

**Norfolk Southern Railway Company
Pittsburgh Vertical Clearance Projects**

Project Purpose and Need Statement

June 2019

INTRODUCTION:

These proposed projects are railway improvement projects on the Pittsburgh and Fort Wayne Lines, owned and operated by Norfolk Southern Railway Company (NSR). The proposed projects consist of addressing freight capacity and delay constraints through the City of Pittsburgh, Allegheny County, Pennsylvania. The Pittsburgh and Fort Wayne Lines serve rail freight traffic in interstate commerce and operates as a primary link through Pittsburgh between Chicago and the New York/New Jersey commercial markets. NSR is a common carrier and the Pittsburgh and Fort Wayne Lines form a critical component of NSR's route between Chicago and the east coast, carrying a variety of commodities, both hazardous material such as chlorine, anhydrous ammonia, hydrogen fluoride, crude oil, and ethanol, as well as nonhazardous materials like coal, auto parts and finished vehicles, lumber, agricultural products, and intermodal containers and trailers.

The six overhead clearance projects [W. North Avenue Bridge, Pittsburgh (PC-1.60); Pennsylvania Avenue Bridge, Pittsburgh (PC-1.82); Columbus Avenue Bridge, Pittsburgh (PC-2.17); Ohio Connecting (OC) Bridge Flyover, Pittsburgh (PC-3.38); Washington Avenue Bridge, Swissvale (PT-344.91); and Amtrak Station Canopy (PT-353.20)] have vertical obstructions along the Pittsburgh and Fort Wayne Lines and prevent efficient movement of freight, especially time-sensitive intermodal freight, by rail between Chicago and New York/New Jersey, and specifically through Pennsylvania. Unused capacity exists on the Pittsburgh and Fort Wayne Lines and these clearance projects will allow the line to accommodate anticipated freight growth while allowing for double-stack intermodal freight to use the Pittsburgh and Fort Wayne Lines in lieu of the Mon Line. The ability to move this double-stack traffic on the Pittsburgh and Fort Wayne Lines will eliminate exposure to hazardous conditions and delay to time-sensitive freight relating to the unpredictable landslides from adjacent property that occur along the Monongahela Line (Mon Line). In addition to clearance for double-stack trains, the W. North Avenue Bridge also has corrosion and other conditions that are considered safety concerns that may pose a safety hazard to the railroad and the traveling public and a potential liability to other transportation entities (e.g., City of Pittsburgh, Allegheny County).

Maps of the individual projects, along with photographs of the existing conditions, are included in Appendix 1, along with additional purpose and/or need statements relating to the individual overhead clearance projects, as applicable. The six clearance projects represent the final double-stack clearance limitations on the Pittsburgh and Fort Wayne Lines.

This Purpose and Need Statement has been developed in accordance with Pennsylvania Act 120 of 1970. It follows guidance from several sources, including the Pennsylvania Department of Transportation (PennDOT) Publication No. 319: Needs Study Handbook. Appendices, figures, and photographs referenced herein provide supporting documentation.

PURPOSE:

The purpose of the Pittsburgh vertical clearance projects is to promote the efficient transportation of goods between Chicago and the New York/New Jersey commercial markets and to improve mobility and safety for freight traffic through Pittsburgh. The projects will remove the final remaining vertical clearance restrictions creating chokepoints and other hindrances to efficient flow of intermodal rail traffic and will support truck/rail intermodal facilities along this important rail corridor by allowing for double-stack intermodal traffic, which is a PennDOT goal under the Commonwealth's State Rail Plan, developed in compliance with Federal Railroad Administration requirement and with the Rail Freight Preservation and Improvement Act of 1984, as amended, Public Law 587-119. See US DOT, The Strategic Multimodal Analysis, Task 3: Chicago-New York City Corridor Analysis, Final Report (Apr. 2006) (<https://www.fhwa.dot.gov/policy/otps/sma/index.cfm>).

The Pittsburgh and Fort Wayne Lines comprise one of two NSR mainline routes through Pittsburgh. The second mainline on the south side of the city is referred to as the Mon Line. The Mon Line is not being considered as a viable railway improvement project due to several major physical constraints and engineering factors. These factors include the fact that the Mon Line is prone to unpredictable landslides from adjacent properties, which cause hazardous conditions and substantial transportation interruption and reliability concerns for freight movement. In addition, although the Mon Line is cleared for double-stack freight movement, it has substantial capacity constraints due to a single-track line through a tunnel and a major river crossing, thus causing further delay and capacity issues for freight transit between Chicago and the east coast on that line.

Because of the constraints of the Mon Line, the Pittsburgh and Fort Wayne Lines currently are the primary route through the City of Pittsburgh for sensitive freight such as hazardous materials and would be the preferred route for time-dependent freight such as intermodal traffic, in large part because it avoids the hazardous conditions and delay experienced on the Mon Line. Furthermore, the Pittsburgh and Fort Wayne Lines are a shorter route between Chicago and the east coast and use of that route increases network fluidity while reducing transit time.

Although the double-track Pittsburgh and Fort Wayne Lines are the preferred freight route through the City of Pittsburgh, several bridges on that line limit the clearance for rail freight such that double-stack intermodal and automobile multilevel freight cannot move on that line. Rail capacity exists on the double-track Pittsburgh and Fort Wayne Lines and these proposed projects will allow the line to accommodate anticipated freight growth and double-stack intermodal traffic. In addition, the condition of the bridge over the railroad at W. North Avenue, Pittsburgh, has safety deficiencies that pose risks to current rail traffic and forecasted rail traffic increases throughout the United States and within Pennsylvania in particular.

NEED

The project need for the railway improvement projects along the Pittsburgh and Fort Wayne Lines is to address:

- A. Forecasted traffic demands;
- B. Vertical clearance constraints;
- C. Operational safety and reliability;
- D. Public safety; and
- E. Facility Deficiencies.

A. Forecasted traffic demands:

Anticipated increases in freight capacity projections, especially in the intermodal market, indicate that double-stack utilization will increase over the next 30 years. Pennsylvania state and national rail plans have identified clearances restricting freight rail transportation as a major impediment to freight capacity, recommending reducing choke points restricting double-stack intermodal traffic. 2015 Pennsylvania State Rail Plan (Dec. 2016); The Strategic Multimodal Analysis, Task 3: Chicago-New York City Corridor Analysis, Final Report (U.S. DOT, Apr. 2006); Pennsylvania Intercity Passenger and Freight Rail Plan (PennDOT 2010); 2003 Pennsylvania State Rail Plan (PennDOT 2003). Intermodal shipment is a method of moving freight from origin to final destination using two or more transportation modes, without handling the freight itself when changing modes. This method improves efficiency by allowing for use of the most efficient transportation mode for each segment of a shipment of goods in a trailer or container. (Congressional Research Service, 2003). In an intermodal transportation network, trains, trucks, ships, and aircraft are connected seamlessly to provide an efficient and flexible transportation system meeting the needs of the nation's consumers, carriers, and shippers (FHWA, 2009a).

The intermodal business is one way to achieve a long-term sustainable balance between business needs and the impact of railroad operations on the environment. In intermodal operations, containers often are loaded two high, called "double-stack," to allow twice as many shipments to be moved on one intermodal train. Double-stack intermodal traffic increases capacity using the existing infrastructure, with appropriate clearance and without requiring new rail lines for additional trains. Double-stack rail traffic also reduces shipping costs and improves service, while at the same time providing new competitive rail alternatives and new economic development opportunities for customers and communities.

The need for improving freight transportation throughout the United States is driven by factors such as:

- Growing congestion on U.S. highways used for long-haul freight movement;
- Volatile or high fuel prices and the quest for energy-efficiency;
- The strain on the truck driver labor pool;
- Need for improvements in shipping services;
- The national policy toward the reduction of greenhouse gas (GHG) emissions.

The Federal Highway Administration (FHWA) Freight Analysis Framework (FAF) forecasts that the tons of freight transported within the U.S. by rail will increase by more than 20% between 2015 and 2045, with a more than 80% increase in value of freight by rail over that same time frame. (<https://www.bts.gov/newsroom/dot-releases-30-year-freight-projections> ; https://www.bts.gov/sites/bts.dot.gov/files/docs/FFF_2017_Full_June2018revision.pdf). FHWA's FAF,

which compares relevant statistics from 2012 to 2045, also predicts that, with current infrastructure, highway congestion would increase dramatically because of the increase in freight and intermodal demand. See Appendix 2. It is infeasible to accommodate these anticipated increases in freight requirements by merely maintaining the current national rail infrastructure, and commensurate congestion would result. Projects are needed to address the national need to enhance rail infrastructure as evidenced by the forecasted increase in demand and congestion.

Pennsylvania ranks first in the country in the number of operating railroads (approximately 65) and ranks near the top in total track mileage (more than 5,600 miles). Each year, around 200 million tons of freight originate in, terminate in, or pass through Pennsylvania by rail, including more than 50 million tons of coal, steel, food, and other products mined or grown throughout the Commonwealth. The Commonwealth of Pennsylvania is expected to face substantial highway-truck traffic congestion as a result of the increase in demand and freight transportation, as shown in the FAF graphics in Appendix 2. PennDOT predicts that within the Commonwealth of Pennsylvania, intermodal freight rail traffic will increase by 86.4%. The primary east-west Class I freight rail corridor in Pennsylvania is through Pittsburgh. The Pittsburgh-Allegheny County region in particular is expected to be highly congested in the absence of additional freight transportation planning. See Appendix 2.

To accommodate the expected increases in rail demand, as well as to support national goals relating to greenhouse gas emissions and fuel efficiency, the national freight rail system has been substantially modernized over the past decades to raise clearances, upgrade tunnels, and modify rail lines throughout much of America's 140,000-mile freight rail network to accommodate double-stack intermodal trains. (See <https://www.aar.org/article/6-milestones-intermodal-growth/>) Limitations for double-stack intermodal trains still impact freight transportation through Pennsylvania, however. The clearance projects represent the final obstacles for double-stack and automobile multilevel traffic along the Pittsburgh and Fort Wayne Lines and complement the clearance of 163 previously existing obstructions to double-stack container traffic in the 1990s through a Conrail/PennDOT partnership.

B. Vertical clearance constraints:

The Pittsburgh and Fort Wayne Lines serve as an alternate route for the Mon Line but currently have limited vertical clearance at various locations that prevents the passage of double-stack trains or automobile multilevel traffic. Six structures limit the height of freight railroad cars travelling along the Pittsburgh and Fort Wayne Lines. The bridges do not provide sufficient vertical clearance between the bridge and the tracks, and Amtrak Station's shed canopy over the freight line is not tall enough, to allow double-stack intermodal trains to travel underneath. The OC Bridge Flyover has overhead obstructions on an approach ramp structure that do not allow sufficient vertical clearance as well.

The current vertical clearance at the project locations varies along the corridor from 18'-3" to 20'-6". The PUC requirement for vertical clearance in Pennsylvania is 22'-0", absent a waiver.

Current vertical clearance of 18'-3" above-top-of-rail is adequate for only some equipment operated on the U.S. Rail Network

(Commonwealth of Pennsylvania PUC Standard Vertical Clearance is 22'-0" ATR)

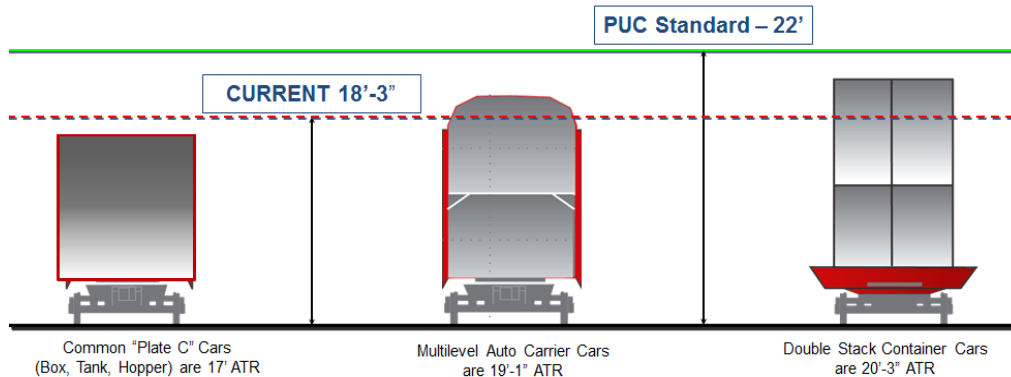


Figure 2. Vertical Clearance Standards

C. Operational safety and reliability:

The NSR line between Chicago and metropolitan New York City via Cleveland, Pittsburgh and Harrisburg is referred to as the Premier Corridor and is the most critical freight artery on Norfolk Southern's 22-state network. NSR has two east-west freight routes through Pittsburgh, one of which is cleared for double-stacked intermodal trains and automobile multilevel trains. However, that double-stack route, known as the Port Perry Branch and the Mon Line (together, the Mon Line) is currently at or near capacity and, as a result, frequently faces congestion issues and service delays. In addition, the infrastructure and geography of the Mon Line create challenges for timely delivery of the service-sensitive intermodal freight that uses it today. The Mon Line has a 3-mile single-tracked segment that includes a tunnel and an adjacent bridge over the Monongahela River. This 3-mile segment is the largest chokepoint on NSR's route between Chicago and the New York metropolitan area. In addition to the choke point, and more importantly, the topography adjacent to the railroad right of way is susceptible to landslides from the adjacent Mount Washington. The slope of Mount Washington continues to shift, and each time it does, the potential exists for soil and rock to be deposited on the railroad tracks, making them unable to be traversed until the debris is removed and the slide area stabilized. Besides the substantial costs incurred for cleanup, the unpredictable slides create hazardous conditions and cause hours of delay annually. These landslides range from moderate to severe in nature and the timing and severity of the incidents are unpredictable. Further, the landslides originate on property not owned or controlled by NSR, and as such NSR can merely react to landslides as they may occur. (See Appendix 3.) Each year, delay times resulting from these events, averaging approximately 32.9 hours, create substantial cost for the railroad, customers, and businesses. Delays on the Mon Line relating to landslides are projected to cause almost 4.3 million hours of closures over the next 30 years. Service-sensitive freight on this line and the additional capacity through southwest Pennsylvania anticipated in the future will need to be accommodated.

NSR's second mainline through Pittsburgh is the Pittsburgh and Fort Wayne Lines, which has double track throughout for more efficient operations. However, the current vertical clearance on this line is inadequate for double-stack trains in several locations, and consequently the line constrains the capability to accommodate the projected increases in freight tons, and the anticipated increase in intermodal

capacity, expected to be moving on the nation's transportation network. These limitations result in freight rail congestion and lead to less efficient intermodal transportation. An increase in intermodal traffic in order to keep trucks off highways needs to be accommodated for this major east-west artery. Under the current circumstances, adding more traffic to the Mon Line route to accommodate the forecasted increases in intermodal and other freight over the next many years would result in additional delays to train schedules and worsened congestion. In addition, NSR's dependence on the capacity- and geography-constrained Mon Line through Pittsburgh for its double-stack intermodal traffic, most of which has interstate commerce related time sensitivities, affects its ability to deliver quality service to customers and, ultimately, to compete with trucks. The structural risks adjacent to the current Mon Line route pose a threat to its long-term vitality, especially for this service-sensitive traffic. Considering that intermodal traffic through this part of Pennsylvania is expected to substantially increase in the coming years, it is crucial that investment be made in infrastructure improvement on the Pittsburgh and Fort Wayne Lines in the near-term for operational safety and reliability.

D. Public safety:

Public safety is the primary operational focus of NSR, PennDOT, the City of Pittsburgh, Allegheny County, and Amtrak. The safety of citizens, employees, and operations are central to the goals of the Pittsburgh Vertical Clearance projects. Additional rail capacity is beneficial to the safety of the motoring public by removing long-haul trucks from the highways of multiple states.

The Pittsburgh and Fort Wayne Lines (in the project area) have only three at-grade crossings, of which just one is a public at-grade crossing. Adding freight to the Pittsburgh and Fort Wayne Lines presents less risk of automobile/rail conflict for high-volume freight transportation. While at-grade crossing accidents have been greatly reduced through public education initiatives nationwide, projects like the Pittsburgh Vertical Clearance projects boost these efforts by routing trains on heavily gated lines with pedestrian and motor vehicle crossing options.

E. Facility Deficiencies:

Structurally deficient structures become less effective and more expensive to maintain or repair as their conditions worsen. Facility deficiencies must be addressed for this key component of the rail network in order to help to minimize future maintenance and address existing structural deficiencies and traffic demands (e.g., rail, vehicular, pedestrian and bicycle). The W. North Avenue Bridge, at the intersection of W. North Avenue and Brighton Road in Pittsburgh, is in poor condition. The current poor condition of the W. North Avenue Bridge has led to increased maintenance actions, with additional substantial maintenance necessary if the structure remains active and in service. These maintenance activities eventually will require more frequent interruptions on the Pittsburgh and Fort Wayne Lines to allow for more extensive maintenance repairs, thus causing significant disruption to interstate commerce on the busiest corridor between the Midwest and the East Coast. If the structural conditions are not addressed, the poor condition of this bridge may pose a threat to public transportation connectivity. In accordance with maintenance obligations, modification or replacement of this bridge will ensure the continued safe and efficient transportation of goods by rail. The condition of this bridge would need to be addressed to ensure the continued safe and efficient transportation of goods by rail in accordance with maintenance obligations to address facility deficiencies.

APPENDIX 1

PROJECT LOCATIONS

The locations of the seven individual proposed projects is shown below in Figure 1.1.

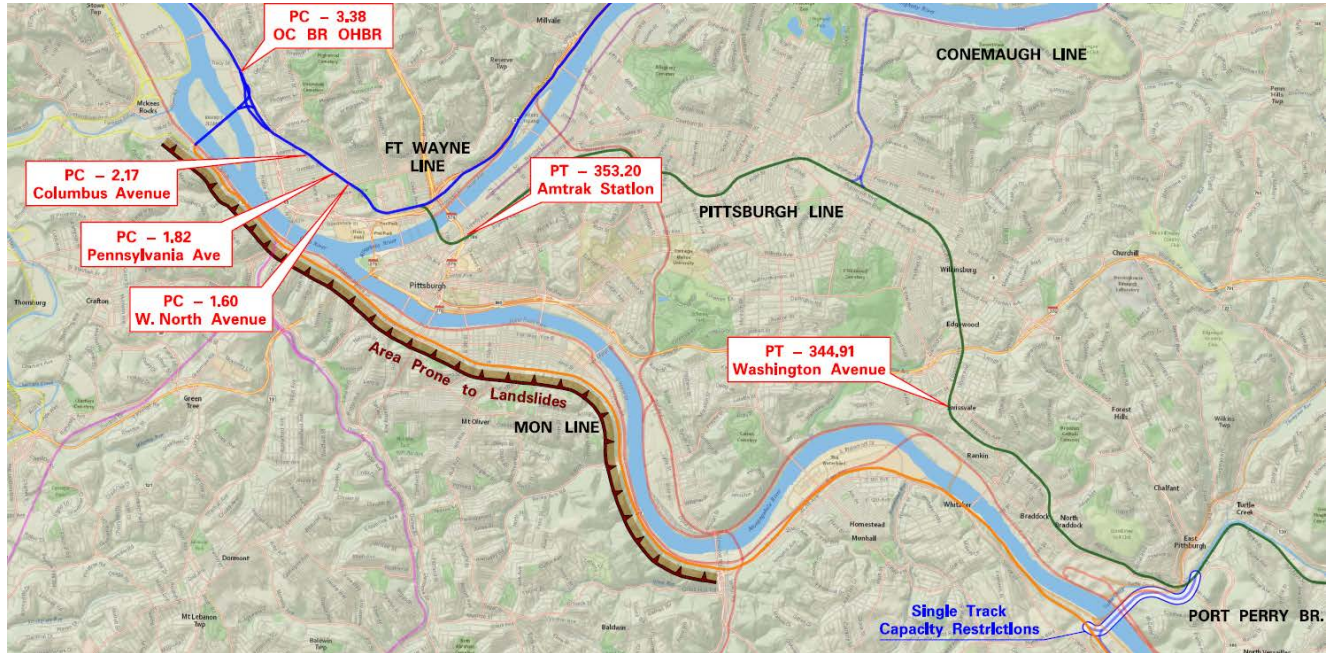
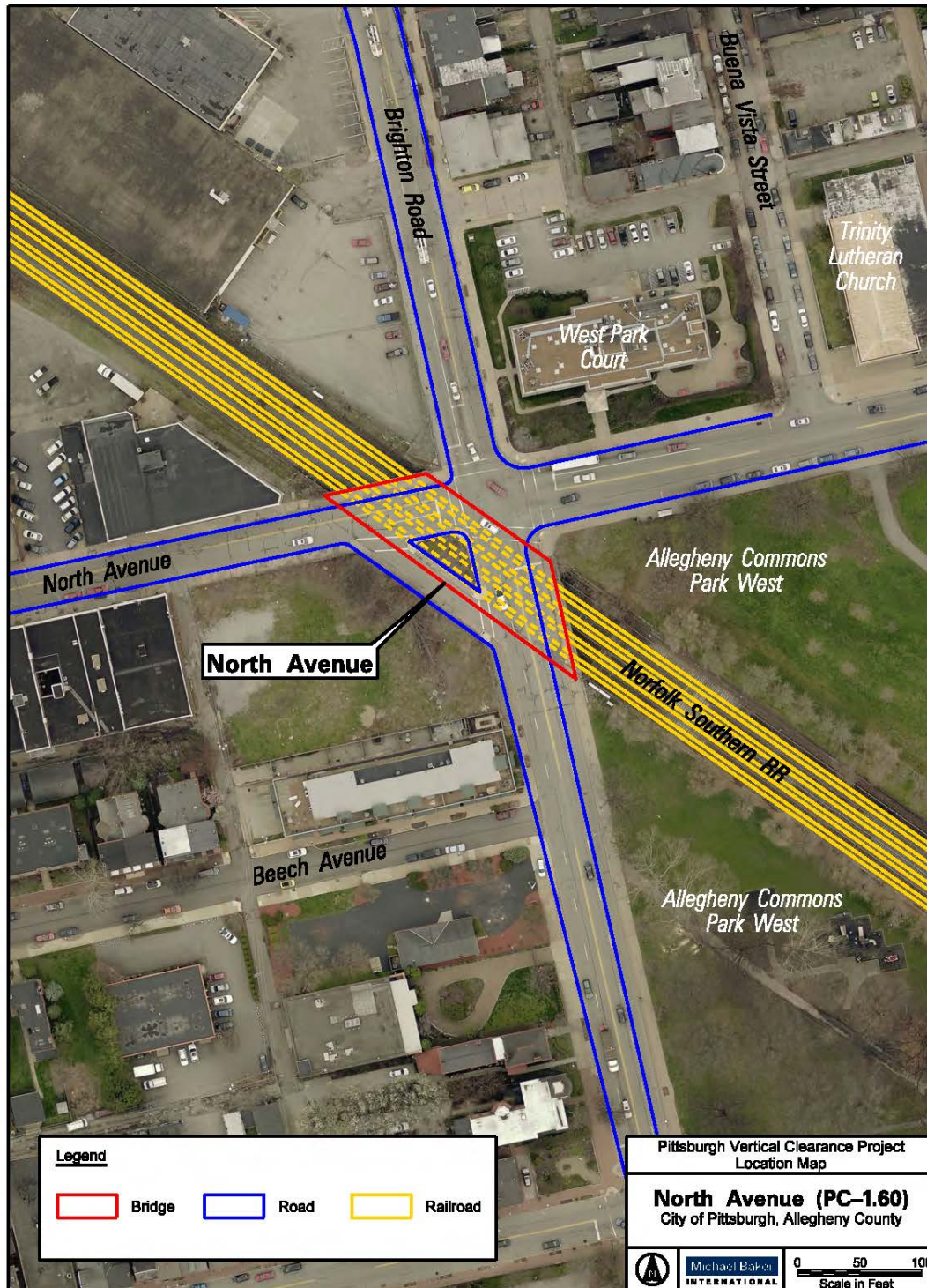


Figure 1.1. Map of Project Locations showing Port Perry Bridge, Mon Line, Pittsburgh Line and Fort Wayne Line

Maps of the individual projects, along with photographs of the existing conditions, are presented in this Appendix, along with descriptions relating to the individual overhead clearance projects, as applicable.

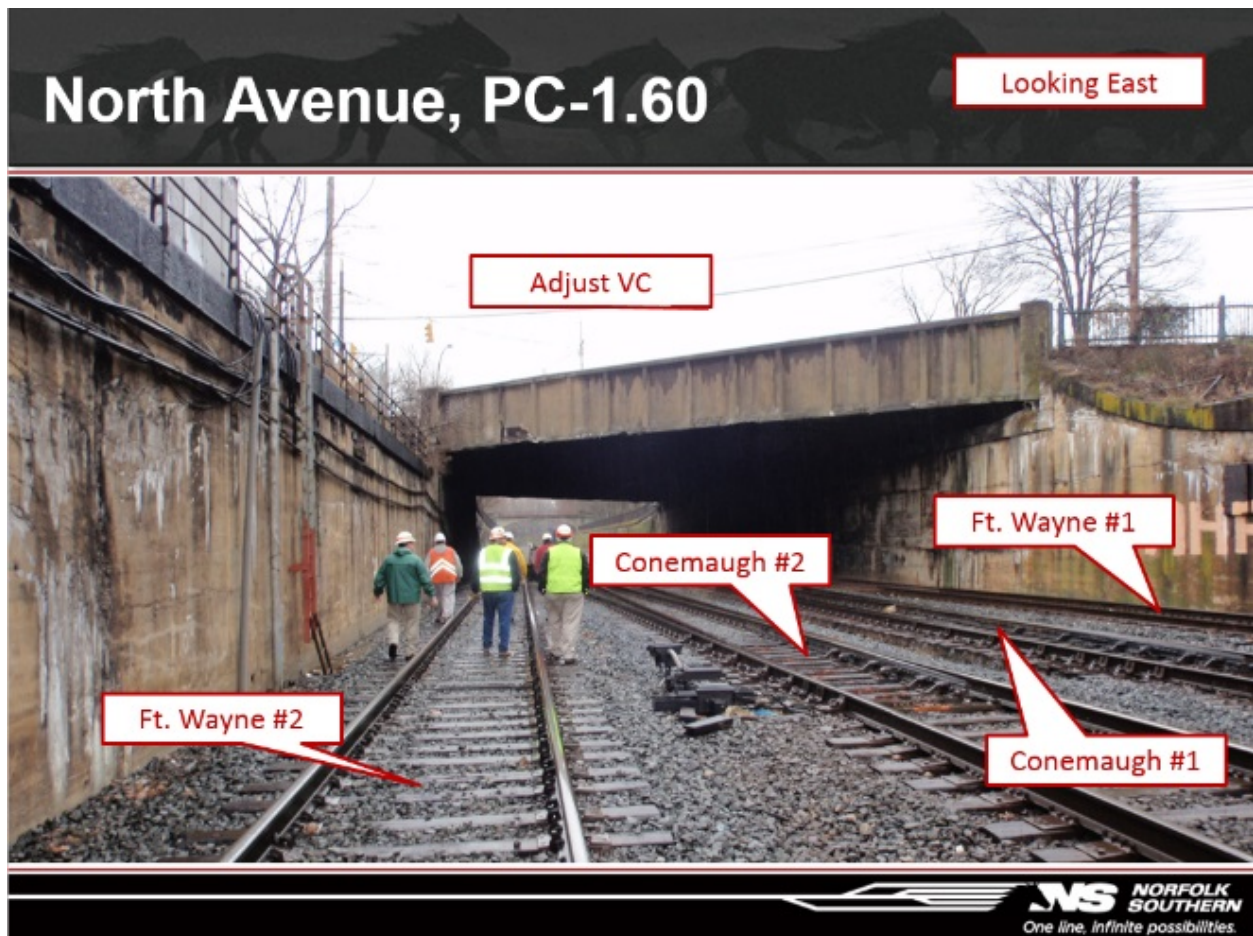
1. Project Location Map:

W. North Avenue Bridge over NS (PC-1.60), City of Pittsburgh, Allegheny County



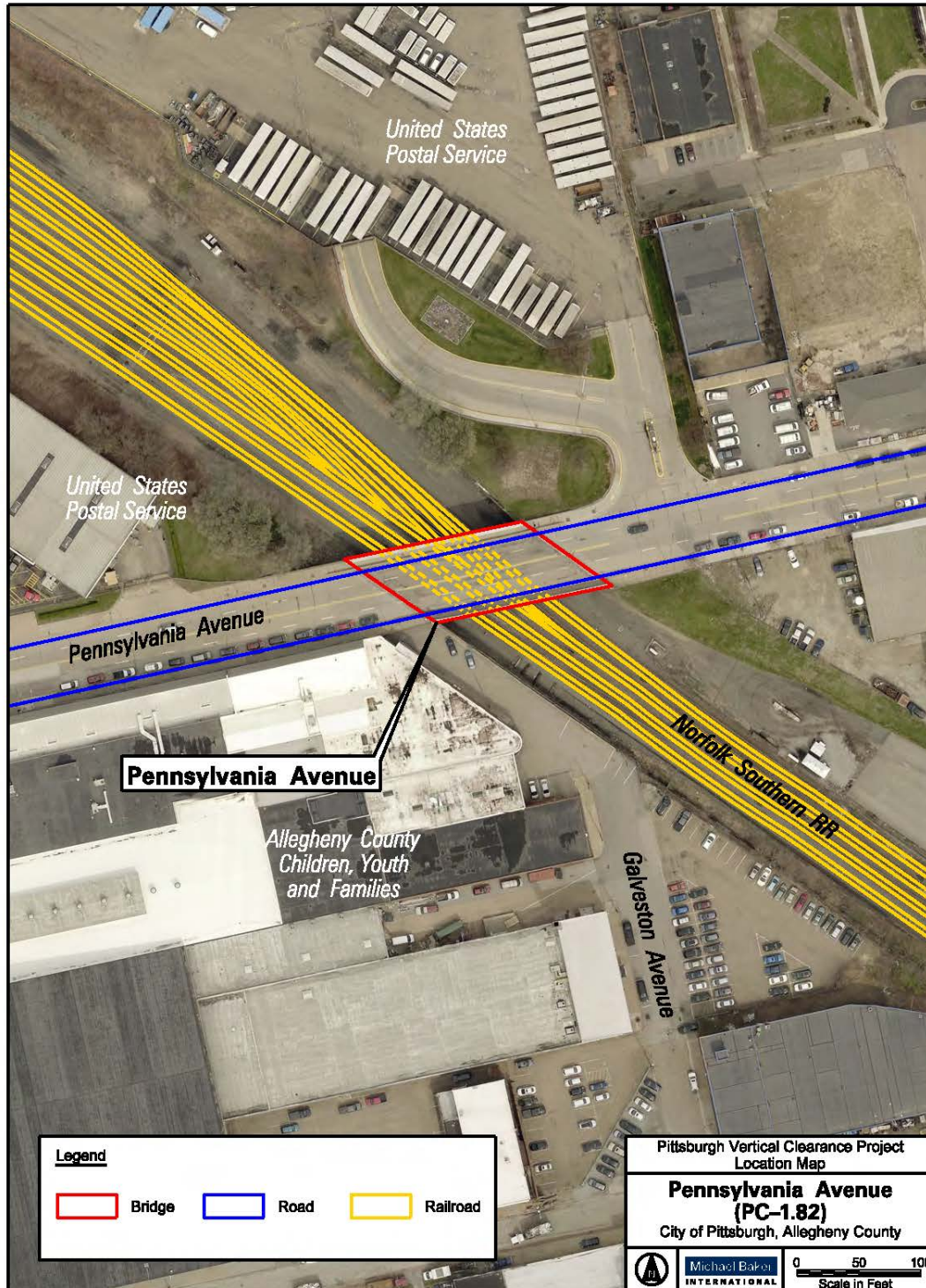
Description:
W. North Avenue Bridge over NS (PC-1.60), City of Pittsburgh, Allegheny County

To increase vertical clearance between the Fort Wayne Line tracks and the bridge to accommodate double-stack railroad traffic and to address structural deficiencies of the bridge in order to provide for safe and efficient rail transportation. The bridge needs attention and is structurally deficient according to a 2018 inspection report. The bridge has an existing vertical clearance of 18'-2", which does not provide adequate clearance for the passage of double-stack intermodal trains. The bridge has spalling concrete, and the back wall is falling onto a bearing on the left side of the bridge.



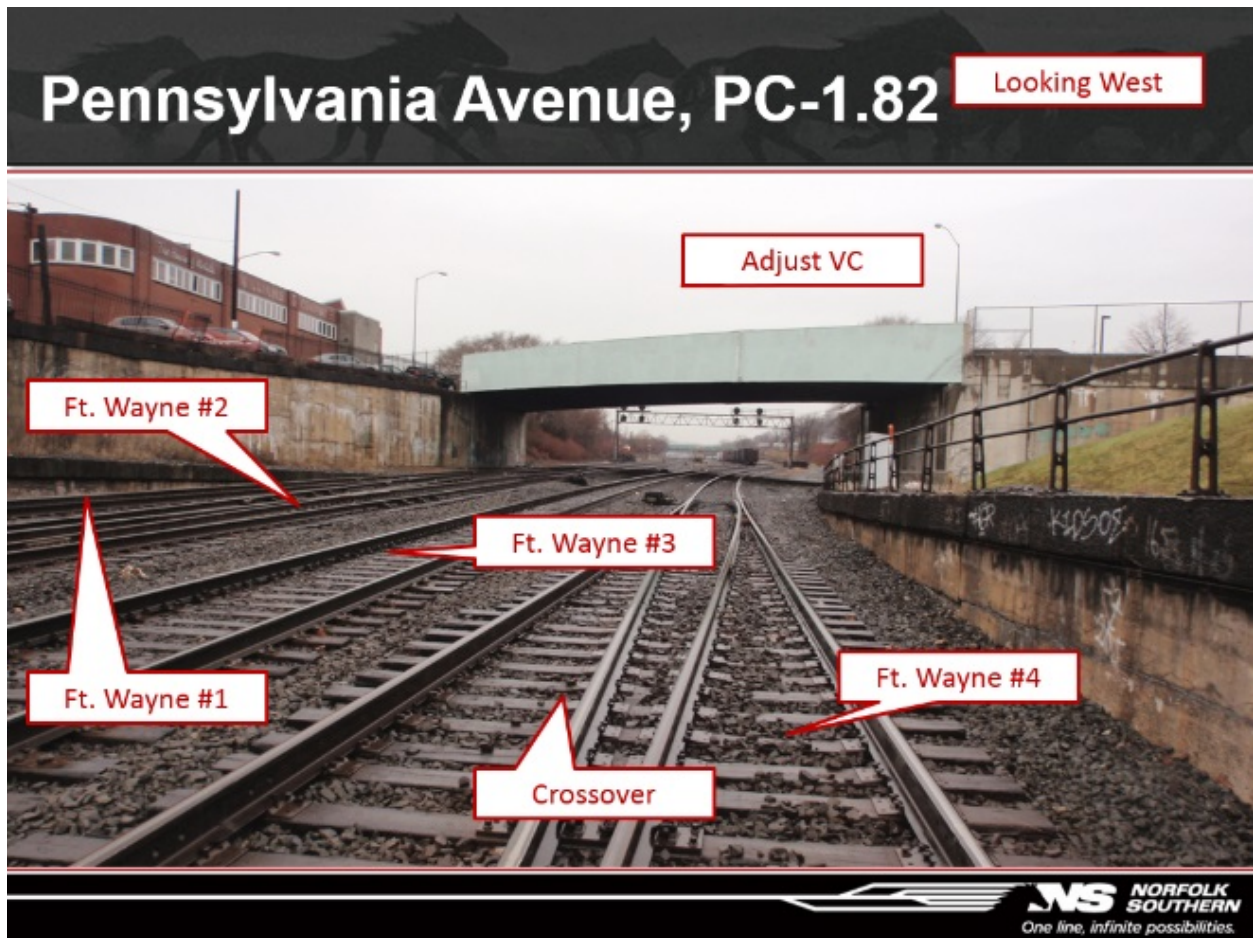
2. Project Location Map:

Pennsylvania Avenue Bridge over NS (PC-1.82), City of Pittsburgh, Allegheny County



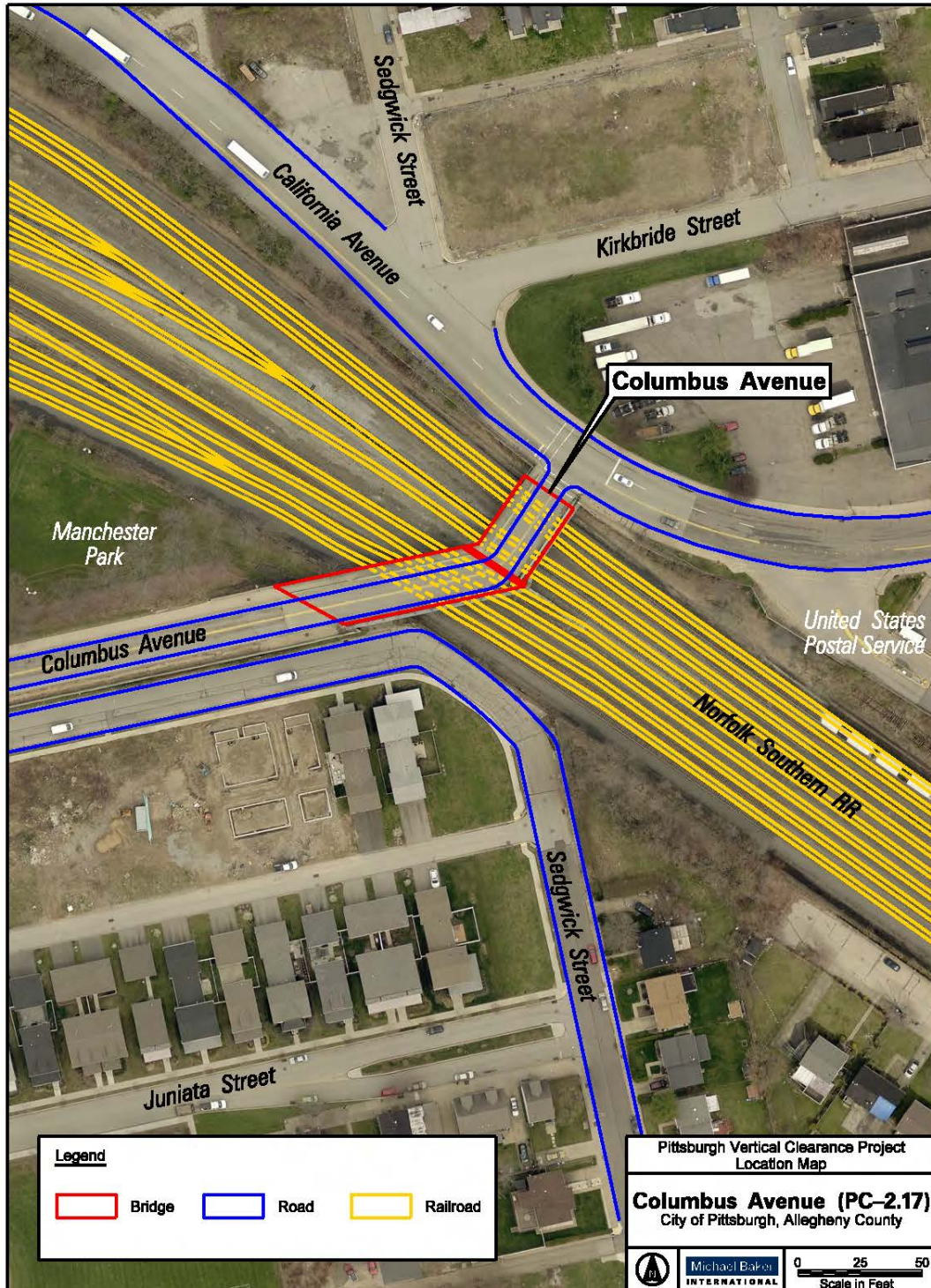
Description:
Pennsylvania Avenue Bridge over NS (PC-1.82), City of Pittsburgh, Allegheny County

To increase vertical clearance between the Fort Wayne Line tracks and the bridge to accommodate double-stack railroad traffic. The bridge has an existing vertical clearance of 19'-7", which does not provide adequate clearance for the passage of double-stack intermodal trains.



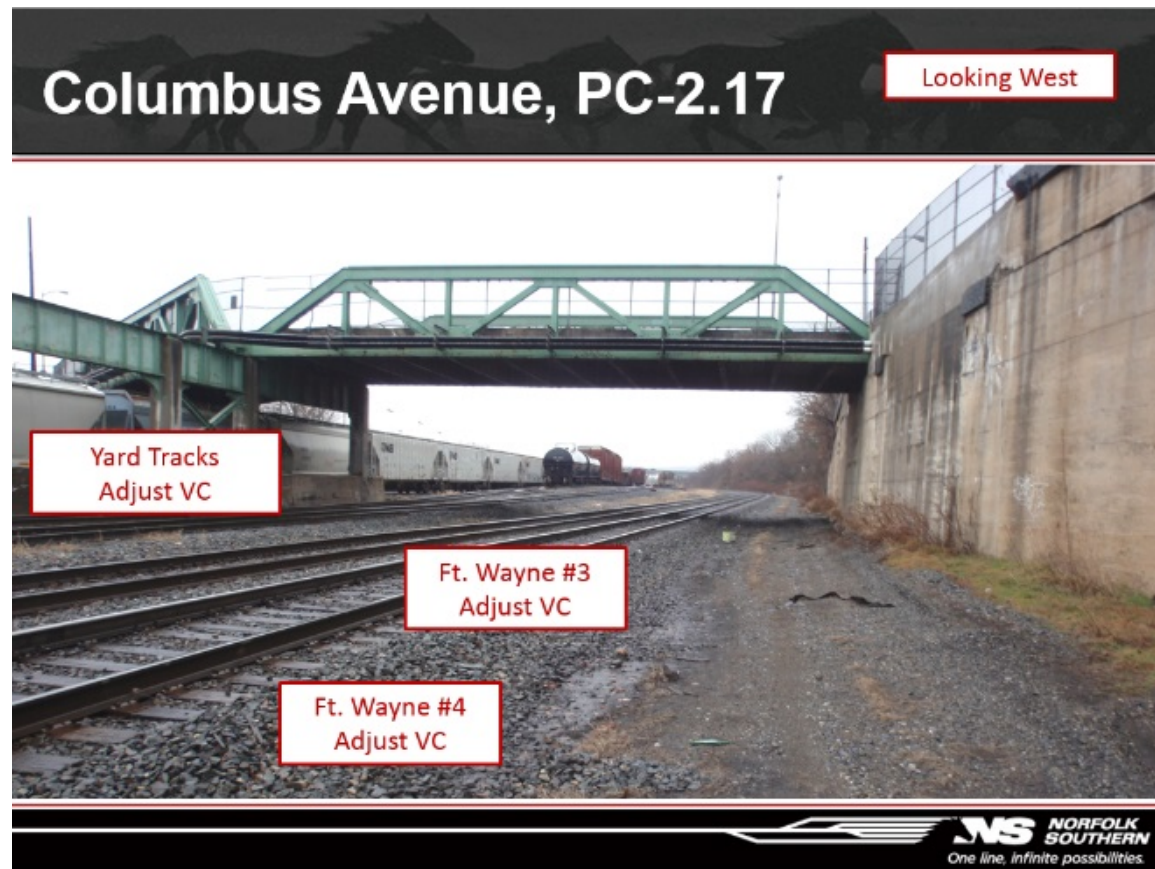
3. Project Location Map:

Columbus Avenue Bridge over NS (PC-2.17), City of Pittsburgh, Allegheny County



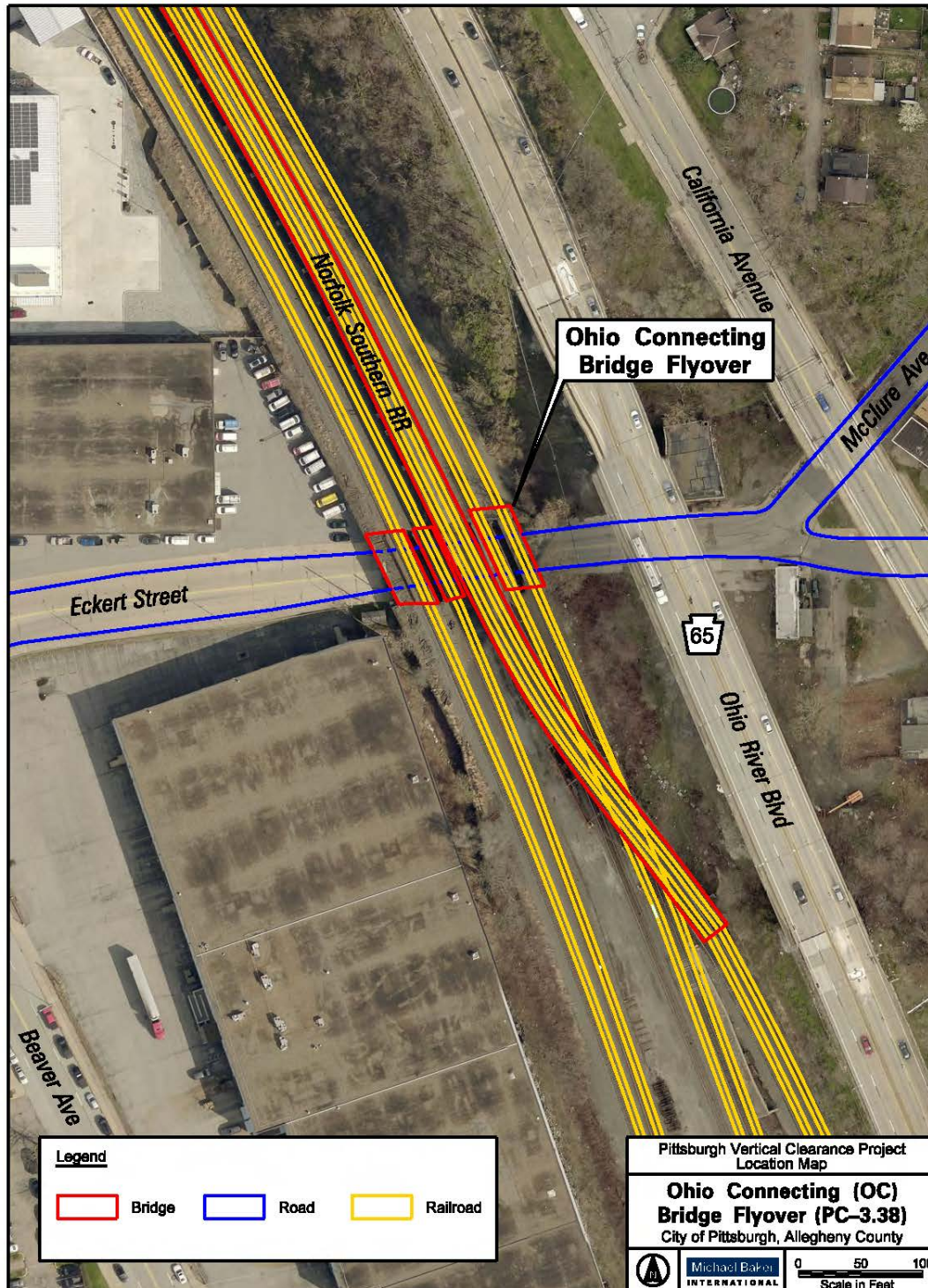
Description:**Columbus Avenue Bridge over NS (PC-2.17), City of Pittsburgh, Allegheny County**

To increase vertical clearance between the Fort Wayne Line tracks and the bridge to accommodate double-stack railroad traffic. The bridge has an existing vertical clearance of 20'-6", which does not provide adequate clearance for the passage of double-stack intermodal trains.



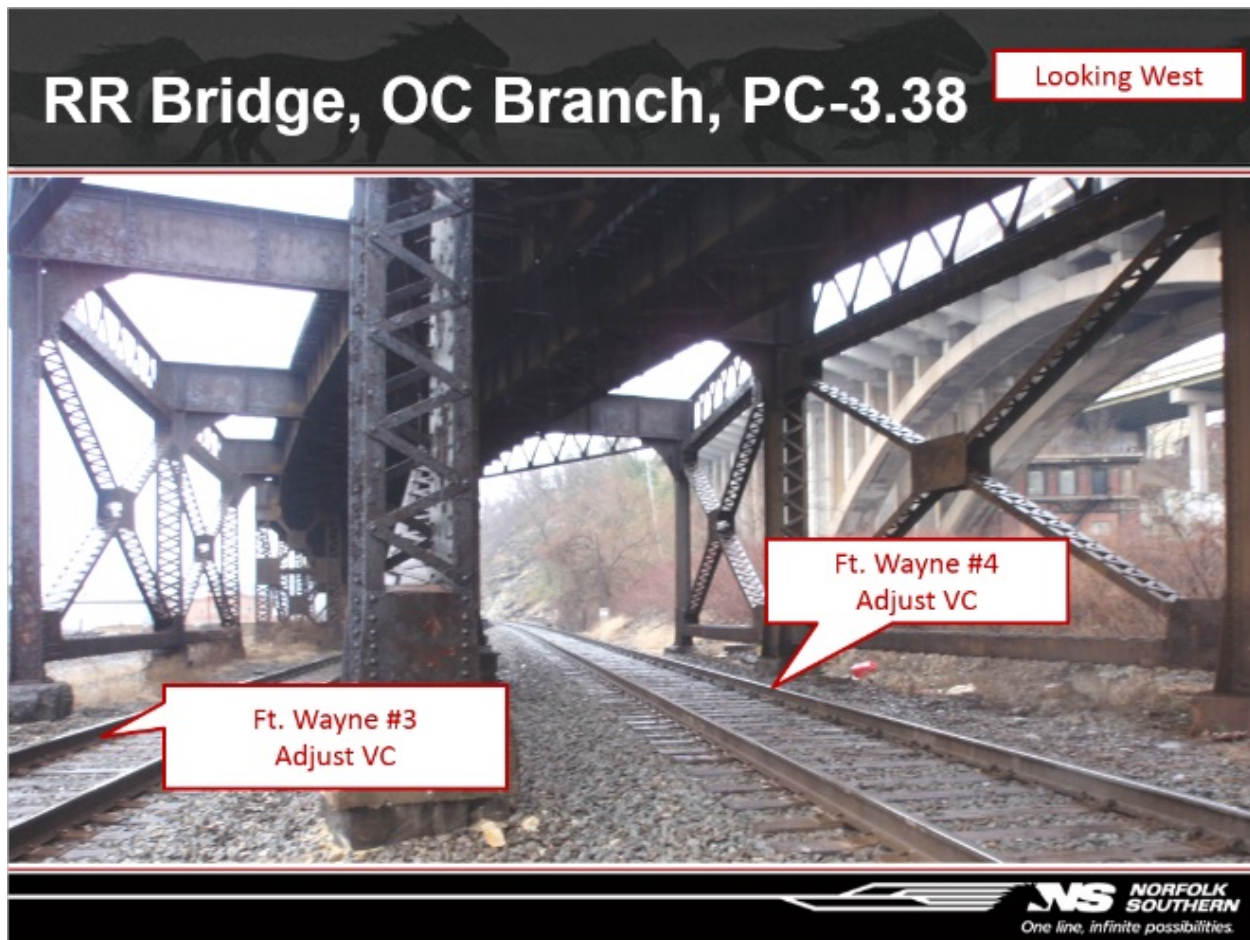
4. Project Location Map:

Ohio Connecting (OC) Bridge Flyover (PC-3.38), City of Pittsburgh, Allegheny County



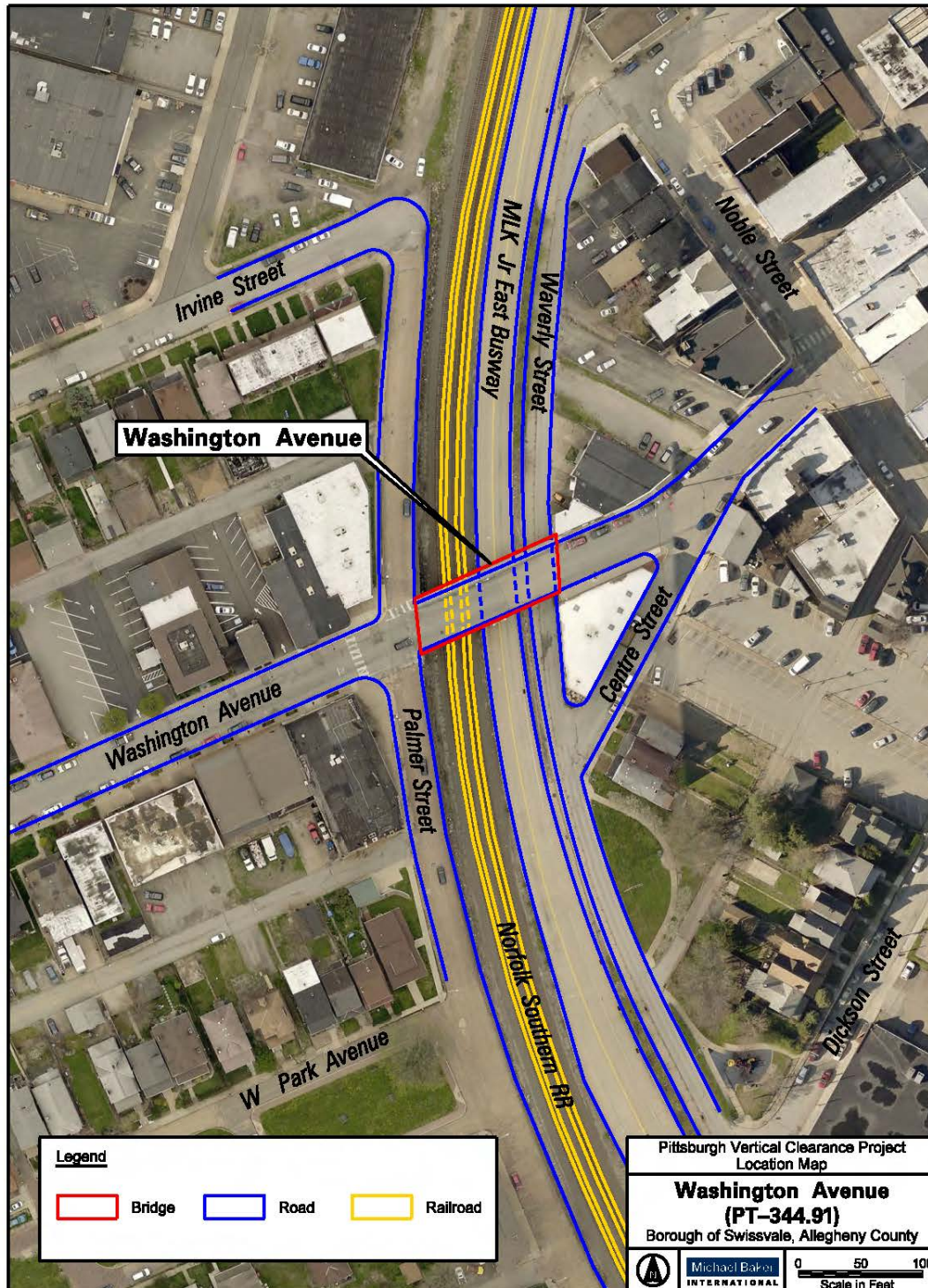
Description:**Ohio Connecting (OC) Bridge Flyover (PC-3.38), City of Pittsburgh, Allegheny County**

To increase vertical clearance between the Fort Wayne Line tracks and bridge to accommodate double-stack railroad traffic. The bridge has an existing vertical clearance of 20' 11", which does not provide adequate clearance for the passage of double-stack intermodal trains.



5. Project Location Map:

Washington Avenue Bridge (PT-344.91), Borough of Swissvale, Allegheny County



Description:**Washington Avenue Bridge (PT-344.91), Borough of Swissvale, Allegheny County**

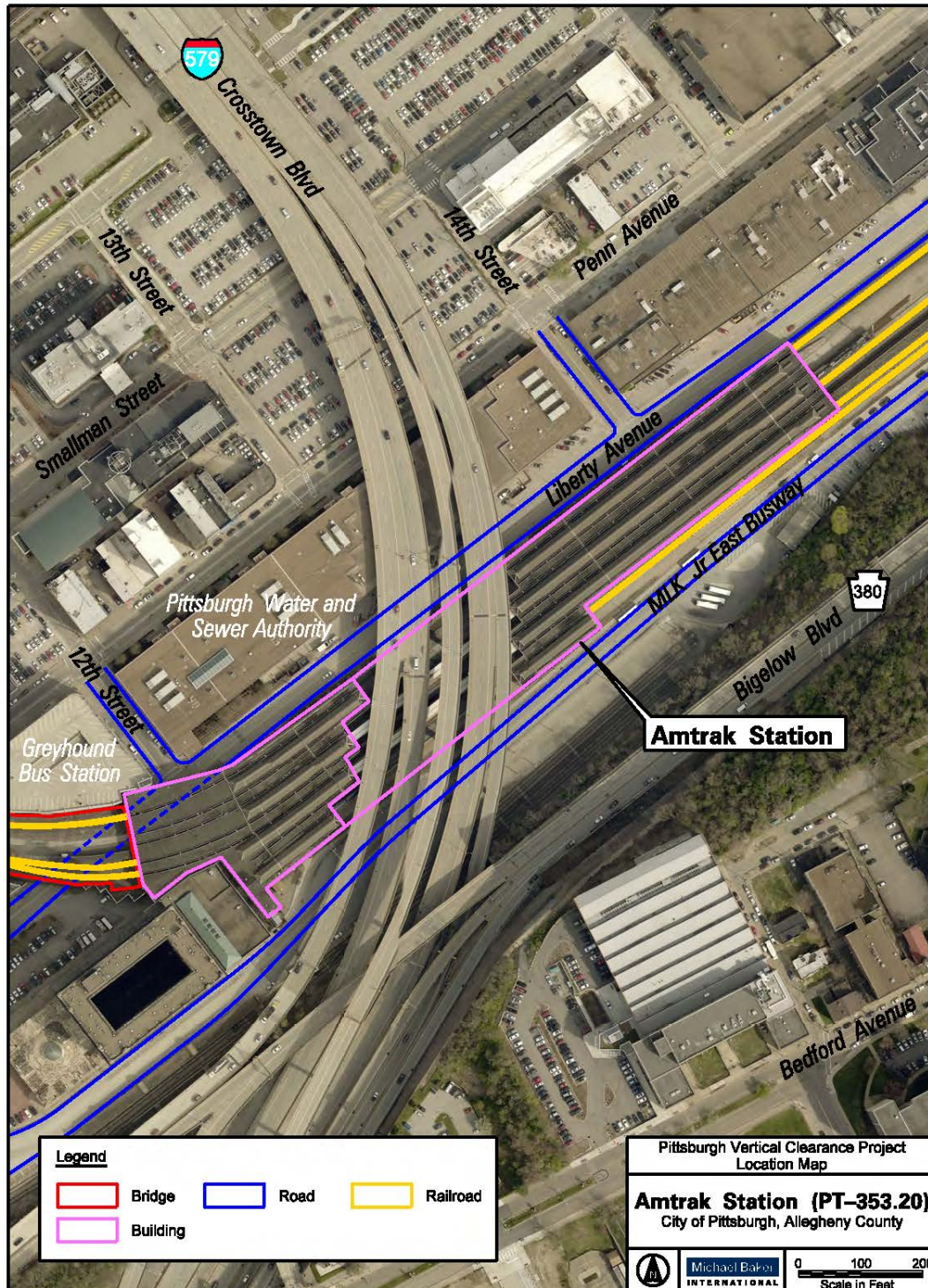
To increase vertical clearance between the Pittsburgh Line tracks and the bridge to accommodate double-stack railroad traffic. The bridge has an existing vertical clearance of 19'-9", which does not provide adequate clearance for the passage of double-stack intermodal trains.

Washington Avenue, PT-344.91

Looking East

6. Project Location Map:

Amtrak Station Canopy (PT-353.20), City of Pittsburgh, Allegheny County



Description:**Amtrak Station Canopy (PT-353.20), City of Pittsburgh, Allegheny County**

To increase vertical clearance between the Pittsburgh Line track and station overhanging roof to accommodate double-stack railroad traffic. The station has an existing vertical clearance of 19', which does not provide adequate clearance for the passage of double-stack intermodal trains.



APPENDIX 2

FHWA FREIGHT ANALYSIS FRAMEWORK

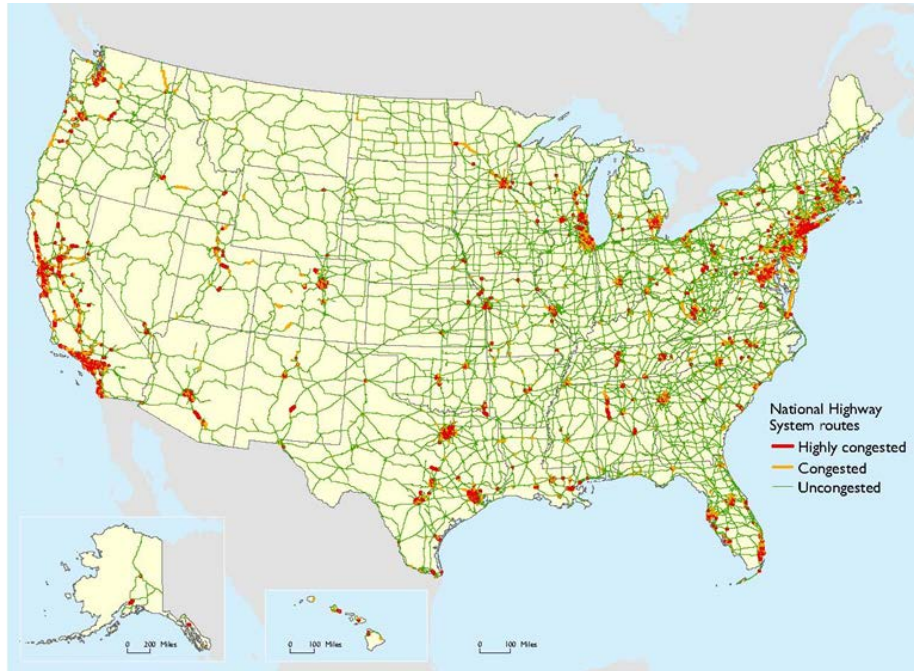


Figure 2.1: Freight Facts & Figures 2017 - Chapter 4: Freight Transportation System Performance. 2012 National Highway System (NHS) routes. (https://www.bts.gov/sites/bts.dot.gov/files/docs/FFF_2017_Full_June2018revision.pdf)

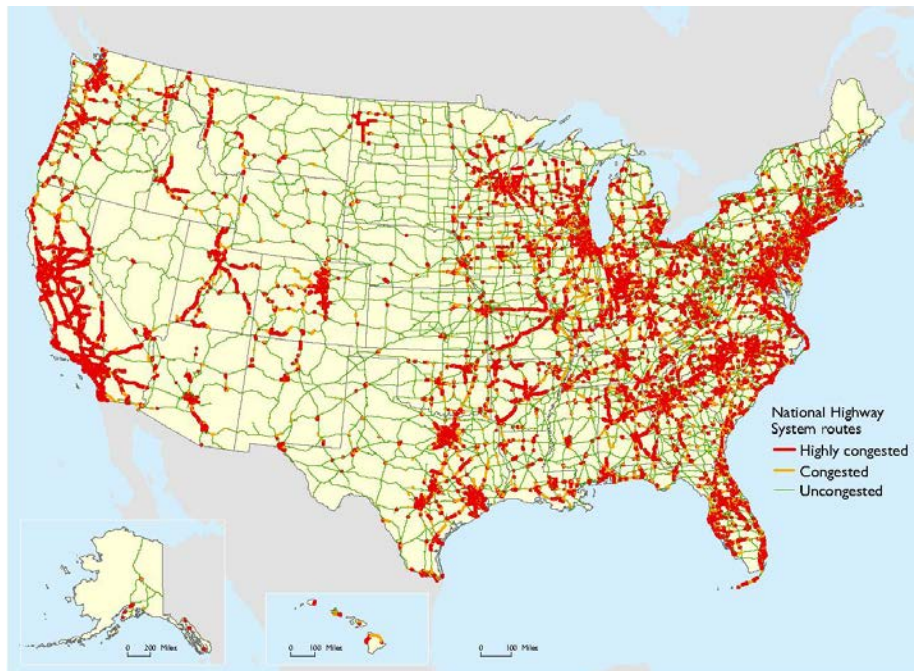


Figure 2.2: Freight Facts & Figures 2017 - Chapter 4: Freight Transportation System Performance. 2045 NHS routes. (https://www.bts.gov/sites/bts.dot.gov/files/docs/FFF_2017_Full_June2018revision.pdf)

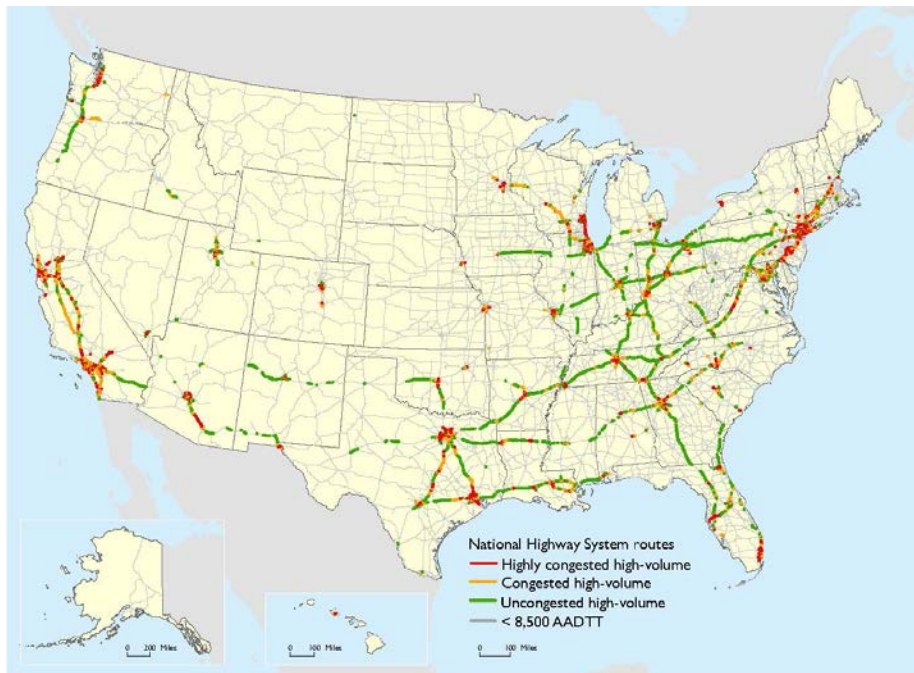


Figure 2.3: Freight Facts & Figures 2017 - Chapter 4: Freight Transportation System Performance. Peak-Period Congestion on High-Volume Truck Portions of the National Highway System: 2012 Map.

(https://www.bts.gov/sites/bts.dot.gov/files/docs/FFF_2017_Full_June2018revision.pdf)

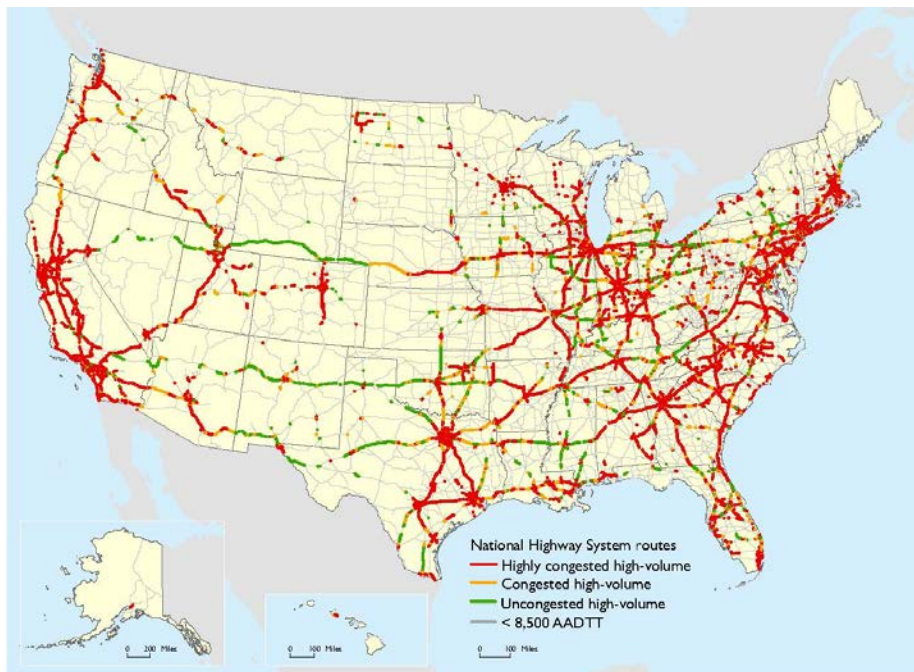


Figure 2.4: Freight Facts & Figures 2017 - Chapter 4: Freight Transportation System Performance. Peak-Period Congestion on High-Volume Truck Portions of the National Highway System: 2045 Map.

(https://www.bts.gov/sites/bts.dot.gov/files/docs/FFF_2017_Full_June2018revision.pdf)

Major Flows by Truck To, From, and Within Pennsylvania: 2012

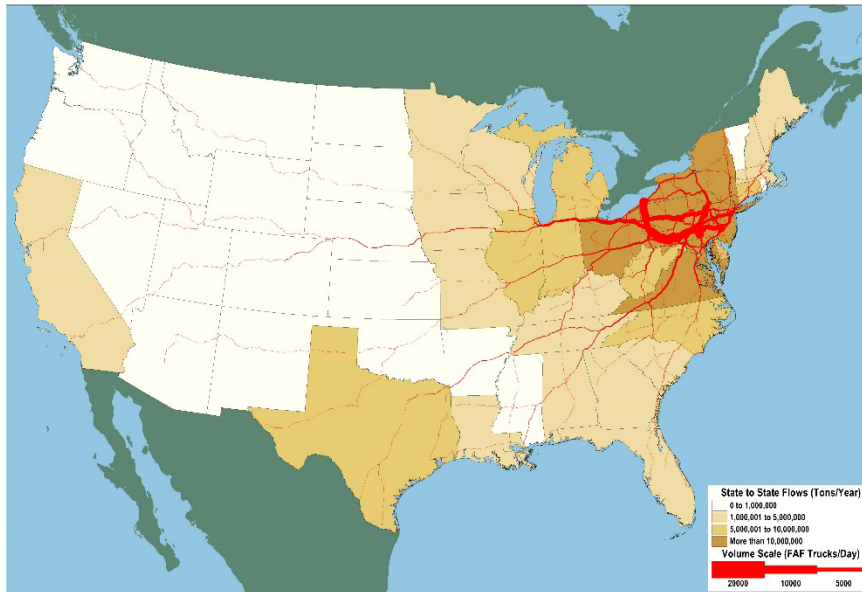


Figure 2.5: Source US DOT, FHWA, Office of Freight Management and Operations, Freight Analysis Framework, 2017.

Major Flows by Truck to, From, and Within Pennsylvania: 2012.

https://ops.fhwa.dot.gov/freight/freight_analysis/state_info/pennsylvania/truckflow.htm

Major Flows by Truck To, From, and Within Pennsylvania: 2045

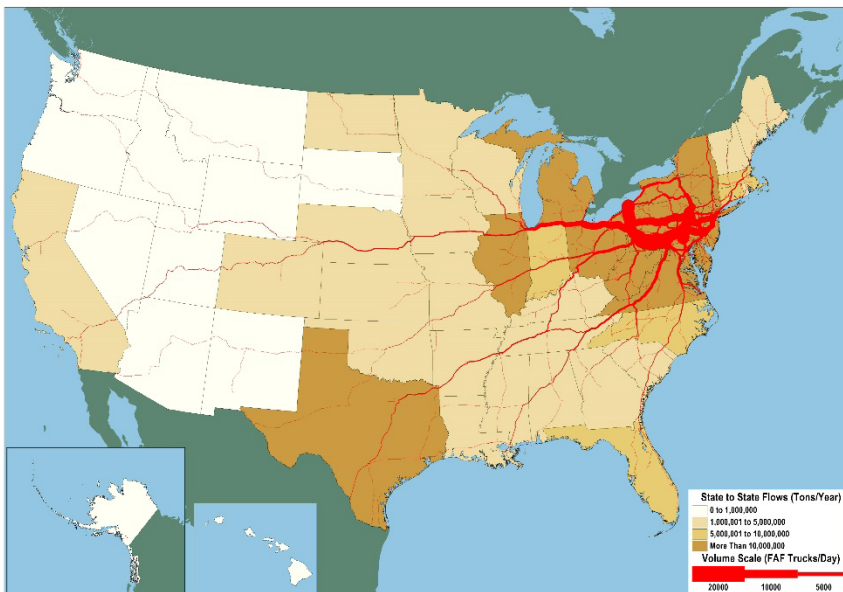


Figure 2.6: Source US DOT, FHWA, Office of Freight Management and Operations, Freight Analysis Framework, 2017.

Major Flows by Truck to, From, and Within Pennsylvania: 2045.

https://ops.fhwa.dot.gov/freight/freight_analysis/state_info/pennsylvania/truckflow.htm

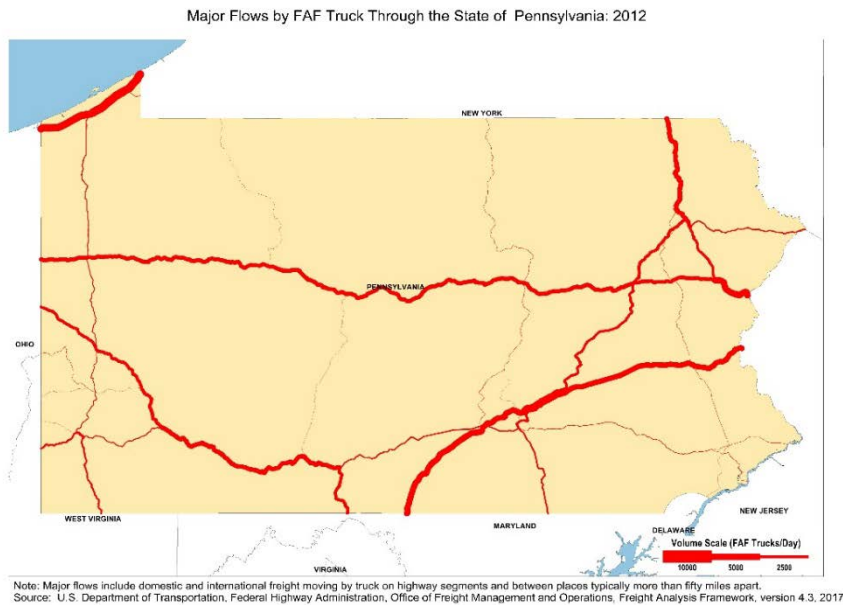


Figure 2.7: Source US DOT, FHWA, Office of Freight Management and Operations, Freight Analysis Framework, 2017.
Major Flows by FAF Truck Through the State of Pennsylvania: 2012.
https://ops.fhwa.dot.gov/Freight/freight_analysis/state_info/pennsylvania/statetruckflow.htm

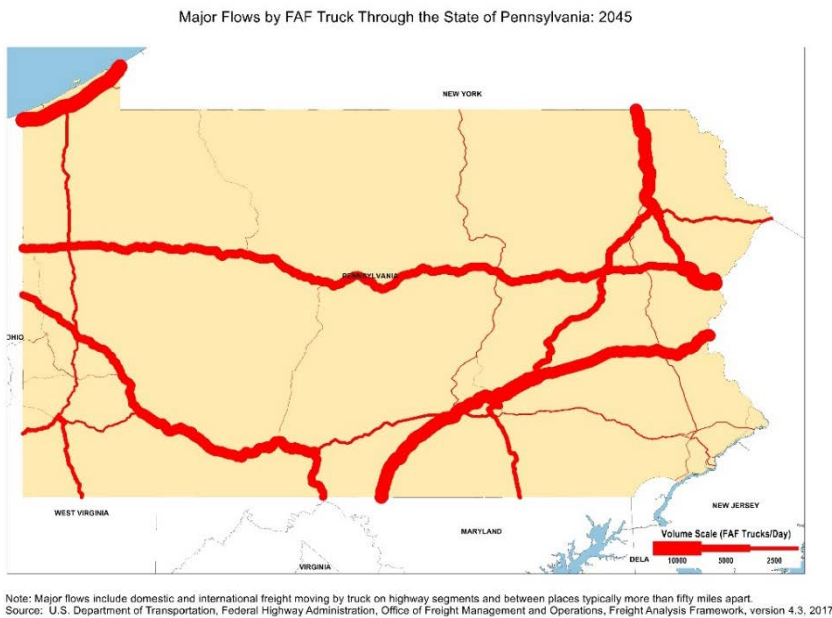


Figure 2.8: Source US DOT, FHWA, Office of Freight Management and Operations, Freight Analysis Framework, 2017.
Major Flows by FAF Truck Through the State of Pennsylvania: 2045.
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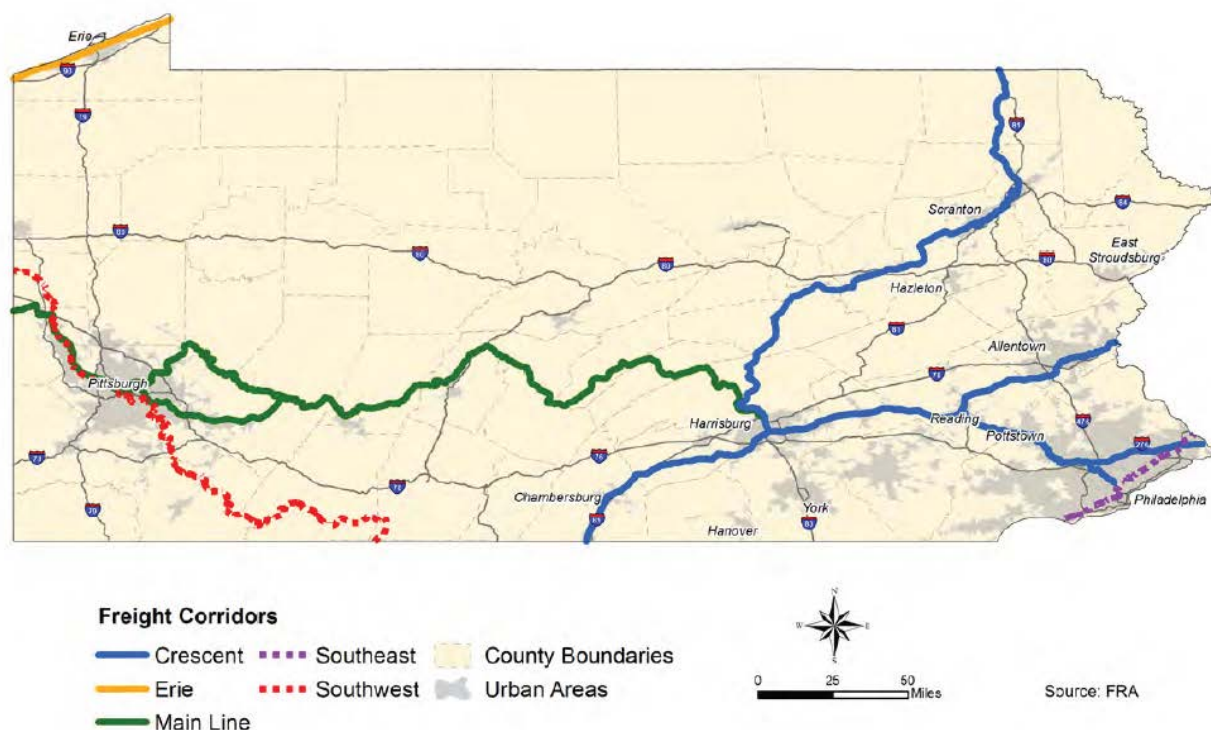


Figure 2.9: Major Class I Freight Corridors in Pennsylvania. Source: PennDOT 2015 Pennsylvania State Rail Plan (Dec. 2016) (adapted from Federal Railroad Administration)
[https://www.penndot.gov/Doing-Business/Transit/InformationandReports/Documents/2015%20Pennsylvania%20State%20Rail%20Plan%20\(low\).pdf](https://www.penndot.gov/Doing-Business/Transit/InformationandReports/Documents/2015%20Pennsylvania%20State%20Rail%20Plan%20(low).pdf)

APPENDIX 3

LANDSLIDES FROM MOUNT WASHINGTON

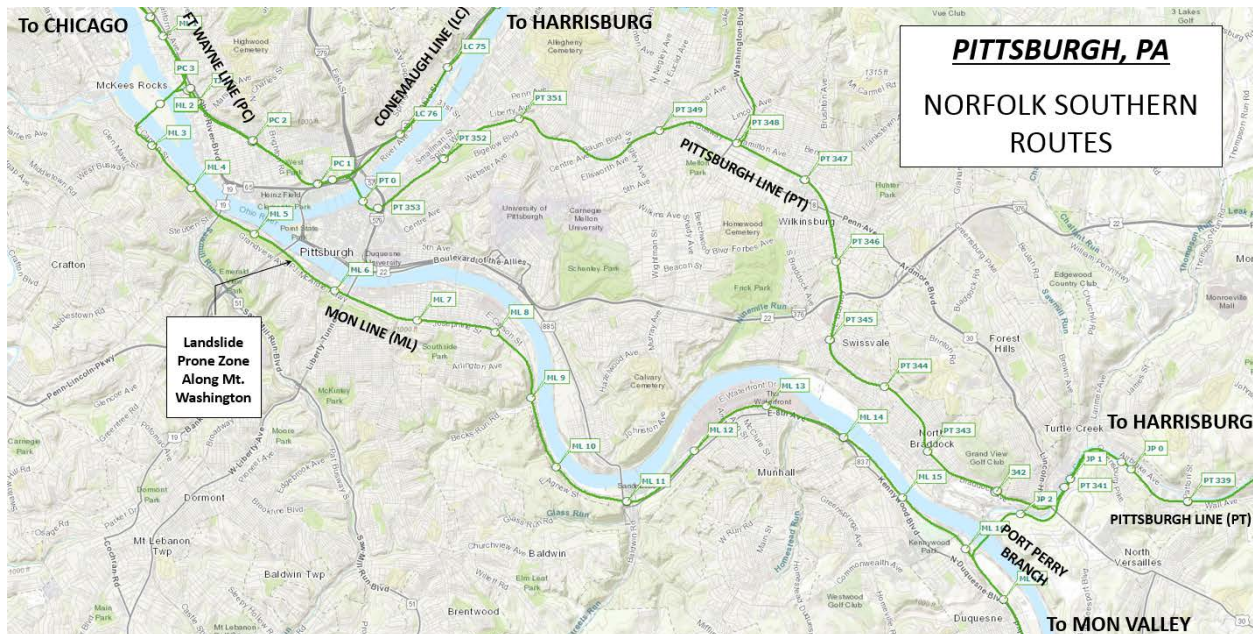


Figure 3.1: Overview Map of Project Locations showing Port Perry Bridge, Mon Line, Pittsburgh Line and Fort Wayne Line



Figure 3.2: Image courtesy of Pittsburgh Post-Gazette, 2014.