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4 FREIGHT

Introduction

The Northwestern Indiana Regional Planning Commission (NIRPC) is the designated Metropolitan Planning Organization for the Northwest Indiana region. NIRPC is responsible for investing federal transportation funds in highways, transit, active (non-motorized) transportation, and other modes of people and goods movement in Northwest Indiana. *NWI 2050+*, is a Metropolitan Transportation Plan (MTP) – which encompasses transportation modal elements, including a freight element. The purpose of the Freight Chapter is to emphasize:

- preserving the existing transportation systems,
- planning for the safety of all transportation system users,
- providing the freight industry with access to the workforce,
- efficiently moving freight to support the economy of the region, and
- ensuring equity in allocating federal, state, and local transportation dollars to benefit all users.

The Freight Chapter was developed in three phases (as shown in Figure 4-1) and builds upon key findings and relevant content from previous related studies, plans, and formal documents, including the Indiana Department of Transportation (INDOT)'s *State Rail Plan*, Long-Range Transportation Plan (LRTP), and Statewide Transportation Improvement Program (STIP); NIRPC's *E-Commerce in Northwest Indiana,* and Air Quality Conformity Determination Report, and other statewide, regional, and local documents. The full list of the reviewed literature and the takeaways of this process can be found in Appendix 4A: Review of the Existing Studies, Plans, and Other Relevant Documents.

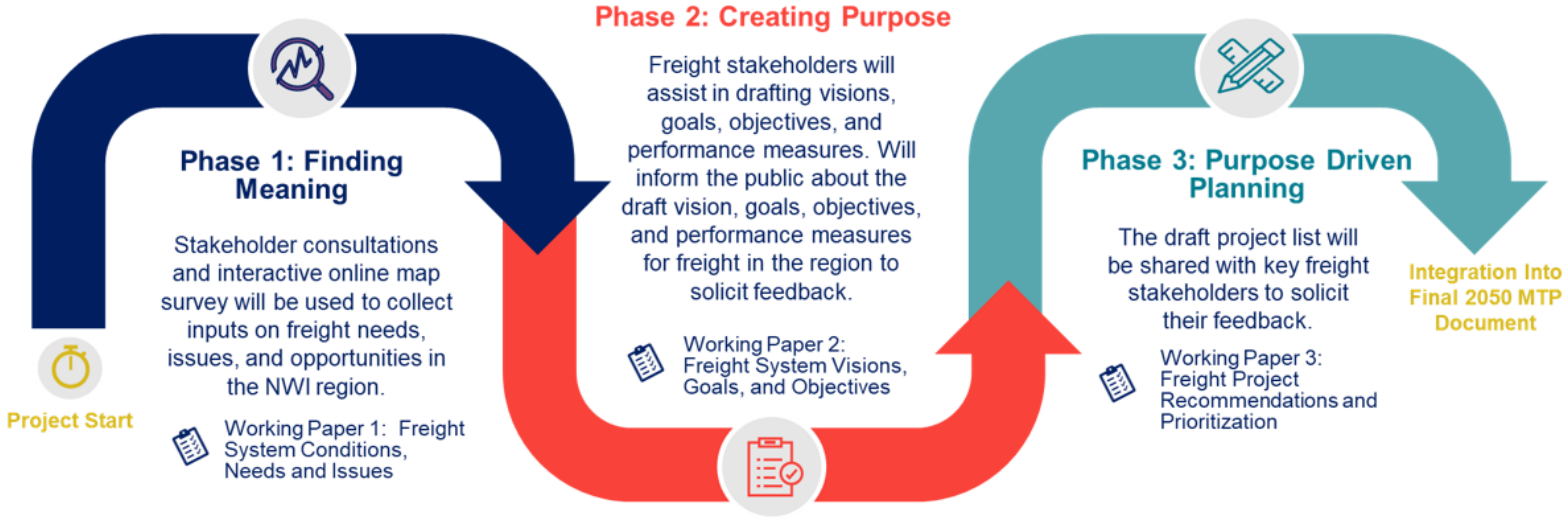


Figure 4-1: Work Plan Summary

Source: CPCS, 2022.

Methodology

This section of the Freight Chapter provides a synthesis of the extent of current freight operations in Northwest Indiana and the characteristics of the existing freight transportation system that supports the movement of goods to, from, and through the region. First, a high-level assessment of freight mode shares in the region and a description of freight-dependent industries provide the regional economic context. Next, freight systems and operations in the region are examined using a modal approach informed through data analysis and triangulation as well as stakeholder outreach. The same modal approach is also used to present a high-level overview of expected growth in freight activities and potential impacts on the transportation system performance.

Stakeholder Outreach Activities

The primary purpose of stakeholder outreach was to meaningfully engage Northwest Indiana's public and private sector freight stakeholders to:

- Guide the development of *NWI 2050+* – Freight Chapter,
- Provide perspectives on the freight system usage, needs, issues, and potential opportunities, and
- Participate in the freight planning process and influence recommendations.

The following is a summary of outreach activities that inform the development of *NWI2050+* – Freight Chapter:

- *Freight Steering Committee (FSC) meetings:* FSC is comprised of individuals representing key freight stakeholder groups in the region. Members are identified by NIRPC and include representatives from local governments, economic development agencies, industry associations, ports, airports, and private sector stakeholders. Four meetings took place with the FSC, in July, September, December 2022, and February 2023.

- *Stakeholder Consultations:* one-on-one consultations with key stakeholders were conducted to inform Phase 1 and Phase 2 efforts. The consultation outreach efforts started in June 2022. A full list of stakeholders consulted as part of this planning effort can be found in Appendix 4B: Stakeholder Consultation List.

- *Public Sessions and Surveys:* public open houses were used throughout *NWI 2050+* development to communicate findings and recommendations with Northwest Indiana residents and transportation system users. The first public session was held in June 2022, introducing the Plan elements to the members of the public and launching an online survey of regional transportation needs, issues and opportunities.

Northwest Indiana's Economic Context

Northwest Indiana's Economy

This section provides an overview of the economic characteristics of Northwest Indiana, focusing on socio-economic aspects such as population, education, employment, and income. Additionally, a review of employment and income in freight-dependent industries provides context for understanding the general transportation needs of businesses in Northwest Indiana, as well as a foundation for further discussions of freight transportation needs and issues in the region.

Population

Economic development, labor force availability, and the current demand and future needs for transportation infrastructure are all influenced by population trends. Between 2010 and 2020, the region's population increased by about 1.62 percent to about 784,000. However, Figure 4-2 shows that this decade-long trend masks a pronounced dip between 2014 and 2017. Lake County has by far the largest population (about 498,000 in 2020), followed by Porter (about 173,000) and La Porte (about 111,000).

Figure 4-3 shows that all three counties saw increases in population over the decade but were below Indiana's overall population growth. Historically, the largest city in the region was Gary, whose population has declined over the last five decades or so. Between 2010 and 2020, the city's population fell by about 14 percent. Hammond replaced Gary as the largest city in Lake County in the last decade, but its population has also been declining over the last fifty years.

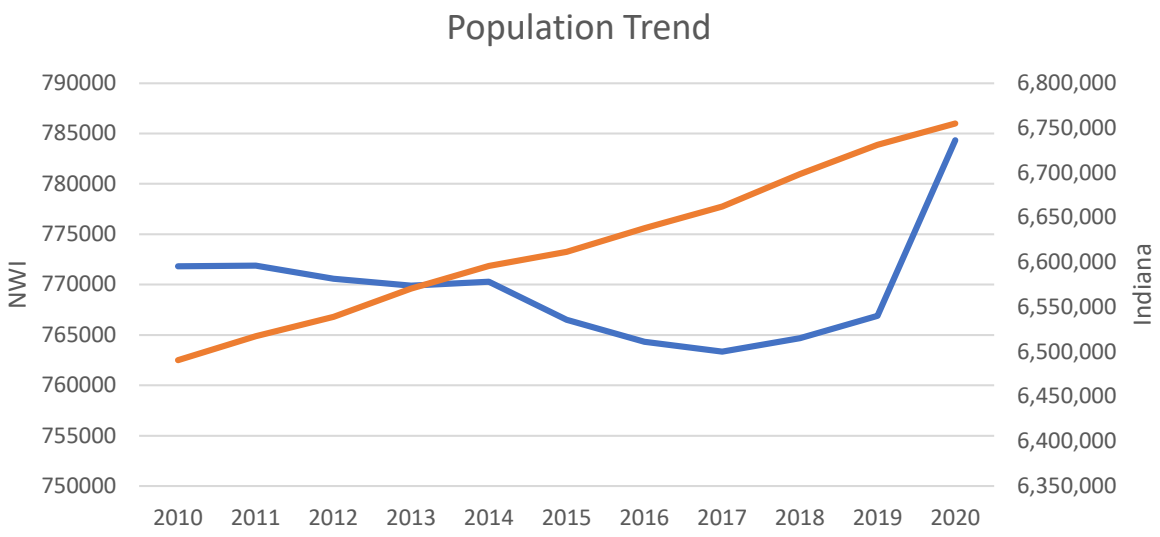


Figure 4-2: Northwest Indiana and Indiana Population Trends, 2010-2020

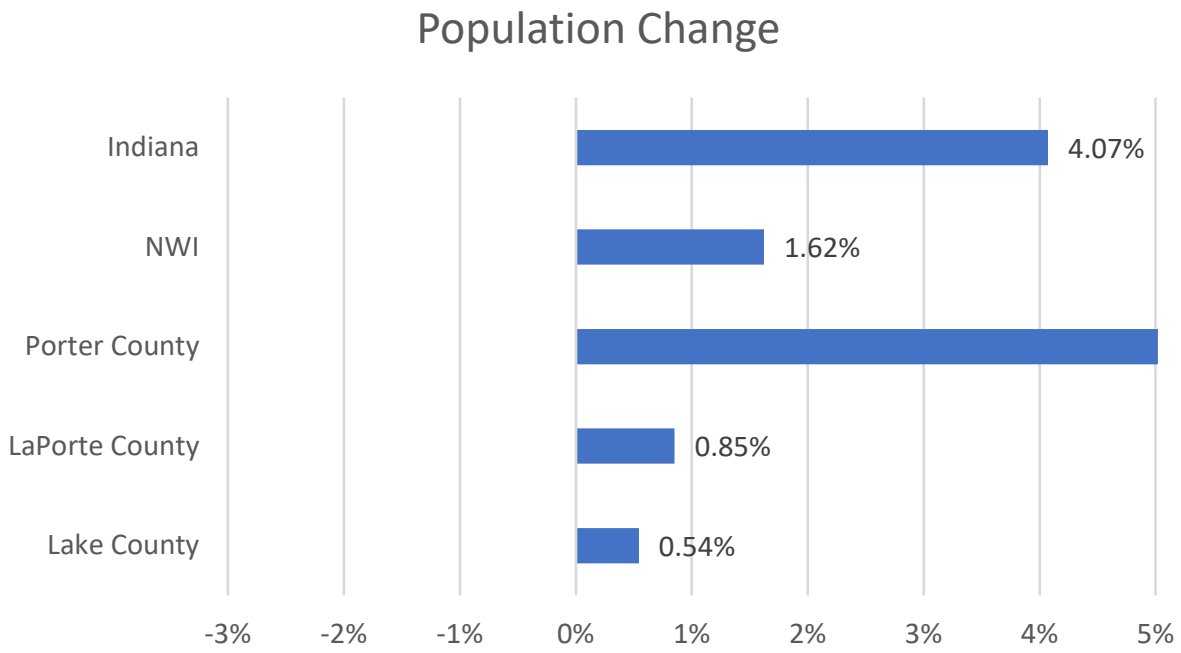


Figure 4-3: Population Trends, 2010-2020

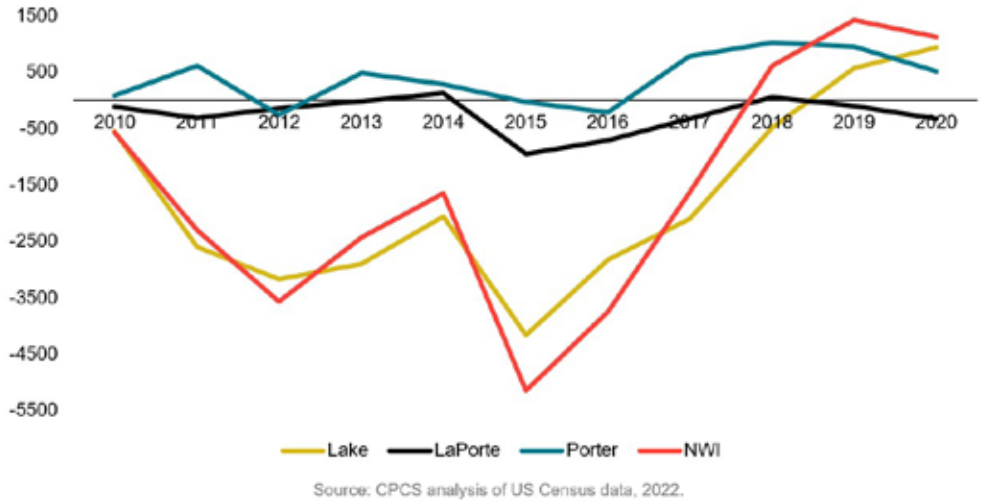


Figure 4-4: Northwest Indiana Net Migration, 2010-2020

Figures 4-5 and 4-6 display changes in Northwest Indiana's population in two age brackets: working-age individuals between 25 and 64 and seniors 65 and over. These figures reveal that Northwest Indiana is seeing a decades-long decline in its working-age population, from roughly 410,000 individuals in 2010 to just over 390,000 in 2020. Meanwhile, the region is seeing steady growth in its senior population, rising from just over 100,000 in 2010 to over 130,000 in 2020. This indicates that the region might face issues with workforce availability or labor shortages. It also hints at a broader struggle in the region to attract and retain younger workers.

Figure 4-7 makes clear that the pace with which Northwest Indiana's population is aging is not mirrored in the rest of the state or country. Indeed, not only has the median age in Northwest Indiana's three counties been rising steadily since 2010, but it has remained above the median age of the state and nation throughout the decade. Again, these trends threaten to induce labor shortages and hint that the region is struggling to retain younger workers. Due to the rising ranks of older residents, industry growth may occur in sectors complementary to aging consumers, including healthcare and e-commerce.

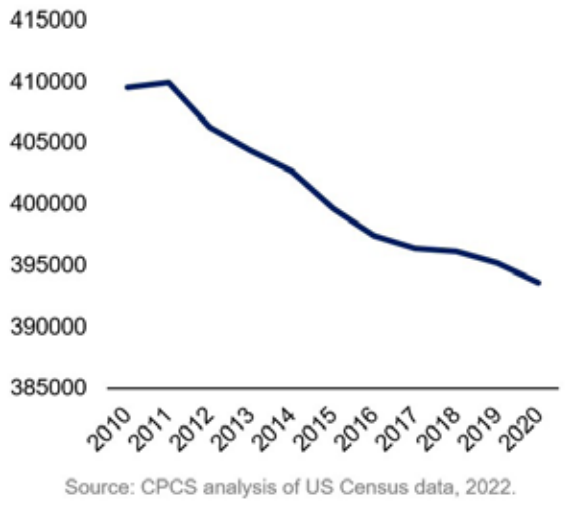


Figure 4-5: Northwest Indiana Working Age Population (25-64), 2010-2020

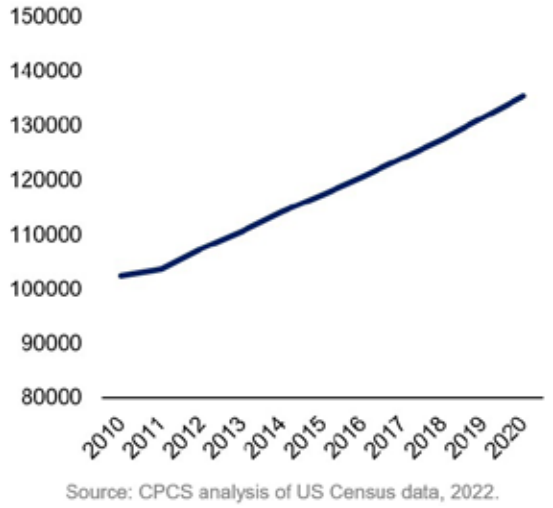


Figure 4-6: Northwest Indiana Senior Population (65+),

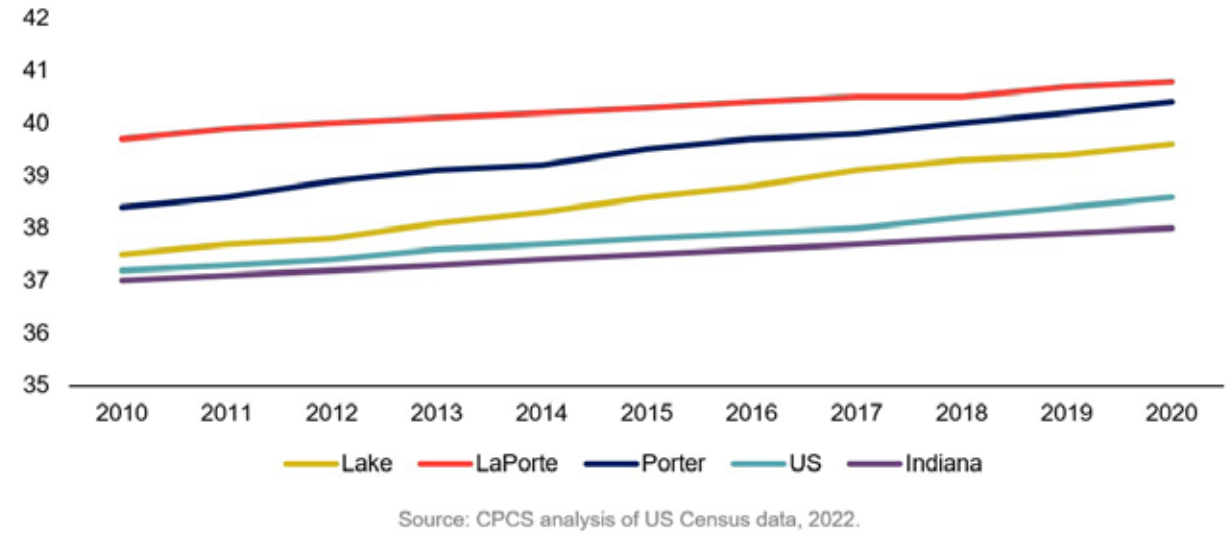


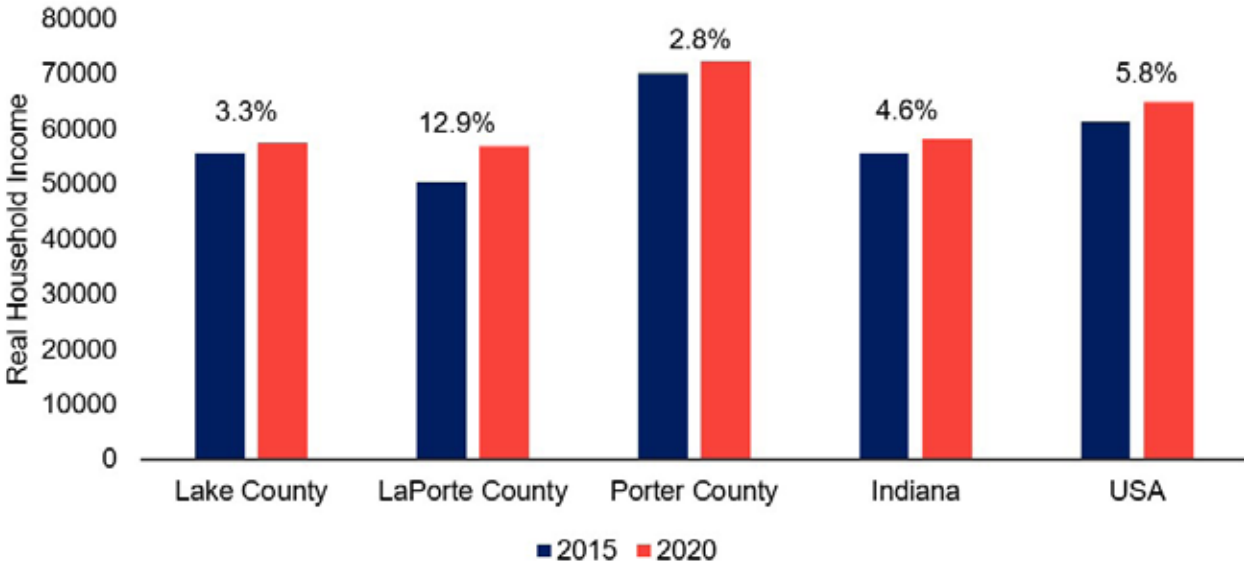
Figure 4-7: Median Age, 2010-2020

Income and Education

An individual's level of education influences their career opportunities and earning potential. Therefore, education and income levels are often closely connected, as educational attainment level can be a determining factor in workforce development to support different industries. Analysis of the income and education levels of the region provides a better understanding of its economic well-being, as well as the ability of its workforce to support relatively higher-paid medium- and high-skill jobs. A workforce with both medium and high-skilled labor may be necessary to support some freight-dependent industries like advanced manufacturing.

Figure 4-8 shows the median real household income in Northwest Indiana's three constituent counties, Indiana, and the US overall. Household income in Lake and La Porte Counties lies at or below the state's overall in 2020, $57,530 and $57,010, respectively. Lake and Porter counties' real income growth lags Indiana and the rest of the country, at 3.3 percent and 2.8 percent, respectively. Porter County, though, has a median household income above the state and national average, at $72,255 in 2020. And La Porte County saw real income growth of nearly 13 percent between 2015 and 2020, which is more than double the national average.

Northwest Indiana's overall educational attainment increased between 2010 and 2019. A smaller share of the population in Northwest Indiana lacks a high school diploma than in the state or nation overall. Moreover, Northwest Indiana has a greater share of high school graduates and of individuals attending some college or receiving an Associates degree than the state and US overall. However, where Northwest Indiana falls behind is in the proportion of the population with a Bachelor's degree or higher, where it lags the state by about 4 percent and the US overall by about 10 percent.



Source: CPCS analysis of US Census data and US Bureau of Labor Statistics CPI Inflation calculator, 2022.

Figure 4-8: Median Real Household Income, 2015 and 2020 in 2020

Table 4-1 lists the highest level of education attained by Northwest Indiana residents in 2010 and 2019 and shows how educational attainment is improving.

These relatively high levels of mid-range educational attainment suggest the labor market in Northwest Indiana may be suitable for middle-income jobs that require some prior training or experience, many of which are concentrated in freight-dependent industries such as agriculture and manufacturing.

Highest Level of Education Attained	NWI 2010	NWI 2019	Indiana 2019	US 2019
No high school diploma	12.10%	9.30%	10.40%	11.40%
High school graduate (includes equivalency)	35.80%	37.00%	33.90%	26.90%
Some College or an Associate's degree	30.70%	30.70%	28.70%	28.60%
Bachelor's degree or higher	21.40%	23.00%	26.90%	33.10%

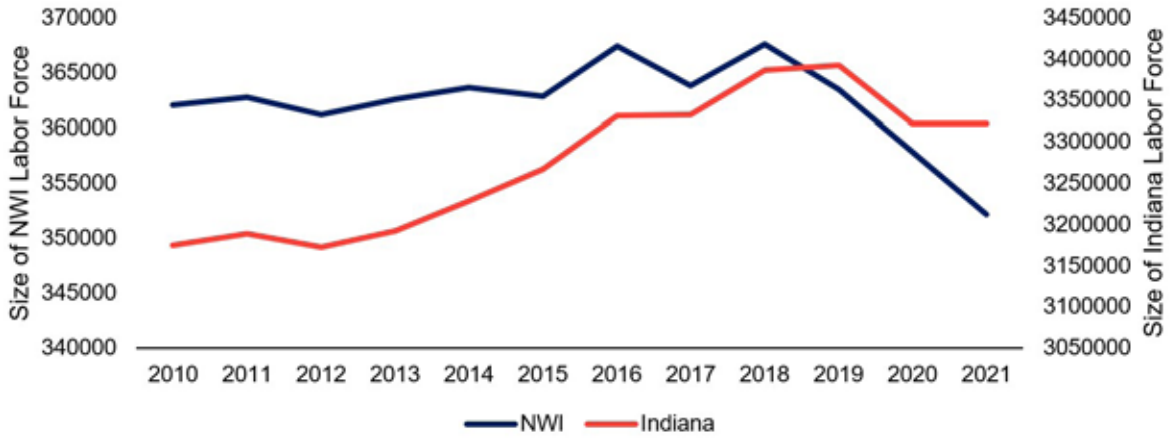
Source: CPCS analysis of US Census data, 2022

Table 4-1: Educational Attainment

Employment

Employment is an important measure of economic well-being as it indicates the availability of labor to support the region's economy. Conversely, unemployment can signal a mismatch between the level or the quality of labor supply and demand. Lastly, examining employment by industry indicates which sectors are the largest employers in the region with an outsized impact on the region's economy.

Figure 4-9 graphs the labor force in Northwest Indiana and Indiana between 2010 and 2021. Whereas Indiana's labor force grew substantially between 2010 and 2019, Northwest Indiana saw much more modest growth. Moreover, the pandemic took a significant toll on its labor force, with numbers falling below 2010 levels. The decline in the labor force in Indiana resulting from the pandemic was far less extreme.



Source: CPCS analysis of US Bureau of Labor Statistics data, 2022.

Figure 4-9: Labor Force in Northwest Indiana and Indiana, 2010-2021

Figure 4-10 graphs the labor force in each of Northwest Indiana's constituent counties between 2010 and 2021. Mirroring relative population size, Lake County has the largest labor force in the region, followed by Porter County and La Porte County. Figure 13 also reveals that only Porter County saw growth in its labor force, with numbers in Lake and La Porte counties contracting.

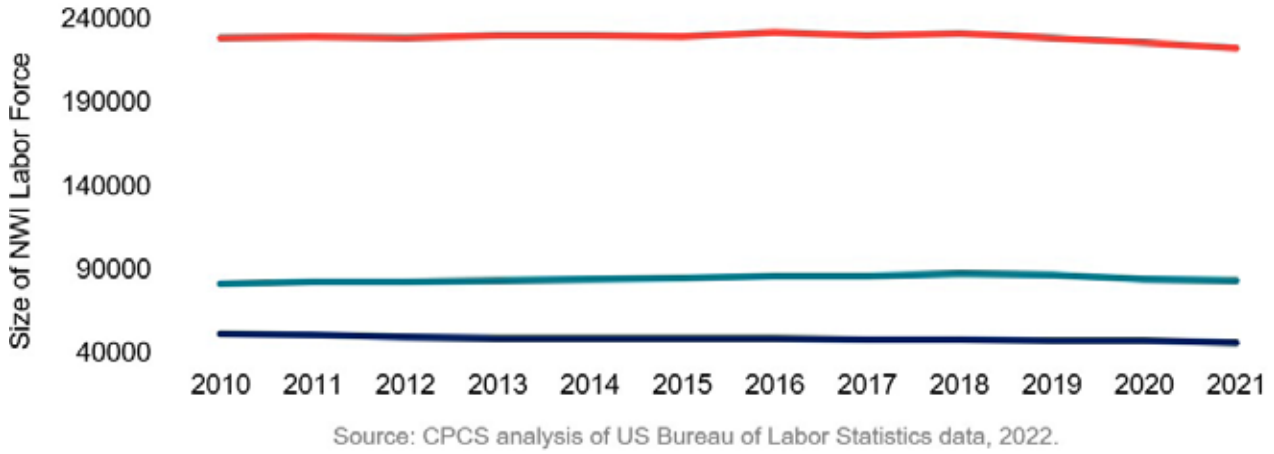


Figure 4-10: Labor Force in Northwest Indiana Counties, 2010-2021

Figure 4-11 shows the change in the unemployment rate from 2010 to 2021 in Northwest Indiana's three constituent counties, Indiana, and the US. Both La Porte and Lake counties had unemployment rates above Indiana's in 2010 and 2021. Porter County's unemployment rate was below Indiana's in 2010 but above it in 2021. In 2021, unemployment rates in Porter and La Porte counties were below the national average of 5.35 percent, while Lake County's unemployment rate was above the national average.

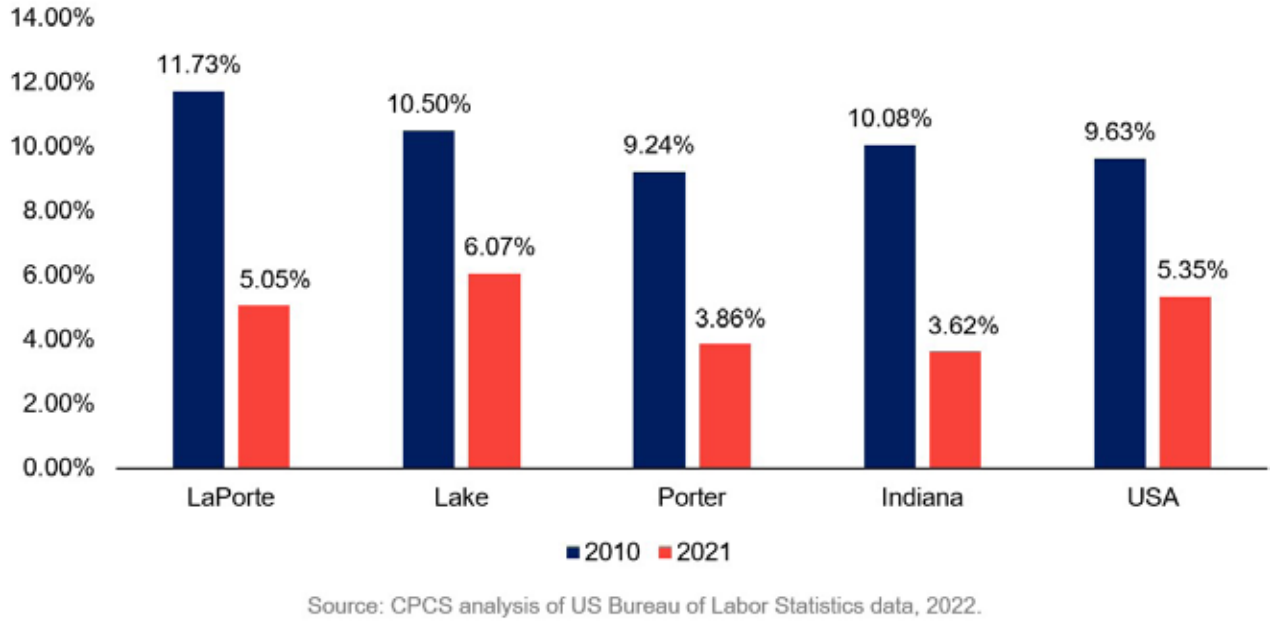


Figure 4-11: Unemployment Rates, 2010 and 2021

Workforce Shortages

Stakeholder consultations confirmed that many industries are struggling to find and hire new workers in Northwest Indiana. Conexus Indiana, which supports industry and cultivates talent in Indiana, noted that in some cases job openings per person approach a ratio of 10 to 1. Several workforce programs, including Catapult Indiana, the Modern Apprenticeship Program, Ivy Tech Community College workforce training solutions, and Center of Workforce Innovations initiatives, strive to address this issue by providing entry-level training and connect potential workers to employers. Also, there has been an ongoing transition to automation across many freight-dependent industries to address ongoing workforce shortages. Indiana's Manufacturing Readiness Grant offers manufacturers funds to invest in automation technologies that perform tasks for which there is an insufficient supply of human labor.

Source: CPCS consultations, July 2022.

	Industry	Employment	% of Total
Private Non-Farm	Forestry, fishing, and related activities	181 (D)	0.05% (D)
	Mining, quarrying, and oil and gas extraction	302	0.08%
	Utilities	(D)	N/A
	Construction	24,144	6.27%
	Manufacturing	42,499	11.04%
	Wholesale trade	4,175 (D)	1.08% (D)
	Retail trade	42,995	11.17%
	Transportation and warehousing	13,507 (D)	3.51% (D)
	Information	2,717	0.71%
	Finance and insurance	11,334	2.94%
	Real estate and rental and leasing	14,629	3.80%
	Professional, scientific, and technical services	15,449	4.01%
	Management of companies and enterprises	2,866	0.74%
	Administrative & support & waste management & remediation services	21,945	5.70%
	Educational services	8,210	2.13%
	Health care and social assistance	53,582	13.92%
	Arts, entertainment, and recreation	10,360	2.69%
	Accommodation and food services	32,358	8.40%
	Other services (except government and government enterprises)	26,760	6.95%
Government and government enterprises		40,787	10.59%
Total Non-Farm Employment		383,305	99.54%
Total Farm Employment		1,755	0.46%
All industry total		385,060	100%

Table 4-2 lists Northwest Indiana's employment among different industries, with freight-dependent industries highlighted in gray. Retail trade and manufacturing both employ among the largest shares of the region's population, at over 11 percent each. The health care and social assistance sector is also an important industry, employing almost 14 percent of the region's total working population. Government and government enterprises and accommodation and food services also employ large proportions of the workforce.

Table 4-2: Northwest Indiana Employment by Industry, 2019

Source: CPCS analysis of Full-Time and Part-Time employment by NAICS Industry, US Bureau of Economic Analysis, 2022. (D) = Not disclosed or data incomplete because some is not disclosed. Note that 3.8% of regional employment is unavailable to avoid disclosure of confidential information. The missing information comes from the agriculture, forestry, fishing, hunting, Utilities; Wholesale trade; and Transportation and warehousing industries among the three counties that make up NWI.

	Industry	GDP, Thousands of 2019$	% of Total
Private	Agriculture, forestry, fishing, and hunting	(D)	N/A
	Mining, quarrying, and oil and gas extraction	22,255	0.06%
	Utilities	197,829 (D)	0.56% (D)
	Construction	2,186,796	6.14%
	Manufacturing	10,114,468	28.40%
	Wholesale trade	557,310 (D)	1.57% (D)
	Retail trade	2,167,770	6.09%
	Transportation and warehousing	1,035,056 (D)	2.91% (D)
	Information	361,071	1.01%
	Finance and insurance	1,197,632	3.36%
	Real estate and rental and leasing	3,345,943	9.40%
	Professional, scientific, and technical services	1,042,648	2.93%
	Management of companies and enterprises	311,283	0.87%
	Administrative & support & waste management & remediation services	1,029,634	2.89%
	Educational services	295,534	0.83%
	Health care and social assistance	3,635,998	10.21%
	Arts, entertainment, and recreation	713,986	2.01%
	Accommodation and food services	1,116,782	3.14%
	Other services (except government and government enterprises)	955,136	2.68%
Government and government enterprises		3,020,826	8.48%
All industry total		35,608,158	100%

Source: CPCS analysis of Full-Time and Part-Time GDP by NAICS Industry, US Bureau of Economic Analysis, 2022. (D) = Not disclosed or data incomplete because some is not disclosed. Note that 6.5% of regional GDP is unavailable to avoid disclosure of confidential information. The missing information comes from the agriculture, forestry, fishing, hunting, Utilities, Wholesale trade, and Transportation and warehousing industries among the three counties that make up NWI.

Figure Table 4-3: Northwest Indiana's GDP by Industry, 2019

Gross Domestic Product

Gross Domestic Product (GDP) is a measurement of the monetary value of the services produced in a country, state, or county. Investigating periodic GDP trends provides insight into the health and growth of an economy and can reveal which industries are most important or productive.

Table 4-3 lists GDP in the different industries in Northwest Indiana. This reveals that manufacturing is by far the most important industry to Northwest Indiana's economy, contributing about 28.4 percent of the region's GDP. The health care and social assistance sector also ranks highly, as do real estate and rental and leasing and government and social assistance. Manufacturing, health care and social assistance, and government and social assistance were also major employers in Northwest Indiana. This suggests that these three industries are of utmost importance to the region's socio-economic landscape. Retail trade is a major employer but contributes a smaller share of GDP. Conversely, real estate and rental and leasing do not place as a significant employer but contribute a large share to the region's GDP.

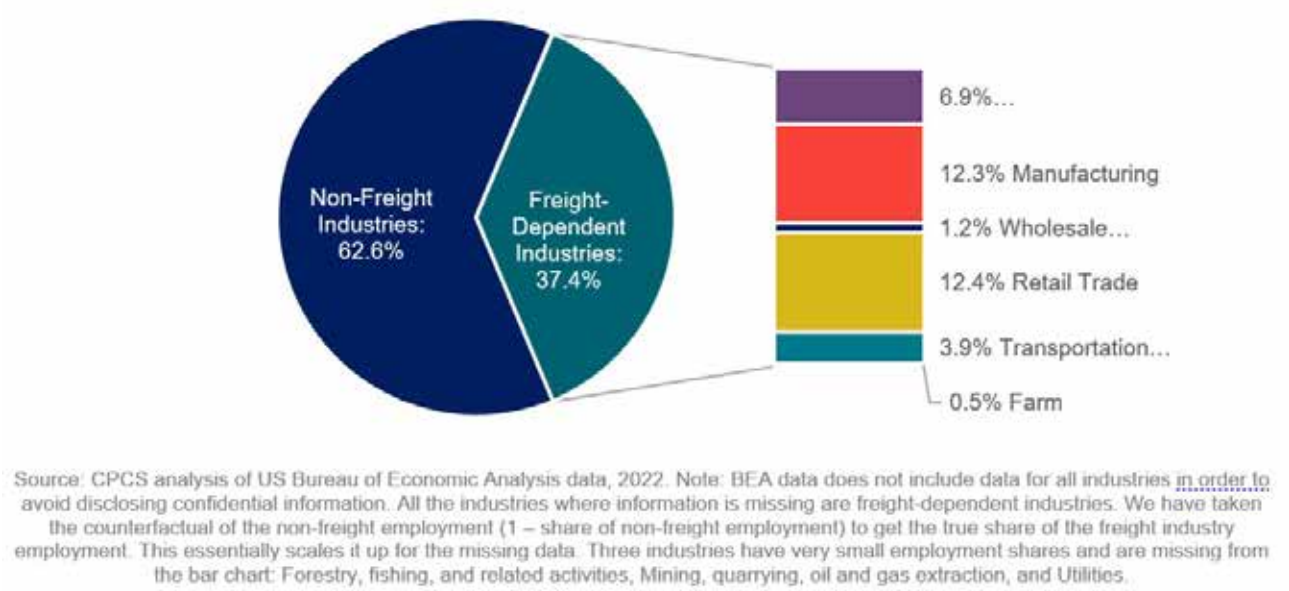
Freight-Dependent Industry

Freight-dependent industries are those that rely heavily on the freight system for their operations and include the following eight industries:

1. Agriculture, forestry, fishing, and hunting
2. Mining, quarrying, and oil and gas extraction
3. Utilities
4. Construction
5. Manufacturing
6. Wholesale trade
7. Retail trade
8. Transportation and warehousing

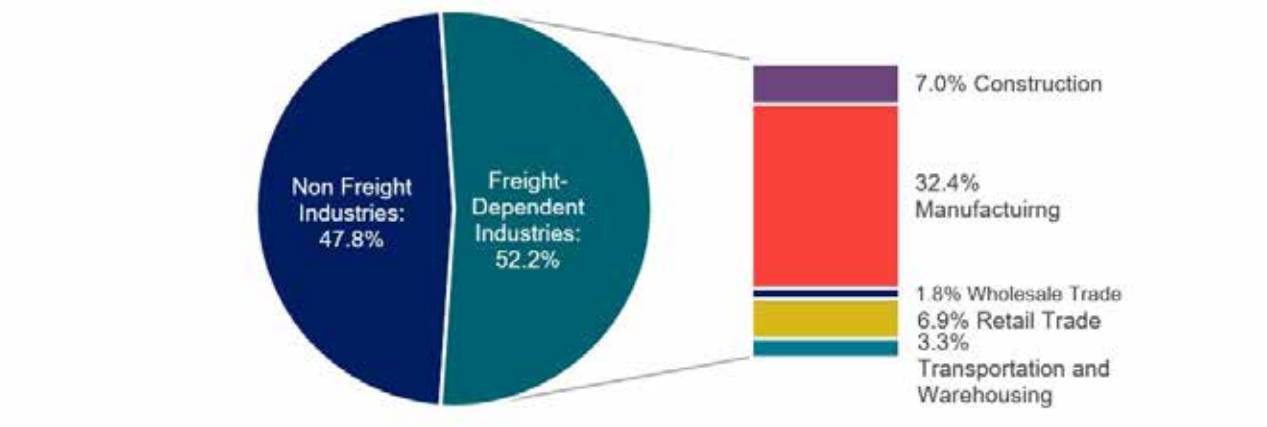
These industries are identified from economic data using North American Industry Classification System (NAICS) codes, which is a standard system for classifying business statistics for analysis and reporting. High-level economic sectors are represented by two-digit NAICS codes, while subsectors and industry groups are classified using three, four, five, and six-digit codes. For instance, NAICS codes 44 and 45 represent the retail trade industry, while code 441 represents motor vehicle and parts dealing businesses. NAICS codes of the freight-dependent industries and some of their sub industries are listed in Figure 4-14.

Using the employment data presented earlier, Figure 4-12 reveals that more than 37 percent of those employed in Northwest Indiana work in freight-dependent industries. Similarly, Figure 4-13 shows that over 52 percent of Northwest Indiana's GDP is generated by freight-dependent industries. These figures highlight the importance of the freight system for Northwest Indiana's economy.



Source: CPCS analysis of US Bureau of Economic Analysis data, 2022. Note: BEA data does not include data for all industries in order to avoid disclosing confidential information. All the industries where information is missing are freight-dependent industries. We have taken the counterfactual of the non-freight employment (1 – share of non-freight employment) to get the true share of the freight industry employment. This essentially scales it up for the missing data. Three industries have very small employment shares and are missing from the bar chart: Forestry, fishing, and related activities, Mining, quarrying, oil and gas extraction, and Utilities.

Figure 4-12: Northwest Indiana Employment Share by Industry, 2019



Source: CPCS analysis of US Bureau of Economic Analysis data, 2022. Note: BEA data does not include data for all industries in order to avoid disclosing confidential information. All the industries where information is missing are freight-dependent industries. We have taken the counterfactual of the non-freight GDP (1 – share of non-freight GDP) to get the true share of the freight industry GDP. This essentially scales it up for the missing data. Three industries have very small employment shares and are missing from the bar chart: Agriculture, forestry, fishing, and hunting, Mining, quarrying, oil and gas extraction, and Utilities.

Figure 4-13: Northwest Indiana GDP Share by Industry, 2019

Table 4-4 presents data on the location quotients (LQs) of the eight two-digit NAICS code freight-dependent industries and select three-digit NAICS code industries. A location quotient indicates the proportion of the workforce employed in an industry relative to the national average. Therefore, analyzing LQs is a quick way to understand a local region's economic base specialization relative to the national norm. Industries that have higher LQ values are typically more export-oriented[1] and, therefore, greater contribution to the regional economy. The data reveals that certain types of manufacturing are particularly competitive in Northwest Indiana, namely primary metal manufacturing, non-metallic mineral product manufacturing, and fabricated metal product manufacturing. Truck transportation and gasoline stations also have high LQs.

Another method of determining the importance of an industry is to analyze the change in its employment over time.

Table 4-5 presents percent employment changes among freight-dependent industries between 2010 and 2019 and reveals that transportation and warehousing is the freight-dependent industry with the fastest-growing employment in Northwest Indiana, whereas the mining, quarrying, and oil and gas extraction industry has the fastest shrinking employment.

1 EMSI Resource Library "Understanding Location Quotient", 2007.

Industry	Lake	La Porte	Porter	NWI
NAICS 11 Agriculture, forestry, fishing, and hunting	0.14	0.67	0.11	0.20
NAICS 21 Mining, quarrying, and oil and gas extraction	0.13	0.11	0.11	0.12
NAICS 23 Construction	1.18	0.95	1.52	1.23
NAICS 236 Construction of buildings	1.1	1.37	1.77	1.30
NAICS 31-33 Manufacturing	1.44	2.32	1.85	1.65
NAICS 311 Food manufacturing	0.58	2.85	0.36	0.83
NAICS 313 Textile mills	NC	5.7	NC	NC
NAICS 326 Plastics and rubber products manufacturing	0.46	4.24	1.45	1.19
NAICS 327 Nonmetallic mineral product manufacturing	2.15	1.11	1.27	1.80
NAICS 331 Primary metal manufacturing	22.58	13.14	30.42	23.22
NAICS 332 Fabricated metal product manufacturing	1.23	1.74	2.43	1.59
NAICS 333 Machinery Manufacturing	0.57	6.56	1.03	1.47
NAICS 42 Wholesale trade	NC	0.8	0.87	NC
NAICS 44-45 Retail trade	1.18	1.2	1.19	1.19
NAICS 447 Gasoline stations	1.49	1.72	2.1	1.67
NAICS 448 Clothing and clothing accessories stores	0.96	2.22	0.48	1.01
NAICS 451 Sports, hobby, music instrument, book stores	1.31	1.11	1.88	1.42
NAICS 48-49 Transportation and warehousing	1.06	NC	NC	NC
NAICS 484 Truck transportation	2.2	1.09	1.71	1.94
NAICS 486 Pipeline Transportation	3	NC	NC	NC

Source: CPCS analysis of US Bureau of Labor Statistics QCEW 2019 Private Average Annual Employment Location Quotient data, 2022. NC = not calculable, either because the data does not exist, or it is zero. Note: NWI LQs are calculated as the average of constituency LQ scaled to each county's relative employment level.

Table 4-4: Location Quotient for Freight Industries Among Northwest Indiana Counties, 2019

Industry	% Employment Change, 2010-2019	
	NWI	US
NAICS 11 Agriculture, forestry, fishing, and hunting	-12.9%	+11.7%
NAICS 21 Mining, quarrying, and oil and gas extraction	-33.4%	+3.9%
NAICS 23 Construction	+6.1%	+35.0%
NAICS 31-33 Manufacturing	+6.2%	+11.2%
NAICS 42 Wholesale trade	+5.2%	+7.7%
NAICS 44-45 Retail trade	+0.4%	+7.8%
NAICS 48-49 Transportation and warehousing	+46.4%	+37.4%

Source: CPCS analysis of US Bureau of Economics Analysis data, 2022.
Note: Utilities data is not provided for the counties in NWI. Comparisons in employment between 2010 and 2019 were only conducted between data that was available for the same industry and counties in both years. If employment data was not available for a particular county in one year, it was excluded from the analysis for the other year. The data here should be viewed as approximations only.

Table 4-5: Change in Northwest Indiana Employment Among Freight Industries, 2010-2019

Although LQs reflect the competitiveness of different regional industries compared to the national averages, a Shift Share Analysis is a more dynamic economic indicator used to understand changes in a region's industrial competitiveness over time compared to the national average.
A shift-share analysis estimates regional job growth based on three factors:

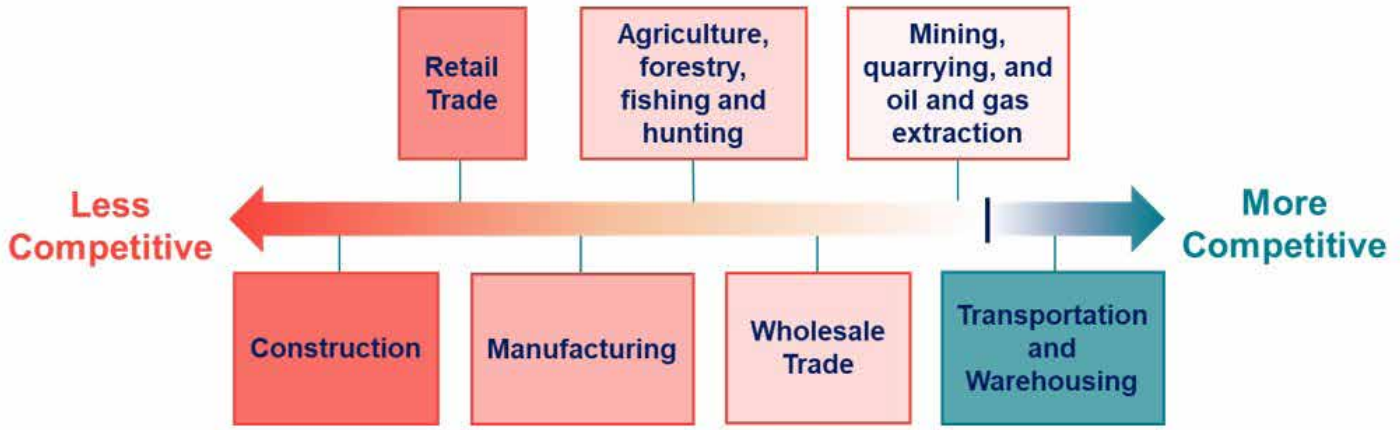
- Industrial mix effect: the growth of a specific industry at the national level. This effect is calculated through analysis of industry-level employment data for the desired time frame.
- National growth effect: the regional industry growth that is impacted by the national level growth rates for the desired time frame.
- Regional competitive effect: the growth (or any change) in regional industry employment due to the unique characteristics of that region.

The resulting shift-share analysis is based on the following formula:

Actual Employment Change = National Share + Industrial Mix + Regional Shift

Figure 4-14 illustrates the change in employment due to the above-mentioned factors for Northwest Indiana's freight-dependent industries. Strikingly, only the transportation and warehousing industry saw a positive regional shift, suggesting that this industry is uniquely competitive in the region. This competitiveness is likely the result of Northwest Indiana housing a nexus of numerous transportation and infrastructure assets that yield Indiana the nickname the "Crossroads of America." This "special formula" includes four major Interstates, three Class I railroads, seven airports, a major Great Lakes port, and numerous terminals, all proximate to Chicago and within a 24-hour drive to 80 percent of the US population. As a result, Northwest Indiana has seen spiking demand for industrial properties like warehouses and distribution centers in recent years, mirroring ongoing growth in e-commerce.[2,3]

2 https://Northwest Indianandianabusiness.com/article/untapped-potential-october-november-2021/
3 https://rejournals.com/northwest-indianas-industrial-boom-only-expected-to-continue-despite-low-supply/



Source: CPCS analysis of US Bureau of Economic Analysis data, 2022. Note: The shift-share analysis uses the same data as earlier, which was subject to certain limitations. The analysis followed the following process for each industry: 2010 Employment in NWI * (2019 Employment in NWI / 2010 Employment in NWI – 2019 US Employment / 2010 US Employment).

Figure 4-14: Northwest Indiana Freight-Dependent Industry Regional Shift, 2010-2019

Industry Profiles

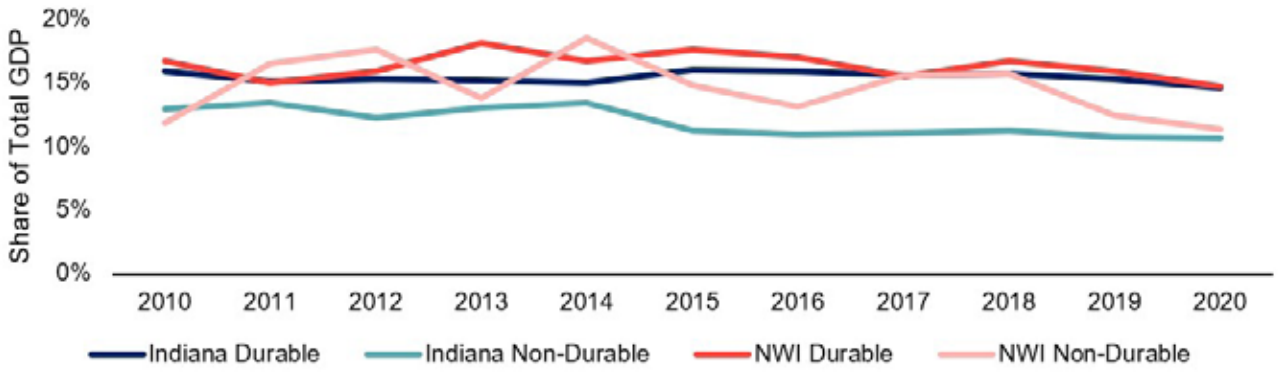
Manufacturing

The manufacturing industry accounted for over 11 percent of the region's total employment and contributed over 28 percent of Northwest Indiana's total GDP in 2019. Manufacturing in both Northwest Indiana and Indiana has seen a very slight decline in importance relative to the overall economy between 2010 and 2020.

Figure 4-15 shows that in Indiana, the manufacturing industry is concentrated more on durable goods production (such as metals and vehicles) than non-durable goods (like food and other disposable items). In Northwest Indiana, neither durable nor non-durable goods clearly make up the majority. The GDP share of non-durable goods, though, appears to fluctuate more widely than durable goods, and these fluctuations largely explain the slight overall decline in the manufacturing industry's GDP contribution.

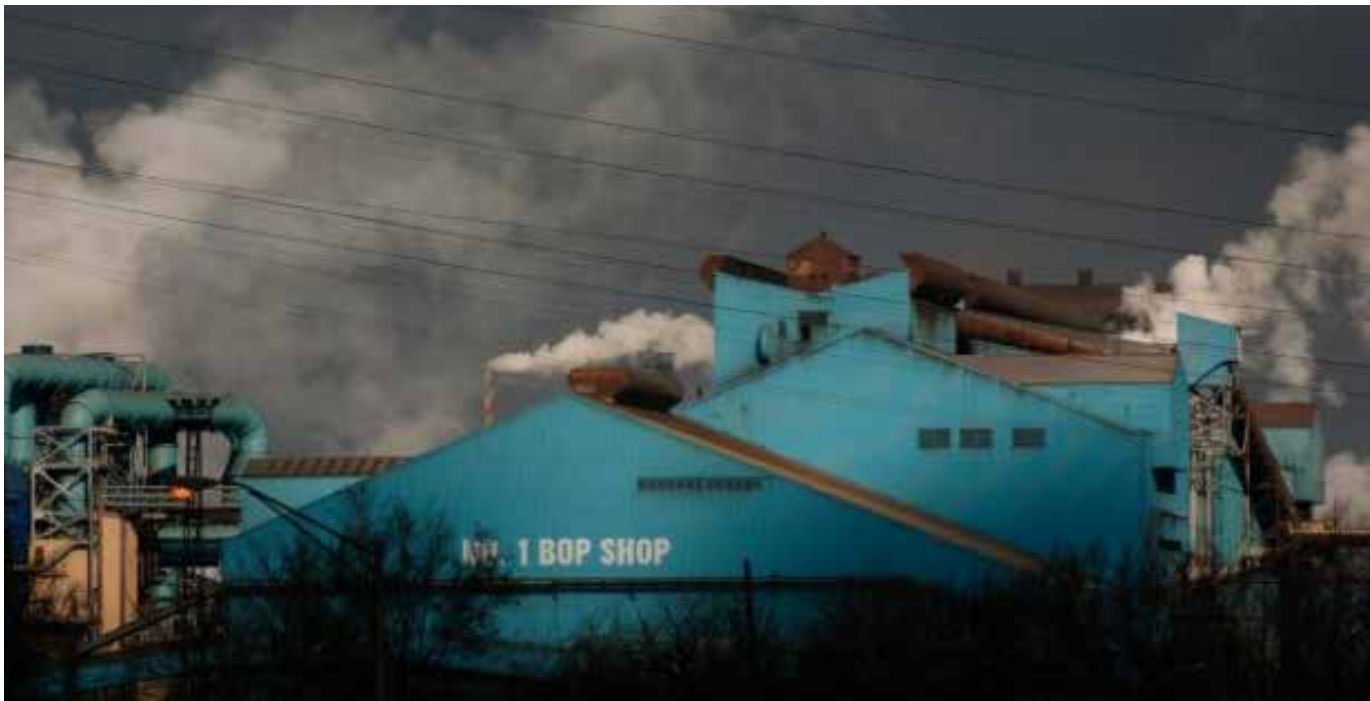
Over $10 billion, or roughly 30 percent of NWI's GDP, comes from the manufacturing industry.	Lake and Porter Counties account for half of the nation's blast furnace capacity.	Michigan City is the largest producer of air compressors in the Midwest.

Source: CPCS analysis, 2022.



Source: CPCS analysis of US Bureau of Economic Analysis data, 2022.

Figure 4-15: Manufacturing Share of GDP by Type of Goods, 2010-2020



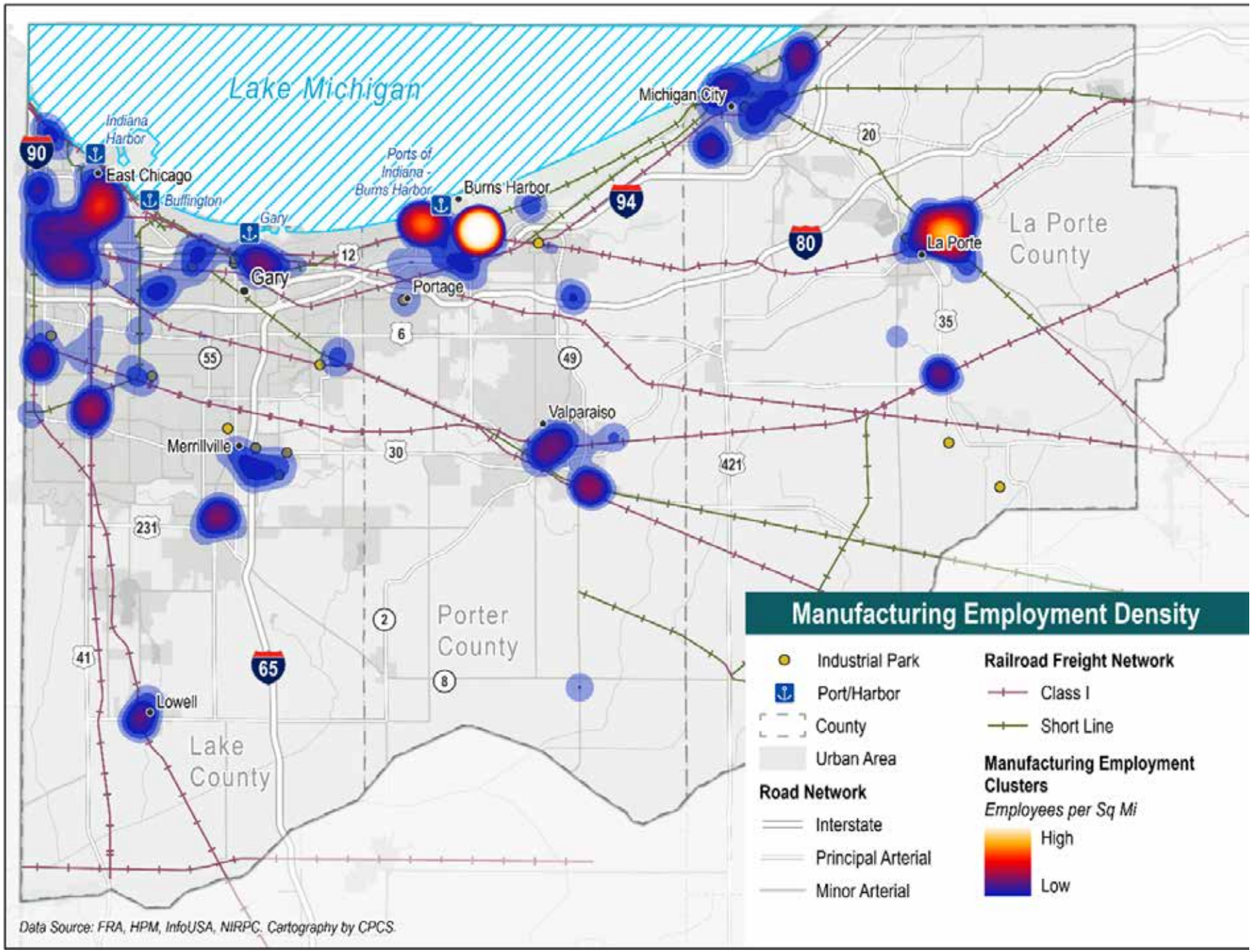


Figure 4-16: Manufacturing Employment Clusters in Northwest Indiana, 2018

The Freight Analysis Framework (FAF) offers a comprehensive picture of freight movements between states and major metropolitan areas by all modes of transportation. FAF constitutes the best publicly available multi-modal commodity flow data set available in the US. The 2017 Commodity Flow Survey, which serves as one of the foundational data sets used to develop FAF, was last released in 2021, marking this the fifth iteration of FAF (hence, the term FAF5). FAF data is critical to freight planning because it identifies the volume and value of goods moving on the freight transportation system. This information helps planners analyze and illustrate the relationship between the economy and the freight system.

The location quotient analysis from the previous section identified certain manufacturing sectors as being particularly important in Northwest Indiana. These included metals manufacturing, non-metallic mineral manufacturing, machinery manufacturing, gas and oil manufacturing, and to some extent, food manufacturing (largely in La Porte County). Using Federal Highway Administration's (FHWA's) Freight Analysis Framework 5 (FAF5) data, we can examine 2017 freight flow trends for some of the commodities related to these manufacturing sectors. Note that this FAF analysis uses FAF Zone 181 for the Indiana portion of the Chicago Metro area. This zone includes not only Lake, Porter, and La Porte Counties but also Newton and Jasper. However, this FAF zone is a good estimate of the commodity flows in Northwest Indiana.

National Level Freight Flows: Manufacturing

The preceding analysis focused on manufacturing commodities that were somehow originating from or destined for Northwest Indiana. This FAF analysis revealed the importance of the freight system, especially the roads, in the movement of these goods. However, this does not capture all of the commodities using the region's freight system. Indeed, many commodities traveling on its roads, rail, or other systems neither originate in nor are destined for the region. FAF provides national-level freight flow maps for the National Highway System in 2017. These demonstrate the high level of demand placed on Northwest Indiana's infrastructure for the movement of goods, not just those originating or terminating in the region, but also pass-through traffic.

As shown in Figure 4-17, manufactured commodities rely heavily on the roads in Indiana, including Northwest Indiana. Similar freight system demand is mirrored among other modes and all manufacturing commodities.

Metals Manufacturing

Metals manufacturing refers to the production of base metals and metal articles using metallic ores. Metals manufacturing is a key industry in Northwest Indiana, with over 45 million tons worth almost $22 billion moving into, out of, or within Northwest Indiana in 2017, according to FAF5 data. Over a quarter of the nation's steel is produced in Indiana, and a significant proportion of this is produced in Northwest Indiana[4]. In fact, Lake and Porter Counties account for over half of the nation's blast furnace capacity, and the Indiana Harbor complex is the largest integrated steel making facility in North America[5]. US Steel and Cleveland-Cliffs have operations in the region.

4 Indiana led nation in steel production again in 2020, maintaining reign of more than 40 years, Northwest Indiana Times, Joseph S. Pete, April 2021.

5 INDOT 2021 State Rail Plan

Note: Major flows include domestic and international freight moving by truck on highway segments with more than 25 FAF trucks per day and between places typically more than fifty miles apart.
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework (FAF), version 5.1.
Flows include Chemical prods (SCTG23), Plastics/rubber (SCTG24), Wood prods (SCTG26), Newsprint/paper (SCTG27), Paper articles (ACTG28), Printed prods (SCTG29), and Textiles/leather (SCTG30) commodities represented in FAF.

Figure 4-17: National Freight Flows for Consumer Manufacturing Commodities, 2017

Idled Blast Furnaces

Although Lake and Porter Counties account for over half of the nation's blast furnace capacity, Northwest Indiana only produces about a quarter of the nation's steel. The cause of this disparity may be that some share of the region's blast furnace capacity is being kept idle. In fact, in the last few years, both Cleveland Cliffs and US Steel idled blast furnaces in Northwest Indiana.

Source: Indiana again led the nation in steel production despite 7.4% drop, Northwest Indiana Times, Joseph S Pete, March 2022.

Most commodities related to metals manufacturing travel by truck, both in terms of tonnage and value. However, the rail and multiple modes and mail modes also handle large quantities of these metal commodities in terms of both tonnage and value. In addition, the vast majority of metal manufacturing commodities moving through Northwest Indiana travel domestically. More information on commodity flows can be found in Appendix 4C: Industry-Level FAF analysis.

The ***multiple modes and mail mode*** is the term used in the FAF database to refer to intermodal commodity movements—shipments using more than one mode. This includes a variety of modal combinations such as a container moving from a cargo ship to rail to a truck, or bulk cargo moving from rail to barge. The term "mail" is included here because the mode used to transport goods by a parcel delivery service is often unknown and may involve multiple modes.

Source: Freight Analysis Framework Version 5 User's Guide for Release 5.1, USDOT, 2021.

Nonmetal Minerals Manufacturing

Nonmetal minerals manufacturing refers to the production of mineral products using raw minerals. Northwest Indiana saw over 6 million tons of mineral products worth over $1 billion move into, out of, or within the region in 2017, according to FAF5 data. One of the major nonmetal mineral manufacturing establishments is Carmeuse at Buffington Harbor, where lime and stone are processed for cement production.

Most commodities related to nonmetal minerals manufacturing travel by truck, both in terms of tonnage and value. The water and rail modes move significant quantities of these commodities by tonnage but much less by value. This suggests that nonmetal mineral products moving by truck tend to be of higher value than those moving by rail or water. In addition, most nonmetal mineral commodities moving through Northwest Indiana travel domestically. However, there is a sizeable volume of these commodities that are international imports. More information on commodity flows can be found in Appendix 4C: Industry-Level FAF analysis.

Machinery Manufacturing

Machinery manufacturing includes the production of goods, including engines, fans, or hand tools. Northwest Indiana saw over 500,000 tons of machinery products worth over $4 billion move into, out of, or within the region in 2017, according to FAF5 data. Northwest Indiana produces a variety of machinery goods, including air compressors, of which Michigan City is the largest producer in the Midwest[6]. A variety of machinery manufacturing establishments have operations in Northwest Indiana, including Howmet Engine Systems for aero engines and Hitachi Sullair for air compressors.

6 CPCS consultation with Michigan City EDC, 2022

Most commodities related to machinery manufacturing travel by truck, both in terms of tonnage and value. The water and multiple modes and mail modes also move significant quantities of these commodities by tonnage and value. The highest value goods appear to travel by multiple modes and mail. In addition, most machinery manufacturing commodities moving through Northwest Indiana travel domestically. However, there is a sizeable volume of these commodities that are international imports and exports. More information on commodity flows can be found in Appendix 4C: Industry-Level FAF analysis.

Oil and Gas

Oil and gas manufacturing refers to the production of crude petroleum, gasoline, and fuel oils. Oil and gas is a major commodity group in Northwest Indiana, both in terms of production and freight movement. Over 76 million tons of oil and gas products worth over $33 billion moved into, out of, or within the region in 2017, according to FAF5 data. BP's Whiting Refinery is the largest in the Midwest and the sixth largest in the US. It is capable of processing 440,000 barrels of crude oil every day, and it produces about 7 percent of all US asphalt[7].

Most oil and gas commodities travel by pipeline, both in terms of tonnage and value. However, the truck mode also handles significant quantities of these commodities in terms of both tonnage and value. In addition, most oil and gas commodities moving through Northwest Indiana travel domestically. However, a sizeable quantity is imported both in terms of tonnage and value. More information on commodity flows can be found in Appendix 4C: Industry-Level FAF analysis.

Food Manufacturing

Food manufacturing refers to the production of meat, seafood, alcoholic beverages, tobacco products, milled grain products, and other foodstuffs using live animals and fish, cereal grains, and other agricultural products. Northwest Indiana saw over 9 million tons of food manufacturing products worth almost $6 billion move into, out of, or within the region in 2017, according to FAF5 data. A number of food manufacturers have operations in the region, including Hearthside Food Solutions and Green Sense Farms, the latter of which operates the country's largest vertical indoor farm[8].

Most commodities related to food manufacturing travel by truck, both in terms of tonnage and value. The rail and multiple modes and mail modes also move significant quantities of these commodities. In addition, the vast majority of food manufacturing commodities moving through Northwest Indiana travel domestically. More information on commodity flows can be found in Appendix 4C: Industry-Level FAF analysis.

7 Indiana, BP's Economic Investment, BP. | Crude Oil Refineries, Indiana Office of Energy Development.

8 Food and Beverage Manufacturing, Northwest Indiana Forum, (n.d.).

Transportation and Warehousing

Transportation and warehousing is an important industry in Northwest Indiana, making up over 4 percent of Lake County's total GDP in 2019. The shift-share analysis from earlier revealed that this is the only freight-dependent industry in Northwest Indiana that is more competitive than the national average. In particular, the shift-share analysis showed that the transportation and warehousing industry is more important to Lake County's economy than Indiana overall.

Stakeholders confirmed the relative competitiveness of the transportation and warehousing industry and reported that this is largely due to the region's concentration of freight-dependent industries and proximity to Chicago. There is strong demand for industrial land to support transportation and warehousing operations in the region, which has been heightened by the e-commerce boom brought about by the pandemic. However, Northwest Indiana is highly developed and is running out of vacant or developable land, especially in the northwest corner closer to Chicago. As a result, many new freight-dependent industrial projects are employing adaptive reuse strategies or redeveloping old properties. Examples of recent such projects include:

- ***East Chicago Logistics Center***: The former DuPont industrial site at 5215 Kennedy Ave is undergoing brownfield remediation before plans to one-million-square-foot logistics center.[9]

- ***Majestic Star Casino Move and Buffington Harbor Redevelopment:*** The Majestic Star Casino has moved from its present location on Lake Michigan in Gary next to Buffington Harbor to make way for an expansion of port operations. The goal is to potentially develop an intermodal facility on the lakefront, an asset that Northwest Indiana currently lacks.[10]

- ***Former Cleveland-Cliffs Steel Mill Site***: In 2021, Speedwagon Capital Partners purchased the former steel mill at 3300 Dickey Road in East Chicago and plans to develop the industrial site, making use of the logistics and supply chain assets available in the site's vicinity.[11]

Indiana is one of the few locations in the US that manufactures railroad locomotives	Transportation and warehousing is the most competitive freight-dependent industry in NWI, based on a shift-share analysis	Employment in the transportation and warehousing industry grew by over 46 percent between 2010 and 2019

Source: INDOT State Rail Plan 2021, NIRPC E-Commerce in Northwest Indiana Fall 2020, US Bureau of Economic Analysis data.

Figure 4-18 shows the transportation and warehousing industry employment clusters in Northwest Indiana as of 2018. As shown, the greatest concentrations of these industries are located in western Northwest Indiana in Hammond, Munster, East Chicago, and Gary. There is an especially pronounced cluster of trucking-related activities along the CN railroad in western Munster. There are also employment clusters in Michigan City, Valparaiso, and Merrillville.

9 Remediation work underway on East Chicago site intended for massive logistics center, Northwest Indiana Times, Andrew Steele, November 2019.

10 Plans for Majestic Star casino move, Buffington Harbor redevelopment progressing in Gary, Chicago Tribune, Craig Lyons and Karen Caffarini, April 2019.

11 Shuttered Cleveland-Cliffs steel mill site in East Chicago purchased by Chicago investment firm, Northwest Indiana Business Magazine, Larry Avila, December 2021.

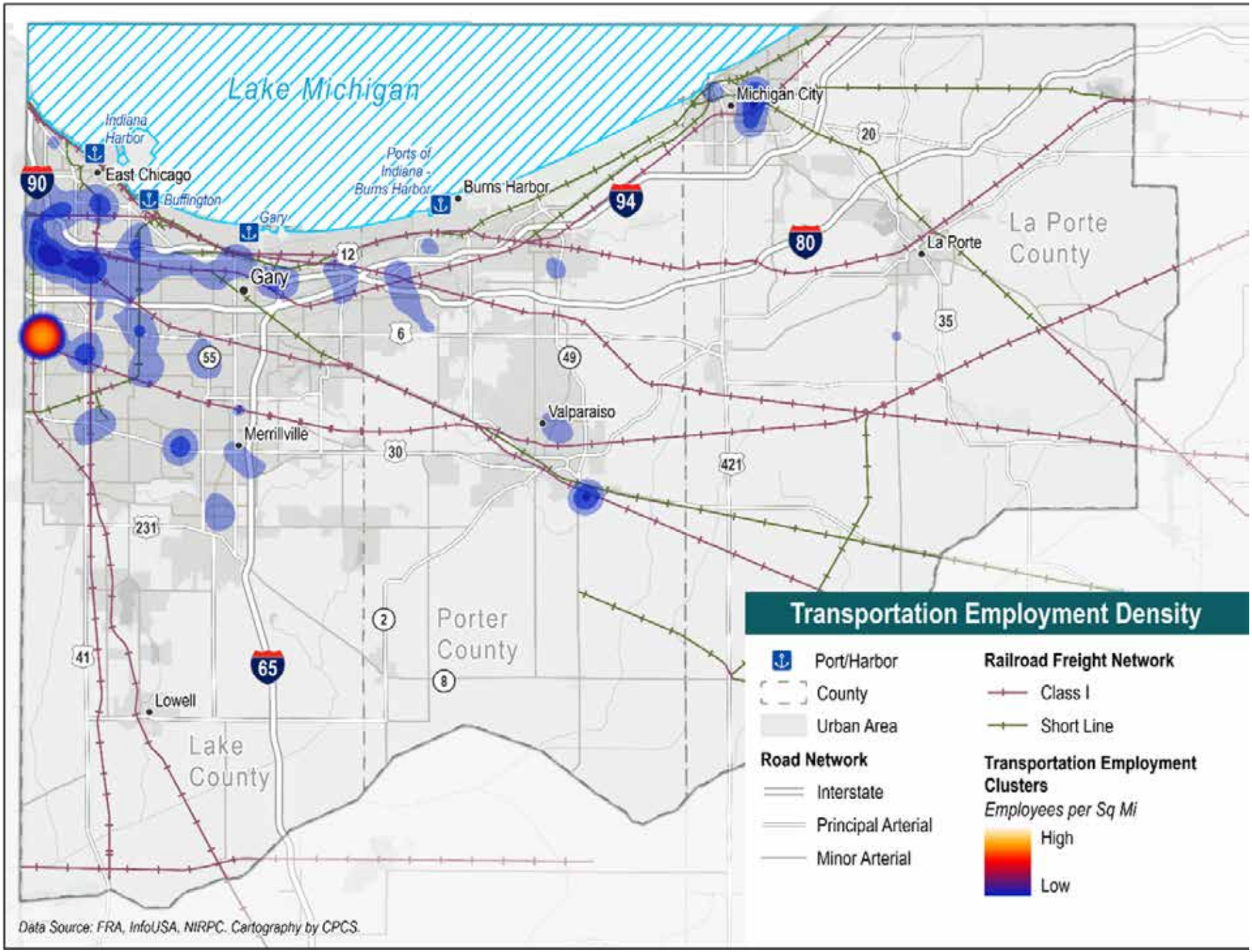
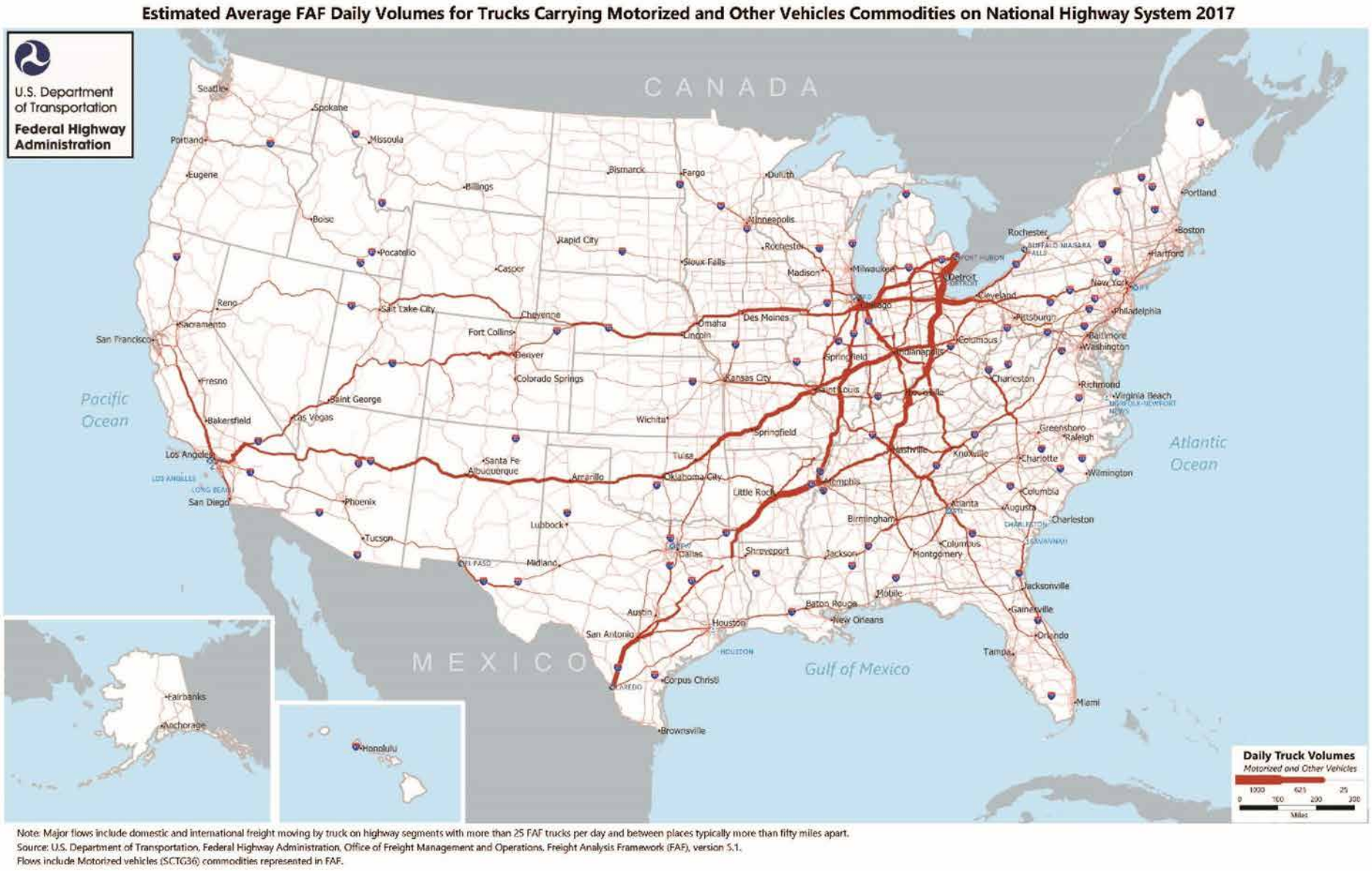
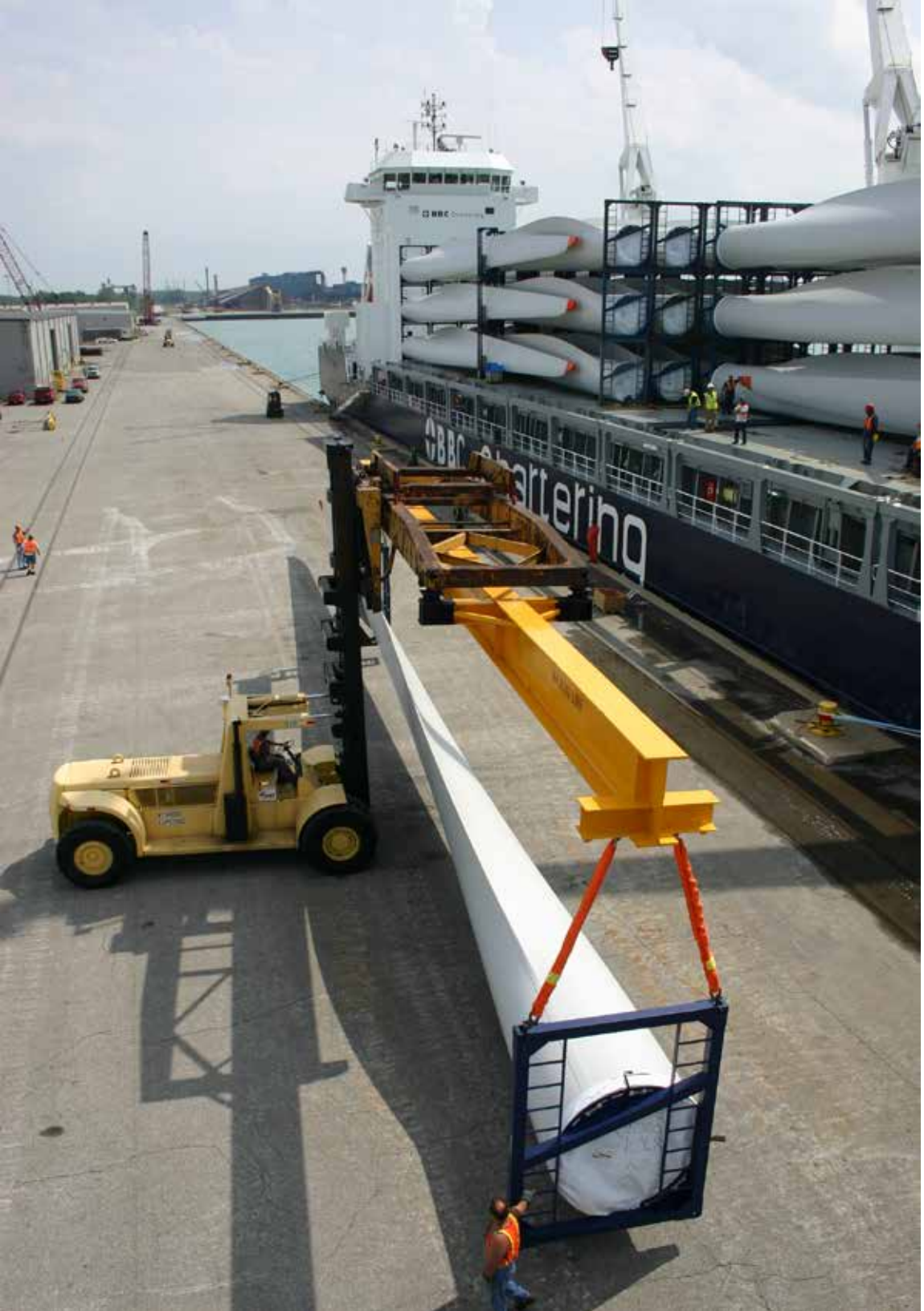


Figure 4-18: Transportation and Warehousing Employment Density in Northwest Indiana, 2018



Note: Major flows include domestic and international freight moving by truck on highway segments with more than 25 FAF trucks per day and between places typically more than fifty miles apart.
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework (FAF), version 5.1.
Flows include Motorized vehicles (SCTG36) commodities represented in FAF.

Figure 4-19: National Freight Flows for Motorized and Other Vehicle Commodities, 2017



National Level Freight Flows: Transportation Equipment

As shown in Figure 4-19, transportation equipment commodities rely heavily on the roads in Indiana, including Northwest Indiana. Similar freight system demand is likely mirrored among other modes.

The transportation equipment industry refers to the production of motorized vehicles and other transportation equipment. Northwest Indiana saw over 500,000 million tons of transportation equipment products worth over $5 billion move into, out of, or within the region in 2017 according to FAF5 data.

Most transportation equipment commodities travel by truck, both in terms of tonnage and value. However, the rail and multiple modes and mail modes also handle significant quantities of these commodities in terms of both tonnage and value. The data also reveal that these commodities tend to be high in value per unit of weight. In addition, most transportation equipment commodities moving through Northwest Indiana travel domestically. However, a large quantity is also imported and exported. More information on commodity flows can be found in Appendix 4C: Industry-Level FAF analysis.

Northwest Indiana's Multimodal Freight System

Freight System Overview

The Northwest Indiana region is serviced by a network of four Interstates, which is supplemented by national and state highways such as US 12, US 20, US 6, US 30, and SR 49. Rail service is provided by three Class I railroads and four short lines in Northwest Indiana. In addition to road and rail, Northwest Indiana is served by four maritime ports and two key airports. Also, 772 miles of pipeline in the region provide high-volume and low-cost shipping options for crude oil, natural gas, and other petroleum products.

227	558	930	997	7	4	772
Miles of Interstate	Miles of US and State Highways	Miles of rail	Bridges	Public airports	Maritime ports	Miles of pipeline

Source: CPCS analysis, 2022.

For the region to remain economically prosperous, these transportation systems need to be connected and efficient to provide key freight services to Northwest Indiana.

Figure 4-20 shows the integrated freight system in Northwest Indiana. As shown, public and private truck parking facilities, industrial parks, refineries, and pipeline terminals also serve Northwest Indiana's freight activities. There are also several truck-rail transload facilities and grain rail-served elevators in Northwest Indiana, but the stakeholders consulted for this analysis noted a lack of rail-transload intermodal facilities in the region, affecting the competitiveness of many freight-dependent businesses in the region. Moreover, the lack of intermodal services in Northwest Indiana is a contributing factor to the high volumes of truck and train traffic through the region to move intermodal containers to and from the intermodal facilities in the Greater Chicago area on the Illinois side.

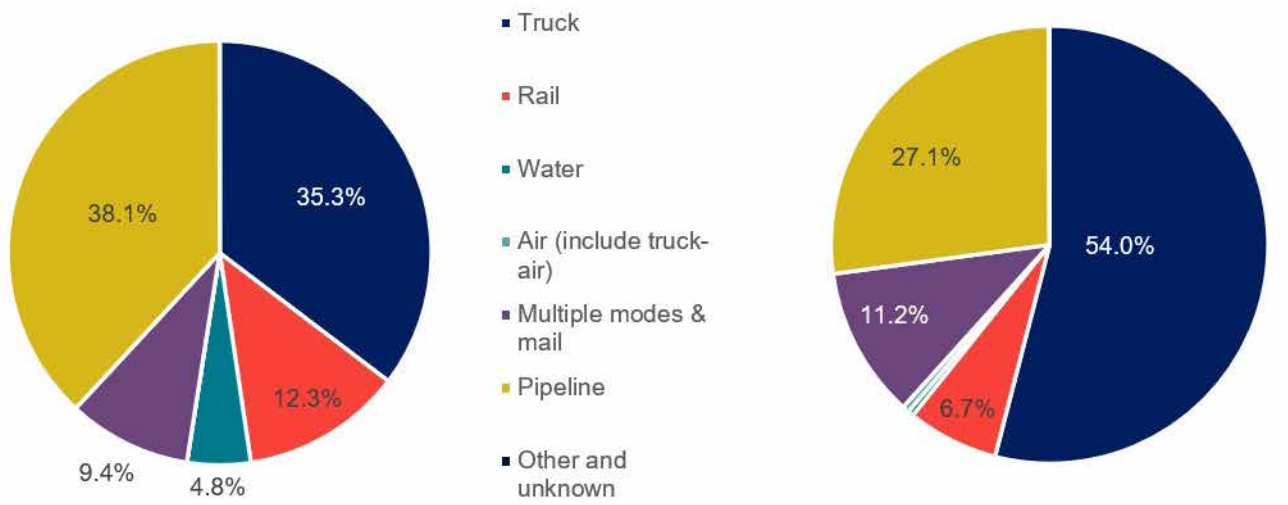
The sections of this chapter present more detail on the components of Northwest Indiana's freight system.

Figure 4-20: Northwest Indiana Freight System

Statewide Freight System Trends

Figures 4-21 and 4-22 present the results of a FAF analysis in the Northwest Indiana region. In 2017, Northwest Indiana's freight system moved over 195 million tons of freight with an estimated value of more than $110 billion. The majority of freight moving into, out of, or within Northwest Indiana in 2017 traveled via truck or pipeline, both in terms of tonnage and value. There was also a sizeable share of freight moving by rail. Maritime and pipeline freight tended to be made up of low-value goods, whereas trucks moved higher-value goods. The air mode moved a negligible amount of freight relative to the other modes.

By 2050, the total tonnage moved on Northwest Indiana's freight system is expected to increase by about 13 percent to more than 221 million tons. The total value of these goods is also expected to increase by about 42 percent to almost $156 billion. As shown in Table 4-6, trucks are expected to make up a growing share of total freight both by tonnage and value by 2050. The water mode will see an increased share of total tonnage but a lower share of value. The rail mode is expected to see a decrease in its share of total tonnage and value in Northwest Indiana (although the multiple modes & mail mode, which often includes rail intermodal, is expected to see increases in total value). The pipeline mode will see a steady share of total tonnage but a significant reduction in relative freight value. And the air mode will see a minor rise in its share of freight value.



Source: CPCS analysis of FAF5 data, 2022. For international flows, only modes for domestic segments are examined here.

Figure 4-21: Tonnage Modal Split for Northwest Indiana *Figure 4-22: Value Modal Split Northwest Indiana*

Freight Mode	Tonnage		Value	
	2017	2050	2017	2050
Truck	35.3%	40.6%	54.0%	61.8%
Rail	12.3%	7.7%	6.7%	4.9%
Water	4.8%	6.3%	0.4%	0.2%
Air	0.0%	0.0%	0.5%	0.8%
Multiple Modes & Mail	9.4%	7.3%	11.2%	13.7%
Pipeline	38.1%	38.1%	27.1%	18.6%
Other/Unknown	0.0%	0.0%	0.1%	0.0%

Source: Freight Analysis Framework 4.5 and Freight Analysis Framework 5, 2021

Table 4-6: Freight Modal Split in Northwest Indiana, 2017 vs. 2050

Northwest Indiana's total freight tonnage is expected to increase by 13 percent between 2017 and 2050. Total freight value is expected to increase by 42 percent.

2017 Top Commodities by Tonnage	Share	2050 Top Commodities by Tonnage	Share
Gasoline	16.8%	Crude Petroleum	21.9%
Crude petroleum	16.2%	Base metals	11.6%
Base metals	14.7%	Coal-NEC	9.4%
Coal-NEC	7.2%	Gasoline	8.8%
Metallic Ores	7.2%	Basic chemicals	8.1%

Source: CPCS analysis of FAF5 data, 2022

Table 4-7: Top Five Current Commodity Shares by Tonnage, 2017 vs. 2050

As shown in Table 4-7, the top five commodities in 2017 by volume were gasoline, crude petroleum, base metals, coal-NEC, and metallic ores. By 2050, this ranking will be rearranged, with gasoline falling from first to fourth place due to an 8 percent decrease in tonnage share. Crude petroleum will rise by 5.7 percent to first place. Metallic ores will be replaced in the fifth-ranked position by basic chemicals.

2017 Top Commodities by Value	Share	2050 Top Commodities by Value	Share
Base metals	18.2%	Base metals	21.9%
Gasoline	16.0%	Crude petroleum	10.0%
Crude petroleum	9.2%	Mixed freight	8.7%
Mixed freight	6.7%	Pharmaceuticals	7.7%
Fuel oils	5.4%	Gasoline	6.7%

Source: CPCS analysis of FAF5 data, 2022.

Table 4-8: Top Five Current Commodity Shares by Value, 2017 vs. 2050

As shown in Table 4-8, the top five commodities in 2017 by value were base metals, gasoline, crude petroleum, mixed freight, and fuel oils. By 2050, the base metals sector will solidify its position in first place, with its share of total freight value rising by 3.7 percent. However, the remaining rankings will be rearranged, with gasoline falling from second to fifth place due to a 9.3 percent decrease in value share. Crude petroleum will rise by 0.8 percent to second place. Pharmaceuticals will enter the rankings in the fourth-place position.

Trading Partners

The top domestic trading partners by tonnage for goods originating in Northwest Indiana in 2017 were Indiana, Illinois, Michigan, Ohio, and Wisconsin (Table 4-9). For goods destined for Northwest Indiana, the top domestic trading partners were Indiana, Illinois, North Dakota, Minnesota, and Michigan (Table 4-10).

The top international trading partner for Northwest Indiana in 2017 by both tonnage and value was Canada (Table 4-11). Europe, Eastern Asia, and Mexico are also significant international origins and destinations for goods moving through Northwest Indiana.

State	Tonnage	Share
1. Indiana	40,156.9	46.2%
2. Illinois	16,987.9	19.5%
3. Michigan	7,738.77	8.9%
4. Ohio	4,370.4	5.0%
5. Wisconsin	4,238.6	4.9%
6. Iowa	3,404.8	3.9%
7. Alabama	1,652.4	1.9%
8. Kentucky	1,228.3	1.4%
9. Texas	797.1	0.9%
10. California	676.0	0.8%
All other states	5,696.4	6.6%
Total	86,947.6	100%

Source: CPCS analysis of FAF5 data, 2022. Note: Indiana includes goods moving entirely within NWI.

Table 4-9: Top Domestic Trading Partners by Tonnage for Goods Originating in Northwest Indiana

State	Tonnage	Share
1. Indiana	34,961.5	25.7%
2. Illinois	26,119.6	19.2%
3. North Dakota	18,884.5	13.9%
4. Minnesota	13,351.5	9.8%
5. Michigan	8,953.2	6.6%
6. Texas	5,452.8	4.0%
7. Ohio	4,848.4	3.6%
8. Wyoming	4,266.7	3.1%
9. West Virginia	4,097.6	3.0%
10. Colorado	2,332.6	1.7%
All other states	12,514.7	9.2%
Total	135,782.9	100%

Source: CPCS analysis of FAF5 data, 2022. Note: Indiana includes goods moving entirely within NWI.

Table 4-10: Top Domestic Trading Partners by Tonnage for Goods Destined for Northwest Indiana

By Tonnage		By Value	
Region	**Share**	**Region**	**Share**
Canada	95.5%	**Canada**	58.6%
Mexico	1.4%	**Europe**	15.5%
Eastern Asia	1.2%	**Eastern Asia**	12.4%
Europe	0.67%	**Mexico**	6.5%
Everywhere else	1.2%	**Everywhere else**	7.0%

Source: CPCS analysis of FAF5 data, 2022

Table 4-11: Top International Trading Partners by Tonnage and Value, 2017

Road Network

The Northwest Indiana region's road network supports more than a third of all freight movement by tonnage and more than half by value. This network is made up of roughly 5,884 miles of public roadways. This includes nearly 227 miles of Interstates, accounting for over 17 percent of Indiana's total Interstate mileage. Northwest Indiana's Interstate system is supplemented by about 302 miles of US highways, 256 miles of State Routes (SR), and an integrated network of county and local routes.

In 2017, trucks on Northwest Indiana roads carried 35.3 percent of the total freight tonnage and 54.0 percent of the value in Northwest Indiana, highlighting the importance of this mode for the movement of freight in the region. As shown in Table 4-12, the top commodities moved by truck by tonnage included base metals, gasoline, gravel, basic chemicals, waste/scape, and fuel oils.

In 2017, the top domestic trading partners by tonnage for truck movements originating in Northwest Indiana, in descending order, were Indiana, Illinois, Michigan, Ohio, and Wisconsin. The top partners for truck movements destined for Northwest Indiana were Indiana, Illinois, Ohio, Michigan, and Wisconsin.

227	558	4,472	997
Miles of Interstate	Miles of US and State Highways	Truck parking spaces	Bridges

Commodity	Tonnage	Share of Total
Base metals	17,871,181	25.9%
Gasoline	6,568,345	9.5%
Gravel	5,694,105	8.2%
Basic chemicals	4,963,956	7.2%
Waste/scrap	4,412,234	6.4%
Fuel oils	4,104,573	5.9%
Nonmetal mineral products	3,912,794	5.7%
Cereal grains	3,538,039	5.1%
Other foodstuffs	2,987,038	4.3%
Articles-base metal	2,417,973	3.5%
Mixed freight	1,743,543	2.5%
Other ag prods.	1,076,533	1.6%
Natural sands	916,311	1.3%
Coal-NEC	911,714	1.3%
Animal feed	801,871	1.2%
Wood products	774,544	1.1%
Chemicals products	723,754	1.0%
All others	5,605,322	8.1%
Total	69,023,827	100%

Source: CPCS analysis of FAF5 data, 2022.

Table 4-12: Major Commodities by Tonnage Carried by Trucks in Northwest Indiana, 2017

Key Corridors

Trucking activities in Northwest Indiana are served by four Interstates: I-65, I-80, I-90, and I-94. Although the region carries four Interstates by name, the region only houses three Interstate routes in practice. I-80 runs concurrently with I-94 west of Lake Station and concurrently with I-90 east of Lake Station. These Interstates offer access south to the Gulf of Mexico, west to the Pacific Northwest and Bay Area, east to New York and New England, and north to the Michigan peninsula. The region is also served by several US Highways and State Routes, primarily US 12, US 20, US 30, and SR 49.

Key roads for truck movement are presented in the truck share map shown in Figure 4-23 and the truck AADT map shown in Figure 4-24. As shown, I-80/I-90 east of SR-49 experiences the highest share of truck traffic in Northwest Indiana. Unsurprisingly, the region's four Interstates handle the highest levels of truck AADT. Of note is the relatively high truck shares of all vehicle traffic on segments of US 12 south of Burns Harbor and on SR 249, which connects US 12 with I-94. While there are no officially designated truck routes in Northwest Indiana, these roadways are preferred by truck drivers because of their geometric compatibility with truck maneuvers and their location relative to freight origins and destinations.

According to Northwest Indiana stakeholders, the high volume of truck traffic and the incompatibility of truck movements with other roadway modes, especially active transportation modes, create mobility, safety, and air quality issues. Also, heavy trucks that move to and from major freight establishments contribute to pavement and bridge infrastructure damage. Formal designation of truck routes in Northwest Indiana can address these concerns; however, a detailed truck impact assessment is required to identify optimal routes and restriction points that can improve efficiency and safety for all road users. The specific issues are assessed in Appendix 4A.

I-65

Interstate 65 is the only north-south Interstate operating in Northwest Indiana and runs entirely within Lake County. The northern end of the Interstate interchanges with I-80 and I-94 and terminates at an interchange with I-90, US 12, and US 20 in Gary. In 2019, the highest Annual Average Daily Traffic (AADT) on I-65 was experienced between its interchange with Ridge Road in Lake Station and its interchange with I-80/94 (Borman Expressway) in Gary. Along this segment, I-65 saw an AADT of roughly 111,757 vehicles, of which 10.5 percent, or 11,766, were combination trucks. More information about AADT on I-65 through Northwest Indiana can be found in Appendix 4D.

I-80

Interstate 80 travels east-west through Northwest Indiana. Between the Illinois state line and Lake Station, it operates concurrently with I-94, a section of highway that is also called the Borman Expressway. East of Lake Station it travels concurrently with I-90, along the Indiana Toll Road. From the west, I-80 enters Northwest Indiana from Illinois on the border of Munster and Hammond. It then travels alongside the Little Calumet River, interchanging with I-65, before its switch from I-94 to I-90. I-80 then travels south of Michigan City and north of La Porte before exiting Northwest Indiana through the northeast corner of La Porte County. In 2019, the highest Annual Average Daily Traffic (AADT) on I-80 was experienced concurrently with I-94 roughly between Burr St and SR 53 (Broadway) in Gary. Along this segment, I-80 saw an AADT of roughly 185,482 vehicles, of which 10.5 percent, or 19,528, were combination trucks. More information about AADT on I-80 through Northwest Indiana can be found in Appendix 4D.

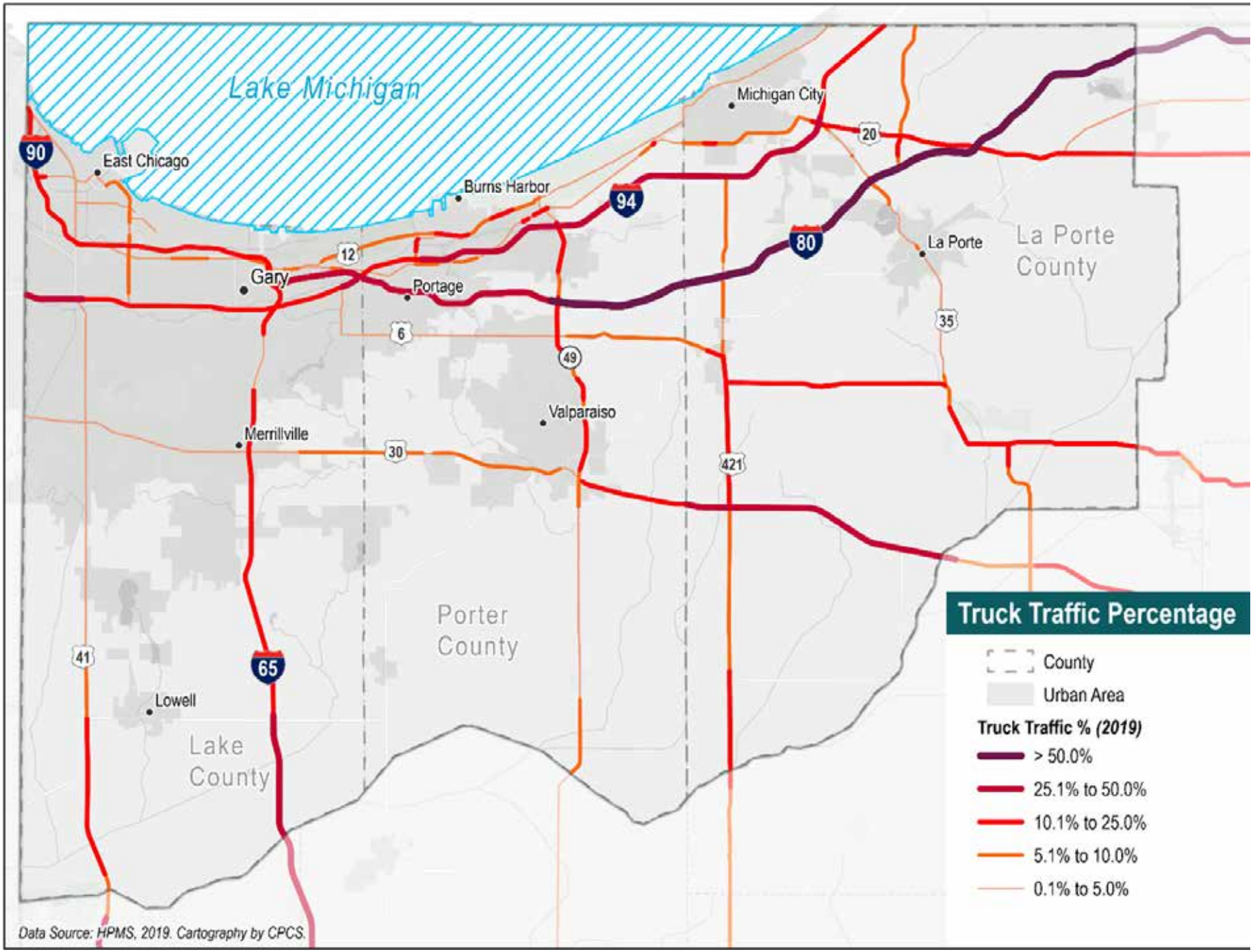


Figure 4-23: Truck Traffic Share in Northwest Indiana, 2019

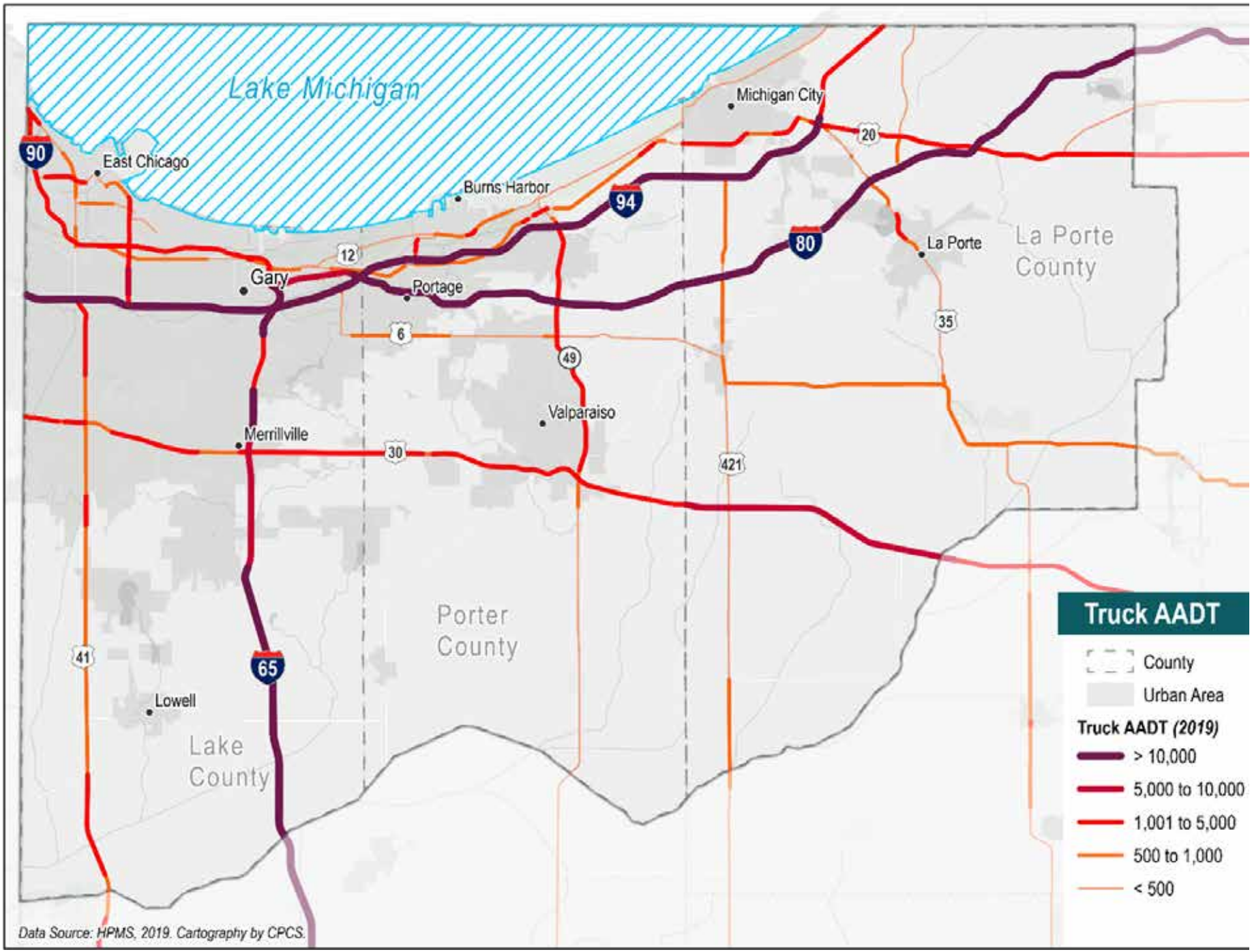


Figure 4-24: Truck Annual Average Daily Traffic in Northwest Indiana, 2019

I-94

Interstate 94 travels from the Illinois state line on the border of Hammond and Munster, alongside the Little Calumet River, to the Michigan state line northeast of Michigan City. The portion of I-94 in Northwest Indiana that lies west of Lake Station is also called the Borman Expressway and runs concurrently with I-80. In 2019, the highest Annual Average Daily Traffic (AADT) on I-94 was experienced concurrently with I-80 roughly between Burr St and SR 53 (Broadway) in Gary. Along this segment, I-94 saw an AADT of roughly 185,482 vehicles, of which 10.5 percent, or 19,528, were combination trucks. More information about AADT on I-94 through Northwest Indiana can be found in Appendix 4D.

I-90

Interstate 90, 157 miles in its entirety, is owned by the Indiana Finance Authority and operated by the Indiana Toll Road Concession Company (ITRCC). The ITRCC was acquired by Australia-based IFM Investors in 2015 for over $5.7 billion.[12] According to its website, the ITRCC has invested over $200 million in the road since 2016. The Indiana Toll Road generally travels east-west through Northwest Indiana. From the west, it enters Northwest Indiana through the region's northwest corner at the Illinois state line, traveling north-south to the Grand Calumet River, then turning to travel east-west alongside US 20. In Gary, the Indiana Toll Road interchanges with I-65, US 20, and US 12, and in Lake Station, it interchanges with I-80/94 (Borman Expressway), running concurrently with I-80 for the rest of its length. In 2019, the highest Annual Average Daily Traffic (AADT) on I-90 was experienced between its interchange with I-65 in Gary and its interchange with I-80/94 (Borman Expressway) in Lake Station. Along this segment, I-90 saw an AADT of roughly 28,570 vehicles, of which 30.9 percent, or 8,842, were combination trucks. More information about AADT on I-90 through Northwest Indiana can be found in Appendix 4D.

US 12

US 12 is an important highway in Northwest Indiana that runs east-west from the Illinois border in the region's northwest corner, along the Lake Michigan coast, and then northeast to the Michigan border. It frequently runs concurrently with US 20 in Lake County and otherwise runs parallel to US 20 until Michigan City. Many portions of the route are divided highways, though the width of the road frequently changes. The route traverses a number of city centers, including Gary and Michigan City, as well as Indiana Dunes National Park as a two-lane rural road. In 2019, the highest AADT on US 12 was experienced in East Chicago. Here, AADT reached roughly 44,786 vehicles, of which 10.9 percent, or 4,891, were trucks.

Truck Restrictions on US 12

Because US 12 travels through the Indiana Dunes National Park and is used extensively for recreational purposes, there has been discussion among regional stakeholders and the public of potential solutions for improving safety and environmental concerns associated with conflicting uses of the road, with heavy duty freight traffic on the one hand and environmental recreational activity on the other. The portion of US 12 between SR 49 and Michigan City experiences relatively low truck share and truck AADT (Figure 40 and Figure 41), meaning potential truck route designation would not impose exorbitant demand on surrounding roads or significant disruptions to truck traffic. These effects would be outweighed by the potential safety, environmental, and quality of life benefits in the Indiana Dunes area. Truck route designation and truck-only lanes are among methods that might also be appropriate on other roads in Northwest Indiana with relatively low truck traffic, nearby route redundancy, and conflict issues between freight, recreational, and other road uses.

12 Down-under consortium claims victory in Toll Road bidding | Lake County News | www.nwitimes.com

US 20

US 20 is another important highway in Northwest Indiana that runs east-west from the Illinois border in the region's northwest corner, along the Lake Michigan coast, before turning east and continuing towards Ohio. It frequently runs concurrently with US 12 in Lake County and otherwise runs parallel to US 12 until Michigan City. Many portions of the route are divided highways, though the width of the road frequently changes. The route traverses many city centers, including Gary and Michigan City. US 20 is the primary INDOT-designated Heavy Duty highway traversing the region. In 2019, the highest AADT on US 20 was experienced in Porter. Here, AADT reached roughly 25,421 vehicles, of which 16.4 percent, or 4,172, were trucks.

US 6

US 6 is a key east-west highway in Northwest Indiana that runs concurrent to the Borman Expressway until Lake Station, where it turns south before continuing east again towards the Ohio border. The width of US 6 is variable in Northwest Indiana, sometimes operating as a four-lane divided highway and other times as a two-lane rural road. In 2019, the highest AADT on US 6 was experienced in Lake Station near its interchange with the Borman Expressway. Here, AADT reached roughly 23,998 vehicles, of which 4.7 percent, or 1,118, were trucks.

US 30

US 30 is a key highway in Northwest Indiana that runs east-west south of other major east-west routes in Northwest Indiana from the Illinois border in Dyer, east through Valparaiso, and slightly southeast towards Ohio. It operates almost entirely as a four-lane divided highway in Northwest Indiana. While US 30 traverses several communities in Northwest Indiana, it avoids municipal centers, except for Dyer. In 2019, the highest AADT on US 30 was experienced in Merrillville at the interchange with I-65. Here, AADT reached roughly 60,028 vehicles, of which 5.9 percent, or 3,537, were trucks.

SR 49

SR 49 is a key north-south highway in Northwest Indiana that operates east of the I-65 route. It begins south of Indiana Dunes State Park and interchanges with US 12, US 20, I-94, I-80, I-90, US 6, and US 30 as it travels south towards the Kankakee River. Between its interchange with I-94 in Chesterton and its interchange with US 30 in Valparaiso, SR 49 operates as a four-lane divided highway. In 2019, the highest AADT on SR 49 was experienced near its interchange with US 6. Here, AADT reached roughly 36,382 vehicles, of which 13.2 percent, or 4,811, were trucks.

National Highway System

The National Highway System (NHS) consists of federally designated highways and major arterials that are critical components of the national and statewide transportation systems and important to the economic vitality of states, regions, and local communities. NHS includes the interstate highways, principal arterials that connect origins and destinations with the interstate system, the Strategic Highway Network (STRAHNET), which is key to the US's defense policy and emergency response capability, and Strategic Highway Network Connectors, which provide access to the STRAHNET highways, and Intermodal Connectors.

All four Interstates in Northwest Indiana (I-65, I-80, I-90, and I-94) are part of the National Highway System. In addition, there are four US highways (US 6, US 30, US 35, and US 41) and four Indiana state highways (SR 2, SR 49, SR 912, and portions of SR 39) that are included in the NHS designation.[13] All Interstates in Northwest Indiana are included in the STRAHNET network.[14]

13 Indiana National Highway System, USDOT FHWA, 2021.

14 Indiana, US Army Transportation Engineering Agency, 2015.

National Highway Freight Network

In line with Fixing America's Surface Transportation Act (FAST Act) requirements, FHWA has established the National Highway Freight Network (NHFN). The NHFN consists of interstate and Primary Highway Freight System (PHFS) segments that are critical to the movement of goods. The NHFN also includes Critical Urban and Critical Rural Freight Corridors (CUFCs/CRFCs), which are key public routes connecting freight facilities to PHFS routes and interstates. A CUFC is an urban arterial that fosters connections between intermodal freight facilities to the interstate system, while a CRFC is a rural arterial where more than 25 percent of the AADT is truck traffic.[15] CRFC/CUFC designation provides access to Federal resources for investment in freight performance improvements.

Within Northwest Indiana, I-65, I-80, and I-94 are designated PHFS routes. In 2019, NIRPC recommended that 34.73 miles be allotted for CRFC, and 16.38 miles be allotted for CUFC mileage in Northwest Indiana.[16] NIRPC convinced INDOT and FHWA to designate the approximately 1.3 mile stretch of Crisman Rd/Willowcreek Bypass from US 20 to the Indiana Toll Road entrance in the City of Portage as a CUFC. Indiana DOT is in the process of updating its state freight plan. However, the state is currently not planning to update NHFN designations, including additional critical freight corridors.

15 USDOT, FAST Act, Section 1116 National High way Freight Program (NHFP) Guidance: Designating and Certifying Critical Rural Freight Corridors and Critical Urban Freight Corridors, 2016.

16 https://www.nirpc.org/wp-content/uploads/2019/08/Critical-Urban-Freight-Corridors-Presentation.pdf

Key Structures and Facilities

Bridges

There are nearly 1,000 road bridges in Northwest Indiana, accounting for about 5.2 percent of Indiana's 19,337 bridges despite making up only 4.2 percent of the state's total land area.[17] Indeed, Northwest Indiana houses over three times more bridges per square mile than the US overall.[18] Significant concentrations of Northwest Indiana bridges are located in the northern and western parts of the region. Indeed, there are 495 bridges in Lake County, 276 in Porter County, and 226 in La Porte County.

Movable Bridges

Northwest Indiana has three bascule bridges (movable bridges). Two are located in the Indiana Harbor complex in East Chicago. One is located on Dickey Road over the Indiana Harbor Canal, and the other is located on Indianapolis Boulevard (US 12/US 20) over the Lake George Canal. The third movable bridge is located on Franklin Street in Michigan City over Trail Creek.

17 Based on the number of bridges identified in the UDSOT National Bridge Inventory. Assumes that the land area of Indiana is 35,868 square miles and that the land area of Northwest Indiana is 1,515.4 square miles.

18 Based on the number of bridges identified in the UDSOT National Bridge Inventory. Assumes that the land area of the US is 3,531,905 square miles and that the land area of Northwest Indiana is 1,515.4 square miles.

Figure 4-25: Dickey Street Movable Bridge

Figure 4-27: Franklin Street Movable Bridge

Figure 4-26: Indianapolis Boulevard Movable Bridge

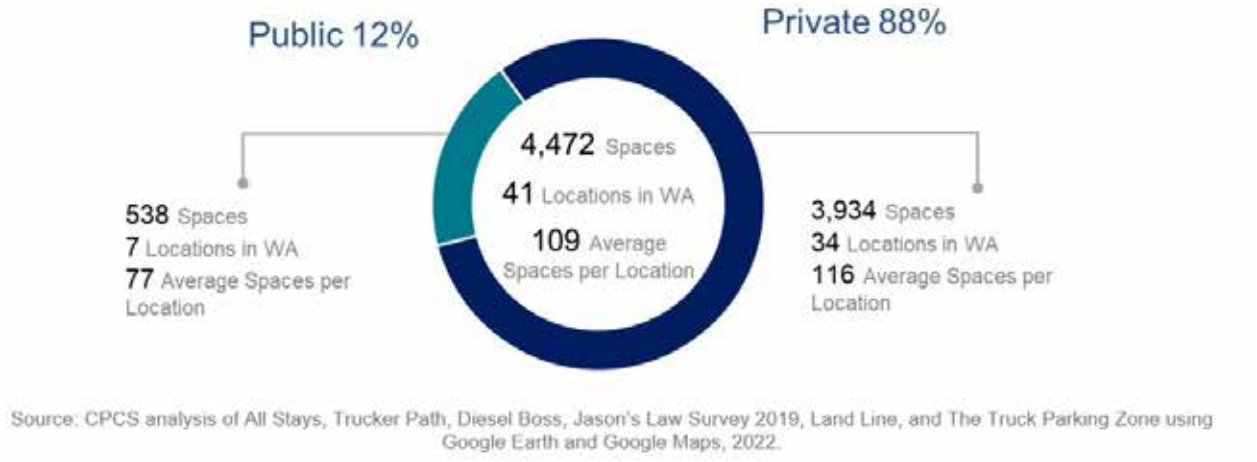


Figure 4-28: Truck Parking in Northwest Indiana

Truck Parking

On average, truck drivers spend 56 minutes every day searching for parking, which exacerbates existing road congestion and reduces the efficiency of the trucking mode.[19] Moreover, this inability to quickly find truck parking costs drivers roughly $5,000 a year in lost wages.[20] Sufficient truck parking availability is critical to improve trucking safety and efficiency and reduce overall traffic mobility. Stakeholders consulted repeatedly reported issues in Northwest Indiana regarding the availability of truck parking in the region. Currently, there are about 41 truck parking locations in Northwest Indiana. Together, these sites provide just under 4,500 truck parking spaces. The majority of these spaces are in private locations. Transport Properties in Gary alone provides over 570 truck parking spaces. An overview of truck parking in Northwest Indiana is shown in Figure 4-28, but a comprehensive truck parking inventory can be found in Appendix 4E.

Truck Parking Information Systems (TPIMS) are another effective method to make it easier for truck drivers to safely and quickly find truck parking. TPIMS provides real-time information on the number of available trucking parking spaces at participating sites. This information can be shared online or using dynamic roadside signs. Indiana is part of the MAASTO TPIMS project, which jointly establishes a single system between eight states in the Midwest. Indiana has installed TPIMS systems at 19 locations in the state, with another six planned. There are currently no TPIMS sites in Northwest Indiana, although a site is planned for 2026 at the Indiana Welcome Center on I-94 in La Porte County.[21]

19 ATRI 'parking diaries' reveal ELDs make finding parking more difficult, Overdrive, James Jaillet, November 2021.

20 Ibid.

21 Indiana TPIMS Lots, INDOT, (n.d.).

Railroad Network

Railroads provide an efficient means of goods movement, saving consumers and freight-dependent industries billions of dollars in shipping costs and reducing energy consumption and emissions. Rail freight is often used to carry high-volume and relatively low-value cargo such as fossil fuels and agricultural products over long distances.

Rail traffic in Northwest Indiana is largely composed of heavier-bulk cargo, which is generally fossil fuels and steel manufacturing products transported to and from industrial establishments. Northwest Indiana has a high-density rail network and is served by over 674 miles of Class I railroad operation and 258 miles of short line operation, accounting for 23 percent of Indiana's freight rail system. The region's rail network crosses the public road system at 675 at-grade crossings, 64 rail bridges, and 107 rail underpasses. The rail network is also supported by multi-modal connection points such as ports, transload facilities, and grain elevators that link the region to national and global markets.

In 2017, the rail mode carried 12.3 percent of the total freight tonnage and 6.7 percent of the value in Northwest Indiana, indicating higher weight and lower value goods. As shown in Table 4-13, the top commodities by tonnage were coal, base metals, coal-NEC., metallic ores, and nonmetal mineral products.

In 2017, the top domestic trading partners by tonnage for rail movements originating in Northwest Indiana, in descending order, were Indiana, Alabama, Ohio, California, and Illinois. The top partners for rail movements destined for Northwest Indiana were West Virginia, Indiana, Wyoming, Illinois, and Wisconsin.

Commodity	Tonnage	Share of Total
Coal	10,012,977	41.6%
Base metals	7,307,020	30.4%
Coal-NEC	2,511,505	10.4%
Metallic ores	806,026	3.4%
Nonmetal mineral products	702,580	2.9%
Basic chemicals	651,925	2.7%
Nonmetallic minerals	540,897	2.2%
All others	1,519,245	6.3%
Total	69,023,827	100%

Source: CPCS analysis of FAF5 data, 2022.

Table 4-13: Major Commodities by Tonnage Transported by Rail in Northwest Indiana, 2017

Key Corridors, Structures, and Facilities

Railroads are classified by the Surface Transportation Board (STB) according to their annual revenues; Class I railroads have annual revenue of $943.9 million or more, Class II or regional railroads have an annual revenue lower than the Class I railroads threshold but more than $42.4 million, and Class III railroads or short lines have annual operating revenues below $42.4 million.[22] Northwest Indiana is served by three Class I railroads and four short lines that operate over 930 miles of track and trackage rights combined.[23]

As Table 4-14 shows, *CSX Transportation railroad (CSXT)* operates on nearly 205 miles of track in Northwest Indiana, which is about 22 percent of the region's total rail freight operations mileage. CSXT's rail operations are anchored in Chicago, New York, and Atlanta, with trains serving major markets in the northwest, northeast, and southeast parts of the US. CSXT's Garret and Barr subdivisions provide east-west connections across the northern parts of the country. Both of these subdivisions pass through Northwest Indiana and are among the railroads' most heavily trafficked lines, carrying 50 to 100 million tons of cargo per mile annually.[24] The railroad's Porter and Grand Rapids subdivisions are also located in Northwest Indiana, providing Class I rail connection to the industrial facilities located along Lake Michigan's shoreline. CSXT's major intermodal facility in Indiana is in Avon. The railroad also has several intermodal yards within the Greater Chicago Area on the Illinois side, including in Bedford Park and Forest Hill areas and on 59th St. in Chicago.

Norfolk Southern Railway (NS) operates on over 240 miles of track in Northwest Indiana, accounting for 26 percent of the region's total rail freight operations. The railroad's Chicago Line and Chicago District subdivisions run east-west through Northwest Indiana, while the Kankakee Line subdivision runs south-north through Lake County. The Chicago Line is one of the railroad's busiest lines in the US and the most heavily trafficked rail line in Indiana and Northwest Indiana, carrying over 100 million tons of cargo per mile annually.[25] NS has a significant intermodal facility in Elkhart, IN, as well as several facilities in the Greater Chicago Area on the Illinois side, such as the Calumet and Ashland Ave facilities.[26]

Canadian National Railway (CN) is also a Class I railroad operating on 229 miles of track in Northwest Indiana, serving trains that run between Chicago and eastern Canada. The CN trains carry between 10 and 50 million tons per mile in Northwest Indiana annually. [27] CN's largest railyard in the US is Kirk Yard, located in Gary, IN. Kirk Yard primarily serves US Steel's Gary Works mill and consolidates CN's switching operations in the Greater Chicago Area.[28]

22 STB, Rail Service Data, Accessed August 2022.
23 Includes private switching railroad mileage. Source: STB North American Rail Lines, 2022.
24 Indiana State Rail Plan, 2021.
25 Ibid.
26 Intermodal of Chicago Website, Chicago Area Intermodal Rail Terminals & Depots, accessed July 2022.
27 Indiana State Rail Plan, 2021.
28 CN Transportation Website, Fact Book, accessed July 2022.

Short Lines active in the Northwest Indiana region serve a wide range of industries and provide connections between various businesses and the Class I rail operations. The Chicago, Ft. Wayne & Eastern Railroad (CFE) is a Genesee & Wyoming Inc. short line that operates on 49 miles of track between Crestline, OH, and Blue Island, IL, through Valparaiso and Gary in Northwest Indiana. The Chesapeake & Indiana Railroad (CKIN) short line operates over 29.6 miles of track in Northwest Indiana, interchanging with CSXT in Wellsboro/Union Mills, IN, and with NS in Thomaston, IN. The Chicago South Shore & South Bend Railroad (CSS) short line trains run over 96.5 miles of track in Northwest Indiana, along Lake Michigan's shoreline. CSS trains interchange with NS and CN railroads in South Bend, IN, with CN railroad in Stillwell, IN, and with CN, CSXT, and Union Pacific (UP) railroads at the Kensington Interchange in Chicago, IL. Finally, the Indiana Harbor Belt Railroad (IHB) short line operates over 83 miles of track in Northwest Indiana. IHB is the largest switching railroad in the US, serving 160 customers between Gary and Franklin Park, IL.

Additionally, Amtrak and Northern Indiana Commuter Transportation District (NICTD) provide passenger rail service in Northwest Indiana. Amtrak operates on tracks also operated by CSXT and NS, while NICTD's South Shore Line trains operate on dedicated tracks between South Bend and downtown Chicago. Construction began in 2021 on the $491 million South Shore Line Double Track project between Michigan City and Gary, with completion slated for 2024. As its name suggests, the project will add 16.9 miles of the second track to this NICTD corridor in order to reduce travel times by over 30 minutes. Although these improvements will mainly benefit passenger rail service, the increased transit use spurred by the project has the potential to reduce congestion on roadways. The project will also eliminate 21 at-grade crossings in Michigan City, which will improve safety and mobility for all modes in the area.[29]

29 Double Track Northwest Indiana Project Overview, NICTD South Shore Line.

Railroad	Type	Miles Owned in NWI*	Miles Trackage Right	Total Operating Miles
CSX Transportation (CSXT)	Class I	151.4	53.5	204.9
Norfolk Southern Railway (NS)	Class I	211.5	29.0	240.5
Canadian National Railway (CN)	Class I	209.3	19.8	229.0
Chicago, Ft. Wayne & Eastern Railroad (CFE)	Short Line	38.0	11.0	49.0
Chesapeake & Indiana Railroad (CKIN)	Short Line	29.6	-	29.6
Chicago South Shore & South Bend Railroad (CSS)	Short Line	38.0	58.5	96.5
Indiana Harbor Belt Railroad (IHB)	Short Line	71.3	12.0	83.3

Source: CPCS analysis of rail profile data provided by NIRPC, 2022; Indiana State Rail Plan, 2021; American Association of Railroads, 2022; STB North American Rail Lines Data, 2022.
*In addition to the Class I and short line railroads, three switching railroads operate in NWI; Gary Railway Company, Lake Michigan & Indiana Railroad Company, and Plate Valley Trolley serving US Steel's Gary Works, ArcelorMittal USA, and Buzzi Unicem Cement companies, respectively.

Table 4-14: Freight Railroads Serving Northwest Indiana

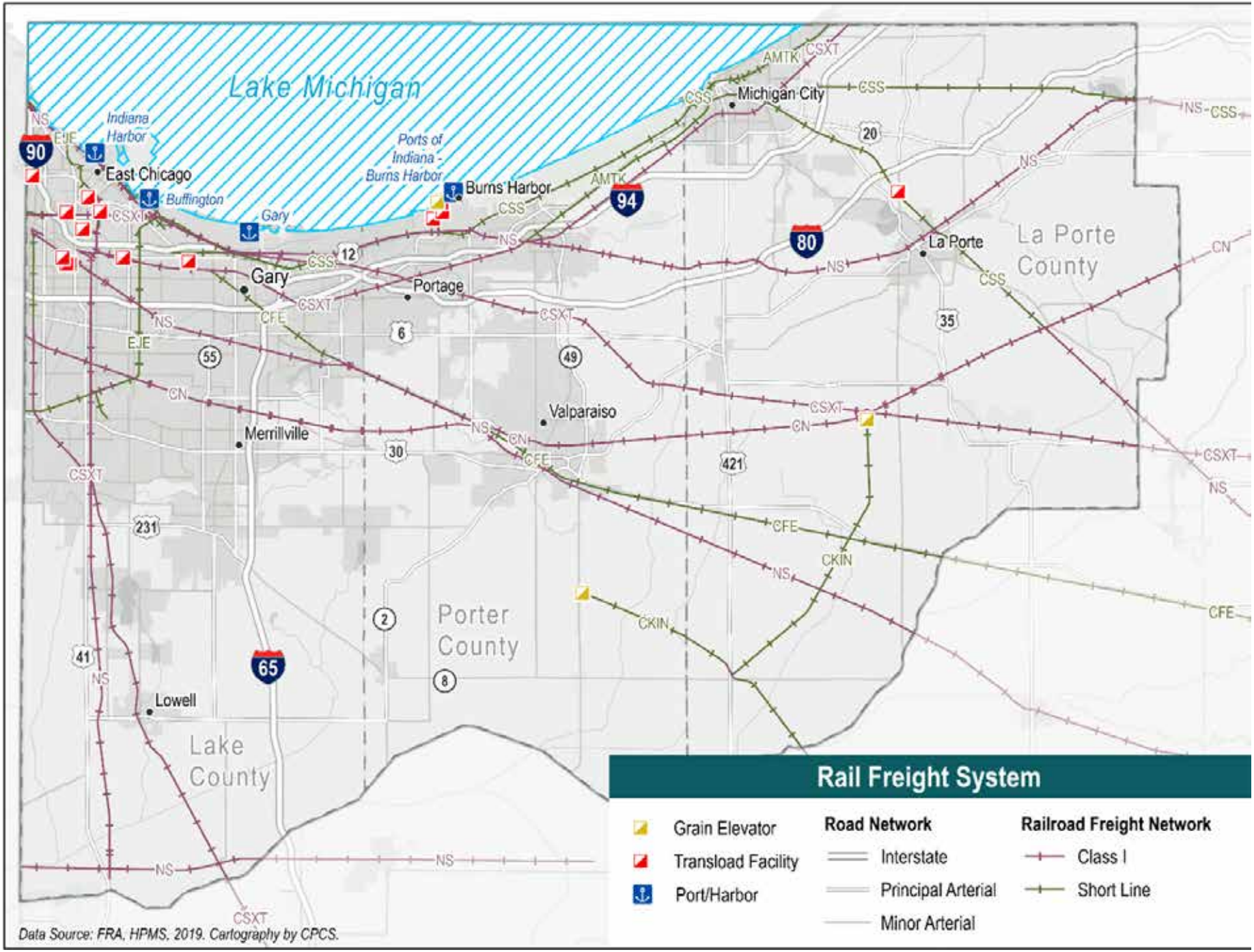


Figure 4-28: Northwest Indiana Freight Rail System, 2019

Rail-Served Multi-modal Facilities

There are 17 transload facilities and three grain elevators in Northwest Indiana. Transload facilities enable the handling and transfer of goods between truck and rail modes. Rail-served grain elevators transfer grains between railcars and grain storage bins.

A list of the transload facilities in Northwest Indiana is provided in Table 4-15, and the region's rail-served grain elevators are listed in Appendix 4F.

In addition to the truck/rail transload facilities and grain elevators, three of the maritime facilities in Northwest Indiana are served by rail:[30]

- ***Port of Indiana – Burns Harbor*** is served by NS railroad along 7 miles of track with the harbor and a railyard owned and operated by NS. The railyard handles over 9,000 railcars annually, primarily carrying manufactured steel products and steel scraps.
- ***Indiana Harbor*** is served by IHB short line, primarily handling railcars carrying steel products.
- ***Port of Gary*** is served by the Gary Railway general carrier line, which interchanges with CN's operations. Railcars served at the Port primarily carry steel products.

Facility	Location	Serving Railroad	Commodities
L&M Storage	East Chicago	IHB	Construction Material
Buckeye Partners	East Chicago	IHB	Industrial Liquid
Steel Warehouse	East Chicago	IHB	Metals
CSXT Transflo East Chicago	East Chicago	CSXT	Liquid Bulk
United Transportation Group	East Chicago	IHB	General Transloading, Car Cleaning
National Industrial Lumber	Gary	IHB	Construction Material
Partners Metals Warehouse	Gary	IHB	Metals
Savage Services	Hammond	IHB, INRD	Food Grade, Industrial Liquids, Dry Bulk
Midwest Terminal Services	Hammond	IHB	Metals
Kinder Morgan	Hammond	IHB	Metals
Wolf Lake Terminal	Hammond	IHB	Metals
Watco Transload	Hammond	NS, IHB	Climatic Steel
KL Chempak Inc	La Porte	Multiple	Liquid Bulk
Frick Services	Portage	IHB	Industrial Dry Bulk
Tanco Terminals	Portage	IHB	Industrial Liquid
Lakes & Rivers Transfer	Portage	IHB	Metals

Source: INDOT, State Rail Plan, 2021.

Table 4-15: Transload Facilities in Northwest Indiana

30 Indiana State Rail Plan, 2021.

Rail Movable Bridges

There are two rail movable bridges in Northwest Indiana, both of which travel over the Indiana Harbor Canal and along the Elgin, Joliet, and Eastern line (miles 0.68 and 1.89) owned and operated by the Canadian National (CN) Railroad. These bridges used to open on signal and were staffed by draw tenders at each bridge. However, due to a decline in the number of trains on the line (less than three trains per week) and CN's request, the movable bridges operate only when there is train traffic.[31] There is also one rail swing bridge in Northwest Indiana over Trail Creek in Michigan City, owned by Amtrak but also used by Norfolk Southern.

Rail Crossings

Table 4-16 presents the number of rail crossings in Northwest Indiana by position and type. A roadway-rail crossing can be at-grade or grade separated, in which case the rail tracks either pass over the roadway or under it. In terms of type, public crossings are located along the rail tracks crossing public roadways, while private crossings are with roads on private properties. A small portion of roadway-rail crossings may have an unknown status.

There are 1,050 rail crossings in the region, of which over 80 percent are public. Moreover, about 82 percent of all rail crossings in the region are at-grade, which is lower than in both Indiana and the US overall.[32] Nevertheless, Northwest Indiana still has a significantly greater concentration of at-grade crossings mile than both Indiana and the US. Measured in terms of crossings per roadway miles, Northwest Indiana has one public at-grade crossing for every 8.8 miles of the public roadway, while the concentration of at-grade crossings in Indiana is one per every 17 miles of public road, which is the highest across all US states.[33] Lake County houses roughly half of all rail crossings in Northwest Indiana, followed by La Porte County with about 31 percent and Porter County with about 19 percent. About 46 percent of the at-grade crossings in Northwest Indiana are in Lake County, 35 percent are in La Porte County, and 19 percent are located in Porter County.

FHWA provides guidance on equipping at-grade crossings with warning devices in the Manual of Uniform Traffic Control Devices (MUTCD). According to the MUTCD, all public grade crossings should at least be equipped with passive warning devices to mitigate conflict between rail and other modes, which will lead to safety incidents. Traffic control devices such as signs and markings located at or in advance of grade crossings to indicate the presence of a rail crossing are known as passive warning devices. In contrast, active warning devices such as flashing lights and gates change their aspect at the approach or passing of a train. Typically, a combination of passive and active warning devices are installed at grade crossings to improve safety.[34]

Crossing Position	Private	Public	Unknown*	Total
At-Grade	186	675	2	863
Railroad Over the Road	8	64	0	72
Railroad Under the Road	7	107	1	115
Total	201	846	3	1,050

Source: CPCS analysis of FRA Rail Crossing Inventory data, 2022.
*Some crossings are keyed as neither private nor public.

Table 4-16: Northwest Indiana Railroad Crossings by Position and Type

31 Federal Register, Drawbridge Operation Regulation; Indiana Harbor Canal, East Chicago, IN, 2020.

32 FRA Rail Crossing Inventory data showed that roughly 90% of rail crossings in Indiana and 88% in the US overall are at-grade.

33 CPCS analysis of FRA crossing inventory data, 2022; INDOT, Indiana State Rail Plan, 2021.

34 Indiana MUTCD, 2011. https://www.in.gov/dot/div/contracts/design/mutcd/mutcd.html

Although FHWA's estimates show that active crossing devices can reduce the risk of incidents at at-grade crossings by about 88 percent,[35] 5-year analysis of statewide rail-related incidents shows that over 50 percent of the at-grade crossing incidents happen at locations equipped with gates. This is likely because active devices such as gates are more likely to be installed where high-volume rail lines cross roadways that serve relatively high vehicle traffic volumes. Indiana and other states are implementing additional safety measures such as full-barrier (or four-quadrant) gates and roadway medians at actively-protected at-grade crossings with a high incident rate.[36] Currently, eight public at-grade crossings in Northwest Indiana are equipped with full-barrier gates (Table 4-18).

35 FHWA, Railroad-Highway Grade Crossing Handbook – 5 Selection of Alternatives, 2007.

36 INDOT, Indiana State Rail Plan, 2021.

Safety Device Type	Public	% of Total Public Crossings	Private	% of Total Private Crossings
Active	551	81.6%	7	3.8%
Passive	120	17.8%	11	5.9%
None	4	0.6%	15	8.1%
Not Specified	-	0.0%	153	82.3%
Total	675	100.0%	186	100.0%

Source: CPCS analysis of FRA Rail Crossing Inventory data, 2022.

Table 4-17: At-Grade Crossing Safety Devices in Northwest Indiana

Crossing Location	Railroad	Roadway
Griffith	CN	45th Ave
Michigan City	Amtrak-Michigan Line	Michigan St/ US 12
Chesterton	CSX	Calumet
Hammond	IHB	165th St
Portage	CSX	Crocker St/SR 149
Gary	CN	Buffington Harbor Dr
Portage	CSX	Tratebas Rd
Westville	NS	US 421

Source: CPCS analysis of FRA Rail Crossing Inventory data, 2022.

Table 4-18: At-Grade Crossings Equipped with Full-Barrier Gates in Northwest Indiana

Maritime Network

Northwest Indiana sits along 42 miles of the Lake Michigan coast. From here, ships can access the St. Lawrence River seaway to the northeast, offering access to Canada and other international destinations. Ships can also access the Chicago canal system to the west, which offers connections to the Mississippi River System, and the Gulf of Mexico. The Indiana Harbor Canal in East Chicago provides access to the Indiana Harbor complex.

In 2017, the maritime mode carried 4.8 percent of the total freight tonnage and 0.43 percent of the value in Northwest Indiana, indicating higher weight and lower value goods. As shown in Table 4-19, the top commodities by tonnage were gravel, coal-NEC, nonmetallic minerals, metallic ores, crude petroleum, and cereal grains.

In 2017, the top domestic trading partners by tonnage for maritime movements originating in Northwest Indiana, in descending order, were Indiana, Louisiana, and California. The top partners for maritime movements destined for Northwest Indiana were Michigan, Indiana, Minnesota, Illinois, and Louisiana.

4 in 1	31 million	11th	~#1
Four ports are included in one consolidated port district	Approximate tonnage handled at NWI ports in 2019	National ranking for domestic tonnage handled by the consolidated port district in 2019	Indiana Harbor is one of the largest integrated steelmaking facilities in North America

Commodity	Tonnage	Share of Total
Gravel	5,561,999	58.8%
Coal-NEC	1,155,672	12.2%
Nonmetallic minerals	1,297,592	13.7%
Metallic ores	1,063,573	11.2%
Crude petroleum	247,301	2.6%
Cereal grains	131,657	1.4%
Total	9,457,793	100%

Source: CPCS analysis of FAF5 data, 2022.

Table 4-19: Major Maritime Commodities by Tonnage in Northwest Indiana, 2017

Key Structures and Facilities

Indiana has six major ports. Four of these ports are located along the 42 miles of Lake Michigan coastline in Northwest Indiana, as shown in Figure Table 4-20.

Ports of Indiana – Burns Harbor is one of the three maritime ports that make up the Ports of Indiana. At just 600 acres, the port handles a significant amount of cargo given its small size. Roughly 350,000 trucks come and go from the port every year. Except for a route traversing a working steel mill, there is only a single access road to the port. This entrance bridge that travels over several railroad tracks is in desperate need of maintenance and repairs and cannot currently handle the port's freight needs. The port plans to build a redundant entrance bridge, then close and fix the original bridge. There are also plans to build a truck marshaling yard to reduce truck idling and delays. Burns Harbor is also in Phase 1 of a multi-phase study to become a microgrid with renewable energy resources.

Port Name	2019 tonnage	National ranking 2019	Commodities	NHS road connection	Railroad connection	Notable assets
Indiana Harbor	12,213,768	43	Steel, waste, gypsum	SR 912, US 12, US 20	Indiana Harbor Belt Railroad (IHB)	One of the largest integrated steelmaking facilities in North America
Burns Harbor	9,189,391	55	Steel, agricultural products, construction materials	I-80, I-90, I-94, I-65, I-12, SR 20	NS, connection to all Class I railroads	Designated FTZ; RORO dock; 15 steel-related and 3 steel mills located at the port; more than 12 miles of track on port property
Gary	7,978,004	63	Steel, minerals	I-90, US 12, US 20	Gary Railway	Open storage area
Buffington	1,570,196	134	Lime, construction materials	SR 912, US 12, I-90	NS Chicago Line	
Total	**30,951,359**	**22**				

Source: CPCS analysis of USACE waterborne commerce data, Google Maps, Ports of Indiana website, 2022.

Table 4-20: Indiana's Maritime Ports

Lake Michigan Ports District Consolidation

Although the four maritime ports in Northwest Indiana abut one another, they were counted as separate maritime assets until 2020. According to the Ports of Indiana, the consolidation of the four maritime ports on Lake Michigan into a single port district not only serves as an awareness tactic, but also makes these maritime assets eligible for additional funding. Had these ports been consolidated in 2019, they would have ranked as the 22nd largest port in the US by total tonnage. When looking at domestic tonnage only, the port district would have ranked 11th nationally. In 2020, after the consolidation, the Northern Indiana Port District ranked 28th nationally in terms of total tonnage and 13th for domestic tonnage.

Source: CPCS consultations with Ports of Indiana, 2022.

Although the port is making significant investments itself, there are other needs for which it must rely on support from other agencies, including USACE. For example, stakeholders noted a critical need for dredging improvements, investments in icebreaking, additional funding for maintenance, pilotage reform, navigation issues, and policy regarding the invasive species, Asian carp, in Chicago's canals.

Figure 4-29 shows the combined tonnages of Indiana's four Lake Michigan maritime ports, all of which are located in Northwest Indiana. The figure shows that, despite modest increases between 2010 and 2012, tonnage handled at these four ports has remained roughly stable over the last decade.[37]

Figure 4-30 provides a map of the maritime system in Northwest Indiana. The port symbols are scaled based on tonnage, with Indiana Harbor leading the way. The four ports are situated along Lake Michigan, with direct access to the M-90 marine highway. The M-90 consists of the Great Lakes, the Erie Canal, and connecting waterways. It offers access to the East Coast via the St. Lawrence Seaway system. The ports also have access to the Gulf Coast via the M-55 marine highway which travels through the Chicago Canal to the Inland Waterway system. [38]

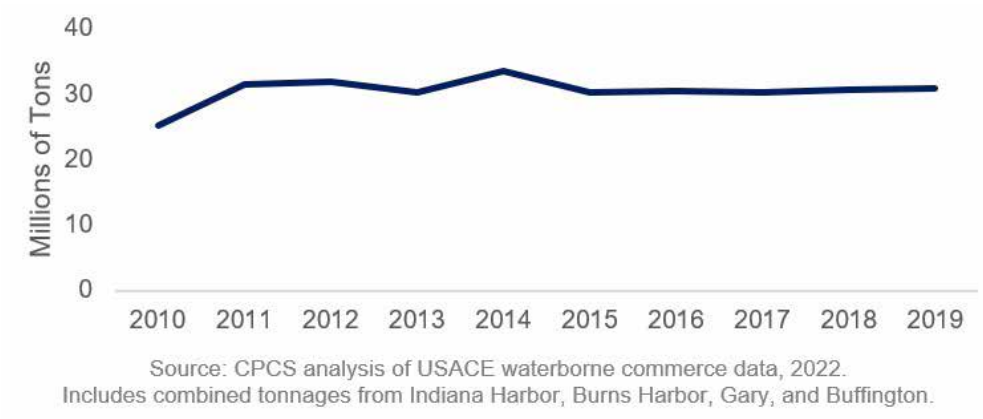


Figure 4-29: Indiana's Lake Michigan Ports Tonnage, 2010-2019

37 CPCS consultation with the Ports of Indiana, 2022.
38 America's Maritime Highway Route Designations, USDOT.

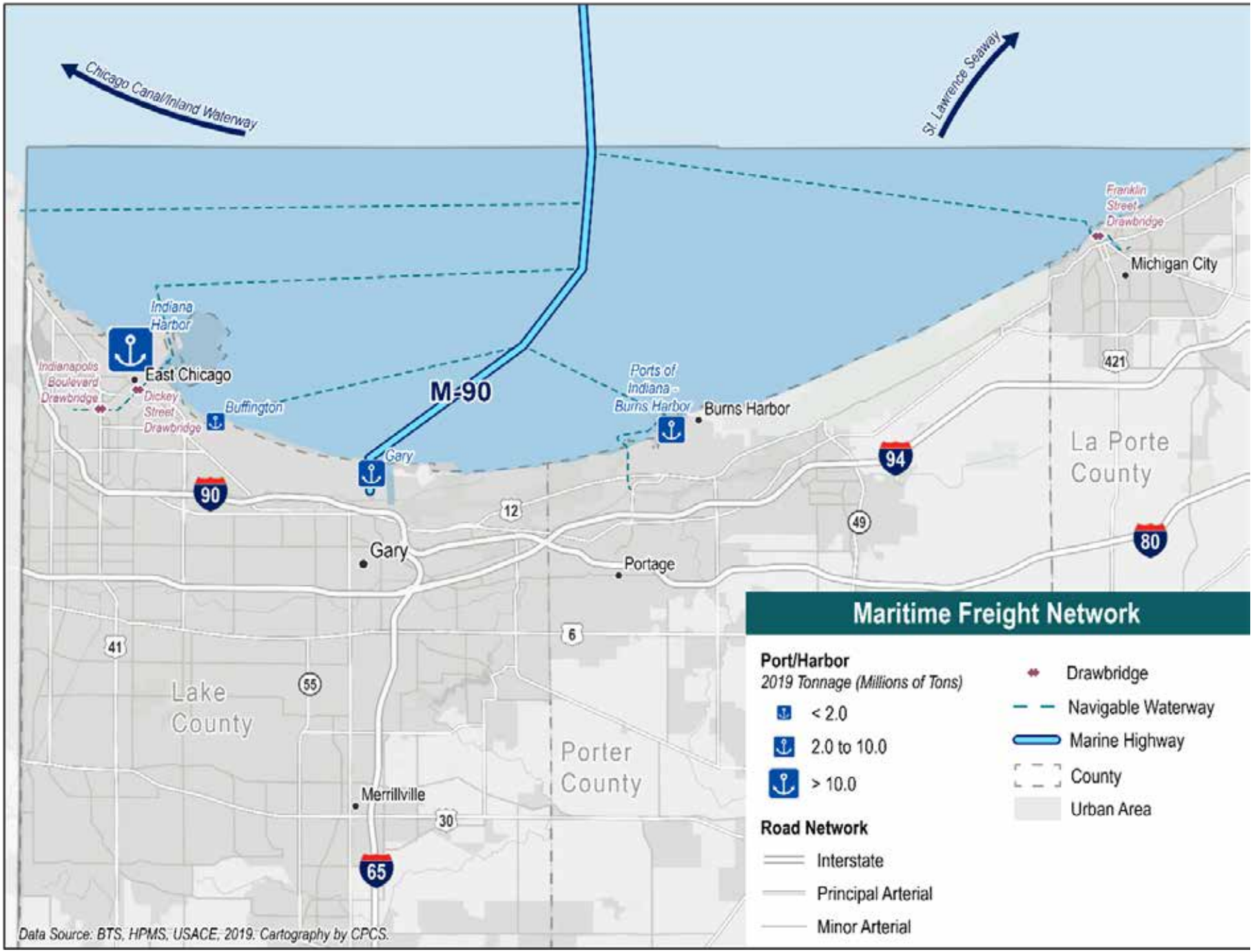


Figure 4-30: Map of Northwest Indiana Maritime Ports, 2019

Air Cargo Network

Despite representing less than 0.1 percent of the state's freight tonnage, air cargo is an important transportation mode for moving Indiana's time-sensitive and higher-value goods, including chemicals, pharmaceuticals, and electronics.

There are thirteen airports in Indiana equipped to handle cargo, of which the third largest is in Northwest Indiana: Gary/Chicago International Airport (GYY). There are an additional 6 non-cargo airports in Northwest Indiana (Table 4-21).

The latest FAF5 data shown in Table 4-22 show that electronics accounted for the largest share of air cargo in 2017 at 24.3 percent, with over 1,000 tons moving into, out of, or within Northwest Indiana. This was followed by machinery, plastics/rubber, base metals, and precision instruments. The latest data does not include landed weight at GYY, as UPS's mixed freight cargo services began in 2020.

In 2017, the top domestic trading partners by tonnage for air movements originating in Northwest Indiana, in descending order, were Florida, Alaska, Tennessee, Pennsylvania, and California. The top partners for air movements destined for Northwest Indiana were Tennessee, Ohio, California, Florida, and Alaska.

2	10	51,803
Cargo airports	Number of runways	Landed all-cargo weight tonnage for Gary/Chicago Airport in 2021

Source: CPCS analysis of FAA ADIP data, 2022.

Airport Name	City	Number of Runways	Cargo Handled
Gary/Chicago International Airport	Gary	2 (8,859 feet and 3,604 feet)	57,103 tons
Porter County Regional Airport	Valparaiso	2 (7,001 feet and 4,001 feet)	On-demand
Michigan City Municipal-Phillips Field Airport	Michigan City	1 (4,099 feet)	None
La Porte Municipal Airport	La Porte	2 (5,000 feet and 2,797 feet)	None
Lowell Airport	Lowell	1 (3,041 feet)	None
Hobart Sky Ranch Airport	Hobart	1 (3,125 feet)	None
Griffith-Merrillville Airport	Griffith	1 (4,899 feet)	None

Source: CPCS analysis of FAA ADIP data, 2022.

Table 4-21: Major Northwest Indiana Airports

Gary/Chicago International Airport (GYY) provides general aviation and charter services and is the largest cargo airport in Northwest Indiana. GYY added cargo facilities in late 2020 when UPS launched service from the airport.[39] As shown in Table 4-23, within a year of designating cargo facilities on site, GYY became the third largest cargo airport in the state, with a landed weight of 51,803 tons in 2021.

The lease with UPS stipulates that UPS must improve the terminal's condition and construct truck staging and parking sites.[40] UPS operates an Airbus A300 daily between Gary and Louisville, carrying up to 120,000 lbs. and 14,000 next-day packages.[41] The facility's 150,000-square-foot ramp, however, is enough to accommodate two A300 airbuses and leaves room for expansion of future UPS or third-party cargo operations.[42]

GYY serves as an important strategic airport to offload demand from the Chicago region's other airports. In 1995 the City of Chicago and the City of Gary established the Gary/Chicago International Airport Authority (GCIAA) with a Board of Directors comprised of individuals from both cities and states.

This agreement allows Passenger Facility Charges (PFC) collected at O'Hare to be used to fund projects at GYY. In 2014, Gary and the GCIAA entered a public-private partnership with AFCO/Avports for the management and development of the airport.[43] In the years following, the airport succeeded in expanding its runway, adding a US customs facility, building new terminals and hangars, and attracting UPS cargo service. However, the two entities agreed to end this partnership in 2022, with full control returning to the GCIAA.[44]

GYY's current slate of projects includes working to improve roadway access to the airport by extending the southeast service road and widening the Chicago Avenue cul-de-sac.[45] GYY's development plan details the possibility of expanding air cargo facilities through a third-party developer in the longer term. GYY also plans to construct a new terminal to accommodate rising cargo and passenger demands.

39 Gary airport lands cargo tenant UPS; Next Day Air growth cited in decision, Chicago Tribune, Carole Carlson, May 2020.
40 Ibid.
41 Ibid.
42 UPS to Launch Air Service from Gary/Chicago International Airport, UPS, May 2020
43 Gary/Chicago International Airport Master Plan Update, Gary Chicago International Airport, February 2021, pg. 2-3.
44 Gary airport cuts ties with private manager, developer, Northwest Indiana Times, AndSteele, June 2022.
45 Gary/Chicago International Master Plan Update, Gary Chicago International Airport, February 2021, pg. 6-7.

Commodity	Tonnage	Share of Total
Electronics	1,156.4	24.3%
Machinery	644.9	13.5%
Plastics/Rubber	387.1	8.1%
Base Metals	305.0	6.4%
Precision Instruments	300.4	6.3%
Motorized Vehicles	279.3	5.9%
Articles-Base Metals	245.2	5.1%
Printed Products	226.6	4.8%
Pharmaceuticals	224.8	4.7%
Textiles/leather	214.8	4.5%
Chemical Products	207.5	4.4%
All Others	574.7	12.1%
Total	4,766.7	100%

Source: CPCS Analysis of FAF5 data, 2022.

Table 4-22: Major Commodities by Tonnage Transported by Air in Northwest Indiana, 2017

Airport Name	Landed Weight (Tons)
Indianapolis International	2,424,235
Fort Wayne International	86,836
Gary/Chicago International	**51,803**
South Bend International	46,814
Total	2,609,688

Source: Preliminary CY2021 All-Cargo Rank Order, FAA

Table 4-23: Landed Weight for Indiana Cargo Airports, 2021

Pipeline Network

Pipelines offer a high-volume, low-cost option for transporting large amounts of liquids and gases, making pipelines a key element of the transportation network for liquid fuels. Pipelines are a major mode of transportation for freight in Northwest Indiana, both in terms of tonnage and value.

Table 4-24 summarizes the tonnage of major commodities that are transported via pipelines in Northwest Indiana. About 70 percent of this tonnage is inbound, arriving from other states or countries. Canada is the only international origin for commodities traveling by pipeline into Northwest Indiana.

In 2017, the top domestic trading partners by tonnage for pipeline movements originating in Northwest Indiana, in descending order, were Indiana, Illinois, Michigan, Iowa, and Wisconsin. The top partners for pipeline movements destined for Northwest Indiana were North Dakota, Illinois, Indiana, Texas, and Ohio. Figure 4-31 provides a map of the pipeline network in Northwest Indiana. Pipelines are concentrated in Lake County, especially in the northwest region, alongside the majority of refineries. Table 4-25 provides pipeline mileages by commodity type. Petroleum pipeline is by far the most prevalent type in Northwest Indiana, which is also evident in the map of the network.

BP Whiting Refinery

There are two crude oil refineries in Indiana, one of which is in Northwest Indiana – the BP Whiting refinery located in Whiting. The BP Whiting is the 6th largest refinery in the US and the largest facility of its kind in the Midwest. The facility processes over 440,000 barrels of oil on a daily basis and contributes 7 percent of the total asphalt produced in the US. The refinery directly employs 1,400 individuals and generates an additional 58,000 support and service jobs.

Source: BP's Economic Investment, 2020; Crude Oil Refineries, Indiana Office of Energy Development. Accessed 2022: Image Source: Superior Construction, accessed 2022.

Commodity	Tonnage	Share of Total
Coal-NEC	9,250,629	12.4%
Crude Petroleum	31,224,660	42.0%
Gasoline	26,108,540	35.1%
Fuel Oils	7,684,809	10.3%
All others	139,073	0.2%
Total	74,407,710	100%

Source: CPCS analysis of FAF5 data, 2022.

Table 4-24: Major Commodities by Tonnage Carried through Northwest Indiana's Pipelines, 2017

Commodity	Length (Miles)	Percent of Total
Crude Oil	77.8	10.1%
Hydrocarbon Gas Liquids (HGL)	32.3	4.2%
Natural Gas	161.8	21.0%
Petroleum Products	499.6	64.8%
Total	771.5	100%

Source: US EIA, 2020.

Table 4-25: Northwest Indiana Pipeline Coverage

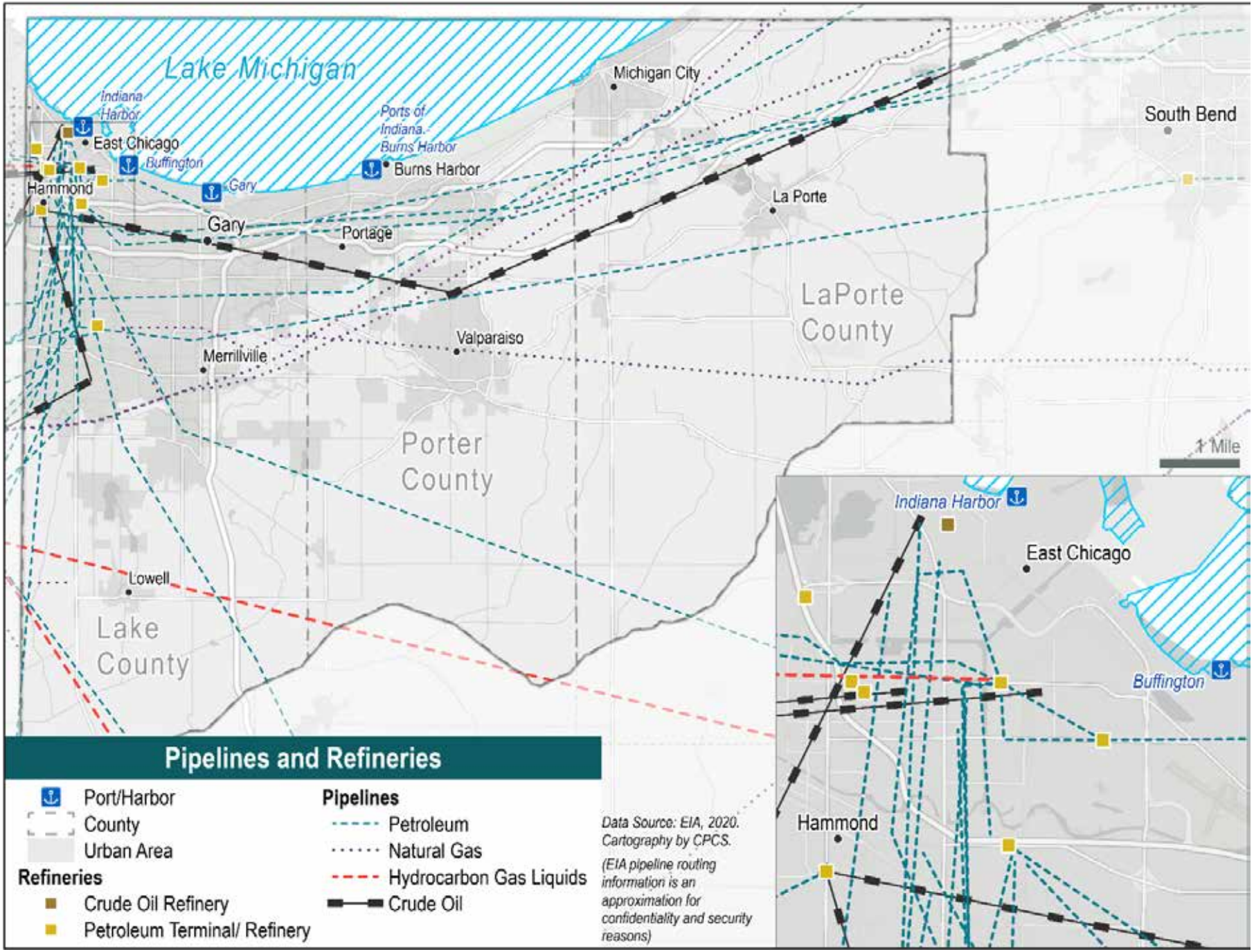


Figure 4-31: Pipeline Network in Northwest Indiana, 2020

Northwest Indiana's Freight System Condition and Performance

Linking System Evaluation to Statewide and Regional Goals

INDOT's *Multi-modal Freight Plan* was last published in 2018 to guide the statewide transportation system investments that benefit goods movement.[46] The statewide freight goals established by INDOT aligned with the national freight policy goals and objectives and, along with other statewide freight planning efforts, such as the Indiana State Rail Plan, guided the vision for the transportation system in Northwest Indiana and their associated goals and objectives.

To support these goals, *NWI 2050* adopted in 2019 established performance measures in the following topic areas to inform investments in the multi-modal freight system.

- ***Economy and Place:*** focusing on the economy and quality of place. Socio-economic factors as they relate to freight activities are assessed earlier in this chapter.
- ***Environment:*** focusing on the region's environmental quality. This section discusses measures related to transportation pollution and noise emission contributions and hazardous material spills that happen during material shipping, handling, and storage.
- ***Mobility:*** focusing on the quality of people and goods movement and modal options available to the transportation system users. Measures related to freight transportation safety, speed profiles, delays, reliability, and impediments to freight movements are analyzed in this section.
- ***People and Leaders:*** focusing on communities and their leaders. Measures related to workforce characteristics in Northwest Indiana are analyzed in Northwest Indiana's Economic Context section.

These topic areas served as the starting point for the data analysis presented in this chapter, using data available at the region, state, and federal levels, consultations with freight industry stakeholders, and building on previous relevant studies that have been conducted by NIRPC, INDOT, and other regional and statewide organizations. The performance of Northwest Indiana's freight system will be further analyzed and compared against the regional goals and objectives in Phase 2 of this project.

Safety

Road Safety

Between 2017 and 2021, over 11,200 truck-involved crashes occurred in Northwest Indiana, the majority of which (86%) were property-damage-only (PDO) crashes. As Figure 4-32 shows, 13 percent of these crashes involved injuries, and 1 percent involved fatalities. A total of 1,932 persons suffered injuries with various severity levels and 105 persons died as a result of truck-involved crashes in Northwest Indiana.

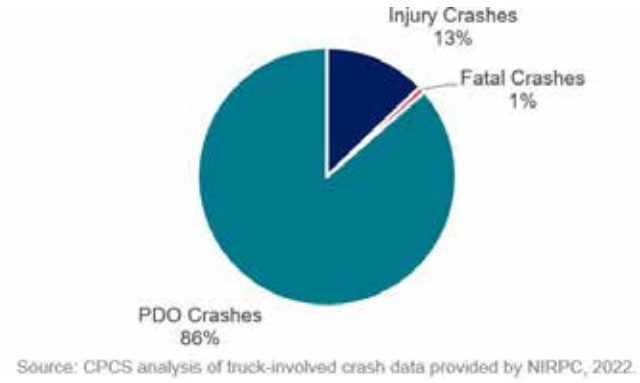


Figure 4-32: Truck-Involved Crashes in Northwest Indiana, 2017-2021

46 INDOT is currently in the process of updating the Indiana Multi-modal Freight Plan to be adopted in 2023.

On average, the number of truck-involved crashes in Northwest Indiana decreased by about 1 percent over the five study years. The largest reduction in the number of crashes happened in 2020, with a 14 percent drop from 2,221 crashes in 2019 to 1,908 crashes in 2020. This significant reduction in the number of crashes is correlated with relatively lower truck miles traveled during the second quarter of 2020. As Table 4-26 shows, daily truck miles traveled in the Northwest Indiana counties declined by over 13 percent in 2020 when compared to 2019 numbers. Of note is that while the regional daily truck miles traveled declined by 13.4 percent in 2020, the number of truck-involved crashes had a significant increase.

As shown in Figure 4-33, truck-involved crashes were primarily clustered along high-volume corridors, including I-90, I-65, I-94, and segments of I-80. The I-90/I-94 interchange in Portage and the segment of I-94 between SR 249 in Portage and the Indiana-Illinois border saw the highest concentration of truck-involved crashes, which is again correlated with truck traffic volumes.
The primary contributing factors for truck-involved crashes in Northwest Indiana between 2017 and 2021 included distracted driving, unsafe lane-changing maneuvers, and crashes due to obstruction in the drivers' lines of sight (Figure 4-34). Pedestrians and cyclists were involved in 46 of the truck-involved crashes between 2017 and 2021 and were partly at fault in about 43 percent of these.

Year	Daily Truck Miles Traveled	% Annual Change	Truck-Involved Crashes	% Annual Change
2017	3,938,100	-	2,451	-
2018	3,548,000	-9.91%	2,216	-9.59%
2019	3,872,000	9.13%	2,221	0.23%
2020	3,365,000	-13.09%	1,908	-14.09%
2021	2,914,000	-13.40%	2,417	26.68%

Source: CPCS analysis of NIRPC truck crash data and INDOT's VMT data, 2022.

Table 4-26: Truck-Involved Crashes and Daily Truck Miles Traveled in Northwest Indiana

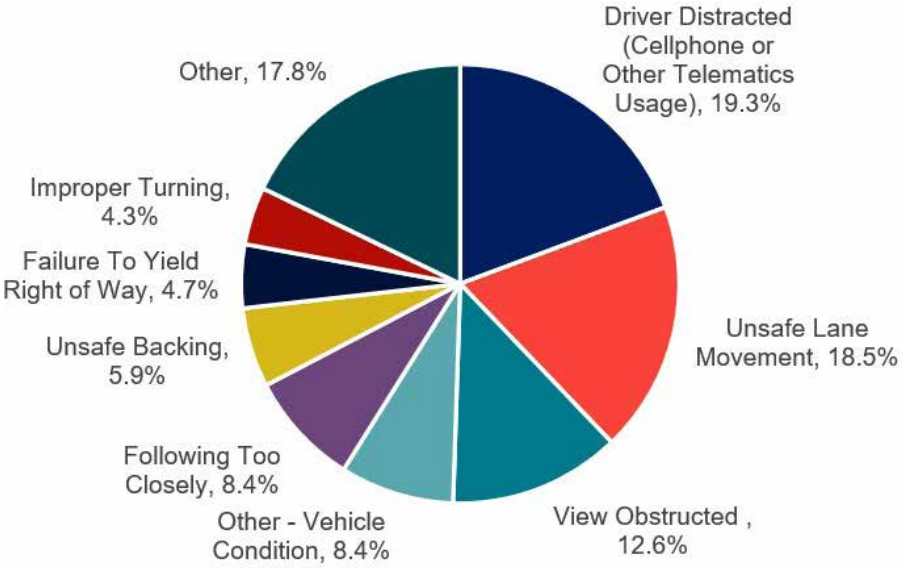


Figure 4-34: Primary Factors Contributing to Truck-Involved Crashes, 2017-2021

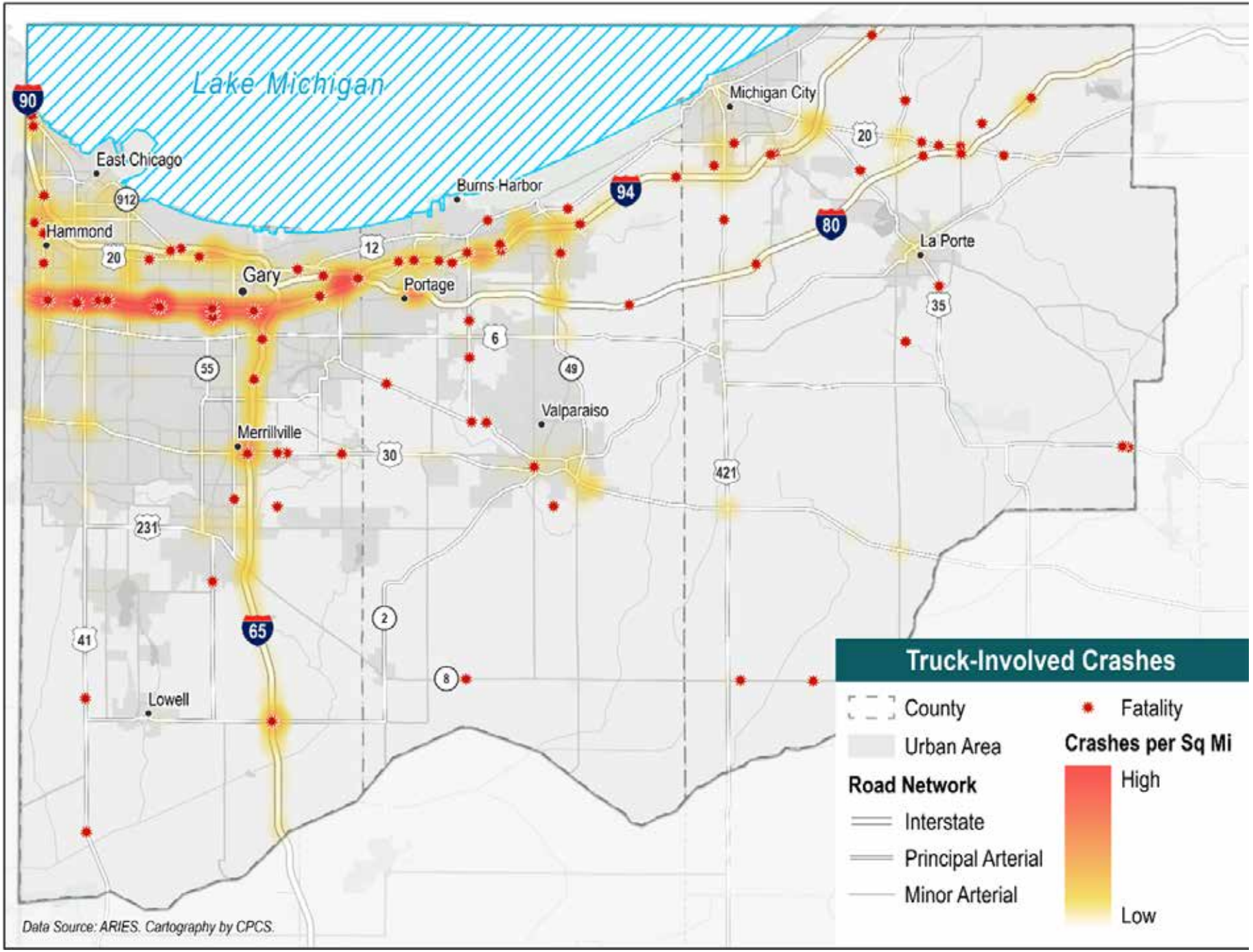


Figure 4-33: Truck-Involved Crash Locations in Northwest Indiana, 2017-2021

Rail Safety

The analysis presented in this section uses rail incident databases provided by the Federal Railroad Administration (FRA). Railroads are required[47] to submit monthly reports of "accidents and incidents resulting in injury or death to an individual or damage to equipment or a roadbed arising from the carrier's operations" to the Secretary of Transportation, which delegates the authority for prescription and enforcement of rail safety standards and regulations to the FRA.

The rail safety incident types considered in the railroad's reports to FRA include:

- Highway-rail grade crossing incidents;
- Rail equipment incidents, including train collisions, derailments, fires or explosions, and other events that happen during rail operations;
- Rail-related casualties include deaths, injuries, and railroad worker occupational illnesses that result in medical treatment, significant diagnosis by a health professional, or loss of consciousness.

47 Initially by the Accident Reports Act (ARA), signed into law in 1910 and later through the provisions and amendments introduced in the 1970 Federal Railroad Safety Act (FRSA). For more information, see: Title 49 Code of Federal Regulations (CFR) Part 225.

Year	Equipment Incidents	Crossing Incidents	Trespassing Incidents	Total	% Annual Change	Fatalities	Injuries
2017	18	24	10	52	-	4	26
2018	19	34	17	70	34.6%	9	32
2019	21	24	8	53	-24.3%	4	32
2020	20	21	6	47	-11.3%	2	26
2021	18	30	19	67	42.6%	8	29
Total	96	133	60	289	-	27	145

Source: CPCS analysis of FRA safety data, 2022.

Table 4-27: Freight Rail Safety Incidents in Northwest Indiana

Between 2017 and 2021, 157 at-grade rail crossing incidents occurred in Northwest Indiana, 133 involving freight trains and the rest involving Amtrak or Northern Indiana Commuter Transportation District (NICTD) passenger trains. Single-unit trucks and tractor-trailers were involved in 14 percent of the at-grade crossing incidents that happened over the five study years.

Over 52 percent of the time, the trucks involved in the crossing incidents were moving over the crossings while the trains were approaching. During the same period, freight trains were involved in 96 equipment incidents in Northwest Indiana, including 54 derailments and 13 side collisions.

In terms of casualties, freight-dependent rail incidents led to 145 injuries and 27 fatalities. Trespassing (whether at road-rail crossings protected by barriers or other locations along the rail tracks)[48] is the primary cause of freight rail-related fatalities and injuries in Northwest Indiana.

Table 4-27 shows the number of freight rail safety incidents in Northwest Indiana by type and provides the total number of fatalities and injuries.

48 A person or vehicle that enters an at-grade crossing without a physical barrier (e.g., gates in a lowered position) is not considered a trespasser, even when the crossing lights or other warning systems are activated. For more information, see FRA's Guide for Preparing Accident Incident Reports.

Figure 4-35 shows the freight rail safety hotspots in Northwest Indiana. As shown, rail safety incidents are primarily clustered along the high-volume Class I rail corridors such as CSXT's Barr subdivision between Portage, IN, and Blue Island, IL, and NS's Chicago District subdivision in Lake County. The following are the top rail safety hotspots in Northwest Indiana:

- ***CSXT's Barr subdivision at-grade crossing with Lake St in Gary***: seven incidents happened at this crossing between 2017 and 2021, leading to four fatalities and three injuries.
- ***NS's Chicago Line subdivision at-grade crossing with Clark Rd in Gary*:** seven incidents happened at this crossing between 2017 and 2021, leading to nine injuries.
- ***NS's Chicago District subdivision at-grade crossing with Grant St in Gary:*** six incidents happened at this crossing between 2017 and 2021, leading to one injury.
- ***CSXT's Barr subdivision at-grade crossing with Calumet Ave in Hammond:*** four incidents happened at this crossing between 2017 and 2021, leading to one injury.
- ***CSS's at grade crossing with Carroll Ave in Michigan City*:** four incidents happened at this crossing between 2017 and 2021, leading to one injury.

Movable Bridge Safety

Safety considerations for vehicles approaching movable bridges are often compared with safety aspects of rail crossings. Therefore, FHWA's Manual on Uniform Traffic Control Devices (MUTCD) specifies various measures and devices that ensure movable bridge safety, including metal signs, pavement markings, and other warning systems.

All three road movable bridges in Northwest Indiana use signs, crossing arms, and stoplights to warn motorists that the bridge is in motion. Roughly 300 feet from the Franklin Street movable bridge is an at-grade rail crossing, which amplifies potential safety concerns and delays. Moreover, bicycle lanes that make up part of the La Porte County Bikeways are located on both sides of Franklin Street.

The three rail movable bridges in Northwest Indiana only operate when there is train traffic. To announce the train passage and lowering of the moveable bridge, a train crew member initiates a secure call on a marine radio channel 10 minutes in advance and gives the last warning five minutes in advance of the train passage. The draw tender visually monitors vessel traffic before lowering the bridge. [49]

49 Federal Register, Drawbridge Operation Regulation; Indiana Harbor Canal, East Chicago, IN, 2020.

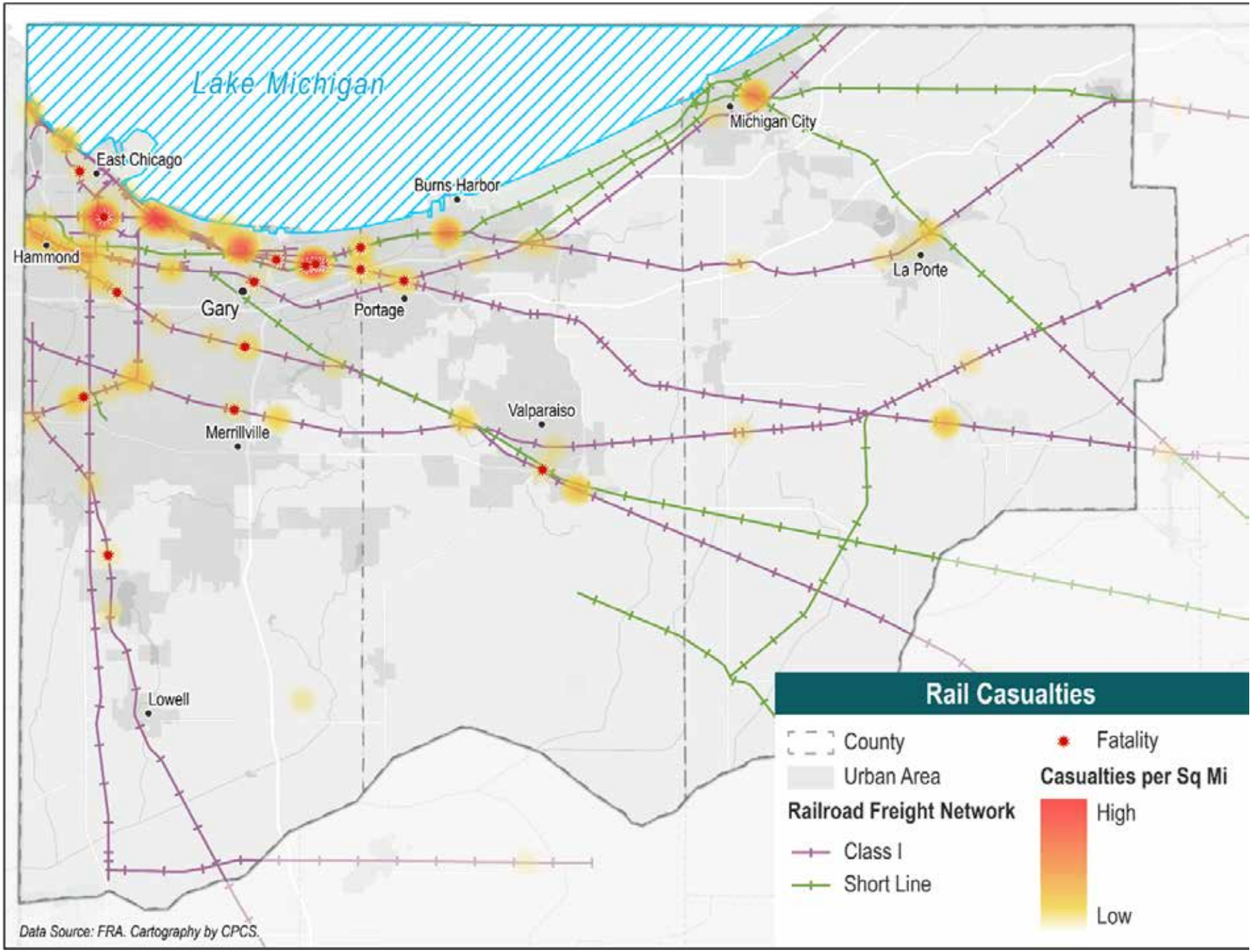


Figure 4-35: Rail Safety Hotspots in Northwest Indiana, 2017-2021

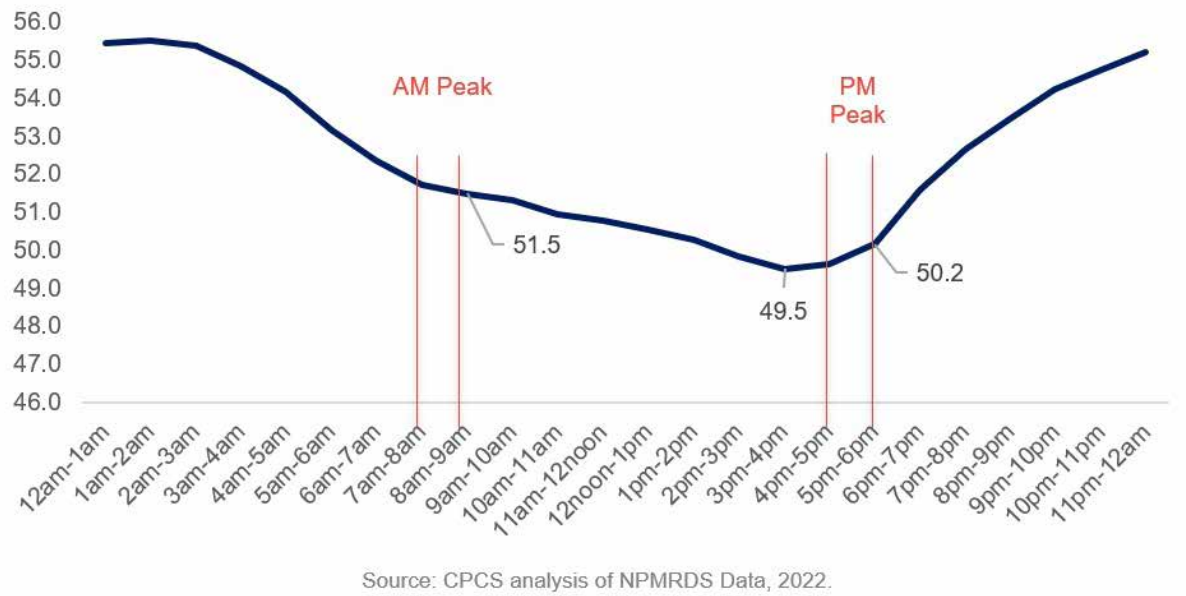
Mobility

Freight system mobility refers to the ability of goods to move effectively throughout the freight network. A high level of mobility indicates an efficient network that is capable of transporting freight quickly and economically. Mobility is affected by the dynamics of supply and demand; excessive system demand or insufficient system capacity can provoke mobility issues.

Freight mobility also interacts with safety and environmental impacts. Safety issues can generate mobility issues, as the incidents force temporary closures of lanes or tracks, which effectively decreases system supply. For example, safety incidents and poor incident clearance times can induce non-recurring congestion and mobility issues. Mobility issues also exacerbate the environmental impacts of freight transportation. Travel slowdowns increase travel times, leading vehicles to emit additional air emissions.

Truck Speed Profile

Figure 4-36 demonstrates the daily profile of average truck speeds along the NHS network in Northwest Indiana. As shown, average truck speeds steadily decrease starting at around 4 AM and reach their lowest levels at around 4 pm at 49.5 mph. After 4 pm, average speeds in the region increased slightly to 50.2 mph during the PM peak (4 pm-6 pm). Because average truck speeds consistently remain at or above 50 mph in Northwest Indiana, the speed profile suggests that congestion is not a glaring concern for truck movement in the region as a whole. However, this speed profile likely averages out specific sections of the road that do experience mobility issues. Indeed, there are a number of road segments with high traffic volumes that experience bottlenecks in Northwest Indiana, as discussed in the "Truck Bottlenecks" section.



Source: CPCS analysis of NPMRDS Data, 2022.

Figure 4-36: Average Truck Speeds along the NHS by Time of Day in the Northwest Indiana Region

Truck Travel Time Reliability Index

The Bipartisan Infrastructure Law (BIL) requires that states report several performance measures to FHWA, including the Truck Travel Time Reliability (TTTR) index for Interstates, which evaluates the reliability (or variability) of travel times experienced by trucks along a roadway. A TTTR equal to 1 indicates that the roadway of interest experiences practically no unexpected delays, meaning there is almost no variability in experienced travel times. The higher the TTTR value is above 1, the more unexpected delays occur on the roadway, meaning there is significant variability in experienced travel times. For instance, a TTTR index of 4.5 implies that 5 percent of the time, travel times are 4.5 times longer than the median travel time.

Using the 2019 National Performance Management Research Data Set (NPMRDS) provided by the FHWA, TTTR indices were calculated for the NHS road segments within Northwest Indiana[50], as shown in Figure 4-37. The segments with the highest TTTR indices are SR 912 in East Chicago, US 12 west of the Gary/Chicago International Airport, the US 30 and US 421 interchange in Wanatah, the US 35 interchanges with US 6, I-80/I-90, and US 20, and I-80/94 (Borman Expressway) near the interchange with I-65. A few key truck corridors, including I-94, I-80, US 6, US 12, US 30, and SR 49, also have segments with higher TTTR indices, indicating that trucks traveling on these roadways also experience variable travel times and more unpredictable delays.

50 When data was missing for a particular segment, the average speeds on roads in a 3-mile vicinity with the same functional class were used to determine the missing TTTR value. Data was only filled in for routes with a road type of 1 or 2 (one-way and two-way roads) meaning other road types like ramps are excluded from this data cleaning process.

Truck Travel Time Delay

Truck travel time delay per mile (DPM) is another mobility performance measure calculated by dividing the difference between free-flow travel time and observed travel time for each road segment of interest by the segment's length.[51] Figure 4-38 highlights the segments with high annual DPM values in the Northwest Indiana region. In general, the Borman Expressway—the portion of I-94/I-80 from just east of the state line to the Interchange with I-65—and SR 912/ US 12 in Gary experience the most severe delay. Segments on US 12, US 41, and I-94 also show increased truck travel time delays.

51 Again, when data was missing, the average speeds on roads in a 3-mile vicinity with the same functional class were used to fill in the missing DPM value. This process was only performed for segments with road types of 1 or 2.

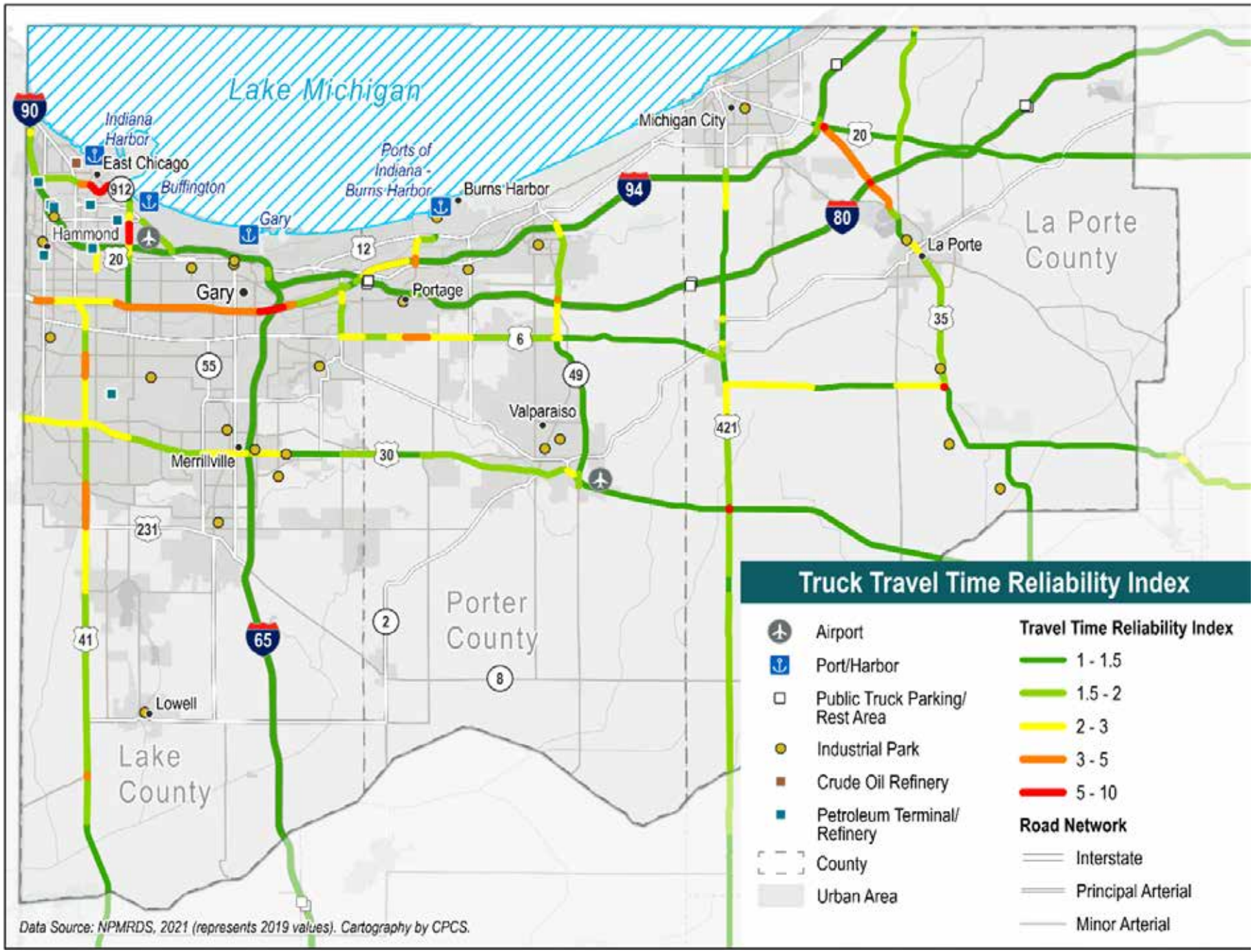


Figure 4-37: Truck Travel Time Reliability Index, 2019

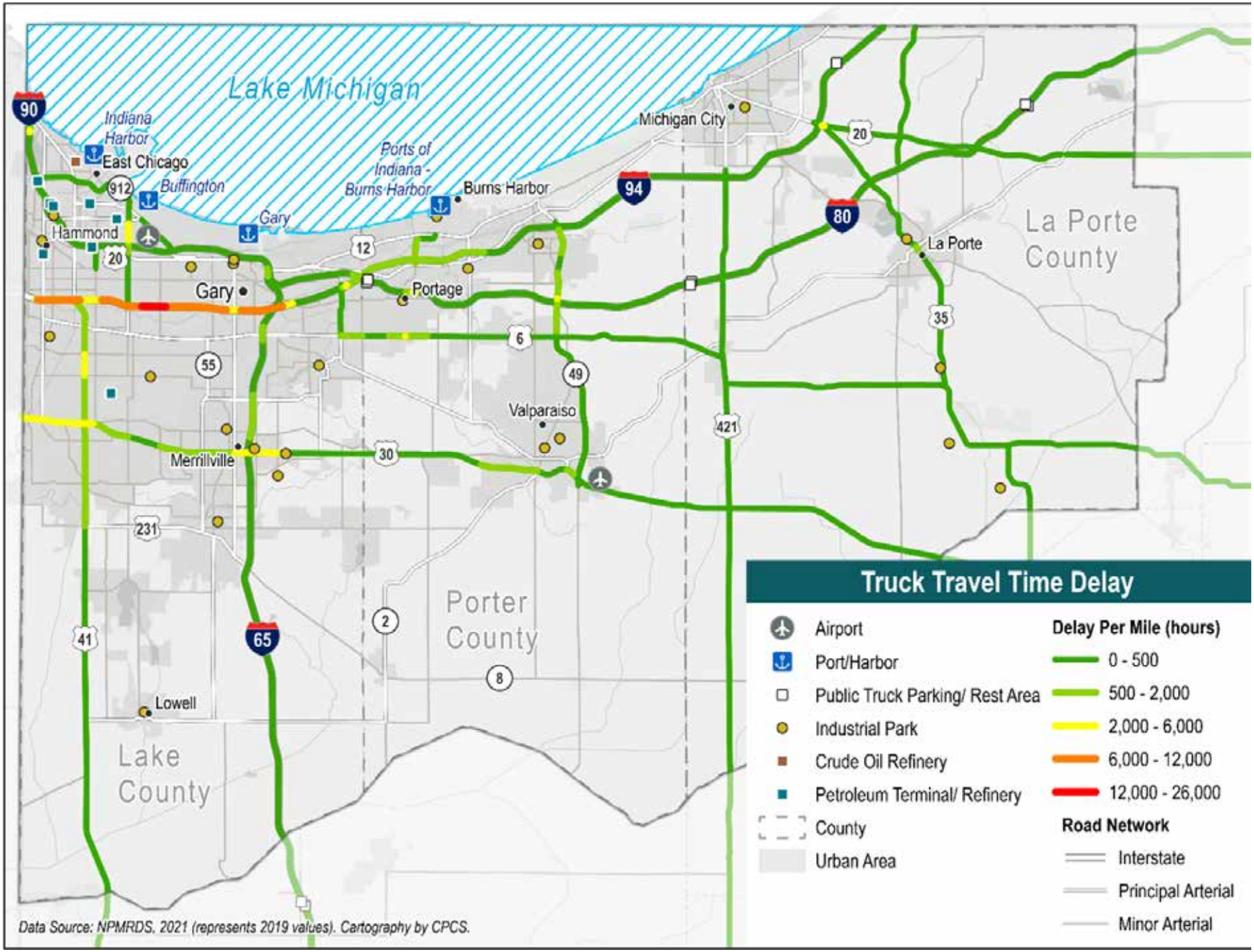


Figure 4-38: Truck Travel Time Delay, 2019

Truck Bottlenecks

A truck bottleneck refers to a segment of the roadway system that frequently experiences a significant decrease in truck speeds. While a bottleneck may cause congestion, congestion is not always the result of a bottleneck. Therefore, a combined DPM-TTTR Index is used in this study to identify truck bottlenecks that are representative of both delay and reliability challenges. The total hours of delay per mile (DPM) is multiplied by the TTTR ratios for each segment to calculate the TTTR-TDPM Index values.

Table 4-39 lists the top truck bottlenecks in Northwest Indiana, and Figure 4-69 shows the ranges of DPM-TTTR Index values along the NHS roads in the region. As shown, Borman Expressway—the portion of I-80/94 (Borman Expressway) between the Illinois-Indiana state line and Lake Station—as well as the segments of US 12 next to the Gary/Chicago International Airport experience the most elevated levels of DPM-TTTR Index values. Unsurprisingly, these two roads round out the top seven bottlenecks in Northwest Indiana.

Bottleneck Rank	Route Name	From	To	Weighted Average DPM-TTTR	Average Truck AADT
1	I-80/I-94 W	Burr St/Exit 6	IN-912/Cline Ave/ Exit 5	0.3791	18,523
2	I-80/I-94 W	I-65/Exit 12	I-65/Exit 11	0.3282	16,657
3	I-80/I-94 E	US-41/Calumet Ave/ Exit 1	US-41/Indianapolis Blvd/Exit 2	0.1892	46,124
4	I-80/I-94 W	IN-53/Broadway/ Exit 10	Grant St/Exit 9	0.1818	17,504
5	SR 912 S	Cline Ave/Exit 7	US 20/Exit 8	0.1538	2,277
6	I-80/I-94 W	Kennedy Ave/Exit 3	US-41/Indianapolis Blvd/Exit 2	0.1519	20,175
7	I-80/I-94 W	Central Ave/Exit 13	I-65/Exit 12	0.1452	16,657
8	IN 49	I-80/I-90/Indiana Toll Rd	I-80/I-90/Indiana Toll Rd	0.0883	2,716
9	I-80/I-94 W	US-41/Indianapolis Blvd/Exit 2	US-41/Calumet Ave/ Exit 1	0.0801	46,124
10	US 20 E	US 35 Intersection	US 35 Intersection	0.0631	2,383

Source: CPCS analysis of NPMRDS data, 2022. Truck AADT is for combination trucks.

Table 4-28: Top 10 Truck Bottlenecks in Northwest Indiana, 2019

The American Transportation Research Institute (ATRI) collects and analyzes truck GPS data in support of numerous USDOT freight mobility projects. Each year, ATRI performs an analysis of 300 freight-significant highways identified by USDOT, state DOTs, and trucking industry stakeholders, calculating the congestion values[52] and rankings for each highway. One bottleneck in Northwest Indiana, I-65 at I-80/94 (Borman Expressway) in Gary, is ranked 55th among ATRI's 2022 list of the top 100 truck bottlenecks in the nation. The TTTR-Delay analysis above identified this as the second worst bottleneck in the region.

52 The congestion value is an index calculated by multiplying the hourly vehicle volumes and the average truck speed deviations from the free-flow speeds. ATRI average the truck volumes and speeds across all days in a year, including weekends and holidays.

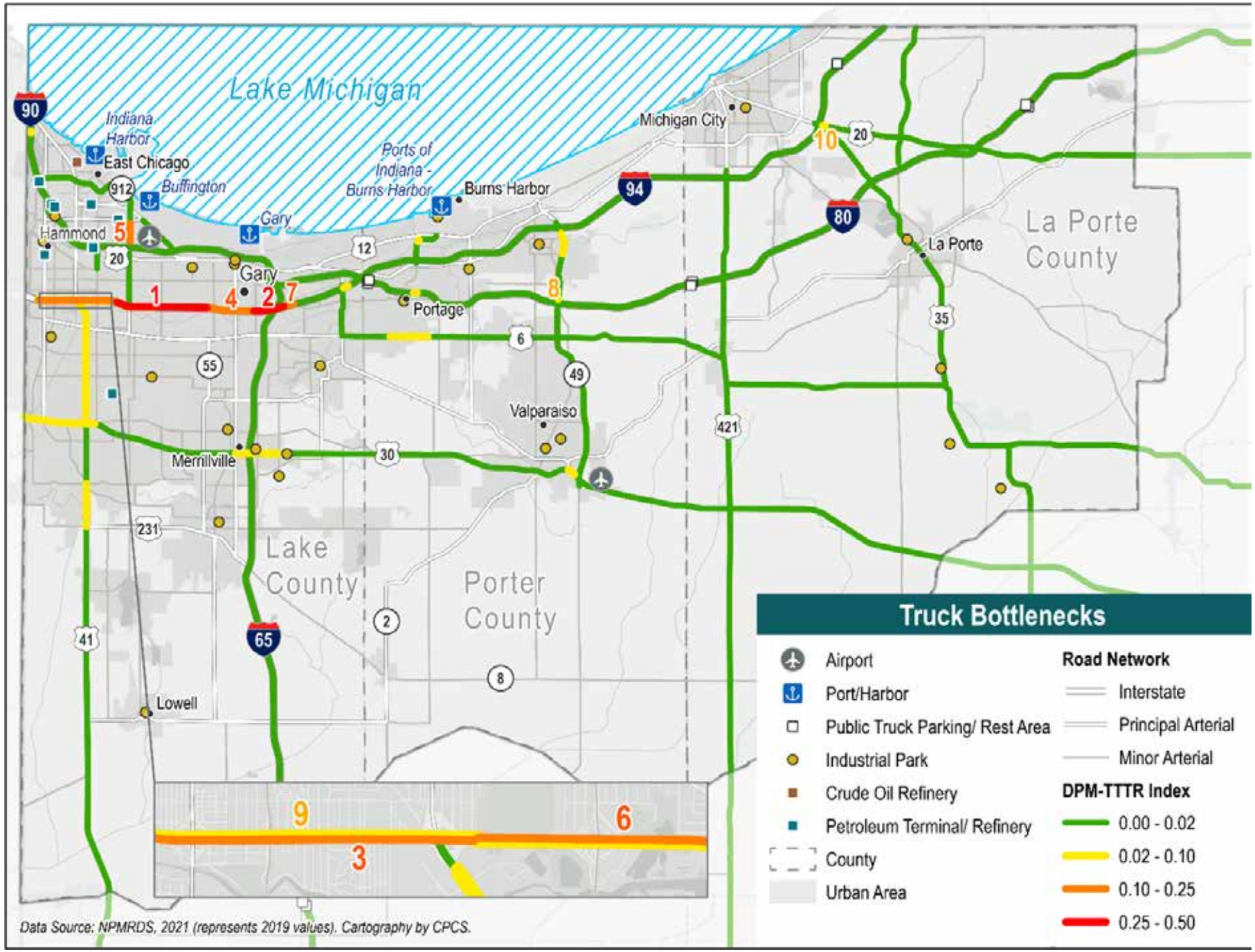


Figure 4-39: Truck Bottlenecks in Northwest Indiana, 2019

Bridge Clearance

Truck movements can be affected by the roadway's geometric design elements, such as the dimensions of curves, roadside elements, and bridges. Low bridge clearances create a localized barrier to trucking activities and, in particular, the movement of trucks carrying oversize/overweight (OS/OW) loads, which may exceed the dimensions of a normal truck.

The FHWA recommends that all bridges should be constructed with at least one foot of additional clearance above maximum truck height. The maximum truck height allowed without a permit per Indiana Size and Weight Laws is 13'6". The FHWA also recommends that bridges have a minimum clearance of 16' on Interstates and 14' on public roads to ensure that the majority of trucks can pass safely underneath.[53]

INDOT separates bridge clearance into five categories:

- *Less than or equal to 13'6"*: These bridges present a significant barrier to all truck movements.
- *Greater than 13'6" but less than or equal to 14'*: These bridges present a significant barrier to truck movements.
- *Greater than 14' but less than or equal to 15':* These bridges pose fewer barriers to truck movements.
- *Greater than 15' but less than or equal to 16':* These bridges pose few barriers to truck movements beyond OSOW operations.
- *Greater than 16'*: These are unlikely to impact truck movements.

53 FHWA, Vertical Clearance, Webpage accessed July 2022

I-80/94 Borman Expressway Planning and Environmental Linkages (PEL) Study

In July 2022, the Indiana Department of Transportation released a PEL study report on the Borman Expressway between the Illinois/Indiana border and the I-65 interchange. The report recognizes the high levels of traffic congestion and safety concerns that exist on this segment of roadway. There is urgency in addressing these issues, as traffic volumes are only forecast to increase—up to 18% by 2040. The report finds that trucks and pass-through traffic make up a significant portion of the travel on this roadway; trucks constitute up to 31% of daily traffic, and through-traffic comprises roughly 60% of westbound afternoon peak-period travel. The study proposes a number of strategies to mitigate existing and future congestion, including:

- Interchange modifications
- Sign enhancements
- Lane merge warning signs
- Dynamic shoulder lanes
- Event management, including a towing incentive program
- Ramp metering
- Variable speed limits
- Dynamic lane control, and
- Queue warnings

Source: Study details strategies for Borman congestion relief, Northwest Indiana Times, Andrew Steele, July 2022.

Table 4-29 presents the counts of each bridge clearance category for the 781 bridge overpasses that pass over roadways in Northwest Indiana. Of these, roughly 60.8 percent, or 475 bridges, provide more than 16 feet of clearance. Another 19.5 percent, or 152 bridges, offer between 15 and 16 feet of clearance. About 19.7 percent or 154 bridges leave less than 15 feet of clearance space for vehicles. These bridges pose mobility concerns for trucks in Northwest Indiana. Of these low clearance bridges, 126, or 82.8 percent, carry roads, and 24, or 15.8 percent, carry railroads.

Figure 4-40 maps the clearance category of each bridge overpass in Northwest Indiana. The majority of the most critical bridge clearance concerns lie along the I-90 corridor. In fact, almost all of the bridge overpasses that are less than or equal to 13'6" in clearance height sit on I-90. There also appear to be several bridge clearance issues along I-94 east of Lake Station and the northern section of I-65. Most of these issues obstruct traffic on Interstate crossroads, although a few obstruct traffic on the Interstates themselves, as discussed below.

A total of about 76 bridges passing over Interstates or Interstate ramps have clearances of less than 16 feet. About 92 percent of these have clearances between 15 and 16 feet. The remaining six have clearances below 15 feet:

- SR 149 over I-94 EB near Burns Harbor[54]
- SR 149 over I-94 WB near Burns Harbor [55]
- I-90 EB over the ramp to I-90 in Gary
- Bleck Road over I-94 WB near Michigan City
- Johnson Road over I-94 WB near Michigan City
- County Line Road over I-94 EB near Michigan City

These bridge clearance issues pose safety and mobility concerns for truck movements in the region and should be addressed.

54 This bridge has a clearance above 15 feet on all of its driving lanes. However, the shoulders have a minimum clearance below 14 feet.
55 Ibid.

Type	Less than or equal to 13'6"	Greater than 13'6" but less than or equal to 14'	Greater than 14' but less than or equal to 15'	Greater than 15' but less than or equal to 16'	Greater than 16'
Road	16	29	81	147	416
Rail	0	11	13	3	5
Other/Unknown	2	0	2	2	54
Total	18	40	96	152	475

Source: CPCS analysis of INDOT Bridge Clearance data, 2022.
Note: Data has been cleaned to only include bridges over roadways.

Table 4-29: Bridge Clearance Category Counts by Type in Northwest Indiana

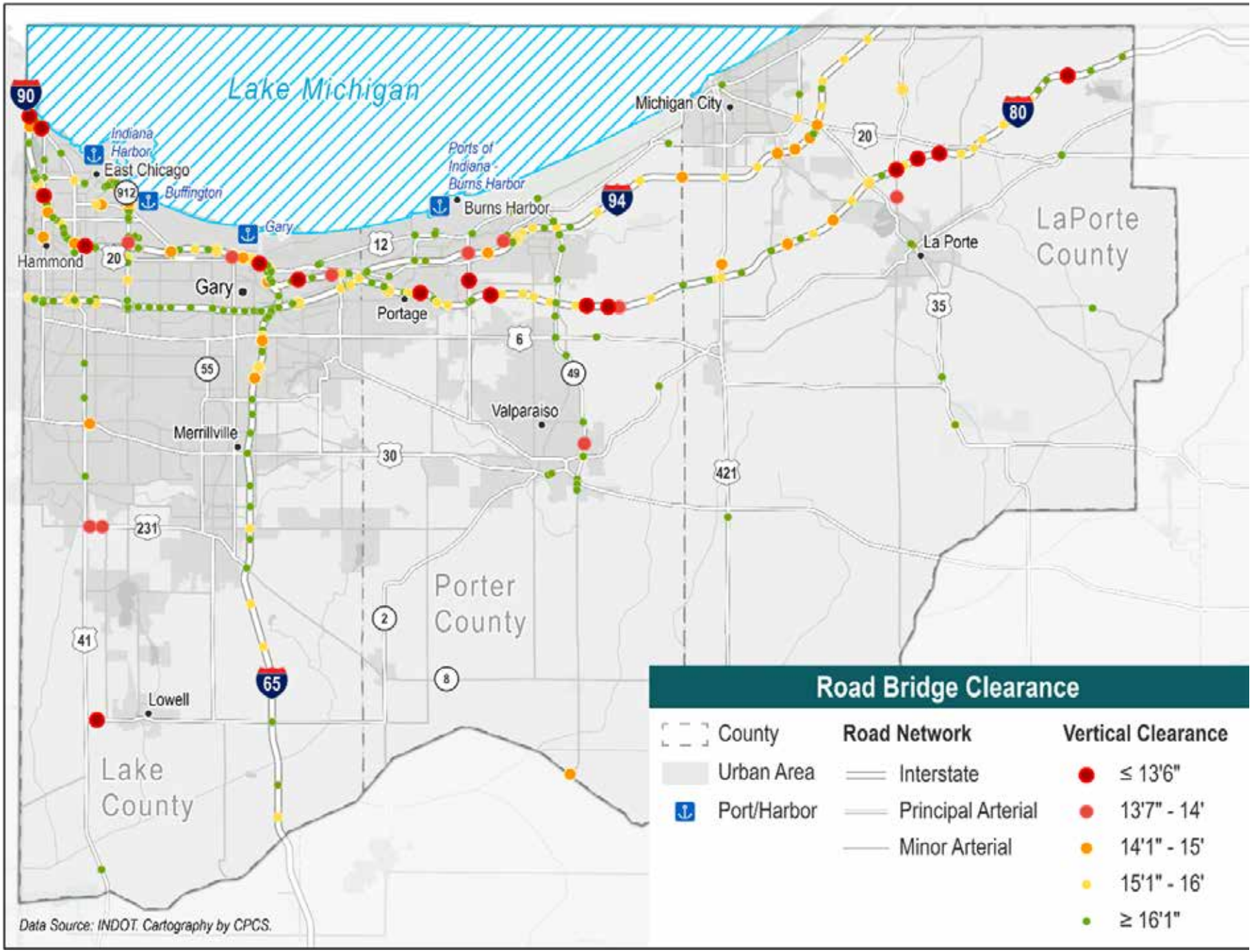


Figure 4-40: Northwest Indiana Bridge Clearance, 2021

OS/OW Operations

Regulating when and where oversize and/or overweight (OS/OW) trucks travel is necessary to preserve and maintain roads in a state of good repair while still supporting the movement of goods. The weights of OS/OW vehicles can accelerate pavement deterioration, according to a study by the American Association of State Highway and Transportation Officials (AASHTO).[56] Moreover, oversized trucks need to be wary of bridge clearance and other geometric limitations on the roadway to ensure that they can operate safely. Usually, OS/OW vehicles are regulated at the state level by issuing permits and imposing fees.

Most Indiana OS/OW permits are issued by the Indiana Department of Revenue's Motor Carrier Services (MCS) department, under the guidance and rules set by INDOT and Indiana law. Drivers must obtain an oversize and/or overweight vehicle permit before traveling on Indiana roads if their vehicle exceeds:

- 13 feet 6 inches in height;
- 8 feet 6 inches in width;
- 53 feet (semi-tractor-semi-trailer combination) in length; or
- 80,000 pounds gross vehicle weight (subject to axle weights).

In addition to obtaining a permit, drivers must follow signage, escort, and other requirements. According to INDOT's 2018 State Freight Plan[57].in Northwest Indiana, I-80 west of I-65, segments of I-94 between I-65 and US 421, and segments of SR 8 between Hebron and Kouts have permanent OS/OW restrictions. US 41 north of I-80 has an overweight restriction. Several state routes in the south part of the region have permanent oversize restrictions. Extra heavy-duty vehicles accessing the Indiana Harbor Works, the Midwest Steel Plant, and the Port of Indiana-Burns Harbor can be accommodated by SR 312, SR 912, US 12, US 20, and SR 39. In Northwest Indiana, the maximum weight on designated extra heavy-duty highways is 134,000 lbs.

Blocked Crossings

The need to mitigate safety and mobility issues at roadway-rail at-grade crossings can increase or decrease depending on the frequency and configuration of trains traveling along a specific section of track. The recent increase in the number of trains and train lengths is a national trend primarily associated with Precision Scheduled Railroading (PSR). The PSR operating model is now used by almost all North American Class I railroads, allowing them to assign the trains to fixed schedules rather than using a minimum or a maximum number of loaded cars to determine when a train should depart. The result is a greater number of trains, longer train configurations along major lines, and the elimination or abandonment of unprofitable lanes. These factors can slow down rail operations, with trains having to sit for long periods at or near busy rail yards and transload facilities and, therefore, block vehicle and pedestrian access at grade crossings.

2022 Indiana OS/OW Fee Increase

During the 2021 legislative session through House Enrolled Act 1190, INDOT was charged with reviewing and instituting a new fee for OS/OW permits. INDOT subsequently implementing an increase in the fee for overweight divisible load permits from $0.07 per Equivalent Single Axle Load (ESAL) mile to $0.25 per ESAL mile effective January 1st, 2022.

A number of stakeholders consulted noted that trucking associations have expressed concerns about this fee increase. However, INDOT noted that the state has not seen a decrease in permit volume, indicating that carriers have been able to absorb the cost so far.

Source: Revised Fees for Overweight Divisible Load Permits, INDOT October 2021.

56 Carpenter, S.H., 1992. Load equivalency factors and rutting rates: The AASHTO road test. Transportation Research Record, (1354). The study found that the damage of an overweight vehicle on the pavement can be as large as fourth power of the loads, meaning if the weight on an axle is doubled, the vehicle does sixteen times the damage to the road.

57 Indiana Extra Heavy Duty Highways, North West Indiana.

The Northwest Indiana region frequently experiences long delays at blocked rail crossings. Since the 2018 Indiana Supreme Court ruling that prevents municipalities from fining trains for blocked crossings, local communities have observed the issue of trains blocking at-grade crossings has only become worse[58]. From January to September 2019, 348 incidents were observed where a crossing warning system was activated.[59] One-third of those incidents were classified as blocked crossing incidents, meaning the crossings were closed to road traffic for more than 10 minutes. On average, it took trains 20 minutes to clear the blocked crossings.

The delays generated by blocked crossings create mobility concerns for all travelers, especially freight trucks facing tight schedules and hours-of-service requirements. In addition to excessive roadway delays, blocked crossings also increase response time for emergency services. Nearly half of all schools, fire stations, and hospitals in Northwest Indiana are within a half-mile distance of an at-grade crossing.[60] Moreover, blocked crossings can lead to safety issues, such as frustrated drivers or pedestrians attempting to clear the crossing while trains are approaching or drivers choosing to detour onto local streets.

Figure 4-41 shows the number of trains (passenger and freight combined) passing at-grade crossings in the region each day, based on 2022 FRA data. Of the 675 public at-grade crossings in the region, approximately 20 percent, or 176 crossings, have 25 trains or more passing through daily. Of these 176 busy crossings, daytime trains account for 46 percent of the trains, indicating the risk for significant modal conflict during the busiest times of the day. Figure 76 also shows the location of blocked crossing incidents observed between April to September 2019. Locations with the highest number of crossing issues include NS Chicago District in the City of Hammond and Indiana Harbor Drive (Michigan Avenue) between the IHB Rail crossing and CN rail crossing.

Blocked Crossing Safety Issues

Studies have shown that drivers will attempt to clear the crossings in front of arriving trains at locations where crossings are routinely blocked for extended periods. Pedestrians may also attempt to cross the blocked crossings by crawling between stopped railcars.

To address such safety issues, the FRA started collecting inputs from the road users and communities living near grade crossings in 2018, in order to identify the priority locations and offer effective solutions.

Source: FRA Newsroom, FRA Launches Web Portal for Public to Report Blocked Railroad Crossings, 2019.

58 Indiana Supreme Court ruling stops communities from finding trains for blocked streets, South Bend Tribune, September 2018.| The ruling argued that the fines violated the 1995 Interstate Commerce Commission Termination Act which prohibits states from managing or governing railroads.

59 EME Rail Solutions on-site evaluation of rail crossing incidents in 2019.

60 Northwest Indiana Rail Crossing Task Force Summary Report.

Recognizing the importance of addressing blocked crossings, regional organizations, including the Northwest Indiana Rail VISION Group and the Northwest Indiana Rail Crossings Task Force, have conducted many studies and reports on this topic in recent years.[61] These reports, in addition to stakeholder consultations, identified a variety of causes for the high number of blocked crossings in the region:

- A significant number of at-grade rail crossings in the region.
- Train dispatching decisions in line with PSR and other operating protocols.
- Speed restrictions on the railroad.
- Mechanical failures and other equipment issues that require the train crew to stop and inspect the train and make repairs, if needed.
- Insufficient double tracking or siding. Short segments of double tracking or siding mean long trains performing a "rolling meet," or traveling towards each other, must coordinate their timing in order to safely pass one another. When the timing is not perfect, one train must wait for the other, leading to blocked crossings and delays.
- Congestion at rail facilities in Chicago forces trains to wait in Northwest Indiana.

Blocked Crossing Safety Issues Northwest Indiana Rail Crossings Task Force

On October 18, 2018, the NIRPC Executive Board established a Northwest Indiana Rail Crossings Task Force to examine how local units of government could approach railroads to remedy the issues posed by blocked crossings. The task force convened four times from December 2018 to October 2019, identifying the need to get the Surface Transportation Board to hold railroads accountable for blocked crossings as well as sources of better data and crowd-sourced tools to report on blocked crossings.

61 Regional At-Grade Crossing Study and Northwest Indiana Rail Crossing Task Force Summary Report

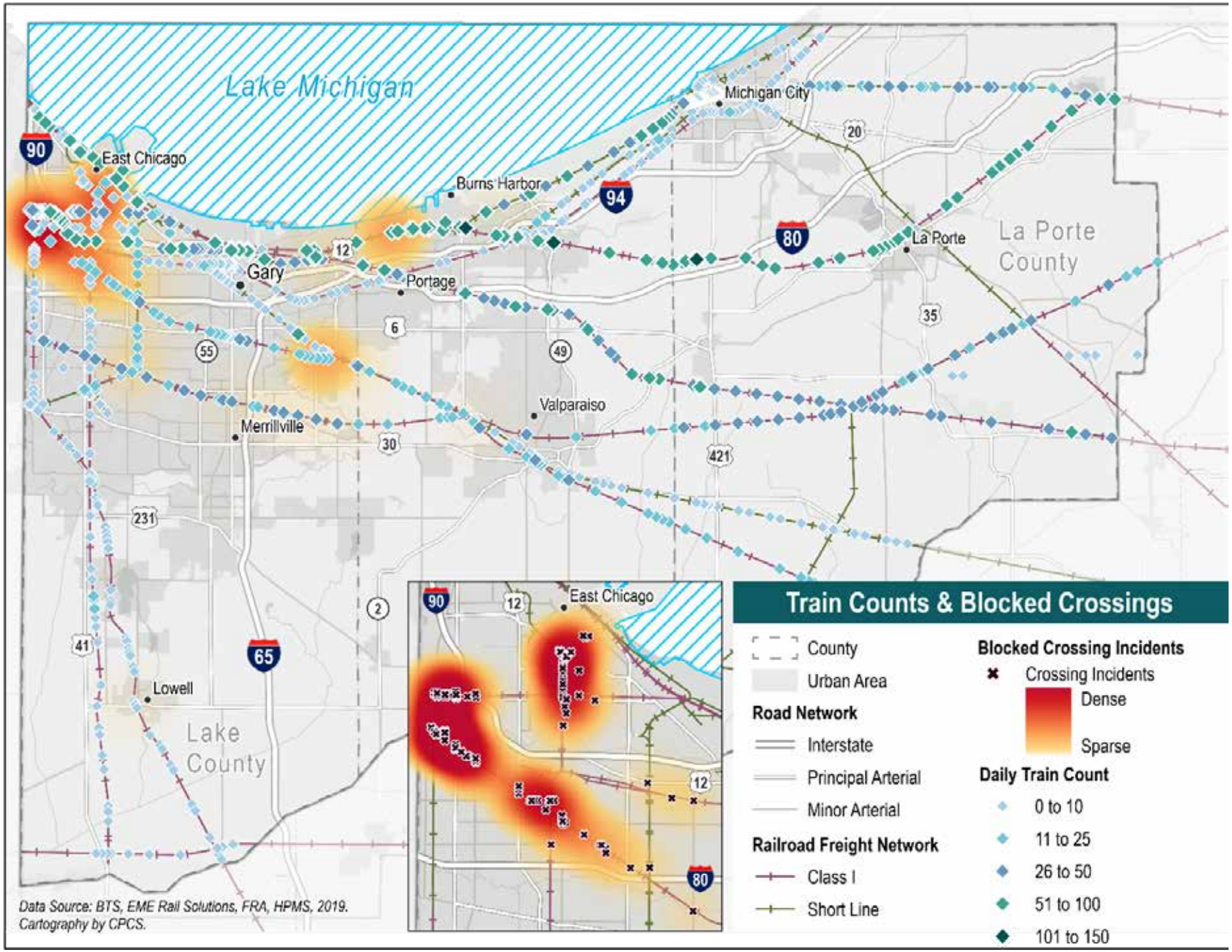


Figure 4-41: Daily Train Counts and Blocked At-Grade Crossing Incidents in Northwest Indiana, 2019

Infrastructure Condition

Pavement Condition

Adequate pavement condition is critical for the safe, comfortable, and efficient travel of vehicles on a region's roadways. The FHWA uses data from the Highway Performance Monitoring System (HPMS) to calculate the condition of pavement on NHS routes. This data considers a variety of road factors, including roughness, rutting, cracking, and faulting, to assign the pavement an overall condition rating of good, fair, or poor. States are required to set targets and assess the performance of road pavement using this data.[62]

Table 4-30 displays the share of Interstate and non-Interstates NHS routes in good, fair, and poor condition. The majority of both Interstate and non-Interstate NHS routes in Northwest Indiana are in fair condition. Figure 4-42 shows a map of pavement conditions on NHS routes in Northwest Indiana. Roads in poor condition are scattered throughout the region with a noticeable concentration in northern Lake County.

Road Bridge Condition

Table 4-31 provides a summary of road bridge inventory and condition in Northwest Indiana. Interstate bridges are clustered in Lake County. Lake County also has the highest number of road bridges, accounting for almost half of the total bridges in the region. La Porte County has a significant number of rural bridges. The average age of bridges in the region is 46 years, with bridges in Porter County being the oldest and bridges in Lake County being the youngest, on average.

62 Overview of Performance Measures: Pavement Condition to Assess the National Highway Performance Program, FHWA, 2017

Segment Type	Good	Fair	Poor
Interstate	5.79%	92.70%	1.51%
Non-Interstate NHS	7.67%	89.84%	2.49%

Source: CPCS analysis of HPMS data, 2022.

Table 4-30: NHS Pavement Condition in Northwest Indiana, 2019

County	Interstate	Other Principal Arterial	Minor Arterial	Collector	Local	Rural	Urban	Total	Average Year Built	Average Age
Lake	177	102	68	61	87	103	392	495	1983	39
Porter	48	56	27	63	82	141	135	276	1968	54
La Porte	38	31	9	64	84	196	30	226	1972	50
Total	263	189	104	188	253	440	557	997	1976	46

Source: CPCS analysis of USDOT National Bridge Inventory data, 2022.

Table 4-31: Count and Average Age of Road Bridges in Northwest Indiana

Figure 4-42: NHS Pavement Conditions in Northwest Indiana, 2019

Table 4-32 demonstrates the number of bridges in poor condition in Northwest Indiana by roadway system. There are a total of 52 bridge structures in poor condition in Northwest Indiana, making up just over 5 percent of all bridges in the region. The remaining 95 percent of bridges are in fair to good condition. Four of the bridges in poor condition are located on an Interstate. Lake County has the greatest number of bridges in poor condition, followed by Porter and La Porte Counties.

Figure 4-43 presents a map of overall road bridge conditions in Northwest Indiana using USDOT National Bridge Inventory data. Bridges in poor condition are located throughout the region with no clear pattern, although the higher concentration of such bridges in Lake County is evident.

Road Bridges in the Worst Condition in Northwest Indiana

- The worst scoring bridge in Indiana is the Kankakee River Stateline Bridge in southwest Lake County which is in critical/ serious condition. This bridge has been closed since 2000.
- The worst scoring bridge that is still in use is the W 117th Ave bridge over West Creek near Cedar Lake in Lake County. This is followed by the 125th Ave bridge over West Creek in Lake County.
- Other bridges in poor condition include 153rd Ave over Lake Dalecarlia in Lake County, S Wisconsin St over Lake George in Lake County, and SR 2 over Hutton Ditch in Porter County.

Source: CPCS analysis of USDOT National Bridge Inventory data and Google Maps, 2022. Note: Worst condition refers to bridges with the lowest scores on any bridge component, either the deck, superstructure, substructure, channel, or culvert.

County	Rural	Urban	Interstate	Other Principal Arterial	Minor Arterial	Collector	Local	Total	Share of Total Bridges
Lake	6	22	4	1	4	7	12	28	5.7%
Porter	11	5	0	0	5	7	4	16	5.8%
La Porte	7	1	0	1	0	4	3	8	3.5%
Total	24	28	4	2	9	18	19	52	5.2%

Source: CPCS analysis of USDOT National Bridge Inventory data, 2022.

Table 4-32: Counts of Road Bridges in Poor Condition by System and County in Northwest Indiana

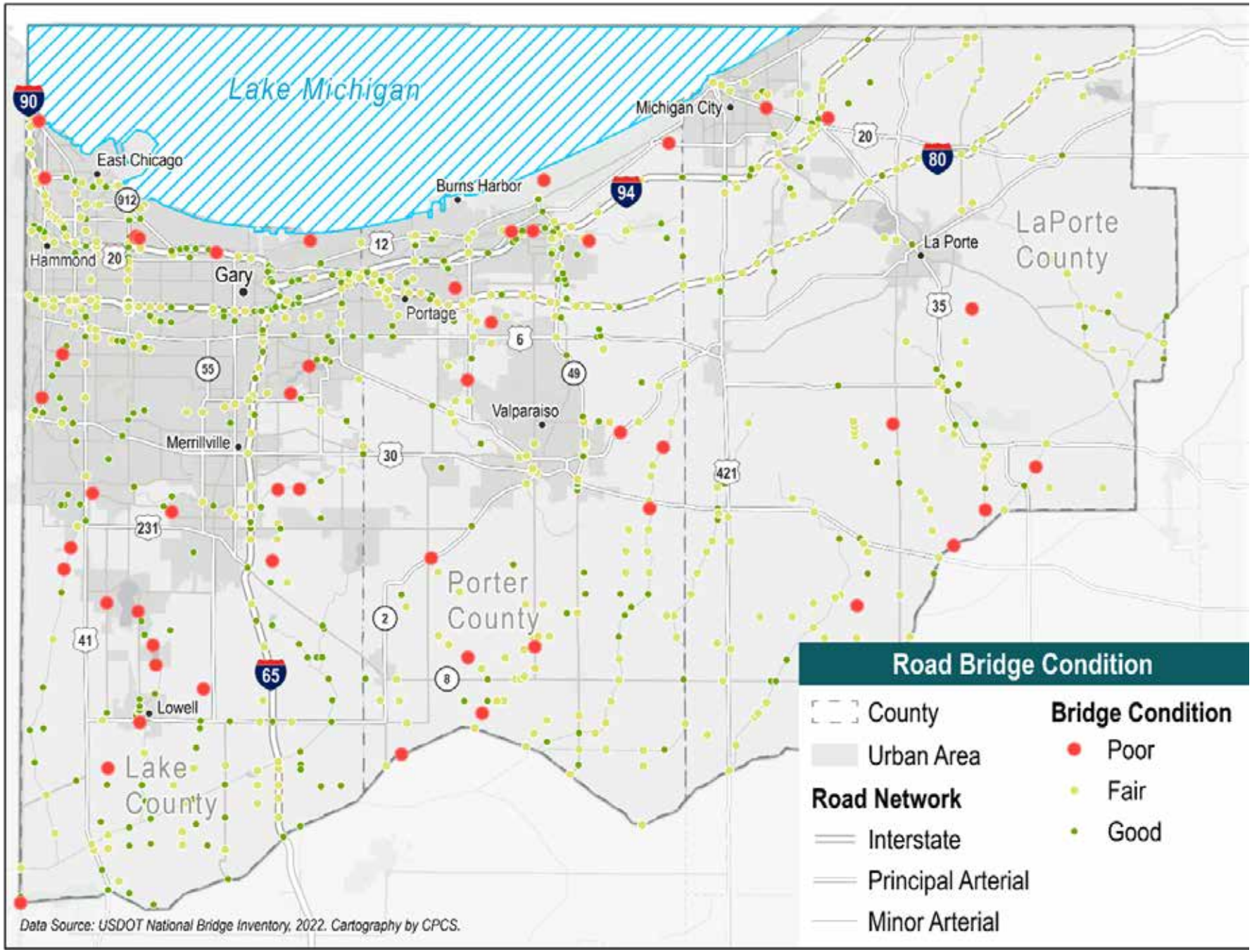


Figure 4-43: Overall Road Bridge Conditions in Northwest Indiana, 2022

Movable Bridges

There are three road movable bridges in Northwest Indiana, two in Lake County and one in La Porte County. As shown in Table 4-33, all three bridges are in fair condition. There are also two rail movable bridges in Northwest Indiana, which are operated by Canadian National and are not included in this data.

Rail Track Condition

The industry standard maximum weight shifted from 263,000 pounds to 286,000 in the 1990s, which required investments in railroad infrastructure. All rail tracks serving Class I railroads in Northwest Indiana are 286K capable, as is the Chicago, Fort Wayne, & Eastern Railroad (CFE). [63]

Track class speed dictates how quickly a train can move along a particular section of track. These classes are often dictated by geometric characteristics and the condition of the track. Table 4-34 presents statewide track class information for railroads in Northwest Indiana.

Movable Bridge	County	Condition	Year Built
Dickey Road	Lake	Fair	1992
Indianapolis Boulevard	Lake	Fair	1987
Franklin Street	La Porte	Fair	1932

Source: CPCS analysis of Bureau of Transportation Statistics National Bridge Inventory data

Table 4-33: Movable Bridge Condition and Year Built

Railroad	Subdivision	Track/Speed Class
CSXT	Barr	Max 60mph
	Garrett	Max 50-60mph
	Porter	Max 40mph
	Grand Rapids	Max 50mph
NS	Chicago Line	Max 50mph
	Chicago District	Max 50mph
	Kankakee	Max 35-45mph
CFE	N/A	Excepted on 17.4 miles; Class 2 or higher on 141.8 miles
CKIN	N/A	Class 1
CSS	N/A	Class 1 on 50 miles; Class 2 or higher on 75 miles
IHB	N/A	Class 2 or higher

Source: 2021 INDOT Rail Plan.
Note: Speed classes are for the state overall. The maximum allowed speed on Class 1 track is 10 mph. On Class 2 it's 25 mph [64]

Table 4-34: Statewide Track Class Information for Railroads in Northwest Indiana

63 INDOT State Rail Pna 2021; Chicago, Fort Wayne & Eastern Railroad (CFE), Genesee and Wyoming Railroad.

64 49 CFR § 213.9 – Classes of track: operating speed limits., Legal Information Institute, Cornell Law School.

Environmental Impacts

The transportation sector both acts on the environment and is acted on by the environment. This section discusses this important interplay between the freight system and the natural and human settings that it occupies. The freight system generates air emissions, noise pollution, and hazardous spills, which all affect the natural and human environment. Conversely, the natural environment strains the resiliency of the freight system's physical infrastructure through natural wear and tear and climate disasters.

Air Emissions

Air emissions can have profound impacts on quality of life, health, wildlife, and the climate. According to the US Environmental Protection Agency (EPA), the transportation sector contributed 27 percent of the greenhouse gas emissions in the US in 2020. Of these transportation-related emissions, trucks, including light-duty vehicles and medium- and heavy-duty trucks, contributed 83 percent.[65] The freight transportation sector thus plays a major role in mitigating air emissions and their impacts.

Nonattainment

Of the six pollutants regulated by the Clean Air Act, all three counties in Northwest Indiana were classified as Ozone nonattainment areas based on the 1997 National Ambient Air Quality Standard (NAAQS). By 2010, these three counties had been reclassified for attainment with maintenance plans according to the 1997 standard. However, Lake and Porter Counties were redesignated as nonattainment areas according to the updated 2008 Ozone NAAQS and were denied a redesignation request in 2015. In 2018, the townships of Calumet, Hobart, North, Ross, and St. John in Lake County were designated as nonattainment for the 2015 Ozone NAAQS. The transportation sector is a major contributor to ground-level Ozone production.[66] Internal combustion engines release nitrogen oxides (NOx) and volatile organic compounds (VOCs), which react under the presence of sunlight to produce Ozone.[67]

Figure 4-44 shows the annual fourth-highest daily maximum 8-hour average ozone concentrations for each Northwest Indiana county. The figure also presents the standard during each year, which is met at each air quality monitor if the three-year average of the annual ozone metric is below the standard. The figure makes clear that the Northwest Indiana region hovers right around the standard, and Ozone emissions have been increasing slightly in recent years.

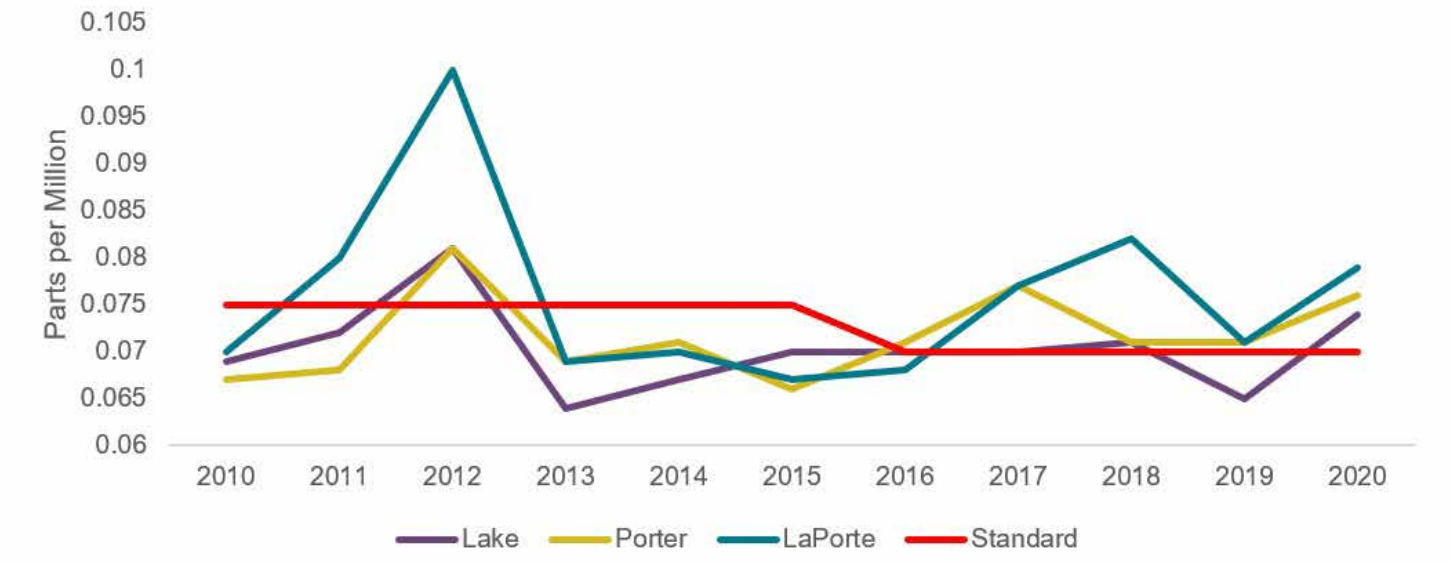
65 Fast Facts on Transportation Greenhouse Gas Emissions, US EPA, (n.d.).

66 Air Quality Conformity Determination Report, NIRPC, April 2021.

67 Ground-level Ozone Basics, EPA, June 2022

NIRPC's Air Quality Conformity Determination Report includes an analysis of forecasted NOx and VOC emissions through 2050. These forecasts suggest that Lake and Porter Counties will emit levels of NOx and VOC that are below the motor vehicle emissions budgets set out in the Indiana State Implementation Plan. This indicates that Northwest Indiana will conform with national Ozone emissions standards.[68]

East Chicago in Lake County has been designated a maintenance area for Particulate Matter less than 10 microns in diameter (PM10) and Carbon Monoxide (CO). However, the transportation sector is not a major contributor of this type of pollution.[69]



Source: CPCS analysis of US EPA Statistics Reports, 2022. https://www.epa.gov/outdoor-air-quality-data/air-quality-statistics-report | Timeline of Ozone National Ambient Air Quality Standards (NAAQS), US EPA. https://www.epa.gov/ground-level-ozone-pollution/timeline-ozone-national-ambient-air-quality-standards-naaqs
Note: Includes exceptional events. The EPA 8-hour ozone air quality standard changed in 2015.

Figure 4-44: Ozone 4th Maximum 8-Hour in Northwest Indiana

68 Air Quality Conformity Determination Report, NIRPC, April 2021.

69 Ibid.

Major Emitters

Table 4-35 presents the top 10 highest greenhouse gas emitting industrial point sources in Northwest Indiana as of 2019. The facility that generated the greatest amount of greenhouse gas emissions was the US Steel Corporation in Gary, which released the equivalent of over 9 million metric tons of CO2. Of the top 10 polluting industrial facilities in 2019, seven were in Lake County, two were in Porter County, and one was in La Porte County. All the industrial facilities are freight dependent.

Noise Pollution

Noise pollution can have serious impacts on both surrounding wildlife and human health and quality of life. As shown in Figure 4-45, transportation-related noise pollution in Northwest Indiana is concentrated around major roads, railways, and airports. According to the US Bureau of Transportation's Noise Map data, the largest contributors to noise pollution are Gary/Chicago International Airport, Porter County Regional Airport, the region's four Interstates, especially I-94, and railroads along Lake Michigan.

Facility	Parent Company	City	County	GHG (metric tons CO2e)
US Steel – Gary Works	US Steel Corp	Gary	Lake	9,015,960
Cleveland-Cliffs Burns Harbor LLC	Cleveland Cliffs Indiana Harbor LLC (formerly ArcelorMittal)	Burn Harbor	Porter	7,739,921
Cleveland-Cliffs Steel LLC (3210 Watling St)	Cleveland Cliffs Indiana Harbor LLC (formerly ArcelorMittal)	East Chicago	Lake	6,200,942
BP Whiting Business Unit	BP America Inc	Whiting	Lake	4,984,462
Cleveland-Cliffs Steel LLC (3001 Dickey Rd)	Cleveland Cliffs Indiana Harbor LLC (formerly ArcelorMittal)	East Chicago	Lake	4,509,626
Linde Whiting	Praxair Inc	East Chicago	Lake	1,656,904
Michigan City Generating Station	NiSource Inc	Michigan City	La Porte	1,158,966
Indiana Harbor Coke Company	Suncoke Energy Inc and DTE Energy Co	East Chicago	Lake	979,203
Carmeuse Lime Inc. Buffington	Carmeuse Lime Inc.	Gary	Lake	872,063
Portside Energy	Perc Holdings 1 LLC	Portage	Porter	224,194

Source: CPCS analysis of US EPA Facility Level Information on Greenhouse Gases Tool (FLIGHT) data, 2022.

Table 4-35: Top 10 Major Emitter Industrial Point Sources in Northwest Indiana, 2019

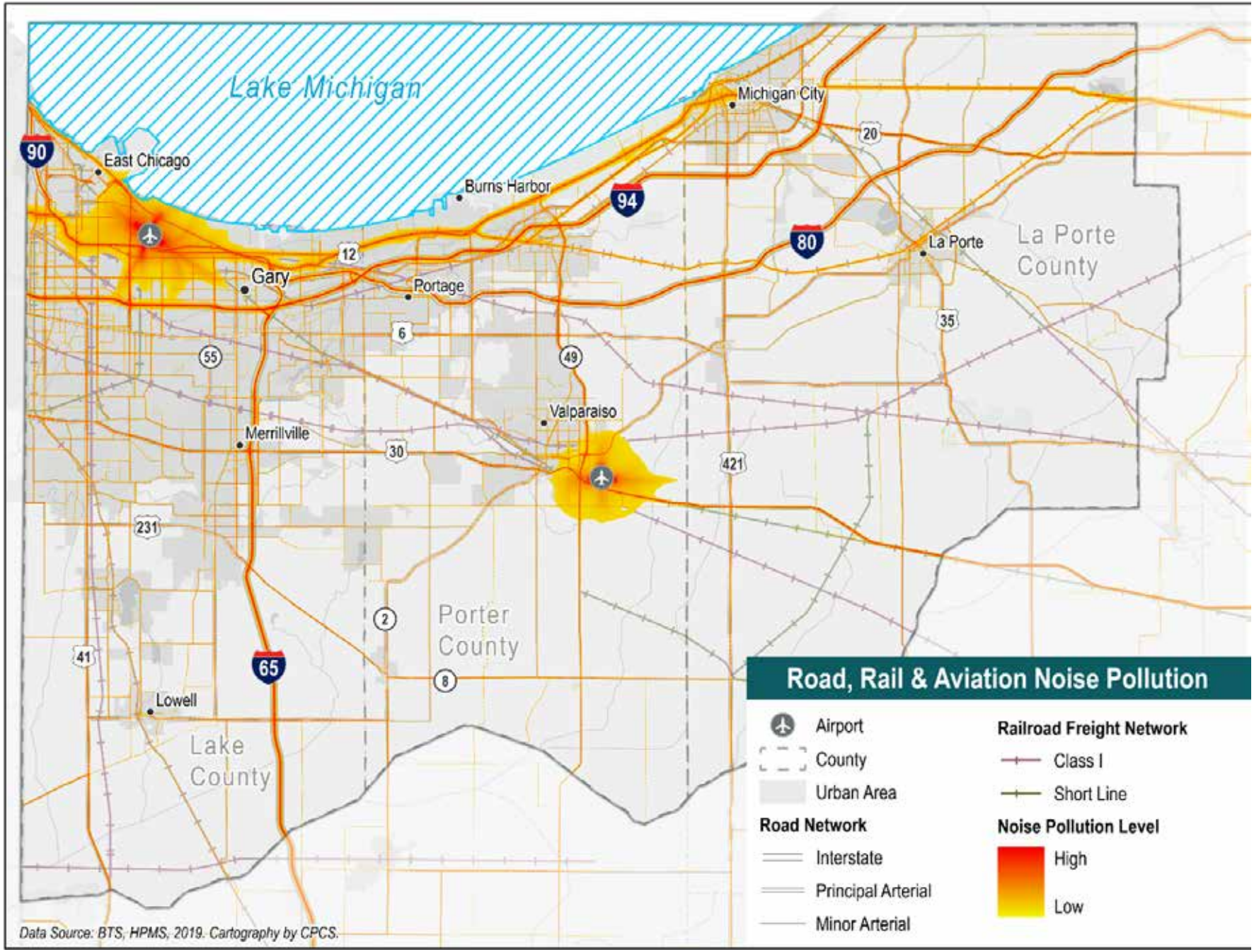


Figure 4-45: Transportation-Related Noise Map in Northwest Indiana

Hazardous Spills

A hazardous material spill refers to the accidental leak of any toxic element into the environment. The most common type of spill involves petroleum products, although other materials may be spilled as well, including sewage, pesticides, paint, firefighting foam, and other chemicals. Not only do such spills threaten the health of wildlife and the natural environment, but they also risk polluting critical human water resources. The transportation sector can be a major source of hazardous spills, not only because they tend to carry fuel oils but also because freight transportation often transports hazardous commodities.

Figure 4-46 provides a snapshot of the number of hazardous spills in Northwest Indiana reported to the Indiana Department of Environmental Management from transportation-related sources between 2011 and 2021. The railroad and roadway modes lead in terms of this metric. However, Figure 4-47 makes clear that in terms of the total volume of spills reported over this period, pipeline far exceeds the other transportation modes. This suggests that the average volume of hazardous materials released during each spill is, on average, much lower for railroad and roadway modes than for pipelines.

It is important to note that the Indiana Department of Environmental Management data does not differentiate between freight-related spills and non-freight-related spills. The data here should be viewed as an approximate proxy for the frequency of freight-related hazardous spills.

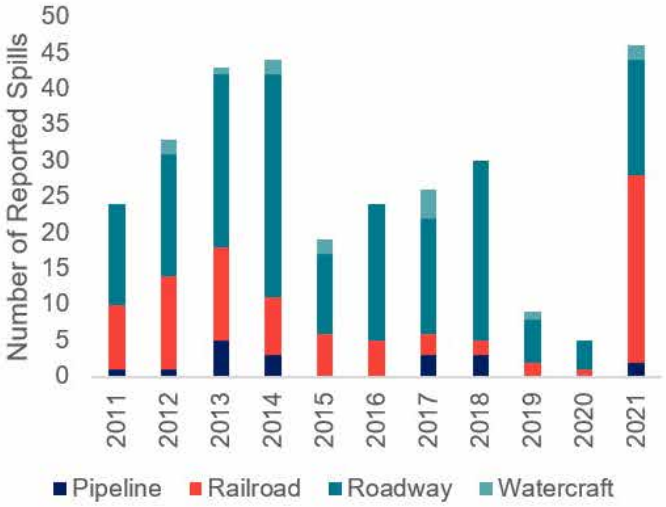


Figure 4-46: Number of Reported Spills in Northwest Indiana, 2011-2021

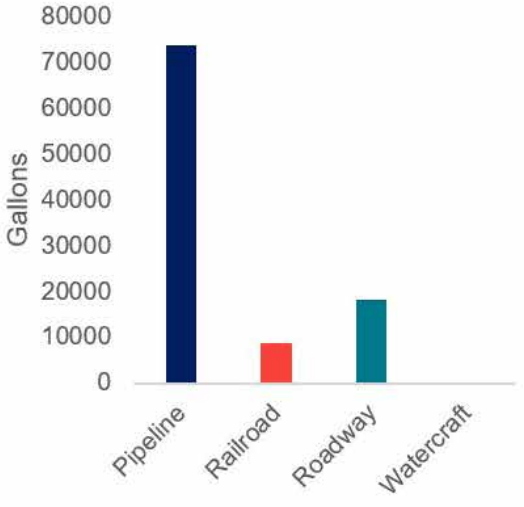
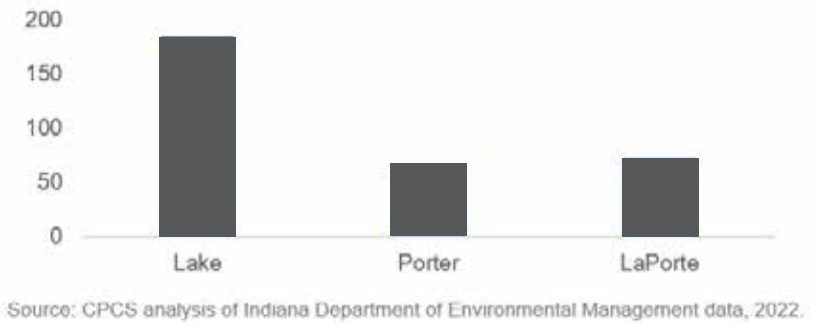


Figure 4-47: Reported Volume of Hazardous Spills in Northwest Indiana, 2011-2021

Source: CPCS analysis of Indiana Department of Environmental Management data, 2022.

Table 4-36 shows that the majority of hazardous spills in Northwest Indiana between 2011 and 2021 occurred in Lake County.

One way of assessing pipeline safety performance, in particular, is to examine the number of pipeline incidents per pipeline mile. Figure 4-48 shows the number of hazardous liquid incidents scaled by hazardous liquid pipeline miles between 2010 and 2021 in Indiana and the US overall. Indiana experiences a roughly similar rate of incidents per pipeline mile compared to the country overall. Figure 4-49 shows the number of gas incidents scaled by gas pipeline miles between 2010 and 2021 in Indiana and the US overall. Here, Indiana tends to perform better than the country overall. Although this data is for the entire state of Indiana, it is fair to assume that similar trends may exist in Northwest Indiana.



Source: CPCS analysis of Indiana Department of Environmental Management data, 2022.

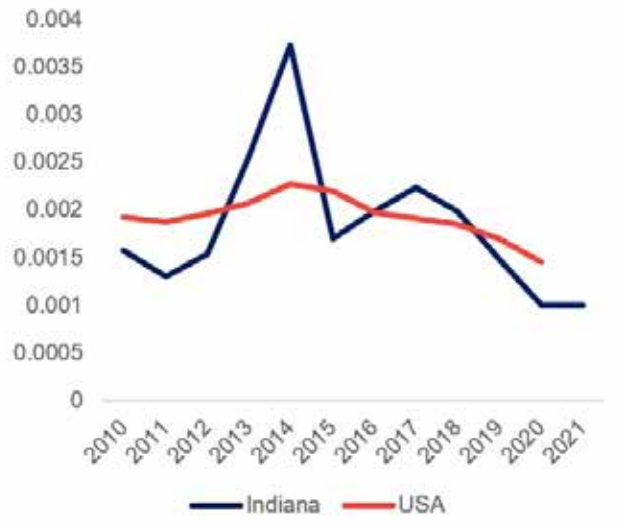
Table 4-36: Number of Hazardous Spills by County, 2011-2021

The USDOT Pipeline and Hazardous Materials Safety Administration defines a **pipeline incident** as:

(1) An event that involves a release of gas from a pipeline, gas from an underground natural gas storage facility (UNGSF), liquefied natural gas, liquefied petroleum gas, refrigerant gas, or gas from an LNG facility, and that results in one or more of the following consequences:
(i) A death, or personal injury necessitating in-patient hospitalization;
(ii) Estimated property damage of $122,000 or more, including loss to the operator and others, or both, but excluding the cost of gas lost. For adjustments for inflation observed in calendar year 2021 onwards, changes to the reporting threshold will be posted on PHMSA's website. These changes will be determined in accordance with the procedures in appendix A to part 191.

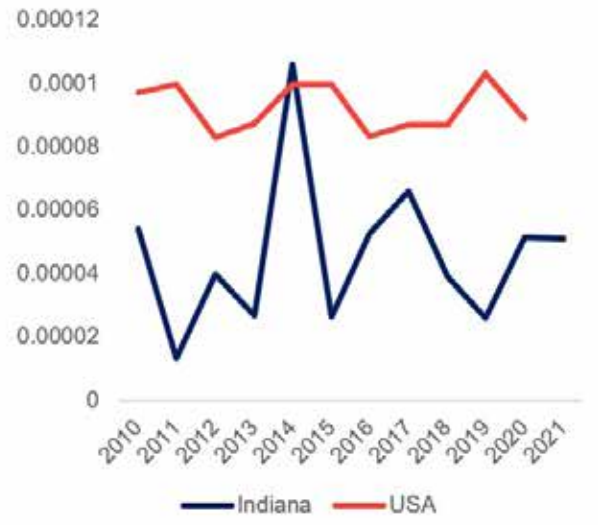
(iii) Unintentional estimated gas loss of three million cubic feet or more.
(2) An event that results in an emergency shutdown of an LNG facility or a UNGSF. Activation of an emergency shutdown system for reasons other than an actual emergency within the facility does not constitute an incident.
(3) An event that is significant in the judgment of the operator, even though it did not meet the criteria of paragraph (1) or (2) of this definition.

Source: 49 CFR § 191.3 – Definitions.



Source: CPCS analysis of USDOT Pipeline and Hazardous Materials Safety Administration's Pipeline Miles and Facilities 2010+ and All Reported Incidents data, 2022.
Note: Pipeline miles and incidents are for hazardous liquids only (Crude Oil, Refined PP, H.V.L. Flamm Toxic, CO2, Biofuel). Values are calculated by year and then averaged.

Figure 4-48: Hazardous Liquid Incidents per Mile of Pipeline in Indiana and US, 2010-2021



Source: CPCS analysis of USDOT Pipeline and Hazardous Materials Safety Administration's Pipeline Miles and Facilities 2010+ and All Reported Incidents data, 2022.
Note: Pipeline miles and incidents are for gas pipelines only (gas distribution, gas gathering, gas transmission). Values are calculate by year and then averaged.

Figure 4-49: Natural Gas Incidents per Mile of Pipeline in Indiana and US, 2010-2021

Infrastructure Resiliency

Environmental events – both extreme weather events and changes in long-term environmental conditions – have the potential to damage infrastructure and disrupt freight and passenger movements. The need to prepare and respond to these events has become increasingly important, with agencies planning and preparing to avoid, adapt to, and recover from – in other words, remain resilient to – these environmental disruptions.

Resiliency refers to the ability to recover from or adjust easily to misfortune or change. In the case of the freight system, this misfortune or change may be caused by a variety of factors (Figure 4-50), including but not limited to environmental and climate factors. A resilient transportation network has the ability to avoid, adapt to, and recover from the stressors on physical infrastructure and operations (both users and organizations) caused by this misfortune or change.

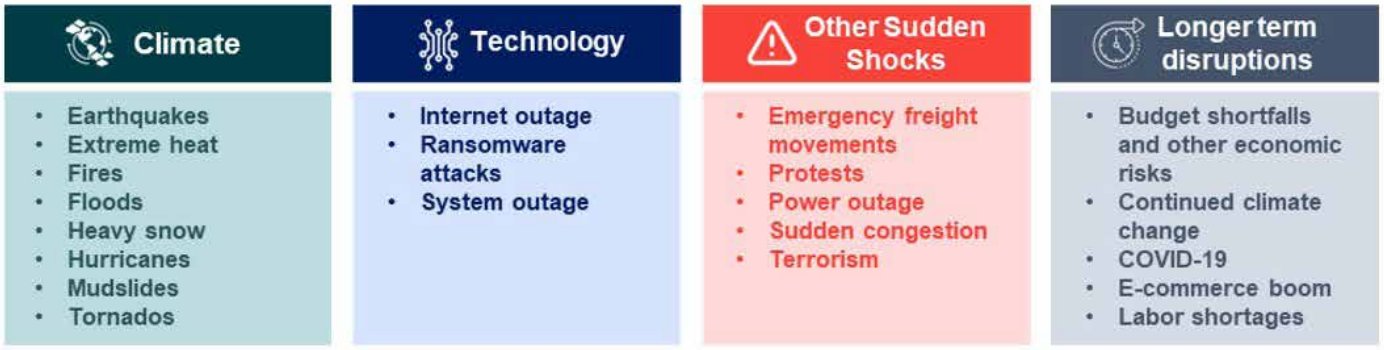


Figure 4-50: Freight System Disruptions

If infrastructure and operations are not prepared for sudden shocks or long-term changes, there may be serious impacts on safety and security, transportation system management, asset preservation, and freight and economic vitality. Strategic investments in tactical improvements to infrastructure (e.g., incorporate more hard-wearing design and construction practices where needed, develop strategic system redundancies) will help improve freight system resiliency. Investing in mitigating strategies yields significant savings in terms of safety, preventing property loss, and minimizing disruption of day-to-day life.

The US Federal Emergency Management Agency (FEMA) produces a National Risk Index (NRI) for each community in the country. The NRI identifies the relative risk faced by a community for 18 natural hazards. This incorporates expected annual economic loss from natural hazards, social vulnerability, and community resilience, which includes infrastructure. Although these scores identify general risk, it is nevertheless a useful indicator for where freight infrastructure is at the highest risk to different disasters.

Figure 4-51 shows that Lake County sees a higher composite risk index than the other two counties in Northwest Indiana. In fact, almost 94 percent of counties in the US have a lower risk index than Lake County. Meanwhile, La Porte County and Porter County have risk indices below the US average. Lake County's high-risk index is the result of above-average component scores for social vulnerability and expected annual loss, which indicate that the county houses valuable economic resources and populations that are uniquely susceptible to disaster. Lake County is particularly vulnerable to certain hazard types, including cold waves, heat waves, flooding, strong winds, winter weather, and tornadoes.[70] As a result of temperature changes, stakeholders consulted noted observable changes in the frost and thaw season, with impacts on road conditions and maritime navigation.

70 National Risk Index, FEMA.

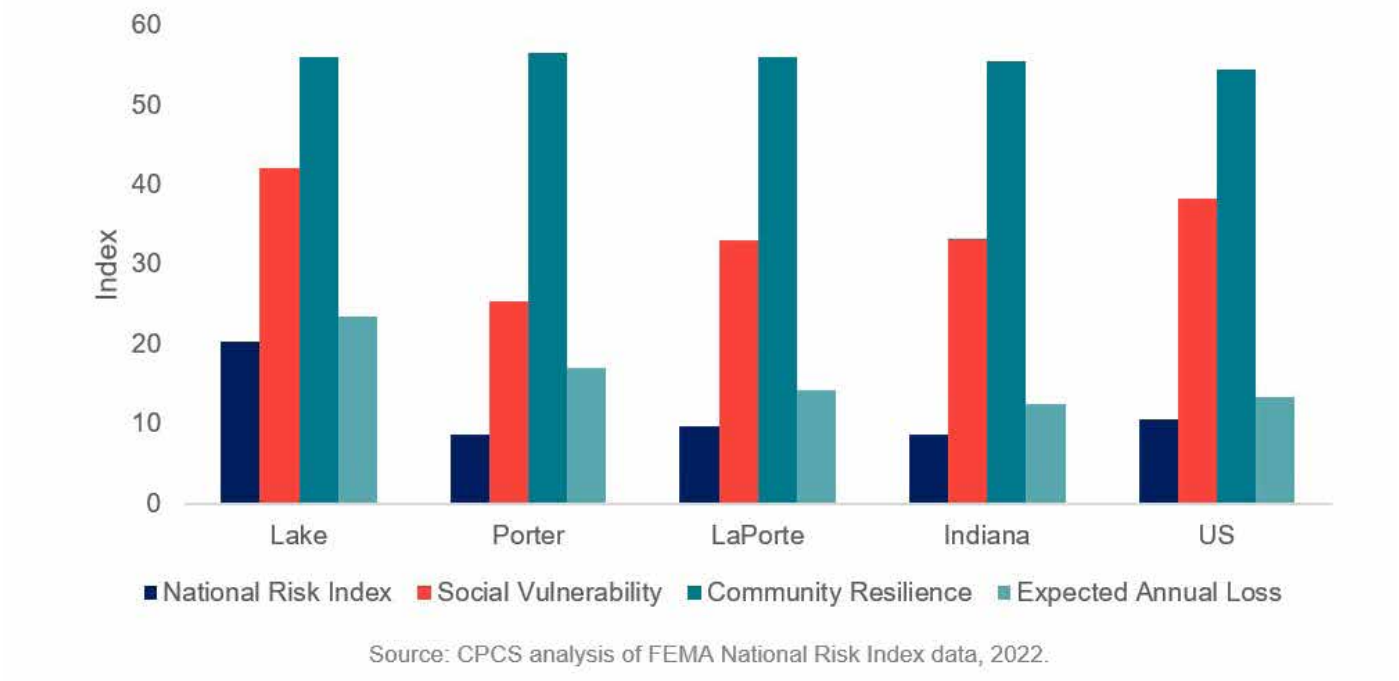


Figure 4-51: Composite National Risk Indices and Component Indices for Northwest Indiana Counties

Borman Expressway Flooding

The portion of I-80/I-94 between the Illinois state line and the Interstate's intersection with I-90 in Lake Station is known as the Borman Expressway. The Borman Expressway lies in the Little Calumet River watershed, which occasionally floods, sometimes forcing sections of road to be closed. In 2008, a disastrous Little Calumet River flood cost the region $88 million and forced the Expressway to shut down in both directions for four days, including a 16-mile stretch eastbound between Ripley Street and Indianapolis Boulevard.

Since then, the Indiana DOT has installed a stormwater pumping station near the Kennedy Avenue interchange. Levees have also been constructed to control the Little Calumet River, supervised by the US Army Corps of Engineers and the Little Calumet River Business Development Commission.

Sources: Northwest Indiana Times, 2022.

Conclusions and Next Steps

Conclusions

Northwest Indiana's robust freight network is a critical source of economic vitality in the region. A variety of freight-dependent industries rely on this system for their operations, including manufacturing, which is among the most prominent industries in the region. The freight system is itself an important component of the economy, with a notable transportation and warehousing industry that is growing faster than the national average. Nevertheless, freight-dependent industries in Northwest Indiana face serious demographic challenges. The region's working age population is shrinking, driving workforce shortages for many industries in Northwest Indiana. In response, workforce training programs and automation are being implemented.

The mobility of goods is the essential role of the freight system. Mobility, however, is an issue on many of Northwest Indiana's roads. Truck congestion and a lack of reliability are experienced along segments of I-94, US 6, US 30, and US 41. Some local roads also experience significant truck traffic. Bridge clearance restricts truck movements along the I-90 corridor, I-94 east of Lake Station, and the northern section of I-65. Moreover, highway-rail at-grade crossings cause delays, especially along high-volume corridors such as CSXT's Barr subdivision and NS's Chicago Line. More than 82 percent of rail crossings in Northwest Indiana are at-grade, and the region has almost doubled the number of at-grade crossings per public roadway mile as Indiana, which already ranks first among all states.

The freight system is also responsible for ensuring the safety of its users. Truck-involved crashes have seen increases in Northwest Indiana recently, as have rail safety incidents. Truck safety hotspots are primarily clustered along I-90, I-65, I-94, and segments of I-80, whereas rail safety issues are concentrated along high-volume Class I railroads like CSXT Barr's subdivision. The region's high concentration of at-grade crossings not only poses mobility issues but also introduces considerable safety concerns.

Northwest Indiana's freight infrastructure yields Indiana the nickname the "Crossroads of America." With this title, though, comes significant pass-through truck and rail traffic. This issue is in part due to the lack of an intermodal facility in Northwest Indiana, causing trucks and trains carrying intermodal containers to travel to and from Chicago facilities through the region. Even the intermodal cargo destined to or originated from Northwest Indiana has to be shipped to Chicago area facilities, often by trucks. These pass-through users exacerbate maintenance needs along the highway system. Unfortunately, the major roadways in the region are generally failing to meet state pavement condition performance targets. As of 2019, the majority of NHS roads in Northwest Indiana are in fair condition, with just 5.8 percent of Interstates and 7.8 percent of non-Interstates routes in good condition.

Infrastructure projects in Northwest Indiana must address infrastructure condition issues and more broadly prioritize ongoing safety and mobility improvements. Infrastructure projects should also advance resilience, both from environmental and human sources, and mitigate environmental impacts like pollution and hazardous spills. These priorities will allow Northwest Indiana's freight system to continue efficiently moving goods and serving as the nation's "Crossroads" into the future.

Other freight needs and issues identified through data analysis and stakeholder outreach are shown in Figure 4-52.

Issues		Needs
	Workforce shortages threaten freight-dependent industries	Consider developing workforce training programs to connect workers with key industries facing shortages. Encourage and support investments in automation technologies when human labor shortages are unavoidable.
	Pavement condition does not meet state performance targets	Invest in road infrastructure, especially pavement condition, as truck freight tonnage and value are expected to increase by 2050
	Truck parking is either in short supply or hard to find	Expand truck parking capacity and introduction of systems to help drivers find parking, perhaps through TPIMS
	The frequency of truck-involved crashes has been increasing recently	Consider solutions that prevent unsafe lane movements and driver distraction in order to reduce truck-involved crashes. Perhaps investigate truck-only lanes to separate passenger and freight movements and reduce weaving.
	Some bridges with low clearance cause mobility concerns	Consider increasing minimum clearances to prevent impediments to the smooth flow of traffic, especially clearances below 15 feet on the Interstate
	At-grade crossings cause delays and safety concerns	Investigate the elimination or grade separation of the at-grade rail crossings that pose the most serious mobility and safety concerns. Also, an opportunity to install additional active warning devices at crossings where they are lacking
	Blocked crossings cause significant delays	Potential to invest in additional siding or double tracking, or to grade-separate crossings
	Some movable bridges are in poor condition	Upgrades to movable bridges

Figure 4-52: Northwest Indiana Freight Needs and Issues

Issues		Needs
	Maritime navigation is impacted by underinvestment and certain policy	Invest in port infrastructure maintenance, ice-breaking equipment, dredging, and environmental issues
	A lack of international destinations at NWI airports means that high-value cargo bound for international destinations has to be shipped by trucks to the Chicago O'Hare International Airport, which exacerbates road congestion in NWI.	Potentially expand air cargo operations at NWI's airports. Currently, high-value cargo bound for international destinations has to be shipped by trucks to the Chicago O'Hare International Airport, which exacerbates road congestion in NWI
	Pipelines are the largest source of hazardous spills by volume	Explore solutions that reduce the frequency and volume of pipeline-related hazardous spills
	Congestion caused by freight traffic traveling to or from Chicago intermodal facilities	Opportunity to investigate the viability of intermodal operations in NWI
	Extreme weather and other disruptive events damage infrastructure, cause delays and pose safety concerns	Resilience improvements against extreme weather events like extreme cold and heat, changing freezing and thawing patterns, and seasonal floods
	Air emissions, especially Ozone, remain a problem in the region	Investigate solutions that reduce air emissions, including the NOx and VOC emissions that contribute to Ozone production
	Some areas experience significant freight-related noise pollution	Consider conducting outreach to gauge community concerns regarding freight-related noise pollution. Problem sites might benefit from noise barriers

Figure 4-52: Northwest Indiana Freight Needs and Issues

Vision for Improving Freight Transportation in the Northwest Indiana Region

Background & Approach

The Northwestern Indiana Regional Planning Commission (NIRPC) is the designated Metropolitan Planning Organization for the Northwest Indiana region. NIRPC is responsible for investing federal transportation funds in highways, transit, active (non-motorized) transportation, and other modes of people and goods movement in Northwest Indiana.

The purpose of the Freight Chapter is to emphasize:

- preserving the existing transportation systems,
- planning for the safety of all transportation system users,
- providing the freight industry with access to the workforce,
- efficiently moving freight to support the economy of the region, and
- ensuring equity in allocating federal, state, and local transportation dollars to benefit all users.

The Freight Chapter builds upon key findings and relevant content from previous related studies, plans, and formal documents, analysis of relevant data, and information collected through public and stakeholder engagement.

NWI 2050+ needs to provide a clear, simple, and broadly accepted vision and associated goals and objectives to effectively guide freight transportation investments and improvements in the region. The critical underpinnings of the regional freight vision and its associated goals and objectives are the broad vision and guiding principles established in *NWI 2050*:

"NWI 2050 envisions a connected, renewed, united and vibrant region by 2050."

Connected: Provide accessible, safe, and equal opportunities for working, playing, living, and learning.

United: Celebrate diversity and work together as a community across racial, ethnic, political, and cultural lines for the mutual benefit of the region.

Renewed: Make Northwest Indiana's urban and rural centers places that people want to come to and live in and ensure our environment is safe and healthy.

Vibrant: Support a thriving economy, a well-educated population, planned growth, and protection of natural and agricultural areas.

As a result of discussions with internal staff and external stakeholders, NIRPC has expanded this vision to include the following additional guiding principles:

Equitable: Seek fairness in access to resources and opportunities to meet the needs of all community members.

Safe: Reduce and mitigate freight safety and security risks.

The Connected, United, Renewed, Vibrant, Equitable, and Safe (CURVES) guiding principles provide a foundation for setting the goals, objectives, and performance measures for the region's freight system. However, the definitions for each of the principles should be adapted to freight needs based on freight-related themes and overarching transportation policy goals at the national and state levels.

Establishing Regional Freight Planning Principles

Figure 4-53 summarizes the sources and the process for establishing the region's freight vision, goals, and objectives. As shown, Northwest Indiana's freight vision is informed by overarching federal, state, and regional transportation policy goals. Federal freight planning goals are outlined in the Fixing America's Surface Transportation (FAST) Act, Bipartisan Infrastructure Law (BIL) Act, and the US Department of Transportation's (DOT's) National Freight Strategic Plan. The state-level freight goals and objectives are established in Indiana's Long-Range Transportation Plan (2045 LRTP), Indiana State Freight Plan,[71] and the Statewide Rail Plan.

Figure 4-53: Process for Aligning the Regional Freight Vision and Associated Goals and Objectives

71 INDOT's Multimodal Freight Plan was published in 2018 as an update to the 2014 Freight Plan to guide the statewide transportation system investments that benefit goods movement. As of November 2022, INDOT is in the process of updating the Statewide Multimodal Freight Plan.

Using this process, the explicit freight-related goals, requirements, and recommendations identified in each of the federal and state-level guiding documents are compared with the vision, guiding principles, and regional goals provided in *NWI 2050*. Table 4-37 provides a summary of the review results. As shown:

- Freight-related goals in the key guiding documents primarily focus on ***mobility.*** Accordingly, these goals relate to the transportation system's condition, efficiency, and reliability in serving shippers, carriers, consumers, and other stakeholders who directly or indirectly impact, or are impacted by, goods movement.

- The national and statewide freight planning principles also focus on the significance of the freight system to ***economic vitality and competitiveness***. Since transportation is a derived demand, economic competitiveness goals often relate to strategic investments in economically-critical assets.

Protecting the ***environment and serving all communities*** are other focus areas in the key guiding documents. These include goals that commit to eliminating barriers to accessibility, implementing transportation systems that serve the needs of diverse users, and mitigating adverse impacts of freight activity on the natural resources and communities' quality of life.

Together, these goals inform a simple statement to guide freight planning in Northwest Indiana. This statement facilitates the process of analyzing investments and freight system improvement priorities:

Support and strengthen regional economic growth and competitiveness with an accessible, connected, safe, and efficient freight transportation system while reducing environmental and community impacts.

Using this statement, the CURVES guiding principles can be adapted to freight planning needs as follows:

- ***Connected:*** Provide an integrated freight transportation system to seamlessly connect and provide access to multimodal options for goods movement in Northwest Indiana.

- ***United:*** Mitigate the environmental and community impacts of freight activities.

- ***Renewed:*** Prioritize investments in critical infrastructure improvements to ensure a resilient freight system that is minimally disrupted due to unplanned events and sudden changes.

- ***Vibrant:*** Support deployment of innovative data and technologies to enhance the efficiency of goods movement and enable a flourishing economy.

- ***Equitable:*** Seek fairness in providing access to freight transportation options to meet the needs of all community members.

- ***Safe:*** Reduce and mitigate freight safety and security risks.

Focus Areas	NWI 2050 Plan Goals	FAST Act/BIL	National Multi-modal Freight Policy	National Freight Strategic Plan	INDOT State Freight Plan 2018 & Rail Plan 2021	2045 INDOT LRTP
Connected: Provide accessible, safe, and equal opportunities for working, playing, living, and learning.						
Economy & Place	Update land development policies & strategies to emphasize accessibility between people & opportunities.		*			*
Environment	Connect fragmented natural areas and integrated links between people and green spaces to increase resiliency and health outcomes.	*				
Mobility	Complete roadway, bicycle, sidewalk, and transit networks across municipal and county lines to enhance safe and efficient access to opportunities for all.	*	*	*	*	*
People & Leaders	Commit to removing barriers and obstacles to guarantee equal and accessible opportunities.	*				*
United: Celebrate diversity and work together as a community across racial, ethnic, political, and cultural lines for the mutual benefit of the region.						
Economy & Place	Maximize growth in existing centers to enhance civic and economic life and to protect natural areas and farmland.					*
Environment	Clean and protect the air, land, water, and natural habitats to sustain and enhance the environment's safety and health for all.	*	*			*
Mobility	Improve roadways, bicycle, sidewalk, and transit networks to revitalize existing urban and rural centers and enhance equity.	*	*		*	*
People & Leaders	Focus educational and workforce development initiatives on expanding skills that the modern economy requires.					
Renewed: Make NWI's urban and rural centers places that people want to come to and live in and ensure our environment is safe and healthy.						
Economy & Place	Collaborate regionally to welcome a diversity of people and talent to achieve mixed and balanced growth.					
Environment	Build region-wide coalitions to advance environmental sustainability for the benefit of future generations.					
Mobility	Prioritize transformative investments to elevate the position of the region and to attract a diversity of residents and high-quality economic opportunities.	*	*	*	*	*
People & Leaders	Foster better communications, cooperation , and coordination to bring people together across the lines that divide us.					*
Vibrant: Support a thriving economy, a well-educated population, planned growth, and protection of natural and agricultural areas.						
Economy & Place	Promote initiatives and policies to ensure healthy living, sustainability, quality of life, and prosperity.					*
Environment	Endorse innovative energy and environmental strategies to achieve a balance that protects diverse and unique ecological treasures while fostering a sustainable economy.	*				
Mobility	Adopt technological innovation that enhances the safe and fluid movement of people and goods to enable a flourishing economy.	*	*	*		*
People & Leaders	Embrace a dynamic, diversified and sustainable economy that attracts and retains talent, enhances quality of life, and increases personal and household income.					

Source: CPCS analysis, 2022 .

Table 4-37: Review of Explicit Freight-Related Goals in Key Guiding Documents

Table 4-38 lists five overarching goals developed based on the freight-specific CURVES principles. These goals are complemented by supporting objectives, which closely align with the freight-related needs and challenges identified earlier in this chapter.

Goal 1: Enhance freight system's contribution to economic competitiveness and growth
Northwest Indiana's robust freight system is a critical source of economic vitality in the region. A variety of freight-dependent industries rely on this system for their operations, including manufacturing, which is among the most prominent industries in the region. Notably, the warehousing and distribution industry is growing faster than the national average. Nevertheless, freight-dependent industries in Northwest Indiana face challenges including a shrinking working-age population, driving workforce shortages for many industries.

A number of freight-related objectives can help Northwest Indiana stimulate continued economic competitiveness and growth, including:

- ***Coordinate with economic development agencies, Northwest Indiana Forum, and Conexus Indiana to provide freight-related industries with relevant resources, including freight data, planning resources, and funding opportunities.*** To support the economic competitiveness and growth of freight-related industries, NIRPC should ensure that they have access to the resources required to make informed planning and investment decisions. This means making requisite data available, sharing funding opportunities, and partnering with other organizations to achieve ongoing engagement with relevant freight stakeholders.
- ***Collaborate with economic development agencies and educational institutions to advance training programs with a focus on freight industry workforce development.*** NIRPC can collaborate with partners to foster proactive labor development programs with an eye toward the future. This demands conscientious data tracking and collaboration with partners ranging from economic development agencies to educational institutions.
- ***Identify and promote the development of land that is appropriate for freight-related industries.*** This entails not only assisting interested developers or private stakeholders find and assemble parcels appropriate for their needs, but to gatekeep development away from incompatible land uses like wildlife habitats or residential and mixed-use areas.

Freight Transportation Goals	Connected	United	Renewed	Vibrant	Equitable	Safe
Goal 1: Stimulate economic competitiveness and growth	✓	✓	✓	✓	✓	
Goal 2: Reduce and mitigate freight safety and security risks				✓		✓
Goal 3: Reduce and eliminate barriers to efficient mobility			✓	✓		
Goal 4: Maintain, preserve, and extend the service life of existing infrastructure			✓	✓		
Goal 5: Preserve natural and community resources by reducing the negative environmental impacts of freight activities		✓			✓	

Source: CPCS analysis, 2022.

Table 4-38: Freight Transportation Goals

Goal 2: Reduce and mitigate freight safety and security risks

NIRPC and its partners are responsible for ensuring the safety not just of freight system users, including truck drivers and railroad engineers, but all users of the infrastructure from bicyclists to pedestrians to drivers. Some of the largest and heaviest equipment is transported by freight operators, using the region's road, rail, air, and water networks. As a major infrastructure crossroads for the country, Northwest Indiana is particularly at-risk for safety issues.

A number of freight-related objectives can help to reduce and mitigate freight safety and security risks, including:

- ***Reduce the incidence and severity of truck-involved crashes.*** This might involve reducing modal conflicts, improving sight lines, reducing travel speeds in dangerous areas, improving emergency response, or improving infrastructure design.

- ***Reduce highway-rail grade crossing safety and trespass risks.*** The most obvious solution is to grade separate crossings to eliminate the problem. When this isn't feasible, safety warning devices should be implemented, some crossings closed, and safety awareness campaigns introduced.

- ***Reduce conflict between freight and active transportation modes.*** Ensuring that the proper protections are in place to reduce risks to bicycles and pedestrians that share the road with trucks and other vehicles is paramount. Certain roads can be closed to trucks, protected bike lanes introduced, and infrastructure design improved for better visibility and to reduce travel speeds in high-density crash locations.

- ***Ensure that safety concerns are not disproportionately clustered in disadvantaged communities.*** Infrastructure improvements should focus on improving safety in these historically under-invested communities. Often, the poorest and most marginalized communities are disproportionately affected by adverse impacts of freight and industrial activity, including safety impacts.

Goal 3: Reduce and mitigate barriers to efficient mobility

Moving goods from point A to point B is an essential role of the freight system. Barriers to mobility, including congestion, delay, and bottlenecks impact the freight system's ability to do its job. While mobility is a goal in itself, it is intimately related to Goal 2: Safety and Goal 5: Environmental Impacts. Safety issues can generate mobility problems, as incidents force temporary closures of lanes or tracks, and travel slowdowns increase travel times, leading vehicles to emit additional emissions.

A number of freight-related objectives can help to reduce and eliminate barriers to efficient mobility, including:

- ***Reduce the number and duration of blocked crossings***. When trains travel across at-grade crossings, vehicles traveling to the other side of the tracks must wait, introducing travel delays. This is a particular issue with trains of excessive length, or when trains are impacted by rail congestion and are either traveling slowly or stopped completely.

- ***Eliminate truck bottlenecks.*** Certain sections of roadways are particularly prone to travel slowdowns and congestion. These bottlenecks introduce disproportionate mobility issues and are important targets of mobility improvement strategies. Infrastructure design, ramp queues, demand management, dynamic lanes, and sometimes capacity expansion are all strategies that can improve bottlenecks.

- ***Eliminate bridge clearance issues.*** Low bridges that prevent vehicles from passing below them force route detours and can slow down travel.

- ***Support dredging and ice-breaking activities at maritime facilities.*** The waterway depths near Northwest Indiana ports must be maintained through dredging. Moreover, in winter, the Great Lakes can freeze, which, unless ice breaking ships create navigable waterways, prevents other ships from traveling. Thus, both investments in dredging and ice-breaking are crucial for maritime mobility.

- ***Support the development of intermodal, transload, and other multi-modal facilities to handle goods.*** Investments in the freight system should help to improve multi-modal connectivity throughout the freight system, including facilities that transfer goods

between road and rail, maritime and rail, or long-distance truck trailers to local delivery vehicles. These facilities move freight to the mode most suitable for each leg of its journey to ensure efficiency and reliability

Goal 4: Maintain, preserve, and extend the service life of existing infrastructure

It is critical that infrastructure be maintained and preserved. Sometimes, bare minimum maintenance is all that can be performed, but usually, it is best to pair maintenance projects with improvements to the asset's service life, safety, environmental impacts, and overall design.

A number of freight-related objectives can help to maintain, preserve, and extend the service life of existing infrastructure, including:

- ***Maintain pavement and bridge condition in a state of good repair.*** Currently, over 98 percent of Northwest Indiana's Interstates, over 97 percent of non-Interstates, and roughly 95 percent of the bridges are in good or fair condition. Regular and strategic investment in transportation system maintenance is the key to preserving this quality and ensuring cost efficiency in the long run.

- ***Increase capacity and accessibility of truck parking.*** Sufficient truck parking is critical to improve trucking safety and efficiency and reduce overall traffic congestion. Parking capacity must be expanded and systems introduced to help drivers find parking.

- ***Identify and address infrastructure condition issues disproportionately clustered in disadvantaged communities.*** As discussed earlier, poorer, or marginalized populations are more likely to live in communities where infrastructure has experienced chronic underinvestment. Infrastructure maintenance must focus on improving conditions in these communities and ensuring that this equity is retained.

Goal 5: Preserve natural and community resources by reducing negative environmental impacts

NIRPC and its partners have a responsibility to address and reduce the impacts of the freight system on the environment while at the same time mitigating the impacts of climate change and natural disasters on the infrastructure.

A number of freight-related objectives can help to preserve natural and community resources by reducing negative environmental impacts, including:

- ***Support demonstration and deployment of technologies and strategies to reduce environmental impacts associated with freight activity.*** According to the US Environmental Protection Agency (EPA), the transportation sector contributed 27 percent of the greenhouse gas emissions in the US in 2020. Freight system operations also emit noise. These air and noise pollutions can have profound impacts on the quality of life, health, wildlife, and climate. It is crucial to reduce these impacts through tactics including electrification, the use of alternative fuels, anti-idling technology, congestion reduction, or noise barriers.

- ***Conduct a hazardous materials commodity flow study to identify and mitigate the risks of spills on supply chain flows, communities, and the environment.*** The freight system moves all kinds of goods, including hazardous materials. Sometimes these toxic materials spill or leak into the environment, which can have disastrous consequences for wildlife habitat, community health, and safety. Hazardous commodity flow studies can help identify and reduce the risks and mitigate the impacts of these kinds of accidents.

- ***Conduct a regional infrastructure vulnerability study to identify and mitigate threats to system resiliency.*** Resiliency refers to the ability to recover from or adjust easily to disruptions. In the case of the freight system, disruptions may be caused by a variety of factors, including environmental risks like floods, extreme heat, winter storms, and human-made disasters such as cyber attacks and sudden shifts in demand. Any such threat has the potential to damage infrastructure, threaten community safety, and disrupt supply chains. It is crucial to conduct a study to identify vulnerabilities to system resiliency and identify strategies to mitigate these risks, either through emergency response systems, hardened infrastructure, or system redundancies.

Performance-Based Freight Planning

Background and Analysis Framework

The regional transportation performance measures identified in *NIRPC 2050* are organized according to the plan's four vision components: connected, renewed, united, and vibrant. Table 4-39 summarizes the freight-related performance measures under each of these vision terms, along with a proposed analysis.

Generally, NIRPC proposed that the "Connected" term be measured using trip times and transportation safety, the "Renewed" term be measured using reported emissions and infrastructure conditions, and the "Vibrant" term be measured using the number of vehicles with advanced technologies (alternative fuels and CAVs) and travel time reliability.[72] There are no freight-related performance measures under the "United" term proposed in NIRPC's *NWI 2050.*

Vision Term	Performance Measure	Analysis Proposed
Connected	Average Trip Time	Trip times from the Household Travel Survey
	Number of fatalities Rate of fatalities per 100 million VMT Number of serious injuries Rate of serious injuries per 100 million VMT	Crashes from ARIES crash database
Renewed	Number of annual ozone emission critical value exceedances	8-hour Ozone Air Quality Action and Exceedance Days Summary from Indiana Department of Environmental Management
	Carbon Monoxide (CO) reduction from Congestion Mitigation Air Quality (CMAQ)-funded projects (kg/day) Particulate Matter less than 10 microns in diameter (PM10) reduction from Congestion Mitigation Air Quality (CMAQ)-funded projects (kg/day)	Emissions are claimed in the CMAQ project applications for CMAQ-funded projects.
	Percent of Interstate pavements in good and poor condition Percent of non-Interstate National Highway System (NHS) pavements in good and poor condition	For asphalt pavements: International Roughness Index (IRI), percent cracking, and percent rutting; for jointed concrete pavements: IRI, percent cracking, percent faulting; for continually reinforced concrete pavements: IRI, percent cracking
	Percent of National Highway System (NHS) bridge area in good and poor condition	Deck condition, superstructure condition, substructure condition, approach roadway width, structure length, and deck width from National Bridge Inventor

Table 4-39: NIRPC Vision Terms and Associated Performance Measures

72 NIRPC, *NWI 2050* Plan.

Under the FAST Act guidelines, INDOT is required to track the Truck Travel Time Reliability (TTTR) Index to measure freight system performance. Additionally, INDOT maintains detailed highway safety records that include truck crashes. However, no specific freight safety performance measure is currently benchmarked by the DOT. The following is a summary of the freight performance measures recommended by INDOT in the 2018 Freight Plan:

- ***Capacity to Meet Demands:*** recommended performance measures are the percentage of lane miles at the level of service C or better, reduction in the hours of truck delay, and improvement in Truck Travel Time Reliability Index.

- ***Multi-modal Integration and Synergy*:** performance measures include the percentage of intermodal connectors with "fair" or better pavement conditions and the number of intermodal or multi-modal projects completed.

- ***Access to National and International Markets:*** the performance measure recommended under this goal is the hours of delay on roadways within 5 miles of ports and cargo airports.

- ***Quality of Life:*** performance measures to benchmark under this goal focus on freight safety and specifically reducing truck-involved crashes and fatalities and the removal of rail-highway grade crossings.

- ***Economic Impact:*** includes tracking of percent growth in jobs in freight-intensive industries and percent growth in export value (domestic or foreign).

These freight planning measures are used to inform this plan's performance measure development.

Vision Term	Performance Measure	Analysis Proposed
United	None	N/A
Vibrant	Number of alternatively fueled/ powered vehicles registered	Number of alternatively fueled/powered vehicles registered from South Shore Clean Cities and/or the Indiana Bureau of Motor Vehicles
	Number of Connected or Automated Vehicles (CAVs) registered plus the fleet size of CAVs licensed to operate in NW Indiana	Vehicle registrations from the Indiana Bureau of Motor Vehicles when data becomes available
	Percent of person miles traveled on the Interstate and non-Interstate NHS that is reliable	Travel time from the National Performance Measure Research Data Set (NPMRDS), Annual Average Daily Traffic (AADT) from Highway Performance Monitoring System (HPMS), vehicle occupancy factors from the US Department of Transportation
	Truck Travel Time Reliability (TTTR) Index	Travel time from the National Performance Measure Research Data Set (NPMRDS)
	Peak Hours of Excessive Delay per capita in the Chicago, IL-IN Urbanized Area	Travel time from the National Performance Measure Research Data Set (NPMRDS), Annual Average Daily Traffic (AADT) and speed limits from Highway Performance Monitoring System (HPMS), vehicle occupancy factors from the USDOT

Source: CPCS analysis of NIRPC NWI 2050 Plan.

Table 4-39: NIRPC Vision Terms and Associated Performance Measures

Evaluation of Freight Performance Measures

This plan recommends aligning regional and statewide freight performance measures with freight planning vision and goals. Each freight-related goal works to attain various vision terms while also informing performance measure classifications. For example, “Goal 5: Preserve natural and community resources by reducing negative environmental impacts” comprises both the United and Equitable vision terms, and the region’s performance in attaining this goal can be measured by examining environmental-related data points.

As shown in Table 4-40, many performance measures are either carried over from or inspired by those in *NIRPC 2050* (2019). The selected measures generally align with those discussed in Phase 1 of this planning effort. Moreover, each performance measure is paired with information that will assist with ongoing performance reporting and monitoring, including data required, data update frequency, data accessibility, and other additional considerations. Recommended performance measures are intended to be simple to track and update while still providing an accurate account of the region’s freight system.

The following ranking system is used to categorize measures based on data accessibility and the level of in-house or outsourced effort required for analysis. The highest rank is assigned to measures that use readily available data and minimal in-house analysis, while the lowest rank is given to measures that require outsourcing for both data access and analysis.

1. Data is readily available and can easily be analyzed using in-house resources.

2. Data can be obtained with some effort and may require substantial in-house resources to analyze.

3. Data access and analysis is complicated and may require assistance from outside resources.

NIRPC Freight Planning Goal	Measure	Data Required	Data Update Frequency	Data Accessibility & Level of Analysis	Notes
Goal 1: Enhance freight system's contribution to economic competitiveness and growth	Freight-dependent industry employment (total and share)	Total Full-Time and Part-Time employment by NAICS Industry, US Bureau of Economic Analysis	Yearly	1 Data is readily available and can easily be analyzed using in-house resources	Freight-dependent industries include Farm employment, Forestry, fishing, and related activities, Mining, quarrying, oil and gas extraction, Utilities, Construction, Manufacturing, Wholesale Trade, Retail trade, and Transportation and warehousing. Pulled for Lake, Porter, and La Porte Counties. Can be compared to total employment among all industries.
	Shift-Share Industry Competitiveness	Comparison of regional and US employment growth among different industries, using US Bureau of Economic Analysis data	Yearly	2 Data can be obtained with some effort and may require substantial in-house resources to analyze	The analysis should follow the following process for each industry: 2010 Employment in NWI * (2019 Employment in NWI / 2010 Employment in NWI – 2019 US Employment / 2010 US Employment). Data gaps can make comparisons complicated.
	Volume and Value of Goods Moved by Each Mode	All modes: Freight Analysis Framework (FAF) data.	Every 5 years	1 Data is readily available and can easily be analyzed using in-house resources	A FAF5 network analysis tool is available to analyze disaggregated freight flows. A visualization tool is also in development and should be released in 2023. FAF Zone 181: Chicago IL-IN-WI (IN Part) should be used. This includes Jasper and Newton Counties but is a good approximation for the NIRPC region.
		Maritime: United States Army Corps of Engineers (USACE) Waterborne Commerce Statistics Center (WCSC) Commerce Data.	Yearly	1 Data is readily available and can easily be analyzed using in-house resources	WCSC data should be analyzed for Indiana Harbor, Burns Harbor, Gary, and Buffington.
		Air: Federal Aviation Administration (FAA) All-Cargo Airports by Landed Weight	Yearly	1 Data is readily available and can easily be analyzed using in-house resources	FAA data should be analyzed for Gary/Chicago International Airport.

Table 4-40: Performance Measures Analyzed in Phase 1

NIRPC Freight Planning Goal	Measure	Data Required	Data Update Frequency	Data Accessibility & Level of Analysis	Notes
Goal 2: Reduce and mitigate freight safety and security risks	Truck-Involved Crashes	ARIES (Automated Reporting Information Exchange System)	Unclear	2 Data can be obtained with some effort and may require substantial in-house resources to analyze	NIRPC can request ARIES data free of charge. Should measure number and severity of truck-involved crashes by filtering the crash data by types of vehicles involved. There is also an option to separate out serious injury crashes and fatal crashes.
	Rail Crossing Incidents	FRA rail safety data	Monthly	1 Data is readily available and can easily be analyzed using in-house resources	NIRPC can obtain the data free of charge. Should measure number and severity. FRA's rail crossing safety data can be downloaded at the county level and individual incident reports are available at crossing level.
Goal 3: Reduce and mitigate barriers to efficient mobility	Interstate TTTR Index	National Performance Management Research Data Set (NPMRDS)	Yearly	2 Data can be obtained with some effort and may require substantial in-house resources to analyze	Requires truck speed data that is available to NIRPC free of charge through FHWA's National Performance Management Research Data (NPMRDS). The Regional Integrated Transportation Information System (RITIS) tool provides summary mobility reports. NIRPC has existing access to this data through INDOT and regularly monitors the TTTR index for the region on the Interstate.
	Interstate Delay per Mile – TTTR Combined Index	HPMS; NPMRDS	Yearly	3 Data access and analysis is complicated and may require assistance from outside resources	FHWA' HPMS manual provide details and steps to analyze delay per mile and TTTR measures separately. These measures then can be combined for each link.
	Number of Bridge Clearances Under 16' on Interstates and 14' on Other Public Roads	INDOT Bridge Clearance data	Ongoing updates	2 Data can be obtained with some effort and may require substantial in-house resources to analyze	Data must be cleaned to include only bridges over roadways.

Table 4-40: Performance Measures Analyzed in Phase 1 (continued)

NIRPC Freight Planning Goal	Measure	Data Required	Data Update Frequency	Data Accessibility & Level of Analysis	Notes
	Blocked Crossing Duration and Frequency	FRA Blocked Crossing Crowdsourced Database	Ongoing	1 Data is readily available and can easily be analyzed using in-house resources	NIRPC can access the data free of charge. Alternatively, NIRPC can collaborate with the NWI Rail Crossings Task Force to regularly collect detailed data of crossing blockage across the region, similar to the efforts in 2019. The information is provided at the crossing level and can be filtered by date, location, and duration of blocking. This blocked crossing data could also be used to identify the share of blocked crossings by duration bucket (i.e., 0-15 min, 15+ min).
Goal 4: Maintain, preserve, and extend the service life of existing infrastructure	Percent of Pavement in Good, Fair, and Poor Condition	HPMS	Yearly	2 Data can be obtained with some effort and may require substantial in-house resources to analyze	FHWA is in charge of collecting and publishing pavement condition data along the NHS routes. The information is reported in the HPMS database. This database provides detailed measures such as IRI, rutting, and cracking by road segment. FHWA's method can be used to translate these measures into overall condition ratings (poor, good, and fair). FHWA is in charge of collecting and publishing pavement condition data along the NHS routes. The information is reported in the HPMS database. This database provides detailed measures such as IRI, rutting, and cracking by road segment. FHWA's method can be used to translate these measures into overall condition ratings (poor, good, and fair). INDOT establishes statewide 2- and 4-year targets for non-Interstate NHS and 4-year targets for the Interstate system.
	Number of Road Bridges in Poor Condition	USDOT National Bridge Inventory	Ongoing	1 Data is readily available and can easily be analyzed using in-house resources	INDOT may have additional bridge performance data

Figure 4-40: Performance Measures Analyzed in Phase 1 (continued)

NIRPC Freight Planning Goal	Measure	Data Required	Data Update Frequency	Data Accessibility & Level of Analysis	Notes
Goal 5: Preserve natural and community resources by reducing negative environmental impacts	Ozone, NOx, and VOC Emissions	US EPA Air Quality Statistics Report; Outdoor Air Quality Data	Yearly	2 Data can be obtained with some effort and may require substantial in-house resources to analyze	The transportation sector is a major contributor to ground-level Ozone production and portions of NWI remain in nonattainment.
	Number and Volume of Reported Hazardous Spills	Indiana Department of Environmental Management Spills Data	Ongoing	2 Data can be obtained with some effort and may require substantial in-house resources to analyze	Data can be split by year and according to mode.
	National Risk Index	FEMA National Risk Index	Yearly	1 Data is readily available and can easily be analyzed using in-house resources	The annual indices are updated on an ongoing basis as new data becomes available.

Source: CPCS analysis, 2022.

Table 4-40: Performance Measures Analyzed in Phase 1 (continued)

Recommended Freight Performance Measures

Based on the evaluation presented in the previous section, Table 4-41 presents the recommended list of freight performance measures for NIRPC to consider. The rationale for inclusion is included and generally considers the accessibility of the data and the importance of the measure to have a comprehensive understanding of freight system performance.

Additional freight-related measures that can provide context and inform NIRPC's various planning efforts (but are not necessary to regularly update) include:

- Freight-dependent industry employment,
- Volume and value of goods moved across the region, and
- Ozone, NOx, and VOC emissions from freight-related activities.

Also, since workforce shortage is a major issue highlighted by both data analysis insights and stakeholder inputs, NIRPC can collaborate with economic development agencies in Northwest Indiana to track job openings and labor turnovers in freight-dependent industries. This measure is currently provided by the US Bureau of Labor Statistics but at the national and state levels.

Goal	Performance Measure	Rationale
Goal 1	Freight-dependent industry employment	Data is highly accessibly and helps to assess the size and condition of the freight workforce.
	Volume and Value of Goods Moved by Each Mode	Data is highly accessible and is necessary to understand the relationship between the freight system and the economy.
Goal 2	Truck-Involved Crashes	Data is less accessible, but is crucial to understand road safety.
	Rail Crossing Incidents	Data is highly accessible and is crucial to understand rail and road safety.
Goal 3	Interstate TTTR Index	Data is less accessible but offers the federal standard of understanding on freight mobility. State DOTs are required to report the TTTR Index on Interstates annually.
	Blocked Crossing Duration and Frequency	Data is highly accessible and provides a crucial understanding of rail and road mobility.
Goal 4	Percent of Pavement in Good, Fair, and Poor Condition	Data is less accessible but is the best method to understand road condition.
	Number of Road Bridges in Poor Condition	Data is highly accessible and provides an understanding of bridge condition which is distinct from pavement condition.
Goal 5	National Risk Index	Data is highly accessible and provides a general understanding of resiliency risks that is useful in planning. .

Source: CPCS analysis, 2022.

Table 4-41: Recommended List of Freight Performance Measures

Project Funding and Prioritization Processes

The Northwestern Indiana Regional Planning Commission (NIRPC) is the Metropolitan Planning Organization (MPO) for the counties of Lake, Porter, and La Porte in Indiana. One goal of this plan is to develop a process for identifying and ranking freight investment needs in Northwest Indiana. Before doing so, it is important to clarify NIRPC's role in project funding and to document existing project prioritization methods in the region.

NIRPC's Role

NIRPC is established in state statute by Indiana Code (IC) 36-7-7.6. NIRPC is governed by a Commission of 53 elected officials from the region's municipalities and counties and a Governor appointee[73]. This Commission oversees and approves NIRPC activities, which are generally carried out by dedicated staff. These groups work together to achieve "comprehensive planning and programming processes for transportation, economic development, and environmental policies" and management processes.[74]

In this role, NIRPC serves as an intermediary between the local and the State governments—coordinating communication between smaller and larger levels of government, facilitating conversation with the public, advocating for Northwest Indiana, developing impactful regional plans and studies, and identifying solutions to regional problems. The local coordination that NIRPC facilitates is paramount to bottom-up planning that synthesizes the nuanced interests and needs of constituents into more comprehensive regional objectives.

To fund these objectives, NIRPC is often beholden to the state, namely the Indiana Department of Transportation (INDOT). Indeed, much of NIRPC's funding, including the money to finance objectives uncovered in the planning process, is apportioned at the discretion of INDOT in coordination with other Metropolitan Planning Organizations in the state through the Indiana MPO Council, though the funds come from federal sources. NIRPC's regional planning and other activities are often crucial inputs to state-level decision-making, including project prioritization and investment.

73 NIRPC, Executive Board/Full Commission, accessed February 2023

74 2017 Indiana Code Title 36, Article 7-7.6-12: Purpose of commission, via Justia US Law, accessed February 2023

Effective planning at the regional level has multiple benefits for NIRPC: it accurately integrates local needs into comprehensive objectives, and it helps to secure the funding needed to accomplish those very objectives.

Formula Funding

Several transportation funding programs are distributed to states as formula funding. States are then tasked with distributing this funding throughout the state for planning, capital, or operating projects, as necessary. Federal formula funding is allocated to NIRPC, and the Commission has the authority over how to spend this funding by adopting a Transportation Improvement Program (TIP), for most categories of federal formula funding, and a Unified Planning Work Program (UPWP), for PL and 5303 funding. NIRPC also has an important role as a regional advocate and facilitator. The planning that NIRPC conducts often serves as a resource for INDOT as it prioritizes where to spend the funding.

For instance, Indiana's State Transportation Improvement Program (STIP) is a federally required budget document that outlines how federal and state funds will be used to invest in surface transportation projects. While INDOT oversees the STIP, the decision-making process relies on recommendations from regional Transportation Improvement Programs (TIPs) and other local inputs. NIRPC ultimately leads the contents of the regional TIP, synthesizing local interests and multimodal transportation needs into a comprehensive list of objectives.[75] NIRPC also serves as a liaison between the region and the state, sharing local inputs and priorities with the state-level decision-making body.

A facilitator of	An advocate for	A steward of
Local grant applications. Regional data collection and sharing. Impactful regional plans and studies. Communication between different levels of government.	The importance of the region's transportation system to the state. Regional needs and potential solutions.	Funding for which MPOs are eligible applicants. Effective planning practices among constituent municipalities.

Figure 4-54: Overview of NIRPC's Role

Case Example: I-80/94 FlexRoad (Borman Expressway)

The I-80/94 FlexRoad project is an effort to improve mobility and safety on I-80/94 in Indiana using various Transportation Systems Management and Operations (TSMO) strategies like dynamic shoulder lanes, variable speed limits, and ramp metering.

The first phase of the project, a Planning and Environment Linkages (PEL) study was jointly conducted by INDOT and Illinois DOT (IDOT) and approved by Federal Highway Administration (FHWA) in April 2022. Indiana FlexRoad is now moving onto a National Environmental Policy Act (NEPA) study to assess the environmental benefits and costs of different project alternatives. The NEPA study will make INDOT eligible for federal funding in the project's eventual implementation.

The I-80/94 FlexRoad project is an example of a state-sponsored project conducted in the NIRPC region. While INDOT is funding and overseeing the project, NIRPC is in an advisory role. NIRPC staff has served on advisory committees related to the FlexRoad project. Additionally, NIRPC's Executive Board Meetings frequently include updates from INDOT on regional projects, including the FlexRoad project, which serves to both keep the public informed and ensure state accountability.

75 The results of this very freight planning process, including any recommendations, will inform NIRPC's efforts for documenting local investment needs in the next TIP.

Indiana STIP

The current Indiana STIP covers the years 2022 through 2026.[76] The STIP allocates a number of federal formula funding dollars for local use, coming from current-year apportionments plus carry-over. Local apportionments derive from the following federal programs:[77]

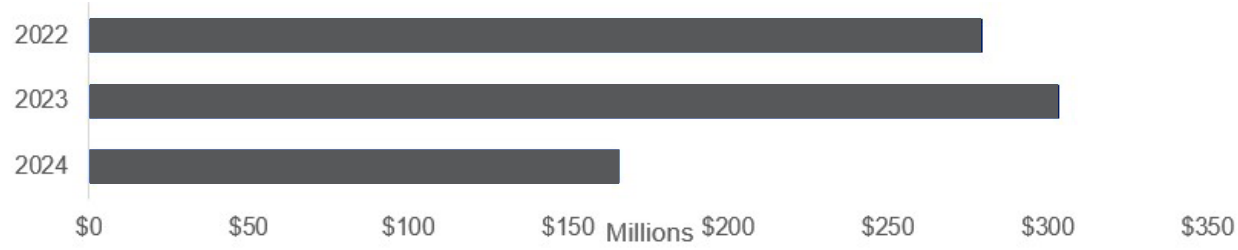
- Metropolitan Planning (PL) funds, which along with Federal Transit Administration (FTA) 5303 apportionments, are suballocated to MPOs for planning projects as spelled out in their UPWPs.
- Surface Transportation Block Grant Program (STBG), which provides flexible funding for projects that preserve and improve Federal-aid highways, bridges, and tunnels.[78]
- Transportation Alternatives (TA) program, a standalone sub-allocated apportionment that funds bicycle and pedestrian facilities, trails, and other projects.[79]
- Highway Safety Improvement Program (HSIP), which works to reduce traffic fatalities and injuries.[80]
- Rail/Highway Crossings (hazard elimination and protective devices).
- Congestion Mitigation and Air Quality (CMAQ) Program, which funds projects and programs that help to reduce congestion and improve air quality in accordance with the Clean Air Act.[81]
- Federal Transit Administration (FTA) apportionments, including 5307 (Urbanized Area Formula Funding [82]), 5310 (Enhanced Mobility of Seniors & Individuals with Disabilities[83]), 5311 (Rural Formula Funding), 5337 (State of Good Repair Grants[84]), and 5339 (Grants for Buses and Bus Facilities[85]).
- Carbon Reduction Program (CRP), which NIRPC has sub-allocated spending authority beginning in FY 2023.
- Promoting Resilient Operations for Transformative, Efficient & Cost Saving Transportation (PROTECT) formula program, which works to make transportation infrastructure more resilient to climate change and other extreme weather events, over which NIRPC has sub-allocated spending authority beginning in FY 2023.

76 INDOT, STIP FY 2022 to FY 2026, accessed February 2023,
77 INDOT, STIP FY 2022 to FY 2026 Appendix A, accessed February 2023,
78 USDOT Federal Highway Administration, Federal-aid Program and Special Funding: Surface Transportation Block Grant Program (STBG), updated October 2022.
79 INDOT, STIP FY 2022 to FY 2026, accessed February 2023
80 USDOT, Federal Highway Administration, Highway Safety Improvement Program (HSIP), updated June 2022
81 USDOT Federal Highway Administration, Bipartisan Infrastructure Law: Congestion Mitigation and Air Quality (CMAQ) Improvement Program, updated February 2022
82 Federal Transit Administration, Urbanized Area Formula Grants – 5307, accessed February 2023.
83 Federal Transit Administration, Enhanced Mobility of Seniors & Individuals with Disabilities – Section 5310, accessed February 2023,
84 Federal Transit Administration, State of Good Repair Grants – 5337, accessed February 2023.
85 Cornell Law School Legal Information Institute, 49 U.S. Code § 5339 – Grants for buses and bus facilities, accessed February 2023,

Beyond these formula programs, STIP funding is generated from:[86]

- Federal-aid FHWA funds and earmarks, some of which are specifically set aside for local governments.
- COVID relief funds (only in FY 2022).
- State Highway Funds from motor fuel taxes and registration fees.
- State Highway Road Construction Improvements Fund.[87]
- Crossroads Fund, which funds the construction or reconstruction of state highways.[88]
- Section 164 Penalties, which in states that do not enforce laws that penalize repeat intoxicated drivers (such as Indiana), transfers a portion (2.5%) of the National Highway System Performance Plan and the Surface Transportation Program funds to a reserve.[89] The reserved funds can then be allocated by the states to eligible projects such as highway safety improvement activities.

NIRPC's estimated 2022 STIP allocation was about $20 million, broken down into the programs shown in Table 4-42.[90]



Source: INDOT, STIP Plan 2022-2026: Appendix A.

Figure 4-55: Estimated STIP Uses for Local Projects (MPO and non-MPO)

Program	Amount
STBG	$13,571,357
HSIP	$2,598,944
CMAQ	$4,341,855
TA	$1,161,357
Section 164 Penalty	$666,398
Total FY 2022 Target	$22,339,911
Total Spending Authority	$22,391,650**

Source: INDOT, STIP Plan 2022-2026: Appendix A.

*Note 1: The amounts shown here are summed totals for "Northwest" in Group I and "Michigan City" in Group II. "Northwest" is part of the Chicago UZA and covers Lake and Porter Counties. "Michigan City" covers La Porte County.

**Note 2: The spending authority is 100.2316% of the target.

Table 4-42: NIRPC STIP Suballocated Spending Authority by Program, 2022 Estimates

86 INDOT, STIP FY 2022 to FY 2026, accessed February 2023,

87 Indiana Code, Title 8. Utilities and Transportation Article 14. Highway Finances Chapter 10. State Highway Road Construction and Improvement Fund, 2015.

88 Ibid

89 National Highway Traffic Safety Administration, Final Rule for Section 164: 23 CFC Part 1275, accessed February 2023,

90 INDOT, STIP FY 2022 to FY 2026 Appendix A, accessed February 2023,

Discretionary Funding

Discretionary funding refers to grants that are awarded to eligible entities based on a competitive application and review process. Discretionary funding is often available to both states and MPOs, as well as counties and municipalities. Therefore, NIRPC can work with counties, municipalities, and sometimes private sector players such as railroads and developers to secure discretionary funding for various investments in the regional transportation system.

In the case of discretionary grants that are available to local municipalities or other regional entities, NIRPC can help to support successful grant applications (e.g., conducting related planning, sharing relevant data, supporting application development, or offering letters of support).

Rail Grade Crossings

The Section 130 Railway Highway Crossing Program has been in place since 1987[91] and apportions formula funds to States for use on improvements to rail-highway crossings.[92] Thus, historically, NIRPC was beholden to statewide project prioritization to improve the regional safety and mobility issues associated with grade crossings.

However, the Bipartisan Infrastructure Law (BIL) introduced a new discretionary grant program called the Railroad Crossing Elimination (RCE) grant program. Eligible recipients include state DOTs, MPOs, and local governments.[93] The RCE program allows NIRPC or constituent municipalities to bypass state project prioritization processes and directly apply for federal funding. The Town of Schererville applied for an RCE grant in 2022 with NIRPC's support.

Economic Development District

In 2019, NIRPC secured for the region a designation as an Economic Development District from the Economic Development Administration (EDA) of the US Department of Commerce. The designation, which is the result of a decades-long effort by NIRPC, makes the region eligible for unique federal funding assistance intended for economic development.[94] Among the funding opportunities now available to NIRPC is the Planning Partnership Program, which offers designated Economic Development Districts funding for economic development and other short-term planning activities,[95] and the Public Works Program, which assists communities in upgrading their physical infrastructure.[96] With this designation, NIRPC has an important new responsibility of leading or supporting EDA grant applications for regional investment.

91 Association of American Railroads, Section 130 Grade Crossing Funding

92 USDOT Federal Highway Administration, Railway Crossing Program Overview, updated July 2022,

93 USDOT Federal Railroad Administration, Railroad Crossing Elimination Grant Program, updated November 2022,

94 Northwestern Indiana Regional Planning Commission, New from NIRPC – For Immediate Release, NIRPC Receives Economic Economics Development District Designation from the U.S. Department of Commerce, September 2019.

95 Economic Development Administration, Planning Program, accessed February 2023.

96 Economic Development Administration, Planning Program, accessed March 2023,

Other Federal Funding Opportunities
NIRPC is eligible for a variety of additional discretionary federal funding programs. There are also some discretionary funding programs that NIRPC is not directly eligible for but is in a position to help partners apply for. Many of these are new or expanded under BIL.

- ***National Infrastructure Project Assistance (Mega)***: MPOs are eligible applicants for Mega grants, which can be used on various highway, bridge, freight intermodal, and grade separation projects.[97]

- ***National Significant Multi-modal Freight and Highway Projects Program (INFRA)***: MPOs serving urbanized areas with a population greater than 200,000 are eligible for funding.[98] NIRPC is an eligible MPO.[99] Funding can be used on projects that, as USDOT puts it, "improve safety, generate economic benefits, reduce congestion, enhance resiliency, and hold the greatest promise to eliminate freight bottlenecks and improve critical freight movements."[100]

- ***Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transport (PROTECT):*** MPOs are eligible for PROTECT grants to improve infrastructure resiliency against severe weather and other natural disasters.[101] Note that there is also a separate PROTECT formula program.[102]

- ***Grants for Charging and Fueling Infrastructure (Corridor and Community)*:** MPOs are eligible to apply for grants to develop and install electric charging and hydrogen, propane, and natural gas fueling infrastructure.[103]

- ***Railroad Crossing Elimination (RCE) Program*:** MPOs are eligible for RCE grants, which can be used on improvements to rail-highway and pathway-rail crossings.[104]In June 2023, it was announced that the Town of Schererville was awarded RCE funding.

- ***Advanced Transportation Technologies & Innovative Mobility Deployment (ATTIMD or ATTAIN)***: MPOs are eligible for ATTAIN grants, which can be used to "deploy, install, and operate advanced transportation technologies that improve safety, mobility, efficiency, system performance, intermodal connectivity and infrastructure return on investment."[105]

- ***Bridge Investment Program*:** MPOs are eligible for BIP grants to improve bridge and culvert condition, safety, efficiency, and reliability.[106]

- ***Congestion Relief Program*:** MPOs serving urbanized areas with a population greater than 1 million are eligible for funding.[107] NIRPC is an eligible MPO. Funding can be used to reduce congestion and associated economic and environmental costs.[108]

- ***Consolidated Rail Infrastructure and Safety Improvements (CRISI)*:** CRISI grants fund safety, efficiency, and reliability improvements to passenger and freight rail. Railroads are eligible applicants.[109]

- ***Rebuilding American Infrastructure with Sustainability and Equity (RAISE)*:** RAISE grants fund a wide variety of surface transportation projects that improve safety, sustainability, quality of life, mobility, economic competitiveness, infrastructure condition, and innovation. Local governments are eligible applicants.[110]

97 USDOT, The Mega Grant Program, updated January 2023.
98 USDOT, The INFRA Grants Program, updated October 2022.
99 USDOT, INFRA Urbanized Area, updated April 2020.
100 USDOT, The INFRA Grants Program, updated October 2022.
101 USDOT Federal Highway Administration, Bipartisan Infrastructure Law: Competitive Grant Program Funding Matrix, updated February 2023.
102 USDOT Federal Highway Administration, Biden Administration Announced New PROTECT Formula Program, $7.3 Billion form Bipartisan Infrastructure Law to Help Communities Build Resilient Infrastructure, July 2022..
103 ibid.
104 USDOT Federal Railroad Administration, Railroad Crossing Elimination Grant Program, updated November 2022.
105 Grants.gov, Advanced Transportation Technologies and Innovative Mobility Deployment (ATTIMD) Program 2022 NOFO, September 2022.
106 USDOT Federal Highway Administration, Bridges & Structures: Bridge Investment Program (BIP) Question and Answers (Q&As), updated October 2022.
107 USDOT Federal Highway Administration, Bipartisan Infrastructure Law: Competitive Grant Program Funding Matrix, updated February 2023.
108 USDOT Federal Highway Administration, Bipartisan Infrastructure Law: Competitive Grant Program Funding Matrix, updated February 2023.
109 USDOT Federal Railroad Administration, Consolidated Rail Infrastructure and Safety Improvements (CRISI) Program, updated December 2022.
110 USDOT, Notice of Funding Opportunity for the Department of Transportation's National Infrastructure Investments (i.e., the Rebuilding American Infrastructure with Sustainability and Equity (RAISE) Grant Program),

The Freight Chapter aims to offer NIRPC the tools to be an effective advocate for solutions—capital or other—to the most pressing regional freight system needs. This starts with the identification of freight investment needs in Northwest Indiana and identifying a prioritization process. Project need prioritization then informs policy and strategy recommendations to address some of the needs and helps identify project concepts that can move to high-level planning and cost estimates.

To begin this process, it is important to first document existing project prioritization methods.

Existing Project Prioritization and Selection Methods in Northwest Indiana

NIRPC *NWI 2050* Metropolitan Transportation Plan (MTP)

The previous MTP[111] assigned projects a score from 1 to 100 according to their direct and indirect impacts on sixteen "critical paths." These critical paths included a combination of topics like economy and place, environment, mobility, and people and leaders, each of which was further broken down by the overall vision for Northwest Indiana: connected, renewed, united, and vibrant. The scoring process also considered the project's impacts on future scenarios and the anticipated investment difficulty.

NWI 2050 explored and scored 77 project types eligible for FHWA or FTA funds. These project types were concepts that could potentially be implemented rather than being specific applications. Similar project types were also grouped into broader investment programs. The higher-scoring project types were targeted for more funding. Total targeted funding was summed into respective investment programs. The purpose of this practice was to enable local public agencies and transit operators to identify the region's most pressing needs and apply for funding available under various programs. This prioritization strategy stayed at a high level and did not drill down into data-driven regional needs or project concepts. However, Invest Northwest Indiana, NIRPC's FY 22-26 TIP, explains this prioritization strategy in more detail.[112]

111 Northwestern Indiana Regional Planning Commission, *NWI 2050*, 2019.

112 Northwestern Indiana Regional Planning Commission, Invest Northwest Indiana 2022-2026 Transportation

E-Commerce in Northwest Indiana

NIRPC released the *E-commerce in Northwest Indiana* study in 2020.[113] The study considered various criteria to identify high-priority locations for land development to accommodate e-commerce. The prioritization framework used in this effort considered negative and positive impacts of potential development using criteria such as proximity to major transportation nodes, proximity to major suppliers, producers, and consumers, environmental impacts, location of omni stores, regional centers, and industrial parks, and population employment. This data-informed framework helped NIRPC to identify regional development opportunities and translate them into concrete project recommendations.

Incorporation Into This Plan

The project prioritization process used for this Freight Chapter incorporates aspects of both *NWI 2050* and the *E-commerce in Northwest Indiana* study. Like *NWI 2050*, this methodology is organized around NIRPC's vision and goals (namely, safety, mobility, and infrastructure condition) and considers high-level project types. And like the *E-commerce in Northwest Indiana* study, this methodology uses a robust set of data to progressively narrow in on system gaps most appropriate for project investment. However, unlike both *NWI 2050* and the *E-commerce in Northwest Indiana* study, this prioritization methodology does not start with projects. Rather, it starts with a data-driven identification of system needs and uses these to inform project concept recommendations.

The development of the Freight Chapter carefully outlined existing freight system conditions, high-level needs, and planning goals. The data gathered as part of this process fed into an analysis of freight issues in the region, focusing on safety, mobility, and condition. This process resulted in the development of three maps of safety, mobility, and condition issues, as shown in Figures 4-56, 4-57, and 4-58.

From here, the process turned to a gap analysis. Programmed or proposed freight-related projects in the region, identified with NIRPC's assistance, were classified by the issue type they were expected to address. Overlaying these projects with the relevant system issues revealed those issues "covered" by a current or future project and those issues that were not. This gap analysis process resulted in a final map of safety, mobility, and condition gaps, as shown in Figure 4-59. In effect, these are all those issues from the previous maps that are not being addressed by programmed or proposed projects. The freight project gap analysis was supplemented by internal needs identification meetings at NIRPC to inform the development of recommendations.

Improvement Program, accessed February 2023.

113 Northwestern Indiana Regional Planning Commission, E-Commerce in Northwest Indiana, 2020.

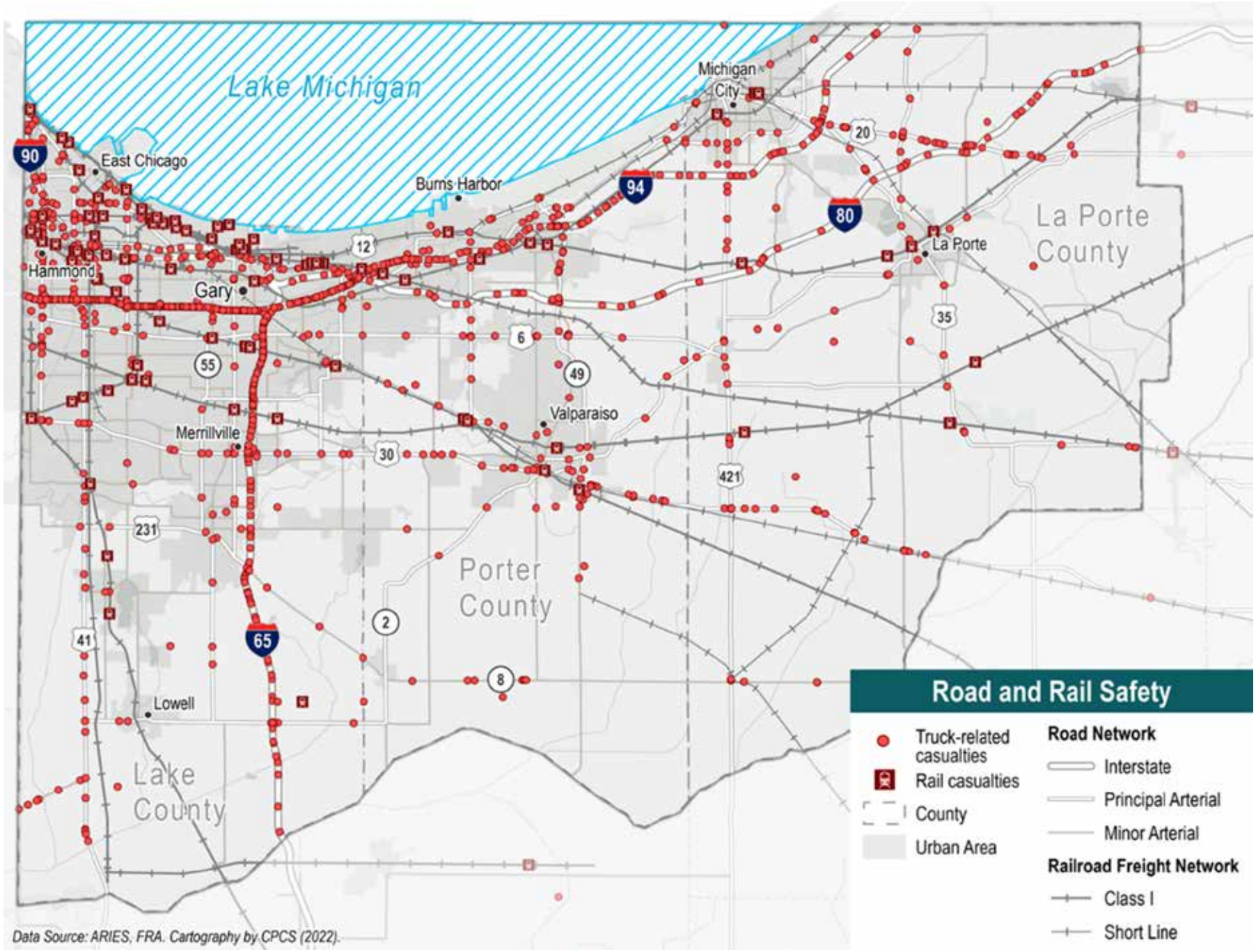


Figure 4-56: Safety Issues

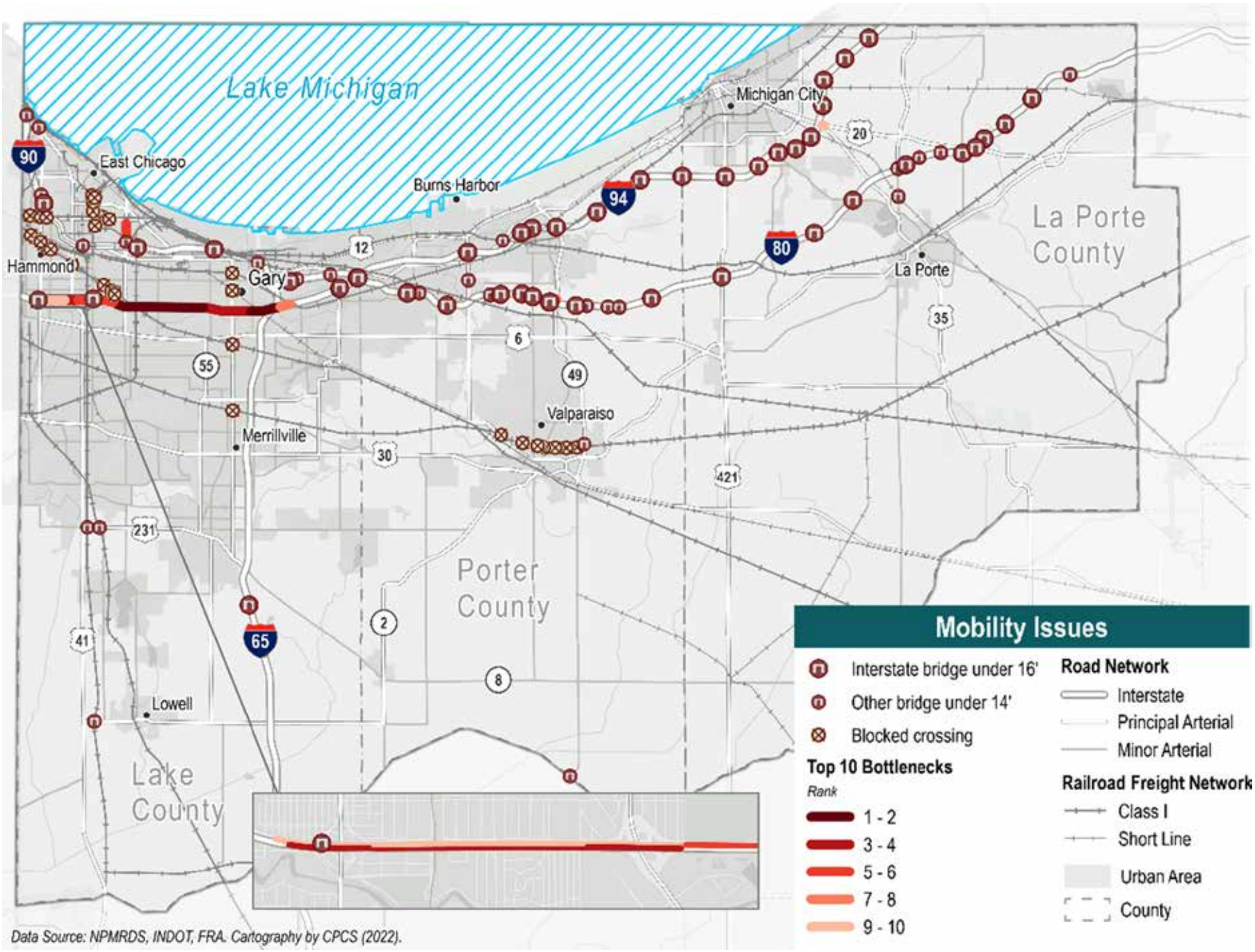


Figure 4-57: Mobility Issues

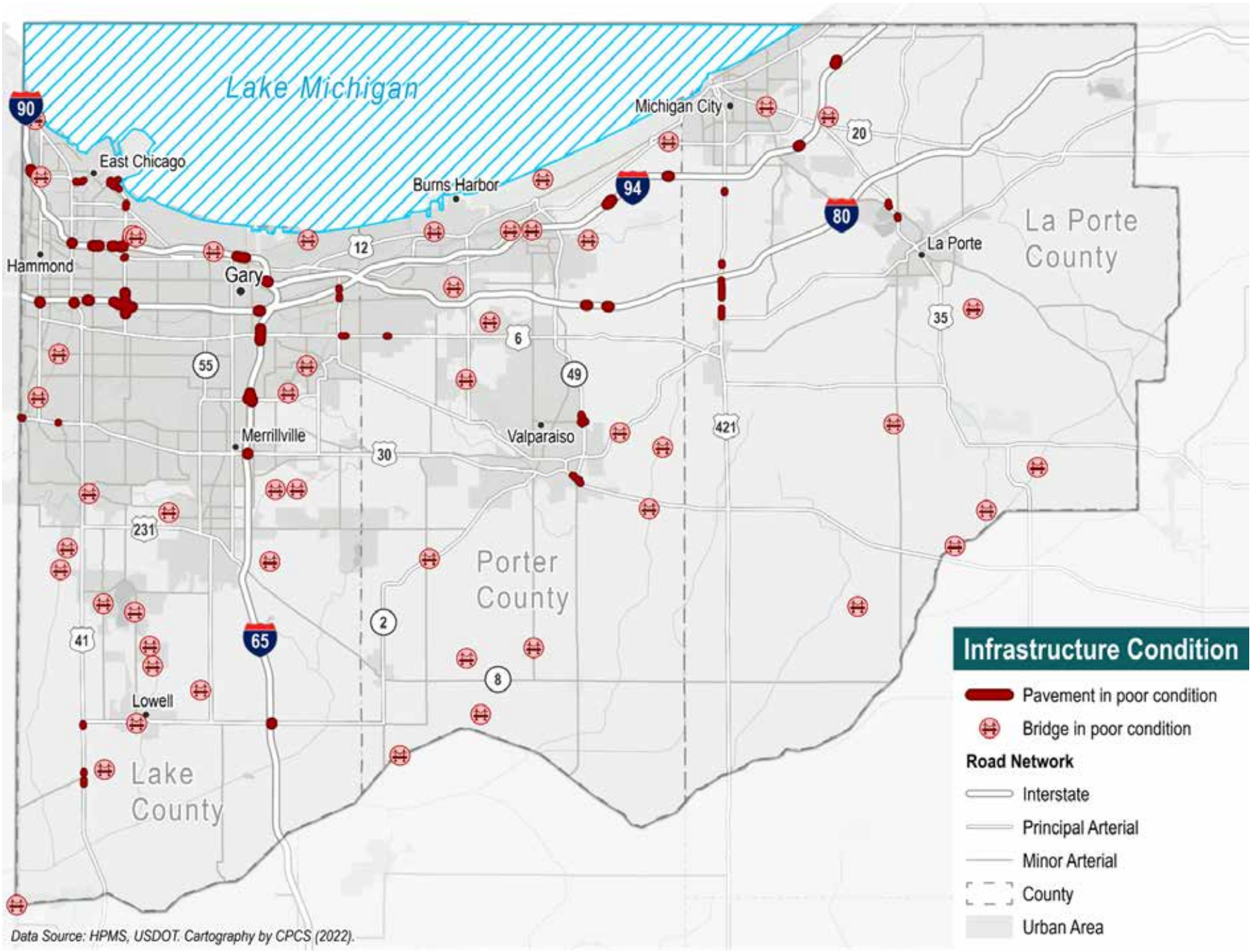


Figure 4-58: Condition Issues

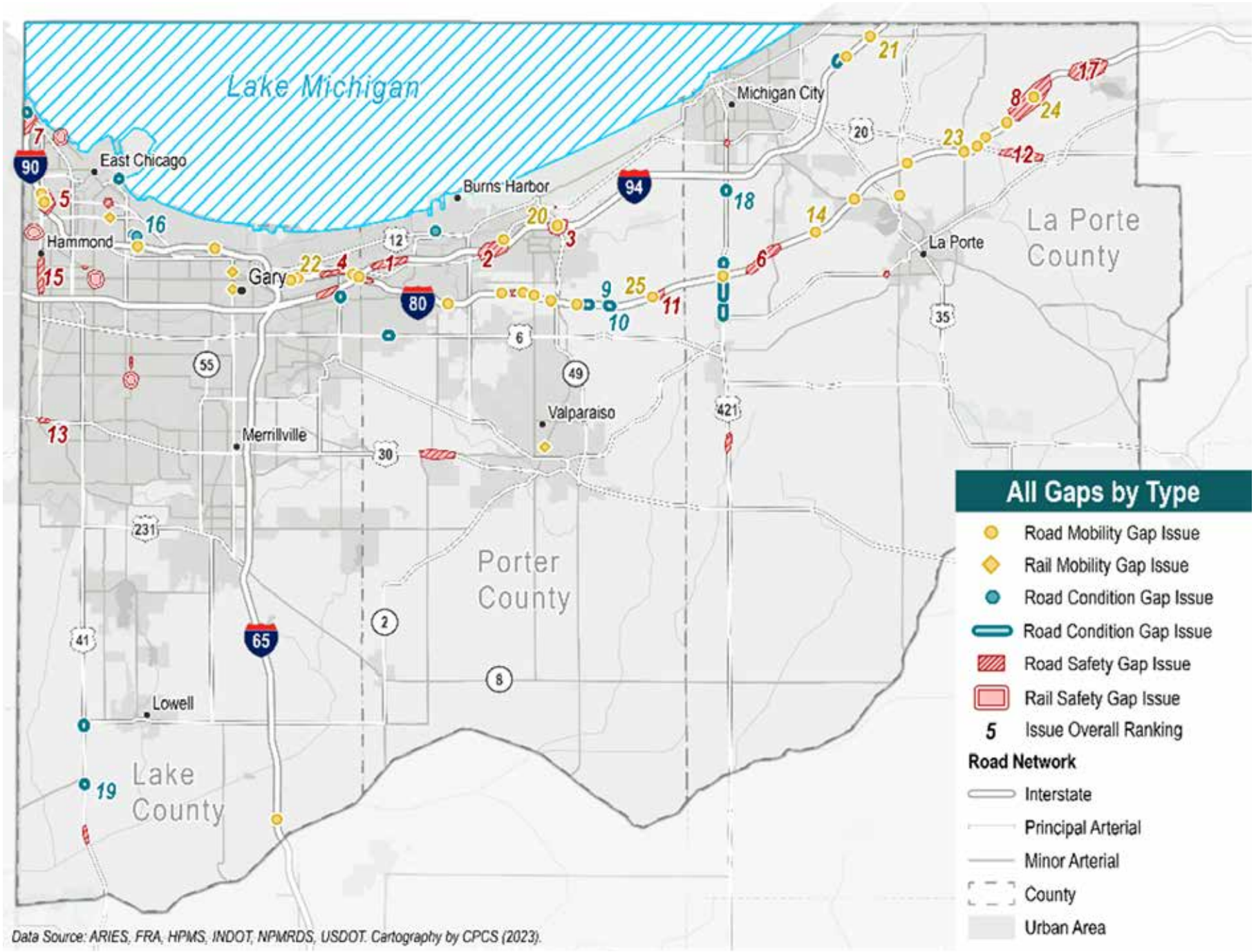


Figure 4-59: All Gaps

Strategy and Project Recommendations

Overview

Phase I of this project made use of a combination of data analysis, stakeholder consultations, and a public survey to identify a set of the most pressing needs in the NIRPC freight system. These needs are summarized in Table 4-43.

To address these gaps, a number of recommendations are developed and discussed with the project team and the Freight Steering Committee members throughout the planning process for the *NWI 2050+* Freight Chapter. These are presented in the following sections and range from policy and research study recommendations to planning-level cost assessments for freight project gap concepts.

Type	Need/Issue	Description
Truck Mode	Truck traffic congestion	Along NWI's primary arterials and on some small local roads, leading to delays and air quality impacts.
	Environmental impacts of trucking activity	This is a concern, and shipping companies and truck stop operators are considering technologies such as computer optimization routing and auxiliary power units to reduce emissions.
	Pavement condition	Only about 5.8 percent of Interstate and 7.7 percent of non-Interstate NHS routes are in good condition.
	Safety issues	Analysis of truck-involved crashes between 2017 and 2021 showed an upward trend in the frequency of these crashes in NWI.
	OS/OW loads	High volumes of OS/OW loads begin/end at Burns Harbor, and sometimes these loads move on local roads. Recent increases in OS/OW permit fees are a concern for the trucking industry.
	Bridge clearance	Some bridges with low clearance cause mobility issues.
	Truck parking	In short supply or hard to find.

Table 4-43: Overview of Freight System Needs Identified in Phase I

Type	Need/Issue	Description
Rail, Air, and Maritime Modes	Rail grade crossings	At-grade crossings cause delays due to relatively long blockage durations and also pose safety concerns.
	Single-track rail bridges	Cause rail traffic congestion and delays.
	Drawbridge condition	Two rail drawbridges are located in the region that are both in poor condition.
	Maritime investment	Need for developing policies and investing in icebreaking equipment, dredging, pilotage reform, and other physical system improvements to address environmental issues.
	Lack of intermodal facility	Congestion caused by freight traffic traveling to or from Chicago intermodal facilities.
	Limited air cargo operations	A lack of international destinations at NWI airports means that high-value cargo bound for international destinations has to be shipped by trucks to the Chicago O'Hare International Airport, which exacerbates road congestion in NWI.
Other	Workforce shortages	Workforce shortages threaten freight-dependent industries.
	Significant pass-through traffic	NWI's infrastructure bears the burden of very high levels of pass-through traffic.
Environment	Extreme weather	Extreme weather and other disruptive events damage infrastructure, cause delays and pose safety concerns, especially extreme cold, and heat, changing freezing and thawing patterns, and seasonal floods.
	Air emissions	Air emissions, especially Ozone, remain a problem in the region.
	Noise pollution	Some areas experience significant freight-related noise pollution.

Source: CPCS analysis and inputs solicited from stakeholders, 2022.

Table 4-43: Overview of Freight System Needs Identified in Phase I

Policy, Study, and Research Recommendations

Workforce Training Programs

Conexus Indiana estimates that in some industries, job openings per person approach a ratio of 10 to 1.[114] This is in line with FHWA's findings from inputs provided by the state DOTs and MPOs across the country. By training workers with in-demand skills and connecting them with relevant industries, workforce training programs would help to proactively address labor shortages that threaten key freight-dependent industries in the region. Vocational programs can be offered as a viable alternative to post-secondary education options. Some programs exist already, including Catapult Indiana, the Modern Apprenticeship Program, Ivy Tech Community College workforce training solutions, and Center of Workforce Innovations initiatives.

NIRPC can collaborate with the stakeholders involved in such programs to develop customized programs targeting freight-related skills. NIRPC can use FHWA's Freight Professional Development (FPD) program as a starting point. The FPD program consists of training courses, seminars, a resource library, guidance establishing university-based, freight-related degree programs, and technical assistance offered to state DOTs and MPOs. [115]

Key partners: Economic development corporations, community colleges, high schools freight industry, Conexus Indiana, Northwest Indiana Forum, Center of Workforce Innovations

Technology Deployment Opportunities

A variety of technologies can help improve the region's freight system. These range from Truck Parking Information Management Systems (TPIMS) to identifying and communicating truck parking availability, gate management strategies like appointment systems and automated scanning, and the implementation of freight signal priority.

NIRPC can coordinate with universities and other research institutions as well as the private sector to investigate innovative solutions that can improve the safety, condition, and efficiency of the transportation system and operations in Northwest Indiana. As an MPO, NIRPC is also eligible for a number of federal grant opportunities related to transportation technologies, including Advanced Transportation Technologies & Innovative Mobility Deployment (ATTIMD or ATTAIN) grants.[116] NIRPC can leverage these programs to sponsor studies focused on technologies that can improve freight issues (such as truck parking shortage, roadway congestion, and port access challenges) and also coordinate or provide financial support for testing, evaluating, and deploying emerging freight-related technologies.

114 CPCS consultation with Conexus Indiana, July 2022.
115 USDOT Office of Operations, Freight Professional Development Program Website.
116 USDOT Office of Operation, Bipartisan Infrastructure Law Key Programs under the Federal Highway Administration Office of Operations Website.

Truck Parking Study

Truck parking is a critical need for the trucking industry, often cited as a top priority.[117] Inadequate truck parking directly impacts safety, freight efficiency, and quality of life. Stakeholders consulted repeatedly reported a lack of truck parking. To address these issues, NIRPC might consider funding a new truck parking study that inventories existing capacity, identifies parking gaps and needs, and offers pertinent recommendations. This study can also investigate the opportunity to expand a TPIMS at additional locations, as there are currently none in Northwest Indiana.[118] Finally, the Indiana State Freight Plan is investigating truck parking issues and will propose recommendations that cover the Northwest Indiana region.[119]

Key partners: INDOT, MAASTO private truck parking providers (Love's, Pilot, Flying J, TravelCenters of America, etc.)

Comprehensive Corridor Analysis

Corridor analysis studies are an effective tool to investigate a specific area, assess its needs, and consider potential solutions. These studies are often effective for corridors facing pronounced safety or mobility issues. Planning efforts should incorporate community and stakeholder input, consider environmental concerns, and offer a range of possible alternatives.

Corridors in the Northwest Indiana region might very well benefit from strategies such as road diets, complete streets, truck-only lanes or truck access permitting systems, and other solutions, but corridor analysis studies are crucial to determine if and where these are appropriate. In particular, the stakeholder inputs and data analyses highlighted the need for comprehensive corridor-level assessments focused on the following issues in Northwest Indiana:

MAASTO TPIMS

In 2015, a group of eight states in the Mid-American Association of State Transportation Officials (MAASTO), including Indiana, partnered to apply for a $25 million TIGER grant for the purpose of creating a regional Truck Parking Information Management System (TPIMS).[120] The award of the grant allowed the eight participating states to install TPIMS technology at about 150 locations. The technology identifies stall availability at truck parking locations in real-time and communicates it to drivers through a variety of technologies. Indiana was awarded over $4 million[121] to install TPIMS at 19 locations covering over 1,200 truck stalls. There is currently no truck parking in locations in Northwest Indiana with TPIMS. There are also no TPIMS locations on I-94, I-90, or I-80 anywhere in the state [122]

117 ATRI-Top-Industry-Issues-2021.pdf (truckingresearch.org)
118 Trucks Park Here, Indiana TPIMS, accessed February 2023.
119 Indianapolis Metropolitan Planning Organization, Central Indiana Regional Freight Plan, approved August 17, 2022.

120 Trucks Park Here, Parking Information, accessed February 2023.
121 Trucks Park Here, TIGER Proposal 2015 Regional Truck Parking Information and Management System (TPIMS), accessed February 2023,
122 Trucks Park Here, Indiana TPIMS, accessed February 2023.

1. ***Truck movements along the US 12/20 corridor:*** NIRPC released its Porter County US 12/20 Transportation Corridor Plan in 2008.[123] The plan involved extensive field analysis, ten public meetings, and input from over 100 stakeholders, and aimed to direct future development of US 12/20 in a way that would "create a livable lakefront." In particular, the plan recognized that there is a mix of passenger traffic, recreational activity, industrial operations, and freight travel that is "not presenting a safe and quality traveling experience for visitors." The plan recommended considering rerouting truck traffic away from US 12. While restricting truck traffic on US 12 has proven infeasible, NIRPC continues to strive for reduced conflict on US 12 between freight and recreational activities.

   Improvements to the US 12/20 corridor remain an ongoing conversation. An INDOT Notice of Project Advancement in 2020 identified a preferred alternative for the US 12/20 corridor that would realign the US 12 to create an improved intersection with US 20 and would introduce new pedestrian and bicycle infrastructure.[124]

2. ***Truck access to the Cleveland Cliffs-Burns Harbor facility:*** Both NIRPC and stakeholders mentioned a need to improve freight access to and from the Cleveland Cliffs Facility at Burns Harbor along US 12. NIRPC's involvement on this topic stretches back over a decade when a group of stakeholders convened to discuss improvements to the facility's entrance and landed on a proposed Intelligent Transportation Systems (ITS) solution to improve signaling and reduce truck queuing on US 12.

   Today, the discussion has been resurrected between NIRPC and key stakeholders, with proposed improvements at the western access point or closure of the easternmost access point. However, any solution will require close collaboration with Cleveland Cliffs and requires further investigation.

   Key partners: INDOT, Indiana Department of Natural Resources, City/county engineers, Indiana Dunes - National Park Service, Businesses and facilities located along the corridors, Community representatives, Economic Development Agencies, and Non-profit environmental groups.

Rail Grade Crossing Improvements

Of the 846 public railroad crossings in Northwest Indiana, 675 (or almost 80 percent) are at-grade, resulting in one at-grade rail crossing for every 8.8 miles of public roadway.[125] This density is double that of Indiana overall, despite Indiana ranking first nationally.[126] As a result, at-grade crossings remain a prevalent issue in the Northwest Indiana region.

NIRPC has an opportunity to continue working with local authorities and communities to identify candidate rail crossing locations for grade separation, closure, or improved active warning safety devices. In this role, NIRPC can also help to identify appropriate funding opportunities related to grade crossings and support the application process.

123 Microsoft Word - Porter County Trans Plan_ Final_030708.doc (nirpc.org)
124 Notice-of-Project-Advancement-for-US-12-Road-Reconstruction-and-Realignment-Project.pdf (in.gov)
125 CPCS analysis of FRA crossing inventory data, 2022; INDOT, Indiana State Rail Plan, 2021. Public road mileage calculated using 2021 Indiana Jurisdictional Mileage data,
126 Ibid

Rail Crossing Task Force

Recognizing the importance of addressing safety concerns and blocked-crossing problems at grade crossings, the Northwest Indiana Rail VISION Group and the Northwest Indiana Rail Crossings Task Force collected field data and conducted several studies over the past few years. The Rail Crossing Task Force last met in 2019, but the data collected by the Task Force informed the analysis conducted in this Freight Chapter.

Reconvening the Task Force can be valuable as NIRPC continues working to improve safety and mobility at grade crossings. NIRPC may also consider sponsoring another round of data collection led by the Rail Crossing Task Force with a focus on blocked crossing issues and hotspots identified in the Federal Railroad Administration (FRA's) crowdsourced Blocked Crossing database. The Task Force can also support and inform NIRPC's and INDOT's regular discussions with the rail industry stakeholders, which are especially important right now for a number of reasons, including extensive new funding for rail-related projects under BIL and ongoing operational changes in the rail industry such as precision-scheduled railroading, struggling short lines, labor issues, the potential for reciprocal switching requirements, and a likely case before the Supreme Court in 2023 about allowing states to hold railroads accountable for blocked crossings.[127]

127 Reciprocal switching refers to arrangements between competing railroads to allow customer access to a facility or business served by only one railroad. The Surface Transportation Board is proposing to adopt a set of rules for reciprocal switching to address high rates and service access concerns. Source: Sarah Zimmerman, STB poised to decide reciprocal switching rules as shippers, railroads remain at odds, Supply Chain Dive March 30, 2022

Air Cargo Study

Gary/Chicago International Airport (GYY) is the third largest air cargo facility in Indiana. GYY serves as an important strategic airport to carry time-sensitive and higher-value goods and offload some of the demand from the air cargo facilities in the Greater Chicago area. As the Airport is planning for new development and air cargo service expansions,[128] NIRPC may consider conducting a study to investigate strategies to strengthen the economic competitiveness of air cargo operations at GYY, which can help shift some of the traffic to and from the greater Chicago area from trucks to the air cargo mode. Such a study should involve close coordination with the City of Gary and the GYY representatives and include considerations regarding the environmental and community impacts of airport-related growth.

Key partners: Gary/Chicago International Airport, City of Gary, Community representative groups, Non-profit environmental groups, Freight industry stakeholders

128 NIRPC stakeholder inputs collected during a Freight Steering Committee Meeting, January 2023.

Expanded Resiliency Study

Northwest Indiana's economy heavily relies on its freight infrastructure, as freight-reliant industries such as manufacturing and transportation, and warehousing account for about 40 percent of the region's employment. While the majority of the Interstate and non-Interstate NHS roadways in Northwest Indiana are in fair condition, timely maintenance and effective planning are required to maximize pavement infrastructure life cycles. The substantial pass-through freight traffic to move cargo to and from the freight facilities in the Chicago area can also exacerbate the maintenance needs along the region's highway system. Finally, Northwest Indiana's Lake Michigan Ports District, which ranks among the top 30 ports nationally, relies on regular investments, including icebreaking, dredging, and improved access roads, to handle demand and remain resilient against weather fluctuations.

In addition to maintaining the transportation system in good or fair condition, investment and policy actions are required to advance systemwide resilience related to both natural and human-made risks. According to the US Federal Emergency Management Agency's (FEMA's) measures of risks faced by communities (which includes infrastructure resilience considerations), Lake County has a higher risk index than the other two counties in Northwest Indiana, and almost 94 percent of other counties in the US. This high-risk index indicates that the County houses valuable economic resources and populations that are uniquely susceptible to hazards, especially cold waves, heat waves, flooding, strong winds, winter weather, and tornadoes.[129] Stakeholders in Northwest Indiana have also confirmed the need for regional and statewide resilience planning due to the now observable impacts of climate change on the frost and thaw seasonal cycles and, as a result, on road, rail, bridge, and port infrastructure.

NIRPC adopted the Northwest Indiana Economic Recovery and Resiliency Plan in December 2022.[130] This plan features an Action Plan goal about Infrastructure. NIRPC can expand upon the infrastructure goal to benchmark infrastructure resiliency, identify risks, and highlight opportunities to make more informed investment decisions. The additional effort can also build upon the findings from the 2019 State of Indiana Standard Multi-Hazard Mitigation Plan and other relevant efforts at the national, state, and regional levels.

Key partners: INDOT, City/County engineers and other local representatives, Community representative groups, Non-profit environmental groups.

Future Planning Support

NIRPC can use the freight system needs and gap areas identified in this project in future transportation planning efforts. By making the list of gaps available to local jurisdictions and to project managers across NIRPC, freight needs have the opportunity to be considered in all aspects of transportation planning across Northwest Indiana. Moreover, NIRPC should continue to tap the expertise represented on the Freight Steering Committee to keep the list of freight gaps and needs updated, coordinate ongoing and future improvements, and establish a platform for ongoing collaboration on freight activities and operations.

Freight Project Gap Areas

To identify freight-related gaps areas, robust data analysis was used to filter out the freight needs identified in Phases I and II that are expected to be addressed with programmed or planned projects. The remaining needs were expanded and refined through internal discussions among NIRPC staff and vetted with project stakeholders. This careful analysis and collaboration allowed the team to group freight needs into seven priority gap areas for planning level cost estimates:

1. Bridge Clearance
2. Tollbooth Inefficiency
3. Noise Pollution
4. At-Grade Rail Crossing Safety
5. Bridge Condition
6. Safety Issues with Low-Cost Solutions
7. Traffic Signals

These high-level gap areas were supplemented with a collection of case examples to ground the analysis. For these gap areas, the project team has developed high-level cost estimates. This information can be used by NIRPC and its partners as a resource to advance sensible investment decisions moving forward but should not be used to assume any on-the-ground or engineering level assessment.

129 National Risk Index, FEMA

130 NIRPC and TIP Strategies, Northwest Indiana Economic Recovery and Resiliency Plan, September 2022.

Planning Level Layouts and Estimated Costs

Gap 1: Bridge Clearance

Low bridge clearances can interfere with the efficient movement of trucks and are susceptible to being hit, which poses safety concerns. This planning effort has identified a number of bridges with low clearance that might benefit from being raised. NIRPC has highlighted a bridge on US 30 in Schererville as a case example for improved height clearance, which the agency is considering pairing with road widening to improve active transportation access.

Case Example: Norfolk Southern Railroad Bridge on US 30 in Schererville

The clearance height of this bridge, located east of US 41, is 15 feet in the westbound direction and 14 feet 9 inches in the eastbound direction (Figure 4-105 and 4-106). In 2019, the average daily traffic volume was 41,117 vehicles, including 823 combination trucks, and the truck travel time reliability was 2.3 for westbound trucks and 2.2 for eastbound trucks. In addition to challenges associated with truck traffic traveling under the bridge, the current width clearance does not allow for the addition of sidewalks or bike lanes, which is an accessibility concern raised by the public. Addressing the height and width clearance challenges at this bridge will require coordination with Norfolk Southern railroad.

Figure 4-60: Eastbound Bridge View

Figure 4-61: Westbound Bridge View

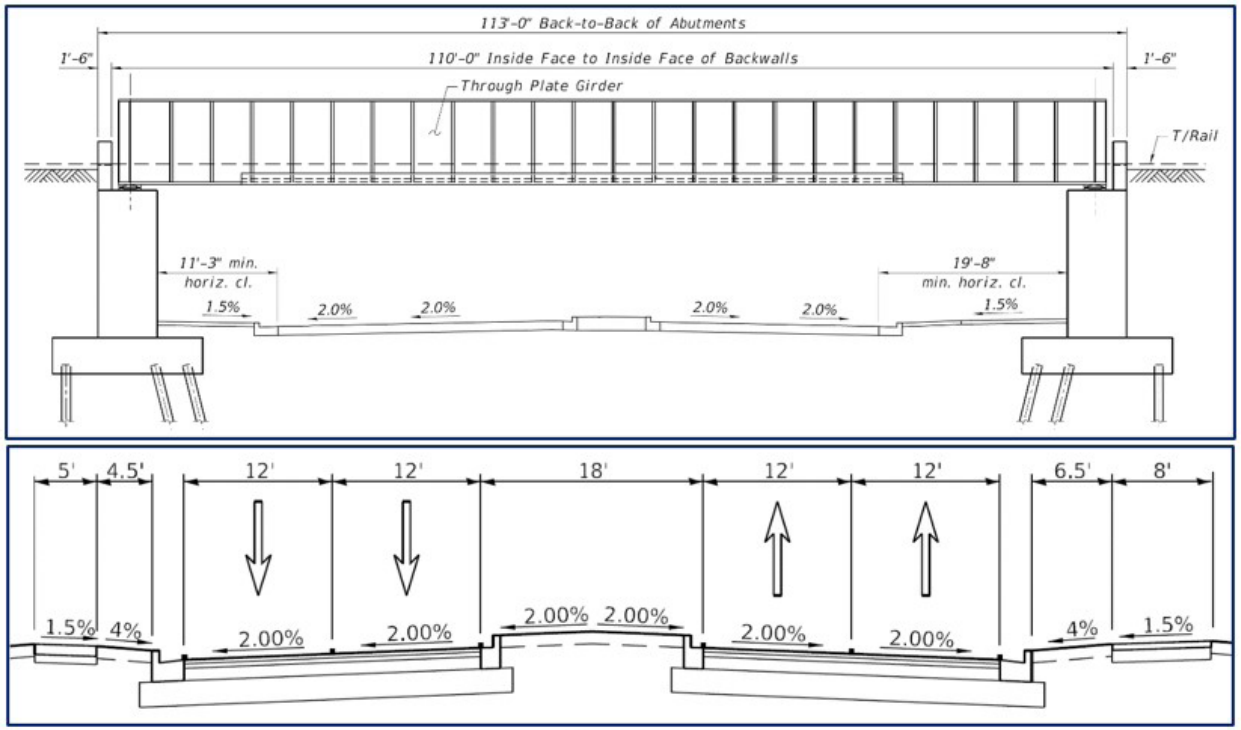
Figure 4-62 shows the overall concept for increasing the height and width clearance of this Norfolk Southern bridge. The bridge deck needs to be reconstructed with the roadway surface lowered to provide adequate height clearance (16 feet). The typical roadway section would include four lanes (two eastbound and two westbound) with accommodations for bicycles and pedestrians. The estimated cost for such a project would be around $25M, assuming that a pump station will not be needed for this location, as the grade difference is less than two feet.

Gap 2: Tollbooth Inefficiency

Tollbooths obstruct the traffic flow; in particular, cash-only tollbooths can cause idling and vehicle queues along their feeder roads. New technologies, such as electronic toll collection or open-road tolling (ORT), can address these problems; they streamline the toll collection process by allowing road users to drive through the toll collection zone at highway speed without having to stop or slow down. NIRPC stakeholders have highlighted the inefficiencies at toll collection zones in Northwest Indiana, particularly along high-volume routes such as the Indiana Toll Road (I-90). Analysis of road congestion issues across the region also revealed truck bottlenecks located along the segment of I-90 within Northwest Indiana.

Case Example: Tollbooths Located Along I-90

I-90, which runs east-west through the Northwest Indiana region, is a toll road operated by a concessionaire. The nine tollbooth locations on I-90 in Northwest Indiana introduce delays as vehicles slow down to pass through. Of the nine tollbooths on I-90 in NIRPC's jurisdiction, four are mainline toll systems, and the remaining five are entry/exit tolling systems. Upgrades to mainline tollbooths are typically a priority because they have the highest traffic volume flow, can be difficult for toll booth employees to navigate, and require a large number of employees. Upgrades might also be prioritized where toll collectors are more difficult to hire—often in rural areas. Because I-90 spans the entire state of Indiana, this opportunity would require extensive collaboration with other regions and stakeholders, as well as with the Indiana Toll Road itself. NIRPC is taking the first step here by calling attention to the opportunity and identifying high-level planning considerations.



Source: TranSystems, 2023.

Figure 4-62: Example Roadway Typical Section - Railroad Clearance

Source: Traffic Technology Today, 2019.

Figure 4-63: Existing Mainline Tollbooths

Table 4-44 outlines planning level cost estimates for different elements of the tollbooth elimination gap area. Of note is that operating costs for different tolling technologies vary significantly. To reduce operating costs, NIRPC should encourage users to have an E-ZPass tag (FRID chip). The Indiana Toll Road has established reciprocity with other toll road systems, increasing the usefulness of a roadway user owning a tag chip. System leakage may also occur with license plate processing when a vehicle has covered, dirty, missing, or hard-to-read license plates.

Source: WTAE, Pennsylvania Turpike Tolling system, 2021.

Figure 4-64: Open Road Tolling

Element	Cost
Existing Tollbooth Removal	$50,000 per tollbooth
Mainline Open Road/Toll-by-plate tolling installation	$1.5 million per tollbooth
Operating costs for tag processing	$0.07-0.10 fee per transaction
Operating costs for license plate processing	$0.35-0.40 fee per transaction

Source: TranSystems, 2023.

Table 4-44: Tollbooth Elimination Planning Level Cost Estimates

Gap 3: Noise Pollution

Highway traffic, especially truck traffic, can be loud and polluting, which can upset the quality of life and health of surrounding communities. Research has found that living within 500 feet of a major highway is linked to asthma, heart disease, stress, sleep disturbances, and dementia.[131] Moreover, these negative externalities are not equitably distributed; communities living next to major highways are often disadvantaged communities. Noise barriers are effective tools to mitigate noise and may reduce the dispersion of dangerous pollutants at a relatively low cost and without major disruption to either traffic or communities.[132]

131 USDOT, Proximity To Major Roadways, updated August 2015, and Bilodeau, Kelly, Exposure to traffic noise linked to higher dementia risk, Havard Heath Publishing: Harvard Medical School, December 2021.

132 Baldauf, R., et al., Impacts of noise barriers on near-road air quality, Atmospheric Environment 42:32, October 2008.

Case Example: Protecting Residential Neighborhoods Located Near I-94

Figure 4-65 identifies five locations along I-94 that lack a noise barrier but where many residences are located within 500 feet of the highway. These locations, shown in Figures 18 to 21, would be appropriate for the installation of noise barriers and are presented as case examples.

A noise barrier costs approximately $4.5 million per mile per side or $840 per linear foot. This assumes a standard 14-foot noise wall within the existing right-of-way at a flat $60 per square foot. These prices translate to the costs per location shown in Table 4-45. Constructing noise barriers at all five locations would cost approximately $10 million.

Location	Approximate Length	Cost
1	1,500 feet	$1.3 million
2	3,500 feet	$3.0 million
3	2,800 feet	$2.4 million
4	1,400 feet	$1.2 million
5	2,300 feet	$1.9 million
Total	**11,500 feet**	**$9.8 million**

Source: TranSystems, 2023.

Figure 4-45: Noise Barrier Planning Level Cost Estimates

Figure 4:65: Potential Noise Barrier Projects

Source: TranSystems, 2023.

Figure 4-66: Location 1 – North of I-94 in Gary along W 27th Ave

Figure 4-67: Location 2 – South of I-94 in Portage East of I-90 Interchange

Figure 4-68: Locations 3 and 4 – Southwest and Northeast of I-94/SR 149 in Burns Harbor

Figure 4-69: Location 5 – North of I-94 in Chesterton West of SR 49

Gap 4: At-Grade Rail Crossing Safety

At-grade crossings pose safety and mobility risks for travelers. These risks can be addressed through grade separation or with improved warning devices. Grade separation is more costly than warning devices and is thus more appropriate at crossings with high traffic volumes or with a significant number of crossing incidents. However, by physically removing the crossing, grade separation eliminates the original safety and mobility risks. While warning devices do not entirely eliminate safety risks or solve mobility issues, they are less costly than grade separation and are still effective at improving rail crossing safety. A number of crossings in the region are equipped with passive-only or limited active warning devices and may benefit from upgrades.

As a result of stakeholder engagement, prior planning efforts, and careful safety and mobility data analysis, the project team has identified two crossings as case examples for grade separation as well as a third collection of crossings that serves as a case example for upgrading grade crossing warning devices.

Case Example 1: Norfolk Southern Crossing 117th Street in Whiting

Two at-grade crossings span six tracks along 117th Street between Center Street and Whiting Lakefront Park. Between 2016 and 2020, this crossing saw four highway-rail crossing incidents, two of which involved a pedestrian. These safety concerns were identified as an unaddressed gap as a result of this planning effort's data analysis. Details on these two crossings are provided in Table 4-45 and Figures 70 and 71.

Crossing #	Owner	AADT (2019)	Daily Train Volumes (2022)
156098N	Norfolk Southern	2,126 vehicles (10% trucks)	58 through trains (12 passengers) and 2 switching trains
260690U	Wisconsin Central LTD		3 through trains

Source: FRA Crossing Database, 2022; HPMS, 2019.

Table 4-45: 117th Street At-Grade Rail Crossing

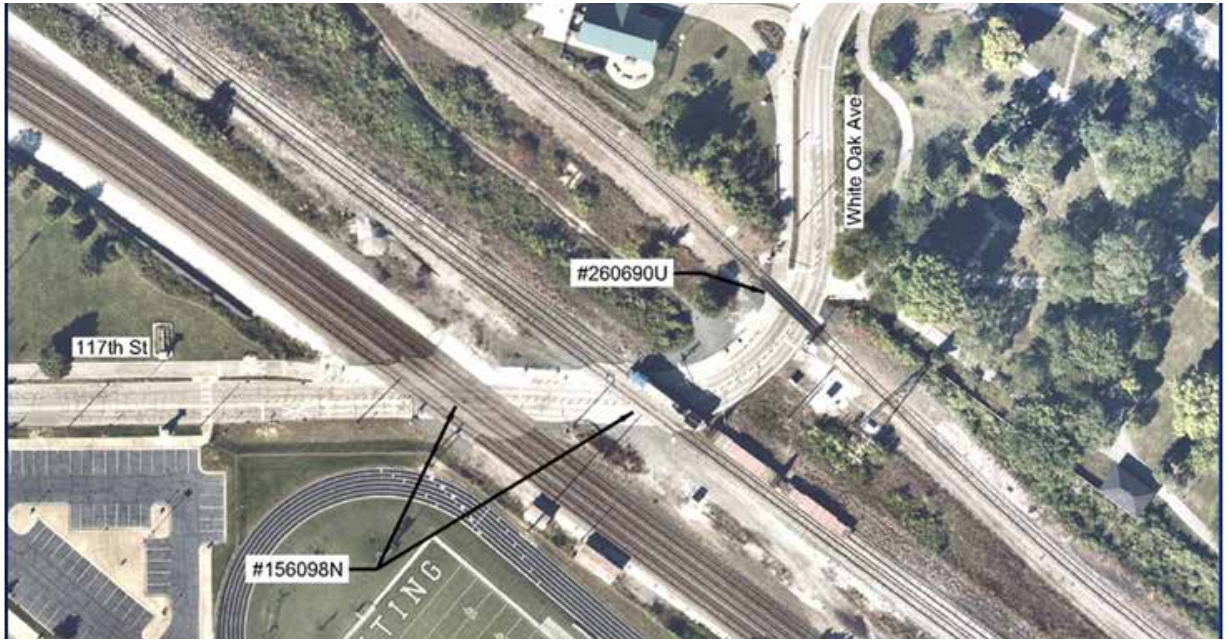


Figure 4-70: 117th Street At-Grade Rail Crossings Imagery

A complete realignment of the roadway will be needed in order to accommodate the grade separation. Typically, 30 feet of grade difference is needed for a roadway overpass, and 5% grades are the maximum allowable for accessible sidewalk and street crossing. This requires more than 600 feet of runout on both the east and west sides of the tracks, plus additional distance needed for the curves to get back to the existing grade. The white line on the aerial image below (Figure 4-72) is the approximate straight-line distance needed to get back to the existing grade. The total cost associated with the road realignment and grade separation is estimated to be around $60M.

Figure 4-71: 117th Street At-Grade Rail Crossing Looking East (left) and West (right)

Figure 4-72: Whiting Aerial

Case Example 2: CSX Rail Line Crossing US 41 in Hammond

Two at-grade crossings appropriate for separation in Hammond span four tracks along US 41 south of Gostlin Street. NIRPC identified this grade separation at this crossing as an ongoing regional need. Details on these two crossings are provided in the following figures.

Crossing #	Owner	AADT (2019)	Daily Train Volumes (2022)
163627L	CSX	17,927 vehicles, including 1,128 combination trucks	29 through and 6 switching trains
870916M	Northern Indiana Commuter Transportation District (NICD)		47 through trains (37 passenger trains)

Source: FRA Crossing Database, 2022; HPMS, 2019.

Table 4-46: US 41 At-Grade Rail Crossing

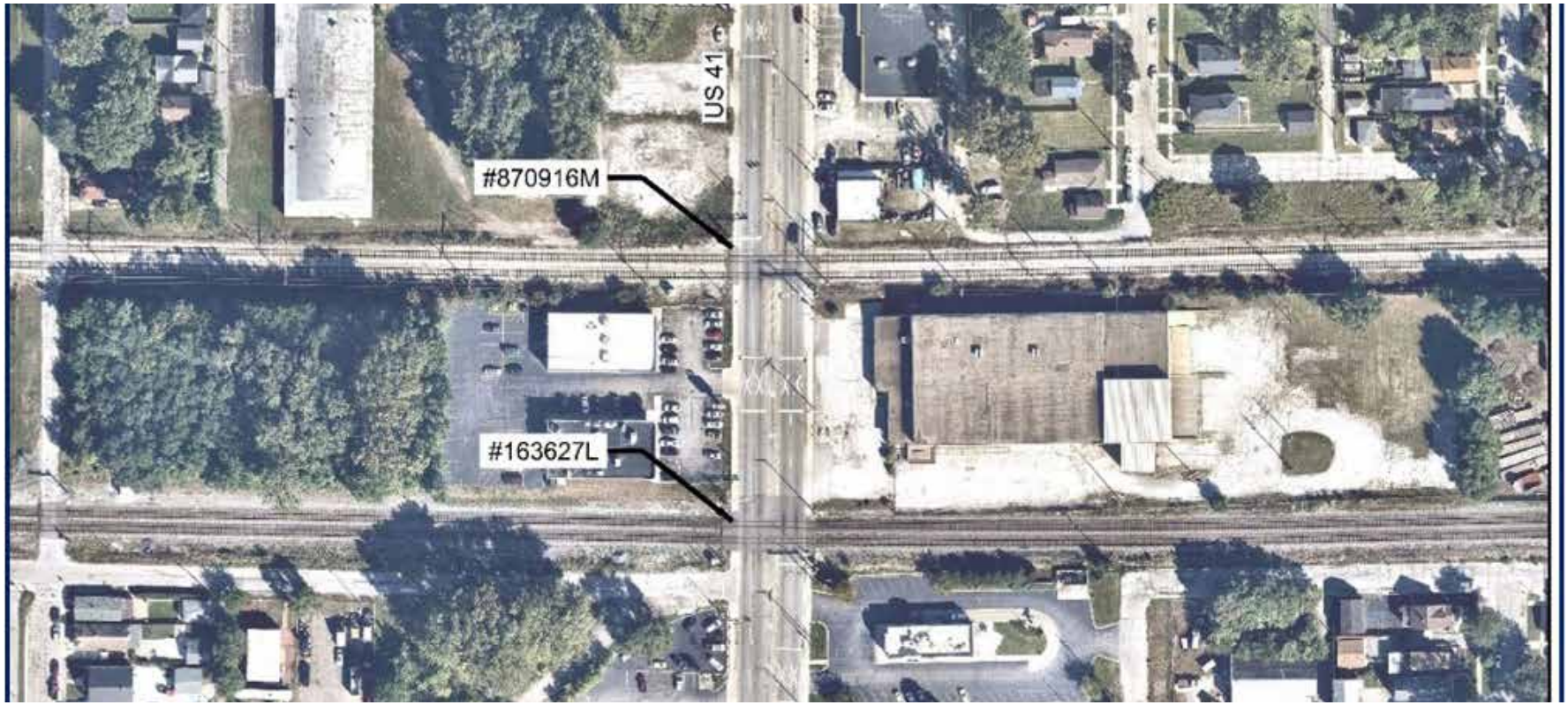


Figure 4-73: US 41 At-Grade Rail Crossing Imagery

Two separate bridges will be required, and more than 1000 feet of retaining wall will be needed for grade separating this crossing. Typically, 20 feet of grade difference is needed for a roadway underpass with 5% max grades allowable for accessibility standards. This requires more than 400 feet of run out on both the east and west sides of the tracks, plus additional distance needed for the curves to get back to the existing grade. The Gostlin intersection is less than 400 feet from the north set of tracks, so modifications to that intersection grade would likely be needed. A pump station is also likely needed here due to the 20 feet cut for the underpass. The total cost associated with these activities is estimated to be around $50M.

Figure 4-74: US 41 At-Grade Rail Crossing Looking South

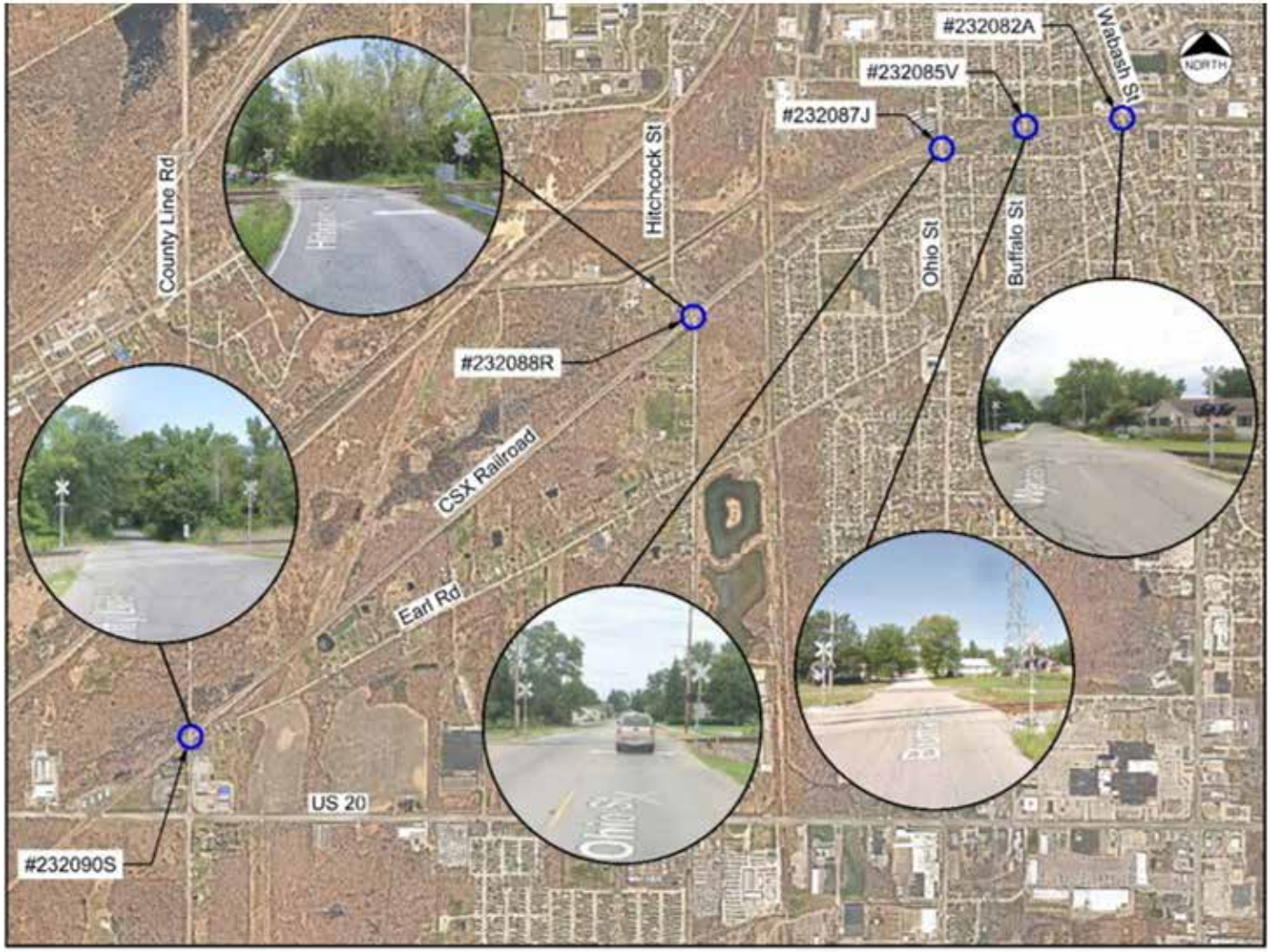
Crossing	Cost
117th Street in Whiting	≈ $60 million
US 41 in Hammond	≈ $50 million

Source: TranSystems, 2023.

Table 4-47: Rail Crossing Grade Separation Planning Level Cost Estimates

Case Example 3: Upgraded Warning Devices for CSX Corridor In and Near Michigan City

Upgrades to warning devices might be appropriate along the CSX corridor in and near Michigan City at the five at-grade highway-rail crossings between County Line Road and Wabash Street (Figure 4-75). These five crossings are currently active with roadside-mounted lights and not gates.



Source: FRA Crossing Database and Google Maps Street View, 2023.

Figure 4-75: At-Grade Crossings Proposed for Active Warning Devices

Table 4-48: Rail Crossing Upgraded Warning Devices Planning Level Cost Estimates

Arrangement	Cost
Gates only	≈ $400,000 per crossing
Gates and cantilever light	≈ $500,000 per crossing

Source: TranSystems, 2023.

Gap 5: Bridge Condition

Data analysis from Phase 1 of this planning effort revealed that only about 5.8 percent of Interstate and 7.7 percent of non-Interstate NHS routes in Northwest Indiana are in good condition. Moreover, more than 50 bridges in the region are in poor condition. It is important for NIRPC to prioritize the rehabilitation of and other improvements to infrastructure conditions to maintain a state of good repair and reduce the risk of disastrous infrastructure failure. An analysis of bridge condition data identified a set of bridges in poor condition on Gary Road between US 12 and I-90 that serves as a useful case example.

Case Example: Bridges on Gary Road between US 12 and I-90

Four adjacent bridges (two eastbound and two westbound) along Gary Road between US 12 and I-90 in Gary are in poor condition (Figure 32). The 2019 average daily traffic volume over the two bridges was 9,283 vehicles, with 1,024 combination trucks. The Gary Road tollbooth is also located south of the bridges.

These four bridges have a superstructure condition rating of 4, which indicates poor condition per the National Bridge Inspection Standards (NBIS) rating system. The substructure is rated 7. This indicates good condition, while the deck is rated 6, meaning it is in satisfactory condition. These ratings show that significant repairs are needed for the superstructure, while the substructure may only require minor repairs. Table 4-49 shows the planning level costs estimated for repairs to the piers and abutments and the replacement of the beams and decks of the bridges.

Element	Cost
Superstructure Replacement	Deck area* x $200/sf = 19,620 sf x $200/sf = $8,748,000 **Deck Area = 268' x 90' + 218' x 90' = 19,620 sf*
Engineering Phase 1, 2 and 3	0.25 x $8,748,000 = $2,187,000
Total Estimated Cost	$10,935,000

Source: TranSystems, 2023.

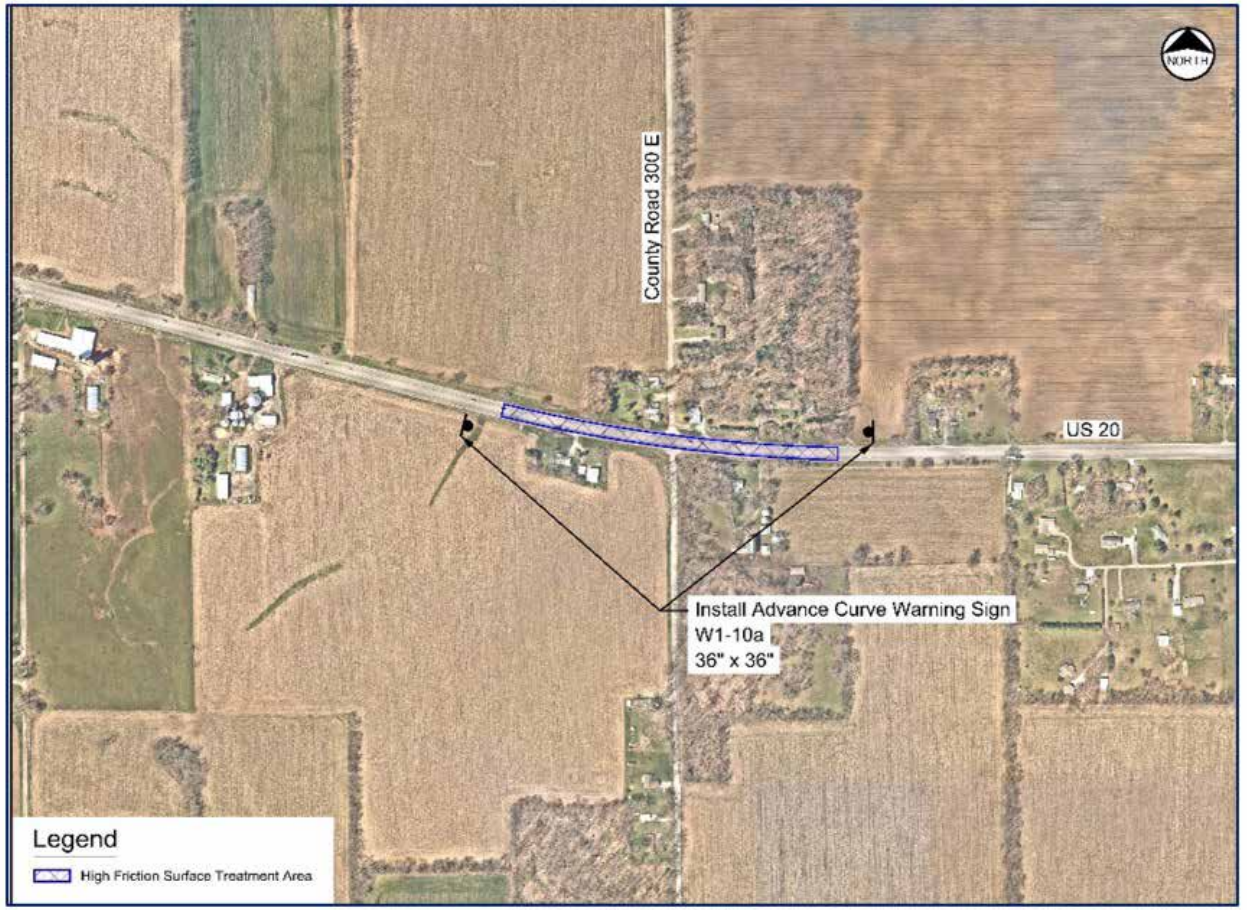
Table 4-49: Bridge Rehabilitation Planning Level Cost Estimates

Source: TranSystems, 2023.

Figure 4-76: Bridges in Poor Condition Along Gary Road between US 12 and I-90

Gap 6: Low-Cost Safety Improvements
Certain segments of roadway with clusters of safety issues can be improved with low-cost, high-impact investments. This is especially true at curves where signage or improved pavement materials can alert drivers and improve traction to reduce the risk of a crash. An analysis of safety data identified a cluster of crashes on US 20 near Rolling Prairie that serves as a use case example.

Case Example: US 20 in La Porte County
US 20 in La Porte County, just west of Rolling Prairie near the intersection with County Road 300, saw five crashes within a five-year period, of which two resulted in fatalities. The speed limit along this stretch of road is 55 miles per hour and is defined by a slight curve. As shown in Table 4-50, safety can be improved along this dangerous stretch of US 20 for little cost. These strategies to improve safety might include introducing advance curve warning signs, installing high friction surface treatment, and clearing and grubbing the land near the intersection with County Road 300.



Source: TranSystems, 2023.

Figure 4-77: US 20 Safety Improvement

Element	Cost
High friction surface treatment	$40,000-50,000 per curve
Advance curve warning signs	$350 per sign
Clearing and grubbing of intersection	$5,000 per intersection

Source: TranSystems, 2023.

Table 4-50: Safety Improvements Planning Level Cost Estimates

Gap 7: Traffic Signals

Many intersections in the region may benefit from signaling to improve mobility and safety. NIRPC is interested in understanding the important planning and cost considerations that go into new traffic signals as the agency works to identify opportunities for installation.

Intersections must usually meet traffic signal warrants based on the Manual on Uniform Traffic Control Devices (MUTCD) for a new signal to be installed. These warrants are often based on vehicular traffic volume thresholds but may also be appropriate for intersections with a significant crash history or pedestrian traffic volume.

Table 4-51 outlines the approximate cost of a traffic signal based on standard equipment assumptions. Costs can fluctuate for a variety of reasons, including variations in roadway width and mast arm length, quantity and type of radar or camera equipment, the presence of pedestrian accommodations, and the number of signal heads.

Assumed Equipment	Cost
Four poles with mast arms One controller Cable communications Other standard equipment	$350,000 – 500,000 per traffic signal

Source: TranSystems, 2023.

Table 4-51: Safety Improvements Planning Level Cost Estimates

Appendix 4A: Review of Studies, Plans, and Other Relevant Documents

Plan Name	Publishing Agency	Year Published
Statewide Freight-Related Studies		
Statewide Transportation Improvement Program (STIP)	INDOT	2022
Investing in the "Crossroads of America" Indiana Infrastructure Report	Conexus Indiana	2021
State of the Logistics Industry	Conexus Indiana	2021
2021 Indiana State Rail Plan	INDOT	2021
INDOT's Customer Satisfaction Survey	INDOT	2020
2020 Indiana Manufacturing Survey: COVID Special Edition	Katz, Sapper, & Miler, Indiana University Kelley School of Business, Indiana Manufacturers Association	2020
Transportation Asset Management Plan	INDOT	2019
Long-Range Transportation Plan	INDOT	2019
2018 Indiana Multimodal Freight Plan Update	INDOT	2018
Indiana's 2013-2035 Future Transportation Needs Report	INDOT	2013
Highway-Rail Grade Crossing Safety Action Plan	INDOT	2010
MPO and Regional Level Studies		
Air Quality Conformity Determination Report	NIRPC	2021
Local and Regional Economic Impacts of the Ports of Indiana	Ports of Indiana	2020
Local and Regional Economic Impacts of the Indiana Maritime Industry	Ports of Indiana	2020
E-Commerce in Northwest Indiana	NIRPC	2020
NWI Rail Crossing Task Force: Summary Report	NIRPC	2019
Critical Urban Freight Corridors Committee Meeting Presentation	NIRPC	2019
NWI 2050 Plan	NIRPC	2019
NWI Rail Crossing Task Force Summary Report	NIRPC	2019
NWI Rail Crossing Task Force Presentations	EME Rail Solutions, LLC	2019
Ignite the Region: NWI's Strategy for Economic Transformation	NWI Forum Regional Economic Development Organization	2018
Comprehensive Economic Development Strategy	NIRPC	2016
Regional At-Grade Crossing Study	NIRPC	2013
Freight Study	NIRPC	2010

Source: CPCS, 2022.

Table 4A-1: Plans and Studies Reviewed

Summary of Key Takeaways

The high concentration of freight activities in Northwest Indiana region poses significant issues. Common findings include congestion on the region's highways, conflict between road and rail modes resulting from at-grade crossings, and emissions nonattainment. However, with the right vision and goals, the region's infrastructure can become an asset. *NWI 2050+* was developed in alignment with regional goals brought forward from *NWI 2050*. In addition to this guidance, implementation strategies and performance measures from the relevant statewide studies will be used to aid in the identification and evaluation of new strategies and performance measures needed for the region.

Current Conditions

This section summarizes the current conditions of the freight system in Northwest Indiana. Some data are presented at the statewide level and need to be identified at the regional level for Northwest Indiana. These are separated into four sections, consistent with the components identified in Phase 1 of the work plan.

The Physical System Profile:

- Northwest Indiana has 5,800 linear miles and 13,000 total lane miles of roadway.
- The Port of Indiana-Burns Harbor provides barge access to more than 20 states via the Inland Waterway System as well as many international locations by transshipment in the Gulf of Mexico or through the Great Lakes. The Port has more than 7 miles of track which handle 9,000 railcars annually. The Indiana Harbor complex is the largest integrated steelmaking facility in North America.
- Class I railroads in Northwest Indiana are Norfolk Southern, CSX, and CN. Almost all rail in Northwest Indiana is 286K compatible.
- There are 1,086 rail crossings in Northwest Indiana, of which 82 percent (886) are at grade. About half of schools, fire stations, and hospitals are within half a mile of a rail crossing.
- Seven airports in Northwest Indiana: the largest is Gary/Chicago International; others are in Griffith, Hobart, Lowell, Valparaiso, Michigan City, and La Porte.

The Economic Profile:

- Northwest Indiana has an economy valued at about $35 billion.
- There is a concentration of minority census blocks in Lake County.
- Manufacturing and logistics are key to Indiana's economy, generating a third of the state's GDP and employing over 13 percent of the state. Northwest Indiana will likely remain a global center of steel production.
- Gary-Chicago International Airport approved a lease with UPS in May 2020.
- The Port of Burns Harbor generated almost 31,000 jobs (6,454 of which were direct) in 2019 and offered over $5 billion in economic activity. The Northern Indiana Maritime District generated 98,465 jobs (18,430 of which were direct) and offered over $17 billion in economic activity.
- The Indiana Harbor complex is the largest integrated steelmaking facility in North America.

The Freight System Demand and Key Corridors:

- 80 percent of manufactured goods travel by truck in Indiana.
- Indiana ranks #1 in the nation for the number of pass-through highways (13 interstates).
- More than half of the freight traveling on Indiana highways is passing through one of the state's PHFS interstates.
- Indiana ranks #1 in rail-tons of primary metals originated and terminated.
- Lake County is the primary county of origin for outbound rail tonnage in Indiana.
- More than 1.5 billion tons of freight are moved in Indiana annually, making it the 5th busiest state for commercial freight traffic.
- The Port of Burns Harbor has more than 7 miles of track and handles 9,000 railcars annually.

Multi-modal Freight Issues in the Region:

- A 2019 Customer Satisfaction Survey found that almost 70 percent of respondents in the La Porte District had experienced a delay due to construction/maintenance.
- Staff resources and labor shortages pose a significant risk to the transportation operations, including goods movement operations.
- Lake and Porter Counties are nonattainment areas for Ozone. Portions of Lake County are maintenance areas for PM10 and CO.
- Indiana is tied with Louisiana for the most at-grade crossing-related fatalities in the US. Between 2007 and 2016, there were 133 deaths, of which five were in Northwest Indiana.
- I-65 experiences significant congestion statewide. US 30 sees significant truck traffic and congestion.
- Vertical bridge clearance remains an issue throughout Indiana, mostly on non-Interstates
- Key highway bottlenecks include: I-80/94 (Borman Expressway) in Lake County (state line to I-65), SR 49 in Porter County (I-80/I-90 to I-94), US 20 in La Porte County (SR 2 junction to I-94), US 30 in La Porte County (various locations), and US 41 in Lake County (I-84/I-94 to I-90).

Vision

Regional Vision

NWI 2050 guides the future of the Northwest Indiana region over the next 30 years. The Plan identifies a broad vision for the region:

1. ***Connected:*** Provide accessible, safe, and equal opportunities for working, playing, living, and learning.
2. ***Renewed:*** Make Northwest Indiana's urban and rural centers place people want to come to and live in and ensure our environment is safe and healthy.
3. ***United:*** Celebrate diversity and work together as a community across racial, ethnic, political, and cultural lines for the mutual benefit of the region.
4. ***Vibrant:*** Support a thriving economy, a well-educated population, planned growth, and protection of natural and agricultural areas.

This vision informs the MTP's focus areas and will be used as the basis and structure for developing performance measures for benchmarking freight movement and improving freight mobility and safety in Northwest Indiana.

The vision is further associated with four themes, as indicated in Table 4A-2.

	Economy and place	Environment	Mobility	People and Leaders
Connected	Update land development policies and strategies to emphasize accessibility between people and opportunities	Connect fragmented natural areas and integrate links between people and green spaces to increase resiliency and health outcomes	Complete roadway, bicycle, sidewalk, and transit networks across municipal and county lines to enhance safe and efficient access to opportunities for all	Commit to removing barriers and obstacles to guarantee equal and accessible opportunities
Renewed	Maximize growth in existing centers to enhance civic and economic life and protect natural areas and farmland	Clean and protect the air, land, water, and natural habitats to sustain and enhance the environment's safety and health for all	Improve roadway, bicycle, sidewalk, and transit networks to revitalize existing urban and rural centers and enhance equity	Focus educational and workforce development initiatives on expanding skills that the modern economy requires
United	Collaborate regionally to welcome a diversity of people and talent to achieve mixed and balanced growth	Build region-wide coalitions to advance environmental sustainability for the benefit of future generations	Prioritize transformative investments to elevate the position of the region and attract a diversity of residents and high-quality economic opportunities	Foster better communications, cooperation, and coordination to bring people together across the lines that divide us
Vibrant	Promote initiatives and policies to ensure healthy living, sustainability, quality of life, and prosperity	Endorse innovative energy and environmental strategies to achieve a balance that protects diverse and unique ecological treasures while fostering a sustainable economy	Adopt technological innovation that enhances the safe and fluid movement of people and goods to enable a flourishing economy	Embrace a dynamic, diversified, and sustainable economy that attracts and retains talent, enhances the quality of life, and increases personal and household income

Source: CPCS analysis of NIRPC NWI 2050 Plan.

Table 4A-2: NIRPC Vision Terms and Themes

Statewide Goals

In addition to the guidance provided in the regional plan, the statewide freight goals will be used in developing the Northwest Indiana freight vision and performance measures to ensure synergy between statewide and regional transportation planning. INDOT's FAST Act[133] compliant Multi-modal Freight Plan was published in 2018 as an update to the 2014 Freight Plan to guide the statewide transportation system investments that benefit goods movement. The 2018 Plan incorporates goals and content from other statewide efforts, including the State Rail Plan, State Aviation System Plan, Future Transportation Needs Report, and Joint Transportation Research Program Report. INDOT is currently updating the Statewide Multi-modal Freight Plan.

To develop and track meaningful freight performance measures, the INDOT Freight Plan sets strategic goals that are in alignment with the National Freight Policy Goals and Objectives. Table 4A-3 summarizes the relationship between INDOT's goals and national goals for freight performance.

INDOT's Goal	National Goal
Capacity to Meet Demand – Reduce bottlenecks to improve the reliability and efficiency of freight movement, leading to less congestion, fewer infrastructure repairs, and lower emissions	• Identify infrastructure improvements to reduce congestion and eliminate bottlenecks • Achieve and maintain a state of good repair • Improve the reliability of freight transportation
Multimodal Integration and Synergy – Develop and implement transportation networks that support direct multimodal freight expansion, leading to the improvement and establishment of multimodal/intermodal facilities	• Improve safety, security, efficiency, and reliability of the National Multimodal Freight Network • Use innovation and technology to improve safety, efficiency, and reliability
Access to National and International Markets – Support better connectivity between all modes of freight transportation, including between Indiana's water ports and highway and rail modes	• Improve short- and long-distance movement of goods through rural areas and gateways • Improve flexibility of states to support multi-state corridor planning
Quality of Life – Identify opportunities to improve and maintain Indiana's transportation infrastructure, supporting the safe movement of freight through the State	• Reduce the adverse environmental impacts of freight movement • Pursue the goals described without burdening state and local governments
Economic Impact – Cultivate a strong and diverse economy by growing Indiana as a magnet for jobs	• Improve economic efficiency and productivity of the National Multimodal Freight Network

Source: INDOT Multimodal Freight Plan, 2018.

Table 4A-3: INDOT's Goals Compared to the National Goals for Freight Performance

133 Fixing America's Surface Transportation (FAST) Act is a funding and authorization bill passed into law in 2015. States are required to develop State Freight Plans to become eligible for receiving funds under various FAST Act programs.

Performance Measures

The following sections summarize the regional and statewide freight-related performance measures that will be considered in the development of the Freight Element.

Regional Freight Performance Measures

The regional transportation performance measures identified in *NWI 2050* are organized according to the plan's four vision components: connected, renewed, united, and vibrant. Table 4A-4 summarizes the freight-related performance measures under each of these vision terms, along with a proposed analysis.

Generally, NIRPC proposes that the "Connected" term be measured using trip times and transportation safety, the "Renewed" term be measured using reported emissions and infrastructure conditions, and that the "Vibrant" term be measured using the number of vehicles with advanced technologies (alternative fuels and CAVs) and travel time reliability.[134] There are no freight-related performance measures under the "United" term proposed in *NWI 2050*.

Vision Term	Performance Measure	Analysis Proposed
Connected	• Average Trip Time	Trip times from the Household Travel Survey
	• Number of fatalities • Rate of fatalities per 100 million VMT • Number of serious injuries • Rate of serious injuries per 100 million VMT	Crashes from ARIES crash database
Renewed	• Number of annual ozone emission critical value exceedances	8-hour Ozone Air Quality Action and Exceedance Days Summary from Indiana Department of Environmental Management
	• Carbon Monoxide (CO) reduction from Congestion Mitigation Air Quality (CMAQ)-funded projects (kg/day) • Particulate Matter less than 10 microns in diameter (PM10) reduction from Congestion Mitigation Air Quality (CMAQ)-funded projects (kg/day)	Emissions are claimed in the CMAQ project applications for CMAQ-funded projects.
	• Percent of Interstate pavements in good and poor condition • Percent of non-Interstate National Highway System (NHS) pavements in good and poor condition	For asphalt pavements: International Roughness Index (IRI), percent cracking, and percent rutting; for jointed concrete pavements: IRI, percent cracking, percent faulting; for continually reinforced concrete pavements: IRI, percent cracking
	• Percent of National Highway System (NHS) bridge area in good and poor condition	Deck condition, superstructure condition, substructure condition, approach roadway width, structure length, and deck width from National Bridge Inventor

Table 4A-4: NIRPC Vision Terms and Associated Performance Measures

134 NIRPC *NWI 2050* Plan.

Vision Term	Performance Measure	Analysis Proposed
United	None	N/A
Vibrant	Number of alternatively fueled/ powered vehicles registered	Number of alternatively fueled/powered vehicles registered from South Shore Clean Cities and/or the Indiana Bureau of Motor Vehicles
	Number of Connected or Automated Vehicles (CAVs) registered plus the fleet size of CAVs licensed to operate in NW Indiana	Vehicle registrations from the Indiana Bureau of Motor Vehicles when data becomes available
	Percent of person miles traveled on the Interstate and non-Interstate NHS that is reliable	Travel time from the National Performance Measure Research Data Set (NPMRDS), Annual Average Daily Traffic (AADT) from Highway Performance Monitoring System (HPMS), vehicle occupancy factors from the US Department of Transportation
	Truck Travel Time Reliability Index (TTTRI)	Travel time from the National Performance Measure Research Data Set (NPMRDS)
	Peak Hours of Excessive Delay per capita in the Chicago, IL-IN Urbanized Area	Travel time from the National Performance Measure Research Data Set (NPMRDS), Annual Average Daily Traffic (AADT) and speed limits from Highway Performance Monitoring System (HPMS), vehicle occupancy factors from the USDOT

Source: CPCS analysis of NIRPC NWI 2050 Plan

Table 4A-4: NIRPC Vision Terms and Associated Performance Measures

Statewide Freight Performance Measures

Under the FAST Act guidelines, INDOT is required to track the Truck Travel Time Reliability Index performance measure. Additionally, INDOT maintains detailed highway safety records that include truck crashes. However, no specific freight safety performance is currently benchmarked by the DOT. The following is a summary of the freight performance measures recommended by INDOT in the 2018 Freight Plan:

- ***Capacity to Meet Demands:*** recommended performance measures are the percentage of lane miles at the level of service C or better, reduction in the hours of truck delay, and improvement in Truck Travel Time Reliability Index.

- ***Multi-modal Integration and Synergy:*** performance measures include the percentage of intermodal connectors with "fair" or better pavement conditions and the number of intermodal or multi-modal projects completed.

- ***Access to National and International Markets:*** the performance measure recommended under this goal is the hours of delay on roadways within 5 miles of ports and cargo airports.

- ***Quality of Life:*** performance measures to benchmark under this goal focus on freight safety and specifically reducing truck-involved crashes and fatalities and the removal of rail-highway grade crossings.

- ***Economic Impact:*** includes tracking of percent growth in jobs in freight-intensive industries and percent growth in export value (domestic or foreign).

These freight planning goals and performance measures will be integrated into the current and future freight condition assessment, performance measure development and analysis, and implementation strategy development steps of this present freight planning effort. The goals and measures will be reviewed by the NIRPC staff and the regional freight stakeholders and redefined or expanded if needed.

NCFRP Report 10: Performance Measures for Freight Transportation

The Transportation Research Board National Cooperative Freight Research Program (NCFRP) Report 10 provides guidelines on developing freight transportation performance measures to support investment strategies, as well as operations and policy decisions for both public agencies and private entities. The performance measures recommended in the report are designed to reflect the local, regional, national, and global perspectives on major freight needs and challenges, including efficiency, effectiveness, capacity, safety, security, infrastructure condition, congestion, energy, and environmental impacts.

As shown in Table 4A-5, the report summarizes the measures ranked by the public and private sector stakeholders based on expected and emerging freight industry trends. The project team used the guidelines provided in this report as a starting point for refining the performance measures for the Freight Element.

Topic Area	Trend	Recommended Measure
Freight Demand	Increasing volumes	• Freight Volumes, All Modes • Containerized Imports/Exports
Freight Efficiency	Decreases in overall average speed are expected	• Interstate Highway Speeds • Class I RR Operating Speed
	Congestion on interstates will increase	• Interstate Highway Reliability • Trend Line of Top Interstate Bottlenecks
	Growing market	• Rail Freight Market Share of Ton Miles • Logistics as a Percentage of GDP
Freight System Condition	Uncertain performance trend	• NHS Bridge Structural Deficiencies • NHS Pavement Conditions
Freight Environmental Impacts	Continued decline in overall emissions	• Truck Emissions (Particulate Matter, Nitrogen Oxides, Green House Gas, Volatile Organic Compound) • Rail-Produced Emissions • Water-Produced Emissions
Freight Safety	General decline	• Truck Injury and Fatal Crash Rates • Highway-Rail At-Grade Incidents
Freight Investment	Increasing investments	Investment to Sustain NHS
	Uncertain	Rail Industry Cost of Capital
	Increasing	• Estimated Capital to Sustain Rail Market Share • Investment to Sustain Inland Waterway System

Source: TRB, NCFRP 10, 2011.

Table 4A-5: Performance Information for National Report Card Performance Summaries

Appendix 4B: Stakeholder Consultation List

Name	Position	Entity
Clarence Hulse	Executive Director	Michigan City Economic Development Corporation
Bryce Carpenter	Vice President, Industry Engagement	Conexus Indiana
Jody Peacock	Senior Vice President	Ports of Indiana – Central Office
Ryan McCoy	Port Director	Ports of Indiana – Burns Habor
Leslie Morgan	Freight Manager	INDOT
Brandon Burgoa	Statewide Bicycle Pedestrian Coordinator	
Casandra Bajek	Northwest Indiana Communications Director	
Kristin Brier	Multimodal Director	
William Moore	CEO, EME Rail Solutions LLC	Rail Crossing Task Force
Duane Alverson	Lake County Engineer	Lake County Government
Robert Thompson	Director, Development & Storm Water Management	Porter County Government
Matt Saltanovitz	Northwest Region Indiana Economic Development Corporation Director	Indiana Economic Development Corporation
Kay Nelson	Environmental Affairs Director	Northwest Indiana Forum
Beth Shrader	City Planner	City of Valparaiso

Source: CPCS, 2022.

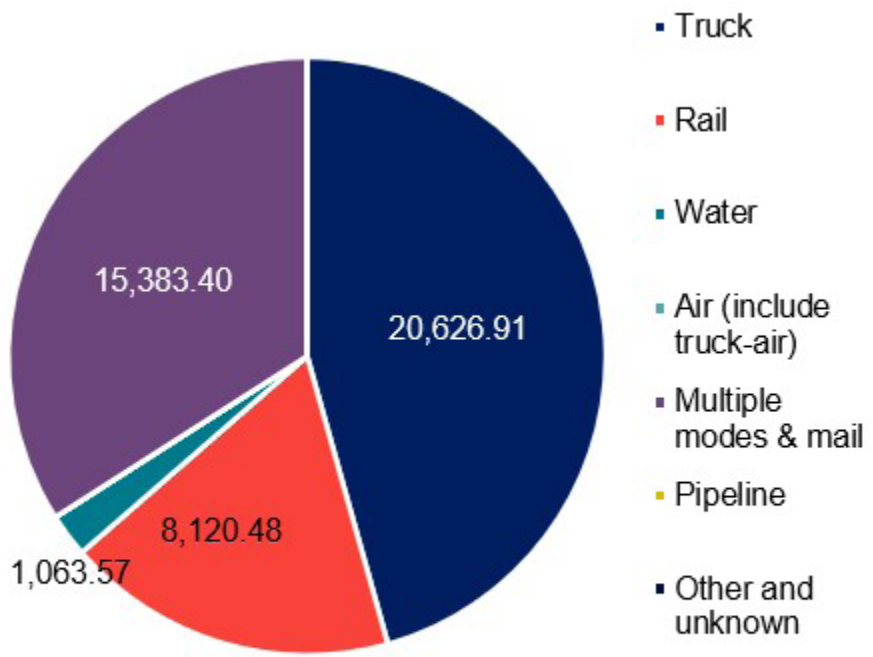
Table 4B-1: Stakeholder Consultation List

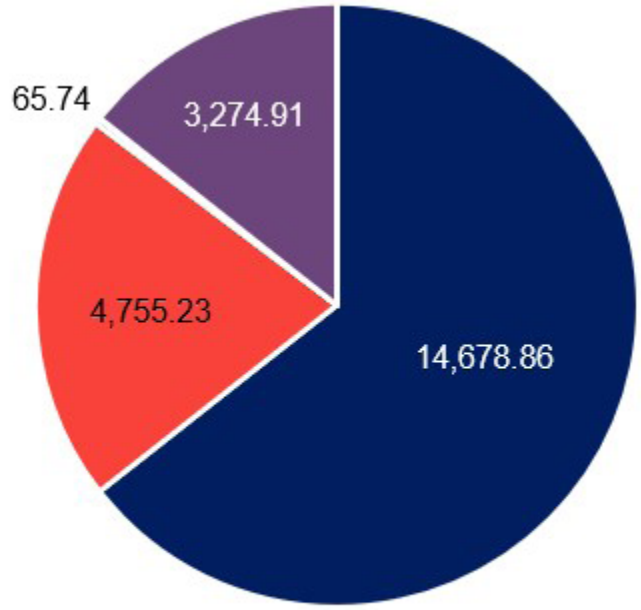
Appendix 4C: Industry-Level FAF Analysis

Metals Manufacturing

SCTG Code	SCTG Name	Description
14	**Metallic ores**	Raw ore used to produce metals
32	**Base metals**	Primary metals like steel
33	**Articles-base metal**	Fabricated metal products like pipes, nails, or hand tools

Table 4C-1: Commodities Considered in Metals Manufacturing FAF Analysis





Source: CPCS analysis of FAF5 data, 2022. For international flows, only modes for domestic segments are examined here.

Figure 4C-1: Tonnage Modal Split for Metals Manufacturing

Figure 4C-2: Value Modal Split for Metals Manufacturing

Mode	Volume		Value	
	Thousands of Tons	Share	Millions of Dollars	Share
Truck	20,626.91	45.64%	14,678.86	64.41%
Rail	8,120.48	17.97%	4,755.23	20.87%
Water	1,063.57	2.35%	65.74	0.29%
Air	0.55	0.00%	14.62	0.06%
Multiple modes and mail	15,383.4	34.04%	3,274.91	14.37%
Pipeline	0.0	0.00%	0.0	0.00%
Other/Unknown	0.21	0.00%	0.43	0.00%
Total	45,195.13	100%	22,789.79	100%

Source: CPCS analysis of FAF5 data, 2022. For international flows, only modes for domestic segments are examined here.

Table 4C-2: Modal Split for Metals Manufacturing Commodities in Northwest Indiana

Mode	Volume		Value	
	Thousands of Tons	Share	Millions of Dollars	Share
Domestic	43,950.23	97.25%	21,913.89	96.16%
Import	365.45	0.81%	525.15	2.30%
Export	879.45	1.95%	350.74	1.54%
Total	45,195.12	100%	22,789.79	100%

Source: CPCS analysis of FAF5 data, 2022

Table 4C-3: Flow Type for Metals Manufacturing Commodities in Northwest Indiana

Nonmetal Mineral Manufacturing

SCTG Code	SCTG Name	Description
13	**Non-metallic minerals**	Raw minerals
31	**Nonmetal mineral products**	Fabricated mineral products like cement or asphalt

Table 4C-4: Commodities Considered in Non-Metallic Minerals Manufacturing FAF Analysis

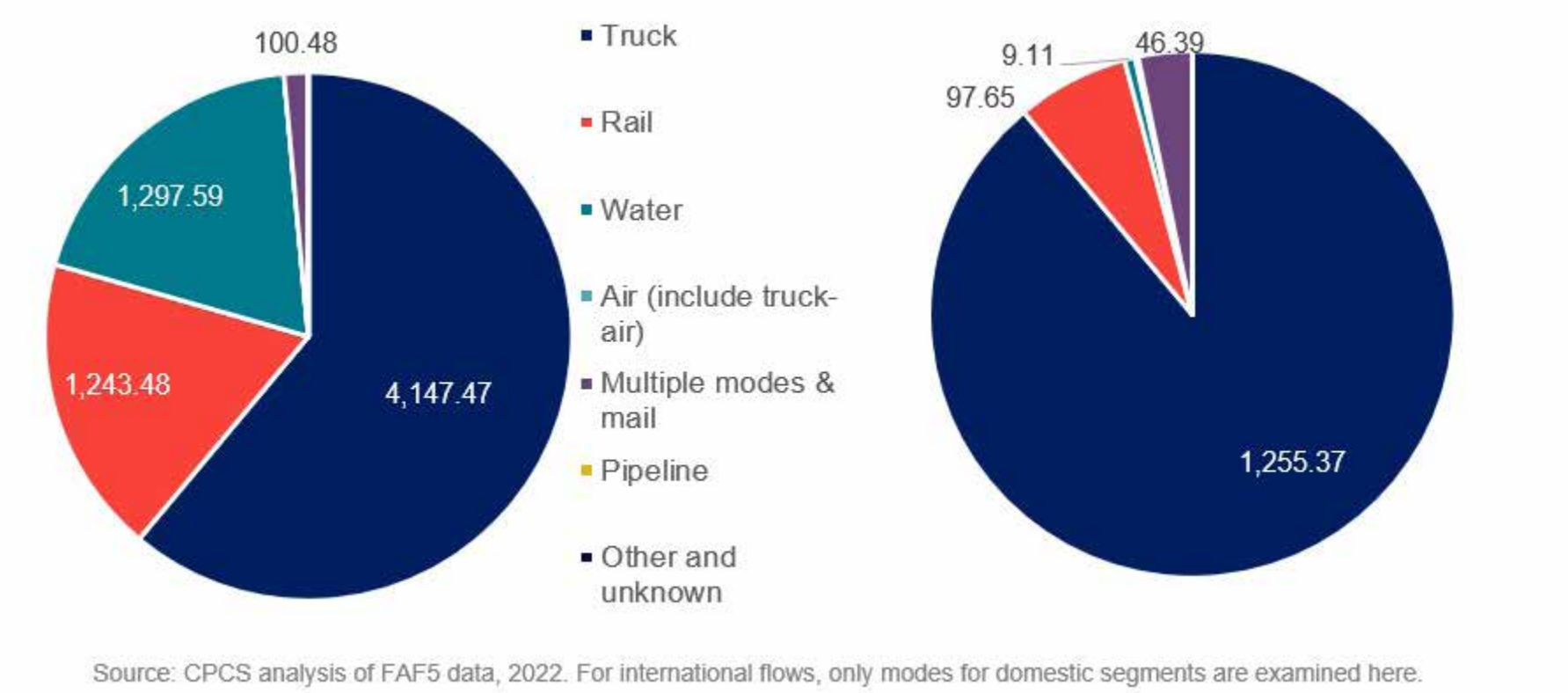


Figure 4C-3: Tonnage Modal Split for Non-Metallic Minerals Manufacturing

Figure 4C-4: Value Modal Split for Non-Metallic Minerals Manufacturing

Mode	Volume		Value	
	Thousands of Tons	Share	Millions of Dollars	Share
Truck	4,147.47	61.09%	1,255.37	88.94%
Rail	1,243.48	18.32%	97.65	6.92%
Water	1,297.59	19.11%	9.11	0.65%
Air	0.05	0.00%	2.93	0.21%
Multiple modes and mail	100.48	1.48%	46.39	3.29%
Pipeline	0	0.00%	0	0.00%
Other/Unknown	0.14	0.00%	0.03	0.00%
Total	6,789.21	100%	1,411.48	100%

Source: CPCS analysis of FAF5 data, 2022. For international flows, only modes for domestic segments are examined here.

Table 4C-5: Modal Split for Nonmetal Minerals Manufacturing Commodities in Northwest Indiana

Mode	Volume		Value	
	Thousands of Tons	Share	Millions of Dollars	Share
Domestic	5,948.15	87.61%	1,216.61	86.19%
Import	663.85	9.78%	67.61	4.79%
Export	177.21	2.61%	127.25	9.02%
Total	6,789.21	100%	1,411.47	100%

Source: CPCS analysis of FAF5 data, 2022

Table 4C-6: Flow Type for Nonmetal Minerals Manufacturing Commodities in Northwest Indiana

Machinery Manufacturing

SCTG Code	SCTG Name	Description
34	**Machinery**	Machinery like engines, fans, or hand tools

Table 4C-7: Commodities Considered in Machinery Manufacturing FAF Analysis

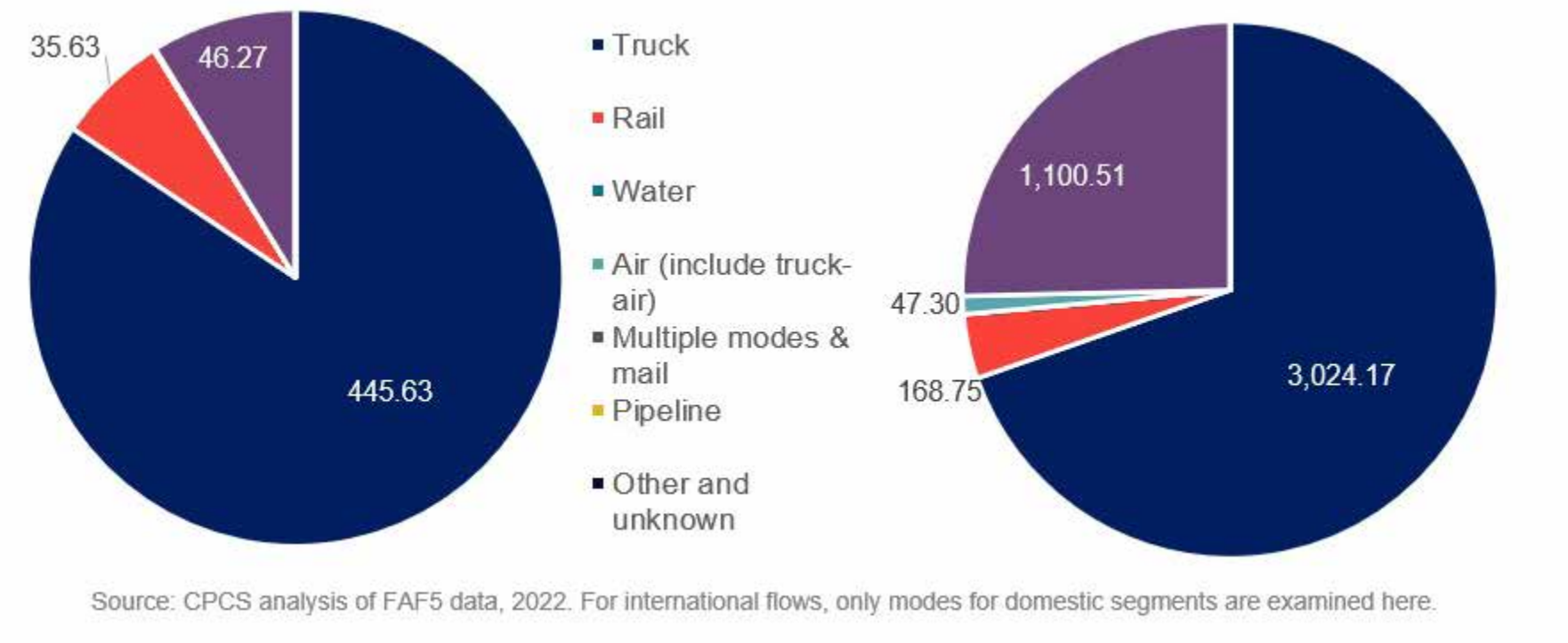


Figure 4C-5: Tonnage Modal Split for Machinery Manufacturing

Figure 4C-6: Value Modal Split for Machinery Manufacturing

Mode	Volume		Value	
	Thousands of Tons	Share	Millions of Dollars	Share
Truck	445.63	84.37%	3,024.17	69.67%
Rail	35.63	6.75%	168.75	3.89%
Water	0	0.00%	0	0.00%
Air	0.64	0.12%	47.30	1.09%
Multiple modes and mail	46.27	8.76%	1,100.51	25.35%
Pipeline	0	0.00%	0	0.00%
Other/Unknown	0.00	0.00%	0.02	0.00%
Total	528.18	100%	4,340.74	100%

Source: CPCS analysis of FAF5 data, 2022. For international flows, only modes for domestic segments are examined here.

Table 4C-8: Modal Split for Machinery Manufacturing Commodities in Northwest Indiana

Mode	Volume		Value	
	Thousands of Tons	Share	Millions of Dollars	Share
Domestic	389.78	73.79%	2,815.42	64.86%
Import	79.10	14.98%	749.77	17.27%
Export	59.32	11.23%	775.56	17.87%
Total	528.18	100%	4,340.74	100%

Source: CPCS analysis of FAF5 data, 2022

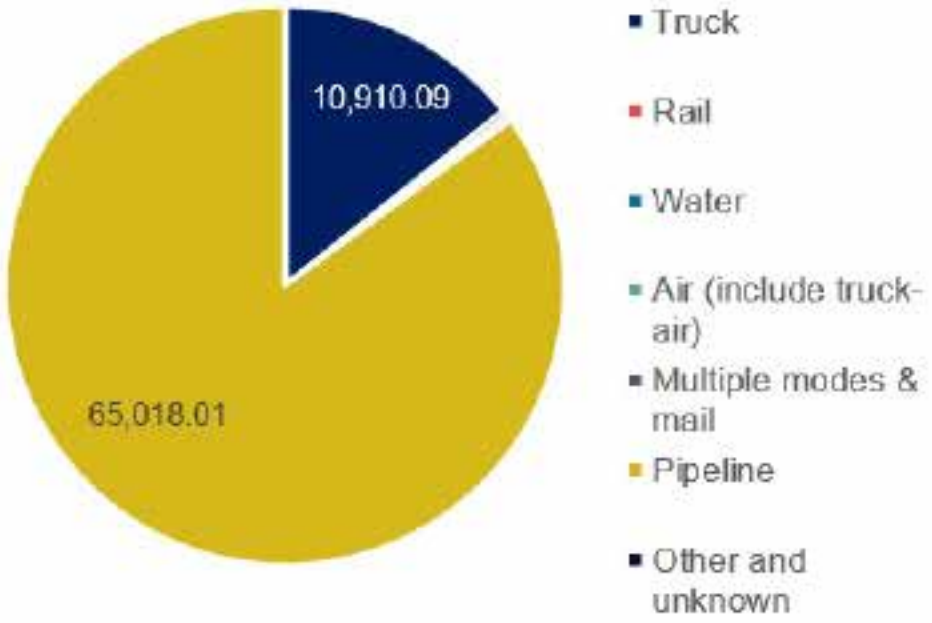
Table 4C-9: Flow Type for Machinery Manufacturing Commodities in Northwest Indiana

Oil and Gas

SCTG Code	SCTG Name
16	**Crude petroleum**
17	**Gasoline**
18	**Fuel oils**

Table 4C-10: Commodities Considered in Oil and Gas FAF Analysis

Figure 117: Tonnage Modal Split for Oil and Gas



Source: CPCS analysis of FAF5 data, 2022. For international flows, only modes for domestic segments are examined here.

Figure 4C-7: Tonnage Modal Split for Oil and Gas

Figure 118: Value Modal Split for Oil and Gas

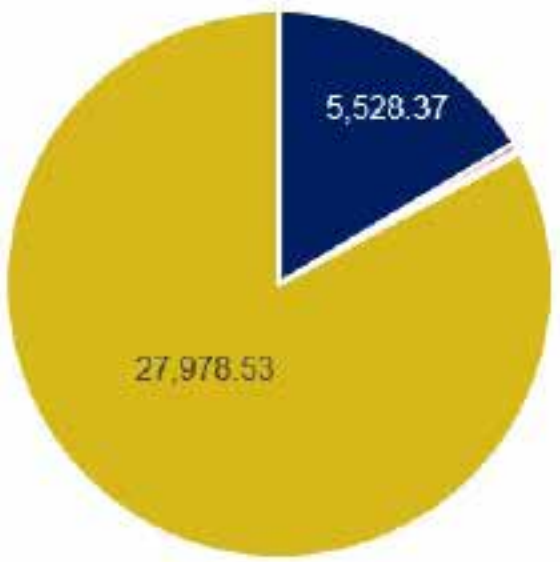


Figure 4C-8: Value Modal Split for Oil and Gas

Mode	Volume		Value	
	Thousands of Tons	Share	Millions of Dollars	Share
Truck	10,910.09	14.27%	5,528.37	16.39%
Rail	289.24	0.38%	146.87	0.44%
Water	247.30	0.32%	78.46	0.23%
Air	0	0.00%	0	0.00%
Multiple modes and mail	0.63	0.00%	0.26	0.00%
Pipeline	65,018.01	85.03%	27,978.53	82.94%
Other/Unknown	0.01	0.00%	0.01	0.00%
Total	76,465.28	100%	33,732.5	100%

Source: CPCS analysis of FAF5 data, 2022. For international flows, only modes for domestic segments are examined here.

Table 4C-11: Modal Split for Oil and Gas Commodities in Northwest Indiana

Mode	Volume		Value	
	Thousands of Tons	Share	Millions of Dollars	Share
Domestic	59,788.28	78.19%	28,353.94	84.06%
Import	16,653.58	21.78%	5,372.05	15.93%
Export	23.42	0.03%	6.52	0.02%
Total	76,465.28	100%	33,732.50	100%

Source: CPCS analysis of FAF5 data, 2022

Table 4C-12: Flow Type for Oil and Gas Commodities in Northwest Indiana

Food Manufacturing

SCTG Code	SCTG Name
01	**Live animals/fish**
02	**Cereal grains**
03	**Other agricultural products**
05	**Meat/seafood**
06	**Milled grain products**
07	**Other foodstuffs**
08	**Alcoholic beverages**
09	**Tobacco products**

Table 4C-13: Commodities Considered in Food Manufacturing FAF Analysis

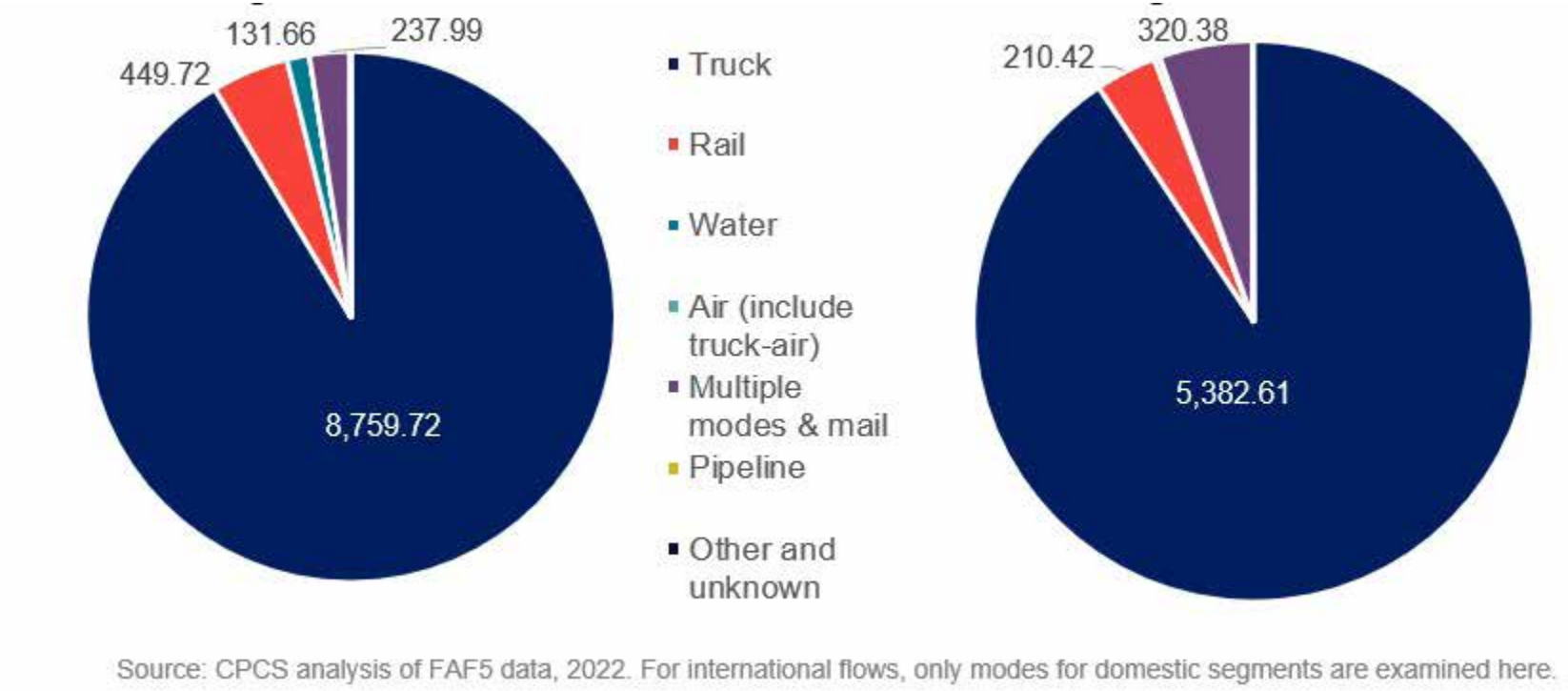


Figure 4C-9: Tonnage Modal Split for Food Manufacturing

Figure 4C-10: Value Modal Split for Food Manufacturing

Mode	Volume		Value	
	Thousands of Tons	Share	Millions of Dollars	Share
Truck	8,759.72	91.43%	5,382.61	90.69%
Rail	449.72	4.69%	210.42	3.55%
Water	131.66	1.37%	18.94	0.32%
Air	0.14	0.00%	1.33	0.02%
Multiple modes and mail	237.99	2.48%	320.34	5.40%
Pipeline	0	0.00%	0	0.00%
Other/Unknown	1.46	0.02%	1.59	0.03%
Total	9,580.69	100%	5,935.27	100%

Source: CPCS analysis of FAF5 data, 2022. For international flows, only modes for domestic segments are examined here.

Table 4C-14: Modal Split for Food Manufacturing Commodities in Northwest Indiana

Mode	Volume		Value	
	Thousands of Tons	Share	Millions of Dollars	Share
Domestic	9,226.57	96.30%	5,563.43	93.74%
Import	73.86	0.77%	115.63	1.95%
Export	280.25	2.93%	256.21	4.32%
Total	9,580.69	100%	5,935.27	100%

Source: CPCS analysis of FAF5 data, 2022

Table 4C-15: Flow Type for Food Manufacturing Commodities in Northwest Indiana

Transportation and Warehousing

SCTG Code	SCTG Name
36	**Motorized vehicles**
37	**Transportation equipment**

Table 4C-16: Commodities Considered in Transportation Equipment FAF Analysis

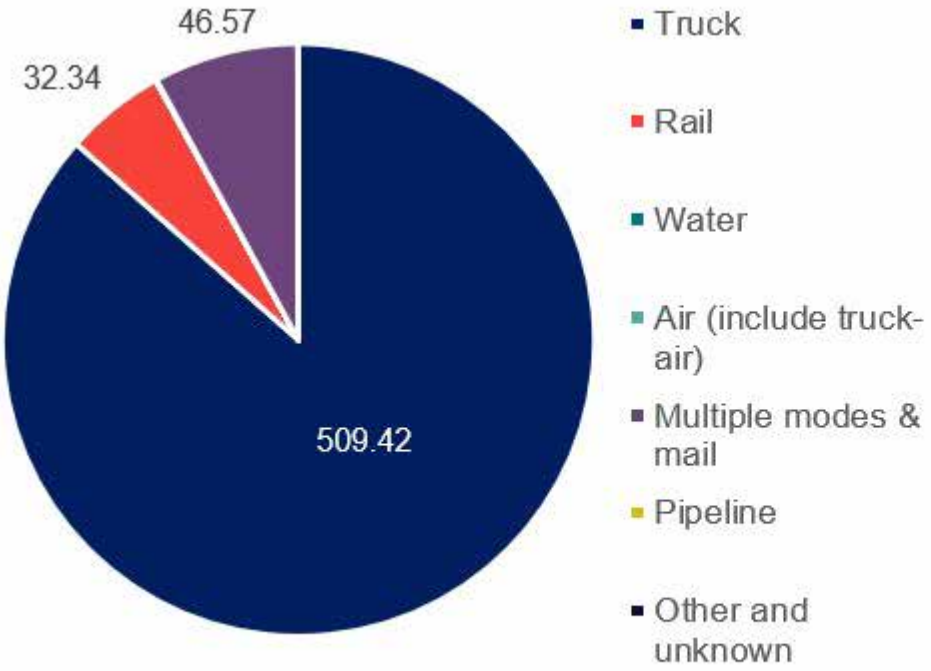


Figure 4C-11: Tonnage Modal Split for Transportation Equipment

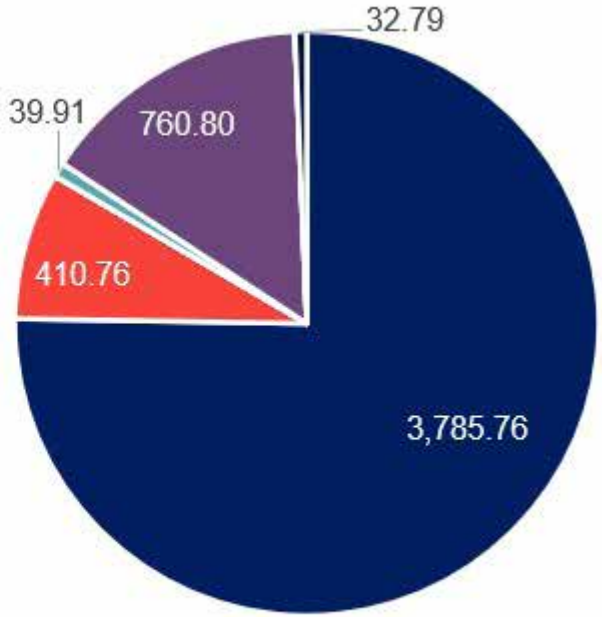


Figure 4C-12: Value Modal Split for Transportation Equipment

Source: CPCS analysis of FAF5 data, 2022. For international flows, only modes for domestic segments are examined here.

Mode	Volume		Value	
	Thousands of Tons	Share	Millions of Dollars	Share
Truck	509.42	86.51%	3,785.76	75.26%
Rail	32.34	5.49%	410.76	8.17%
Water	0	0.00%	0	0.00%
Air	0.33	0.06%	39.91	0.79%
Multiple modes and mail	46.57	7.91%	760.80	15.13%
Pipeline	0	0.00%	0	0.00%
Other/Unknown	0.19	0.03%	32.79	0.65%
Total	588.85	100%	5,030.02	100%

Source: CPCS analysis of FAF5 data, 2022. For international flows, only modes for domestic segments are examined here.

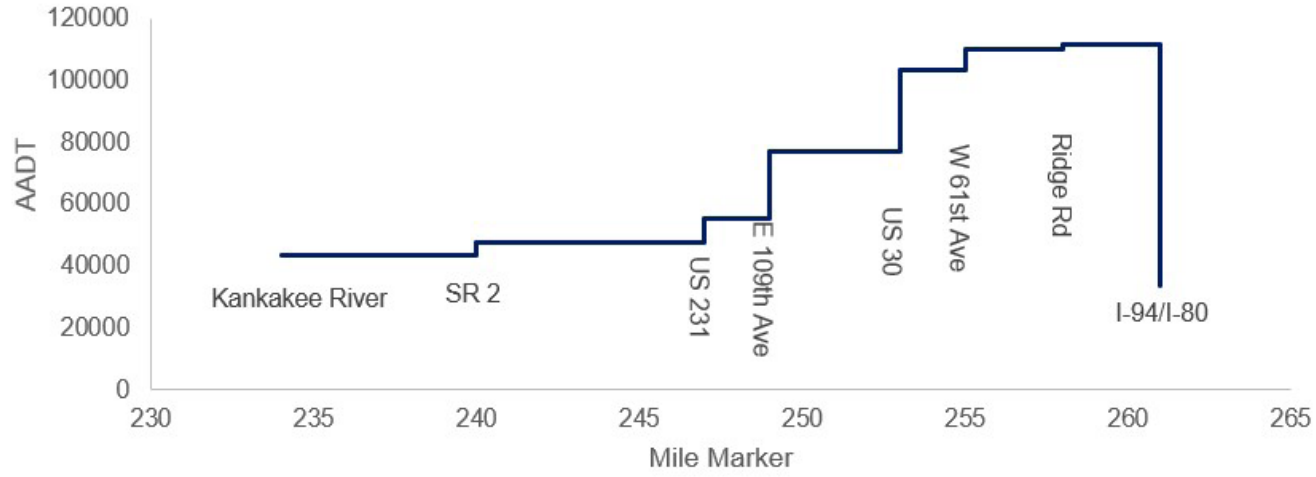
Table 4C-17: Modal Split for Transportation Equipment in Northwest Indiana

Mode	Volume		Value	
	Thousands of Tons	Share	Millions of Dollars	Share
Domestic	376.15	63.88%	2,964.94	58.94%
Import	80.56	13.68%	657.06	13.06%
Export	132.14	22.44%	1,408.02	27.99%
Total	588.85	100%	5,030.02	100%

Source: CPCS analysis of FAF5 data, 2022

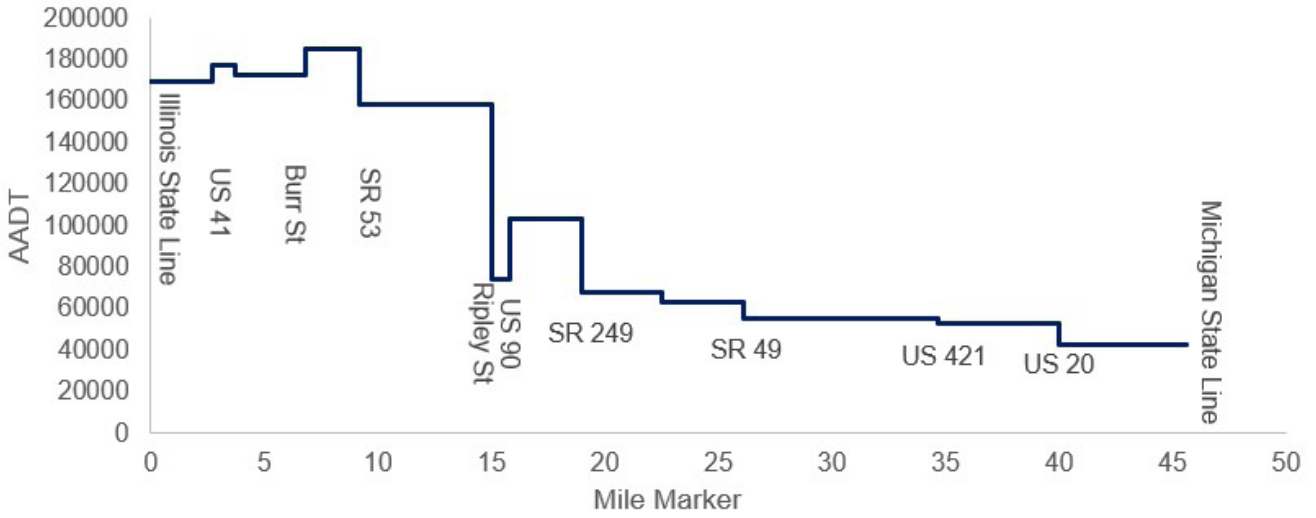
Table 4C-18: Flow Type for Transportation Equipment in Northwest Indiana

Appendix 4D. AADT Profile



Source: CPCS of HPMS 2019 data. Mile Markers – System 1 Roads (INDOT) 2012, Indiana.edu, 2022.

Figure 4D-1: I-65 AADT in Northwest Indiana, 2019



Source: CPCS of HPMS 2019 data, 2022. Mile Markers – System 1 Roads (INDOT) 2012, Indiana.edu, 2022.

Figure 4D-2: I-94 AADT in Northwest Indiana, 2019

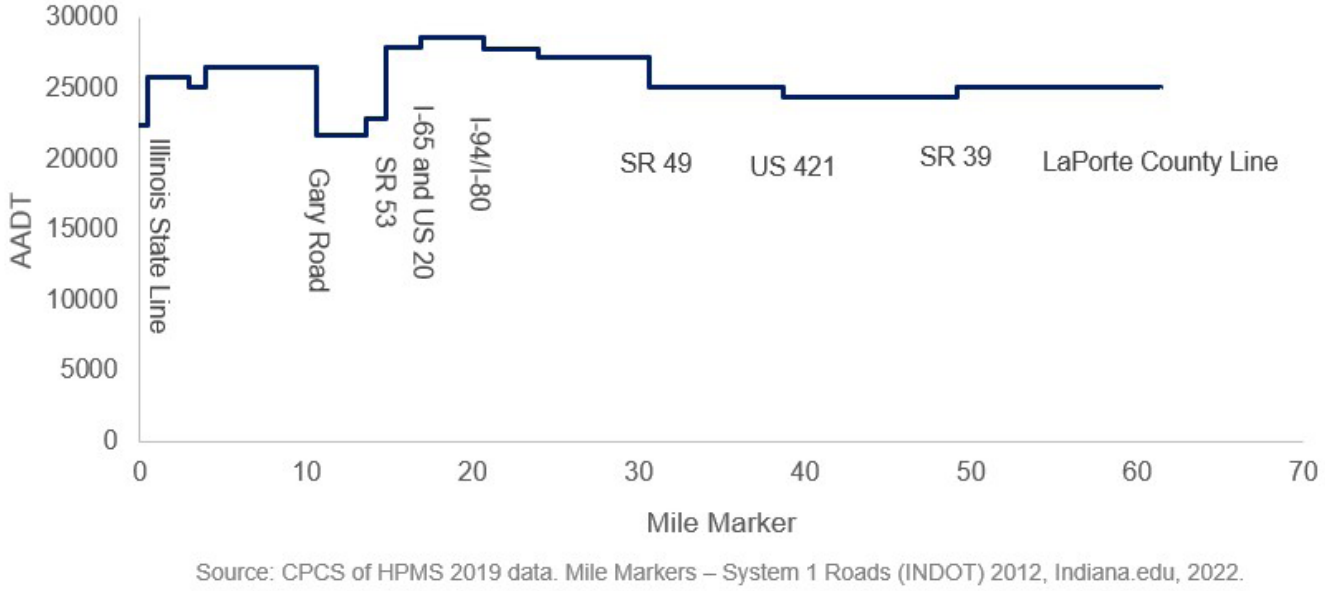


Figure 4D-3: I-90 AADT in Northwest Indiana, 2019

Appendix E. Truck Parking Inventory

City	County	Name	Number of spaces*	Type	Address
Burns Harbor	Porter	Pilot's Travel Center #445	120	Private	243 Melton Road, Burns Harbor, IN 46304
Dyer	Lake	Speedway	8	Private	US30, 630 E. Joliet St, Dyer IN 46311
Gary	Lake	Love's Travel Shop #417	150	Private	I-94, Exit 9, 3150 Grant St., Gary IN 46408
Gary	Lake	Petro Travel Center #369	405	Private	I-90/I-84, Exit 9, 3001 Grant Street, Gary IN 46408
Gary	Lake	Pilot Travel Center #271	236	Private	I-80/94 Exit 6, 2501 Burr Street, Gary IN 46406
Gary	Lake	TA Travel Center #010	318	Private	I-80/ I-94, Exit 6, Burr St., 2510 Burr St, Gary IN 46408
Gary	Lake	Mr. Fuel Travel Center #719	19	Private	I-94 Exit 6, 2945 Burr Street, Gary IN 46406
Gary	Lake	Speedway	16	Private	3201 Grant Street, Gary IN 46408
Gary	Lake	Colfax Parking	360	Private	1500 Colfax St, Gary, IN 46406
Gary	Lake	Transport Properties	571	Private	8121 US 20, Gary, IN 46403
Hammond	Lake	IMK Marina Fuel Stop	20	Private	I-90 Ex 5 (US41), 4705 Calumet Ave, Hammond IN 46327
Hammond	Lake	Shell	10	Private	3350 Calumet Avenue, Hammond IN 46320
Hammond	Lake	Cabela's	27	Private	7700 Cabela Dr, Hammond, IN 46324
Hanna	La Porte	Hank's Truck Stop	6	Private	1799 US 30, Hanna, IN 46340
Hebron	Porter	Flying J Travel Center #653	385	Private	3231 E 181ST AVE Hebron, IN 46341

Table 4E: Truck Parking Inventory Northwest Indiana

City	County	Name	Number of spaces*	Type	Address
Highland	Lake	Pilot Travel Center #31	10	Private	I-80/94 Exit 2, 8150 Indianapolis Boulevard, Highland IN 46322
Hobart	Lake	Speedway	20	Private	4733 W 61st Ave, Hobart, IN 46342
Lake Station	Lake	Flying J Travel Center #650	385	Private	I-94 & Exit 15b, 1401 Ripley Street, Lake Station IN 46405
Lake Station	Lake	Mr. Fuel Travel Center #1020	8	Private	I-80 I-94 Exit 15B, 1235 Ripley Street, Lake Station IN 46405
Lake Station	Lake	Road Ranger	15	Private	I-80 Exit 15A, 2151 Ripley Street, Lake Station IN 46405
Lake Station	Lake	TA Travel Center #219	252	Private	I-80/I-94, Exit 15B, 1201 Ripley Street, Lake Station IN 46405
La Porte	La Porte	Speedway	4	Private	I-94 Ex 40a, 5905 N US 35, La Porte IN 46350
La Porte	La Porte	Gallops La Porte	18	Private	1877 US 20, La Porte, IN 46350
La Porte	La Porte	Family Express	4	Private	1874 US 20, La Porte, IN 46350
Merrillville	Lake	Speedway	10	Private	6325 East Lincoln Highway, Merrillville IN 46410
Michigan City	La Porte	Michigan City Welcome Center Westbound I-94	31	Public	I-94 Westbound, Michigan City, IN 46360
Michigan City	La Porte	Speedway	50	Private	2884 N US Hwy 421, Michigan City IN

Table 4E: Truck Parking Inventory Northwest Indiana

City	County	Name	Number of spaces*	Type	Address
Porter	Porter	TA Travel Center #220	212	Private	I-94, Exit 22B, 1600 West US Hwy 20, Porter IN 46304
Porter	Porter	TA Travel Center #250	25	Private	I-94, Exit 22B, 1441 US Hwy 20, Porter, IN 46304
Rolling Prairie	La Porte	Indiana Toll Road Travel Plaza Three Eastbound I-80	40	Public	3 S Knute Rockne Plaza, Rolling Prairie, IN 46371
Rolling Prairie	La Porte	Indiana Toll Road Travel Plaza Three Westbound I-80	70	Public	1 N Wilbur Shaw Plaza, Wilbur Prairie, IN 56371
Valparaiso	Porter	Pilot Travel Center #36	25	Private	US 30 & SR 49, 4105 US 30 East, Valparaiso IN 46383
Wanatah	La Porte	Marathon Gas	14	Private	6352 W Us Highway 30, Wanatah, IN 46390
Westville	La Porte	Truck parking rest area WB I-90	119	Public	I-90 Westbound Rest Area, Westville, IN
Westville	La Porte	Truck parking rest area EB I-90	174	Public	I-90 Eastbound Rest Area, Westville, IN
Westville	La Porte	USA Truck Stop	25	Private	9954 US 6, Westville IN 46391

Source: CPCS analysis of All Stays, Trucker Path, Diesel Boss, Jason's Law Survey 2019, Land Line, and The Truck Parking Zone using Google Earth and Google Maps, 2022.

*Approximate count only.

Table 4E: Truck Parking Inventory Northwest Indiana

Appendix 4F: Acronyms & Abbreviations

AADT	Annual Average Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
ATRI	American Transportation Research Institute
BIL	Bipartisan Infrastructure Law
CFE	Chicago, Fort Wayne, & Eastern Railroad
CKIN	Chesapeake & Indiana
CN	Canadian National
CO	Carbon Monoxide
CRFC	Critical Rural Freight Corridor
CSS	Chicago South Shore & South Bend
CSXT	CSX Transportation
CUFC	Critical Urban Freight Corridor
DOT	Department of Transportation
DPM	Delay per Mile
EPA	Environmental Protection Agency
ESAL	Equivalent Single Axle Load
FAF	Freight Analysis Framework
FAST	Fixing America's Surface Transportation (Act)
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FRA	Federal Railroad Administration
FSC	Freight Steering Committee
GCIAA	Gary/Chicago International Airport Authority
GHG	Greenhouse Gas
HGL	Hydrocarbon Gas Liquid
HPMS	Highway Performance Monitoring System
IHB	Indiana Harbor Belt
INDOT	Indiana Department of Transportation
ITRCC	Indiana Toll Road Concession Company
GDP	Gross Domestic Product
GYY	Gary/Chicago International Airport

LNG	Liquid Natural Gas
LRTP	Long-Range Transportation Plan
LQ	Location Quotient
MAASTO	Mid America Association of State Transportation Officials
MCS	Motor Carrier Services
MUTCD	Manual of Uniform Traffic Control Devices
MTP	Metropolitan Transportation Plan
NAAQS	National Ambient Air Quality Standard
NAICS	North American Industry Classification System
NHFN	National Highway Freight Network
NHFP	National Highway Freight Program
NHS	National Highway System
NICTD	Northern Indiana Commuter Transportation District
NIRPC	Northwest Indiana Regional Planning Commission
NOx	Nitrogen Oxide
NPMRDS	National Performance Management Research Data Set
NTAD	National Transportation Atlas Database
NWI	Northwest Indiana
OS/OW	Oversize/Overweight
PDO	Property Damage Only
PFC	Passenger Facility Charge
PHFS	Primary Highway Freight System
PHMSA	Pipeline and Hazardous Materials Safety Administration
PM10	Particulate Matter less than 10 microns in diameter
PSR	Precision Scheduled Railroading
SR	State Route
STB	Surface Transportation Board
STIP	Statewide Transportation Improvement Program
STRAHNET	Strategic Highway Network
TPIMS	Truck Parking Information Management System
TTTR	Truck Travel Time Reliability
UNGSF	Underground Natural Gas Storage Facility
USACE	United States Army Corps of Engineers
VOC	Volatile organic compound