

# Ohio Freight Rail Choke Point Study

## final report

*prepared for*

**Ohio Department of Transportation**

*prepared by*

**Cambridge Systematics, Inc.**

*with*

**Burgess & Niple  
Rosen Consulting**

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*August 2007*

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# Executive Summary

The Ohio freight railroads originated 69 million tons of freight and terminated 98 million tons of freight in 2005. When through trains are considered, freight railroads handled a total of 315 million tons and 6.8 million carloads in Ohio. The railroads provide critical services to industries important to Ohio's economy, hauling raw materials, parts, and finished goods for the energy, construction, automotive, agriculture, and distribution and trade industries. The railroads themselves also are an important industry, employing over 8,000 workers and paying approximately \$500 million in wages in Ohio.

Nationwide, the demand for freight rail service remains strong, and is forecast to increase 71 percent by tonnage and 85 percent by ton-miles between 2005 and 2035. However, the freight railroads are not keeping pace with this demand. The railroads are investing to expand capacity and improve operations, but despite the recent increases in rail rates and revenues, the railroads are not generating enough internal revenues nor attracting enough investment monies to expand as quickly as industry analysts believe they should. To balance moderate growth in rail capacity with relatively rapid growth in the demand for rail services, railroads are focusing on more profitable and longer-distance intermodal unit train services, and pricing out less profitable and shorter-distance carload services. This has a direct impact on Ohio industries that depend on carload service; and an indirect, but real impact on Ohio citizens, because when railroads shed traffic to trucks, it increases the cost of maintaining public roads.

This study identifies the most severe rail choke points in Ohio – the specific physical locations on the rail system where trains routinely experience recurring congestion delays because volumes are approaching or exceeding capacity. Delays at these choke points add to the cost of rail shipments because crews must work longer to deliver freight, because more fuel is burned than is necessary to deliver that freight, and because industries must pay more to keep excess materials, parts, and finished goods in inventory in case a train arrives later than planned. Taken one by one, the delays and costs are usually not critical, but over the course of a year, millions of rail shipments are delayed and the cumulative costs of these delays erode the productivity and profitability of hundreds of Ohio businesses and industries. Ultimately, these costs are passed back to consumers, increasing the cost of living in Ohio.

At issue is whether the public – through the Ohio Department of Transportation (ODOT), the Ohio Rail Development Commission (ORDC), the Ohio Department of Development, and local government agencies – should invest public money to expand the capacity of the freight rail system.

Recent analyses of the Nation's rail system<sup>1</sup> have pointed to several potential futures that are the direct result of present-day policy choices about public and private investment in the rail system:

- **Market-based futures**, in which railroads make infrastructure investments based solely on business performance with minimum public investment. In these scenarios, the railroads are viable business entities, but aim to maximize profitability, as opposed to maximizing system volumes and services. Lower-profit traffic is shed from the system over time, and must be handled by truck or barge.
- **Partnership-based futures**, in which the public sector actively invests to encourage expansion of the rail system in cases where solving the capacity problem on rail costs less than solving it on other modes. This is often justified based on mobility, economic, safety, environmental, and other public benefits.

Today's system is a blend of both approaches, although market-based futures and private investments largely shape the freight rail network. As a result, there are no comprehensive system expansion strategies at the national level, and very few at the regional or state level.

This study provides a foundation of information about the condition and performance of the freight rail system in Ohio, which will help Ohio determine if there are sufficient public benefits to be gained by investing public funds to accelerate the expansion of rail capacity in Ohio.

The 30 most severe choke points in the Ohio freight rail network were identified by considering:

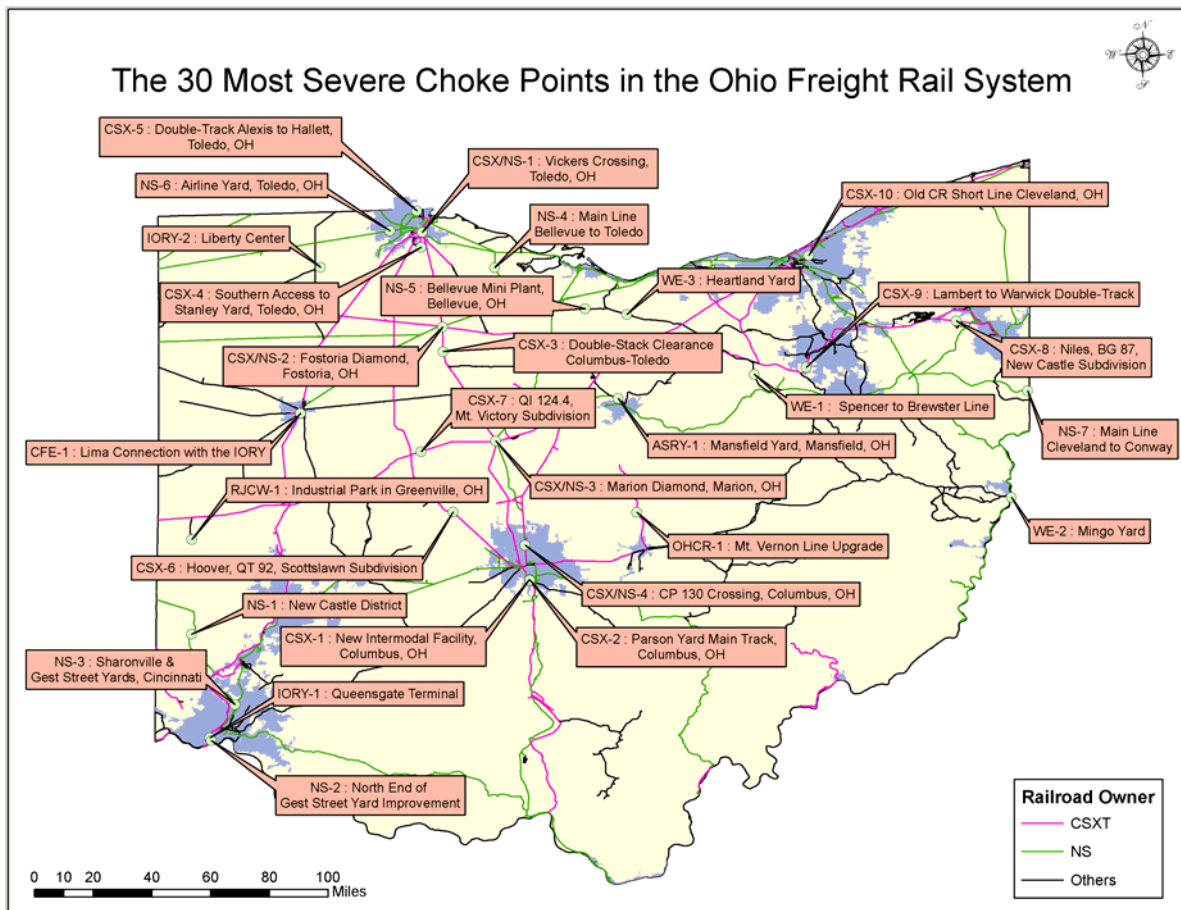
- Severity of the existing choke point;
- Potential for Ohio truck-to-rail diversions;
- Potential for Ohio job creation or retention;
- Impact of the choke point on railroad operating efficiency;
- Project readiness; and
- Safety, security, and environmental issues.

Figure ES.1 **identifies and locates** the 30 most severe choke points in Ohio. They are spread across the State and across eight railroads.

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<sup>1</sup> See American Association of State Highway and Transportation Officials (AASHTO), *Freight Rail Bottom Line Report and Passenger-Rail Bottom Line Report*, Washington, D.C., 2003; and the various Government Accountability Office report on freight and passenger rail trends and capacity issues.

**Figure ES.1 Ohio’s Most Severe Freight Rail Choke Points by Location**



The study then **estimates the cost** to eliminate or reduce train delays at these choke points. The total cost is estimated to be \$1.19 billion. Projects that jointly impact the two largest railroads in Ohio – CSX and Norfolk Southern – are the most expensive, totaling \$442.6 million. These projects include the notoriously complex choke points of Vickers Crossing, Fostoria Diamond, and Marion Diamond.

Finally, the study **assesses the benefits** to Ohio shippers, railroads, and the State of Ohio of improving these rail choke points. The study team was directed to focus on a very germane factor – train delay. While this factor does not translate directly into public benefits, it does provide a common measure of severity for each choke point. This proved to be a difficult measure to obtain, since without extensive computer simulation work, the reduction in train delay could not be established. Therefore, the following list of qualitative measures was used to determine a relative ranking of improving railroad choke points in Ohio:

- State of Ohio:
  - Choke point severity;
  - Highway congestion mitigation and highway cost savings;
  - Economic growth;
  - Safety, security, and/or environmental improvements; and
  - Project readiness.
- Freight railroads:
  - Choke point severity;
  - Potential for traffic and revenue increase;
  - Safety and security improvements;
  - Operating efficiency improvements; and
  - Project readiness.
- Ohio shippers:
  - Lower logistics costs;
  - Business expansion;
  - Reduction in delay, improvement in on-time performance; and
  - Project readiness.

# 1.0 Study Purpose and Background

The efficient movement of freight within and through Ohio is a critical component of a well balanced, efficient multimodal transportation system. ODOT has been a strong proponent of integrating freight into the transportation planning process for a number of years conducting several key studies, including *Freight Impacts on Ohio's Roadways* in June 2002 and the *Ohio Freight Mobility Study* in 2005. To continue these efforts, ODOT initiated the *Ohio Freight Rail Choke Point Study* to identify the most severe choke points in Ohio's freight rail network.

## ■ 1.1 Study Purpose

The objectives of the study are to identify the most severe rail choke points in the Ohio rail system; estimate the cost of eliminating or reducing train delays at these choke points; and assess the value to Ohio shippers, the railroads, and the State of Ohio of those improvements.

## ■ 1.2 National Perspective

The questions addressed by the study for Ohio are a part of the larger national debate about if, where, when, and how much the public sector should invest in the private freight rail networks.

The demand for freight rail service is forecast to increase 71 percent by tonnage and 85 percent by ton-miles between 2005 and 2035. However, the freight railroads are not keeping pace with this demand. The rail industry today is stable, productive, and competitive, with enough business and profit to operate. But despite the recent increase in prices and revenue, the industry is still not attracting capital fast enough to replenish its infrastructure quickly nor keep pace with demand and public expectations. The rail industry is straining to meet the growing demand for rail freight transportation today.

This is in part because the railroad industry is unique among the Nation's major industries in its extraordinary need for capital reinvestment. The rail industry spends three to five times as much on infrastructure as other major industries; much of this going to maintenance of existing track and facilities. From 1995 through 2004, the rail industry reinvested 17.8 percent of revenue into capital spending, compared to an average of 3.5 percent for all other U.S. industries. The rail industry announced that total Class I spending for replacing old track and laying new track, buying new locomotives and other

equipment, and improving existing infrastructure would reach \$8 billion in 2006 – an increase of 21 percent over 2005 levels. The rail industry also spends nearly \$500 million annually in property taxes for their privately-owned right-of-way.<sup>2</sup>

In the highway freight system, the public sector constructs the roads, and the trucking industry pays for the highways through fuel taxes as they use the highways. Railroads, conversely, construct their own lines, incurring fixed costs that must be paid, whether the lines, bridges, tunnels, and terminals are used or not. As a consequence, both lenders and railroads tend to be very cautious about over-investing in infrastructure, and the proportion of total capital that represents real increases in system capacity remains at fairly modest levels. Most capacity-related investments are very carefully targeted to specific lanes and commodities.

In 2003, the AASHTO *Freight-Rail Bottom Line Report* estimated that at the level of investment the Class I railroads could afford from their revenue plus borrowing, the freight rail system could handle around one-half of its ‘fair share’ of the forecast growth in freight rail tonnage, but could not keep pace with the full demand for rail freight movement.<sup>3</sup> The unmet one-half of new rail freight demand would likely shift to trucks and the highway system. The report estimated that to keep pace with economic growth and maintain its current share of freight tonnage, the rail system needed an investment of \$175 billion to \$195 billion over the next 20 years. The report anticipated that the railroads would be able to provide the majority of the funding needed (up to \$142 billion) from revenue and borrowing, but the remainder (up to \$53 billion, or \$2.65 billion annually) would have to come from other sources, perhaps including loans, tax credits, and other forms of public-sector participation.

Although no current reassessment of rail investment compared to need is available, industry analysts continue to see a shortfall in investment in rail infrastructure. The railroads are focusing on the more profitable, longer-distance, “hook and haul” traffic, which has led to the much improved financial health of the railroad industry in the last few years. But in doing this, the railroads are continuing to shed rail traffic – including some less profitable carload traffic – to the highway system. This is worrisome because if rail cannot maintain its share of freight, then the consequences will be increased congestion on the highways, a higher cost of doing business, and a higher cost of living for the Nation.

The questions of if, where, when, and how to invest are complicated by the fact that there are no comprehensive rail system expansion strategies at the national level to keep pace with the growing demand. Expansion is done by each railroad based on business decisions. Left to market pressures, the Nation’s freight rail infrastructure and services will

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<sup>2</sup> Cambridge Systematics, Inc., AASHTO *Freight Transportation Bottom Line Reports*, forthcoming, 2007, based on Association of American Railroads and Class I railroad data.

<sup>3</sup> AASHTO, *Transportation: Invest in America: Freight-Rail Bottom Line Report*, Washington, D.C., 2003. See [http://freight.transportation.org/doc/rail/ex\\_railreport.pdf](http://freight.transportation.org/doc/rail/ex_railreport.pdf) and <http://freight.transportation.org/doc/FreightRailReport.pdf>.

continue to transform from “retail” railroading to “wholesale” railroading, with less direct customer service, more trains between large hubs, and continuing pressure to price out less profitable and more complex rail carload services. The choices for the future are broadly described as:

- **Market-based futures**, in which railroads make infrastructure investments based solely on business performance, with minimum public investment. In these scenarios, the railroads are viable business entities, but aim to maximize profitability, as opposed to maximizing system volumes and services. Lower-profit traffic is shed from the system over time, and must be handled by truck or barge.
- **Partnership-based futures**, in which the public sector actively invests to encourage expansion of the rail system in cases where solving the capacity problem on rail costs less than solving it on other modes. This is often justified based on mobility, economic, safety, environmental, and other public benefits.

Ohio will be joining other states and railroads in the debate over the value of freight- and passenger-rail services; the appropriate role of the public sector in regulating and investing in the rail system to achieve public transportation, social, economic, and environmental goals; and the impact of these actions on the productivity, efficiency, and profitability of the railroads and their shippers and receivers.

## **2.0 The Ohio Freight Rail System Overview and Initiatives**

### **■ 2.1 Overview of Freight Railroads Serving Ohio**

The Ohio freight railroads originated 69 million tons of freight and terminated 98 million tons of freight in 2005. When through trains are considered, freight railroads in Ohio handled 315 million tons of freight in 6.8 million carloads. These railroads provide critical services to industries important to Ohio's economy, such as energy, construction, automotive, agriculture, and distribution and trade. The railroads themselves also are an important industry, employing 8,000 workers and paying approximately \$500 million in wages in Ohio. Table 2.1 lists the 35 active freight railroads in Ohio in 2005.<sup>4</sup>

Table 2.2 provides a summary of the major commodities hauled by the freight railroads in Ohio. Metal products, coal, ores, farms products, and nonmetallic minerals are the principal commodities originated, while coal, metal products, chemicals, and scrap and waste are the principal commodities terminates. Another important commodity, which does not appear as a top commodity based on tonnage, is international and domestic containers and trailers filled with consumer goods.

The largest category of shipments is the 43 million tons of coal terminated at coal-fired electric utility plants throughout Ohio. Another energy-related industry that is one of the fastest growing markets for the railroads is ethanol, including inbound shipments of grains to the plants and outbound shipments of ethanol. In addition to the energy industry, the railroads support other key Ohio industries, including agriculture, construction, automotive, and distribution and retailing of consumer goods. The railroads haul bulk minerals, ores, and construction stone that are impractical to move by truck; and for goods that can move by truck (e.g., assembled automobiles, chemicals, intermodal containers and trailers), rail offers a lower-priced competitive choice.

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<sup>4</sup> Source: Association of American Railroads (AAR) "Railroads Service in Ohio, 2005" retrieved from <http://www.aar.org/AboutTheIndustry/StateInformation.asp>. Railroad names, type of railroad, and mileages obtained from the AAR, with some corrections provided by the ORDC.

**Table 2.1 Freight Railroads Serving Ohio<sup>a</sup>**

Railroad Name	RR Abbreviation	Class I	Regional	Local	Terminal/ Switching	Miles Operated in Ohio
Akron Barberton Cluster Railway	AB				●	68
Ann Arbor Railroad	AA			●		5
Ashland Railway	ASRY			●		70
Ashtabula, Carson, and Jefferson	ACJR				●	6
Camp Chase Railroad	CCRA				●	14
Canadian National/Grand Trunk	CN	●				7
Canadian Pacific/Soo Line	CP	●				29
Central Railroad Company of Indiana	CIND			●		40
Chicago, Ft. Wayne and Eastern	CFE			●		171
Cleveland Commercial Railroad Co.	CCRC			●		11
Columbus and Ohio River Rail Road Co.	CUOH			●		166
CSX Transportation	CSX	●				1,914
Flats Industrial Railroad	FIRR				●	3
Indiana Northeastern Railroad Co.	IN			●		9
Indiana and Ohio Railway	IORY		●			559
ISG Cleveland Works Railway Co.	CWRO				●	10
Lake Terminal Railroad	LT				●	1
Mahoning Valley Railway	MVRY				●	12
Maumee and Western Railroad Corp.	MAW				●	49
Newburgh and South Shore	NSR				●	3
Norfolk Southern Corp.	NS	●				2,233
Northern Ohio and Western Railway	NOW				●	25
Ohi-Rail Corporation	OHIC				●	73
Ohio and Pennsylvania Railroad	OHPA			●		43
Ohio Central Railroad	OHCR			●		94
Ohio Southern Railroad	OSRR			●		50
Republic N&T Railroad	-				●	24
RJ Corman Cleveland Line	RJCL			●		89
RJ Corman Western Ohio Line	RJCW			●		105
U.S. Rail Corporation-Jackson Division	USRC				●	74
Warren and Trumbull Railroad	WTRM				●	24
Wheeling and Lake Erie	WE		●			558
Youngstown and Austintown Railroad	YARR				●	4
Youngstown Belt Railroad Co.	YB				●	32
Youngstown & Southern	Y&S			●		30

Source: Association of American Railroads, "Railroad Service in Ohio, 2005."

<sup>a</sup> Railroad classification is determined by the Surface Transportation Board. In 2005, a Class I railroad had \$319.3 million or more in operating revenues; a regional railroad was a non-Class I line-haul railroad operating 350 miles or more with operating revenues of at least \$40 million; a local railroad was a non-Class I or regional line-haul railroad; and Switching and Terminal Railroad was a railroad engaged primarily in switching and/or terminal services for other railroads.

**Table 2.2 Rail Tonnage in Ohio by Commodity**

<b>Commodity</b>	<b>Originated</b>	<b>Terminated</b>
All Other	21,572,267	24,828,373
Primary Metal Products	11,347,132	9,288,440
Coal	11,244,320	43,124,475
Metallic Ores	9,899,930	B
Farm Products	8,591,380	B
Nonmetallic Minerals	6,270,532	6,483,922
Chemicals	A	7,372,382
Waste and Scrap	A	6,990,860
<b>Total</b>	<b>68,935,561</b>	<b>98,088,452</b>

Source: Association of American Railroads, "Railroad Service in Ohio, 2005."

Note: Traffic originating and terminating in Ohio is included in both columns.

A – commodity was reported in "All Other" originated category; and B – commodity was reported in "All Other" terminated category.

## ■ 2.2 Transportation Initiatives Impacting Freight Rail in Ohio

The choke point analysis presented in this report is focused on existing and near-term capacity issues in the Ohio rail system. No effort was made to anticipate future problems. It is important, however, to consider other initiatives that could impact future freight rail movement as Ohioans consider public participation in rail capacity expansion. Three projects are outlined in this section: Heartland Corridor, The Ohio Hub, and Chicago Region Environmental and Transportation Efficiency (CREATE).

### 2.2.1 Heartland Corridor

The Heartland Corridor is a public-private economic development partnership that will improve rail service between the ports at Norfolk, Virginia, and the Midwest. Specifically, Heartland will improve nearly 30 tunnel clearances and other overhead obstructions in western Virginia and West Virginia, permitting the movement of double-stacked international and domestic container trains through the coal fields. A key element of the project from Ohio's perspective will be an intermodal center at the Norfolk Southern facility at Rickenbacker, which will further promote Columbus as a hub for distribution and retail activity in the Midwest. The Heartland Corridor was designated as a Project of National

and Regional Significance under the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), and received a \$90 million earmark. This money, combined with funding from Norfolk Southern and from the states, will be used to develop the corridor.

Heartland will impact train movements in Ohio, especially southern Ohio. Additional trains can be expected on NS between Huntington, West Virginia and Columbus, which might offer some relief to the congested yards at Cincinnati. The most likely scenario though, will see additional intermodal trains into Columbus creating additional congestion problems on rail lines in the State.

### **2.2.2 The Ohio Hub**

The Ohio Hub initiative envisions a network of higher-speed rail corridors offering improved passenger and freight transportation services between Ohio's major cities and towns, with connections to the remainder of the Midwest and the nation. This initiative will examine the regional railroad network to identify a program of railroad capacity improvements. The Ohio Hub will include 860 route miles and 32 stations connecting four states and southern Ontario, and accessing 11 major metropolitan areas with a total of 22 million people.<sup>5</sup> The nine-corridor intercity/interstate passenger rail system includes:

- Cleveland-Columbus-Dayton-Cincinnati;
- Cleveland-Toledo-Detroit;
- Cleveland-Pittsburgh;
- Cleveland-Toledo-Chicago;
- Columbus-Lima-Chicago;
- Cincinnati-Indianapolis-Chicago;
- Columbus-Toledo;
- Columbus Pittsburgh; and
- Cleveland-Erie-Niagara Falls-Toronto

The Ohio Hub proposes a shared-use rail system. Passenger trains will operate at speeds up to 110 mph over hundreds of miles of upgraded Federal Railroad Administration (FRA) Class 6 track, most of which will be shared with freight trains. The plan recommends capacity, speed, and safety improvements to existing freight railroad owned lines that will enable the operation of frequent, reliable higher-speed passenger service. The Ohio Hub Plan suggests that this effort will:

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<sup>5</sup> "Moving Passengers and Products: The Ohio Hub Rail Plan," The Ohio Rail Development Commission, March 2006.

*“...strengthen Ohio’s partnership with the freight railroads by working to identify “system-wide” improvements that will increase transportation capacity for growing volumes of freight while removing railroad bottlenecks, improving fluidity, and having a positive affect on highway capacity, shipping rates, and economic development.”*

The economic benefits of operating a reliable, time competitive, frequent, passenger rail service over improved and expanded railroad infrastructure will be shared with the freight railroads, the shippers, as well as the public. The Ohio Hub Plan also states:

*“The most important goal in planning the Ohio Hub is to provide new transportation capacity for increasing volumes of freight traffic. New passenger rail service must not impair railroad operations, create impediments or bottlenecks nor should it constrain future growth; rather, passenger rail improvements must increase capacity and improve the fluidity of railroad operations.”*

The Ohio Hub planned improvements include a variety of corridor capacity enhancement projects, including track upgrades, additional main line tracks, sidings, yard improvements, signal upgrades, bridges, and rail/rail flyovers. This will not only expand capacity for passenger service, but all of these will add capacity to the freight system as well. Moreover, the Ohio Hub overlays capital improvements on top of many of the same projects identified in this Choke Point Study. For example, Ohio Hub capacity projects include new yard capacity and connections at Airline Yard; a new NS main track from Airline Yard along the Detroit Line to Alexis; a third main track along the NS Cleveland Line to Conway Yard; multiple flyovers at key interlocking locations, including Vickers; and new bridges over the Cuyahoga, Maumee, and Scioto Rivers, among many other rehabilitation projects. The Ohio Hub plan incorporates the costs for many of same capacity bottlenecks identified in the Choke Point Study. This suggests that a planning strategy should be developed to advance the Ohio Hub planning and project development in conjunction with a comprehensive analysis of the railroad choke points identified in this study.

### **2.2.3 Chicago Region Environmental and Transportation Efficiency (CREATE) Project**

CREATE was conceived as a package of critically needed improvements to the Chicago region’s rail infrastructure. The project is being advanced by a consortium consisting of the Illinois DOT; Chicago DOT; the six largest North American freight railroads (Union Pacific (UP), Burlington Northern Santa Fe (BNSF), Norfolk Southern (NS), Canadian Pacific (CP), Canadian National (CN), and CSX Transportation); and Metra, Chicago’s regional passenger railroad. Physically, CREATE calls for rationalization, reconstruction, and upgrade of five cross-town corridors in Chicago: Belt Railway of Chicago East-West Connector, UP/CSX/NS Western Avenue Corridor, CSX/Indiana Harbor Belt Beltway Corridor, Metra South West Service Passenger Express Corridor, and a new Central Corridor connecting CN-Wisconsin Central with Eastern Class I railroads.

The project has two main goals: 1) reduce highway-rail conflicts by rerouting rail traffic in such a way as to avoid grade-crossing prone lines and physically separating rail lines crossing high-volume roadways at selected locations; and 2) upgrade logical corridors to create through routes and additional capacity in Chicago, transcending historical ownership barriers.

By creating improved through routes and additional capacity in Chicago, CREATE will lead to additional freight rail traffic in Ohio. This is beneficial, since it will offer some relief to long-haul truck traffic on the interstates, but the railroads need to be able to handle the additional trains.

## 3.0 Identifying Ohio Freight Rail Choke Points

This section defines a rail choke point, describes how rail choke points in Ohio were identified, and provides a map of the 30 projects that were deemed the most severe freight rail choke points in the State of Ohio.

### ■ 3.1 Identification of Freight Rail Choke Points in Ohio

A rail choke point can be a location where trains routinely wait for other trains to pass. It can be a low tunnel or bridge that prevents passage of double-stack intermodal trains or multilevel auto carriers. Or it can be a rail yard that is too small to accommodate all the cars being picked or put out, causing the train to “park” on the main line and block through traffic. These and other physical choke points are usually addressed by adding additional track or sidings, expanding yard track and storage space, clearing tunnels and overpasses to allow double-stack intermodal service, or upgrading track and bridges to allow for heavier and longer trains.

For the purposes of this study, a choke point was defined as a specific physical location on the rail system that routinely experiences recurring congestion and train delays, because volume exceeds capacity. Choke points created by equipment, staff shortages, and uncoordinated operations, which would normally be addressed by the railroads, were not considered as choke points for the purposes of this study. Choke points are further restricted to locations that are current problems or anticipated near-term (five years) problems.

Armed with this definition, each freight railroad operating in Ohio was contacted and given an opportunity to submit their list of choke points. ODOT, ORDC, the Ohio Railroad Association, and the consultant team’s rail experts also were asked to nominate choke points for consideration. Finally, a presentation about the study was made at a meeting of Ohio’s metropolitan planning organizations (MPO) who were invited to identify freight rail choke points affecting metropolitan shippers and communities.

The railroads were provided with choke point identification forms and asked to provide information for each choke point on their system.<sup>6</sup> The form was limited to one page

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<sup>6</sup> See Appendix A for a copy of the form.

(with two pages of instructions) to reduce the burden on the railroads, and enhance the response rate. Four general categories of information were gathered:

1. Information about the railroad;
2. Information about the respondent;
3. Information about the choke point; and
4. Information about the benefits of eliminating or reducing the choke point.

This survey yielded a total of 44 locations that met the criteria for a choke point. This information was supplemented, as needed, through telephone and e-mail discussions with the railroads, shippers, and other agencies. Not all choke points identified in this study were identified as choke points by the railroads. For example, the Fostoria Diamond, where two CSX lines and one NS line cross, is a known rail choke point in Ohio, but it was not nominated by either CSX or NS, in part because the railroads may not be prepared to tackle the high cost and complexity of this choke point.<sup>7</sup>

This study did not attempt to evaluate the sufficiency of the Ohio freight rail system as a whole. Nor did it include an assessment of roadbed, rail, or tie conditions; or the condition of other railroad infrastructure, such as drainage, tunnels, structures, and retaining walls. Deficiencies in these areas can reduce train speeds and throughput, but only major capital deficiencies, such as insufficient track, low tunnels, etc., were considered for this study.

## ■ 3.2 Designation and Ranking of the Most Severe Freight Rail Choke Points in Ohio

The 44 choke points were then evaluated and ranked according to the following six broad criteria:

1. Severity of the existing choke point:
  - a. Is this a current or future problem?
  - b. Does it involve one or multiple railroads?
  - c. Is the rail traffic through this choke point (number of trains or cars) low, medium, or high?

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<sup>7</sup> A railroad “diamond” is a specialized track configuration that allows two tracks to cross each other at the same grade. At Fostoria, three tracks cross within close proximity, creating additional scheduling complications and safety considerations.

2. Potential for Ohio truck-to-rail diversions:
  - a. Does this choke point impact long-haul moves?
  - b. Does this choke point impact rail service along a heavily used truck corridor?
  - c. Are the commodities moved in this corridor suitable for rail transportation?
3. Potential for Ohio job creation or retention:
  - a. Does this project directly create jobs (e.g., a new rail facility)?
  - b. Does this project provide new or improved service to Ohio businesses and industries?
  - c. Does improving this choke point lead to lower logistics costs for Ohio businesses and industries?
4. Improves operating efficiency for railroad:
  - a. Does improving this choke point increase average train speeds and/or reduce train and car delay?
  - b. Will improving this choke point reduce operating costs through lower crew and fuel usage, and/or improved equipment utilization?
  - c. Will the operating efficiency gain allow the railroad to attract new business?
5. Project readiness:
  - a. Is this choke point identified as a high priority by the railroad?
  - b. Have engineering, environmental, and other studies been developed regarding a solution to this choke point?
6. Safety, security, or environmental concerns:
  - a. Is the choke point currently a safety or security problem (e.g., dangerous roadway-rail grade crossing)?
  - b. Does the proposed solution create any new safety or security concerns?
  - c. Are there environmental, community, or other concerns to implementing the proposed solution?
  - d. Will the solution provide net environmental benefits (e.g., less truck vehicle-miles traveled (VMT))?

Cost to eliminate or reduce delays at the choke points was not a consideration in identifying the most severe freight rail choke points in Ohio.

A numerical value was assigned for each criterion for each choke point based on the following scale:

- **Low:** 1;
- **Low-Medium:** 2;

- **Medium:** 3;
- **Medium-High:** 4; and
- **High:** 5.

The scores across the six categories were cumulated to create a total score for each choke point. For this initial statewide study, the criteria were not weighted individually. The scores for each choke point were then used to rank order the choke points. The ratings and rankings are shown in Table 3.1. The choke points listed in the table are sorted in descending order based on the total score in the far right column. There were 30 projects that received a score of 14 points or more. These were designated as the most severe freight rail choke points in Ohio. These 30 projects are individually profiled in Section 6.0.

It should be noted that this prioritization is only intended as a preliminary ranking of the choke points. A detailed engineering and operational analysis of each location, along with a detailed public benefit analysis, would help provide a more definitive project prioritization list.

CSX's lines had the most choke points, with 10 severe choke points in the State; NS was second with 7; and CSX and NS shared 4 additional severe choke points. The 9 other choke points were distributed across 6 other railroads. Figure 3.1 shows graphically the number choke points by railroad. Figure 3.2 shows the location of the choke points, which are widely distributed across the State in urban and rural areas.

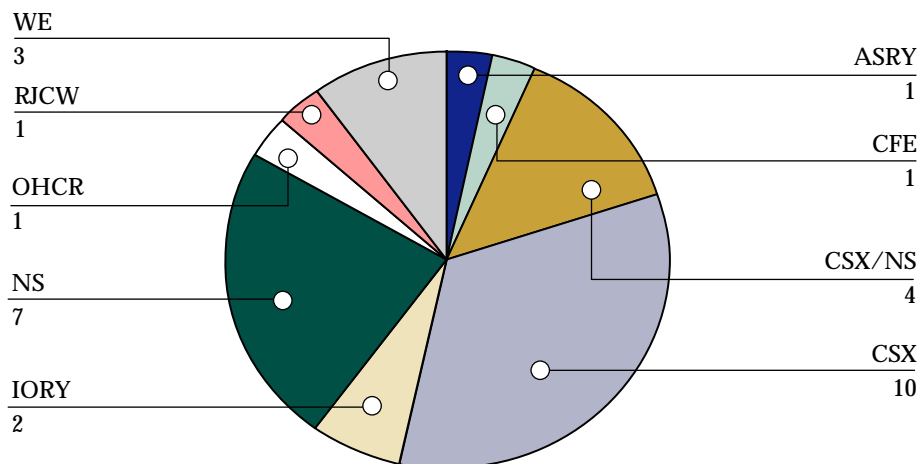
**Table 3.1 Prioritization of the Ohio Freight Rail Choke Points**

<b>Railroad</b>	<b>Choke Point Name/Location</b>	<b>Current Severity</b>	<b>Truck to Rail</b>	<b>Jobs</b>	<b>Railroad Efficiency</b>	<b>Project Readiness</b>	<b>Safety, Security, Environment</b>	<b>Total Score</b>
NS	New Castle District	5	4	3	5	5	1	<b>23</b>
NS	North End of Gest Street Yard Improvements	5	4	3	5	5	1	<b>23</b>
NS	Sharonville and Gest Street Yards, Cincinnati, Ohio	5	5	2	5	5	1	<b>23</b>
CSX	New Intermodal Facility, Columbus, Ohio	1	5	5	5	5	1	<b>22</b>
CSX/NS	Vickers Crossing, Toledo, Ohio	5	5	1	5	3	1	<b>20</b>
NS	Bellevue Mini Plant, Bellevue, Ohio	5	4	1	5	3	1	<b>19</b>
NS	Airline Yard, Toledo, Ohio	5	3	3	4	3	1	<b>19</b>
CSX	Lambert to Warwick Double-Track	5	5	1	5	1	1	<b>18</b>
CSX	Old CR "Short Line" Cleveland, Ohio	5	5	1	5	1	1	<b>18</b>
CSX/NS	Fostoria Diamond, Fostoria, Ohio	5	5	1	5	1	1	<b>18</b>
CSX/NS	Marion Diamond, Marion, Ohio	5	5	1	5	1	1	<b>18</b>
CSX/NS	CP 130 Crossing, Columbus, Ohio	5	5	1	5	1	1	<b>18</b>
CSX	Parsons Yard Main Track, Columbus, Ohio	5	1	1	5	4	2	<b>18</b>
NS	Main Line Bellevue to Toledo	5	4	1	4	3	1	<b>18</b>
CSX	Double-Stack Clearance Columbus-Toledo	1	3	1	5	4	3	<b>17</b>
CSX	Southern Access Stanley Yard, Toledo, Ohio	1	3	1	5	4	3	<b>17</b>
IORY	Queensgate Terminal	5	1	1	5	2	3	<b>17</b>
CSX	Double Track Alexis to Hallett, Toledo, Ohio	5	2	1	3	4	1	<b>16</b>
IORY	Liberty Center	3	1	1	5	5	1	<b>16</b>
WE	Spencer to Brewster Line	3	3	1	3	5	1	<b>16</b>
WE	Mingo Yard	3	1	1	5	5	1	<b>16</b>
CFE	Lima Connection with the IORY	3	3	1	2	3	3	<b>15</b>
NS	Main Line Cleveland to Conway	5	3	2	3	1	1	<b>15</b>
OHCR	Mt. Vernon Line Upgrade	1	3	3	3	4	1	<b>15</b>
RICW	Industrial Park in Greenville, Ohio	3	1	1	5	2	3	<b>15</b>
ASRY	Mansfield Yard, Mansfield, Ohio	3	3	1	3	3	1	<b>14</b>
CSX	Hoover, QT 92, Scottslawn Subdivision	1	2	1	5	4	1	<b>14</b>
CSX	QI 124.4, Mt. Victory Subdivision	1	2	1	5	4	1	<b>14</b>
CSX	Niles, BG 87, New Castle Subdivision	1	2	1	5	4	1	<b>14</b>
WE	Heartland Yard	3	3	1	3	3	1	<b>14</b>
ACJR	Car Storage Area	1	1	1	4	3	2	<b>12</b>
NSR	NS and Newburgh and South Shore Connection, Cleveland	1	3	1	5	1	1	<b>12</b>

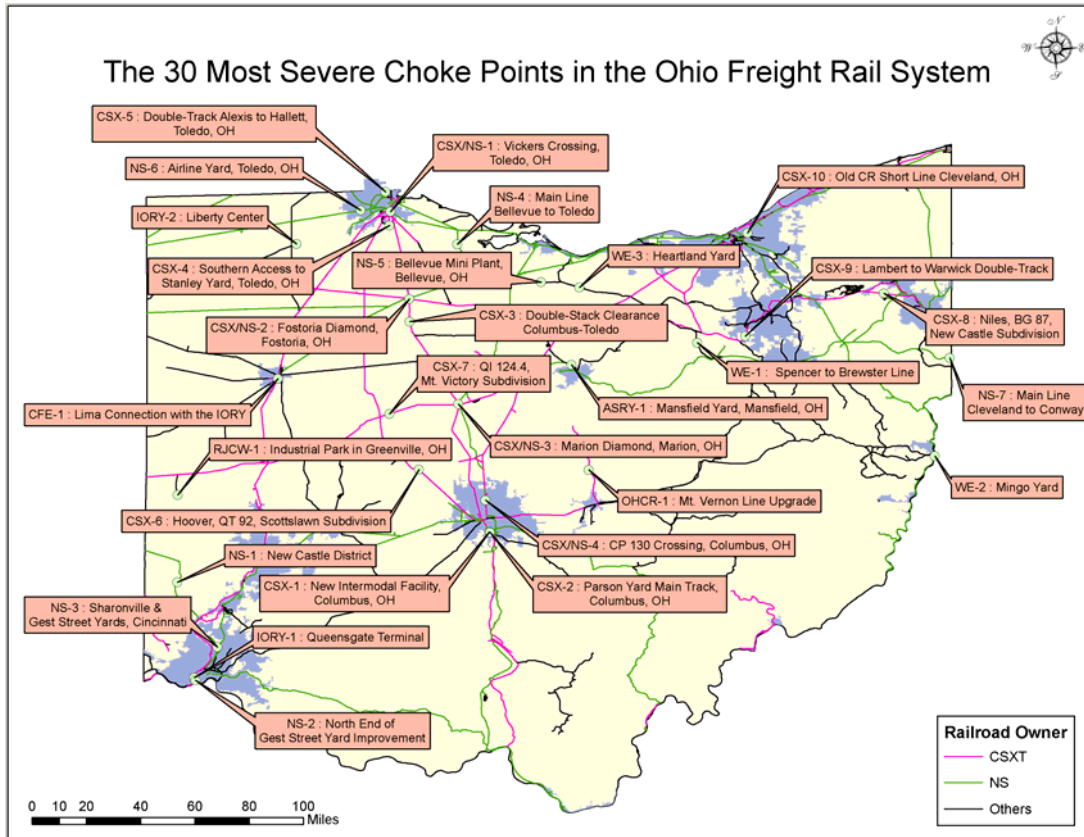
**Table 3.1 Prioritization of the Ohio Freight Rail Choke Points (continued)**

Railroad	Choke Point Name/Location	Current Severity	Truck to Rail	Jobs	Railroad Efficiency	Project Readiness	Safety, Security, Environment	Total Score
NSR	CSX and Newburgh and South Shore Connection, Cleveland	1	3	1	5	1	1	12
NS	Main Line Bellevue to Ft. Wayne	3	3	1	3	1	1	12
U.S. Rail	Vaues Yard	3	1	1	5	1	1	12
CSX	FS Tower, BG 103.9, New Castle Subdivision	1	2	1	5	1	1	11
CSX	Install TCS, Youngstown through Lordstown to FS Tower	1	2	1	5	1	1	11
NS	Dayton District Double-Stack Clearance	1	3	1	3	1	1	10
RJCW	Congested Interchange, Warwick, Ohio	3	1	1	3	1	1	10
State of Ohio	Gould Tunnel	1	3	1	3	1	1	10
ACJR	Two Bridges Upgrade to 286,000 Pounds Standard	1	2	1	1	3	1	9
IORY	Lima Interchange with NS	1	1	1	3	2	1	9
U.S. Rail	Hudson Wye Track	1	2	2	1	1	1	8
ASRY	Plymouth Bridge, Low Clearance	1	1	1	1	1	1	6

**Figure 3.1 Ohio's Most Severe Freight-Rail Choke Points by Railroad**



**Figure 3.2 Ohio's Most Severe Freight Rail Choke Points by Location**



## 4.0 Estimating the Cost of Eliminating or Reducing Train Delays at the 30 Most Severe Choke Points

To properly frame a policy discussion, it is necessary to understand the magnitude of the problem. It also is necessary to understand the consequences of the actions, or inactions. Section 4.1 presents the cost estimates for implementing the proposed solutions to the choke points. The total estimated cost to improve the 30 most severe choke points in Ohio totals \$1.19 billion. To better understand the consequences of improving or not improving the choke points, Section 4.2 presents a preliminary analysis of the value of implementing the proposed solutions for the three primary stakeholders: the State of Ohio, the freight railroads, and Ohio shippers. This qualitative assessment assigns a “low,” “medium,” or “high” value to each stakeholder, based on what they stand to gain if the choke points are improved.

Preliminary cost estimates were developed for eliminating or reducing trains delays at each of the 30 most severe freight rail choke points in Ohio. The cost estimates were obtained in two ways:

1. **From the railroads** – For approximately one-half of the choke points, the railroads supplied the solution and the cost estimate. These ranged from detailed engineering drawing and cost estimates to “ballpark” estimates using best professional judgment. Each railroad cost was examined by the study team’s consulting engineer, Burgess & Niple, for reasonableness and consistency. About one-third of the choke points use the railroad cost estimates. The single-page summaries in Section 6.0 indicate whether or not the railroad cost estimate was used.
2. **From the study consulting engineers** – Burgess & Niple developed bottom-up cost estimates based on the installed cost of each individual component of the proposed solution (e.g., linear feet of track, number and type of switches, flyovers, etc.). The calculations of the cost estimates are not detailed in this report, but were supplied to ODOT in electronic format.

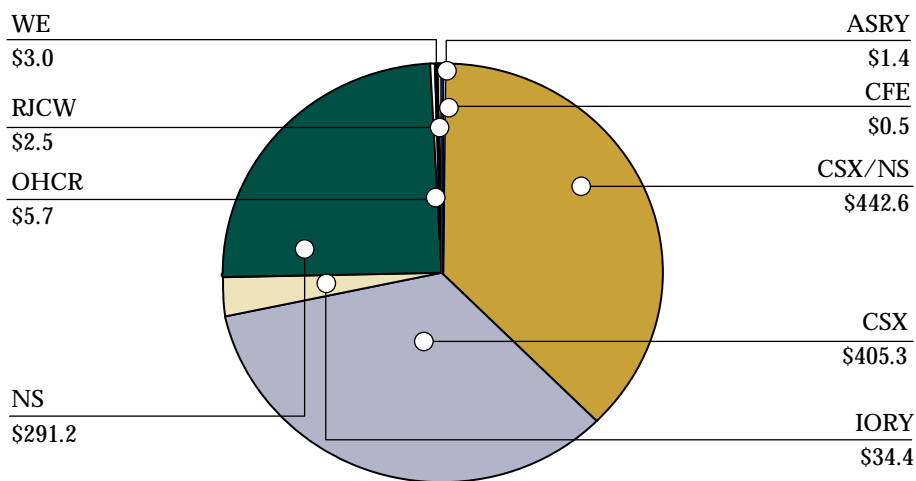
In general, the cost estimates do not include costs for land acquisition (where required). The cost estimates also do not include allowances for additional locomotives, railcars, crews, and operating expenses associated with handling any increase in traffic resulting

from the elimination or reduction of train delays. It is expected that provision of additional rolling stock, labor, and operating budget will be the responsibility of the railroads.

The total estimated cost to implement the proposed solutions to the 30 most severe choke points in Ohio was estimated at \$1.19 billion. Figure 4.1 shows the distribution of cost by railroads. Table 4.1 lists the choke points projects by estimated cost.

Projects that affect both CSX and NS are the most expensive, totaling \$442.6 million. These include the notoriously complex choke points at Vickers Crossing, Fostoria Diamond, and Marion Diamond. The single most expensive choke point project is the Conrail "Short Line," which is now the CSX main line around Cleveland. This is a double-tracked main with single-track tunnels. The proposed solution to this choke point is to bore a new tunnel at a cost estimate of \$243 million.

**Figure 4.1 Ohio's Most Severe Freight-Rail Choke Points by Railroad and Cost**  
*In Millions of Dollars*



**Table 4.1 Estimated Costs to Improve the Most Severe Rail Choke Points**

<b>Choke Point ID</b>	<b>Railroad</b>	<b>Choke Point Name/Location</b>	<b>Cost of Solution</b>
CSX-10	CSX	Old CR "Short Line" Cleveland, Ohio	\$243,000,000
CSX/NS-2	CSX and NS	Fostoria Diamond, Fostoria, Ohio	\$219,000,000
CSX/NS-3	CSX and NS	Marion Diamond, Marion, Ohio	\$132,000,000
NS-4	NS	Main Line Bellevue to Toledo	\$126,000,000
NS-7	NS	Main Line Cleveland to Conway	\$121,000,000
CSX-1	CSX	New Intermodal Facility, Columbus, Ohio	\$76,000,000
CSX/NS-4	CSX and NS	CP 130 Crossing, Columbus, Ohio	\$52,200,000
CSX/NS-1	CSX and NS	Vickers Crossing, Toledo, Ohio	\$39,440,000
IORY-1	Indiana and Ohio (RailAmerica)	Queensgate Terminal	\$33,700,000
CSX-5	CSX	Double-Track Alexis to Hallett, Toledo, Ohio	\$33,400,000
CSX-2	CSX	Parsons Yard Main Track, Columbus, Ohio	\$20,400,000
NS-1	NS	New Castle District	\$19,900,000
NS-3	NS	Sharonville and Gest Street Yards, Cincinnati, Ohio	\$11,400,000
CSX-9	CSX	Lambert to Warwick Double-Track	\$10,900,000
NS-5	NS	Bellevue Mini Plant, Bellevue, Ohio	\$10,000,000
CSX-6	CSX	Hoover, QT 92, Scottslawn Subdivision	\$6,600,000
CSX-4	CSX	Southern access to Stanley Yard, Toledo, Ohio	\$5,900,000
OHCR-1	Ohio Central	Mt. Vernon Line Upgrade	\$5,740,000
CSX-3	CSX	Double-Stack Clearance Columbus-Toledo	\$4,000,000
CSX-8	CSX	Niles, BG 87, New Castle Subdivision	\$2,900,000
RJCW-1	R.J. Corman Western Ohio Line	Industrial Park in Greenville, Ohio	\$2,500,000
CSX-7	CSX	QI 124.4, Mt. Victory Subdivision	\$2,200,000
NS-6	NS	Airline Yard, Toledo, Ohio	\$2,100,000
WE1	Wheeling and Lake Erie	Spencer to Brewster Line	\$1,500,000
ASRY-1	Ashland Railway	Mansfield Yard, Mansfield, Ohio	\$1,400,000
NS-2	NS	North End of Gest Street Yard Improvements	\$802,000
WE-2	Wheeling and Lake Erie	Mingo Yard	\$750,000
WE-3	Wheeling and Lake Erie	Heartland Yard	\$750,000
IORY-2	Indiana and Ohio (RailAmerica)	Liberty Center	\$650,000
CFE-1	Chicago, Ft. Wayne, and Eastern (RailAmerica)	Lima Connection with the IORY	\$500,000
<b>Total Cost</b>			<b>\$1,186,632,000</b>

## 5.0 Assessing the Value of Eliminating or Reducing Delay at Severe Choke Points to the State, Railroads, and Shippers

To evaluate the consequences of eliminating or reducing train delays at each choke point, an assessment was made of the benefits that might accrue to the Ohio shipper, the railroads, and the State of Ohio. The criteria used in assessing benefits are listed in Figure 5.1. The assessments were qualitative, relying on the information provided in the choke point identification forms and the team’s knowledge of Ohio, the railroads, and the supply chain practices of Ohio shippers and receivers. For each criterion were assigned a “low,” “medium,” or “high” value based on the perceived gain to the stakeholder, if train delays at the choke point were eliminated or reduced compared the current base case condition.

Table 5.1 lists the factors used to assess the value to stakeholders of eliminating or reducing train delays at choke points. Table 5.2 lists the 30 most severe choke points and the assessed value to each of the three stakeholder groups. It should be noted that this evaluation is only intended as a preliminary assessment of the choke points. A detailed engineering and operational analysis of each location, along with a detailed public benefit analysis, would help provide a more definitive project prioritization list.

**Table 5.1 Criteria for Assessing the Value to Stakeholders of Eliminating or Reducing Train Delays at Choke Points**

Stakeholder	Decision Criteria	Factors
State of Ohio	Choke point severity	Number of trains or railcars, percent of traffic originating and terminating in Ohio.
	Highway congestion mitigation	Truck-rail diversion potential.
	Economic growth	Job creation or retention potential.
	Safety, security, and environmental improvements	Fewer trucks on roadways, less truck emissions, less fuel consumed.
	Project readiness	Current versus future choke point, advancement of engineering design.

**Table 5.1 Criteria for Assessing the Value to Stakeholders of Eliminating or Reducing Train Delays at Choke Points (continued)**

Stakeholder	Decision Criteria	Factors
Freight railroads	Choke point severity	Number of trains or railcars.
	Potential for traffic and revenue increase	Truck-rail diversion potential, new business.
	Safety and security improvements	Expands capacity by improving safety.
	Operating efficiency improvements	Reduction in delay, increase in average train speed.
	Project readiness	Current versus future choke point, advancement of engineering design.
Ohio shippers	Lower logistics costs	New or improved rail service.
	Business expansion	Does rail service expand markets and/or lead to sales growth?
	Operating efficiency improvements	Reduction in delay, improvement in on-time performance.
	Project readiness	Will this help with existing traffic, or is this a future project?

**Table 5.2 Value of Improving Choke Points to the Stakeholders**

Choke Point ID	Railroad	Choke Point Name/Location	Value to State of Ohio	Value to Railroad	Value to Ohio Shippers
CSX/NS-1	CSX and NS	Vickers Crossing, Toledo, Ohio	High	High	High
CSX-1	CSX	New Intermodal Facility, Columbus, Ohio	High	High	High
NS-1	NS	New Castle District	High	High	High
NS-2	NS	North End of Gest Street Yard Improvements	High	High	High
NS-3	NS	Sharonville and Gest Street Yards, Cincinnati, Ohio	High	High	High
CSX/NS-2	CSX and NS	Fostoria Diamond, Fostoria, Ohio	High	Medium	Medium
CSX/NS-3	CSX and NS	Marion Diamond, Marion, Ohio	High	Medium	Medium
CSX-10	CSX	Old CR "Short Line" Cleveland, Ohio	High	Medium	Medium
CSX-9	CSX	Lambert to Warwick Double-Track	High	Medium	Medium
ASRY-1	Ashland Railway	Mansfield Yard, Mansfield, Ohio	Medium	High	Medium
CSX-2	CSX	Parsons Yard Main Track, Columbus, Ohio	Medium	High	Medium

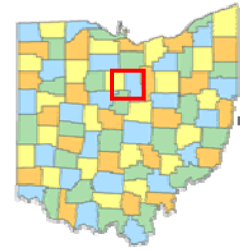
**Table 5.2 Value of Improving Choke Points to the Stakeholders  
(continued)**

<b>Choke Point ID</b>	<b>Railroad</b>	<b>Choke Point Name/Location</b>	<b>Value to State of Ohio</b>	<b>Value to Railroad</b>	<b>Value to Ohio Shippers</b>
CSX-3	CSX	Double-Stack Clearance Columbus-Toledo	Medium	High	Medium
CSX-5	CSX	Double-Track Alexis to Hallett, Toledo, Ohio	Medium	High	Medium
CSX-7	CSX	QI 124.4, Mt. Victory Subdivision	Medium	High	Medium
NS-4	NS	Main Line Bellevue to Toledo	Medium	High	Medium
NS-5	NS	Bellevue Mini Plant, Bellevue, Ohio	Medium	High	Medium
WE1	Wheeling and Lake Erie	Spencer to Brewster Line	Medium	High	Medium
CSX/NS-4	CSX and NS	CP 130 Crossing, Columbus, Ohio	Medium	Medium	Medium
NS-6	NS	Airline Yard, Toledo, Ohio	Medium	Medium	Medium
CFE-1	Chicago, Ft. Wayne, and Eastern (RailAmerica)	Lima Connection with the IORY	Medium	High	Low
CSX-4	CSX	Southern access to Stanley Yard, Toledo, Ohio	Low	High	Medium
OHCR-1	Ohio Central	Mt. Vernon Line Upgrade	Low	High	Medium
CSX-6	CSX	Hoover, QT 92, Scottslawn Subdivision	Low	Medium	Medium
CSX-8	CSX	Niles, BG 87, New Castle Subdivision	Low	Medium	Medium
WE-2	Wheeling and Lake Erie	Mingo Yard	Low	Medium	Medium
WE-3	Wheeling and Lake Erie	Heartland Yard	Low	Medium	Medium
RJCW-1	R.J. Corman Western Ohio Line	Industrial Park in Greenville, Ohio	Low	High	Low
IOFY-1	Indiana and Ohio (RailAmerica)	Queensgate Terminal	Low	Medium	Low
IOFY-2	Indiana and Ohio (RailAmerica)	Liberty Center	Low	Medium	Low
NS-7	NS	Main Line Cleveland to Conway	Low	Medium	Low

Note: Sorted by Value to State of Ohio, Value to Ohio Shippers, and Value to Railroad.

## **6.0 The Most Severe Freight Rail Choke Points in Ohio**

This section provides single-page summaries and maps describing the 30 most severe freight rail choke points in Ohio. Each summary shows the location of the choke point on the rail network, describes the choke point, discusses the type of freight traffic delayed, describes the preferred engineering solution, provides a preliminary cost estimate to implement the solution, and discusses the value of reducing delay at the choke point to the State, the railroads, and Ohio shippers.



## **ASRY-1 Mansfield Yard, Mansfield, Ohio**

### *Choke Point Description*

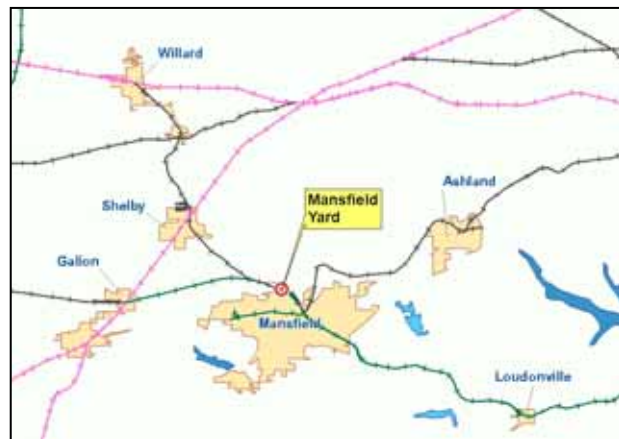
This yard is used to serve industries in the Mansfield area, and it allows ASRY to interchange local shipments with CSX and NS for nationwide movement. Traffic on the Ashland Railway (ASRY) is growing and expected to double in the near future. The current yard, located in Mansfield, Ohio, can hold 250 cars, but cannot efficiently handle the projected growth.

### *Traffic Volumes and Type*

The yard currently handles 16,000 to 17,000 loaded cars annually. It serves industries in the Mansfield area, especially the automotive industry.

### *Solution*

Build storage tracks to accommodate an additional 250 cars, for a total capacity of 500 cars. Additional land will have to be acquired to accommodate these tracks.



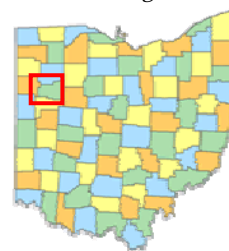
CSX – Red; NS – Green; Other – Black

### *Cost Estimate by the Study Team*

\$1,400,000 plus land acquisition costs.

### *Value of Improving Choke Point to State, Railroad, and Shippers*

<b>Stakeholder</b>	<b>Value</b>	<b>Description</b>
Ohio shippers	Medium	Expanded rail service creates increased multimodal transportation competition, lowering logistics costs for shippers in the Mansfield area.
State of Ohio	Medium	If the Mansfield Yard is not expanded, ASRY will have to block crossings in Mansfield and may refuse some traffic due to lack of capacity. Industries unable to obtain rail service will either have to pay higher rates for truck service, or be forced to relocate to an area with rail capacity.
Freight railroads	High	Doubling the size of the yard will lead to expanded business opportunities for the railroad and lower operating costs by reducing unnecessary switching. It also will improve safety by reducing blockage of crossings in Mansfield.



**CFE-1 Lima Connection with the IORY**

**Choke Point Description**

A new interchange is needed between the Chicago, Ft. Wayne, and Eastern Railroad and the Indiana and Ohio Railway at Lima, Ohio. This connection will improve service reliability by reducing the number of times trains block Route 309 (adjacent to a hospital) as they access Ford Yard.

**Traffic Volumes and Type**

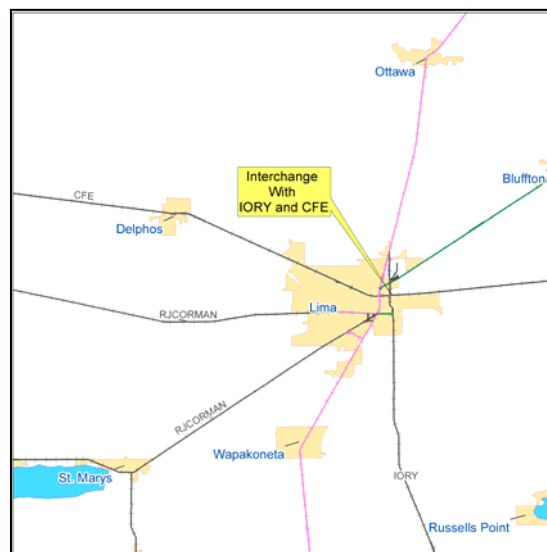
Traffic types include grain, agricultural products, and steel products.

**Solution**

Construct a new connection north of the existing connection, thereby eliminating blockage of Route 309.

**Cost Estimate by the Railroad for the IORY Connection**

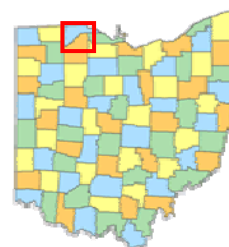
\$500,000.



CSX – Red; NS – Green; Other – Black

**Value of Improving Choke Point to State, Railroad, and Shippers**

Stakeholder	Value	Description
Ohio shippers	Low	Improves service reliability for local rail shippers.
State of Ohio	Medium	Improves safety by eliminating blockage of Route 309, adjacent a hospital, as trains access Ford Yard.
Freight railroads	High	Improves safety, and reduces delays between interchanges.



## CSX/NS-1 Vickers Crossing, Toledo, Ohio

### Choke Point Description

Vickers is a complex arrangement of connected signals and switches allowing the Norfolk Southern Chicago line and the CSX Toledo Terminal line to cross. Complicating this even further, there are roadway crossings (e.g., Wales Road) and insufficient land to build a rail overpass at an acceptable grade. Vickers leads to delays on both railroads, and creates blockages on the local roads.

### Traffic Volumes and Type

The NS and CSX main lines carry a variety of merchandise and intermodal trains. NS sends 950,000 annual railcars through Vickers, 30 percent of which originate and/or terminate in Ohio. CSX hauls 286,000 cars annually through Vickers, 18 percent originating and/or terminating in Ohio. This translates into 125 daily trains on NS, 55 on CSX, and 4 passenger.



CSX – Red; NS – Green; Other – Black

### Solution

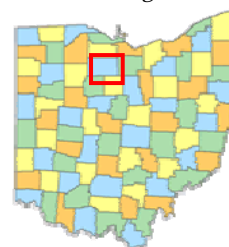
Grade separate the railroad and the roadway crossings.

### Cost Estimate from Access Ohio Rail Impediments Analysis

Adjusted for Inflation – \$39,440,000.

### Value of Improving Choke Point to State, Railroad, and Shippers

Stakeholder	Value	Description
Ohio shippers	High	Improvements would lower transit times and improve reliability for Ohio shippers with traffic passing through Vickers.
State of Ohio	High	Vickers creates significant delay on both CSX and NS, and restricts the growth in rail traffic. Improvement of this crossing would expand capacity and improve the railroads' competitiveness in diverting truck traffic. Improvement of this crossing also would improve safety at grade crossings, especially at Wales Road.
Freight railroads	High	Improvements to Vickers will increase average train speeds and improve on-time delivery. This project was listed as a secondary choke point for CSX, and was not one of the top nine choke points listed by NS. Part of the reason for this is the cost and lack of a good solution.



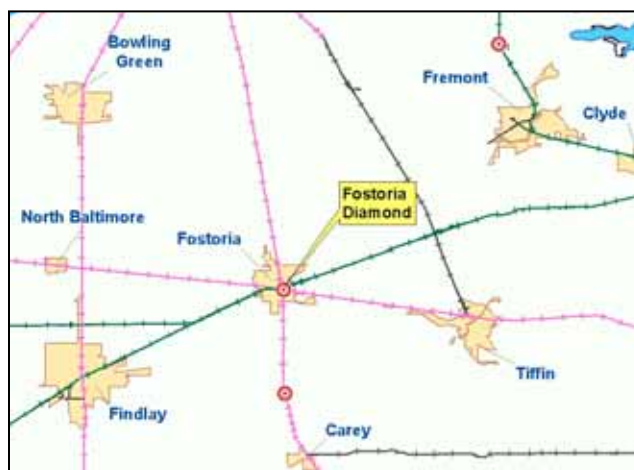
## CSX/NS-2 Fostoria Diamond, Fostoria, Ohio

### Choke Point Description

The Fostoria Diamond consists of three high-volume main lines crossing in a complex set of connected signals and switches. Norfolk Southern operates trains between Bellevue, Ohio, and Ft. Wayne, Indiana, with service on to St. Louis and Kansas City. CSX operates an east-west line that is the main line between Chicago and the Northeast. CSX also operates a north-south line through the Diamond that runs between Toledo, Columbus, and points south.

### Traffic Volumes and Type

About 100 trains per day operate through the Fostoria Diamond. North-south traffic on CSX includes coal, automotive, grain, and merchandise trains. East-west CSX trains are predominantly intermodal. NS operates intermodal, automotive, and merchandise trains through the Fostoria Diamond, totaling 721,000 annual carloads, 53 percent originating and/or terminating in the State.



CSX – Red; NS – Green; Other – Black

### Solution

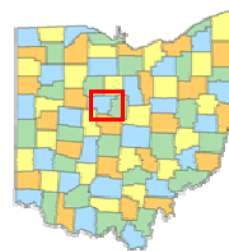
Elevate the NS track from the east yard to the west yard over the CSX track.

### Cost Estimate by the Study Team

\$219,000,000.

### Value of Improving Choke Point to State, Railroad, and Shippers

Stakeholder	Value	Description
Ohio shippers	Medium	Improvements to CSX and NS service will improve transit time and reliability for Ohio shippers, especially those located in Toledo and northern Ohio.
State of Ohio	High	Would improve the average train speeds and on-time delivery of rail traffic passing through the Diamond. Improvements to east-west trains could divert long-haul trucks to rail, helping to alleviate a percentage of long-haul trucks on Interstate 90.
Freight railroads	Medium	Improvements to the Fostoria Diamond will increase average train speeds and improve on-time delivery for both NS and CSX. This project was not listed as a top choke point by either railroad, possibly due to the complexity and cost.



## **CSX/NS-3 Marion Diamond, Marion, Ohio**

### ***Choke Point Description***

The Marion Diamond consists of three rail lines crossing in a complex set of switches and signals similar to the situation at Fostoria (choke point CSX/NS-2). CSX operates an east-west main line that is the primary route between St. Louis/Indianapolis and the northeast. CSX also operates a north-south line through the Diamond that runs between Toledo, Columbus, and points south (the same north-south line that passes through Fostoria). Norfolk Southern's Bellevue-Columbus line passes through Marion in a north-south direction.

### ***Traffic Volumes and Type***

North-south traffic on CSX includes coal, automotive, grain, and merchandise trains. East-west CSX trains are predominantly intermodal. NS operates intermodal, automotive, and merchandise trains through the Marion Diamond, totaling 526,000 annual carloads, 46 percent originating and/or terminating in Ohio.



CSX – Red; NS – Green; Other – Black

### ***Solution***

Construct a new alignment west of Marion for the north-south CSX line, and build a fly-over to grade separate it from the east-west CSX line. Construct a flyover for the NS line over the east-west CSX line.

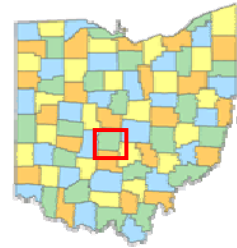
### ***Cost Estimate by the Study Team***

\$132,000,000.

### ***Value of Improving Choke Point to State, Railroad, and Shippers***

<b>Stakeholder</b>	<b>Value</b>	<b>Description</b>
Ohio shippers	Medium	Improvements to CSX and NS service will improve transit time and reliability for Ohio shippers, especially those located in Toledo and northern Ohio.
State of Ohio	High	Would improve the average train speeds and on-time delivery of rail traffic passing through the Diamond. Improvements to east-west trains could divert long-haul trucks passing through Ohio.
Freight railroads	Medium	Improvements to the Marion Diamond will increase average train speeds and improve on-time delivery for both NS and CSX. This project was not listed as a top choke point by either railroad, possibly due to the complexity and cost.

**CSX/NS-4 CP 130 Crossing, Columbus, Ohio**



**Choke Point Description**

CSX and NS operate parallel tracks north of Columbus. CSX operates their single-track Columbus Line northward to Galion and Cleveland. The line crosses NS' Portsmouth-Sandusky main line at CSX Control Point (CP) 130 in the suburb of Worthington, just north of downtown Columbus. This crossing creates delays on both railroads.

**Traffic Volumes and Type**

Both railroads move a mixture of merchandise and intermodal traffic. CSX operates 40 trains per day and NS operates 55 trains per day through this crossing.



CSX – Red; NS – Green; Other – Black

NS is scheduled to complete improvements on the Heartland corridor (from Richmond, Virginia, to Columbus, Ohio) in 2009. This, along with the opening of the Rickenbacker Intermodal Facility on the south side of Columbus, will generate additional intermodal traffic through the crossing, creating further operational issues and delays for both railroads in the near future.

**Solution**

Grade separate the rail crossing at CP 130 by constructing a CSX flyover.

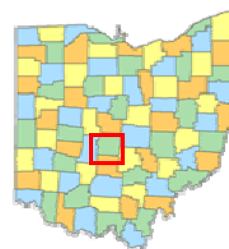
**Cost Estimate by the Study Team**

\$52,200,000.

**Value of Improving Choke Point to State, Railroad, and Shippers**

Stakeholder	Value	Description
Ohio shippers	Medium	Will reduce delays for Columbus area shippers.
State of Ohio	Medium	Will make rail more competitive with trucks, potentially leading to truck to rail diversion.
Freight railroads	Medium	Will reduce conflicts, improving train speeds and safety. This project was not listed as a top choke point by CSX or NS.

## **CSX-1** New Intermodal Facility, Columbus, Ohio



### *Choke Point Description*

CSX handles carload traffic in the Columbus area at Parsons Yard, and intermodal traffic at Buckeye Yard. Due to land constraints, Buckeye Yard can not be expanded to handle growth. A new intermodal facility is proposed at Parsons Yard. The proposed project will expand CSX's capacity in the Ohio Valley market from 135,000 lifts per year to over 400,000 lifts per year.

### *Traffic Volumes and Type*

This new yard will allow CSX to expand intermodal service for international trade, consumer goods, and other products. This choke point impacts 268,000 annual carloads (loaded and empty), 49.5 percent of which originate and/or terminate in Ohio.



*CSX – Red; NS – Green; Other – Black*

### *Solution*

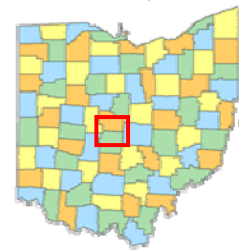
Construct a new intermodal facility at Parsons Yard to be operated by CSX Intermodal. A related project will construct an east-west bypass around the existing Parsons Yard (see choke point CSX-2).

### *Cost Estimate by the Railroad*

\$76,000,000.

### *Value of Improving Choke Point to State, Railroad, and Shippers*

<b>Stakeholder</b>	<b>Value</b>	<b>Description</b>
Ohio shippers	High	Improved intermodal service and increased competition should lower logistics costs and enhance service for central Ohio businesses.
State of Ohio	High	Expanded intermodal facility will create jobs in central Ohio. Improved intermodal traffic flows reduce costs of goods to consumers, reduce fuel usage, and reduce noise exposure. Facility should generate truck to rail diversions.
Freight railroads	High	Allows CSX to expand their capacity in the Ohio Valley Market from 135,000 to over 400,000 annual lifts. This project is one of the top eight priorities for CSX in Ohio.



**CSX-2 Parsons Yard Main Track, Columbus, Ohio**

***Choke Point Description***

Parsons Yard handles carload traffic in Central Ohio. There is not a main track from the east end to the west end of Parsons Yard, which means that through trains must traverse the facility. The lack of a main track creates congestion around and through Parsons Yard, which delays shipments and also creates safety issues.

***Traffic Volumes and Type***

The proposed bypass will improve the flow of intermodal and automotive traffic on CSX in central Ohio by allowing these trains to bypass Parsons Yard rather than passing through the Yard. This choke point impacts 268,000 annual carloads (loaded and empty), 49.5 percent of which originate and/or terminate in Ohio.



CSX – Red; NS – Green; Other – Black

***Solution***

Build a 3.3-mile, signal-equipped, double-tracked, main line bypass of the Parsons Yard.

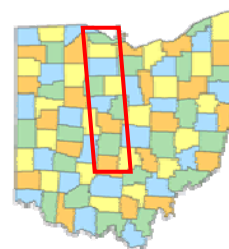
***Cost Estimate by the Railroad***

\$20,400,000.

***Value of Improving Choke Point to State, Railroad, and Shippers***

Stakeholder	Value	Description
Ohio shippers	Medium	Reduces delay, which improves transit time and reliability for intermodal and automotive traffic hauled by CSX.
State of Ohio	Medium	The bypass will improve the flow of trains through central Ohio, enhancing the competitiveness of the railroad and potentially leading to truck to rail diversion. A reduction in train delays reduces fuel usage and noise from idling trains.
Freight railroads	High	Improves speed of through trains at Parsons Yard. Improves safety by eliminating the through trains from the facility. This project is one of the top eight priorities for CSX in Ohio.

## CSX-3 Double-Stack Clearance Columbus-Toledo



### Choke Point Description

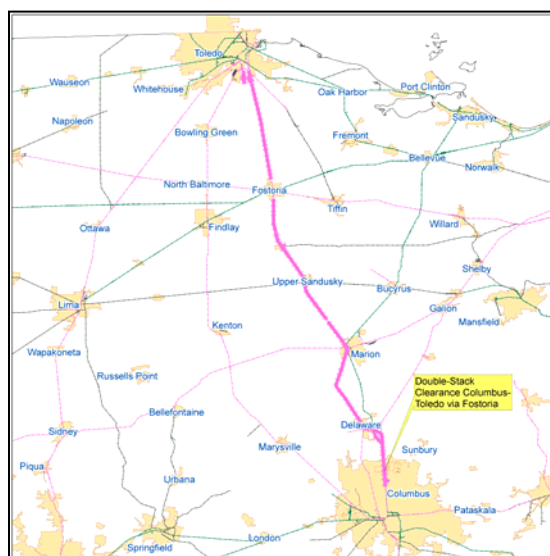
Inadequate clearances between Columbus and Toledo on the Buckeye and Columbus subdivisions impede CSX Intermodal’s ability to efficiently move intermodal containers. Rather than running one double-stack train, it is necessary to run two single-stack trains. This adds to railroad expenses by using extra fuel, crews, and equipment; and it adds to congestion on the line causing delays. The increased railroad expenses are ultimately passed on to Ohio shippers in the form of higher transportation costs.

### Traffic Volumes and Type

Intermodal and automotive traffic moving over the CSX line between Columbus and Toledo.

### Solution

Improve clearances to permit passage of 20-foot and 2-inch high double-stack containers. Clearance problems occur at Front Street (Mile Post (MP) 0.12), Whittier Street (MP CK 2.3), and High Street (MP CK 4.2).



CSX – Red; NS – Green; Other – Black

### Cost Estimate by the Railroad

\$4,000,000.

### Value of Improving Choke Point to State, Railroad, and Shippers

Stakeholder	Value	Description
Ohio shippers	Medium	Reduces the cost of moving intermodal shipments along this line, which should lead to reduced transportation costs. Reduces shipment delays by freeing up capacity.
State of Ohio	Medium	Improved intermodal service will make the railroad more competitive with truck service. Diversions of trucks to rail reduces highway maintenance costs, improves highway safety, and improves air quality. Fewer trains also reduces exposure at grade crossings, thereby improving safety.
Freight railroads	High	Would allow CSX to run fewer intermodal trains along this line, since each train could haul twice as many containers. This saves on crews, locomotives, and fuel. This project is one of the top eight priorities for CSX in Ohio.



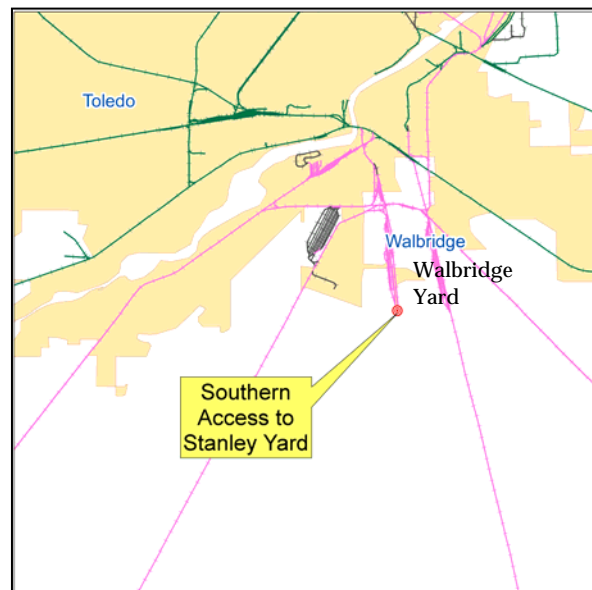
## **CSX-4 Southern Access to Stanley Yard, Toledo, Ohio**

### ***Choke Point Description***

Prior to 1999, CSX operations in the Toledo area were handled out of Walbridge Yard. When CSX acquired Conrail in 1999, they also acquired Conrail's nearby Stanley Yard. Stanley Yard lacks access from the south to CSX's adjacent mainline to Columbus (ex-C&O line). This forces trains to and from the south to use a longer route, and approach Stanley Yard by advancing north and west to the entrance on the north end of the Yard. Correcting this choke point would improve service to both Stanley Yard, as well as Walbridge Yard for all trains and traffic.

### ***Traffic Volumes and Type***

A mixture of merchandise and intermodal traffic for the Toledo and northern Ohio markets. This choke point impacts 289,000 annual carloads (loaded and empty), 48.2 percent of which originate and/or terminate in Ohio.



CSX - Red; NS - Green; Other - Black

### ***Solution***

Build a connection between the south end of Stanley Yard and the main line track going to the Walbridge Yard.

### ***Cost Estimate by the Study Team***

\$5,900,000.

### ***Value of Improving Choke Point to State, Railroad, and Shippers***

<b>Stakeholder</b>	<b>Value</b>	<b>Description</b>
Ohio shippers	Medium	Lowers transit time, delays, and potential costs for Ohio shippers using Stanley Yard and Walbridge Yard.
State of Ohio	Low	Rated low due to low-truck to rail diversion potential and low-job creation potential. Improved rail traffic flows will reduce fuel usage and noise exposure. The routing change also will reduce grade crossing exposure.
Freight railroads	High	Reduces mileage for trains to and from the south that access Stanley Yard. A southern access reduces operating expenses, and reduces congestion at the north access to the Yard. This project is one of the top eight priorities for CSX in Ohio.



## **CSX-5 Double Track Alexis to Hallett, Toledo, Ohio**

### *Choke Point Description*

CSX currently operates on 1.5 miles of single track across Norfolk Southern at Alexis, Ohio. There is a need for a second main track between Alexis and Hallett to reduce delays along this line.

### *Traffic Volumes and Type*

General CSX traffic uses this line, with a special focus on automotive traffic. This choke point impacts 285,728 annual carloads (loaded and empty), 18 percent of which originate and/or terminate in Ohio.



*CSX – Red; NS – Green; Other – Black*

### *Solution*

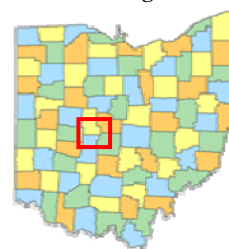
Construct a new double-track flyover crossing the NS track at Alexis. Extend the double track currently ending at Alexis to the siding at Hallett. Reconfigure the single track at Hallett to double track with improved connections.

### *Cost Estimate by the Study Team*

\$33,400,000.

### *Value of Improving Choke Point to State, Railroad, and Shippers*

<b>Stakeholder</b>	<b>Value</b>	<b>Description</b>
Ohio shippers	Medium	Reduces delay to shippers in the Toledo and northern Ohio areas.
State of Ohio	Medium	CSX, with less train delay, would be more competitive with truck traffic in the area. Less trucks reduces highway maintenance costs, improves highway safety, and improves air quality.
Freight railroads	High	Double tracking this section will reduce train delays, improve on-time performance, and lead to less fuel usage. This project is one of the top eight priorities for CSX in Ohio.



**CSX-6 Hoover, QT 92, Scottslawn Subdivision**

**Choke Point Description**

CSX needs a new 10,000-foot siding to reduce delay and improve service at the Honda facility in Marysville, Ohio. Currently, there are no passing sidings between Ridgeway (MP 82) and the Honda leads at MP 97.5, which causes reduced on-time performance for Honda shipments and for through trains. A new siding at MP QT92 (Hoover) will improve operation flexibility and increase track utilization to allow improved traffic flow. A related choke point is CSX-7, which involves construction of a crossover near Ridgeway, Ohio.

**Traffic Volumes and Type**

This project will improve the flow of all CSX traffic on the line, and especially the flow of automotive and intermodal shipments for the Honda plant in Marysville. This choke point impacts 105,595 annual carloads (loaded and empty), 73.6 percent of which originate and/or terminate in Ohio.



CSX – Red; NS – Green; Other – Black

**Solution**

Build a new 10,000-foot siding on the Scottslawn Subdivision.

**Cost Estimate by the Railroad**

\$6,600,000.

**Value of Improving Choke Point to State, Railroad, and Shippers**

Stakeholder	Value	Description
Ohio shippers	Medium	Improves the transit time and reliability of automotive shipments for the Honda facility in Marysville, Ohio.
State of Ohio	Low	Rated low due to low-truck to rail diversion potential and low-job creation potential. Improved rail traffic flows will reduce fuel usage and noise exposure from trains idling.
Freight railroads	Medium	Provides CSX with operating flexibility, which will improve on-time performance for Honda and other shipments. Also will add capacity to the Scottslawn Subdivision. This project is one of the top eight priorities for CSX in Ohio.



## **CSX-7** QI 124.4, Mt. Victory Subdivision

### *Choke Point Description*

A crossover is needed at MP QI 124.4 on CSX's Indianapolis line, east of Ridgeway, Ohio. This will allow trains to move efficiently between tracks, thereby reducing delays on both the Mt. Victory and Scottslawn Subdivisions. The current configuration creates delay for through trains and for Honda traffic. A related choke point is CSX-6, which involves construction of a 10,000-foot siding.

### *Traffic Volumes and Type*

This project will improve the flow of general CSX traffic using the Mt. Victory and Scottslawn Subdivision track, and especially the flow of automotive and intermodal shipments for the Honda plant in Marysville. This choke point impacts 264,213 annual carloads (loaded and empty), 39.9 percent of which originate and/or terminate in Ohio.



CSX – Red; NS – Green; Other – Black

### *Solution*

Build a crossover at QI 124.4 to allow efficient movement of the trains between tracks.

### *Cost Estimate by the Railroad*

\$2,200,000.

### *Value of Improving Choke Point to State, Railroad, and Shippers*

Stakeholder	Value	Description
Ohio shippers	Medium	Reduces delays and improves on-time performance for all traffic using the Mt. Victory and the Scottslawn subdivision track. Will benefit automotive traffic at the Honda plant.
State of Ohio	Medium	Improved rail traffic flows reduce costs of goods to consumers, reduce fuel cost, and reduce noise exposure. Improved service could lead to truck to rail diversions.
Freight railroads	High	Reduces train delay through this area, thereby lowering operating costs. This project is one of the top eight priorities for CSX in Ohio.



## **CSX-8** Niles, BG 87, New Castle Subdivision

### *Choke Point Description*

There is a need to install crossovers at BG 87 (4 miles east of Lordstown) to reduce congestion on the line and improve on-time delivery into the General Motors Lordstown plant. The crossovers allow trains to switch between tracks, thereby reducing delays from train meets and passes.

### *Traffic Volumes and Type*

This line handles intermodal and automotive through trains serving the General Motors Lordstown plant. This choke point impacts 373,000 annual carloads (loaded and empty), 24.7 percent of which originate and/or terminate in Ohio.



CSX – Red; NS – Green; Other – Black

### *Solution*

Install new universal crossovers at BG 7, which is 4 miles east of Lordstown, Ohio.

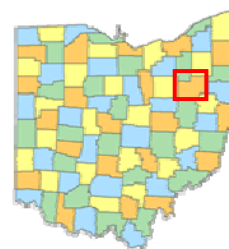
### *Cost Estimate by the Study Team*

\$2,900,000.

### *Value of Improving Choke Point to State, Railroad, and Shippers*

Stakeholder	Value	Description
Ohio shippers	Medium	This project would improve current operations and provide improved on-time performance for through trains and General Motors service at Lordstown.
State of Ohio	Low	Rated low due to low-truck to rail diversion potential and low-job creation potential. Improved rail traffic flows will reduce fuel usage and noise exposure.
Freight railroads	Medium	This project will reduce delay on the New Castle Subdivision for through trains, and improve the ability of CSX to provide on-time deliveries to General Motors. Reduced delay lowers crew costs and fuel usage for the railroad. This project is one of the top eight priorities for CSX in Ohio.

## **CSX-9** Lambert to Warwick Double-Track



### *Choke Point Description*

This section of track between Lambert (near Akron, Ohio) and Warwick (near Clinton, Ohio) is the only remaining single-track segment on the CSX main line between Baltimore/Washington and Chicago.

### *Traffic Volumes and Type*

A mixture of merchandise and inter-modal traffic moving between the West Coast and Midwest to and from Mid-Atlantic markets.

### *Solution*

Construct a second main line on 9.25 miles of abandoned, parallel, ex-Conrail right-of-way (MP BG 134.75 to BG 144.00).



CSX – Red; NS – Green; Other – Black

### *Cost Estimate by Study Team*

\$10,900,000.

### *Value of Improving Choke Point to State, Railroad, and Shippers*

Stakeholder	Value	Description
Ohio shippers	Medium	Would improve on-time performance and lower transit times for Ohio origins and destinations using this line.
State of Ohio	High	Would increase capacity and improve rail service, which helps divert long-haul trucks from the roadways. This frees roadway capacity, lowers maintenance costs, improves safety, and improves air quality.
Freight railroads	Medium	Would reduce delays on this single-track section, thereby increasing the overall average train speed. This project was not listed as a choke point by CSX.



**CSX-10 Old Conrail “Short Line,” Cleveland, Ohio**

**Choke Point Description**

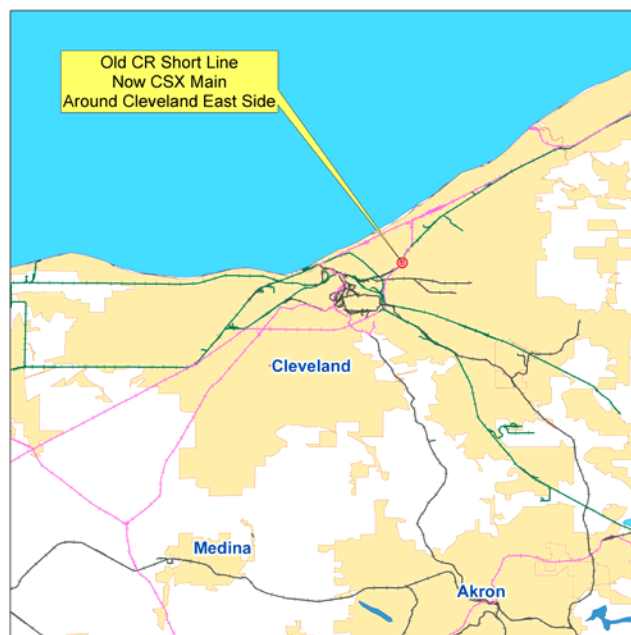
CSX uses the old Conrail “Short Line” route to move from the west side of Cleveland, near Rockport Yard, to the east side of Cleveland, near Collinwood Yard. Most of the Short Line is double tracked and grade separated, so it forms an efficient route through Cleveland. The choke points are two single-track tunnels, known as the Kinsman Tunnels. It is not possible to easily double track the tunnels and still maintain double-stack clearances. The tunnels date from about 1911, and are still in excellent condition.

**Traffic Volumes and Type**

This route offers an efficient bypass of Cleveland for CSX trains moving between the West Coast and Midwest to and from the northeast. It includes international, intermodal traffic destined for the New York metropolitan market.

**Solution**

Bore a new parallel tunnel and install a second track. An alternative is to “daylight” the existing tunnels and install a second track, but this obviously has serious negative environmental and community impacts. The cost estimate is based on boring a new tunnel.



CSX - Red; NS - Green; Other - Black

**Cost Estimate by Study Team**

\$243,000,000.

**Value of Improving Choke Point to State, Railroad, and Shippers**

Stakeholder	Value	Description
Ohio shippers	Medium	Would reduce transit times and improve service reliability for shipments that traverse the “Short Line.”
State of Ohio	High	Would expand through-rail traffic in the Cleveland area, promoting more diversion of long-haul trucks to rail service.
Freight railroads	Medium	Would increase train speeds and reduce delay. This reduces operating costs by lowering crew costs, lowering fuel usage, and improving equipment utilization. This project was not listed as a choke point by CSX, possibly due to costs and environmental concerns.

## **IORY-1 Queensgate Terminal**



### *Choke Point Description*

The Indiana and Ohio Railway (IORY) must cross the CSX main line to access IORY property in Cincinnati. IORY incurs significant delays waiting for permission from CSX to proceed. IORY wants to construct a bypass around, through, or over CSX.

### *Traffic Volumes and Type*

Shipments include pig iron, grain, lumber, aggregates, and hazardous materials.

### *Solution*

Construct a third interchange track on CSX property at Queensgate Yard, and acquire trackage rights from CSX to operate trains into Queensgate Yard. An alternative is to construct a 5-mile flyover at a cost in excess of \$365 million.



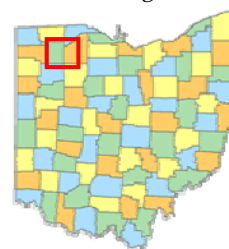
CSX – Red; NS – Green; Other – Black

### *Cost Estimate by the Study Team for Third Track*

\$33,700,000.

### *Value of Improving Choke Point to State, Railroad, and Shippers*

<b>Stakeholder</b>	<b>Value</b>	<b>Description</b>
Ohio shippers	Low	Would reduce delays and improve on-time performance for shippers in the Cincinnati area using the IORY.
State of Ohio	Low	Would reduce delay of shipments into the Cincinnati area on the IORY, especially hazardous material shipments. Would reduce noise, fuel usage, and locomotive emissions for IORY trains waiting for permission from CSX to proceed.
Freight railroads	Medium	This project is Priority 1 in Ohio for the IORY. Although it is a high priority for IORY, it is rated as medium value because of the difficulties of the project.



## **IORY-2 Liberty Center**

### *Choke Point Description*

The Indiana and Ohio Railway (IORY) and the Maumee and Western Railroad (MAW) cross at Liberty Center. The IORY runs north-south and the MAW runs southwest-northeast. The two railroads do not connect where they cross. A connection would improve traffic flows and transit times, and improve transportation access to Liberty Center and the proposed Liberty Commons Industrial Park.

### *Traffic Volumes and Type*

This connection would benefit customers at Liberty Center, and especially benefit the transportation of food products in the region.



CSX – Red; NS – Green; Other – Black

### *Solution*

Construct a connection between the IORY and the MAW at Liberty Center.

### *Cost Estimate by the Study Team*

\$650,000.

### *Value of Improving Choke Point to State, Railroad, and Shippers*

<b>Stakeholder</b>	<b>Value</b>	<b>Description</b>
Ohio shippers	Low	Would reduce transit times for shippers at Liberty Center and the Liberty Commons Industrial Park.
State of Ohio	Low	Would reduce delays to local customers and improve the movement of food products in the State. Rated low due to low-truck to rail diversion potential and low potential to generate new jobs.
Freight railroads	Medium	Would lower rail costs by increasing transit times and eliminating circuitous routing. This project is Priority 2 in Ohio for the IORY.

## NS-1 New Castle District



### Choke Point Description

Short sidings on the New Castle District between Cincinnati and the Ohio-Indiana border restricts the length of trains that can be operated on this line, which contributes to congestion at the Gest Street Yard in Cincinnati. Also, the lack of a connection from the New Castle District to Sharonville Yard limits the capacity in the Cincinnati area, because traffic to/from Chicago using the New Castle District must use Gest Street.

### Traffic Volumes and Type

Merchandise and intermodal for customers including, but not limited to, P&G, Kroger, Bunge, Ford, General Mills, and Georgia Pacific. Traffic also is interchanged with the IORY. This choke point impacts 428,000 annual carloads, 11.5 percent of which originate and/or terminate in Ohio.



CSX – Red; NS – Green; Other – Black

### Solution

Full solution involves double track from the Crescentville Siding to the Vaughan Connection at Control Point (CP) 248, upgrade of the ADM Lead to main line standards, installation of new #15 power crossovers, extension of the Camden siding, and construction of a connection into Sharonville. Cost estimate is for rehabilitation and lengthening of existing sidings and construction of new sidings.

### Cost Estimate by the Study Team

\$19,900,000.

### Value of Improving Choke Point to State, Railroad, and Shippers

Stakeholder	Value	Description
Ohio shippers	High	The present rail structure impacts shippers by increasing transit time and costs. Movements between Gest Street Yard and Sharonville Yard are often necessary to serve local customers, thus slowing delivery times and increasing costs.
State of Ohio	High	Car handling delays limit the diversion of highway traffic to rail, contributing to increased highway congestion and consequential decreased air quality and increased energy consumption from greater dependency on heavy trucks.
Freight railroads	High	Causes additional handling of merchandise and intermodal loads at Gest Street Yard, which increases operating costs. Increased switching congestion in Gest Street Yard causes congestion on ingress and egress rail routes. NS listed this as Priority 1 in Ohio.

## NS-2 North End of Gest Street Yard Improvements



### *Choke Point Description*

Capacity constraints on the north end of Gest Street Yard delay yard operations, negatively affecting NS traffic moving on the Cincinnati-Chicago corridor and the Cincinnati-Columbus corridor. It also affects local moves between Cincinnati and Sharonville and service to local industries in the Cincinnati area. This is one of several choke points in the Cincinnati area (see also NS-1 and NS-3).

### *Traffic Volumes and Type*

Cincinnati is a key terminal location for the flow of traffic on the NS system, especially for the corridor between Florida and Chicago. Delays at Gest Street Yard also directly affect local industries. This choke point impacts 591,000 annual carloads, 15 percent of which originate and/or terminate in Ohio.



CSX – Red; NS – Green; Other – Black

### *Solution*

Full solution involves installation of power switches at the north end of Gest Street Yard, addition of a crossover at Winton Place to aid directional running with CSX, and addition of a second NS main line between Hopple Street and Winton Place. The cost estimate is for adding three crossovers at locations designated as Liberty Street, #14, and #19.

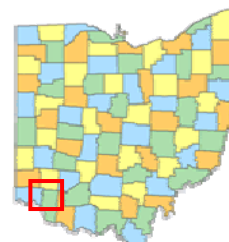
### *Cost Estimate by the Study Team*

\$802,000.

### *Value of Improving Choke Point to State, Railroad, and Shippers*

Stakeholder	Value	Description
Ohio shippers	High	Increased rail congestion in and around the Cincinnati area due to delayed ingress and egress at Gest Street Yard contributes to delayed deliveries and increased transportation costs.
State of Ohio	High	Capacity constraints limit the diversion of highway traffic to rail, thus causing increased highway congestion and fuel usage, and decreased air quality due to greater dependency on heavy trucks.
Freight railroads	High	Congestion negatively affects rail operations for traffic moving on the Cincinnati-Chicago corridor and the Cincinnati-Columbus corridor. It also impacts local moves between Cincinnati and Sharonville and service to local industries in the Cincinnati area. NS listed this as Priority 2 in Ohio.

## NS-3 Sharonville and Gest Street Yards, Cincinnati, Ohio

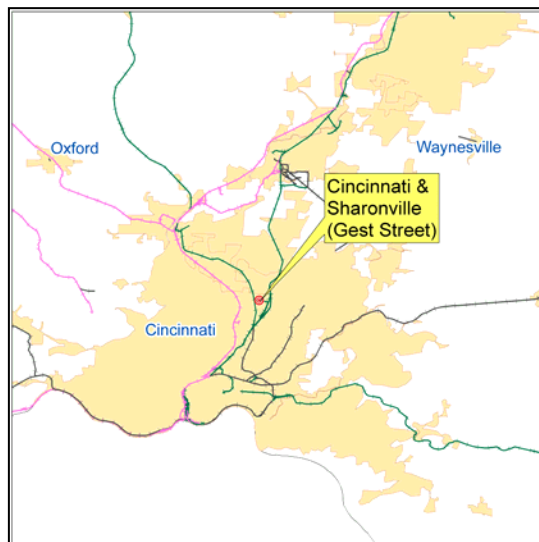


### Choke Point Description

NS has capacity constraints at both the Sharonville Yard and the Gest Street Yard in Cincinnati. Expansion at Gest Street Yard is precluded by the proximity of the CSX Queensgate Yard and CSX intermodal facility, as well as the lack of available land for significant expansion in Mill Creek Valley. Sharonville Yard is not currently developed to its optimal capacity due to the lack of connection to the New Castle District (see Choke Point NS-1) and other capacity constraints.

### Traffic Volumes and Type

NS offers merchandise and intermodal service for customers, including P&G, Kroger, Bunge, Ford, General Mills, and Georgia Pacific. Traffic also is interchanged with the IORY. This choke point is on a main NS route between Chicago and the Southeast. It impacts 591,000 annual carloads, 15 percent originate and/or terminate in Ohio.



CSX – Red; NS – Green; Other – Black

### Solution

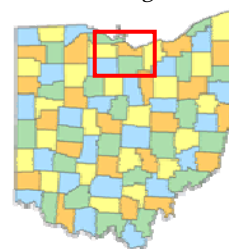
NS currently is reviewing engineering designs to address the capacity constraints, but anticipates a need to increase the size of Sharonville Yard to accommodate increased flat switching (or perhaps a hump operation) and a larger intermodal facility at Sharonville. Other possibilities are a new green field intermodal facility in the Cincinnati area, or expansion of the Gest Street intermodal facility. Temporary relief can be obtained through a grade separation of Reading Road at Sharonville.

### Cost Estimate by the Study Team for Grade Separation Project Only

\$11,400,000.

### Value of Improving Choke Point to State, Railroad, and Shippers

Stakeholder	Value	Description
Ohio shippers	High	The delays resulting from the congestion in these yards and intermodal facilities have a direct effect on local industries throughout the area that depend on rail service. This includes longer transit times, lower reliability, and increased transportation costs.
State of Ohio	High	Expansion of yards and intermodal facilities in the Cincinnati area would likely create new jobs. The capacity constraints also limit diversion of long-haul trucks passing through the Cincinnati area.
Freight railroads	High	Current capacity constraints slow train speeds in, out, and through both yards, which increase dwell times and costs. The congestion also impacts national shipments on NS. NS listed this as Priority 3.



## NS-4 Main Line Bellevue to Toledo

### Choke Point Description

Capacity constraints on the NS Toledo District between Bellevue and Oak Harbor limit access by NS to its classification yard at Bellevue (see Choke Point NS-5) for traffic on the Chicago Line. This also impacts Wheeling and Lake Erie (WE), which has trackage rights on 55 miles of this line, by limiting their service to one train per day per direction.

### Traffic Volumes and Type

The choke point impacts NS service to a variety of industries in northern Ohio. It also impacts WE traffic, including coal, coke, steel, scrap, lumber, and miscellaneous freight, all originating and/or terminating in Ohio. For NS, this choke point impacts 858,000 annual carloads, 27.6 percent of which originate and/or terminate in Ohio.



CSX – Red; NS – Green; Other – Black

### Solution

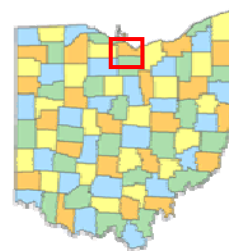
Double track approximately 75 percent of the 55-mile Toledo District line segment, mostly east of Oak Harbor. Install an improved signaling system to accommodate an increase in NS traffic and unlimited trackage rights for WE.

### Cost Estimate by the Study Team

\$126,000,000.

### Value of Improving Choke Point to State, Railroad, and Shippers

Stakeholder	Value	Description
Ohio shippers	Medium	Lowers transit time and shipment delays for customers served by NS and WE in northern Ohio. Potential logistics cost reductions for industries that can shift from truck to rail.
State of Ohio	Medium	Handling delays limit diversion of truck traffic to rail for goods in northern Ohio markets, thus causing increased highway congestion, increased fuel consumption, and increased air pollutants. Delays also lead to blocking of grade crossings and increased emissions from idling locomotives.
Freight railroads	High	Capacity constraints affect train speeds, delivery times, and costs, as well as limiting business growth opportunities for both NS and WE. For the WE, this leads to constantly outlaw crews, inefficient locomotive use, and poor car utilization. NS listed this as Priority 4 in Ohio. WE listed it as Priority 1.



## NS-5 Bellevue Mini-Plant, Bellevue, Ohio

### Choke Point Description

At the west end of the Norfolk Southern Bellevue Yard in Bellevue, Ohio, is an interlocking where the Wheeling and Lake Erie Railroad crosses the NS Sandusky Line (a main line which continues through Indiana and Illinois to Kansas City, and also includes a connection to Toledo). This interlocking is known as the “Mini-Plant.” Capacity constraints at the Mini-Plant increases rail congestion, which affects NS access to and use of the yard, and also affects interchanges with and operations of the WE.

### Traffic Volumes and Type

This choke point affects NS and WE shipments in and around Bellevue, as well as throughout northern Ohio. This choke point impacts 858,000 annual carloads on NS, 27.6 percent of which originate and/or terminate in Ohio.



CSX – Red; NS – Green; Other – Black

### Solution

Make improvements to increase capacity and relieve congestion for train movements on both NS and WE. A proposed design plan for reconfiguring the Mini-Plant has been developed by NS that includes installation of new track and turnouts.

### Cost Estimate by the Railroad

\$10,000,000.

### Value of Improving Choke Point to State, Railroad, and Shippers

Stakeholder	Value	Description
Ohio shippers	Medium	Lowers transit time and shipment delays for customers served by NS and WE in northern Ohio. Potential logistics cost reductions for industries that can shift from truck to rail.
State of Ohio	Medium	Handling delays limit the diversion of highway traffic to rail. This contributes to increased highway congestion, decreased air quality, and increased energy consumption from goods moving by truck instead of rail in northern Ohio markets.
Freight railroads	High	Capacity constraints affect train speeds, delivery times, and costs for both NS and WE, as well as limiting business growth opportunities for WLE in northern Ohio due to additional train handling requirements at Bellevue. NS listed this as Priority 5 in Ohio.



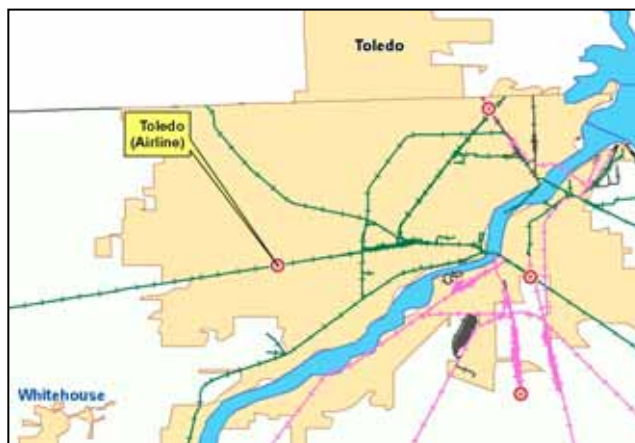
**NS-6 Airline Yard, Toledo, Ohio**

**Choke Point Description**

Congestion at Airline Yard delays merchandise and intermodal trains at Toledo, resulting in shipment delays and increased costs for Toledo industries, especially for traffic to and from the Chicago and Detroit markets.

**Traffic Volumes and Type**

Traffic affected by this choke point includes general merchandise and intermodal for industries throughout northern Ohio and southeastern Michigan. This choke point impacts 1.21 million annual carloads on NS, 7.7 percent of which originate and/or terminate in Ohio.



CSX – Red; NS – Green; Other – Black

**Solution**

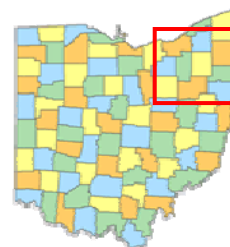
Double track approximately 2.4 miles of the Detroit connection at Airline Yard in Toledo.

**Cost Estimate by the Study Team**

\$2,100,000.

**Value of Improving Choke Point to State, Railroad, and Shippers**

Stakeholder	Value	Description
Ohio shippers	Medium	Improves service and reduces delays for Toledo industries using rail, especially for traffic to and from the Chicago and Detroit markets.
State of Ohio	Medium	Improvements will reduce logistics costs for industries in the Toledo area. Improvements also could lead to truck to rail diversion, lowering highway maintenance costs, highway delays, and improving air quality and highway safety.
Freight railroads	Medium	This improvement is projected by the railroad to reduce average train delay by approximately 27 hours per week. NS listed this as priority 6 in Ohio.



## NS-7 Main Line Cleveland to Conway

### Choke Point Description

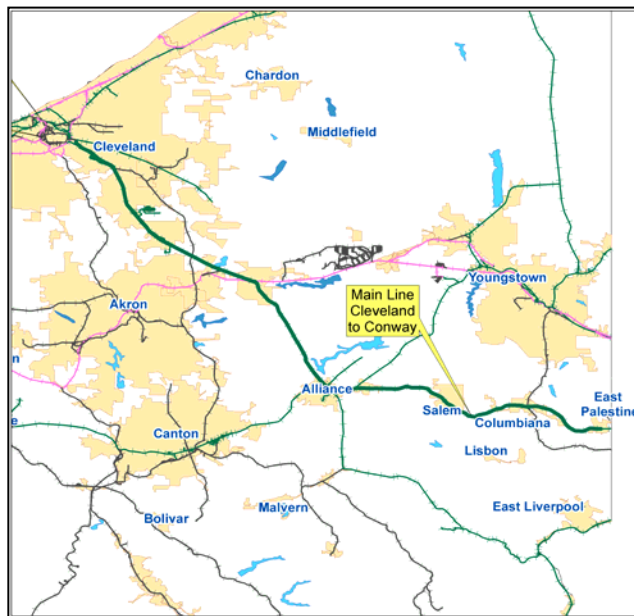
There are capacity constraints on the main line between Cleveland and Conway Yard in Pittsburgh, Pennsylvania, which delays traffic on the New York-Chicago corridor. The route travels through Alliance, Ohio, and crosses the Ohio-Pennsylvania border near East Palestine, Ohio.

### Traffic Volumes and Type

This route carries intermodal, coal, and merchandise trains. It is part of the New York-Chicago corridor, and also a main line serving Ohio. This choke point impacts 1.26 million annual carloads on NS, 13.7 percent of which originate and/or terminate in Ohio.

### Solution

Increase capacity on main line between Cleveland and the Ohio-Pennsylvania border. Projects include adding three passing sidings on the Fort Wayne Line between Alliance (MP PC 83.2) to just east of East Palestine (MP 48.8). Also included are five grade separations at major highways along the route.



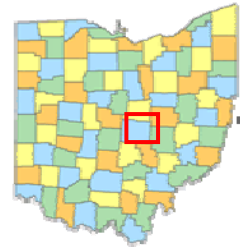
CSX – Red; NS – Green; Other – Black

### Cost Estimate by the Study Team

\$121,000,000.

### Value of Improving Choke Point to State, Railroad, and Shippers

Stakeholder	Value	Description
Ohio shippers	Low	Improves service and reduces delays for Cleveland industries using rail.
State of Ohio	Low	Rated low due to average truck to rail diversion potential and low-job creation potential. Transit delay due to congestion limits diversion of long-haul highway traffic to rail, contributing to increased highway congestion, increased fuel consumption, and decreased air quality.
Freight railroads	Medium	Capacity constraints affect train speeds, delivery times, and costs, as well as limiting railroad business growth opportunities for industries along the route. NS listed this as Priority 7 in Ohio.



## **OHCR-1** Mt. Vernon Line Upgrade

### *Choke Point Description*

A track upgrade is needed to safely handle traffic at 10 mph. The Mt. Vernon Line is the only railroad serving Mt. Vernon, Ohio. The Ohio Central provides the primary mode of transportation for Weyerhaeuser and the Farmers' Cooperative facilities at this location.

### *Traffic Volumes and Type*

Customers in Mt. Vernon, especially Weyerhaeuser and the Farmers' Cooperative.

### *Solution*

Upgrade ties, rail, and bridges to meet the FRA Class I level standards.

### *Cost Estimate by the Railroad*

\$5,740,000.

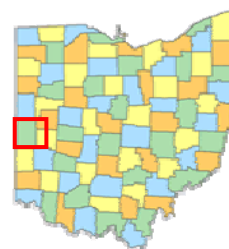


CSX – Red; NS – Green; Other – Black

### *Value of Improving Choke Point to State, Railroad, and Shippers*

<b>Stakeholder</b>	<b>Value</b>	<b>Description</b>
Ohio shippers	Medium	Improves rail service to Weyerhaeuser and the Farmers' Cooperative facilities.
State of Ohio	Low	Benefits Ohio industries, thereby supporting the local economy.
Freight railroads	High	Allows railroad to safely serve customers along the line.

## **RJCW-1 Industrial Park in Greenville, Ohio**



### *Choke Point Description*

Greenville, Ohio is the site of an industrial park. To handle the increase in traffic from this industrial park, the Western Ohio Line of RJ Corman needs a new track connection to improve access into the facility. The existing connection is not adequate to accommodate unit train handling in a single block.

### *Traffic Volumes and Type*

Potash, 600 annual cars originating in Canada. Plastics, 60 annual cars originating in Texas and Louisiana. New shipments of agricultural product, totaling up to 3,000 annual carloads.



CSX – Red; NS – Green; Other – Black

### *Solution*

Construct a new track to improve access to the industrial park. Track on the south side must be extended to accommodate 65 railcars, and a runaround track parallel to this extension also is needed.

### *Cost Estimate by the Study Team*

\$2,500,000.

### *Value of Improving Choke Point to State, Railroad, and Shippers*

Stakeholder	Value	Description
Ohio shippers	Low	Rail service at the industrial park will help the park owner attract additional tenants and lower logistics costs for existing tenants.
State of Ohio	Low	Provides improved service to a new industrial park, which is improving jobs in Greenville. The new track connection will eliminate two existing grade crossings, improving safety.
Freight railroads	High	More efficient operations with ability to handle unit trains in a single block and ability to serve additional rail customers.



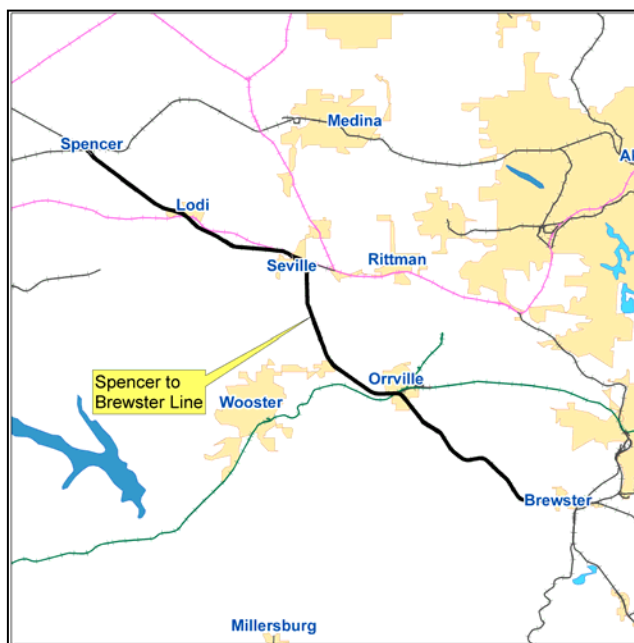
## **WE-1** Spencer to Brewster Line

### *Choke Point Description*

There are approximately 40 miles of single main line with no passing tracks between Spencer and Brewster. On a typically day, five or six trains in each direction are delayed due to the lack of a passing siding. A passing siding is needed, especially to accommodate the stone unit trains moving along this corridor.

### *Traffic Volumes and Type*

Shipment on the WE originating and terminating in Ohio include coal, coke, steel, stone, ore, plastics, grain, and miscellaneous freight. This line in particular is used to move tens of thousands of stone cars from western Ohio quarries to eastern Ohio terminals. If the schedule is disrupted, it can throw the aggregate plant production off, resulting in a one- or two-week service interruption.



CSX – Red; NS – Green; Other – Black

### *Solution*

Construct a passing track approximately 1.5 miles long in Creston, Ohio.

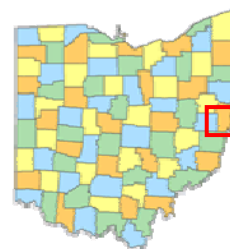
### *Cost Estimate by the Study Team*

\$1,500,000.

### *Value of Improving Choke Point to State, Railroad, and Shippers*

Stakeholder	Value	Description
Ohio shippers	Medium	Delays lead to increased cost of business and, in some cases, a temporary shutdown of operations. The stone business, which depends on an efficient delivery of aggregate, can have schedules disrupted for one or two weeks due to late rail shipments.
State of Ohio	Medium	Will reduce noise of trains waiting in Spencer and Brewster, and will lower logistics costs to Ohio businesses service by this line. Lower logistics costs contributes to economic growth of the industries.
Freight railroads	High	The WE is experiencing delays to trains, because they are having to wait either in Spencer or Brewster for the track to clear. This is causing delays to customers. WE listed this its Priority 2 in Ohio.

## **WE-2 Mingo Yard**



### *Choke Point Description*

Mingo Yard no longer has enough capacity to handle the growth in WE freight traffic that has occurred over the last three years, especially growth in steel traffic at the Wheeling-Pittsburgh Steel Company. Rail traffic at Wheeling-Pittsburgh is up because a recently installed electric arc furnace receives about 100 railcars of scrap per day. To accommodate this traffic, the railroad must spend excessive time hostelling (moving) cars around the yard to temporarily free space, because there is insufficient storage for all the cars in the yard. What is needed are additional yard tracks to handle the increased traffic.

### *Traffic Volumes and Type*

Shipment on the WE originating and terminating in Ohio include coal, coke, steel, stone, ore, plastics, grain, and miscellaneous freight. A large customer of Mingo Yard is the Wheeling-Pittsburgh Steel Company.



CSX – Red; NS – Green; Other – Black

### *Solution*

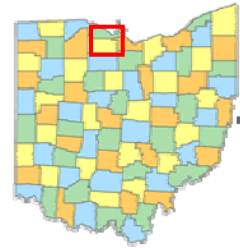
Construct additional storage tracks in Mingo Yard.

### *Cost Estimate by the Railroad*

\$750,000.

### *Value of Improving Choke Point to State, Railroad, and Shippers*

Stakeholder	Value	Description
Ohio shippers	Medium	Reduces delays and lowers logistics costs through more efficient rail operations. Accommodates increased rail demand at the Wheeling-Pittsburgh Steel Company.
State of Ohio	Low	Running fewer trains translates into less fuel consumption and lower emissions output. It also reduces delays to customers.
Freight railroads	Medium	Since there is not enough room for storage at Mingo Yard, the WE has to leave one-half of their freight for Mingo Yard at Brewster. This results in running more trains, which decreases productivity with crew, power, and car utilization. WE listed this their Priority 3 in Ohio.



## **WE-3 Heartland Yard**

### *Choke Point Description*

Heartland Yard no longer has sufficient capacity to handle the growth in WE traffic that has occurred over last three years. There is not enough room for productive switching operations. Rather than switching trains at Heartland Yard, the WE frequently is forced to run them straight through due to insufficient capacity. This delays freight and heavily contributes to late deliveries. Adding to the capacity issue at Heartland is the need to store trains waiting to access the NS Oak Harbor-Toledo line (see Choke Point NS-4).

### *Traffic Volumes and Type*

Shipment on the WE originating and terminating in Ohio include coal, coke, steel, stone, ore, plastics, grain, and miscellaneous freight.

### *Solution*

Construct additional track and lengthen existing track in Heartland Yard.



CSX – Red; NS – Green; Other – Black

### *Cost Estimate by the Railroad*

\$750,000.

### *Value of Improving Choke Point to State, Railroad, and Shippers*

<b>Stakeholder</b>	<b>Value</b>	<b>Description</b>
Ohio shippers	Medium	Delays lead to increased cost of business and, in some cases, a temporary shutdown of operations.
State of Ohio	Low	Delays in shipments have negative impacts on Ohio businesses.
Freight railroads	Medium	Would allow handling of additional traffic, and lower operating costs by preventing bypassing yard due to capacity constraints. WE listed this their Priority 4 in Ohio.

## 7.0 Conclusions

This study has defined and identified the 30 most severe freight rail choke points on the Ohio rail network. It has estimated the cost to eliminate or reduce train delays at these choke points. The study also has assessed the value of each improvement to the State, the railroads, and Ohio shippers.

These choke points cause a significant amount of train delay that reduces the productivity of the railroads, and increases the cost of doing business for Ohio shippers and receivers of rail freight.

Neither the State of Ohio nor the railroads can afford to make improvements to all 30 choke points. The intent of this analysis is not to provide a final list recommending that the State invest public funds into any one project, but rather to begin to define the rationale for public participation in rail choke point improvements; and to begin framing a methodology for estimating the benefits, costs, risks, and appropriate level of public participation.

The findings of this study help establish if shippers, railroads, and/or the State benefit from correction of each choke point, and how they benefit. For projects where the value is “high,” the benefiting stakeholder group should have a high level of involvement and investment. A “low” value is not a recommendation against taking action, but it does indicate that the level of support should be appropriate for the expected gains.

The State of Ohio and the railroads must next look at the choke points from a system perspective, identifying groups of projects and phasing of projects that will be the most cost productive. At that point, Ohio can begin to make policy decisions about where, when, and how much to invest to improve rail capacity. The questions that Ohio must ultimately address include:

- What types of investments are appropriate and justifiable in the freight rail system?
- Where will the State realize the greatest public benefits and/or economic development from investments?
- What levels of service are required from the freight railroads to realize these public benefits?
- What commitments are required from the shippers to support expanded rail service?
- How will passenger rail plans, including the Ohio Hub, impact freight rail capacity?

The information in this study lays the foundation for informed policy decisions that will maximize the value of public investment in the freight rail system.

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# **Appendix A**

*The Ohio Freight Rail Choke Point Identification Form*

# The Ohio Freight Rail Choke Point Identification Form

## ■ Instructions for Completing the Ohio Freight Rail Choke Point Identification Form

Thank you for assisting with the Ohio Freight Rail Choke Point Study being conducted by Ohio Department of Transportation, with the assistance of the Ohio Rail Development Commission and the Ohio Railroad Association. A choke point is a specific physical location on the Ohio rail system that routinely experiences recurring congestion and train delays because volume exceeds capacity. Solutions will involve capital infrastructure projects that relieve congestion or increase capacity to address pent up demand for Ohio rail services. Improvements of the identified choke points must demonstrate benefits to Ohio industries, businesses, and residents. Choke points impeding the flow of your cars might be located on your rail lines, or on lines owned by another railroad. Other types of choke points (rolling stock, upgrade to industry standards, etc.) will be considered, provided they demonstrate a clear benefit to Ohio industries, businesses, and residents.

Please enter information about freight rail choke points on the attached form. Additional pages may be attached, as needed. The form contains four parts:

1. **Information about the Railroad** – Please provide basic information about your rail operations in Ohio.
2. **Information about the Respondent** – Please provide basic information about the person completing the form. It may be necessary to contact you to clarify any questions about the responses.
3. **Information about the Choke Point** – In addition to the location and basic description of the choke point, please provide:
  - Impacts on Rail Operations – Information on how this choke point impacts rail operations.
  - Goods Movement Impacts – What Ohio industries are most impacted by this choke point.
  - Societal Impacts – This is from a rail operations view point. Are rail operations impacted due to the need to mitigate community impacts (noise, safety, security, etc.).
  - Proposed Solution – Description of any proposed solutions (double track, siding, etc.).

- Approximate Cost – What is the approximate cost of the solution.
  - Status – What is the status of this solution (none, engineering plans, EIS, etc.).
  - Railroad Priority – Please rank order the choke points on your railroad (there should be only one project on your railroad with priority 1, one with priority 2, etc.).
  - Timing – Is this proposed solution need in the short term (less than 5 years), mid-term (5 to 10 years), or long term (10 to 20 years).
4. **Information about the Benefits** – The consultant team will establish the benefits of improving or eliminating the choke points, but some basic information is needed. Not every project will include all benefits.
- Ohio Jobs Created or Retained – How many full-time, permanent jobs will be created or retained in Ohio as a result of correcting this choke point. This is net jobs to Ohio, not shifting of jobs from one location to another.
  - Square Feet of New Ohio Business Space – How much square footage of Ohio business space will be created or retained as a result of correcting this choke point. This is net square footage in Ohio, not a shifting from one location to another.
  - Trucks Diverted to RAILROAD – How many trucks (please specify daily or annual) will be divert to rail as a result of correcting this choke point. This can be trucks currently on Ohio’s roadways, or trucks that would be on the roadways if rail service was not available.
  - Average Length of Haul/Percent in Ohio – What is the average length of haul of the moves through this choke point and what percentage of this distance is in Ohio. This information will help establish the cost saving to ODOT of lower roadway maintenance expenses due to less truck-miles on the roads.
  - At-Grade Crossings Eliminated – Please provide the location and name of the road.
  - Safety/Security Improvement – Whereas question 12 looked at this from a rail operations viewpoint, this question looks at whether the proposed choke point improvement will lead to public safety and/or security improvements within the State of Ohio.
  - Environmental/Noise Improvement – Whereas question 12 looked at this from a rail operations viewpoint, this question looks at whether the proposed choke point improvement will lead to environmental or noise reduction improvements within the State of Ohio.
  - Other – Please list any other benefits to the State of Ohio that have not otherwise been listed.

**Information for returning the information is contained at the bottom of the Ohio Freight Railroad Choke point Identification Form on the following page.**

**Thank You!**

## Ohio Freight Railroad Choke Point Identification Form

### A. Information about the Railroad

1. Railroad name	
2. Miles of track (total/in Ohio)	
3. Primary commodities	

### B. Information about the Respondent

4. Name	
5. Title	
6. Telephone/Fax	/
7. E-mail	

### C. Information about the Choke Point (Repeat for Each Choke Point)

8. Location	
9. Problem description	
10. Rail operations impacts (train speed, late deliveries, etc.)	
11. Goods movement impacts (types of goods, volume, Ohio origins and destinations, etc.)	
12. Societal impacts (noise, safety, security, etc.)	
13. Proposed solution	
14. Approximate cost	
15. Status (plan, design, EIS, etc.)	
16. Railroad priority (1, 2, 3, ...)	
17. Timing (near-term < 5 years, midterm 5-10 years, long-term 10-20 years)	

### D. Information about the Benefits (Repeat for Each Choke Point)

18. Ohio jobs created or retained	
19. Square feet of new Ohio business space	
20. Trucks diverted to railroads	
21. Average length of haul/percent in Ohio	
22. At-grade crossings eliminated	
23. Safety/security improvement	
24. Environmental/noise improvement	
25. Other	

Please Return Completed Forms by **May 1, 2006** to:  
David Hunt, Cambridge Systematics, P.O. Box 816, Pennington, NJ 08534-0816  
Phone (609) 737-6713 \* Fax (609) 737-6714 \* dhunt@camsys.com

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# **Appendix B**

*Approaches for Quantifying Public Benefits*

# Approaches for Quantifying Public Benefits

## What Metrics and Evaluation Process Has Been Used in Other States/Organizations?

Several other states and organizations have made the decision to participate in the rail sector, if public benefits exceed public costs. To do this, they have first determined what constitutes “public benefit,” and then developed methods by which to measure the public benefit of rail improvement actions. This section will review the variables chosen to represent public benefit by other states and organizations. This will help in the selection of variables by which to represent, measure, and quantify public benefit for Ohio. Many of the variables have been adapted from the Federal Railroad Administration (FRA) methodology developed in the early 1990s for the Local Rail Freight Assistance Program, and directed primarily at job retention on short-line railroads formed from Class I spin-offs. The variables by which the FRA measures public benefit are summarized below, as well as those from the following other states and organizations:

- Florida DOT, Florida Freight Rail Benefit/Cost Methodology, 2005;
- Tennessee DOT, Strategic Project Evaluation Protocols, and Procedures, Tennessee Rail System Plan, 2001; and
- Freight Mobility Strategic Investment Board, Freight Mobility Strategic Investment Program Criteria, 2006.

### *Federal Railroad Administration (FRA) Benefits Methodology*

The FRA method was developed in order to calculate the benefit/cost ratios for projects where assistance is requested to acquire, rehabilitate, or construct rail facilities. It is based on seven metrics that represent the benefits to the public of a particular action.

The FRA methodology differentiates between two types of benefits: efficiency benefits and secondary benefits. Efficiency benefits result from the impact that the project has on the reduction of transportation costs to the shipper and the increase on profits derived from the incremental traffic, which is the additional traffic that occurs due to service improvement. Secondary benefits are an indirect consequence of the project, such as the avoidance of relocation costs of shippers or other businesses, creation of new jobs or retention of current jobs, reduction of both highway maintenance costs, and pollution emissions due to traffic diverted from trucks to rail. The salvage value of the facilities also is included.

Table B.1 list the metrics used in the FRA benefits evaluation, as well as a simple description of how the value of the metrics can be assessed.

**Table B.1 FRA Measurement of Benefits**

Benefits Description	Benefit Calculation
<b>Efficiency Benefits</b>	
Reduced transportation costs to shippers on base traffic	Difference between rates charged by alternate mode and rail on base traffic (traffic that occurs independently of the project).
Profits earned by the shipper in producing, shipping, and selling incremental traffic	Profits provided by the shipper derived from incremental traffic.
<b>Secondary Benefits</b>	
Prevention of relocation costs of shippers/businesses	Data provided by the shippers/businesses. These include costs of moving equipment and inventory, employees, and breaking the lease.
Avoidance of jobs loss	Value of the wages earned for the length of time that workers would have been unemployed, if the project was not undertaken.
Reduction in highway maintenance costs	No measure provided.
Reduction in pollution emissions	No measure provided.
Salvage value	No measure provided.

Source: Federal Rail Administration, Benefit/Cost Methodology for Local Rail Freight Assistance.

## Florida Department of Transportation (Florida DOT)

Florida’s methodology expanded on the FRA methodology. The difference between them is that Florida DOT includes a broader estimation of the benefits affecting the general public.

The methodology differentiates between three types of impacts: transportation, economic, and external. These impacts can lead to positive public benefits (e.g., reduction in highway maintenance costs due to less trucks on the roads) or negative public benefits (e.g., increased delays at grade crossings due to additional train service). The specific transportation, economic, and external impacts considered in the Florida methodology are described in Table B.2.

**Table B.2 Florida DOT Measurement of Benefits**

<b>Impact Description</b>	<b>Benefit Measure</b>
<b>Transportation Impacts</b>	
Avoided Maintenance Costs	Maintenance costs saved = Distance * traffic diverted to rail * maintenance costs
Reduction in Shipper Costs	Shipping costs saved = (Truck rate – rail rate)* (Average tons per truck) * Distance * Diversions
Reduction in Automobile Delays at Grade Crossings	Value of delay reduction = (AADT/min. in a day) * Delay value/veh min) * (grade crossings impacted) * (highway delay/2) <sup>2</sup>
<b>Economic Impacts</b>	
Jobs Created or Retained in State	Value of new wages earned = (# New Jobs) * (Avg. Annual Wage) * (Indirect Jobs Multiplier)
Tax Increases from Industrial Development	Property taxes from new industrial development = (Square feet of new industrial development) * (Tax rate/Square Feet)
<b>External Impacts</b>	
Safety Improvements	Savings from safety improvements = (Distance) * (% distance in WA State) * (Diversions) * Safety Value/VMT)
Environmental Benefits	Savings from environmental improvements = (Distance) * (% Distance in WA State) * (Diversions) * (2/3) * Environ. value/VMT)

Source: Florida DOT, Freight Rail B/C Methodology, 2005.

## Tennessee Department of Transportation (Tennessee DOT)

Tennessee’s methodology for benefit/cost evaluation of rail projects, similar to Florida, is built on the FRA’s methodology. However, the Tennessee DOT method provides a greater level of detail on the input variables to calculate the benefits, and includes additional criteria for ranking the projects.

The calculation of benefits involves capturing data on five levels:

1. Economic Impact;
2. Job Creation;
3. Tax Impact;

4. Operational, Socioeconomic/Environmental Effects; and
5. Rate of Return on State Capital Investments.

**Table B.3 Tennessee DOT Measurement of Benefits**

Benefits Description	Benefit Calculation
<b>Economic Impact</b>	
State Economic Output	Estimation of regional output using Regional Industrial Multiplier System (RIMS II) based on total capital and operating investments.
Job Creation Employment	Number of total jobs created in the region calculated using RIMS II based on information provided by private entities.
Tax Impact Property Tax	Cumulative amount of property taxes = Land developed (square feet) * property tax.
Return on Capital Investment of the State Fuel Savings	Gallons saved = Number of trucks displaced * (avg. miles displaced) * (tons per truck)/(tons per gallon) * (fuel price).
Impact on Shipping Costs	Differential in rates between trucks and rail service. Data to be collected from interviews with shippers.
Railroad Operation Cost Differential	Cost differential for the railroad carrier between the current situation and the project situation.
Travel-Time Effects	Changes in travel times of the proposed route compared to existing route.
Reduction in Highway Maintenance Costs	Highway/pavement maintenance costs = (number of trucks displaced) * (average miles traveled) * (maintenance cost per mile).
Reduction in Accidents, Injuries and Fatalities	Safety benefits = (number of trucks displaced) * (average miles traveled)*(average crash cost).
Reduction in Congestion Costs	Congestion costs = (number of trucks displaced) * (average miles) * (congestion cost/mile).
Other Annual Fees, State Receipts, or Costs Savings	Includes all revenues to the State that may not be captured in other benefits such as sale taxes.
Public/Private Project Capital	The ratio is calculated based on the information provided by the public and private funding sources.
Public/Private plus Induced Capital	The ratio is calculated based on the information provided by the public and private funding sources, and the induced capital calculated using RIMS II.

Source: Tennessee DOT, Strategic Project Evaluation Protocol and Procedures, Tennessee Rail System Plan, 2001.

## **Freight Mobility Strategic Investment Board**

The Freight Mobility Strategic Investment Board (FMSIB) does not provide a methodology to undertake benefit/cost analysis, however, it does have a set of criteria to rank projects based on the project's ability to improve freight mobility in the area and in the region, enhance safety, attract private sources to fund the project, and mitigate projects impact on the environment, among others.

The FMSIB supports projects from public entities that meet the eligibility criteria summarized as follows:

- The project must be on a strategic corridor.
- The project must meet one of the following conditions:
  - It is primary aimed at reducing identified barriers to freight movement with only incidental benefits to general or personal mobility;
  - It is primarily aimed at increasing capacity of the movement of freight with only incidental benefits to general or personal mobility; and
  - It is primarily aimed at mitigating the impacts on communities of increasing freight movement, including roadway/railway conflicts.
- The project must have a total public benefit/total public cost ratio of equal or greater than one.

Table B.4 describes the criteria included and their weight in the project score. However, unlike Tennessee's additional criteria, the FMSIB does not provide a detailed score of the level to which the criterion is accomplished.

**Table B.4 FMSIB Criteria**

Criteria	Weight
<b>Freight Mobility for the Project Area</b>	<b>35 Maximum</b>
Reduce truck, train, or car delays	0-25
Increase capacity for peak hour truck	0-10
<b>Freight Mobility of the Region, State, Nation</b>	<b>35 Maximum</b>
Importance to the regional freight system and regional economy	0-10
Importance to state freight system and state economy	0-10
Direct access to ports or international border	0-10
Provide a corridor/system solution	0-5
<b>General Mobility</b>	<b>25 Maximum</b>
Reduce vehicular traffic delay	0-10
Reduce queuing and backups	0-7
Reduce delay from use of alternative railroad crossing	0-5
Address urban principal arterials	
Urban principal arterials	3
Otherwise	0
<b>Safety</b>	<b>20 Maximum</b>
Reduce railroad crossing accidents	0-5
Reduce nonrailroad crossing accidents	0-5
Provide emergency vehicle access	
Essential access route	5
Otherwise	0
Close additional related railroad crossings	
2 or more additional crossing closures	5
1 additional crossing closure	3
No crossing closures	0
<b>Freight and Economic Value</b>	<b>15 Maximum</b>
Benefit main line rail operations	
High	5
Moderate	3
Minimal	1
Negligible	0
Access to key employment areas	0-5
Support faster train movements	0-5
<b>Environment</b>	<b>10 Maximum</b>
Reduce vehicle emissions	0-5
1.0 x delay in attainment area	
1.5 x delay in nonattainment area	
Reduce train whistle noise crossing vicinity	0-5
<b>Partnership</b>	<b>25 Maximum</b>
Matching funds (35% match is required)	20 maximum
Public participation	1 point for every 4% of match after initial 20%
Private participation	2 point for every 2% of match after initial 20%
Critical timing of partner investments	0-5
<b>Consistency with Regional and State Plans</b>	<b>5 Maximum</b>
Regional transportation plan	3
State level of transportation plan	2
Not in regional or state transportation plan	0
<b>Cost</b>	<b>10 Maximum</b>
Cost-effectiveness	0-7
Degree to which least-cost alternatives are considered	0-3
<b>Special Issues</b>	<b>8 Maximum</b>
Address special or unique circumstances not otherwise addressed	0-8

Source: FMSIB, Freight Mobility Strategic Investment Program Criteria.