Working Paper 1: Freight System Conditions, Needs, and Issues

Prepared for:

Northwest Indiana Regional Planning Commission

Prepared by:

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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

Executive Summary

The Northwest Indiana (NWI) region consists of three Counties of Lake, Porter, and La Porte, accounting for 4.2% of the state's land area and 11.4% of the state's total population. The Northwest Indiana Regional Planning Commission (NIRPC), the designated planning organization for NWI, is responsible for investing federal transportation funds in this region's transportation system. To inform these decisions, NIRPC is updating its Metropolitan Transportation Plan (MTP)[1] – the NWI 2050+ Plan, which encompasses transportation modal elements, including a freight element.

NWI's Economic Context

Analysis of NWI's employment, Gross Domestic Product (GDP), and market competitiveness by industry shows that the region's economy is heavily reliant on freight-dependent industries like manufacturing and transportation and warehousing. Figure 1 shows that over 37 percent of employment in NWI is linked to the freight transportation system.

Figure 1: NWI 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 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.

Except for the transportation and warehousing industry, employment in freight-dependent industries in NWI is growing slower than the national average. This is likely due in part to the existing maturity of many of these industries in the region. NWI has a storied history as a national leader in the metals manufacturing industry. However, the slower pace of growth in these industries also parallels broader economic and social trends in the region. The region saw a shrinking and aging population between 2010 and 2020 and tends to experience unemployment rates that exceed state and national averages.

Issues with the labor force are driving workforce shortages for many industries in NWI. A number of workforce training programs are working to fill these gaps. The region sees significant levels of mid-level educational attainment, which could serve as effective pools for additional labor. However,

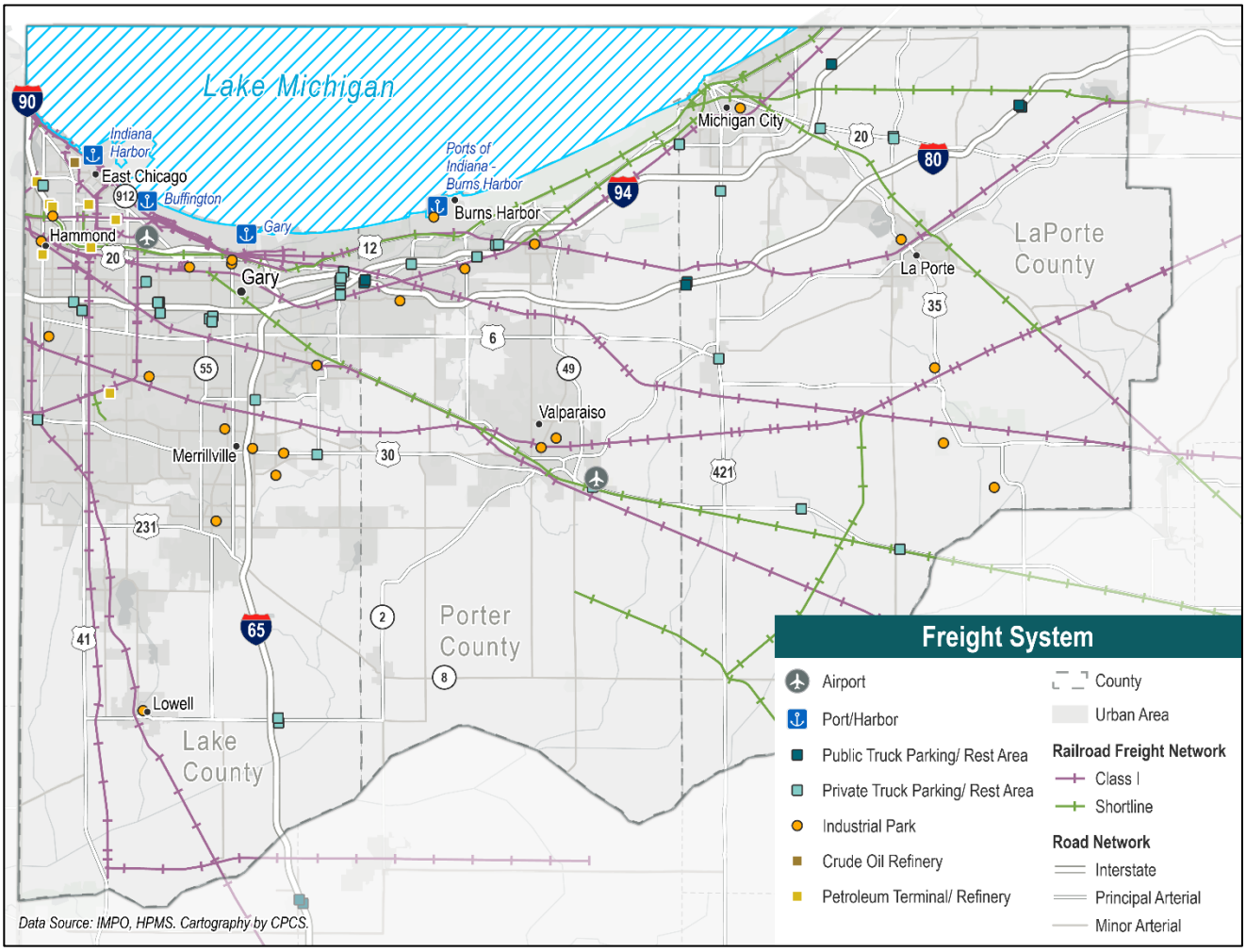
[1] Accordance to 49 USC 5303(i), regional planning organizations must prepare MTPs for the development of their region's transportation network over a 20-or-more-year planning horizon.

investments in automated technologies are also accelerating to fill positions that are consistently difficult to fill with human workers.

NWI's Freight Transportation System

Figure 2 provides a high-level snapshot of NWI's key transportation assets. The region is served by four Interstates, I-65, I-80, I-90, and I-94, which are supplemented by US highways and State Routes (IN) such as US 12, US 20, US 6, US 30, and IN 49. Rail service is provided by three Class I railroads and four short lines in NWI. Stakeholders consulted noted a lack of rail-transload intermodal facilities in the region, which likely has an impact on the competitiveness of many freight-dependent businesses in the region. In addition to road and rail, NWI 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.

Figure 2: NWI Freight System



NWI's Freight System Condition and Performance

This report discusses system conditions and performance related to safety, mobility, infrastructure condition, and environmental impacts. Between 2017 and 2021, there were over 11,200 truck-involved crashes in NWI, occurring primarily on I-94/I-80. More than a third of these crashes were driven by just two primary factors: driver distraction and unsafe lane movements. During this same period, there were 157 at-grade rail crossing incidents and 27 freight-dependent rail fatalities. These fatalities were concentrated in northern Lake County.

Analysis of truck mobility measures indicates that congestion is not a glaring concern for truck movement in the region as a whole. However, specific road segments do experience unique mobility issues, especially the Borman Expressway (I-94/I-80 from the Illinois state line to Lake Station). Other impediments to mobility in the region include low bridge clearances (six Interstate overpasses have clearances less than 15 feet) and blocked crossings (176 at-grade crossings have 25 or more trains per day).

In terms of infrastructure condition, the region falls short of statewide pavement condition performance measure targets, with only about 5.8 percent of Interstate and 7.7 percent of non-Interstate NHS routes in good condition. Just over 5 percent, or 52, of the region's 997 road bridges are in poor condition. The majority of these bridges are located in Lake County. However, only four are located on Interstates. All Class I railroads in NWI are 286K capable, as is the Chicago, Fort Wayne, & Eastern Railroad (CFE).

Environmental impacts related to freight transportation refer to both those created by the freight system, like air and noise pollution and hazardous spills, and those that affect the freight system, like climate disasters. The transportation sector is a major emitter of NOx and VOCs. These pollutants produce Ozone, for which Lake and Porter Counties are in nonattainment. Seven facilities emitted over 1 million metric tons of carbon dioxide equivalent pollution in 2019, all of which are freight dependent and five of which are located in Lake County. Noise pollution is concentrated around major roads, railways, and airports in NWI. Pipelines are the largest source of hazardous spills by tonnage in NWI. Lake County has a higher FEMA risk index than the state and national average and is most vulnerable to cold waves, heat waves, strong winds, and tornados, all of which affect the freight transportation system.

Conclusion and Next Steps

NWI's robust freight network is a critical source of economic vitality in the region, supporting a variety of freight-dependent industries. However, freight-dependent industries in NWI face serious demographic challenges. The region's working-age population is shrinking, driving workforce shortages for many industries in NWI.

The mobility of goods is the essential role of the freight system. Mobility, however, is an issue on many of NWI's roads. The freight system is also responsible for ensuring the safety of its users. However, truck-involved crashes have seen increases in NWI recently, as have rail safety incidents. The region's high concentration of at-grade crossings not only poses mobility issues but also introduces considerable safety concerns. The region is also faced with substantial pass-through freight traffic, which exacerbates freight congestion and worsens pavement conditions that already underperform state targets.

Infrastructure projects in NWI 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 NWI's freight system to continue efficiently moving goods and serving as the nation's "Crossroads" into the future.

The freight system conditions, needs, and issues identified in this working paper provide the foundation for all future work on the NWI 2050+ Plan. The data and analysis presented here will be supplemented with additional feedback and insights from stakeholder consultations and committee meetings. This will be used to establish regional freight system visions, goals, and objectives and, ultimately, to propose project recommendations and prioritization.

1 Introduction

Key Chapter Takeaways

Northwest Indiana Regional Planning Commission is updating its Metropolitan Transportation Plan (MTP) called the NWI 2050+ Plan. The Plan will comprise various transportation modal elements, including a freight element. The freight element supplements key findings and relevant content from previous studies with data analysis and stakeholder engagement to assess freight system condition and operation.

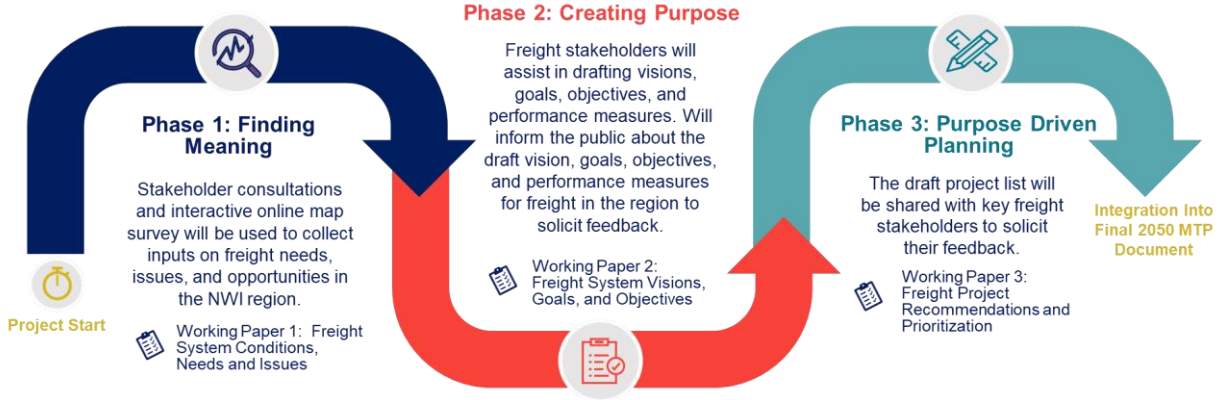
1.1 Purpose of this Plan

The Northwest Indiana Regional Planning Commission (NIRPC) is the designated planning organization for the NWI region. NIPRC is responsible for investing federal transportation funds in highways, transit, active (non-motorized) transportation, and other modes of people and goods movement in NWI. NIRPC is updating its Metropolitan Transportation Plan (MTP)[2] – the NWI 2050+ Plan, which encompasses transportation modal elements, including a freight element. The purpose of the Freight Element 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 Element will be developed in three phases (as shown in Figure 3) 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 A: Review of the Existing Studies, Plans, and Other Relevant Documents.

Figure 3: Work Plan Summary



Source: CPCS, 2022.

[2] According to 49 USC 5303(i), regional planning organizations must prepare MTPs for the development of their region's transportation network over a 20-or-more-year planning horizon.

1.2 Methodology

This Working Paper provides a synthesis of the extent of current freight operations in NWI 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 NWI 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 is to meaningfully engage NWI's public and private sector freight stakeholders to:

- Guide the development of the NWI 2050+ Plan – Freight Element,
- 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 NWI 2050+ Plan – Freight Element:

- **Freight Steering Committee (FSC) meetings:** FSC is comprised of individuals representing key freight stakeholder groups in the NWI region. Members are identified by NIRPC and include representatives from local governments, economic development agencies, industry associations, ports, airports, and private sector stakeholders. Three meetings have been planned with the FSC in July, September, and December 2022.
- **Stakeholder Consultations:** one-on-one consultations with key stakeholders are conducted 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 B: Stakeholder Consultation List.
- **Public Sessions and Surveys:** public open houses will be used throughout NWI 2050+ Plan development to communicate findings and recommendations with the NWI 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.

2 NWI's Economic Context

Key Chapter Takeaways

NWI's economy is heavily reliant on freight-dependent industries like manufacturing and transportation and warehousing, with over 37% of employment in NWI linked to the freight transportation system. Except for the transportation and warehousing industry, employment in freight-dependent industries in NWI is growing slower than the national average. This is likely due in part to the existing maturity of many of these industries in the region. However, the slower pace of growth in these industries also parallels broader economic and social trends in the region. The region saw a shrinking and aging population between 2010 and 2020 and experienced unemployment rates exceeding state and national averages. Moreover, issues with the labor force are driving workforce shortages for many industries in NWI.

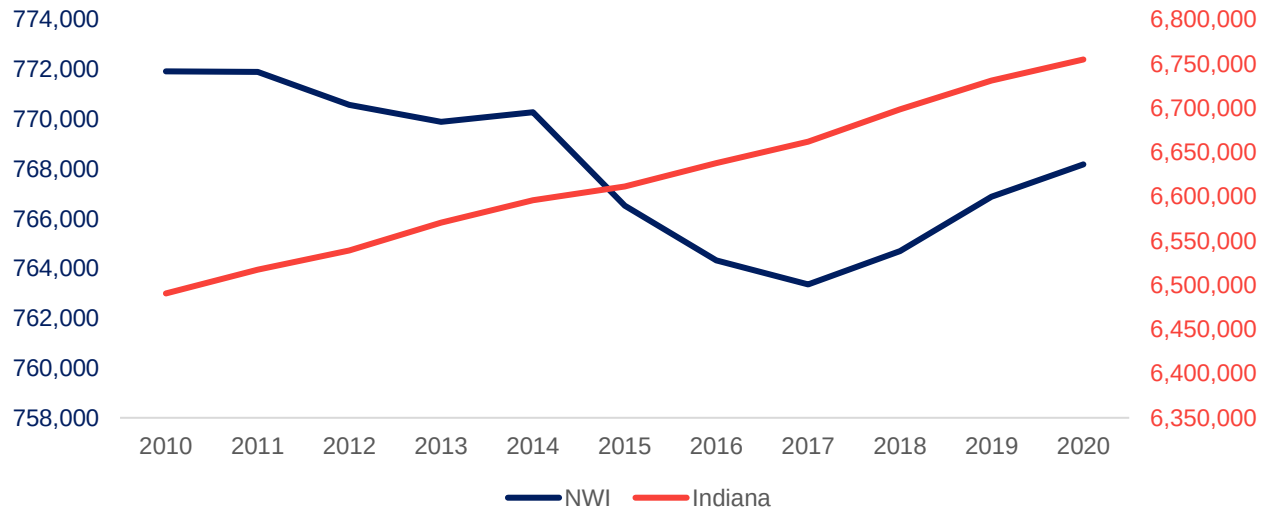
2.1 NWI's Economy

This chapter provides an overview of the economic characteristics of NWI, 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 NWI, 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, NWI's population decreased overall by about 0.5 percent. However, Figure 4 shows that this decade-long trend masks a more pronounced dip between 2014 and 2017 (0.9%) that has only recently bounced back. NWI's population stood at approximately 768,000 individuals in 2020. As shown, Lake County has by far the largest population (about 487,000 in 2020), followed by Porter (about 171,000) and LaPorte (about 110,000).

Figure 4: NWI and Indiana Population Trends, 2010-2020

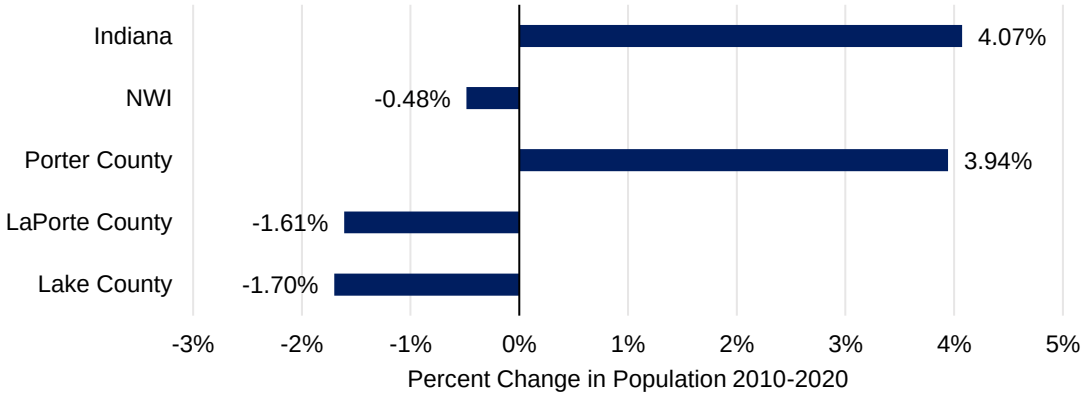


Source: CPCS analysis of US Census data, 2022.

Figure 5 shows that both LaPorte and Lake Counties saw declines in population over the decade. Porter County, though, saw a significant increase in population. However, all three counties saw population changes that were below Indiana's overall population growth.

The largest city in NWI was historically Gary, whose population has seen precipitous declines over the last five decades or so. Between 2010 and 2020 alone, the city saw its population fall by about 14 percent. Hammond replaced Gary as the largest city in Lake County in the last decade. However, Hammond's population has also been declining over the last fifty years, albeit more slowly than Gary's.

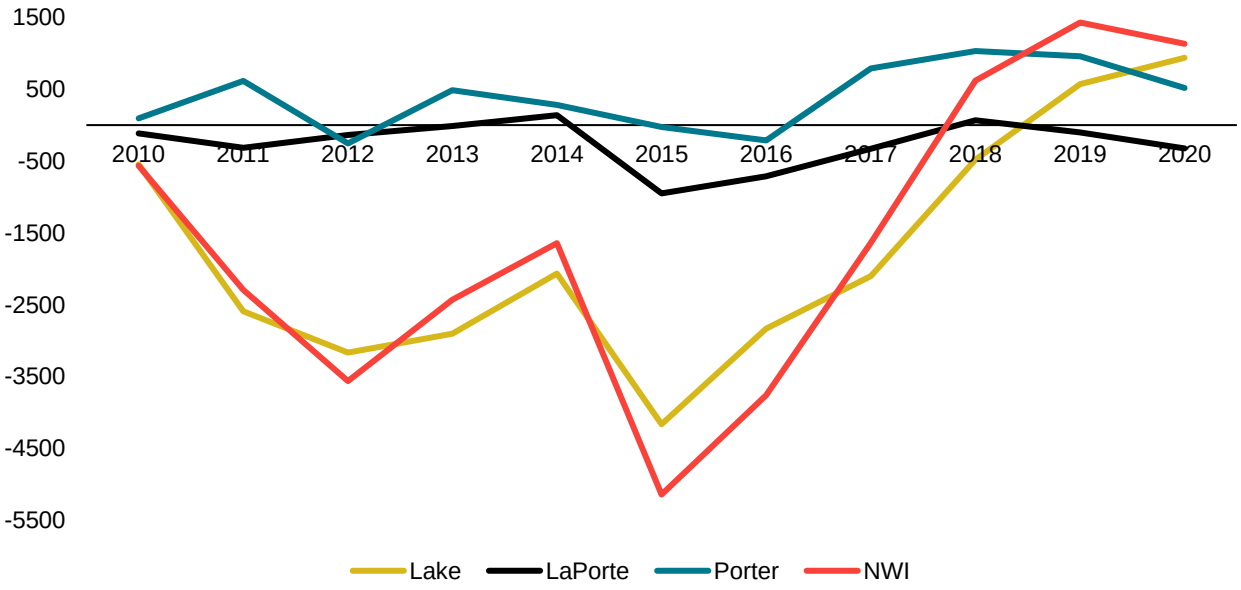
Figure 5: Population Trends, 2010-2020



Source: CPCS analysis of US Census data, 2022.

Because Lake County has the largest population of the counties in NWI, its socio-economic trends tend to have an outsized impact on NWI overall. This is exemplified in Figure 6, which shows changes in net migration in NWI and its three counties, calculated as the difference between in-migration and out-migration. While LaPorte and Porter Counties saw relatively small changes in net migration between 2010 and 2020, Lake County's broader swings dictated the changes seen in NWI overall. The region saw net migration outflows between 2010 and 2017, which reversed in 2018.

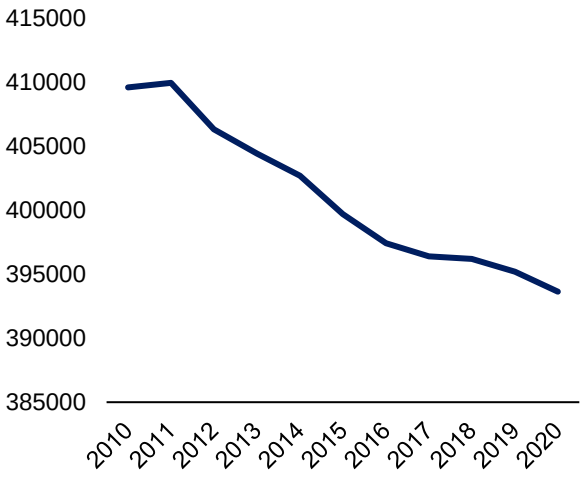
Figure 6: NWI Net Migration, 2010-2020



Source: CPCS analysis of US Census data, 2022.

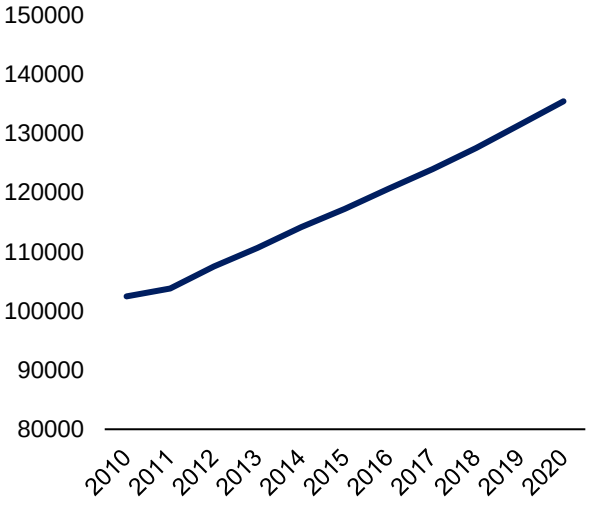
Figure 7 and Figure 8 display changes in NWI's population in two age brackets: working-age individuals between 25 and 64 and seniors 65 and over. These figures reveal that NWI is seeing a decades-long decline in its working-age population, from roughly 410,000 individuals in 2010 to just over 390,000 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 7: NWI Working Age Population (25-64), 2010-2020



Source: CPCS analysis of US Census data, 2022.

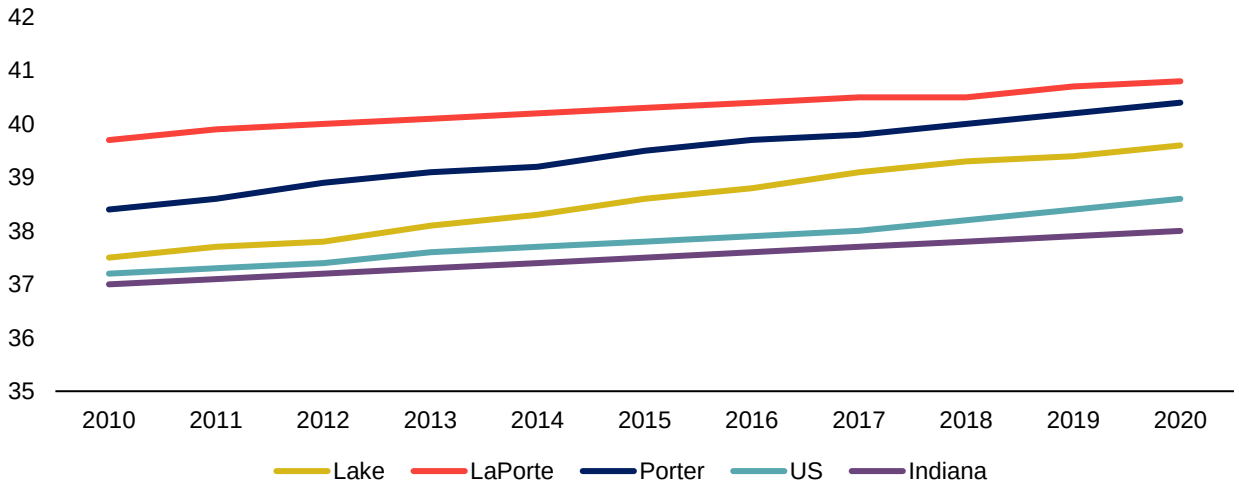
Figure 8: NWI Senior Population (65+), 2010-2020



Source: CPCS analysis of US Census data, 2022.

Figure 9 makes clear that the pace with which NWI's population is aging is not mirrored in the rest of the state or country. Indeed, not only has the median age in NWI'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 9: Median Age, 2010-2020



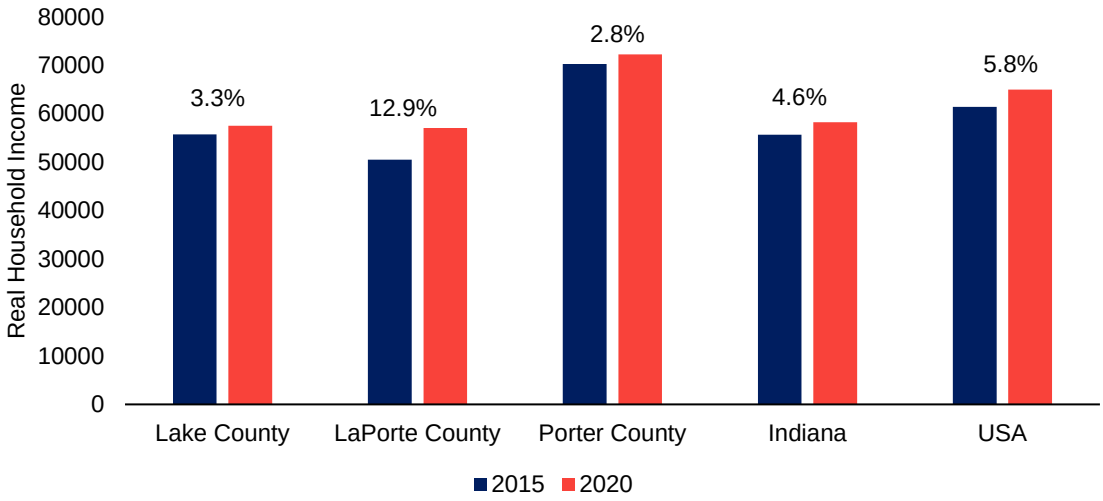
Source: CPCS analysis of US Census data, 2022.

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 NWI provides a better understanding of the economic well-being of NWI, as well as the ability of NWI's 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 10 shows the median real household income in NWI's three constituent counties, Indiana, and the US overall. Household income in Lake and LaPorte Counties lies at or below the state's overall 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 LaPorte County saw real income growth of nearly 13 percent between 2015 and 2020, which is more than double the national average.

Figure 10: Median Real Household Income, 2015 and 2020 in 2020$



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

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

Figure 11 lists the highest level of education attained by NWI's residents in 2010 and 2019 and shows how educational attainment is improving.

Figure 11: Educational Attainment

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%

Highest Level of Education Attained	NWI, 2010	NWI, 2019	Indiana, 2019	US, 2019
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.

These relatively high levels of mid-range educational attainment suggest the labor market in NWI 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.

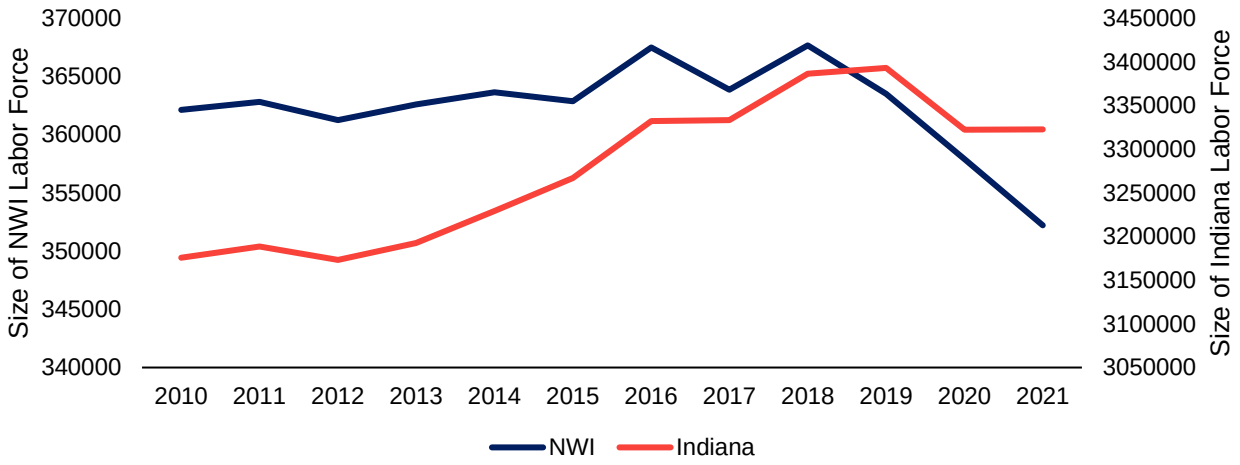
Employment

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

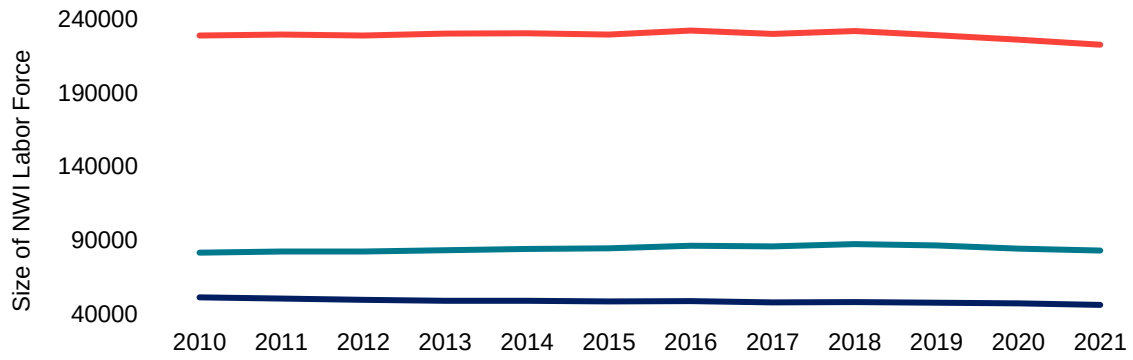
Figure 13 graphs the labor force in each of NWI's constituent counties between 2010 and 2021. Mirroring relative population size, Lake County has the largest labor force in NWI, followed by Porter County and LaPorte county. Figure 13 also reveals that only Porter County saw growth in its labor force, with numbers in Lake and LaPorte Counties contracting.

Figure 12: Labor Force in NWI and Indiana, 2010-2021



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

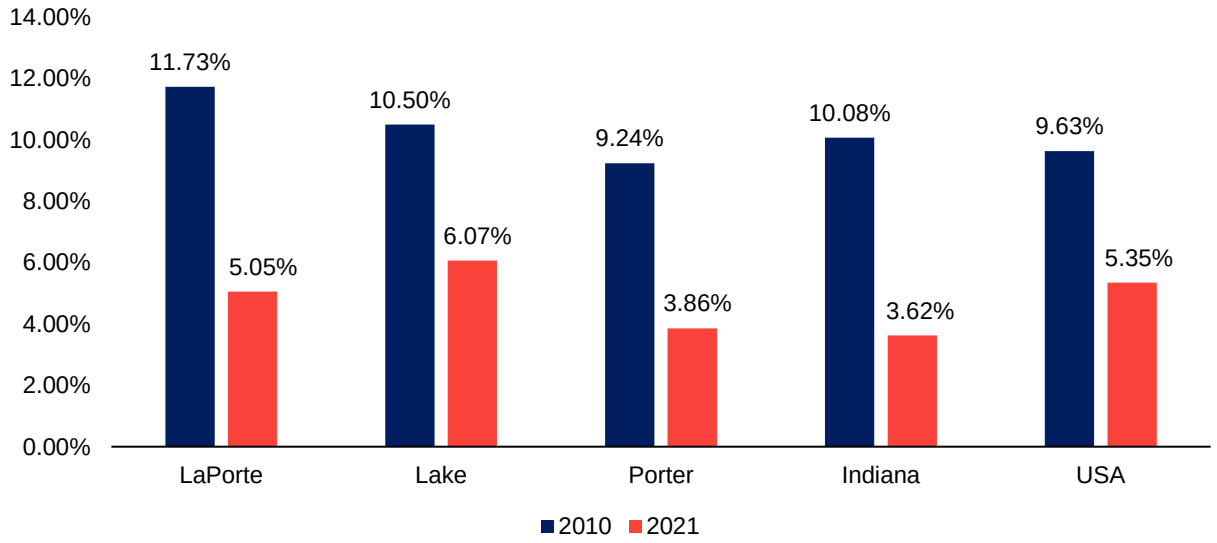
Figure 13: Labor Force in NWI Counties, 2010-2021



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

Figure 14 shows the change in the unemployment rate from 2010 to 2021 in NWI's three constituent counties, Indiana and the US. Both LaPorte 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 LaPorte Counties were just below the national average of 5.35 percent, while Lake County's unemployment rate was above the national average.

Figure 14: Unemployment Rates, 2010 and 2021



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

Workforce Shortages

Stakeholder consultations confirmed that many industries are struggling to find and hire new workers in the NWI region. 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.

Figure 15 lists NWI's employment among different industries. Retail trade and manufacturing both employ the largest share of the region's population, at over 11 percent each. The health care and social assistance sector also ranks highly, 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.

Figure 15: NWI Employment by Industry, 2019

	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%

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.

Gross Domestic Product

Gross Domestic Product (GDP) is a measurement of the monetary values 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.

Figure 16 lists GDP in the different industries in NWI. This reveals that manufacturing is by far the most important industry to NWI'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 NWI. This suggests that these three industries are of utmost importance to NWI's socio-economic landscape. Retail trade is a major employer but contributes a smaller share to GDP. Conversely, real estate and rental and leasing did not place as a significant employer but contributed a large share to the region's GDP.

Figure 16: NWI's GDP by Industry, 2019

	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.

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

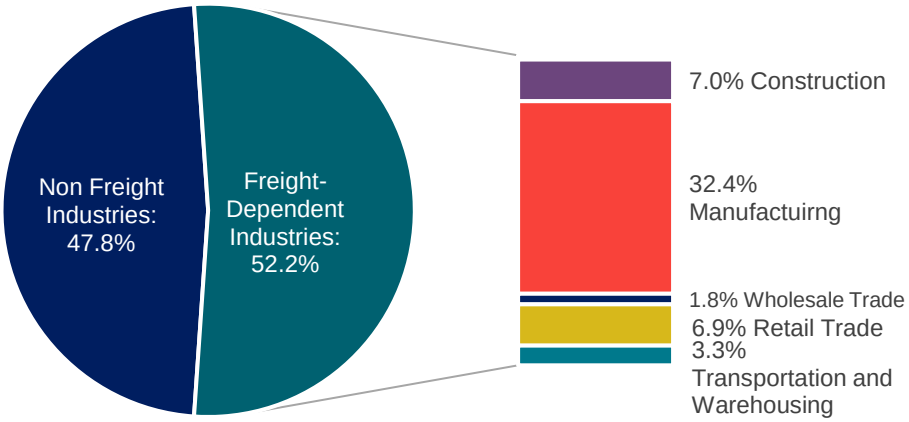
These industries are identified from economic data using North American Industry Classification System (NAICS) codes, which is a standard system for classifying business statistics for analysis and reporting. High-level economic sectors are represented by two-digit NAICS codes, while subsectors and industry 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 subindustries are listed in Figure 19.

Using the employment data presented earlier, Figure 17 reveals that more than 37 percent of those employed in NWI work in freight-dependent industries. Similarly, Figure 18 shows that over 52 percent of NWI's GDP is generated by freight-dependent industries. These figures highlight the importance of the freight system for NWI's economy.

Figure 17: NWI 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 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 18: NWI GDP 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 19 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[3] and, therefore greater contribution to the regional economy. The data reveal that certain types of manufacturing are particularly competitive in NWI, namely primary metal manufacturing, non-metallic mineral product manufacturing, and fabricated metal product manufacturing. Truck transportation and gasoline stations also have high LQs.

Figure 19: Location Quotient for Freight Industries Among NWI Counties, 2019

Industry	Lake	LaPorte	Porter	NWI
NAICS 11 Agriculture, forestry, fishing, and hunting	0.14	0.67	0.11	0.202446
NAICS 21 Mining, quarrying, and oil and gas extraction	0.13	0.11	0.11	0.122568
NAICS 23 Construction	1.18	0.95	1.52	1.231442
NAICS 236 Construction of buildings	1.1	1.37	1.77	1.296418
NAICS 31-33 Manufacturing	1.44	2.32	1.85	1.654131
NAICS 311 Food manufacturing	0.58	2.85	0.36	0.825475
NAICS 313 Textile mills	NC	5.7	NC	NC
NAICS 326 Plastics and rubber products manufacturing	0.46	4.24	1.45	1.19456
NAICS 327 Nonmetallic mineral product manufacturing	2.15	1.11	1.27	1.801948
NAICS 331 Primary metal manufacturing	22.58	13.14	30.42	23.22259
NAICS 332 Fabricated metal product manufacturing	1.23	1.74	2.43	1.585265
NAICS 333 Machinery Manufacturing	0.57	6.56	1.03	1.467688
NAICS 42 Wholesale trade	NC	0.8	0.87	NC
NAICS 44-45 Retail trade	1.18	1.2	1.19	1.18503
NAICS 447 Gasoline stations	1.49	1.72	2.1	1.666749
NAICS 448 Clothing and clothing accessories stores	0.96	2.22	0.48	1.010291
NAICS 451 Sports, hobby, music instrument, book stores	1.31	1.11	1.88	1.420631
NAICS 48-49 Transportation and warehousing	1.06	NC	NC	NC
NAICS 484 Truck transportation	2.2	1.09	1.71	1.936427
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 constituent county LQ scaled to each county's relative employment level.

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

Figure 20 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

[3] EMSI Resource Library "Understanding Location Quotient", 2007. https://www.economicmodeling.com/wp-content/uploads/2007/10/emsi_understandinglq.pdf

fastest-growing employment in NWI, whereas the mining, quarrying, and oil and gas extraction industry has the fastest shrinking employment.

Figure 20: Change in NWI Employment Among Freight Industries, 2010-2019

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.

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.

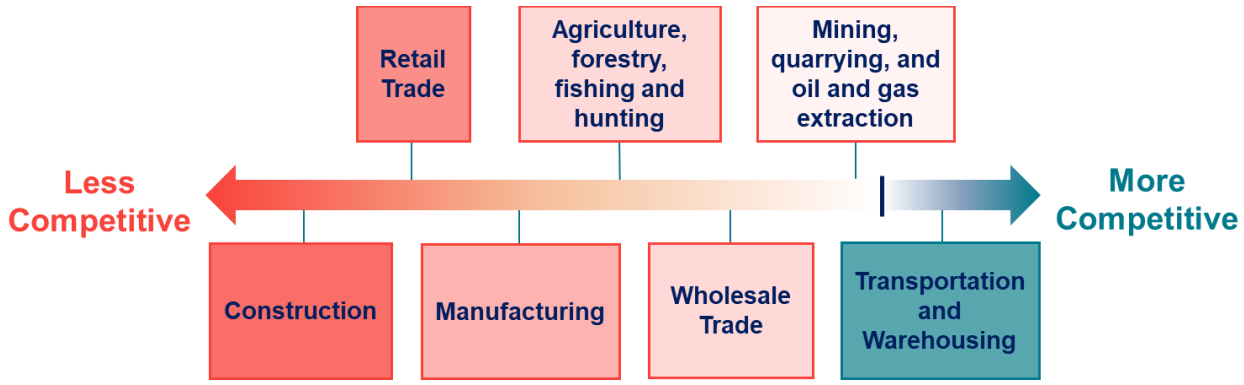
The resulting shift-share analysis is based on the following formula:

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

Figure 21 illustrates the change in employment due to the above-mentioned factors for NWI'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 NWI 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, NWI has seen spiking demand for industrial properties like warehouses and distribution centers in recent years, mirroring ongoing growth in e-commerce.[4][5]

[4] https://nwindianabusiness.com/article/untapped-potential-october-november-2021/
[5] https://rejournals.com/northwest-indianas-industrial-boom-only-expected-to-continue-despite-low-supply/

Figure 21: NWI Freight-Dependent Industry Regional Shift, 2010-2019



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).

Industry Profiles

Manufacturing

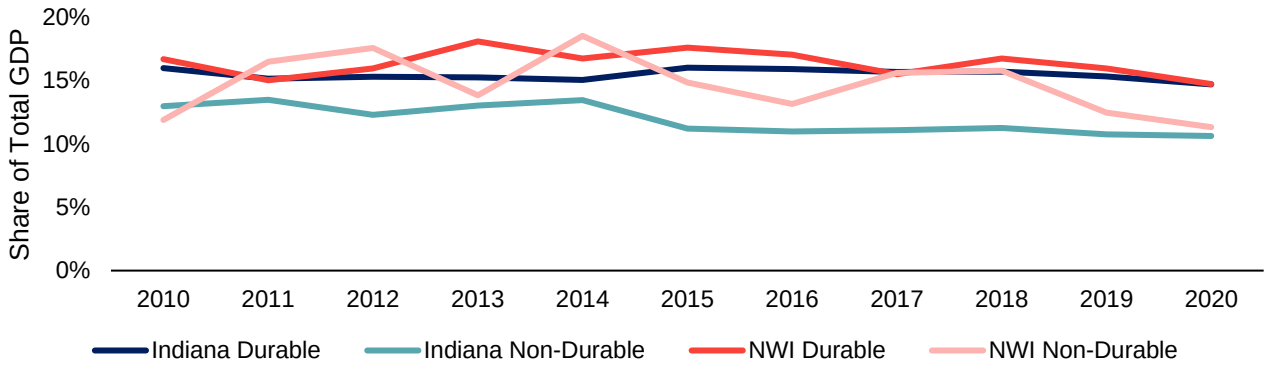
The manufacturing industry accounted for over 11 percent of the region's total employment and contributed over 28 percent of NWI's total GDP in 2019. Manufacturing in both NWI and Indiana has seen a very slight decline in importance relative to the overall economy between 2010 and 2020.

Figure 22: Manufacturing Fast Facts

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.**

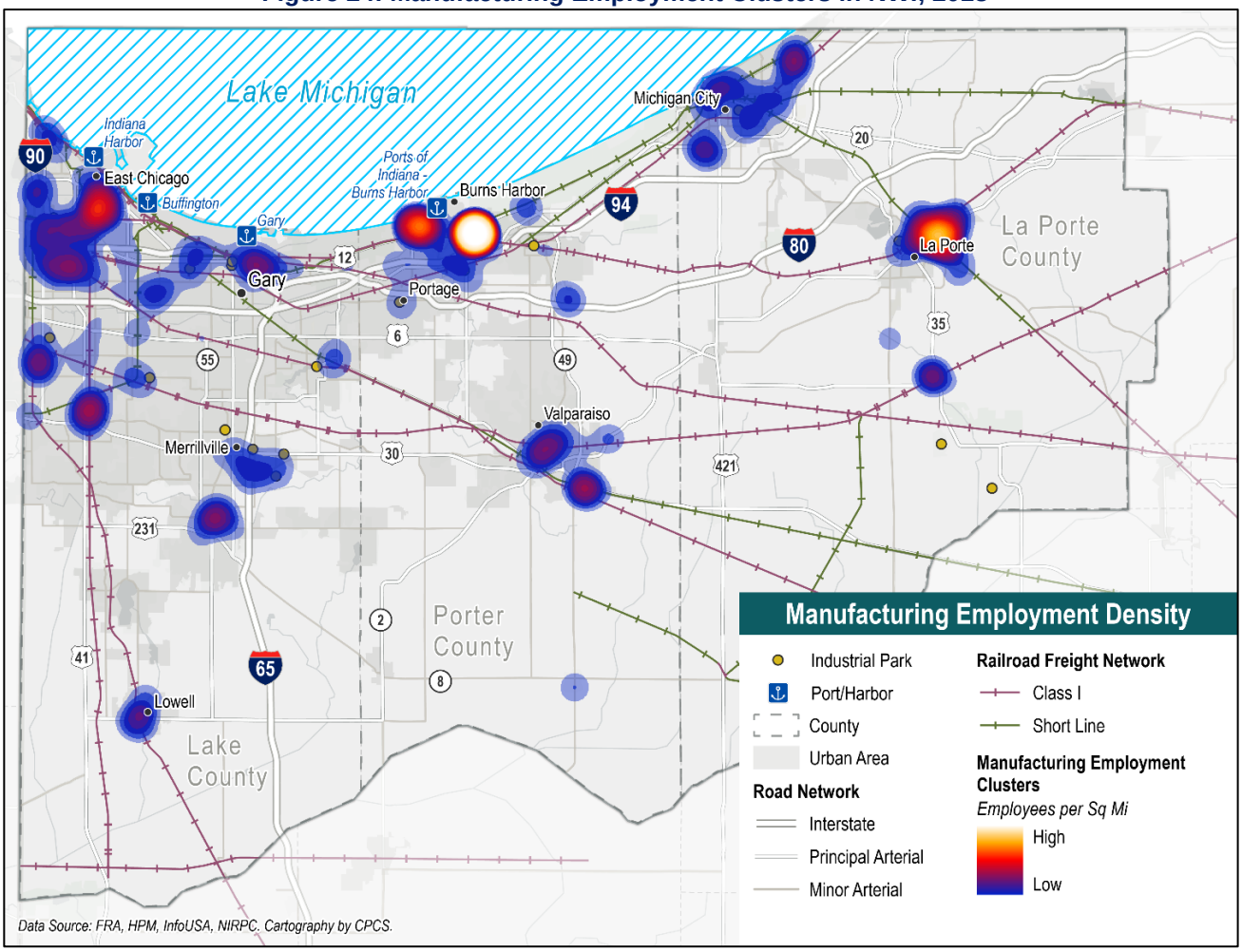
Source: CPCS analysis, 2022.

Figure 23 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 NWI, 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.
Figure 24Figure 23: Manufacturing Share of GDP by Type of Goods, 2010-2020



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

Figure 24: Manufacturing Employment Clusters in NWI, 2018



The location quotient analysis from the previous section identified certain manufacturing sectors as being particularly important in NWI. These included metals manufacturing, non-metallic mineral manufacturing, machinery manufacturing, gas and oil manufacturing, and to some extent, food manufacturing (largely in LaPorte County). Using Federal Highway Administration's (FHWA's) Freight

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 multimodal 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.

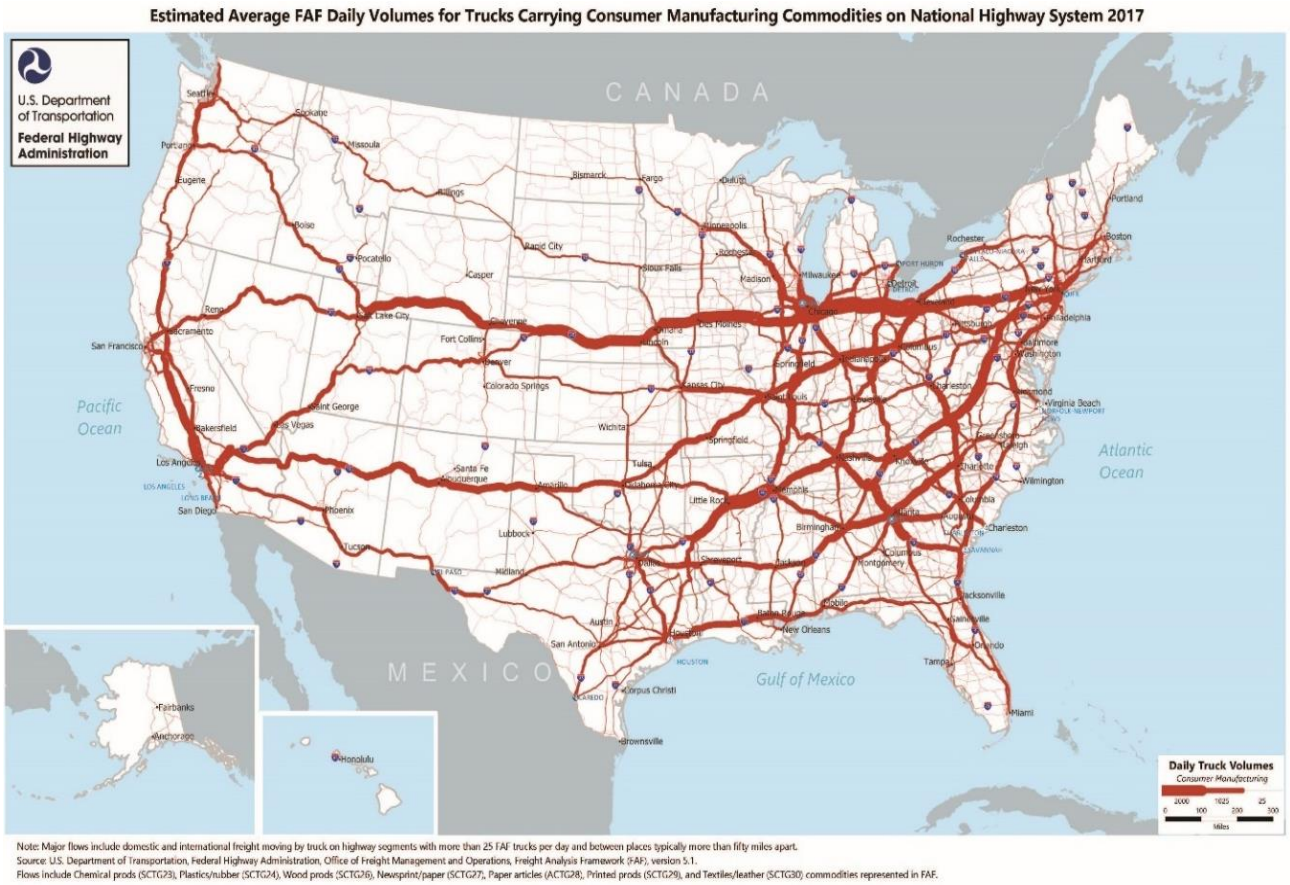
Analysis Framework 5 (FAF5) data, we can examine 2017 freight flow trends for some of the commodities related to these manufacturing sectors. Note that this FAF analysis uses FAF Zone 181 for the Indiana portion of the Chicago Metro area. This zone includes not only Lake, Porter, and LaPorte Counties but also Newton and Jasper. However, this FAF zone is a good estimate of the commodity flows in the NWI region.

National Level Freight Flows: Manufacturing

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

As shown in Figure 25, manufactured commodities rely heavily on the roads in Indiana, including NWI. Similar freight system demand is mirrored among other modes and all manufacturing commodities.

Figure 25: National Freight Flows for Consumer Manufacturing Commodities, 2017



Source: FAF5, FHWA, 2022.

Metals Manufacturing

Metals manufacturing refers to the production of base metals and metal articles using metallic ores. Metals manufacturing is a key industry in NWI, with over 45 million tons worth almost $22 billion moving into, out of, or within NWI 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 NWI.[6] In fact, Lake and Porter Counties account for over half of the nation's blast furnace capacity, and the Indiana Harbor complex

[6] Indiana led nation in steel production again in 2020, maintaining reign of more than 40 years, Northwest Indiana Times, Joseph S. Pete, April 2021. https://www.nwitimes.com/business/local/indiana-led-nation-in-steel-production-again-in-2020-maintaining-reign-of-more-than-40/article_6acba453-8967-5f3d-85fe-7f4effe117f7.html#tncms-source=login

is the largest integrated steelmaking facility in North America.[7] US Steel and Cleveland-Cliffs have operations in the region.

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 NWI travel domestically. More information on commodity flows can be found in **Appendix C: 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. NWI 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 NWI 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 C: Industry-Level FAF analysis.**

Machinery Manufacturing

Machinery manufacturing includes the production of goods, including engines, fans, or hand tools. NWI 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. NWI produces a variety of machinery goods, including air compressors, of which Michigan City is the largest producer in the Midwest.[8] A variety of machinery manufacturing establishments have operations in NWI, including Howmet Engine Systems for aero engines and Hitachi Sullair for air compressors.

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 NWI 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 C: 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 NWI, both in terms of production and freight movement. Over 76

[7] INDOT 2021 State Rail Plan.

[8] CPCS consultation with Michigan City EDC, 2022.

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.[9]

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 NWI 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 C: 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. NWI 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.[10]

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 NWI travel domestically. More information on commodity flows can be found in **Appendix C: Industry-Level FAF analysis.**

Transportation and Warehousing

Transportation and warehousing is an important industry in NWI, 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 NWI 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.

Figure 26: Transportation and Warehousing Fast Facts

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.

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, NWI is highly developed and is running out of vacant or developable land, especially in the northwest region 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:

[9] Indiana, BP's Economic Investment, BP. https://www.bp.com/content/dam/bp/country-sites/en_us/united-states/home/documents/where-we-operate/states/bp%20in%20Indiana.pdf | Crude Oil Refineries, Indiana Office of Energy Development. https://www.in.gov/oed/indianas-energy-landscape/petroleum-and-biofuels/refineries-and-infrastructure/

[10] Food and Beverage Manufacturing, Northwest Indiana Forum, (n.d.). https://www.nwiforum.org/industries-1#food-beverage

- **East Chicago Logistics Center:** The former DuPont industrial site at 5215 Kennedy Ave is undergoing brownfield remediation before plans to develop a one-million-square-foot logistics center[11]
- **Majestic Star Casino Move and Buffington Harbor Redevelopment:** Plans are in place to move the Majestic Start Casino 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 NWI currently lacks.[12]
- **Former Cleveland-Cliffs Steel Mill Site:** In 2021**,** Speedwagon Capital Partners purchased the former steel mill at 3300 Dicky 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.[13]

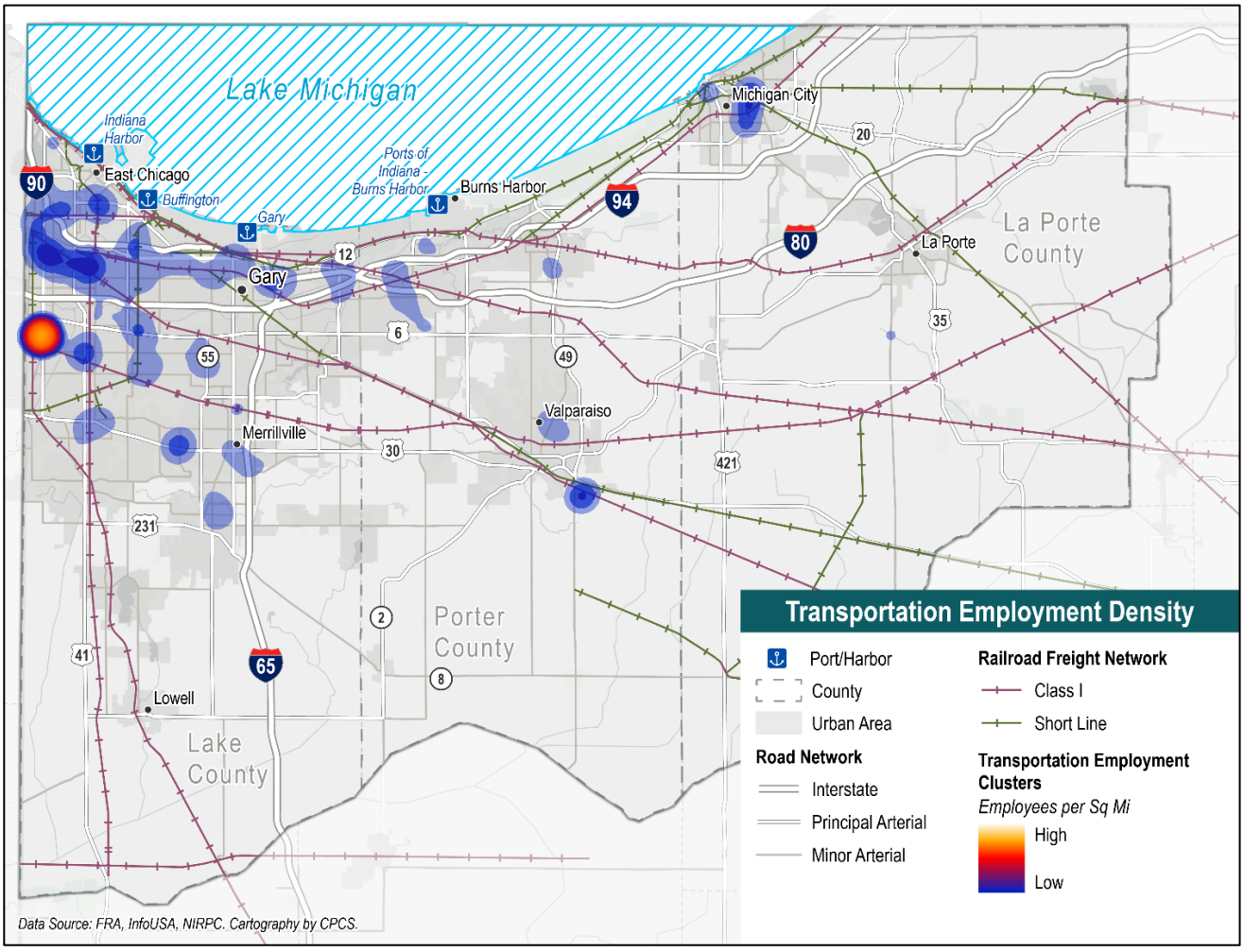
Figure 27 shows the transportation and warehousing industry employment clusters in NWI as of 2018. As shown, the greatest concentrations of these industries are located in western NWI in Hammond, Munster, East Chicago, and Gary. There is an especially pronounced cluster of trucking-related activities along the CN railroad in western Munster. There are also employment clusters in Michigan City, Valparaiso, and Merrillville.

[11] Remediation work underway on East Chicago site intended for massive logistics center, Northwest Indiana Times, Andrew Steele, November 2019. https://www.nwitimes.com/news/local/lake/remediation-work-underway-on-east-chicago-site-intended-for-massive-logistics-center/article_c7e6ee5b-518a-574e-8f7e-f2534f40911f.html#tncms-source=login

[12] Plans for Majestic Star casino move, Buffington Harbor redevelopment progressing in Gary, Chicago Tribune, Craig Lyons and Karen Caffarini, April 2019. https://www.chicagotribune.com/suburbs/post-tribune/ct-ptb-gary-gaming-bill-future-st-0428-story.html

[13] Shuttered Cleveland-Cliffs steel mill site in East Chicago purchased by Chicago investment firm, Northwest Indiana Business Magazine, Larry Avila, December 2021. https://nwindianabusiness.com/community/business-news-bits/shuttered-cleveland-cliffs-steel-mill-site-in-east-chicago-purchased-by-chicago-investment-firm/

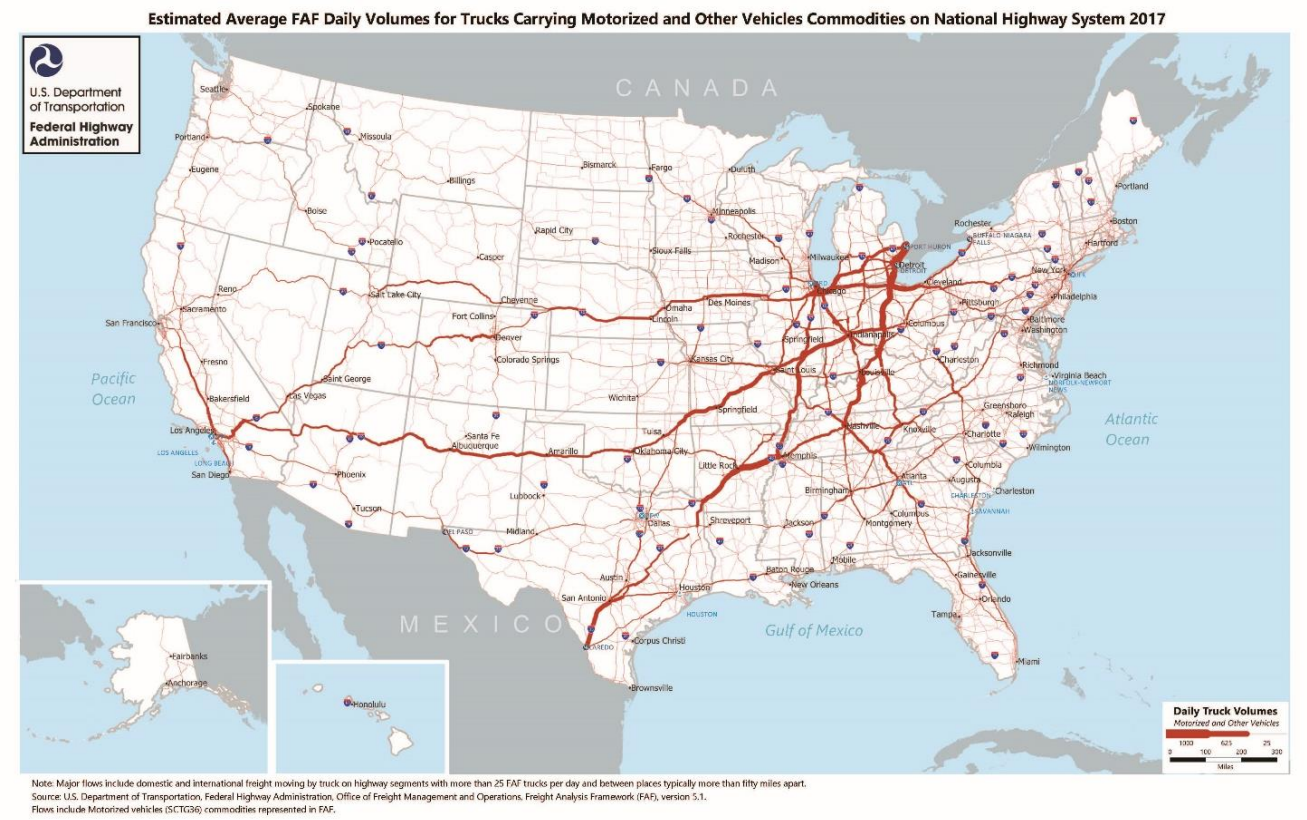
Figure 27: Transportation and Warehousing Employment Density in NWI, 2018



National Level Freight Flows: Transportation Equipment

As shown in Figure 28, transportation equipment commodities rely heavily on the roads in Indiana, including NWI. Similar freight system demand is likely mirrored among other modes.

Figure 28: National Freight Flows for Motorized and Other Vehicle Commodities, 2017



Source: FAF5, FHWA, 2022.

Transportation Equipment

The transportation equipment industry refers to the production of motorized vehicles and other transportation equipment. NWI 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 NWI travel domestically. However, a large quantity is also imported and exported. More information on commodity flows can be found in **Appendix C: Industry-Level FAF analysis**.

3 NWI's Multimodal Freight System

Key Chapter Takeaways

The NWI region is served is by four Interstates, I-65, I-80, I-90, and I-94, which are supplemented by national and states 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 NWI.

Stakeholders consulted noted a lack of an intermodal rail facility in the region, which likely has an impact on the competitiveness of many freight-related businesses in NWI and the amount of through traffic that carries freight to and from the intermodal facilities in the Chicago area. In addition to road and rail, NWI is served by four maritime ports and two key airports that offer air cargo service. 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.

3.1 Freight System Overview

The NWI 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 NWI. In addition to road and rail, NWI 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.

Figure 29 provides a high-level snapshot of NWI's key transportation assets. For the region to remain economically prosperous, these transportation systems need to be connected and efficient to provide key freight services to NWI.

Figure 29: NWI Freight System Fast Facts

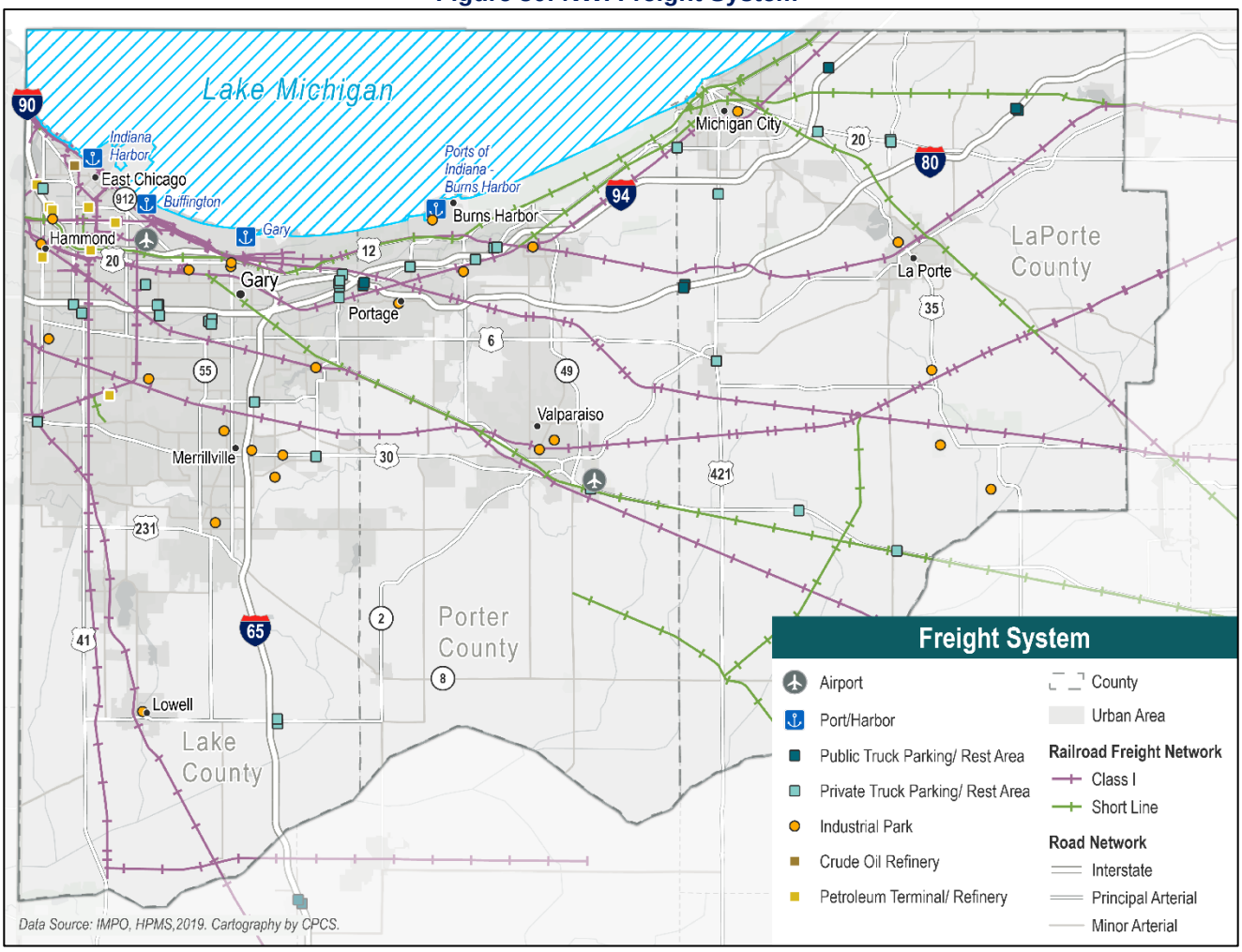
227	558	930	997	7	4	772
Miles of Interstate	Miles of US and State Highways	Miles of rail	Bridges	Public airports	Maritime ports	Miles of pipeline

Source: CPCS analysis, 2022.

Figure 30 shows the integrated freight system in NWI. As shown, public and private truck parking facilities, industrial parks, refineries, and pipeline terminals also serve NWI's freight activities. There are also several truck-rail transload facilities and grain rail-served elevators in NWI, 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 NWI 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 NWI's freight system.

Figure 30: NWI Freight System



Statewide Freight System Trends

Figure 31 and Figure 32 present the results of a FAF analysis in the NWI region. In 2017, NWI'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 NWI 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.

Figure 31: Tonnage Modal Split for NWI

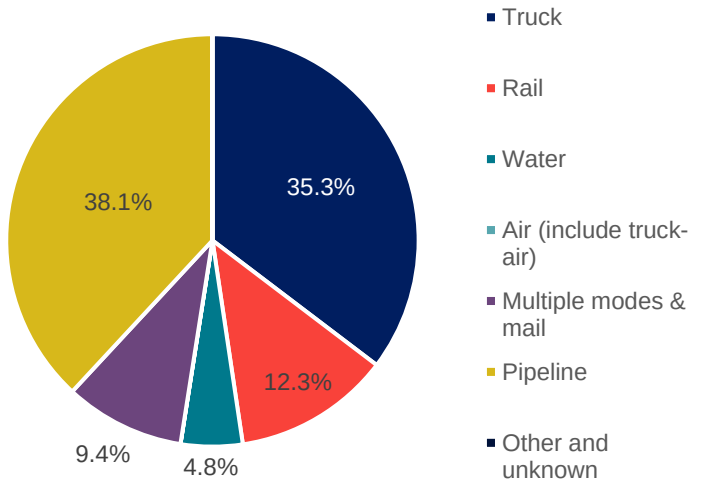
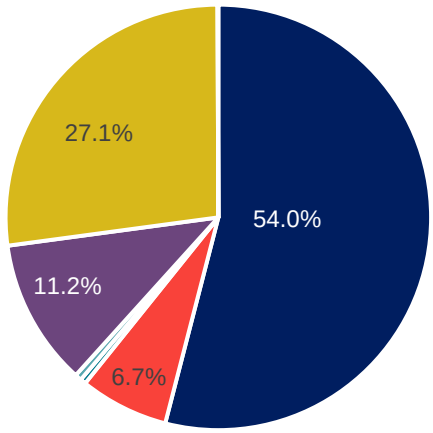


Figure 32: Value Modal Split NWI



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

By 2050, the total tonnage moved on NWI'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 Figure 33, 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 NWI (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.

Figure 33: Freight Modal Split in NWI, 2017 vs. 2050

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.

NWI'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.

As shown in Figure 33, the top five commodities in 2017 by volume were gasoline, crude petroleum, base metals, coal-n.e.c., 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.

Figure 34: Top Five Current Commodity Shares by Tonnage, 2017 vs. 2050

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-n.e.c.	9.4%
Coal-n.e.c.	7.2%	Gasoline	8.8%
Metallic Ores	7.2%	Basic chemicals	8.1%

Source: CPCS analysis of FAF5 data, 2022.

As shown in Figure 35, 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.

Figure 35: Top Five Current Commodity Shares by Value, 2017 vs. 2050

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.

Trading Partners

The top domestic trading partners by tonnage for goods originating in NWI in 2017 were Indiana, Illinois, Michigan, Ohio, and Wisconsin (Figure 36). For goods destined for NWI, the top domestic trading partners were Indiana, Illinois, North Dakota, Minnesota, and Michigan (Figure 37).

Figure 36: Top Domestic Trading Partners by Tonnage for Goods Originating in NWI

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%

State	Tonnage	Share
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.

Figure 37: Top Domestic Trading Partners by Tonnage for Goods Destined for NWI

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.

The top international trading partner for NWI in 2017 by both tonnage and value was Canada (Figure 38). Europe, Eastern Asia, and Mexico are also significant international origins and destinations for goods moving through NWI.

Figure 38: Top International Trading Partners by Tonnage and Value, 2017

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.

3.2 Road Network

The NWI 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. NWI'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.

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

In 2017, trucks on NWI roads carried 35.3 percent of the total freight tonnage and 54.0 percent of the value in NWI, highlighting the importance of this mode for the movement of freight in the region. As shown in Figure 39, the top commodities moved by truck by tonnage included base metals, gasoline, gravel, basic chemicals, waste/scape, and fuel oils.

Figure 39: Major Commodities by Tonnage Carried by Trucks in NWI, 2017

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-n.e.c.	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.

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

Key Corridors

Trucking activities in NWI 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 40 and the truck AADT map shown in Figure 41. As shown, I-80/I-90 east of SR-49 experiences the highest share of truck traffic in NWI. 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 NWI, 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 NWI 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 NWI 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 the next chapter of this report.

Figure 40: Truck Traffic Share in NWI, 2019

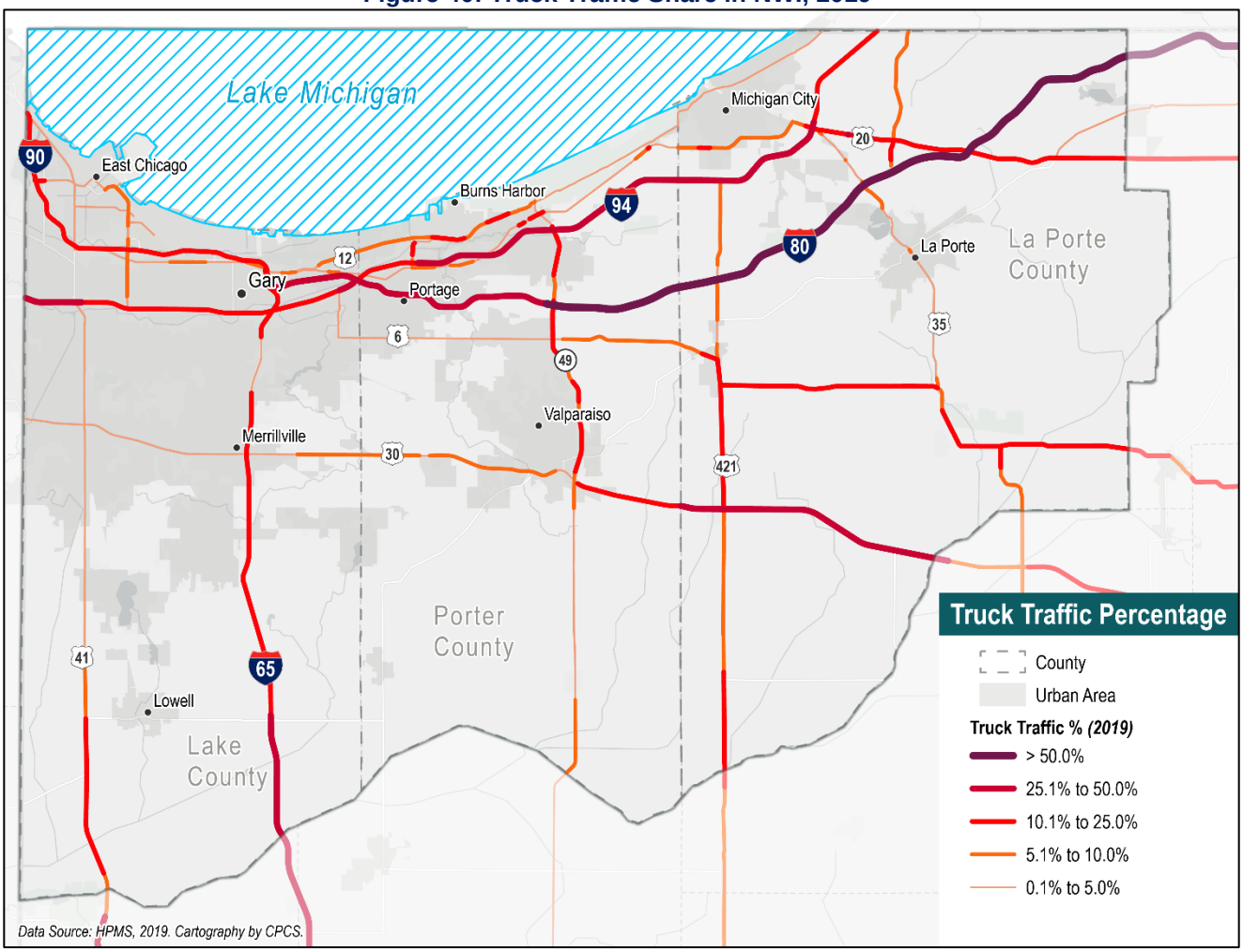
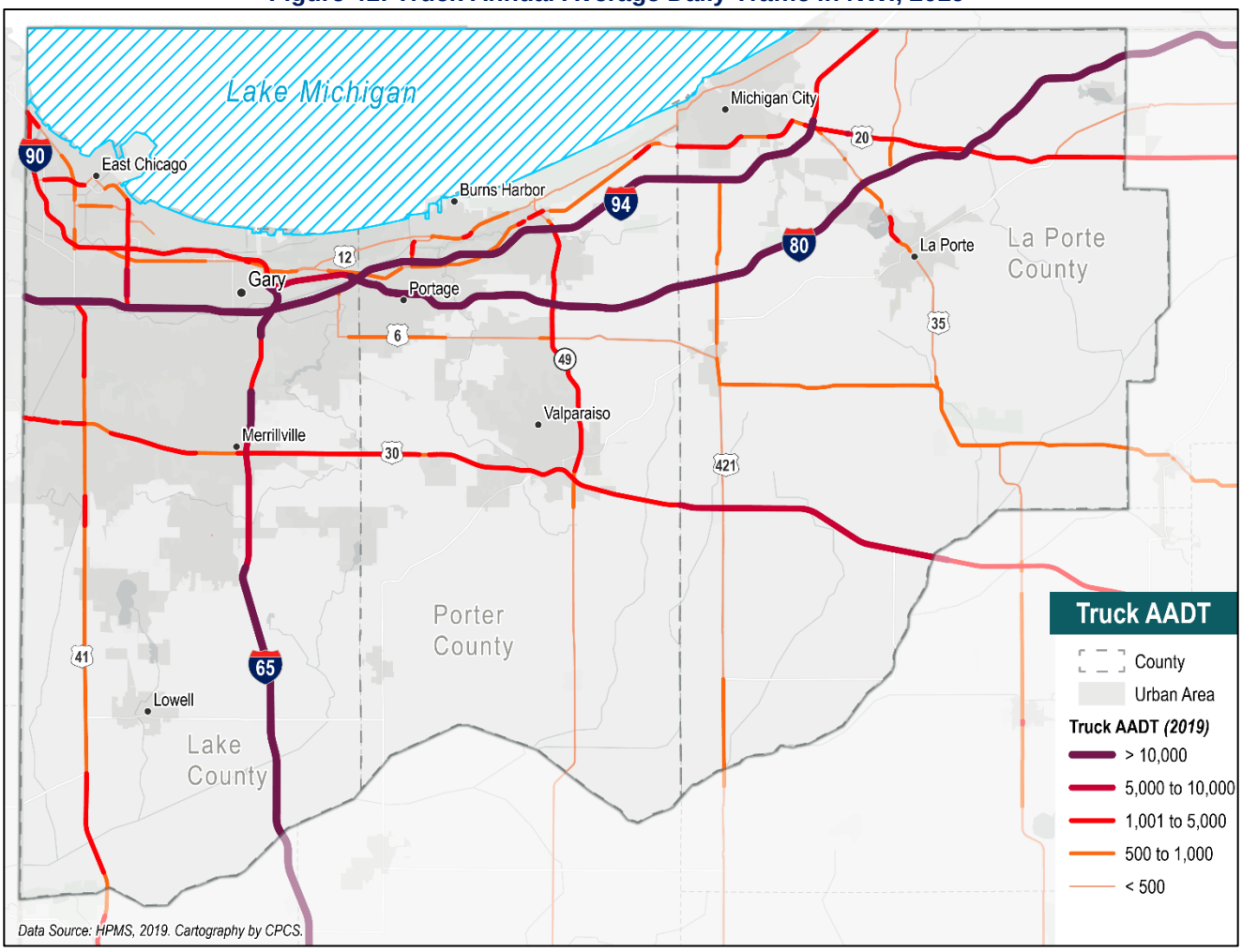


Figure 41: Truck Annual Average Daily Traffic in NWI, 2019



Note: Truck AADT shown here is for combination trucks only.

I-65

Interstate 65 is the only north-south Interstate operating in NWI 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-94/I-80 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 NWI can be found in **Appendix D**.

I-80

Interstate 80 travels east-west through NWI. 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 NWI 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 NWI through the northeast corner of LaPorte 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 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 NWI can be found in **Appendix D**.

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 NWI 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 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 NWI can be found in **Appendix D**.

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.[14] 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 NWI. From the west, it enters NWI 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/I-94, 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-94/I-80 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 NWI can be found in **Appendix D**.

US 12

US 12 is an important highway in NWI 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 restricting the road to truck traffic. Doing so would eliminate potential 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 the road's closure to trucks 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 restrictions like these might also be appropriate on other roads in NWI with relatively low truck traffic, nearby route redundancy, and conflict issues between freight, recreational, and other roads uses.

[14] Down-under consortium claims victory in Toll Road bidding | Lake County News | nwitimes.com

US 20

US 20 is another important highway in NWI 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. 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 NWI 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 NWI, sometimes operating as a four-lane divided highway and other times as a two-lane rural road. In 2019, the highest AADT on US 30 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 NWI that runs east-west south of other major east-west routes in NWI 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 NWI. The route traverses a number of city centers, including Gary and Michigan City. 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 NWI that operates east of the I-65 route. It begins south of Indiana Dunes National Park and interchanges with US 12, US 20, I-94, I-80, I-90, US 6, and US 30 as it travels south towards Lewiston. 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 NWI (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.[15] All Interstates in NWI are included in the STRAHNET network.[16]

[15] Indiana National Highway System, USDOT FHWA, 2021. https://www.fhwa.dot.gov/planning/national_highway_system/nhs_maps/indiana/in_indiana.pdf

[16] Indiana, US Army Transportation Engineering Agency, 2015. https://www.sddc.army.mil/sites/TEA/Functions/SpecialAssistant/STRAHNET/Indiana.pdf

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.17 CRFC/CUFC designation provides access to Federal resources for investment in freight performance improvements.

Within NWI, 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 NWI.18 Indiana DOT is in the process of updating its state freight plan. However, the state is currently not planning to update NHFN designations, including critical freight corridors.

Key Structures and Facilities

Bridges

There are nearly 1,000 road bridges in NWI, 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.[19] Indeed, NWI houses over three times more bridges per square mile than the US overall.[20] Significant concentrations of NWI bridges are located in the northern and western parts of the region. Indeed, there are 495 bridges in Lake County, 276 in Lake County, and 226 in LaPorte County.

Drawbridges

NWI has three bascule bridges (drawbridges). 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 drawbridge is located on Franklin Street in Michigan City over Trail Creek.

[17] USDOT, FAST Act, Section 1116 National Highway Freight Program (NHFP) Guidance: Designating and Certifying Critical Rural Freight Corridors and Critical Urban Freight Corridors, 2016.

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

[19] 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 NWI is 1,515.4 square miles.

[20] 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 NWI is 1,515.4 square miles.

Figure 42: Dickey Street Drawbridge

Source: Google Maps Streetview, 2022.

Figure 43: Indianapolis Boulevard Drawbridge

Source: Google Map Streetview, 2022.

Figure 44: Franklin Street Drawbridge

Source: Google Maps Streetview, 2022.

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.[21] Moreover, this inability to quickly find truck parking costs drivers roughly $5,000 a year in lost wages.[22] Sufficient truck parking availability is critical to improve trucking safety and efficiency and reduce overall traffic mobility. Stakeholders consulted repeatedly reported issues in NWI regarding the availability of truck parking in the region. Currently, there are about 41 truck parking locations in NWI. 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 NWI is shown in Figure 45, but a comprehensive truck parking inventory can be found in **Appendix E**.

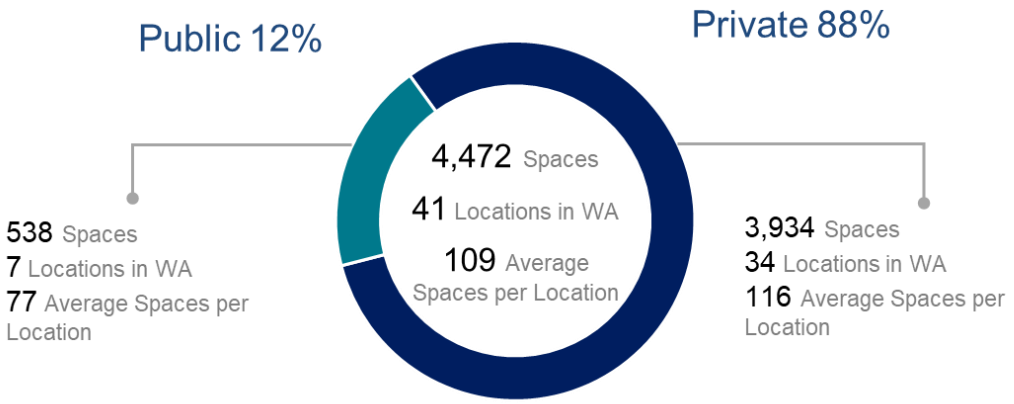
Truck Parking Information Systems (TPIMS) are another effective method to make it easier for truck drivers to safely and quickly find truck parking. TPIMS provides real-time information on the number of available trucking parking spaces at participating sites. This information can be shared online or 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 NWI, although a site is planned for 2026 at the Indiana Welcome Center on I-94 in LaPorte County.[23]

[21] ATRI 'parking diaries' reveal ELDs make finding parking more difficult, Overdrive, James Jaillet, November 2021. https://www.overdriveonline.com/parking/article/14891433/atri-parking-diaries-reveal-elds-make-finding-parking-more-difficult?utm_medium=overdrive&utm_campaign=site_click&utm_source=popular

[22] Ibid.

[23] Indiana TPIMS Lots, INDOT, (n.d.). https://secure.in.gov/indot/files/New-TPIMS-sites-on-State-Map-Shading.pdf

Figure 45: Truck Parking in NWI



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.

3.3 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 NWI is largely comprised of heavier-bulk cargo, which is generally fossil fuels and steel manufacturing products transported to and from industrial establishments. NWI 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, over 64 rail bridges, and 107 rail underpasses. NWI's rail network is also supported by multimodal connection points such as ports, transload facilities, and grain elevators that link the region to national and global markets.

930	20	551	3	4
Miles of Track and Trackage Rights	Rail-Served Facilities	Actively-Protected Public Crossings	Class I Rail Operators	Short Line Railroads

In 2017, the rail mode carried 12.3 percent of the total freight tonnage and 6.7 percent of the value in NWI, indicating higher weight and lower value goods. As shown in Figure 46, the top commodities by tonnage were coal, base metals, coal-n.e.c., metallic ores, and nonmetal mineral products.

Figure 46: Major Commodities by Tonnage Transported by Rail in NWI, 2017

Commodity	Tonnage	Share of Total
Coal	10,012,977	41.6%
Base metals	7,307,020	30.4%
Coal-n.e.c.	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.

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

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.[24] NWI is served by three Class I railroads and four short lines that operate over 930 miles of track and trackage rights combined.[25]

As Figure 47 shows, **CSX Transportation railroad (CSXT)** operates on nearly 205 miles of track in NWI, 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 NWI and are among the railroads' most heavily trafficked lines, carrying 50 to 100 million tons of cargo per mile annually.[26] The railroad's Porter and Grand Rapids subdivisions are also located in NWI, 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 NWI, 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 NWI, 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 NWI, carrying over 100 million tons of cargo per mile annually.[27] 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.[28]

Canadian National Railway (CN) is also a Class I railroad operating on 229 miles of track in NWI, serving trains that run between Chicago to eastern Canada. The CN trains carry between 10 and 50 million tons per mile in NWI annually.[29] 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.[30]

Short Lines active in the NWI region serve a wide range of industries and provide connections between various businesses and the Class I rail operations. The Chicago, Ft. Wayne & Eastern

[24] STB, Rail Service Data, Accessed August 2022. https://www.stb.gov/

[25] Includes private switching railroad mileage. Source: STB North American Rail Lines, 2022.

[26] Indiana State Rail Plan, 2021.

[27] Ibid.

[28] Intermodal of Chicago Website, Chicago Area Intermodal Rail Terminals & Depots, accessed July 2022. https://www.intermodalofchicago.org/terminals_map.cfm

[29] Indiana State Rail Plan, 2021.

[30] CN Transportation Website, Fact Book, accessed July 2022. https://www.cn.ca/en/

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 NWI. The Chesapeake & Indiana Railroad (CKIN) short line operates over 29.6 miles of track in NWI, 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 NWI, 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 NWI. 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 NWI. 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.[31]

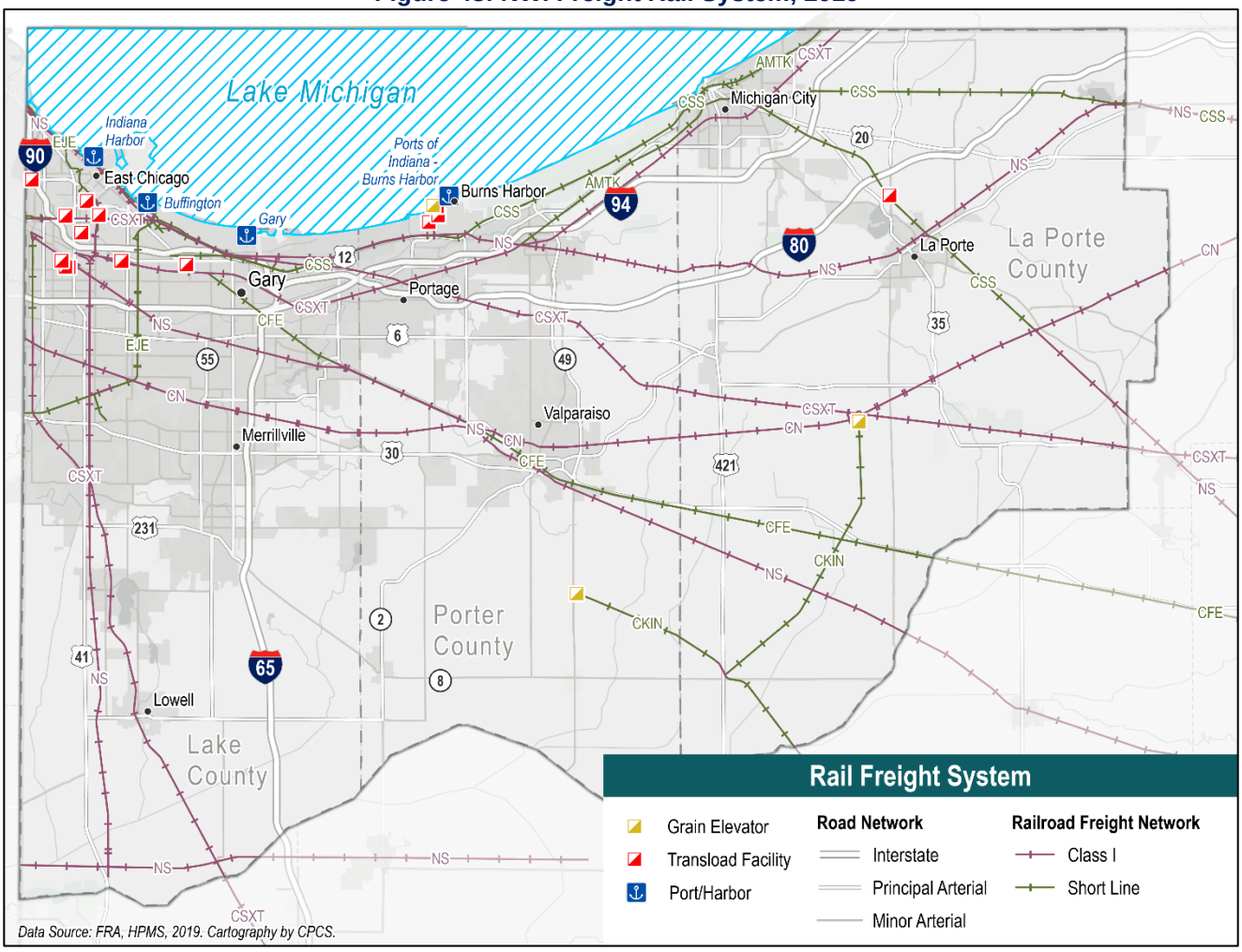
Figure 47: Freight Railroads Serving NWI

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.

[31] Double Track NWI Project Overview, NICTD South Shore Line. https://www.doubletrack-nwi.com/about/project-overview

Figure 48: NWI Freight Rail System, 2019



Note: Some transload sites shown on the map support multiple facilities.

Rail-Served Multimodal Facilities

There are 17 transload facilities and three grain elevators in NWI. 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 NWI is provided in Figure 49, and the region's rail-served grain elevators are listed in **Appendix F**.

Figure 49: Transload Facilities in NWI

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

Facility	Location	Serving Railroad	Commodities
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	LaPorte	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.

In addition to the truck/rail transload facilities and grain elevators, three of the maritime facilities in NWI are served by rail:[32]

- **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.

Rail Drawbridges

There are two rail drawbridges in NWI, 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 manned 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 drawbridges operate only when there is train traffic.[33]

Rail Crossings

Figure 50 presents the number of rail crossings in NWI 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.[34] Nevertheless, NWI still has significantly more concentration of at-grade crossings mile than both Indiana and the US. Measured in terms of crossings per roadway miles, NWI has one public at-grade crossing for every 8.8 miles of the public roadway, while the concentration of at-grade crossings

[32] Indiana State Rail Plan, 2021.
[33] Federal Register, Drawbridge Operation Regulation; Indiana Harbor Canal, East Chicago, IN, 2020.
[34] FRA Rail Crossing Inventory data showed that roughly 90% of rail crossings in Indiana and 88% in the US overall are at-grade.

in Indiana is one per every 17 miles of public road, which is the highest across all US states.[35] Lake County houses roughly half of all rail crossings in NWI, followed by LaPorte County with about 31 percent and Porter County with about 19 percent. About 46 percent of the at-grade crossings in NWI are in Lake County, 35 percent are in LaPorte County, and 19 percent are located in Porter County.

Figure 50: NWI Railroad Crossings by Position and Type

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.

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. The 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.[36]

As shown in Figure 51, over 81 percent of the public at-grade crossings in NWI are equipped with active devices (primarily gates and flashing lights), and the rest have passive devices such as crossbucks or stop signs. A small portion of the public at-grade crossings in NWI is not equipped with any safety devices. The existence or type of safety devices at most private crossings in NWI is unknown.

Figure 51: At-Grade Crossing Safety Devices in NWI

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.

Although FHWA's estimates show that active crossing devices can reduce the risk of incidents at at-grade crossings by about 88 percent,[37] 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

[35] CPCS analysis of FRA crossing inventory data, 2022; INDOT, Indiana State Rail Plan, 2021.
[36] Indiana MUTCD, 2011. https://www.in.gov/dot/div/contracts/design/mutcd/mutcd.html
[37] FHWA, Railroad-Highway Grade Crossing Handbook – 5 Selection of Alternatives, 2007. http://toolkits.ite.org/gradecrossing/sec05.htm

medians at actively-protected at-grade crossings with a high incident rate.[38] Currently, eight public at-grade crossings in NWI are equipped with full-barrier gates (Figure 52).

Figure 52: At-Grade Crossings Equipped with Full-Barrier Gates in NWI

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.

3.4 Maritime Network

NWI 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.

4 in 1
Four ports are included in one consolidated port district

31 million
Approximate tonnage handled at NWI ports in 2019

11th
National ranking for domestic tonnage handled by the consolidated port district in 2019

~#1
Indiana Harbor is one of the largest integrated steelmaking facilities in North America

In 2017, the maritime mode carried 4.8 percent of the total freight tonnage and 0.43 percent of the value in NWI, indicating higher weight and lower value goods. As shown in Figure 53, the top commodities by tonnage were gravel, coal-n.e.c., nonmetallic minerals, metallic ores, crude petroleum, and cereal grains.

Figure 53: Major Maritime Commodities by Tonnage in NWI, 2017

Commodity	Tonnage	Share of Total
Gravel	5,561,999	58.8%
Coal-n.e.c.	1,155,672	12.2%
Nonmetallic minerals	1,297,592	13.7%
Metallic ores	1,063,573	11.2%

[38] INDOT, Indiana State Rail Plan, 2021.

Crude petroleum	247,301	2.6%
Cereal grains	131,657	1.4%
Total	**9,457,793**	**100%**

Source: CPCS analysis of FAF5 data, 2022.

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

Key Structures and Facilities

Indiana has six major ports. Four of these ports are located along the 42 miles of Lake Michigan coastline in NWI, as shown below in Figure 54.

Figure 54: Indiana's Maritime Ports

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; Ro-Ro 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.

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 which 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.

Lake Michigan Ports District Consolidation

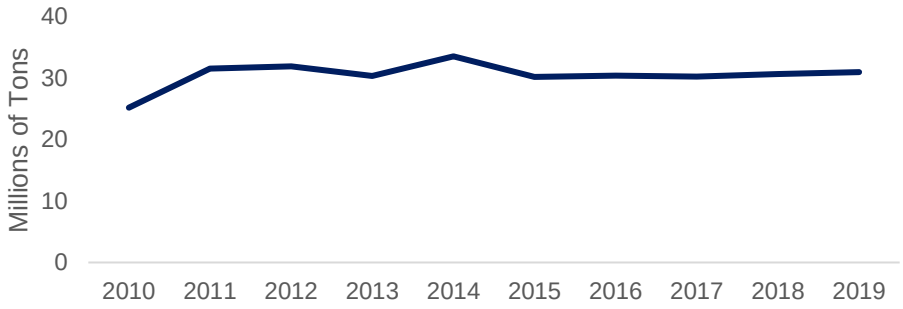
Although the four maritime ports in NWI abut one another, they were counted as separate maritime assets until 2020. According to the Ports of Indiana, the consolidation of the four maritime ports on Lake Michigan into a single port district not only serves as an awareness tactic, but also makes these 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.[39]

Figure 55 shows the combined tonnages of Indiana's four Lake Michigan maritime ports, all of which are located in NWI. 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.

Figure 55: Indiana's Lake Michigan Ports Tonnage, 2010-2019



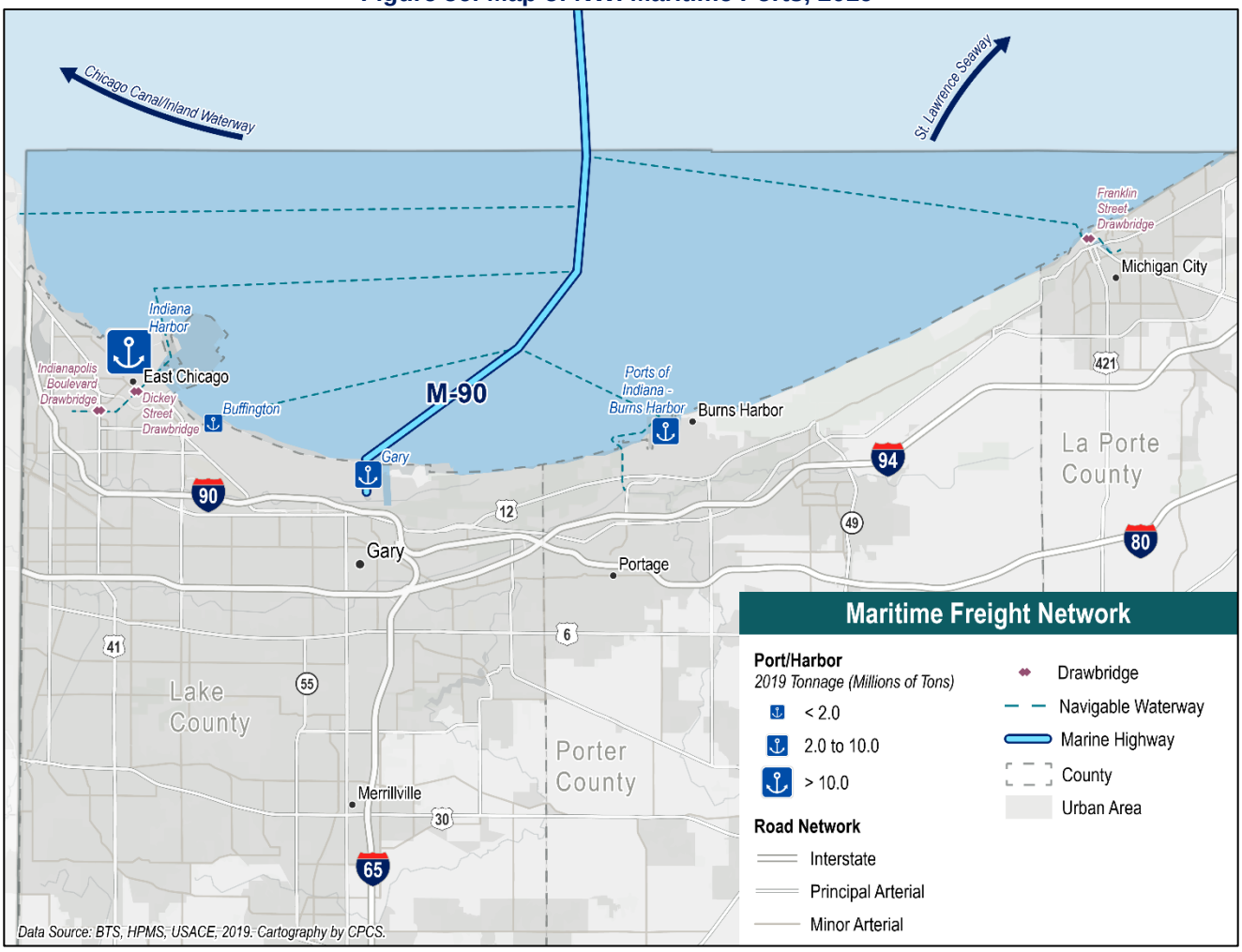
Source: CPCS analysis of USACE waterborne commerce data, 2022.
Includes combined tonnages from Indiana Harbor, Burns Harbor, Gary, and Buffington.

Figure 56 provides a map of the maritime system in NWI. 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.[40]

[39] CPCS consultation with the Ports of Indiana, 2022.

[40] America's Maritime Highway Route Deisgnations, USDOT. https://cms.marad.dot.gov/sites/marad.dot.gov/files/2021-04/Route%20Designation%20one-pagers%20Apr%202021.pdf

Figure 56: Map of NWI Maritime Ports, 2019



3.5 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.

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.

There are thirteen airports in Indiana equipped to handle cargo, of which the third largest is in NWI: Gary/Chicago International. There are an additional 6 non-cargo airports in NWI (Figure 57).

Figure 57: Major NWI Airports

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.

The latest FAF5 data shown in Figure 58 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 NWI. 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.

Figure 58: Major Commodities by Tonnage Transported by Air in NWI, 2017

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.

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

Gary/Chicago International Airport (GYY) provides passenger and commercial services and is the largest cargo airport in NWI. GYY added cargo facilities in late 2020 when UPS launched service from the airport.[41] As shown in Figure 59, 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.

41 Gary airport lands cargo tenant UPS; Next Day Air growth cited in decision, Chicago Tribune, Carole Carlson, May 2020. https://www.chicagotribune.com/suburbs/post-tribune/ct-ptb-gary-airport-meet-st-0515-20200513-vawr364dobfhhmtiljw5nhsbue-story.html

Figure 59: Landed Weight for Indiana Cargo Airports, 2021

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

The lease with UPS stipulates that UPS must improve the terminal's condition and construct truck staging and parking sites.[42] UPS operates an Airbus A300 daily between Gary and Louisville, carrying up to 120,000 lbs and 14,000 next-day packages.[43] 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.[44]

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.[45] 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.[46]

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.[47] 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.

3.6 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 NWI, both in terms of tonnage and value.

Figure 60 summarizes the tonnage of major commodities that are transported via pipelines in NWI. 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 NWI.

42 Ibid.
43 Ibid.
44 UPS to Launch Air Service from Gary/Chicago International Airport, UPS, May 2020, https://about.ups.com/us/en/newsroom/press-releases/customer-first/ups-to-launch-air-service-from-gary-chicago-international-airport.html
45 Gary/Chicago International Airport Master Plan Update, Gary Chicago International Airport, February 2021, pg. 2-3. https://flygyy.com/wp-content/uploads/2021/03/Ch-2-GYY-Inventory.pdf
46 Gary airport cuts ties with private manager, developer, NWI Times, Andrew Steele, June 2022. https://www.nwitimes.com/business/local/gary-airport-cuts-ties-with-private-manager-developer/article_0de6e262-414a-59a8-b11e-289b7653082b.html
47 Gary/Chicago International Master Plan Update, Gary Chicago International Airport, February 2021, pg. 6-7. https://flygyy.com/wp-content/uploads/2021/03/Ch-6-GYY-Proposed-Development-Plan.pdf

Figure 60: Major Commodities by Tonnage Carried through NWI's Pipelines, 2017

Commodity	Tonnage	Share of Total
Coal-n.e.c.	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.

In 2017, the top domestic trading partners by tonnage for pipeline movements originating in NWI, in descending order, were Indiana, Illinois, Michigan, Iowa, and Wisconsin. The top partners for pipeline movements destined for NWI were North Dakota, Illinois, Indiana, Texas, and Ohio. Figure 61 provides a map of the pipeline network in NWI. Pipelines are concentrated in Lake County, especially in the northwest region, alongside the majority of refineries. Figure 62 provides pipeline mileages by commodity type. Petroleum pipeline is by far the most prevalent type in NWI, which is also evident in the map of the network.

Figure 61: Pipeline Network in NWI, 2020

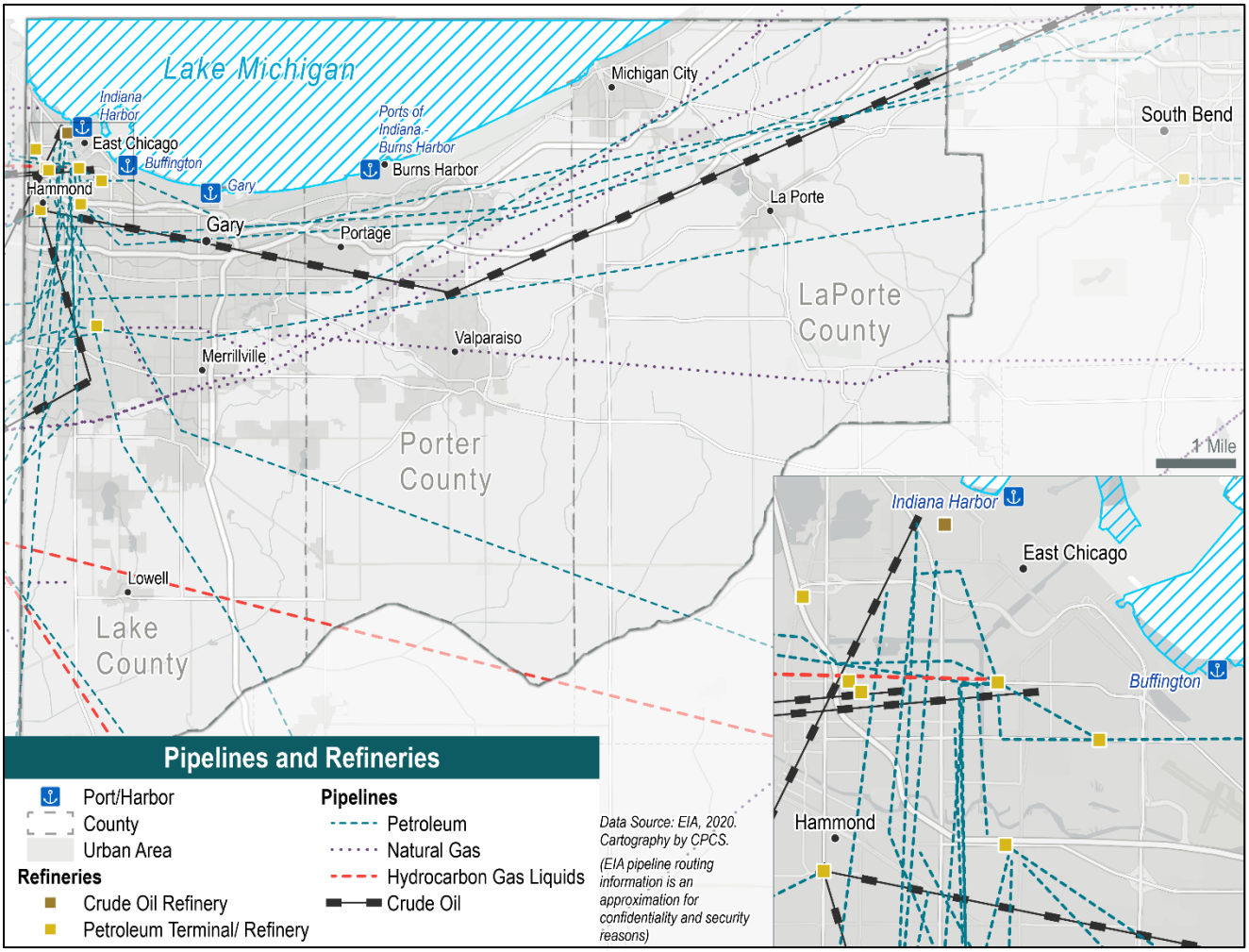


Figure 62: NWI Pipeline Coverage

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.

BP Whiting Refinery

There are two crude oil refineries in Indiana, one of which is in NWI – 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.

4 NWI's Freight System Condition and Performance

Key Chapter Takeaways

Between 2017 and 2021, there were over 11,200 truck-involved crashes in NWI occurring primarily on I-94/I-80. During this same period, there were 27 freight-related rail fatalities. These fatalities were concentrated in northern Lake County.

Congestion is not a glaring concern for truck movement in the region as a whole. However, specific road segments do experience unique mobility issues, especially the Borman Expressway. Other impediments to mobility in the region include low bridge clearances, with six Interstate overpasses providing clearances below 15 feet, and blocked crossings, with 176 at-grade crossings seeing 25 or more trains pass through daily.

NWI roads tend to fall short of statewide pavement condition performance measure targets, with only about 5.8 percent of Interstate and and 7.7 percent of non-Interstate NHS routes in good condition. Just over 5 percent, or 52, of the region's 997 road bridges are in poor condition. All Class I railroads in NWI are 286K capable, as is the Chicago, Fort Wayne, & Eastern Railroad (CFE).

The transportation sector is a major emitter of NOx and VOCs. These pollutants produce Ozone, for which Lake and Porter Counties are in nonattainment. Seven facilities emitted over 1 million metric tons of carbon dioxide equivalent pollution in 2019, all of which are freight dependent. Noise pollution is concentrated around major roads, railways, and airports in NWI. Pipelines are the largest source of hazardous spills by tonnage in NWI. Lake County sees a higher FEMA risk index than the state and national average and is most vulnerable to cold waves, heat waves, strong winds, and tornados.

4.1 Linking System Evaluation to Statewide and Regional Goals

INDOT's Multimodal Freight Plan was last published in 2018 to guide the statewide transportation system investments that benefit goods movement.[48] 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 NWI and their associated goals and objectives. To support these goals, the NWI 2050+ Plan adopted in 2020 established performance measures in the following topic areas to inform investments in the multimodal freight system.

- **Economy and Place:** focusing on the economy and quality of place. Socio-economic factors as they relate to freight activities are assessed in Chapter 2 of this document.
- **Environment:** focusing on the region's environmental quality. This chapter 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 chapter.

[48] INDOT is currently in the process of updating the Indiana Multimodal Freight Plan to be adopted in early 2023.

- **People and Leaders:** focusing on communities and their leaders. Measures related to workforce characteristics in NWI are analyzed in Chapter 2.

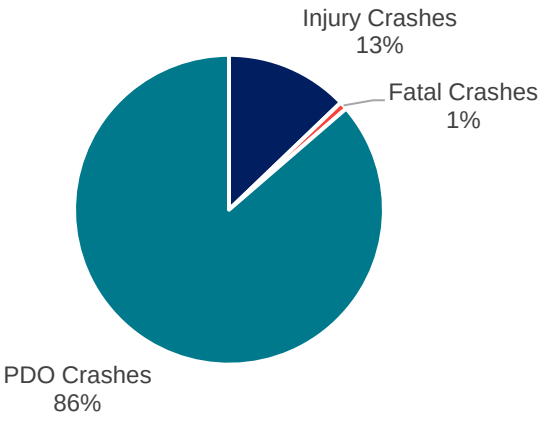
These topic areas served as the starting point for the data analysis presented in this chapter, using data available at the region, state, and federal levels, consultations with freight industry stakeholders, and building on previous relevant studies that have been conducted by NIRPC, INDOT, and other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

4.2 Safety

Road Safety

Between 2017 and 2021, over 11,200 truck-involved crashes occurred in NWI, the majority of which (86%) were property-damage-only (PDO) crashes. As Figure 63 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 NWI.

Figure 63: Truck-Involved Crashes in NWI, 2017-2021



Source: CPCS analysis of truck-involved crash data provided by NIRPC, 2022.

On average, the number of truck-involved crashes in NWI 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 Figure 64 shows, daily truck miles traveled in the NWI 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.

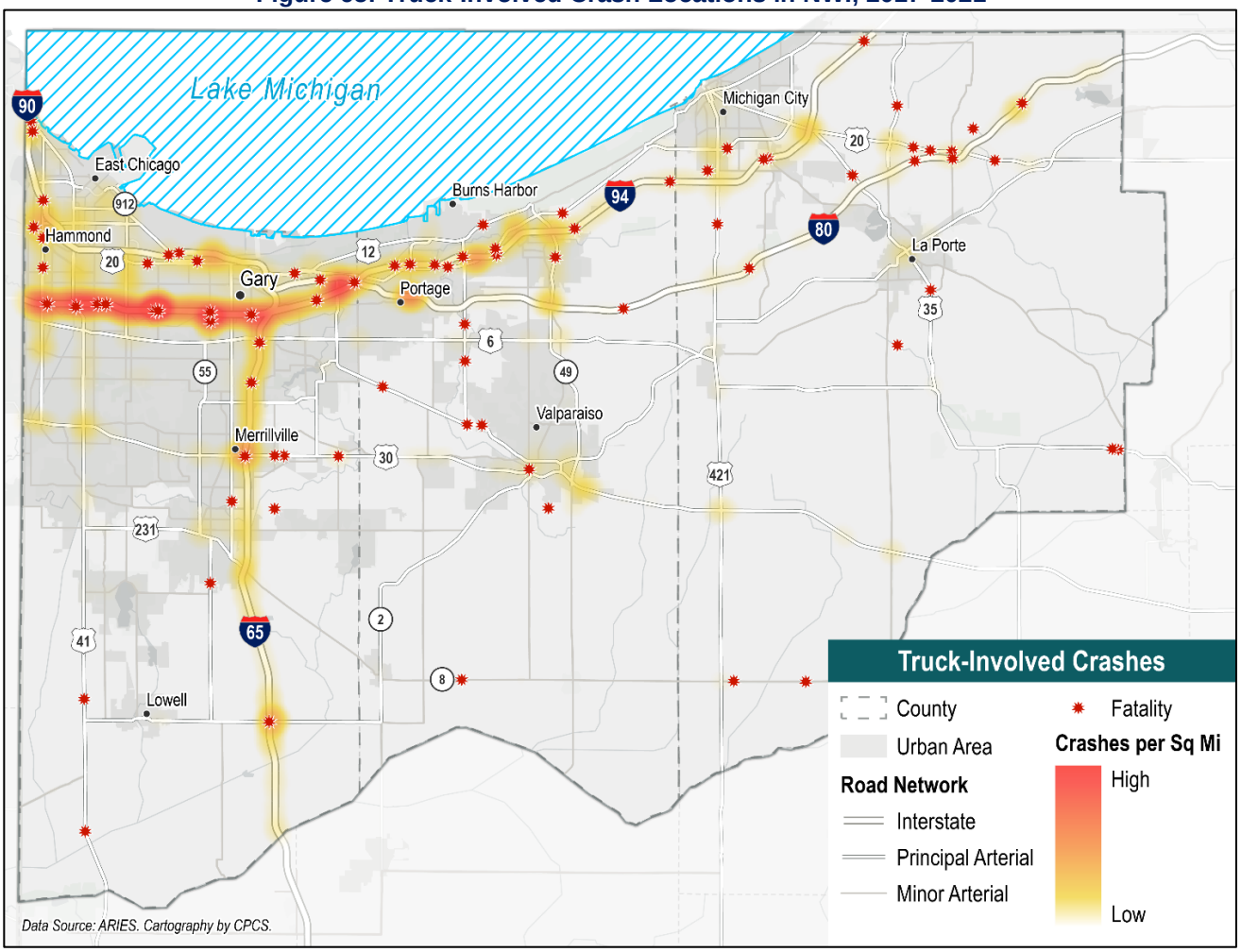
Figure 64: Truck-Involved Crashes and Daily Truck Miles Traveled in NWI

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.

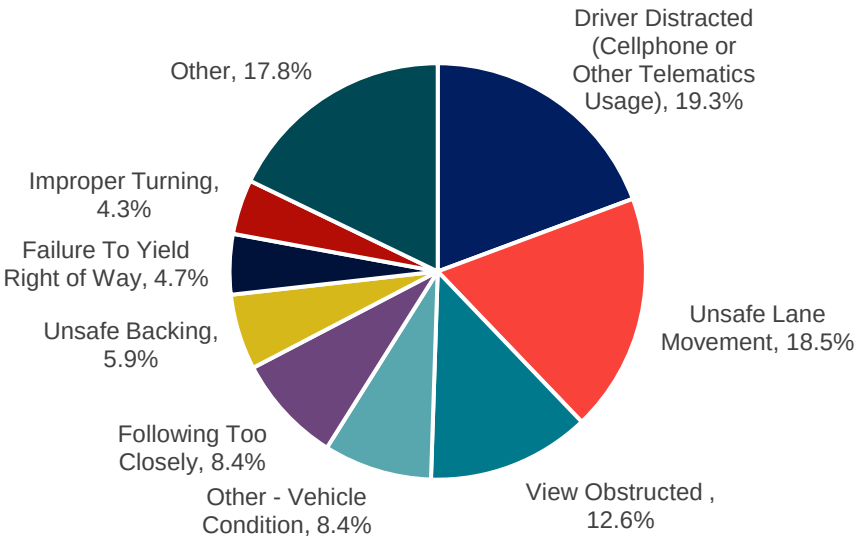
As shown in Figure 65, truck-involved crashes were primarily clustered along high-volume corridors, including I-90, I-65, I-94, and segments of I-80. The I-90/I-94 interchange in Portage and the segment of I-94 between Portage and the Indiana-Illinois border saw the highest concentration of truck-involved crashes, which is again correlated with truck traffic volumes.

Figure 65: Truck-Involved Crash Locations in NWI, 2017-2021



The primary contributing factors for truck-involved crashes in NWI between 2017 and 2021 included distracted driving, unsafe lane-changing maneuvers, and crashes due to obstruction in the drivers' lines of sight (Figure 66). 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.

Figure 66: Primary Factors Contributing to Truck-Involved Crashes, 2017-2021



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

Rail Safety

The analysis presented in this section uses rail incident databases provided by the Federal Railroad Administration (FRA). Railroads are required[49] 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; and
- Rail-related casualties include deaths, injuries, and railroad worker occupational illnesses that results in medical treatment, significant diagnosis by a health professional, or loss of consciousness.

Between 2017 and 2021, 157 at-grade rail crossing incidents occurred in NWI, 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 NWI, 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)[50] is the primary cause of freight rail-related fatalities and injuries in NWI.

[49] 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.

[50] 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 67 shows the number of freight rail safety incidents in NWI by type and provides the total number of fatalities and injuries.

Figure 67: Freight Rail Safety Incidents in NWI

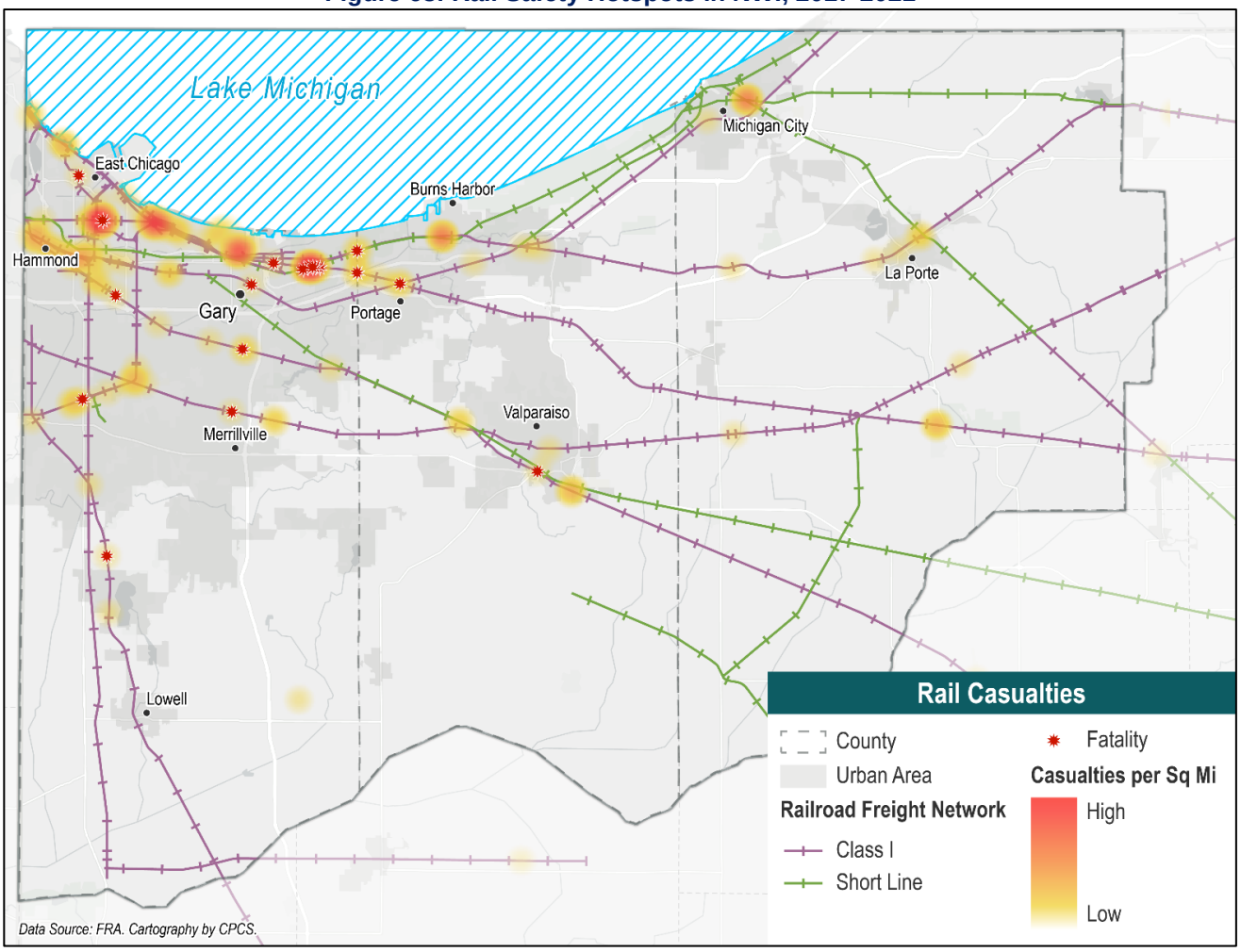
Year	Equipment Incidents	Crossing Incidents	Trespassing Incidents	Total	% Annual Change	Fatalities	Injuries
2017	18	24	10	**52**	-	4	26
2018	19	34	17	**70**	34.6%	9	32
2019	21	24	8	**53**	-24.3%	4	32
2020	20	21	6	**47**	-11.3%	2	26
2021	18	30	19	**67**	42.6%	8	29
Total	**96**	**133**	**60**	**289**	**-**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

Source: CPCS analysis of FRA safety data, 2022.

Figure 68 shows the freight rail safety hotspots in NWI. 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 NWI:

- **CSXT's Barr subdivision at-grade crossing with Lake St in Gary:** seven incidents happened at this crossing between 2017 and 2012, 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 2012, 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 2012, 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 2012, leading to one injury.
- **CSS's at grade crossing with Carroll Ave in Michigan City:** four incidents happened at this crossing between 2017 and 2012, leading to one injury.

Figure 68: Rail Safety Hotspots in NWI, 2017-2021



Drawbridge Safety

Safety considerations for vehicles approaching drawbridges 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 drawbridge safety, including metal signs, pavement markings, and other warning systems.

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

The two rail drawbridges in NWI only operate when there is train traffic. To announce the train passage and lowering of the drawbridge, 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.[51]

[51] Federal Register, Drawbridge Operation Regulation; Indiana Harbor Canal, East Chicago, IN, 2020.

4.3 Mobility

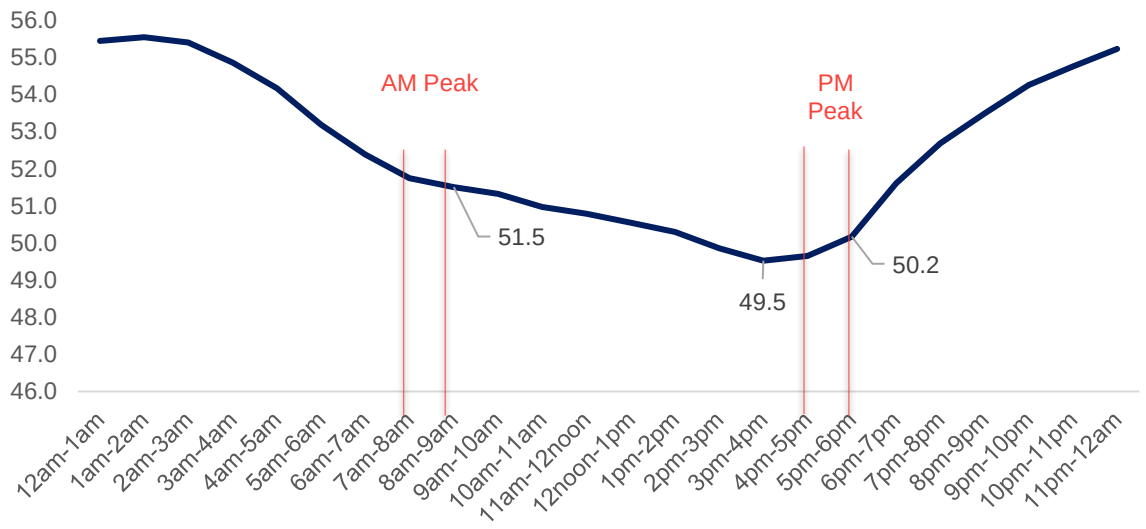
Freight system mobility refers to the ability of goods to move effectively throughout the freight network. A high level of mobility indicates an efficient network that is capable of transporting freight quickly and economically. Mobility is affected by the dynamics of supply and demand; excessive system 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 69 demonstrates the daily profile of average truck speeds along the NHS network in NWI. 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 NWI, 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 NWI, as discussed in the “Truck Bottlenecks” section.

Figure 69: Average Truck Speeds along the NHS by Time of Day in the NWI Region



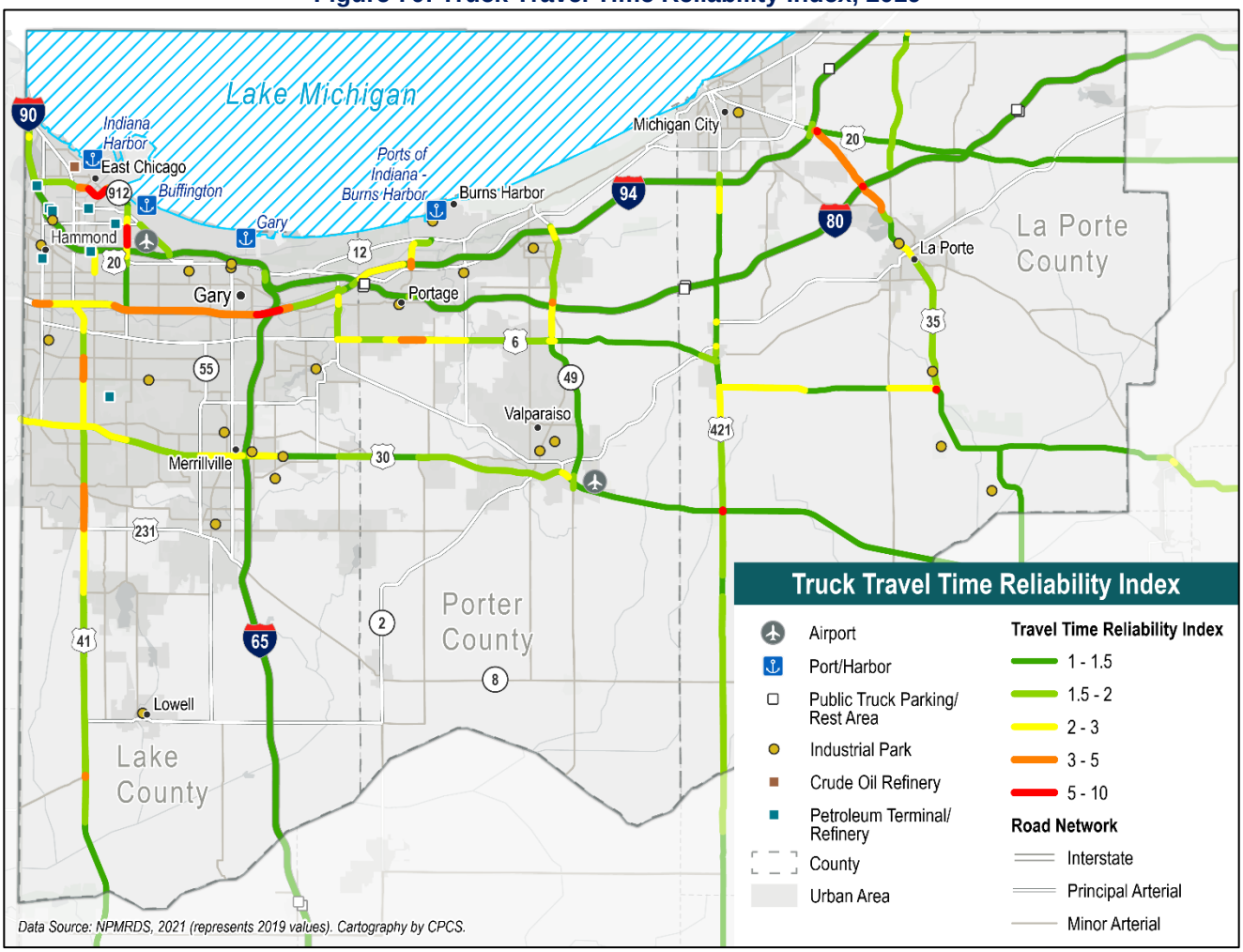
Source: CPCS analysis of NPMRDS Data, 2022.

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 NWI[52], as shown in Figure 70. 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-94/I-80 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.

Figure 70: Truck Travel Time Reliability Index, 2019



Truck Travel Time Delay

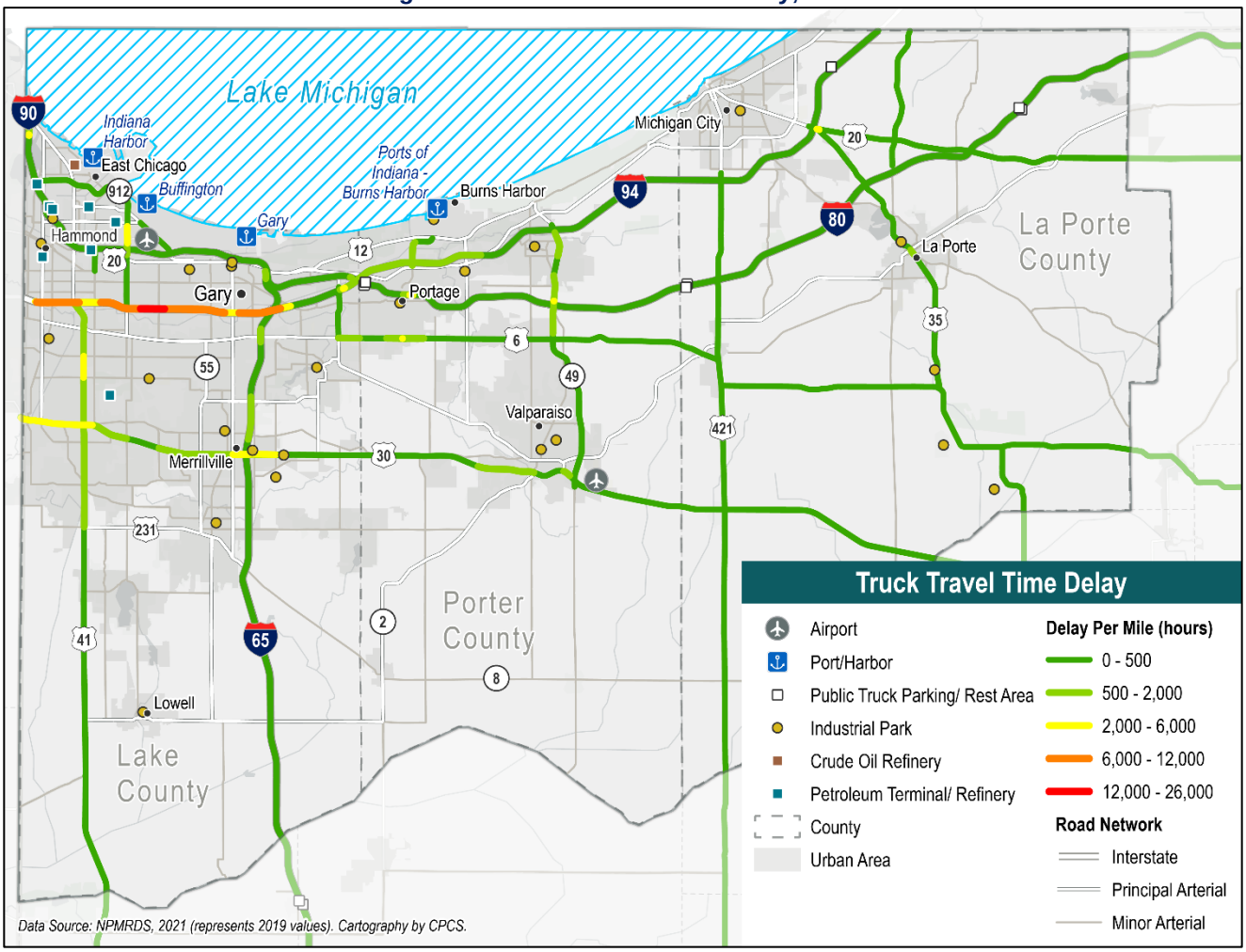
Truck travel time delay per mile (DPM) is another mobility performance measure calculated by dividing the difference between free-flow travel time and observed travel time for each road segment of interest by the segment's length.[53] Figure 71 highlights the segments with high annual DPM values in the NWI region. In general, the Borman Expressway—the portion of I-94/I-80 from just east of the state line to

[52] 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.

[53] 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.

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.

Figure 71: 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.

Figure 72 lists the top truck bottlenecks in NWI, and Figure 73 shows the ranges of DPM-TTTR Index values along the NHS roads in the region. As shown, Borman Expressway—the portion of I-94/I-80 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 NWI.

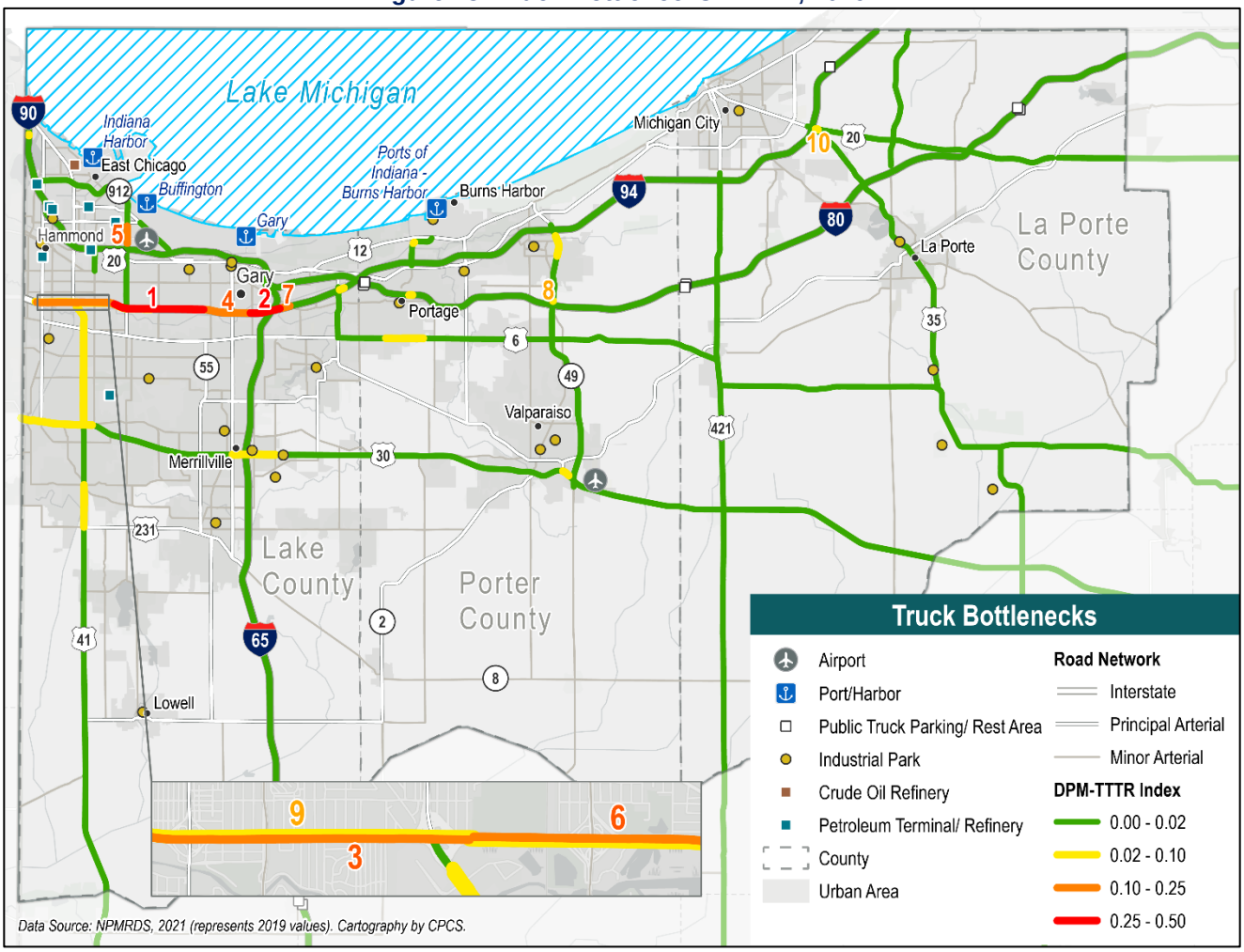
Figure 72: Top 10 Truck Bottlenecks in NWI, 2019

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

Bottleneck Rank	Route Name	From	To	Weighted Average DPM-TTTR	Average Truck AADT
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.

Figure 73: Truck Bottlenecks in NWI, 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[54] and rankings for each highway. One bottleneck in NWI, I-65 at I-80/I-94 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.

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, including improved left 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.

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.[55]

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.

[54] 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. https://truckingresearch.org/2022/02/08/top-100-truck-bottlenecks-2022/

[55] FHWA, Vertical Clearance, Webpage accessed July 2022. https://safety.fhwa.dot.gov/geometric/pubs/mitigationstrategies/chapter3/3_verticalclearance.cfm

- **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.

Figure 74 presents the counts of each bridge clearance category for the 781 bridge overpasses above Interstates, US highways, and state routes in NWI. 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 NWI. Of these low clearance bridges, 126, or 82.8 percent, carry roads, and 24, or 15.8 percent, carry railroads.

Figure 74: Bridge Clearance Category Counts by Type in NWI

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 includes all bridges above Interstates, US highways, and state routes, including roadways and railways. Local roads are not included in the data. Data has been cleaned to include only bridges over roadways.

Figure 75 maps the clearance category of each bridge overpass in NWI. The majority of the most critical bridge clearance concerns lie along the I-90 corridor. In fact, almost all of the bridge overpasses 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.

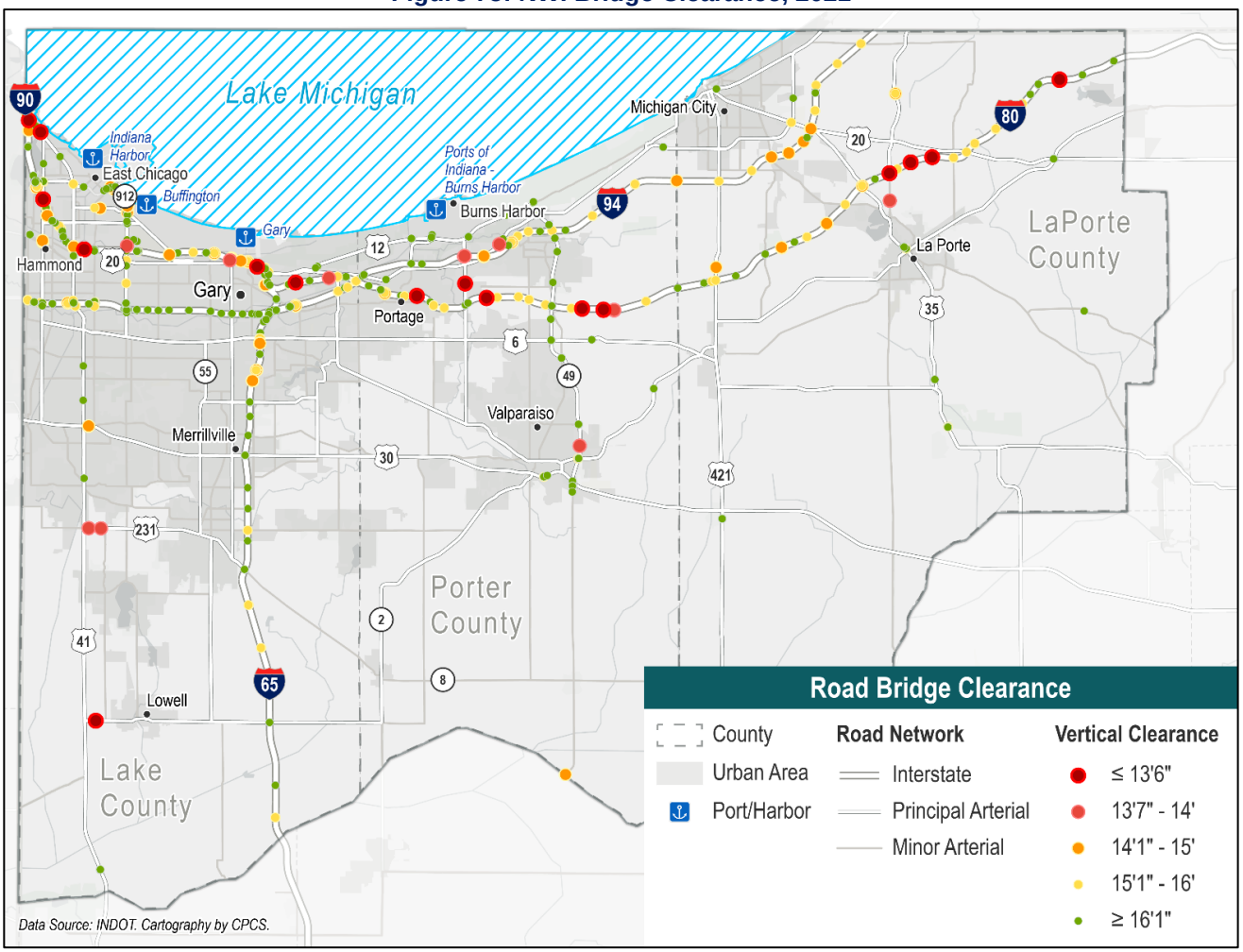
A total of about 76 bridges passing over Interstates or Interstate ramps have clearances of less than 16 feet. About 92 percent of these have clearances between 15 and 16 feet. The remaining six have clearances below 15 feet:

- SR 149 over I-94 EB near Burns Harbor[56]
- SR 149 over I-94 WB near Burns Harbor[57]
- 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.

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

Figure 75: NWI Bridge Clearance, 2021



Note: Data includes all bridges above Interstates, US highways, and state routes, including roadways and railways. Local roads are not included in the data.

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).[58] 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;

[58]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.

- 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[59], In NWI, 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-Burn Harbor can be accommodated by SR 312, SR 912, US 12, US 20, and SR 39.[60] In NWI, the maximum weight on designated extra heavy-duty highways is 134,000 lbs.

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.

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.

The NWI 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[61], local communities have observed the issue of trains blocking at-grade crossings has only become worse. From January to September 2019, 348 incidents were observed where a crossing warning system was activated.[62] 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.

[59] Indiana Multimodal Freight Plan Update 2018, Chapter 4. Retrieved from https://www.in.gov/indot/files/IN2018SFP-Chapter-4.pdf as of July 2022.

[60] Indiana Extra Heavy Duty Highways, North West Indiana. Retrieved from https://www.in.gov/indot/doing-business-with-indot/files/Hvydty.pdf, as of July 2022.

[61] Indiana Supreme Court ruling stops communities from finding trains for blocked streets, South Bend Tribune, September 2018. https://www.southbendtribune.com/story/news/2018/09/25/indiana-supreme-court-ruling-stops-communities-from-fining-trains-for-blocked-streets/46494025/ | The ruling argued that the fines violated the 1995 Interstate Commerce Commission Termination Act which prohibits states from managing or governing railroads.

[62] EME Rail Solutions on-site evaluation of rail crossing incidents in 2019.

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.

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 NWI are within a half-mile distance of an at-grade crossing.[63] 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 76 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.

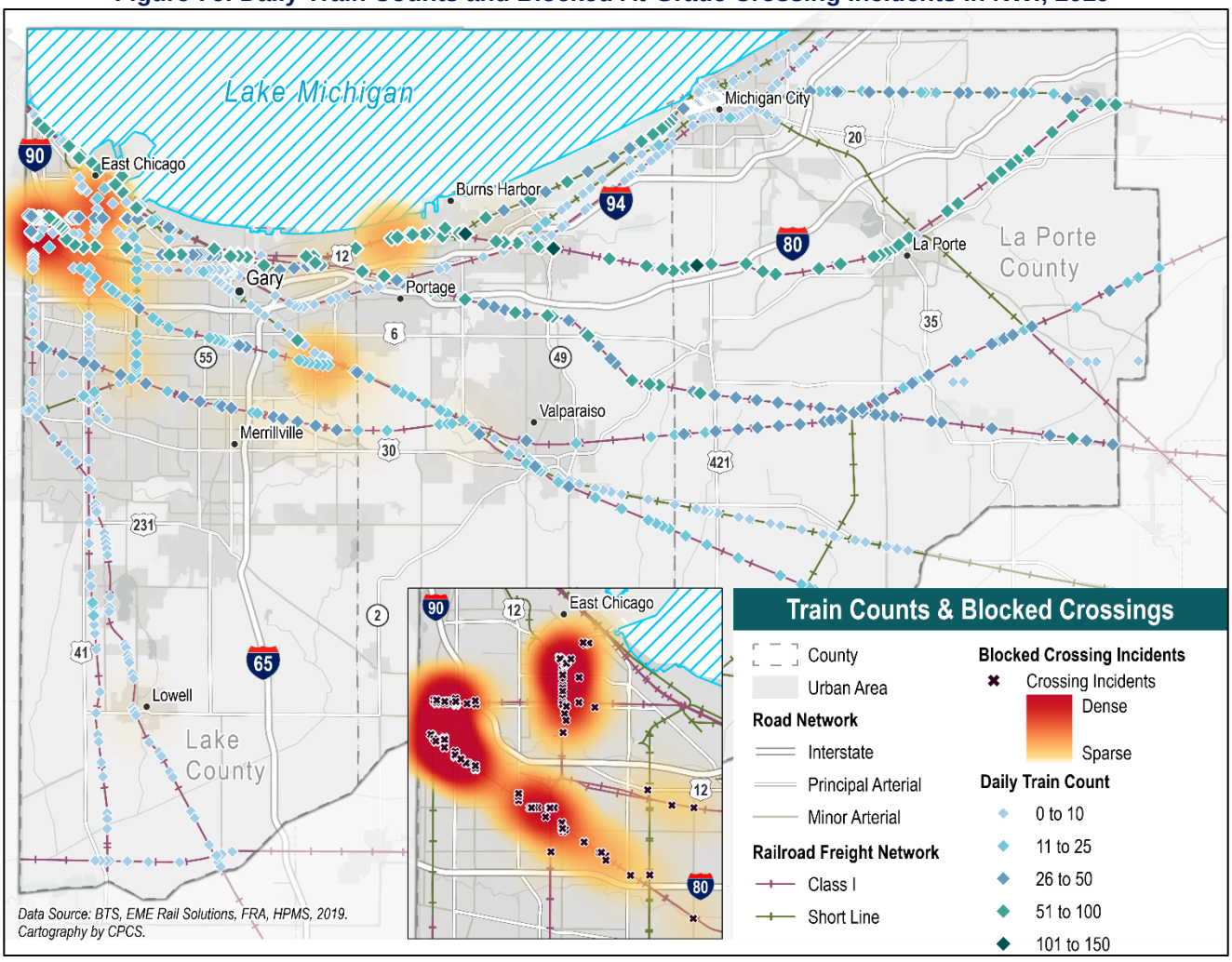
Recognizing the importance of addressing blocked crossings, regional organizations, including the NWI Indiana Rail VISION Group and the NWI Rail Crossings Task Force, have conducted many studies and reports on this topic in recent years.[64] These reports, in addition to stakeholder consultations, identified 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 NWI.

[63] NWI Rail Crossing Task Force Summary Report. Retrieved from https://nirpc.org/wp-content/uploads/RCTF-Summary-Report-10-19.pdf as of July 2022.

[64] Regional At-Grade Crossing Study (retrieved from https://nirpc.org/wp-content/uploads/2017/08/Northwest-IN-At-Grade-Crossing-Report_Final-2.pdf, as of July 2022) and NWI Rail Crossing Task Force Summary Report (retrieved from https://nirpc.org/wp-content/uploads/RCTF-Summary-Report-10-19.pdf as of July 2022).

Figure 76: Daily Train Counts and Blocked At-Grade Crossing Incidents in NWI, 2019



4.4 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.[65]

Indiana sets statewide targets for pavement condition in 2017 with two- and four-year goals, as shown in Figure 77.[66] The NWI region currently uses statewide pavement condition targets, as indicated in the NWI 2050+ Plan. However, NWI intends to establish regional targets soon that encourage more aggressive pavement condition improvements than those adopted statewide.

[65] Overview of Performance Measures: Pavement Condition to Assess the National Highway Performance Program, FHWA, 2017. https://www.fhwa.dot.gov/policyinformation/presentations/hisconf/thu01_hpms_and_tpm-part_1_overview_of_performance_measures-pavement_condition_max_grogg.pdf

[66] Indiana Performance-Based Planning and Asset Management, INDOT, 2019. https://www.in.gov/indot/files/STIP_A_Performance_measures_2019.pdf

Figure 77: Indiana's Statewide Pavement Condition Performance Targets, 2021

Performance Targets	Good	Poor
Interstate	84.2%	0.80%
Non-Interstate NHS	78.7%	3.1%

Source: Indiana Performance-Based Planning and Asset Management, INDOT, 2019. | NWI 2050 Plan, NIRPC.

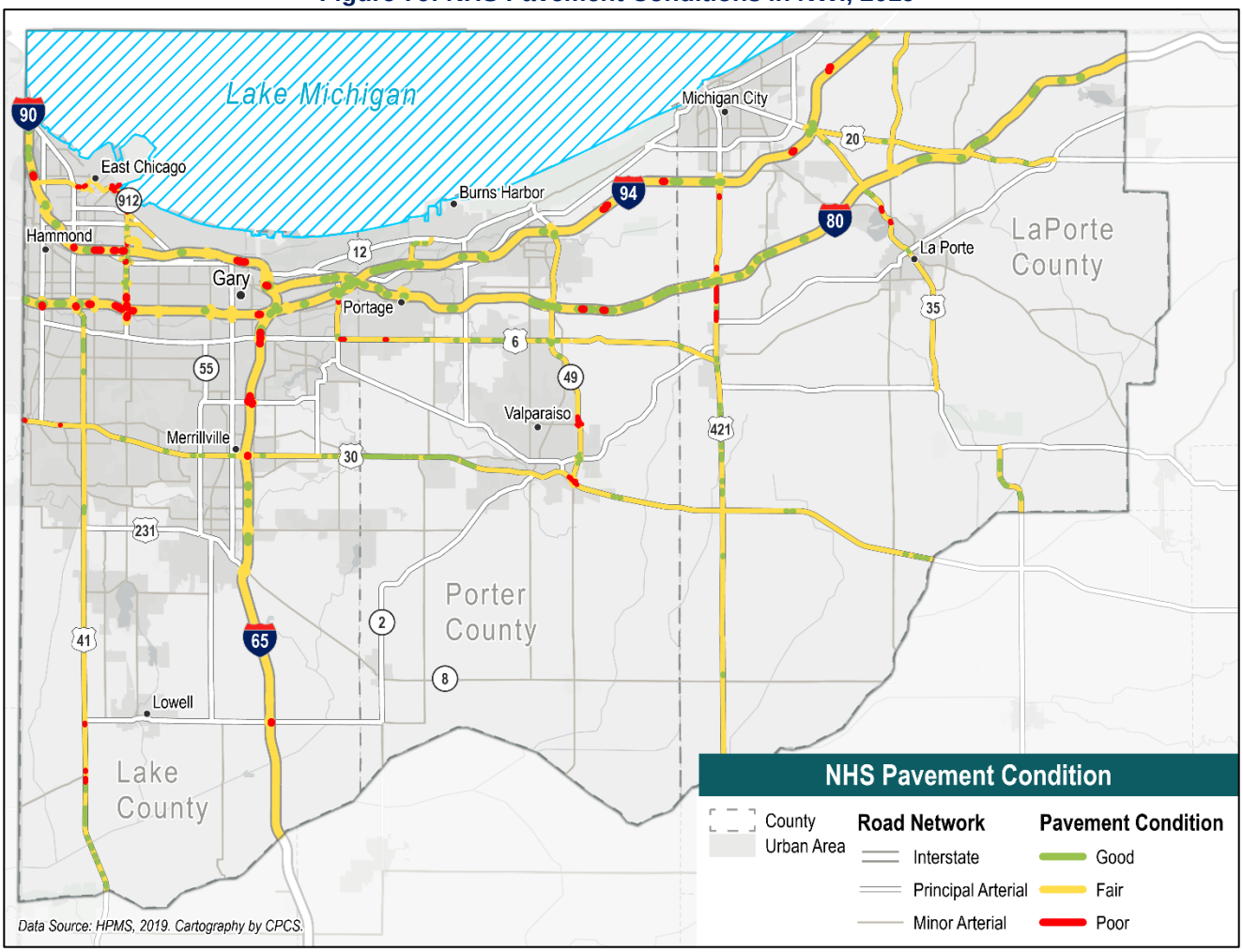
Figure 78 displays the share of Interstate and non-Interstates NHS routes in good, fair, and poor condition. The majority of both Interstate and non-Interstate NHS routes in NWI are in fair condition. The share of roads in good and poor condition tends to fall short of the state performance measure targets. The one exception is that non-Interstate NHS routes meet the performance target of under 3.1 percent of roads in poor condition. Strikingly, only about 5.8 percent of Interstate and 7.7 percent of non-Interstate NHS routes are in good condition. Figure 79 shows a map of pavement conditions on NHS routes in NWI. Roads in poor condition are scattered throughout the region with a noticeable concentration in northern Lake County.

Figure 78: NHS Pavement Condition in NWI, 2019

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.

Figure 79: NHS Pavement Conditions in NWI, 2019



Road Bridge Condition

Figure 80 provides a summary of road bridge inventory and condition in NWI. 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. LaPorte 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.

Figure 80: Count and Average Age of Road Bridges in NWI

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
LaPorte	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.

Figure 81 demonstrates the number of bridges in poor condition in NWI by roadway system. There are a total of 52 bridge structures in poor condition in NWI, 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 LaPorte Counties.

Figure 81: Counts of Road Bridges in Poor Condition by System and County in NWI

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%
LaPorte	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.

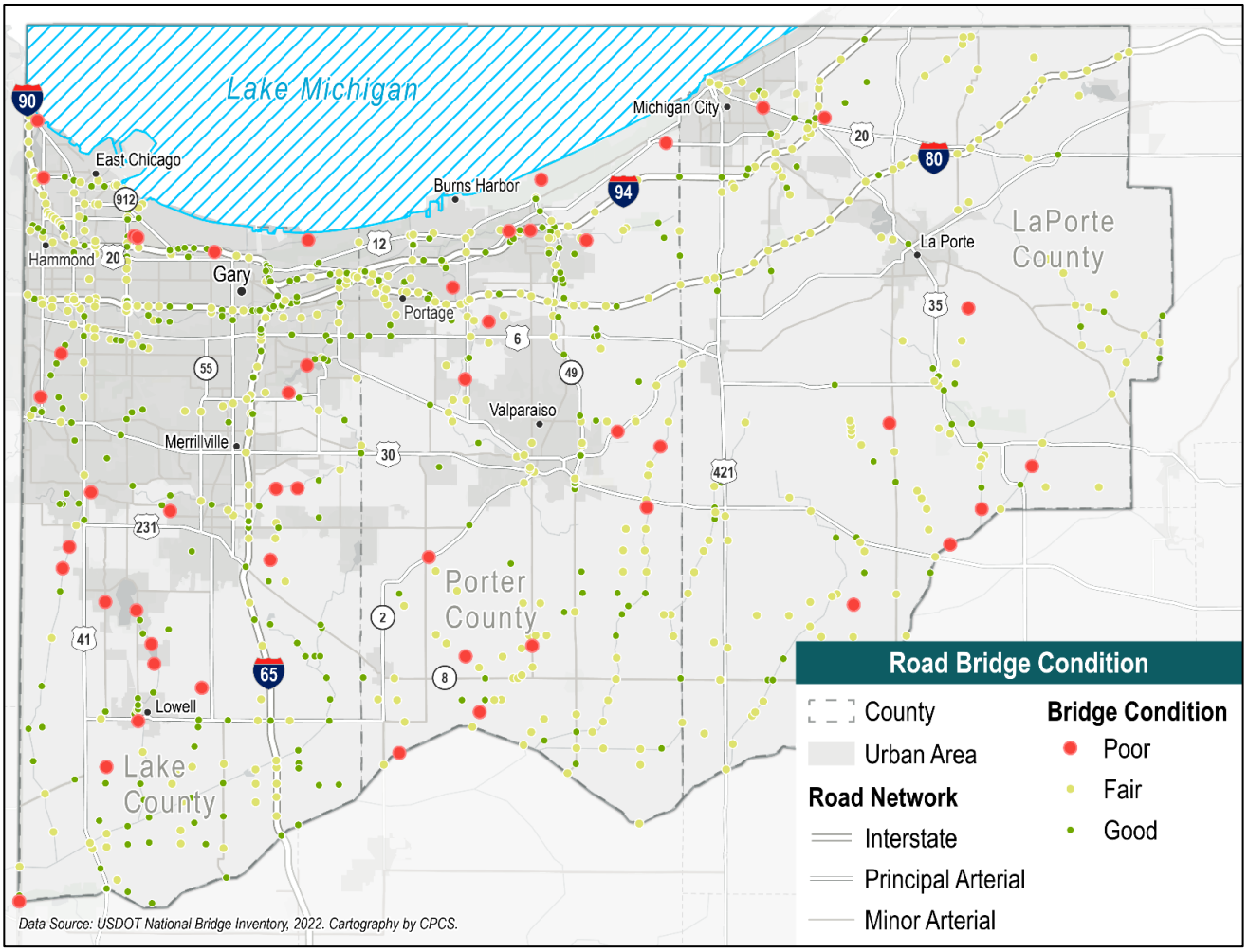
Road Bridges in the Worst Condition in NWI

- 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.

Figure 82 presents a map of overall road bridge conditions in NWI 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.

Figure 82: Overall Road Bridge Conditions in NWI, 2022



Drawbridges

There are three road drawbridges in NWI, two in Lake County and one in LaPorte County. As shown in Figure 83, all three bridges are in fair condition. There are also two rail drawbridges in NWI, which are operated by Canadian National and are not included in this data.

Figure 83: Drawbridge Condition and Year Built

Drawbridge	County	Condition	Year Built
Dickey Road	Lake	Fair	1992
Indianapolis Boulevard	Lake	Fair	1987
Franklin Street	LaPorte	Fair	1932

Source: CPCS analysis of Bureau of Transportation Statistics National Bridge Inventory 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 NWI are 286K capable as is the Chicago, Fort Wayne, & Eastern Railroad (CFE).[67]

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. Figure 84 presents statewide track class information for railroads in NWI.

Figure 84: Statewide Track Class Information for Railroads in NWI

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.[68]

4.5 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.[69] The freight transportation sector thus plays a major role in mitigating air emissions and their impacts.

[67] INDOT State Rail Pna 2021; Chicago, Fort Wayne & Eastern Railroad (CFE), Genesee and Wyoming Railroad. https://www.gwrr.com/cfe/

[68] 49 CFR § 213.9 – Classes of track: operating speed limits., Legal Information Institute, Cornell Law School. https://www.law.cornell.edu/cfr/text/49/213.9

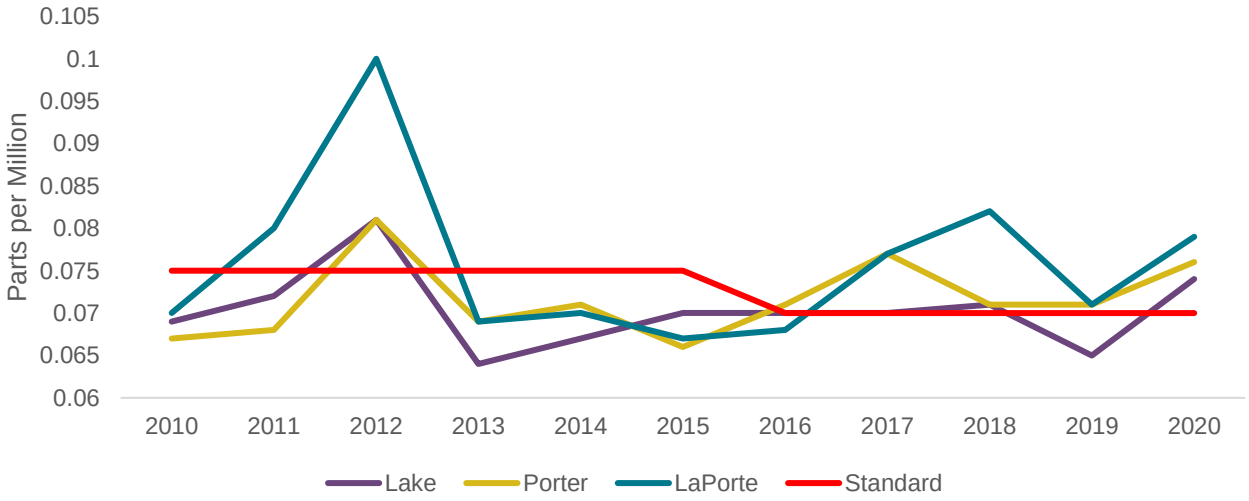
[69] Fast Facts on Transportation Greenhouse Gas Emissions, US EPA, (n.d.). https://www.epa.gov/greenvehicles/fast-facts-transportation-greenhouse-gas-emissions

Nonattainment

Of the six pollutants regulated by the Clean Air Act, all three counties in the NWI region 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 communities 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. [70] Internal combustion engines release nitrogen oxides (NOx) and volatile organic compounds (VOCs), which react under the presence of sunlight to produce Ozone.[71]

Figure 85 shows the annual fourth-highest daily maximum 8-hour average ozone concentrations for each NWI 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 NWI region hovers right around the standard, and Ozone emissions have been increasing slightly in recent years.

Figure 85: Ozone 4th Maximum 8-Hour in NWI



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.

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 NWI will conform with national Ozone emissions standards.[72]

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.[73]

[70] Air Quality Conformity Determination Report, NIRPC, April 2021. https://nirpc.org/wp-content/uploads/Res-21-07-Air-Quality-Conformity_with_Report.pdf
[71] Ground-level Ozone Basics, EPA, June 2022. https://www.epa.gov/ground-level-ozone-pollution/ground-level-ozone-basics#formation
[72] Air Quality Conformity Determination Report, NIRPC, April 2021. https://nirpc.org/wp-content/uploads/Res-21-07-Air-Quality-Conformity_with_Report.pdf
[73] Ibid.

Major Emitters

Figure 86 presents the top 10 highest greenhouse gas emitting facilities in NWI 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 facilities in 2019, seven were in Lake County, two were in Porter County, and one was in LaPorte County. All the facilities are freight-dependent.

Figure 86: Top 10 Major Emitter Facilities in NWI, 2019

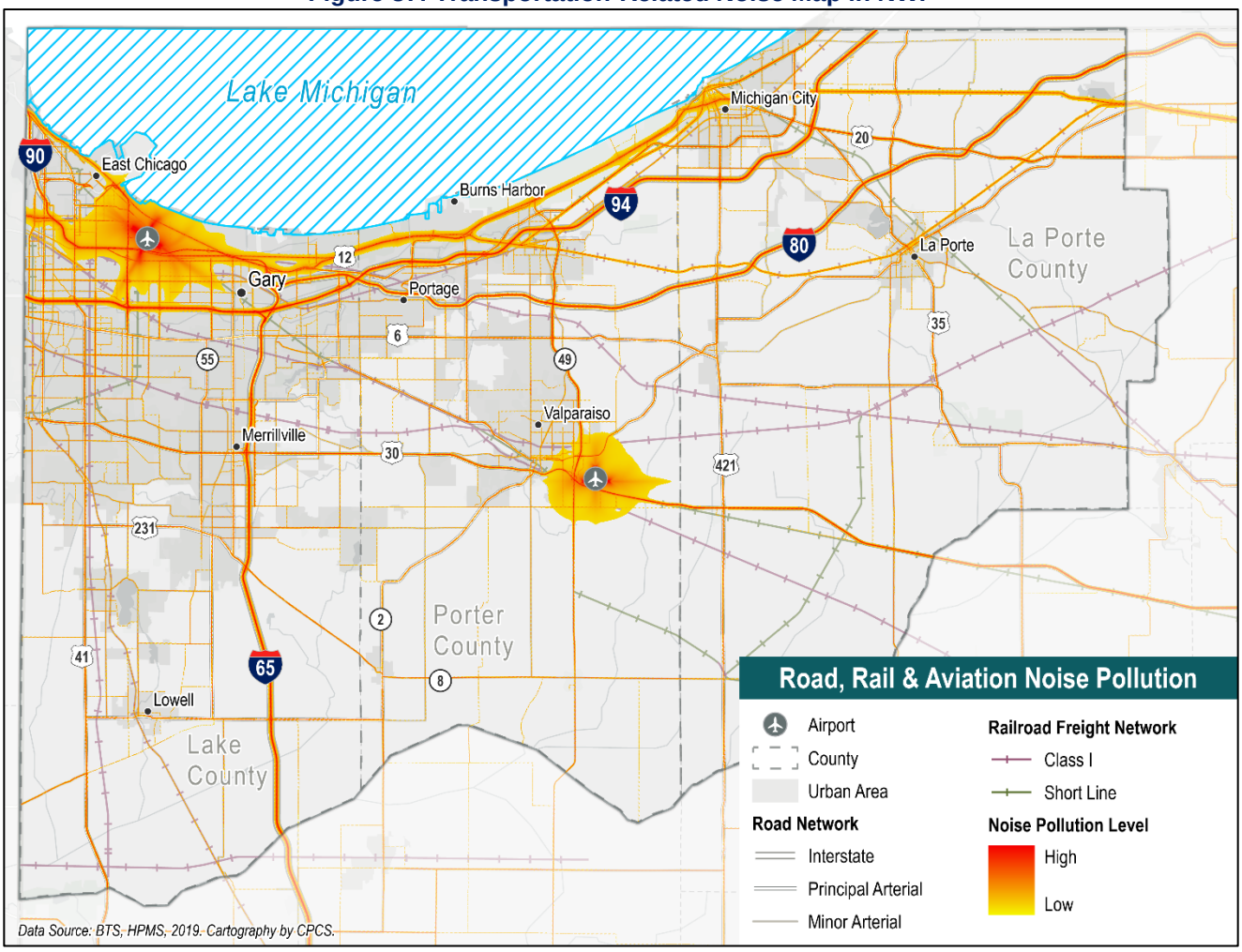
Facility	Parent Company	City	County	GHG (metric tons CO2e)
US Steel – Gary Works	US Steel Corp	Gary	Lake	9,015,960
Cleveland-Cliffs Burns Harbor LLC	Cleveland Cliffs Burns Harbor LLC (formerly ArcelorMittal)	Burn Harbor	Porter	7,739,921
Cleveland-Cliffs Steel LLC (3210 Watling St)	Cleveland Cliffs Burns 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 Burns 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	LaPorte	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.

Noise Pollution

Noise pollution can have serious impacts on both surrounding wildlife and human health and quality of life. As shown in Figure 87, transportation-related noise pollution in NWI 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.

Figure 87: Transportation-Related Noise Map in NWI



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 88 provides a snapshot of the number of hazardous spills in NWI 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 89 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 88: Number of Reported Spills in NWI, 2011-2021

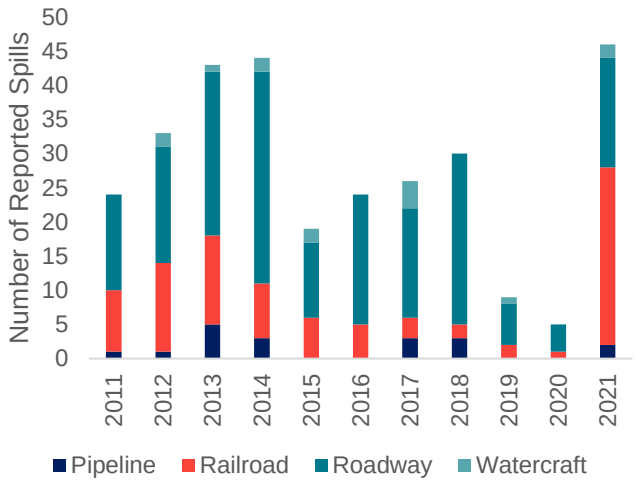
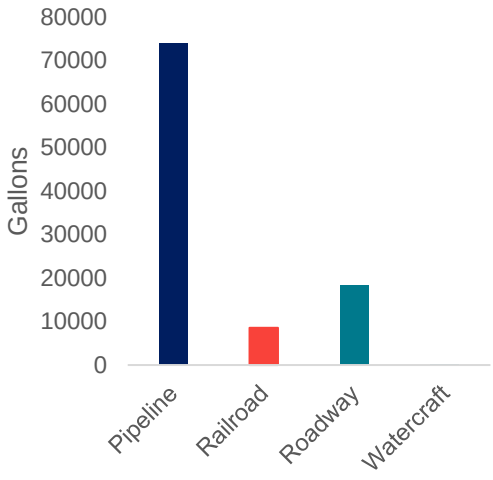


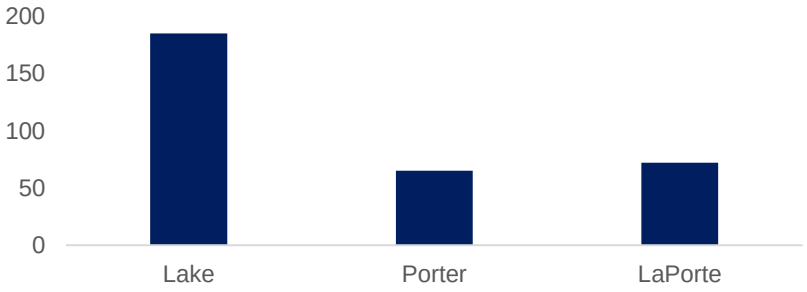
Figure 89: Reported Volume of Hazardous Spills in NWI, 2011-2021



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

Figure 90 shows that the majority of hazardous spills in NWI between 2011 and 2021 occurred in Lake County.

Figure 90: Number of Hazardous Spills by County, 2011-2021



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

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.

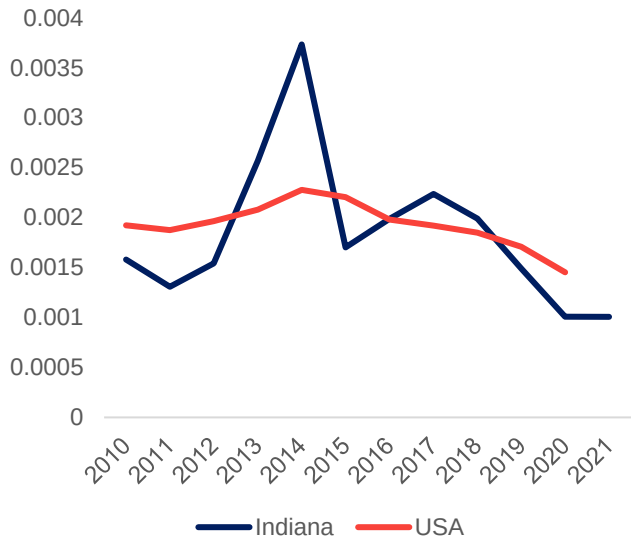
(2) An event that results in an emergency shutdown of an LNG facility or a UNGSF. Activation of an emergency shutdown system for reasons other than an actual emergency within the facility does not constitute an incident.

(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.

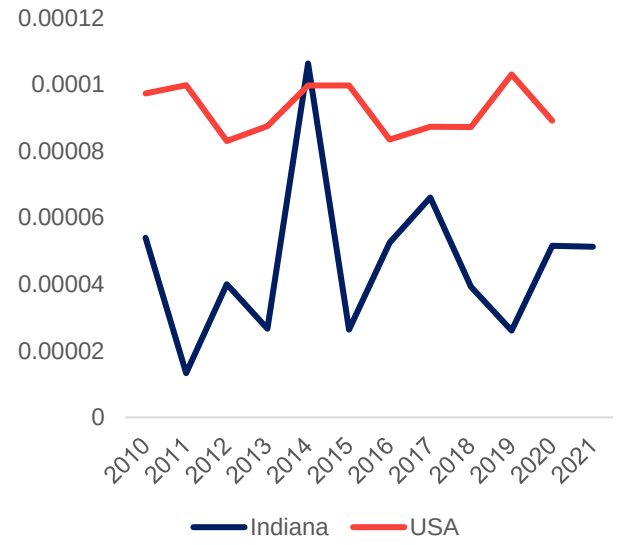
One way of assessing pipeline safety performance, in particular, is to examine the number of pipeline incidents per pipeline mile. Figure 91 shows the number of hazardous liquid incidents scaled by hazardous liquid pipeline miles between 2010 and 2021 in Indiana and the US overall. Indiana experiences a roughly similar rate of incidents per pipeline mile compared to the country overall. Figure 92 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 NWI.

Figure 91: 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 hazardous liquids only (Crude Oil, Refined PP, H.V.L. Flamm Toxic, CO2, Biofuel). Values are calculated by year and then averaged.

Figure 92: Natural Gas Incidents per Mile of Pipeline in Indiana and US, 2010-2021



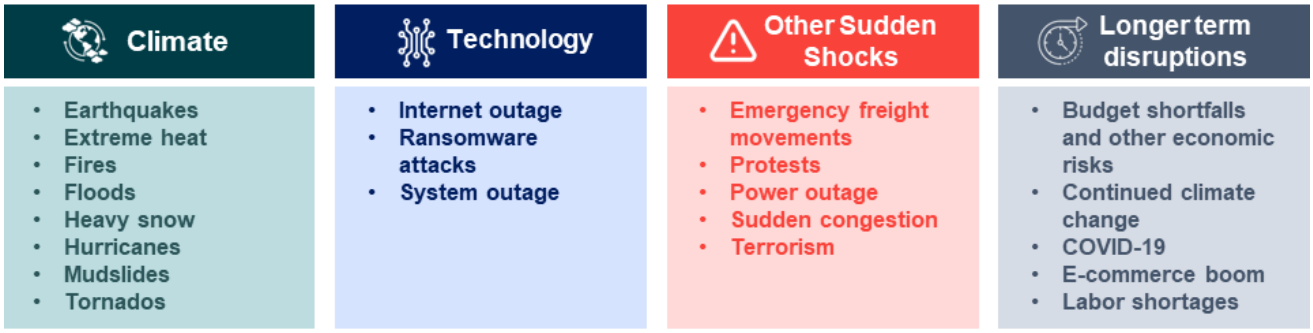
Source: CPCS analysis of USDOT Pipeline and Hazardous Materials Safety Administration's Pipeline Miles and Facilities 2010+ and All Reported Incidents data, 2022.
Note: Pipeline miles and incidents are for gas pipelines only (gas distribution, gas gathering, gas transmission). Values are calculated by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

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 93), 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 misfortunate or change.

Figure 93: Freight System Disruptions



Source: CPCS

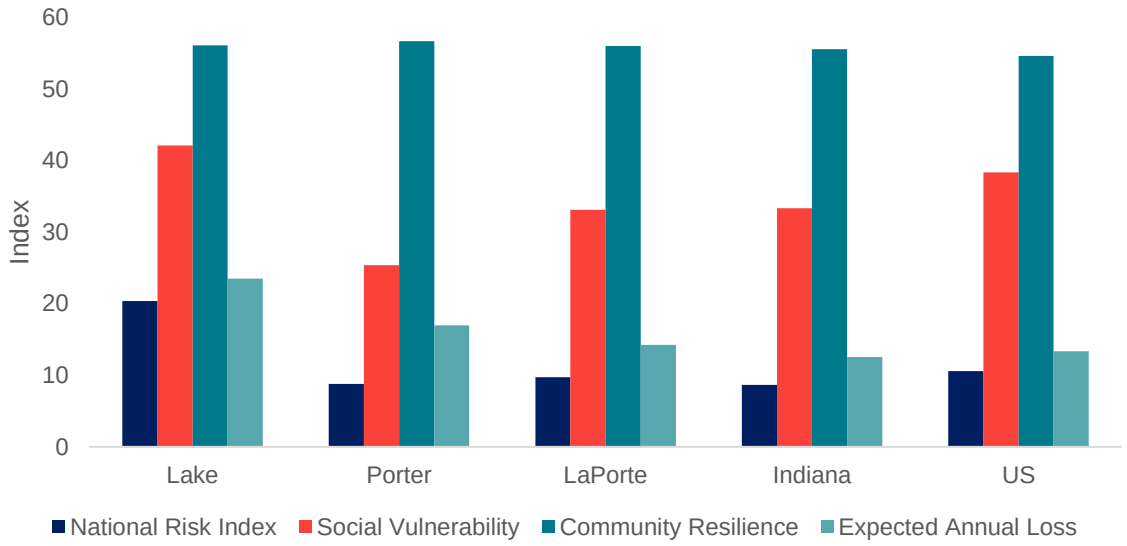
Infrastructure and operations that are not prepared for sudden shocks or long-term changes may result in serious impacts on safety and security, transportation system management, asset preservation, and freight and economic vitality. Strategic investments in tactical improvements to infrastructure (e.g., 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 94 shows that Lake County sees a higher composite risk index than the other two counties in NWI. In fact, almost 94 percent of counties in the US have a lower risk index than Lake County. Meanwhile, LaPorte 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, and tornados.[74] 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.

[74] National Risk Index, FEMA. https://hazards.fema.gov/nri/map

Figure 94: Composite National Risk Indices and Component Indices for NWI Counties



Source: CPCS analysis of FEMA National Risk Index data, 2022.

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 often 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: NWITimes, 2022.

5 Conclusions and Next Steps

Key Chapter Takeaways

NWI's robust freight network is a critical source of economic vitality in the region, supporting a variety of freight-dependent industries. However, freight-dependent industries in NWI face serious demographic challenges. The region's working age population is shrinking, driving workforce shortages for many industries in NWI.

The mobility of goods is the essential role of the freight system. Mobility, however, is an issue on many of NWI's roads. The freight system is also responsible for ensuring the safety of its users. However, truck-involved crashes have seen increases in NWI recently, as have rail safety incidents. The region's high concentration of at-grade crossings not only pose mobility issues, but also introduce considerable safety concerns. The region is also faced with substantial pass-through freight traffic, which exacerbates freight congestion and worsens pavement conditions that already underperform state targets.

Infrastructure projects in NWI 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.

The data and analysis presented in this report will be used as a foundation to establish regional freight system visions, goals, and objectives, and ultimately, to propose project recommendations and prioritization.

5.1 Conclusions

NWI'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 NWI face serious demographic challenges. The region's working age population is shrinking, driving workforce shortages for many industries in NWI. 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 NWI'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 NWI are at-grade, and the region has almost double 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 NWI 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.

NWI'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 NWI, 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 NWI 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 NWI 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 NWI 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 NWI'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 95.

Figure 95: NWI Freight Needs and Issues

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 drawbridges are in poor condition	Upgrades to drawbridges

	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

5.2 Next Steps

This working paper represents the conclusion of Phase 1 of the Freight Element of NIRPC's NWI 2050+ Plan. The freight system conditions, needs, and issues identified in this working paper provide the foundation for all future work on the NWI 2050+ Plan. The data and analysis presented here will be supplemented with additional feedback and insights from stakeholder consultations and committee meetings. This will be used to establish regional freight system visions, goals, and objectives as part of Phase 2, and, ultimately, to propose project recommendations and prioritization as part of Phase 3.

Appendix A. Review of the Existing Studies, Plans, and Other Relevant Documents

Figure 96: Plans and Studies Reviewed

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.

Summary of Key Takeaways

The high concentration of freight activities in NWI 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. The NIRPC 2050+ MTP will be developed in alignment with regional goals brought forward from the NWI 2050 Plan. 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:

- NWI 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 NWI are Norfolk Southern, CSX, and CN. Almost all rail in NWI is 286K compatible.
- There are 1,086 rail crossings in NWI, 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 NWI: the largest is Gary/Chicago International; others are in Griffith, Hobart, Lowell, Valparaiso, Michigan City, and LaPorte

The Economic Profile:

- NWI 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. NWI will likely remain a global center of steel production.
- Gary-Chicago International Airport approved a lease with UPS in May 2020
- Indiana is one of the few places in the US that manufactures railroad locomotives
- 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 is 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

Multimodal Freight Issues in the Region:

- A 2019 Customer Satisfaction Survey found that almost 70 percent of respondents in the LaPorte 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 NWI.
- 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/I-94 in Lake County (state line to I-65), SR 49 in Porter County (I-80/I-90 to I-94), US 20 in LaPorte County (SR 2 junction to I-94), US 30 in LaPorte County (various locations), and US 41 in Lake County (I-84/I-94 to I-90)

Vision

Regional Vision

The NWI 2050 Plan 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 NWI'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 Figure 97.

Figure 97: NIRPC Vision Terms and Themes

	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.

Statewide Goals

In addition to the guidance provided in the regional plan, the statewide freight goals will be used in developing the NWI freight vision and performance measures to ensure synergy between statewide and regional transportation planning. INDOT's FAST Act[75] compliant 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. 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 Multimodal Freight Plan.

[75] 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. https://www.fhwa.dot.gov/fastact/

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. Figure 98 summarizes the relationship between INDOT's goals and national goals for freight performance.

Figure 98: INDOT's Goals Compared to the 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.

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 the NIRPC 2050 Plan are organized according to the plan's four vision components: connected, renewed, united, and vibrant. Figure 99 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.[76] There are no freight-related performance measures under the "United" term proposed in NIRPC's 2050 Plan.

Figure 99: NIRPC Vision Terms and Associated Performance Measures

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	Crashes from ARIES crash database

[76] NIRPC NWI 2050 Plan. https://nirpc.org/2050-plan/.

Vision Term	Performance Measure	Analysis Proposed
	Number of serious injuries Rate of serious injuries per 100 million VMT	
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
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 o 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

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 percent 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.
- **Multimodal Integration and Synergy:** performance measures include the percent of intermodal connectors with "fair" or better pavement conditions and the number of intermodal or multimodal 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 Figure 100, the report summarizes the measures ranked by the public and private sector stakeholders based on expected and emerging freight industry trends. The project team will use the guidelines provided in this report as a starting point for refining the performance measures for the Freight Element.

Figure 100: Performance Information for National Report Card Performance Summaries

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
	Uncertain performance trend	NHS Bridge Structural Deficiencies

Topic Area	Trend	Recommended Measure
Freight System Condition		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.

Appendix B. Stakeholder Consultation List

Figure 101: 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.

Appendix C. Industry-Level FAF Analysis

Metals Manufacturing

Figure 102: Commodities Considered in Metals Manufacturing FAF Analysis

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

Figure 103: Tonnage Modal Split for Metals Manufacturing

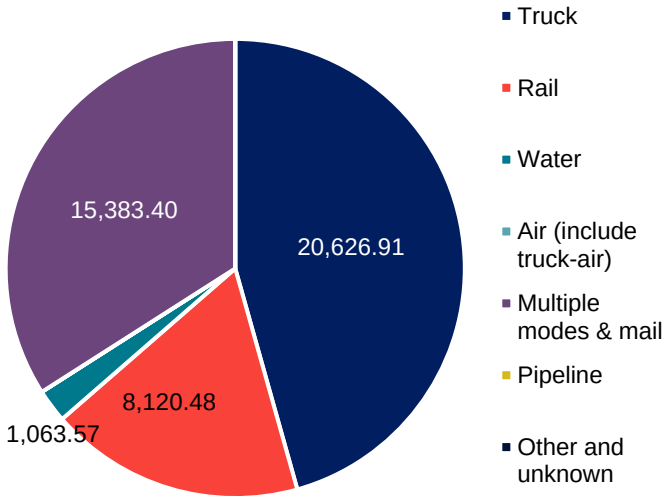
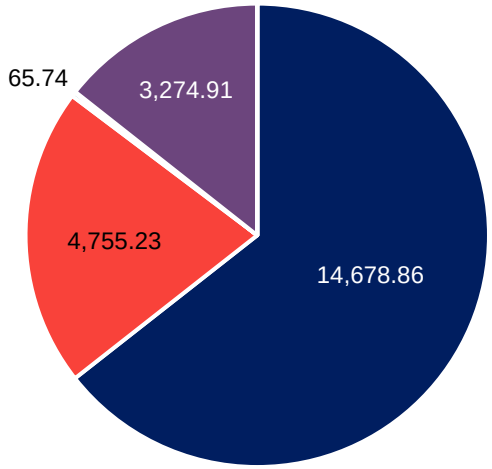


Figure 104: Value Modal Split for Metals Manufacturing



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

Figure 105: Modal Split for Metals Manufacturing Commodities in NWI

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.

Figure 106: Flow Type for Metals Manufacturing Commodities in NWI

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

Nonmetal Mineral Manufacturing

Figure 107: Commodities Considered in Non-Metallic Minerals Manufacturing FAF Analysis

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

Figure 108: Tonnage Modal Split for Non-Metallic Minerals Manufacturing

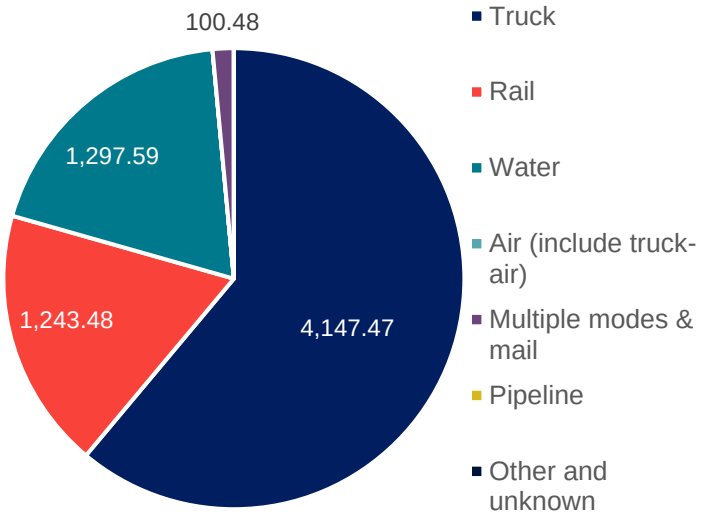
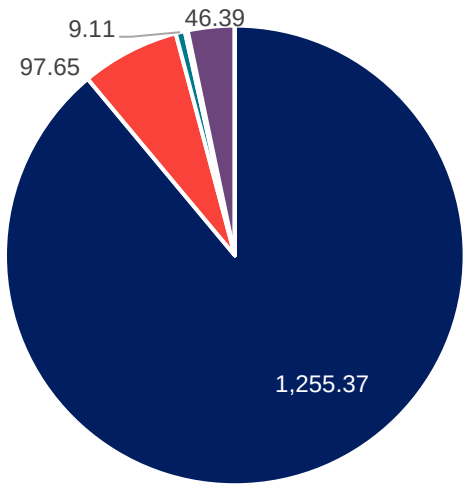


Figure 109: Value Modal Split for Non-Metallic Minerals Manufacturing



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

Figure 110: Modal Split for Nonmetal Minerals Manufacturing Commodities in NWI

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.

Figure 111: Flow Type for Nonmetal Minerals Manufacturing Commodities in NWI

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

Machinery Manufacturing

Figure 112: Commodities Considered in Machinery Manufacturing FAF Analysis

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

Figure 113: Tonnage Modal Split for Machinery Manufacturing

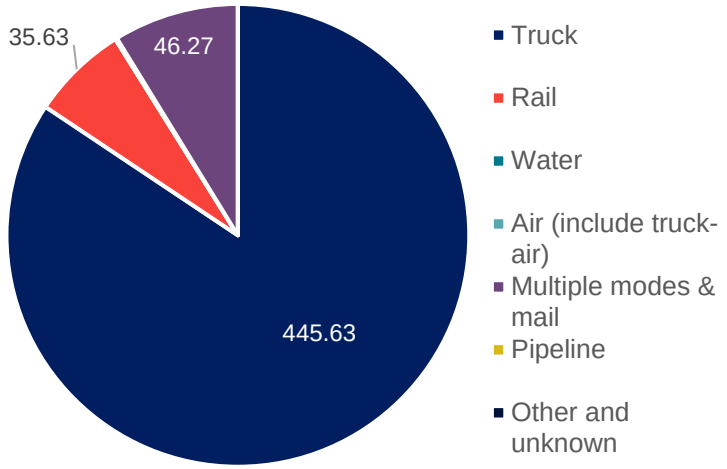
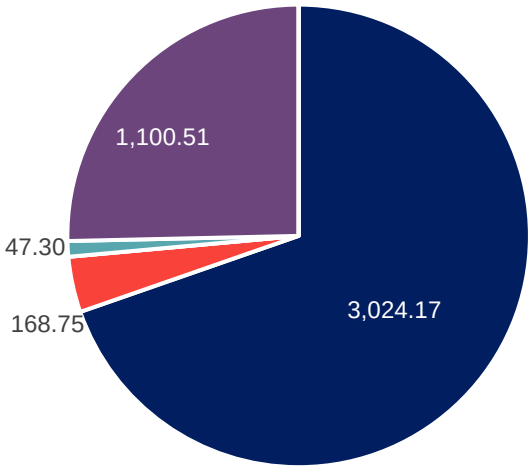


Figure 114: Value Modal Split for Machinery Manufacturing



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

Figure 115: Modal Split for Machinery Manufacturing Commodities in NWI

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.

Figure 116: Flow Type for Machinery Manufacturing Commodities in NWI

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.

Oil and Gas

Figure 117: Commodities Considered in Oil and Gas FAF Analysis

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

Source: CPCS analysis of FAF5 data, 2022.

Figure 118: Tonnage Modal Split for Oil and Gas

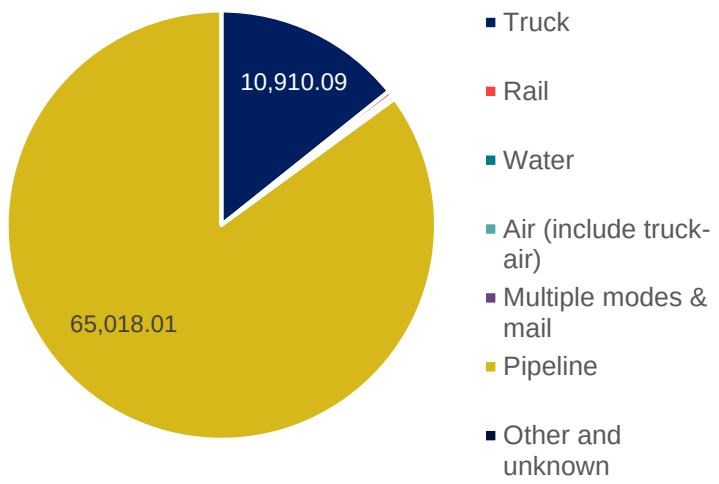
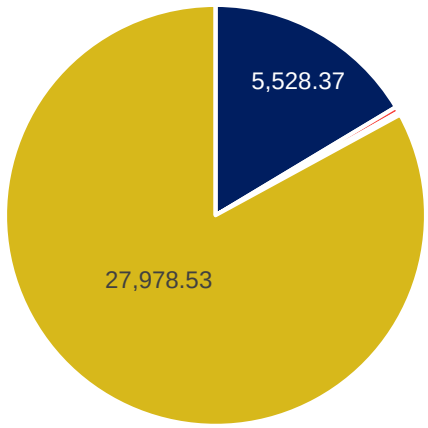


Figure 119: Value Modal Split for Oil and Gas



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

Figure 120: Modal Split for Oil and Gas Commodities in NWI

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.

Figure 121: Flow Type for Oil and Gas Commodities in NWI

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

Food Manufacturing

Figure 122: Commodities Considered in Food Manufacturing FAF Analysis

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

Source: CPCS analysis of FAF5 data, 2022

Figure 123: Tonnage Modal Split for Food Manufacturing

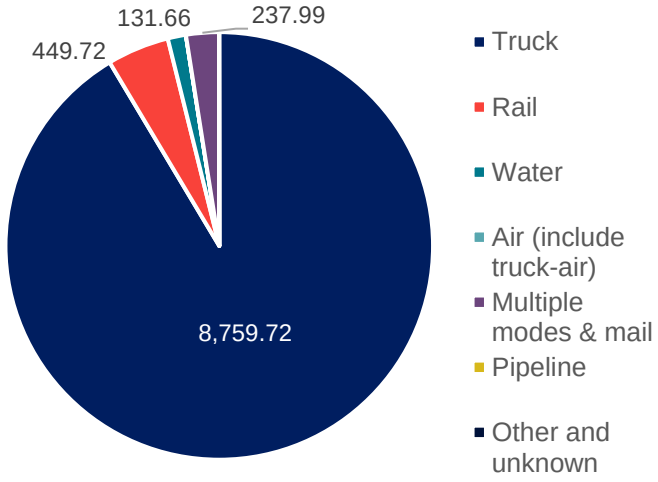
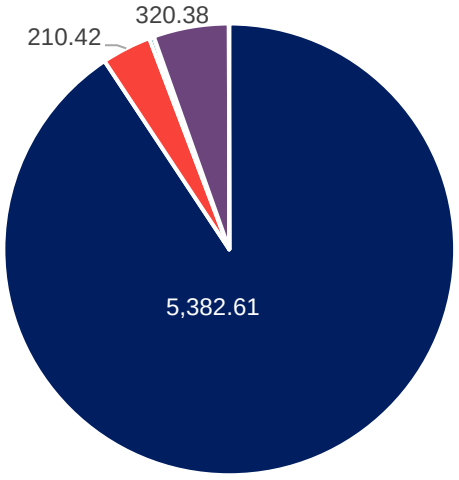


Figure 124: Value Modal Split for Food Manufacturing



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

Figure 125: Modal Split for Food Manufacturing Commodities in NWI

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.

Figure 126: Flow Type for Food Manufacturing Commodities in NWI

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.

Transportation and Warehousing

Figure 127: Commodities Considered in Transportation Equipment FAF Analysis

SCTG Code	SCTG Name
36	Motorized vehicles
37	Transportation equipment

Source: CPCS analysis of FAF5 data, 2022.

Figure 128: Tonnage Modal Split for Transportation Equipment

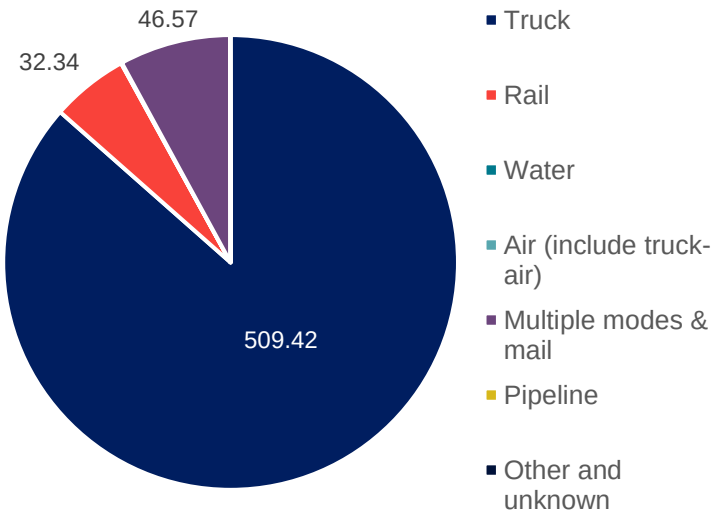
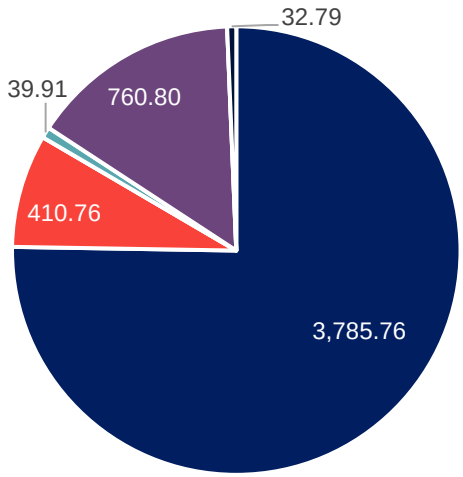


Figure 129: Value Modal Split for Transportation Equipment



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

Figure 130: Modal Split for Transportation Equipment in NWI

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.

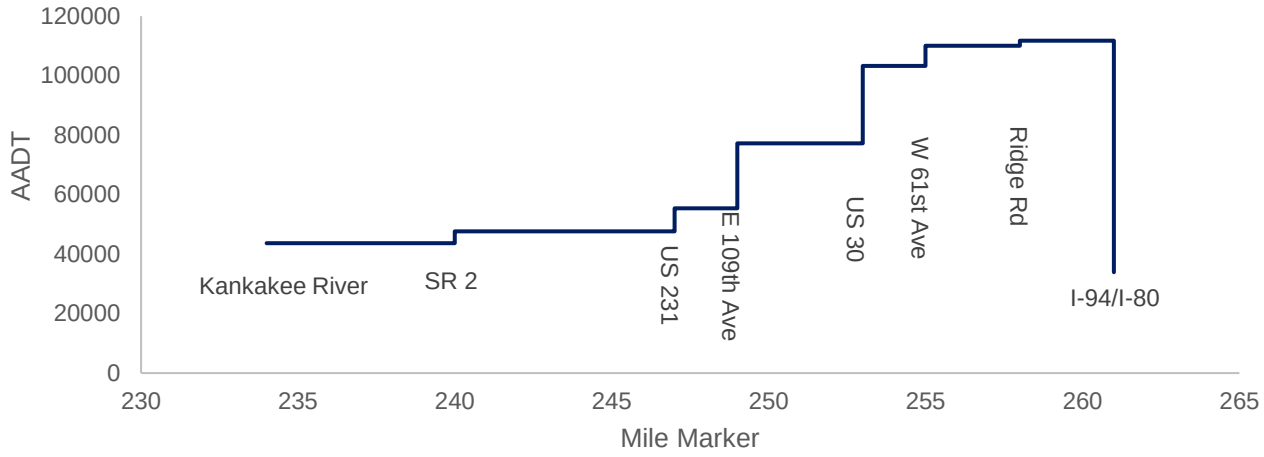
Figure 131: Flow Type for Transportation Equipment in NWI

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.

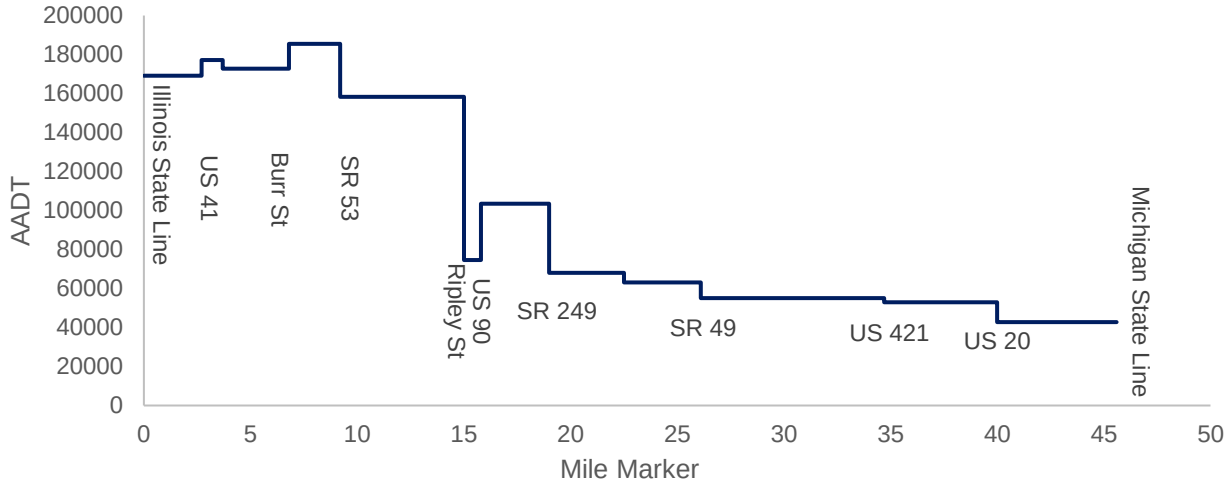
Appendix D. AADT Profile

Figure 132: I-65 AADT in NWI, 2019



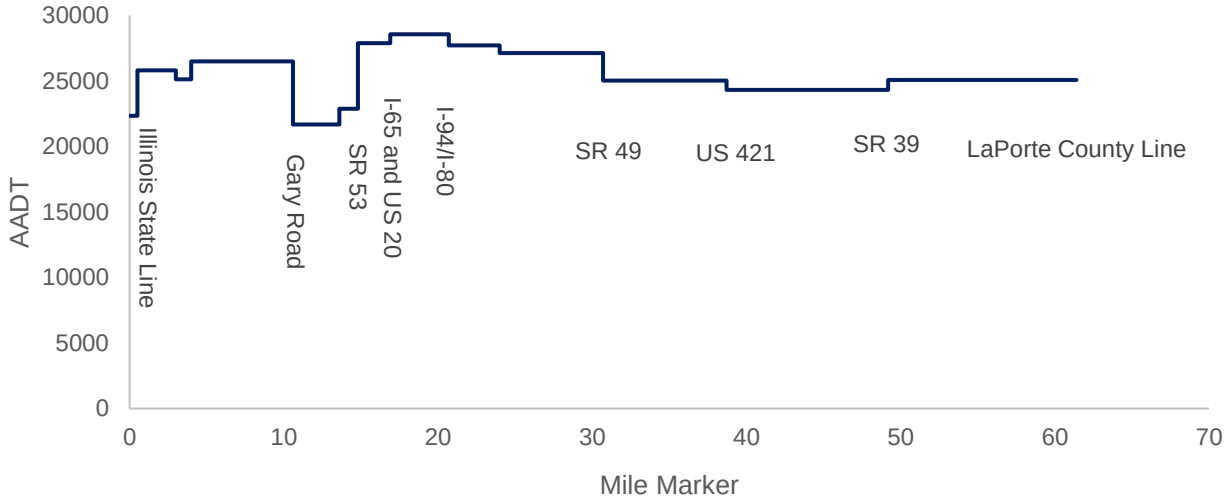
Source: CPCS of HPMS 2019 data. Mile Markers – System 1 Roads (INDOT) 2012, Indiana.edu, 2022.

Figure 133: I-94 AADT in NWI, 2019



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

Figure 134: I-90 AADT in NWI, 2019



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

Appendix E. Truck Parking Inventory

Figure 135: Truck Parking Inventory NWI

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	LaPorte	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
Hebron	Porter	Pilot Travel Center #448	140	Private	18011 Colorado Street Hebron, IN 46341
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
LaPorte	LaPorte	Speedway	4	Private	I-94 Ex 40a, 5905 N US 35, La Porte IN 46350
LaPorte	LaPorte	Gallops LaPorte	18	Private	1877 US 20, La Porte, IN 46350

City	County	Name	Number of spaces*	Type	Address
LaPorte	LaPorte	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	LaPorte	Michigan City Welcome Center Westbound I-94	31	Public	I-94 Westbound, Michigan City, IN 46360
Michigan City	LaPorte	Speedway	50	Private	2884 N US Hwy 421, Michigan City IN
Michigan City	LaPorte	Gallops Michigan City	30	Private	1615 W US 20 and County Line Rd, Michigan City IN 46360
Portage	Porter	Indiana Toll Road Travel Plaza One Eastbound I-80	52	Public	5100 Plaza Ave, Portage, IN 46368
Portage	Porter	Indiana Toll Road Travel Plaza One Westbound I-80	52	Public	5100 Clem Road, Portage, IN 46368
Portage	Porter	Best Western Portage	36	Private	6200 Melton Rd, Portage, IN 46368
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	LaPorte	Indiana Toll Road Travel Plaza Three Eastbound I-80	40	Public	3 S Knute Rockne Plaza, Rolling Prairie, IN 46371
Rolling Prairie	LaPorte	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	LaPorte	Marathon Gas	14	Private	6352 W Us Highway 30, Wanatah, IN 46390
Westville	LaPorte	Truck parking rest area WB I-90	119	Public	I-90 Westbound Rest Area, Westville, IN
Westville	LaPorte	Truck parking rest area EB I-90	174	Public	I-90 Eastbound Rest Area, Westville, IN
Westville	LaPorte	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.

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