and a private entity (or another public entity) in which the public entity transfers the responsibility of engineering, construction, operation, financing, and/or maintenance (or any combination) of a transportation project or facility to the private sector for a defined period of time." Benefits of P3s include cost savings, risk-sharing, accelerated project delivery, and access to new sources of private capital.

PennDOT established an Office of Public-Private Transportation Partnerships (P3 Office) and a Public-Private Transportation Partnership Board in 2012. The P3 Office works with all transportation modes. Working closely with stakeholders and industry partners, the office develops innovative project delivery and financing models for a wide array of initiatives designed to strengthen the transportation network. The P3 Office Director is responsible for ensuring that external stakeholders, including the FRA, are adequately represented during the various stages of project identification, screening, development, procurement, and implementation processes. The Public-Private Transportation Partnership Board is tasked with evaluating "where the board finds that the requests or plans for transportation projects are in the best interests of the Commonwealth and a public entity, approve the requests or plans for transportation projects." The P3 Office published a P3 Implementation Manual and Guidelines in December 2022. The document provides guidance on public-private transportation project development and implementation in Pennsylvania applied to both solicited and unsolicited transportation projects across all modes.

1.5 FREIGHT AND PASSENGER RAIL SERVICES (INITIATIVES)

Pennsylvania has advanced several rail improvement initiatives since the last State Rail Plan was published in 2020, some of which are ongoing and some of which are completed. These include:

- Freight rail initiatives
- Rail technology initiatives
- Passenger rail initiatives
- Safety initiatives

These initiatives are introduced in the sections below and discussed in detail in Chapters 3 and 4.

Freight Rail Initiatives

The RFAP and the RTAP are ongoing programs that are the primary mechanisms with which PennDOT supports freight rail improvements in the Commonwealth.

Table 1.8 summarizes RFAP and RTAP award history by year over the past five years. During this time, PennDOT has awarded $172 million across both programs, supporting 126 freight rail projects. Selected projects have prioritized:

- The rehabilitation or replacement of existing track and/or ties
- The creation of new track and/or ties
- Increasing track storage capacity by adding and/or extending rail sidings
- Replacement and repair of bridges and culverts
- Rehabilitation of at-grade crossings
- Construction and installation of unloading equipment

Most projects improve shipper access to the rail network or upgrade or maintain rail infrastructure on Class II and Class III railroad lines. Another key initiative over this period was to clear overhead obstructions on a CSX rail line to enable double-stack container and multi-level auto rack cars to access the Port of Philadelphia. PennDOT also funded a double-stack clearance project on the NS in the western part of the state, investing $22.8 million between 2019 and 2020.

Table 1.8 2019-2023 RFAP and RTAP Awards

YEAR	AWARD AMOUNT (MILLIONS)	PROJECTS FUNDED
2019	$40.0	26
2020	$31.1	26
2021	$33.0	25
2022	$26.0	24
2023	$42.5	25
Total	**$172.6**	**126**

Figure 1.7 displays highlights of work performed by RFAP and RTAP grants awarded between 2019 and 2023.

Figure 1.7 Projects Funded by RTAP and RFAP

Highlights of projects funded by RFAP and RTAP include:

Rehabilitated over **300 miles of track** on short line and regional railroads

Constructed over **5.5 miles** of new track, mostly to provide access to freight shippers

Rehabilitated at least **31 highway-rail grade crossings**

Constructed or improved at least **12 loading/unloading facilities**

Rehabilitated or replaced at least **32 bridges**

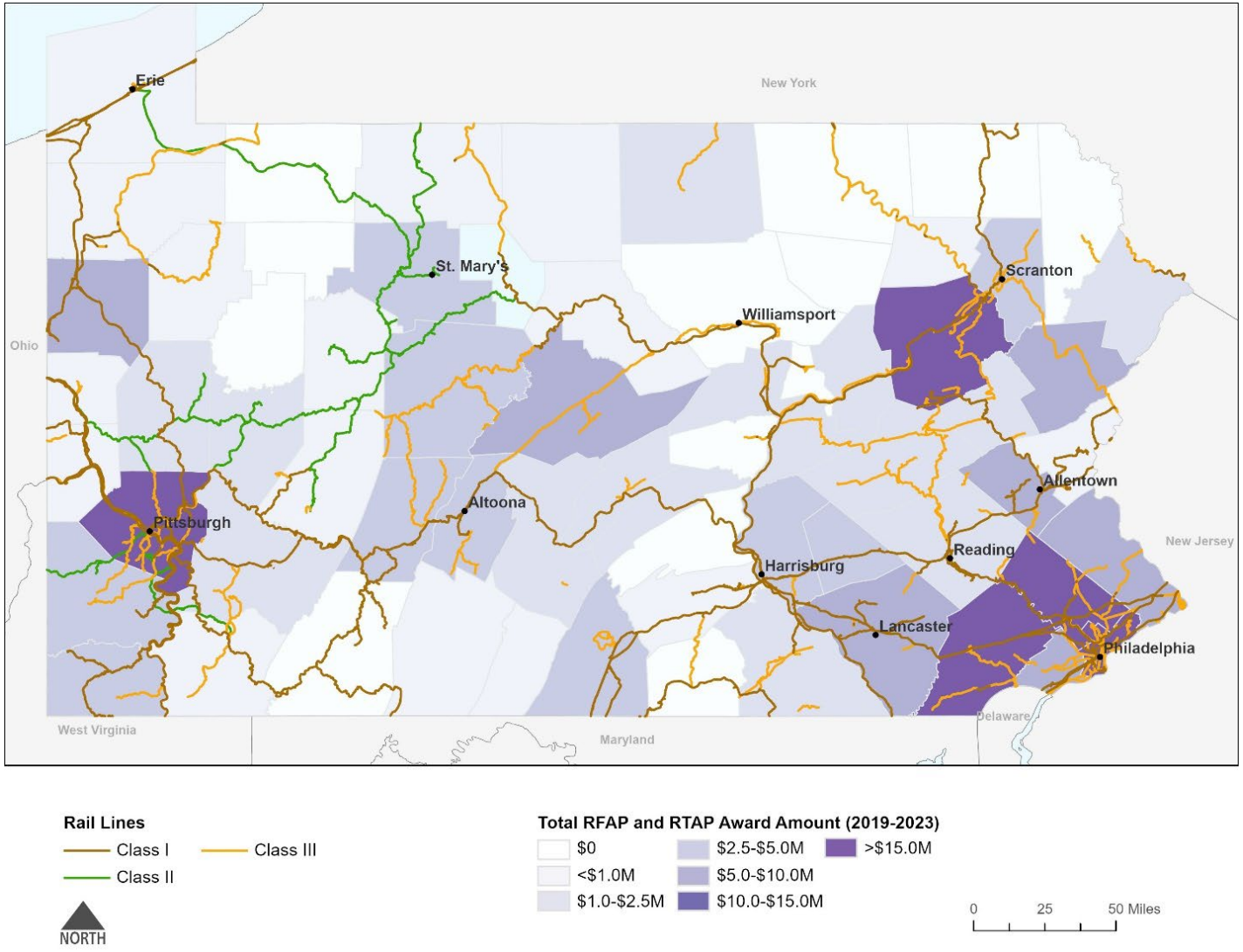
Installed at least **37 turnouts**

Replaced **76,765 ties**, including only those projects that focused specifically on tie replacement rather than rail line rehabilitation

Source: PennDOT Awarded Projects (2019-2023)
(www.penndot.pa.gov/Doing-Business/RailFreightAndPorts/Pages/Grants-and-Loans.aspx)

Figure 1.8 shows the distribution of RFAP and RTAP funds across the state from 2019 to 2023.

Figure 1.8 RFAP and RTAP Award Amount Total (2019 – 2023) by County



Source: PennDOT data, WSP analysis

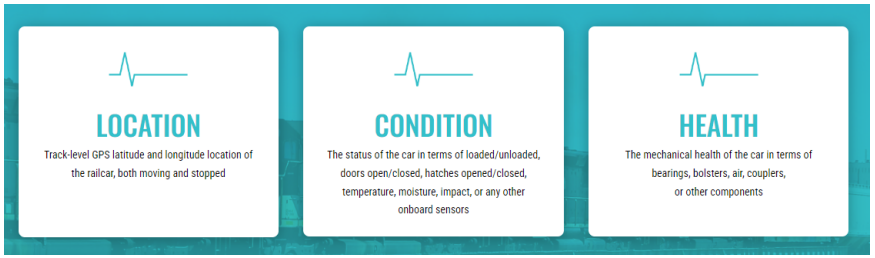
PennDOT and other public sector agencies have also supported freight rail in Pennsylvania by sponsoring and in some cases providing matching funds for federal discretionary grant programs. To illustrate an example of one federal multimodal discretionary grant program, several Commonwealth projects were awarded grants under the U.S. Consolidated Rail Infrastructure and Safety Improvements (CRISI) program:

- In FY2019, McKean County won a grant to rehabilitate four bridges on the Western New York and Pennsylvania (WNYP) line.
- In FY2020, PennDOT, as lead applicant with its partners, won a grant to develop an innovative railcar telematics technology platform, RailPulse.
- In FY2021, the Redevelopment Authority of the County of Berks won a grant to rehabilitate a rail line between Boyertown and Pottstown.
- In FY2022, PennDOT won a grant to support state-of-good-repair track improvements and grade crossing upgrades across 220 track miles of the Buffalo & Pittsburgh Railroad.

Rail Technology Initiatives

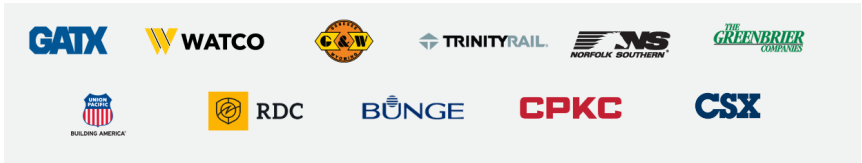
PennDOT played a leading role in submitting the successful CRISI grant application for up to $7.9 million in FRA funding for RailPulse (www.railpulse.com), an innovative railcar telematics technology platform that will support rail shipping by providing essential shipment visibility to customers by tracking three key conditions: (1) location, (2) condition, and (3) Health (**Figure 1.9**).[2] A joint venture between the FRA, NS, and 10 major North American railcar owners (**Figure 1.10**), RailPulse is expected to help drive carload growth in the Commonwealth.[3]

Figure 1.9 Key Car Conditions Tracked by RailPulse



Source: RailPulse

Figure 1.10 RailPulse Participating Companies



Source: RailPulse

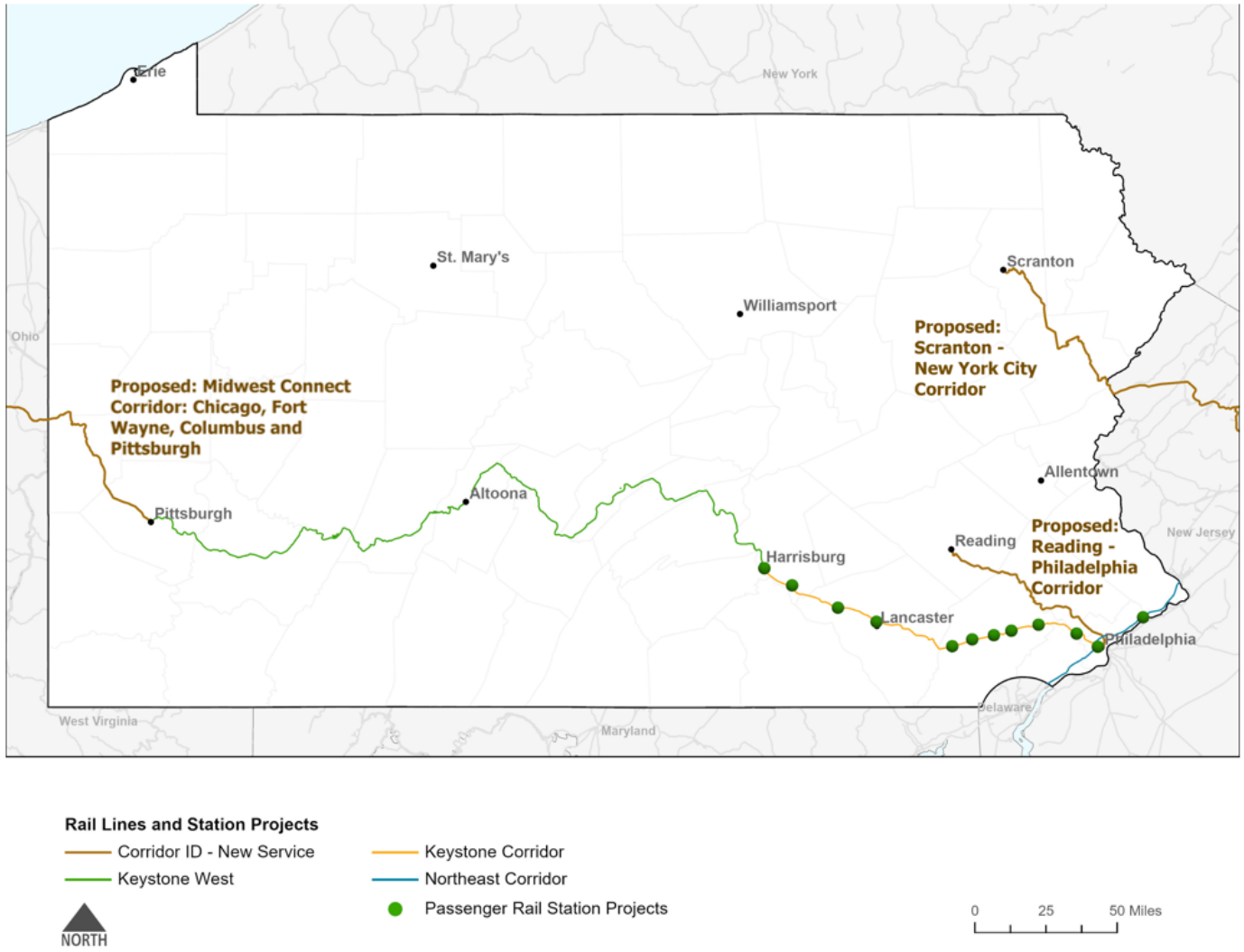
[2] FRA: https://railroads.dot.gov/sites/fra.dot.gov/files/2020-10/FY20%20CRISI%20Project%20Listing%20for%20Press%20Release_FINAL2.pdf

[3] RailPulse: www.railpulse.com/about/

Passenger Rail Initiatives

PennDOT has been active in supporting intercity passenger rail initiatives while SEPTA has been supporting regional passenger rail projects. **Figure 1.11** shows the major intercity passenger rail initiatives underway in the Commonwealth, which are detailed on the following pages.

Figure 1.11 Locations of Pennsylvania Intercity Passenger Rail Initiatives



Source: WSP

KEYSTONE CORRIDOR

PennDOT supports two Amtrak services on the Keystone Corridor:

- Keystone Service® (Harrisburg Line) operates between New York and Harrisburg. PennDOT subsidizes the portion of service between Harrisburg and Philadelphia. The Keystone Service® comprises 13 daily round trips.
- The Pennsylvanian® operates between New York and Pittsburgh. PennDOT subsidizes service between Philadelphia and Pittsburgh, with one train per day in each direction.

There are plans to add a second Pennsylvanian® train, which will include an investment by PennDOT of at least $250 million. PennDOT received a $143 million grant from the U.S. Department of Transportation (USDOT) Federal-State Partnership grant program. The goal is to initiate the new service in 2026. The service will be made possible through a collaborative effort between PennDOT, Amtrak, and NS.

KEYSTONE CORRIDOR STATIONS

PennDOT has also improved stations on the Keystone Corridor between Philadelphia and Harrisburg, Keystone East. These improvements are summarized in **Table 1.9**.

Table 1.9 Keystone East Station Improvements Started or Completed Since 2020 Rail Plan

STATION	WORK PERFORMED	TIMING OF WORK
Ardmore	Construction of a new station building and high-level platforms.	Began in 2019 and is anticipated to be completed in 2025
Paoli	Current phase, called the North Valley Road Bridge Relocation project, focuses on improving traffic flow and safety for motorists and pedestrians by reconfiguring the roadways surrounding the station.	Expected completion 2027
Exton	Renovations were completed in 2020, including the construction of an Americans with Disabilities Act (ADA)-compliant station building on the eastbound (south) side of the tracks and new passenger shelter on the westbound (north) side of the tracks.	Completed 2020
Coatesville	Coatesville Station Access project involves construction of new station, two streetscaping projects between 3rd and 4th Avenue from Fleetwood Street and Lincoln Highway, completed in 2020.	Station access project completed in 2020; new station construction began 2022, estimated completion 2026
Lancaster	Improvements include increased parking, new lighting, stormwater management facilities, and accessible sidewalk improvements to provide better station access. A pedestrian bridge will be constructed, providing direct access from the new parking lot to the existing passenger bridge.	Parking lot completed in 2023 Pedestrian bridge estimated completion 2026
Middletown	Construction of a new station that includes a central high-level ADA-compliant platform, elevator and stair towers, and a parking lot with 400 spaces with designated bus loading zones	Completed in January 2022
Downingtown	Construction of a new ADA-compliant train station that will accommodate intercity and commuter service	Construction will begin in 2026
Parkesburg	The project will increase parking capacity and will make improvements to increase station access for motorists and pedestrians. The project will construct new high-level boarding platforms.	Design ongoing in 2025, including design for high-level boarding, which began in 2024
Harrisburg	The Harrisburg Transportation Center Project replaces the station roofs and skylights which are beyond their useful life and improves public meeting space for visitors of the Observation Room.	Completed 2024

Source: PennDOT

NORTHEAST CORRIDOR

Several improvements are taking place on the Northeast Corridor (NEC), involving SEPTA and PennDOT and/or Amtrak. These include the following:

- **Philadelphia Zoo (Zoo) Interlocking** – Improvements to interlocking where trains move between the NEC and the Keystone East Corridor. This will reduce train conflicts and improve the fluidity of the connection.
- **Philadelphia 30th Street Station** – Improvements to the south concourse and south office tower.
- **Cornwells Heights Station** – Project will include a new 600-foot high-level platform and using a grant from the USDOT Federal-State Partnership for Intercity Passenger Rail – NEC grant program, a new accessible pedestrian overpass with elevators.

OTHER PLANNING INITIATIVES - CORRIDOR IDENTIFICATION AND DEVELOPMENT PROGRAM (CID)

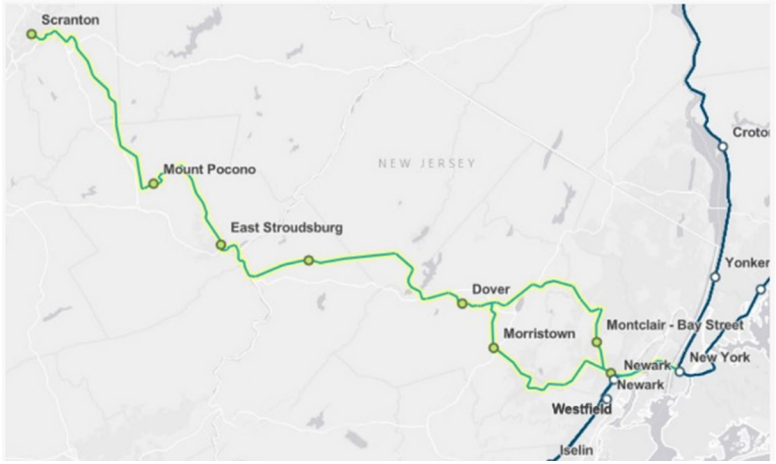
The IIJA required the establishment of the CID Program to identify and prioritize passenger rail projects for future investment. CID projects may receive funding for the service development plan, preliminary engineering, and environmental phases of the project.[4]

PennDOT served as the primary applicant or co-applicant for the FY22 FRA Corridor ID Program grant projects highlighted below, which were selected in December 2023 and will each receive up to $500,000 towards passenger rail planning projects.

Scranton – New York City

PennDOT and co-applicants PNRRA and NJ TRANSIT propose restoring rail service between Scranton, Pennsylvania, and New York City. The 140-mile corridor spans 60 miles across Pennsylvania, owned by the Pennsylvania Northeast Regional Railroad Authority (PNRRA) and 80 miles in New Jersey, owned and operated by NJ TRANSIT. The remaining 20 miles of missing track is the property of the New Jersey Department of Transportation (DOT) (**Figure 1.12**).[5]

Figure 1.12 Proposed Corridor from Scranton to NYC



Source: Amtrak (www.amtrakconnectsus.com/maps/new-york-scranton/)

[4] FRA: https://railroads.dot.gov/corridor-ID-program

[5] PennDOT: https://advancingparail.com/projects/corridor-id-program/

Reading – Philadelphia

The proposed project, sponsored by the SRPRA, would restore passenger train service along the corridor, utilizing the existing rail alignment to provide connection from Reading to Philadelphia, with new intermediate stops at Pottstown, Phoenixville, and potentially Norristown, Pennsylvania (**Figure 1.13**).

Chicago, Fort Wayne, Columbus, and Pittsburgh

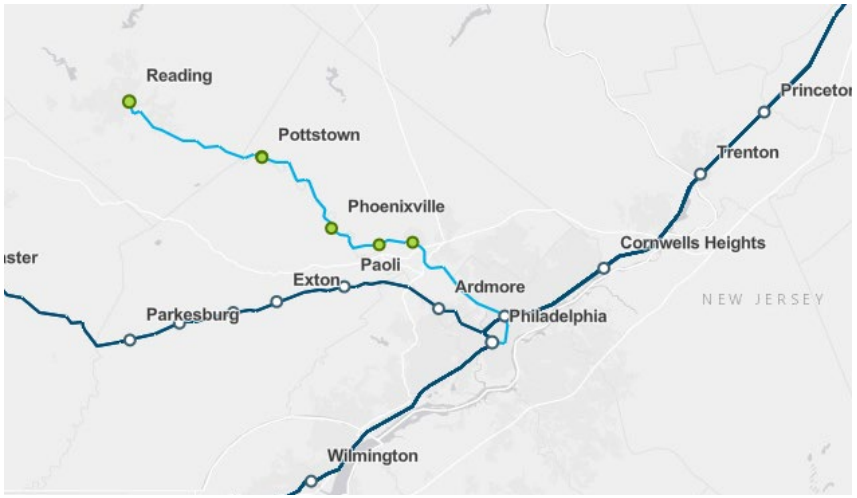
The proposed project would reinstate service on an existing rail alignment, providing a connection from Chicago, Illinois, to Pittsburgh, Pennsylvania , through Fort Wayne, Indiana, and Columbus, Ohio. Funds will be used to develop a project scope, schedule, and cost estimate for preparing, completing, or documenting its service development plan.[6] The sponsor is the City of Fort Wayne, Indiana.

SEPTA INITIATIVES

SEPTA's most recent strategic plan, *SEPTA Forward, A Vision for a Stronger Future,* and SEPTA's *Fiscal Year 2023 Capital Budget* identify several initiatives relevant to SEPTA's regional rail service:

- **Customer Experience** – SEPTA is seeking to make the system easier to use so that stations are improved by enhanced visibility, lighting, wayfinding, and better communication about arrivals; Another improvement is seamless fare systems that work across services and interact with smartphones.
- **Reimagining Regional Rail** – SEPTA is adjusting rail service that had focused more on commuter trips to enable more frequent services (15-minute, 30-minute, 60-minute) all-day and all-week that serve a broader range of trip purposes. SEPTA is coordinating the planning, design, and construction of infrastructure with Amtrak along the Keystone Corridor (SEPTA's Paoli/Thorndale Line) and the NEC (Wilmington/Newark Line and Trenton Line) to minimize service delays due to construction-based outages. SEPTA is finalizing a study evaluating infrastructure requirements to increase service on the Airport Line and is starting similar work on the Norristown Line.
- **Fleet Replacement** – Much of SEPTA's fleet has been in operation since the 1970s, but SEPTA is starting to replace its fleet with cars that will be more reliable, accessible, and will generally improve customer experience. SEPTA is preparing the specifications for the Silverliner VI to replace approximately 65 percent of its Regional Rail fleet. These vehicles will be designed with modern passenger amenities and for improved operations and reliability.
- **Mainline Schuylkill Bridges** – The 11 bridges between Suburban Station and 30th Street Station were built in 1929 and will need rehabilitation, including replacement of interlockings to provide more efficient throughput for proposed frequent services.

Figure 1.13 Proposed Corridor from Reading to Philadelphia



Source: Amtrak (New York – Philadelphia – Reading (amtrakconnectsus.com)

[6] Ibid.

- **Interlockings** – Interlockings allow trains to pass from one track to another, and improvements to interlockings will allow operational improvements.
- **Station Accessibility and Amenities** – SEPTA will be investing in accessibility improvements at stations such as high-level platforms, as well as other station amenities. SEPTA recently completed the reconstruction of Conshohocken Station, and construction is underway at Ardmore Station, among others.
- **Transit-Oriented Communities (TOC) Program** – SEPTA will be coordinating future rail investments with local jurisdictions and highlight the potential for future TOC on agency-owned property adjacent to stations and station area multimodal connections, including pedestrian, bike, and micro-mobility access.

Safety Initiatives

The Commonwealth of Pennsylvania is committed to continuously improving freight and passenger railroad safety, where PennDOT employs a multi-faceted approach through the promotion of education programs and the implementation of infrastructure improvements that enhance safety. Notable collaborative partners and safety programs in Pennsylvania include, but are not limited to:

- **Section 130:** Through the ongoing work of the federal Railway-Highway Crossing (Section 130) Program administered by PennDOT, safety at numerous crossings has been improved.
- **Ongoing PUC Activities:** As discussed earlier in this chapter, the PUC participates in the FRA inspection program, including inspections of track, train control, rail equipment, signals, operations, and hazardous materials handling. The PUC Engineering Section is responsible for oversight, approval, and inspection of infrastructure interactions with railroads, i.e., railroad over railroad, road over railroad, and railroad over road. Through direct engagement with responsible parties (railroads, highway departments, municipalities, etc.), the PUC works to identify and pre-emptively mitigate safety hazards.
- **Operation Lifesaver:** Operation Lifesaver is an international, nonprofit education and awareness program dedicated to ending tragic collisions, fatalities, and injuries at highway-rail grade crossings and on railroad rights of way. The Pennsylvania Operation Lifesaver promotes rail safety in the Commonwealth through public awareness campaigns and education initiatives, including free safety presentations by authorized volunteers.
- **Station Improvement Project Safety Elements:** All station improvement projects in the Commonwealth are evaluated for safety across multiple disciplines and departments, including but not limited to passenger safety, pedestrian, highway, platform, train operations, etc. Safety elements commonly incorporated into these designs include fencing, blue lights, warning systems, wayfinding, emergency access, security cameras, and lighting.
- **Amtrak/PennDOT SSPP Program:** PennDOT has partnered directly with Amtrak and FRA to execute a System Safety Program, which started in 2023 with safety assessment steps that included establishing a safety policy statement, setting goals, outlining the implementation process, identifying procurement requirements, risk-based hazard analysis and management, defining a safety culture, and determining how to execute the internal safety program assessment. Subsequent steps in this FRA-sanctioned program continued through 2024 and will be completed in 2025. Details are highlighted in the **Figure 1.14.**

Figure 1.14 Amtrak/PennDOT System Safety Program

Amtrak/PennDOT System Safety Program

1st Year (June 9,2022 – June 9, 2023)

Section	SSP Element
270.103(b)	System safety program policy statement
270.103(c)	System safety program goals
270.103(f)	System safety program Implementation process
270.103(o)	Contract procurement requirements
270.103(p)	Risk-based hazard management
270.103(q)	Risk-based hazard management
270.103(t)	Safety culture
270.303	Internal system safety program assessment

2nd Year (June 9,2023 – June 9, 2024)

Section	SSP Element
270.103(d)	Rail system description
270.103(e)	Management and organizational structure
270.103(g)	Maintenance, Repair, and inspection program
270.103(h)	Rules compliance and procedures review
270.103(m)	Accident/Incident reporting and Investigation
270.103(n)	Safety data acquisition
270.103(s)	Safety Assurance
270.303	Internal system safety program assessment

3rd Year (June 9,2024 – June 9, 2025)

Section	SSP Element
270.103(i)	System safety program employee/contractor training
270.103(k)	Workplace safety
270.103(l)	Public safety outreach program
270.103(j)	Emergency management
270.103(r)	Technology analysis and implementation plan
270.303	Internal system safety program assessment

Source: PennDOT

2. Pennsylvania's Existing Rail System

2.1 DESCRIPTION AND INVENTORY

Existing Freight, Intercity Passenger, and Commuter Transportation System

PENNSYLVANIA'S EXISTING RAIL LINES

Pennsylvania's rail network spans 5,532 miles, making it one of the most extensive in the United States. The rail network not only supports the shipment of Pennsylvania's products but also serves as a key bridge to connect ports and markets on the eastern seaboard to economic centers across the country.

Pennsylvania's existing rail lines include Class I main lines, Class II regional rail lines, and a multitude of Class III short-line railroads. While most overhead traffic (traffic originating and terminating outside of Pennsylvania) operates over the Class I lines, a robust first-mile/last-mile network exists in Pennsylvania, supported by the Class II and Class III railroads.

RAIL LINE OWNERSHIP

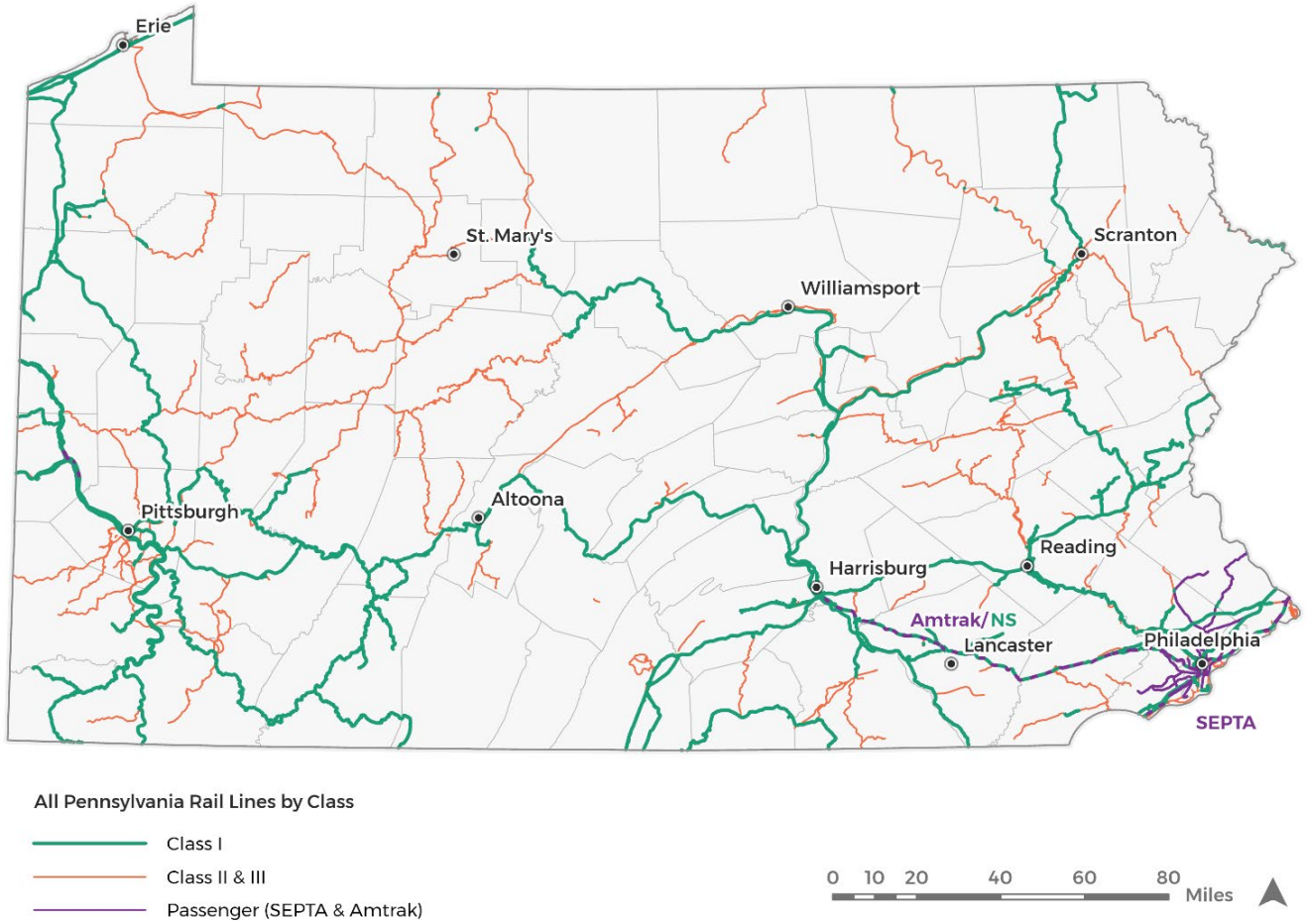
A variety of private and public entities own and operate Pennsylvania's rail lines. Most rail lines in the Commonwealth are owned and operated by freight railroads. The primary exception is Southeastern Pennsylvania, where extensive intercity and regional passenger rail operations are operated by Amtrak and SEPTA.

- **Freight Railroad Ownership**: Freight railroads own and operate 5,228 miles of rail lines in Pennsylvania. In addition to privately owned railroads, multiple public entities own freight rail lines,

including local governments, rail authorities, and the federal government. Where freight rail lines are owned by public entities, a private operator is contracted to operate the lines. Most rail lines owned by freight railroads are exclusively for freight use; however, Amtrak operates over some freight rail main lines, as illustrated in **Figure 2.1**.

- **Passenger Railroad Ownership**: Passenger railroads own 304 miles of rail lines in Pennsylvania. They include 153 miles owned and operated by Amtrak on the NEC and Keystone Corridor (Amtrak's Harrisburg Line), as well as 154 miles owned and operated by SEPTA on 13 regional rail lines in the Philadelphia area. Amtrak and SEPTA allow freight rail carriers to operate on their lines through trackage rights agreements.

Figure 2.1 Map of Pennsylvania State Rail Lines



Source: WSP, PennDOT GIS

Freight Rail Services in Pennsylvania

RAIL LINE CLASSIFICATIONS AND REVENUE THRESHOLDS

Railroads in Pennsylvania are classified based on annual revenue,[7] as outlined by the U.S. Surface Transportation Board (STB). The classes describe the size of the railroads in terms of revenue and generally describe the nature of the railroad's operations:

- **Class I Railroads** have annual revenues that exceed $1.05 billion. These railroads primarily handle long-haul shipments and comprise the nation's highest volume freight lines. Nationwide, there are six Class I railroads, with a duopoly consisting of CSX and NS existing in most markets east of the Mississippi River.
- **Class II Railroads** have annual revenue between $47.3 million and $1.05 billion, and provide connections within a specific region. These railroads often are hundreds of route-miles long and serve regional markets, which may include multiple states.
- **Class III Railroads** have annual revenues below $47.3 million. These "short-line railroads" provide first-mile/last-mile connections between local shippers and the larger freight railroad networks. Often, these railroads are small, serving a single location or low volume branch lines that cannot be profitably served by the larger railroads.

Table 2.1 Pennsylvania Operated Route-Miles by Railroad Class

TYPE OF RAILROAD	ROUTE-MILES OPERATED*	PERCENTAGE OF TOTAL
Class I	3,615	53%
Regional (Class II)	984	14%
Short Line (Class III)	2,243	33%
Total	**6,842**	**100%**

Source: AAR, STB

Note: * Class I route-miles based on 2023 STB Annual Financial Report Data. Regional and Short-Line route-miles based on 2021 AAR State Fact Sheet for Pennsylvania. Data differs from the 5,532 mile figure cited earlier because it includes trackage rights where one railroad operates over the other railroad's tracks.

[7] Railroad classes are established by the Surface Transportation Board (STB), which accounts for inflation by applying a Deflator Factor based on the Railroad Freight Price Index developed by the Bureau of Labor Statistics. The referenced revenue numbers reflect 2023 classifications, which is the most recent year available, and had an applied Deflator Factor of 0.8541.

CLASS I RAILROADS IN PENNSYLVANIA

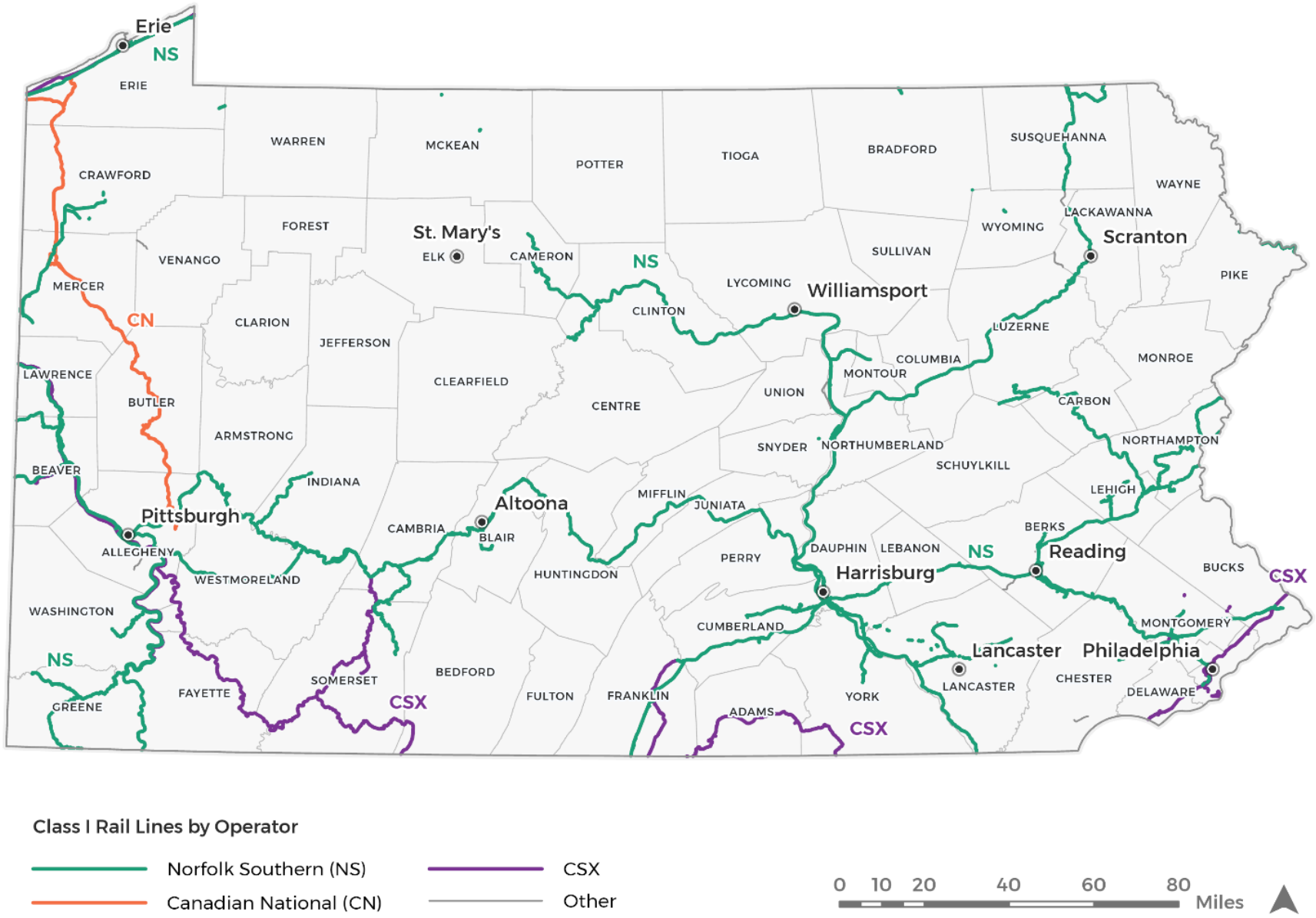
Class I railroads in Pennsylvania operate 53 percent of the state's rail mileage and transport over 60 percent of the state's rail freight tonnage. Pennsylvania's Class I operators are as follows:

- **Norfolk Southern**: NS operates over 2,400 miles within Pennsylvania, including its core east-west New York/New Jersey–Chicago mainline operation. In the eastern portion of the state, multiple NS lines connect Harrisburg to east coast markets such as New England, New York/New Jersey, Philadelphia, Wilmington, Baltimore, and Washington. West of Harrisburg, the NS Pittsburgh and Fort Wayne lines form a major route between Harrisburg, Pittsburgh, and the Midwest. Directly or through Class II and Class III connections, NS serves many freight markets in Pennsylvania.
- **CSX**: With over 1,000 miles within Pennsylvania, CSX primarily operates in three corridors through Pennsylvania. In the east, CSX operates a freight corridor roughly parallel to the NEC between New York, Philadelphia, and Wilmington. In western Pennsylvania, CSX operates the former Baltimore & Ohio and Pittsburgh & Lake Erie main lines, connecting Pittsburgh to Baltimore and Youngstown. Finally, in northwestern Pennsylvania, CSX operates the former New York Central "Water Level" route connecting Erie to Buffalo and Cleveland. This is the major east-west CSX route between New York/New Jersey and the Midwest. In the remainder of the state, while CSX has some branch lines across southern Pennsylvania, it is generally dependent on Class II and Class III railroads to access Pennsylvania markets.

- **Canadian National (CN)**: Operating 156 miles in Pennsylvania along the former Bessemer & Lake Erie Railroad, CN's network handles north/south shipments between Pittsburgh and the Port of Conneaut on Lake Erie, linking Pennsylvania with the Upper Midwest, Canada, and New York. This is a unique Class I operation, as it is a single line primarily carrying iron ore from the Port of Conneaut to Pittsburgh steel mills and does not directly connect with the rest of the CN network.

Pennsylvania's Class I railroads are mapped in **Figure 2.2.**

Figure 2.2 Pennsylvania Class I Railroads



Source: WSP, PennDOT GIS

Table 2.2 Pennsylvania Class I Railroad Mileage

CLASS I RAILROADS	MILES LEASED	MILES OWNED	MILES OWNED, NOT OPERATED	MILES OPERATED	TRACKAGE RIGHTS
Canadian National	-	154	-	154	-
CSX Transportation	22	414	57	1,049	568
Norfolk Southern	-	1,764	193	2,410	641
Total	**22**	**2,332**	**250**	**3,613**	**1,209**

Source: STB. Note that trackage rights includes mileage where one railroad operates over the other railroad's tracks.

CLASS II RAILROADS IN PENNSYLVANIA

Pennsylvania's regional (Class II) railroads operate over 984 miles, with the Buffalo & Pittsburgh Railroad being the largest Class II in the state. These regional railroads handle around 8 percent of Pennsylvania's rail traffic and provide vital links between Class I mainlines and local rail networks, while at the same time handling some overhead traffic of their own.

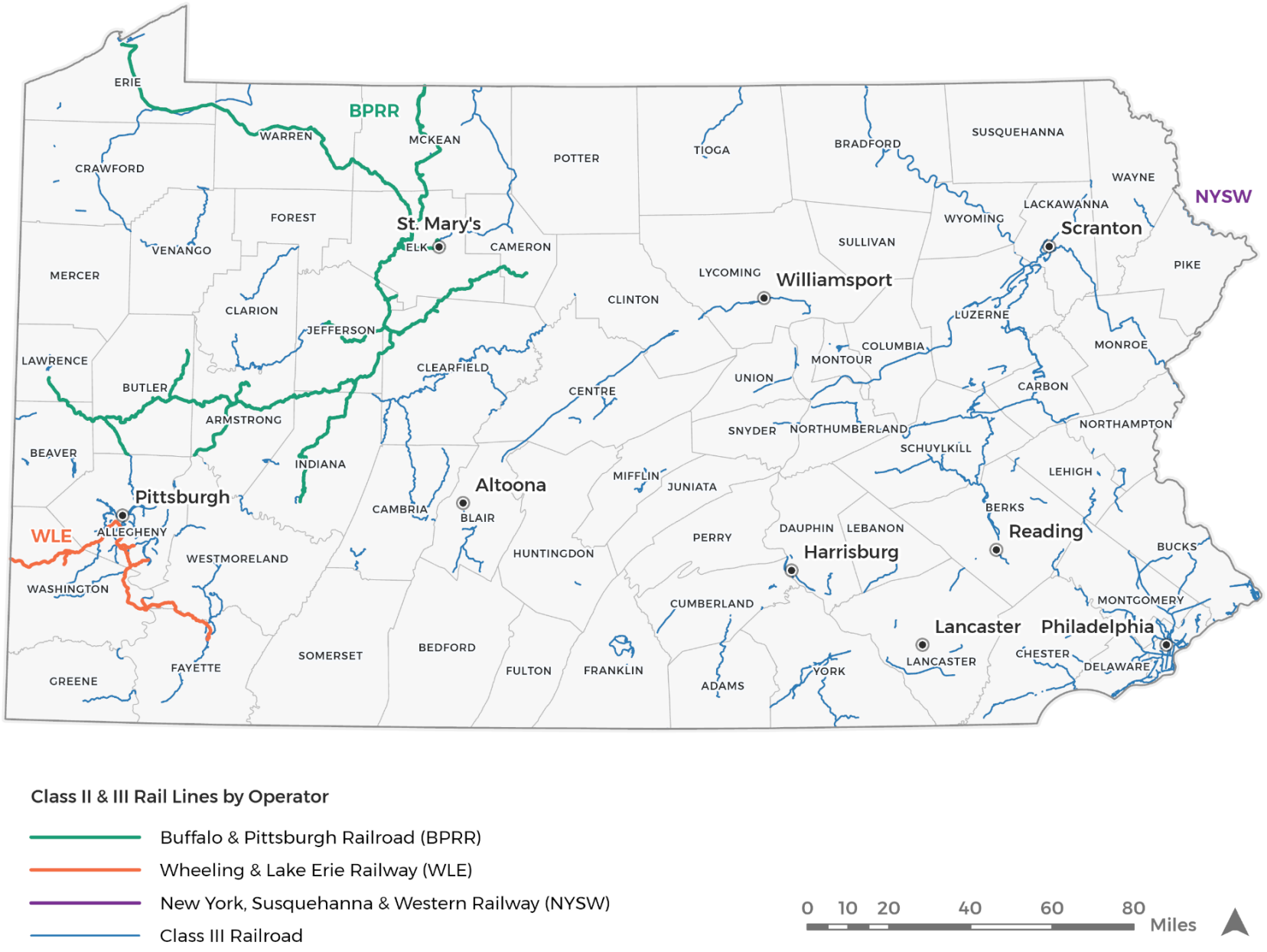
Pennsylvania's Class II railroads are:

- **Buffalo & Pittsburgh Railroad (BPRR):** A subsidiary of Genesee & Wyoming, BPRR operates 655 route miles in the northwestern part of Pennsylvania, connecting Pittsburgh to Erie, New Castle, Dubois, Ridgway, Bradford, and western New York.
- **Wheeling & Lake Erie Railway (W&LE):** W&LE operates approximately 287 miles across southwestern Pennsylvania and connects Pittsburgh and Connellsville to Ohio and Maryland.
- **New York, Susquehanna & Western Railway (NYSW):** NYSW operates over 42 route miles in northeastern Pennsylvania along the former Erie Railroad main line. All NYSW traffic in Pennsylvania is overhead traffic, with the limited local traffic being provided by CNYK railroad, which is also owned by Delaware Otsego Corporation.

CLASS III RAILROADS IN PENNSYLVANIA

Pennsylvania's Class III (short-line) railroads operate over 2,243 miles in the Commonwealth, providing essential connections for local industries by providing first-mile and last-mile service to customer facilities. While individually, Pennsylvania's Class III railroads are small, the 53 short-line railroads collectively operate 33 percent of the state's route mileage. Generally, this mileage is composed of much lighter-density rail lines than those of the Class I and Class II railroads. These are mapped in **Figure 2.3**.

Figure 2.3 Pennsylvania's Class II and III Railroad Network



Source: PennDOT GIS

Both Class II and Class III railroads may operate independently, but many are owned by holding companies. These holding companies amass ownership in multiple smaller railroads, not necessarily contiguous, allowing for greater economies of scale in shared resources and increased commercial opportunities. **Table 2.3** outlines Pennsylvania's Class II and Class III railroads by ownership.

Table 2.3 Pennsylvania's Class II and Class III Railroads

PARENT COMPANY	SUBSIDIARY	ACRONYM	ROUTE-MILES OPERATED
Alpha Natural Resources	Cumberland Mine Railroad	CM	17
Cleveland Cliffs	Brandywine Valley Railroad	BVRY	3
	Steelton and Highspire Railroad	SHRR	2
	Upper Merion and Plymouth Railway	UMP	6
Carload Express Inc.	Allegheny Valley Railroad	AVR	77
	Southwest Pennsylvania Railroad	SWP	66
Chesapeake and Delaware	Belvidere & Delaware River Railway	BDRV	1
Colebrookdale Railroad Preservation Trust	Eastern Berks Gateway Railroad	EBG	9
Delaware Otsego	Central New York Railroad	CNYK	42
Genesee & Wyoming	Aliquippa & Ohio River Railroad	AOR	9
	Maryland Midland Railway	MMID	1
	Pittsburgh & Ohio Central Railroad	POHC	38
	Wellsboro & Corning Railway	WCOR	29
	York Railway	YRC	53
Genesee Valley Transportation	Delaware–Lackawanna Railroad	DL	88
Indiana Boxcar	Youngstown & Southeastern Railway	YSRR	5
Kasgro Rail	Kasgro Rail	KRL	4
Lehigh Valley Rail Management	Bethlehem Division	LVRB	5
	Johnstown Division	LVRJ	19
Livonia, Avon, & Lakeville	Western New York & Pennsylvania Railroad	WNYP	159
McKees Rocks Industrial Enterprises	Pittsburgh, Allegheny, & McKees Rocks Railroad	PAM	5
North Shore Railroad & Affiliates	Juniata Valley Railroad	JVRR	64

PARENT COMPANY	SUBSIDIARY	ACRONYM	ROUTE-MILES OPERATED
	Lycoming Valley Railroad	LVRR	107
	Nittany & Bald Eagle Railroad	NBER	125
	North Shore Railroad	NSHR	37
	Shamokin Valley Railroad	SVRR	29
	Union County Industrial Railroad	UCIR	12
Patriot Rail	Gettysburg & Northern Railroad	GET	27
Railroad Enterprise Group	Pennsylvania and Southern Railroad	PSCC	15
R.J. Corman Railroad Group	Allentown Lines	RJCN	2
	Lehigh Line	LRWY	60
	Luzerne & Susquehanna Railroad	LS	60
	Pennsylvania Lines	RJCP	243
SMS Rail Service	SMS Rail Service	SLRS	4
Transtar	Union Railroad Company	URR	22
Wabtec	East Erie Commercial Railroad	EEC	5
Watco Transportation Services	Ithaca Central Railroad	ITHR	1
	Pennsylvania Southwestern Railroad	PSWR	12
Regional Rail, LLC	East Penn Railroad	ESPN	110
	Tyburn Railroad	TYBR	15
Independent / Other Ownership	Allentown and Auburn Railroad	ALLN	4
	Columbia and Reading Railway	CORY	3
	Chestnut Ridge Railway	CHR	5
	Conrail Shared Assets	CRCX	127
	Delaware, Lackawaxen & Stourbridge Railroad	DLS	25
	East Broad Top Connecting Railroad	EBTC	4
	Elizabethtown Industrial Railroad	EZR	1
	Everett Railroad	EV	24

PARENT COMPANY	SUBSIDIARY	ACRONYM	ROUTE-MILES OPERATED
	Landisville Railroad	LVR	1
	Middletown & Hummelstown Railroad	MIDH	7
	New Castle Industrial Railroad	NCIR	16
	Northampton Development Center Railroad	NDCR	1
	New Hope Railroad	NHRR	19
	Oil Creek & Titusville Lines	OCTL	14
	Reading Blue Mountain & Northern Railroad	RBMN	400
	Strasburg Railroad	SRC	5

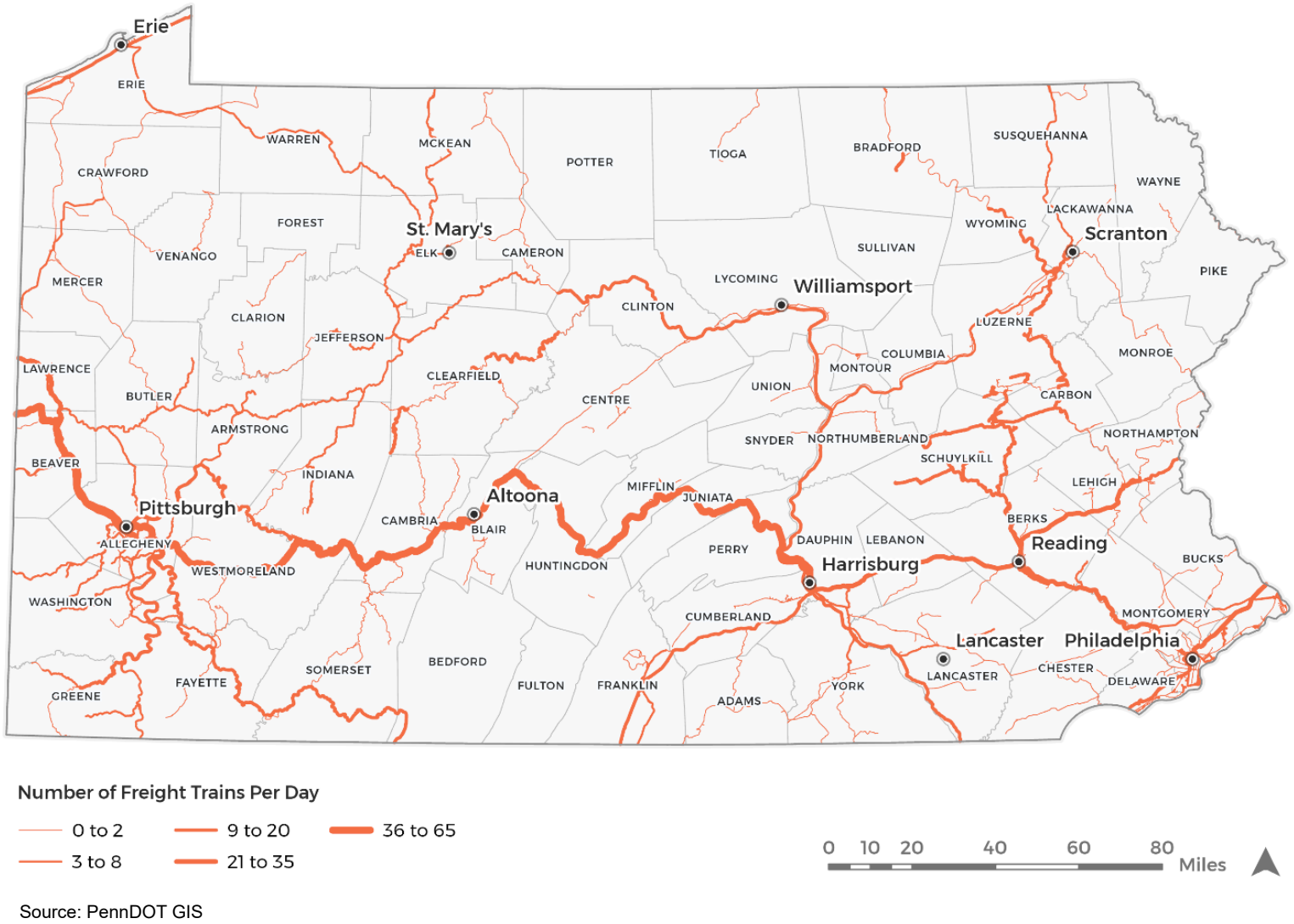
Source: Railroad websites, AAR

USE OF PENNSYLVANIA RAIL LINES

Pennsylvania has multiple core freight rail routes operating throughout the Commonwealth.

The highest density route is the NS main line between Philadelphia, Harrisburg, and points west (**Figure 2.4**).

Figure 2.4 Freight Trains Per Day by Line

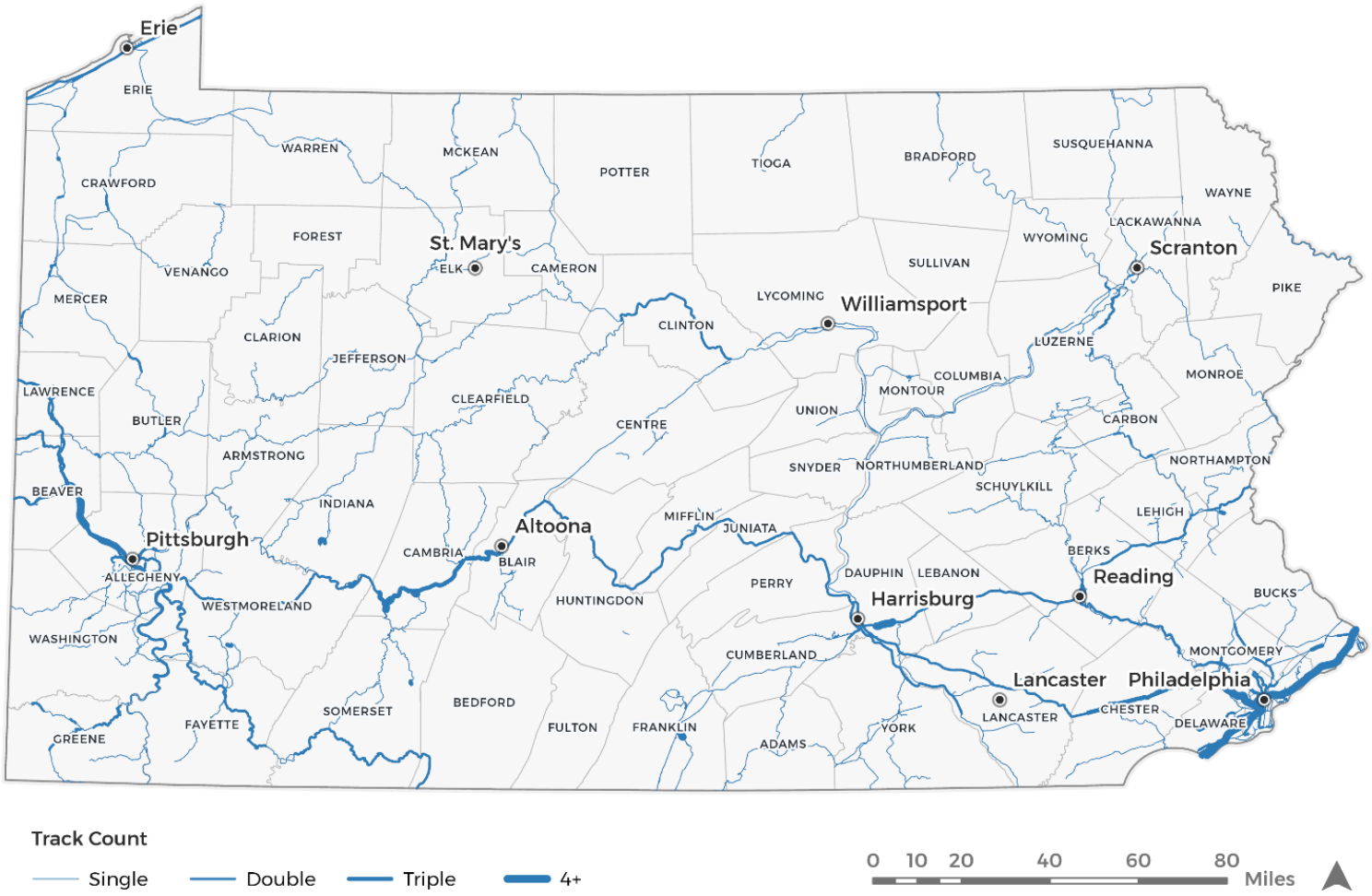


Source: PennDOT GIS

TRACK CONFIGURATION

Rail lines in Pennsylvania vary in the number of tracks to meet capacity needs. Most Class II and Class III lines are only single-track as they provide adequate capacity for low-density train traffic. Trains pass each other using passing sidings. The high-volume corridors operated by CSX and NS use double-track configurations, with NS having sections of triple-track mainline to facilitate the movement of trains over the Allegheny Mountains. Class I branch lines, like Class II and III lines, are almost always single-track. **Figure 2.5** shows Pennsylvania's rail lines by track count.

Figure 2.5 Rail Lines by Track Count

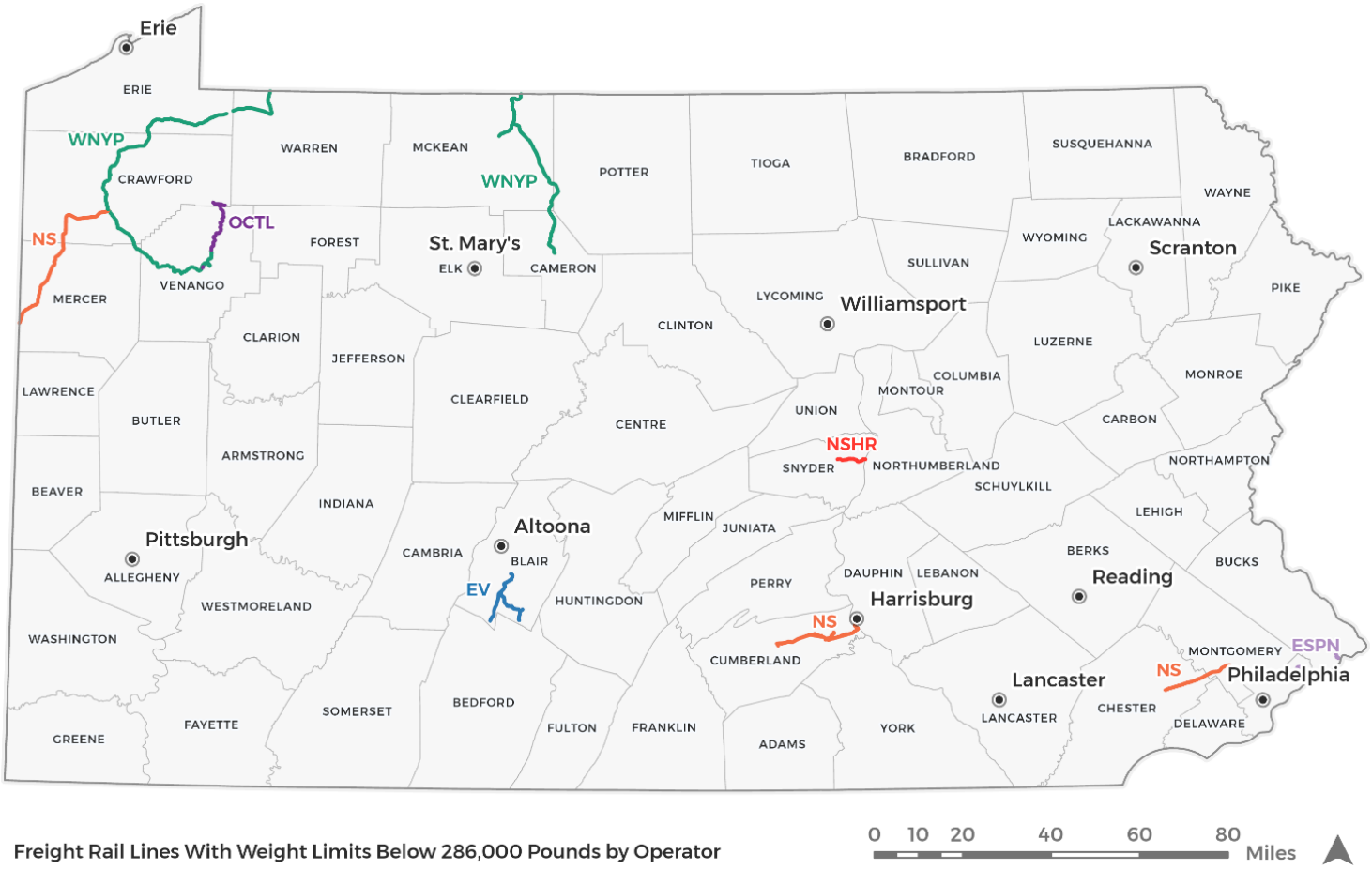


Source: Various Sources, Compiled by Envision Consultants and WSP USA

WEIGHT LIMITS

Most rail lines in Pennsylvania are designed and maintained to support industry-standard 286,000-pound railcars. However, some lines are limited to handling railcars with lower maximum weights, impacting the capacity of railcars that can be shipped over these routes. As a result, when rail lines have a weight limit below 286,000 pounds, there is a strong disincentive for rail shippers to locate along these lines due to inadequate economies of scale for shipments. Over time, rail utilization on these lines decreases, impacting their economic viability. **Figure 2.6** shows the 303 miles of rail lines in Pennsylvania not cleared for 286,000-pound railcars.

Figure 2.6 Freight Rail Lines Not Cleared for 286k Railcars



Freight Rail Lines With Weight Limits Below 286,000 Pounds by Operator

Source: Rail Plan Survey

VERTICAL CLEARANCE

Height restrictions along rail lines also limit the size of railcars that are moved over those lines. Where height restrictions exist, only specific types of cars are allowed. There are two key railcar heights that are important considerations for the railroads' ROWs.

- **Plate F (17-foot ATR)**: The *Official Railway Equipment Register* is a compendium of the physical specifications of every active North American freight car. The registry also includes dimensional templates, referred to as "plates." Plate F, with vertical height specification of 17 feet above-top-of-rail, is the modern standard for boxcars and other enclosed freight cars. This standard is common, and boxcars with vertical clearances lower than Plate F (such as Plate C) are becoming obsolete because of their lower capacity and less favorable economics. As a consequence**,** rail lines will be increasingly required to be cleared for Plate F. Lines that do not have Plate F clearance will have economic disadvantages to the railroad and shippers.
- **Double-Stack (20 feet, 2 inches)**: While many rail lines can handle Plate F railcars, a limited number of corridors have enough vertical clearance to accommodate the 20-foot-2-inch above-top-of-rail clearance required for double-stack intermodal container trains.
- Double-stack intermodal is highly preferred over single-stack because of the economies of scale in carrying twice the number of containers over the same length of a train. While the absence of double-stack line capacity limits a railroad's ability to move certain equipment over certain lines, it only limits the railroad's ability to serve a specific business market if that market desires double-stack services and the railroad sees a business case for providing it. For example, if a line is only serving coal customers, the ability to provide double-stack container service is irrelevant. Clearances can also limit a rail line's ability to handle automotive railcars, which can have the same clearance requirements. Likewise, such restrictions are only relevant to the extent that a potential auto customer cannot be served by rail due to a height restriction.

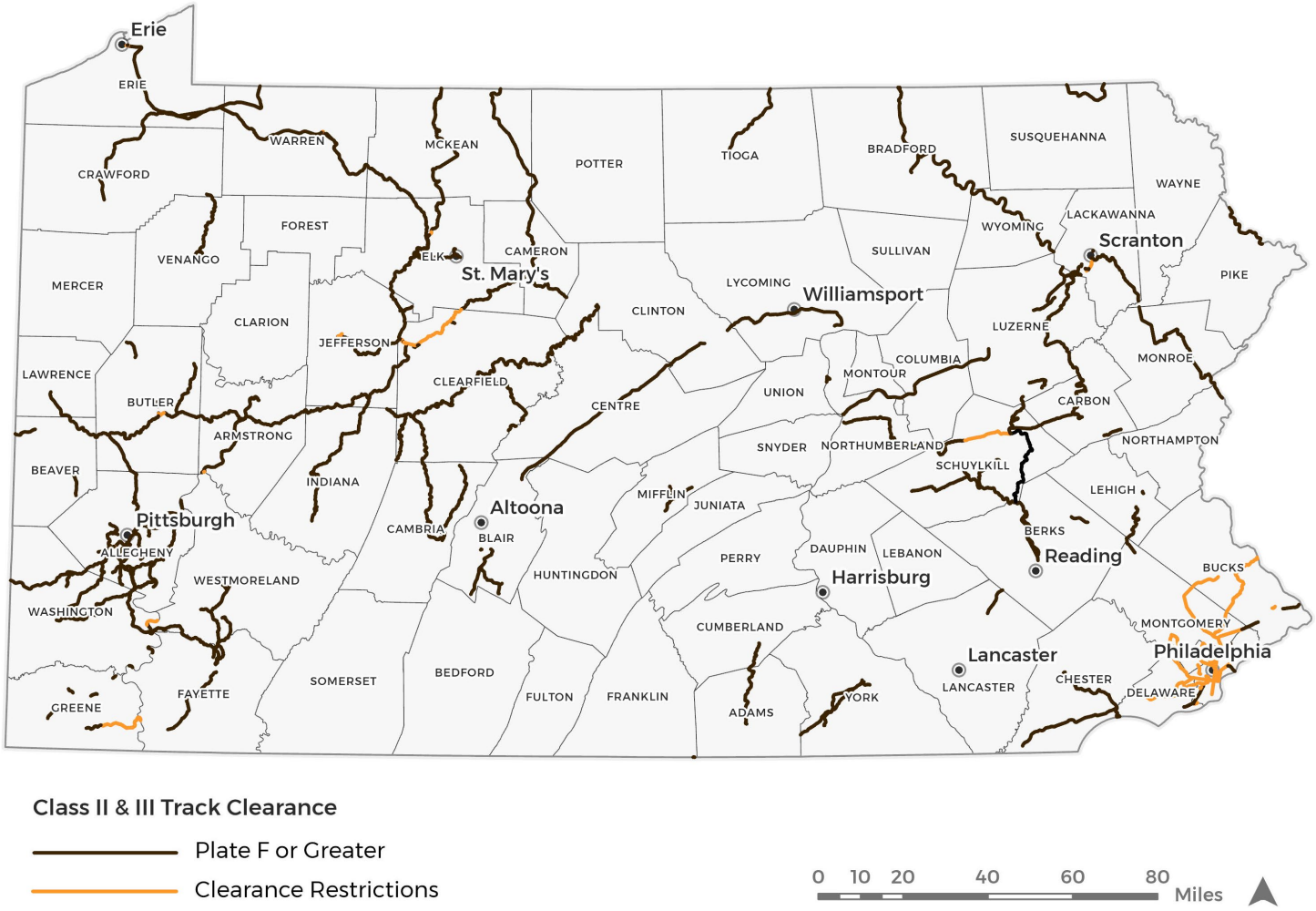
Figure 2.7 focuses specifically on Class I rail lines and whether they can accommodate 20-foot-2 inch double-stack intermodal railcars. As shown, many of the Class I mainlines can accommodate these railcars, including the NS mainline that crosses Pennsylvania between New York and Chicago, and the CSX "National Gateway" corridor, which connects the Mid-Atlantic to the Midwest, passing through the southwest corner of Pennsylvania. Branch lines and other Class I corridors in Pennsylvania are not set up to handle double-stack intermodal cars

Figure 2.7 Class I Rail Lines by Track Clearance for 20-Foot-2-Inch Railcars

Source: Various Sources, Compiled by Envision Consultants and WSP USA

Figure 2.8 assesses whether rail lines on Class II and Class III railroads can accommodate 17-foot Plate F railcars. Most of the rail lines that cannot accommodate 17-foot railcars are concentrated around Philadelphia. This likely results from short lines such as the Pennsylvania Northeastern Railroad operating over passenger rail corridors, since clearances below catenaries used by electrically powered passenger trains often do not permit Plate F freight cars to operate.

Figure 2.8 Class II/Class III Rail Lines by Track Clearance for 17-Foot Railcars



Source: Rail Plan Survey, Railroad Websites

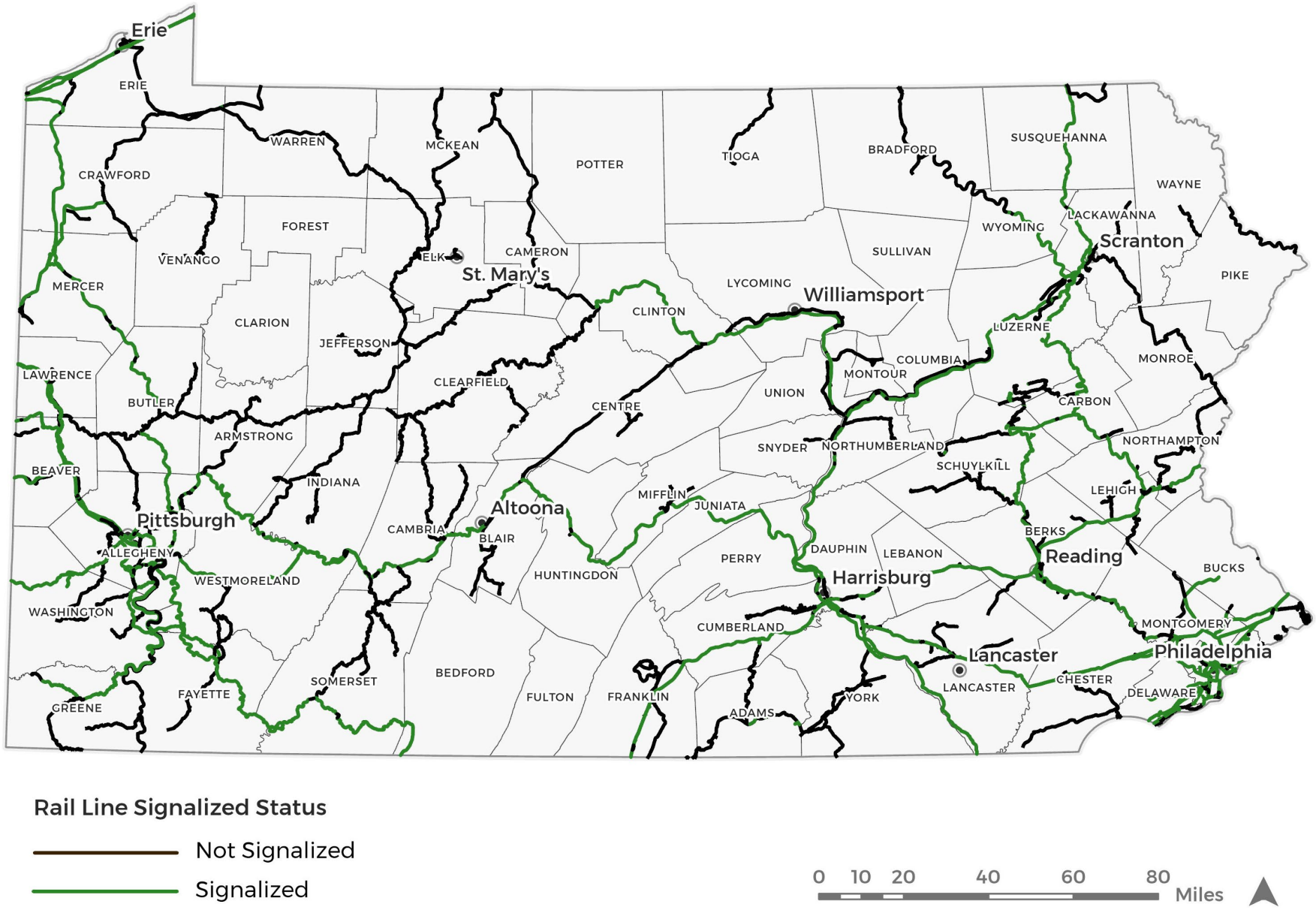
TRAIN CONTROL AND SIGNALING SYSTEMS

The train control systems employed across Pennsylvania's rail network vary depending on traffic density, rail operator requirements, and the type of infrastructure in place. Control systems include the following:

- **Centralized Traffic Control (CTC):** CTC is implemented on high-density rail corridors, particularly those operated by Class I railroads. This system provides real-time remote train monitoring and movement control, optimizing network fluidity and ensuring safe operations.
- **Positive Train Control (PTC):** PTC is a technology that complements CTC. Mandated by Congress and ensuing federal regulations in response to several train collisions, PTC systems have been implemented on many of Pennsylvania's Class I routes. PTC prevents train collisions, derailments, and unauthorized movements by providing real-time data to dispatchers and train crews. As of this writing, only Class I railroads are generally required to have PTC in place. PTC is required on rail lines with the following characteristics:
  - Class I railroad mainlines that transport at least 5 million gross tons of traffic annually
  - Mainlines that transport poisonous-inhalation-hazardous materials
  - Rail lines that regularly provide intercity or commuter passenger service
- **Automatic Block Signaling (ABS):** ABS controls train spacing and prevents train conflicts, including collisions, by using signals to indicate track occupancy. Within ABS territory, signal equipment automatically adjusts to show different colors and or configurations based on whether trains are occupying various segments of track. The system often exists in tandem with CTC systems and provides protection of train movements outside of locations directly controlled by a train dispatcher.
- **Dark Territory:** On low-density lines, including many short-line railroads, sections of track operate as "dark territory" with no electronic signaling systems. In these areas, train movements rely on manual dispatcher permissions and written track warrants to maintain safety. This system is cost-effective for railroads with low traffic density.

Figure 2.9 displays rail lines in Pennsylvania, categorized as whether they are signalized or not signalized. Class I mainlines and heavily used rail lines in Pennsylvania are signalized, as are rail lines used for passenger rail. Low-density rail lines are generally not signalized.

Figure 2.9 Rail Lines by Signal System



Source: Various Sources, Compiled by Envision Consultants and WSP USA

TRACK SPEED CLASSIFICATIONS

The FRA specifies track speed classifications based on track attributes. The classifications stipulate the maximum allowable speeds for both freight and passenger trains, reflecting track condition, track configuration, and operational requirements.

- **Class 1 Track:** Class I track, typically found on short lines, is limited to a maximum of 10 miles per hour (mph) for freight trains and 15 mph for passenger trains. This class of track is primarily used for low-speed freight operations or industrial spurs, where high-speed operations are unnecessary.
- **Class 2 Track:** Designed for moderate speeds, Class 2 track accommodates freight speeds of up to 25 mph and passenger speeds of up to 30 mph. These speeds are common on branch lines, regional, and short-line railroads serving industrial hubs and rural areas.
- **Class 3 Track:** Common on higher-capacity regional routes, Class 3 track allows freight speeds of up to 40 mph and passenger speeds of up to 60 mph. These tracks often serve as connectors on Class I networks, supporting efficient movement of bulk goods.
- **Class 4 and Higher:** Found predominantly on Class I corridors, this category is designed for freight train speeds exceeding 60 mph and passenger speeds exceeding 80 mph. High-speed passenger rail services, such as Amtrak's Keystone Service®, operate on Class 4 or higher tracks in Pennsylvania.
- **Excepted Track:** Track that does not meet FRA Class I requirements can be designated "excepted" by a rail carrier in accordance with rules established in Title 49 Code of Federal Regulations Part 213. Excepted track is limited to 10 mph operation, cannot carry passengers, and has limitations on hazardous materials.

FRA track class and associated speeds of rail lines in Pennsylvania are detailed in Appendix A and Appendix B.

STRATEGIC RAIL CORRIDOR NETWORK

The Strategic Rail Corridor Network (STRACNET) is a 38,000-mile-interconnected network of rail lines designated by the U.S. Department of Defense to ensure the efficient movement of military equipment, supplies, and personnel.

- **Purpose and Functionality:** STRACNET routes facilitate the rapid mobilization of oversized and heavy equipment, such as tanks and other military vehicles, between key military installations, ports, and logistics hubs.
- **Coverage in Pennsylvania:** Pennsylvania's STRACNET corridors connect military installations such as the Letterkenny Army Depot in Chambersburg to major East Coast ports and inland distribution centers.
- **Infrastructure Requirements:** Rail lines in STRACNET must meet specific standards, including the capacity to handle 286,000-pound railcars, adequate clearance for oversized loads, and operational flexibility to prioritize military movements. Where high-level station platforms exist, specific designs are required to allow military shipments to pass without damage. The designation also requires ongoing coordination between the U.S. Department of Defense and rail operators to ensure infrastructure readiness. Future considerations of passenger service expansion may need to take STRACNET clearances into account.

STRACNET routes in Pennsylvania are mapped in **Figure 2.10.**

Figure 2.10 STRACNET Route Map

Source: U.S. Department of Transportation

RAILBANKING, RAIL TRAILS, AND RAILS-WITH-TRAILS

Railbanking, rail trails, and rails-with-trails (RWT) offer a way for unused or underutilized rail lines to be preserved for recreation or other uses while at the same time maintaining the corridor. Rail corridor preservation is vital because once a rail line is abandoned, it is challenging to reconstruct.

Railbanking is a voluntary agreement between railroads and local governments or other entities to preserve inactive rail corridors through interim use as a recreational trail, per the federal National Trails System Act. Railbanked corridors are maintained in a state of readiness for reactivation should the demand for rail service return. In Pennsylvania, railbanking initiatives are supported collaboratively by the railroads, local governments, and PennDOT, which facilitates corridor preservation efforts through funding, technical assistance, and partnerships with local governments and non-profits. Pennsylvania is home to over 1,800 miles of completed rail trails, with many more corridors in various stages of planning and development. Notable trails include the following:

- **Great Allegheny Passage:** This 150-mile trail connects Pittsburgh to Cumberland, Maryland. Portions were developed through rail banking.
- **Schuylkill River Trail:** Spanning over 75 miles, portions of this trail were developed through railbanking. It has become a key recreational and commuter route in southeastern Pennsylvania.

RWT projects involve the construction of trails parallel to active rail corridors. RWT projects are challenging to implement because of the safety concerns of having trail users near active train traffic. Safety measures such as fencing, signage, and designated crossing points are integral to RWT development to ensure trail users and rail operations coexist safely.

RAIL ABANDONMENT IN PENNSYLVANIA

In the last five years, there have been three railroad abandonments in Pennsylvania (**Table 2.4**). When a railroad is abandoned, the railroad obtains permission from the STB to discontinue service and sell the rail line. This is different from changing a rail line's status to "Inactive," under which the STB allows a railroad to cease regular freight service but maintain the line as part of the rail network. After abandonment, while some lines are railbanked or converted to trail use, many others are sold outright and cease to be a transportation corridor.

Table 2.4 Pennsylvania Rail Abandonments Since 2020

RAILROAD	EFFECTIVE DATE	ABANDONMENT DESCRIPTION	ABANDONMENT/ INTERIM TRAIL USE
Allegheny Valley Railroad Company **STB Docket No. AB_1233_2_X**	8-Aug-24	To abandon an approximately 3.6-mile segment of rail line known generally as the "Brilliant Branch" located in Pittsburgh and Aspinwall, Allegheny County, PA	Interim Trail Use or Abandonment
Kiski Junction Railroad, Inc. (KJRR) **STB Docket No. AB_1317_0_X**	2-Oct-21	To abandon two segments of rail line: (1) Line Code 2229, from at or near milepost 30.0 in Alladin, PA, to milepost 28.8 in Armstrong and Westmoreland Counties, PA; and (2) Line Code 2242, from milepost 0.0 at the connection of Line Code 2229 to milepost 4.0 in Armstrong County (together, the Line)	Interim Trail Use or Abandonment
CSX Transportation, Inc. (CSXT) **STB Docket No. AB_55_806_X**	24-Mar-22	To abandon an approximately 0.5-mile rail line between Val Sta. 1576+25 and Val Sta. 170+35 on its Great Lakes Division, Erie West Subdivision, in Erie County, PA	Abandonment Exemption

Source: STB

Freight Terminals and Intermodal Connections

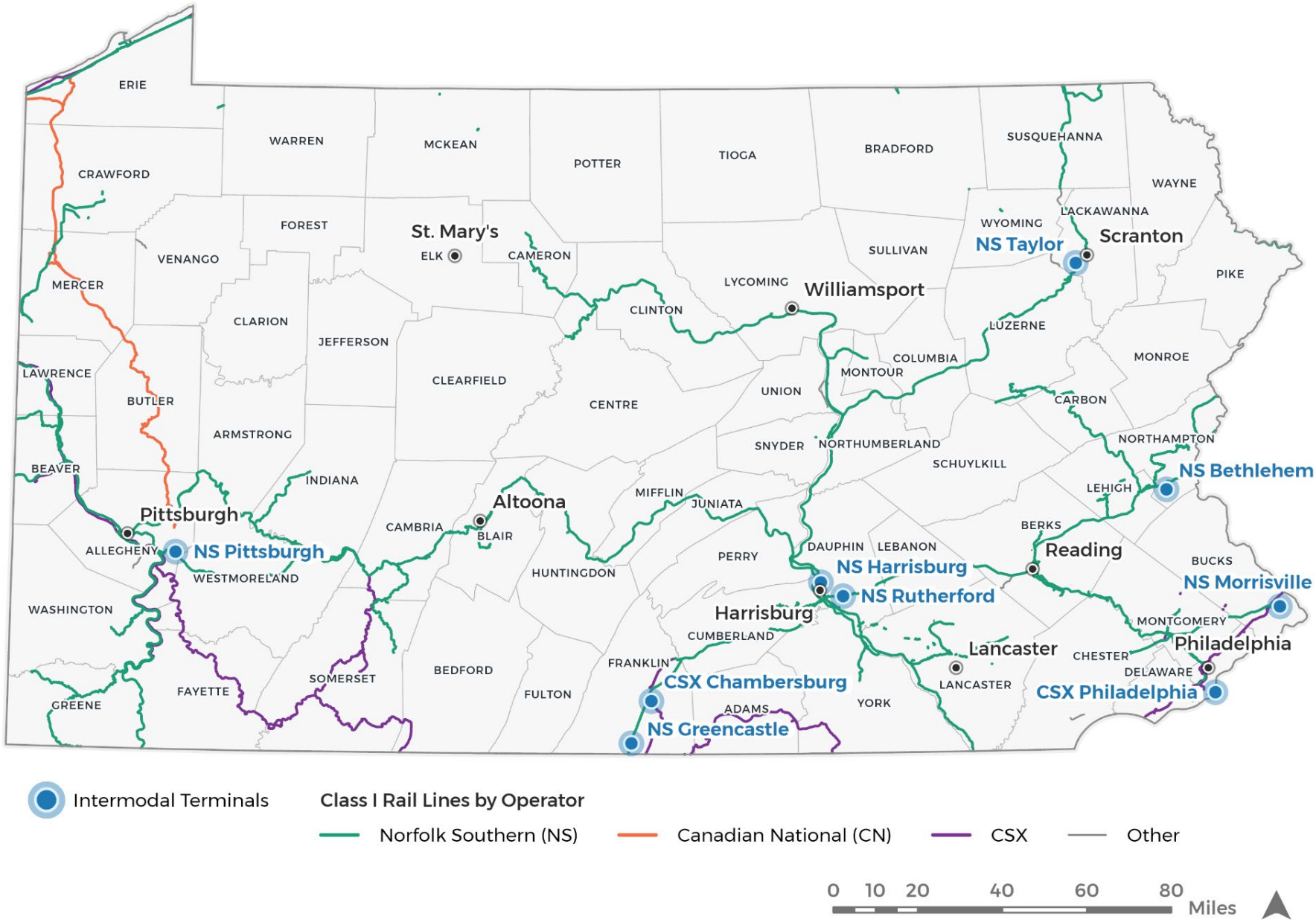
Multimodal transportation involves the transfer of freight between rail and another mode. Shippers benefit from the advantages of rail and other modes, such as rail's favorable economics for long-haul shipments combined with trucking's flexibility for local delivery. Details on Pennsylvania multimodal facilities can be found Appendix C.

INTERMODAL TERMINALS

Pennsylvania's multimodal system includes nine primary intermodal terminals, shown in **Figure 2.11** and **Table 2.5**.

NS and CSX operate Pennsylvania's intermodal terminals. Intermodal terminals are specialized facilities designed to facilitate the transfer of containerized freight between truck and rail. Intermodal terminals can handle domestic and/or international containers. International containers are 20-foot or 40-foot containers, which can be stacked on ocean ships, while domestic containers are usually 53 feet. Some international cargoes are transferred to domestic containers, so that international cargo may travel in the larger domestic containers within the United States. This practice also frees up international containers for their next use.

Figure 2.11 Pennsylvania Intermodal Terminals



Source: NS and CSX Intermodal websites

Table 2.5 Pennsylvania Intermodal Terminals

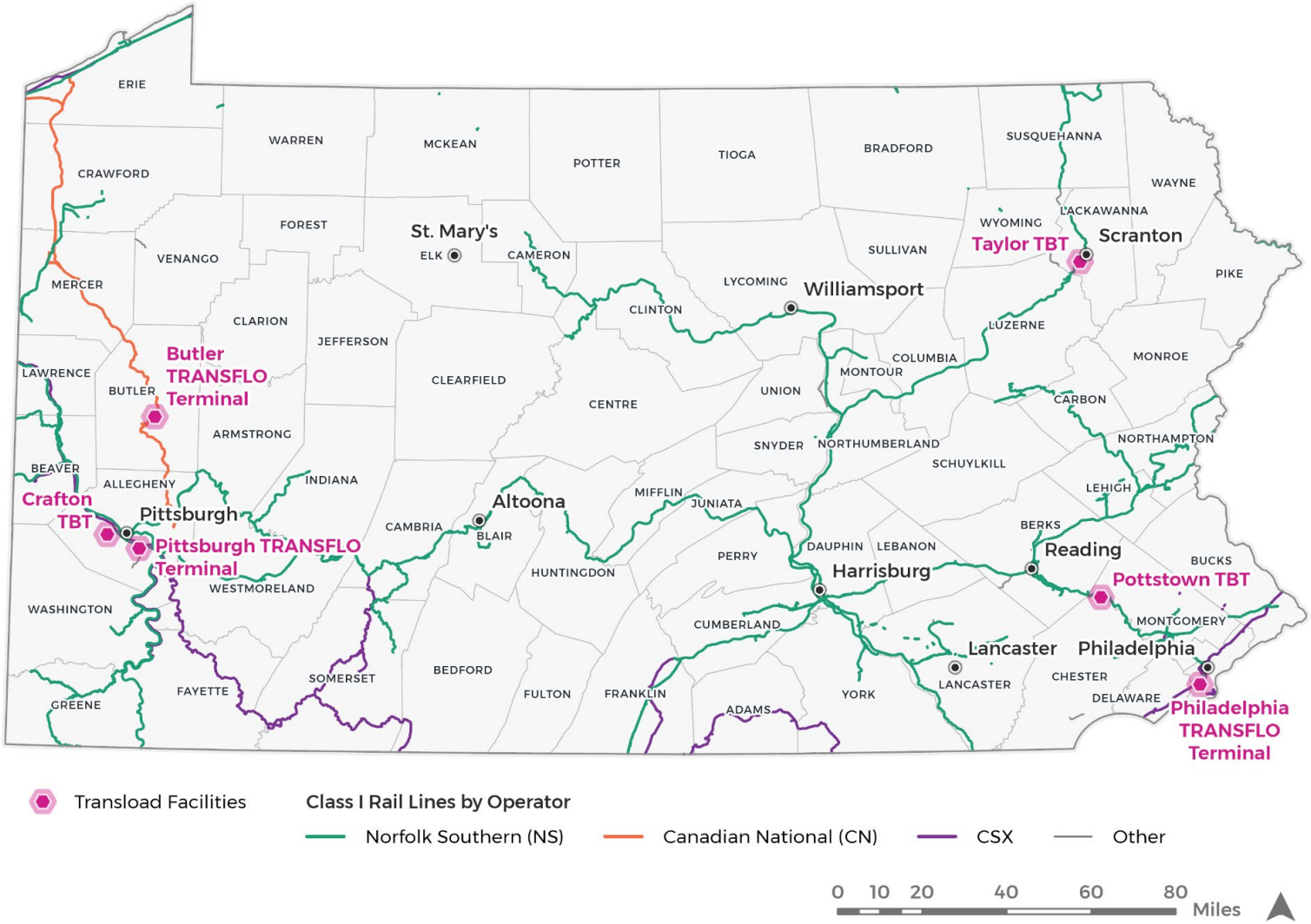
TERMINAL	RR	DOMESTIC/ INTERNATIONAL	MARKETS SERVED
Harrisburg Intermodal Terminal	NS	Both	East Coast and Midwest
Philadelphia Intermodal Terminal	CSX	Both	East Coast and International
Pittsburgh Intermodal Yard	NS	Domestic	Western Pennsylvania
Bethlehem Intermodal Terminal	CSX	Domestic	Northeast and Mid-Atlantic
Greencastle	NS	Domestic	Northeast and Mid-Atlantic
Morrisville	NS	Both	Northeast and Mid-Atlantic
Rutherford	NS	Both	Southeastern Pennsylvania
Taylor	NS	Domestic	Scranton-Wilkes-Barre Area
Chambersburg	CSX	Both	South-Central Pennsylvania

Source: Railroad websites

CLASS I TRANSLOAD FACILITIES

Transload facilities facilitate the transfer of freight between truck and rail for non-containerized cargo. Pennsylvania's Class I railroad transload facilities include NS's Thoroughbred Bulk Terminals and CSX's TRANSFLO Terminals (**Figure 2.12**). These are primarily liquid bulk terminals, allowing liquids to be transferred from railcar to truck.

Figure 2.12 Class I Transload Terminals

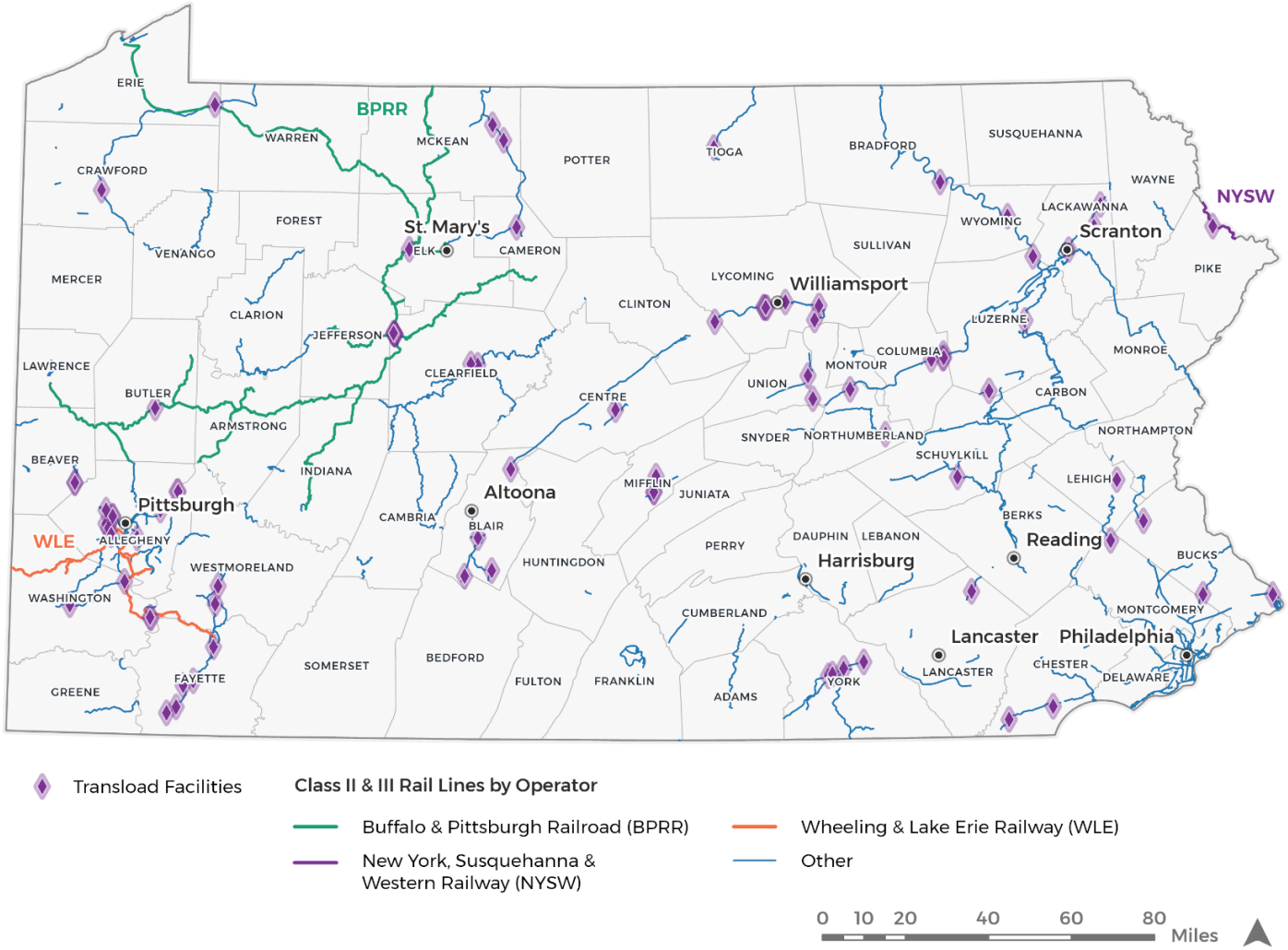


Source: Railroad Websites

CLASS II AND CLASS III RAILROAD TRANSLOAD FACILITIES

With the limited market coverage of Class II and III railroads, transload facilities allow railroads to expand their market reach and allow shippers to use rail even when their locations are not directly served by rail. These terminals include bulk goods such as plastics, sand, and aggregates; liquids (including chemicals and edible oils); lumber; steel; refrigerated products; and other products. **Figure 2.13** shows the Class II and Class III transload facilities located in Pennsylvania.

Figure 2.13 Class II / Class III Transload Terminals

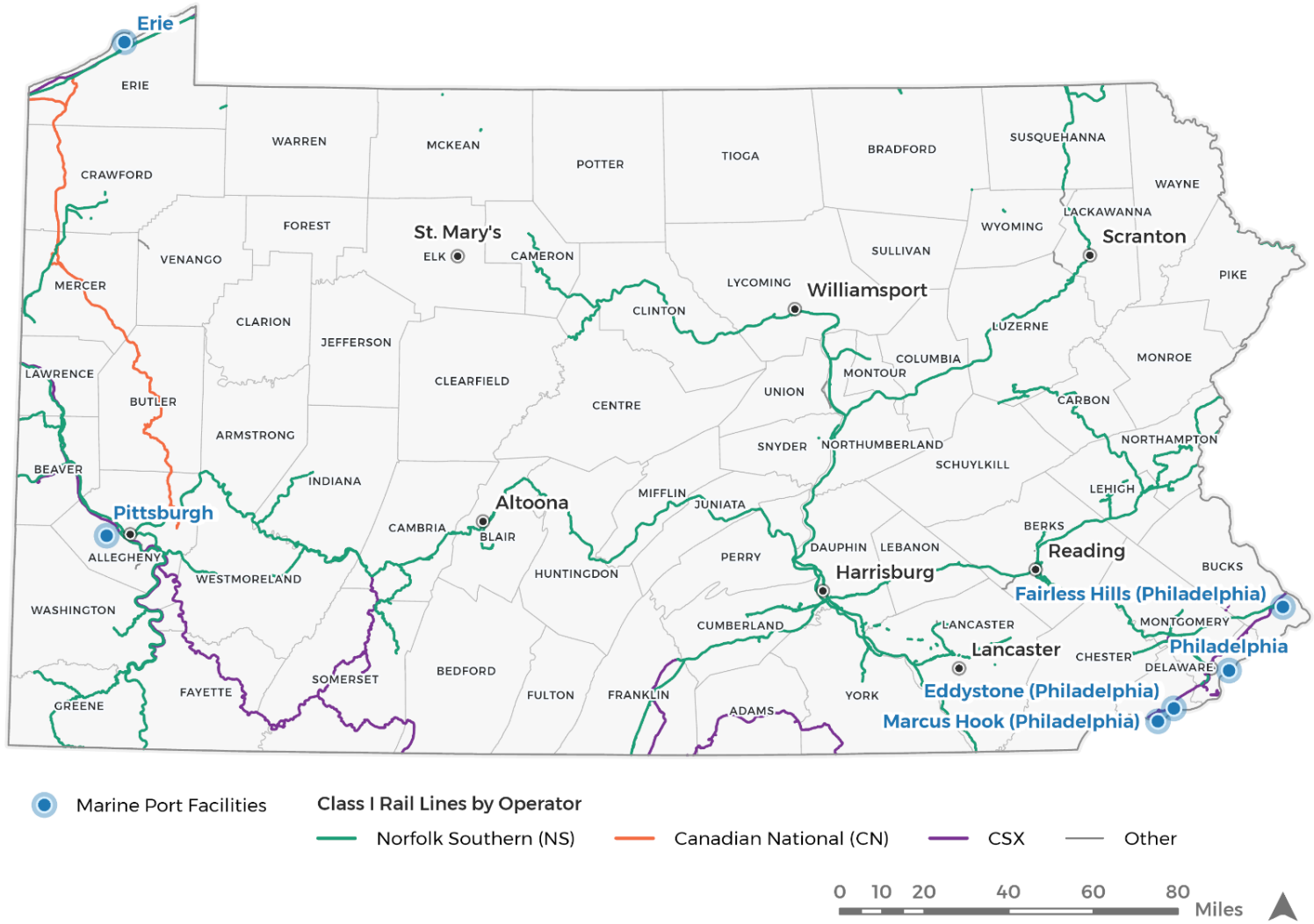


Source: Rail Plan Survey, Railroad Websites

PORTS AND MARINE TERMINALS

Pennsylvania's ports and marine terminals integrate maritime transport with rail and road networks (**Figure 2.14**). These facilities handle a diverse range of cargo, including containers, bulk materials, and specialized goods.

Figure 2.14 Marine Port Facilities



Source: Review of Online Resources

Port of Philadelphia

The Port of Philadelphia (inclusive of PhilaPort as well as the broader Delaware River waterfront port region stretching from Marcus Hook north to Morrisville) is an essential component of Pennsylvania's logistics network. Not only does the Port of Philadelphia handle containerized freight, it is also well known for being a point-of-entry for imported produce, supported by significant regional refrigerated warehouse infrastructure. Increasingly, the Port of Philadelphia is also serving roll-on-roll-off automotive imports, providing an alternative to the Port of New York and New Jersey. The Port of Philadelphia is served by CSX and NS, with Conrail providing significant portions of the first-mile/last-mile switching service.

PhilaPort includes the following facilities and infrastructure:

- **Packer Avenue Marine Terminal** is the port's busiest container handling facility. This facility has seven container cranes, including five super post-Panamax cranes capable of handling some of the largest vessels. It features rail access via nearby connections to NS, CSX, and CN.
- **Tioga Marine Terminal** is a multipurpose terminal specializing in breakbulk and project cargo. Tioga offers over 116 acres of operational space and direct rail connections with CSX and NS.
- **SouthPort Marine Terminal** opened in 2019 and was built to serve the automotive industry, providing vehicle processing and delivery post manufacturing. Vehicles arrive internationally as "Ro/Ro" (roll-on, roll-off) cargo automobiles that can drive on and off a ship before and after being loaded on auto rack rail cars. Expansion of this terminal to include more robust integration of rail and the addition of two berths is planned within the next few years.

Port of Erie

The Port of Erie is Pennsylvania's gateway to the Great Lakes, providing a link to the St. Lawrence Seaway and global maritime trade routes. Located on Lake Erie and served by nearby rail connections to CSX, NS, and the Buffalo and Pittsburgh Railroad, the port supports regional manufacturing, construction, and agriculture by facilitating the transport of bulk goods and raw materials from Great Lakes freighters. There are limited rail waterfront connections to the Port of Erie, and only CSX has direct waterfront access.

Port of Pittsburgh

The Port of Pittsburgh consists of marine facilities located on the Ohio, Monongahela, and Allegheny Rivers. Many of the facilities within the port are served by CSX or NS. Being located at the source of the Ohio River, it allows access to downstream markets along the Ohio and Mississippi Rivers, as well as the Gulf of Mexico. Its location along the Ohio River combined with Class I rail access help make the Port of Pittsburgh the fifth busiest inland port in the United States by tonnage.

Passenger Rail Services in Pennsylvania

AMTRAK

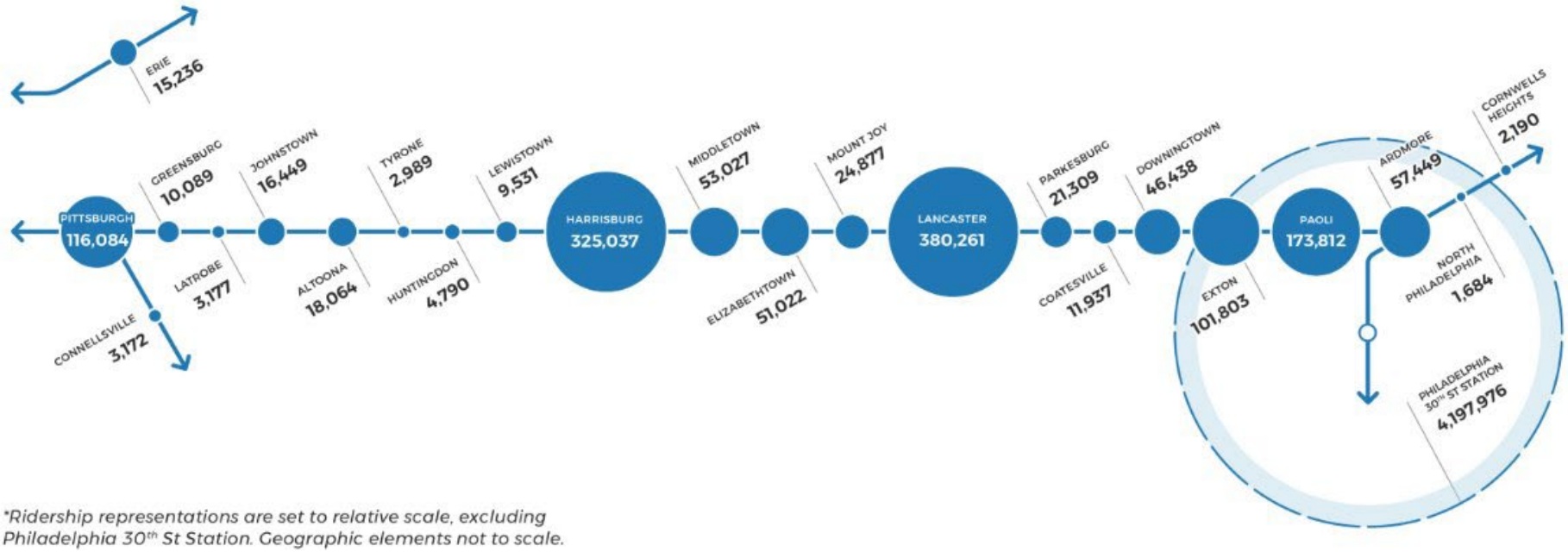
Intercity passenger rail service in Pennsylvania is provided by the National Railroad Passenger Corporation, otherwise known as Amtrak. Amtrak is owned by the federal government, with a Board of Directors appointed by the President of the United States. Amtrak is operated as a for-profit company that receives financial support for operating and capital costs from states and the federal government. Amtrak was created in 1970 by the Rail Passenger Service Act, when private railroads were relieved of their obligation to provide passenger rail service. At the time, private railroads were required to operate passenger trains, although these passenger rail operations more often than not incurred large losses. In return for being relieved of passenger operating obligations, participating private railroads were required to provide Amtrak trains with access to their rail lines.

In Pennsylvania, Amtrak served 5,657,603 passengers in FY2023, with 74 percent boarding or alighting from Philadelphia 30th Street Station.

Details on all stations in Pennsylvania, including their rail connections, are listed in Appendix D. In 2020, the COVID-19 pandemic caused Amtrak ridership to plummet, declining 54 percent in FY2020 as pandemic restrictions and risks led travelers to avoid crowded, confined spaces like passenger trains. By FY2023, Amtrak ridership in Pennsylvania had recovered to 85 percent of the pre-pandemic peak reached in FY2019. The 24 Amtrak stations in Pennsylvania are served by 13 routes and a statewide average of 96 trains per day.

Figure 2.15 provides a visual scale overview of FY2023 Amtrak ridership at all stations in Pennsylvania.

Figure 2.15 Pennsylvania FY2023 Ridership by Station



*Ridership representations are set to relative scale, excluding Philadelphia 30th St Station. Geographic elements not to scale.

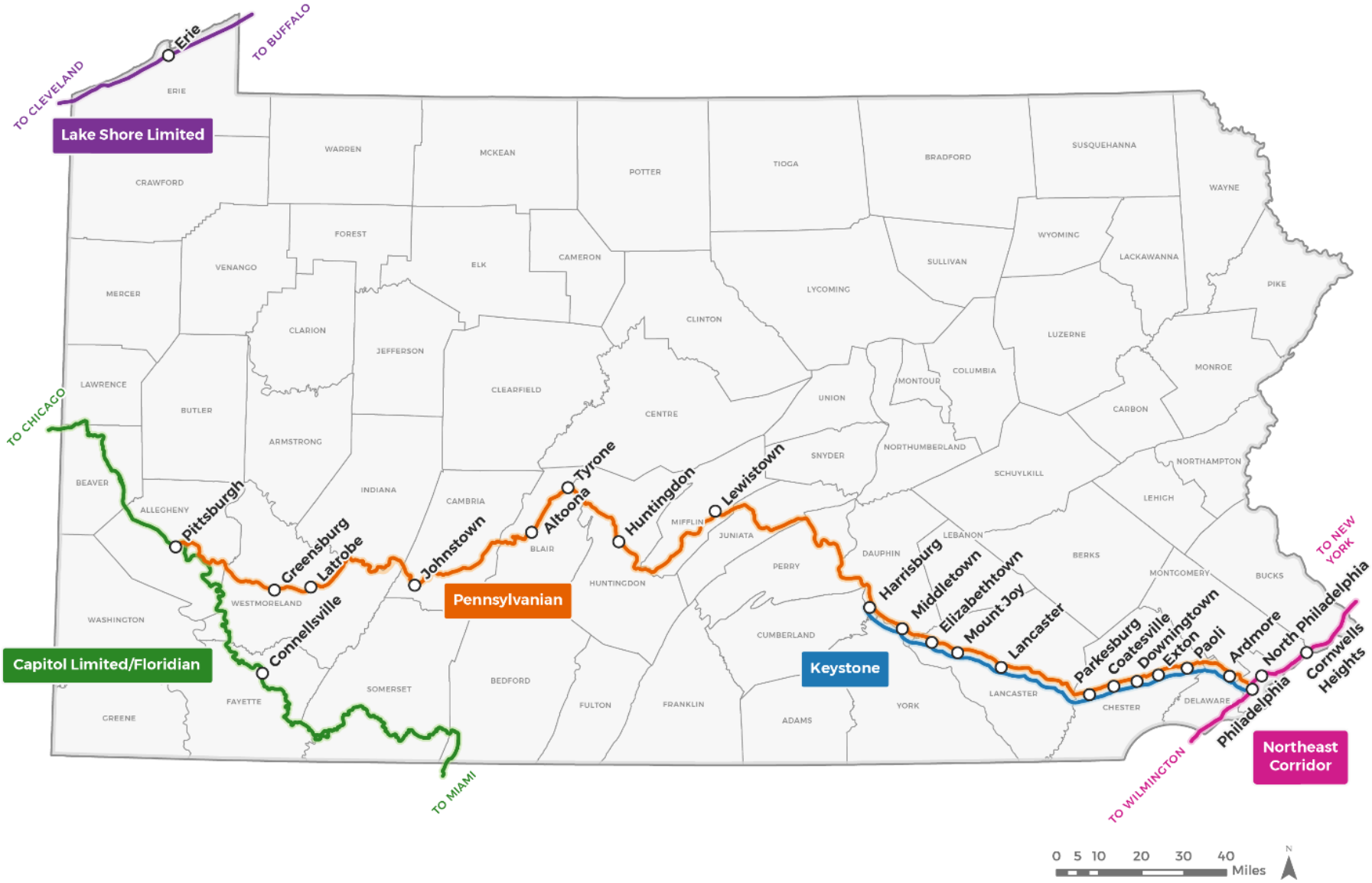
Source: Amtrak Fact Sheet Fiscal Year 2023 Commonwealth of Pennsylvania

Four primary Amtrak services operate in Pennsylvania:

- A section of the 457-mile **NEC** spine between Washington, DC, and Boston, Massachusetts, passes through Pennsylvania.
- Sponsored by the Commonwealth of Pennsylvania through PennDOT, Amtrak's **Keystone Service®** operates between Philadelphia and Harrisburg ("Keystone East" corridor), with most trains continuing on the NEC to/from New York.
- The **Pennsylvanian®** service operates between Pittsburgh and New York, over the NEC between New York and Philadelphia, the Keystone East corridor between Philadelphia and Harrisburg, and the "Keystone West" corridor between Harrisburg and Pittsburgh.
- **Long-Distance passenger services** operated by Amtrak through Pennsylvania include the Lake Shore Limited®, Capitol Limited® (now known as the Floridian℠), Silver Meteor®/Palmetto®, Crescent®, and Cardinal®. In Pennsylvania, these services also operate over freight host railroads.

These corridors are shown in **Figure 2.16.**

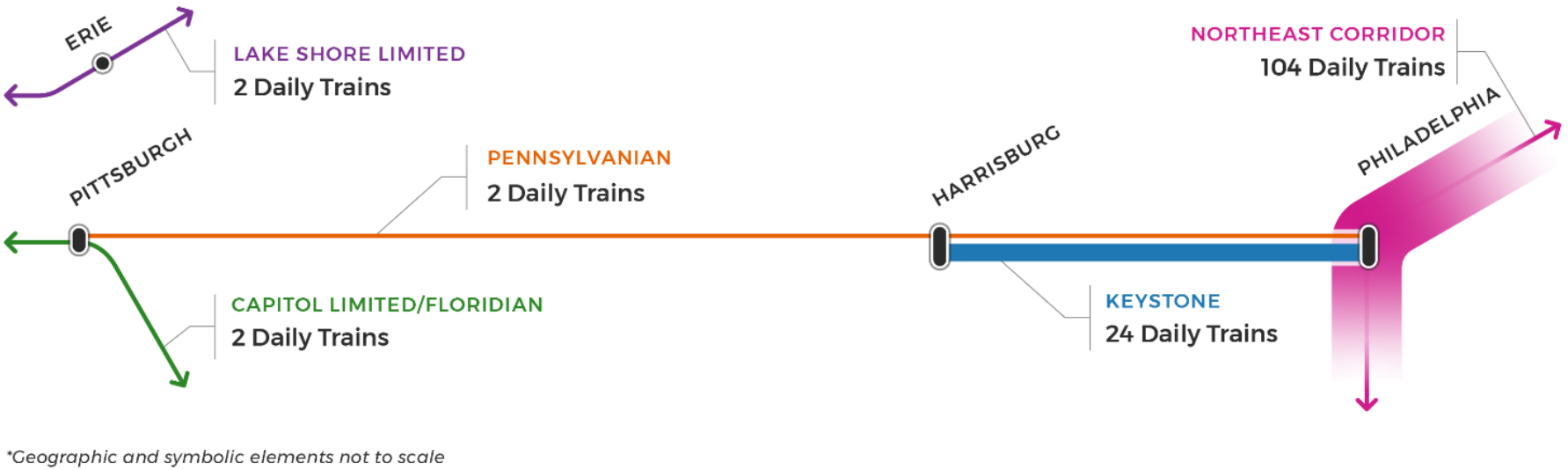
Figure 2.16 Amtrak Service in Pennsylvania



Source: WSP

The frequency of trains on these corridors varies significantly, with service on the NEC being very frequent (**Figure 2.17**). Service on the Keystone East corridor is relatively frequent, while the Pennsylvanian® (Keystone West), Floridian℠, and Lake Shore Limited® services are limited to one train per day in each direction. PennDOT is actively working with NS to invest in capacity between Harrisburg and Pittsburgh that would enable a second round trip for the Pennsylvanian® service at the end of 2026.

Figure 2.17 Pennsylvania Intercity Passenger Rail Network by Trains per Day



*Geographic and symbolic elements not to scale

Source: Amtrak Timetable 2024

Northeast Corridor

The NEC in Pennsylvania can trace its founding to the Pennsylvania Railroad (1847-1968), headquartered in Philadelphia, which was once one of the largest transportation companies in the world. Among the Pennsylvania Railroad's achievements include tunneling under the Hudson and East Rivers, Pennsylvania Station and Sunnyside Yard construction, and the Hellgate Bridge connection to the New York, New Haven and Hartford Railroad (New Haven Railroad).

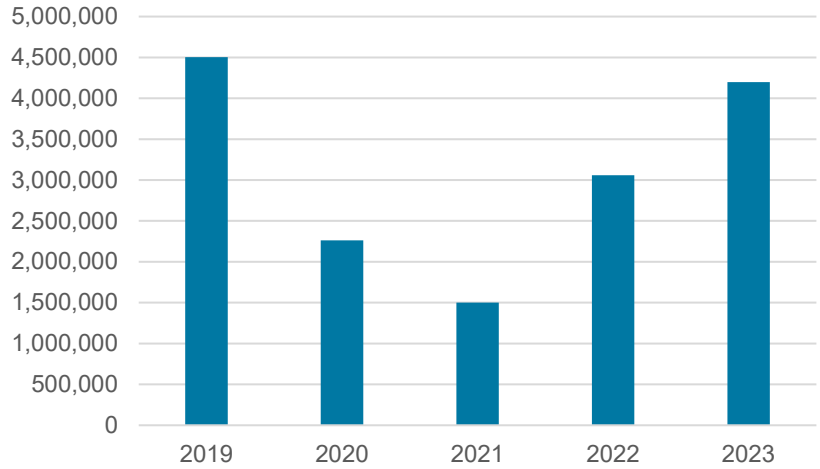
The Pennsylvania Railroad merged with the New York Central Railroad and the New Haven Railroad in 1968 to form the Penn Central Transportation Company (Penn Central). The New Haven Railroad owned the NEC north of New York. Due to heavy regulations and unprofitable business lines, Penn Central went bankrupt in 1970. Following the bankruptcy, the federal government created the United States Railway Association, a quasi-private railroad operator, through the Regional Rail Reorganization Act of 1973. The United States Railway Association then created a new railroad to take over the assets of the former Penn Central, the Consolidated Railroad Corporation or Conrail. Eventually, the operations and ownership of much of the NEC was conveyed from Conrail to Amtrak, but also to Metro-North Railroad, Connecticut Department of Transportation, and the Massachusetts Bay Transportation Authority.

Ownership plays an important role not only in dividing capital contributions between stakeholders, but also with respect to dispatching and determining train priority: Amtrak controls dispatching on all territory, with the exception of the Metro-North and Connecticut DOT-owned segments, which are dispatched by Metro-North Railroad.

Funding for capital needs along the NEC currently comes from three places: the federal government, Amtrak, and states through which the corridor traverses. The creation of the NEC Commission following the PRIIA established a singular entity responsible for unifying regional action among different constituencies to support investment and future growth of the NEC.

In FY2023, the NEC served an average of 593,895 daily commuters and Amtrak passengers, with Amtrak intercity customers accounting for an average of 47,380 daily passengers. Pre-pandemic, the NEC's average daily ridership was 902,061 for all (commuter and intercity) services. Across all NEC operators, as of FY2023 Amtrak ridership has recovered the most (94.8 percent) when compared to pre-pandemic, FY2019 travel.[8] Within Pennsylvania, 30th Street Station is by far the largest Amtrak station, and FY2023 ridership was 93 percent of FY2019 ridership (**Figure 2.18**).

Figure 2.18 Philadelphia 30th St. Station Ridership Trend



Source: Amtrak Fact Sheets

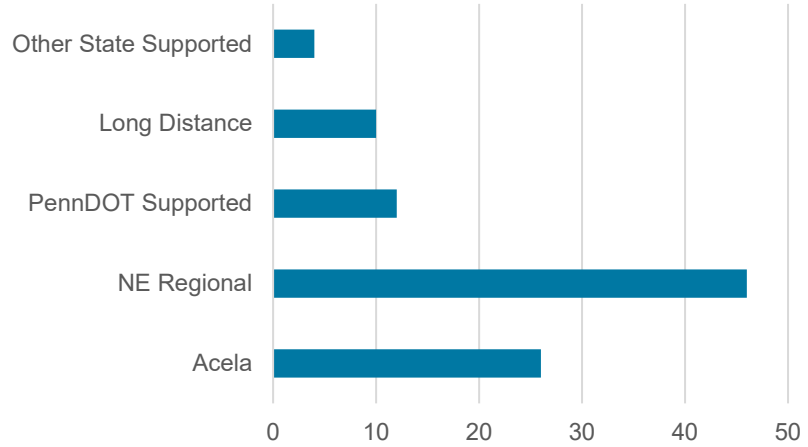
The NEC is unique among U.S. passenger rail corridors in that it is completely electrified, with electric locomotives sourcing power from catenary, or overhead wires. Diesel-powered trains can also operate on the NEC except through the tunnels accessing New York Penn Station.

[8] NEC-Annual-Report-FY23.pdf, p36

Amtrak operates multiple service lines on the NEC. Acela® is Amtrak's premium high-speed (up to 150 mph) intercity passenger service, with 20 high-speed trainsets made of up to seven cars (one first class, five business class, one café) powered by two locomotives at each end. Northeast Regional® service is provided by conventional locomotives pulling on average eight to 10 Amfleet cars. All Northeast Regional® trains make stops in Philadelphia. The Northeast Regional® service is the most frequent service on the NEC (**Figure 2.19**).

In addition, some Amtrak regional routes and long-distance services operate over portions of the NEC. PRIIA assigned states the responsibility of managing and providing any necessary subsidies for "regional routes" of less than 750 miles. Subsidies for long-distance routes over 750 miles are the responsibility of the federal government. Non-PennDOT-supported trains stopping in Philadelphia include the Carolinian® (North Carolina) and Vermonter® (Vermont). Federally supported long-distance trains operated by Amtrak via the NEC through Philadelphia include the Silver Meteor®/Palmetto®, Cardinal®, and Crescent®.

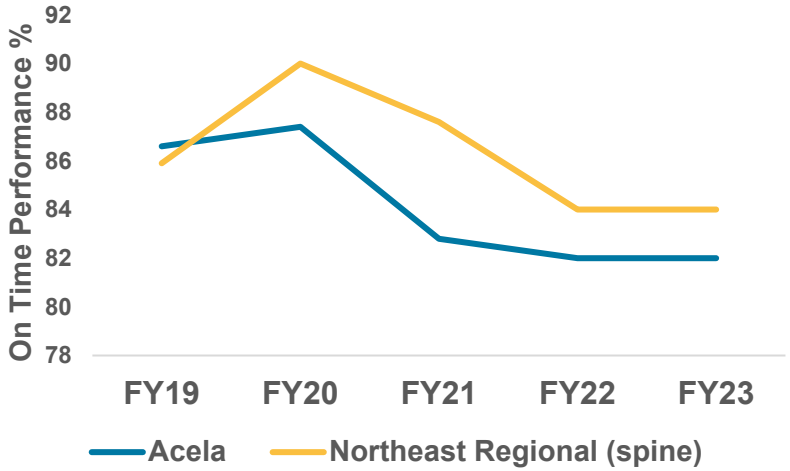
Figure 2.19 Average Weekday Roundtrip Trains by NEC service Line



Source: Amtrak Fact Sheets

As the most frequent services on the NEC, the Northeast Regional® and Acela® provide an indicator of the overall on-time performance trends of the NEC operations. Amtrak and FRA have set a standard of 80 percent of customers arriving at their destination within 15 minutes of their scheduled arrival time. As shown in (**Figure 2.20**), Northeast Regional® and Acela® services have maintained on-time performance above the FRA/Amtrak standard of 80 percent for the last five years.

Figure 2.20 NEC Acela® and Northeast Regional® On-Time Performance



Source: Amtrak Performance Reports

Keystone/Pennsylvanian®

All Keystone trains serve Philadelphia 30th Street Station and operate on the Amtrak Harrisburg Line (Keystone East). The service offers between 10 and 14 weekday round-trip between New York and Harrisburg. Two to three of these round trips (depending on day of week) operate only between Philadelphia and Harrisburg.[9] Excluding 30th Street Station, Lancaster (380,000 passengers in FY2023) and Harrisburg (325,000 passengers in FY2023) are the busiest stations on the Keystone Corridor (**Figure 2.21).**

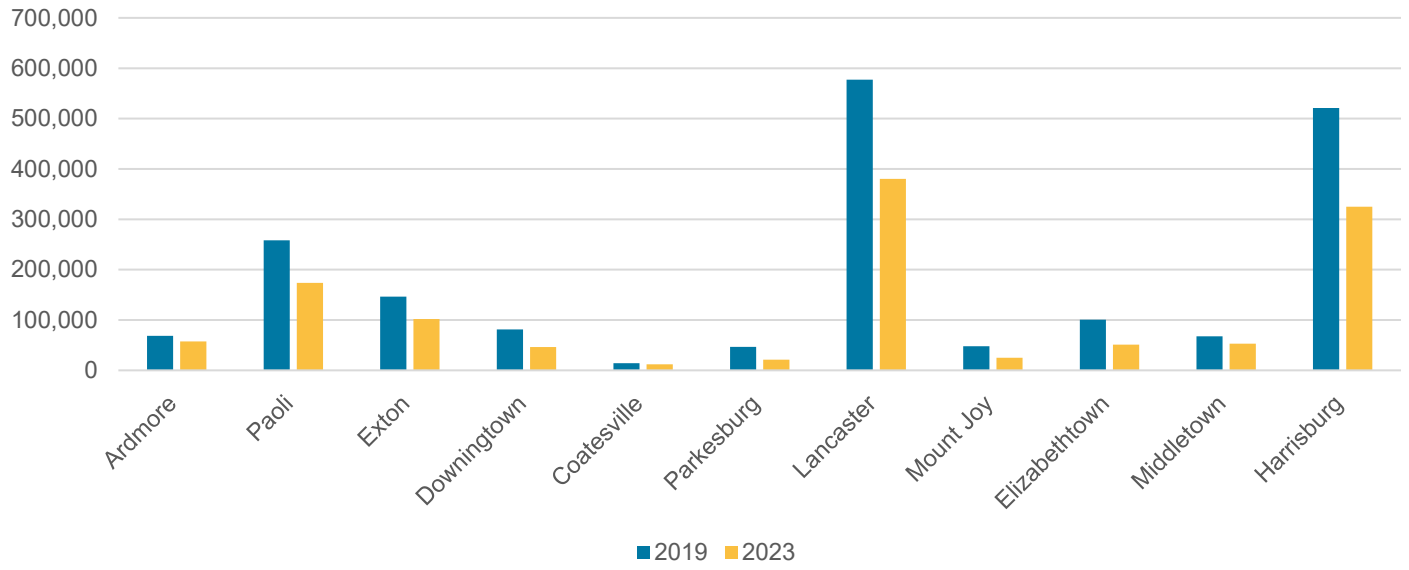
Under normal conditions, Amtrak operates the Keystone Service® with one electric locomotive, four coaches, and a cab-control coach to navigate the infrastructure layout in Philadelphia, which requires trains to change direction to serve 30th Street Station.

The Keystone East corridor between Philadelphia and Harrisburg was electrified by the Pennsylvania Railroad in the 1930s. The Keystone East Corridor is considered to be a connecting corridor to the NEC by the NEC Commission.

Ridership on Keystone Service® has recovered to 81 percent of pre-pandemic levels, with 1,284,000 passengers choosing to ride Amtrak Keystone in FY2024 versus the FY2019 high of 1,576,000.

Keystone Service® achieved a 45.8 percent cost recovery ratio in FY2024. It has delivered on-time performance above 93 percent for the last five years.[10]

Figure 2.21 Keystone East Corridor Ridership Trends



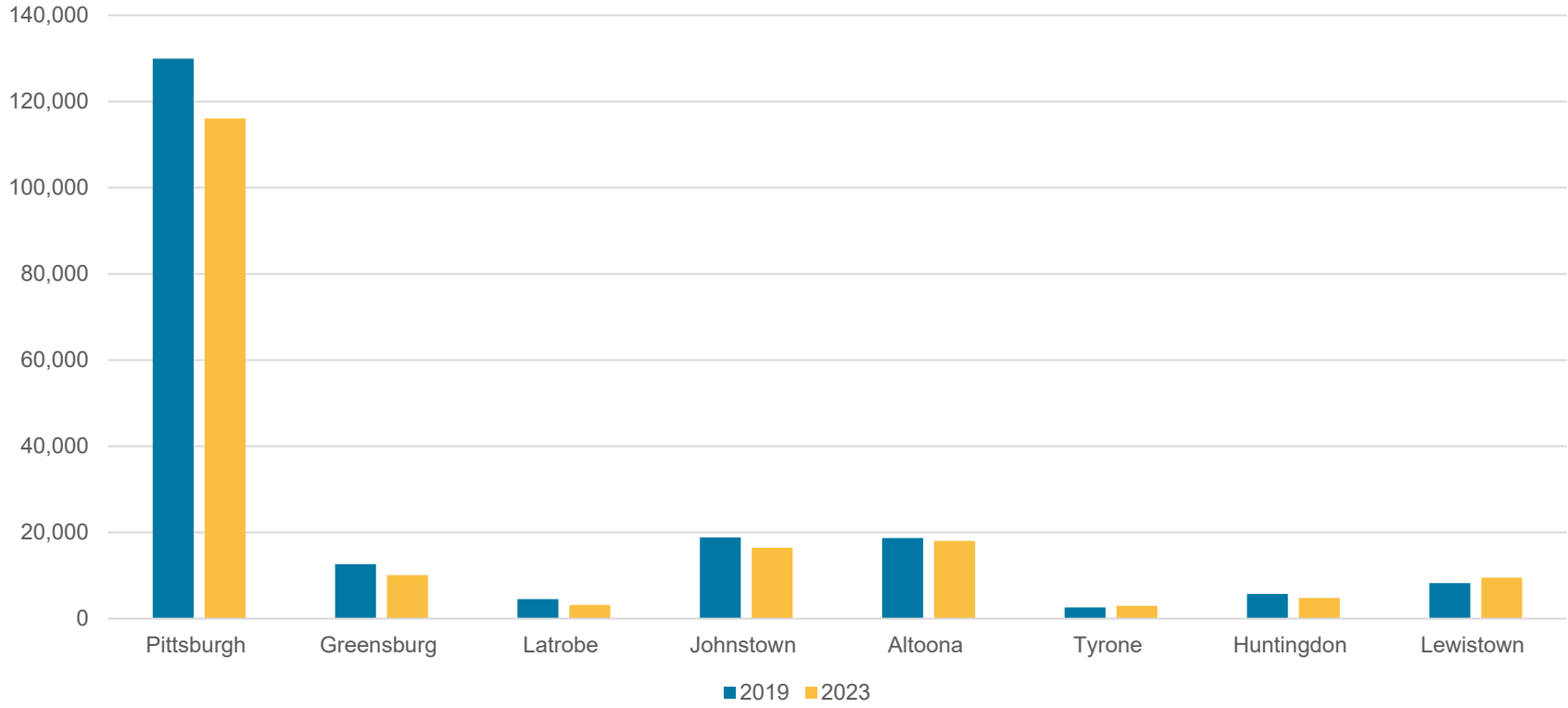
Source: Amtrak Fact Sheets, 2019-2023

[9] Amtrak Timetable Effective Through 11/7/2024.

[10] Amtrak Monthly Performance Report, September FY2024 and FY2019.

The Pennsylvanian® service operates over the Keystone East corridor and the Keystone West corridor between Harrisburg and Pittsburgh. The Pennsylvanian® operates with electric power between New York and Philadelphia, and switches to diesel power between Philadelphia and Pittsburgh. Electric locomotives cannot operate on the NS-owned corridor west of Harrisburg. In FY2024, service over the Keystone West corridor exceeded pre-pandemic ridership levels, recovering 108 percent (233,000) versus FY2019 (**Figure 2.22**).

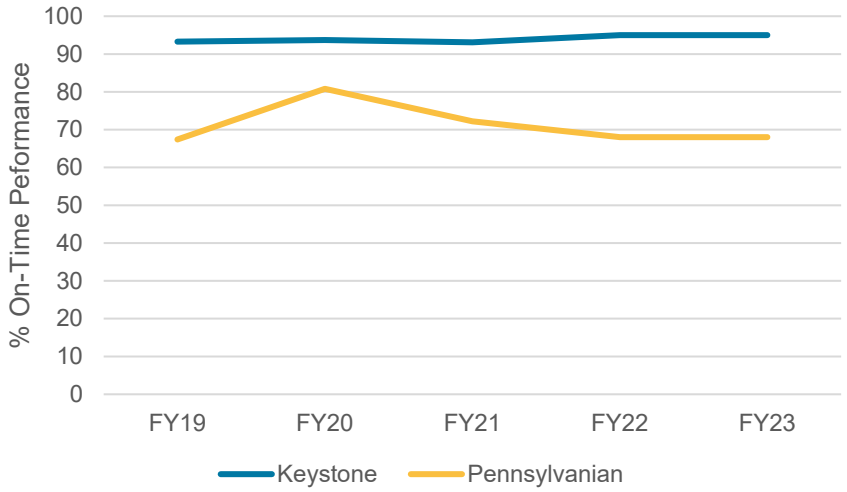
Figure 2.22 Keystone West Station Ridership Trends



Source: Amtrak Fact Sheets, 2019-2023. Erie and Connellsville, PA are exclusively served by long-distance Amtrak services, respectively the Lake Shore Limited® and Floridian℠.

The Pennsylvanian® achieved a 68 percent cost recovery ratio in FY2024 on $16 million in revenue. Between FY2019 and FY2023, on-time performance exceeded 80 percent only once, during FY2020, the peak of the COVID-19 pandemic (**Figure 2.23**).[11] Most delays to the Pennsylvanian® occur on the western portion of the route traversing NS. Average on-time performance for the route has been around 70 percent from FY2021 through FY2023. Freight train interference is the leading category for delay minutes on Keystone West Amtrak service.[12]

Figure 2.23 Keystone and Pennsylvanian® On-Time Performance

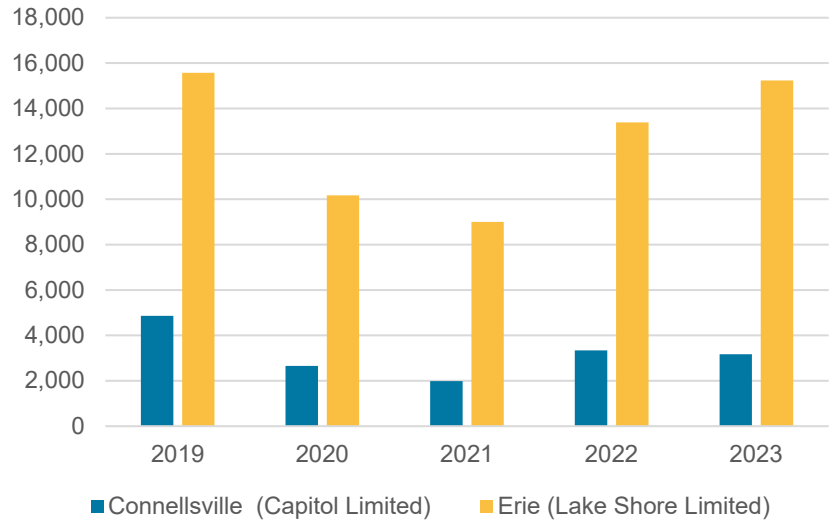


Source: Amtrak Fact Sheets 2019-2023

Long-Distance Routes

Amtrak long-distance routes are those that are over 750 miles in length. As stipulated in PRIIA, costs not covered by passenger ticket revenues are the responsibility of the federal government. Two stations in Pennsylvania are served exclusively by Amtrak long-distance train routes: Connellsville and Erie. As in other locations, ridership at both stations declined due to the COVID-19 pandemic, as shown in **Figure 2.24**, though ridership at the Erie station has recovered faster.

Figure 2.24 Ridership Trends at Connellsville and Erie



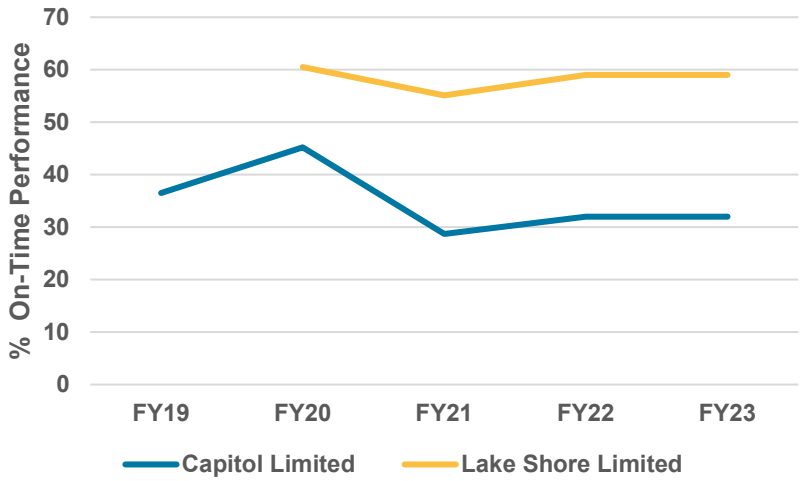
Source: Amtrak Fact Sheets, 2019-2023

Of the two long-distance routes that serve Pennsylvania, the Lake Shore Limited® has generally had better on-time performance, as shown in **Figure 2.25**. Neither service met the FRA/Amtrak goal of 80 percent on-time performance over the last five years.

[11] Amtrak Monthly Performance Report, September FY2024 and FY2019.

[12] Amtrak Calendar Year 2023 Host Railroad Report Card & Route On-Time Performance.

Figure 2.25 Capitol Limited®/Floridian℠ and Lake Shore Limited® On-Time Performance



Source: Amtrak Fact Sheets 2019 - 2023

Amtrak's Lake Shore Limited® operates daily New York to Chicago and Boston to Chicago service, with stops in Albany, Buffalo, Erie, Cleveland, and additional stations in between. A total of 398,400 passengers rode the Lake Shore Limited® in FY2024, exceeding the pre-pandemic FY2019 base year by 12 percent.[13]

As a full-service train in Amtrak's long-distance network, the Lake Shore Limited® offers first-class sleeping car accommodations, full-service dining, café car, coach, and checked baggage service. Newer Viewliner equipment is used for sleepers, diners, and baggage cars, while coach and lounge cars are made up of Amfleet II cars built in late 1970s. All equipment on the Lake Shore Limited® destined for New York must be single-level due to tunnel restrictions into New York Penn Station. Bicycle service is available at select stations.

Erie, Pennsylvania is the only station in Pennsylvania served by the Lake Shore Limited®, which is also the only train serving Erie, Pennsylvania. Amtrak service in Erie provided 15,236 passengers in FY2023 access to intercity rail transportation, or 97.8 percent of levels achieved in pre-pandemic FY2019. As an overnight train between New York and Chicago, the Lake Shore Limited® serves Erie, Pennsylvania, eastbound at 2:10 a.m. Westbound, the scheduled departure time of 7:24 a.m. is more reasonable for attracting customers.[14]

In FY2023, on-time performance for the Lake Shore Limited® on NS and CSX was 69 percent. For the 12 months trailing through September 2024, NS was responsible for 1,090 minutes of delay per 10,000 train miles on the Lake Shore Limited®, missing the FRA standard of 900 delay minutes per 10,000 train miles. CSX, which has the same prescribed standard, was responsible for 701 delay minutes per 10,000 train miles for the same time period.[15]

Amtrak's Capitol Limited®, which Amtrak merged with the Silver Star® in 2024 to create the Floridian℠ service, operated daily between Washington, DC; Martinsburg, West Virginia; Pittsburgh, Pennsylvania; Cleveland, Ohio; Elkhart, Indiana; and Chicago, Illinois, with additional stops in between. This service change was made to provide more network capacity on the NEC during rehabilitation and construction of tunnels serving New York Penn Station. It is anticipated that upon completion of tunnel work, the Floridian℠ service will revert to the separate Capitol Limited® and Silver Meteor® long-distance trains. A total of 163,100 passengers rode the Capitol Limited® in FY2024, or 77 percent of the pre-pandemic ridership achieved in FY2019.[16]

The Capitol Limited® was a full-service train in Amtrak's long-distance network, offering a full-service diner, lounge, sleeper, and coaches utilizing bi-level Superliner equipment. The Floridian℠ uses single-level long-distance equipment and features a full-service dining car, lounge,

[13] Amtrak Monthly Performance Report, September FY2024 and FY2019.
[14] Amtrak Lake Shore Limited® Timetable Effective through 10/30/2024.
[15] Amtrak Host Railroad Report, data through September 2024.
[16] Amtrak Monthly Performance Report, September FY2024 and FY2019.

sleeper, and coaches, with checked baggage and bicycle service at select stations.

Pittsburgh and Connellsville are the only stations serviced by the Floridian℠ in Pennsylvania. While Pittsburgh is served by both the Pennsylvanian® and Floridian℠, Connellsville's only passenger service is provided by the Floridian℠. Two of the service's top three city pairs by ridership and revenue include Pittsburgh as either an origin or destination.[17] Departure times in Pittsburgh are less than ideal for customers, with both westbound and eastbound departures being late at night or early in the morning. Connellsville has more convenient service, times approximately two hours earlier in the evening and two hours later in the morning compared to Pittsburgh.

Amtrak's Capitol Limited®/Floridian℠ has not met the federal 80 percent standard for on-time performance. In FY2023, the Capitol Limited® achieved 70 percent on-time performance on NS and CSX. For the 12 months trailing through September 2024, NS was responsible for 1,112 minutes of delay per 10,000 train miles, exceeding the FRA's 900 delay minutes per 10,000 train mile standard, while CSX met the target, with 677 delay minutes per 10,000 train miles for the same time period.

SOUTHEASTERN PENNSYLVANIA TRANSPORTATION AUTHORITY

Overview

SEPTA operates regional rail, rapid transit, trolleys, and bus service in the Philadelphia region. The regional rail service includes 13 routes spanning 280 track miles and 155 stations. All 13 routes serve the city of Philadelphia. Nine routes extend into Pennsylvania suburbs, two routes travel into New Jersey, and one route travels into Delaware.

History & Ownership

The majority of SEPTA's rail system has its origins in infrastructure investment and mergers dating back to the early 1800s and 1900s. Electric commuter train lines were constructed across the Philadelphia region by two railroads, the Pennsylvania Railroad and the Reading Company. The Pennsylvania Railroad owned and operated six train lines that carried passengers into downtown Philadelphia from the suburbs, with wide rights-of-way and multiple tracks. The Pennsylvania Railroad built high-capacity infrastructure, including largely double-track lines, three lines that have three to four tracks, several fully grade-separated junctions, and a few grade crossings. The Reading Company owned and operated six rail lines, serving suburban neighborhoods north of Philadelphia and terminating at Reading Terminal. Compared to those constructed by the Pennsylvania Railroad, these rail lines had longer segments of single-track, more grade crossings, and no grade-separated junctions.

SEPTA was formed in 1963 by the Pennsylvania State legislature to coordinate funding of rail and transit services operated by private railroads in Southeastern Pennsylvania. From the mid-1960s through 1983, SEPTA contracted with the Reading and Pennsylvania railroads, Penn Central, and later Conrail to run commuter rail operations. SEPTA acquired ownership of nine of the 12 lines (Amtrak owns three lines) and began operations on these rail lines in 1983, and continues to operate the Regional Rail service today. In 1984, SEPTA used the new Center City tunnel to connect the lines into a single network with all trains providing service to 30th Street, Suburban, and Jefferson stations through the rail tunnel under Philadelphia's central business district. In 1985, the Airport Line began service, creating a critical air-rail connection for the region to Philadelphia International Airport. The Airport Line is owned by the City of Philadelphia, and it provides service to the Philadelphia International Airport every 30 minutes from 5 a.m. to midnight .

SEPTA owns much of the track right-of-way, bridges, tunnels, electrical, communication, signal systems, and buildings on which it operates. However, it operates several lines on Amtrak infrastructure and leases some of its stations from Amtrak. Three of the lines have four tracks, and

[17] Rail Passenger Association, Capitol Limited®, FY2022.

several others have at least two tracks running the entire length of the route. Multiple tracks, similar to multiple lanes on a roadway, provide more capacity and avoid train conflicts such as opposing train movements or fast trains (i.e., Express service) getting stuck behind slower trains. Most of the system has complete separation of passenger and freight rail traffic, with minor exceptions on specific branch lines (Norristown Line and Airport Line) and limited freight movements on services traversing the Northeast Corridor.

Fleet and Equipment

The Regional Rail system is fully electrified, with the fleet consisting of mostly electric, self-propelled passenger cars known as Electric Multiple Units (EMU). Each EMU railcar provides its own traction (power) to move the train via the overhead catenary system. When multiple units are coupled together, each unit is providing traction to move the train. EMUs are well-suited to serve lines with closely spaced stations and accelerate faster than passenger cars pulled by locomotive-hauled trains. SEPTA's Regional Rail fleet currently consists of 227 Silverliner IV, 120 Silverliner V, and 45 Push-Pull. Silverliner IV and V are single-level EMU cars. The push-pull services are operated with an electric locomotive pulling (or pushing) single-level cars. Unlike EMUs, traction (power) is only provided by the locomotive. When the locomotive is on the rear and pushing the train, the operator controls the train from a cab car with a train operator's compartment at the end of the train opposite the locomotive.

All SEPTA equipment is designed for dual access to both high- and low-level boarding platforms. This requires cars to have steps for boarding from low-level platforms as well as an arrangement (usually a trap door over those steps) that enables access for high-level platforms. All SEPTA operations are managed through its Rail Operations Control Center, which unifies all the dispatching of all trains from one location.

Span of Service

Train frequency by SEPTA line is shown in **Table 2.6** for both weekday and weekend service. Lines offering the most weekday and weekend service include the Airport, Paoli/Thorndale, and Lansdale/Doylestown lines.

Table 2.6 SEPTA Weekday and Weekend Train Frequency by Line

TRAIN LINE	WEEKDAY	WEEKEND
Airport	78	78
Chestnut Hill West	39	18
Fox Chase	40	18
Media/Wawa	52	36
Paoli/Thorndale	64	36
Warminster	52	41
West Trenton	42	20
Chestnut Hill East	40	19
Cynwyd	12	0
Lansdale/Doylestown	55	36
Manayunk/Norristown	54	38
Trenton	50	38
Wilmington/Newark	42	19

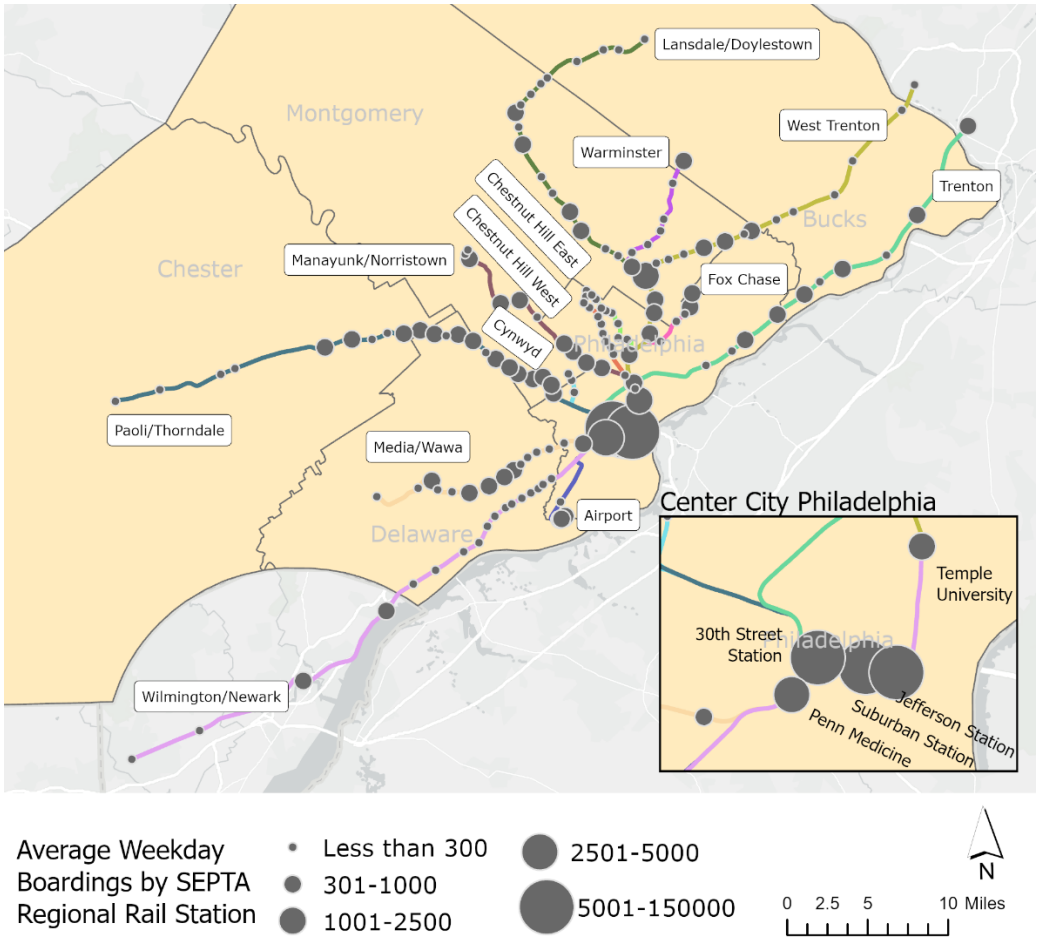
Source: Spring 2025 Service Levels, SEPTA

Ridership

Figure 2.26 shows average weekday boardings by SEPTA regional rail station for 2024, where marker size indicates the quantity of boardings.

Notably, Center City Philadelphia stations, including Suburban Station, Jefferson Station, and 30th Street Station, demonstrate the highest average weekday ridership. Weekday boardings at these stations totaled 13,970, 5,813, and 5,893, respectively.

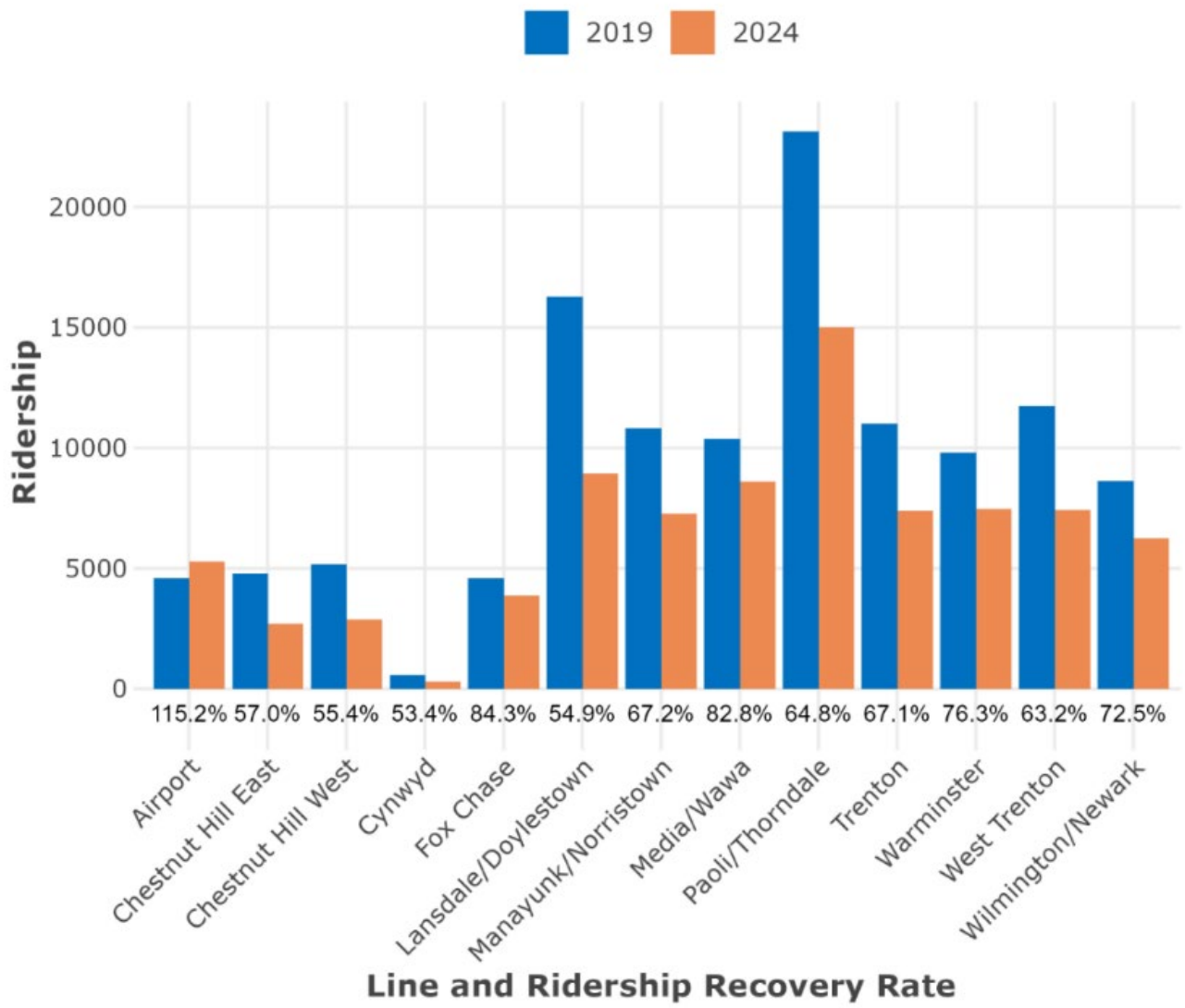
Figure 2.26 SEPTA Regional Rail 2024 Weekday Boardings by Station



Source: SEPTA Regional Rail Census, Office of Innovation

SEPTA's 13 routes range in length from 6.1 miles (Cynwyd Line) to 41.1 miles (Wilmington/Newark Line). Average weekday ridership across the regional rail system in 2024 was 83,413 compared to 120,222 in 2019. While ridership plummeted 97 percent at the height of the pandemic, it rebounded to around 45 percent by late 2021, with a steady increase since then to 68 percent as of 2025. Absolute ridership has historically been highest on the Lansdale/Doylestown and Paoli/Thorndale lines, with both featuring large numbers of peak-hour commuters. These lines have experienced slower ridership recovery than other shorter lines (**Figure 2.27**). Like other commuter-oriented transit systems, this is due to many employers shifting to full- or part-time work-from-home, decreasing weekday activity. In Pennsylvania and across the country, ridership on regional and commuter rail has recovered at a slower pace than rapid transit and bus service, in part due to the higher proportion of trips for employment taken on regional and commuter rail compared to other modes. The Airport Line, unlike all other lines, has surpassed pre-pandemic ridership, which can be attributed to the all-day ridership driver of the airport, as well as fully restored, half-hourly service all day. Other densely populated lines such as Fox Chase, Media/Wawa, and Warminster have seen better-than-average recovery rates from 75 percent to 85 percent.

Figure 2.27 Weekday Ridership FY2019 vs FY2024 on SEPTA Regional Rail Lines



Source: SEPTA Regional Rail Census, Office of Innovation

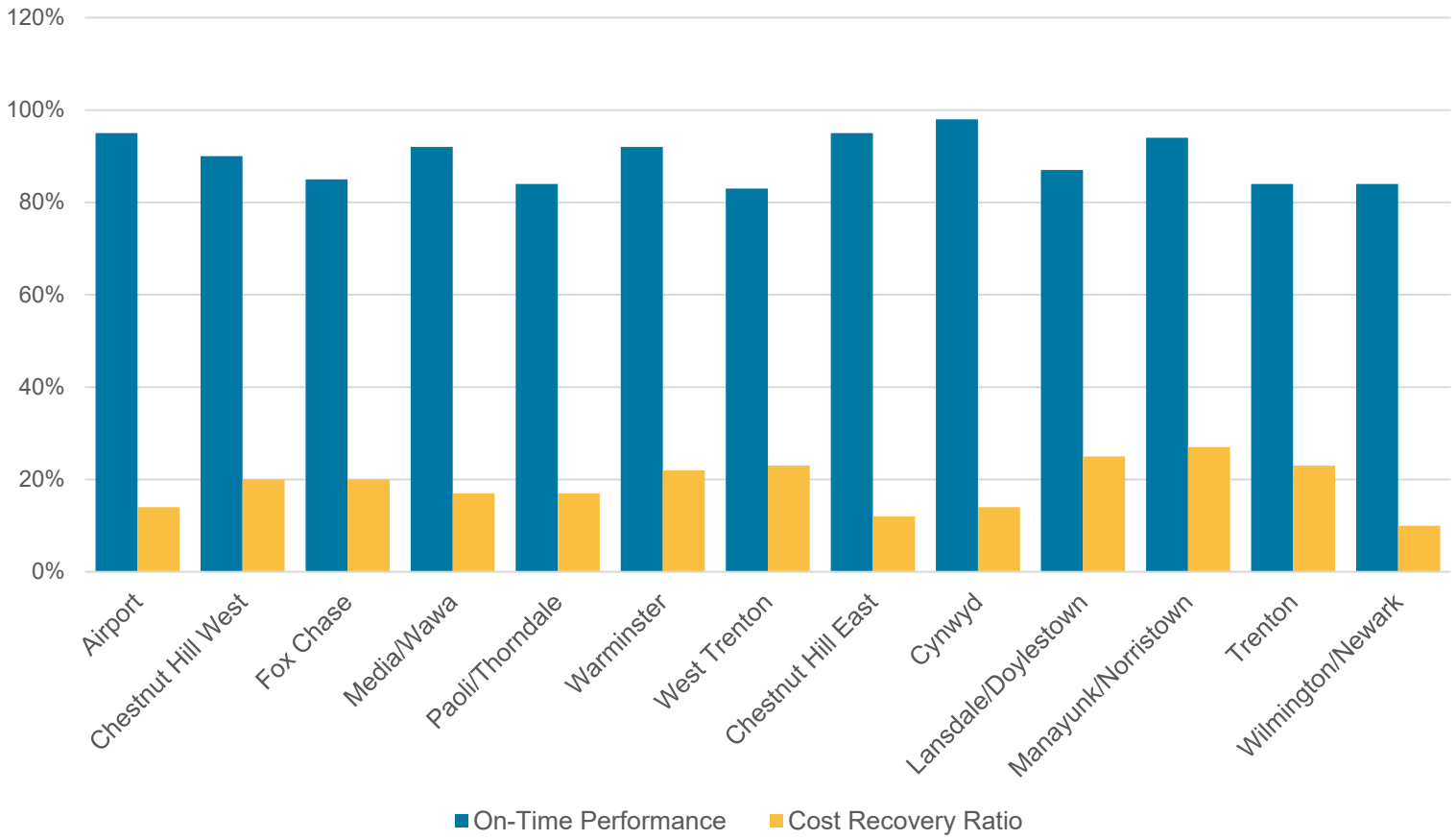
Rail Station Amenities

Appendix D inventories SEPTA rail station amenities such as parking, bike racks, elevators, benches, and restrooms. Most stations have parking, bike racks, a station building, a shelter, benches, lighting, trash and recycling services, a map, and schedule and fare information.

Performance Evaluation

The cost recovery ratio and on-time performance by SEPTA Regional Rail route are shown in **Figure 2.28**. The operating ratio is highest (23 to 27 percent) on the Manayunk/Norristown, Lansdale/Doylestown, Trenton, and West Trenton lines. On-time performance for all-day service lines is highest on the Airport Line (95 percent) and Chestnut Hill East Line (93 percent).

Figure 2.28 On-Time Performance and Cost Recovery Ratio by SEPTA Regional Rail Route



Source: SEPTA Route Statistics 2024, SEPTA Service Planning Department

OTHER COMMUTER SYSTEMS THAT OPERATE IN PENNSYLVANIA – NJ TRANSIT

SEPTA's regional rail system is connected to other transit systems, including NJ TRANSIT, which provides commuter rail in Pennsylvania. NJ TRANSIT is the nation's largest statewide public transportation system, consisting of about 240 bus routes, 3 light rail lines, and 11 commuter rail lines. It is the third-largest transit system in the country, with 164 rail stations, 60 light rail stations, and more than 18,000 bus stops linking major points in New Jersey, New York, and Philadelphia.

The Trenton Transit Center provides connections between NJ TRANSIT's Northeast Corridor line and SEPTA's Trenton line that operates between Trenton and Philadelphia. A joint ticketing option was introduced in the early 2000s that allows the purchase of NJ TRANSIT and SEPTA tickets in a single transaction for passengers' convenience. The Trenton Transit Center also offers connections to Amtrak intercity rail service.

NJ TRANSIT's Atlantic City Rail Line operates between Philadelphia and Atlantic City, with connections to NJ TRANSIT's River Line to Camden and Trenton at the Pennsauken Transit Center. The River Line connects communities between Trenton and Camden, located across the river from Philadelphia.

SEPTA's West Trenton Line operates between Philadelphia and Ewing, New Jersey. NJ TRANSIT has proposed a West Trenton Line that would connect to SEPTA at the West Trenton station. Due to a lack of funding, there has been no development since 2007.

Public Funding and Financing of Rail

As in other locations, passenger rail services in Pennsylvania are subsidized by the public sector for both operating cost shortfalls and capital costs. Private freight railroad companies fund their own operating expenses from freight revenues. Rail systems, whether intended for passenger or freight, are highly capital intensive. Public entities fund freight capital projects that yield public benefits and that would not have been funded by the private sector alone.

LOCAL FUNDING

The Municipality Authorities Act of 1935 (1935 Act) allows municipalities in Pennsylvania to create authorities that are permitted to acquire, construct, finance, improve, maintain, and operate projects,[18] provide financing for insurance reserves, make loans and borrow money, and issue bonds to finance them. The 1935 Act was repealed and replaced in 1945 to provide greater flexibility in operation and in the types of bonds issued. While the 1935 Act focused on specific public works projects, the 1945 Act expanded to include a broader range of projects. The 1945 Act also provided authorities greater control and power to issue bonds, acquire property, and enter contracts. An authority can be a financing agent for a capital project, an operating entity, or both. The Act also confers the right of eminent domain and allows the authority to enter into contracts with and accept grants from the federal government. Municipal codes enable local governments to make grants and loans to municipal authorities. These funds can be repaid when the authority issues bonds. The 1935 Act was officially codified in the Pennsylvania Consolidated Statutes in 2001.

Three regional rail authorities operate in Pennsylvania are as follows:

- Susquehanna Economic Development Association – Council of Governments Joint Rail Authority
- Pennsylvania Northeast Regional Rail Authority
- Schuylkill River Passenger Rail Authority

[18] As defined in 53 Pennsylvania Consolidated Statutes § 5602, project is equipment leased by an authority to the municipality or municipalities that organized it or to any municipality or school district located wholly or partially within the boundaries of the municipality or municipalities that organized it, or any structure, facility or undertaking which an authority is authorized to acquire, construct, finance, improve, maintain or operate, or provide financing for insurance reserves under the provisions of this chapter, or any working capital which an authority is authorized to finance under the provisions of this chapter.

Regional rail authorities are funded by local municipalities and counties, and state and federal government earmarks and bonds. Interest paid on bonds issued by the authority is exempt from federal income tax and from Pennsylvania state and local income taxes, which can help make these investments attractive and sold at a lower interest rate.

STATE FUNDING PROGRAMS

Act 119

Act 119 of the General Assembly of Pennsylvania (1984) established the Pennsylvania Rail Freight Preservation and Improvement Act (P. L. No. 587, No. 119) that declared state assistance for "the preservation, rehabilitation, and improvement of efficient and coordinated rail freight transportation services, systems, and facilities is essential to the solution of these statewide problems."

Act 119 enabled the Rail Freight Assistance Program (RFAP) and Rail Transportation Assistance Program (RTAP). The intent of RFAP and RTAP is to preserve essential rail freight service where economically feasible and preserve or stimulate economic development through the generation of new or expanded rail freight service.

Rail Freight Assistance Program

The RFAP provides financial assistance for investment in rail freight infrastructure. The maximum state funding for a RFAP project is 70 percent of the total project cost. This program awards grants annually.

Rail Transportation Assistance Program

The RTAP, is available to applicants with a line item(s) in the Capital Budget Act through legislative sponsorship from state representatives or state senators. It provides funding up to 70 percent of the total project cost. This program awards grants annually.

Pennsylvania Infrastructure Bank

The RFAP and RTAP grant programs allow for the grantee's match to be in the form of a loan. One option to obtain a low-interest loan is from PennDOT's Pennsylvania Infrastructure Bank (PIB). PIB provides financing for eligible projects including rail track improvements, new sidings, rail/street crossings, and rail bridge infrastructure projects in the form of loans for rail freight projects. PIB loans have fixed interest rates at half the prime lending rate with terms of up to 10 years. The PIB can be used in conjunction with RFAP and RTAP grants, so that a PIB loan can be counted toward the grantee's required 30 percent match.

Public Transportation Trust Fund

State funding for transit programs including commuter and intercity passenger rail in Pennsylvania is provided for in Act 44 of 2007 as amended by Act 89 of 2013. Act 44 established the Public Transportation Trust Fund to fund public transportation programs and projects. The various funding sources for the Public Transportation Trust Fund include turnpike, sales and use tax, motor vehicle sales tax, the Public Transportation Assistance Fund, capital bond funds, state lottery,

transfers from the Motor License Fund that are not restricted to highway purposes, and various fines. It authorizes the following six major public transportation programs:[19]

- **Operating Program (Section 1513)** provides funds for operating expenses with a required local match of 15 percent of the grant amount.
- **Asset Improvement Program for Capital Projects (Section 1514)** provides funds for the improvement, replacement, or expansion of capital projects. The local match funding is not less than 3.33 percent of the grant amount.
- **Capital Improvement Program (Section 1517)** provides funds for capital improvement projects. While still included as a capital program in the public transportation legislation, no new funding was deposited in this program after 2013 because Act 89 authorized capital funding to be included as part of Section 1514.
- **Alternative Energy Program (Section 1517.1)** implements capital improvements conversion to an alternative energy source. Funding for this program is transferred from Section 1514.
- **New Initiatives Program (Section 1515)** provides the framework to advance new or expansion of existing fixed guideway systems. The local match is 3.33 percent of the state funding. However, no funding has been available for this program since the legislature has not appropriated funds.
- **Programs of Statewide Significance (Section 1516)** include programs such as Persons with Disabilities, Welfare to Work, intercity bus and rail service, as well as technical assistance and demonstration projects. The match requirement varies by program.

[19] https://talkpatransportation.com/perch/resources/pennsylvania-2023-transportation-program-financial-guidance.pdf

ACT 89

Act 89, signed into law in November 2013, increased transportation funding by eliminating the cap on the wholesale gas tax and increasing a range of user fees. Act 89 provides an estimated $2.3 billion in additional revenue annually. The legislation also established minimum annual funding levels for freight rail ($10 million) and passenger rail ($8 million) programs.

Act 89 also established a dedicated Multimodal Transportation Fund (MTF) that stabilized funding for ports and rail freight, increased aviation investments, and established dedicated funding for bicycle and pedestrian improvements. The MTF provides grants to encourage economic development and to ensure that a safe and reliable system of transportation is available to the residents. Grants are available for projects with a total cost of $100,000 or more but not exceeding $3 million. Rail freight projects are eligible for MTF. The MTF is authorized through two distinct programs offered by the Pennsylvania Department of Community and Economic Development and PennDOT.

Department of Community and Economic Development

Other relevant rail funding programs through the Pennsylvania Department of Community and Economic Development include the following:

- **Pennsylvania Strategic Investments to Enhance Sites Program** provides grant and loan funding to develop competitive sites for businesses to relocate or expand within the Commonwealth. Funding includes planning grants and construction grants/loans that can be used for rail infrastructure planning and improvements, or other improvements to sites that are rail-served.
- **Tax Increment Financing Guarantee Program** lowers capital costs by guaranteeing bonds or other indebtedness used for infrastructure

or environmental projects for industrial enterprises and retail establishments. Infrastructure improvements could include rail or other improvements to a rail-served site.

- **Business in Our Sites Program** provides grants and loans to make sites shovel-ready. Sites must be previously utilized or undeveloped property that is planned and zoned for development. Among the eligible uses is railroad infrastructure.

Other Commonwealth Agencies Funding Sources

Additional funding sources are available through Pennsylvania agencies' programs to incentivize private sector development. The following may be coupled with PennDOT sources to advance projects that support economic development:

- **Pennsylvania First** is a comprehensive funding source that offers grants, loans, and loan guarantees for equipment, infrastructure, land, and site improvements.
- **Job Creation Tax Credits** offers a $1,000-per-job tax credit for approved businesses that demonstrate new job creation within three years.
- **Pennsylvania Industrial Development Authority** provides low-interest loans for eligible businesses that create or retain full-time jobs at industrial parks and multi-tenant facilities.
- **Redevelopment Assistance Capital Program** provides grants for projects of regional or multi-jurisdictional impact. Similar to RTAP, these grants require legislative sponsorship.

FEDERAL FUNDING PROGRAMS

Federal funding for rail infrastructure projects is provided primarily through competitive discretionary grant programs. Some discretionary grant programs are rail-specific and are administered by the FRA, while others are multimodal and are relevant across modal administrations, including the USDOT. Relevant federal discretionary grant programs funding Pennsylvania rails are listed in **Table 2.7**.

The most recent federal surface transportation bill, the Infrastructure Investment and Jobs Act passed in 2021, has provided an unprecedented level of transportation funding. The legislation invests $66 billion in new funding between federal FY2022 and FY2026 for passenger and freight rail, of which, $22 billion would be provided as grants to Amtrak, $24 billion as federal-state partnership grants for NEC modernization, $12 billion for partnership grants for intercity rail service, including high-speed rail, $5 billion for rail improvement and safety grants, and $3 billion for grade crossing safety improvements.

Table 2.7 Federal Discretionary Grant Programs Relevant to Rail

PROGRAM	PROGRAM DESCRIPTION	ANNUAL FUNDING	AVERAGE AWARD SIZE	ELIGIBLE PROJECTS	ELIGIBLE APPLICANTS	PA RAIL EXAMPLE(S)
FRA Discretionary Grant Programs						
Corridor Identification and Development (CID) Program	A comprehensive intercity passenger rail planning and development program that will fund the development of a scope, schedule, and cost estimate for preparing a service development plan for a Corridor.	Only one round as of 2025	$500,000 per corridor for Step 1, varies for Step 2, 3	MODE: rail, RELEVANT PROJECT TYPES: intercity passenger rail projects	States, Amtrak. Regional passenger rail authorities, regional passenger rail authorities, Regional planning organizations, entities implementing interstate compacts	FY2022: $500,000 to PennDOT's Scranton to New York Penn Station Passenger Rail Corridor FY2022: $500,000 to PennDOT's Keystone Corridor: Pittsburgh to Philadelphia FY2022: $500,000 Schuylkill River Passenger Rail Authority's Reading-Philadelphia-New York Corridor
Federal-State Partnership for Intercity Passenger Rail (FSP - NEC)	Provides funding for capital projects located on the Northeast Corridor that reduce the state of good repair (SOGR) backlog, improve performance, or expand or establish new intercity passenger rail service, including privately operated intercity passenger rail service, if an eligible applicant is involved.	Approximately $2 billion in FY2024		MODE: Intercity Passenger Rail, RELEVANT PROJECT TYPES: SOGR, performance improvements or new services, planning, environmental studies	States, interstate compact, public agencies, Amtrak	FY2022-2023: SEPTA's Reconstruction of Cornwells Heights Station (Up to $30,500,000)
Federal-State Partnership for Intercity Passenger Rail (FSP - National)	Provides funding for capital projects not located on the Northeast Corridor that reduce the SOGR backlog, improve performance, or expand or establish new intercity passenger rail service, including privately operated intercity passenger rail service, if an eligible applicant is involved.	Approximately $1.06 billion in FY2024		MODE: Intercity Passenger Rail, RELEVANT PROJECT TYPES: SOGR, performance improvements or new services, planning, environmental studies	States, interstate compact, public agencies, Amtrak	FY2022-2023: Up to $143,629,028 PennDOT's Pennsylvania Rail Modernization Project along Norfolk Southern's (NS) main line trackage between Pittsburgh and Harrisburg
Railroad Restoration and	Provides funding assistance for initiating, restoring, or enhancing	$50M/Yr (FY2022 – FY2026)		MODE: Intercity Passenger Rail,	State, Interstate Compact, public	New program

PROGRAM	PROGRAM DESCRIPTION	ANNUAL FUNDING	AVERAGE AWARD SIZE	ELIGIBLE PROJECTS	ELIGIBLE APPLICANTS	PA RAIL EXAMPLE(S)
Enhancement Grants (RREG)[1]	intercity passenger rail transportation operations.			RELEVANT PROJECT TYPES: Operating subsidies of intercity passenger rail services with preferences for restoring discontinued services, services that would "enhance connectivity and geographic coverage of the existing national network of intercity rail passenger service"	agencies, Amtrak, Intercity Passenger Rail Carrier	
Railroad Crossing Elimination Program[2] (RCE)	Provides funds for highway-rail or pathway-rail grade crossing improvement projects that focus on improving the safety and mobility of people and goods.	$573M in FY2022 Nearly $1.1B in FY2023- 2024	$9M in FY2023	MODE: road/rail crossings, RELEVANT PROJECT TYPES: grade separations or closures, track relocation, other safety improvements. Construction, planning, environmental, design are eligible.	State, public agencies, MPOs	FY2022: Redevelopment Authority of the County of Berks Project to Upgrade and Refurbish At-Grade Crossings and Bridges (Up To $16,063,596) FY2022: PennDOT's CSX/SEPTA Grade Crossing Elimination Study – A Study to Alleviate Congestion and Enhance Community Safety (Up To $375,000)

PROGRAM	PROGRAM DESCRIPTION	ANNUAL FUNDING	AVERAGE AWARD SIZE	ELIGIBLE PROJECTS	ELIGIBLE APPLICANTS	PA RAIL EXAMPLE(S)
Consolidated Rail Infrastructure and Safety Improvements Program (CRISI)[3]	Funds capital projects that improve passenger and freight rail transportation systems in terms of safety, efficiency, or reliability.	$2.4 B in FY2023-2024	$12.7 in FY2023	MODE: rail, RELEVANT PROJECT TYPES: passenger and freight capital projects, workforce development, studies	Public agencies, Intercity rail passenger providers, Class II or Class III railroads, Universities, rail labor organizations	FY2024: $8.9 million to the Pennsylvania Northeast Regional Railroad Authority for track and tie replacement, upgrades to one grade crossing, on the authority's Pocono main line between Slateford and Gouldsboro.
USDOT Multimodal Discretionary Grant Programs						
National Infrastructure Project Assistance Program (MEGA)	Provide funds to large, complex projects that are relatively difficult to fund by other means and likely to generate national or regional economic, mobility, or safety benefits.	Approximately$1.5 B/yr (FY2022 – FY2026)		MODE: All freight modes, intercity passenger rail, certain transit projects, PROJECT TYPES: Large, complex projects capital projects that would otherwise be difficult to fund	State, MPO, local government, public agencies	New program
Infrastructure for Rebuilding America (INFRA)	Funds multimodal freight and highway projects of national or regional significance to improve the safety, efficiency, and reliability of the movement of freight and people in and across rural and urban areas.	Approximately $480M/yr non-highway FY2022 – FY2026	$38M in FY2021, but 85% reserved for projects $100M+ in cost	MODE: All freight modes, but 70%+ highway, PROJECT TYPES: Freight projects	State, local government, public agencies	New program

PROGRAM	PROGRAM DESCRIPTION	ANNUAL FUNDING	AVERAGE AWARD SIZE	ELIGIBLE PROJECTS	ELIGIBLE APPLICANTS	PA RAIL EXAMPLE(S)
Rural Surface Transportation Grant Program (RURAL)	Funds surface transportation infrastructure projects in rural areas to increase connectivity, improve safety and reliability of movement of freight and people, generate regional economic growth, and improve quality of life.	Approximately $300M/yr (FY2022 – FY2026)	$25M	MODE: All surface modes, PROJECT TYPES: Capital projects	State, local government, public agencies	New program
Rebuilding American Infrastructure with Sustainability and Equity (RAISE)	Provides funds for surface transportation infrastructure projects with significant local or regional impact to safety, environmental sustainability, quality of life, economic competitiveness, SOGR, innovation, and partnership.	$1.8B for 148 projects in FY2024: Approximately $1.5B for FY2025	$13M in FY2022	MODE: All surface modes, PROJECT TYPES: Capital and planning projects	State, local government, public agencies, transit agencies	New program

Notes:

1 Federal Railroad Administration. Restoration and Enhancements Grant Program Fact Sheet. https://railroads.dot.gov/elibrary/restoration-and-enhancements-grant-program-fact-sheet

2 Federal Railroad Administration. Railroad Crossing Elimination Grant Program Fact Sheet. https://railroads.dot.gov/elibrary/railroad-crossing-elimination-grant-program-fact-sheet

3 Federal Railroad Administration. Consolidated Rail Infrastructure & Safety Improvements Grant Program Fact Sheet. https://railroads.dot.gov/elibrary/consolidated-rail-infrastructure-safety-improvements-grant-program-fact-sheet

RELEVANT FORMULA GRANT FUNDS

Congestion Mitigation and Air Quality Improvement Program

The Congestion Mitigation and Air Quality Improvement Program provides a flexible funding source to state and local governments for transportation projects and programs to meet the requirements of the Clean Air Act. This includes surface transportation projects and rail-related projects. The IIJA apportioned $2.6 billion per year for the Congestion Mitigation and Air Quality Improvement program from FY2022 through FY2026. Pennsylvania's apportionment is $118 million per year.

Federal Loans / Tax Credits

Federal assistance is also in the form of a loan guarantee, or direct loans that have low-interest rates, long payback periods, and/or payment schedules that do not typically begin until completion of a project.

- **Railroad Rehabilitation and Improvement Financing** program provides direct federal loans and loan guarantees up to $35 billion to finance the development of railroad infrastructure, with $7 billion reserved for projects benefiting Class II and Class III railroads. Eligible borrowers include railroads, state and local governments, government-sponsored authorities and corporations, joint ventures, and limited option freight shippers that intend to construct a new rail connection. Eligible projects include improvements to, rehabilitation of, or acquisition of freight and passenger railroad equipment, track

and structures, new multimodal facilities, and refinancing of associated debt. Direct loans can fund up to 100 percent of a railroad project with repayment periods of up to 35 years and interest rates equal to the cost of borrowing to the government.

- **Transportation Infrastructure Finance and Innovation Act** created a program to provide credit assistance for large projects up to $50 million or 33 percent of a state's annual apportionment of federal aid funds, whichever is less. Eligible applicants include state and local governments, transit agencies, railroads, special authorities, special districts, and private entities. The program has a rolling application process, and projects must satisfy statutory eligibility requirements.
- **IRS Tax Credit (Section 45G of the Internal Revenue Code)** specifies that the railroad track maintenance credit is an amount equal to 40 percent (50 percent in the case of any taxable year beginning before January 1, 2023) of the qualified railroad track maintenance expenditures paid or incurred by an eligible taxpayer during the taxable year, with a cap of $3,500 per mile.

Passenger Rail Funding Sources: Federal Transit Administration

Federal funding for transit improvements including passenger rails is administered through the Federal Transit Administration (FTA). FTA provides annual formula grants to transit agencies, as well as discretionary funding in competitive processes.

- Public transportation agencies identified as Urban Systems are recipients of **Section 5307 (Urbanized Area Formula) and Section 5340 (High Density and Growing States) funds**. This funding program makes federal resources available to urbanized areas and to governors for transit capital and operating assistance in urbanized areas and for transportation-related planning. Funding is made available to designated recipients, including public agencies. As shown in **Table 2.8**, the combined funds that SEPTA budgeted for FY2025 from Section 5307 (Urbanized Area Formula Funding program) and Section 5340 (High-Density States Formula) is $298.6 million, which accounts for about 28 percent of the total capital funding sources available to SEPTA. This is also 11 percent of the overall funding sources for SEPTA's total capital and operations budget.
- **Section 5337 (State of Good Repair Program)** provides funding for public transit systems in urbanized areas that can be used for the repair and upgrade of rail transit systems, along with high-intensity bus systems that use high-occupancy vehicle lanes, including bus rapid transit. These projects must be either replacement or rehabilitation, or capital projects required to maintain public transportation systems in a state of good repair (SOGR). As shown in **Table 2.8**, SEPTA budgeted $198.1 million from Section 5337 for FY2025. This accounts for 18 percent of the capital funding sources. This is approximately 7 percent of the overall funding sources for SEPTA's total capital and operations budget.
- **Capital Investment Grants Program** funds transit capital investments, including heavy rail, commuter rail, light rail, streetcars, and bus rapid transit.[20] The program is authorized by the IIJA, which amended Chapter 53 of Title 49 of the U.S. Code. The IIJA included $1.6 billion per year in advanced appropriations for this program and $3 billion per year subject to annual appropriations for FY2022 through FY2026. It includes new fixed guideways or extensions of existing guideways for public transportation, projects that improve the capacity of fixed guideways, and projects shared between public transportation and intercity rail. This is a new program that can be a potential source of funds for rail in Pennsylvania.

[20] https://www.transit.dot.gov/CIG

FUNDS FOR SEPTA

The primary commuter rail provider in Pennsylvania is SEPTA. NJ TRANSIT operates in Pennsylvania but is funded by New Jersey.

The funding sources for SEPTA rail operations and capital projects come from a variety of state, local, and self-generated revenue sources. Federal funds are primarily disbursed directly from the FTA to SEPTA. SEPTA's funding sources for the FY2025 Operating & Capital budget are shown in the **Table 2.8**:

Table 2.8 SEPTA's FY2025 Operating & Capital Budget (Funding Sources)

FUNDING TYPE	FUNDING SOURCE	AMOUNT (IN $MILLION)*
Operating (Regional Rail)		$452.4
Federal	Capital Lease and Debt Service / Highway Pass Through Subsidy	$50.1
State	Section 1513 Operating Assistance	$231.0
State	Other Subsidy (Section 1514)	$26.0
Local	Match on Section 1513	$35.5
Local	Other Subsidy	$0.0
Other	Route Guarantees	$3.7
Revenue	Passenger Revenue	$88.8
Revenue	Shared Ride Program	$0.0
Revenue	Other Income	$9.2
Revenue	Investment Income	$8.1
Capital (All SEPTA divisions)		$1,030.7
Federal	Section 5307 (Urbanized Area Formula Funding program)/Section 5340 (High-Density States Formula)	$298.6
Federal	Section 5337	$198.1
State	Section 1514 Asset Improvements	$417.4
Local	Match On Federal/State Grants	$16.6
Bonds	SEPTA Capital Financing	$100.0
Total Operating & Capital		**$1,483.1**

Source: 2025 Budget Amendment, SEPTA (wwww.septa.org/wp-content/uploads/page/planning/FY-2025-Budget-Book-Amendment-Full.pdf)

*For Operating funding, SEPTA's budget identifies line items by Division. Only funding for the Regional Rail division is included in this table. For Capital funding, SEPTA's budget does not identify by line item or mode.

FUNDS FOR NORTHEAST CORRIDOR AND KEYSTONE CORRIDOR[21]

The country's only two electrified intercity rail passenger corridors are the NEC and Keystone Corridor, both of which run through Pennsylvania.

Northeast Corridor

The NEC Commission includes Amtrak, USDOT, and eight northeastern states and the District of Columbia. It was established by Section 212 of the PRIIA, which mandated a cost allocation policy to share operating and normalized replacement of the NEC's basic infrastructure costs for NEC users based on each NEC railroad's proportional use.

Pennsylvania state funding includes Act 89 Passenger Rail funds for Amtrak operating and Section 1516 funds for Amtrak operating and capital projects. Amtrak provides dispatching services and electric propulsion power and maintains and improves the infrastructure and facilities used by Amtrak, as well as commuter and freight rail services.

The IIJA provides up to $30 billion in additional funding over FY2022 through FY2027 to Amtrak and the FRA which is allocated to the NEC.

Some recently funded projects along the Pennsylvania portion of the NEC include the following:

- The Philadelphia William H. Gray III 30th Street Station is undergoing a large-scale restoration and renovation that will modernize station operation and advance significant concourse and station improvement.
- FY2022–FY2023 Federal-State Partnership for Intercity Passenger Rail Program (FSP-NEC) provides funds to capital projects located on the NEC that reduce the state of good repair backlog, improve performance, or expand or establish new intercity passenger rail service.
- Infrastructure Renewal and Speed Improvement Program is a planning study partnered with SEPTA, Maryland DOT, Virginia Railway Express, Delaware DOT, and NJ TRANSIT (receiving approximately $21 million funds).
- Cornwells Heights Station is a final design/construction project partnered with SEPTA (receiving approximately $350,000 funds).

Keystone Corridor

Amtrak owns the 104-mile Keystone Corridor from Philadelphia to Harrisburg. Amtrak's operating and capital costs are funded by federal grants, passenger revenues (fare, food, beverage), commercial revenues (real estate, parking, pipe/wire), and Act 89 and Section 1516 state funds through PennDOT's agreement with Amtrak per the formula from PRIIA Section 209. One-time capital costs (such as station construction) on the Keystone Corridor are funded by FTA formula fund grants from the Section 5307 (Urbanized Area Formula)/Section 5340 (High Density and Growing States) Program, and Section 5337 (State of Good Repair) Program.

PennDOT has provided pass-through federal funds for capital projects on the Keystone Corridor. Some recently funded projects along the Keystone Corridor are from the following funding sources:

- **Corridor ID Program**: In December 2023, the Keystone Corridor was selected for Corridor ID funding, which PennDOT applied to a Pittsburgh-to-Philadelphia project that will expand, modernize, and improve the two state-supported Amtrak services, the Pennsylvanian® and the Keystone Service®, to meet the demands of intercity passenger rail in the Keystone Corridor and improve co-mingled operations for intercity, commuter, and freight trains.

[21] https://www.amtrak.com/content/dam/projects/dotcom/english/public/documents/corporate/businessplanning/Amtrak-Service-Asset-Line-Plans-FY24-29.pdf

- **Federal-State Partnership for Intercity Passenger Rail Grant Program**: In 2023, PennDOT's Pennsylvania Rail Modernization Project was selected for funding. The project involves final design construction activities for various track and signal-related improvements along the NS main line trackage between Pittsburgh and Harrisburg in preparation for an additional daily Pennsylvanian® train that is anticipated to start operating in 2026.

Safety Trends

Although rail is a relatively safe mode of transportation, it is not without risks. Pennsylvania ranks third in the nation in the number of rail miles and fifth in the number of accidents over a 20-year period, with an average of 90 accidents per year. When normalizing average annual accidents by number of rail miles, the Commonwealth ranks 23rd in the nation. Twenty years was chosen as an analysis period to review broad trends in order to capture shifts over the decades.

OVERALL BY INCIDENT TYPE (TRAIN, HIGHWAY/RAIL, OTHER)

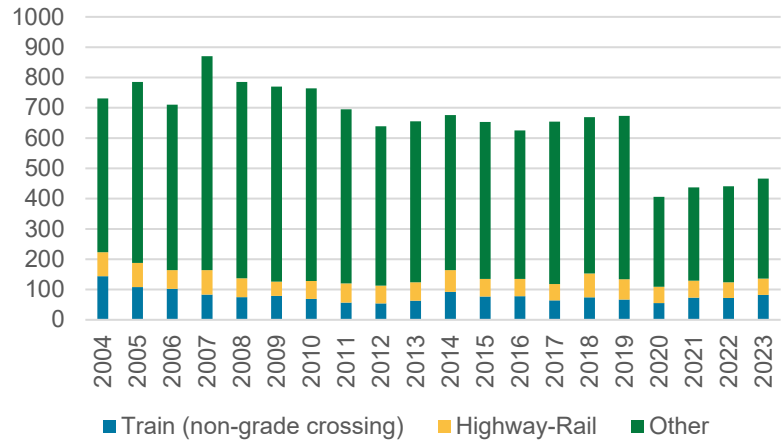
FRA categorizes incidents into three categories: train accidents, crossing incidents, and other accidents/incidents.[22] Definitions of these categories are noted as follows:

- **Train Accidents:** A safety-related event involving on-track rail equipment (both standing and moving), causing monetary damage to the rail equipment and track above a prescribed amount. These do not include highway-rail crossings.
- **Highway-Rail Grade Crossing Accidents/Incidents:** Any impact between a rail and highway user (both motor vehicles and other users) of the crossing at a designated crossing site, including walkways, sidewalks, etc., associated with the crossing.
- **Other Incident:** Any death, injury, or occupational illness of a railroad employee that is not the result of a train accident or highway-rail incident.

FRA uses the term "accident" when a train or a train and a roadway user is involved. "Incident" is used to include circumstances that include death, injury, or occupational illness of a railroad employee that is not the result of a train accident or highway-rail incident. FRA uses "incidents/accidents" instead of "crashes," because some events like occupational illness are not crashes.

Figure 2.29 displays rail-related incidents in Pennsylvania between 2004 and 2023. As shown in the figure, most accidents/incidents fall into the "Other Incident" category. The number of incidents declined 35 percent between 2004 and 2023, primarily driven by reductions in "Other Incidents."

Figure 2.29 Accidents/Incidents by Type (2004 – 2023)



Source: Federal Railroad Administration, Office of Safety Analysis 1.12 – Ten Year Accident/Incident Overview

[22] Accident/Incident Definitions | FRA

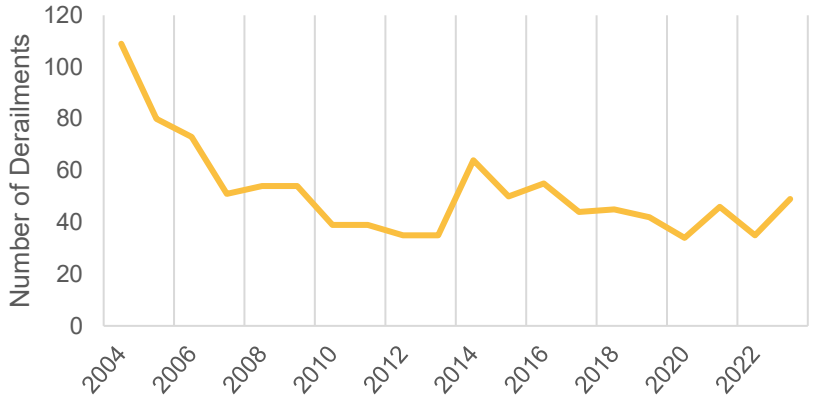
TRAIN ACCIDENTS/DERAILMENTS – HAZMAT SPILL

The FRA defines derailment as follows:

> **A derailment occurs when on-track equipment leaves the rail for a reason other than a collision, explosion, highway-rail grade crossing impact, etc.**[23]

Derailments can be caused by deferred maintenance of track or equipment, human error, or environmental factors. Since 2004, derailments have been trending generally downward, as shown in **Figure 2.30**. In 2004, 109 derailments occurred within the Commonwealth. The rate dropped to 35 by 2013, then increased in 2014 due to a surge in rail traffic around that year nationwide. Since 2014, derailments have trended downward again, but at a slower pace.

Figure 2.30 Train Derailments in Pennsylvania



Source: Federal Railroad Administration, Office of Safety Analysis 1.12 – Ten-Year Accident/Incident Overview

Train derailments can lead to hazmat spills. **Table 2.9** shows that 12 hazmat accidents occurred over the past 20 years, and none have occurred since 2017.

Table 2.9 Rail-Related Hazmat Spills in Pennsylvania

YEAR	COUNT	YEAR	COUNT
2004	2	**2014**	1
2005	1	**2015**	0
2006	4	**2016**	0
2007	1	**2017**	2
2008	1	**2018**	0
2009	0	**2019**	0
2010	0	**2020**	0
2011	0	**2021**	0
2012	0	**2022**	0
2013	0	**2023**	0

Source: Federal Railroad Administration, Office of Safety Analysis 1.12 – Ten-Year Accident/Incident Overview

HIGHWAY-RAIL GRADE CROSSINGS ACCIDENTS

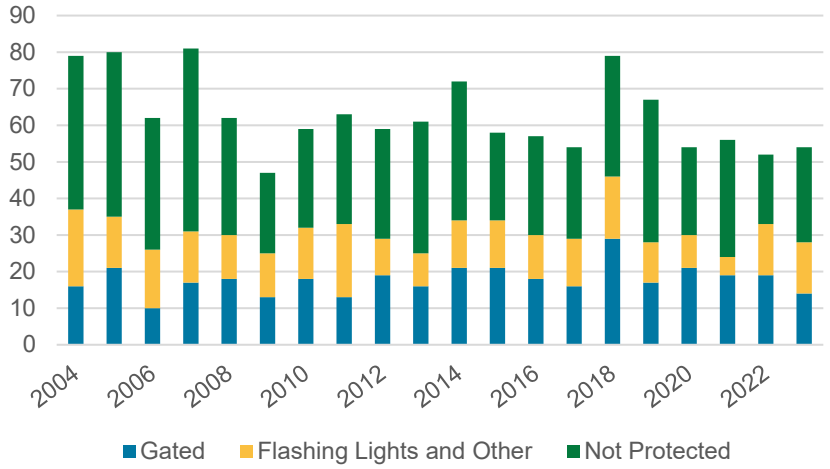
Highway-rail grade crossing definitions are as follows:

- **Gated:** Highway-rail grade crossings with gates along with flashing lights to stop roadway users from entering crossings when trains are present.
- **Flashing Lights and Other:** Highway-rail grade crossings with train-activated warning devices such as flashing lights, wig-wags, and audible signals warn roadway users that a train is present or about to enter the crossing.
- **Unprotected:** Highway-rail grade that do not have train-activated warning devices. Instead, the crossing has cross-buck signs, stop signs, and roadway markers to warn roadway users that they are approaching a highway-rail grade crossing.

[23] https://data.transportation.gov/stories/s/Data-Definitions/hsik-vfxx/

As shown in **Figure 2.31**, the number of accidents at highway-rail grade crossings since 2004 declined 32 percent between 2003 and 2023. However, there has been no consistent trend since 2009. In 2023, 33 percent of accidents occurred at crossings with no active warning devices, 26 percent at gated crossings, and 18 percent at crossings with flashing lights/other.

Figure 2.31 Highway-Rail Grade Crossing Accidents in Pennsylvania



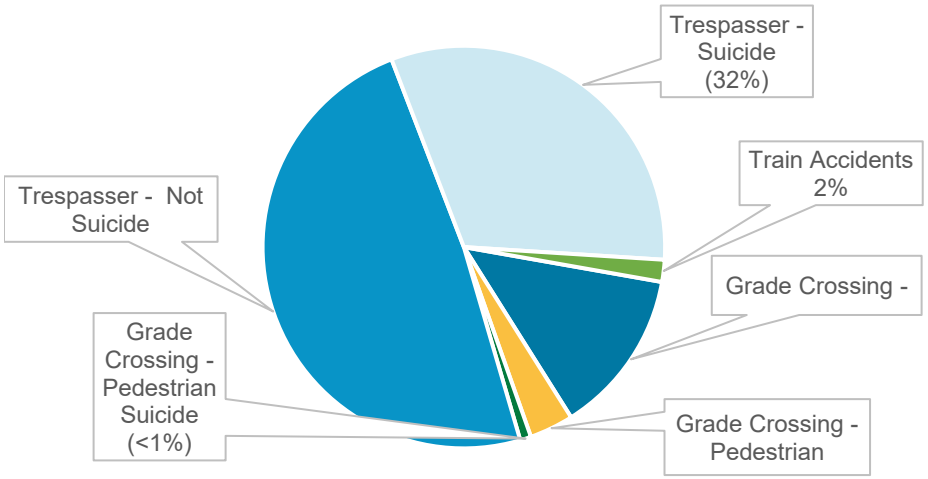
Source: Federal Railroad Administration, Highway-Rail Grade Crossing Accident Data Form 57

FATALITIES – TRESPASSERS, HIGHWAY-RAIL GRADE CROSSING CRASHES, OR OTHER

The assessment of rail-related fatalities in Pennsylvania covers the period between 2019 and 2023. Here the goal is not to understand the changes over time but to understand the circumstances of fatalities. Fatalities statistics are analyzed by the total number of fatalities over a five-year period.

The largest share of rail-related fatalities in Pennsylvania is trespassers, of which 35 percent are categorized as suicides. Trespassers are defined as "persons who are on the part of railroad property used in railroad operation and whose presence is prohibited, forbidden, or unlawful."[24] **Figure 2.32** shows the five-year fatalities by location and type. In the past five years, 55 (49 percent) of all fatalities were trespassers struck by trains, excluding suicides. The second-highest category, with 36 fatalities (32 percent of total fatalities), were suicides located outside highway-rail grade crossings. At highway-rail grade crossing, there were 20 fatalities, of which 15 (13 percent) involved a vehicle and 4 (3 percent) involved a pedestrian. There was only one suicide at a highway-rail grade crossing, and this was a pedestrian.

Figure 2.32 5-Year Fatalities by Location and Type

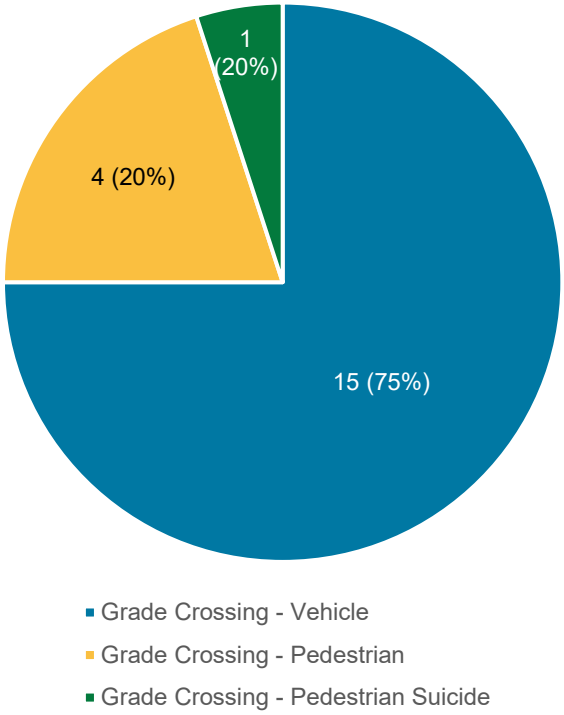


Source: WSP Analysis of FRA Section 4.08 and 4.13 reports, and FRA Form 57 data

[24] https://data.transportation.gov/stories/s/Data-Definitions/hsik-vfxx/

Figure 2.33 describes fatalities at highway-rail grade crossing since 2019. The data is categorized into three types: vehicle fatality, pedestrian fatality, and suicide (regardless of vehicle or pedestrian). Since 2019, 20 fatalities occurred at highway-rail grade crossings, a majority of which (75 percent) were caused by a train striking a vehicle. Four fatalities (20 percent) were pedestrians and one fatality (5 percent) was a suicide.

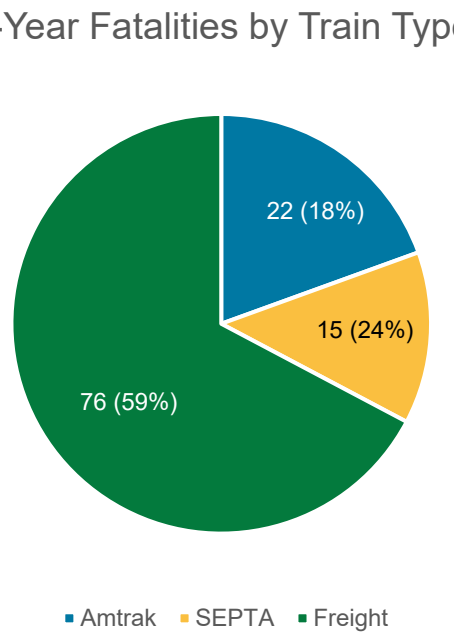
Figure 2.33 5-Year Crossing Fatalities by Type



Source: WSP Analysis of FRA Form 57 data

Figure 2.34 Quantifies fatalities by train type between 2019 and 2023. During the five-year period, fatalities associated with freight trains represented 59 percent of the fatalities, with passenger trains accounting for the other 41 percent. For both freight and passenger rail, the majority of fatalities were trespassers. Over half the SEPTA train fatalities were suicides, while most Amtrak and freight train fatalities were non-suicide trespasser strikes.

Figure 2.34 5-Year Fatalities by Train Type (2019-2023)

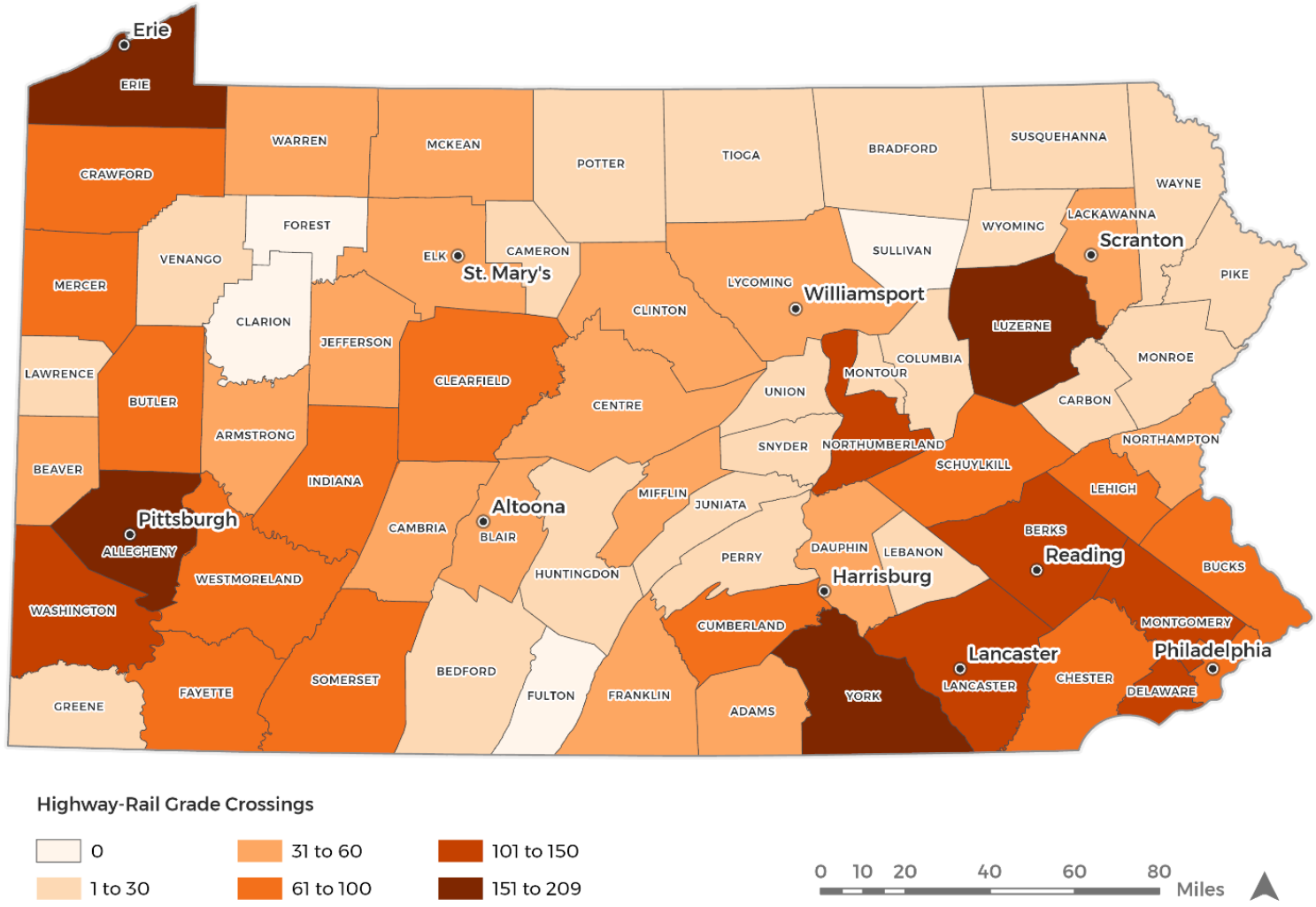


Source: WSP Analysis of FRA data from the following datasets: “Public and Private Highway-Rail Grade Crossing Incidents, Fatalities and Injuries (5.14),” “Trespassers (not at Highway-Rail Crossings), including Suicides (2.07),” and “Suicide Casualties by State/Railroad (4.11)”

GEOGRAPHY OF SAFETY ISSUES

According to the FRA, a total of 3,615 active public highway-rail grade crossings are currently located in Pennsylvania. **Figure 2.35** shows the location of public highway-rail grade crossings. Allegheny County has the greatest number of highway-rail grade crossings (209, or 6 percent of the state total), followed by York County (183, or 5 percent), and Luzerne County (174, or 5 percent).

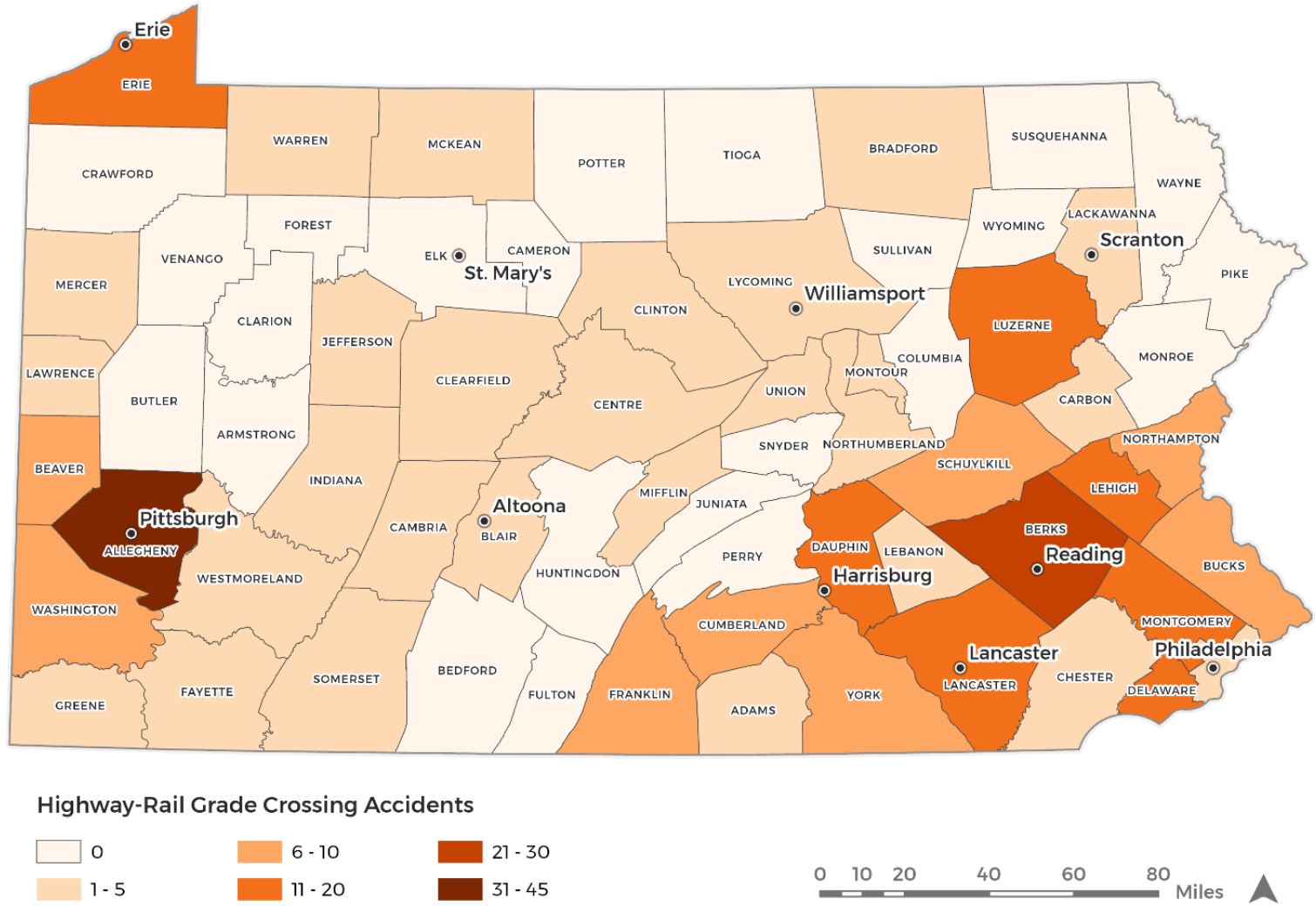
Figure 2.35 Statewide Public Highway-Rail Grade Crossing by County



Source: WSP Analysis, FRA Crossing Inventory Data Form 71

Unsurprisingly, counties with the greatest number of highway-rail grade crossings and greater populations have higher accident rates. **Figure 2.36** shows highway-rail grade crossing accidents between 2023 and 2019. The county with the most frequent highway-rail grade crossing accidents is Allegheny County, with 45 (16 percent of the total), followed by Berks County with 22 (8 percent), and Lancaster County with 17 (6 percent).

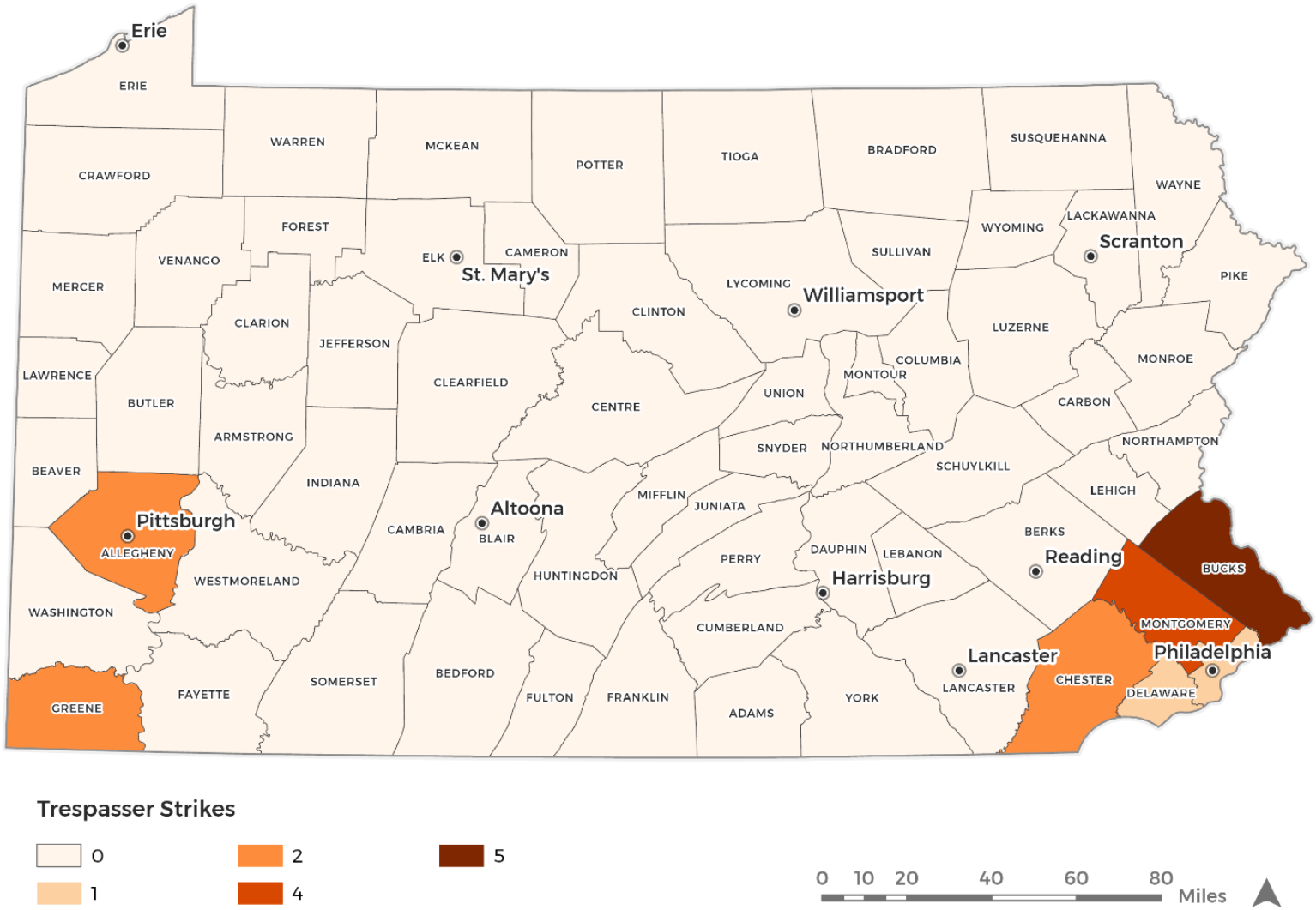
Figure 2.36 Highway-Rail Grade Crossing Accidents by County (2019 – 2023)



Source: WSP Analysis: Federal Railroad Administration, Highway-Rail Grade Crossing Accident Data Form 57

A majority of the trespasser strikes were in the Philadelphia metropolitan area. **Figure 2.37** shows the trespasser strikes by county, Bucks County has the highest number of incidents, with 5 representing 29 percent of all trespasser strikes, followed by Montgomery County (4, or 24 percent), and Allegheny, Chester, and Greene counties (each with 2, or 12 percent).

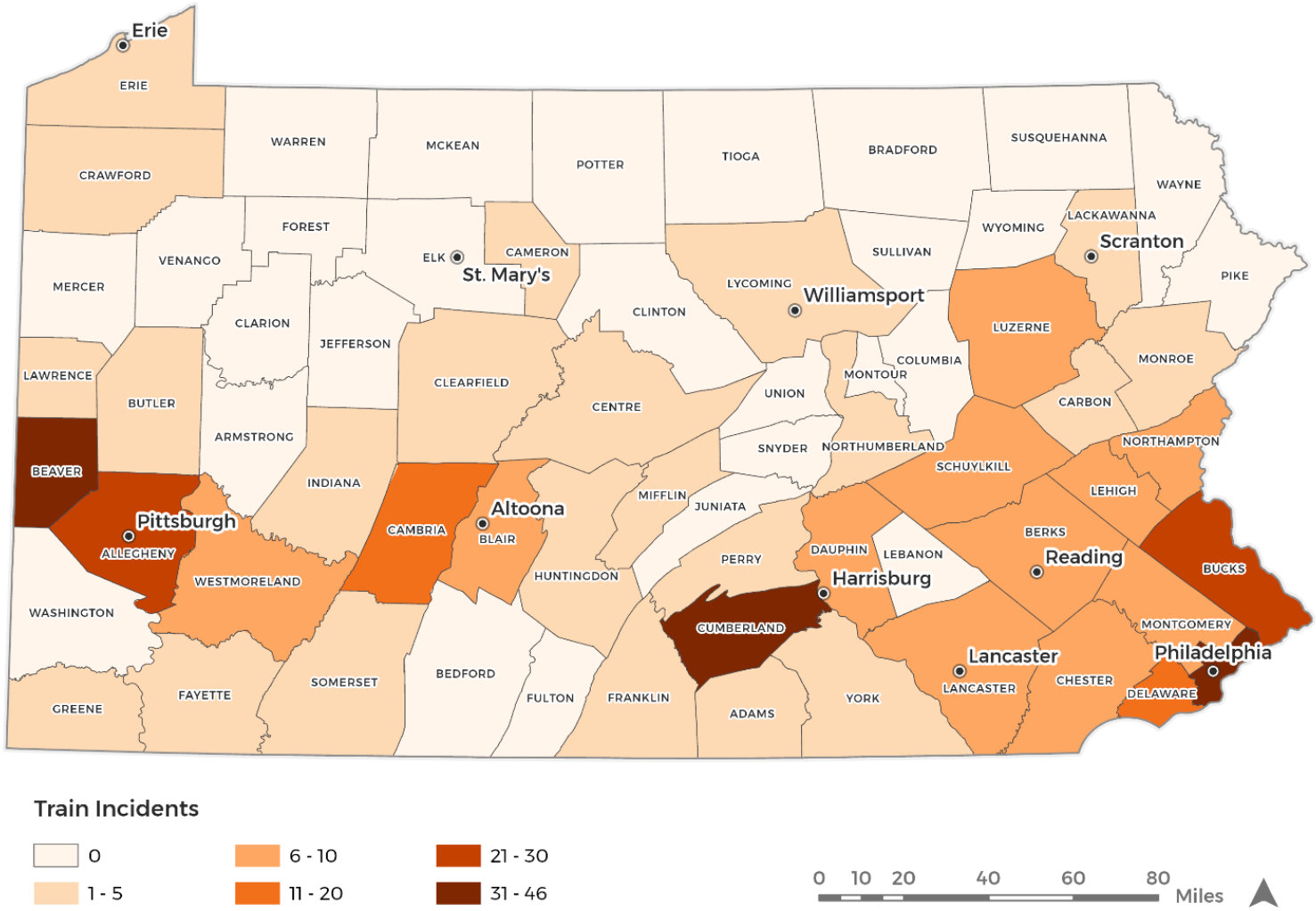
Figure 2.37 Trespasser Strikes by County (2019 – 2023)



Source: WSP Analysis, Federal Railroad Administration, Rail Equipment Accident Data Form 54

Figure 2.38 provides the number of train accidents by county between 2019 and 2023. These figures exclude highway-rail grade crossing incidents. The accidents include collisions, derailments, fires, explosions, and other events involving the operation of railroad on-track equipment (standing or moving) and causing reportable damages. During this time period, there were a total of 348 accidents. The county with the most accidents is Philadelphia with 46 (13 percent of the total), followed by Beaver with 44 (13 percent), and Cumberland with 43 (12 percent).

Figure 2.38 Distribution of Train Accidents by County (2019 – 2023)



Source: WSP Analysis, FRA Train Accident (not at Highway-Rail Crossings) Summary (2.03)

HIGHWAY/RAIL GRADE CROSSING INITIATIVES

Pennsylvania Highway-Rail Grade Crossing State Action Plan

Each state must develop a Highway-Rail Grade Crossing State Action Plan (SAP) as mandated by the Fixing America's Surface Transportation Act of 2015. The SAP details the state's actions to reduce accidents at highway-rail grade crossings. PennDOT completed its SAP in February 2022, outlining goals, objectives, and strategies that PennDOT will pursue to improve safety at highway-rail grade crossings. The SAP was led by PennDOT's Central Office Grade Crossing Unit (CO GCU), which acts as a liaison between the department's 11 engineering districts.

The CO GCU manages PennDOT's administration of the FHWA Railway-Highway Crossings (Section 130) Program. The CO GCU works with District Grade Crossing Engineers/Administrators to identify projects to establish a multi-year program. Projects are typically selected based on crossings within the top 25 percent highest hazard rating utilizing the PennDOT's Grade Crossing Safety Project Selection Tool, which uses information from the FRA Web Accident Prediction System while incorporating other data; corridor projects; or crossings with safety concerns raised by various stakeholders. The Railway-Highway Crossing Program is funded at approximately $7 million annually, which between 2019 and 2022 provided funding for more than 80 projects.

The SAP included a series of strategies to improve safety in Pennsylvania over the next five years. They fall into several categories:

1) Crossing closure/grade separation actions
   - Attempt to close two redundant crossings per year
   - Identify grade crossing that could potentially be grade separated
2) Enforcement
   - Work with State Police to increase enforcement campaigns
3) Public education/stakeholder coordination
   - Partner with Operation Lifesaver to raise public awareness of safety issues
4) Technology
   - Investigate new technology to monitor/study motorist actions
5) Funding
   - Monitor federal funding and submit grant applications for priority projects
6) Management
   - Obligate all Section 130 allocations to projects within 18 months of notification of spending authority
   - Monitor and assess the effectiveness of Section 130 implementation
7) Passive protection improvements like signs and pavement markings
   - Install crossbucks at passive crossings that lack crossbucks
   - Ensure that crossings are posted with PennDOT number and emergency notification phone number
8) Crossing prioritization/data tools
   - Monitor crashes and update Grade Crossing Safety Project Selection Tool
9) Update list of the top 50 high priority crossings in year 5 and 10

PENNSYLVANIA PUBLIC UTILITIES COMMISSION

The Pennsylvania PUC is responsible for regulating the 65 railroad companies operating in Pennsylvania. This includes tracks and public highway-rail grade crossings, as well as crossings that are not at grade (rail overpasses and underpasses). The PUC has a Rail Safety Division that carries out two separate functions. The engineering Section manages applications and proceedings related to the elimination, modification, construction, relocation, and suspension of public highway-railroad crossings to prevent accidents and enhance public safety. The Inspection Section addresses complaints and conducts safety inspections at railroad company facilities to ensure compliance with the PUC and FRA regulations concerning tracks, motive power and equipment, hazardous materials, operating practices, and grade crossings.

THE PENNSYLVANIA EMERGENCY MANAGEMENT AGENCY/EMERGENCY RESPONSE

The Pennsylvania Emergency Management Agency (PEMA) assists communities and individuals in mitigating against, preparing for, responding to, and recovering from emergencies. These include natural disasters, acts of terrorism, and human-made events. The agency coordinates between federal and state partners, volunteer organizations involved in disasters, private sector business communities, and the general public. If a significant event involving the release of hazardous materials from railcars were to occur, PEMA would coordinate the response.

PEMA has developed a hazard mitigation plan to help counties prepare for hazardous events within their community. The plan helps streamline county hazard mitigation plans, which are every five years per FEMA.

PEMA also administers federal and state grants that can be used for emergency preparedness and recovery from disasters. Grants available to local communities include the following:

- Building Resilient Infrastructure and Communities Grants
- Emergency Management Performance Grants
- Grants for Damages Due to Federally Declared Disasters
- Hazard Mitigation Grants
- Hazardous Materials Emergency Preparedness Planning and Training Grants
- Hazardous Materials Response Fund Grant
- Homeland Security Grants
- Nonprofit Security Grants

Rail's Economic and Environmental Impacts

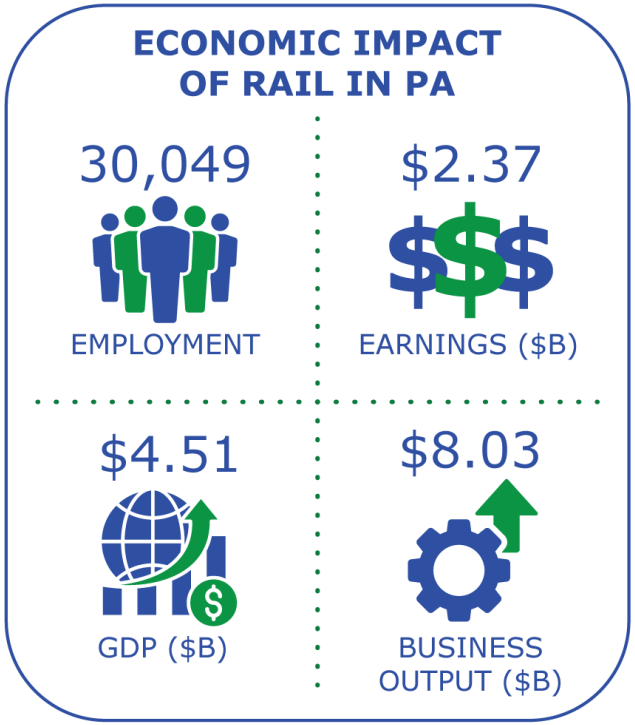
Passenger and freight rail enable the efficient movement of people and goods for Pennsylvania, providing access to jobs and educational opportunities and supporting key industries, including energy, manufacturing, and agriculture.

In 2021, the freight railroad industry directly employed more than 4,500 Pennsylvania residents, paying more than $547 million in annual income to those employees.[25] Approximately 28,600 railroad retirees also reside in Pennsylvania, receiving $745 million in annual pension benefits that are spent in local communities.

Amtrak has major regional offices in Philadelphia and as of 2023 employed nearly 3,300 people within the Commonwealth with wage earnings totaling $333 million.[26] In addition, Amtrak procured goods and services worth $432 million across Pennsylvania, supporting job growth in local communities. More than 5.6 million passengers boarded Amtrak trains in Pennsylvania, relying on the service for trips within the Commonwealth and beyond. SEPTA provides a critical service for more localized trips in southeastern Pennsylvania, with almost 18 million Regional Rail trips in 2023. Across all its divisions, SEPTA employs approximately 9,500 people.[27]

In addition to the direct economic impacts, the railroad industry also stimulates indirect economic impacts. Freight railroads, Amtrak, and SEPTA all purchase goods and services from businesses across Pennsylvania, leading to what are known as "indirect" effects. Similarly, employees, suppliers, and railroad retirement beneficiaries spend their earnings on household goods and services to further propel a flow of money though the economy, thereby creating an "induced" effect. The Bureau of Economic Analysis Regional Input-Output Modeling System produces "multipliers" that were used to estimate these indirect and induced effects of the railroad industry on employment, income, value added or Gross Domestic Product (GDP), and gross output or sales.

Figure 2.39 Economic Impact of Rail in PA



Source: WSP analysis

Table 2.10 summarizes the economic impacts of Pennsylvania's rail industry. Across direct, indirect, and induced effects, the industry supports more than 30,000 jobs, nearly $2.4 billion in earnings, more than $4.5 billion in GDP, and over $8.0 billion in total business output annually in 2022 dollars.[28]

[25] Association of American Railroads, Pennsylvania, Freight Rail 2021 Data.
[26] Amtrak Fact Sheet, Fiscal Year 2023, State of Pennsylvania.
[27] SEPTA: Leadership - Southeastern Pennsylvania Transportation Authority
[28] These totals exclude any impacts from SEPTA as the rail-specific impacts could not be isolated.

Table 2.10 Economic Impact Analysis of Pennsylvania Rail Industry (Dollar Figures in $2022)

ECONOMIC INDICATOR	DIRECT	INDIRECT	INDUCED	TOTAL
Freight Rail				
Employment	4,528	4,313	5,234	14,075
Earnings ($M)	$547.1	$403.6	$351.7	$1,302.4
GDP ($M)	$1,180.2	$602.1	$508.3	$2,290.6
Business Output ($M)	$2,133.0	$1,088.2	$872.8	$4,094.0
Intercity Passenger Rail (Amtrak)				
Employment	3,297	3,140	3,811	10,248
Earnings ($M)	$332.9	$245.6	$214.0	$792.5
GDP ($M)	$859.3	$438.4	$370.1	$1,667.9
Business Output ($M)	$1,553.1	$792.4	$635.5	$2,981.0
Railroad Retiree Spending				
Employment	N/A	N/A	5,726	5,726
Earnings ($M)	N/A	N/A	$275.7	$275.7
GDP ($M)	N/A	N/A	$556.1	$556.1
Business Output ($M)	N/A	N/A	$955.1	$955.1
Total Rail Impacts				
Employment	7,825	7,453	14,771	30,049
Earnings ($M)	$880.0	$649.2	$841.3	$2,370.6
GDP ($M)	$2,039.5	$1,040.6	$1,434.5	$4,514.5
Business Output ($M)	$3,686.1	$1,880.6	$2,463.4	$8,030.1

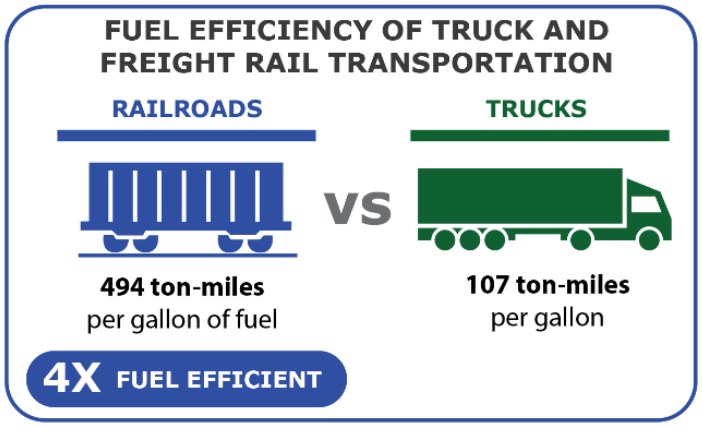
Source: WSP Analysis of the Economic Impact of Rail Employment using Bureau of Economic Analysis Regional Input-Output Modeling System.

Beyond the direct contribution to Pennsylvania's economy as an employer and purchaser of goods and services, rail also contributes to Pennsylvania's economy by helping to efficiently and safely move people and goods, reducing roadway damage, congestion, vehicle crashes, fuel use, and greenhouse gas emissions.

In 2023, Amtrak passengers originating or terminating their journey in Pennsylvania traveled approximately 655 million miles by rail, while SEPTA commuter rail passengers traveled more than 260 million rail miles. If these passengers instead drove in personal vehicles, this would use the equivalent of nearly 13.7 million gallons of additional fuel annually and release more than 121,000 metric tons of carbon dioxide (CO_2) compared to rail travel.[29] These additional CO_2 emissions are equivalent to economic damages of more than $29 million annually.[30] Moreover, if the roadway network was required to carry all Amtrak and SEPTA passenger trips, it would exacerbate congestion, resulting in economic costs of more than $72 million.[31] This would possibly lead to additional car crashes at an estimated cost of $25 million.[32]

Pennsylvania's freight railroads moved approximately 169 million tons of cargo in 2022.[33] Moving this quantity by truck would require 7.1 billion additional truck miles.[34] Transporting freight by rail is more than four times as fuel efficient as by truck, with Class I railroads carrying an average 494 ton-miles per gallon of fuel compared to 107 ton-miles per gallon for trucks annually.[35] This means that if trucks moved all cargo carried by rail in 2022 across the average rail-trip distance of 790 miles, more than 975 million additional gallons of fuel would be consumed. This difference in fuel usage produces approximately 9.9 million additional metric tons of CO_2 emissions, an amount equivalent to nearly $2.4 billion in a year.[36] Adding the incremental truck mileage to roadways would also lead to additional congestion and roadway crashes, annually costing more than $1.7 billion and $156 million, respectively.[37]

Figure 2.40 Rail Fuel Efficiency



[29] Fuel consumption for intercity rail were based on Keystone Service' BTU intensity as published in Oak Ridge National Labaratory's Transportation Energy Fact Book (Table 7.2), as well as SEPTA's commuter rail service. Because these services are electrified, this represents the energy intensity of electrified rail service used in Pennsylvania. The BTU per passenger mile expended by these systems was interpolated into gallons of gas equivalent per passenger mile (GGEPPM) using national averages from the Alternative Fuels Data Center's Average Per-Passenger Fuel Economy by Travel Mode. The national average for cars of 43.14 GGEPPM was used to estimate avoided personal vehicle emissions. CO_2 is calculated based on 8,887 grams of CO_2 per gallon of gasoline factor recommended by the Environmental Protection Agency's Greenhouse Gas Equivalency Calculator. The GGEPPM values are based on national analysis; Pennsylvania's rail system is largely electrified, resulting in even greater fuel efficiency than shown here.

[30] Economic damages are calculated using the value of $241 per metric ton of CO_2 emissions, per the USDOT Benefit Cost-Analysis Guidance for Discretionary Grant Programs, November 2024, based on the EPA Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances (November 2023), which defines the Social Cost of Greenhouse Gases as "a comprehensive metric that includes the value of all future climate change impacts (both negative and positive), including changes in net agricultural productivity, human health effects, property damage from increased flood risk, changes in the frequency and severity of natural disasters, disruption of energy systems, risk of conflict, environmental migration, and the value of ecosystem services."

[31] Congestion costs are calculated using the value of $0.120 per mile and an assumption of 1.52 passengers per automobile, per the USDOT Benefit Cost-Analysis Guidance for Discretionary Grant Programs, November 2024.

[32] Safety costs are calculated using the value of $0.042 per mile and an assumption of 1.52 passengers per automobile, per the USDOT Benefit Cost-Analysis Guidance for Discretionary Grant Programs, November 2024.

[33] Surface Transportation Board Carload Waybill Sample Data, 2022.

[34] Based on average truckload for trips greater than 500 miles of 18.8 tons from Quick Response Freight Manual II, FHWA Publication Number: FHWA-HOP-08_010 (EDL 14396), and average distance of freight-rail moves touching Pennsylvania of 790 miles, from Surface Transportation Board Carload Waybill Sample Data, 2022.

[35] Rail fuel efficiency from Table 4.17: Class I Rail Freight Fuel Consumption and Travel, Bureau of Transportation Statistics, 2022. Truck fuel efficiency calculated based on Class 8 Truck fuel efficiency calculated based on fuel economy of 5.7 miles per gallon from US DOE, Alternative Fuels Data Center and truckload of 18.8 tons, per Footnote 34.

[36] CO_2 is calculated based on 10,180 grams of CO_2 per gallon of diesel factor recommended by the Environmental Protection Agency's Greenhouse Gas Equivalency Calculator. The associated value is as described in Footnote 30.

[37] Congestion costs are calculated using the value of $0.245 per mile for trucks, while roadway crash costs are calculated using the value of $0.022 per mile for trucks, both from the USDOT Benefit Cost-Analysis Guidance for Discretionary Grant Programs, November 2024.

2.2 TRENDS AND FORECASTS

Demographic and Economic Trends

This section highlights the Commonwealth's population, income, employment, and GDP trends, and their impacts on rail transportation. The demographic and economic trends discussed below will impact the future of passenger and freight rail in Pennsylvania.

POPULATION

As of 2023, Pennsylvania is the fifth most populous state in the country, with nearly 13 million residents.[38] Philadelphia County is the largest of Pennsylvania's 67 counties, with over 11 percent of the state's population. Over the past decade the population of Pennsylvania grew at less than the national average. From 2013 to 2023, the U.S. population grew at an annualized rate of 0.58 percent, compared to 0.14 percent in Pennsylvania, as shown in **Table 2.11**.

Table 2.11 Population Estimates and Change, 2013-2023

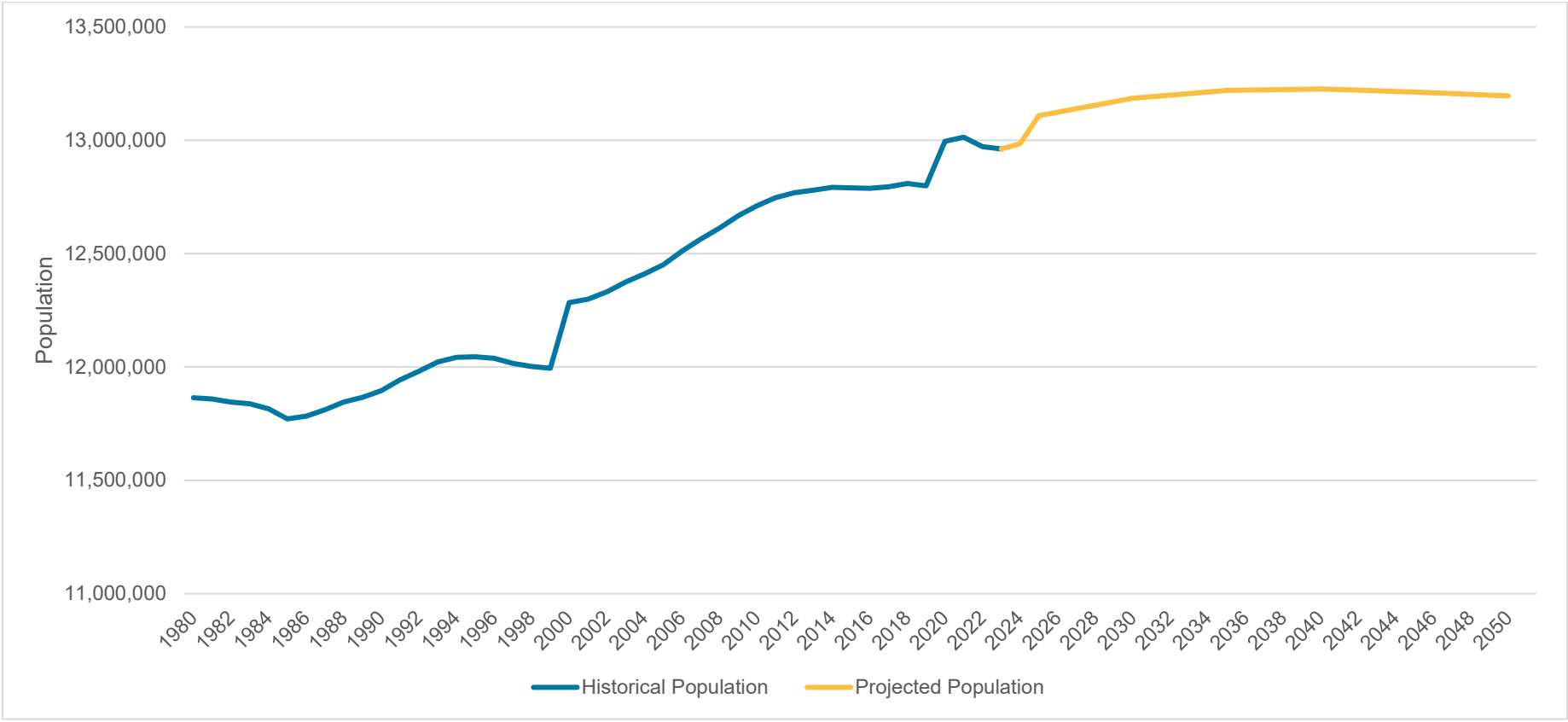
GEOGRAPHIC AREA	2013 POPULATION	2023 POPULATION	2013-2023 CHANGE	2013-2023 ABSOLUTE GROWTH RATE	2013-2023 CUMULATIVE ANNUAL GROWTH RATE
United States	316,059,947	334,914,895	18,854,948	5.97%	0.58%
Pennsylvania	12,779,538	12,961,683	182,145	1.43%	0.14%

Source: U.S. Census Bureau (2023)

[38] U.S. Census Bureau

Figure 2.41 illustrates the historic and projected population of Pennsylvania from 1980 to 2050. Pennsylvania's population is projected to grow at an approximate annual growth rate of 0.09 percent until reaching a peak of approximately 13.2 million people in 2040, after which the state's population is expected to decline slowly.

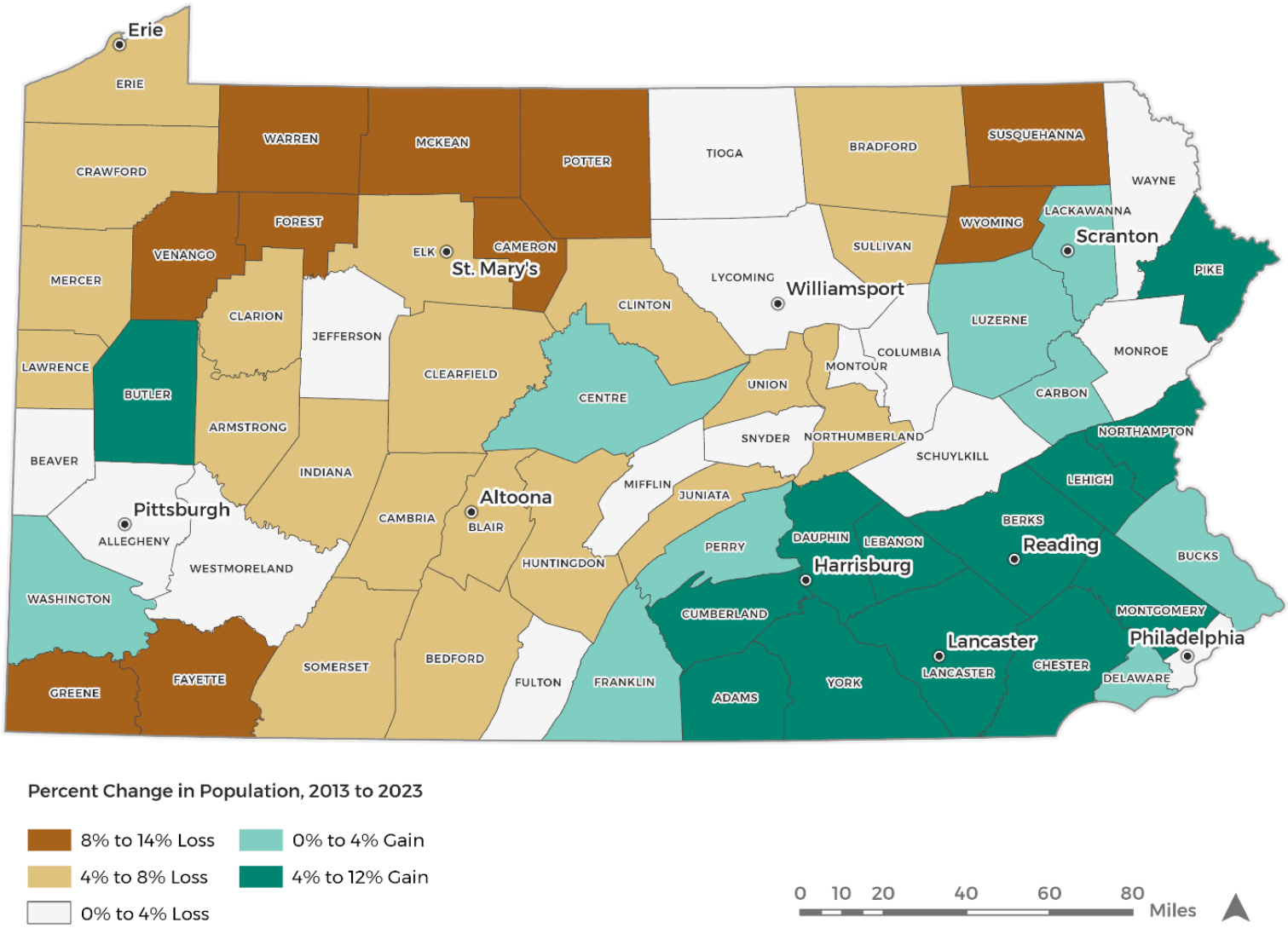
Figure 2.41 Pennsylvania Historical and Projected Population, 1980-2050



Source: U.S. Census Bureau and Pennsylvania State Data Center for the Center of Rural Pennsylvania, September 2023

As shown in **Figure 2.42**, much of Pennsylvania's population growth between 2013 and 2023 has been in its southeastern and central regions, which offsets population decline in other parts of the Commonwealth.

Figure 2.42 Population Change by County, 2013-2023

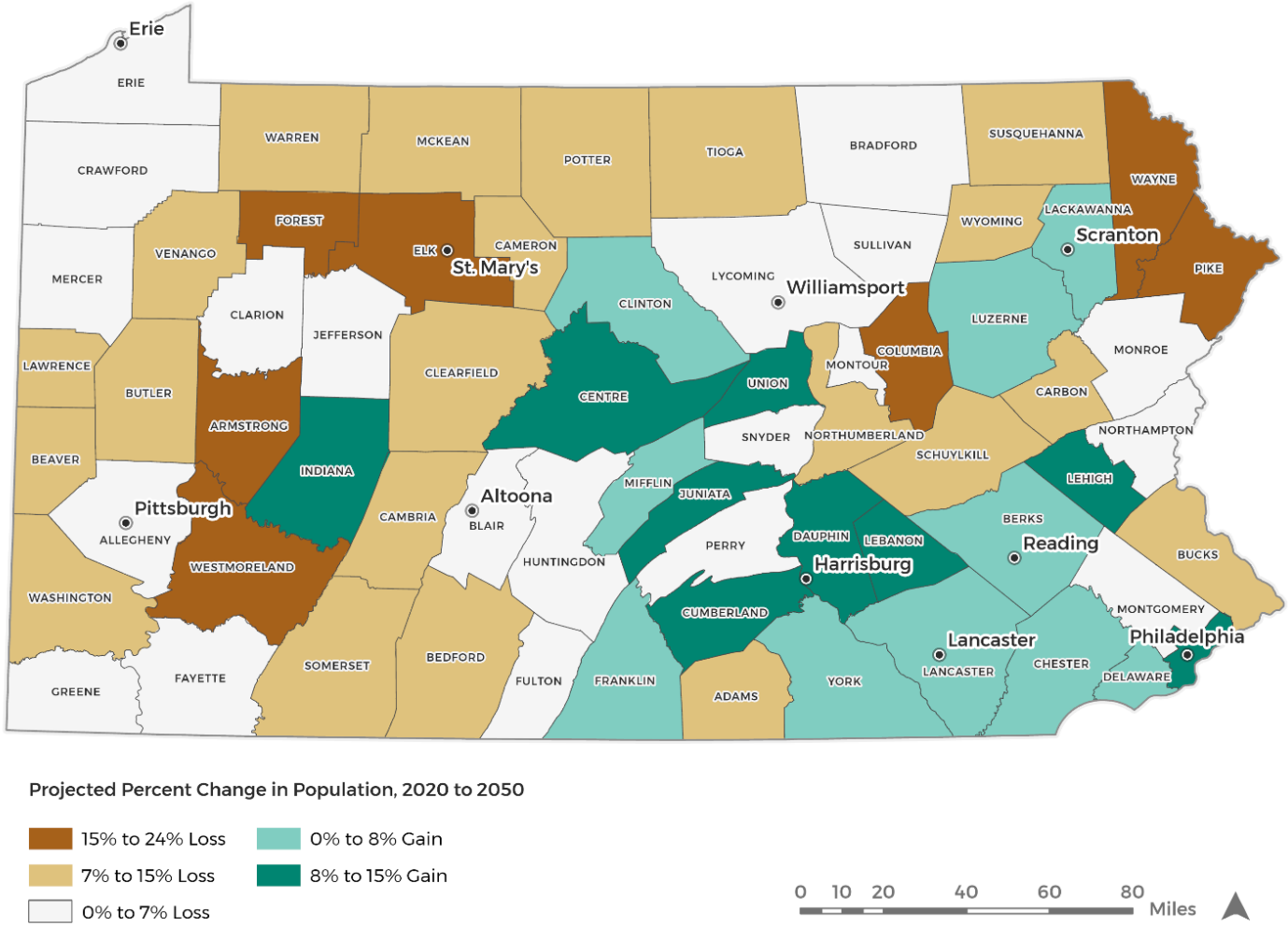


Source: WSP Analysis, Pennsylvania State Data Center for the Center of Rural Pennsylvania, September 2023

Figure 2.43 shows the projected population growth rates in Pennsylvania from 2020 to 2050. While the overall population growth of the Commonwealth is projected to be fairly stable, growth varies by county. In general, Pennsylvania's rural counties are projected to lose population, while its urban counties are projected to gain population.

From 2020 to 2050, the population of Pennsylvania's rural counties is forecast to decline by 5.8 percent, compared to a 4.1 percent population increase for urban counties. This can be explained in large part by the greater share of older populations in rural counties.

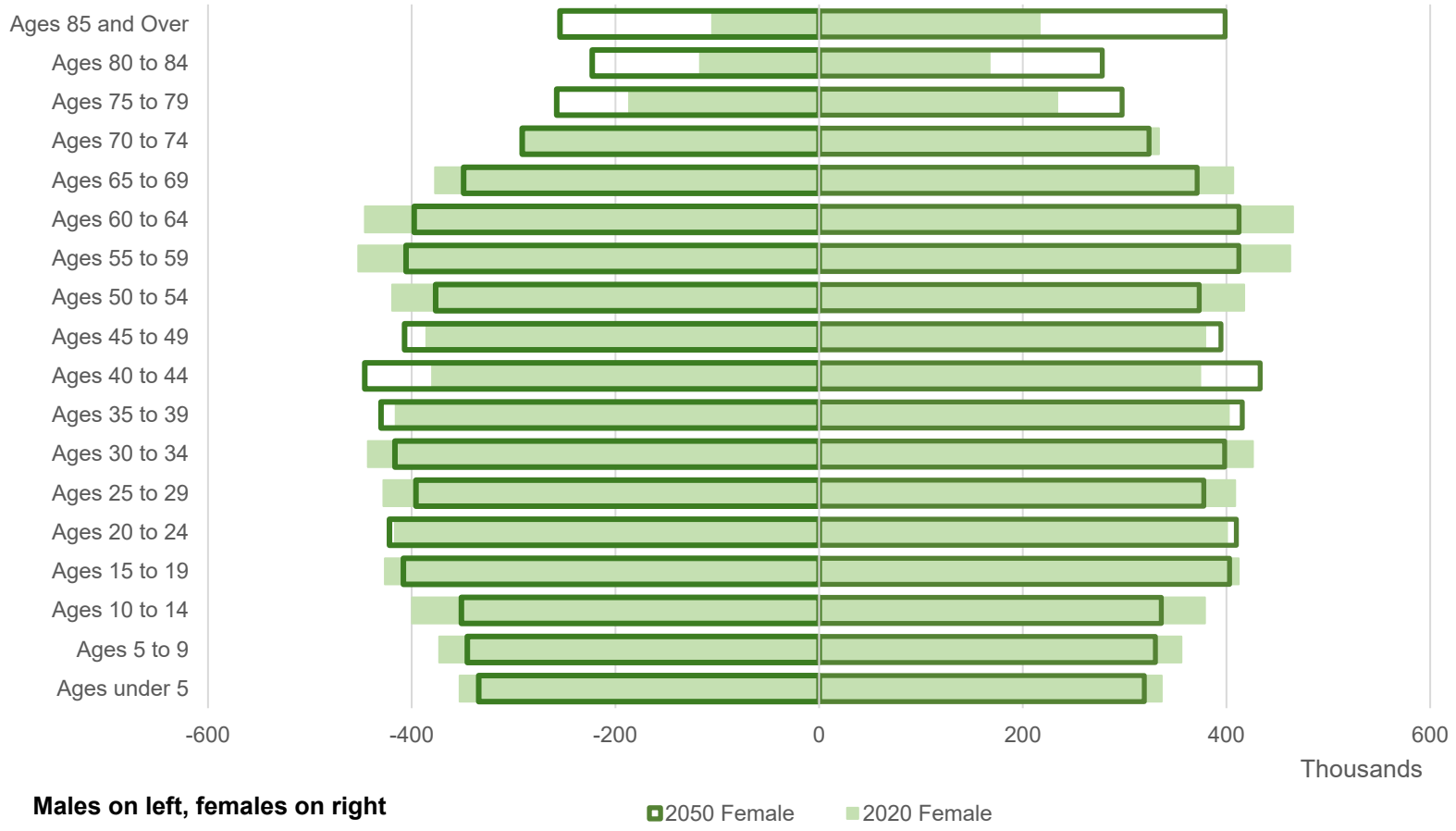
Figure 2.43 Projected Population Change by County 2020-2050



Source: WSP Analysis, Pennsylvania State Data Center for the Center of Rural Pennsylvania, September 2023

Pennsylvania's aging population explains not just the divergence in population growth across counties, but also its comparatively low population growth rate overall. According to the 2019-2022 American Community Survey, 7.05 percent of Pennsylvania's population falls within the ages of 60 to 64, the largest 5-year age bracket. **Figure 2.44** below highlights the state's age-sex distribution in 2020 and its projected distribution in 2050. The results suggest that seniors (ages 65 and above) will be a larger portion of the population in the future. As the state's population becomes older, it is necessary for Pennsylvanians to have transportation alternatives to driving, which could increase the importance of passenger rail.

Figure 2.44 Pennsylvania Age-Sex Pyramid - 2020, 2050

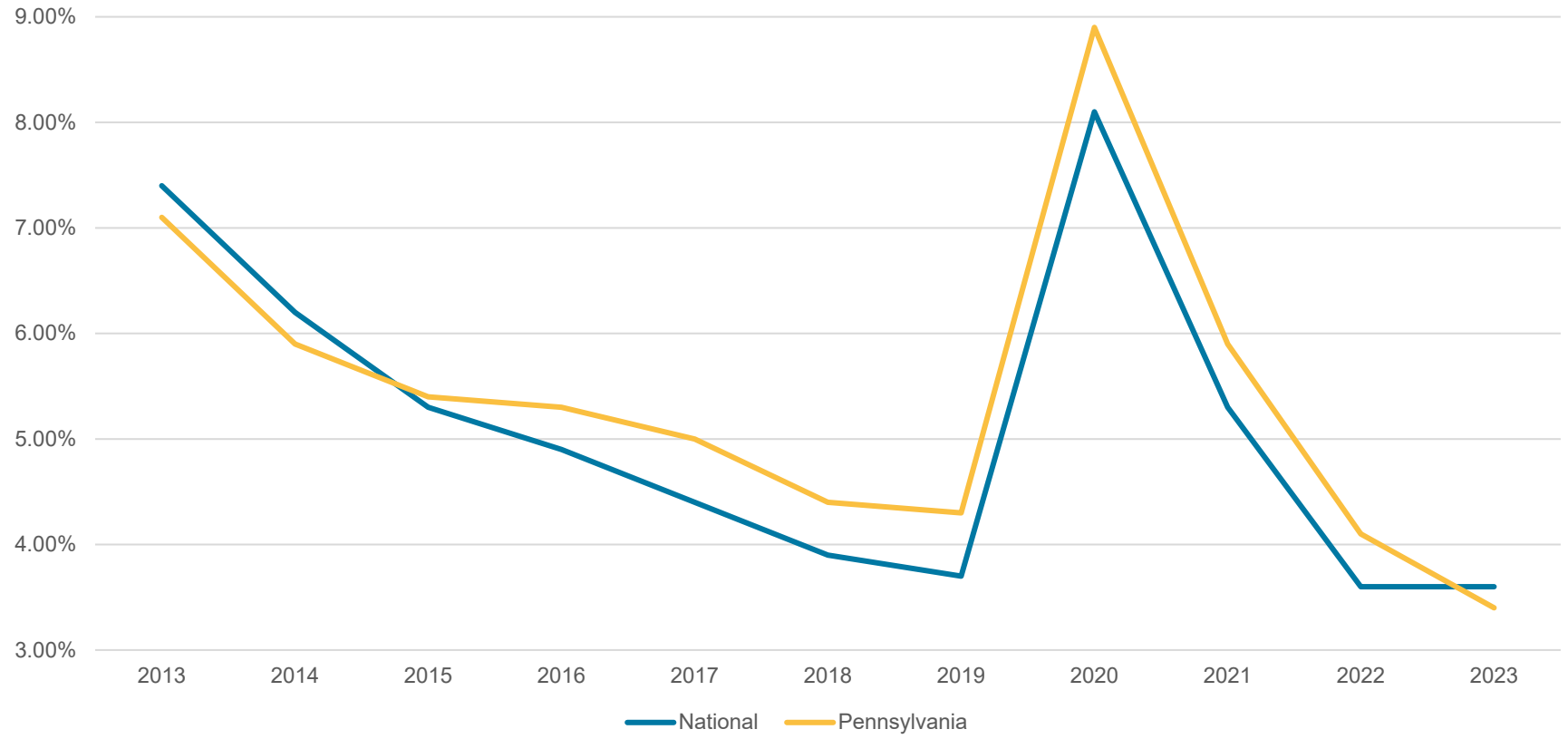


Source: Pennsylvania Commonwealth Data Center

EMPLOYMENT

The 2020 COVID-19 pandemic resulted in the highest average annual unemployment rate the state has seen since 1984, at 8.9 percent. Since then, unemployment rates have decreased significantly. In 2023, Pennsylvania's unemployment rate reached its lowest recorded level at 3.4 percent, comparable to the national unemployment rate of 3.6 percent. The approximately 222,691 unemployed individuals in the state account for 3.7 percent of the overall level of unemployment in the country.[39] **Figure 2.45** shows the Pennsylvania and national unemployment rates from 2013 to 2023.

Figure 2.45 Unemployment Rate in Pennsylvania and the United States, 2013-2023

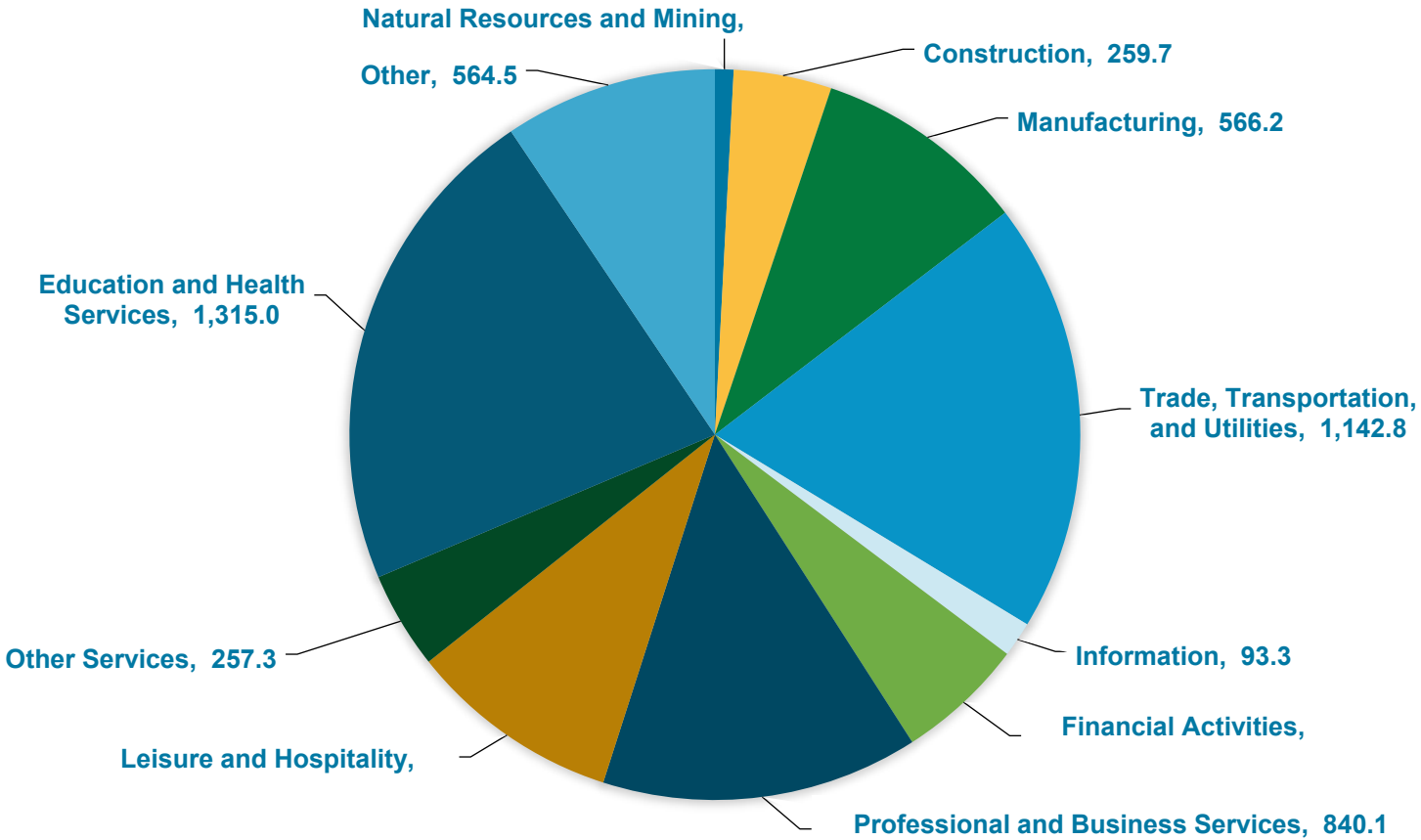


Source: U.S. Bureau of Labor Statistics

[39] US Bureau of Labor Statistics

As illustrated in **Figure 2.46**, Education and Health Services, Trade, Transportation, and Utilities, and Professional and Business Services industries are dominant employers in the Commonwealth.

Figure 2.46 Employment by Major Activity Sectors, Thousands, 2023

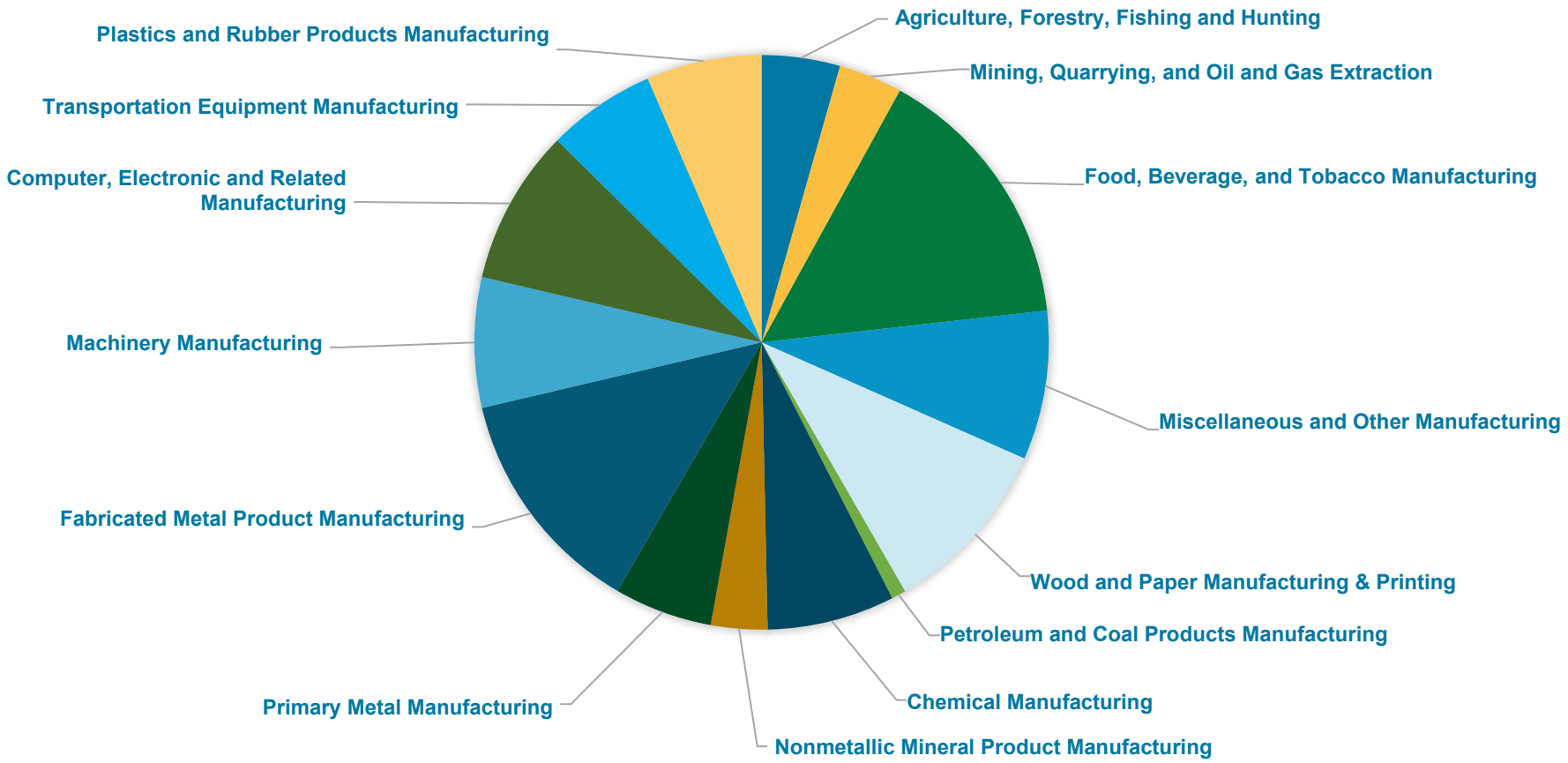


Source: U.S. Bureau of Labor Statistics

Large freight-dependent economic sectors in Pennsylvania include Food and Beverage Manufacturing, Fabricated Metal Product Manufacturing, and Wood and Paper Manufacturing and Printing

Figure 2.47 below provides a deeper look at the distribution across freight-dependent sectors.

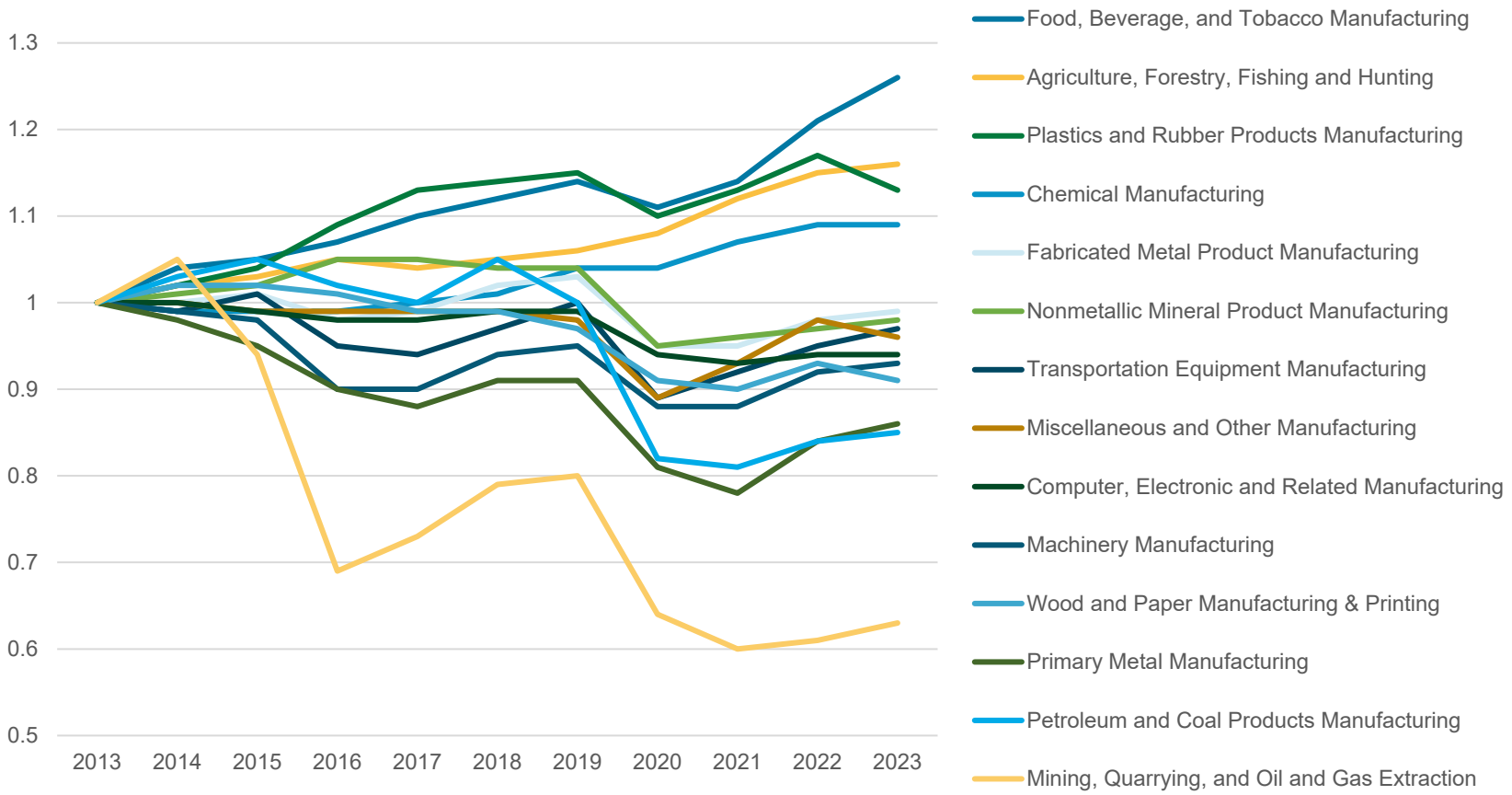
Figure 2.47 Employment by Major Freight-Dependent Industries, 2023



Source: U.S. Bureau of Labor Statistics

The COVID-19 pandemic resulted in a momentary decrease in employment across virtually all industries. Most industries have since regained employment momentum, in some cases surpassing pre-pandemic levels. However, employment in key freight-dependent industries, most notably Mining, Quarrying, and Oil and Gas Extraction, Primary Metals Manufacturing, and Petroleum and Coal Product Manufacturing have experienced significant declines since 2013, despite some modest gains since 2021. These trends could relate to the decline of coal mining, to some extent counterbalanced with growth in natural gas development. These industries had generally been declining before the COVID-19 pandemic, but COVID-19 further impacted them. Some of the employment decline may be due to productivity gains, where an industry produces more with fewer employees. **Figure 2.48** shows the relative change in employment for various freight-dependent industries since 2013, with 2013 levels indexed to 1.0.

Figure 2.48 Employment Index by Major Freight-dependent Industries, 2013-2023



Source: U.S. Bureau of Labor Statistics

Many of Pennsylvania's freight-dependent industries have a greater concentration of employment in the Commonwealth relative to the nation, as measured by their location quotient. Location quotient is calculated as each industry's share of Pennsylvania employment divided by its share of national employment. Values above 1 indicate that an industry is more concentrated in Pennsylvania relative to the nation. Pennsylvania's employment location quotient across major freight-dependent industries in 2013 and 2023 are summarized in **Table 2.12**.

Some of the freight-dependent industries that have an outsized presence in Pennsylvania include Primary Metal Manufacturing, Fabricated Metal Product Manufacturing, Plastics and Rubber Product Manufacturing, and the Wood and Paper Manufacturing and Printing. Pennsylvania's Primary Metal Manufacturing industry has remained a significant employer in the Commonwealth over the past decade.

Table 2.12 Pennsylvania Employment Location Quotient 2013 and 2023

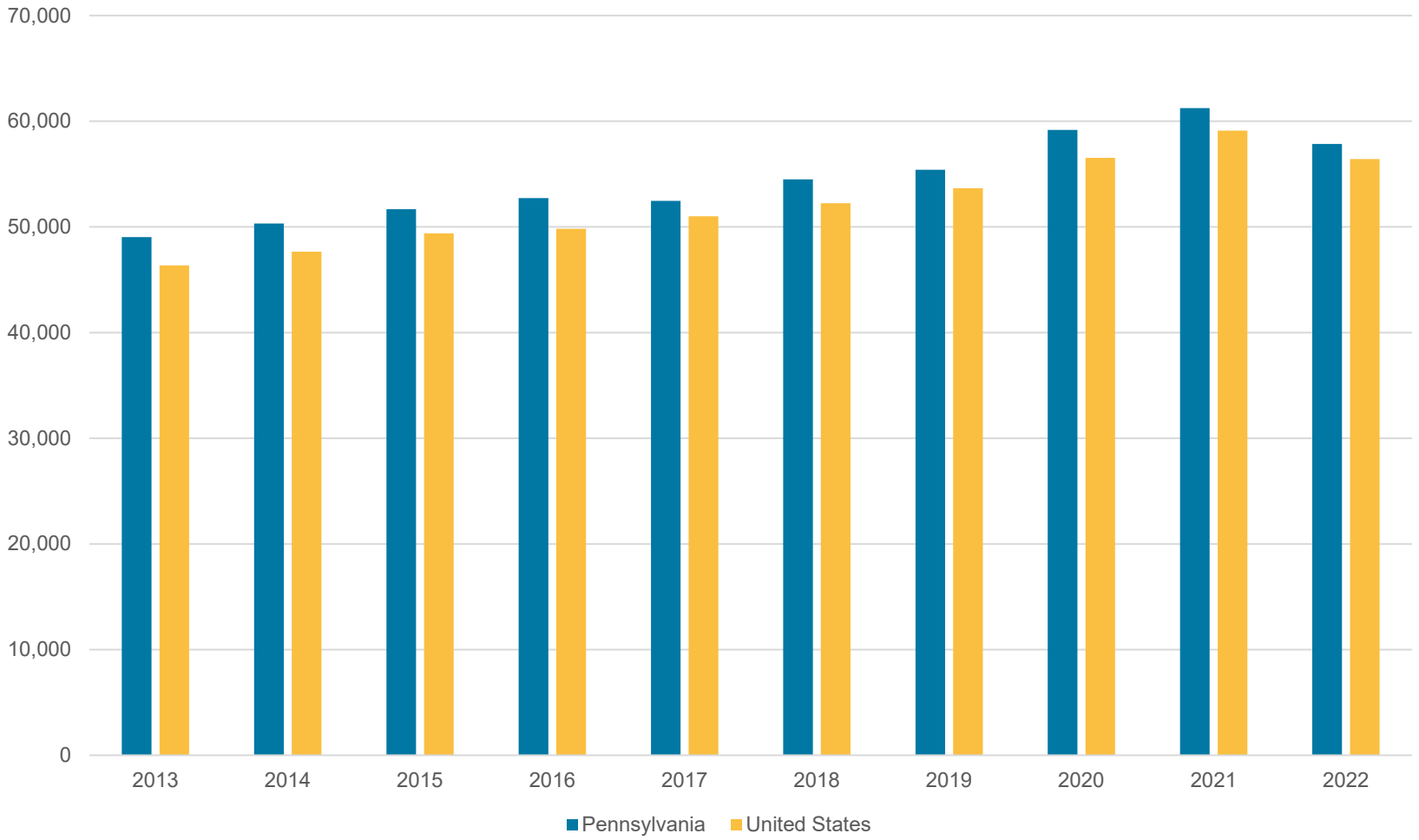
INDUSTRY	2013 LOCATION QUOTIENT	2023 LOCATION QUOTIENT
Agriculture, Forestry, Fishing, and Hunting	0.46	0.56
Mining, Quarrying, Oil and Gas Extraction	1.37	1.21
Food, Beverage and Tobacco Manufacturing	1.07	1.16
Miscellaneous and Other Manufacturing	0.97	1.03
Wood and Paper Manufacturing and Printing	1.42	1.39
Chemical Manufacturing	1.22	1.27
Nonmetallic Mineral Product Manufacturing	1.29	1.20
Petroleum and Coal Product Manufacturing	1.25	1.18
Plastics and Rubber Products Manufacturing	1.28	1.40
Primary Metal Manufacturing	2.39	2.34
Fabricated Metal Product Manufacturing	1.36	1.42
Machinery Manufacturing	1.05	1.03
Computer, Electronic Products, Electrical Equipment, Appliances, and Component Manufacturing	0.96	0.92
Transportation Equipment Manufacturing	0.61	0.55

Source: U.S. Bureau of Labor Statistics

INCOME

Echoing national trends, Pennsylvania experienced a greater than 10 percent increase in per capita income between 2019 and 2021, as demand for labor pushed up wages and the federal government distributed stimulus checks. However, as inflation increased, income declined in real terms between 2021 and 2022 (the last year of available data). As **Figure 2.49** shows, Pennsylvania's real per capita income has been consistently 2.5 to 6 percent higher than the national average.

Figure 2.49 Pennsylvania and National Per Capita Income, Real 2017 Dollars, 2013-2022



Source: U.S. Bureau of Economic Analysis

There is wide variation in average income levels across Pennsylvania, with the highest income county (Chester County) having a per-capita income three times higher than the lowest income county (Forest County) in 2023, as shown in **Table 2.13**.

Table 2.13 Top and Bottom Pennsylvania Counties by Income (2023)

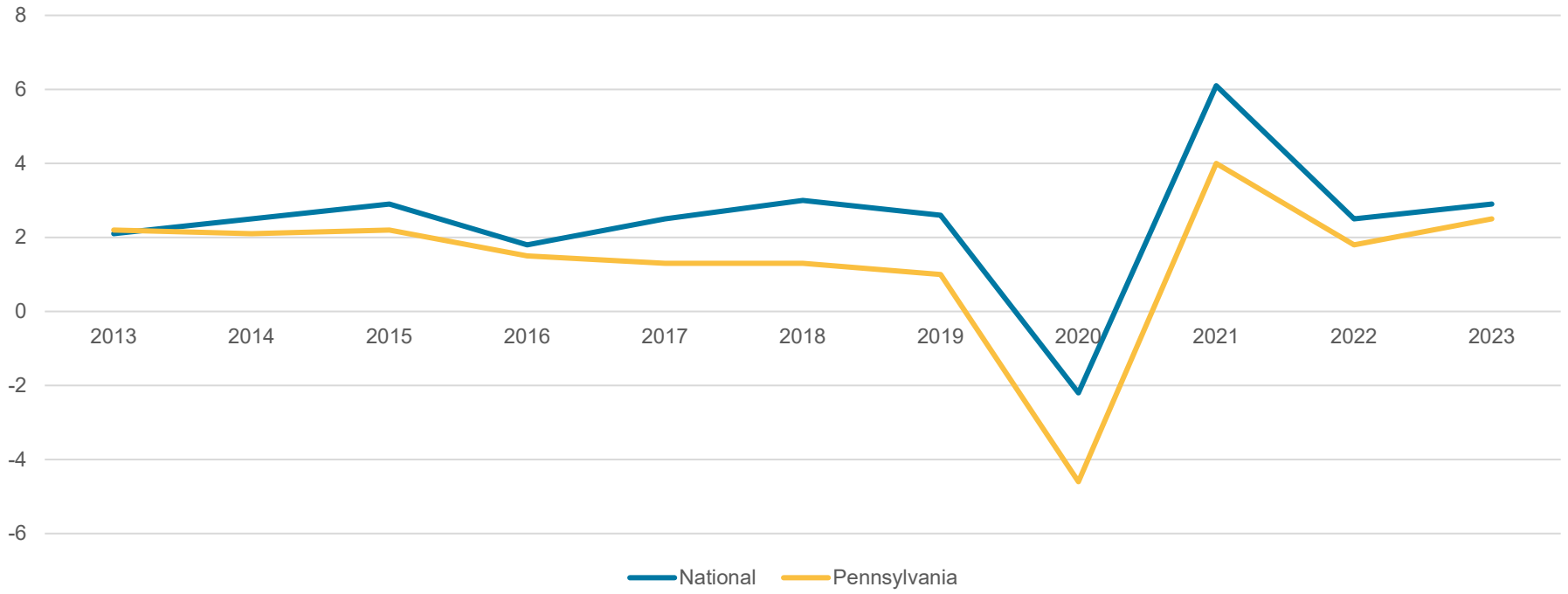
COUNTY	2023 PER CAPITA INCOME
Chester, PA	$108,215
Montgomery, PA	$101,172
Bucks, PA	$92,846
Delaware, PA	$83,368
Allegheny, PA	$75,468
Indiana, PA	$48,336
Potter, PA	$48,180
Tioga, PA	$47,580
Huntingdon, PA	$46,957
Forest, PA	$30,606

Source: U.S. Bureau of Economic Analysis

GROSS DOMESTIC PRODUCT (GDP)

Pennsylvania has the sixth largest economy in the country, with a real GDP of $799 billion dollars (in 2017 dollars). However, Pennsylvania's GDP growth was lower between 2013 and 2023 than the national average, most significantly during the COVID-19 pandemic, and has had a slower recovery in the years since. **Figure 2.50** demonstrates that in every year since 2014, Pennsylvania's GDP growth has lagged behind the nation. From 2013 to 2023, Pennsylvania's real GDP grew 13.5 percent, compared to 27.3 percent nationally.

Figure 2.50 Annual Change in Real GDP, 2013-2023



Source: U.S. Bureau of Economic Analysis

Pennsylvania lagged behind the nationwide GDP growth of most industries from 2013 to 2023 as well, as shown in **Table 2.14**. One notable exception was the Mining, Quarrying, and Oil and Gas Extraction industry, which experienced GDP growth of 69.6 percent in Pennsylvania compared to 39.1 percent nationwide. This was especially pronounced in the Oil and Gas Extraction sector, which experienced 231.4 percent growth over the decade, more than double the national rate of 83.3 percent. This is likely related to the increase in hydraulic fracturing of the Marcellus Shale, beginning in 2004.

The Mining, Quarrying, and Oil and Gas Extraction industry is also one of the industries with a stronger economic concentration in Pennsylvania than the country.

Table 2.14 also shows the concentrations of each industry in Pennsylvania compared to the United States as a whole, as measured by the GDP-based location quotient. Similar to the employment-based location quotient, the GDP-based location quotient is calculated as each industry's share of Pennsylvania GDP divided by its share of national GDP. A location quotient above one indicates that the industry is more prevalent in Pennsylvania compared to the country.

Manufacturing is another freight-dependent industry that is more heavily concentrated in Pennsylvania, though the industry is growing less quickly in Pennsylvania than it is nationally. Primary Metal Manufacturing, Chemical Manufacturing, Food and Beverage Manufacturing, Wood Product Manufacturing, and Miscellaneous Manufacturing are key manufacturing sectors that are growing in both Pennsylvania and nationally, and where Pennsylvania has an existing specialty in the industry. Each uses freight rail.

Pennsylvania also has strong concentrations of several growth industries that are less if at all reliant on freight transportation, including Educational Services, Healthcare, and Social Assistance, and Professional and Business Services.

Meanwhile, the Agriculture, Forestry, Fishing and Hunting industry is freight-dependent, with a notably lower-than-average concentration in Pennsylvania.

Table 2.14 Pennsylvania Industry Sector Growth and National Concentration

INDUSTRY	PA GDP GROWTH 2013-2023	U.S. GDP GROWTH 2013-2023	PA GDP LOCATION QUOTIENT 2023
Agriculture, forestry, fishing and hunting	3.4%	20.1%	0.47
Mining, quarrying, and oil and gas extraction	69.6%	39.1%	1.09
Utilities	6.3%	12.8%	1.10
Construction	-7.6%	17.7%	0.90
Manufacturing	6.1%	14.2%	1.07
Wholesale trade	-8.4%	7.8%	0.94
Retail trade	26.5%	34.7%	0.97
Transportation and warehousing	25.5%	29.1%	1.12
Information	14.7%	110.5%	0.85
Finance, insurance, real estate, rental, and leasing	8.9%	21.1%	0.94
Professional and business services	46.2%	61.4%	1.08
Educational services, health care, and social assistance	22.3%	31.2%	1.45
Arts, entertainment, recreation, accommodation, and food services	8.3%	19.8%	0.87
Other services (except government and government enterprises)	-0.4%	4.0%	1.07

Source: U.S. Bureau of Economic Analysis

Freight Demand and Growth

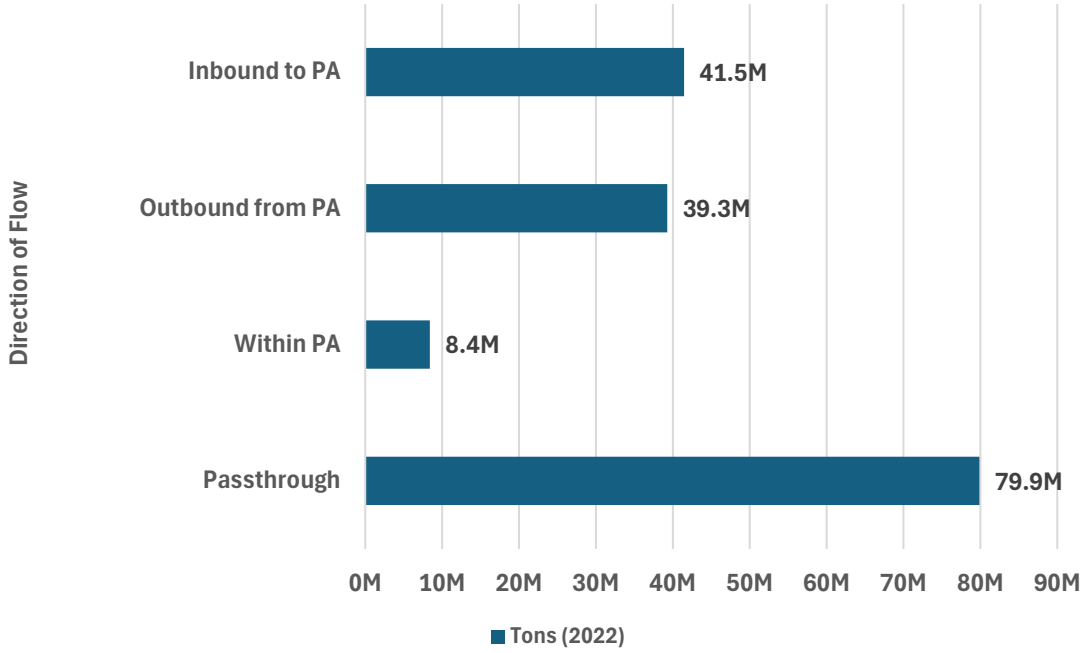
Pennsylvania is a leader in freight rail transportation. The Commonwealth ranks high in rail freight carloads and tonnage moved, at sixth and eighth in terminated and originated carloads, respectively, and ninth and twelfth in originated and terminated rail tons.

DIRECTION OF FREIGHT FLOWS

The confidential 2022 STB carload waybill sample data was analyzed to determine how rail freight moves throughout Pennsylvania. A waybill is a document used by a railroad to record information about a shipment, including the commodity, amount, and sender and recipient of the goods. The STB carload waybill sample data reflects waybills from U.S. rail carries that terminate 4,500 or more annual revenue carloads. This data showed that the Commonwealth's freight railroads moved nearly 170 million tons of goods in 2022. As shown in **Figure 2.51**, the largest share of tonnage, at nearly 80 million tons, was passing through Pennsylvania between other states. The significant passthrough volume highlights Pennsylvania's importance to the freight network and role in removing trucks from the road network as outlined in the section about Rail's Economic and Environmental Impacts.

Freight originating in the state totaled nearly 48 million tons. This figure incorporates freight that moved both outbound from Pennsylvania (39.3 million tons), as well freight that moved within the state (8.4 million tons). Freight destined to Pennsylvania totaled 41.5 million tons, a near even balance of inbound and outbound rail freight trade.

Figure 2.51 Direction of Rail Freight Flows in Pennsylvania, 2022 (tons)



Source: STB Waybill Sample

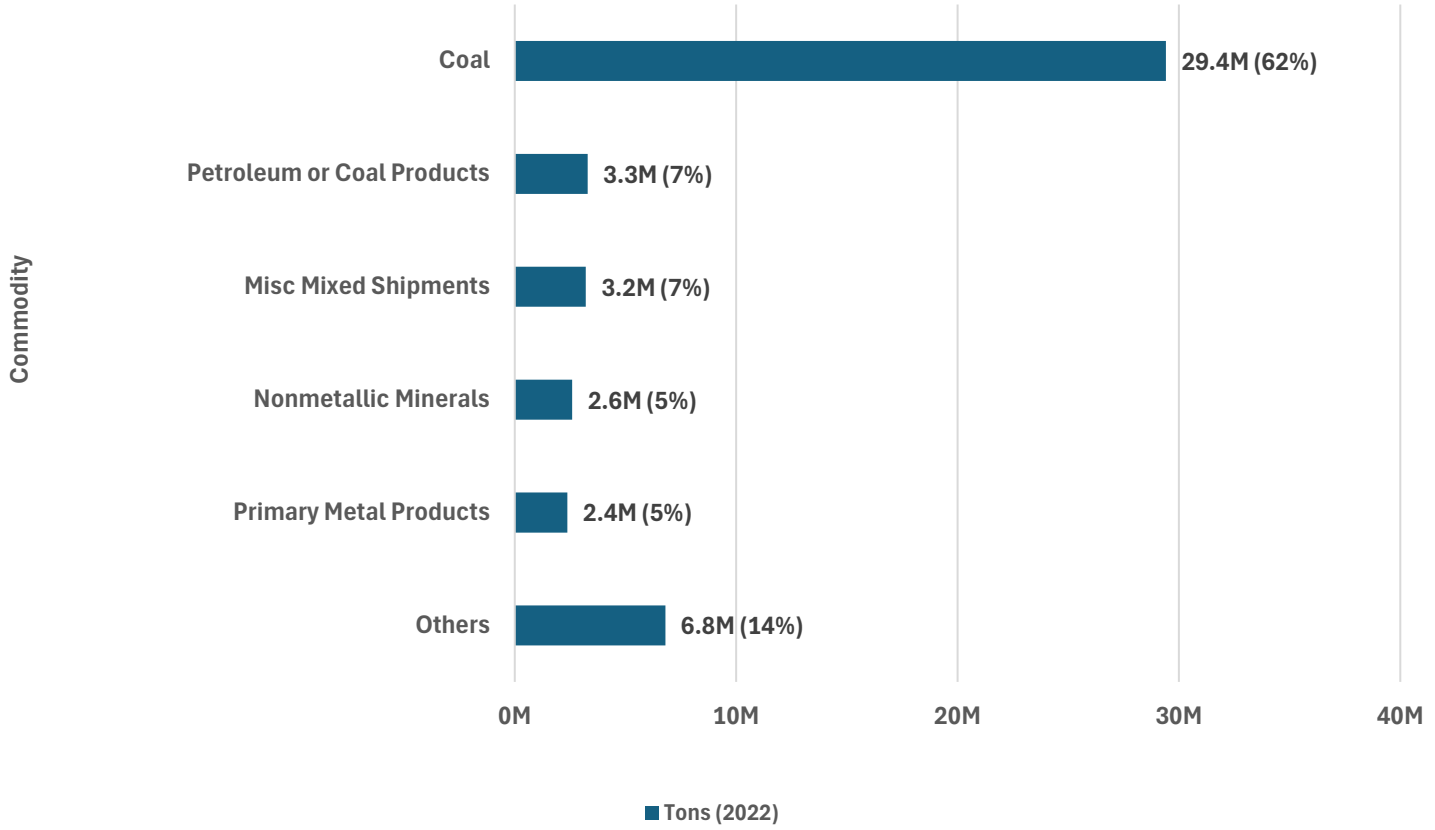
COMMODITY FLOWS

Commodities and Tonnage Originating in Pennsylvania

Coal was Pennsylvania's top outbound commodity by tonnage in 2022 and was 62 percent of the total outbound tonnage (**Figure 2.52**).

Petroleum or coal products, mixed shipments, nonmetallic minerals, and primary metal products tonnages all followed far behind coal, each comprising between 5 and 7 percent of outbound tonnage.

Figure 2.52 Freight Rail Commodities Originating in Pennsylvania, 2022 (tons)



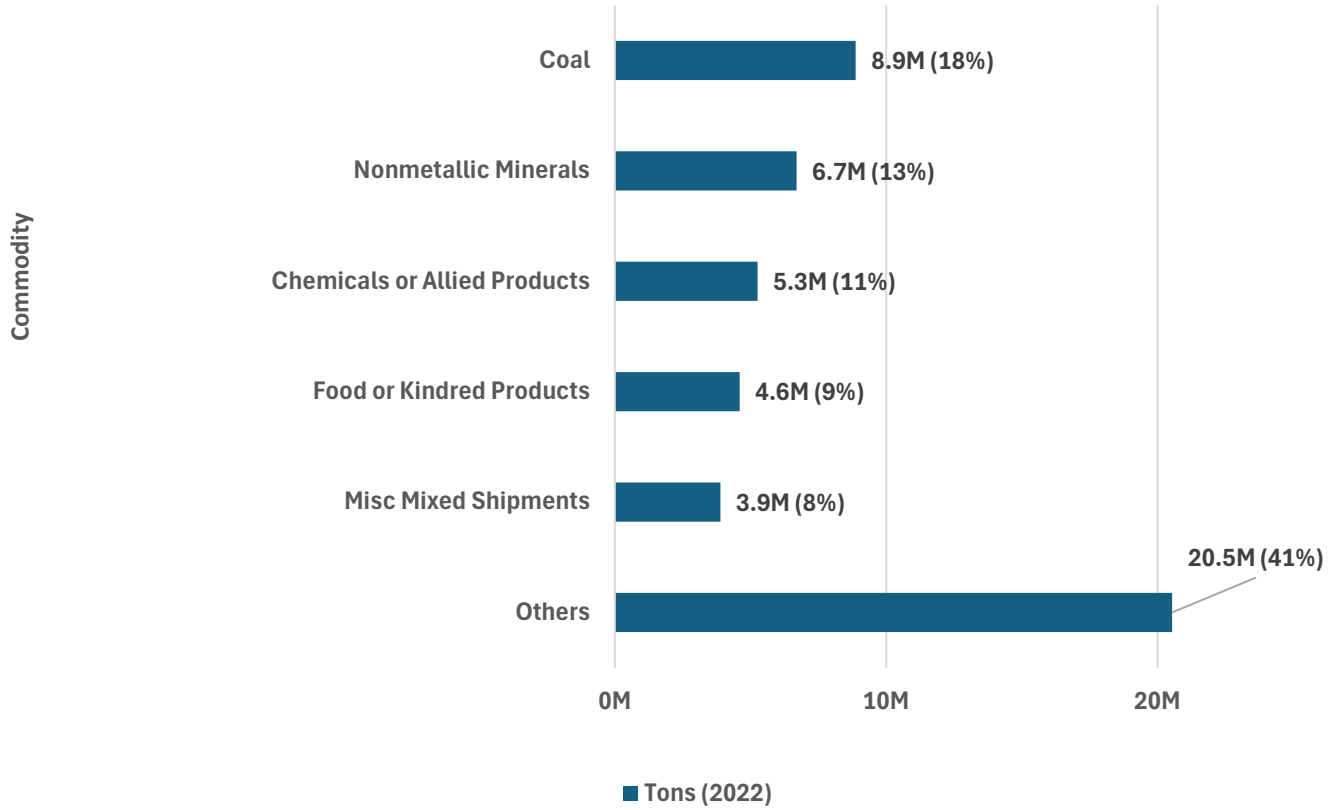
Source: STB Waybill Sample

Commodities and Tonnage Terminating in Pennsylvania

The inbound commodities are more diverse than outbound commodities. Coal is the top commodity, comprising 18 percent of the tonnage terminating in the state **Figure 2.53**).

At 6.7 and 5.3 million tons, nonmetallic minerals and chemicals/allied products are the second and third commodities terminating in Pennsylvania, respectively. All other commodities, which include metallic ores, farm products, and lumber, among other goods, made up 41 percent of terminating tonnage in 2022.

Figure 2.53 Freight Rail Commodities Terminating in Pennsylvania, 2022 (tons)



Source: STB Carload Waybill Sample

TOP COMMODITIES

Forecasted Top Commodities

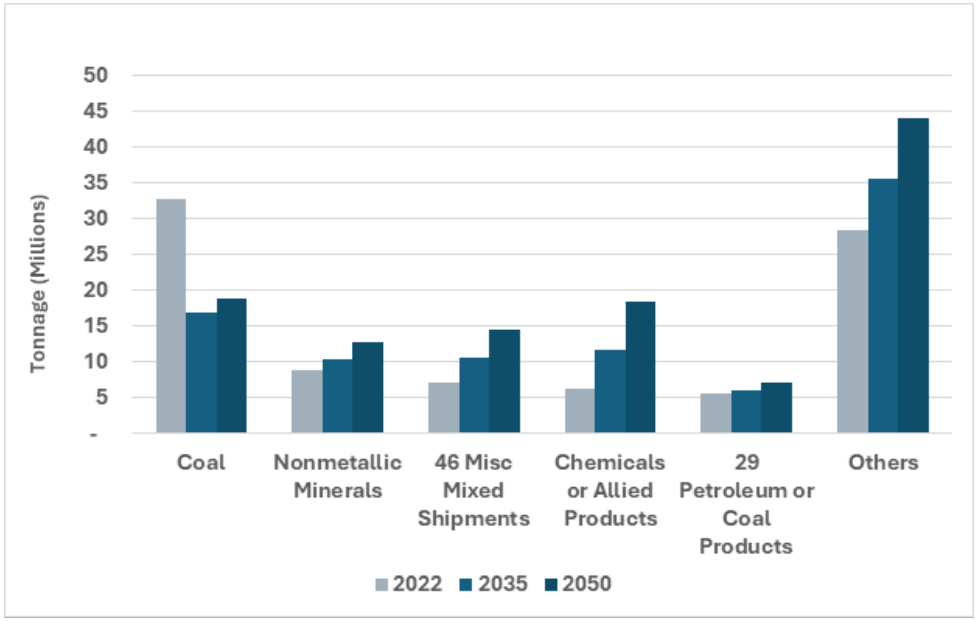
Based on forecasts from the U.S. Federal Highway Administration's Freight Analysis Framework-6, (FAF-6), all of Pennsylvania's top commodities in 2022, except for coal, are projected to grow in tonnage by both 2035 and 2050, as shown in **Figure 2.54** although coal will remain the leading single commodity.

Coal tonnage projections were partly developed using the 2025 Annual Energy Outlook from the U.S. Energy Information Administration. The Annual Energy Outlook was used for developing originating tonnage forecasts for Pennsylvania as these reflect coal production estimates, while inbound tonnage forecasts continued to be developed using FAF.

According to the 2025 Annual Energy Outlook, coal production in the Northern Appalachia region (which includes Pennsylvania) is expected to drop significantly from 2022 through 2035, before recovering slightly by 2050. While domestic consumption of coal may continue to fall, the part of the freight rail network that carries Pennsylvania coal to the Port of Baltimore will remain critical to supporting Pennsylvania's coal exports in the coming years. Inbound tonnages were expected to drop significantly based on FAF, reflecting a nationwide drop in both coal production and demand both through 2035 and further to 2050.

The following sections discuss the leading Pennsylvania rail commodities in more detail.

Figure 2.54 Forecasted Trends of Top Commodities, 2022-2050



Source: STB Waybill Carload Sample Data, and FAF 5.6, and U.S. Energy Information Administration Annual Energy Outlook (2025)

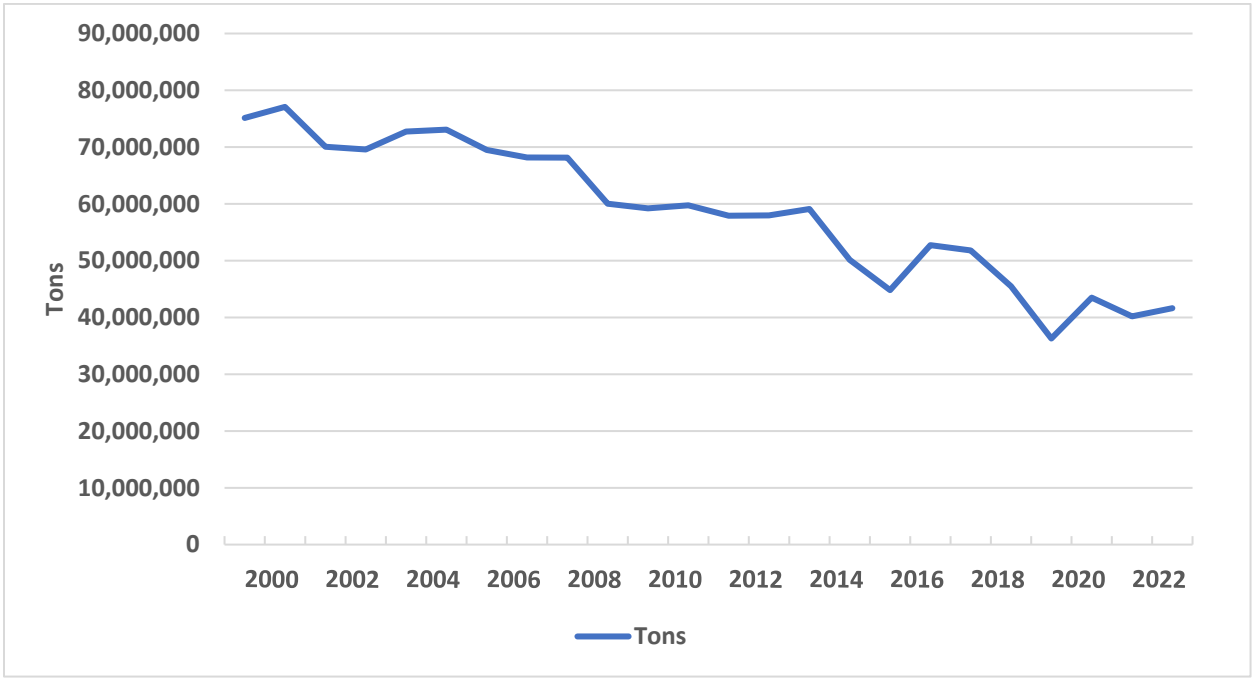
Coal

OVERVIEW

According to the U.S. Energy Information Administration, in 2023 Pennsylvania ranked third nationally in coal tonnage produced. The state is a producer of both anthracite coal and bituminous coal. Anthracite coal has the highest carbon content of the coal types and burns more efficiently, making it ideal for use in home heating, as a filter medium, and as a component in charcoal briquettes. Bituminous is the most abundant coal type in the United States and is used to fuel coal-fired power plants (thermal coal) and in iron and steel production (metallurgical coal).

Pennsylvania's coal production has declined since 2000, producing less than 50 million tons each year since 2018 **(Figure 2.55**). The move away from coal-fired power plants toward natural gas and renewable sources for energy production has led to the decrease in domestic demand for coal. Two Pennsylvania coal-fired plants closed since 2020, including what had been the state's largest plant, the Homer City Generating Station.[40]

Figure 2.55 Total Production of Bituminous Coal in Pennsylvania, 2000-2023



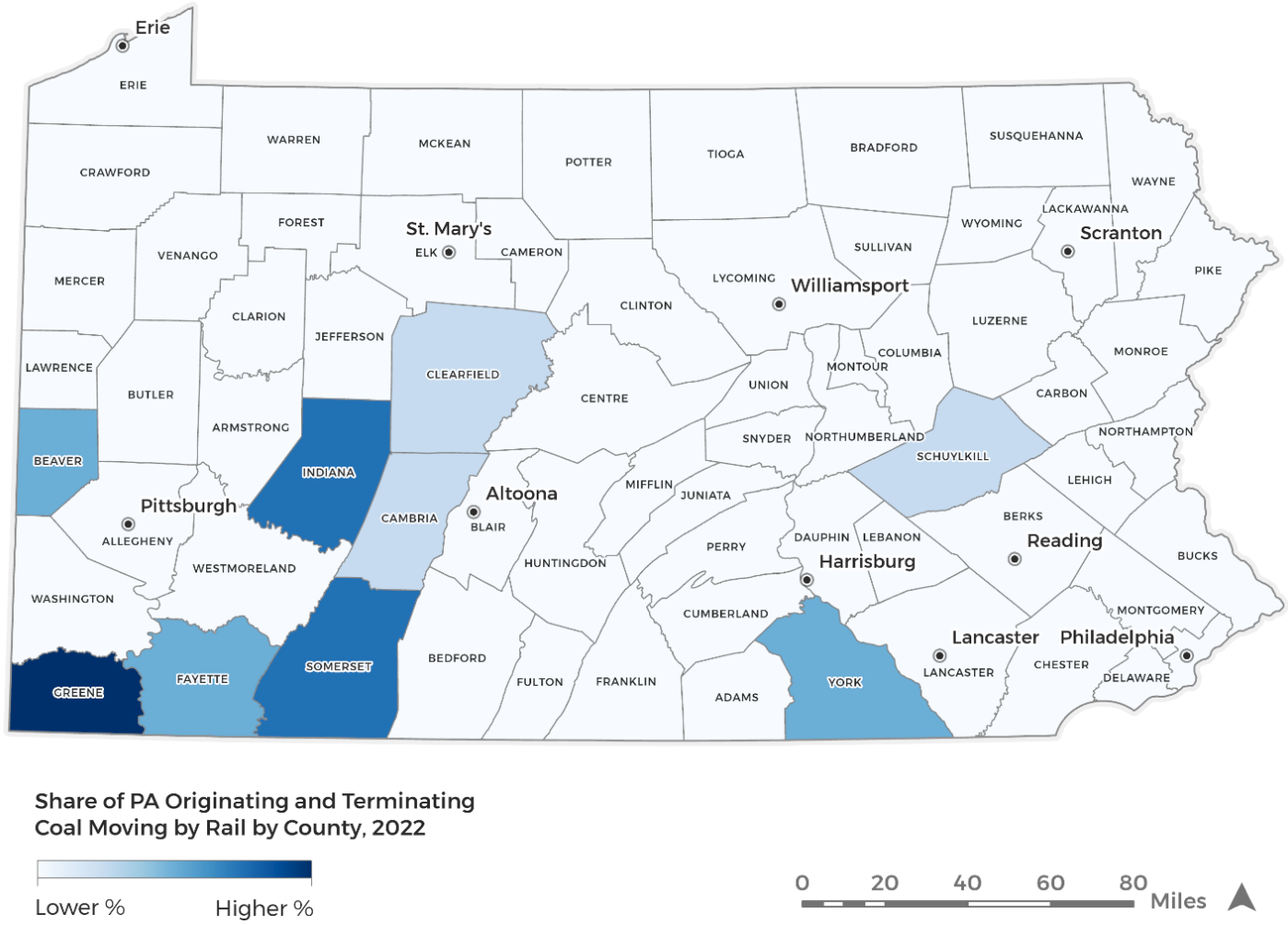
Source: Pennsylvania Department of Environmental Protection, 2023

[40] U.S. EIA "The largest coal-fired power plant in Pennsylvania will close by July 2023." June 5, 2023. https://www.eia.gov/todayinenergy/detail.php?id=56700

COUNTY-LEVEL ACTIVITY

In 2023, Pennsylvania produced 2.8 million tons of anthracite and 39.8 million tons of bituminous coal.[41] The vast majority of rail coal tonnage originates in Greene County, in the most southwestern corner of the state (**Figure 2.56**). Indiana, Somerset, and Beaver counties produce the next largest percentages of coal tonnage.

Figure 2.56 Coal: County Tonnage Density Map for Originating, Terminating Rail Movements, 2022



Source: STB Carload Waybill Sample

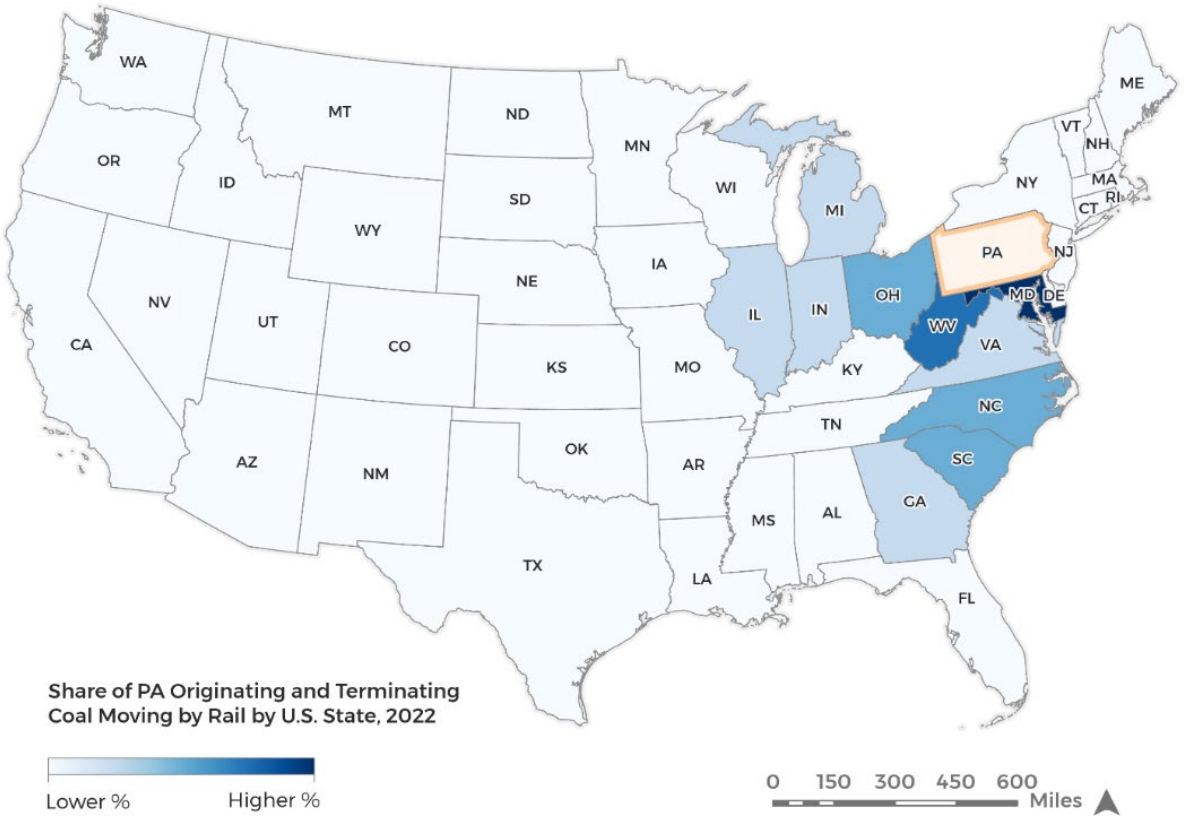
[41] U.S. EIA, Coal Production and Number of Mines by State and Mine Type, 2023 and 2022

DOMESTIC TRADE ACTIVITY

Shown in **Figure 2.57**, Pennsylvania's top three U.S. trading partners for rail-transported coal in 2022 were Maryland, followed by West Virginia and North Carolina. Much of the coal delivered to Maryland was for export through the Port of Baltimore. In 2022 the Port of Baltimore exported just under 20 million tons of coal, primarily to India, Japan, and the Netherlands.[42] As discussed in Chapter 1, Pennsylvania exported nearly 2.7 million tons of coal, and 36 percent of that tonnage (957,000 tons of coal) by rail. Overall, Maryland is Pennsylvania's biggest trading partner for coal.

For coal that Pennsylvania shipped to other states, West Virginia is the top trading partner followed by North Carolina. The coal was used to generate electricity.[43]

Figure 2.57 Coal: State Trade Partner Map for Originating/Terminating Rail Movements, 2022



Source: STB Carload Waybill Sample

[42]U.S. EIA, "What are the energy impacts from the Port of Baltimore closure?" March 28, 2024. https://www.eia.gov/todayinenergy/detail.php?id=61663

[43] U.S. EIA, Annual Coal Distribution Report, 2023.

Petroleum and Chemical Products

Petroleum products encompass commodities such as gasoline, jet fuel, liquified natural gas (LNG), kerosene, lubricating oils, asphalt, and residential fuel oil.

Pennsylvania is second behind Texas in natural gas reserves. The movement of LNG by rail has been subject to changing federal regulations. In 2019, Energy Transport Solutions was granted a special permit to move LNG via rail from a plant in Wyalusing, Pennsylvania, to a terminal in Greenwich Township, New Jersey. This permit expired in 2021, and the Pipeline and Hazardous Materials Safety Administration (PHMSA) denied the permit in 2023. Additionally, PHMSA amended its Hazardous Materials Regulations in 2023 to reverse provisions in a 2020 rulemaking that had authorized transport of LNG in rail tank cars.[44]

Dry natural gas or methane is subject to the LNG restrictions described above, and is predominantly shipped by pipeline. However, natural gas produced in Pennsylvania includes heavier hydrocarbons such as propane, butane, and ethane, known as natural gas liquids. These natural gas liquids often move by rail. Over half of the petroleum products shipped from Pennsylvania are natural gas liquids. Pennsylvania, like other states in the Marcellus and Utica shale plays, has been looking to provide more economic value added to the natural gas supply chain, rather than just ship natural gas products out of the region. One new development is the new Shell Polymers cracker plant in Monaca, Pennsylvania, which can convert ethane to produce ethylene and polyethylene pellets that are used by the plastics industry.

COUNTY-LEVEL ACTIVITY

Rail shipments of petroleum and chemical products originate throughout the state, with concentrations in Delaware, Allegheny, and Butler counties (**Figure 2.58**).

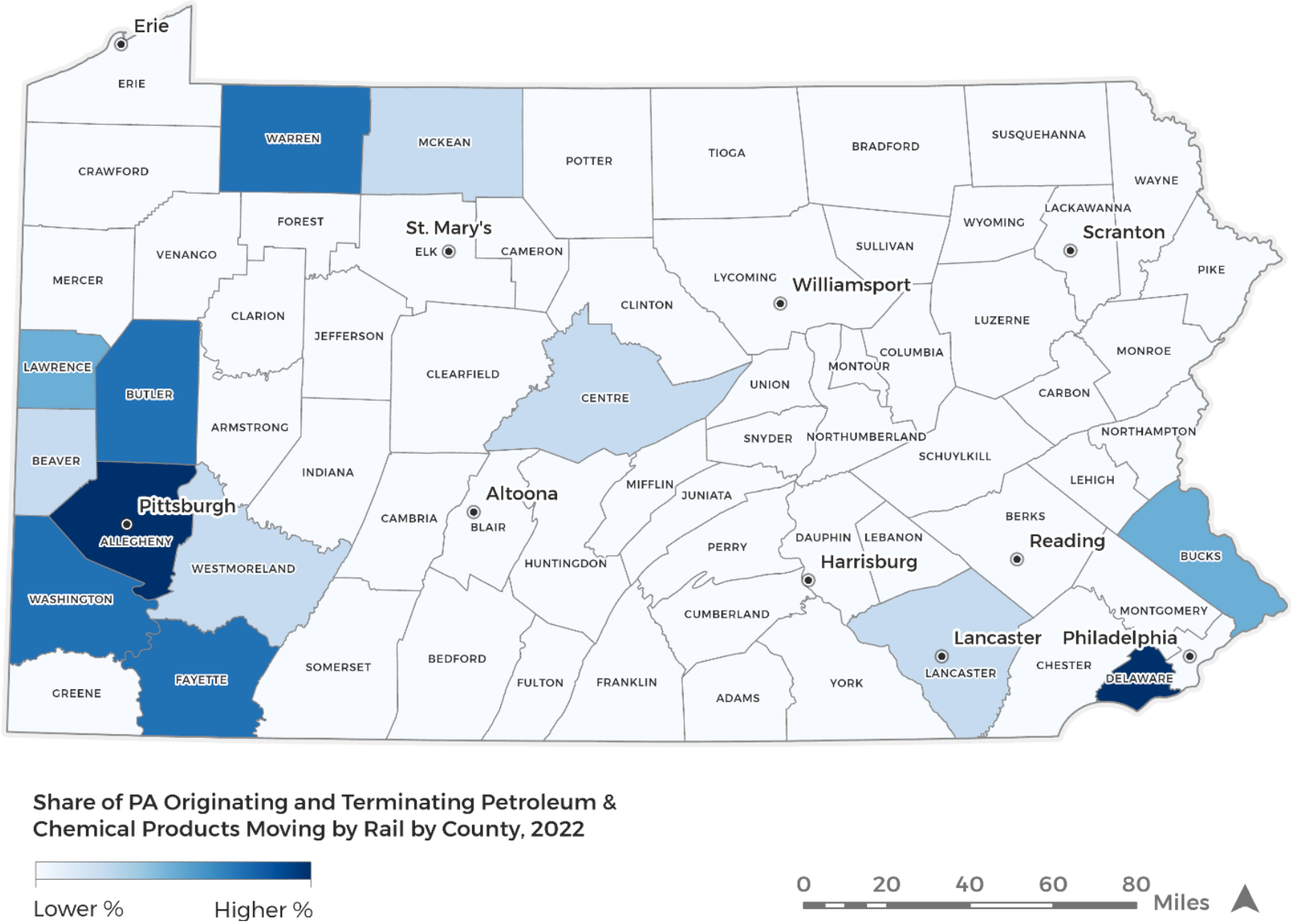
Although Pennsylvania has 0.1 percent of the nation's crude oil reserves, with extraction capacity of 13 thousand barrels, it is a significant producer of petroleum and chemical products. Pennsylvania has the second largest natural gas reserves in the nation behind Texas. Pennsylvania primarily refines petroleum products from crude oil shipped into the state. These products include many oils and lubricants for automotive use, including military grade engine oils, as well as metalworking fluids used in activities such as cutting and grinding steels. Allegheny County is home to a key producer of these types of products, one which also offers rails transloading services at its plants.

As discussed in the 2020 Pennsylvania State Rail Plan, a 2019 explosion and subsequent closure of the Philadelphia Energy Solutions refinery, which was the largest on the East Coast, halved Pennsylvania's petroleum refinery capacity. Currently, Pennsylvania has three active refineries:

- **Trainer Refinery**, operated by Monroe Energy and owned by Delta Airlines, refines about 185,000 barrels per day.[45] Located in Delaware County along the Delaware River.
- **United Refining Company**, which averages about 70,000 barrels per day.[46] Located in Warren County along the Allegheny River.
- **American Refining Group**, which averages about 11,000 barrels per day.[47] Located in McKean County along the Tunungwant Creek.

[44] https://www.phmsa.dot.gov/news/final-rule-suspension-hmr-amendments-authorizing-transportation-liquefied-natural-gas-rail
[45] https://www.monroe-energy.com/the-facilities/
[46] https://www.urc.com/about
[47] https://www.amref.com/about/#:~:text=Since%20becoming%20American%20Refining%20Group,more%20than%20340%20hardworking%20employees.

Figure 2.58 Petroleum & Chemical Products: County Tonnage Density Map for Originating/Terminating Rail Movements, 2022



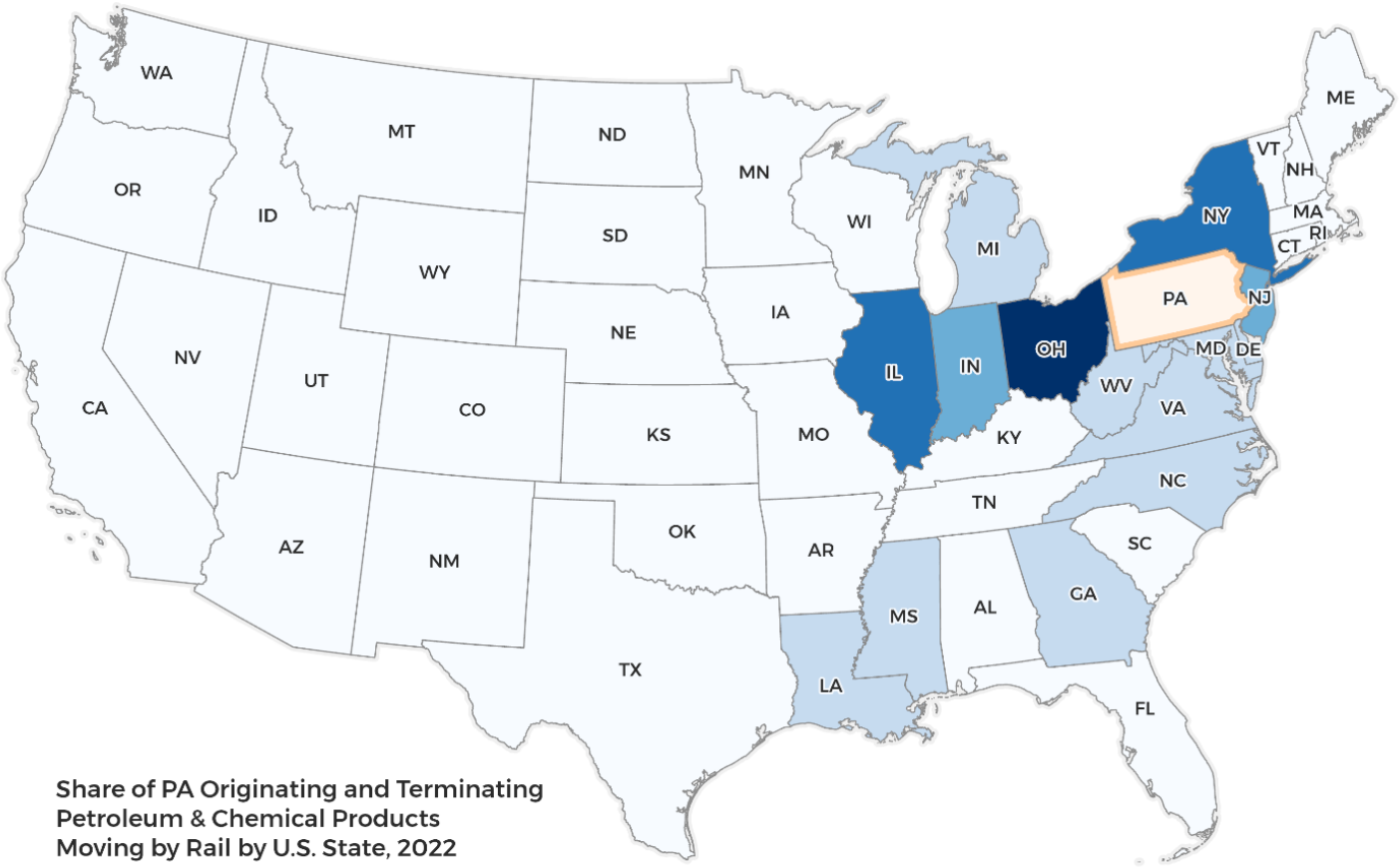
Source: STB Carload Waybill Sample

DOMESTIC TRADE ACTIVITY

Pennsylvania's primary domestic trading partners for petroleum and chemical products in 2022 were Illinois, Ohio, and New York (**Figure 2.59**). The vast majority of petroleum and chemical product tonnage moving between Illinois and Pennsylvania was inbound from Illinois in the form of fuel oils and a commodity called coal-n.e.c, which refers to coal products "not elsewhere classified." Coal-n.e.c. includes petroleum lubricating oils and paraffin/petroleum waxes.

Pennsylvania also shipped a significant tonnage of coal-n.e.c. by rail to Ohio and New York.

Figure 2.59 Petroleum & Chemical Products: State Trade Partner Map for Originating/Terminating Rail Movements, 2022



Source: STB Carload Waybill Sample

Steel

Primary metal products, a commodity that includes steel, is one of the top commodities shipped by rail to and from Pennsylvania. The centrality of steel production to Pennsylvania's industrial heritage is reflected by five of its Class III railroads having been founded expressly for the purpose of moving steel. They include the following:

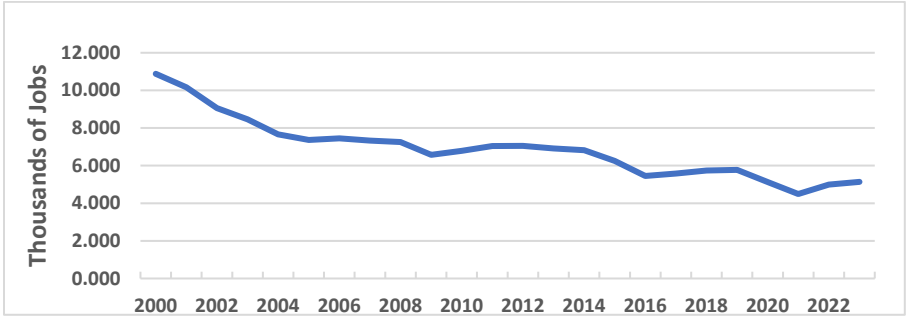
- **Union Railroad**. Operated by Transtar, a subsidiary of U.S. Steel.
- **Mittal Steel U.S.A. Railways**. Operated by ArcelorMittal, a multinational steel manufacturer.
- **Pennsylvania Southwestern Railroad**. Primarily services the Allegheny Ludlum Steel Plant in Midland.

Prior to acquisition of the railroad by CN, U.S. Steel also owned the Class II railroad, Bessemer & Lake Erie Railroad.
Changes in trade policy regarding steel could impact this key Pennsylvania industry in the coming years, and as of 2025, trade agreements and tariffs are in a state of flux.

COUNTY-LEVEL ACTIVITY

Employment in steel production in the Pittsburgh Metropolitan Statistical Area has been on the decline since 2000, though it has mostly recovered following COVID-19 pandemic lows (**Figure 2.60**).

Figure 2.60 Annual Iron and Steel Mill Employment in Pittsburgh Metropolitan Statistical Area, 2000-2023

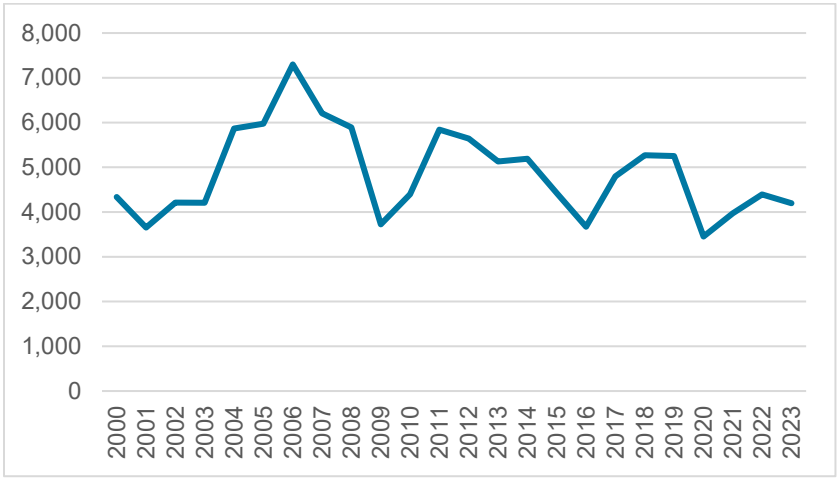


Source: Federal Reserve Bank of St. Louis; U.S. Bureau of Labor Statistics, 2023

Although employment has declined, the industry is producing more product with fewer employees.

Figure 2.61, the GDP of Pennsylvania's steel industry has reflected various business cycles between 2000 and 2023, but not the same significant downward trend as employment.

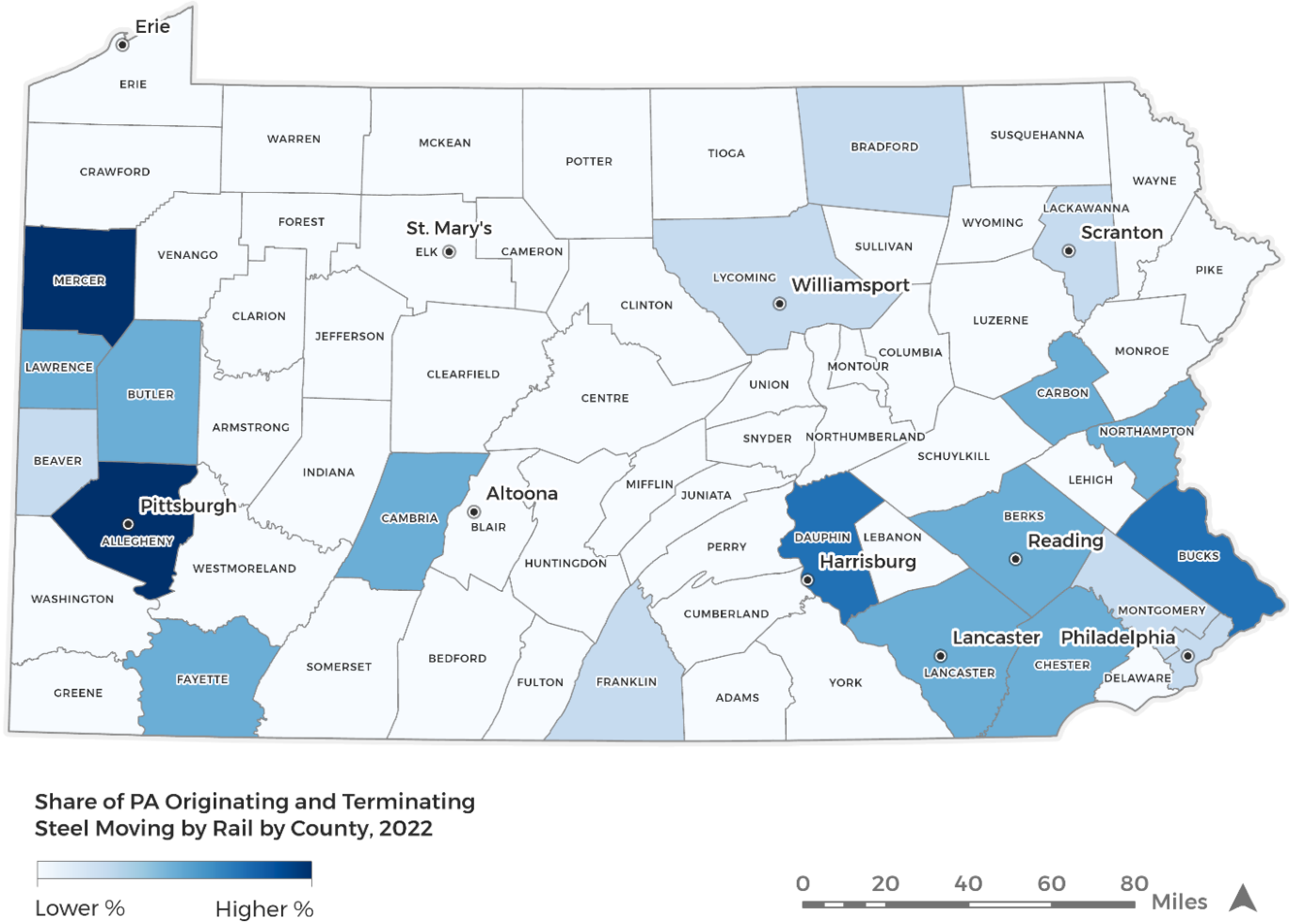
Figure 2.61 Annual Primary Metal Gross Domestic Product in Pennsylvania, 2000-2023 (2000 $s)



Source: U.S. Bureau of Economic Analysis

As shown in **Figure 2.62**, Allegheny County, of which Pittsburgh is the county seat, shipped the most primary metal tonnage by rail in the state, followed by Mercer County. Allegheny County is home to both the headquarters of U.S. Steel and the three plants that comprise the company's Mon Valley Works. Mercer County is home to the NLMK Pennsylvania plant, as well as the Wabtec manufacturing facility, which produces locomotives and rails cars.

Figure 2.62 Steel: County Tonnage Density Map for Originating/Terminating Rail Movement, 2022

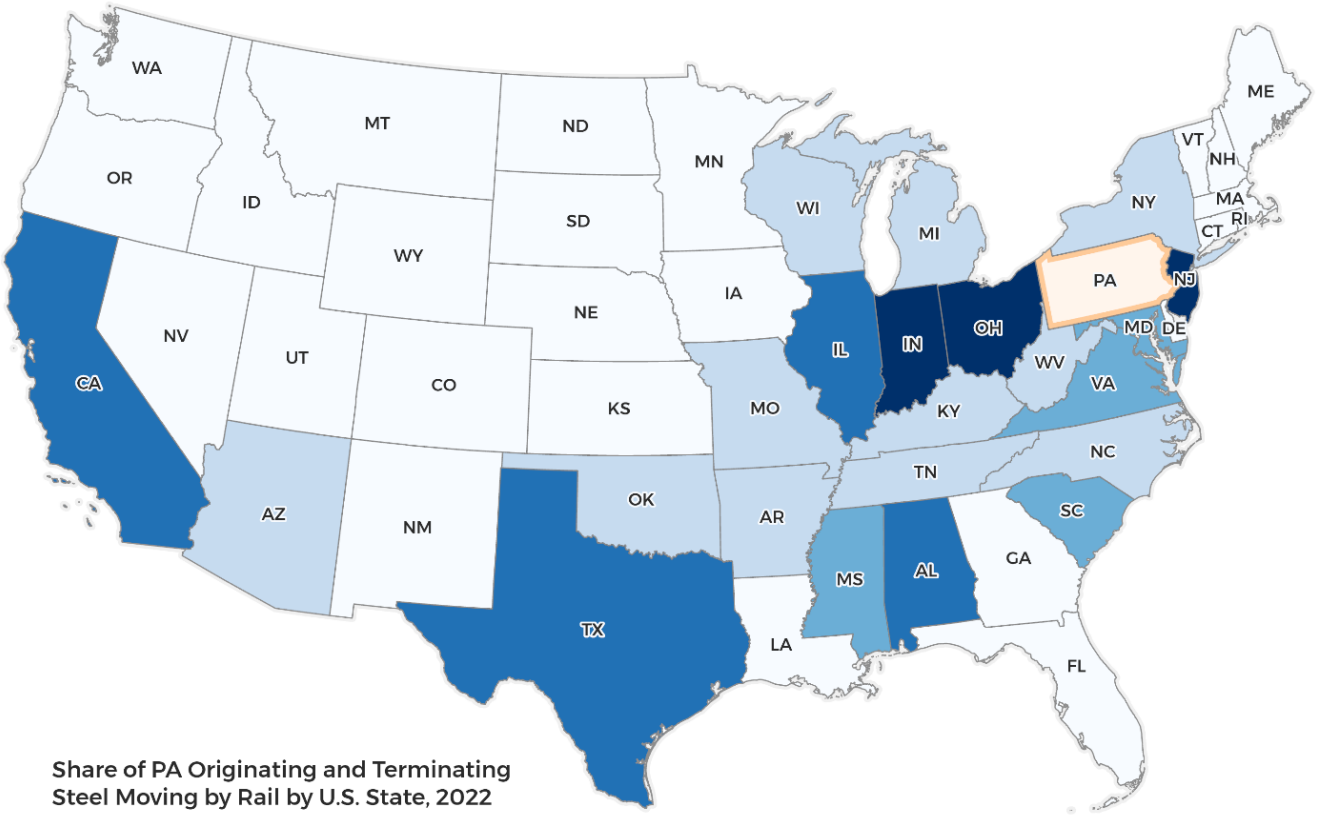


Source: STB Carload Waybill Sample

DOMESTIC TRADE ACTIVITY

In 2022, 2.4 million tons of primary metal products originated in Pennsylvania, a third of which was sheet steel. Approximately 3.4 million tons of primary metals terminated in the state, nearly a third of which was sheet steel and another third of which was slabs of iron or steel. As shown in **Figure 2.63**, New Jersey, Ohio, and Indiana were top domestic rail trading partners in 2022. In trade of primary metal products between Ohio and Pennsylvania, exports exceeded imports, 475,000 tons to 333,000 tons. The majority of the trade between Pennsylvania and New Jersey was inbound shipments to the Commonwealth, totaling close to 760,000 tons, consisting mostly of imports through a port facility in New Jersey. California, Illinois, and Indiana were significant recipients of Pennsylvania's primary metal products.

Figure 2.63 Steel. State Trade Partner Map for Originating/Terminating Rail Movements, 2022



Source: STB Carload Waybill Sample

Nonmetallic Minerals

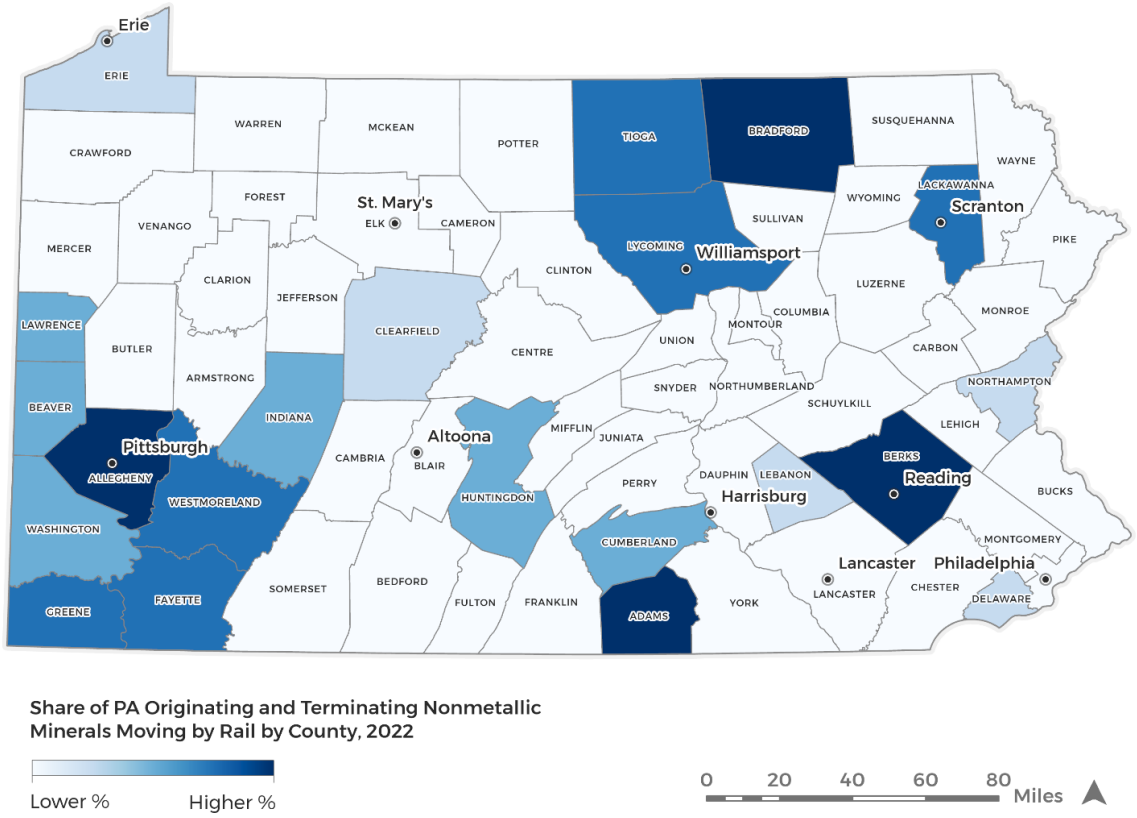
Nonmetallic minerals is a commodity group that includes products such as gravel and natural sands. In Pennsylvania, this commodity group is related to both the production of aggregate and rock such as limestone, sandstone, bluestone, and refractory sand and inbound shipments of sand for natural gas production.

COUNTY-LEVEL ACTIVITY

The counties with the highest tonnages of nonmetallic minerals moved by rail were Bradford, Berks, Adams, and Allegheny counties (**Figure 2.64**).

Bradford County is home to significant sand, gravel, and sandstone quarries; within Berks County are quarries of limestone-dolomite, clay-shale, diabase, and sand and gravel; within Adams County is produced clay-shale, limestone-dolomite, and sericite; and Allegheny County is home to sand and gravel, limestone, and sandstone quarries.

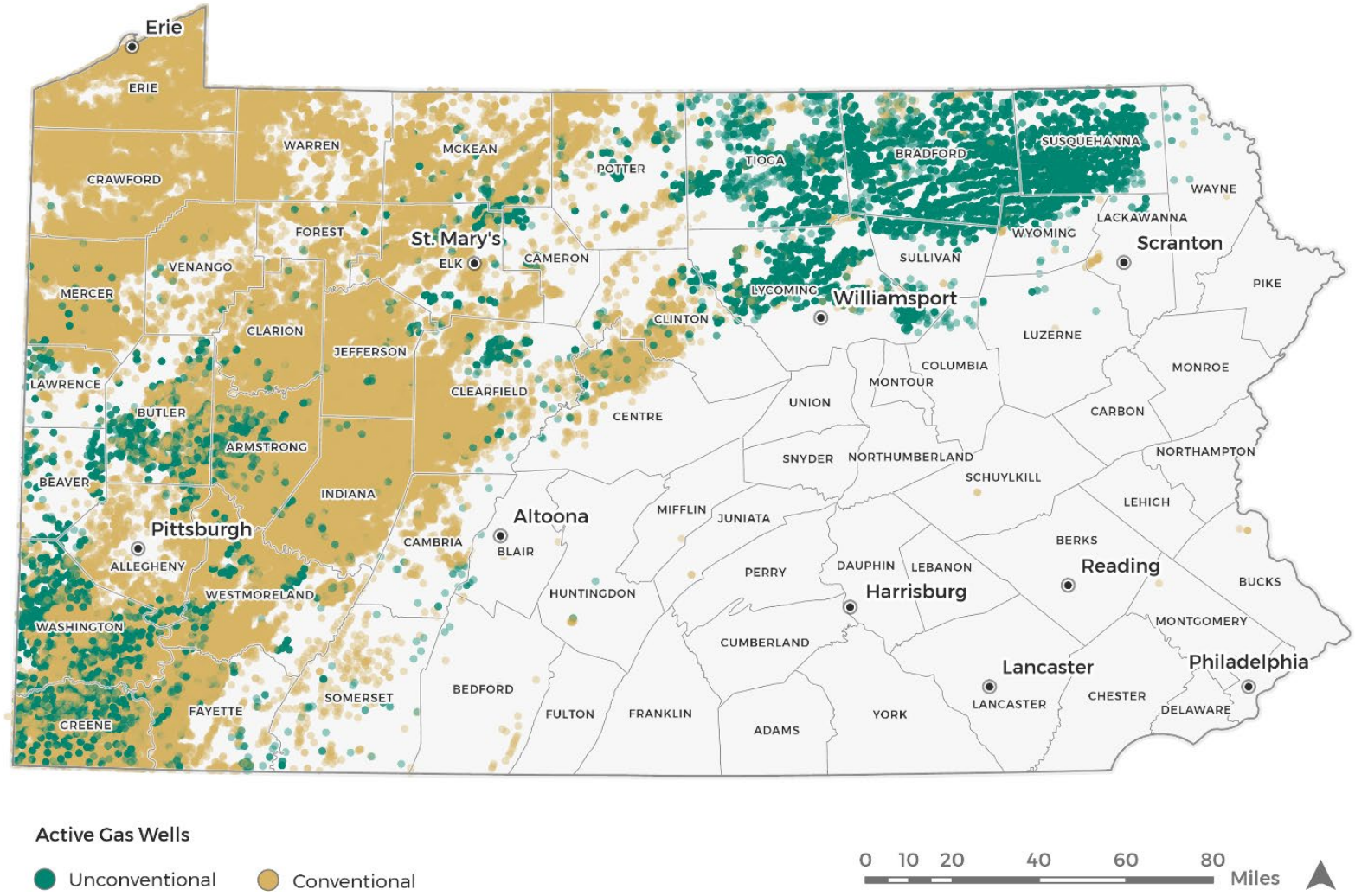
Figure 2.64 Nonmetallic Minerals: County Tonnage Density Map for Originating/Terminating Rail Movements, 2022



Source: STB Carload Waybill Sample

Counties along the Marcellus Shale Formation require sand for gas production, including Westmoreland, Lycoming, Tioga, and Bradford counties. A map of active gas wells by county is provided in **Figure 2.65.**[48]

Figure 2.65 Active Gas Wells in Pennsylvania, 2024



Source: Pennsylvania Department of Environmental Protection, Oil and Gas Well Layers 2024

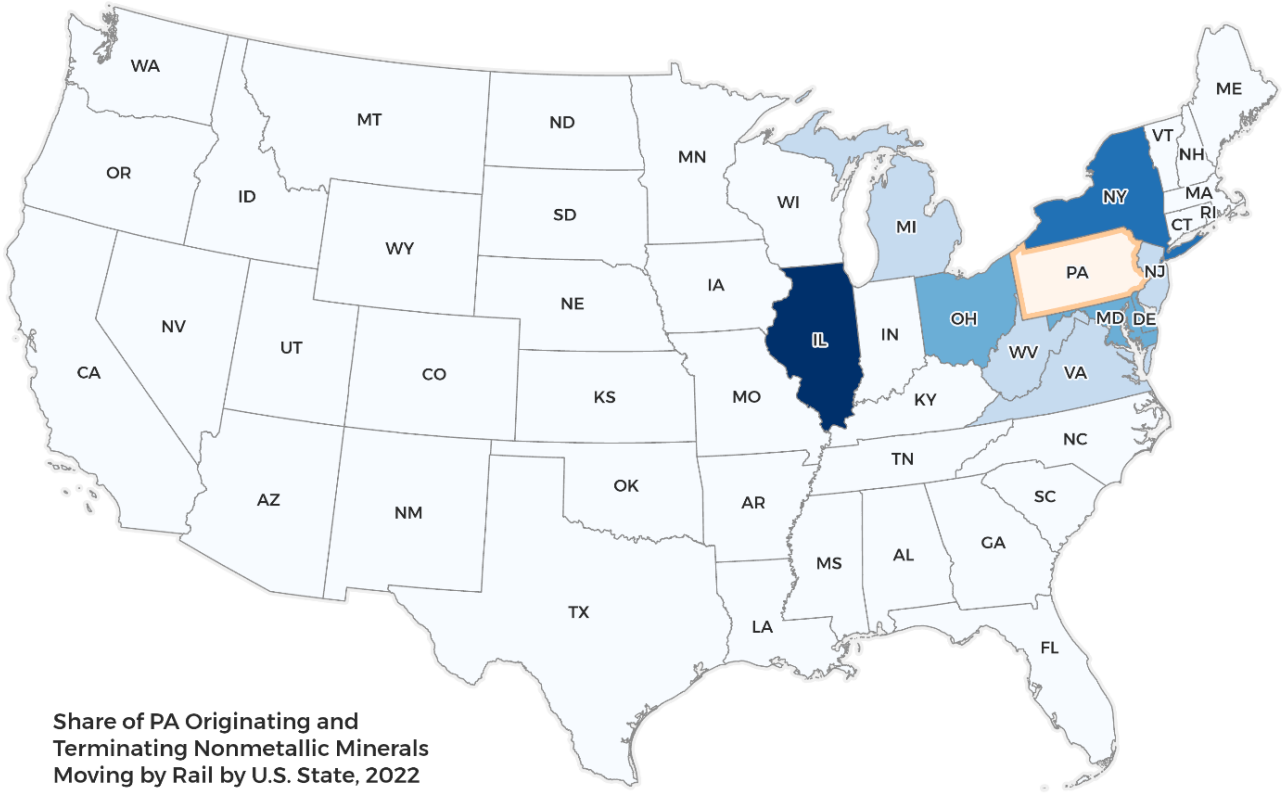
[48] https://gis.dep.pa.gov/paoilandgasmapping/oilgaswellsstraygasmap.html

DOMESTIC TRADE ACTIVITY

As shown in **Figure 2.66**, Pennsylvania's principal domestic trading partners in 2022 were Illinois, New York, Maryland, and Delaware. About 3.7 million tons of natural sands were moved by rail from Illinois to Pennsylvania. A significant portion of these sands from Illinois are what is known as "frac sand," a type of sand used in the hydraulic fracturing process to extract oil and natural gas from shale.

Pennsylvania sent nearly 200,000 tons of natural sands to New York; 883,000 tons of gravel to Delaware; and over 1 million tons of gravel to Maryland.

Figure 2.66 Nonmetallic Minerals: State Trade Partner Map for Originating/Terminating Rail Movements, 2022



Source: STB Carload Waybill Sample

Food

Home to corporations such as Hershey's, Heinz, Yuengling, Auntie Anne's, and Utz, Pennsylvania is internationally known for its food industry. Additionally, Pennsylvania is a major national grower of grapes and producer of wines and grape juices. According to the U.S. Department of the Treasury, in 2022 Pennsylvania ranked fifth nationally in wine production.[49]

However, while "food and kindred products" is a commodity category that includes edible human food and alcohol, it also includes animal feed and inedible animal fats. Pennsylvania's highest tonnage of food products that move by rail include liquid inedible animal fats (90,000 tons), soft drinks (30,000 tons), sauces (30,000 tons), and alcoholic beverages (27,000 tons).

COUNTY-LEVEL ACTIVITY

The majority of rail-moved tonnage of food products originate in the south-central portion of the Commonwealth, particularly in Bucks, Lancaster, Dauphin, Cumberland, and Franklin counties. This pattern is reflective of the food and agricultural industries active in these counties, including vineyards, livestock production, and prepared food operations.

Figure 2.67 Paradocx Vineyard, Chester County, PA

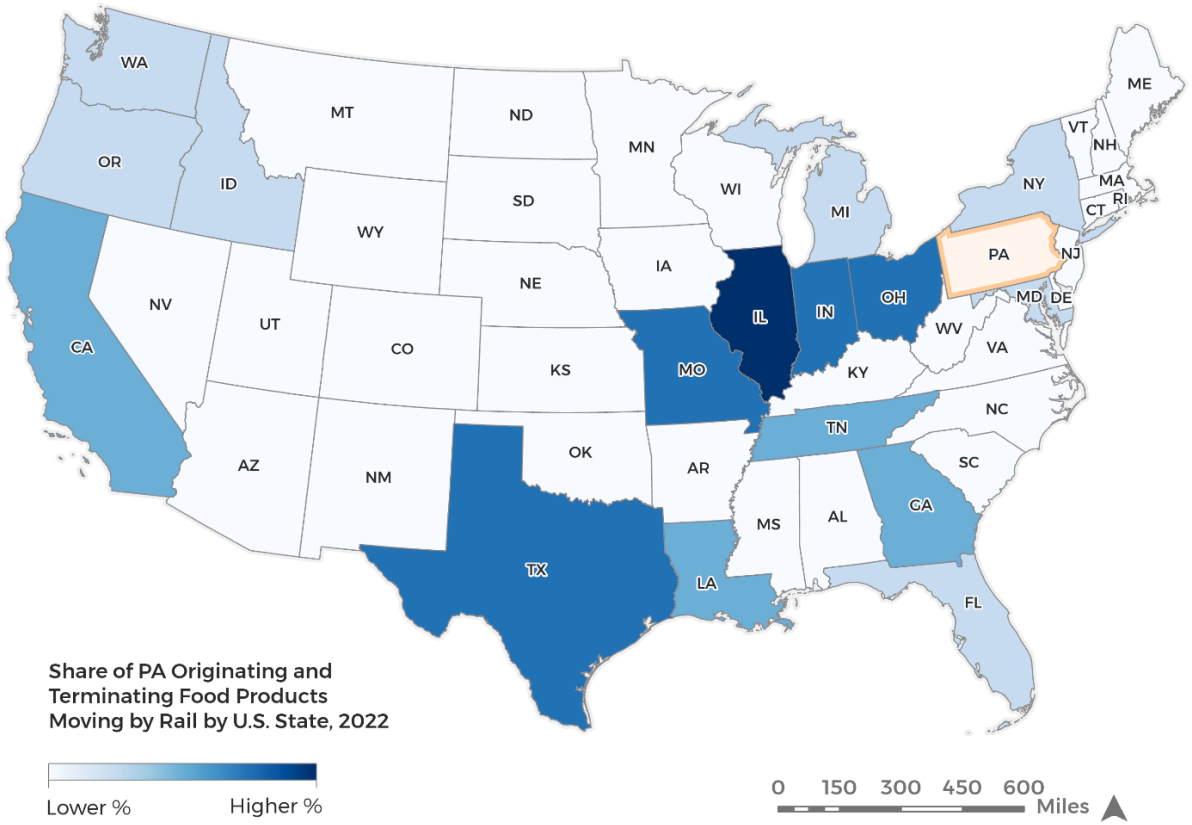
[49] https://www.ttb.gov/regulated-commodities/beverage-alcohol/wine/wine-statistics

DOMESTIC TRADE ACTIVITY

Pennsylvania's 700,000 tons of food products shipped by rail are sent throughout the country, with key destinations of Illinois, Ohio, Texas, and Louisiana, as shown in **Figure 2.68**. Over 40 percent (300,000 tons) of this outbound tonnage terminates in Illinois, with wines and liquors, sauces, prepared foods, and soft drinks comprising the largest shares of tonnage.

Missouri is also a major destination for Pennsylvania food products, led in tonnage (14,000 tons) by an amino acid called methionine, which is an important component of animal feed. Edible food products are also shipped to Missouri, including 8,000 tons of beverages, 5,800 tons of soybean oil, and 4,400 tons of potato chips. Illinois is Pennsylvania's largest trading partner for food, likely reflecting not only Illinois as a source of food, but also as a gateway, with the waybill sample reflecting shipments transferred from western railroads in Illinois as originating from Illinois.

Figure 2.68 Food: State Trade Partner Map for Originating/Terminating Rail Movements, 2022



Source: STB Carload Waybill Sample

Passenger Travel Demand and Growth

VEHICLE MILES TRAVELED

Because highway transportation has the highest modal share of passenger transportation, it serves as a rough barometer of overall passenger travel demand. The FHWA Office of Highway Policy Information publishes an annual Highway Statistics Series analyzing vehicle miles traveled (VMT) for urban and rural areas. **Table 2.15** shows the annual VMT across Pennsylvania for both urban and rural areas. VMT in urban areas grew by 10 percent from 2013 to 2022, while VMT in rural areas decreased by 8 percent, leading to an overall increase statewide of 1 percent. VMT growth has been particularly highest in Harrisburg and Lancaster urbanized areas.

Table 2.15 Annual Highway Statistics Series Measures

METRIC	GEOGRAPHY	TIMEFRAME	2013	2022	TOTAL CHANGE	ANNUAL CHANGE
Urban VMT (M)	Pennsylvania	Annual	36,110	39,565	10%	1%
Rural VMT (M)	Pennsylvania	Annual	16,336	16,169	-8%	0%
Total VMT (M)	Pennsylvania	Annual	52,446	55,733	1%	1%
VMT (M)	Philadelphia UA*	Daily	103.9	106.8	3%	0%
VMT Per Capita	Philadelphia UA*	Daily	19.8	19.6	-1%	0%
VMT (M)	Pittsburgh UA	Daily	32.9	35.5	8%	1%
VMT Per Capita	Pittsburgh UA	Daily	18.8	20.0	6%	1%
VMT (M)	Allentown UA*	Daily	13.9	14.8	6%	1%
VMT Per Capita	Allentown UA*	Daily	24.2	22.3	-8%	-1%
VMT (M)	Scranton UA	Daily	7.5	8.1	8%	1%
VMT Per Capita	Scranton UA	Daily	19.4	21.2	9%	1%
VMT (M)	Harrisburg UA	Daily	10.9	12.9	18%	2%
VMT Per Capita	Harrisburg UA	Daily	30.1	29.2	-3%	0%
VMT (M)	Lancaster UA	Daily	7.1	8.8	24%	2%
VMT Per Capita	Lancaster UA	Daily	21.9	21.8	0%	0%
VMT (M)	Reading UA	Daily	4.7	5.1	9%	1%
VMT Per Capita	Reading UA	Daily	19.6	19.1	-3%	0%

Source: FHWA Office of Highway Policy Information Highway Statistics Series 2015-2024

Notes: UA=Urbanized Area

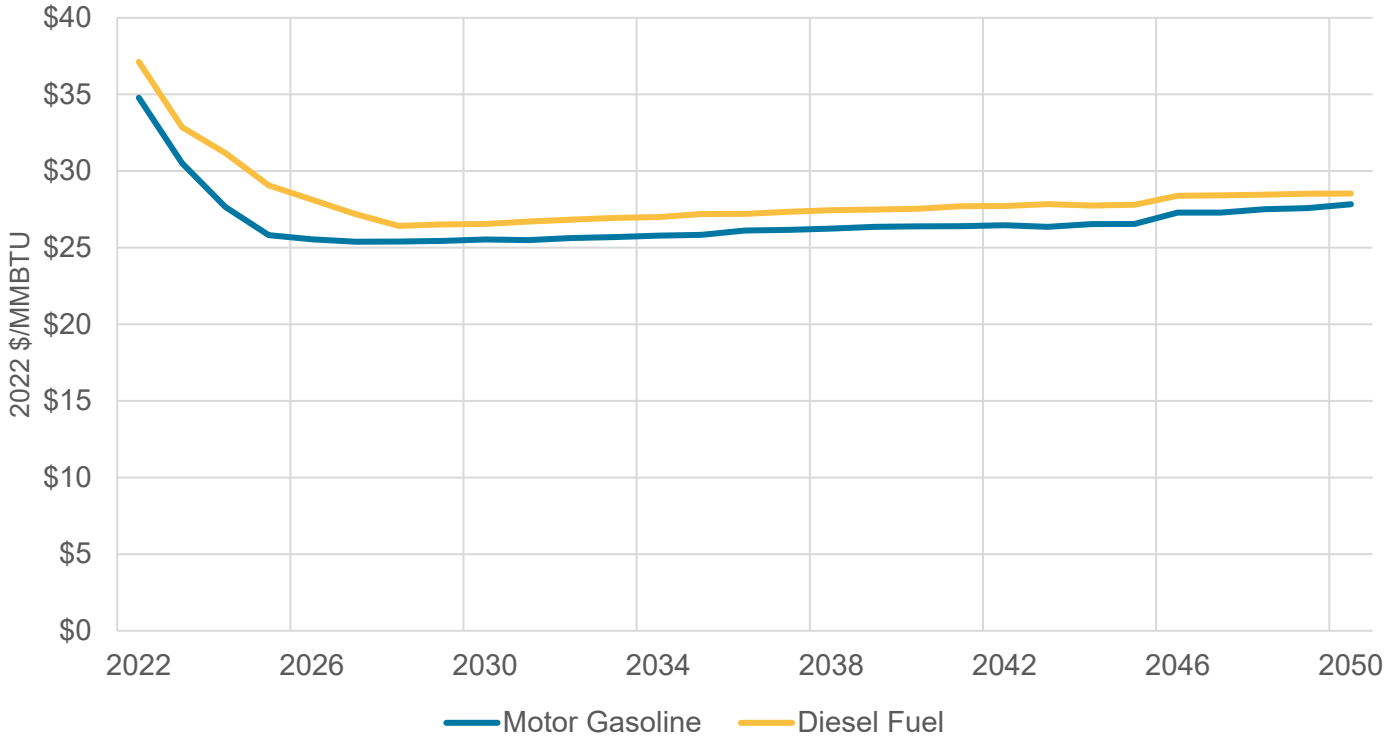
*Urbanized Area extends into adjacent state

The relative growth of VMT in urban areas suggests that passenger rail or other forms of public transportation could play a larger role in congestion mitigation and help alleviate the need to construct additional highway infrastructure in these areas, in particular the Harrisburg (parts of Dauphin, Perry, Cumberland, and York counties) and Lancaster (part of Lancaster County) urbanized areas.

Fuel Cost Trends

According to projections from the U.S. Energy Information Administration's 2023 Annual Energy Outlook, the real price of motor vehicle gasoline and diesel fuel are expected to decrease significantly (20 to 30 percent) between 2022 to 2026 before gradually rising in subsequent years (**Figure 2.69**).

Figure 2.69 Annual Fuel Costs



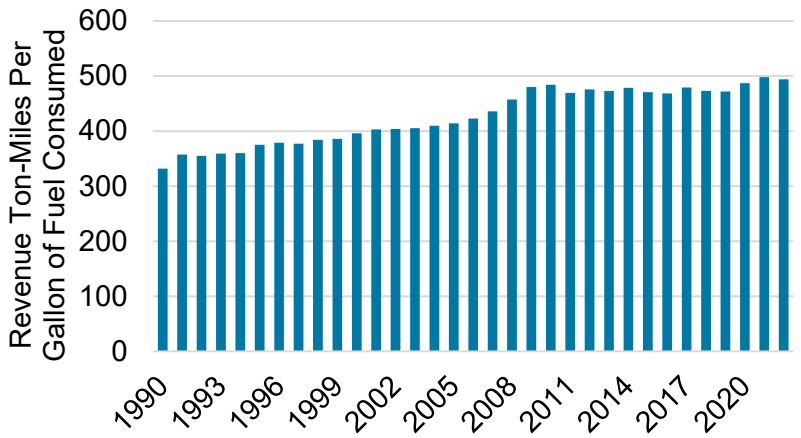
Source: U.S. Energy Information Administration Annual Energy Outlook 2023

FUEL EFFICIENCY OF RAIL AND MOTOR VEHICLES

Fuel efficiency of the Class I railroads since 1990 is displayed in **Figure 2.70**. Fuel efficiency for freight trains has improved nearly every year from 332 ton-miles per gallon in 1990 to 494 ton-miles per gallon in 2022. The most significant increase was from 1990 to 2010. Since 2018, fuel efficiency has only improved by 10 ton-miles per gallon. Fuel efficiency increased because the freight locomotive fleet became more efficient, but also as a result of railroad operating practices that monitor fuel usage and seek to lower fuel usage.

Freight rail has a much lower fuel intensity than trucking, meaning that less fuel is required per ton-mile to operate freight trains compared to trucks on the highway.

Figure 2.70 Class I Rail Freight Fuel Efficiency



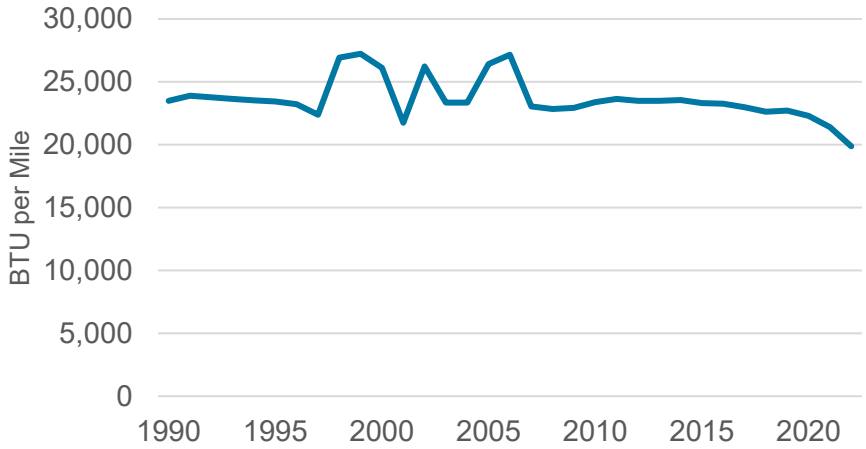
Source: United States Bureau of Transportation Statistics, 2022

A report by the FRA found that trucking ton-miles per gallon was between 68 and 133 compared to the 494 rail ton-miles shown in **Figure 2.70**.[50] Expressed as British thermal units (BTU) per mile, the efficiency of combination trucks did not follow a consistent trend through 2019. However, between 2019 and 2022, the energy intensity of combination trucks declined over 15 percent.

[50] Federal Railroad Administration, Final Report: Comparative Evaluation of Rail and Truck Fuel Efficiency on Competitive Corridors, November 19, 2009.

The USDOT Bureau of Transportation Statistics also provides the energy intensity of various passenger modes of transportation. This data, expressed in BTU per passenger-mile, is shown in **Figure 2.71**. for light duty vehicles and Amtrak rail service.

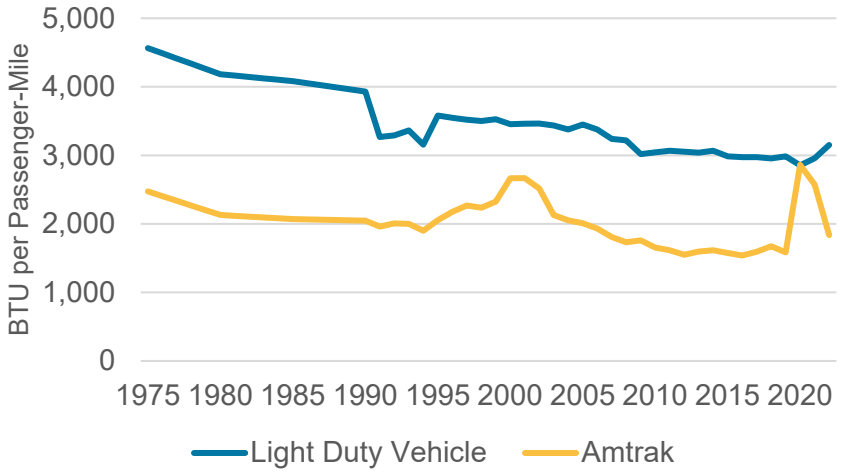
Figure 2.71 Combination Truck Energy Intensity per Vehicle Mile



Source: U.S. Bureau of Transportation Statistics

Amtrak's energy intensity (**Figure 2.72**) per passenger mile gradually decreased through the 1970s and 1980s at more than 2,000 BTU per passenger mile before spiking around year 2000 to 2,500 BTU per passenger mile, experiencing a more rapid improvement, and then spiking again during the COVID-19 pandemic to nearly 3,000 BTU per passenger mile and once again decreasing to 1,600 BTU per passenger mile in 2023. Energy intensity for light duty vehicles decreased from more than 4,500 BTU per passenger mile in 1975 to below 4,000 BTU per passenger mile in 1988, further decreasing to 3,000 BTU per passenger mile in 2015. At the onset of the COVID-19 pandemic, the energy intensity of Amtrak and light duty vehicles matched one another, though they have since diverged again, with light duty vehicles at 3,151 BTU per passenger mile and Amtrak at 1,836 BTU per passenger mile in 2022.

Figure 2.72 Passenger Mode Energy Intensity per Passenger Mile

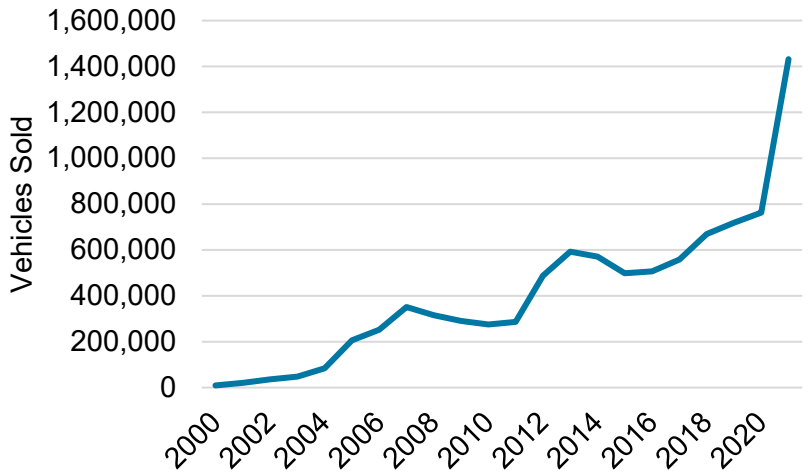


Source: USDOT Bureau of Transportation Statistics, 2024

Electric and hybrid motor vehicles have become more common in recent decades. Changes in person vehicle preferences and automotive efficiency standards have contributed to more efficient automobiles overall.

According to the U.S. Bureau of Transportation Statistics, the total number of electric vehicles sold in the United States experienced modest growth from 2018 to 2020, with a 7 percent increase from 2018 to 2019 and a 6 percent increase from 2019 to 2020, before undergoing rapid growth (88 percent) from 2020 to 2021 (**Figure 2.73**). Since 2000, electric vehicle sales have increased dramatically. Further expansion of electric vehicles will depend in part on national and international economic factors, as well as initiatives from the state and federal government.

Figure 2.73 Electric Vehicles Sold in the United States



Source: United States Bureau of Transportation Statistics, 2022

INTERACTION BETWEEN GASOLINE PRICES AND RAIL/ HIGHWAY MODAL PREFERENCES

If railroad transportation is less fuel-intensive than highway transportation, an increase in fuel prices would increase the cost advantage that rail has over highway transportation. Conversely, a decrease in fuel prices would reduce the cost advantage of rail transportation. Passengers and shippers would trend toward rail with higher fuel prices and away from rail with lower fuel prices.

Studies have investigated the correlation between gasoline prices and transit ridership, including ridership of commuter rail. Studies suggest that higher gas prices lead to an increase in commuter rail ridership and that larger increases in gas prices lead to larger increases in commuter rail ridership. For example, a 2014 study by the Mineta Transportation Institute found an increase in commuter rail ridership of between 0.90 percent and 8.25 percent depending on the extent of the increase in gas prices, with a higher price increase associated with a higher increase in ridership.[51]

CONCLUSIONS

All things equal, a projected decline in diesel and gasoline prices would tend to push passengers and freight away from rail as roadway transportation becomes relatively less expensive.[52] However, a significant share of passenger rail service in Pennsylvania uses electricity, not diesel, and energy usage by both highway and rail modes is projected to become less dependent on diesel and gasoline, which will muddle the relationship between prices of these fuels and modal preferences.

Given recent improvements in fuel economy and energy efficiency of highway modes, it will be important that rail energy efficiency continue to improve apace if rail is to maintain its emissions benefits compared to highway transportation.

[51] https://rosap.ntl.bts.gov/view/dot/28385

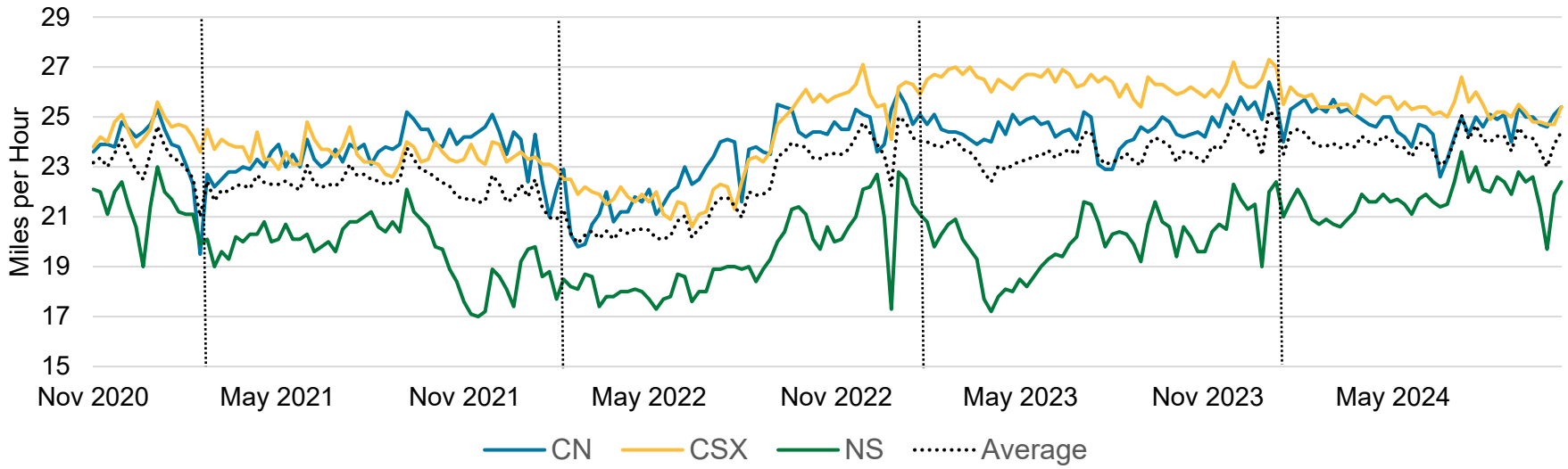
Over the next decade, Amtrak aims to reduce its greenhouse gas emissions by 40 percent. Amtrak initiatives include energy efficiency upgrades, improved train handling, and more efficient locomotives.[53] The Amtrak Airo trainset that will be operating in Pennsylvania on the Northeast Regional®, Keystone Service®, Palmetto®, Carolinian®, Pennsylvanian®, and Vermonter® routes, will be more efficient than existing trainsets, utilizing dual-mode locomotives. Similarly, freight railroads are investigating energy efficiency options, from operating existing fleets more efficiently, to using alternative fuels or battery-powered locomotives. The railroads are also employing advanced train management technologies that optimize the use of fuel.

Rail Congestion Trends

FREIGHT RAIL

The STB requires Class I rail carriers to provide weekly reports containing data on rail service performance. Higher train speeds can indicate lower congestion, although other factors may impact average trains speeds, such as shifts in network usage or train types. Average train speed for CN, CSX, and NS (the three Class I rail carriers in Pennsylvania) is shown in **Figure 2.74**. From late 2020 to mid-2024, CSX speeds nationally were consistently the highest (25 to 27 mph), while CN were slightly lower (23 to 25 mph) and NS were lowest (19 to 23 mph). **Figure 2.74** also shows the average speed of the three Class I carriers.

Figure 2.74 Average Train Speeds



Source: STB, 2024

[53] https://www.amtrak.com/looking-to-the-future#:~:text=Although%20Amtrak%20trains%20consume%20less,percent%20from%202010%20to%202030.

SHARED PASSENGER-FREIGHT RAIL LINES

During outreach for this State Rail Plan, stakeholders expressed concern that shared use corridors be well coordinated so that freight and passenger operations do not cause congestion for one another. In Pennsylvania, Amtrak passenger trains operate over corridors owned by freight railroads, including the Pennsylvanian® between Harrisburg and Pittsburgh, the Floridian℠, and the Lake Shore Limited®. Additionally, freight trains operate over Amtrak-owned corridors in Pennsylvania.

Recent research has focused on issues that arise with shared use corridors. Research by the University of Illinois examined technical problems that arise when passenger trains operate at much faster speeds than freight trains on the same corridor.[54] The faster the passenger operations and the greater number of passenger trains, the more challenges need to be overcome in terms of allocating capacity and resolving the contradictory demands (fast passenger trains and slower freight trains) on the infrastructure. Another study examined delay avoidance when adding a third track to a two-track freight railroad mainline to create capacity for passenger rail service.[55] The study found a linear relationship between delay avoidance and the percentage of triple-track corridors. A guidebook by the Transportation Research Board provides recommendations on how to identify needed capacity improvements and how to share costs.[56]

Highway and Airport Congestion Trends

HIGHWAY BOTTLENECKS

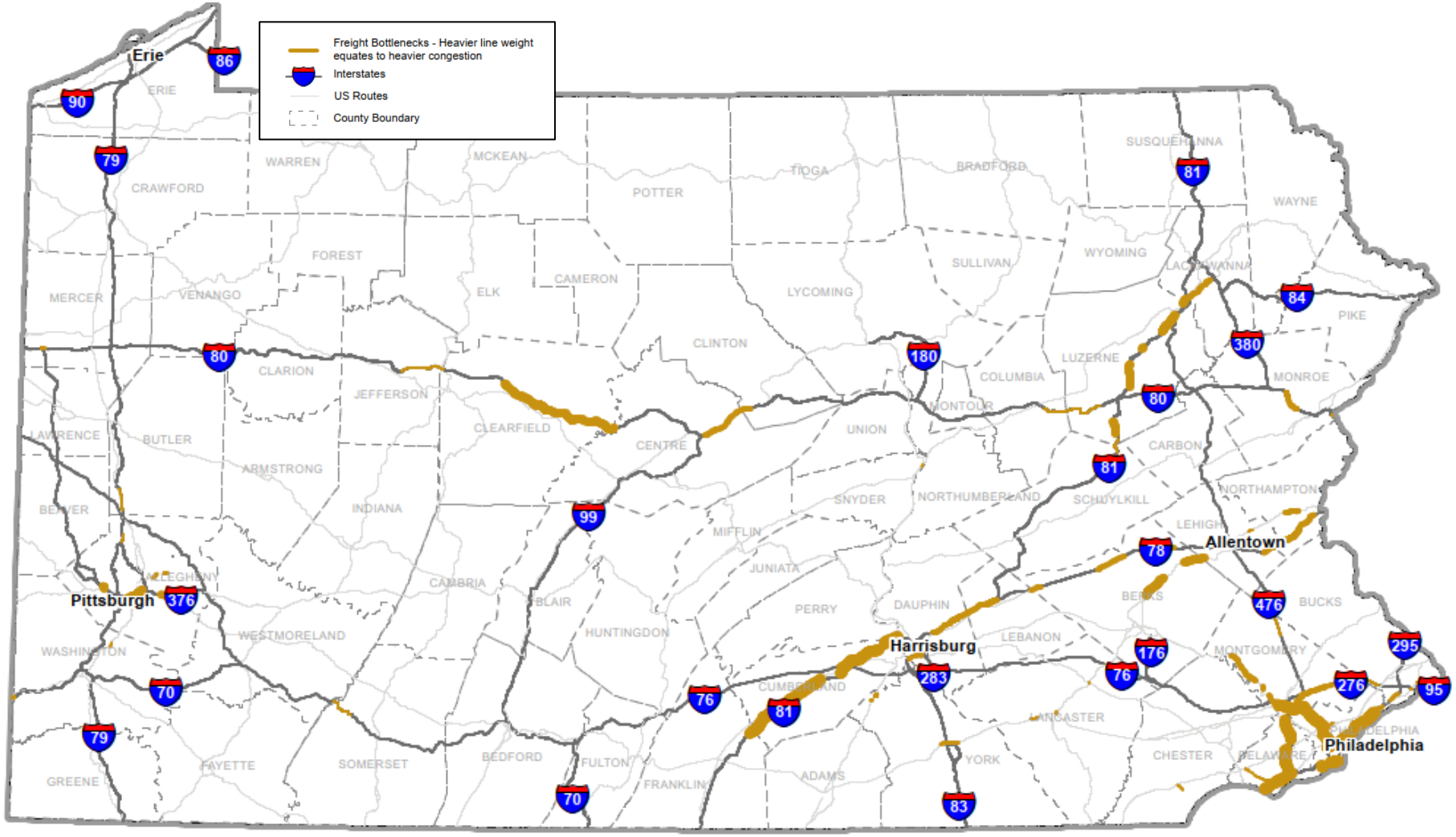
Significant recent analysis has been conducted to identify highway bottlenecks with particular emphasis on truck delay. PennDOT has evaluated truck bottlenecks for the 2045 Freight Movement Plan (released in 2021 and updated in 2023 to reflect the passage of IIJA). The top 10 highway bottlenecks are mapped in **Figure 2.75**. These bottlenecks tend to coincide with higher traffic volumes. Freight bottlenecks are located in and around Philadelphia, Harrisburg, Allentown, Scranton, and Pittsburgh.

[54] Brennan C. Caughron, M. Rapik Saat, Chrstopher P.L. Barkan of the University of Illinois at Urbana-Champaign, "Identifying and Prioritizing Shared Rail Corridor Technical Challenges", 2012, https://railtec.illinois.edu/wp/wp-content/uploads/2019/01/Caughron-et-al-2012.pdf.

[55] Ivan Atanassov and C. Tyler Dick of the University of Illinois at Urbana-Champaign, "Incremental Capacity in Transitioning from Double to Triple Track on Shared Rail Corridors," 2015.

[56] Alan J. Bing, et. al., National Academy of Science, Transportation Research Board, "NCHRP Report 657: Guidebook for Implementing Passenger Rail Service on Shared Passenger and Freight Corridors," 2010, Guidebook for Implementing Passenger Rail Service on Shared Passenger and Freight Corridors | The National Academies Press.

Figure 2.75 Freight Highway Bottlenecks



Source: 2045 Freight Movement Plan

In addition to the truck bottlenecks documented in the 2045 Freight Movement Plan, the American Transportation Research Institute collects and processes truck GPS data to locate specific chokepoints in the nation's truck network. The institute identifies three truck bottlenecks in Pennsylvania ranked in the top 100 nationwide in 2024. All three bottlenecks are in the Philadelphia region and are listed in **Table 2.16**.

Rail plays an important role in relieving highway bottlenecks by diverting freight and people from roadways to the rail network, thereby decreasing the volume of traffic that passes through Pennsylvania's roadway bottlenecks. Commuter rail such as SEPTA is particularly impactful, since people more often use commuter rail during peak hours for travel in busy metropolitan areas, decreasing traffic volumes when and where roadway capacity is needed the most.

Table 2.16 Pennsylvania Truck Bottlenecks

NATIONAL RANKING	LOCATION	AVERAGE SPEED (MPH)	PEAK AVERAGE SPEED (MPH)	NONPEAK AVERAGE SPEED (MPH)	NONPEAK/ PEAK RATIO	PEAK AVERAGE SPEED CHANGE (2022-2023)
32	I-76 at I-676	29.8	23.8	32.0	1.35	-5.4%
63	I-476 at I-95	43.8	37.5	46.4	1.24	-3.3%
64	I-76 at US 1	34.3	25.5	38.3	1.50	0.7%

Source**:** American Transportation Research Institute, 2024

AIRPORT ACCESS AND CONGESTION

There are 128 airports in Pennsylvania, 15 of which are commercial airports (**Table 2.17**).

The PennDOT Bureau of Aviation anticipates passenger enplanements to grow from 20 million in 2016 to 26.7 million in 2036, an increase of 33 percent. Enplanements are expected to increase 1.37 percent annually at Philadelphia International Airport, 1.77 percent annually at Pittsburgh International Airport, 1.45 percent annually at Harrisburg International Airport, and 1.6 percent annually at Lehigh Valley International Airport.

Table 2.17 Pennsylvania Commercial Airports

ID	NAME	COUNTY	REGION	ENPLANEMENTS (2016)	ENPLANEMENTS (2036)	PROJECTED ANNUAL GROWTH
AOO	Altoona-Blair County Airport	Blair	Altoona	1,865	2,242	0.92%
LBE	Arnold Palmer Regional Airport	Westmoreland	Pittsburgh	145,436	176,843	0.98%
BFD	Bradford Regional Airport	McKean	None	2,623	3,317	1.18%
DUJ	Dubois Regional Airport	Jefferson	None	2,934	3,408	0.75%
ERI	Erie International/ Tom Ridge Field	Erie	Erie	87,647	103,200	0.82%
MDT	Harrisburg International Airport	Dauphin	Harrisburg	586,936	783,426	1.45%
JST	John Murtha Johnstown-Cambria County Airport	Cambria	Johnstown	4,193	4,726	0.60%
LNS	Lancaster Airport	Lancaster	Lancaster	4,226	3,751	-0.59%
ABE	Lehigh Valley International Airport	Northampton	Allentown	324,151	444,869	1.60%
PHL	Philadelphia International Airport	Delaware	Philadelphia	14,521,408	19,058,961	1.37%
PIT	Pittsburgh International Airport	Allegheny	Pittsburgh	3,953,440	5,611,647	1.77%
UNV	University Park Airport	Centre	State College	134,266	190,951	1.78%
FKL	Venango Regional Airport	Venango	None	2,025	3,683	3.04%
AVP	Wilkes-Barre/ Scranton International Airport	Luzerne	Scranton	232,850	319,309	1.59%
IPT	Williamsport Regional Airport	Lycoming	Williamsport	19,312	25,266	1.35%

Source: Pennsylvania Statewide Airport System Plan Volume II, 2016 Philadelphia International Airport

Philadelphia International Airport is the busiest airport in Pennsylvania and is the only airport in the state directly served by passenger rail. Passenger data for 2019 and 2023 was obtained from Airport Activity Reports and is shown in **Table 2.18**.

SEPTA's Airport Line serves all major terminals at Philadelphia International Airport. Service travels through the Center City Commuter Connection, stopping in Center City and providing connections to various regional rail, rapid transit, bus, trolley, and Amtrak routes. No plans are anticipated at this time for other airports in Pennsylvania to be served by passenger rail. The Middletown Amtrak station is just two miles from Harrisburg International Airport and is accessible by public bus, taxis, and ride-sharing services.

The Philadelphia International Airport Master Plan Update (anticipated to be completed in 2025) includes an Alternatives Development & Evaluation. The preferred terminal concept includes a consolidated SEPTA station within the terminal building, providing passengers a simplified and more convenient transit experience. This new station would replace the existing four on-site stations. Current SEPTA service runs every 30 minutes, but future capital improvements could allow for 15- to 20-minute headways (if capital/operating costs are secured).

As described in a 2022 report of the largest passenger origin and destination markets, the top locations for passengers using Philadelphia International Airport are Orlando (2,233 daily passengers), Atlanta (1,166 daily passengers), Miami (912 daily passengers), Fort Lauderdale (903 daily passengers), and Los Angeles (896 daily passengers). Domestic and international destinations within 500 miles (a distance amenable to intercity rail) include Boston (618 daily passengers), Charlotte (472 daily passengers), Raleigh (301 daily passengers), Toronto (151 daily passengers) and Montreal (61 daily passengers). Rail can compete with aviation in some, such as to and from Boston. For others, the significant difference in transit time due to current infrastructure and timetables makes rail service uncompetitive with air, thus limiting the extent that rail could serve as a substitute for aviation.

Table 2.18 Philadelphia International Airport

ACTIVITY	2019	2023	CHANGE
Domestic Passengers	28,936,512	24,511,411	-15%
International Passengers	4,082,374	3,620,561	-11%
Air Mail (Tons)	28,495	38,472	35%
Air Freight (Tons)	579,005	485,442	-16%

Source: Philadelphia International Airport Aviation Activity Reports, December 2019 and December 2013

Land Use Trends

Changes in land use across Pennsylvania influence the demand for passenger and freight rail, as well as how rail interacts with surrounding communities. A report from Pennsylvania State University's College of Agricultural Sciences in 2001 identifies that one challenge to land use is that Pennsylvania has 2,600 municipalities, which are responsible for land use decisions. Therefore, land use decisions are widely dispersed, and policies, processes, and goals may not be aligned among jurisdictions.[57] Data from a 2020 State Land Use and Growth Management Report shows Pennsylvania land cover acreage for 2011 and 2016 (most recently available) in **Table 2.19**. Of note is the increase in developed land cover. As previously undeveloped land is developed, it has the potential to create conflicts or support the rail network. Highway-rail grade crossings with previously low utilization become busier, increasing the potential for crashes and inconvenience to roadway users, and train horns and other rail-related noise that had not previously been an issue become so as more people are located near train tracks. On the other hand, development could create demand for railroad services.

Table 2.19 Land Cover

LAND COVER	ACRES (2011)	ACRES (2016)	CHANGE	CHANGE
Open Water	340,987	335,704	-5,283	-1.55%
Developed, Open	2,008,518	2,011,408	2,890	0.14%
Developed, Low	909,343	919,835	10,492	1.15%
Developed, Med	412,995	426,255	13,260	3.21%
Developed, High	175,806	181,756	5,950	3.38%
Barren Land	131,306	130,937	-368	-0.28%
Deciduous Forest	13,292,546	13,274,108	-18,438	-0.14%
Evergreen Forest	549,267	547,708	-1,560	-0.28%
Mixed Forest	3,837,731	3,848,209	10,478	0.27%
Shrub/Scrub	276,878	305,664	28,786	10.40%
Grassland/Herbaceous	264,442	220,449	-43,993	-16.64%
Pasture/Hay	3,777,359	3,711,784	-65,575	-1.74%
Cultivated Crops	2,515,110	2,572,239	57,129	2.27%
Woody Wetlands	434,552	437,909	3,358	0.77%
Emergent Herbaceous Wetlands	64,610	67,845	2,876	4.45%

Source: 2020 State Land Use and Growth Management Report

[57] https://planningpa.org/wp-content/uploads/10.-How-Effective-is-Land-Use-Planning-in-PA.pdf

3. Proposed Passenger Rail Improvements and Investments

Chapter 3 describes a range of proposed passenger rail projects to upgrade existing infrastructure and operations, in addition to providing new infrastructure, new services, and other capital projects to improve Pennsylvania's future passenger rail network. Both intercity passenger rail and commuter rail projects are identified in this chapter, as well as conceptual proposals for improved or expanded passenger rail service. Also included are general passenger rail-related issues that were identified by stakeholders during the development of this rail plan.

3.1 PROJECT IDENTIFICATION

Infrastructure projects identified for this chapter have been categorized by the primary passenger rail corridors in Pennsylvania. These include:

- **Keystone East.** This corridor is a connecting corridor to the Amtrak NEC. Projects that are on the NEC mainline, which passes through Pennsylvania between Delaware and New Jersey, are characterized as "NEC," and projects between Philadelphia and Harrisburg are categorized as "Keystone East." The primary source of information regarding projects on this corridor is the Keystone Master Plan, which is a joint planning effort between PennDOT, Amtrak, and SEPTA. Some projects are also carried forward from the 2020 Pennsylvania State Rail Plan (2020 Rail Plan). These include the reconstruction or rehabilitation of PennDOT roadway/bridges over the Keystone East line.
- **Keystone West.** This corridor refers to the NS-owned rail line between Harrisburg and Pittsburgh, over which the Pennsylvanian® provides passenger rail service. The primary source of projects is a program of investments sponsored by PennDOT to support an additional roundtrip train.

- **NEC.** Projects on the NEC mainline have been identified through SEPTA and capital planning by the Northeast Corridor Commission. Other projects have been carried forward from the 2020 Rail Plan, such as several roadway/bridge overpasses over the NEC.
- **SEPTA.** Projects exclusively on SEPTA lines beyond the Keystone East corridor and the NEC have been provided by SEPTA. There are relevant SEPTA projects on shared lines that are counted in the Keystone East and NEC corridor categories. As of late 2024, SEPTA has prepared a draft Reimagining Regional Rail Master Plan, which includes planning-level cost estimates to inform future project planning. In addition, SEPTA has provided direct input to short- and long-term projects based on the FY2026 Capital Budget, Reimagining Regional Rail Master Plan, NEC Commission, and guidance from the SEPTA planning department.

Table 3.1 summarizes passenger rail projects by corridor and category. The projects shown in the SEPTA category in **Table 3.1** are only those that are exclusively on SEPTA assets and not co-located on Keystone East or the NEC. (A summary of all SEPTA projects for all corridors is provided later in **Table 3.3**.) For the purpose of the Pennsylvania State Rail Plan, corridor projects are further subdivided into short-term and long-term categories. “Short-term” is defined as any project where the start date comes before or during the year 2029. Any project starting after 2029 is defined as long term. In some cases, projects may start before 2029 but remain underway for a longer period of time. **Table 3.2** summarizes passenger rail projects applying these short-term and long-term definitions.

Three of the “visionary projects” identified in the 2020 State Rail Plan—including the Keystone Corridor, Reading-Philadelphia-New York Corridor, and the Scranton to New York Penn Station Corridor—were recently selected by the FRA to be included in the Corridor ID Program and are discussed below in Section 3.3.

Table 3.1 Passenger Rail Project Categories by Corridor

CORRIDOR	PROJECT CATEGORY	NUMBER OF PROJECTS	TOTAL ESTIMATED COST (MILLIONS $)
Keystone East	Infrastructure	26	$2,802
	Stations	28	$590
	Bridges	15	$224
	Rolling Stock	0	$0
Keystone West*	Infrastructure	11	$212
	Stations	8	$64
	Bridges	0	$0
	Rolling Stock	0	$0
NEC	Infrastructure	14	$2,772
	Stations	8	$2,047
	Bridges	10	$124
	Rolling Stock	2	$67
SEPTA	Infrastructure	59	$5,249
	Stations	24	$2,996
	Bridges	7	$706
	Rolling Stock	4	$2,281
Total		**217**	**$20,134**

* Keystone West cost is based on 2022 program estimate to support second frequency of the Pennsylvanian train.

Table 3.2 Passenger Rail Project Summary 2025-2050

PROJECT TIMEFRAME	NUMBER OF PROJECTS	TOTAL ESTIMATED COST (IN MILLIONS OF DOLLARS)
Short Term	126	$9,394
Long Term	91	$10,740
Total	**217**	**$20,134**

(1) Includes projects that do not all have associated costs.

3.2 AMTRAK AND INTERCITY PASSENGER RAIL PROJECTS

Keystone East

The Keystone East Corridor, between Harrisburg and Philadelphia, is a connecting corridor to the NEC and is owned by Amtrak. Key projects on the Keystone East Corridor (described in more detail in Appendix E) include:

- ZOO Interlocking
- Downingtown Early Action (includes DOWNS Interlocking removal)
- Downingtown Station and Bridge
- Coatesville Station
- Parkesburg Station Early Action
- Parkesburg High Level Platforms
- Lancaster Pedestrian Bridge
- Elizabethtown Parking Management (adjacent to right-of-way)
- Harrisburg Cooling Tower (adjacent to ROW)

In addition, other major station improvement projects, including high-level platform improvements, are planned for the following Amtrak and SEPTA stations along the Keystone East Corridor: Gray 30th Street, Ardmore, Malvern, Harrisburg, Overbrook, Merion, Narberth, Wynnewood, Haverford, Bryn Mawr, Rosemont, Villanova, Radnor, St. Davids, Strafford, Devon, Berwyn, Daylesford, Paoli, Whitford, Thorndale, and Lancaster (as capital funding becomes available).

FEATURED PROJECT: ZOO INTERLOCKING IMPROVEMENTS (ONGOING)

PennDOT District: District 6

Project Location: Philadelphia

Affected Railroad(s): Amtrak, SEPTA, NJ TRANSIT, CSX

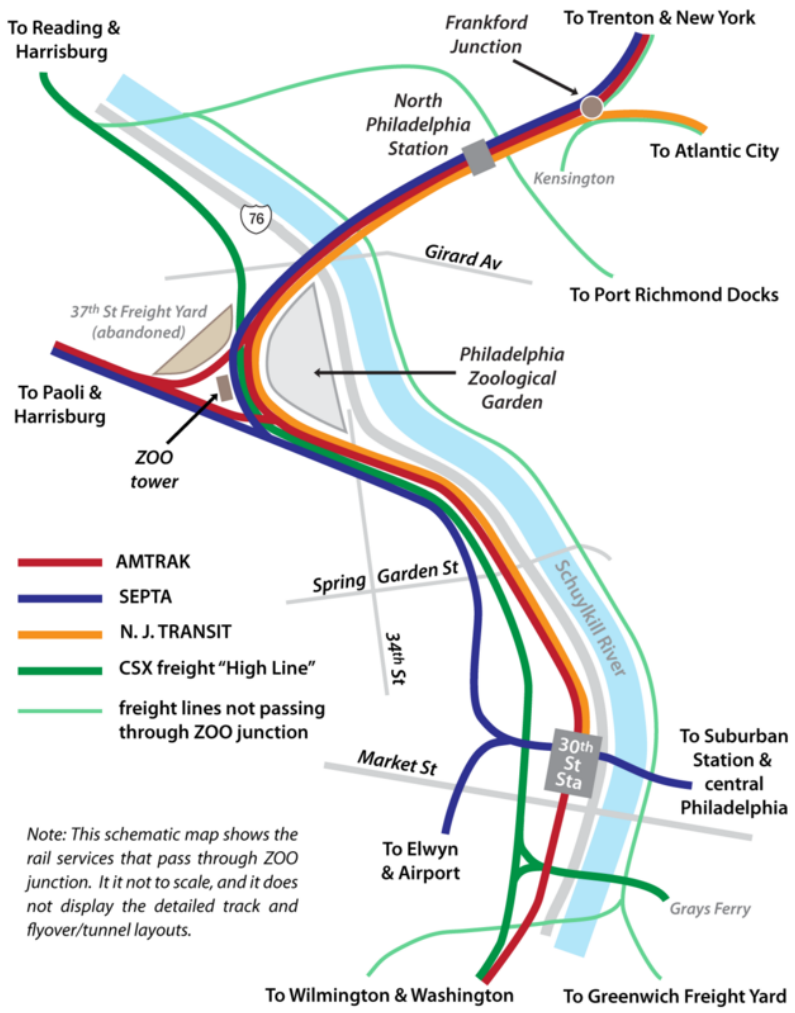
Approx. Capital Cost: $55 million (early action projects)

Project Description

One of the most critical improvements on the NEC in Pennsylvania is the improvement of the ZOO Interlocking. This project will allow increased train volumes and reduced trip times for Amtrak Keystone and NEC trains as well as SEPTA's Trenton, Paoli, and Chestnut Hill West lines. It will also further reconfigure the ZOO Interlocking area to allow higher train volumes, eliminate train delays, and reduce running times while also reducing overall maintenance costs.

Short-range projects include $55 million in federal funding (FTA and FRA), state, and local funding to improve the interlocking including signal cable replacement, drainage, tie renewal, etc.

The project is necessary to maintain hourly Amtrak service, support 15-minute SEPTA service to Villanova (proposed), and reduce delays to all other trains moving through ZOO. Potential future phases of the project may include increased speeds between Paoli and Exton to 110 mph and increase speeds within the 36th Street connection to 60 mph.



FEATURED PROJECT: NEW DOWNINGTOWN PASSENGER RAIL STATION IMPROVEMENTS

PennDOT District: District 6

Project Location: Downingtown

Affected Railroad(s): Amtrak, SEPTA

Approx. Capital Cost: $200 million

Project Description

The existing Downingtown Station is located along the Keystone East Corridor in Downingtown, Pennsylvania. The existing station location is constrained by limitations of available land and track geometry. The superelevation and curvature of the tracks make it impossible to provide high-level platforms and achieve modern ADA standards at the existing station location. The new Downingtown Station will replace the existing station and relocate it approximately a half mile to the east where the Keystone Corridor crosses US Route 322 (Brandywine Avenue). This location was selected as it is one of the few areas in the Downingtown Borough area that has sufficient straight track. The new station will continue to serve both Amtrak and SEPTA Regional Rail service. PennDOT is leading the project with funding by the FTA.

Early action project phases include catenary foundation installation, utility relocation, and the removal of DOWNS Interlocking (track crossovers) which began in 2025. The proposed Downingtown Station and US 322 Bridge Project has a three-year construction duration with construction expected to begin in 2026.

The proposed Downingtown Station will have parking in each of the four quadrants of the crossing of US 322 and the Keystone Corridor. The additional parking lots will provide approximately 480 parking spaces, a significant increase in customer-dedicated parking over the existing station. Bike racks will also be provided in each of the four project quadrants.

The new station will have high-level platforms that allow for level boarding of the trains and meet ADA standards. Each quadrant will have an elevator and stair tower to provide direct pedestrian access from each of the parking lots to the proposed platforms, eliminating the need for pedestrians to cross US 322 at grade.

FEATURED PROJECT: LANCASTER STATION IMPROVEMENTS

PennDOT District: District 8

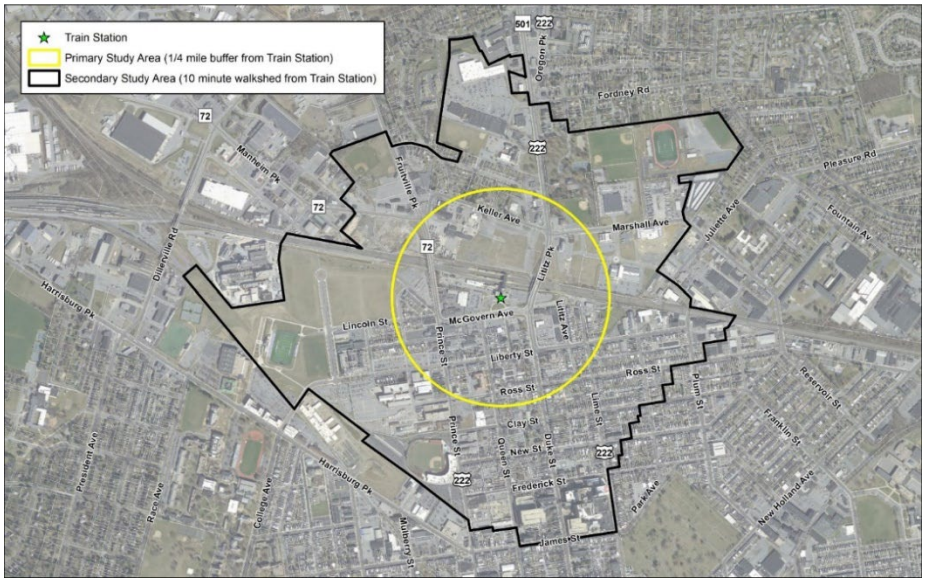
Project Location: Lancaster

Affected Railroad(s): Amtrak

Approx. Capital Cost: $22 million

Project Description

The Lancaster Pedestrian Bridge project, currently under construction, will provide a new pedestrian bridge connecting the newly constructed Keller Avenue parking lot to the existing Lancaster station. The Pedestrian Bridge will be constructed over the railroad tracks and will also feature an elevator and stair tower on the parking lot end of the bridge. The project will create a new accessible connection to accommodate growing ridership and be fully compliant with ADA requirements. The $22.0 million project is being funded with PennDOT and FTA funds.



Lancaster ridership in 2024 was 464,190, which ranks it as the second busiest passenger rail station in Pennsylvania. Only Philadelphia's Gray 30th Street Station serves more rail passengers. The Amtrak-owned station serves both Keystone Service® trains and the Pennsylvanian®.

The Lancaster station, built by the Pennsylvania Railroad, opened in 1929 in the northern section of the city, about a mile from downtown. In 1998, a Lancaster Regional Transportation Station Master Plan was completed which called for numerous interior and exterior repairs and enhancements. In 2003, a plan was drafted that included the creation of additional parking, a separate waiting area for bus passengers, commercial spaces and new Amtrak offices, as well as upgrades to the station's heating system, installation of an air conditioning system and the realignment of the station's driveway to meet North Duke Street.

Following design review and permitting, PennDOT and the Lancaster County Transportation Coordinating Committee approved $12 million in federal, state and county funding for the project, and construction began in 2009. As the project neared completion in 2013, Amtrak, PennDOT, the Lancaster County Planning Commission and the Lancaster County Transportation Authority launched the "Capstone" project to address rehabilitation of the passenger areas and improvements to the exterior stairways and platforms.

Federal grants supported many of these earlier station improvements, which all together cost approximately $17.7 million. These included the FTA's Bus and Bus Facilities program, which advances intermodal transportation, provided $3 million. An additional $7.2 million, matched with $1.4 million in local funds, came from the Federal Highway Administration (FHWA) Transportation Enhancements program, which promotes the rehabilitation of historic transportation facilities. Lancaster County, Amtrak, and PennDOT also contributed significant funding towards the multi-year project.

Keystone West

The Keystone corridor traverses nearly the entire state of Pennsylvania and carries both freight and passenger traffic. The portion of line known as Keystone West runs between Harrisburg and Pittsburgh and is owned by NS.

PennDOT, Amtrak, and NS are currently coordinating to improve and expand the state-supported Pennsylvanian® service between Pittsburgh and New York City. NS will complete 11 infrastructure projects on Keystone West to reduce delays and improve operational capacity on the line, with the bulk of work occurring between Harrisburg and Altoona, where rail traffic is the most congested. This program of projects has an anticipated completion date of 2030. Four of these projects are underway to support the additional Pennsylvanian® train, which is expected to begin operating in 2026.

In December 2023, Pennsylvania Governor Josh Shapiro announced over $143 million in federal passenger rail funding was approved through the FRA Federal-State Partnership for Intercity Passenger Rail grant program and the Corridor ID Program, which will support the expansion of passenger rail along the Keystone West corridor.[58]

[58] Keystone West - Advancing PA Rail

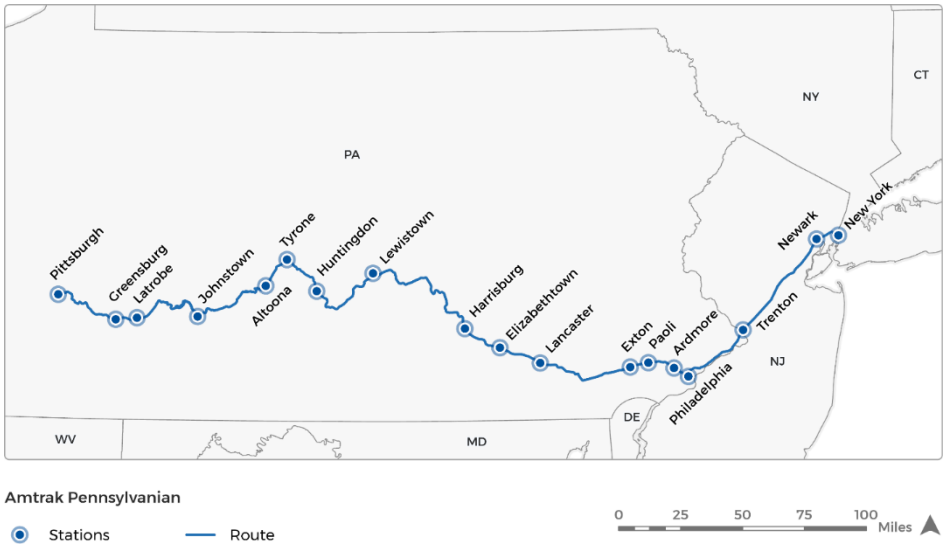
FEATURED PROJECT: SECOND PENNSYLVANIAN® DAILY TRAIN

PennDOT District: District 6, 8, 2, 9, 10, 11, and 12

Project Location: Keystone West Corridor

Affected Railroad(s): NS, Amtrak

Approx. Capital Cost: $220.7 million



Project Description

The last time Amtrak had two trains in each direction between Lancaster City and Pittsburgh was 2005, before the Three Rivers train from New York City to Chicago was discontinued. However, PennDOT and NS have reached an agreement to add a second daily round-trip train between New York City and Pittsburgh. The additional Pennsylvanian® train trips are scheduled to begin in 2026.

An analysis by NS in 2021 concluded that the existing Keystone corridor between Harrisburg and Pittsburgh could not accommodate an additional train without creating unacceptable delays for both Amtrak and freight trains. The study identified upgrades that would reduce the delays caused by the additional passenger train and accommodate future growth in NS freight traffic. These improvements include upgraded rail lines, sidings and communications infrastructure, and will be constructed and maintained by NS.

PennDOT will fund NS infrastructure and safety improvement projects on the NS-owned part of the corridor between Harrisburg and Pittsburgh to support Amtrak's additional daily roundtrip Pennsylvanian® train service. PennDOT was awarded a $143 million Federal-State Partnership (National) Grant in December 2023 to support proposed improvements on the NS-owned portion of the corridor.

Amtrak trains make the round trip between New York City and Harrisburg 14 times per day. Of those, only one eastbound and one westbound train currently serve stations west of Harrisburg, including Pittsburgh.

Amtrak's Next-Generation Equipment

Amtrak has two outstanding procurements for two new equipment types that will see service in Pennsylvania: (1) Next Generation Acela® Trainsets, and (2) Airo Trainsets. Details on the procurement, timing, features, and service lines to where this equipment will see Pennsylvania deployment are outlined below.

Next Generation Acela® Trainsets

Amtrak ratified a $2.45 billion contract with Alstom for the delivery of 28 next-generation Acela high speed trainsets in 2016. The new trainsets will ultimately replace the first-generation Acela equipment, built between 1998 and 2001 jointly by Alstom and Bombardier. The 20 first-generation trainsets introduced the premium Acela service product to the Northeast Corridor and after nearly 25 years of operation, will be phased out as the next generation equipment arrives and is certified for revenue operation.

The next generation Acela equipment will operate on the NEC between Boston, New York, Philadelphia, and Washington, DC, stopping in Pennsylvania at Philadelphia. The equipment will only be used for the Acela® service line brand, and will not be used on Northeast Regional®, Long Distance, or other state supported routes.

The next generation Acela trainsets will offer an array of improvements over the first generation equipment, including: (a) Maximum operational speeds of 186 mph versus 160 mph, although the new equipment will be limited to 160 mph until improvements are made to NEC infrastructure, (b) 27% increase in passenger capacity (386 versus 304) with 9 passenger cars and an option to expand up to 12 cars, (c) High speed 5G enabled Wi-Fi, (d) Power outlets, including USB at every seat (not available at every seat on 1st-gen), (d) Enhanced ADA features, (d) Panoramic window, (e) Contactless restrooms, (f) LED ambient lighting as well as other features.

As of plan publication, Amtrak is actively booking reservations for the first next generation trainsets operating on the public timetable set to begin on August 28, 2025. Five trainsets will initiate the first deployment round, with the remaining 20 arriving by 2027.

Airo Trainsets:

The Airo trainsets are bidirectional and offer dual power modes, allowing for seamless transition between diesel engines and overhead electric power. This eliminates the need for engine changes, particularly for the Pennsylvanian service, and will allow this service to operate under electric propulsion between Harrisburg and 30th Street station.

The Airo trainsets will also provide improved passenger amenities, including modern, comfortable seating, spacious restrooms, and a redesigned Café Car offering more contemporary food choices and self-service options and lifts for wheelchair users and people with reduced mobility. Amtrak Airo trains will come with inductive hearing technology to assist with onboard announcements.

The new trains are more fuel efficient and produce 90 percent less particulate emissions in diesel operations than existing equipment.

Final test results must be approved by the FRA before the new equipment can be put into service along the NEC. The new fleet is expected to start service in 2026 on Amtrak's west coast Cascades route, with the next set of trainsets coming to the NEC later that year.

NEC MAINLINE IN PENNSYLVANIA

In addition to improvements on the Keystone East and Keystone West corridors, are proposed improvements on the NEC mainline. As of 2025, the most recent plan that outlines NEC goals and infrastructure requirements is CONNECT NEC 2037 (C37), published in November 2023. The plan kicks off what the NEC Commission calls a "historic era of reinvestment in the NEC which will provide faster, more frequent, more reliable service" on the corridor.[59] The NEC Capital Investment Plan translates the CONNECT 15-year vision to a project-level implementation plan for the next five years.[60]

In Pennsylvania, C37 identifies several projects in five-year increments over the next 15 years, including the following:

- 30th Street West Catenary Replacement
- Penn Coach Yard Intercity Trainset Maintenance Facility
- Philadelphia 30th Street District Plan
- Harrisburg Line Track 2 Restoration between Paoli and Frazer
- Mid-Atlantic Overhead Catenary System Replacement between ZOO and Paoli
- Keystone Interlocking Improvements
- Harrisburg Line Signal Upgrade: Park to ZOO

Approximately one third of funding is expected to come from the Federal-State Partnership for Intercity Passenger Rail grant program. The remainder of funding is anticipated to come from federal discretionary grants, and state and local funding.

Figure 3.1 NEC Mainline, Branches, and Connecting Commuter Rail Systems

Source: NEC Commission

[59] CONNECT NEC 2037 | NEC Commission
[60] 2024-12-17_FY25-29-CIP_FINAL-WEB.pdf

FEATURED PROJECT: PHILADELPHIA'S 30TH STREET STATION IMPROVEMENTS

PennDOT District: District 6

Project Location: Philadelphia

Affected Railroad(s): Amtrak, SEPTA, NJ TRANSIT

Approx. Capital Cost: $1 billion

Project Description

Philadelphia's Gray 30th Street Station was originally constructed in 1933, with renovations in 1984 and 1990-1991. The station is the third busiest Amtrak station in the United States, serving 4.2 million passengers in 2023. All Amtrak, SEPTA, and NJ TRANSIT trains serving the Philadelphia area serve 30th Street Station. The 30th Street Station District Plan has identified numerous phases of improvement over the next 25 years to accommodate the expected growth in ridership on Amtrak, SEPTA, and NJ TRANSIT trains.

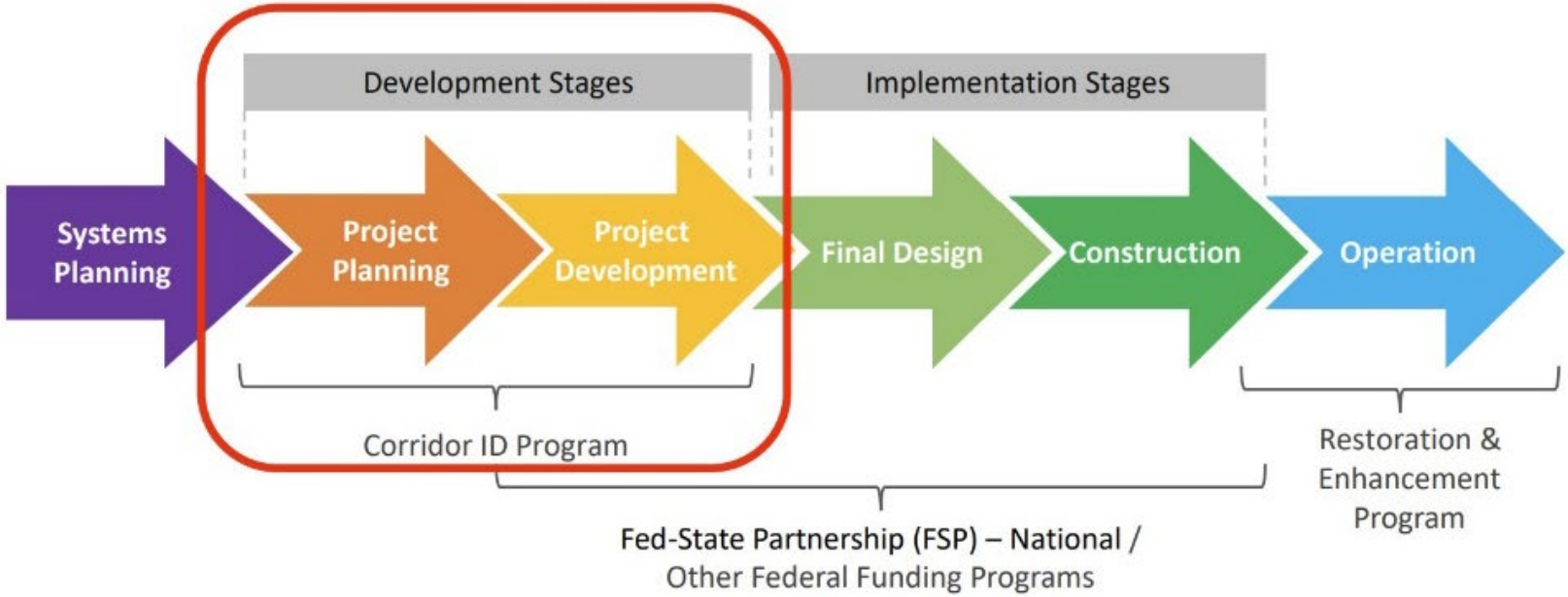
The various work to be completed at the station will focus on improving customer experience for Amtrak, SEPTA and NJ TRANSIT customers, enhancing the station's functionality, improving intermodal connections, and expanding capacity of concourses. An early action component of the project is to upgrade all the lighting on platforms two and three. The cost of this lighting project is $20 million and it is expected to be completed in March 2029.

The benefits of the overall project include modernizing station operations, enhancing safety for passengers utilizing the station, improving pedestrian circulation and wayfinding, improving building and surrounding area aesthetics, adding landscape and public space upgrades, and expanding the station's food, beverage and retail offerings. The project is expected to create an additional 3,000 direct and indirect jobs.

3.3 CORRIDOR IDENTIFICATION AND DEVELOPMENT PROGRAM (CID)

The FRA defines six stages in a passenger rail project lifecycle, outlined in **Figure 3-2**, to help guide project sponsors. The CID Program provides funding for the development stages of a project, including project planning and preliminary design activities.

Figure 3.2 FRA Project Lifecycle Stages and Corresponding FRA Funding Programs

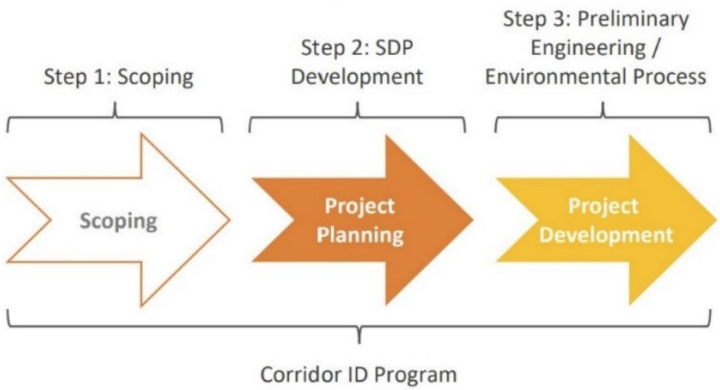


Source: FRA

The FRA's CID Program is a comprehensive intercity passenger rail planning and development program that helps guide intercity passenger rail investment throughout the country and create a pipeline of projects ready for implementation.

The Corridor ID Program has three distinct development stages as shown below in **Figure 3.3**.

Figure 3.3 Corridor ID Program Development Stages[61]



Source: FRA

Step 1: Scoping

Step 2: Completion of a Service Development Plan

Step 3: Preliminary Engineering/Environmental Process

The Corridor ID process is a structured approach to developing intercity passenger rail systems, with each stage building upon the previous one to ensure thorough planning and feasibility analysis. In Step 1, the corridor's goals, needs, and project feasibility are determined, allowing for a comprehensive understanding of the benefits of the proposed project. Step 2 involves the creation of detailed plans for rail service, addressing operational and infrastructure requirements, service patterns, and cost analysis. Finally, Step 3 includes the technical design and environmental evaluations necessary to bring the project closer to construction. Each step ensures that rail systems are not only feasible but also sustainable and able to meet regional transportation needs.

The FRA is authorized to allocate up to 5 percent of Federal-State Partnership (FSP) funding, for which total appropriation is $36 billion ($36 billion x 5 percent = $1.8 billion) to the CID Program. Of the $1.8 billion, the FRA will allocate up to $800 million for selected corridors to complete Steps 1 and 2 and will reserve the remaining $1 billion in funding for corridors moving into and / or selected for Step 3.

The FRA awards the applicant of a selected corridor up to $500,000 for eligible Step 1 activities. Subsequent individual awards for Step 2 and Step 3 activities have no predetermined minimum or maximum dollar thresholds. As of January 2025, Step 1 funding has been obligated for 66 corridors (65 through Corridor ID funding and 1 through a CRISI grant), and Step 2 funding has been obligated for four corridors, including the Scranton-to-New York Penn Station corridor. As of August 2025, about $90 million was obligated for Step 1 and 2.[62]

CORRIDOR ID PROJECTS IN PENNSYLVANIA

Keystone Corridor: Pittsburgh to Philadelphia

This Corridor ID project includes improvements to the existing Keystone Corridor between Philadelphia and Pittsburgh via Lancaster, Harrisburg, Altoona, Johnstown, and other intermediate points by adding frequencies (including at least one additional daily round-trip between Harrisburg and Pittsburgh), reducing end-to-end travel time, and improving reliability.

This Corridor ID project differs from the other three in Pennsylvania in that this project identifies improvements to an existing passenger rail route rather than establishing a new route or reinstating previous passenger rail service. PennDOT is the corridor sponsor.

[61] FRA Program Delivery Workshop, July 2024, Washington, DC.

[62] https://railroads.dot.gov/elibrary/fras-corridor-id-obligation-status-report

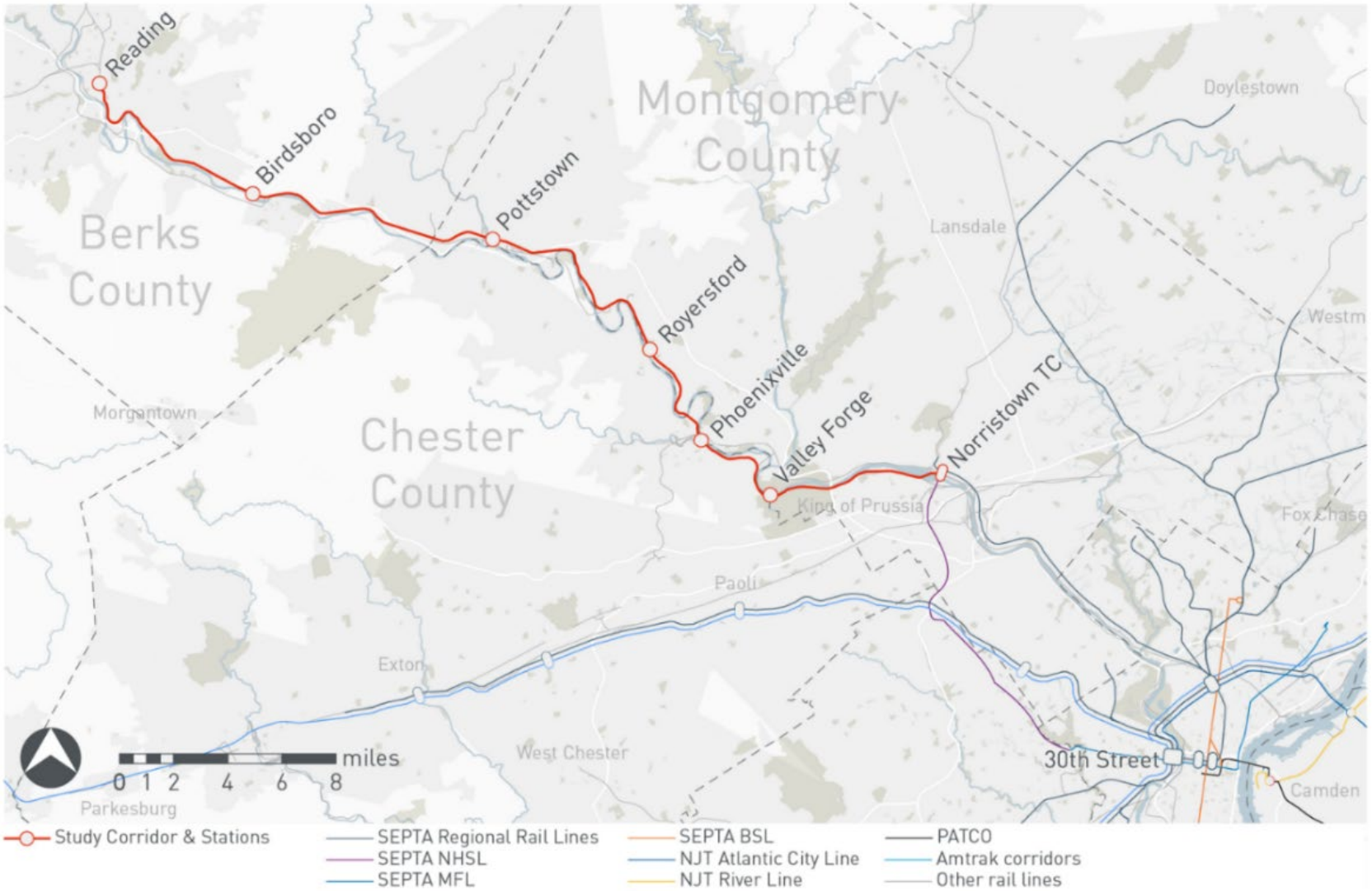
Reading - Philadelphia - New York Corridor

This proposed corridor would connect Reading with Philadelphia and New York City with intermediate stops at Pottstown, Phoenixville, and potentially Norristown, then incorporate the NEC for the connection between Philadelphia and New York (**Figure 3.4**) on an existing alignment that last hosted passenger trains in 1983. Based primarily upon the results of a study in 2020 sponsored by the Berks Alliance and the Greater Reading Chamber Alliance, as well as a study completed by PennDOT that same year, the Counties of Berks, Chester and Montgomery incorporated the SRPRA in June 2022. The SRPRA envisions an initial phase consisting of between four and eight daily Amtrak-operated intercity round trips between Reading and Philadelphia, and a later phase that would provide for a one-seat-ride between Reading, Philadelphia and New York. The later phase would require deployment of dual powered rolling stock as well as completion of the Gateway Projects in the New York area, currently anticipated circa 2035. The initial phase is targeted for implementation by as early as 2029.

The SRPRA project was accepted in the FRA's CID Program in December 2023, and Step 1 work commenced in March 2024. Step 1 work was characterized by FRA as complete in early June 2025, with advancement into Step 2 of the CIDP anticipated during the summer of 2025.

The route between Reading and Philadelphia consists of a portion of the NS Harrisburg Division between Reading and Bridgeport, and a combination of NS, CSX, SEPTA and/or Amtrak between Bridgeport and 30th Street Station in Philadelphia, depending upon which of three alternative alignments are selected in that segment. The route consists almost completely of double track, is in FRA Class IV condition with both tracks bi-directionally signaled, and the entire route is PTC equipped. Because none of the previous studies are precisely consistent with the current plan in terms of mode, alignment and other features, the SRPRA's CID Program Step 2 effort is anticipated to provide new insight into potential ridership, required infrastructure improvements to provide increased capacity and flexibility, capital and operating and maintenance costs, and potential environmental issues.

Figure 3.4 Proposed Rail Service Corridor to Reading[63]



Source: PennDOT, Reading to Philadelphia Passenger Rail Analysis

[63] Reading to Philadelphia Passenger Rail Analysis

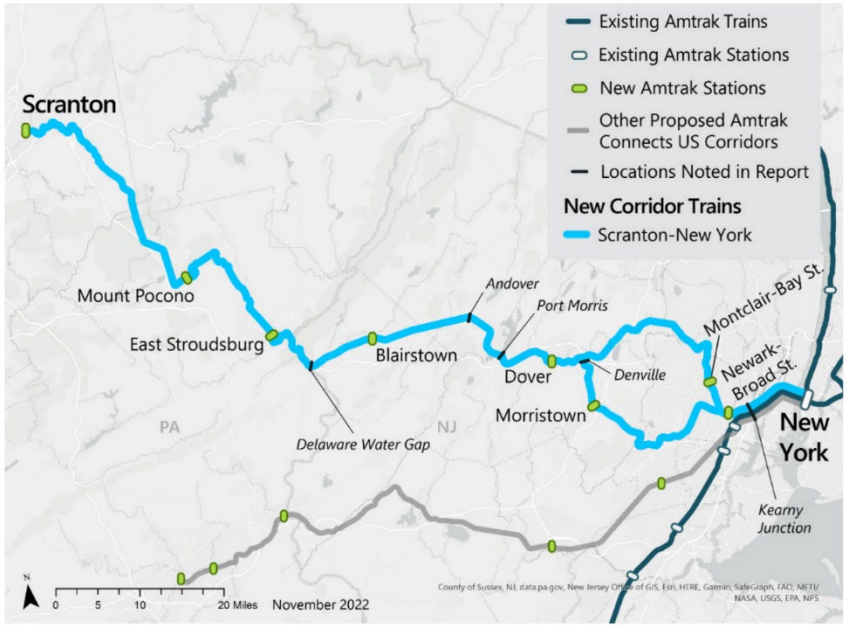
Scranton-to-New York Penn Station Corridor

The Scranton to New York Penn Station (NYP) Passenger Rail Corridor (Corridor) project will restore intercity passenger rail service between Scranton, Pennsylvania and New York Penn Station (NYP), providing access to New York City, northwestern New Jersey, and Scranton for employment, business, leisure trips, tourism, recreation, and opportunities at higher education institutions along the route. The Corridor was included in the Amtrak Connects US Corridor Vision Plan, and long-range transportation plans that show growing demand for intercity passenger rail service along a corridor that has heavy auto traffic and unpredictable travel times for commuters. The Corridor will provide an intercity transportation option for historically under-served northeastern Appalachian Pennsylvania and northeastern New Jersey. Portions of the defined route already exist as passenger rail, and this corridor is wholly public-government-owned by the Pennsylvania Northeast Regional Railroad Authority (PNRRA), NJ TRANSIT, the New Jersey DOT, and Amtrak.

Since passenger rail service to Scranton terminated in 1970, there has been strong local and state support in re-establishing Scranton to NYP service and the Corridor has been the subject of numerous studies. NJ TRANSIT prepared a 2008 Environmental Assessment (EA), 2009 Supplemental EA (SEA), and in 2009 received a Finding of No Significant Impact (FONSI) for restoration of NJ TRANSIT passenger rail service between Scranton, PA and Hoboken, NJ. The Minimal Operable Segment (MOS), the 7.3-mile segment from Port Morris, NJ to Andover, NJ, is currently under construction. A 2016 New Jersey-Pennsylvania Lackawanna Cut-Off Passenger Rail Restoration Project study evaluated the remainder of the corridor. In 2022/2023, Amtrak finalized a preliminary service plan and financial analysis for the proposed service.

The Scranton to New York corridor entered Step 2 of the Corridor ID process in December 2024, with $4.9M obligated to prepare a service development plan for the proposed corridor. As outlined in the Corridor ID project, the corridor would provide new service (three daily roundtrips) on a mostly existing alignment, plus some abandoned track to be rebuilt. PennDOT is the project sponsor for the Corridor ID grant, although the PNRRA has been heavily involved in the effort.

Figure 3.5 Map of Scranton to Penn Station Corridor[64]



Source: Amtrak

[64] Analysis-of-Options-Scranton-New-York-Amtrak-Passenger-Rail-Service.pdf

Chicago, Fort Wayne, Columbus and Pittsburgh (Midwest Connect) Corridor

The proposed Midwest Connect corridor would connect Chicago to Pittsburgh through Fort Wayne, Indiana, and Columbus, Ohio, reinstating service on a portion of existing alignment (**Figure 3.6**). The City of Fort Wayne is working with the Mid-Ohio Regional Planning Commission and the Southwestern Pennsylvania Commission (SPC) to advance the project, which is currently in Step 1 of the Corridor ID process. The proposed rail corridor in Pennsylvania is owned by NS. The corridor sponsor is the City of Fort Wayne.

Figure 3.6 Map of Chicago-Fort Wayne-Columbus-Pittsburgh Corridor[65]

Source: City of Fort Wayne

[65] Midwest Connect Passenger Rail - Corridor Identification & Development | Engage Fort Wayne

3.4 SEPTA REGIONAL RAIL PROJECTS

SEPTA's capital program of projects (Appendix E) focuses on efforts to support sustainability and maintain a state of good repair, safety and security, customer experience, and ridership growth. These projects include:

- **Track and Right-of-Way –** Renewal or replacement of track, switches, track surfacing, bridges, retaining wall, yard, and grade crossing improvements.
- **Station Facilities –** Rehabilitation and ADA accessibility improvements of station buildings and associated facilities, including roofs and canopies, ticket offices and waiting rooms, platforms, lighting, sanitary facilities, and parking.
- **Rolling Stock –** Silverliner IV Equipment replacement.
- **Communications and Signals Systems –** Rehabilitation of signal systems and select communications equipment.
- **Power Systems –** Rehabilitation of electric traction and power systems and associated components, including catenary and support structures and transmission lines.
- **Maintenance/Support Facilities –** Rehabilitation of shops, maintenance/storage yards, and associated maintenance and support facilities, tunnel lighting, vehicle servicing equipment, and other support functions.

Table 3.3 SEPTA Passenger Rail Projects Summary, 2025 - 2050

PROJECT CATEGORY	YEAR RANGE	NUMBER OF PROJECTS	TOTAL ESTIMATED COST (IN MILLIONS OF DOLLARS)
Infrastructure	2025-2055	79	$7,295
Stations	2025-2055	52	$5,634
Bridges	2025-2029	7	$706
Rolling Stock	2025-2050	4	$2,281
Total		**142**	**$15,916**

Source: SEPTA Capital Planning Documents, project lists provided by SEPTA for the Rail Plan

(1) Includes long-term visionary projects, and projects that do not all have associated costs.

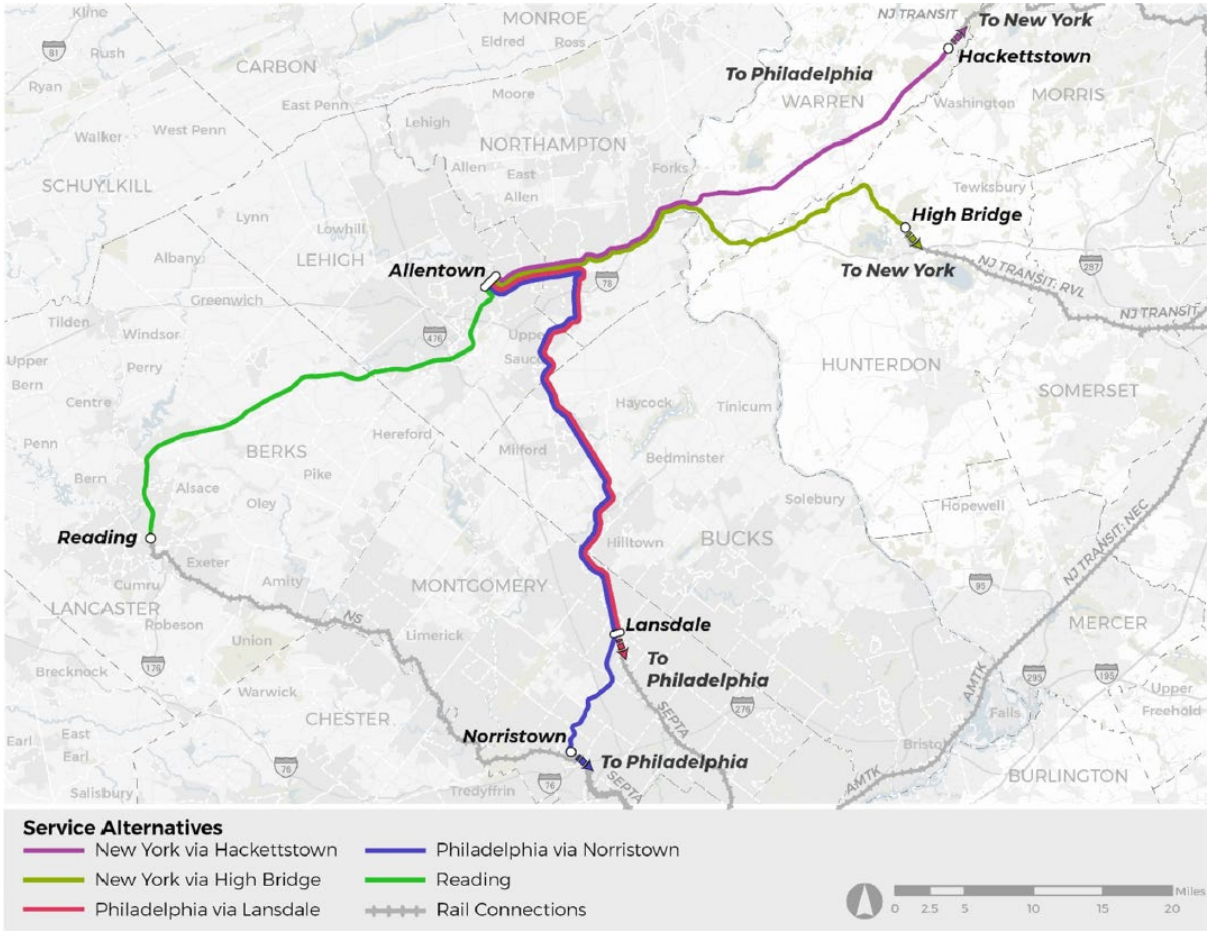
3.5 STUDIES AND INITIATIVES THAT IMPACT PENNSYLVANIA

Lehigh Valley Passenger Rail Restoration Study

In 2024, PennDOT completed a planning-level study to examine the feasibility of reestablishing passenger rail service in the Lehigh Valley. The study laid out the opportunities and challenges of reestablishing passenger rail service and the various routes along which such a service could potentially operate, using existing and former rail corridors in the region (**Figure 3.7**). The study presented conceptual operating plans, operating cost estimates, a summary of the advantages and challenges for three origin-destination market pairs and a pathway to implementation should a local project sponsor emerge.

Regional stakeholders are currently exploring whether to pursue the next phase of study to determine the technical and financial feasibility of the project.

Figure 3.7 Lehigh Valley Passenger Rail Restoration Study Service Alternatives



Source: PennDOT

FRA Long-Distance Study

In January 2025, the FRA completed its Amtrak Daily Long-Distance Service Study. The purpose of the effort is to evaluate the restoration of daily passenger rail service along discontinued Amtrak long-distance routes, as well as potential new Amtrak long-distance routes, with specific attention provided to routes in service as of April 1971 but discontinued when Amtrak began operations that year. In addition, FRA evaluated the potential for providing daily service on the two Amtrak long-distance routes that currently operate with less than daily frequencies (Cardinal® and Sunset Limited®).

The FRA identified 15 Selected Preferred Route Options (**Figure 3.8**). One of the selected preferred route options would provide service between Dallas/Ft. Worth and New York City by way of Oklahoma City, Tulsa, St. Louis, Indianapolis, Cincinnati, Columbus, and Pittsburgh, with Pennsylvania station stops at Pittsburgh, Altoona, Harrisburg, Lancaster, and Philadelphia. This route, being a long-distance service, would require no financial investment or commitment by the Commonwealth of Pennsylvania.

Further analysis, corridor prioritization, and identification of funding would be necessary to advance the Selected Preferred Route Options identified in the study.

The FRA also recommended daily service restoration for the three day a week Cardinal® route, which serves 30th Street Station. Independent of the FRA Long-Distance Study, the Cardinal® was accepted into the Corridor ID program in December 2023. In addition to upgrading the route to daily service, Amtrak is evaluating infrastructure improvements to increase train speeds and reduce travel times between Indianapolis and Dyer, Indiana; service improvements in Indiana, Ohio, and West Virginia; and connectivity improvements to the passenger rail network in Chicago and along the NEC.

Figure 3.8 FRA Long-Distance Service Study Selected Preferred Route Options

Source: FRA, 2025

CONNECT NEC 2037

In addition to the Pennsylvania-specific infrastructure improvements highlighted in Section 3.2 above, other NEC infrastructure investments beyond the Commonwealth's borders will have a positive impact on rail service through Philadelphia. Investment in state-of-good-repair projects along the corridor, major capital projects to rebuild bridges and tunnels in New York and New Jersey, modernized signal and catenary equipment, and projects to straighten key curves along the corridor will increase rail service reliability, frequency, and speed for passengers throughout the corridor, including Philadelphia. If fully funded and implemented, the plan envisions that by 2037 travelers along the NEC will experience nearly doubled service with 60 daily round trips, up from 35 daily round trips today. Acela® trains will depart every 30 minutes in peak periods, and hourly at other times. Amtrak will also reintroduce direct New York-Philadelphia-Washington, DC super-express Acela® service, allowing riders to travel between New York and Washington, DC, in only 2 hours and 30 minutes.

Amtrak Vision Plans

Amtrak Connects US, Amtrak's 2021 vision plan, featured proposals for new and expanded rail connections between Pennsylvania cities points to the west and east. It included new Reading-Philadelphia-New York and Scranton-New York services, both of which are now advancing through the CID program. It proposed increased service along the existing Keystone Corridor and introduced the possibility of a new Allentown-New York service, subject to further analysis by stakeholders in Pennsylvania and New Jersey. The plan also proposed a second Pennsylvanian® frequency extending into Ohio to create a new, interstate Pittsburgh-Cleveland corridor, and extending one New York City-Buffalo Empire Service® round trip to Cleveland, linking cities across New York, western Pennsylvania, and eastern Ohio, as well as connecting to corridor services envisioned in New York and Ohio. The plan states that Amtrak will work with the DOTs in New York, Pennsylvania, and Ohio to determine the feasibility of this service.

More recently Amtrak announced improvements that focus on advancing major infrastructure projects, upgrading its fleet, and expanding service on state-supported routes to drive service expansion and double ridership by 2040.[66]

Other Passenger Routes without Proposed Projects

Two existing Amtrak long-distance routes that do not as of this writing have proposed improvement or investment projects are:

- **Floridian℠:** This daily service connects Chicago and Miami via Washington, DC, with stops in Connellsville and Pittsburgh.
- **Lake Shore Limited®:** This daily service connects New York City and Chicago with a stop in Erie.

[66] https://amtraknewera.com/

3.6 OTHER INITIATIVES PROPOSED BY STAKEHOLDERS

Roundtable meetings were held in 2024 with representatives of MPO/RPOs, port authorities, rail authorities, and other regional and municipal stakeholders to gather information on initiatives and needs at a more local level. The following initiatives were identified at these forums and through surveys of stakeholder groups and the general public.

Bus Service Connecting Penn State University Park to Amtrak

Penn State University in State College has a total undergraduate population of more than 40,000 and more than 13,000 graduate students that converge seasonally in Centre County. The nearest Amtrak stations are at Tyrone (27 miles) and Lewistown (30 miles), which are served once per day by Amtrak's Pennsylvanian® train. There is no synchronized bus connection with Amtrak to State College, and Amtrak does not provide any Thruway bus service to State College. University students are important users of railroad transportation, since they represent large populations of individuals who typically do not own an automobile.

In addition to the large number of students, the town's population experiences large surges during Penn State football games at Beaver Stadium. The stadium, which can accommodate over 107,000 people, is the second largest stadium in the western hemisphere.

Feedback from the state rail plan outreach emphasized Lewistown as the first priority, given its closer proximity to the Harrisburg Line and its connections to the NEC. However, with the initiation of a second daily frequency to Pittsburgh as part of the proposed Keystone West service, a more western connection with State College at Tyrone could also provide a viable alternative. The Centre County MPO highlighted the opportunity that bus service connecting State College and Amtrak would bring to commonwealth constituents.

Buffalo to Cleveland via Erie

The Erie MPO supports expanding passenger rail service to Erie, which currently is served by Amtrak's Lake Shore Limited® once per day in each direction at inconvenient, early morning hours. The initiative is building broader support through the work of All Aboard Erie, the Empire State Passenger Association, and the Lakeshore Rail Alliance, a multi-state coalition advocating expanded passenger rail transportation serving cities along Lake Ontario, Lake Erie, and other locations in New York State. The corridor was included in Amtrak's 2021 Amtrak Connects US vision plan. A CID application for the

Cleveland-Erie-Buffalo corridor was submitted in 2022 but was unsuccessful, though there is intent to reapply.

Principal objectives include more frequent service at more appealing hours during the day with connections to points west, including Cleveland, Detroit, and Chicago. To the east, passenger advocates seek to increase service offerings to Buffalo, Albany, and New York City.

Tourist Train Success

Pennsylvania stakeholders cited in various PennDOT forums and surveys that tourist trains are becoming increasingly popular and are being expanded by several railroads that have substantial freight operations. The Northeastern Pennsylvania Alliance (NEPA) MPO and Luzerne County both noted that excursion trains operated by the Reading, Blue Mountain & Northern Railroad (RBMN) have been successful. RBMN operates regular excursion trips – some with steam locomotives – between Reading and Jim Thorpe and between the Wilkes-Barre / Scranton Regional Railroad Station in Pittston and Jim Thorpe, with intermediate stops at Port Clinton, Tamaqua, Penobscot (Mountain Top), and White Haven. RBMN also operates special event trains throughout the railroad's network. Interviews with RBMN staff suggest that these services cover RBMN's above the rail operating costs (i.e., costs other than the tracks themselves) and provide a strong connection between the railroad and the communities it passes through. The station in Jim Thorpe connects directly to the Delaware & Lehigh National Heritage Corridor and the Lehigh Gorge Trail. Connecting bus services are also available near the station.

In mid-2025, Patriot Rail, a short line holding company that operates 32 railroads across the United States and scenic excursions in Georgia and New Hampshire, is planning to revive tourist passenger service through Adams County on the Gettysburg & Northern Railroad. The line passes through part of Gettysburg National Military Park, site of the July 1863 Battle of Gettysburg, which draws more than a million tourists each year. The town is also home to the national military cemetery where President Abraham Lincoln delivered his Gettysburg Address on November 19, 1863. The train will depart from and return to the 1884 Gettysburg train depot, located near the southeast entrance to Gettysburg College.

Pennsylvania is also home to the oldest continuously operating railroad in North America: the Strasburg Rail Road (SRC). Chartered in 1832, SRC is the oldest public utility in the Commonwealth of Pennsylvania. SRC operates steam-powered tourist passenger trains on 4.5 miles of track between East Strasburg and Leaman Place. SRC also performs specialized work on steam locomotives from across the country in their mechanical shops.

Pittsburgh Commuter Rail

Some stakeholders within western Pennsylvania, Allegheny County, and the counties surrounding Pittsburgh have suggested studying commuter rail service to Pittsburgh. One public commenter from Westmoreland County remarked that commuter rail service has the potential to reduce congestion on Routes 30 and 22, revitalize downtowns, and improve connections for pedestrians in station areas. Blair Planning Commission, the MPO for Blair County, noted that a morning peak period run into Pittsburgh from Altoona with a corresponding evening return would be

beneficial; currently, if a business traveler wished to make the trip from Altoona to Pittsburgh by rail two-night stay for one day of business would be required.

The last commuter rail service in Pittsburgh, known as the PAT Train, which operated from downtown Pittsburgh's former Baltimore and Ohio Railroad Station (now demolished) was discontinued in 1989. Other short-haul services originating in Pittsburgh were operated by Amtrak for short periods in the 1980s, including the Fort Pitt (Pittsburgh – Altoona) and Parkway Limited (Pittsburgh – Greensburg). The chronic highway congestion on I-376, commonly known as the Parkway East, which is routinely congested through the Squirrel Hill Tunnels, is one rationale for investing in passenger rail alternatives. Reactivating commuter service into downtown Pittsburgh would require coordination with NS to get access to the downtown station currently served by Amtrak. In 2019, PennDOT studied the potential of commuter rail between Altoona and Pittsburgh.[67]

Pennsylvania's Western Anchor: Pittsburgh, PA

The current Amtrak Station in Pittsburgh was constructed in the late 1980s on the footprint of the historic station building, which was acquired by the General Services Administration after Penn Central's bankruptcy and converted into residences. During the State Rail Plan outreach process, stakeholders noted that Pennsylvania's western anchor was in need of a refresh, including expanded parking and improved vertical access via elevator and escalator between the street-level station building and the tracks located two stories above. In addition, they noted that platform lighting, signage, and surface areas should be improved to provide a brighter, more welcoming environment for rail customers. Amtrak has recently addressed some of these concerns, completing several SOGR projects at the station, including lighting, signage, painting, and vertical transportation improvements.

[67] Altoona-Pittsburgh Passenger Rail Study

3.7 OTHER ISSUES RAISED BY STAKEHOLDERS

Station Access and Amenities

PennDOT received comments on rail station facilities at the roundtable forum held with MPOs, as well as among the 205 comments from a public survey.. The Delaware Valley Regional Planning Commission (DVRPC) noted in forum feedback that completing sidewalk networks near stations is important for station access, not just immediately adjacent to the station, but expanding beyond the station property to areas within 5-, 10-, and 15-minute walking distance. Cambria County MPO echoed this recommendation and noted that the Johnstown station, which is located on the Iron Arts Trail Corridor, also provides connectivity to the National Park Service Flight 93 National Memorial in Shanksville.

In addition to multimodal access by bike, pedestrian, and transit modes, encouraging the provision of amenities in or near the station is similarly important, as noted by the Schuylkill Passenger Rail Authority. Amenities such as restaurants, breweries, and other social attractions provide not only an attraction for residents not traveling, but also a place to wait comfortably for a train to arrive.

Bicycle Access

Amtrak currently offers trainside checked bicycle service on the Pennsylvanian®, and carry-on bicycle service on the Keystone Service®. Stakeholders see a benefit in expanding this amenity, particularly on Keystone East trains between New York, Philadelphia, and Harrisburg. Cambria County MPO observed that permitting bicycle storage on the trains and providing easier boarding and other amenities geared towards bicycle travelers serves a key, growing constituency and provides a beneficial service to rail customers. Similarly, the Lancaster MPO noted that bikes provide an important viable “last-mile” connection to passenger rail for some customers and should be encouraged.

Transit-Oriented Development

The areas surrounding stations are also important to agency and public stakeholders, with many advocates for transit-oriented development (TOD) focused on initiatives throughout the Commonwealth.

The Schuylkill River Passenger Rail Authority, which seeks to connect Philadelphia to Reading via Phoenixville and Pottstown by rail, underscored the potential for $1.4 billion in income generation and more than $1 billion in new property development and property value increases with the initiation of the proposed passenger rail service.

The Lancaster MPO noted that Lancaster station, which will be accessible from both sides of the track at the end of 2026, is seeing interest from developers on the north side of the tracks, where the township increased allowable building heights and floor area ratios to encourage density near the train station. Similarly, DVRPC emphasizes the importance of TOD and has developed a rating system that assimilates physical, demographic, and economic factors to assist planners and policy makers with identifying TOD opportunities. In addition to facilitating TOD at transit stations, DVRPC has initiatives at facilities served by both Amtrak and SEPTA, including Paoli, Pennsylvania.

SEPTA Initiatives

Eastern Pennsylvania stakeholders, including MPOs, rail advocacy groups, passenger rail authorities, and SEPTA, acknowledge the following key challenges that need to be overcome to deliver a more appealing mobility choice for travelers that use SEPTA Regional Rail:

- In a post-pandemic marketplace, the system needs to broaden its appeal from predominantly serving a commuter clientele traveling between suburbs and downtown for 9-to-5 white-collar employment.
- Regional Rail's access to underserved communities presents an opportunity to expand workforce access and lower the cost of living for populations with less economic means.
- Reimagining Regional Rail as a service for non-commuting trips, including but not limited to personal appointments, multimodal access (bus/trolley/subway), family excursions, and entertainment and sports events is an opportunity to improve system utilization seven days per week.
- Redundant routes with other transit services including bus and trolley, which run on different fare structures that are always cheaper than regional rail, present an opportunity to rethink payment expectations and provide more flexibility and lower costs to system users of Regional Rail and other transit modes.
- Key bottlenecks constrain the capacity of the entire system, which, absent these obstacles, could provide a far more comprehensive service offering.

Prior to the COVID-19 pandemic, the SEPTA Regional Rail system was the fifth largest in the nation, moving more than 132,000 daily weekly riders. System utilization plummeted more than 79 percent during the pandemic period from April 2020 to December 2021, as SEPTA contracted service levels due to low travel demand. Since then, SEPTA has added back service to 81 percent of pre-pandemic service and witnessed steadily increasing ridership gains – average daily ridership in 2024 was 64 percent of pre-pandemic ridership. While there has been some movement recently in commuters returning to the office several days per week, stakeholders acknowledge that the expectation that Regional Rail can recover to pre-pandemic commuter utilization and service patterns is impractical.

In addition to SOGR investments, eliminating bottlenecks, and providing better connectivity with other transit services, SEPTA's Reimagining Regional Rail Master Plan proposes to increase service levels to 15-, 30-, and 60-minute frequencies after capital projects resolve bottleneck constraints and with new operating budget appropriations over the 30-year timeframe of the master plan. The master plan proposes several phases of implementation to incrementally transform a commuter-centric railroad into a higher-frequency rail system and address the needs of the 21st century travelers in the Philadelphia region. These are long-term initiatives which could be impacted in the short-term by immediate budget constraints.

4. Freight Rail Issues, Opportunities, Improvements, Investments

Chapter 4 describes issues, opportunities, and the safety needs of Pennsylvania freight rail and a range of proposed investments that are intended to address these needs. A detailed project list for Chapter 4 can be found in Appendix G.

This chapter also describes the proposed freight rail investments in Pennsylvania that have been identified during the development of this 2025 State Rail Plan. These investments include a carryover of projects identified in the 2020 State Rail Plan excluding projects that have been completed or identified as no longer needed.

The result is a list of 371 potential freight rail projects that includes both the 2020 and 2025 requests, which demonstrate an estimated need of approximately $1,395,000,000. For the 2025 State Rail Plan update, PennDOT sent a survey to all the freight railroads operating in Pennsylvania requesting information about their current levels of traffic, issues, and opportunities. The survey presented the railroads with the opportunity to identify grade crossings that needed improvement, issues they faced with maintaining their existing railroads, as well as opportunities that were presenting themselves to bring rail service to existing and potential new industries along their lines. PennDOT also conducted a series of meetings with various focus groups, including MPOs/RPOs, to understand their needs and programs.

For the 2025 State Rail Plan, all three Class I railroads, all three Class II railroads, and 32 of the 59 Class III railroads responded to PennDOT's request for projects. The number of projects submitted by railroad class are shown in **Table 4.1**.

Table 4.1 Identified Projects by Railroad Class

RR CLASS	TOTAL PROJECTS
Class I	34
Class II	18
Class III	319
Total	**371**

Source: Quandel Consulting Analysis

The issues and opportunities described by the railroads, shippers, communities, and other stakeholders included:

- Creating or improving connections between railroads to expedite rail shipments for existing or potential new customers
- Creating new railroad capacity to respond to the current and future needs of the energy exploration industry in the Utica and Marcellus Shale zones in Pennsylvania
- Adding or expanding sidings and interchange tracks to accommodate increasing volumes of freight rail traffic
- Improving rail yard track conditions, configuration and capacity to increase efficiency
- Improving or replacing bridges to meet the upgraded industry standard capacity of 286,000 pounds gross weight for each rail car
- Creating or expanding transload terminals: rail-to-truck, rail-to-water, and water-to-rail
- Rehabilitating or reconstructing tracks to improve safety, reduce rail transit time, and increase operating efficiency
- Rehabilitation of existing rail/highway grade crossing surfaces and updating their grade crossing warning systems or construction of new rail/highway grade separations and elimination of grade crossings

Freight rail issues and opportunities identified as part of the 2025 State Rail Plan are organized into the following seven categories:

- **State of Good Repair** includes projects necessary to maintain competitive service and market presence for both track and civil works. This includes addressing deferred maintenance, such as stabilizing bridges, waterproofing tunnels, and tie and rail replacement programs. These can also include investments necessary to upgrade track and structures to support the handling of 286,000-pound freight cars, the current national standard. Many of the railroads were built or had been upgraded to the previous national standard of 263,000 pounds gross weight per car.
- **Capacity** improvements include projects intended to improve the efficiency and fluidity of rail operations. They include bridge and tunnel improvements related to operations and capacity, upgrading yard track, and other projects needed to improve yard throughput efficiency.
- **Multimodal** includes intermodal, transload, and port-related improvements.
- **Customer Access** includes new track connections to new or existing commercial and industrial developments. These are projects that are intended to attract specific business to the railroad to provide new rail service to support shipments by rail or to expand track to meet increased shipper demand. Improvements such as adding a siding and making capacity upgrades at shipper facilities fall into this category.
- **Rolling Stock Improvements** include locomotive emissions reduction efforts and freight car rehabilitation. Typical locomotive investments include the acquisition of low-emissions switching engines and the retrofitting of locomotives with auxiliary power units, which allow idle units to be shut down and readily restarted in cold weather. Modifications to freight cars, including cars used in maintenance-of-way service are also in this category. Facilities to conduct these repairs and upgrades are also included.
- **Grade Crossing Safety Enhancements** include track and crossing surface repairs or upgrades, including crossing signal system additions, upgrades, or replacements.

Freight projects included in this State Rail Plan were categorized into the project types shown in **Table 4.2**.

Table 4.2 Projects by Project Type

PROJECT TYPE	TOTAL
State of Good Repair	201
Capacity	66
Multimodal	26
Customer Access	40
Rolling Stock	14
Grade Crossing	24
Total	**371**

Source: Quandel Consulting Analysis

4.1 STATE OF GOOD REPAIR ISSUES AND NEEDS

As discussed in Chapter 2, not all of the Pennsylvania rail network is in a state of good repair. Rail lines with low levels of freight traffic often do not generate sufficient revenue to fund long-term maintenance needs. Frequently, when short line and regional rail operators acquire lines from previous owners, these rail lines suffered from years of neglect. It is costly to "catch up" from deferred maintenance and to bring rail lines to modern standards.

As discussed in Chapter 2, a total of 303 miles of existing rail line in Pennsylvania cannot accommodate industry-standard 286,000-pound railcars, placing shippers and railroad operators of those lines at a strategic disadvantage. About three fifths of the state of good repair projects listed in **Table 4.2** plan to improve railroad track and roadbed. This includes projects involving replacing ties and surfacing ballast, replacing rail, and maintaining drainage ditches and culverts.

About one third of the projects are to maintain and repair bridges. Several projects are intended to upgrade rail lines to 286,000-pound standard, and one project would address required maintenance to a tunnel. Five projects would rehabilitate infrastructure in rail yards.

4.2 CAPACITY

The largest share of projects listed under "Capacity" in **Table 4.2** are yard improvements. However, the costliest project of those proposed for the 2025 State Rail Plan is a $25 million project that would increase the clearance at Broad Street underpass on Conrail Port Richmond Branch at the Port of Philadelphia. Currently, this bridge does not permit the passage of hi cube boxcars, which are 17 feet high. Given that tri-level automotive racks and double-stack intermodal railcars are as high as 20 feet 2 inches, these too would be precluded from crossing under the bridge. The project would increase the capacity and accessibility of rail traffic.

Other "Capacity" projects in **Table 4.2** would build/improve sidings that would improve railroad operations. Several projects proposed during the 2020 Rail Plan and continued in this plan would separate passenger and freight operations, such as the SEPTA Airport Line. Freight trains share tracks with SEPTA Regional Rail for 0.75 miles through Eastwick Station and sometimes interfere with SEPTA Airport Line trains as they pass through the area. The most likely solution would be a parallel freight track, and adequate space exists on the ROW for such a separation. Similarly, the Pennsylvania Northeastern Railroad is interested in separating its freight operations from SEPTA passenger rail operations to the extent possible on the SEPTA Lansdale/Doylestown Line.

Other projects would improve connections between railroads. Adding trackage at key locations is a way to improve the capacity of the railroads to handle the available traffic, improve the efficiency of train operations, and provide better service for the rail customers.

4.3 MULTIMODAL PROJECTS

Rail Multimodal Opportunities and Needs

Transload facilities can serve dry bulk commodities (sand, cement, aggregates), liquid products (fuel, fertilizer), and dimensional products (lumber, metal) and can be tailored to the customer(s) and area where the transloading must occur.

Expanding and upgrading transload facilities are examples of projects that can increase revenue for the railroads, reduce long distance highway truck traffic, and provide a more dependable supply of materials to the railroads' customers. Transload facilities often have the capacity to service several customers simultaneously. In a railroad survey for this rail plan, 13 of 32 respondents identified transload opportunities as the greatest opportunity to add capacity. Seven projects were recommended in the 2020 State Rail Plan that would improve transload facilities or improve access to transload facilities, and six new transload projects were recommended for the 2025 State Rail Plan.

Other proposed multimodal projects would improve access or conditions at marine terminals, such as building a connection to an Ohio River dock in Aliquippa, reconfiguring rail access to a wharf in Duquesne, and/or upgrading tracks at the PhilaPort Tioga Marine Terminal.

4.4 RAIL AND ECONOMIC DEVELOPMENT – PROVIDING ACCESS TO EXISTING AND NEW CUSTOMERS

Economic development is a key driver of investment in freight rail infrastructure. Freight rail service can help to attract new businesses to Pennsylvania, as well as boost the competitiveness of existing businesses. These companies create jobs and support Pennsylvania's economy. The Commonwealth can help improve railroad infrastructure and thereby enable railroads to better serve shippers or help shippers by improving access to the rail network.

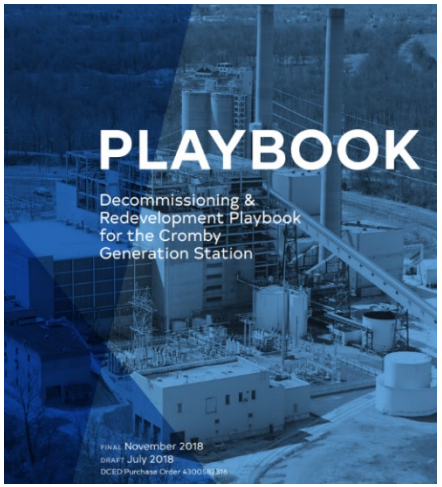
Of the 125 projects selected for the RFAP and RTAP program between 2019 and 2023, 46 were investments in rail infrastructure on shipper premises, accounting for $43 million of $172 million in PennDOT investment. The vast majority were projects that rehabilitated, increased the capacity, or improved the efficiency of rail infrastructure owned by existing shippers. Five projects would build rail infrastructure to new establishments or existing establishments that had not previously been rail-served.

There continues to be strong demand for improved access to rail shippers. Of the projects that were proposed for the 2020 State Rail Plan carried forward to the 2025 plan, 31 involve establishing or improving access to industrial sites, compared to 23 new projects recommended for the 2025 State Rail Plan.

The dynamic nature of freight rail markets and the movement of materials drives the need to modify existing or establish new industrial connections to the rail network. As some freight markets develop, it is necessary to repurpose or build new rail-served sites.

As noted in Chapter 2, Pennsylvania is ranked third nationally for coal production, and coal represents 62 percent of Pennsylvania's originating rail tonnage and 18 percent of terminating tonnage. A significant portion of Pennsylvania's coal is sent to the Port of Baltimore for export, but other coal is used for electric generation by eastern power plants, such as in North Carolina. But coal production has declined since 2000, with 2022 production about 44 percent lower than 2000 production. Power plants have shifted from coal to other sources of power, which has reduced the demand for rail in certain areas. The Pennsylvania Department of Community and Economic Development has put together a series of "playbooks" for how to redevelop decommissioned coal-fired power plants.[68] Given that many of these were rail-served, there is potential for rail to be a component of the redevelopment. Existing rail infrastructure can be instrumental in redevelopment plans.

Figure 4.1 Example of Coal-Fired Power Plant Redevelopment Playbook



Source: DCED

[68] https://dced.pa.gov/coal-fired-power-plant-redevelopment-playbooks/

Changes in petroleum energy markets also have had a large impact on rail usage, given that Pennsylvania is a leader in natural gas reserves ranking second behind Texas. Several short line railroads in completing surveys for the 2025 Rail Plan were concerned about over reliance on shale-related traffic such as sand and proppants, but some saw significant traffic opportunities for transporting natural gas liquids, which are the byproducts of natural gas development.

Pennsylvania's new economic development strategy, "Pennsylvania Gets it Done,"[69] identifies three key industries to target, each of which utilize rail:

- Food and agriculture
- Energy, including natural gas and renewable energy
- Manufacturing, including chemical and plastics manufacturing

In responding to a survey for the 2025 State Rail Plan, several railroads suggested creating a fund specific to economic development initiatives to attract new businesses or new users to the rail network. Pennsylvania has initiated Pennsylvania Strategic Investments to Enhance Sites Program,[70] which funds planning grants and construction grants, loans aimed at preparing "shovel-ready" sites that can help compete more effectively for expanding or relocating businesses. Among the eligible use of funds is rail infrastructure.

When asked about opportunities to grow traffic, railroads cited access to industrial parks, buildable locations, as well as concern over maintaining properties along their rail lines that could be developed as shipper locations. Pennsylvania is home to rail-served industrial parks. These are compelling options for shippers, since they enable rail users to share freight rail lines into the park. Of the projects recommended by railroads for the 2025 State Rail Plan, three would build sidings or spurs into industrial parks, and of the 2020 State Rail Plan projects carried over to the 2025 plan, seven would build access into industrial parks.

[69] https://pagetsitdone.com/

[70] https://dced.pa.gov/programs/pennsylvania-strategic-investments-to-enhance-sites-program-pa-sites/

4.5 ROLLING STOCK IMPROVEMENTS

Projects categorized as “Rolling Stock” in **Table 4.3** include projects that would construct or improve a locomotive/railcar inspection and maintenance facilities, improve/replace locomotives, upgrade railcars, improve maintenance of way equipment. Of projects from the 2020 State Rail Plan carried forward in the 2025 plan, two of the “Rolling Stock” projects would improve locomotive/railcar inspection and maintenance facilities, while three would improve/replace locomotives or railcars. Of the 125 projects selected for RTAP or RFAP funding between 2019 and 2023, one project funded the expansion of a locomotive house.

Table 4.3 Rolling Stock Improvement Projects

RAILROAD(S)	PROJECT	ESTIMATED COST ($M)
AOR	Upgrade locomotive fleet to reduce emissions and increase reliability – captive fleet, good test location	$2.00
BPRR	Upgrade current aggregate car fleet to remote dump capability in Punxsutawney	$4.00
BVRY	Coatesville – construct all-weather building for car and locomotive inspection and repair including pit, drainage, utilities including track and switches	$1.20
DL	Purchase and installation of auxiliary power units on locomotives	$0.22
DL	Building to help maintain equipment located in Scranton	$1
EBT	Construct commercial railroad repair facility	$5.00
LVRM	Locomotive Shop Repairs	$0.90
NHRR	Construct new engine houses at New Hope, Almshouse, and Buckingham	$4.00
NHRR	Locomotive and freight car repair facility with large machinery	$14.80
PN	Construct new locomotive/rolling stock maintenance facility and tracks	$0.80
PN	Improvements to car repair facility	$14.80
PN	Maintenance of way machinery, rolling stock	$2.80
PN	PTC improvements to 5 locomotives	$1.38
POHC	McKees Rocks – upgrade the new locomotive shop with electricity, insulation, and heat	$0.25
YRC	New locomotive maintenance facility – Lincoln Yard	$4.00

Source: Railroad Survey, 2020 Pennsylvania State Rail Plan

4.6 SAFETY AND CROSSING ISSUES, OPPORTUNITIES, AND NEEDS

This section describes issues, opportunities, and needs, not only of at-grade crossings, but also of grade separated highway-rail crossings.

Grade Crossing Safety Improvements

As described in Chapter 2, PennDOT administers the FHWA Railway-Highway Crossings (Section 130) Program. The program receives about $7 million annually and funds approximately 20 projects per year to improve safety at crossings. Section 130 projects included in the 2025 State Rail Plan are identified in Appendix F.

Figure 4.2 Highway-Rail Grade Crossing in Pennsylvania

Source: PennDOT

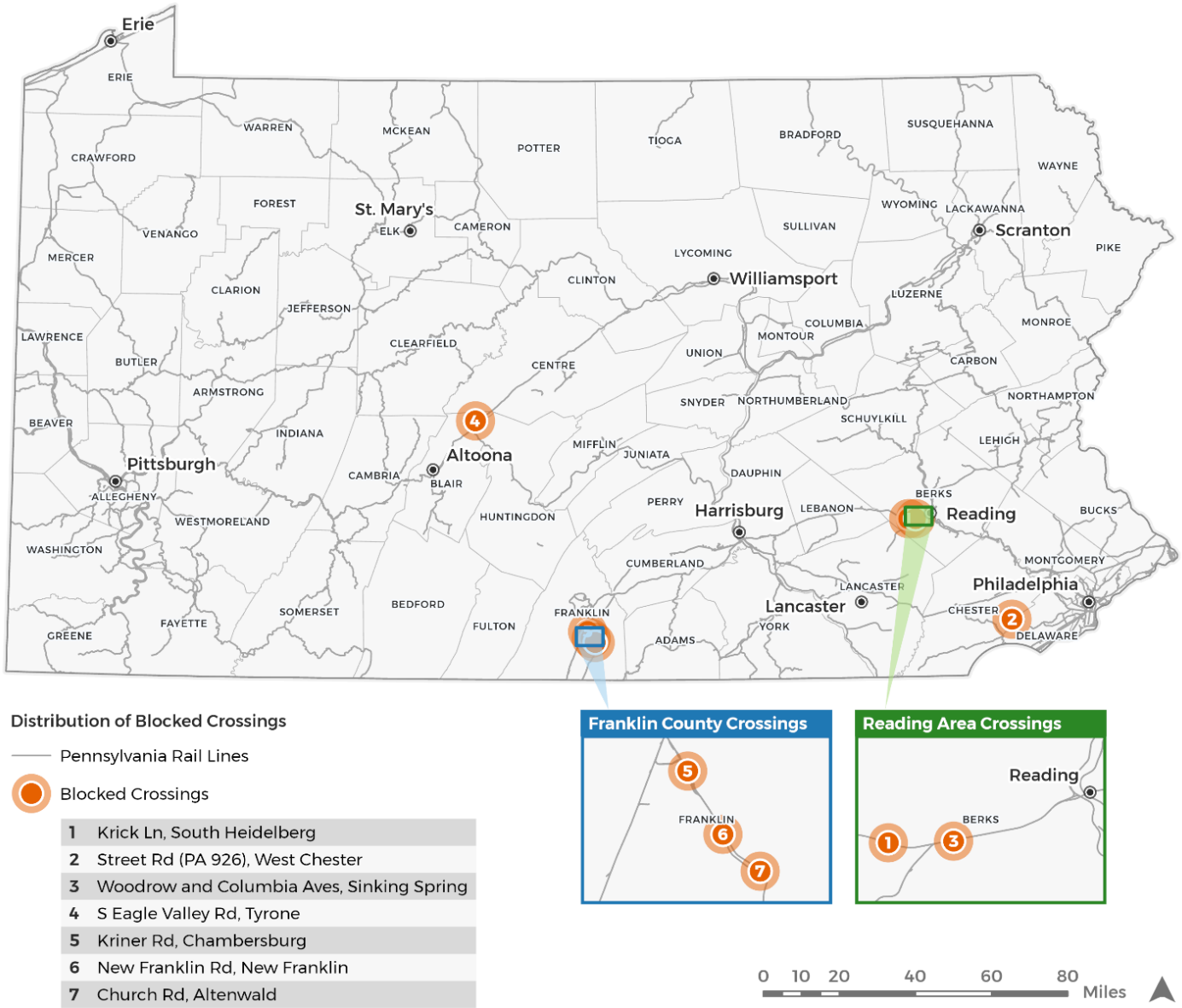
Grade Crossing Maintenance and Improvements

As in other states, railroads in Pennsylvania are responsible for maintaining railroad crossings, including crossing surfaces, as well as any crossing signals. In addition to Section 130 funding, PennDOT's RFAP and RTAP programs have been used to assist railroads in maintaining crossings. Selected RFAP and RTAP projects between 2019 and 2023 involved resurfacing and/or maintenance or improvements of signals at 31 crossings. Of the projects recommended for the 2020 State Rail Plan and carried forward in this plan, 20 would replace crossing signal systems, and 2 would improve crossings. Of the projects proposed in this 2025 State Rail Plan, 46 would resurface crossings and in some cases replace signal equipment, 14 would replace signal equipment only, two would add a grade separation, 17 would improve crossings such as adding gates and lights to a crossing with passive devices, and one would improve sight lines at crossings.

Blocked Crossings

As train lengths have increased, blocked crossings have become a greater issue across the nation. It is more difficult to park a longer train than a shorter train without occupying a highway/rail grade crossing. Stakeholders were asked to identify areas where stationary trains frequently occupy crossings for extended periods of time. Seven locations rose to the top, as shown in **Figure 4.3**.

Figure 4.3 Locations of Blocked Crossings



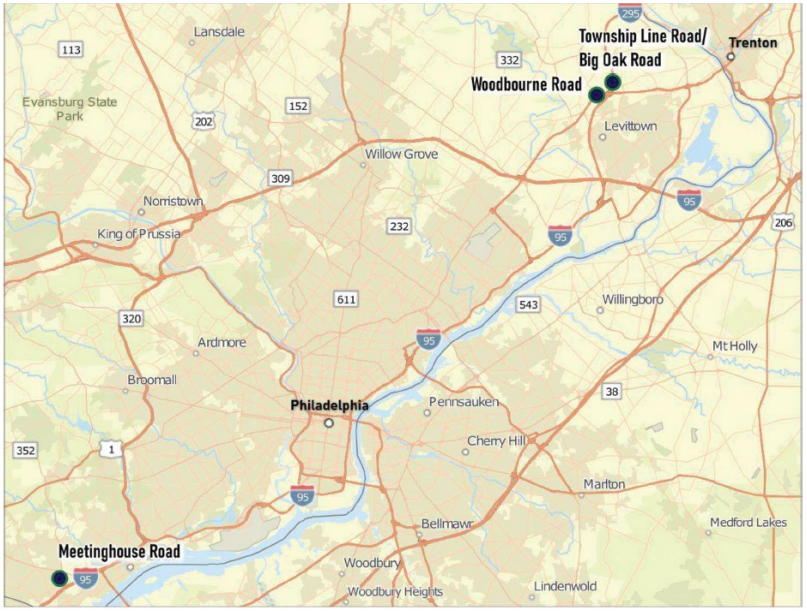
Source: Rail Plan Outreach, WSP Analysis

FEATURED CROSSING ELIMINATION PROJECT: GRADE CROSSING ELIMINATION STUDY.

PennDOT was awarded a Fiscal Year 2022 Railroad Grade Crossing Elimination Grant by the FRA for the CSX/SEPTA Grade Crossing Elimination Study. The study used next-generation artificial intelligence technologies to support safety and operational improvement alternative analyses. he three crossings are on two CSX freight lines, one of which is a shared corridor with a SEPTA commuter rail line to West Trenton, which is identified as the Neshaminy Line by SEPTA. Shown with green dots on the map in Exhibit 1 below, the three crossings are:

- Meetinghouse Road crossing at Milepost 16.02 on CSX's Philadelphia Subdivision-Crossing Number USDOT #140670C.
- Township Line Road/Big Oak Road crossing at Milepost 27.40 of CSX's Trenton Subdivision and 27.50 of SEPTA's Neshaminy Line-Crossing Number USDOT 589731K.
- Woodbourne Road (SR 2033) crossing at Milepost 25.70 of CSX's Trenton Subdivision and 26.50 of SEPTA's Neshaminy Line-Crossing Number USDOT 589964G.

Figure 4.4 Locations of Blocked Crossings



Source: PennDOT

These crossings experience frequent congestion impacting supply chains, nearby residents, regional visitors, first responders, commuter rail services, and freight operations. Conflicts between nearby rail yard movements that trigger extended gate activations and high volumes of vehicle, commuter rail and freight traffic raise serious safety concerns for nearby communities. The Grade Crossing Elimination Study will evaluate the potential for closing these highway at-grade crossings, grade separation alternatives, and site-specific congestion reduction and safety upgrades. The study is expected to be finalized in mid-2026.

Trespasser Prevention

According to the FRA, more than 500 trespassing fatalities occur on U.S. railroads each year.[71] In Pennsylvania, about half of all rail-related fatalities between 2019 and 2023 were trespasser strikes, excluding suicides. Including suicides, 81 percent of rail-related fatalities over that time-period were individuals on railroad property struck by trains. In addition to tracking data on trespassing incidents, FRA also sponsors prevention programs, include the Trespass and Suicide Prevention Toolkit, which emphasizes: (1) Risk Assessment, (2) Policy and Enforcement, (3) Training and Education, (4) Public Communication, (5) Physical Barriers, (6) Detection and Lighting, (7) Infrastructure Modification, and (8) Post Incident Management.[72]

Trespasser prevention is a core element of railroad management. Train crews and line of maintenance personnel are encouraged to report sightings of trespassing to local or railroad police forces for investigation and enforcement action, particularly in high-risk zones. An important aspect of preventing trespasser strikes is to understand why trespassers enter the railroad right-of-way. In some cases, common foot paths used by trespassers can be identified, along with the likely origins/destinations that trespassers are traveling from and to. These types of analyses could point to potential improvements to prevent or shift access away from the railroad right-of-way to a safer location.

Low Rail Overpasses

Stakeholders consulted for the 2025 State Rail Plan identified locations where rail overpasses provide inadequate clearances that constrain the movement of trucks and other large vehicles within communities. The average tractor/semi-trailer is 13 feet, 6 inches high. Highway overpasses should be at least 14 feet to account for truck jostling. Examples of low rail overpasses include those under the NEC as it crosses Chester City southwest of Philadelphia (**Figure 4.5**).[73] An analysis by the Delaware Valley Regional Planning Commission found that 15 bridges have clearance less than 13 feet 6 inches. Some of these bridges are poorly marked and do not give advance warning of low clearance. Low clearance bridges not only reduce mobility within communities, but they create the potential for disruptions to railroad operations. If a bridge is struck by a truck, inspectors need to inspect the bridge before normal rail operations can resume. Issues with low overpasses are present throughout the Commonwealth with a predominance in Lycoming and York Counties, as well as the cities of Reading, Hollidaysburg, Erie, and Elizabethtown.

[71] Trespass Prevention | FRA
[72] https://railroads.dot.gov/railroad-safety/divisions/crossing-safety-and-trespass-prevention/trespass-suicide-prevention

[73] DVRPC, *Truck Wayfinding in the City of Chester: Balancing Community and Business Needs,* Juen 2018, 18009.pdf.

Figure 4.5 Low NEC Overpasses in Chester

Source: DVRPC

Quiet Zones

Per federal regulations, locomotive engineers must sound train horns in advance of all public grade crossings. Train horns must be sounded in a standardized pattern of two long, one short, and one long blast.[74]

Localities that meet certain safety requirements can designate a segment of rail line with one or more consecutive public highway-rail grade crossings as a "quiet zone" where locomotive horns are not routinely sounded. Localities that want to establish a quiet zone are first required to mitigate the increased risk caused by the absence of a horn. In quiet zones, trains still use horns in emergency situations. Frequently, rail lines pass through poorer areas, and these disadvantaged communities bear the brunt of train noise pollution. If quiet zones decrease the burden of noise pollution on these poorer communities, establishment of quiet zones can support lifestyle equality across communities.

However, quiet zones can have unintended implications within communities. The supplemental safety measures implemented to compensate for the absence of train horns are generally designed for the motoring public, and not necessarily other roadway users like pedestrians and bicyclists. They also target crossings and do not address potential nearby trespasser issues on the right-of-way. The warnings that train horns provided are no longer available to trespasses and potentially other crossing users like bicyclists and pedestrians. Several stakeholders mentioned existing quiet zones or quiet zones that communities would like to establish. Neither PennDOT nor the federal government participate in funding quiet zones. These initiatives must be locally led. Several stakeholders mentioned interest in quiet zones or revising existing quiet zones in Cambria County, the City of Reading, City of York, City of Sunbury, Gettysburg Borough, and City of Lebanon.

[74] https://www.ecfr.gov/current/title-49/subtitle-B/chapter-II/part-222.

4.7 TECHNOLOGY TO SUPPORT RAILROAD SAFETY

PennDOT continually monitors technologies that could improve rail safety to evaluate their potential for use in Pennsylvania.

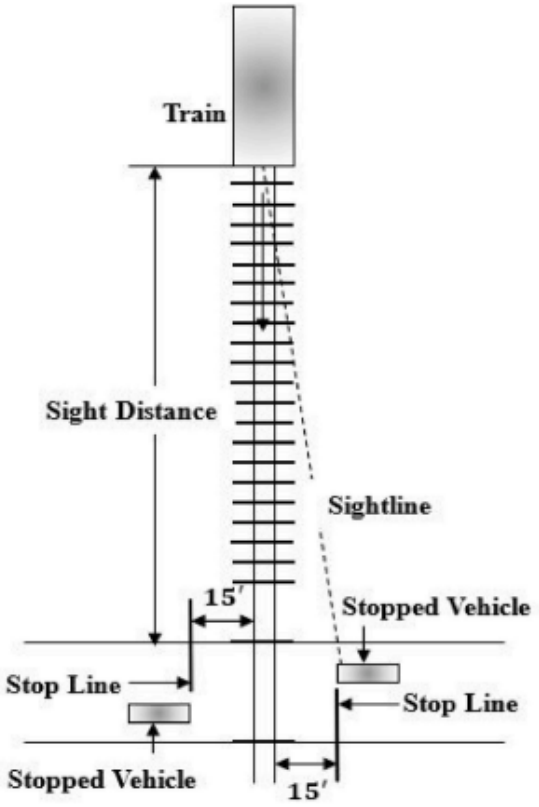
Safety Technologies for Grade Crossings

An example of a technology to improve safety at grade crossings is WAZE, a navigation and live traffic mapping application available in Web, iOS, and Android, which has added features that include grade crossing awareness. Similar to a notification of "accident ahead," WAZE notifies users of railroad grade crossings when navigating using the mobile app. Data on grade crossings is sourced from the FRA and bounded with trigger zones around grade crossings that create the pop-up prompt to drivers. This is not an optional feature in WAZE that can be toggled on or off. The prompt also generates an audio alert that can be heard if the user has volume activated on their mobile device.

Other technologies help to assess needed improvements to sightlines, to enabling motorists to see oncoming trains. With automated technology, more crossings can be assessed and the need to improve sightlines can be more readily identified. Researchers at Michigan Technological University[75] developed a methodology for automatically assessing the visibility at highway-rail grade crossings using light detection and ranging (LiDAR) technology, rather than more costly on-site assessments by field personnel. Using high-resolution LiDAR technology enables an efficient evaluation of sightlines at grade crossings using remote sensors in contrast to traditional surveying and on-site assessments by field personnel. The study examined 12 crossing case studies and concluded that LiDAR technology could provide a rapid and cost-effective method for identifying and addressing sightline issues at grade crossings.

A major problem for gated crossings is that motorists sometimes drive around closed gates. Some areas of the country have experimented with automated enforcement technologies that can issue photo citations to motorists that drive under or around crossing gates grade crossing signals and gate arms are in operation. One example in California found that enforcement cameras significantly reduced crossing violations.[76]

Figure 4.6 Sight Distance for a Stopped Vehicle



Source: Michigan Tech

[75] Hohsen Naghdi, Pasi Lautala, Abdolmajid Erfani, "Assessing the visibility at highway-rail grade crossings using light detection and ranging (LiDAR) technology," 2024.
[76] Linda Meadow, "Automated enforcement at highway rail grade crossings" Institute of Transportation Engineers, ITE Jornal, June 1988.

Safety Initiatives to Monitor the Health of Railroad Equipment and Infrastructure

PennDOT partnered with NS to sponsor RailPulse, a system that actively monitors railcar health and helps to avoid railcar failures, such as bearings, bolsters, air pressure, and couplers. RailPulse is in early adoption, but a wider implementation will help to improve safety of the railcar fleet.

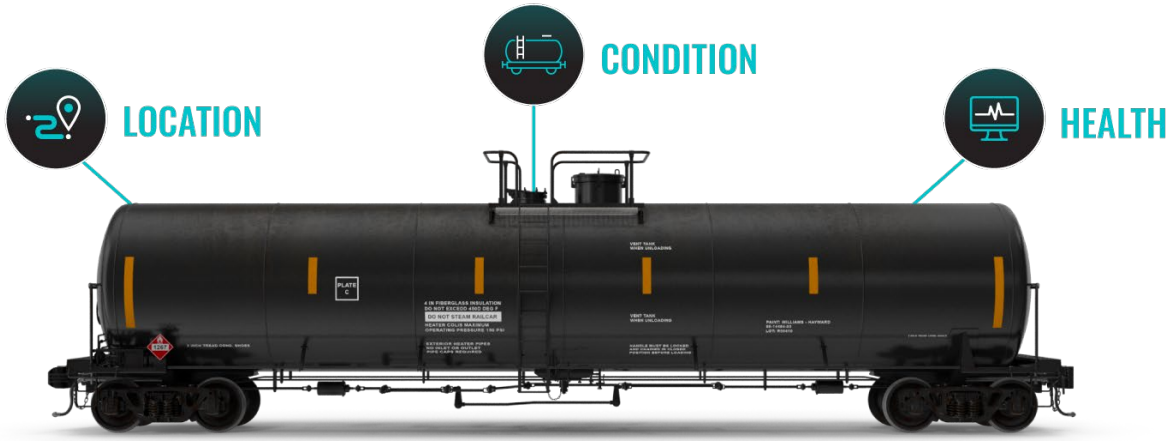
TECHNOLOGY PROJECT TO IMPROVE RAIL SAFETY AND OPERATIONS: RAILPULSE.

RailPulse's full name is "RailPulse-The Realization of Railcar Location, Condition, Health, and Telematics Sensors on the North American Railcar Fleet." RailPulse was partially financed by a $7.9 million UDOT FY2020 CRISI grant awarded to PennDOT. The Commonwealth and its major rail partners provided additional investments to launch the program using GPS technology and other telematics on the freight car fleets operating in North America.

RailPulse is a joint venture project of five major companies: Trinity Industries, NS, GATX, Genesee & Wyoming, and Watco Companies. RailPulse is committed to developing new standards and system infrastructure to support the railroad industry in meeting two key objectives. The first is to provide real-time information for enhanced safety through the consistent, reliable provision of key data on railcars across the entire North American fleet to shippers, railcar owners, and railroads. The second is to reinforce rail's competitive modal share position of freight transportation through increased real-time sustainable visibility into status, location, and condition of rail equipment and commodities being transported.

Since 2020, additional Class I railroads (UP, CSX, and CPKC), short line railroad holding companies, major shippers, rail car manufacturers, component vendors, and lessors continue to join the RailPulse coalition as enthusiasm for this industry-wide effort grows.

Railroads, rail industry suppliers, shippers, and others interested in knowing more about RailPulse can connect and get started through the RailPulse website: https://railpulse.com.



In addition, Class I railroads NS and CSX are moving forward with Railcar/Train Inspection Portals (TIPs) to enable full inspection of a train while moving at track speed. TIPs provide much more comprehensive data than traditional equipment defect detectors, which typically address only one issue, like a hot bearing. In contrast, a TIP uses cameras, lasers, thermal sensors, and back-end big data and AI to assess the mechanical “health” of a train and the cars and locomotives that make up its consist.

CSX first deployed a TIP in 2019 and has since expanded to three inspection portals that strategically capture 95 percent of all traffic moving on CSX. The three portals are all located in Georgia, specifically at Waycross, on CSX’s Fitzgerald Subdivision, and at Walthourville.

Following the 2023 derailment in East Palestine, Ohio, NS also began deploying digital train inspection portals to enhance rail safety across the company's 22-state network (**Figure 4.7**). Like the technology employed by CSX, the hardware attains 360-degree views of passing equipment and generates 700 images of each car and locomotive while a train is passing at track speed. These images and data points are then run through algorithms to determine if equipment is complying with prescribed safety standards or needs to be set aside for further inspection and/or repair. NS’s initial inspection portals were installed in Ohio and in Georgia.

Figure 4.7 NS Digital Inspection Portal

Track Inspection Technology and Digital Twins

Class I railroads are also using railcar mounted inspection technology to inventory and assess the state of repair for fixed network assets. In the case of NS, as trains transport goods across the network, car-mounted imaging systems and AI models are inventorying every rail — including the manufacturer, year, size, and condition. NS is using this information to create a digital twin of the entire 22,000-mile network. The digital model enables remote analysis of rail condition and facilitates proactive safety programs of the track network.

5. Rail Service and Investment Program

5.1 VISION, GOALS, AND OBJECTIVES

For the 2025 Pennsylvania State Rail Plan, PennDOT updated the vision, goals, and objectives from the 2020 plan. The update reflects changes in safety, rail funding, land use, and railroad operating practices that have occurred in the intervening five years, as well as additional input from stakeholders and the general public. In preparing the 2025 State Rail Plan, PennDOT held several stakeholder and focus group meetings and conducted an online survey. Throughout these outreach activities, participants were invited to identify priorities and assess goals and objectives. This feedback has been incorporated into the 2025 Plan vision, goals, and objectives, which are described below.

Pennsylvania's Rail Vision

Pennsylvania's integrated rail system will provide safe, convenient, reliable, and cost-effective connections for people and goods. Rail is a core transportation mode that supports economic vitality and sustainable growth throughout the Commonwealth.

Rail Plan Goals

To achieve Pennsylvania's vision for a safe, convenient, reliable, and cost-effective rail system, the following goals and supporting objectives have been identified:

Enhance safety and security of Pennsylvania's rail system while minimizing risks to communities in which railroads operate.

- Improve the safety of pedestrians and motor vehicles where there are highway-railroad grade crossings.
- Advance opportunities to eliminate highway-railroad grade crossings through crossing closure, grade separation, or roadway realignment, where feasible.
- Improve the security of rail passengers on rail vehicles and at stations, consistent with federal and state policies.
- Enhance the safety and security of rail rights-of-way, rail infrastructure, and rolling stock per federal and state policy.
- Continue efforts to promote safe and lawful behavior by the public around the rail network.
- Support efforts at the federal, state, and local levels to reduce the risk of railroad accidents in which hazardous materials are involved, including improvements to infrastructure, equipment, operations, and emergency response procedures.
- Support expansion and advancement of technologies that improve rail safety.

Bring the rail system to a state of good repair (SOGR) and ensure continued maintenance.

- Promote the preservation of rail rights-of-way for future railroad use.
- Invest in rail network infrastructure to bring the system to a SOGR where standards are not met and maintain SOGR going forward.
- Upgrade the rail system infrastructure and equipment to meet current standards.

Enhance the connectivity and coordination within Pennsylvania's rail network and between rail and other modes of transportation.

- Improve coordination among freight, passenger, and commuter rail systems, balancing passenger and freight needs and ensuring capacity constraints restricting the movement of passenger and freight traffic are addressed.
- Increase opportunities for multimodal freight traffic such as rail/truck, rail/marine, and rail access to airports.
- Advance existing passenger rail expansion initiatives within the Commonwealth.
- Improve multimodal access to the commuter and intercity rail systems.
- Improve connectivity within the freight rail network, by supporting enhancing connections between railroads and between rail lines.

Enhance quality of life in Pennsylvania

- Mitigate highway congestion by diverting roadway traffic to rail.
- Encourage rail-compatible land uses along rail lines.
- Increase economic development opportunities in communities by advancing investments in rail and by promoting market responsiveness and competition in the freight rail system.
- Enhance rail as an option to improve the mobility of both people and freight.
- Mitigate potential negative impacts of rail operations, particularly considering equity concerns of those living near rail infrastructure.
- Educate the public about rail-related quality of life benefits to Pennsylvania.

Support energy efficiency, environmental sustainability, and resiliency.

- Promote energy efficiency and lower greenhouse gas emissions by further investing in rail transportation.
- Explore and promote technological improvements that can enhance energy efficiency, environmental sustainability, or resilience.
- Investigate the risks and impacts of extreme weather events on rail lines and identify potential mitigation actions and resilience improvements.

Identify stable and predictable funding alternatives.

- Continue to pursue and prioritize funding for improvements in the rail system.
- Identify innovative and non-traditional sources of funding for rail projects.
- Advocate for a greater balance in funding between rail and highway modes.
- Determine legislative actions that support the further development and financing of the Commonwealth's rail system.

5.2 PROGRAM COORDINATION

As part of the planning process for the 2025 State Rail Plan, PennDOT consulted key statewide strategic planning documents to ensure the State Rail Plan maintains consistency and continuity with other PennDOT plans. **Table 5.1** provides a contextual synopsis of the strategic elements of each of these PennDOT plans and their relevance to the State Rail Plan. PennDOT coordinated extensively with Amtrak, SEPTA, regional planning agencies and other stakeholders in preparing the State Rail Plan and thereby coordinated with the planning initiatives of these organizations.

Table 5.1 Related PennDOT Planning Documents

POLICY DOCUMENT	STRATEGIC ELEMENTS SUMMARY
2045 PA Long Range Transportation Plan **Published: 2021** **Sponsor: PennDOT**	**Safety**: Enhance safety and security for both motorized and non-motorized modes throughout Pennsylvania's transportation system. **Mobility:** Strengthen transportation mobility to meet the increasingly dynamic needs of Pennsylvania residents, businesses, and visitors. **Equity:** Improve transportation access and equity throughout Pennsylvania. **Resilience:** Strengthen Pennsylvania transportation resilience to climate change and other risks and reduce the environmental impacts associated with transportation improvements. **Performance:** Improve the condition and performance of transportation assets. **Resources:** Structure transportation funding and finance approaches that allocate sufficient resources for system safety, maintenance, preservation, and improvement.
2045 PA Freight Movement Plan **Published: 2021, updated 2023** **Sponsor: PennDOT**	**Land Use:** Align freight mobility with economic development and land use. **Mobility:** Advance project investments that enhance freight mobility. **Analytical Tools & Processes:** Provide planning, data, and analytical tools for improved decision-making and collaboration with freight stakeholders. **Operations Safety:** Improve multimodal freight transportation operations and safety. **Environmental Stewardship:** Reduce, avoid, and/or mitigate adverse environmental impacts from Pennsylvania's freight transportation system, and plan for environmental impacts to freight movement.

Sources: 2045 PA Long Range Transportation Plan, 2045 PA Freight Movement Plan

5.3 RAIL AGENCIES

PennDOT does not anticipate any organizational, policy, legislative changes, or new programs related to rail at this time.

5.4 PASSENGER ELEMENT

Appendix E lists all passenger rail projects. This section of Chapter 5 organizes the projects by intercity or commuter corridor, identifies funding sources (if known), and establishes a high-level overview for advancing passenger rail development for each corridor in the short and long term. The section also identifies where anticipated uncertainty and potential gaps in project development and/or funding could potentially arise and slow the pace of corridor expansion progress.

Where SEPTA operates and has identified projects over the same corridors that intercity (Amtrak) trains operate, the SEPTA projects have been included in project totals. Projects exclusive to SEPTA that are not on Amtrak corridors are listed separately as “SEPTA-Other” projects.

Projects are organized into four categories, shown in **Table 5.2**.

Table 5.2 Categories of Passenger Rail Projects

CATEGORY	DESCRIPTION	BENEFITS
1) Infrastructure	Includes track, rail, ties, switches, grade crossings, interlockings, flyovers, and signals.	These projects add capacity to lines, create new lines, avoid traffic conflicts with other trains, eliminate grade crossings or improve grade crossing safety, increase speeds, and improve reliability.
2) Stations	Includes station buildings, platforms, signage, parking lots, and sidewalks.	These projects enhance the passenger experience and provide accessibility to communities. They also can improve service reliability and on-time performance.
3) Bridges	Includes both large bridges and smaller culverts. Generally, these projects do not add capacity but rather address SOGR or improve existing structures.	These investments increase service reliability. In the case of the Keystone East corridor, bridge projects are mainly roadway overpasses rather than rail bridges. These impact and benefit the Keystone East corridor because they typically involve the replacement of catenary and catenary structures in the area of the roadway overpass work.
4) Rolling Stock	Includes renewal of existing equipment and/or purchase of new railway equipment such as locomotives and railcars.	New or renewed equipment improves the overall passenger experience, train reliability, and capacity to run more trains.

Source: WSP

For the purpose of the State Rail Plan, corridor projects are also subdivided into short- and long-term categories. “Short term” is defined as any project with a start date that falls before or during the year 2029. Any project starting after 2029 is defined as “long term.” In some cases, projects may start before 2029 but remain underway for a longer period of time. For example, SEPTA procurement for new Silverliner railcars is projected to run from 2028 to 2037, therefore defining this project as short term.

The following tables are high-level summaries of total number of projects and costs for the short and long term. Cost estimates for each corridor are totals of all projects for a given category and timeframe for which estimates are available. For detailed project line items for each corridor, including specification of which projects have estimates and which projects do not, please see Appendix E.

Table 5.3 summarizes the number of projects and aggregate costs for all passenger-related projects included in the State Rail Plan for both the short and long term. **Table 5.4** and **Table 5.5** segment the passenger rail projects by timeframe.

Table 5.3 Summary of Pennsylvania Statewide Passenger Rail Investment Program

CATEGORY	NUMBER OF PROJECTS	COST (MILLIONS $)
Infrastructure	111	$11,034.8
Stations	68	$5,697.9
Bridges	32	$1,054.1
Rolling Stock	6	$2,348.0
Total	**217**	**$20,134.8**

Sources: Multiple, detailed in Appendix E

Table 5.4 Summary of Statewide Passenger Rail Investment Program: Short Term

CATEGORY	NUMBER OF PROJECTS	COST (MILLIONS $)
Infrastructure	68	$5,835.6
Stations	27	$1,192.0
Bridges	27	$988.9
Rolling Stock	4	$1,378.0
Total	**126**	**$9,394.50**

Sources: Multiple, detailed in Appendix E

Table 5.5 Summary of Statewide Passenger Rail Investment Program: Long Term

CATEGORY	NUMBER OF PROJECTS	COST (MILLIONS $)
Infrastructure	43	$5,199.2
Stations	41	$4,505.9
Bridges	5	$65.1
Rolling Stock	2	$970.0
Total	**91**	**$10,740.2**

Sources: Multiple, detailed in Appendix E

Keystone East

The Keystone Master Plan, a joint planning effort between PennDOT, Amtrak, SEPTA, and other key stakeholders, is the primary planning document identifying projects on the Keystone East corridor between Philadelphia and Harrisburg. Sixty-nine projects totaling approximately $3.57 billion over 25 years have been identified across the infrastructure, stations, and bridges categories. Rolling stock is not counted as a Keystone East investment because the new single-level Airo cars that will operate on the corridor are included in the Northeast Corridor costs described later in this section. **Table 5.6** and **Table 5.7** itemize short- and long-term projects for each investment category on the Keystone East corridor.

Keystone West

In September 2023, PennDOT announced an agreement with NS to extend a second round-trip frequency between Harrisburg and Pittsburgh. The program estimate to support this second frequency includes $212.0 million in infrastructure costs and $8.7 million in station costs. As part of this agreement, 13 projects are identified for improvements along the Keystone West corridor (**Table 5.8**). All projects are identified for construction in the relatively short term, starting during or before 2029.

In addition, the Pittsburgh Station bypass project, currently under construction, will add a bypass track at Pittsburgh Station. The bypass track will have double-stack clearance to accommodate extra rail traffic in the area, which will prevent freight interference with passenger trains. Amtrak is also in the process of improving seven stations to comply with ADA standards.

In parallel with Keystone East, the Keystone West corridor will also benefit from the $500,000 Corridor ID – Step 1 funding awarded by FRA, announced in December of 2023.

Table 5.6 Summary of Keystone East Investment Program: Short Term

CATEGORY	NUMBER OF PROJECTS	COST (MILLIONS $)
Infrastructure	9	$1,525.4
Stations	9	$333.2
Bridges	10	$159.1
Rolling Stock	0	$0.0
Total	**28**	**$2,017.7**

Sources: Multiple, detailed in Appendix E

Table 5.7 Summary of Keystone East Investment Program: Long Term

CATEGORY	NUMBER OF PROJECTS	COST (MILLIONS $)
Infrastructure	17	$1,276.9
Stations	19	$256.8
Bridges	5	$65.1
Rolling Stock	0	$0.0
Total	**41**	**$1,598.8**

Sources: Multiple, detailed in Appendix E

Table 5.8 Summary of Keystone West Investment Program: Short Term

CATEGORY	NUMBER OF PROJECTS	COST (MILLIONS $)
Infrastructure	12	$212.0
Stations	8	$63.9
Bridges	0	$0.0
Rolling Stock	0	$0.0
Total	**20**	**$275.9**

Source: PennDOT Bureau of Rail, Freight, Ports, and Waterways

NORTHEAST CORRIDOR

For the purposes of the 2025 State Rail Plan, the NEC is comprised of the NEC mainline that passes through Pennsylvania between Delaware and New Jersey. A total of 34 projects have been identified costing at least $5 billion, in addition to one project for which cost estimates have not been completed. Sources for the projects include the Keystone Master Plan, SEPTA, Northeast Corridor Commission, Delaware Valley Regional Planning Commission, and Amtrak.

The NEC is the only intercity passenger corridor where rolling stock investments are identified, with deliveries and equipment entering service expected as early as 2025. Not included in the 2025 State Rail Plan is the $2.45 billion new Acela® trainsets, which are being paid for directly by Amtrak and the federal government.

Table 5.9 and **Table 5.10** outline the breakdown of categories, target implementation timeframe and cost for projects on the NEC.

Table 5.9 Summary of NEC Investment Program: Short Term

CATEGORY	NUMBER OF PROJECTS	COST (MILLIONS $)
Infrastructure	6	$1,744.8
Stations	3	$568.4
Bridges	10	$123.6
Rolling Stock	1	$67.0
Total	**20**	**$2,503.8**

Sources: Multiple, detailed in Appendix E

Table 5.10 Summary of NEC Investment Program: Long Term

CATEGORY	NUMBER OF PROJECTS	COST (MILLIONS $)
Infrastructure	8	$1,027.0
Stations	5	$1,479.0
Bridges	0	$0.0
Rolling Stock	1	$0.0
Total	**14**	**$2,506.0**

Sources: Multiple, detailed in Appendix E

SEPTA

SEPTA projects not on the NEC or the Keystone East Corridor are presented in this plan in a “SEPTA-Other” category. Ninety-four short- and long-term projects have been identified with an estimated cost of $11.2 billion, not including projects with unspecified cost estimates.

Documents used to identify SEPTA-Other projects include a list of projects provided by SEPTA for the 2025 State Rail Plan, the SEPTA FY2024 Capital Program, and the 2020 Pennsylvania State Rail Plan. SEPTA’s planning department also provided direct input and reviewed the project lists. SEPTA investment projects in the short- and long-term span all categories, including infrastructure, stations, bridges, and rolling stock. SEPTA plans to replace Silverliner IV railcars and support infrastructure, with target renewal between 2028 and 2037 at a cost of $1.8 billion. This figure includes $128 million for Silverliner infrastructure. The Silverliner IV Replacement and Infrastructure project is one of SEPTA’s Projects of Significance that remains underfunded by $970.02 million. In addition, SEPTA has planned a separate $1.1 billion vehicle overhaul program from 2026 to 2037.

Table 5.11 and **Table 5.12** summarize the short- and long-term project count and costs for all SEPTA investments that are not included on the Keystone East or NEC corridors.

Table 5.11 Summary of SEPTA-Other Investment Program: Short Term

CATEGORY	NUMBER OF PROJECTS	COST (MILLIONS $)
Infrastructure	41	$2,353.4
Stations	7	$226.4
Bridges	7	$706.3
Rolling Stock	3	$1,311.0
Total	**58**	**$4,597.1**

Sources: Multiple, detailed in Appendix E

Table 5.12 Summary of SEPTA-Other Investment Program: Long Term

CATEGORY	NUMBER OF PROJECTS	COST (MILLIONS $)
Infrastructure	18	$2,895.3
Stations	17	$2,770.0
Bridges	0	$0.0
Rolling Stock	1	$970.0
Total	**36**	**$6,635.3**

Sources: Multiple, detailed in Appendix E

Long Distance Trains

While no investments have been itemized for long-distance trains specific to Pennsylvania, it should be noted that as of spring 2025, Amtrak is in procurement discussions with various suppliers to reinvest in its long-distance passenger car fleet, which would include replacement of bi-level Superliner cars used on the Floridian℠ and single-level cars used for service including long distance trains on the NEC and the Lake Shore Limited® that services Pennsylvania in Erie.

Passenger Rail Program Funding

KEYSTONE EAST FUNDING

Planned projects on the Keystone East corridor would be paid for through a mix of PennDOT, FTA, and SEPTA funding. Ongoing support from PennDOT for operating costs is determined by formula and policy as set out by the Passenger Rail Investment and Improvement Act (PRIIA) Section 209, and PRIIA Section 212 specifies ongoing SEPTA contributions to access the Keystone East and the NEC mainline. FTA formula funding is allocated to support Keystone East.

Because the Keystone East corridor is considered by the FRA to be a part of the NEC, it is also eligible for funding under the Federal-State Partnership for Intercity Passenger Rail Grant—NEC (FSP-NEC) Program. Projects in this State Rail Plan on the Keystone East are identified in the 2024 Northeast Corridor Project Inventory and are eligible for funding under the FSP-NEC.[77] Other federal discretionary grant programs as listed in Chapter 2 suitable for funding Keystone East projects include Consolidated Rail Infrastructure and Safety Improvements (CRISI) and Better Utilizing Investments to Leverage Development (BUILD), formerly known as RAISE.

[77] https://railroads.dot.gov/elibrary/nec-inventory.

KEYSTONE WEST FUNDING

Funding sources anticipated for Keystone West will continue to be a combination of state and federal funding programs. Notably, in December 2023, Governor Josh Shapiro and the FRA announced that up to $143 million in funding would be awarded from FRA's Federal-State Partnership–National for Keystone West improvements between Harrisburg and Pittsburgh on NS. As a condition of the award, PennDOT would provide a 20 percent match for the overall program, or $35.7 million. Together, federal and state funding will cover $178 million, or 89 percent, of the estimated $212 million in project costs agreed to between the state of Pennsylvania and NS. The FSP grant covers a subset of the 11 projects identified as part of PennDOT's agreement with NS to support the second Pennsylvanian® frequency. Four of the projects are advancing without the federal grant to allow the new service to be initiated prior to completion of all 12 projects.

NORTHEAST CORRIDOR FUNDING

The NEC is unique in that multiple state and federal funding sources contribute to different investments across the entire corridor. SEPTA contributes capital funding to the NEC through PRIIA Section 212 cost allocation methodology. Projects on the NEC mainline are eligible for funding under the Federal-State Partnership—NEC program, and NEC projects identified in this State Rail Plan are among those listed in the 2024 Northeast Corridor Project Inventory. Other federal discretionary grant programs are applicable to these projects as well.

Amtrak also provides capital for the NEC through the annual legislative and grant requests to the U.S. Congress. In addition, the Infrastructure Investment and Jobs Act (IIJA), provided $6 billion to Amtrak's supplemental NEC account and $16 billion to Amtrak's national network account.

As one example for Pennsylvania, the Cornwells Heights Station rehabilitation project received a $30.5 million FSP-NEC grant from FRA in fiscal years 2022-2023. The project will be matched by $11.9 million from SEPTA and another $13.1 million from other federal programs secured by SEPTA. Amtrak will contribute $244,000.

States, commuter agencies, and other stakeholders local to the NEC can also initiate projects that leverage federal funding.

SEPTA FUNDING

SEPTA projects are funded using federal, state, and local sources with the expectation that programs identified in Chapter 2, including those managed by FRA, FTA, and USDOT, would similarly be leveraged depending on project eligibility and program capacity.

Core revenue sources cited by SEPTA for capital investments include programs established as part of the IIJA, as well as state funding under Act 89. SEPTA approved and successfully raised $550 million in bonds in FY2022.

The current FY2026 SEPTA capital budget of $984 million is sourced from 55 percent federal ($536 million), 43 percent state ($424.1 million), and 2 percent local ($21.3 million) funding. Between FY2020 and FY2025, SEPTA's capital budget has ranged between $640 million to $1.077 billion.[78]

In late summer 2025, SEPTA faced the prospect of permanent service cuts due to a deficit in its operating budget, which funds day-to-day operations of the agency. However, in September 2025, the Commonwealth approved the use of up to $394 million in capital assistance funds to cover operations to avoid planned service cuts for the next two years. This will allow SEPTA to continue to meet the needs of nearly 800,000 Pennsylvanians every day, as well as to provide critical transportation services ahead of and during high-profile events in 2026, including America's 250th anniversary, the FIFA World Cup, and the MLB All-Star Game. During this two-year period, SEPTA will continue to seek long-term solutions to its funding situation.[79]

Table 5.13 provides a summary of passenger rail funding.

Table 5.13 Summary of Passenger Rail Operating and Capital Project Funding

CORRIDOR	OPERATING FUNDING SOURCES	CAPITAL PROJECT FUNDING SOURCES
Keystone East	Passenger ticket revenues, PennDOT PRIIA Section 209 payments	SEPTA PRIIA Section 212 payments, FRA discretionary grants such as FSP-NEC, USDOT multimodal discretionary grants, FTA formula funding
Keystone West	Passenger ticket revenues, PennDOT PRIIA Section 209 payments	FRA discretionary grants such as FSP-off NEC grant, state funding
NEC	Passenger ticket revenues, SEPTA federal, state and local subsidies	SEPTA PRIIA Section 212 payments, FRA discretionary grants such as FSP-NEC, USDOT multimodal discretionary grants
SEPTA Other	Passenger ticket revenues, FTA formula funding, state and local subsidies	State funding, FTA formula grants, revenue bonds, USDOT multimodal discretionary grants

Source: WSP

[78] Southeastern Pennsylvania Transportation Authority (SEPTA).
[79] https://www.pa.gov/governor/newsroom/2025-press-releases/shapiro-admin-approves-septa--394-million-capital-funding-mainta; https://wwww.septa.org/news/septa-restores-full-service-fare-increase/

Passenger Rail Program Effects

PROGRAM EFFECTS BY SERVICE GOALS

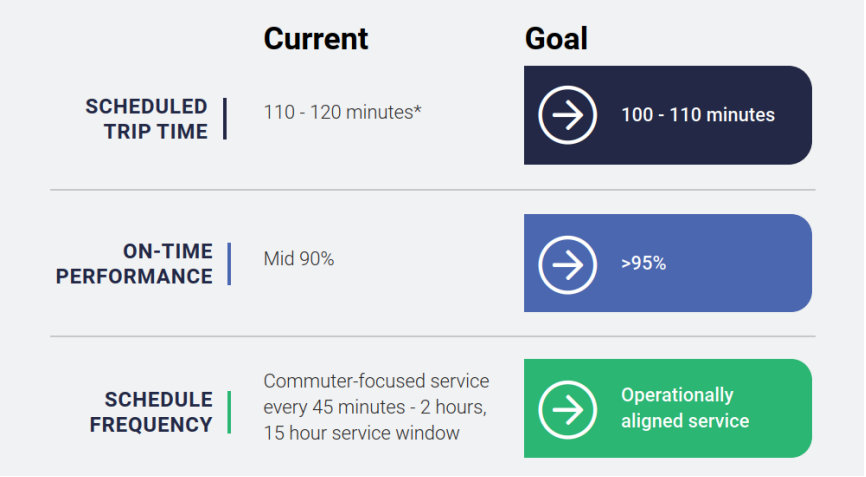
The passenger rail projects included in this State Rail Plan for the most part are components of multi-project programs that seek to improve the level of passenger rail service through several types of enhancements:

- More frequent service
- Faster service
- More reliable service
- Better station connections
- Better customer experience

These service improvements divert travelers from highway travel to rail, provide communities with more transportation options, and improve the state of repair of infrastructure with associated benefits per State Rail Plan goal areas.

Figure 5.1 and **Figure 5.2** from the Keystone Master Plan show anticipated service improvements that will result from the program of infrastructure projects on the Keystone East Corridor. Amtrak intends to decrease the runtime of the Keystone Service® between Harrisburg and Philadelphia to 100 minutes. Given the timing of the projects in the Keystone Master Plan, these service improvements should occur by 2040. SEPTA would increase peak train volumes by 135 percent on the Paoli/Thorndale line portion of the Keystone East Corridor. SEPTA would decrease the max wait times with service operating 15 hours per day, and additional early morning and late night service. Station enhancements from the Keystone Master Plan improve connections to the rail network and customer experience. These are long-term goals that may be impacted by short-term budget limitations.

Figure 5.1 Amtrak Service Goals on Keystone East Corridor

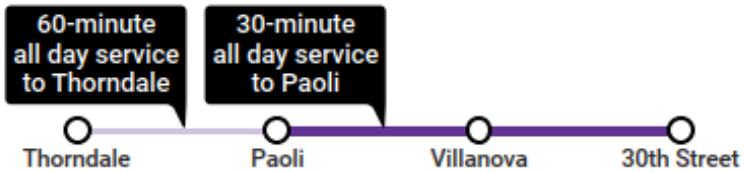


Source: Keystone Master Plan

Figure 5.2 SEPTA Service Goals for Paoli/Thorndale Line

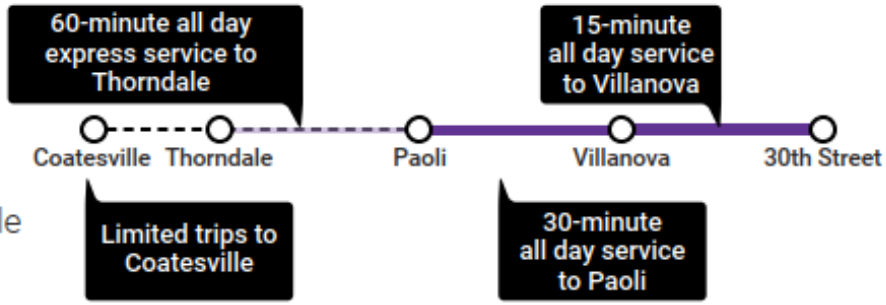
Short Term: 2024-2029

- 30-minute MAX to Paoli
- 60-minute MAX to Thorndale



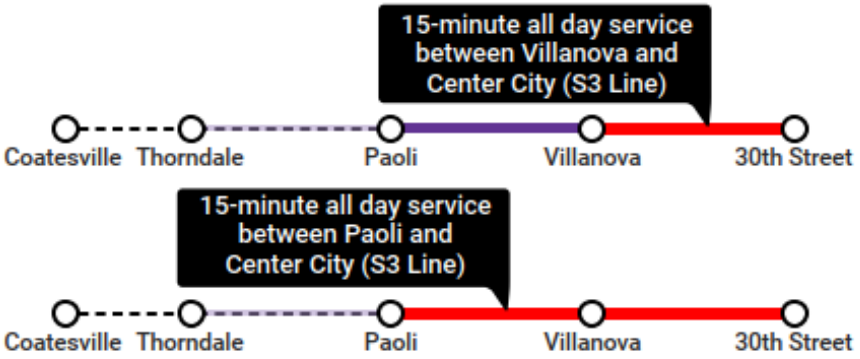
Mid Term: 2030-2039

- 15-minute MAX to Villanova
- 60-minute MAX express to Thorndale
- Limited service to Coatesville



Long Term: 2040+

- Phased roll-out of [S3] 15-minute MAX to Paoli



Source: Keystone Master Plan

A service goal for the Keystone West program of infrastructure projects is to add a second frequency for the Pennsylvanian®. Future improvements for the second Pennsylvanian® also include station enhancements that would provide better access to the rail network and customer experience.

The Northeast Corridor Commission, in conjunction with Amtrak, has established a series of service goals for the NEC Mainline. According to Connect 2037,[80] the 15-year service and infrastructure development plan for the NEC published in late 2023, Amtrak's service goal is to increase service nearly 100 percent, with 60 round trips (up from 35) between New York and Washington, DC. Under this plan, Acela® trains will offer nearly 25 percent more seats with train speeds up to 160 miles per hour, traveling between New York City and Washington, DC, in as little as 2.5 hours. The number of SEPTA trains on the NEC will increase by over 25 percent.

Projects recommended by SEPTA adhere to a program of projects from the 12-year capital investment program and the Reimagining Regional Rail strategic plan. SEPTA intends to shift to a lifestyle network that will work for all types of trips, not just morning/afternoon commutes. Service will be consistent, integrated and all-day, all-week to all corners of the SEPTA regional rail service area.

PROGRAM EFFECTS BY PROJECT TYPE

The impacts of projects can be assessed not only in the context of corridor service goals, but also individually, by the nature of the projects themselves.

Table 5.14 illustrates the alignment of the rail plan goals with the following passenger rail project categories. Appendix E provides a project-by-project matching with State Rail Plan goals.

Infrastructure Projects. These capital projects enhance safety and security by ensuring key assets are in a state of good repair. By supporting rail as a viable transportation option, these projects help improve quality of life for Pennsylvanians. Because trains have a lower energy intensity and therefore produce less greenhouse gas than most other transportation modes, projects that encourage rail service support energy efficiency and environmental sustainability. Passenger trains in Pennsylvania are particularly efficient, since electric trains are more energy efficient than diesel trains, and most passenger trains in Pennsylvania are powered by electric locomotives.

Station Projects. Accessibility and state of good repair investments at stations contribute to a safe, secure, and desirable transport system, encouraging ridership and connectivity. Projects that add high-level platforms ensure that all passengers, regardless of physical ability, can board trains safely and conveniently. Well-lit and maintained stations and parking lots provide riders with an attractive alternative for their transport needs.

Bridge Projects. Bridge projects ensure that bridges remain safe. Investing in these assets to bring them into a state of good repair or improve capacity helps promote rail as a more viable transportation option.

Rolling Stock Projects. Rebuilt or new rolling stock enhances safety and operational efficiency with the latest technology and manufacturing standards. By definition, these investments improve state of good repair for equipment. New rail equipment can be more attractive to users, enhancing rail as a modal choice. New rail equipment can also be more efficient, thus improving sustainability and decreasing operating costs.

[80] https://nec-commission.com/app/uploads/2023/11/C37-Executive-Summary-Nov-23.pdf

Table 5.14 Passenger Rail Project Support for the 2025 Pennsylvania Rail Plan Goals

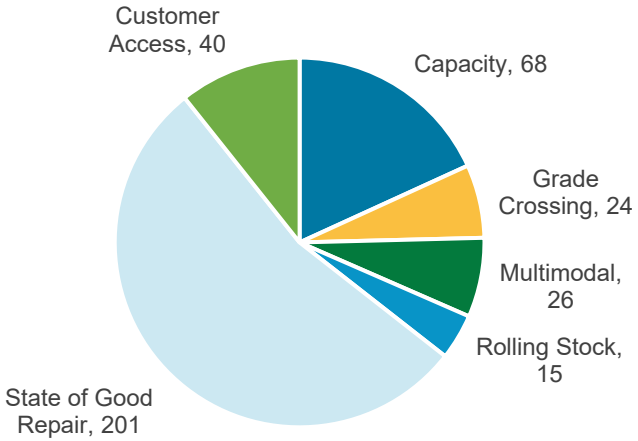
PROJECT TYPE	SAFETY AND SECURITY	STATE OF GOOD REPAIR	CONNECTIVITY	QUALITY OF LIFE	SUSTAINABILITY
Infrastructure	✓	✓		✓	✓
Stations	✓	✓	✓	✓	
Bridges	✓	✓		✓	
Rolling Stock	✓	✓		✓	✓

Source: WSP

5.5 FREIGHT/SAFETY ELEMENT

This State Rail Plan identifies 374 freight and rail safety projects, in addition to programmed Section 130 grade crossing projects identified in Appendix F. Of the 374 projects, over half are state of good repair projects, intended to restore or modernize rail infrastructure, while the remaining are a mix of customer access, capacity, grade crossing, multimodal, and rolling stock initiatives to increase and augment freight operations (**Figure 5.3**).

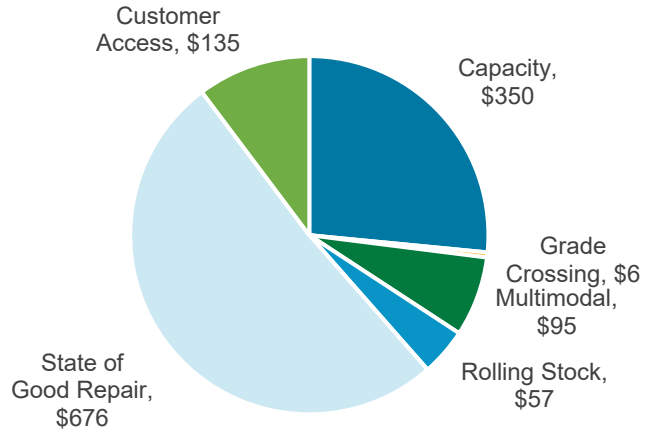
Figure 5.3 Summary of Freight and Safety Projects by Project Count



Source: WSP

Cost estimates have been provided for 309 of these projects, totaling $1.3 billion. **Figure 5.4** shows the breakdown of costs by project type.

Figure 5.4 Summary of Freight and Safety Projects by Project Cost ($M)



Source: WSP

As part of the outreach process for this State Rail Plan, stakeholders were asked to suggest timing of freight and safety projects. The projects noted by the 38 railroads that responded were roughly divided into short term (Year 1 through Year 4, or 2026–2029) or long term (Year 5 through 20, or 2030–2045) timeframes. For about half of the projects, the timing was specified, and for the remainder the timing was not determined or classified as “To Be Determined.” For those projects where the timing was specified, slightly over three quarters (78 percent) were identified as short-term projects to be completed over the next four years.

Table 5.15 Freight and Safety Projects by Project Type and Timing

PROJECT TYPE	SHORT TERM	LONG TERM	NOT DETERMINED	TOTAL
State of Good Repair	97	17	87	201
Capacity	17	11	40	68
Customer Access	10	4	26	40
Multimodal	6	4	16	26
Grade Crossing	10	2	12	24
Rolling Stock	5	3	7	15
Grand Total	**145**	**41**	**188**	**374**

Source: WSP

Freight Rail Funding

For projects that have been identified as short term and for which stakeholders provided cost estimates, total project needs for the short term are $444 million, or $111 million per year. The primary funding source by which PennDOT supports rail freight projects is through its two freight assistance programs, the Rail Freight Assistance Programs (RFAP) and Rail Transportation Assistance Program (RTAP). Available funding under those programs is about $41 million per year. This means private railroad investment of at least $70 million is needed annually to complete the short-term rail projects for which timing and costs were specified, as illustrated in **Figure 5.5**.

Assuming the projects for which the cost was *not* specified have the same average cost and short-term/long-term distribution as those for which the cost *was* specified, the total short-term needs would be $1.2 billion, or $311 million per year. The difference between short-term funding needs and available RTAP and RFAP funding would then be $270 million per year.

Figure 5.5 Summary of Freight and Safety Projects

Source: WSP

For freight projects, the remaining non-state funding would likely come from private sources, such as railroad investment, or from federal sources. The most common federal programs for freight rail projects are the CRISI and BUILD programs. For very large projects, funding can be sought from the Nationally Significant Multimodal Freight & Highway Projects (INFRA) program or the National Infrastructure Project Assistance (Mega) programs.

The CRISI Notice of Funding Opportunity for Fiscal Years of 2023 and 2024 states that no minimum project size exists under the program but applicants are encouraged to request funding in excess of $1 million. Assuming the grant request represents half of the total project cost, this means that the typical CRISI project is at least $2 million. To be eligible for Mega, projects must be over $100 million in cost, and projects are most competitive for INFRA if they are over $100 million as well.

Projects in **Table 5.16** are categorized by their size, with small projects less than $2 million in cost and medium projects between $2 million and $100 million. None of the freight rail projects identified for this Rail Plan exceed $100 million in cost, and therefore would not be eligible for the federal Mega program and would be less competitive for the INFRA program.

More than half of the projects cost less than $2 million and therefore would likely not be good candidates for federal discretionary construction grants and more appropriate for state funding through RFAP and RTAP.

While the projects over $2 million are less than half of projects by project count, by definition they are the larger projects and represent 91 percent of the total cost of all proposed projects. These projects have costs between $2 million and $100 million and could be candidates for federal funding.

Table 5.16 Projects by Type and Size

PROJECT TYPE	NUMBER OF PROJECTS		SUM OF ESTIMATED COST ($M)	
	Medium ($2M–$99M)	Small (Less than $2M)	Medium ($2M–$99M)	Small (Less than $2M)
State of Good Repair	73	111	$606	$70
Capacity	31	24	$408	$17
Customer Access	15	15	$129	$11
Multimodal	13	6	$88	$7
Grade Crossing	1	5	$3	$3
Rolling Stock	8	7	$51	$5
Grand Total	**141**	**168**	**$1,285**	**$113**

Sources: Multiple, detailed in Appendix E

Freight Rail Program Effects

Completing freight projects included in this State Rail Plan supports the Plan goals and objectives. By improving and enabling rail service, many of the projects generally support State Rail Plan goals by diverting freight from highway to rail and increasing freight movement by rail altogether.

State of Good Repair Projects. By definition, these projects help to support the goal of bringing the rail system in Pennsylvania to a state of good repair. They also support safety by reducing the risks of derailment or other accidents that may result from poorly maintained rail infrastructure. State of good repair projects can also support sustainability since fuel usage per ton-mile on slow, out-of-date rail lines tends to be higher than on newer and well-maintained rail lines. For example, fuel consumption on a 10-mile-per-hour rail line tends to be higher than on a 25-mile-per-hour rail line, and 286,000-pound railcars are more fuel efficient than 263,000-pound railcars because they can hold more capacity compared to the weight of the rail equipment, thus avoiding the need for locomotives to haul the extra railcar weight.

Capacity Projects. Many capacity projects boost connectivity by improving connecting track, yards, and sidings that are used to transfer railcars between rail lines. By encouraging the efficient flow of additional rail traffic over the rail network, capacity projects help to position rail as a viable freight transportation option. By supporting the fluidity of the rail network and enabling more rail traffic, they contribute to sustainability.

Customer Access Projects. Some customer access projects also improve state of good repair, bringing shipper rail infrastructure up to operating standards. They promote the connectivity goal by improving or establishing connections between customers and the rail network. By establishing or improving rail access, they help attract new shippers or augment the competitiveness of existing shippers, thus supporting economic development in Pennsylvania communities and enhancing the quality of life in those communities. By shifting more freight to rail from highway, customer access projects help support sustainability.

Multimodal Projects. Multimodal projects support connectivity by enabling or improving connections between rail and other transport modes. By creating synergies with rail access, these projects support continued economic development. Shifting freight to rail for even part of a journey helps to alleviate road congestion, therefore supporting sustainability and improving quality of life for nearby residents.

Grade Crossing Projects. Grade crossing projects support safety by reducing conflicts between trains and roadway users. Many grade crossing projects involve state of good repair activities like the resurfacing of crossings or rehabilitation of signals, pavement marking, or signage. By reducing conflicts with roadway users, they improve the quality of life in Pennsylvania communities.

Rolling Stock Projects. Rolling stock projects include not only the acquisition of physical rolling stock but also the construction of infrastructure to store and maintain this equipment. These projects support the state of good repair of rolling stock and the infrastructure needed to maintain railroad equipment. These projects can support sustainability since new rail equipment is typically more energy efficient than old rail equipment. The construction of maintenance facilities may also support sustainability since new buildings are also more efficient than old buildings and because new locomotive sheds may enable railroads to store locomotives during cold weather, rather than idling to avoid freezing conditions.

Table 5.17 Freight Rail Project Support for Rail Plan Goals

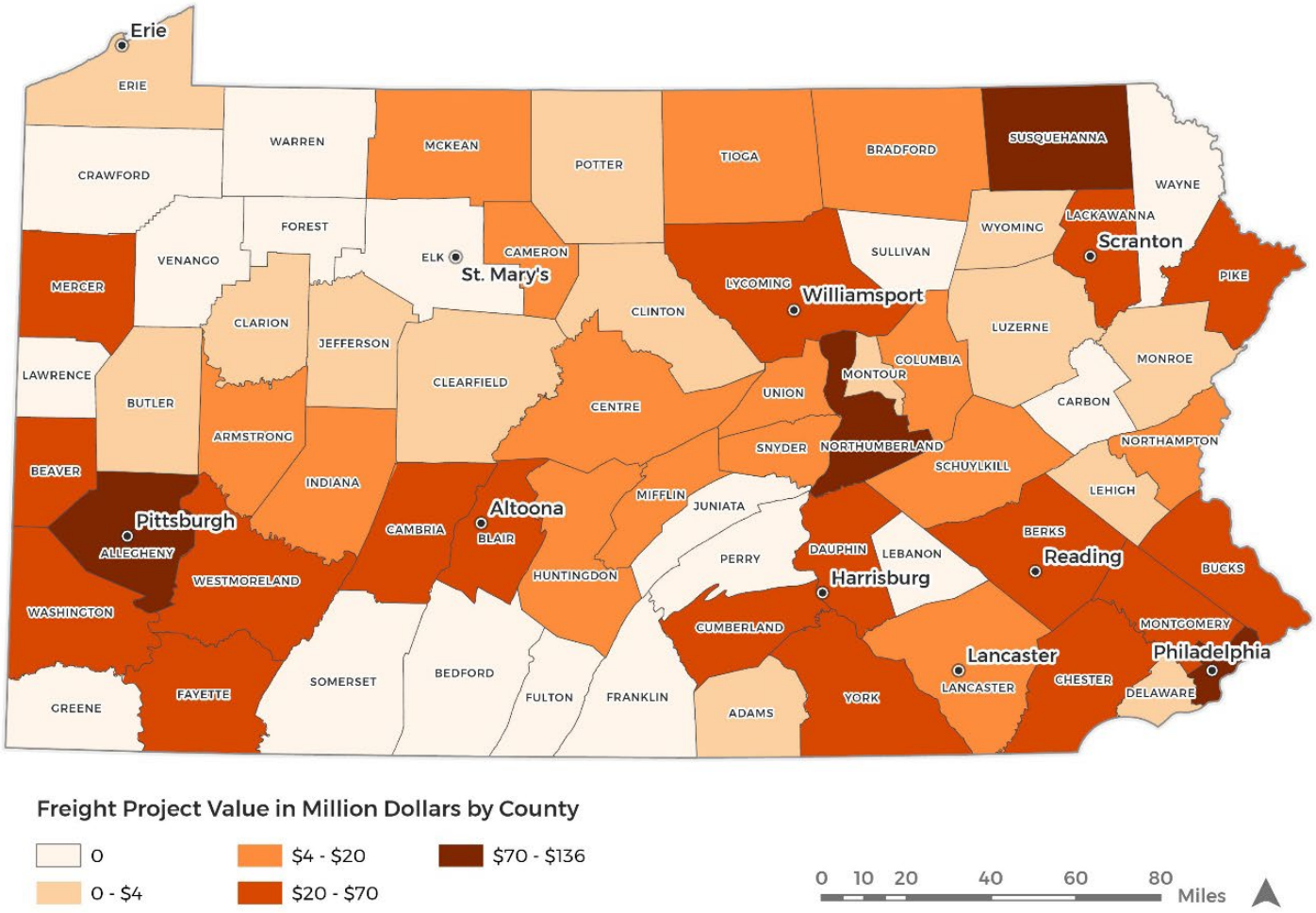
PROJECT TYPE	SAFETY AND SECURITY	STATE OF GOOD REPAIR	CONNECTIVITY	QUALITY OF LIFE	SUSTAINABILITY
State of Good Repair		✓		✓	✓
Capacity			✓	✓	✓
Customer Access		✓	✓	✓	✓
Multimodal			✓	✓	✓
Grade Crossing	✓	✓		✓	
Rolling Stock		✓			✓

Source: WSP

Geographic Distribution of Freight Projects

Proposed freight projects are distributed broadly throughout the Commonwealth. Susquehanna, Northumberland, Allegheny, and Philadelphia counties have a relatively large share of the proposed freight projects by value, but projects are located in most counties across Pennsylvania (**Figure 5.6**). These include 309 projects, of which cost estimates have been provided for 274 projects with a total estimated cost of $1.3 billion.

Figure 5.6 Geography of Freight Projects



Source: WSP

5.6 RAIL STUDIES AND REPORTS

Several planning studies and reports are anticipated for passenger rail initiatives in Pennsylvania. Primarily among these are Service Development Plans under the federal Corridor ID program that are either in the process of being scoped (Step 1 of the Corridor ID Program) or have been initiated (Step 2 of the Corridor ID Program):

- Keystone Corridor: Pittsburgh to Philadelphia
- Scranton–New York City Corridor
- Reading–Philadelphia Corridor
- Midwest Connect Corridor: Chicago, Fort Wayne, Columbus, and Pittsburgh

In late 2024, SEPTA completed a draft *Reimagining Regional Rail Master Plan*, which includes planning-level cost estimates to inform future project planning. In addition, the Lehigh Valley Planning Commission is also continuing to assess the feasibility of passenger rail between Allentown and major regional urban centers like Philadelphia, New York, Reading, and Harrisburg.

In terms of a potential need for future studies and reports, discussions on blocked crossings with MPO stakeholders suggests that this may be a potential area for further investigation. Locations were identified where crossings are routinely blocked, but relatively few projects to address these situations were proposed. Additional study could suggest ways to alleviate these situations.

6. Coordination and Review

This chapter describes how stakeholders and the public were engaged in the development of this 2025 State Rail Plan, as well as the coordination with other planning efforts. PennDOT is committed to wide-ranging stakeholder and public involvement that informs all aspects of rail planning.

A stakeholder database was developed for the project, consisting of government contacts at federal, state, regional, and local agencies; freight and passenger railroads; freight rail users; ports; planning partners in Metropolitan Planning Organizations and Rural Planning Organizations; economic development groups; advocacy groups; elected officials; and the public. In total, the database contained over 160 interested parties and entities. The database was used to disseminate project information such as newsletters, meeting announcements, etc.

Input and comments received during the outreach informed the Rail Plan's vision, goals, and objectives; identified projects included in the Rail Service and Investment Program; and generally provided content for the plan. See Appendix H for examples of surveys and outreach materials provided to the stakeholders and the public.

Additional input during the Draft Rail Plan public comment period further updates information in the State Rail Plan.

6.1 APPROACH TO PUBLIC AND AGENCY PARTICIPATION

Several approaches were taken to engage with stakeholders and the general public:

- Advancing PA Rail website
- Public meetings
- Stakeholder workshops
- Online public survey
- Meetings with economic development organizations, trade associations, and shippers
- Railroad meetings and information requests
- Port authority roundtable
- Rail authority roundtable
- MPO/RPO roundtable and survey
- Meetings with neighboring states

Advancing PA Rail Website

PennDOT's Bureau of Rail, Freight, Ports, & Waterways created the Advancing PA Rail website (www.advancingparail.com) to help stakeholders and members of the general public stay abreast of improvements to rail in Pennsylvania, as well as the Bureau's rail planning activities. A dedicated section for the State Rail Plan was added to the Advancing PA Rail website and was updated throughout the planning process. The webpage provided an overview of the planning process, including stakeholder workshops and public outreach activities, public meeting presentations, plan information, and a link to the public survey. **Figure 6.1** provides a screenshot of the website.

Figure 6.1 Screenshot of Advancing PA Rail

This Draft State Rail Plan document will be posted and made available for a 30-day public comment period. The Advancing PA Rail website will be the primary mechanism by which public comment can be provided on the Draft State Rail Plan. The Final State Rail Plan document will also be posted to this website.

Public Meetings

Two public meetings are held for the Rail Plan.

The first virtual public meeting was held on December 10, 2024, to share information about the 2025 State Rail Plan and to gather information from participants to inform the plan. PennDOT announced the meeting through a press release, social media posts, emails to elected officials, stakeholders, and planning partners, and through information posted to the Advancing PA Rail website. The virtual meeting provided an introduction of the Rail Plan update process and background information on freight and passenger rail. This was followed by an interactive question and answer session. A total of 161 people attended, representing a variety of organizations including freight and passenger rail entities (e.g., Amtrak, NJ TRANSIT, Reading Blue Mountain & Northern Railroad, Oakland Transportation Management Association, Schuylkill River Passenger Rail Authority, and Transtar), as well as local and county officials, state representatives, school districts, economic development organizations, port authorities, the press, and the general public. PennDOT's responses to questions raised at this meeting can be found in Appendix H.

A second public meeting will be held following the issuance of the Draft Rail Plan in late Summer of 2025.

Stakeholder Workshops

Three Virtual Stakeholder Workshops were held in September 2024. Attendees included representatives from passenger and freight railroads, MPOs and RPOs, local and state government agencies, the Pennsylvania General Assembly, rail advocacy groups, and business and economic development interests. In addition to the project team, there were 39 attendees at the September 4 workshop, 24 attendees at the September 12 workshop, and 10 attendees at the September 17 workshop.

At each workshop, a brief presentation was given, followed by a discussion of the Rail Plan's goals objectives, needs, and opportunities for the Pennsylvania rail system. Discussion was facilitated using an interactive polling software, PollEverywhere. See Appendix H for a depiction of the PollEverywhere exercise. The workshops also allowed for questions and comments via the virtual meeting's chat function.

A summary of some of the themes of the stakeholder workshop is below.

COMMUNITY

- Ensure safety for communities through which rail travels (concerns specific to safety along tracks, as well as potential for rail derailment leading to hazardous material spills)
- Reduce negative rail impacts on local communities
- Improve safety of grade crossings or eliminate where possible
- Pursue rail trail development along abandoned roadbeds

ECONOMIC DEVELOPMENT

- Secure dedicated funding to support rail projects
- Increase rural access to freight transportation
- Attract industrial development that would use rail services
- Work to eliminate ROW encroachment by non-rail use facilities, which inhibits opportunity for development by railroads and shippers

PASSENGER RAIL

- Increase access to passenger rail in areas where none is currently available; connect passenger rail service to northern parts of the state
- Provide higher-speed passenger rail service between states and other major metropolitan areas

- Provide connections between passenger rail and other modes of transportation (bus, bike, trails, etc.)
- Provide passenger rail access to natural features (recreation opportunities)
- Promote opportunities to expand rail service along highways (for example, I-81 median for passenger rail)

RAILROADS

- Improve data governance and interoperability
- Improve Class I cooperation in approval of permits, etc.
- Impose weight and height restrictions for freight rail
- Provide infrastructure to separate freight and passenger services (ex. SEPTA freight and passenger service separation on airport line)
- Foster collaboration between freight and passenger rail to maximize efficiencies and minimize conflicts

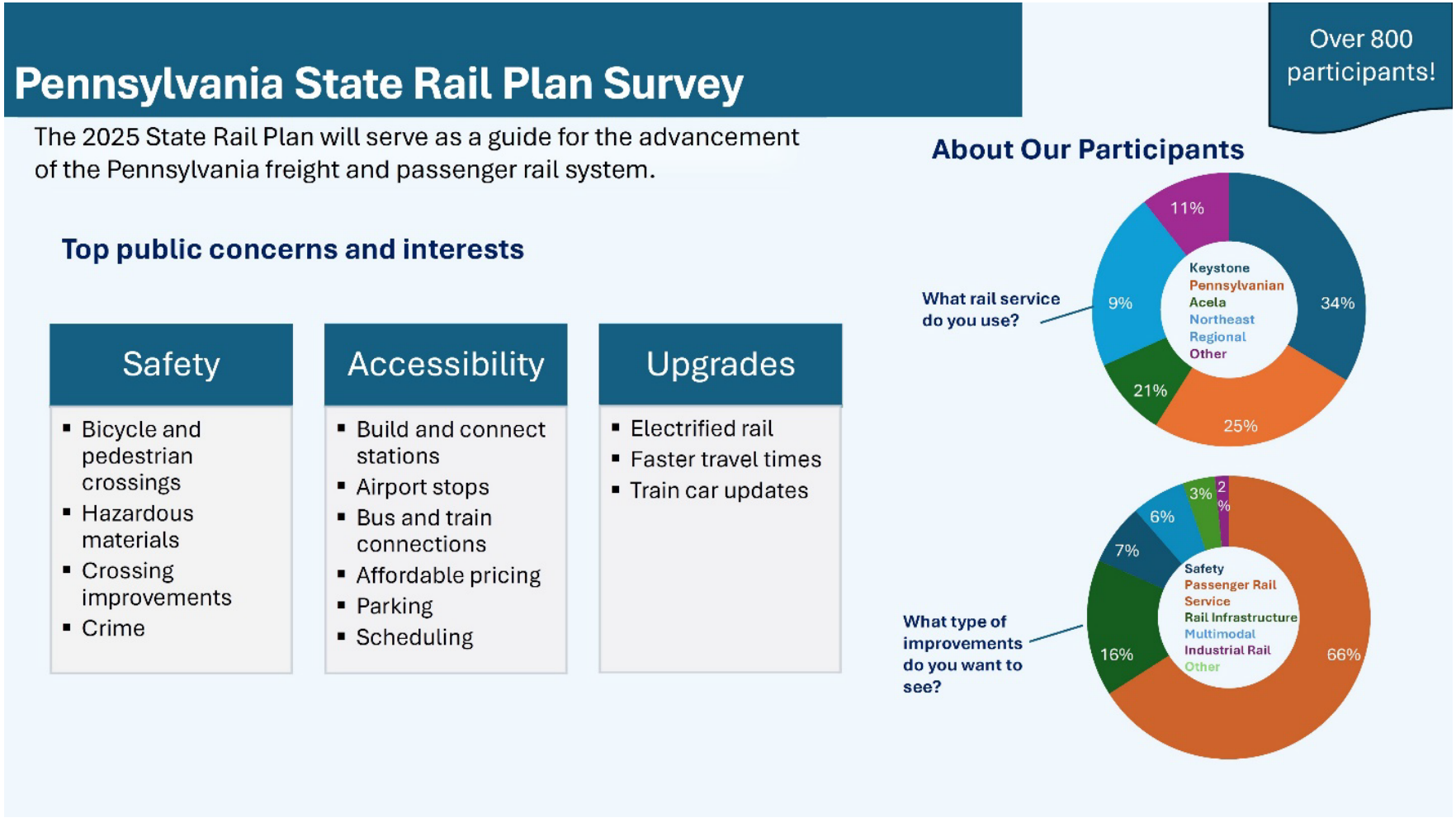
Online Public Survey

To gather input and feedback from a broad cross-section of the public, an online survey was posted to the www.advancingparail.com website. The survey was available starting on November 21, 2024, and remained posted until January 22, 2025. In addition, participants of the December 10, 2024 Virtual Public Meeting were invited to complete the survey and were provided a link via a QR code. There were 884 participants in the survey.

Additionally, comments were received by PennDOT via email. PennDOT acknowledged all comments received during the public comment period and provided responses. Substantive comments will be considered and incorporated into the Final Rail Plan. A copy of the survey form is available in Appendix H, as well as a summary of the comments and responses.

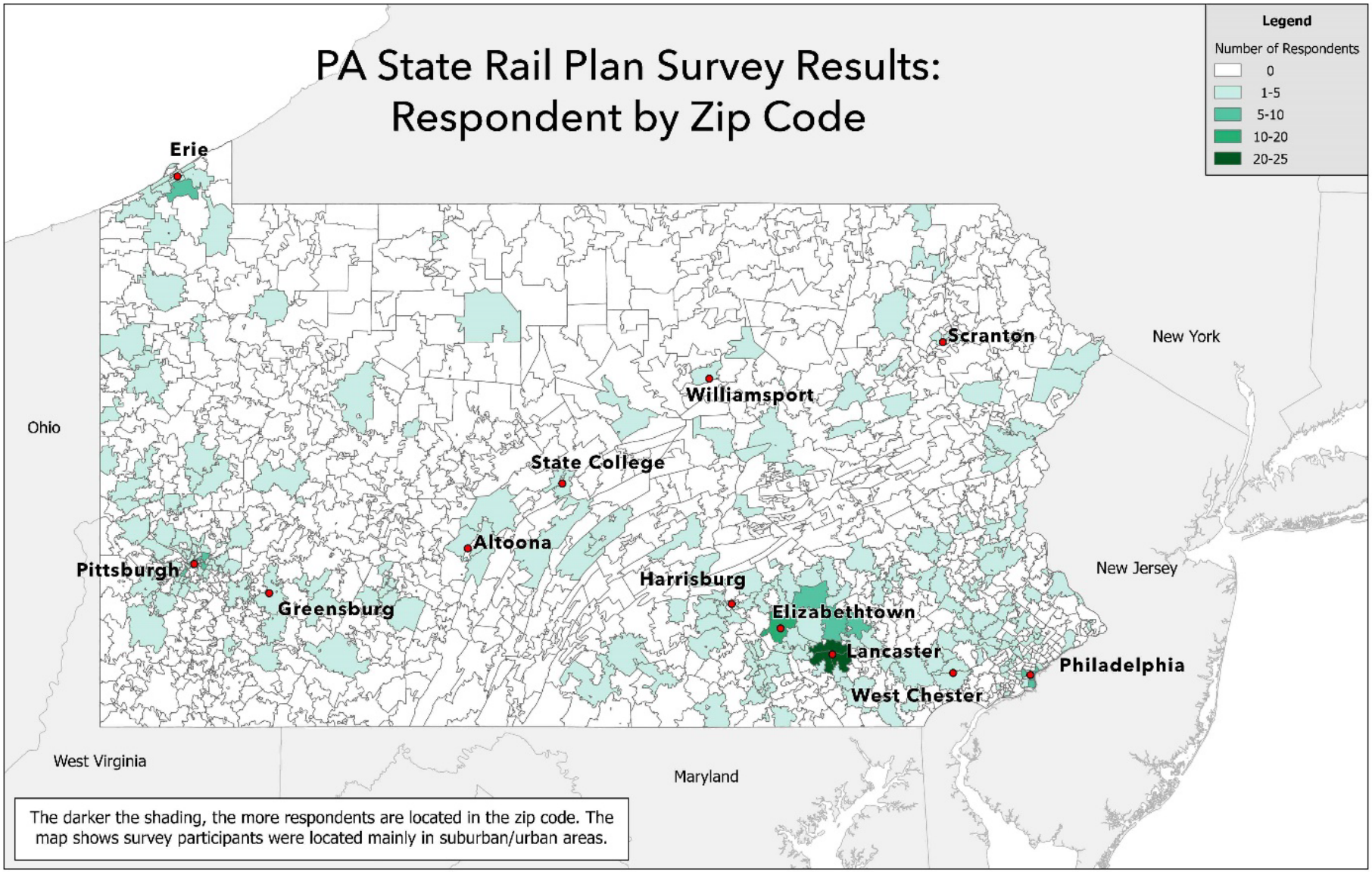
Figure 6.2 summarizes the survey results, while **Figure 6.3** summarizes the location of survey respondents by zip code.

Figure 6.2 Online Public Survey Results



Source: 2025 State Rail Plan Survey

Figure 6.3 Online Public Survey Respondents by Zip Code



Source: 2025 State Rail Plan Survey

Additional highlights of the survey responses were as follows:

PASSENGER RAIL

- When asked what improvements would make them take Amtrak or SEPTA more often, most respondents cited scheduling concerns, such as frequency of service or convenient travel times.
- When asked to recommend improvements on a map, two thirds of the responses were for passenger rail improvements, and most of these suggested new routes and services.
- The most cited markets for new or improved passenger services were in Philadelphia, Pittsburgh, Lancaster, and Allentown.

COMMUNITY CONCERNS

- When asked how rail can improve the quality of life in Pennsylvania, top responses were reducing highway usage and congestion; using rail as a component of land use strategies that emphasize non-highway transportation; and connecting workers with employment and work opportunities.
- When asked about future needs, respondents cited the need to provide sufficient capacity for freight and passenger rail, and improving rail access to Pennsylvania's airports.
- When asked about potential negative impacts of rail, respondents were most concerned about safety at highway-railroad grade crossings and hazardous materials moving by rail through communities.
- The largest number of recommended safety improvements were in the Philadelphia/North Philadelphia area, followed by Wilkes-Barre, Pittsburgh, and Erie.

Economic Development, Shipper, and Industry Trade Association Interviews

Economic development organizations, industry trade associations, and shippers were asked to provide information on issues with rail service, potential infrastructure or operational improvements that could increase the usage of rail, and regulatory restrictions that impact rail service. These groups were also asked to provide input on the value of public rail and infrastructure programs, how the public sector could support rail service to local industries, and their general views on the future of local rail freight service. Five economic development representatives, four trade association representatives, and individuals from three rail shippers were interviewed.

The list below highlights the rail issues raised in these interviews:

- There is a lack of railroad competition, which can impact pricing and quality of service.
- Interviewees emphasized the importance of short lines to connect shippers to the national freight network.
- There is a negative public perception of rail transportation with concern over transportation of hazardous materials.
- The closing of coal-fired power plants could reduce overall rail shipments, reducing freight revenues to maintain connecting and adjacent rail lines.
- Shippers pay demurrage charges but cannot build the rail infrastructure to avoid them.
- With low natural gas prices, some natural gas wells are capped until needed. Owners siphon off heavier products like propane and butane, which move by rail.

Interviewees also mentioned several advantages:

- Pennsylvania has rail-served industrial parks, which is an opportunity. At these locations, multiple shippers within an industrial area can share infrastructure, such as rail.
- Pennsylvania rail has an advantage for food production and transportation because the Commonwealth is an agricultural producing state and is situated between other agricultural producing midwestern states and the consumer markets of the Northeast.

Railroad Meetings and Information Requests

Initial meetings and follow-up telephone conferences with Amtrak, SEPTA, NS, and CSX focused on potential rail projects/improvements that affect the individual railroads and SEPTA. In addition to the meetings and phone calls, surveys and information requests were sent to SEPTA and each railroad operating in the state. A copy of the survey sent to Class II and Class III railroads can be found in Appendix H.

Input from freight railroads included the issues and opportunities identified below.

MAINTENANCE/INFRASTRUCTURE

- Several railroads mentioned locomotive replacement needs.
- Rail infrastructure maintenance is costly and heavily impacted by inflation. For some railroads in Pennsylvania, the topography results in significant grades and curvature, which causes high rail wear.
- Railroads commented on the need to replace or upgrade maintenance equipment such as ballast cars.
- Railroads maintain crossings and surface and signal upgrades are needed.
- Poor connections to other carriers results in inefficient routing.
- Rail infrastructure has been reduced in some areas, and now these areas are experiencing growth and require rail re-investment. Railroads should be encouraged to maintain existing infrastructure and not reduce it.
- The number and capacity of rail yards limits or inhibits rail operations, particularly at interchanges with Class I.
- Railroads advocate for continued funding.
- PA DEP permitting requirements for bridge work can be a challenge.

ECONOMIC DEVELOPMENT

- Railroads advocate for continued funding for the RTAP and RFAP.
- One respondent suggested the creation of a funding program that would focus specifically on new rail industrial access for economic

development projects with regional and statewide importance, in addition to RTAP and RFAP.

- New freight traffic growth is based on availability and suitability of land for track and industry shippers, maintaining existing industrial sites as such and/or having sites available for greenfield development.
- Some Pennsylvania railroads felt the need to diversify commodities transported by rail, since they are dependent on a few commodities.
- Railroads felt that transload opportunities should be promoted.
- Railroads are experiencing workforce challenges.
- The increase in the production of natural gas liquids may be an opportunity for railroads.
- Truck traffic and pipelines are in direct competition to rail. Policy changes that benefit trucking and pipelines could be disadvantageous to rail.
- Class III railroads are limited by the pricing of their Class I partners.

Port Authority Roundtable

Pennsylvania ports, including the Port of Philadelphia, Port of Erie, and Port of Pittsburgh, participated in a round table discussion on October 28, 2024. These discussions covered existing operations at the ports, future development plans, and rail access needs and opportunities.

Current priority issues identified by the three Pennsylvania ports include the following:

- The Erie Port Authority is working to ensure continued access to CSX despite the cessation of Wabtech locomotive manufacturing in the area, and to bring new rail-served businesses into the port area.
- The Pittsburgh Port Commission noted their port is dependent on the condition of the locks on the Ohio River system, funded by the federal government. Federal funding in part relates to tonnage, which has decreased recently due to a shift away from coal-fired power plants on the Ohio River. There is a need to shift to alternate cargoes, which currently consist of aggregates, iron ore, and scrap. The Pittsburgh Port Commission is continuing to have conversations with the railroads to attempt to increase multimodal traffic.
- Philadelphia Regional Port Authority noted three primary concerns: the lack of intermodal traffic, the need for additional at-grade crossings due to traffic congestion, and the need to upgrade the rail at the Tioga Marine Terminal. In addition, the river channel depth is only 45 feet, and should be dredged to 50 feet or more in depth to allow entrance of newer ships into the port.

Railroad Authority Roundtable and Survey

On October 30, 2024, a railroad authority roundtable discussion was held (see Appendix H for agenda). Attendees included the SEDA-COG Joint Rail Authority, the Schuylkill River Passenger Railroad Authority, and the Pennsylvania Northeast Regional Railroad Authority. The purpose of the roundtable was to discuss the rail-related needs and issues for these entities. Generally, the railroad authorities stressed the challenges of maintaining aging tracks and infrastructures, flood resilience issues, and pricing with Class I railroads.

In addition, the Pennsylvania Northeast Railroad Authority is taking part in the FRA Corridor ID program to plan passenger service between Scranton and New York. The Schuylkill River Passenger Rail Authority has also been selected by the FRA Corridor ID to plan passenger service between Reading and Philadelphia.

MPO/RPO Roundtable and Survey

Roundtable discussions were held on November 20, 2024 with approximately 20 Metropolitan Planning Organizations (MPO) and Rural Planning Organizations (RPO) that operate in the state of Pennsylvania. An online survey was provided to the MPOs and RPOs, as well as invitation to the December 2024 Virtual Public Meeting (see Appendix H for the survey form). Some of the feedback received includes:

COMMUNITY

- Railroad crossings should be grade separated, where feasible, to eliminate blockages and improve safety. Specific examples of blocked crossings cited include the Sinking Spring area of Reading along NS, and the NS crossing at Knick Lane in South Heidelberg.
- FRA-required train horn blasts cause noise concerns. Quiet zones are recommended for environmental justice communities and residential communities, such as Gettysburg Borough and downtown Reading.
- One community was concerned by rail cars parked near water intakes, and the potential for spills or release that would impact the water system.
- Loomis Street in North East Borough, Erie County, has just enough space between CSX and NS tracks that cars stop between. Rail and agency parties are working together to resolve this issue.
- Several examples were mentioned of highway overpasses over rail that limit railcar heights, including the Delair Secondary and the Richmond Industrial Track to Tioga Marine Terminal in Philadelphia. In other cases, low rail overpasses limit the roadways below, including the low overpasses of NS over Heisters Lane and Spring Street in Reading.

ECONOMIC DEVELOPMENT

- The Lake Erie Rail Alliance and All Aboard Erie are involved in efforts to increase the frequency of Amtrak passenger rail on the Lake Shore Limited® line. These include efforts to initiate planning for a rail corridor connecting Cleveland, Erie, and Buffalo.

For freight rail in Erie County, connectivity to the Port in Erie is important, especially for sand and gravel.

- A second daily Amtrak Pennsylvanian® could support business travel with a morning run to Altoona from Pittsburgh and evening run back.
- Transit-oriented development (TOD) in Lancaster may include increases in allowed building heights for more density near tracks and better access to the rail station.
- Opportunities exist for TOD near SEPTA regional rail stations.
- Passenger rail access to University Park would benefit Pennsylvania State University students and faculty.
- Opportunities for freight/passenger rail separation can increase the reliability of SEPTA service to Philadelphia airport.

- There are opportunities for rail-served development on brownfield sites, including the reuse of locations of former coal-fired power plants and the rail lines that access those locations.
- Energy shifts away from coal will influence freight opportunities. However, rail remains an important method to move other energy-related materials, including frac sand and wind turbines.
- Opportunities may exist to increase rail use to transport building materials, recycling, or solid waste.
- Several industrial/manufacturing hubs need rail access, such as Great Stream Common in Union County.
- There is an opportunity to reconnect rail to the Riverside Construction Materials site in the Philadelphia area.
- There is a need to rebuild rail infrastructure at the Tioga Marine Terminal in PhilaPort.
- The Schuylkill River Passenger Rail Authority is working to return passenger rail service to the corridor between Reading and Philadelphia and eventually points beyond. The project has been accepted into the FRA CID Program.
- There is a potential for rail-served freight development in Reading at the former Dana South site.
- There are opportunities for a transload facility on US 522 in Snyder County, which the SEDA-COG Joint Rail Authority could help to facilitate.
- The Eastern PA Freight Alliance has prepared the Eastern Pennsylvania Freight Infrastructure Plan, which provides rail policy recommendations and several recommended infrastructure projects at highway/rail grade crossings.

MULTIMODAL OPPORTUNITIES

- The Delaware Valley Regional Planning Commission (DVRPC) has the tool AccessScore (www.dvrpc.org/webmaps/accessscore) to analyze the infrastructure and demographic characteristics around transit stations to determine how supportive of bicycling and walking the area is and how much bicycle and pedestrian activity could be occurring there.
- TOD and better multimodal transportation connections to passenger rail stations, including sidewalks, ADA, buses, and bike share, would be beneficial.
- Allowing bikes and e-bikes on trains is a very beneficial service.
- Altoona Rail Yards are underdeveloped and could include a multimodal facility.
- The Erie County passenger rail station is poorly located. Ideally, this station would be moved to the transit facility hub (Erie Metropolitan Transit Authority).
- With the increase of warehousing in Lebanon County, coordination between passenger rail and public transit would allow for easier access for workers.
- Tourist train initiatives include improvements to the Gettysburg Scenic Railway and improvements to the Reading Blue Mountain & Northern train between Pittston to Jim Thorpe. Jim Thorpe Station currently connects the Delaware & Lehigh Corridor and the Lehigh Gorge trails.
- Pittston station and its parking lot are not multimodal accessible and are unattractive.
- A portion of the Erie Pittsburgh trail is planned along the Buffalo and Pittsburgh Railroad near the City of Corry in Erie County.
- There are opportunities for Lake Shore Limited® trips to Erie's Union Station.
- TOD and new transit connections at a proposed Franklin Street station are part of the proposed Reading to Philadelphia Corridor ID project.

PROPOSED NEW PASSENGER RAIL ROUTES

- Residents of the SEDA-COG region would like service from Harrisburg to Williamsport.
- The Keystone Study is identifying feasible options for improving service between existing stations in Tyrone and Lewiston and the State College area.

6.2 MEETINGS WITH NEIGHBORING STATES

Rail offices in neighboring states were contacted to inform of the development of the State Rail Plan and to solicit their input. During March 2025, meetings were held between PennDOT and departments of transportation of Delaware, Maryland, New Jersey, and New York.

The following issues and opportunities were identified in these meetings:

Delaware

- Northeast Corridor growth is a key consideration.
- Growing freight rail in Delaware requires coordination between Class Is and short line railroads.
- Sea level rise is a concern, particularly for coastal rail corridors.
- Rail-served industrial development requires preserving parcels for rail use near rail lines.

Maryland

- Rail line capacity is a challenge.
- Safety initiatives include a trespasser study, collaboration with Operation Lifesaver, and general rail safety education.
- Freight rail opportunities exist between Maryland and Pennsylvania shipping stone from Pennsylvania to the Delmarva peninsula and then shipping sand from Delmarva to Pennsylvania. Northbound sand shipments have not been fully developed.
- There is an opportunity for more industrial development along freight rail corridors.

New Jersey

- The Gateway Project is a priority for New Jersey.
- There is an opportunity to coordinate between Pennsylvania and New Jersey on passenger rail services between the two states, such as the proposed service between New York and Scranton through New Jersey. SEPTA lines operate into New Jersey to Trenton and West Trenton. There are also SEPTA yard facilities in New Jersey.

New York

- New York has an interest in the Pennsylvania Northeast Railroad Authority's efforts to establish a passenger rail service between Scranton, Pennsylvania, and New York, New York. This is primarily because any passenger rail service that would connect New York City to Binghamton, New York, would pass through Scranton. Therefore, a Scranton–New York service would be a building block for a future Binghamton–New York service.
- Investment is needed in wayside detectors and inspection portals.
- New York has been challenged by the loss of manufacturing jobs, which has decreased the need for freight rail service. Improved rail service can help to mitigate job losses by providing transportation connections that enable manufacturing enterprises to remain viable.

6.3 COORDINATION WITH OTHER PLANNING EFFORTS

As described previously, the PennDOT Multimodal Transportation Deputate is responsible for rail-related planning and project funding assistance for freight, passenger, and commuter rail operations within the Commonwealth—efforts that include the development of this State Rail Plan.

Numerous offices within PennDOT were involved and consulted in the preparation of this State Rail Plan, including the bureaus responsible for local and public transportation, ports and waterways, aviation and airports, and planning. Additionally, input was sought from other Pennsylvania state agencies, including the Public Utility Commission, Pennsylvania Department of Community and Economic Development, Pennsylvania Department of Environmental Protection, Pennsylvania State Historic Preservation Office, and Pennsylvania Department of Conservation and Natural Resources.

Information was shared amongst these agencies and organizations, primarily through the Advancing PA Rail website, the three Stakeholder Workshops with a live polling exercise, and the Draft State Rail Plan public comment period. Appropriately, state rail planning is coordinated with other transportation planning programs and activities in the Commonwealth.

Likewise, this coordination is reciprocal regarding the preparation of the other agency transportation plans in the Commonwealth, including the following:

- *Transportation Improvement Programs*, which are adopted at the regional level by the MPOs and RPOs.
- The *Statewide Transportation Improvement Program FFY 2025-2028*, a combination of the regional programs (PennDOT, 2024).

- The 2025 State Transportation Commission's *12-Year Program*, which is a multimodal, fiscally constrained program of transportation improvements spanning a 12-year period for the entire Commonwealth.
- Regional long-range transportation plans developed by the MPOs and RPOs.
- The *Pennsylvania 2045 Long-Range Transportation Plan*, Pub. 394 (PennDOT, 2021), which looks ahead 20 years to establish multimodal strategic direction for the state's transportation network.
- The *Pennsylvania 2045 Freight Movement Plan*, Pub 791, (PennDOT, 2022), which proposes strategies, recommends policies, and identifies projects to improve multimodal freight movements while fostering sustainable economic growth and competitiveness.

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