Illinois 2023

State Freight Plan

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Illinois Department of Transportation

Illinois 2023 State Freight Plan

Draft

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Illinois 2023
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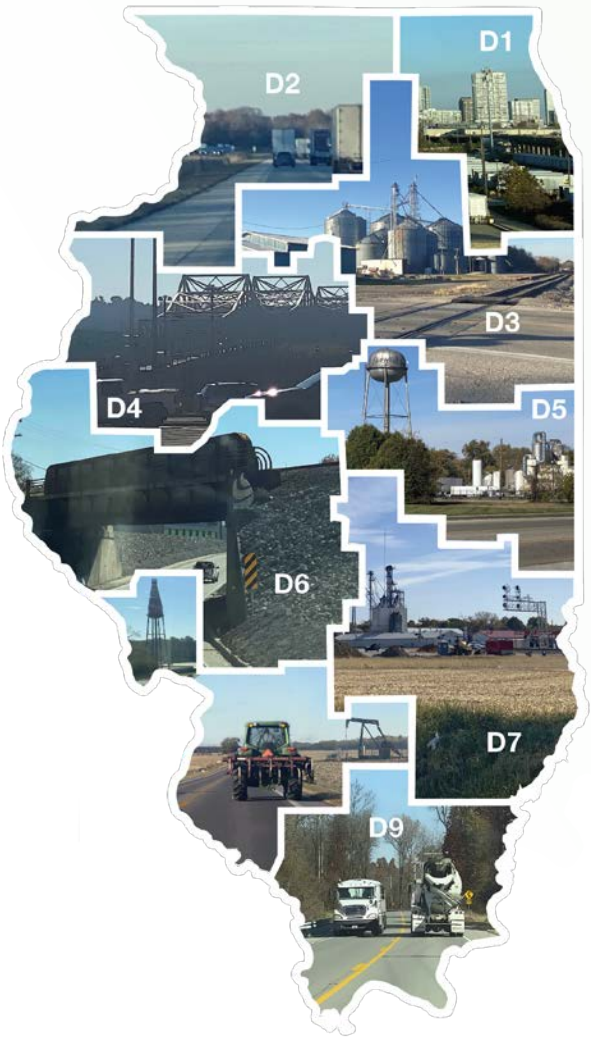
1.0 Introduction to the Illinois 2023 State Freight Plan

Illinois is a vibrant and thriving hub for freight, with 147,000 miles of roadway, over 10,000 miles of railroad tracks, 1,118 miles of navigable waterways, and numerous airports, pipeline and other facilities that carry goods across the State. The State's multimodal freight network connects businesses, and consumers in all parts of the State and across the U.S. One in every four freight trains in the Nation traverses Illinois, primarily through the Nation's premier freight hub, Chicago. In addition to its importance as an international passenger hub, O'Hare International Airport is a world-class cargo airport, bringing fresh fish, flowers, and consumer goods to the State, and shipping out manufactured equipment, agricultural products, and pharmaceuticals from businesses across Illinois and the Midwest. Every year, about 1.6 billion tons ($2.5 trillion dollars)[1] of freight flow into, out of, and through Illinois. According to Federal Highway Administration (FHWA) statistics, Illinois is the third busiest freight state when measured by value, and fourth when measured by tonnage.[2]

FIGURE 1.1 ILLINOIS DEPARTMENT OF TRANSPORTATION DISTRICTS



The Illinois Department of Transportation (IDOT), in partnership with Federal agencies, port authorities, municipalities, and other state and local agencies, plays a critical role in supporting Illinois freight. IDOT builds, maintains, and enhances the infrastructure and technology that serves as the backbone of the State's freight transportation network. IDOT operates with its central headquarters in Springfield and five transportation regions across the State. The five regions host a total of nine highway districts, strategically located to best assess and oversee Illinois' transportation infrastructure (Figure 1.1). IDOT's role is vital not only to support Illinois' economy and way of life, but also to ensure connections between the State and global markets that depend on Illinois to move their goods. Yet the world is changing, and trends such as climate change, shifts in world markets, impacts from the COVID-19 pandemic, and technological advances continue to impact how freight moves both within the State and across the globe. Now more than ever, it is imperative for IDOT to be a leader in advancing the state-of-the-art policies, infrastructure, and technology that is needed to support freight within the State and ensure Illinois' place as a freight hub in the years to come.

[1] S&P Transearch and 2019 STB Carload Waybill Data
[2] Federal Highway Administration (FHWA) Freight Analysis Framework version 5 (FAF5)

1.1 Overview of the Illinois 2023 State Freight Plan

This *Illinois 2023 State Freight Plan* (Freight Plan) has been developed by IDOT in accordance with Federal guidelines for state freight plans as outlined in the Infrastructure Investment and Jobs Act (IIJA), signed into law on November 15, 2021.[3] The Freight Plan fulfills Federal requirements for state freight planning, identifies opportunities for Illinois to invest in its freight system, and positions IDOT to take full advantage of Federal formula and discretionary funding programs for freight transportation investments. Additionally, the Plan details freight activity, needs, and priorities at both the State and District level, and supports IDOT in meeting the agency's overall goals as well as those of this Plan. The organization of this Freight Plan is as follows:

- *Chapter 1.0: Introduction to the Illinois 2023 State Freight Plan*
- *Chapter 2.0: Freight Plan Vision and Goals*
- *Chapter 3.0: Stakeholder Outreach and Engagement*
- *Chapter 4.0: Freight Transportation Drives the Illinois Economy*
- *Chapter 5.0: Illinois' Multimodal Freight Network*
- *Chapter 6.0: Freight, Equity, and the Environment*
- *Chapter 7.0: Freight Demand and Forecasts*
- *Chapter 8.0: Multimodal Freight Trends, Challenges, and Needs*
- *Chapter 9.0: Freight Project Identification, Prioritization, and Investment*
- *Chapter 10.0: Freight Strategies and Actions*
- *Appendix A: IIJA Requirements Reference Table*

The Freight Plan serves as a roadmap for the Illinois' freight program, identifying both policies and investments that will enhance freight in the state. It builds upon IDOT's extensive library of recent transportation plans and programs, incorporates national freight planning best practices for data analytics, and synthesizes input from key public- and private-sector freight stakeholders throughout Illinois.

In addition to this Freight Plan, IDOT is developing nine individual District Freight Plans. These and other Freight Plan materials will be made available on the Freight Plan website, https://www.ilfreightplan.org/.

[3] Table A.1 serves as a guide to reading this plan and its alignment with Federal requirements.

2.0 Freight Plan Vision and Goals

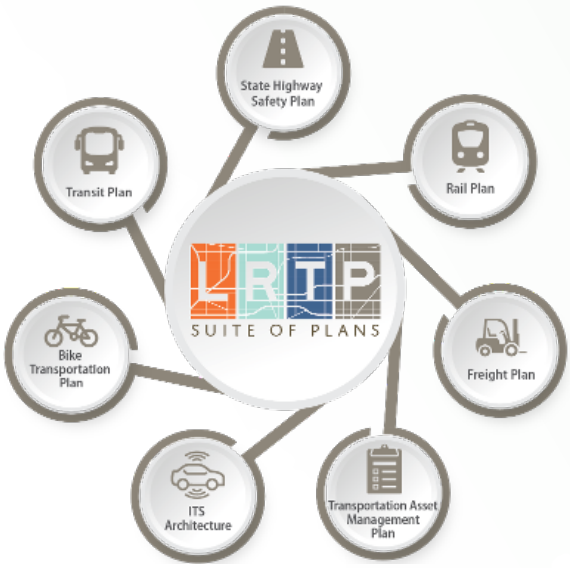
Setting a clear Vision and Goals for freight is an important step to guide direction of the 2023 Illinois State Freight Plan. Moreover, the vision and goals serve as a guide for IDOT, its planning partners, and freight stakeholders throughout the entire planning process and into implementation. The 2023 Illinois State Freight Plan Vision and Goals were created through a collaborative and robust process involving numerous stakeholders. Between August and October 2021, subject matter experts, freight industry representatives, and IDOT representatives collaborated to define the Vision and Goals of the Freight Plan. The U.S. Department of Transportation (DOT) National Freight Program goals, the National Highway Freight Program goals, and IIJA guidance were also used to inform the process.

A STATEWIDE, COLLABORATIVE VISION FOR FREIGHT

- IDOT worked with subject matter experts to develop a first draft of a vision and goals
- Illinois State Freight Advisory Council (ISFAC) representatives, IDOT District staff, local agencies, and freight industry stakeholders vetted the draft vision and goals
- IDOT developed a final vision and goals for inclusion in this plan

IDOT's previous planning efforts, including the 2017 Illinois State Freight Plan and IDOT's Long-Range Transportation Plan (LRTP) were also reviewed and used to inform the Vision and Goals development. The Freight Plan is part of IDOT's "Suite of Plans" (Figure 2.1) under the umbrella of the LRTP. The LRTP sets long-range policy and strategic direction for development of asset and system-specific actions, including the Freight Plan. The Freight Plan role is to guide understanding of freight modal needs and to establish concrete strategies and actions that align with overarching LRTP goals.

FIGURE 2.1 IDOT SUITE OF PLANS



The finalized Freight Plan Vision (Figure 2.2) was the result of this collaborative, iterative process. Not only important during development of this plan itself, the Vision will be critical to guiding IDOT's implementation of this plan in years to come.

FIGURE 2.2 ILLINOIS STATE FREIGHT PLAN VISION

ILLINOIS STATE FREIGHT PLAN VISION

The Illinois State Freight Plan will advance a safe, efficient, reliable, resilient, and sustainable multimodal freight system that supports Illinois' competitive position as a global hub, grows the economy, and enhances equity and quality of life for Illinois residents.

Goals serve to support a vision and provide more specific direction on how the vision will be achieved. In consultation with stakeholders and informed by both USDOT and State goals, IDOT developed five goals to support implementation of this Freight Plan (Figure 2.3). Along with the vision, these five goals are the foundation for all aspects of this Freight Plan. Details about how IDOT plans to achieve these goals, including objectives, strategies, and actions linked to each goal, can be found in *Chapter 10.*

FIGURE 2.3 ILLINOIS STATE FREIGHT PLAN GOALS

1. Prioritize the development of plans and policies and deployment of innovative technologies, that help achieve the vision of the State Freight Plan.
2. Drive collaboration and foster partnerships with public agencies and private-sector freight stakeholders throughout Illinois.
3. Make investments and implement policies that improve the safety, resiliency, and reliability of access to the multimodal freight system.
4. Implement a data informed approach to freight asset management, preservation of the multimodal freight system, and stewardship of public funds.
5. Incorporate socioeconomic and environmental impacts into freight related decision-making.

3.0 Stakeholder Outreach and Engagement

3.1 Overview

This Freight Plan, while led by IDOT, is a statewide effort. A robust stakeholder engagement effort was undertaken to ensure that a wide variety of input from a diverse group of stakeholders was incorporated into the planning process and plan development. Freight "stakeholders" include a diverse group of public- and private-sector organizations that impact or are impacted by freight, including:

- Illinois DOT District Offices.
- The Illinois State Freight Advisory Council.
- Public-sector agencies, including Metropolitan Planning Organizations, Regional Planning Organizations, Counties and Cities.
- Private-sector companies, including freight operators, carriers, and shippers.
- Freight facility operators and developers.
- Military installations.
- Manufacturers and other freight-adjacent businesses, including agriculture, mining, retail, and e-commerce.
- Economic Development Organizations.

Stakeholder outreach for the Freight Plan focused on equitable stakeholder and community engagement throughout each of the State's nine Districts. Additionally, engagement was used to foster partnerships and collaboration between IDOT and stakeholders who will have a strong role in implementation.

Early coordination with stakeholders was prioritized to identify additional stakeholders and gather initial concerns and feedback from the previous plan. Stakeholder engagement was conducted in two core engagement phases, internal to IDOT and external to industry stakeholders.

3.2 Internal Engagement

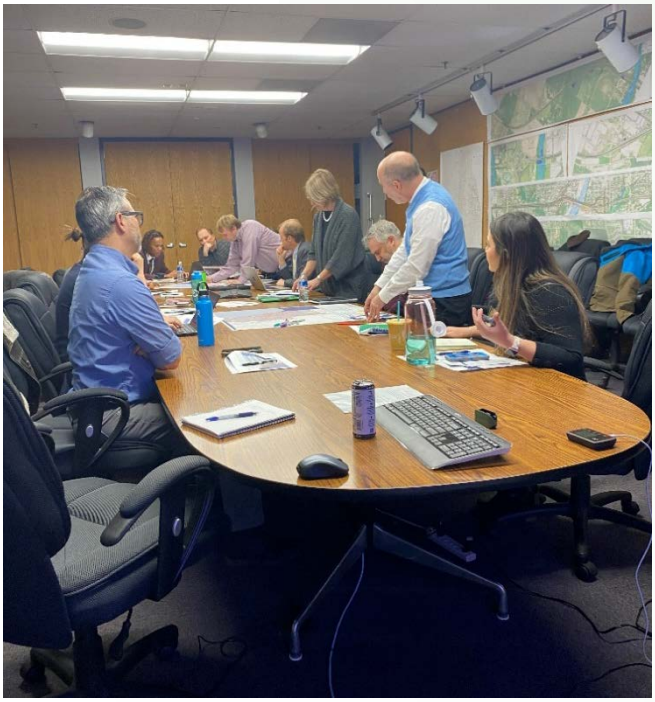
Initial internal engagement consisted of meetings with each of the IDOT Districts and others within IDOT, such as the Office of Highways Project Implementation, the Bureau of Operations, the Highway Regional Offices, the Office of Planning and Programming, the Bureau of Planning, the Bureau of Local Roads and Streets, and the Bureau of Data Collection and Mapping. These meetings aimed to provide information to garner support for the plan as well as gather feedback and input on additional information required by stakeholder to facilitate the advancement of the plan.

Internal engagement included engaging IDOT staff to develop a Vision, Mission, and Goals for the Plan (described in Chapter 2.0) and conduct a Strengths, Weaknesses, Opportunities, and

Threats (SWOT) Analysis (described in Chapter 8.0). The SWOT Analysis complemented the plan's data analysis findings and served as a guide for plan development and implementation. Ongoing internal engagement, including nine District staff interviews, took place throughout the plan development to further validate the findings and add perspectives to the data analysis.

Interviews were conducted with each of the nine District offices to introduce the project and gather initial input from the previous freight plan, current concerns, and opportunities for collaboration. These initial interviews supported the refinement of the vision, mission, and goals and the SWOT analysis. Participants in these interviews also validated the stakeholder list and added names and contacts for future consideration as the plan further developed.

FIGURE 3.1 DISTRICT 1 STAKEHOLDERS DISCUSS PRIORITY PROJECTS



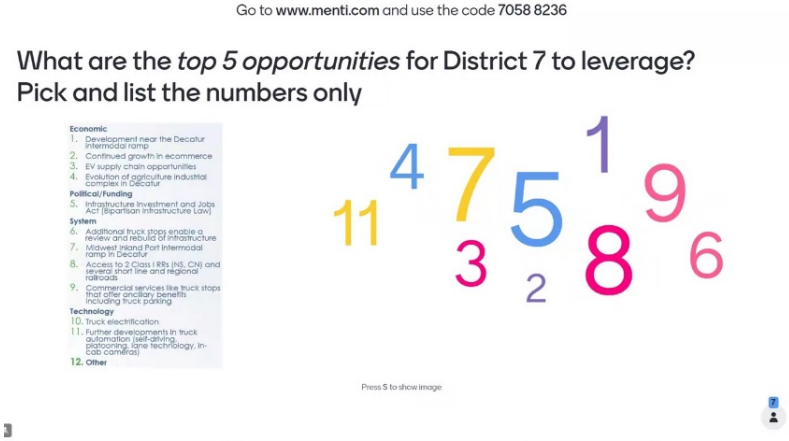
3.3 External Engagement

External engagement included outreach to both private- and public-sector industry organizations and agencies. These stakeholders were engaged via interviews, existing ISFAC meetings, and geographic focused groups. External engagement was conducted to gather detailed information to support evaluating the state of freight in Illinois, developing a vision for the future, establishing a plan to achieve the vision, and validating the findings from the data and final recommendations. A total of 22 meetings were conducted, in virtual and hybrid—in-person and virtual platforms: 18 Freight Forums, and four ISFAC meetings.

Freight Forums

District-level focus groups, known as Freight Forums, were conducted twice during the project within each IDOT District. These forums engaged both private- and public-sector industry organizations and agencies and were conducted both virtually and via hybrid platforms. Stakeholders ranged from economic development organizations, public-sector agencies, freight carriers,

FIGURE 3.2 DISTRICT 7 STAKEHOLDERS VOTING ON THE TOP OPPORTUNITIES IN THE DISTRICT

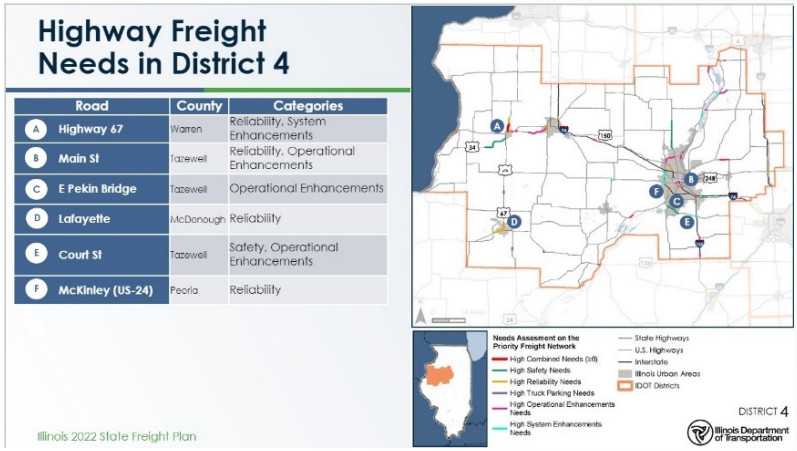


shippers, military installations, facility operators, brokers, developers, and other relevant stakeholders.

Freight Forum #1 introduced the project to stakeholders and provided an opportunity to identify routes and networks to add to the Illinois Priority Freight Network, highlight multimodal connections, and provide insights and feedback on the SWOT analysis in each District. Feedback from this Freight Forum supported in helping finalize the state-wide SWOT analysis, (Figure 3.2), adding to the Priority Freight Network for further data collection and analysis, and highlighted the need to further investigate previous modal plans and proposed projects and recommendations. Over 80 stakeholders were engaged during Freight Forums #1.

Freight Forum #2 provided an update on the technical analysis of the project as well as facilitated opportunities to validate the data collection and vote on potential multimodal policies and strategies. The technical analysis presented outlined a freight overview on the District's freight generators, industry clusters, commodities and commodity flows, trading partners, highway bottlenecks, truck parking, freight rail, ports and waterways, air cargo, pipelines, and equity and environmental justice areas in the District (Figure 3.3). Potential freight policies and strategies were voted on in the areas of system infrastructure, system impacts, and agencies resources. Results of these forums outlined potential setbacks of the data available, such as data collected during construction may indicate more bottlenecks than experienced on an average day. When polling, all Freight Forums indicated that providing stable, dedicated, predictable, and meaningful funding for freight should be a top priority. Over 130 stakeholders were engaged during Freight Forums #2.

FIGURE 3.3 FREIGHT FORUM DISCUSSION TOPIC: HIGHWAY FREIGHT NEEDS



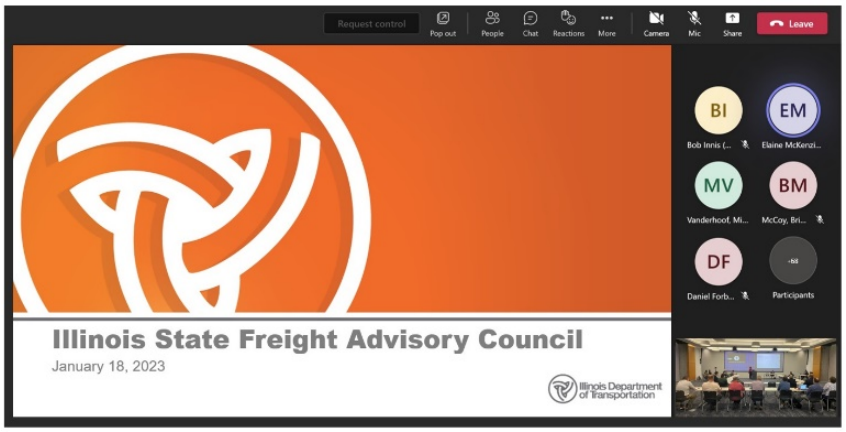
2023 Illinois Competitive Freight Program Stakeholder Engagement

External stakeholders were also engaged during Freight Forums #2 about the 2023 Illinois Competitive Freight Program (CFP). The CFP is funded by Illinois' apportionment of the National Highway Freight Program formula distribution. IDOT has elected to use the funds for a competitive grant program for freight investment, which supports the implementation of the Freight Plan. Prior to the application process, external stakeholders were provided an overview of the application process as well as available application tools during the Freight Forums. To further ensure potential applicants were comfortable with the CFP process and application, a webinar was conducted in November shortly after the application period was opened to thoroughly outline the process and tools. The CFP was open for applications between November 15, 2022 to December 19, 2022.

3.4 Illinois State Freight Advisory Council (ISFAC) Engagement

The Illinois State Freight Advisory Council was engaged regularly through the Freight Plan development to provide general guidance on Freight Plan direction, vet technical findings, and provide feedback on policies and strategies.

FIGURE 3.4 HYBRID MEETING WITH ISFAC TO GUIDE THE FREIGHT PLAN TEAM



ISFAC is an ongoing, quarterly Illinois forum focusing on the coordination of freight multimodal planning in the State of Illinois in order to enhance the benefits of every mode, improve intermodal connections, and sustain the State's position as the primary freight hub of the United States. ISFAC's members include the FHWA, USDOT Maritime Administration (MARAD), the Illinois Trucking Association, MPOs, Counties, Port Authorities, and other public- and private-sector representatives involved with freight transportation on Illinois' highways, railways, waterways, and airways. The Freight Plan engaged ISFAC at five meetings during the planning process through both virtual and in-person presentations, online polling, and open questions and discussion (Figure 3.4). The following subsections provide a brief overview of ISFAC activities related to the Freight Plan.

ISFAC Meeting #1 (November 2021)

- Meeting Objective: gain ISFAC support for the Freight Plan, validate the draft vision and goals, identify key needs, issues, concerns, and opportunities.
- Key Insights: participants largely agreed with the intent of the plan and outlined what freight challenges impact Illinois, such as aging infrastructure, capacity issues, bottlenecks, and a lack of data to make data-informed decisions.

ISFAC Meeting #2 (February 2022)

- Meeting Objective: update ISFAC on plan technical activities, provide and seek input on the methodology to determine the Priority Freight Network, and validate the SWOT analysis.
- Key Insights: participants weighed categories for prioritizing development of a Priority Freight Network, including goods movement, strategic supply chain, market access and connectivity, and economic competitiveness factors. ISFAC also participated in a SWOT exercise.
  - Participants identified Illinois' top freight-related strength as transportation focused capital programs, such as Rebuild Illinois.

- The top freight-related weakness identified was a lack of response from utilities, pipelines, and railroads, which directly impact the timely advancement of state and local projects.
- The top freight-related opportunity identified was the expanded use of Illinois' four marine highways for freight.
- The top freight-related threat identified was supply chain disruptions.

ISFAC Meeting #3 (June 2022)

» Objective: update ISFAC on the key findings from technical activities, summarize the new requirements of the Infrastructure, Investment and Jobs Act (IIJA), and demonstrate the commodity flow tool and Priority Freight Network map.

» Key Insights: participants indicated that they were anticipating an increase in goods movement in the State beyond what the technical analysis presented.

ISFAC Meeting #4 (October 2022)

» Objective: update ISFAC on the technical analysis, explore the equity analysis, and gather feedback from ISFAC on the potential freight strategies and policies.

» Key Insights: participants vetted the Freight Plan needs assessment categories (safety, reliability, system enhancements, and operational needs, and truck parking) and discussed the alignment with the upcoming Competitive Freight Program.

ISFAC Meeting #5 (January 2023)

» Objective: update ISFAC on the highlights of the technical analysis and discuss ongoing ISFAC support in the Freight Plan strategies and actions.

» Key Insights: participants identified and vetted next steps for IDOT and ISFAC during Freight Plan implementation. Participants highlighted that ISFAC should prioritize freight infrastructure needs, capital programs, policies and programs, and emerging freight technologies to support the implementation of the Freight Plan. Additionally, participants asked for a focus on truck parking, routing, and coordination; non-highway modes and concerns (e.g., rail and marine); workforce development; engaging the private sector; and coordination with agencies on data, economic planning, and emerging technologies in actions for the Freight Plan and ISFAC.

3.5 Communications Materials

The plan team also developed a broad set of communication materials to help IDOT connect with stakeholders outside of official engagement activities. The website ILFreightPlan.org was designed to effectively communicate the overview, benefits, and opportunities of the freight plan (Figure 3.5). This website will be a final repository for all plan materials, including the Illinois 2023 Freight Plan, District Freight Plans, and County Profiles.

FIGURE 3.5 ILLINOIS 2023 STATE FREIGHT PLAN WEBSITE

4.0 Freight Transportation Drives the Illinois Economy

Freight drives the Illinois economy, the fifth largest in the Nation. From the cornfields of Iroquois County, to the Chicago region's intermodal facilities and distribution centers, to O'Hare International Airport or America's Central Port, Illinois businesses and residents depend on freight. Nearly 40 percent of Illinois' economy, $305 billion, and over 2.4 million jobs are directly tied to freight and freight-related industries in the State.[4] Illinois also plays an important role as a multimodal freight hub for both the Midwest and the Nation as a whole.

The demand for freight in the U.S. is continually growing, both due to long-term economic trends as well as near-term factors such as the impacts of the COVID-19 pandemic. The U.S. DOT National Freight Strategic Plan from 2020 sets a course for robust economic growth.[5]:

> *"The U.S. economy is expected to double in size over the next 25 years. By 2045, the Nation's population is projected to increase to 389 million people, compared to 321 million in 2015. To support projected population and economic growth, freight movements across all modes are expected to grow by more than 40 percent."*

According to recent forecasts, Illinois is expected to surpass this expectation, growing by about 85 percent by 2050, and more than doubling in value (see Figure 7.1). Illinois' projected growth in freight tonnage is led by continued growth at major facilities, including the Will County intermodal facilities, which are the Midwest's busiest and fastest growing[6], the Midwest Inland Port in Decatur, O'Hare and Chicago Rockford International Airports, the numerous waterway ports in the St. Louis region, and many other key facilities throughout the state.

This chapter explores the linkages between Illinois' economy and freight, including subsections on the State's multimodal freight network, freight-related industries, employment, and real-estate.

4.1 Illinois' Multimodal Freight Network Structure

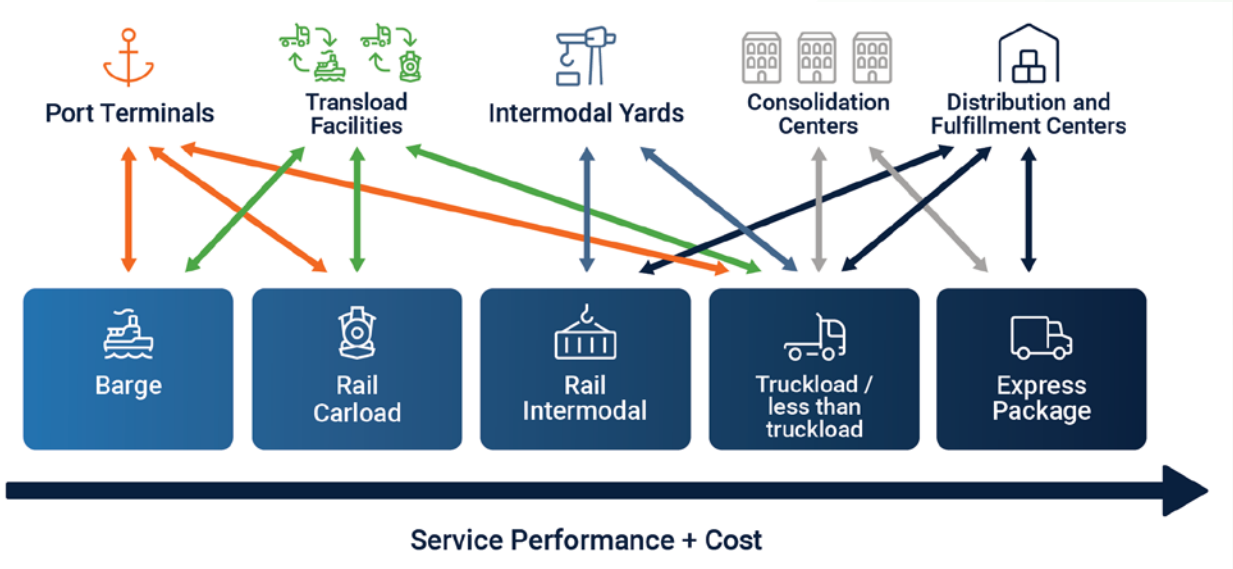
Illinois' freight network includes both multimodal corridors and freight facilities that provide not only critical linkages between modes but also services that allow goods to be transferred, stored, assembled, transformed, sorted, or consolidated for shipment. These facilities include ports, transload facilities, intermodal yards, consolidation centers, and distribution and fulfillment centers. This chapter focuses on the economic linkages between freight corridors and terminals. Specific details of the Illinois Multimodal Freight Network can be found in Chapter 5.0.

Multiple modes of transportation are often used to move goods from a point of origin to a destination, and there may be intermediate stops along the way. There are tradeoffs in service performance (most often measured in transit time or reliability) and cost between all modes of freight transportation. For example, barge transportation is typically the lowest cost option on a ton-mile basis, but it is limited to major inland waterways and transit time is often measured in days and weeks: the transit time by barge from Chicago to New Orleans is about 20 days. Conversely, express package services can get a door-to-door shipment from Chicago to New Orleans in less than a day, but it is much more expensive. Figure 4.1 provides a graphical view of

[4] EMSI, U.S. Bureau of Economic Analysis, Gross Domestic Product Summary, By State, 2019.
[5] U.S. Department of Transportation, "National Freight Strategic Plan".
[6] Intermodal Lift Count Data, CMAP, 2021.

the tradeoff between cost and service/performance that is typical of surface transportation modes in moving freight, as well as the types of freight facilities commonly used to transfer goods onto or between modes.

FIGURE 4.1 FREIGHT MODES AND FACILITIES LINKAGES



4.2 Illinois' Freight-Related Industries and Supply Chains

This section describes several key freight industries and supply chains in Illinois, and their relationship to the broader transportation network. These industries are divided into three categories: primary, secondary, and tertiary.

Primary Industry Sectors

The first stage of many supply chains begins with industries that extract or harvest raw materials from the earth. These are commonly referred to as the *primary-sector industries.* Raw material movements are largely business-to-business (B2B) trade components of the economy. Businesses within the primary economic sectors are generally producers of bulk materials transported in large volumes by pipeline, barge, and rail carload. In Illinois, primary industry sectors include cereal grains, raw materials extraction, and energy production.

Primary Industry Sector: Agriculture

Illinois Agriculture was a $16.1 billion dollar industry in 2020, ranking 7th in the Nation.[7] Corn, soybeans and animal products represent 95 percent of the State's agriculture industry, and a majority of the land area in most Illinois counties is dedicated to crops (Figure 4.2). Corn represents the largest share of Illinois' crop production at roughly $7 billion, making Illinois 2nd in the Nation, trailing Iowa. Illinois is the top soybean producer in the nation, producing over 600 million bushels, with sales of $5.77 billion, or roughly 14 percent of the national total. Illinois farmers also generated $2.5 billion from animals and animal products.

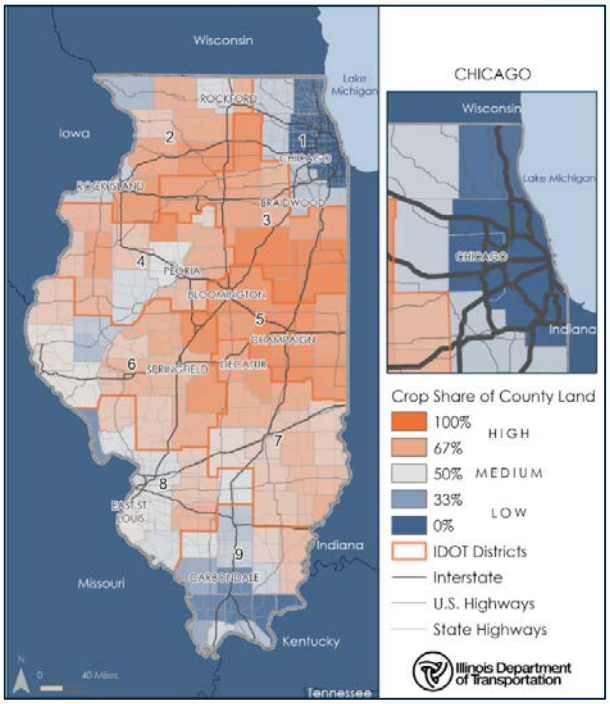
[7] Analysis of USDA's Economic Research Service cash receipts.

Grain elevators are facilities that allow for the aggregation and temporary storage of grain before being processed or transported. Illinois has roughly 770 grain elevators throughout the State (Figure 4.3). Grain elevator facilities in Illinois range in capacity from under 100,000 bushels to over 33 million bushels. While grain elevators are located in each of IDOT's districts, the highest concentrations can be found in the central part of the State. Made from steel or concrete, the grain elevators use pneumatic equipment and conveyor systems with buckets to transfer agricultural commodities to and from trucks, railcars, or barges and the silo or storage building.

Recent trends have led to the development of bigger, faster and more highly automated agricultural loading facilities to move products quickly and improve price competitiveness. The current trend in Illinois is to move away from the ubiquitous country elevators to these more modern facilities, called *shuttle train elevators*, which can load a 110-car unit train in 15 hours or less. Unlike the traditional country elevators that routinely appeared every 10 or so miles on mainline railroad tracks, shuttle-train elevators are spaced much further apart, often drawing grain from a surrounding radius of 50 to 75 miles or more. Illinois currently has about 15 shuttle train elevators, connected to rail and port facilities in the State. Many are located just north of St. Louis. This portion of the Mississippi River hosts more than 15 river elevator facilities, including some of the largest barge elevators in the Nation. Together, the growing agricultural markets and consolidation facilities have increased the demands on the State's rural roadways. The once short haul from farm to elevator has in many cases become a long haul using larger trucks to access high-volume elevators or intermodal container yards.

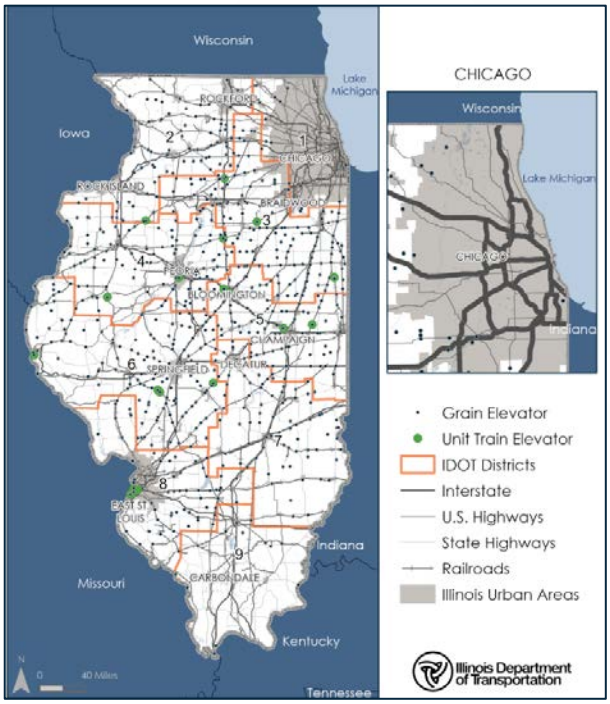
In addition to bulk grain shipments, grain is increasingly moved in large volumes to facilities, such as ethanol plants, animal/poultry feed lots, and animal feed/food processing facilities. There is also an

FIGURE 4.2 ILLINOIS COUNTIES' CROP SHARE OF TOTAL LAND



Source: USDA Cropland Data Layer.

FIGURE 4.3 ILLINOIS GRAIN ELEVATOR LOCATIONS



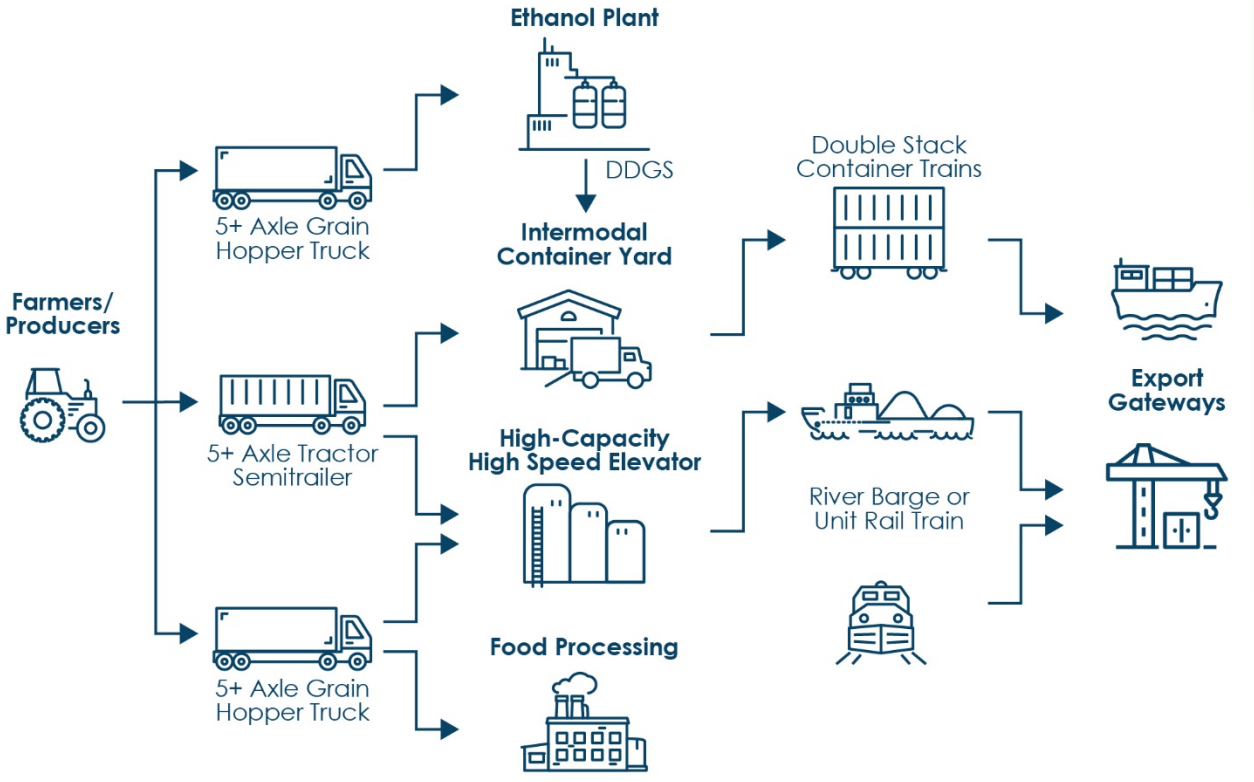
Source: Illinois Department of Agriculture, Google Imagery.

emerging market for higher-value specialty agriculture products in the State, such as energy production and single-source containerized grain. In 2020, more than 4.5 million metric tons of soybeans and 3 million metric tons of distiller's dried grains with solubles (DDGS) were exported from the U.S. in containers, much of this coming from Illinois. Finally, Illinois produces the third most ethanol in the U.S. In 2019, Illinois plants produced over 35 million barrels of ethanol. Illinois also has five biodiesel plants operating with a total production capacity of 188 million gallons.

Image of a Grain Elevator in Illinois

Figure 4.4 shows the diversity of modern grain movements, which includes ethanol production, and containerization for shipments across the globe.

FIGURE 4.4 CONTEMPORARY AGRICULTURE SUPPLY CHAINS

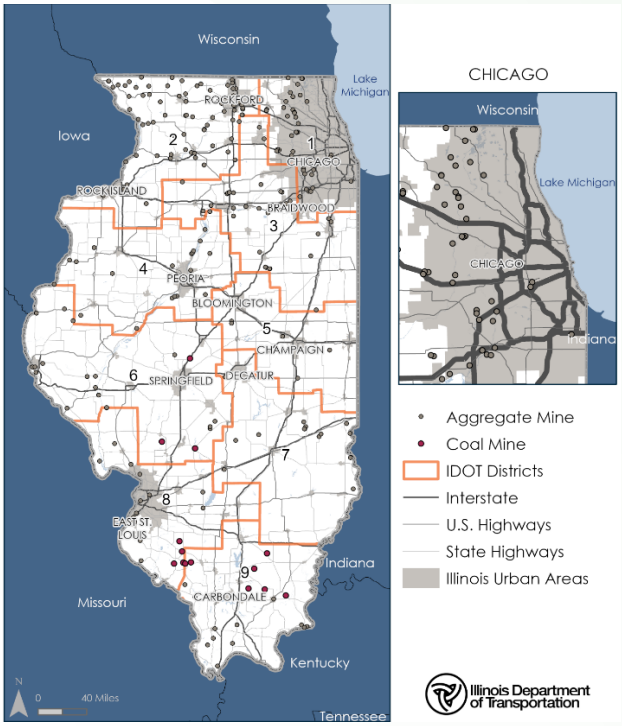


Primary Industry Sectors: Raw Materials

Raw material extraction via mining operations produces high volume, low-value bulk commodities, such as aggregate products, including gravel, crushed stone, sand, and coal. More than half of Illinois' 264 aggregate mines are in Districts 1 and 3 (Figure 4.5). In contrast, the State's 45 active coal mines are in southern Illinois.

Efficient and cost-effective transportation is essential for all mining operations, but modal usage varies by type. Most aggregates are sold within 20 to 30 miles of the mining site. As such, trucking is the predominate mode of transportation; rail and water is used when products move longer distances and mines have direct access to those modes. On the other hand, coal moves by the rail and inland water networks. The Association of American Railroads reports that Illinois accounted for 49.9 million tons and 427,100 carloads in 2019 representing 21 percent of the tonnage and roughly 6 percent of the carloads of coal moving across the country.

FIGURE 4.5 ILLINOIS MINE LOCATIONS



Source: Illinois State Geological Survey

Illinois mines produce essential inputs for the construction of a multimodal transportation network, including its roads and highways, railroads, the inland waterway network and coastal ports, and airports. These products are also essential inputs in the construction of the buildings that support our society, including homes, offices, schools, stores, and supporting infrastructure, such as our storm and sewer systems. Beyond construction, mined aggregate products are utilized by a number of industries, including farming, to treat soil and feed poultry; at power plants to eliminate pollutants, such as sulfur, oil and gas in the fracking process; and manufacturing to produce glass, ceramics, chemicals, paint, abrasives, and paper. Aggregates are even used to filter harmful chemicals from water. With such a wide breadth of uses, demand for Illinois' aggregate products is closely tied to the state of the economy, the locations of population growth, and infrastructure investment and maintenance needs.

The Illinois State Geological Survey (ISGS) has recorded 264 active aggregate and industrial mineral mines in the State. In its 2016 special report, *Construction Aggregates and Silica Sand in the Economy of Illinois,* the ISGS estimated that approximately 12.25 jobs are created for every $1 million in Illinois aggregate sales, including those in the aggregate industry.[8] The same report found that for every job in the aggregates industry an additional 1.8 jobs are created in other industries within the State's economy.

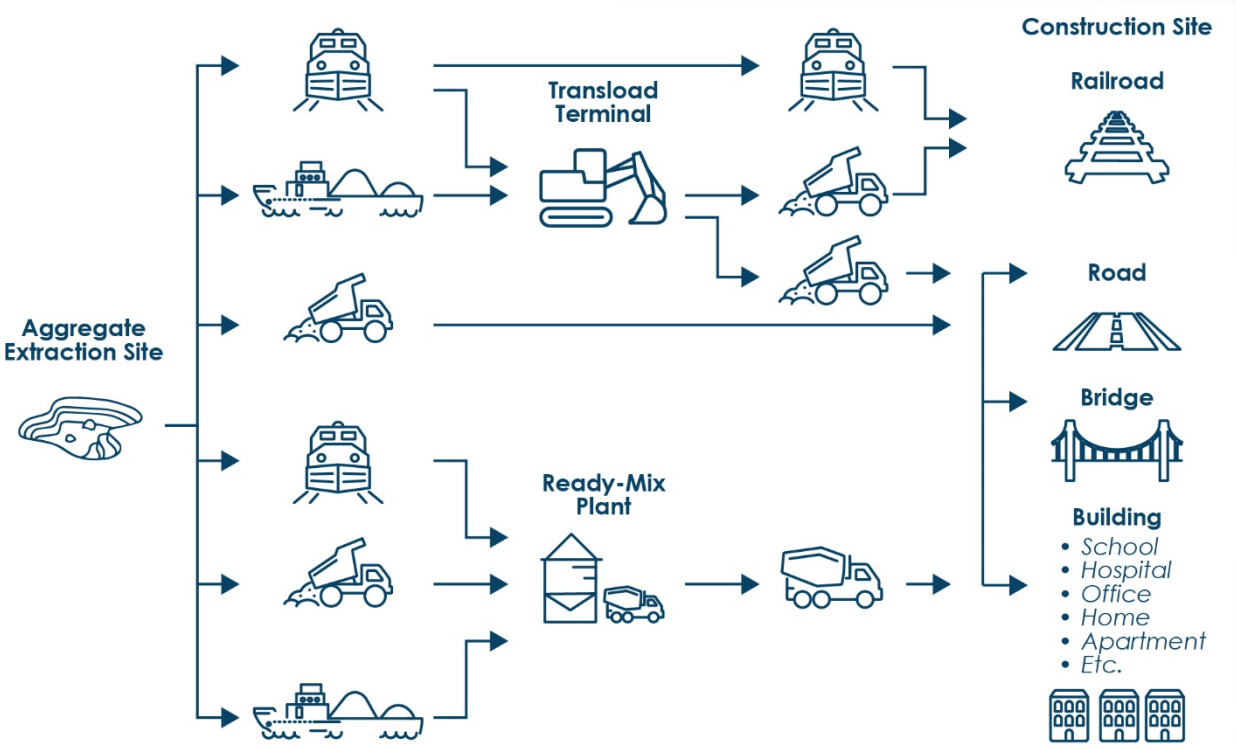
As in many industries, technological enhancements and automation are being used to increase production at Illinois' raw materials facilities. Illinois' aggregate industries, which often handle

[8] Subhash B. Bhagwat. *Construction Aggregates and Silica Sand in the Economy of Illinois.* Illinois State Geological Survey, Prairie Research Institute, University of Illinois at Urbana-Champaign. 2016. sp-05.pdf (illinois.edu).

large volumes of a uniform product at a single location and thus are highly suited to automation, are embracing these opportunities. For example, some gravel pits/mines have recently installed self-serve kiosks that allow drivers to check-in, weigh loads, and check-out without having to engage with a gate attendant.

Illinois' construction industry is heavily linked to the state's raw materials production industries. The construction industry uses these materials to build residential and commercial buildings, utility systems (water, sewer, oil and gas pipelines), power and communication lines; and highways, roads, and bridges. Construction sites attract heavy-duty equipment and freight ranging from aggregates to concrete, steel, wood, glass, roofing materials, electrical products, plumbing and heating, ventilation, and air conditioning (HVAC) supplies, flooring, and many others that must be delivered on schedule. Trucks generally bring the equipment and materials to the construction site while the road, rail, and waterway networks are used to cover the long-haul portion of the delivery. Most materials mined in Illinois are used in Illinois, however many specialty products used by the construction industry cross state lines. Figure 4.6 shows the linkages between Illinois' aggregates and construction industry sectors.

FIGURE 4.6 CONSTRUCTION AGGREGRATES SUPPLY CHAIN



Secondary Industry Sectors

The secondary sector of an economy is comprised of businesses that convert raw materials into finished or usable products through manufacturing or construction, transforming raw materials into durable and nondurable goods that either flow to other businesses as inputs into their production, or are sold directly to the consumer. Businesses in the secondary sector of the economy are both large receivers of freight and large generators of freight.

Secondary Industry Sector: Manufacturing

Manufacturing is one of the largest economic sectors in Illinois. Illinois' 12,000 manufacturers produced more than $114 billion worth of output in 2019, accounting for almost 13 percent of state GDP.[9] As shown in Figure 4.7, the top manufacturing sectors included chemicals; food, beverage and tobacco products; machinery, and fabricated metal products. Manufacturing employment is most dense in the Chicago metropolitan region, with strong connections to Interstates 90, 290 and 55, as well as O'Hare International Airport (Figure 4.8). Manufacturers are also located throughout the State in other Illinois metro areas, including Rockford, Rock Island, Peoria, Decatur, and East St. Louis.

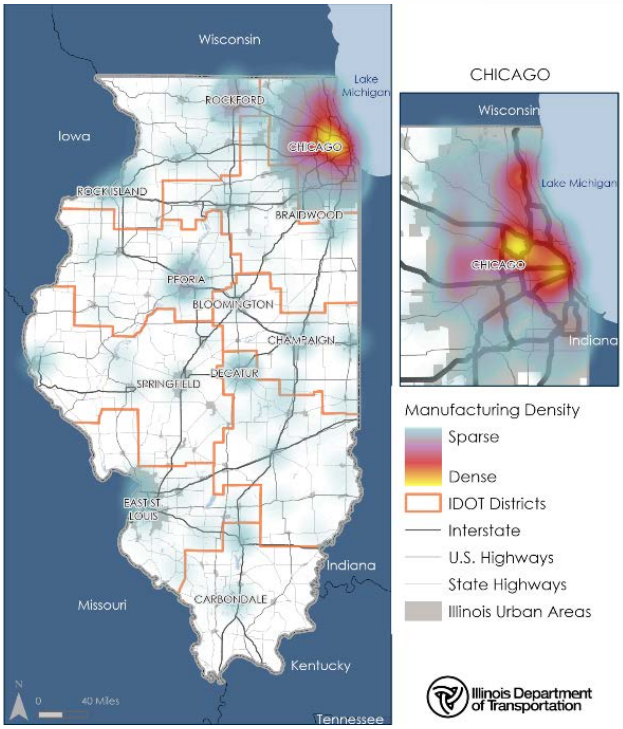
Innovative technologies are being used to create existing products efficiently as well as develop new products, from computers to electric vehicles to pharmaceuticals. Collectively, these processes are referred to as *advanced manufacturing.* Advanced

FIGURE 4.7 ILLINOIS TOP MANUFACTURING SECTORS (2021)

ILLINOIS TOP MANUFACTURING SECTORS, 2021

Chemicals	Food & Beverage	Machinery
$24.2 Billion	$13.5 Billion	$13.1 Billion
Fabricated Metals	**Computers & Electronics**	
$9.3 Billion	$7.4 Billion	
Plastics & Rubber Products	**Petroleum & Coal Products**	**Other Durable Goods**
$6.1 Billion	$5.7 Billion	$5.3 Billion
Motor Vehicles & Parts	**Electrical Equipment**	
$4.5 Billion	$4.1 Billion	

FIGURE 4.8 ILLINOIS MANUFACTURING DENSITY



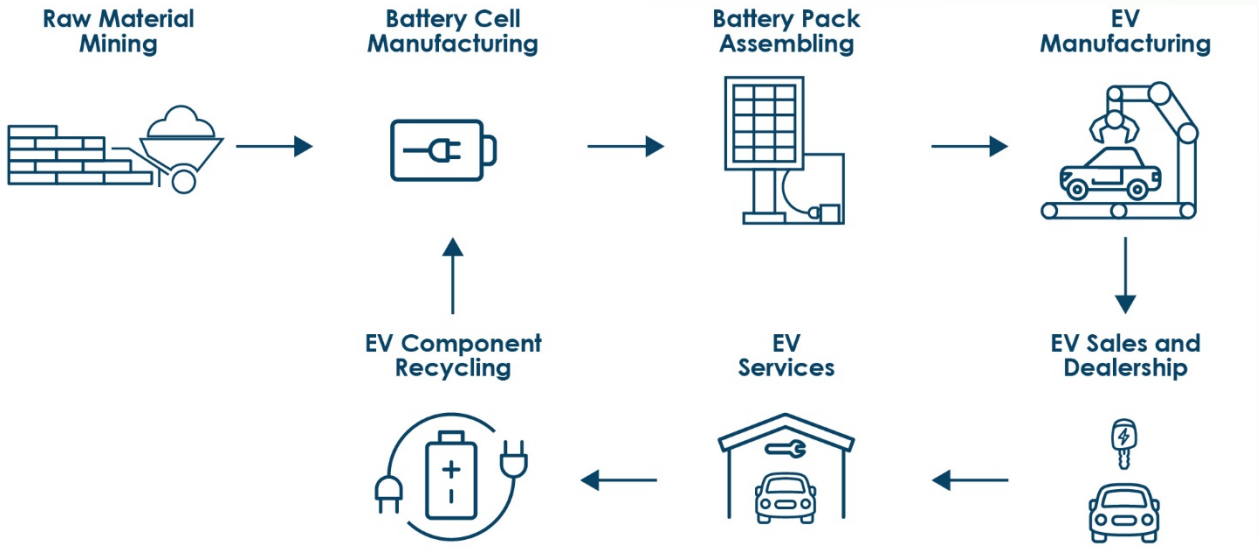
Source: U.S Census Bureau, Longitudinal Employer-Household Dynamics Origin-Destination Employment Statistics (LODES) Workplace Area Characteristic data (2018).

[9] https://www.nam.org/state-manufacturing-data/2022-illinois-manufacturing-facts/

manufacturing differs from traditional manufacturing models in a few ways, including utilization of smaller physical spaces, and heavier reliance on digitalization and information technology. Advanced manufacturing also often requires longer or more complex global supply chains than traditional models.[10] As the State's advanced manufacturing industries continue to grow and gain market share, Illinois' economy is also growing more sensitive to national or global supply chain disruptions.

In Illinois, electric vehicle (EV) manufacturing, a type of advanced manufacturing, has seen tremendous growth due to an explosion of demand for EVs, financial incentives for both producers and consumers, and tighter environmental regulations. Figure 4.9 shows an example supply chain for EV manufacturing. The Illinois legislature encouraged growth of the EV industry with the passage of the Reimagining Electric Vehicles in Illinois Act (REV), which seeks to "reduce carbon emissions, create new good-paying jobs, and generating long-term economic investment in the Illinois business economy." The REV Act "provides income tax credits for electric vehicle (EV) manufacturers, including EV parts suppliers such as battery and charging station manufacturers," In addition, Illinois put into law the Climate and Equitable Jobs (CEJA) Act[11] in 2022, which includes provisions to phase out carbon emissions from the energy and transportation sectors, and provides another push to the growing EV sector.

FIGURE 4.9 ELECTRIC VEHICLE SUPPLY CHAIN



As recent as 2017, Illinois did not have significant employment share in automotive manufacturing. Recently, Illinois has risen to 7th in terms of automotive manufacturing employment concentration, in part driven by the growth of electric vehicle manufacturing, as well as investments by Ford Motor Company and others. Much of the existing growth of Illinois EV manufacturing is tied to Rivian, a maker of all electric trucks, that established a manufacturing facility in Normal, by repurposing an automotive manufacturing plant previously owned by Mitsubishi. Rivian currently is contracted to provide 100,000 electric delivery vans to Amazon, the first of which began operating in Illinois in 2022. [12] In addition, Lion Electric's Joliet facility

[10] https://www.thomasnet.com/articles/services/what-is-advanced-manufacturing.
[11] https://www2.illinois.gov/epa/topics/ceja/Pages/default.aspx
[12] https://www.nrdc.org/stories/story-normal-car-factory-abandoned-gas-guzzlers-soon-be-buzzing-electric-vehicles.

delivered the company's first U.S. manufactured electric buses in 2022. Stellantis and Ford are also planning to produce electric vehicles in the Chicago area.

The steady rise in demand for EVs is putting extreme pressure on the industry's supply chains. These problems present in many ways. First, the world's production of lithium, the primary material needed to produce the batteries for EVs, is extremely environmentally taxing to produce and is in minimal supply. This could prove challenging for EV manufacturers to be able to source the needed materials for full production of vehicles. In addition, many of the newly established EV manufacturers, such as Rivian, must build their supply chain from scratch, unlike more firmly established automotive manufacturers like Ford. This increases stress and introduces new demands on the State's multimodal freight network.

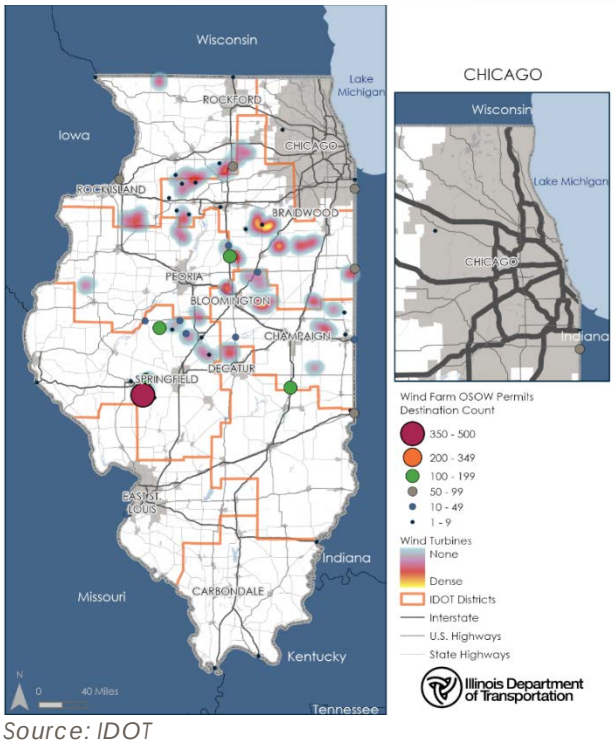
Secondary Industry Sector: Utilities

Illinois is home to 209 electric utilities and independent power producers, including coal, nuclear, natural gas, wind, solar and other.[13] These power generators both engage in electricity generation and distribution of electricity, and use various sources of energy to do so. District 1 has the highest number of power plants with 51, followed by Districts 2 and 3 with 41 and 33 respectively.

The demands on the multimodal freight network vary based on the type of electricity being generated. Coal fired electric plants require access to the rail network, waterway network, or both in order to receive large quantities of raw materials from coal mines, primarily located in Wyoming. Plants that use natural gas or petroleum for power generation must be located adjacent to the associated pipeline network. While electric plants that draw on renewable energy sources, such as solar or wind, do not require continual delivery of raw materials like coal or natural gas, they do require considerable deliveries of project cargo during the construction period. Plants utilizing landfill gas and hydroelectric power require plants to be situated in close proximity to the associated power source.

Wind energy is a clean and renewable energy source that creates electricity using wind turbines to capture energy from the earth's natural flowing air. It is a cost-effective sustainable energy source that also provides economic development opportunities by creating jobs, increasing tax bases, providing land-lease payments, and lowering electricity costs for users. Wind farms are a significant and growing portion

FIGURE 4.10 ILLINOIS WIND TURBINE LOCATIONS AND OSOW TURBINE PERMITS



Source: IDOT

[13] U.S. Energy Information Administration, 2020.

of the Illinois utilities sector. In 2021, Illinois ranked 5th in wind power generation, producing 18.69 billion kilowatt hours of electricity, about 10 percent of the State's total.[14] Power Up Illinois, an advocacy group focused on promoting renewable energy, reports that $13 billion in capital investments have been made to wind, solar, and energy storage in Illinois.[15] As of 2020, Illinois had 35 active wind energy farms, with roughly 30 additional wind projects either proposed or under construction.[16] Figure 4.10 shows destination for wind turbine equipment within Illinois, as measured by permits granted by IDOT.

Image of a Wind Turbine in Shabbona, Illinois

Wind farms are a hybrid of manufacturing and on-site construction. Illinois wind farms utilize both domestically produced and imported components, which make their way to Illinois by ship, barge, rail, and truck. No matter the mode, turbine components must be trucked over the last leg of their journey and assembled at a wind farm project site. The transportation of wind turbines requires substantial effort and upfront planning, as they can weigh up to 350 tons when fully assembled. The tower alone can extend in height between 200 and 400 feet and weigh between 72 and 220 tons. Towers are typically moved in three sections. The nacelle, which houses a number of components, including the rotor, gearbox, and generator among others, is generally 50 feet in length and between 56 and 75 tons, but can weigh up to 300 tons. Blades range in length from 110 to 177 feet and weigh roughly 12 tons each. Unlike other components, blades cannot be dismantled any further.

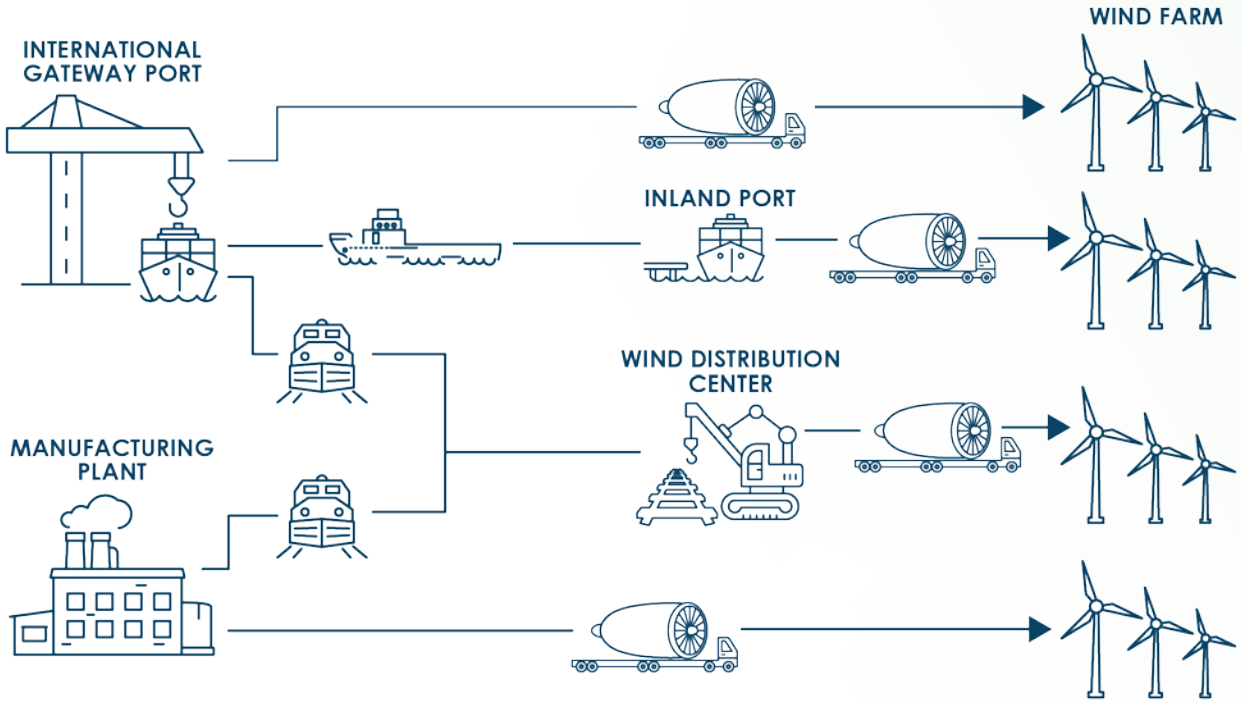
It is estimated the construction of a single 150-megawatt (MW) wind farm requires eight ocean shipments, 140 trips by rail, and 650 truckloads, which require obtaining Oversize/Overweight (OSOW) permits for moving the many individual components.[17] Using non-highway modes to the extent possible has significant benefits to both shippers and the State, including reducing impacts to motorists and highway infrastructure, as well as reducing costs. Shippers strive to get components as close as possible to the project sites before putting them on the roadway network in order to mitigate risks, keep the projects on schedule, and minimize the distance and complexity of OSOW movements.

Wind turbine supply chains are complex (Figure 4.11) and require coordination of many components. Sourcing and delivering components to a site can take more than a year of planning and coordination between the developer, IDOT, and other agencies. Wind farms may

[14] Ibid.
[15] *Our Renewable Energy Future*. Power Up Illinois. https://www.powerupillinois.org/our-energy-future/.
[16] Power Up Illinois. Ibid.
[17] *Wind Turbine Transport: What you Need to Know*. August 28, 2020. Truckload Shipping. https://usatruckloadshipping.com/wind-turbine-transport-what-you-need-to-know/.

be located away from main highways and require travel on secondary routes which tend to be narrow, winding, traverse small towns, and have weight-restricted bridges. Turning issues are common at intersections along state and county roads, forcing turns from one two-lane road to another. It is common for route surveys, simulations, and test runs to be conducted in order to identify places along the route where modifications are needed such as trees to be cut down or utility poles to be moved. Other state regulations related to OSOW loads also significantly impact the delivery of wind turbine components, such as the requirement for a state police escort, and a ban on Saturday movements.

FIGURE 4.11 WIND ENERGY SUPPLY CHAIN



Tertiary Industries: Commerce and Trade

The tertiary industry sector is primarily comprised of commerce and trade industries, which includes both wholesale and retail businesses. Trade industries by nature attract and receive high volumes of freight deliveries, as well as hold significant volumes of inventory awaiting sale. Products range from durable goods like cars and trucks, furniture, electronics, and appliances, to nondurable goods like gasoline, food and beverages, clothing, and even raw materials or product components. Businesses often concentrate near regions with high densities of customers, though trade industries can be found throughout the State.

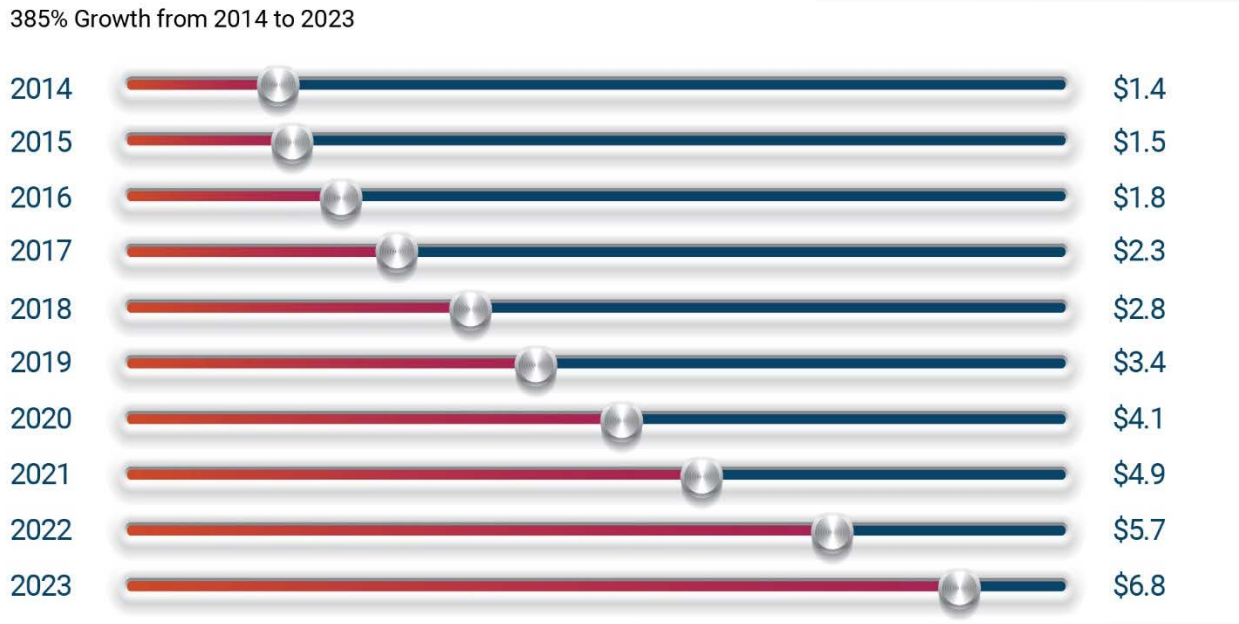
Image of a Worker Checking Packages in a Delivery Van

Logistics services are a growing part of the trade industries, as supply chains are reshaped by e-commerce and other trends. The more than 500 cross-docks, distribution centers, fulfillment centers, and warehouses in Illinois that are providing various logistical services to freight shippers and receivers play an integral part of 21st century supply chains. Cross-dock facilities transfer freight from multiple inbound shipments to outbound shipments with minimal handling and storage. While warehouses and distribution centers are both used for storing freight, distribution centers also provide other logistical services, such as product mixing, packaging, picking orders, and even managing product returns. Warehouses and distribution centers can provide storage for dry and temperature-controlled products. Distribution centers and fulfillment centers differ in terms of the type of customers serviced. For example, distribution centers typically service B2B customers while fulfillment centers provide services for e-commerce retailers picking and packaging orders for delivery to customers' homes.

Figure 4.12 highlights the exponential global growth in e-commerce in the past decade. Changes are also fueled by global impacts of the COVID-19 pandemic and a general restructuring of the retail sector. In particular, e-commerce and COVID-linked supply chain challenges has led to significant growth at O'Hare International Airport, which saw 6.6 percent growth in air cargo (about $305 billion) in 2021.[18] Even in brick-and-mortar stores, the inventory control and operations have been impacted by the e-commerce sector. Ordering online, home delivery, and pick-up options are now available from many retailers who continue to maintain large physical and online presences, including Walmart and Target, Home Depot, Lowe's, Ikea, and others.

[18] The Economist, https://www.economist.com/united-states/2022/05/19/supply-chain-woes-are-forcing-more-of-americas-trade-onto-planes, May 2022.

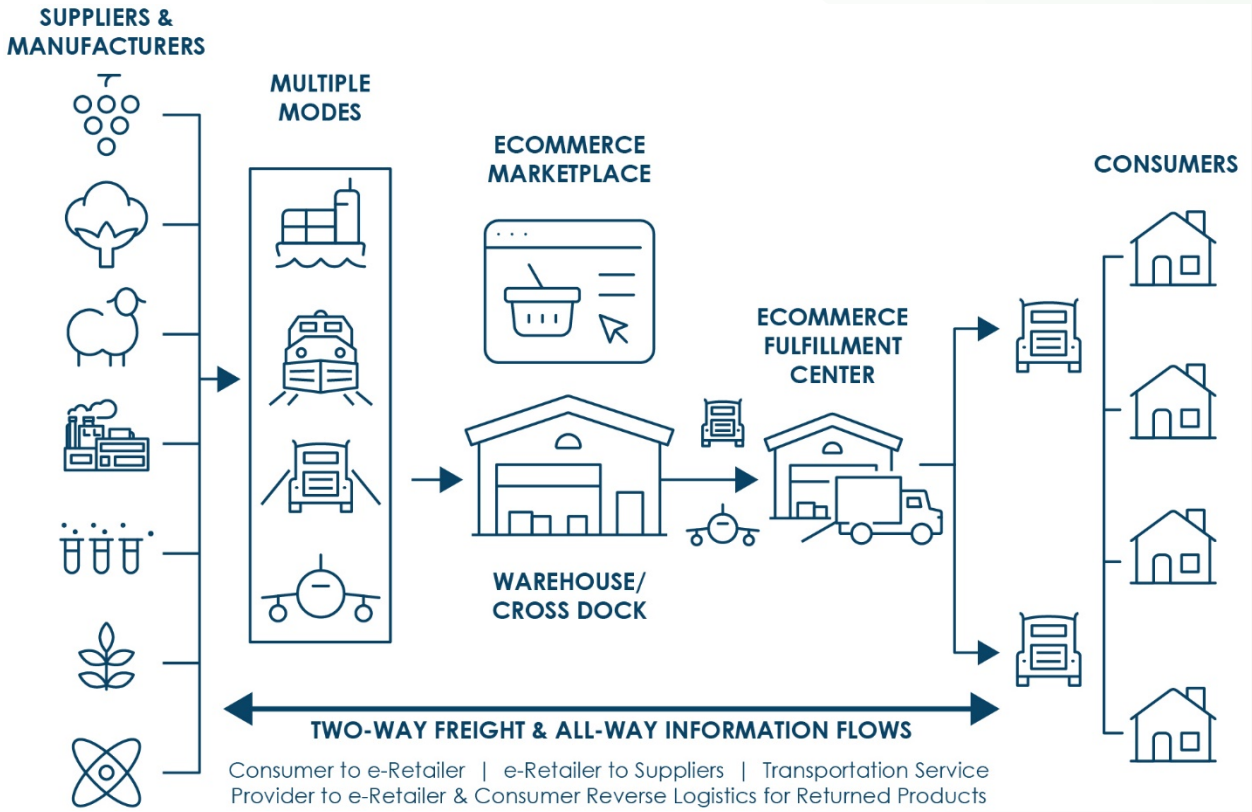
FIGURE 4.12 GLOBAL RETAIL E-COMMERCE SALES ($ TRILLIONS)



Source: eMarketer © 2020 www.ecommerceo.com.

Figure 4.13 illustrates the complex e-commerce supply chain from suppliers/manufacturers, through transportation and warehousing/fulfillment, to eventual end-user product receipt. Important components of e-commerce are the "all way" flow of information and communication through online marketplaces and the consumers. This communication includes the ordering of products, and a growing need for *reverse logistics*, which deals with shipping returned products/items back to a retailer, wholesaler, or to another buyer.

FIGURE 4.13 E-COMMERCE SUPPLY CHAIN



As e-commerce requires more than three times the distribution space as traditional warehousing, "mega-warehouse" developments of more than one million square feet or more located close to the customer base are increasing in Illinois and throughout the Nation. Between 2015 and 2020, Amazon opened 36 warehouses in the Chicago area, with two more fulfillment centers planned for Chicago's south suburbs in Matteson and Markham. The new facilities will be spaced at over 855,000 square feet each and employ over 2,000 full-time employees. On the other end of the scale, smaller warehouses to support e-commerce, averaging about 10,000 sq. feet, are being located close to or in major population centers where space for larger facilities is not available.

4.3 Illinois Freight Employment and Industrial Facilities

The Illinois' economy's heavy emphasis on freight means that a significant portion of the State's workforce and industrial facilities are freight-related. This section provides an overview of freight-related employment, economic, and real estate trends in Illinois.

Illinois Freight-Related Economy and Employment

About 2.4 million of Illinois' 6.1 million jobs are in freight-related sectors (Table 4.1). These jobs are growing slightly faster than jobs in the State as a whole, while the Gross Regional Product (GRP) created from these jobs is growing slightly slower than the average rate. Illinois added jobs at a compound annual growth rate (CAGR, or annual rate) rate of 0.9 percent between 2010 and 2019, slower than U.S. growth of 1.6 percent. GRP followed a similar pattern, with Illinois adding GRP at an annual rate of 3.2 percent compared to U.S. growth of 4.0 percent. Total job and GRP growth rates within the State were fastest in IDOT District 1 though all IDOT districts experienced nominal increases in GRP. Illinois added jobs in freight-related industries at an annual rate of 1.1 percent, slightly faster than total job growth rate, while the U.S. added jobs in freight-related industries at an annual rate of 1.8 percent. Freight-related GRP in Illinois increased at an annual rate of 2.9 percent, slower than the national rate of 3.9 percent.

TABLE 4.1 ILLINOIS EMPLOYMENT AND GRP SUMMARY FOR ALL JOBS AND FREIGHT-RELATED JOBS

	All IL Jobs		IL Freight-Related Jobs		IL GRP	
Geography	2019	CAGR 2010–2019	2019	CAGR 2010–2019	All Industries CAGR 2010–2019	Freight-Related CAGR 2010–2019
U.S.	156,714,948	1.6%	61,059,607	1.8%	4.0%	3.9%
Illinois	6,140,297	0.9%	2,478,388	1.1%	3.2%	2.9%

Source: EMSI.

Table 4.2 depicts freight producing industry job and GRP trends across select freight-related industries which are heavily concentrated in Illinois, as measured by location quotient (LQ). Only industries where Illinois has a higher than average share of an industry (location quotient >1, measured by employment) are shown in the table.

TABLE 4.2 ILLINOIS FREIGHT-RELATED INDUSTRY EMPLOYMENT, GRP, AND LOCATION QUOTIENT

	IL Jobs		IL GRP in millions of USD		IL Industry Freight-Related LQ
Cluster	2019	CAGR 2010–2019	2019	CAGR 2010–2019	2019
Agricultural Inputs	7,762	1.0%	$1,544.62	-0.8%	1.73
Agricultural Wholesale	16,369	-0.3%	$2,680.00	2.4%	1.33
Chemical Manufacturing	21,701	-0.9%	$8,047.61	-0.2%	1.40
Electronics Manufacturing	36,491	-0.8%	$6,093.51	0.1%	1.44
Food	84,405	1.2%	$11,209.75	1.5%	1.32
Food Wholesale	42,158	1.6%	$5,790.59	4.2%	1.36
Machinery Manufacturing	66,016	-0.8%	$11,724.73	1.1%	1.78
Medical Manufacturing	20,768	1.7%	$12,732.43	4.0%	1.73
Metal Manufacturing	110,860	0.6%	$13,422.35	2.4%	1.51
Miscellaneous Manufacturing	23,478	-0.5%	$2,712.40	1.0%	1.17
Plastic/Rubber Manufacturing	46,394	1.1%	$6,834.65	2.7%	1.43
Retail Services	31,900	-0.1%	$2,813.96	3.0%	1.01
Transportation Services	201,780	2.1%	$31,465.28	5.4%	1.41
Wholesale and Distribution	298,358	1.7%	$51,775.99	3.7%	1.15
Wood Product Manufacturing	54,880	-1.2%	$6,238.79	1.5%	1.10

Source: EMSI.

Figure 4.14 illustrates the five largest freight-related clusters by GRP in each district, the U.S., and State of Illinois as a whole. Among freight-related clusters, wholesale and distribution industries fall in the top five clusters for all geographies except IDOT District 9. In southern Illinois (IDOT Districts 7, 8, and 9), oil, gas, and coal producing industries fall in the top five clusters, and these activities can generate large amounts of freight tonnage that move via rail and pipeline. In central Illinois (IDOT Districts 4, 5, and 6), food manufacturing and agricultural activities are found in the top five freight-related industry clusters in the region. Agricultural and food manufacturing activities can also generate large volumes of bulk tonnage that require rail and/or truck transportation to process and deliver final output. Retail is a significant industry cluster in every geography. This speaks to end-market demand for freight goods, which can create a need for light truck transportation in communities of all sizes.

FIGURE 4.14 TOP FIVE ILLINOIS INDUSTRY CLUSTERS, STATEWIDE AND BY DISTRICT (RANKED BY 2019 GRP)

Source: EMSI.

Industrial Real Estate

Freight and supply chains are inevitably linked with industrial real estate. As noted earlier in this section, the warehousing and retail markets in particular are experiencing significant changes due to e-commerce and technology innovation, which is leading to the development of both mega and micro industrial spaces, as well as shifting demand for traditional industrial locations. Table 4.3 depicts industrial real estate trends across IDOT districts and for the State in total. The data shows that District 1 represents one of the single largest concentrations of industrial space in the country, with roughly 1 billion square feet of inventory, and about 70 percent of the growth since 2010. District 8 (St. Louis area) experienced the second fastest pace of inventory growth, from 49 to 59 million square feet, over the same period.

TABLE 4.3 ILLINOIS INDUSTRIAL REAL ESTATE TRENDS BY DISTRICT

	Number of Industrial Buildings		Industrial Inventory (million square feet)		Vacant Percent
IDOT District	2019	CAGR 2010–2019	2019	CAGR 2010–2019	2019
1	20,239	0.2%	1,075.59	1.1%	5%
2	1,288	0.4%	77.70	0.9%	6%
3	1,027	0.6%	68.90	0.8%	11%
4	701	0.4%	37.03	0.4%	2%
5	555	1.2%	32.37	1.7%	5%
6	490	1.4%	18.11	1.7%	2%
7	343	2.6%	25.71	3.0%	5%
8	955	0.6%	59.28	2.0%	6%
9	179	4.4%	6.95	4.5%	5%
Illinois	25,777	0.4%	1,402	1.2%	6%

Source: Costar.

Table 4.4 shows the change in freight-related GRP and industrial space by IDOT District between 2010 and 2019. This table compares growth in industrial real estate and GRP, with a general finding that increases in space directly lead to increases in industrial output. While the data reinforces how growth in industrial space tends to yield increases in GRP, there are clear differences in performance across IDOT Districts. For example, in District 1, a 1.8 percent annual increase in occupied industrial space yielded a 3.5 percent annual increase in freight-related GRP. For District 3, a modest increase in occupied space (0.3 percent) yielded a stronger 4.7 percent annual increase in freight-related GRP.

The industrial space needed in each IDOT District is partially influenced by the type of economic activity in which each area specializes. For example, in IDOT District 9, commodity-producing activities are a significant driver of economic activity through the extraction of materials like coal. Transportation infrastructure, such as rail terminals, and storage facilities for bulk mining materials could be needed in the region to support these activities, as well as support any new manufacturing facilities that add value to mining commodities. In contrast, central Illinois (IDOT Districts 6 and 7) has large food processing clusters of economic activity and may need new goods-producing and food storage facilities.

TABLE 4.4 ILLINOIS GRP AND INDUSTRIAL SPACE GROWTH BY DISTRICT (2010–2019)

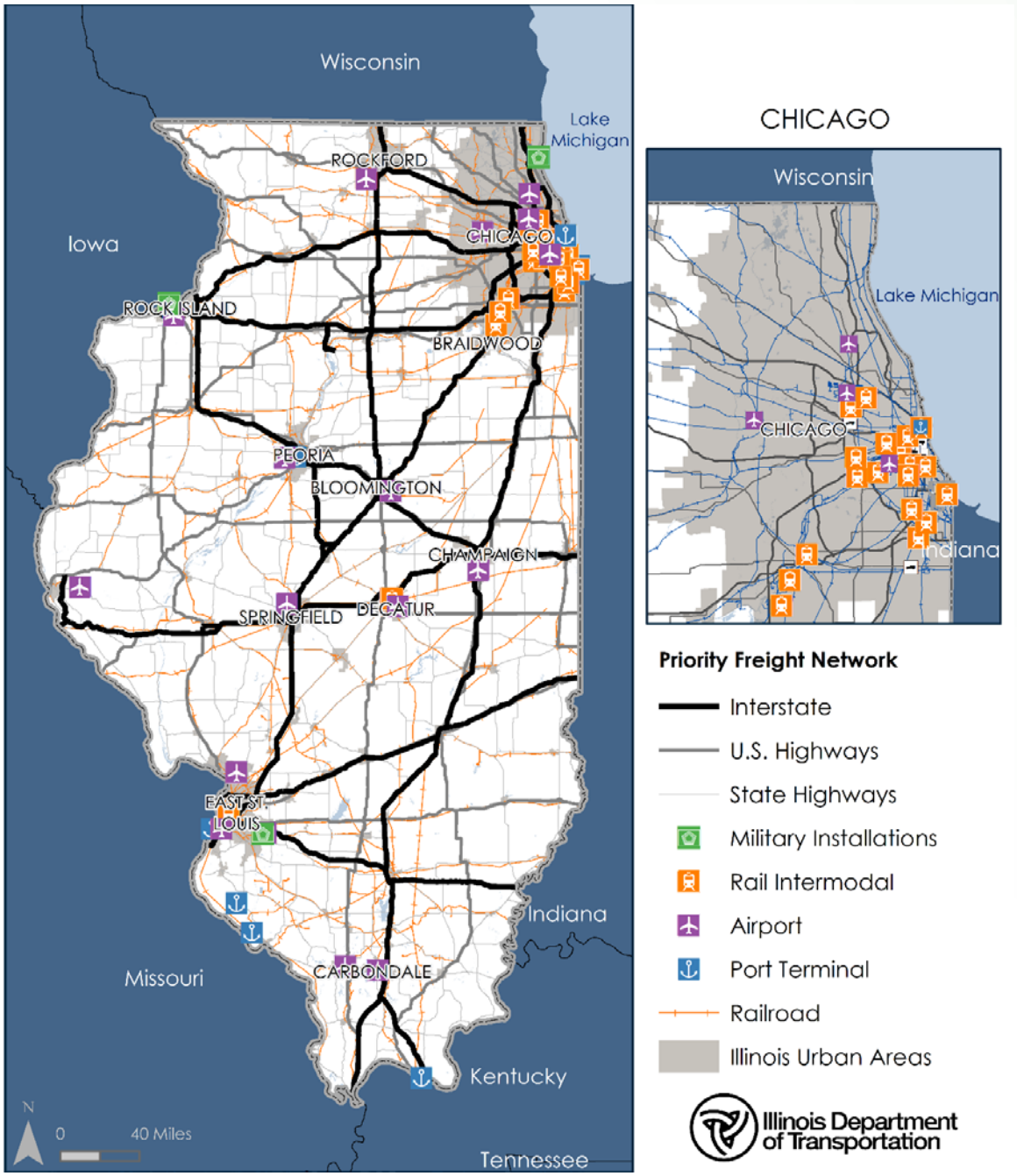
IDOT District	Total Industrial Inventory (SF)		Occupied Industrial Space (SF)		Freight-Related GRP	
	2019	CAGR	2019	CAGR	2019	CAGR
1	1,075,585,361	1.1%	1,012,470,438	1.8%	$155,876,818,578	3.5%
2	77,695,095	0.9%	73,010,222	1.5%	$11,879,504,401	1.6%
3	68,901,978	0.8%	60,983,066	0.3%	$10,592,865,640	4.7%
4	37,025,144	0.4%	36,175,206	1.5%	$9,622,856,112	1.3%
5	32,372,936	1.7%	30,601,416	1.8%	$4,882,866,979	0.6%
6	18,105,763	1.7%	17,682,290	1.7%	$5,831,672,454	0.7%
7	25,714,228	3.0%	24,548,189	3.0%	$7,992,566,956	0.6%
8	59,282,266	2.0%	55,603,896	1.9%	$10,331,337,998	2.5%
9	6,952,286	4.5%	6,579,271	5.7%	$3,756,807,636	0.4%
Illinois	1,401,635,057	1.2%	1,317,653,994	1.8%	$220,767,296,753	3.0%

Source: Costar, EMSI.

5.0 Illinois' Multimodal Freight Network

The movement of goods is the backbone of Illinois' economy and Illinoisans' way of life. Illinois' multimodal freight network (Figure 5.1) provides resilient and cost-effective shipping alternatives for all types of commodities produced in, consumed by, or moving through the State. Residents and businesses in urban and rural areas of the State alike rely on the multimodal freight network for connections to markets near and far.

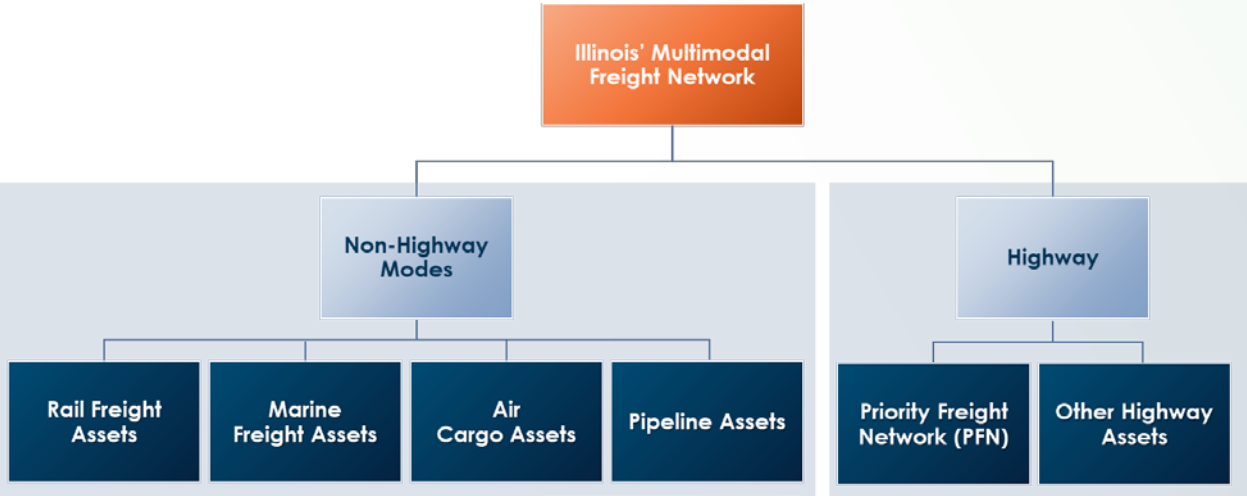
FIGURE 5.1 ILLINOIS' MULTIMODAL FREIGHT NETWORK



Source: IDOT, FHWA.

The key components of Illinois' multimodal freight network (Figure 5.2) are the State's highway, rail freight, marine freight, and air cargo, and pipeline infrastructure, as well as interchange points between the modes. Together, these networks allow for billions of tons of freight to move to, from, within, and through the state each year, keeping Illinois' manufacturers, agricultural producers, and other businesses connected and competitive in regional, national, and global economies.

FIGURE 5.2 ILLINOIS' MULTIMODAL FREIGHT NETWORK COMPONENTS



Note: Many of Illinois' highway, rail, marine, and airport assets are also part of the National Multimodal Freight Network (NMFN).

This chapter profiles each mode of the multimodal freight network in the state, including development of the Illinois Priority Freight Network (PFN), which identifies the most important highway corridors for freight in Illinois. Also within this chapter is a discussion of the demand, condition and performance, and needs of Illinois' multimodal freight network. A full analysis of the goods moving to, from, through, and within the State is included in Chapter 7.0, and additional details on multimodal freight trends, challenges and needs is found in Chapter 8.0.[19]

5.1 Illinois' Highway Freight Network

Overview

Illinois highways are a central pillar to the State's freight network, providing the conduit for the 53 percent of freight within the State that moves by truck. Even when goods primarily move on another mode, the State's highway and roadway systems provide critical first- and last-mile links between suppliers, customers, and multimodal facilities. Almost all goods transported in the State utilize the highways for at least one leg of their trip.

The Illinois highway system is comprised of over 147,000 centerline miles. Of these roads, over 15,000 miles are managed by IDOT. IDOT maintains 54 safety rest areas that provide truck parking across 30 facilities in the State. As of 2019, drivers on Illinois roads drove over 107.6 billion vehicle miles annually, of which about 12.7 billion are truck vehicle miles traveled.

[19] For this Freight Plan, a base year of 2019 was adopted, in part due to the challenges of understanding the impacts of the Covid-19 pandemic on long term trends and needs. In some cases, such as highway and bridge infrastructure condition, 2022 data was used.

Illinois' Priority Freight Network

The Priority Freight Network (PFN) was identified using a combination of data and stakeholder input to identify the roadways most critical to freight in the state. This network was identified using metrics that looked at economic competitiveness, goods movement, strategic supply chains, and market access and connectivity factors (Figure 5.3). Stakeholder contribution and vetting of the network was key to the process. IDOT received over 600 comments providing input into the final network identification. The PFN is the basis for the analyses of equity and environmental impacts in Chapter 6.0 and freight system needs in Chapter 8.0.

FIGURE 5.3 ILLINOIS' PRIORITY FREIGHT NETWORK IDENTIFICATION PROCESS

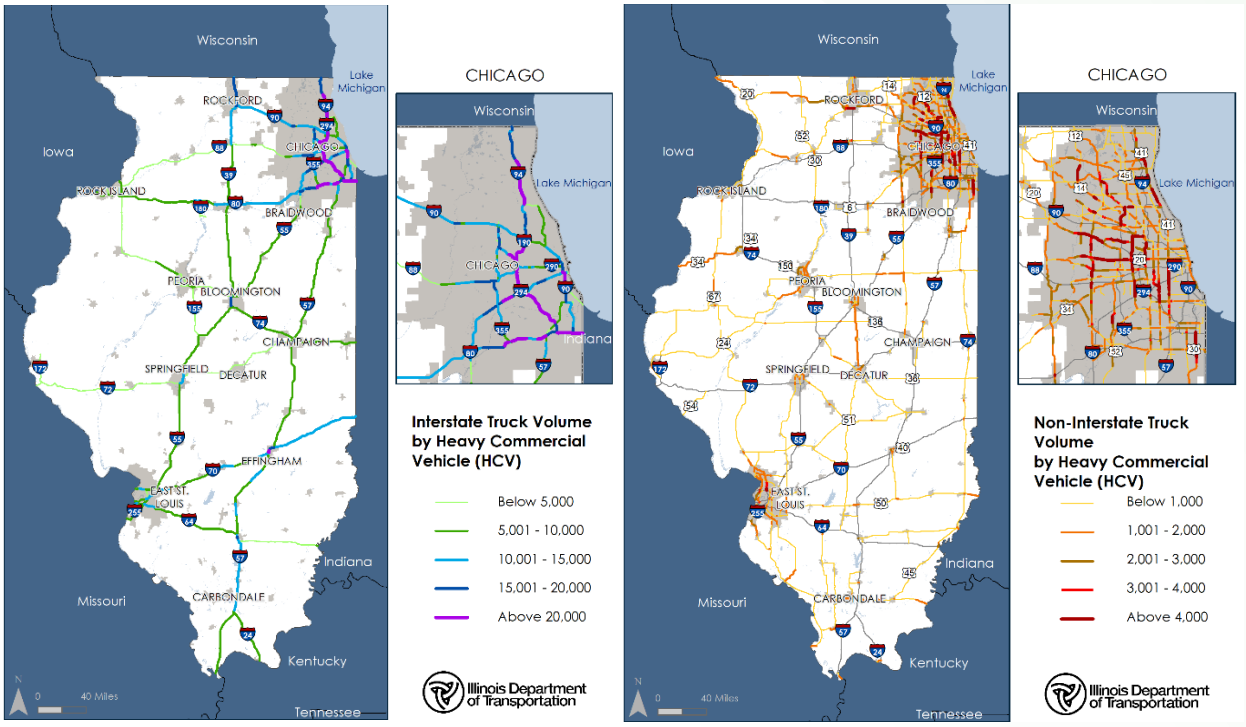
Highway Freight Demand

Highway freight transportation demand measures how many trucks are using highways in Illinois, what commodities they are carrying, and what markets they are serving. Interstates see significantly higher truck volumes than all other roads both within the State and nationwide. In Illinois, the highest truck volumes are in the Chicago region along I-294, I-94, I-80, I-190, and I-90. There are also high volumes of trucks along I-70 near Effingham, I-57 near Mount Vernon, and I-39 near Rockford and Bloomington (Figure 5.4). While the highest volumes of trucks are found in these urban areas, in many cases, the *percentage* of trucks compared to total traffic is comparatively lower than in rural areas of the State.

Truck transportation is the dominant means of moving goods in the State, accounting for 53 percent of total tonnage and 53 percent of total value moving in the State's multimodal freight network in 2019. The trucks on Illinois' roads carry around 848 million tons of goods worth just under $1.34 trillion as of 2019. Figure 5.5 shows the breakdown of total tonnage and value by direction. Farm Products, Secondary Traffic, and Nonmetallic Minerals are the top commodity based on tons and Secondary Traffic, Transportation Equipment, and Food or Kindred Products are the top commodity based on value. [20] Top trading partners include: Wisconsin, Indiana, and Missouri.

[20] Secondary Traffic is consumer goods moving from warehouses to retail stores.

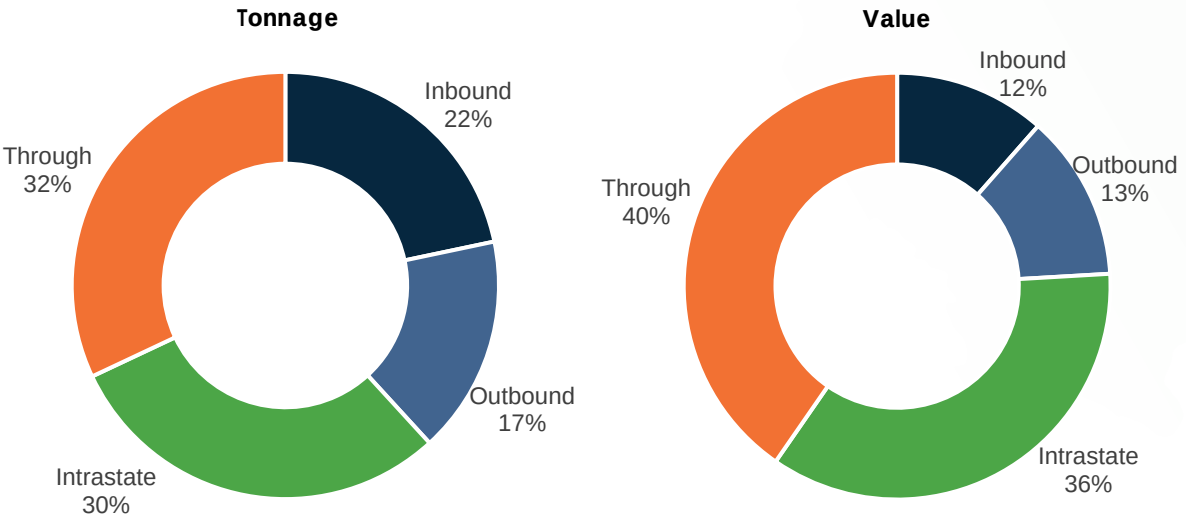
FIGURE 5.4 ILLINOIS TRUCK VOLUMES, INTERSTATES AND NON-INTERSTATES



Note: This map displays truck volumes for all non-Interstates that are part of the National Highway System (NHS).

Source: IDOT IRIS Highway Inventory (2019).

FIGURE 5.5 ILLINOIS TRUCK TONANGE AND VALUE BY DIRECTION (2019)

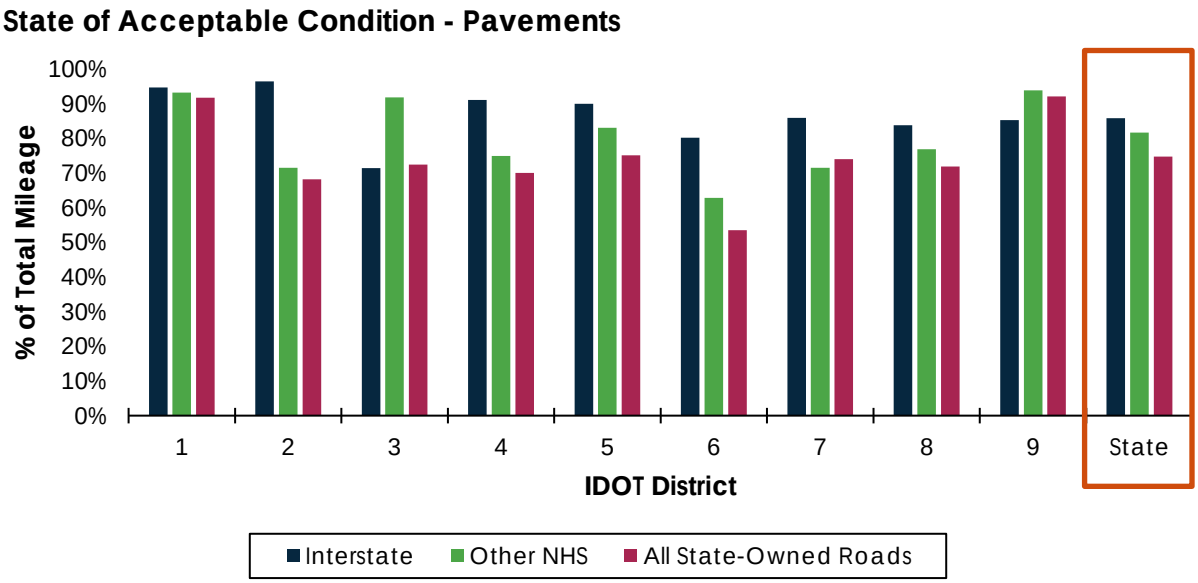


Source: 2019 S&P Transearch Data.

Highway Condition and Performance

Overall, about 75 percent of pavement on all state-owned roads in is in a state of acceptable condition (Figure 5.6), defined as Interstates with a Condition Rating Survey (CRS) greater than 5.5 or other roads with a CRS greater than 5.0. 86 percent of Interstate pavement and 82 percent of other NHS pavement is in a state of acceptable condition, just under the 90 percent goals identified for each category of roads set in the *Illinois Transportation Asset Management Plan*.[21]

FIGURE 5.6 ILLINOIS PAVEMENT CONDITION, STATEWIDE AND BY DISTRICT



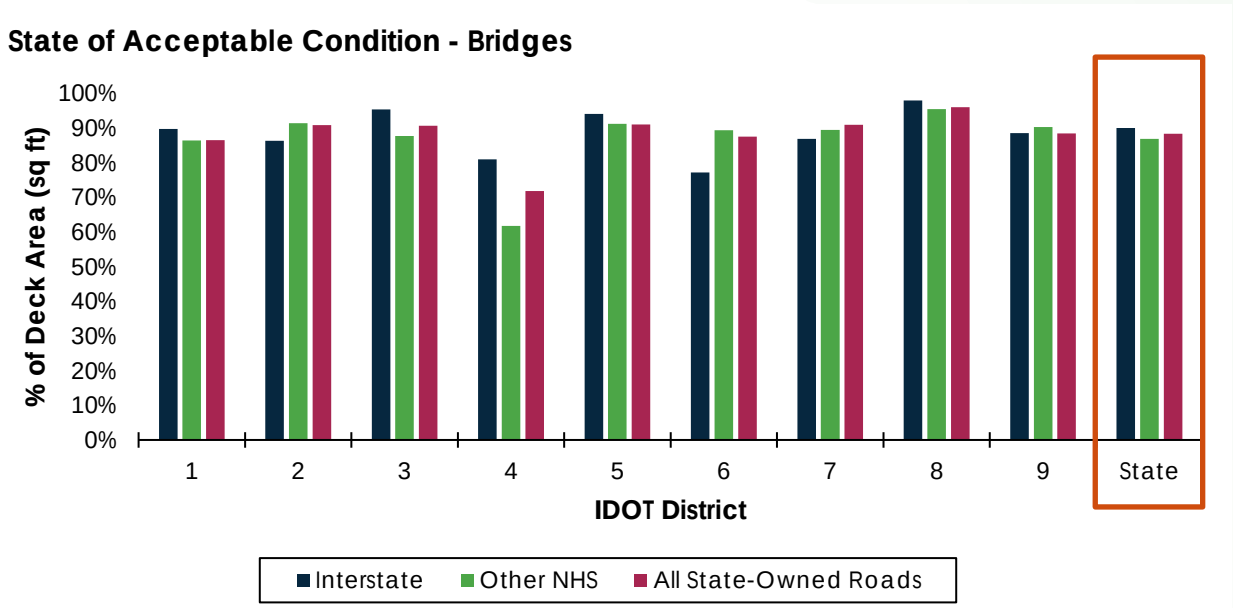
Source: IDOT FY2022 State of Acceptable Condition Report

Overall, bridges in Illinois are in acceptable condition across the State. About 88 percent of bridge deck area is in a state of acceptable condition, defined for all roadway systems as a National Bridge Inventory (NBI) value greater than 5. This includes 90 percent of Interstate deck area and 87 percent of other NHS deck area in a state of acceptable condition, just under the 93 percent goal identified for each category of roads set in the *Transportation Asset Management Plan*.[22]

[21] https://idot.illinois.gov/transportation-system/transportation-management/planning/tamp

[22] Further information about the condition of roadways and bridges in Illinois can be found in the Transportation Asset Management Plan: https://idot.illinois.gov/transportation-system/transportation-management/planning/tamp.

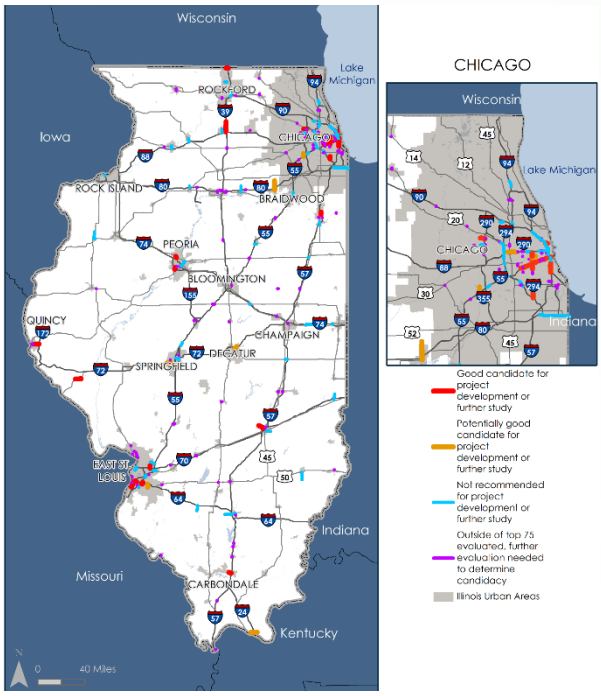
FIGURE 5.7 ILLINOIS BRIDGE CONDITION, STATEWIDE AND BY DISTRICT



Source: IDOT FY2022 State of Acceptable Condition Report

The *Illinois Truck Bottleneck Study* identified and evaluated truck bottlenecks across the State. Different thresholds on truck congestion costs were set to identify bottlenecks in Urban Chicago-Region, Urban Other, and Rural areas of the State. The top 75 bottlenecks were evaluated to determine if the locations are a good candidate for project development or further study (Figure 5.8).

FIGURE 5.8 ILLINOIS STATEWIDE HIGHWAY BOTTLENECKS



Source: 2021 IDOT Truck Bottleneck Study.

Highway Safety

There were close to 67,000 truck-involved crashes in Illinois between 2015 and 2019, averaging around 13,400 crashes per year. Most truck-involved crashes (82 percent) only involved property damages. Most truck-involved crashes (22,000 or one-third) during this period were collisions between either a multi-unit or single-unit commercial truck and a personal vehicle. Between 2015 and 2019, the total number of truck-involved crashes increased 23 percent. As can be expected, there is some degree of fluctuation from year to year in the number of crashes and their severity.

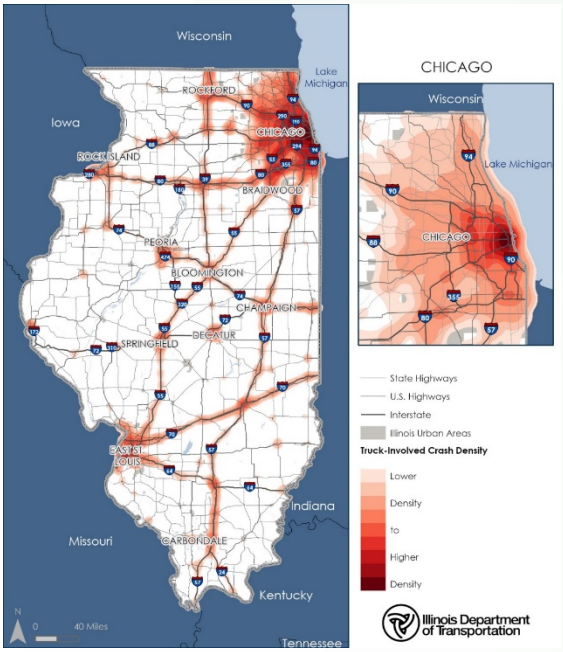
Roads in the State's urban areas, especially roads around the Chicago metropolitan region and the St. Louis metropolitan area, including East St. Louis, experience higher rates of truck-involved crashes (Figure 5.9). Roads in these urban areas also showed a higher concentration of severe truck-involved crashes (i.e., fatal and serious injury crashes).[23]

Truck Parking

IDOT maintains 54 safety rest areas that provide truck parking across 30 facilities in the State. Twenty-four of the 30 facilities are dual facilities, in which there is one facility on each directional side of the highway. The other 6 sites contain a single facility. There are also 91 privately operated truck stops throughout the State. These truck stops provide services and amenities such as fuel stations, convenience stores, showers, and restrooms in addition to truck parking.

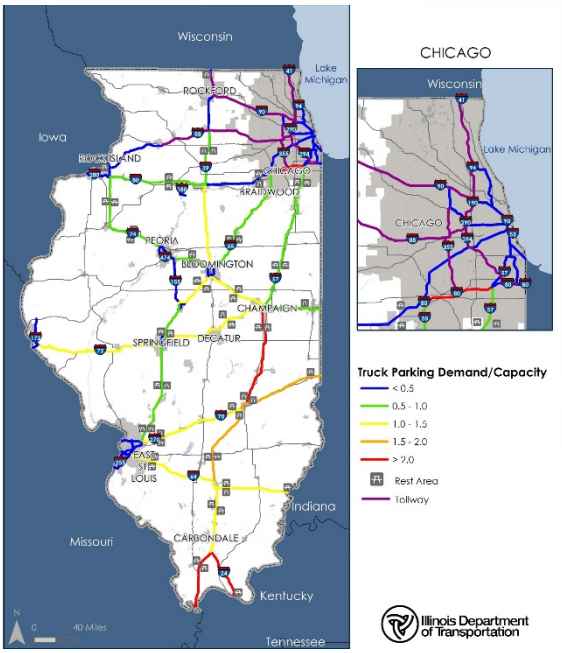
The truck parking demand-to-capacity for IDOT maintained facilities can be seen in Figure 5.10. Areas that have been identified as having shortages of adequate commercial motor vehicle parking spaces include: I-80 south of Chicago, from I-55 to I-57; I-57 south of Champaign, from I-70 to I-72; I-57 south of Carbondale; and, I-24 south of Carbondale.

FIGURE 5.9 ILLINOIS DENSITY OF TRUCK-INVOLVED CRASHES



Source: IDOT Crash Data (2015–2019).

FIGURE 5.10 ILLIINOIS INTERSTATE TRUCK PARKING DEMAND TO CAPACITY RATIOS



Source: IDOT Draft Truck Parking Study (2022).

[23] Illinois Strategic Highway Safety Plan: https://idot.illinois.gov/transportation-system/transportation-management/planning/SHSP.

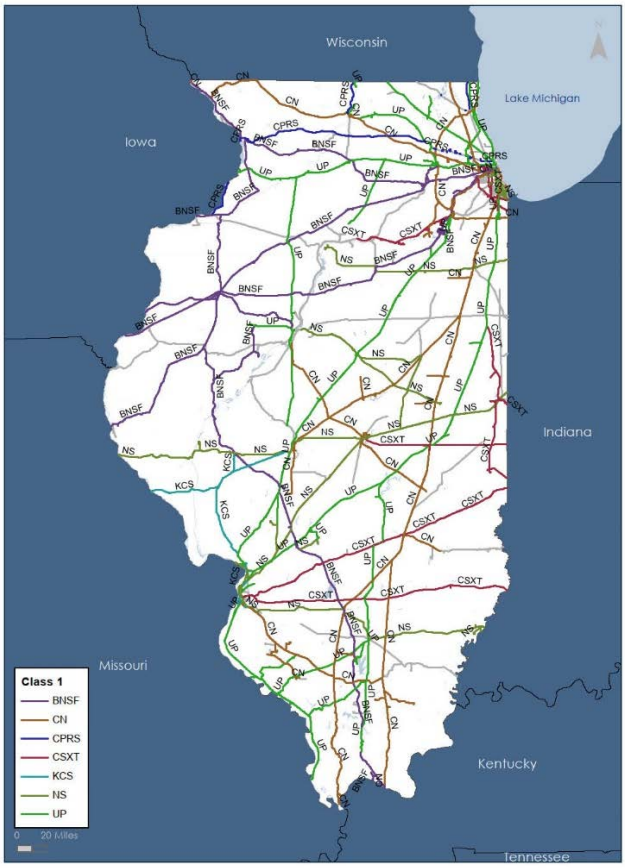
5.2 Illinois' Rail and Intermodal Freight Network

Overview

Illinois is a leader and a hub to the North American rail network. It is the only state in the U.S. in which all seven Class I railroads operate. The seven Class I railroads of Illinois operate 5,298 rail miles, excluding trackage rights (Figure 5.11 and Table 5.1). In addition, there are 4 regional railroads, and 44 short-line railroads in the State. Illinois also has the highest number of intermodal terminals of any state, with 23 intermodal rail terminals. Finally, there are 49 rail-served port terminals located on navigable waterways within the State, mostly concentrated on the Calumet River near Lake Michigan, around Joliet and Peoria on the Illinois River, and in East St. Louis on the Mississippi River.

Chicago and East St. Louis serve as the two largest gateways where rail traffic is interchanged between railroads from different parts of the U.S. This role is graphically illustrated by Figure 5.12, where western railroads in green meet eastern railroads in red, while north/south railroads, including the former Illinois Central lines of CN and KCS, Canadian rail lines of CN and CP, all meet in Illinois.

FIGURE 5.11 CLASS I RAILROADS IN ILLINOIS



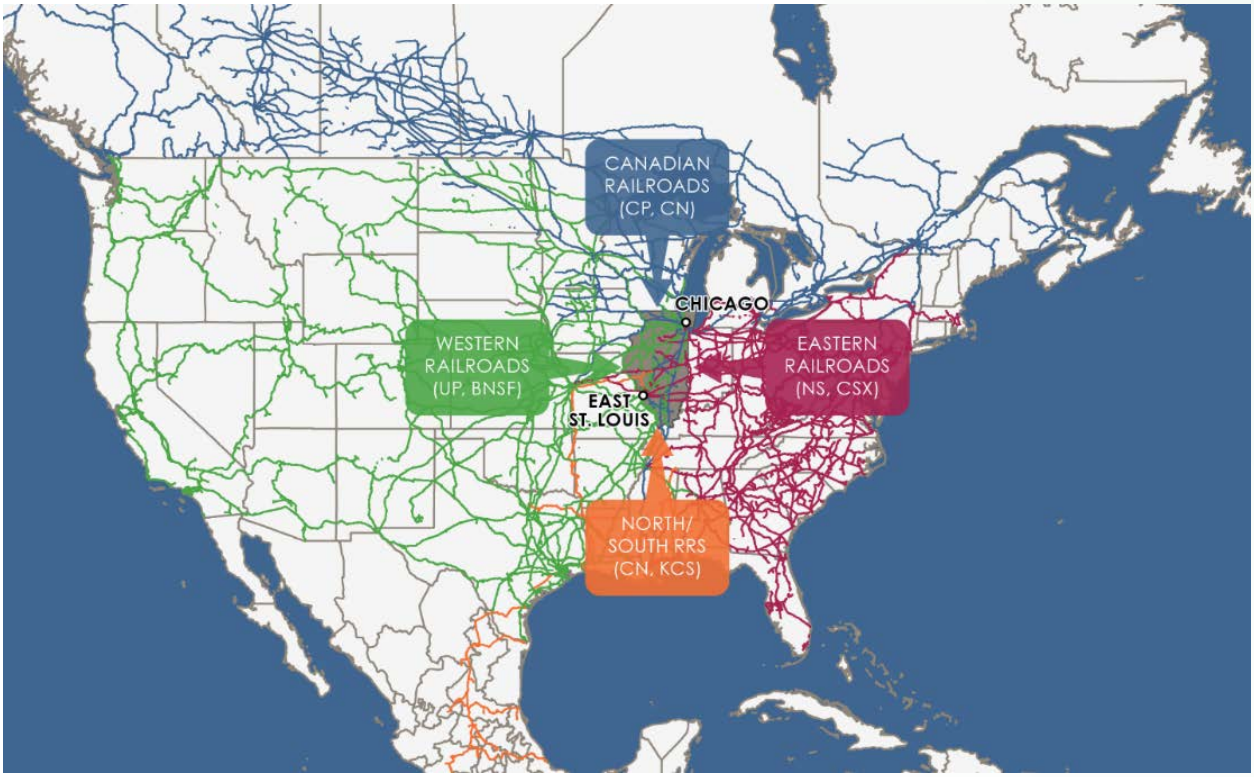
Source: IDOT GIS.

TABLE 5.1 RAILROAD OPERATING ROUTE MILEAGE IN ILLINOIS

Railroad type	Miles operated (excluding trackage rights)	Percent
Class I	5,298	79%
Regional	322	5%
Short Line	1,092	16%
TOTAL	**6,712**	**100%**

Sources: STB Schedule 702 Reports (2020), AAR Illinois State Fact Sheet (2019).

FIGURE 5.12 ILLINOIS' POSITION AS A HUB WITHIN THE U.S. RAIL NETWORK



Source: Bureau of Transportation Statistics (BTS) National Transportation Atlas Database.

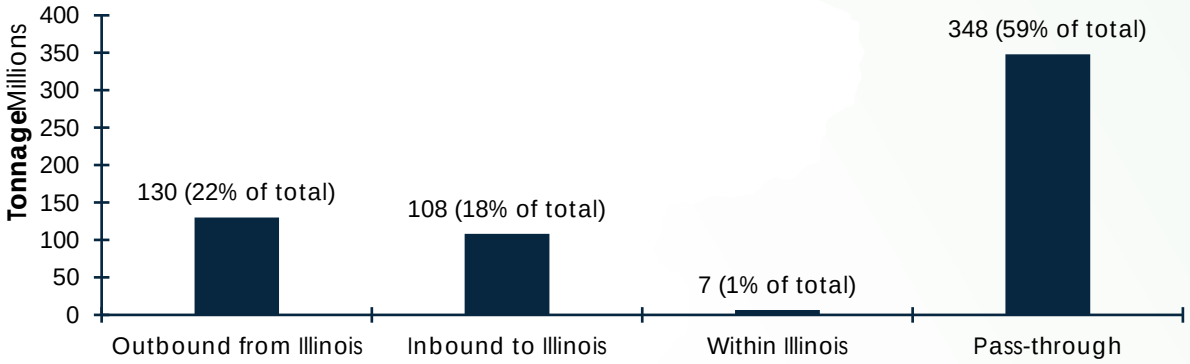
Rail Freight Demand

Rail transportation is the second most dominant means of moving goods in the State, accounting for 37 percent of total tonnage and 41 percent of total value moving in the State's multimodal freight network in 2019. Railroads carry 592.5 million tons of goods worth $1.04 trillion as of 2019. Coal, chemicals and allied products, and miscellaneous mixed shipments are the top commodities based on tons; and miscellaneous mixed shipments, transportation equipment, and chemicals and allied products are the top commodities based on value. Top trading partners include: California (intermodal, farm products, food products), Wyoming (coal), Texas (farm products, nonmetallic minerals, intermodal, chemical products, transportation equipment, food products), Indiana (coal, farm products, food products, metal products, non-metallic minerals) and Louisiana (coal, farm products).

As shown in Figure 5.13, most freight handled by the Illinois rail network (59 percent) is passing through the State between other states. Otherwise, Illinois ships out more traffic (22 percent) than it receives (18 percent), and relatively little freight rail traffic originates and terminates within Illinois (1 percent). According to the Association of American Railroads (AAR), Illinois is number one state nationally in terms of both originating and terminating carloads, and second in terms of originating and terminating rail tonnage.[24]

[24] https://www.aar.org/wp-content/uploads/2021/02/AAR-State-Rankings-2019.pdf

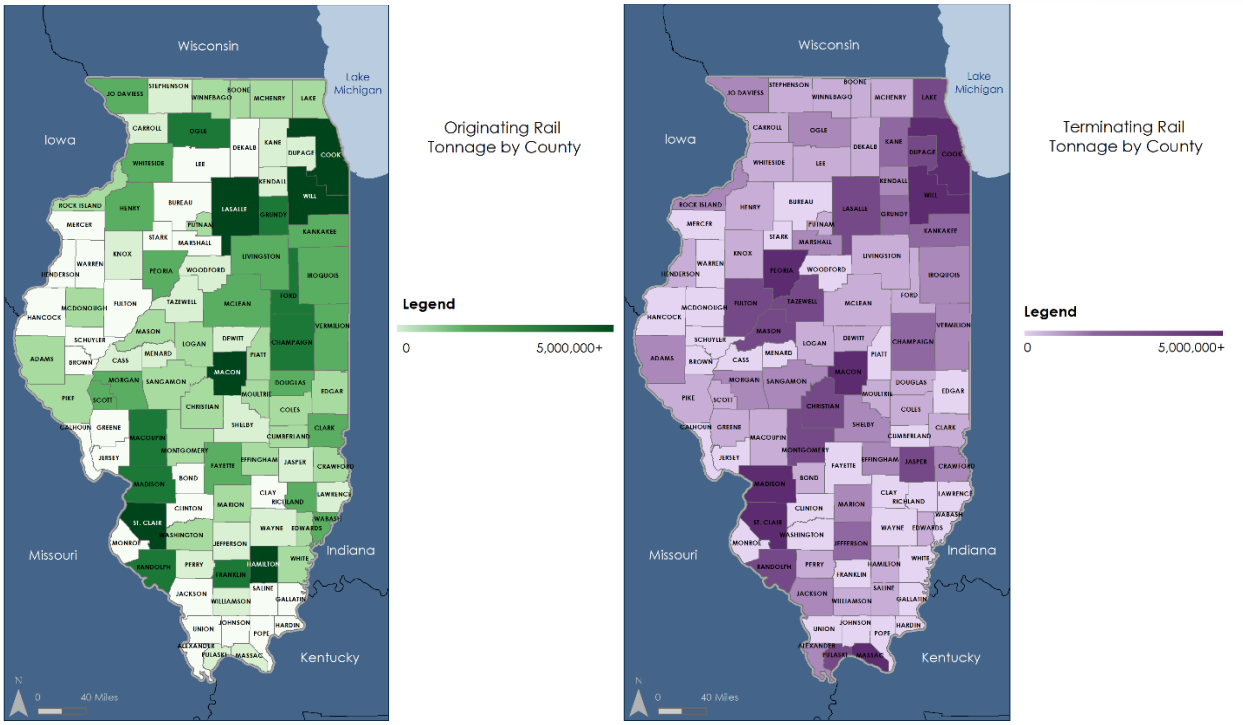
FIGURE 5.13 ILLINOIS FREIGHT RAIL TONNAGE BY DIRECTION (2019)



Source: 2019 STB Waybill data

As shown in Figure 5.14, the top originating counties in the State are Cook, Will, Lasalle, Hamilton, Macon and St. Clair Counties. The top terminating counties are Cook, Will, Massac, St. Clair Madison, Macon and Peoria counties. Cook and Will counties, comprising the greater Chicago area, primarily ship intermodal goods, food products (such as corn, flour and liquors), and farm products (such as grain), and primarily receive intermodal goods, food products (such as sugar, soybean and miscellaneous food preparations), and chemical products (such as potassium and sodium products and plastics). Aggregates (gravel, sand), coal, and agricultural products (corn, soybeans, prepared feed products) comprise the majority of goods moving from the middle of the State. St. Clair County, which includes East St. Louis, originates a variety of commodities such as chemicals, transportation equipment, intermodal goods and nonmetallic minerals.

FIGURE 5.14 ILLINOIS ORIGINATING AND TERMINATING RAIL TONNAGES BY COUNTY

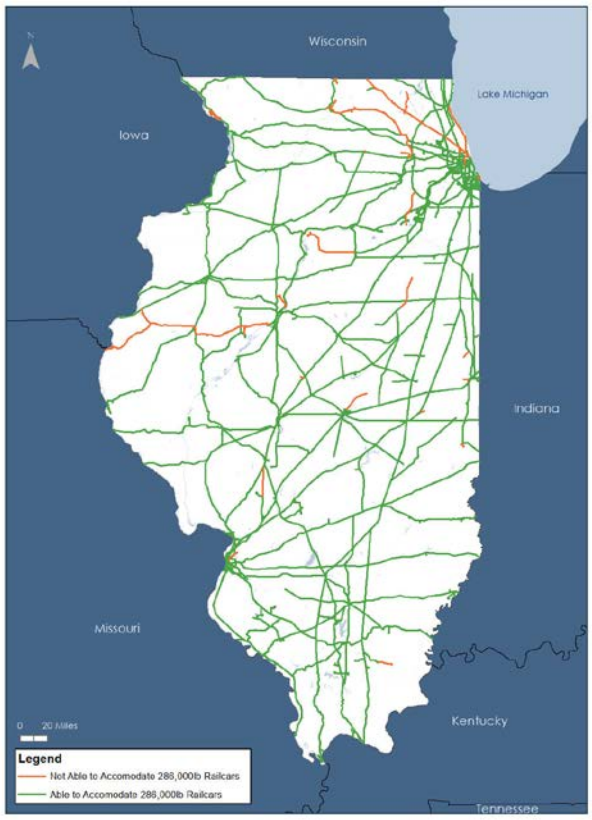


Source: 2019 STB Waybill data.

Rail Condition and Performance

There are two primary issues that affect Illinois' rail network condition and performance. Approximately 738 miles of track within the State cannot handle industry standard 286,000-pound railcars (Figure 5.15). Additionally, a total of 113 miles of rail lines are Federal Railroad Administration (FRA) Excepted track, while another 784 miles are FRA Track Class 1 (Figure 5.16). Freight railroads are more efficient if trains can operate at FRA Track Class 2 standards (up to 25 miles per hour) and can accommodate 286,000-pound railcars. In some cases, the same rail lines that cannot accommodate 286,000-pound railcars are the same lines that are rated Class I or Excepted, but not always. In Illinois, 20 percent of tracks that either 1) FRA Excepted or Track Class 1; or 2) cannot accommodate 286,000-pound railcars fall under both categories.

FIGURE 5.15 ILLINOIS RAIL WEIGHT RESTRICTIONS



Source: IDOT GIS, Illinois Rail Needs Assessment.

FIGURE 5.16 ILLINOIS FRA TRACK CLASS CLASSIFICATION

Source: IDOT GIS, Illinois Rail Needs Assessment.

5.3 Illinois' Marine Freight Network

Overview

Illinois has 19 Public Port Districts (Figure 5.17) and 341 public and private cargo-handling port facilities (Figure 5.18) located on over 1,118 miles of commercially navigable waterways. Collectively known as the Illinois Marine Transportation System (IMTS), the State's waterways that are commercially navigable include the Chicago Area Waterway System (CAWS) and portions

of five designated U.S. Marine Highway routes: M-35 (Mississippi River), M-55 (Illinois River), M-70 (Ohio River), M-3 (Kaskaskia River), and M-90 (Lake Michigan). Illinois is unique in that it is the only direct waterway connection between the Great Lakes (and subsequently the St. Lawrence Seaway and North Atlantic Coast) and the Mississippi River System (and subsequently the Gulf of Mexico). Figure 5.20 shows the prominence of Illinois within the U.S. Marine Highway System.

FIGURE 5.17 ILLINOIS MARINE TRANSPORTATION SYSTEM BY THE NUMBERS

ILLINOIS MARINE TRANSPORTATION SYSTEM BY THE NUMBERS

Mississippi River Facts

- 15 Locks and Dams
- 580 River Miles
- 89 Terminals

Ohio River Facts

- 2 Locks and Dams
- 128 River Miles
- 34 Terminals

Illinois River Facts

- 5 Locks and Dams
- 273 River Miles
- 137 Terminals

Chicago Area Waterway System Facts

- 3 Locks and Dams
- 1 Lock
- 96 River Miles
- 141 Terminals

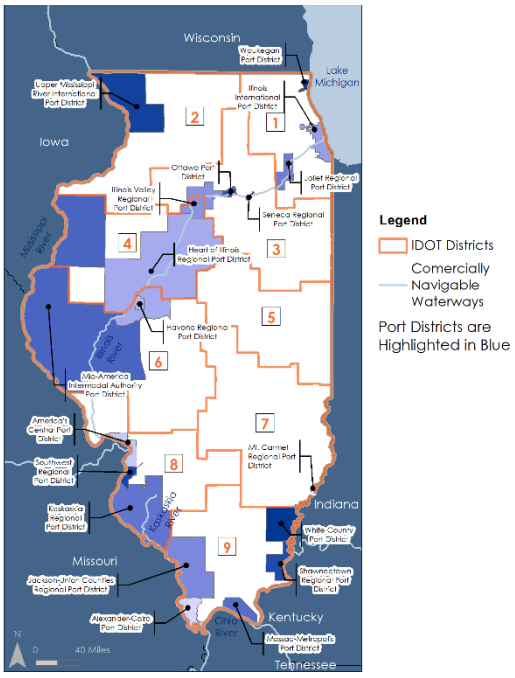
Kaskaskia River Facts

- 1 Locks and Dams
- 36 River Miles
- 3 Terminals

Lake Michigan Facts

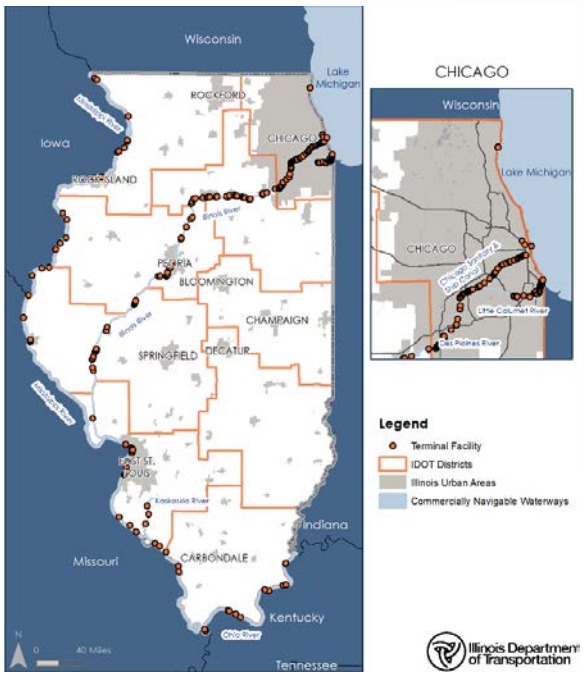
- 63 Miles of Coastline
- State jurisdiction extends 1,500 square miles into the lake
- 2 Terminals

FIGURE 5.18 ILLINOIS PORT DISTRICTS



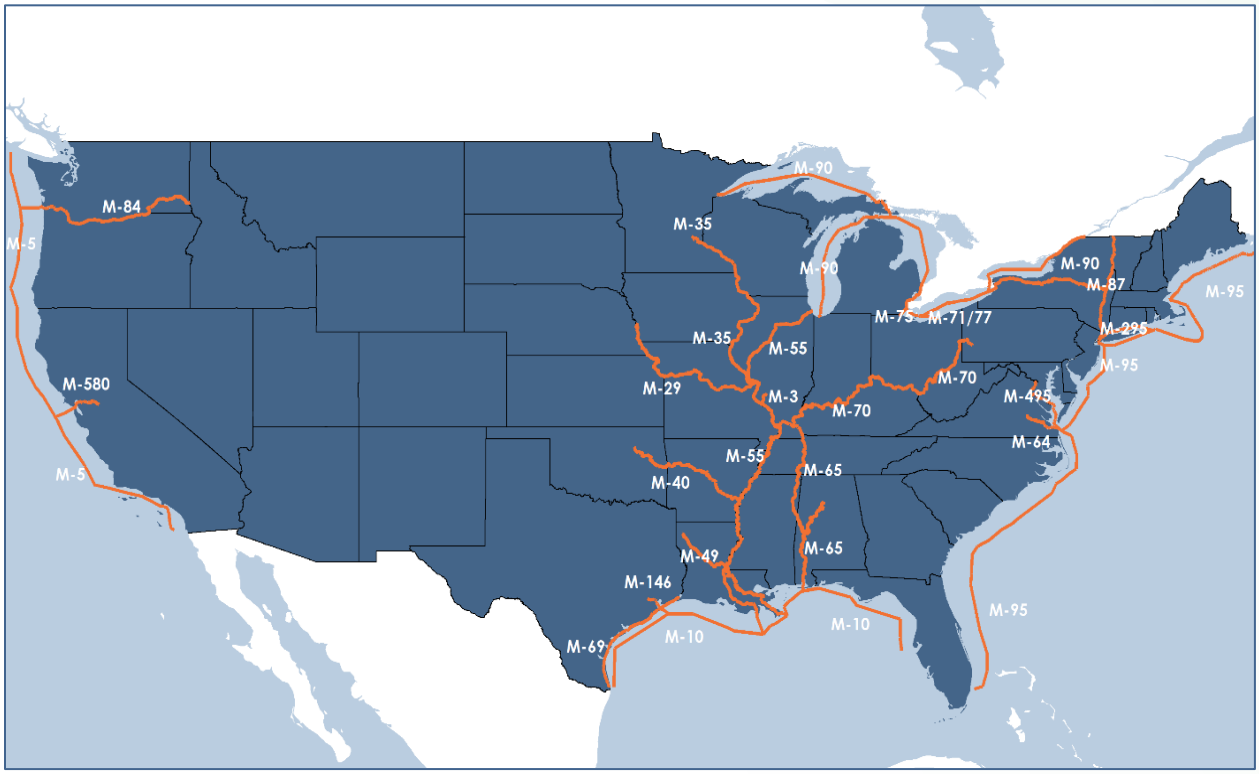
Source: U.S. Army Corps of Engineers.

FIGURE 5.19 ILLINOIS MARINE TERMINALS



Source: Illinois Marine Transportation System Plan.

FIGURE 5.20 UNITED STATES MARINE HIGHWAY SYSTEM



Source: U.S. DOT Maritime Administration.

Marine Freight Demand

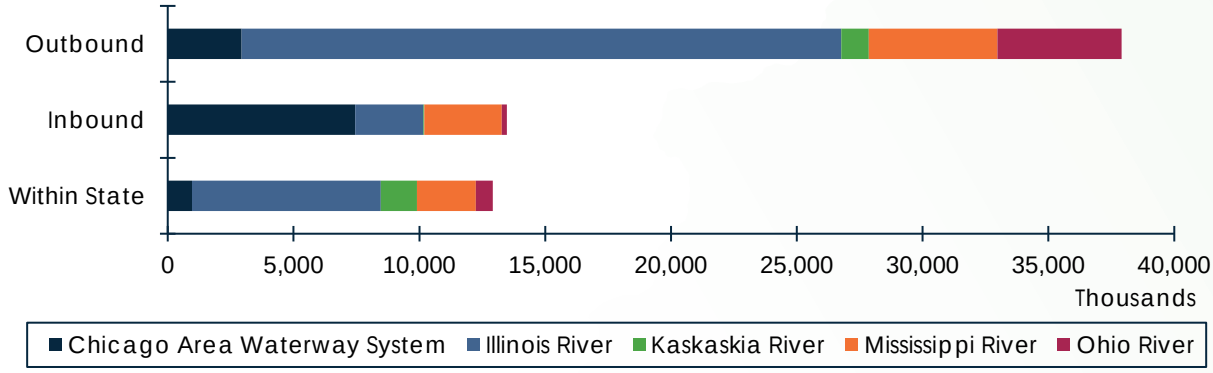
Figure 5.21 shows the distribution of 71.4 million tons of waterway tonnage moving to, from, and between Illinois origins and destinations in 2019.[25] Top outbound commodities include: farm products, including grain (corn) and soybeans, food and kindred products, and petroleum or coal products. Top inbound commodities include: nonmetallic minerals (primarily broken stone or riprap), chemicals or allied products (mainly fertilizers), and petroleum or coal products (largely refined petroleum products). Top

Image of a Tugboat in Illinois

[25] Note that while S&P Transearch data is based on and generally consistent with state level waterborne tonnage totals published by the U.S. Army Corps of Engineers, the Transearch database does not include tonnage reported by the Corps as having an unknown or "not elsewhere classified" commodity type, as that tonnage cannot be reliably assigned at the county level. The Corps tonnage figure for 2019, including the tonnage not assigned by Transearch, is 77,615,653 tons. The Transearch figure for 2019 is 71,389,000 tons, for a difference of 6,226,653 tons.

intrastate commodities include: nonmetallic minerals, including miscellaneous minerals, gravel or sand, and broken stone, chemicals or allied products, and petroleum or coal products.

FIGURE 5.21 ILLINOIS TONNAGE BY DIRECTION AND WATERWAY (2019)

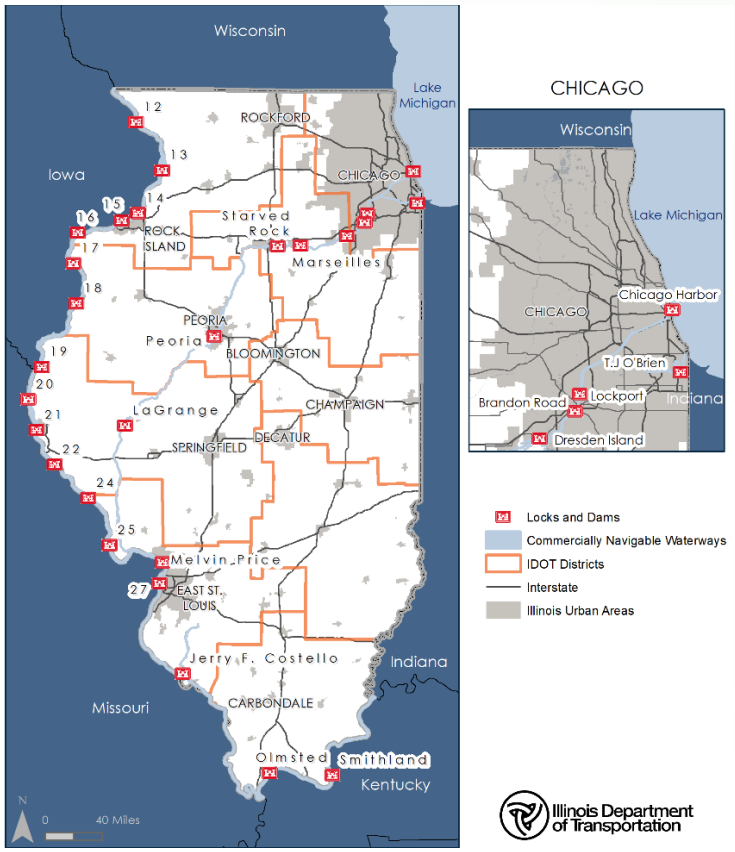


Source: S&P Transearch data.

Marine Network Condition and Performance

There are a total of 26 locks and dams and 1 lock (Chicago Harbor) throughout the IMTS (Figure 5.22). A majority of these locks and dams were constructed in the1930s and 1940s, with seven of them constructed since 1957. Most of these locks and dams have outlived their engineered lifespan of 50 years, resulting in periodic closures due to unforeseen maintenance. USACE Mississippi Valley Division (which oversees all the Mississippi River from St. Paul to New Orleans and Illinois River) estimates a backlog of maintenance for navigation at over $1 billion, of which nearly 40 percent is attributed to the Rock Island District which oversees 17 of the 27 locks and dams within the IMTS.[26]

FIGURE 5.22 LOCKS AND DAMS IN ILLINOIS



Source: U.S. Army Corps of Engineers.

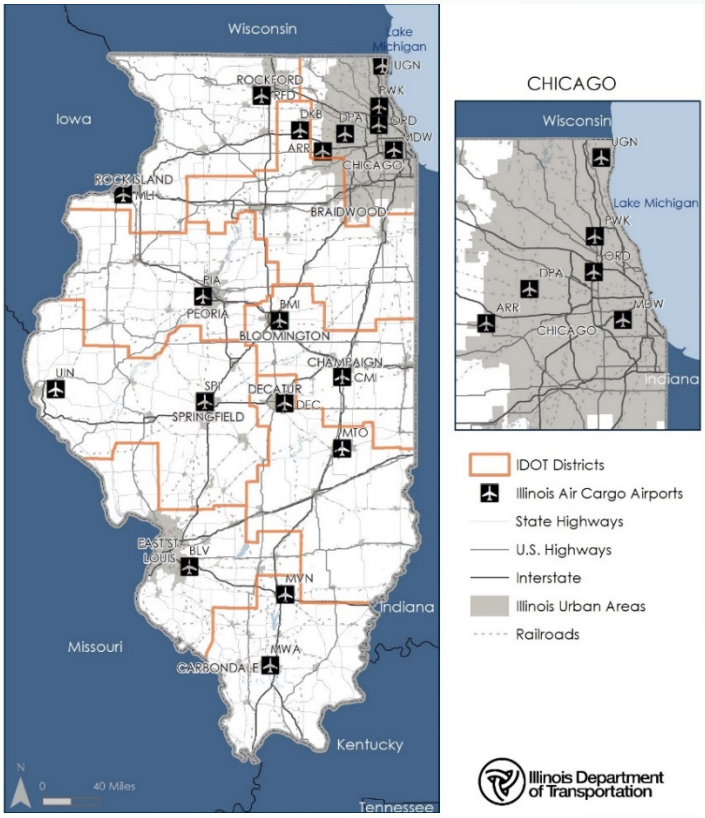
[26] https://www.usace.army.mil/Media/News-Archive/Story-Article-View/Article/2106959/backlog-of-maintenance/.

5.4 Illinois' Air Cargo Network

Overview

Air cargo is vital to Illinois' freight economy, allowing for freight to be moved over long distances in a short amount of time, and supporting the State's overall competitiveness with other air-served freight markets. With national and international airports that distribute cargo located in Chicago and Rockford, Illinois is a major air cargo origin and destination point for national and international shipments. The largest air cargo hub in Illinois is O'Hare International Airport (ORD) in northwest Chicago. ORD is one of the Nation's premier international gateways due to its substantial airside infrastructure capacity and Chicago's central location within the U.S. for truck and rail distribution.

FIGURE 5.23 ILLINOIS AIR CARGO AIRPORTS



Source: Bureau of Transportation Statistics (2021).

Commodities transported by air are typically highly valuable, and generate a significant amount of economic activity to the State. The Illinois Aviation Systems Plan estimated that air cargo flowing through Illinois airports directly contributes approximately $19.9 billion to off-airport businesses by providing production inputs and contributing to the long-distance transport of goods, supporting over 57,000 jobs, more than $5.2 billion in labor income, and $9 billion in value added. When considering indirect and induced effects of this activity, the benefits grow to a total of more than 142,000 jobs, $10.6 billion in labor income, $18.8 billion in value added, and nearly $40 billion in business revenue.[27]

Out of the 85 public use airport facilities in the State, 20 airports have handled some amount of air cargo within the past five years (Figure 5.23). However, nearly all (98 percent) of Illinois air cargo is handled through two major airports: O'Hare International (ORD) and Chicago-Rockford (RFD). The largest air cargo hub in Illinois is ORD, which transported 82 percent of total air cargo tonnage in the State. In 2020 ORD was ranked 7th among U.S. cargo hubs, and 17th globally. Other airports that handled minimal amount of air cargo include: Chicago Midway International (MDW), General Downing-Peoria International (PIA), Central Illinois Regional Airport at Bloomington-Normal (BMI), University of Illinois-Willard (CMI), DuPage Airport (DPA), Quad City International Airport (MLI), DeKalb Taylor Municipal Airport (II3), Veterans Airport of Southern Illinois (MWA), and Abraham Lincoln Capital Airport (SPI).

[27] http://www.ilaviation.com/wp-content/uploads/2021/05/EIA-Air-Cargo_050421.pdf.

There are four types of air cargo service offered in Illinois, as shown in Table 5.2. The majority (62 percent) of all tonnage is Service Class G, which is scheduled all-cargo service and does not include any passengers or belly cargo.

TABLE 5.2 AIR CARGO SERVICE IN ILLINOIS (2019)

Airport Name	Total Tons	Percent of Total
Scheduled Passenger/Cargo Service (F)	439,478	20%
Scheduled All-Cargo Service (G)	1,373,593	62%
Non-Scheduled Civilian All-Cargo Service (P)	414,079	19%
Non-Scheduled Civilian Passenger/Cargo Service (L)	829	< 1%
Total	**2,227,978**	**100%**

Source: BTS T-100 Market Data (2019). Due to rounding, percentages may exceed 100 percent.

In 2019, there were nearly 130 different carriers transporting cargo to and from Illinois' airports. The leading freight carriers for domestic and international trade are shown in Table 5.3. United Parcel Service (UPS) is the primary carrier, handling more than 348,000 tons or 16 percent of the total tonnage in 2019. Other top carriers include Atlas Air (8 percent), Federal Express Corporation (FedEx) (8 percent), and United Air Lines (6 percent).

TABLE 5.3 TOP 10 AIR CARGO CARRIERS IN ILLINOIS BY DIRECTION (2019)

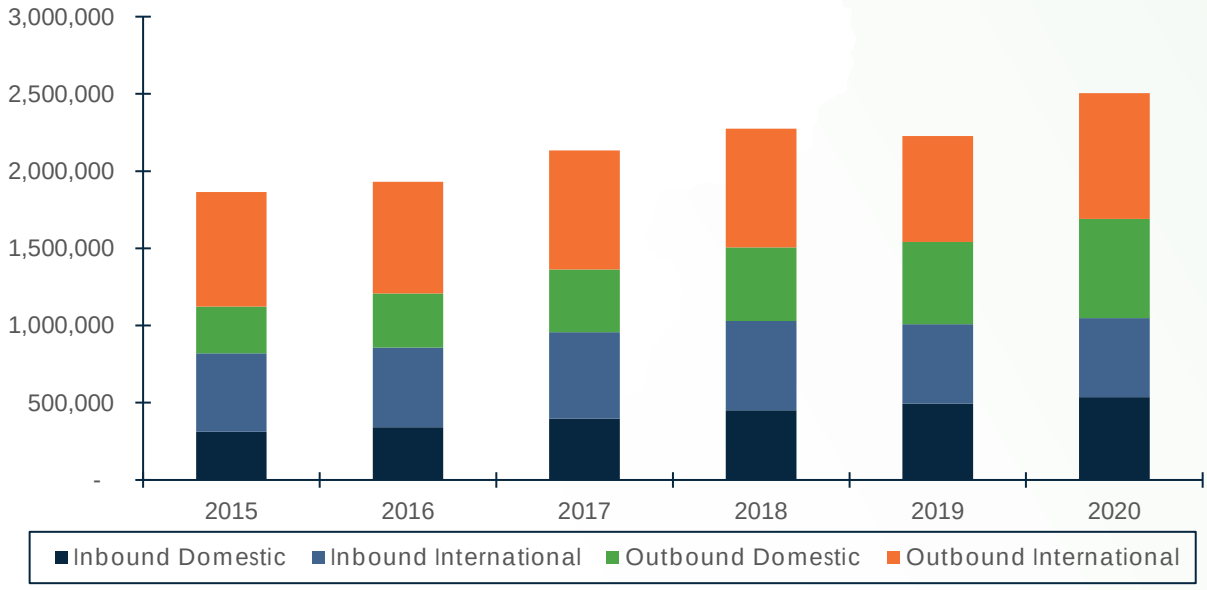
Carrier Name	Inbound	Outbound	Total	Percent of Total
United Parcel Service	151,123	197,197	348,319	16%
Atlas Air Inc.	111,511	75,150	186,661	8%
Federal Express Corporation	82,552	87,954	170,506	8%
United Air Lines Inc.	75,008	60,930	135,937	6%
Cargolux Airlines International S.A	54,080	36,207	90,287	4%
Qatar Airways (Q.C.S.C)	42,071	37,206	79,277	4%
Kalitta Air LLC	47,387	22,039	69,426	3%
American Airlines Inc.	36,018	31,599	67,617	3%
Nippon Cargo Airlines	46,898	20,501	67,399	3%
China Southern Airlines	41,660	25,348	67,008	3%

Source: BTS T-100 Market Data (2019).

Air Cargo Demand

Air cargo activity in Illinois has increased significantly since 2015 (Figure 5.24), with the total tonnage surpassing 2.5 million tons by 2020 due to a surge in consumer goods demand during the COVID-19 pandemic. Top commodities by tonnage included electronics, machinery, plastics/rubber, motorized vehicles, and precision instruments. By value, the top commodities were electronics, machinery, pharmaceuticals, precision instruments, and transportation equipment.

FIGURE 5.24 TOTAL AIR CARGO TONNAGE IN ILLINOIS (2015 TO 2020)



Source: BTS T-100 Market Data (2015-2020).

O'Hare (ORD) is by far the largest air cargo hub in the state, serving over 25 cargo carriers, plus over 30 international passenger airlines, including major hubs for both United Airlines and American Airlines. In 2019, carriers transported cargo from ORD to nearly 250 individual destination airports. Shanghai Pudong International Airport (PVG) in Shanghai, China received the highest amount of tonnage, nearly 61,000 tons or 8 percent of total outbound tonnage. Other top export airports include Incheon International Airport (ICN) in Seoul, South Korea, Memphis International Airport (MEM) in Memphis, TN, and Frankfurt Airport (FRA) in Frankfurt, Germany. The top domestic destinations in Memphis, Louisville, Cincinnati, and Indianapolis are all major hubs for private courier services (FedEx, UPS, DHL and FedEx Express, respectively), which comprise the majority of domestic air cargo volumes.

In 2019, carriers transported cargo to ORD from over 225 individual origin airports. The highest volume of tonnage originated from Ted Stevens Anchorage International Airport (ANC) in Anchorage, AK, nearly 134,000 tons or 13 percent of total inbound tonnage. Anchorage is a common stopover point for fueling between Asia and North America, and this flow represents trade with Asian markets. Other top inbound airport trading partners include PVG in Shanghai, China, Narita International Airport (NRT) in Tokyo, Japan, and FRA in Frankfurt, Germany.

Air Cargo Network Condition and Performance

On-time airport departures and departure delay reflect performance and air operations at airports. There are three Illinois airports with Federal Aviation Administration (FAA) reported Aviation System Performance Metrics (ASPM) data: MDW, ORD, and RFD. In 2019, the percent of on-time airport departures was 69.1 percent at MDW, 74.9 percent at RFD, and 61.4 percent at ORD, with increases to 83.2 percent, 80.8 percent, and 78 percent respectively in 2020, as fewer flights resulted in less congestion at the airports.

ORD, the State's highest volume airport, typically had the lowest performance among airports with data, having both the lowest percentage of on-time departures and highest average departure delay in most years. The average delay at ORD was over 17 minutes between 2015 and 2019, compared to 12 minutes at RFD. In 2020, the average delay at ORD was only 10 minutes.

5.5 Illinois' Pipelines

Overview

Pipelines are a critical piece of infrastructure, transporting natural gas, petroleum, crude oil, biofuels, and other products, for processing, handling, and to end consumers. The pipeline system is owned and operated by private entities and varies by size, material, and commodity transported.

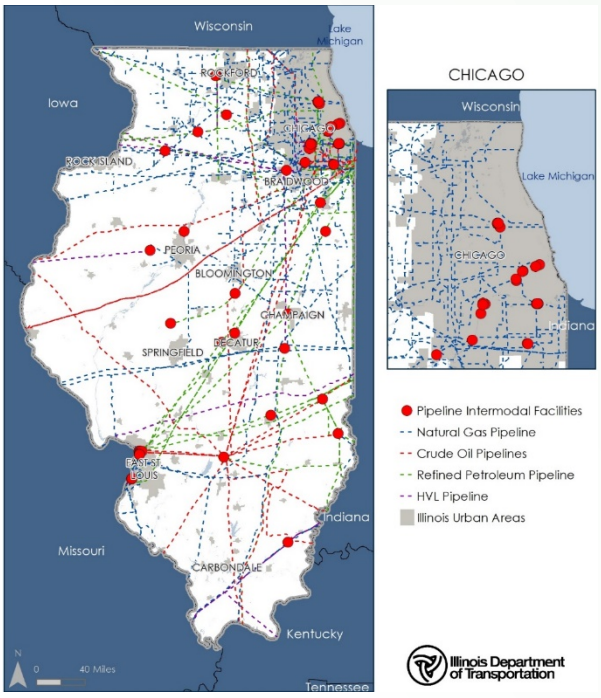
Illinois contains over 134,000 miles of pipeline (Figure 5.25) that carry crude oil (2 percent), highly volatile liquids (HVL) (1 percent), refined petroleum (3 percent), and natural gas (94 percent). There are 54 pipeline intermodal connections throughout the State, of which 16 connect to freight rail and 17 connect to marine freight, and 10 connect to both rail and marine modes.

Illinois consumes more natural gas than any other form of energy and has decreased its reliance on coal in the past 10–15 years. Illinois is a major junction for natural gas with two natural gas market centers, and 28 underground natural gas storage facilities that comprise over one-tenth of U.S. natural gas storage capacity. Figure 5.26 shows the Natural Gas Supply Chain.

Pipeline Demand

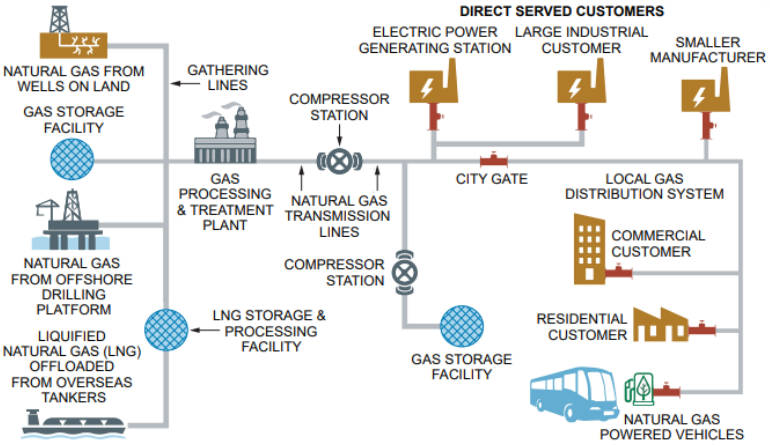
In 2017, an estimated 231.0 million tons of commodities valued at $67.6 billion flowed through Illinois' pipeline network. Figure 5.27 presents pipeline tonnage and value by direction. The largest category of pipeline flows are domestic inbound flows, which

FIGURE 5.25 ILLINOIS PIPELINES AND PIPELINE INTERMODAL FACILITIES



Source: IDOT; U.S. Energy Information Administration.

FIGURE 5.26 NATURAL GAS SUPPLY CHAIN

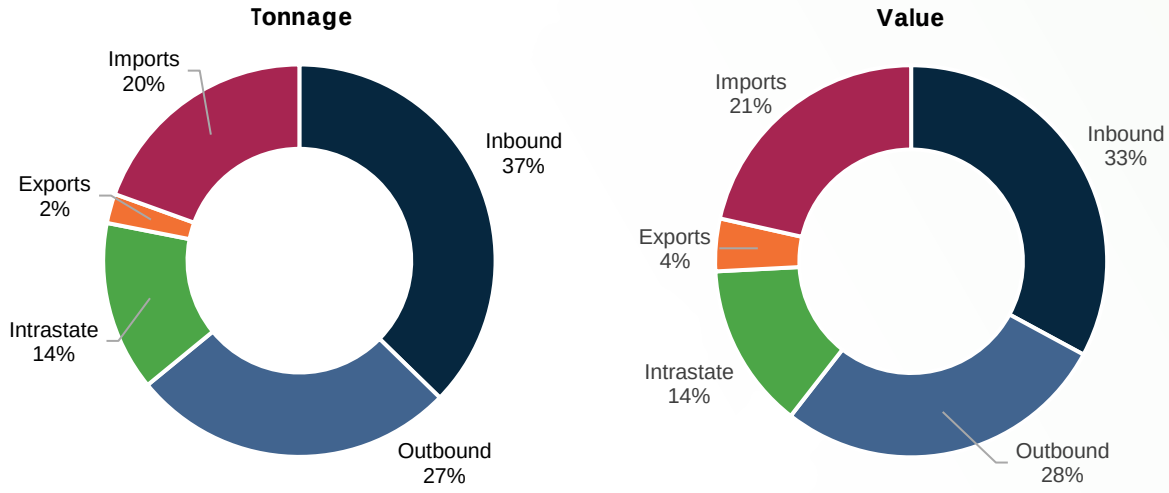


Source: U.S. Pipeline and Hazardous Materials Safety Administration.

comprised 37 percent of total tonnage and 33 percent of total value. About 64 percent of pipeline tonnage is moved to and from domestic locations, while 21 percent of flows are moved to and from international locations. A small proportion (14 percent) of pipeline volume and value is moved within the state of Illinois.

The top commodity group transported via pipeline in Illinois in 2017 was natural gas and fossil products (49 percent of total pipeline tonnage and 31 percent of value), which includes liquefied natural gas, propane, butane, and other liquefied gaseous hydrocarbons that can be transported via pipeline. Crude petroleum and gasoline are also significant pipeline commodities in terms of weight and value, comprising 29 percent and 17 percent of tonnage, respectively, and 31 percent and 30 percent of value, respectively in 2017. Fuel oils and basic chemicals are transported via pipeline, but in lesser volumes. [28]

FIGURE 5.27 ILLINOIS PIPELINE FLOWS BY DIRECTION (2017)



Note: Excludes through-state flows

Source: FHWA Freight Analysis Framework V5.

Pipeline Safety

Despite the significant safety benefits of transporting hazardous materials (HazMat) on pipelines versus other modes, minimizing risk of incident across the pipeline network must continue to be a priority for IDOT and Illinois overall. There are precautions that governments, pipeline operators and users can take to improve safety throughout the network. Pipeline terminals can develop secure rail car storage facilities rather than exposed rail spurs to minimize exposure of neighboring communities to HazMat products. Local governments should be aware of all pipeline easements and seek to prevent encroachment through local utility identification and marking, as well as safety programs. It is also critical to prohibit the development of residences and other sensitive facilities, such as hospitals, schools, or prisons, within a half mile of a pipeline in the event of a serious incident requiring immediate evacuation.

[28] FHWA FAF V5, excludes through flows.

6.0 Freight, Equity, and the Environment

While the movement of goods is critical to Illinois' economy, it also can impact the State's communities, natural, and cultural resources. Freight movements can have global implications, such as rising levels of greenhouse gas emissions. According to U.S. Environmental Protection Agency (EPA), trucks create seven percent of the total U.S. contribution to greenhouse gases, while aircraft, rail and marine transportation, both passenger and freight, make up another three percent.[29] Freight can also create local impacts, including reduced air quality, real and perceived safety hazards, pollutant discharges, and impacts to natural or cultural resources.

Image of Flooding at Big Marsh Park in Chicago, Illinois

The impacts of freight have historically been disproportionately felt by underserved communities throughout Illinois and the Nation. As such, improving equity, and reducing the environmental impacts of freight are a priority for both IDOT and U.S. DOT. Illinois is already taking legislative and executive action to achieve these goals. As a leader in implementation, IDOT has developed significant guidance and taken action over time avoid, minimize and/or mitigate environmental impacts, including air quality, traffic noise, community impacts such as relocations and access changes, natural resources including protected species and habitats, cultural resources such as prehistoric and historic sites, and land and water contamination issues.[30] Additionally:

- Illinois has committed to achieving the targets in the U.S. Climate Alliance, consistent with the Paris Accord, and implementing policies that reduce greenhouse gas emissions by at least 26–28 percent of 2005 levels by 2025, and tracking progress towards this goal. The State, including IDOT, is accelerating policies to reduce carbon emissions and deploy clean energy, including electric and zero-emission vehicles, to help achieve this goal.[31]

- The State is aggressively pursuing electrification as part of its clean energy goals. Incentives for vehicle electrification, deployment of clean energy, and creating jobs related to these sectors were expanded in early 2023.[32] IDOT is at the forefront, with ongoing deployment of its National Electric Vehicle Infrastructure (NEVI) program.[33] IDOT is also working with other state agencies such as the Illinois Environmental Protection Agency (IEPA), who among other actions, is currently administering the funds from a settlement with Volkswagen to implement

[29] https://www.epa.gov/greenvehicles/fast-facts-transportation-greenhouse-gas-emissions.
[30] https://idot.illinois.gov/transportation-system/environment/index.
[31] https://www2.illinois.gov/epa/topics/climate/Pages/default.aspx.
[32] https://ev.illinois.gov/
[33] https://idot.illinois.gov/home/drive-electric-illinois

diesel reduction technologies. Illinois is also working with the states of Indiana, Michigan, Minnesota, and Wisconsin who are cooperating on the Regional Electric Vehicle (REV) Midwest Plan.[34]

- IDOT has specific and targeted guidance for reducing or mitigating adverse environmental impacts, including air quality emissions from construction and other activities, and that serves as guidance for compliance with NEPA and other activities. IDOT also continues to take action, including hosting Peer Exchanges to discuss emerging air quality issues and state-of-the-art air quality improvement practices. Additionally, the IDOT Bureau of Design and Environment manual outlines comprehensive processes that must be followed to ensure compliance with federal and state regulations.[35]

- Most recently, IDOT has created a Data-Driven Decisions (DDD) Tool[36] to increase transparency and align selection process of capacity-enhancing projects with broader state goals. The DDD tool includes categories for environmental justice, level of environmental impact analysis required, and resiliency, all of which are factored into project selection.

- The Illinois Department of Natural Resources (IDNR) has developed a Comprehensive Wildlife Conservation Plan and Strategy that is an actionable plan for habitat management within the State. IDOT was involved with and is a partner in implementing this plan.[37]

- IDOT has a strong stormwater management plan that is designed to mitigate impacts of construction and infrastructure on the environment.[38]

- IDOT has been consistently working towards resiliency of the transportation system. In 2017, IDOT developed the All-Hazards Transportation System Vulnerability Assessment, which defined priority areas for resiliency within the State. The Illinois LRTP has also identified numerous performance measures, strategies and actions that are underway to create resilient transportation systems, including freight, within the State. Additionally, IDOT will undertake a multimodal Resilience Improvement Plan that will specifically identify actions to improve the ability of the State to respond to the impacts of extreme weather and natural disasters, prepare for increased flooding risk, and reduce impacts on community assets.

Image of Flooding on Kensington Ave, LaGrange, Illinois,

[34] https://afdc.energy.gov/laws/12708
[35] https://idot.illinois.gov/transportation-system/environment/index.
[36] https://idot.illinois.gov/data-driven-decisions.html
[37] https://idot.illinois.gov/Assets/uploads/files/Transportation-System/Reports/Highways/Design-and-Environment/The%20Illinois%20Comprehensive%20Wildlife%20Conservation%20Plan%20and%20Strategy%202005.pdf.
[38] https://idot.illinois.gov/transportation-system/transportation-management/planning/storm-water-management-plan.

In order to help the State achieve its environmental and community goals, it is also critical for IDOT to understand where freight movements pose the most risk to communities and the environment. This increases the State's ability to collect and track data on both acute issues and trends, and design and implement policies and procedures to mitigate or reduce impacts in places where they will have the most effect. The remainder of this chapter summarizes analyses that were undertaken as part of this Freight Plan to help IDOT understand the spatial relationship between freight, disadvantaged communities, and natural and cultural resources within the state. These analyses, in conjunction with the strategies and actions identified in Chapter 10.0, will help DOT and its planning partners to move closer to achieving its goals of minimizing negative impacts of freight within the state and in particular reduce impacts to already overburdened communities and environmental areas.

IDOT examined the spatial relationship between the PFN and disadvantaged communities in Illinois, as defined by the U.S. DOT's Justice40 metrics and various Illinois metrics. By multiple metrics, over half of disadvantaged census tracts are intersected by the PFN, which points to a strong relationship between areas of freight intensity and disadvantaged communities. IDOT also examined the intersections between the PFN and the State's natural and cultural resources. Identifying and assessing the intersection between these roadways that are critical for freight movement and these areas will allow IDOT to better understand the potential scope and scale of impacts of freight, and assess existing policies and procedures for their ability to mitigate these impacts.

6.1 Spatial Analysis of the PFN and Communities

This section summarizes the spatial analysis of the interaction between the PFN and disadvantaged or underserved communities within Illinois. The three measures used to identify disadvantaged or underserved communities are the U.S. DOT Justice40 Transportation Disadvantaged Communities, the Illinois Department of Commerce & Economic Opportunity (DCEO) Underserved Areas, and the IL EPA EJ Start measures. Each of these is described below.

U.S. DOT Justice40 Transportation Disadvantaged Communities

The U.S. DOT Justice40 Initiative was created in 2022 to confront and address decades of underinvestment in disadvantaged communities, particularly those impacted by climate change, pollution, and environmental hazards. *Transportation Disadvantaged Communities* is a composite measure used by U.S. DOT under the Justice40 Initiative to identify areas of disadvantage in six key categories: transportation access, health, environment, economy, resiliency, and equity. Under this measure, a census tract is defined as *Transportation Disadvantaged* if it meets the criteria for disadvantage in at least four out of the six categories.[39]

Illinois has 3,121 census tracts, of which 62 percent (1,945) are intersected by the PFN. Twenty eight percent of all census tracts in the state are considered *Transportation Disadvantaged* using the Justice40 Initiative definition. Of these census tracts considered disadvantaged, 59 percent are intersected by the PFN. More than half of these intersecting tracts (362) are located in District 1, with the remainder spread across the state. On a percentage basis, Districts 4, 6, and 8 have the highest percentage (over 90 percent) of disadvantaged tracts intersected by the

[39] https://www.transportation.gov/equity-Justice40.

PFN, while only District 2 has less than half (48 percent) of their disadvantaged tracts intersected by the PFN (Table 6.1 and Figure 6.1).

TABLE 6.1 INTERSECTION BETWEEN THE PRIORITY FREIGHT NETWORK AND USDOT JUSTICE40 DISADVANTAGED COMMUNITIES, BY DISTRICT

District	Total 2010 Census Tracts		Total PFN-Intersected Census Tracts		Total J40 Disadvantaged Census Tracts		J40 Disadvantaged Census Tracts Intersected by PFN		
	#	% of Statewide Tracts	#	% of District Tracts	#	% of District Tracts	#	% of District Tracts	% of Total J40 Tracts
1	1,972	63%	1,093	55%	664	34%	362	18%	55%
2	200	6%	117	59%	33	17%	16	8%	48%
3	132	4%	101	77%	12	9%	10	8%	83%
4	146	5%	132	90%	11	8%	10	7%	91%
5	127	4%	89	70%	7	6%	6	5%	86%
6	153	5%	120	78%	12	8%	11	7%	92%
7	113	4%	70	62%	18	16%	10	9%	56%
8	178	6%	147	83%	58	33%	52	29%	90%
9	100	3%	76	76%	51	51%	37	37%	73%
IL	**3,121**	**100%**	**1,945**	**62%**	**866**	**28%**	**514**	**16%**	**59%**

Source: IDOT, U.S. Census, U.S. DOT Justice 40.

Illinois DCEO Underserved Areas

According to the Illinois DCEO, an underserved area is a census tract which meets at least one of the following[40]:

- Has a poverty rate of at least 20 percent;
- 35 percent or more of the families with children are living below 130 percent of the poverty line;
- At least 20 percent of the households in the area receive assistance under the Supplemental Nutrition Assistance Program (SNAP); or
- Average unemployment rate that is more than 120 percent of the national unemployment average.

As noted in the previous section, Illinois has 3,121 census tracts, of which 62 percent (1,945) are intersected by the PFN. Forty eight percent of all census tracts in the state are considered *Underserved* by the DCEO definition. Of these census underserved census tracts, 63 percent are intersected by the PFN. More than half of these intersecting tracts (490) are located in District 1, with the remainder spread across the state. On a percentage basis, Districts 4 and 8 have the

[40] https://dceo.illinois.gov/expandrelocate/incentives/underservedareas.html.

highest percentage (over 80 percent) of underserved tracts intersected by the PFN. No district has less than 50 percent of underserved tracts intersected by the PFN (Table 6.2 and Figure 6.1).

TABLE 6.2 INTERSECTION BETWEEN THE PRIORITY FREIGHT NETWORK AND ILLINOIS DCEO UNDERSERVED AREAS, BY DISTRICT

District	Total 2010 Census Tracts		Total PFN-Intersected Census Tracts		Total DCEO Underserved Areas Census Tracts		DCEO Underserved Areas Intersected by PFN		
	#	% of Statewide Tracts	#	% of District Tracts	#	% of District Tracts	#	% of District Tracts	% of Total J40 Tracts
1	1,972	63%	1,093	55%	862	44%	490	25%	57%
2	200	6%	117	59%	115	58%	60	30%	52%
3	132	4%	101	77%	67	51%	49	37%	73%
4	146	5%	132	90%	78	53%	69	47%	88%
5	127	4%	89	70%	67	53%	49	39%	73%
6	153	5%	120	78%	75	49%	56	37%	75%
7	113	4%	70	62%	65	58%	36	32%	55%
8	178	6%	147	83%	85	48%	71	40%	84%
9	100	3%	76	76%	70	70%	51	51%	73%
IL	**3,121**	**100%**	**1,945**	**62%**	**1484**	**48%**	**931**	**30%**	**63%**

Source: IDOT, IL DCEO.

Illinois EPA EJ Start

Another tool used throughout the State of Illinois to identify disadvantaged and underserved communities is the IEPA EJ Start 2021 tool. This tool measures 2010 Census Block Groups with Minority Populations above 76 percent of the Illinois threshold and/or Low-Income Households above the 62 percent threshold.[41]

Illinois has 9,691 census block groups, of which 1,878 (19 percent) are considered to be underserved due to minority population, and 967 (10 percent) due to poverty (583 block groups, or 6 percent, are underserved due to both measures). Of these underserved block groups, between 48-50 percent are intersected by the PFN, depending on the specific measure used. All census block groups that are considered both minority and low income in Districts 5 and 9 intersected by the PFN. In District 1, which has the bulk of Illinois' disadvantaged block groups by either measure, just under half of the block groups intersect the PFN (Table 6.3 and Figure 6.1).

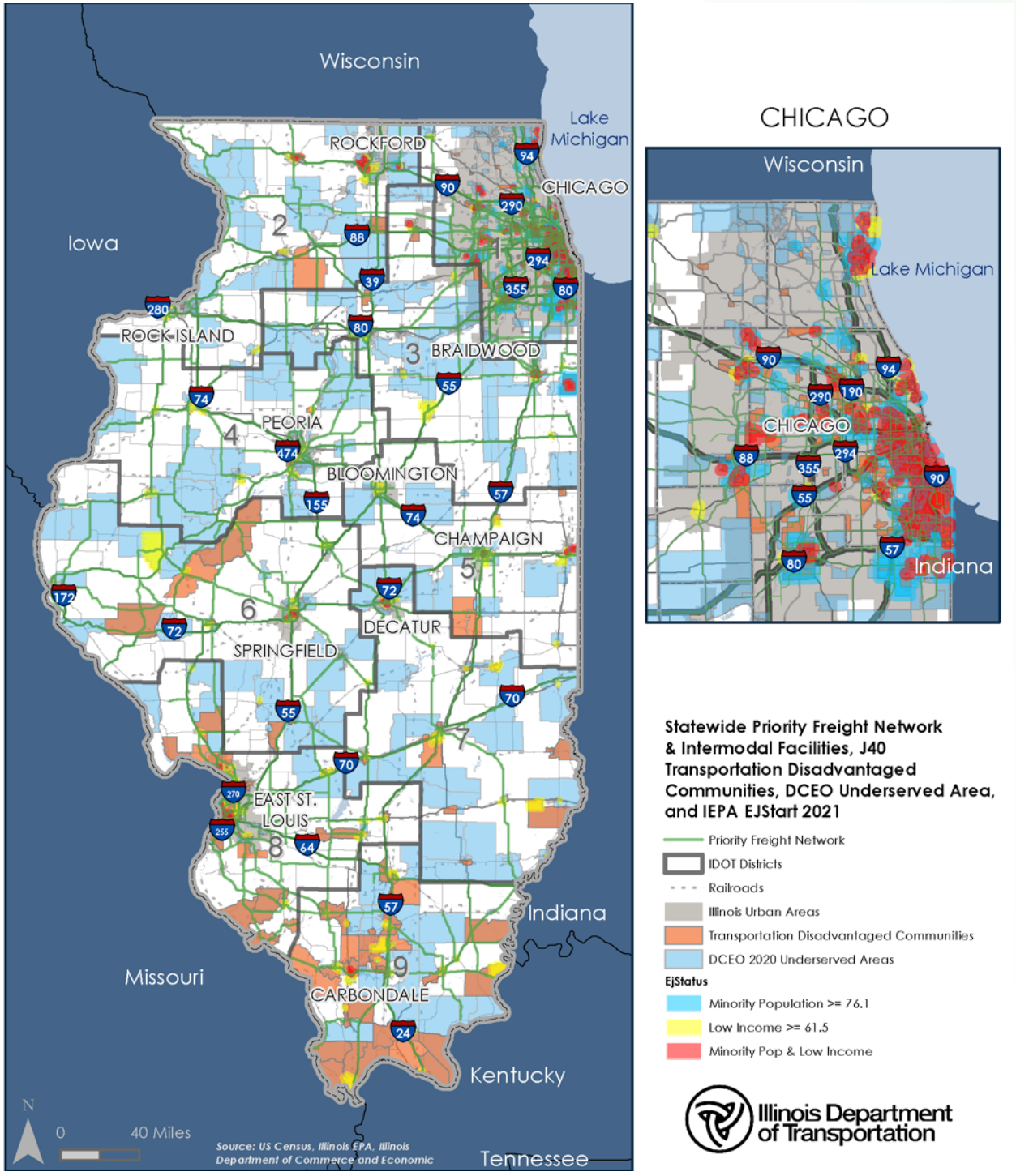
TABLE 6.3 MILEAGE OF INTERSECTION BETWEEN THE PRIORITY FREIGHT NETWORK WITH IEPA EJ START CENSUS BLOCK GROUPS BY EJ CATEGORY

	Total Block Groups	EJ Start Block Groups			PFN Intersection with Minority Block Groups		PFN Intersection with Low-Income Block Groups		PFN Intersection with Both Minority and Low-Income Block Groups	
Dist.	#	# Min.	# Pov.	# Both	#	%	#	%	#	%
1	5,843	1,736	539	488	834	48%	252	47%	236	48%
2	696	27	91	20	7	26%	22	24%	5	25%
3	442	14	32	9	8	57%	19	59%	5	56%
4	470	13	49	10	6	46%	35	71%	5	50%
5	395	5	61	5	5	100%	35	57%	5	100%
6	531	8	39	5	1	13%	24	62%	1	20%
7	384	6	37	5	2	33%	14	38%	1	20%
8	590	65	76	38	41	63%	55	72%	24	63%
9	340	4	43	3	4	100%	23	53%	3	100%
IL	9,691	1,878	967	583	**908**	48%	**479**	50%	**285**	**49%**

Source: IDOT, IEPA.

[41] https://www2.illinois.gov/epa/topics/environmental-justice/Pages/default.aspx

FIGURE 6.1 INTERSECTION OF THE PRIORITY FREIGHT NETWORK AND DISADVANTAGED OR UNDERSERVED COMMUNITIES IN ILLINOIS



Source: IDOT, U.S. Census, U.S. DOT Justice 40, IL DCEO, IEPA.

6.2 Spatial Analysis of the PFN and Natural and Cultural Resources

Illinois has significant natural systems and cultural resources that are also potentially impacted by freight movements. Natural systems examined within this analysis include farmland, flood zones, and areas with endangered or threatened species. Cultural resources include historic districts and historic properties.

Natural Systems

Like many human activities, the movement of freight can be a threat to not only human health but the environment, including emissions or other pollutants that can impact air and water quality, as well as noise or vibrations that may impact wildlife. It is critical to understand where and how freight movements might adversely affect these natural systems so precautions or mitigation efforts can be taken for the adverse effects. Natural areas examined by this analysis include flood zones, wetlands, streams, lakes, aquifers, farmland, and poor air quality zones.

More than 70 percent of the Illinois PFN passes through high-quality Farmland and poor Air Quality ($PM_{2.5}$) zones. The PFN also intersects 312 miles of 100-Year Flood Zone, 310 miles of Impaired Lakes, and 547 miles of the Mahomet Sole Source Aquifer, which provides drinking water to many communities in central Illinois. The intersections of the PFN and other natural systems (wetlands, impaired streams, 500-Year Flood Zone) are comparatively lower (Table 6.4 and Figure 6.2).

TABLE 6.4 STATEWIDE NATURAL SYSTEM INTERSECTIONS

Natural System	PFN Intersecting Miles	Intersection of PFN with Natural Systems (% PFN Miles)
500-Year Flood Zone	46	0.6%
100-Year Flood Zone	312	4.0%
Wetlands	21	0.3%
Impaired Streams	3	0.03%
Impaired Lakes	310	4.0%
Sole Source Aquifer	547	7.0%
Farmland	5,794	74.0%
Air Quality ($PM_{2.5}$)	6,166	78.8%
Illinois	**7,829**	

Source: IDOT, Federal Emergency Management Agency (FEMA), IEPA, U.S. EPA, U.S. Department of Agriculture (USDA).

Information on Threatened and Endangered species in Illinois is maintained by the Illinois Natural Heritage Database, and is available at a county level. Identification of the presence of Threatened and Endangered Species and habitat is best performed as specific IDOT projects are identified and submitted to the IDNR's EcoCAT, Ecological Compliance Assessment Tool. Caution should therefore be taken to avoid any harm or damages being done to these species as investments are made to the PFN in these areas.

As shown in Table 6.5, the vast majority (7,777 of 7,829 miles) of the PFN is in counties that have a presence of Endangered or Threatened species habitat. Table 6.6 shows the prevalence of Endangered species habitats in Illinois counties with PFN, highlighting the top 20 species. The

districts with greatest presence of Endangered Species habitats are District 6 (414), District 7 (420), District 8 (440), and District 9 (855). The Loggerhead Shrike, Indiana Bat and Northern Harrier are the Endangered species with the greatest presence in the Illinois.

TABLE 6.5 STATEWIDE THREATENED AND ENDANGERED SPECIES HABITATS IN COUNTIES WITH PFN

Species	# Habitats in Counties with PFN	PFN Intersecting Miles
Endangered Species	8,607	7,777
Threatened Species	5,413	7,777

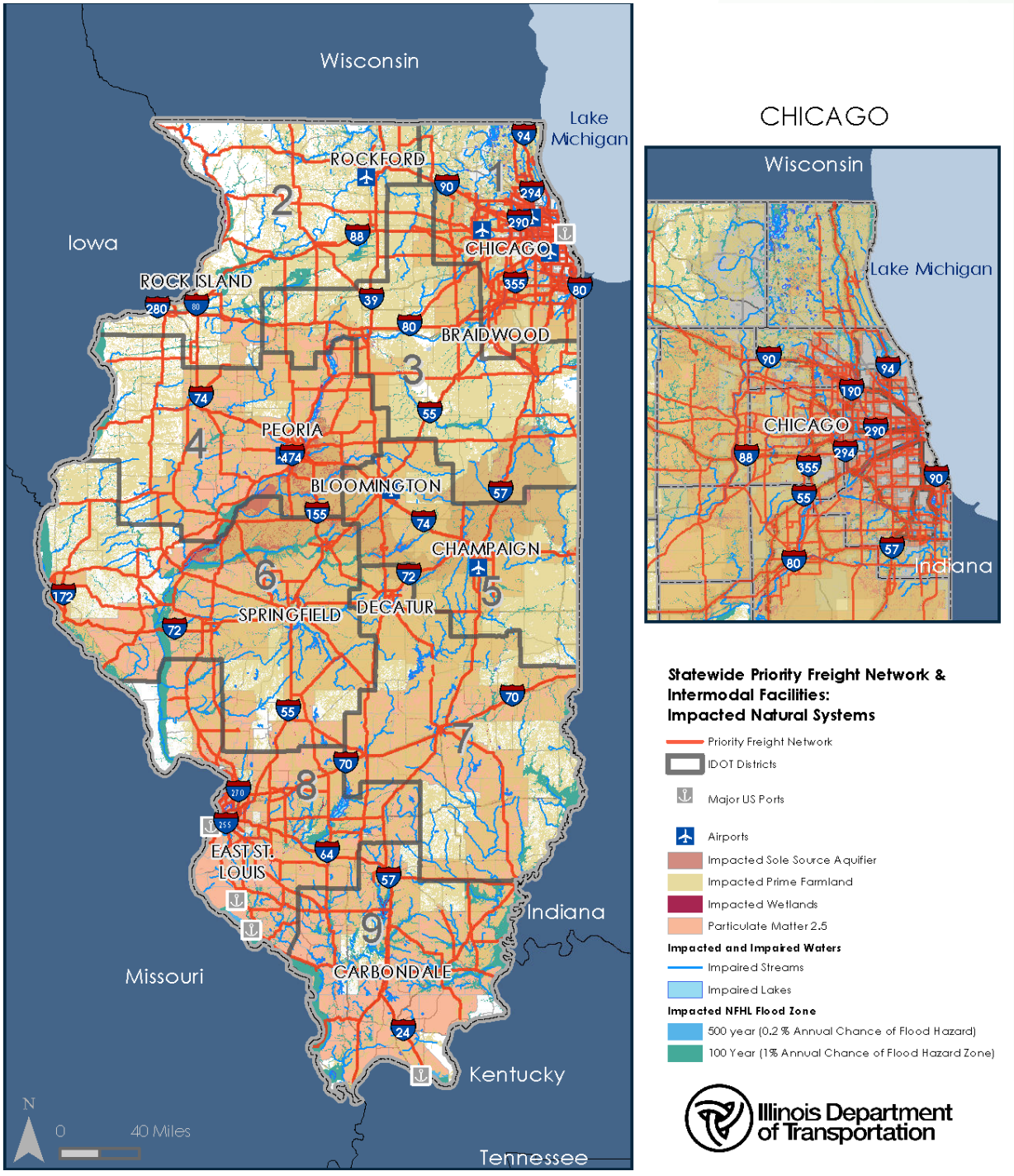
Source: IDOT, IDNR.

TABLE 6.6 TOP 20 ENDANGERED SPECIES WITH HABITATS IN COUNTIES WITH PFN BY IDOT DISTRICT

	Common Name	Species Type	# Habitats in Counties with PFN by IDOT District									
			1	2	3	4	5	6	7	8	9	Statewide
1	Loggerhead Shrike	Bird	3	16	15	28	15	60	77	56	99	369
2	Indiana Bat	Mammal	-	6	9	36	10	72	21	72	117	343
3	Northern Harrier	Bird	6	6	12	12	15	42	35	24	63	215
4	Short-eared Owl	Bird	6	4	12	12	15	18	21	24	45	157
5	Common Gallinule	Bird	6	10	3	8	5	12	28	32	36	140
6	Upland Sandpiper	Bird	5	12	12	20	15	24	28	8	9	133
7	Ebonyshell	Invert.	-	4	-	12	5	30	7	16	54	128
8	Spike	Plant	5	10	18	8	15	-	35	8	27	126
9	Bigeye Shiner	Fish	2	2	9	4	5	12	28	32	18	112
10	Spring Ladies' Tresses	Plant	-	-	-	-	-	-	14	16	81	111
11	Yellow-crowned Night-Heron	Bird	2	4	-	-	5	-	28	32	36	107
12	King Rail	Bird	5	2	3	12	-	12	28	8	36	106
13	Lake Sturgeon	Fish	1	8	3	20	5	36	-	32	-	105
14	Royal Catchfly	Plant	3	6	3	8	10	24	35	16	-	105
15	Black-crowned Night-Heron	Bird	6	4	6	8	-	18	14	32	9	97
16	Gray Bat	Mammal	-	-	3	-	-	18	-	16	54	91
17	River Cooter	Reptile	1	-	-	-	-	6	-	-	81	88
18	Blanding's Turtle	Reptile	6	18	21	4	10	12	14	-	-	85
19	Swollen Sedge	Plant	2	-	-	-	-	6	-	-	72	80
20	Small Yellow Lady's Slipper	Plant	3	6	3	8	5	12	7	16	18	78
Totals, Top 20			**62**	**118**	**132**	**200**	**135**	**414**	**420**	**440**	**855**	**2,776**
Totals, All Species			**409**	**544**	**477**	**448**	**340**	**1,122**	**791**	**984**	**3,492**	**8,607**

Source: IDOT, IDNR.

FIGURE 6.2 INTERSECTIONS BETWEEN THE PRIORITY FREIGHT NETWORK AND NATURAL SYSTEMS IN ILLINOIS



Source: IDOT, FEMA, IEPA, U.S. EPA, USDA.

Cultural Resources

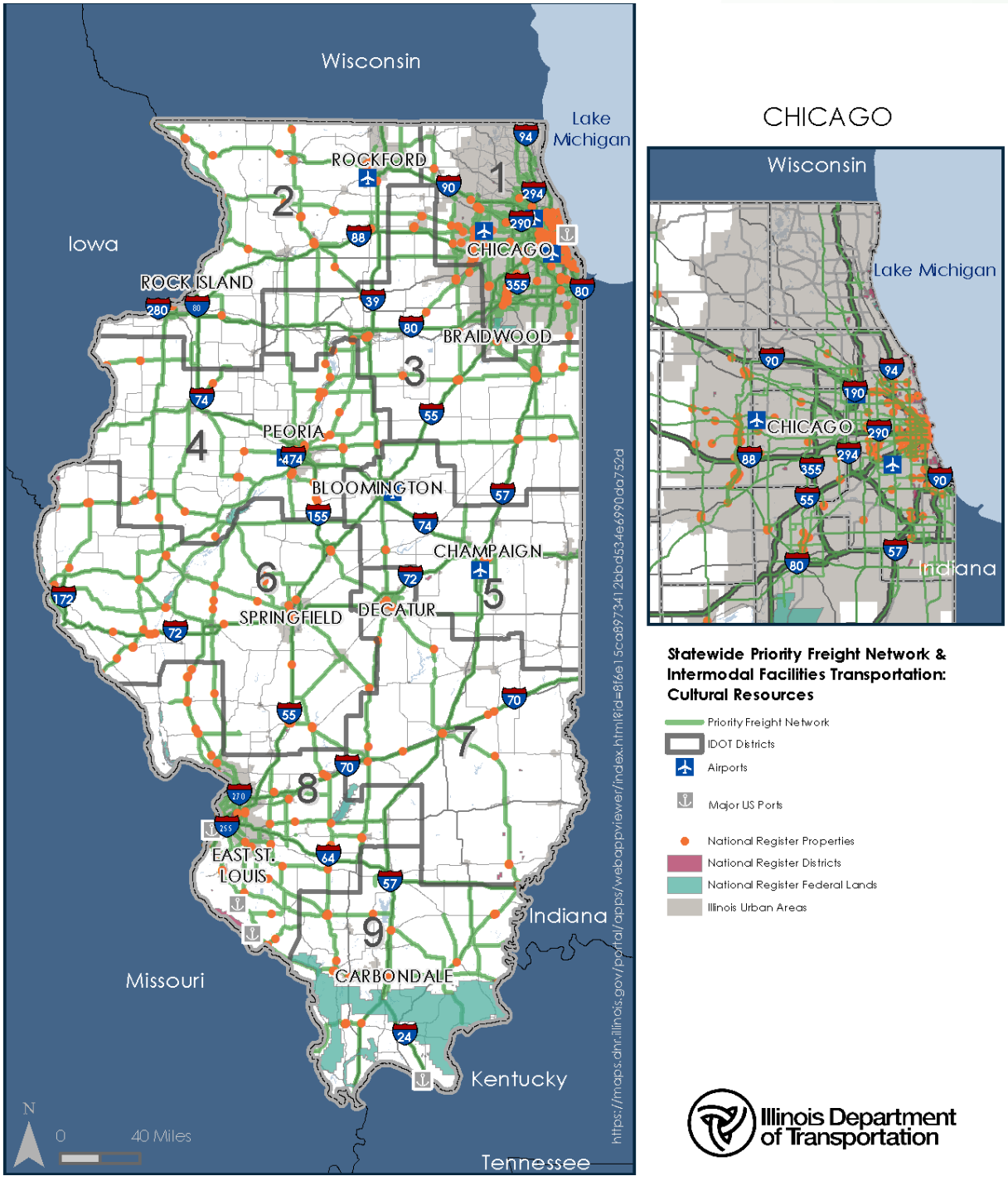
Cultural resources are an important part of communities and our way of life. Impacts of freight, particularly noise, vibration, and pollutants can damage human-created structures as well as the natural environment. For the purposes of this Plan, intersections between the PFN and historic districts or historic properties have been examined. Table 6.7 summarizes the prevalence of Historic Districts and Properties listed on the National Registry that are within a quarter-mile buffer of the PFN. Figure 6.3 shows that most of the Historic Properties in Illinois are in the Chicago area. Historic Properties assets are also located in other parts of Illinois; however, in total, only 342 miles of the PFN buffer intersects these assets.

TABLE 6.7 HISTORIC PRESERVATION INTERSECTION WITH PFN

Historic Preservation	# in Counties around the State	Priority Freight Network Intersection in Miles
Historic Districts	525	29
Historic Properties	3,351	342

Source: IDOT, IDNR

FIGURE 6.3 INTERSECTIONS BETWEEN THE PRIORITY FREIGHT NETWORK AND CULTURAL RESOURCES IN ILLINOIS



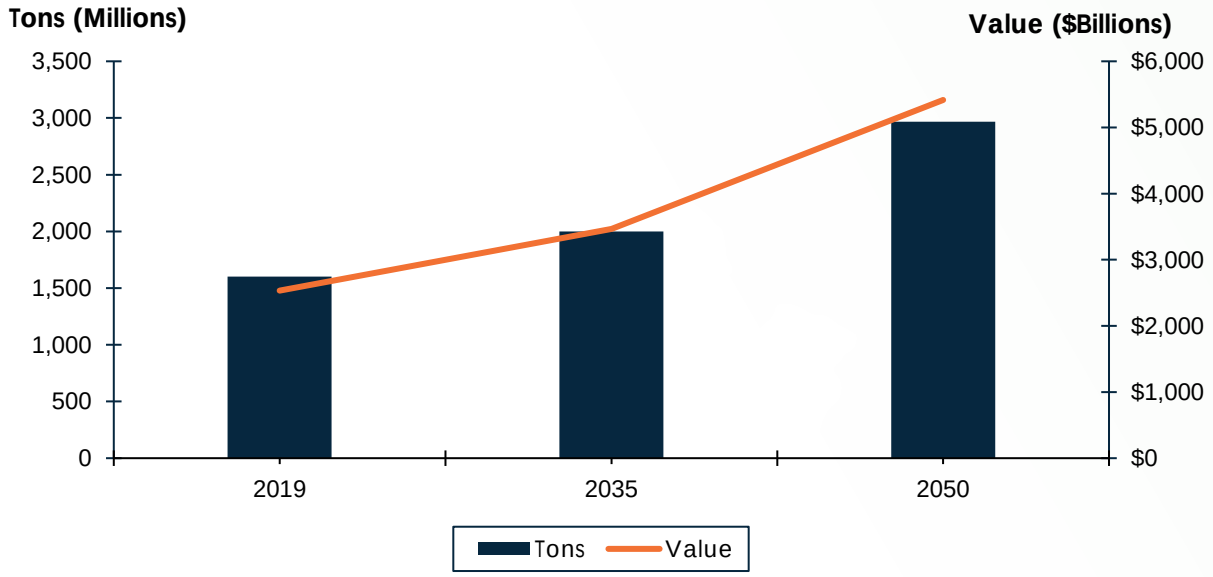
Source: IDOT, IDNR

7.0 Freight Demand and Forecasts

As discussed in Chapters 4.0 and 5.0, freight and the multimodal freight network is closely linked to Illinois' economy. A well performing and connected freight network is critical to support both the businesses and residents of Illinois—now and in the future. A critical component of this Freight Plan is understanding current and future freight demand for Illinois, which in turn influences the needs of the State's multimodal freight network. A baseline year of 2019 and a forecast year of 2050 was used in this Freight Plan.

Vast amounts of freight moves to, from, through, and within Illinois each year. According to S&P Transearch data, 1.6 billion tons of freight, valued at $2.5 trillion, was transported on Illinois' network of highways, railways, waterways, pipelines, and airports in 2019. By 2050, this volume of goods is projected to reach 3.0 billion tons, valued at $5.4 trillion (Figure 7.1), an increase of 87 percent by tonnage and 115 percent by value.

FIGURE 7.1 ILLINOIS TOTAL FREIGHT FLOWS, ALL MODES (2019 TO 2050)

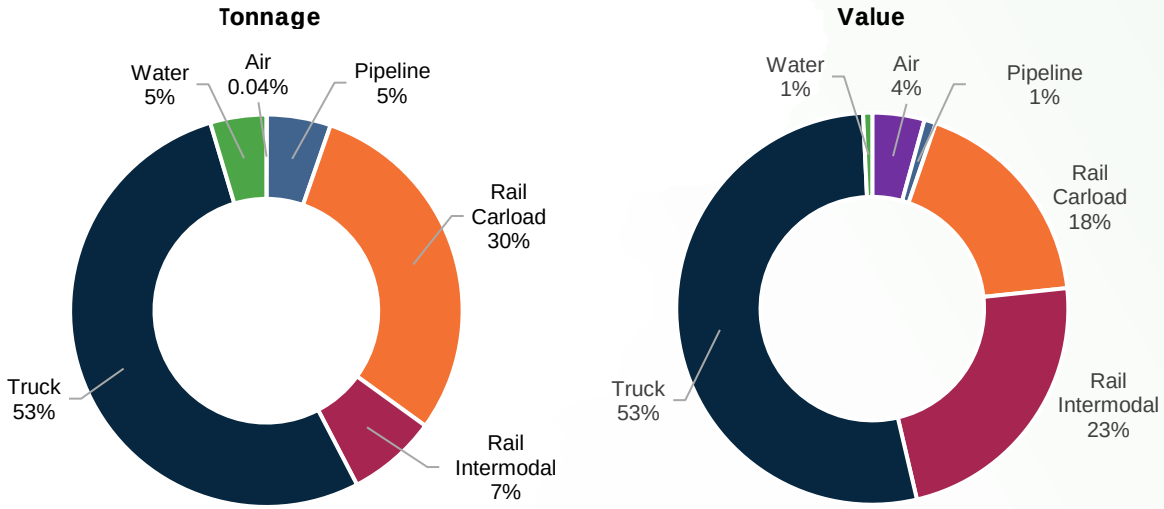


Source: 2019–2050 S&P Transearch and 2019 STB Carload Waybill Data.

7.1 Illinois Freight Flows: Big Picture

Truck and rail dominate Illinois' freight movement, together accounting for over 90 percent of freight tonnage and value in the State (Figure 7.2). While smaller in total volume and value, air, marine and pipeline transportation play unique and critical roles. Air is used to transport high value, time-sensitive goods, while the marine system moves bulk commodities like chemicals, energy products, metals, and food/agriculture products. The pipeline system also moves significant volumes of chemical and energy products throughout Illinois.

FIGURE 7.2 ILLINOIS FREIGHT TONNAGE AND VALUE BY MODE (2019)

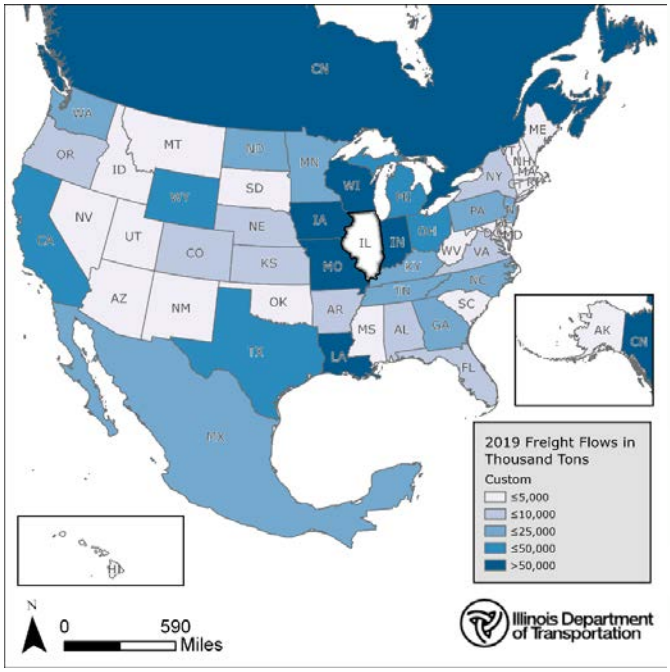


Source: 2019–2050 S&P Transearch and 2019 STB Carload Waybill Data.

Illinois ships and receives goods from various states and international locations. Figure 7.3 shows the State's top North American inbound and outbound trading partners by tonnage and Figure 7.4 shows the trading partners by value.

Illinois trades a high concentration of freight tonnage with the State's nearest neighbors. The top trading partner is Canada accounting for 8 percent (127 million tons) of the combined inbound/outbound freight tonnage, followed by Indiana (6 percent or 95 million tons). Louisiana ranks third in trading partners, accounting for 4 percent (62 million tons) of combined inbound/outbound trade. Wisconsin (4 percent or 60,102 thousand tons), Iowa (4 percent or 60,041 thousand tons), and Missouri (3 percent or 55,960 thousand tons).

FIGURE 7.3 ILLINOIS TOP TRADING PARTNERS BY TONNAGE



Source: 2019–2050 S&P Transearch and 2019 STB Carload Waybill Data.

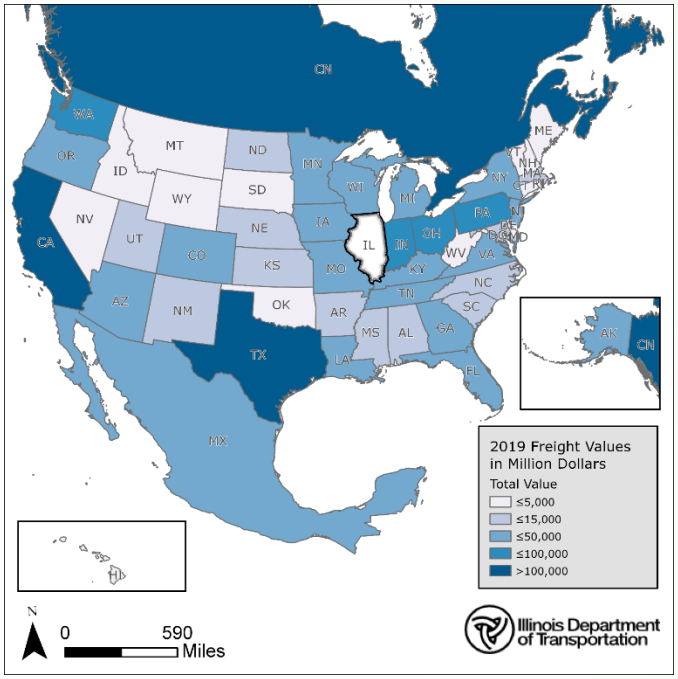
Major trading partners by value are still concentrated among neighboring states, but not as intensely as when measured by weight. California, which is the highest ranked trading partner by value accounts for 9 percent of total trade ($232 billion), and Texas accounts for 5 percent ($119 billion). Canada is ranked third amongst trading partners when measured by value, accounting for 4 percent of total value ($110 billion), followed by Ohio (3 percent or $68 billion), Indiana (2 percent or $57 billion), Washington State (2 percent or $51 billion), and Pennsylvania (2 percent or $50 billion).

7.2 Future Freight Flows

In 2019, the top 10 commodities in Illinois by tonnage made up 84 percent of the total tonnage moved to, from, within, and through the State. By 2050 these commodities are expected to account for 80 percent of the projected tonnage. Figure 7.5 shows the top 10 commodities by tonnage in 2019 and their 2050 projections. Coal, and Petroleum or Coal Products, are projected to decline by 85 percent and 36 percent respectively.

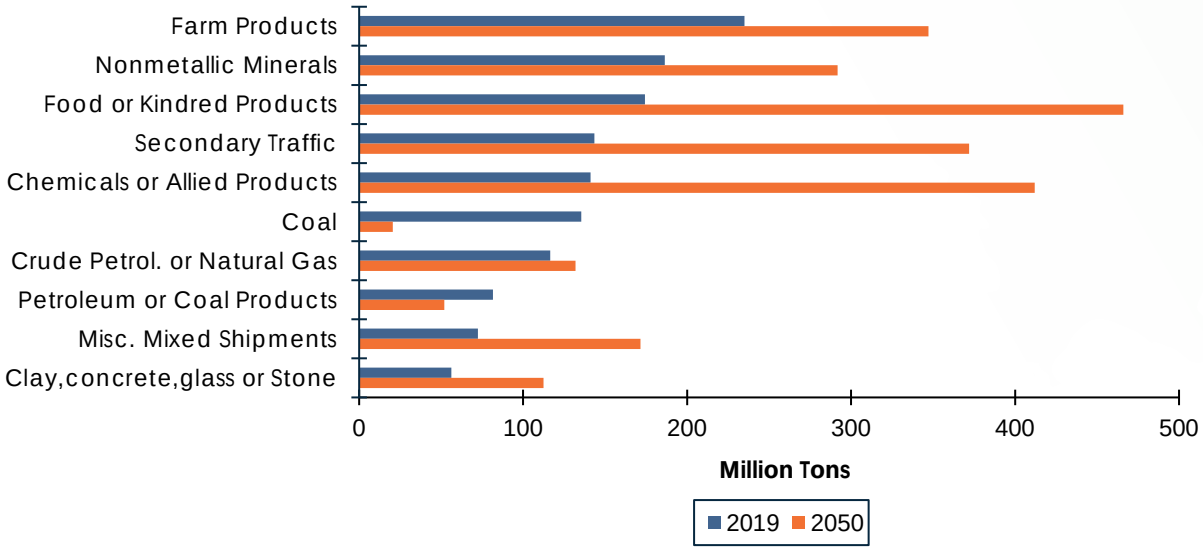
When measured by value the projected decline in coal has less of an impact in 2050. Figure 7.6 shows the top commodities by value in 2019 and their projected value in 2050. Secondary Traffic (i.e., consumer goods moving from warehouses to retail stores), Transportation Equipment, Miscellaneous Mixed Shipments, Chemicals or Allied Products, and Food or Kindred Products are projected to be the top value commodities moved on Illinois' transportation network, accounting for $3.8 trillion and 71 percent of the total value in 2050.

FIGURE 7.4 ILLINOIS TOP TRADING PARTNERS BY VALUE



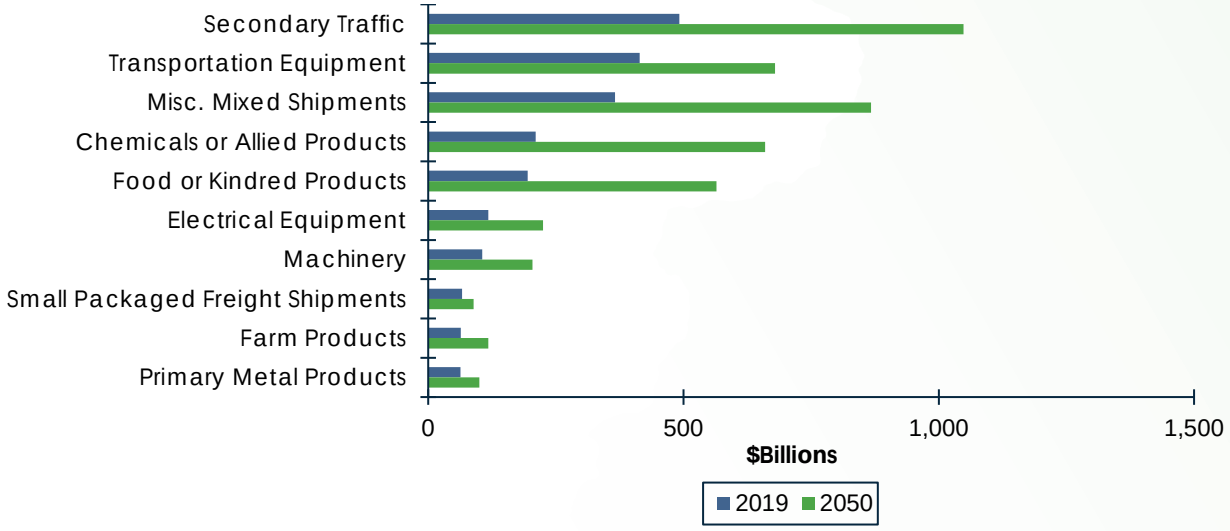
Source: 2019–2050 S&P Transearch and 2019 STB Carload Waybill Data.

FIGURE 7.5 ILLINOIS TOP COMMODITIES BY TONNAGE (2019 AND 2050)



Source: 2019–2050 S&P Transearch and 2019 STB Carload Waybill Data.

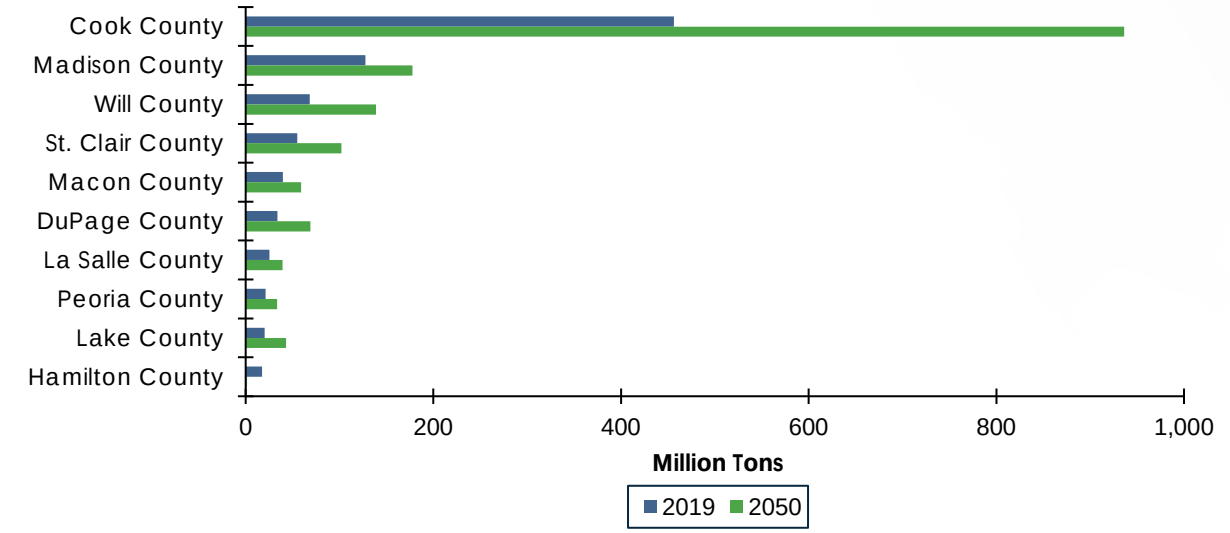
FIGURE 7.6 ILLINOIS TOP COMMODITIES BY VALUE (2019 AND 2050)



Source: 2019–2050 S&P Transearch and 2019 STB Carload Waybill Data.

While freight is critical to all counties of Illinois, the distribution of freight activity is not equal across the State. Several areas of concentrated freight activity stand out. Cook and surrounding counties reflect the impact of activity near the City of Chicago. Madison and St. Clair counties in the southwestern portion of the State similarly reflect activity near the City of St. Louis. Figure 7.7 shows the top 10 counties by tonnage of freight activity in 2019 and 2050. In 2050, the geographic distribution of freight across Illinois is projected to remain relatively the same. In 2019, Cook County was the leading goods-movement county in Illinois. By tonnage, Cook County had the most freight activity with 456 million tons of goods, which accounted for 38 percent of the 1.2 billion tons of goods shipped to, from, and within Illinois. Cook County is anticipated to account for 45 percent of freight activity, or 936 million tons projected trade.

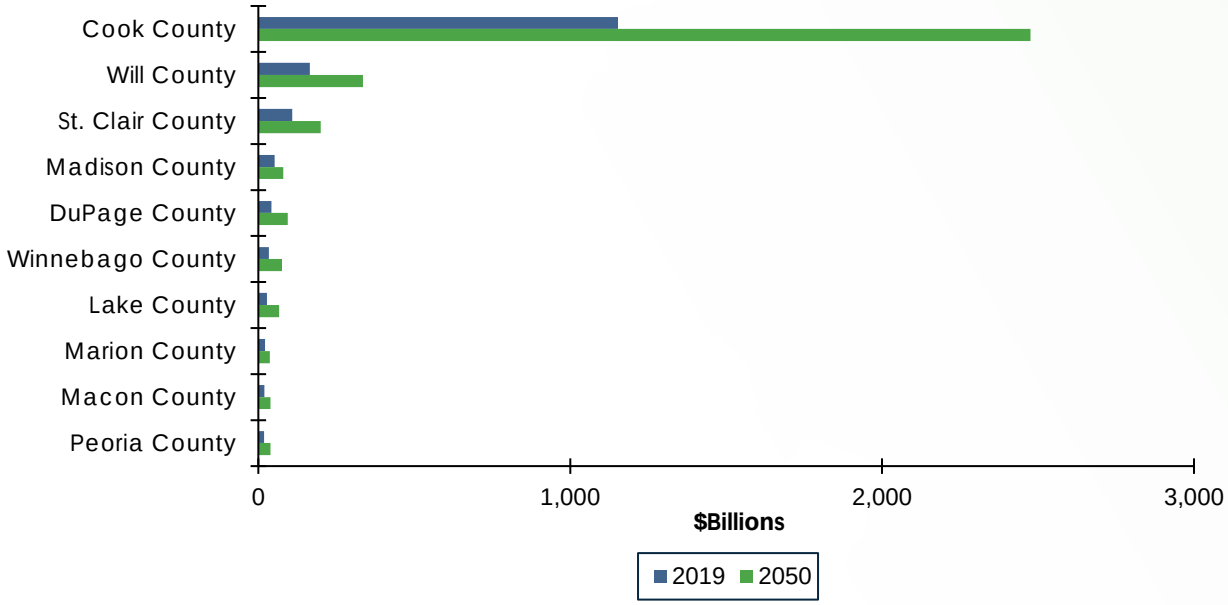
FIGURE 7.7 TOP ILLINOIS COUNTIES BY TONNAGE OF FREIGHT ACTIVITY (2019 AND 2050)



Note: Hamilton County 2050 freight activity is too low for current scale (1.6 million tons).
Source: 2019–2050 S&P Transearch and 2019 STB Carload Waybill Data.

When measured by value of freight activity, Cook County accounted for $1.2 trillion (64 percent) of the $1.8 trillion in goods shipped to, from, and within Illinois counties. The remaining top five counties by freight value in 2019 were Will County (9 percent or $164 billion), St. Clair County (6 percent or $108 billion), Madison County (3 percent or $52 billion), and DuPage County (2 percent or $42 billion). Altogether the top five counties accounted for 84 percent of the $1.8 trillion in goods shipped to, from, and within Illinois. The same top 10 counties in 2019 are anticipated to remain constant through 2050 with little adjustments in their relative positions. Cook County is anticipated to continue to dominate the freight activity, expected to account for 65 percent or $2.4 trillion of the total projected $3.8 trillion inbound, outbound and intrastate total freight movement in 2050. Figure 7.8 shows the top 10 counties by value of freight activity in 2019 and 2050.

FIGURE 7.8 TOP ILLINOIS COUNTIES BY VALUE OF FREIGHT ACTIVITY (2019 AND 2050)



Source: 2019–2050 S&P Transearch and 2019 STB Carload Waybill Data.

8.0 Multimodal Freight Trends, Challenges, and Needs

Illinois is the third-highest state in the amount of freight it handles. To keep up with this demand, it is critical to address the needs and challenges the freight system faces. Some of these are driven by local conditions, such as outdated geometric design or end of life infrastructure, while others are derived from national and international trends, such as increasing volumes of local delivery due to the e-commerce economy, and increased OSOW traffic influenced by factors such as the growth of wind energy farms.

This chapter provides a summary of the most critical trends impacting Illinois' multimodal freight system as well as the challenges and needs on the system. On the highway system, the needs assessment is focused on the State's Priority Freight Network (Figure 8.3). Non-highway needs are identified primarily based on information developed through Illinois' suite of modal plans and stakeholder input.

8.1 Trends Impacting Freight in Illinois

When considering needs on the freight system, it is important to understand the issues and trends that impact freight in Illinois. This subsection reviews the trends most impactful to freight in 2022 to provide context for the needs and issues specific to the Illinois freight system, including regulatory, policy, market, technology, and economic trends. Key trends are briefly discussed below and summarized in Table 8.1.

The 2021 IIJA legislation provides the most expansive investment in U.S. infrastructure in recent history. The IIJA is expected to provide $17.8 billion to fund Illinois over the next five years.[42] Nationally, the bill dedicates $78 billion to freight investments, including significant funding for freight-related competitive grant programs. Funding of this magnitude will have a significant impact on Illinois' and the Nation's ability to improve the quality of critical transportation infrastructure. IIJA also formed the groundwork for action in a number of other important categories, including climate change, resilience, and reducing dependency on fossil fuels through programs such as the Carbon Reduction Program (CRP)[43], which directly funds projects designed to reduce transportation emissions. IIJA spurred development of a national network of zero-emissions vehicle infrastructure along highway corridors and in communities, of which Illinois is an active participant.[44]

In addition to Federal action, Illinois put into law the Climate and Equitable Jobs Act (CEJA)[45] in 2022, which includes provisions to phase out carbon emissions from the energy and transportation sectors. Climate change is expected to bring increased flooding and droughts to Illinois, and impacts to shipping are already being seen along the State's waterways which have experienced several years of extreme conditions. To avoid the worst impacts to the freight system, Illinois must not only reduce its carbon emissions but also make investments to harden its infrastructure and protect against climate stressors.

[42] https://idot.illinois.gov/Assets/uploads/files/Transportation-System/Fact-Sheets/Rebuild-Illinois/IIJA-fact-sheet.pdf
[43] https://highways.dot.gov/newsroom/president-biden-usdot-announce-new-guidance-and-64-billion-help-states-reduce-carbon
[44] https://idot.illinois.gov/home/drive-electric-illinois.
[45] https://ilcleanjobs.org/

TABLE 8.1 SUMMARY OF KEY TRENDS IMPACTING FREIGHT IN ILLINOIS

Trend Categories	Details
2021 Infrastructure Investment and Jobs Act (IIJA)	» $567 billion to fund the transportation system over the next five years. $78 billion dedicated to freight investments. » Established the Carbon Reduction Program (CRP) and National Electric Vehicle Infrastructure Formula (NEVI) Program, as well as others aimed at mitigating the impacts of climate change, increasing resilience, improving safety, and addressing other impacts of both freight and passenger transportation.
Climate Change and Resilience	» Illinois CEJA of 2022 includes provisions to phase out carbon emissions from the energy and transportation sectors. » Neighborhood Access and Equity Grant Program provides support for resiliency-related transportation projects and planning to protect against flooding, extreme heat, and more.
Energy	» Renewable energy accounted for 11% of Illinois' in-state electricity generation, nearly 19 Billion KWh, and Illinois ranks fifth in the U.S. in wind-powered generating capacity. » The Renewable Portfolio Standard targets 50% of all retail energy be sourced from renewables by 2040. » Reduction in coal traffic on rail and waterways.
Supply Chain Distribution and Management	» Reshoring of manufacturing driven by reduction in delivery lead times, logistics costs, quality of goods, labor cost/availability, and reduced carbon footprint. » The Global Supply Chain Pressure Index (GSCPI) has seen the highest deviations from average since 1997 in 2021.
E-commerce	» E-commerce's retail sales grew on average 10% annually until 2020 where it gained over a decade worth of growth. » Retail e-commerce sales will likely continue to "run ahead" of the forecast by several years.
Changing Workforce	» Illinois DCEO has several programs that target freight and manufacturing-related workforce shortages. » Smaller railroad companies are in pursuit of eliminating Two-Person Crew requirements in rail cabs.
Technology	» Strategic investment in broadband was a key to Illinois maintaining a competitive economic environment during the COVID-19 pandemic. » Illinois is a national leader in ITS/Transportation System Management and Operations (TSMO) and Autonomous Vehicle (AV)/Connected Vehicle (CV) integration, and actively promoting the shift to electric trucks.

Energy, supply chain management, e-commerce, the changing workforce, and technology are broad reaching trends that continue to impact freight in Illinois and across the Nation. The reduction in coal power plants is driving a major commodity shift, particularly on the rail and waterways, whereas increases in wind energy farms in the State have led to significant amounts of OSOW traffic moving throughout the State. Changes in the global supply chain, both due to stress through the COVID-19 pandemic, the rise in e-commerce, and other market shifts continue to drive the need for flexible, multimodal supply chains in Illinois to support both businesses and consumers in the State.

Like many industries, freight-related sectors are currently facing significant and widespread workforce challenges. Most notably, substantial challenges in either recruiting or retaining staff in the trucking, rail, marine, and aviation sectors, and for warehouse/distribution facilities create disruption and challenges to the freight system. Some industry leaders and operators are motivated by these challenges to increase investment in technologies such as autonomous and

connected vehicles. At the same time, other industries are looking at ways to improve efficiency and reduce their workforce needs. Together, these overlapping trends create a shifting environment that will continue to impact how the Illinois' multimodal freight system is used both now and in the future.

8.2 Military Freight

The military and defense industry play an important role in the Illinois' economy. Annually, the military and the defense industry directly and indirectly contribute $13.3 billion in economic activity and 150,000 jobs.[46] The military is also a driver of freight and cargo movements, including the movement of military personnel, supplies and equipment within and through Illinois. Military facilities and activities in the State center around three active bases: Scott Air Force Base, Rock Island Arsenal, and Naval Station Great Lakes.

Ensuring that military facilities are connected to both military and civilian assets is critical for both day-to-day operations and national defense needs. Freight transportation assets are a contributing factor in base expansion and realignments. The U.S. Transportation Command developed the Strategic Highway Network (STRAHNET), which is a system of approximately 62,500 miles of roadways, including the Interstate System, that serves as the foundation of the U.S. Department of Defense's domestic on-the-ground operations. The STRAHNET defines the public highway network that is essential for supporting critical military and defense needs, including emergency mobilization and movement of goods including heavy armor, fuel, ammunition, repair parts, food, and other freight commodities that supports military operations. In Illinois, the STRAHNET includes the Interstate System and the highway connectors linking the three military installations in the State to the Interstate STRAHNET.

The U.S. Transportation Command also developed the Strategic Rail Corridor Network (STRACNET), which is a system of commercial railroads that serves U.S. Department of Defense's domestic operations, connecting bases, military installations, and maritime ports when rail service is needed. In Illinois, the STRACNET includes some of the major Class I (UP, BNSF, CP, CSXT, NS) east-west and north-south rail corridors in the State, the Indiana Harbor Belt Railroad (IHB) corridor circling Chicago, and the BNSF rail line connecting to Rock Island Arsenal.

WHAT IS HAZMAT?

HazMat, in some form, is being transported in Illinois at all times, as it is essential to our society and economy. Many chemicals are present in common products that are used to power, clean, make, or maintain virtually every consumer good.

8.3 Hazardous Materials

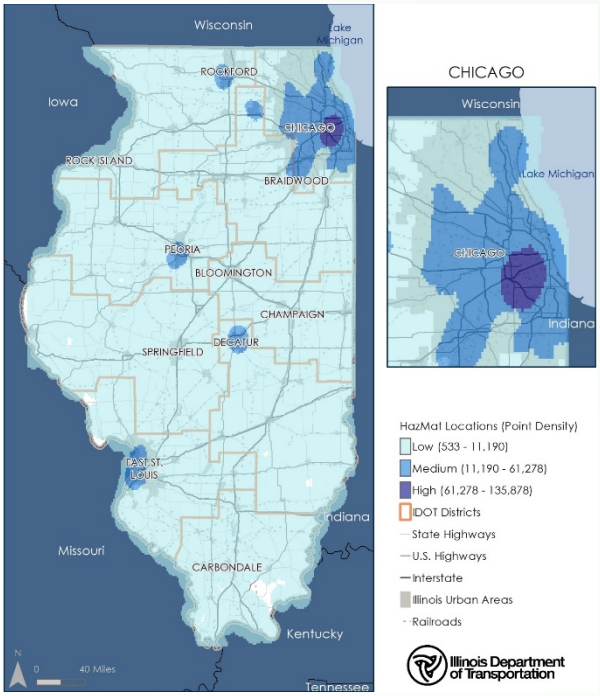
The term "hazardous materials" (HazMat) involves the transport of chemicals that have one or more hazardous properties. The hazardous properties are those that make up the nine U.S. DOT HazMat classes: explosives, gasses, flammable liquids, flammable solids, oxidizing substances and organic peroxides, toxic and infectious substances, radioactive materials, corrosive substances, and miscellaneous.

[46] Center for Governmental Studies Northern Illinois University, Illinois Military Base and Defense Industry Assets Economic Impact Study: State and Regional Analysis, November 2014. https://www2.illinois.gov/sites/ltg/issues/military/Documents/FINAL%20State%20Military%20Impacts%20Report%2011-20-14.pdf.

In 2020, there were over 2,500 unique chemicals in production, use, and storage at nearly 31,000 facilities throughout the State of Illinois. The average 24-hour storage mass at Illinois facilities ranges from 5.3 billion pounds to 18.8 billion pounds, translating to between 66,400 and 234,000 fully loaded trucks on state roadways.

HazMat sites are particularly concentrated in the Chicago metropolitan region, which is a significant manufacturing and industry hub in the State. Other areas with a high concentration of HazMat sites include Rockford and DeKalb in the north, Peoria and Decatur in central Illinois, and East St. Louis in the southwest region (Figure 8.1).

FIGURE 8.1 HAZMAT LOCATIONS IN ILLINOIS (2020)



Source: IDOT; IEMA Tier II Hazardous Materials Reporting Data.

8.4 Technology and ITS

For many years, the focus of state and Federal transportation agencies was on building out their systems, and expanding modal networks through capital infrastructure investments to provide the needed accessibility for freight to successfully move. Even though expansion may have been warranted due to increased traffic volumes, this previous trend started to prove more difficult as highway construction and expansion projects became more costly due to competing needs and increasing value of land. Many DOTs have adopted programs that aim to preserve their existing networks by focusing on the use of technology as a means to keep the existing system running, taking advantage of its relatively low-cost (compared to a highway expansion project) to either increase the efficiency of road network resiliency or automate certain parts of the job to allow the workforce to solve more problems than previously possible. IDOT is an early adopter of road technology to improve traffic operations.

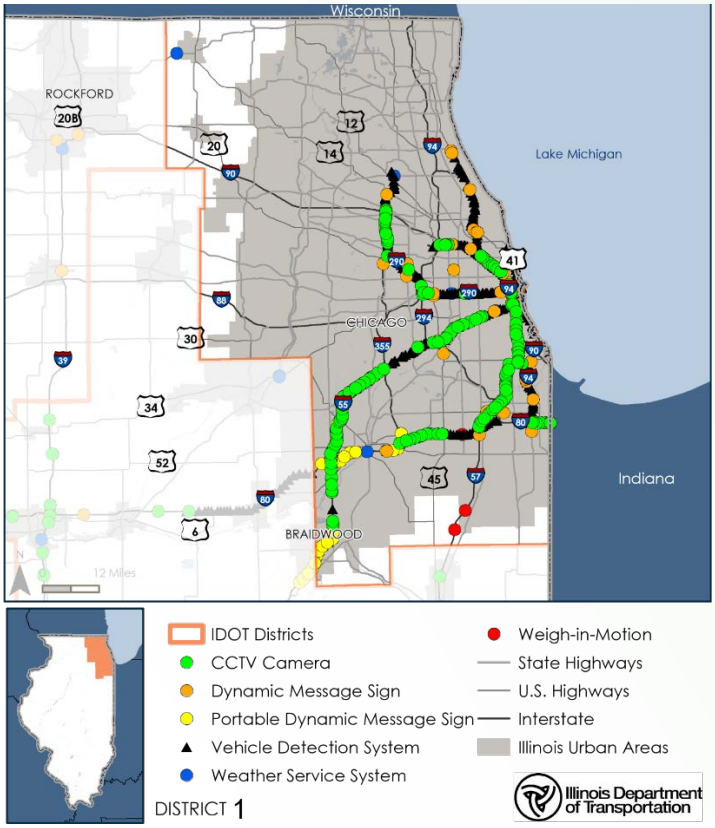
IDOT utilizes an array of technology to collect real-time information on system performance, review and assess the current state of the transportation system, and issue traveler information to help motorists make informed decisions.

Concurrent to the advancement of IDOT's technology program, the freight industry has explored the use of technology to help improve its operations, recognizing that smart investment in technology can yield real cost savings in terms of efficiency and safety. With the prevalent truck driver shortage, exacerbated by the COVID-19 pandemic, the freight industry has looked to technology again to provide solutions, exploring topics like vehicle automation to help truck drivers be more efficient with their trips and comply with Hours-of-Service (HOS) restrictions.

When exploring ways to improve freight operations and economic competitiveness in Illinois, IDOT's road technology program is one core component to keep freight moving on the state-owned road network.

The ITS and technology inventory (Figure 8.2 provides an example of IDOT's ITS coverage for District 1) for road operations programs that are relevant to freight traffic operations, traveler information, and enforcement, includes:

FIGURE 8.2 IDOT DISTRICT 1 ITS COVERAGE



- Traffic and Incident Management Program.
  - Traffic Management Centers (TMC) establish communication for responding to roadway disruptions and coordinating information sent to motorists in strategic metropolitan areas, as well as a statewide.
  - ITS roadside assets such as Closed-Circuit Television (CCTV) Cameras, Dynamic Message Signs (DMS), Vehicle Detection Systems (VDS), Weather Station System (WSS).
  - Third-party data service providers to augment parts of the network where VDS coverage is minimal allowing IDOT insight on general traffic speeds on state-owned roads to assemble travel times and identify congestion hotspots that generally correlate to incidents
- Statewide and regionally focused Advanced Traveler Information System (ATIS) platforms that travelers can utilize to obtain real-time traffic and incident conditions and relevant travel information.
- Commercial vehicle enforcement is critical to ensure that freight can operate safely and within the design allowances provided by the highway freight network. Some of the ITS technology and systems used by enforcement include electronic screening on the mainline and on them ramp at weigh stations which includes verification of electronic credentials (e.g., International Registration Plan [IRP], International Fuel Tax Agreement [IFTA]), weigh-in-motion (WIM), and Tire Anomaly Classification System (TACS).
- A Truck Parking Information Management System (TPIMS) is being designed by IDOT to be deployed at select public rest areas throughout the State, to publish real-time truck parking availability at these parking lots to help truckers make informed decisions when determining where they should park, in order to comply with their hours of service (HOS) regulations.
- IDOT is exploring creating a Connected and Automated Vehicle oversight program to support connected and autonomous vehicle technology programs that look to operate in

Illinois. One of its main goals is to connect key stakeholders in the State—such as industries, universities, research institutions, and technology partners—with the public- and private-sector industry leaders that can help facilitate advancement, set policy, and establish testing grounds.

LOOKING FORWARD—WHAT'S NEXT FOR ILLINOIS IN FREIGHT ITS/TECHNOLOGY

- Freight Electrification
- Advancements in Truck Parking Availability Systems
- Connected Freight Corridors
- Technology Planning Efforts
- Freight Signal Priority
- Drone Operations
- Truck Automation Testing
- Truck Platooning
- Freight Advanced Traveler Information System
- Dedicated Truck Lanes

8.5 Challenges and Needs on Illinois' Freight System

Comprehensive data analyses were combined with input from and vetting by freight stakeholders to develop the needs assessment for this Freight Plan. Needs on each of the five modes on the multimodal freight network were investigated. The unique needs and challenges of each mode are described in the subsections below.

Highway Freight Needs

The highway freight needs assessment focuses on needs of freight movement on the Illinois PFN; (shown in Figure 5.1) which is the 7,777 miles of roadway most critical to freight in the State. Needs assessment criteria were developed using a data-driven, stakeholder-informed approach that structures the needs into five categories (Figure 8.3). Two to five metrics are combined within each category to develop a composite needs score.

Highway Freight Needs Assessment Methodology

Seventeen metrics were used to quantify needs within five categories. Within each category, these metrics were weighted and then summed into a composite score of high, medium, or low, calculated separately for urban and rural roadways. Then, the scores were summed into a comprehensive score by allocating each roadway segment two points for each category where it scored high and one point for each category where it scored medium. Scores from each of the five needs categories were added together, for a total of up to 10 possible points, to determine an overall Combined Highway Freight Needs score for each segment on the PFN (Figure 8.4).

FIGURE 8.3 HIGHWAY NEEDS ASSESSMENT CATEGORIES AND CRITERIA

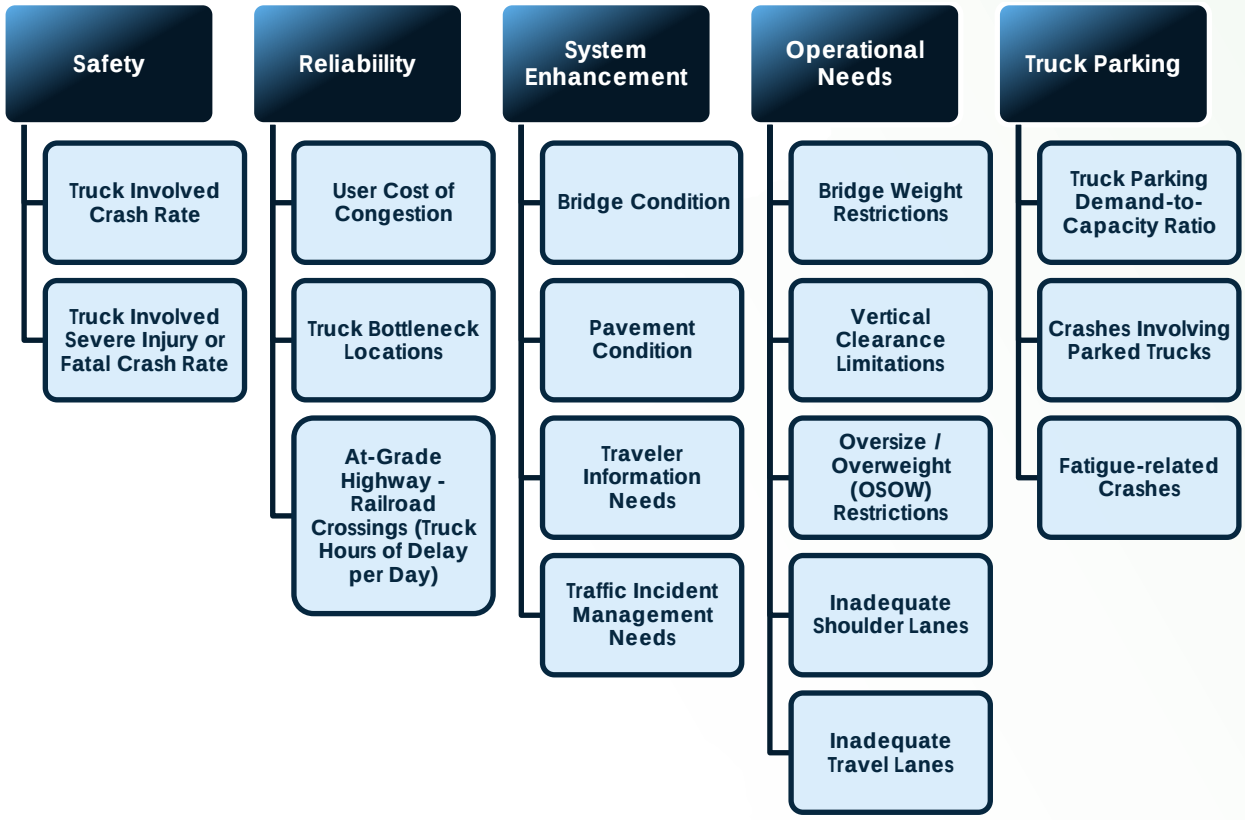
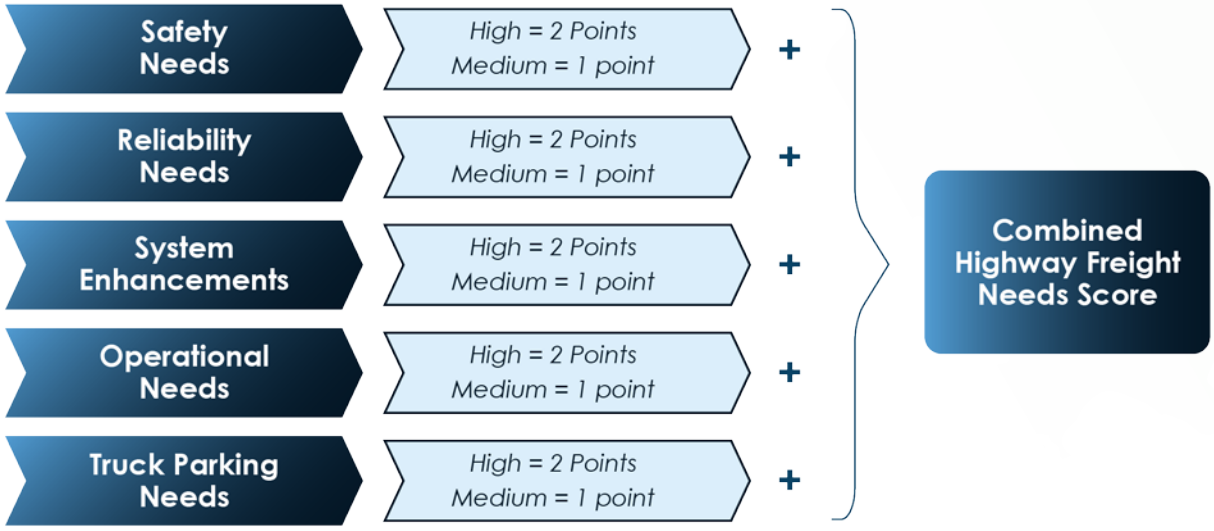


FIGURE 8.4 CALCULATION OF THE HIGHWAY NEEDS ASSESSMENT TOTAL SCORE



Highway Freight Needs Assessment Findings

Each segment of the Illinois PFN was scored using the methodology described in the previous sub-section. Table 8.2 lists the highest scoring roadways, those receiving scores of at least seven out of ten. The table also describes the categories for which the segments score High (Medium needs in categories that are not listed in the table). The 12 segments in Table 8.2 represent the segments with the highest combined freight need scores (at least seven points) across multiple categories. Additionally, 418 segments scored at least five points across multiple categories. Of these 418 segments, 53 percent (220) scored high for safety needs, 85 percent (357) scored high for reliability needs, 43 percent (178) scored high for system enhancement needs, 17 percent (73) scored high for operational needs, and 17 percent (73) scored high for truck parking needs. Figure 8.5 also displays the highest scoring roadways on the Illinois PFN. Segments that scored at least a 4 out of 10 are shown on the map.

TABLE 8.2 ROADWAYS WITH THE HIGHEST COMBINED NEEDS SCORES

Roadway	County	High Needs Categories
Interstate 80	Lasalle, Will	Reliability, Truck Parking, Operations
Interstate 57	Coles, Union	Reliability, Truck Parking, Operations
E IL Hwy 15	Jefferson	Safety, Reliability, System Enhancements
U.S.136	Mclean	Safety, Reliability, Operations, System Enhancements
4th St.	Adams	Safety, Reliability, System Enhancements
7th St.	Ogle	Safety, Reliability, System Enhancements
Everett St.	Lee	Safety, Reliability, System Enhancements
Harlem Ave	Cook	Safety, Reliability, Operations
Touhy Ave	Cook	Reliability, Operations, System Enhancements
Lincoln Hwy	Ogle	Safety, Reliability, System Enhancements
Maine St.	Adams	Safety, Reliability, System Enhancements
St. Charles St.	Kane	Safety, Reliability, System Enhancements

When segments are combined into County level corridors, there are 49 distinct roadways with a high combined needs score within the state (Figure 8.6). Of those roads, 57 percent (28 roads) scored high for safety needs: 84 percent (41) scored high for reliability needs, 57 percent (28) scored high for system enhancement needs, 41 percent (20) scored high for operational needs, and 10 percent (5) scored high for truck parking needs. The five counties with the largest number of high scoring needs segments are Adams (51 segments), Cook (50), Kane (48), Ogle (43), and Will (26). Measured by roadways, the five counties with the highest combined needs are Cook (10 roads, 4.5 mi), Adams (5 roads, 2.6 mi), Kane (5 roads, 3.2 mi), Effingham (4 roads, 2.6 mi), and Will (3 roads, 3.8 mi).

Highway needs are not surprisingly concentrated in the areas with the most freight traffic, with many high needs segments located within the greater Chicagoland area. However, other areas of the State also show significant highway freight needs, including both other smaller urban areas such as the Quad Cities and Quincy, but also rural counties throughout the State. Unsurprisingly, needs are heavily concentrated along interstate corridors, which carry the highest

volumes of freight traffic within the State. The movement of freight in the agricultural and energy sector also drives the needs of the system, as is shown by the concentration of such needs in counties including Effingham and McLean.

FIGURE 8.5 HIGH COMBINED NEEDS SCORE BY SEGMENTS

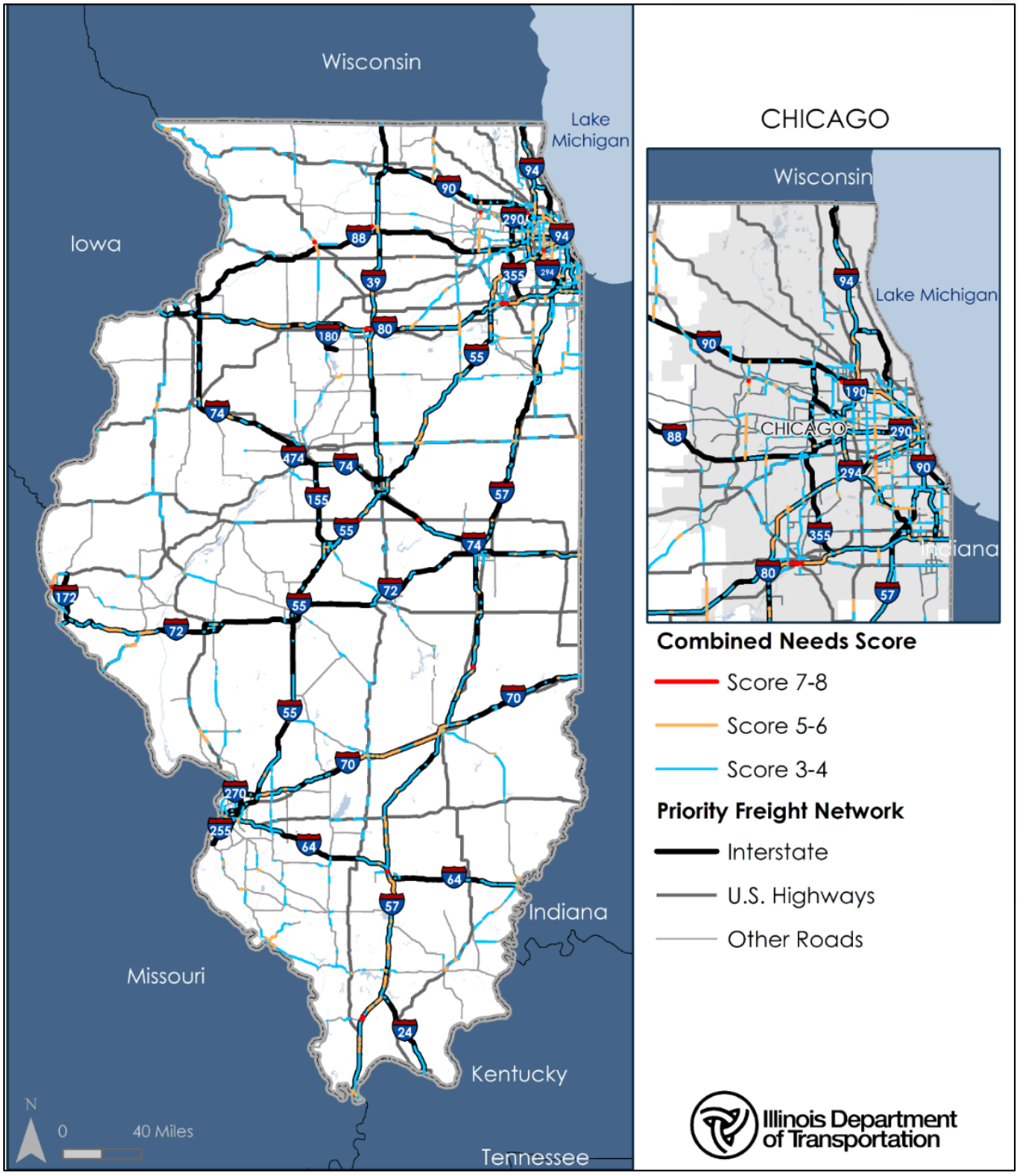
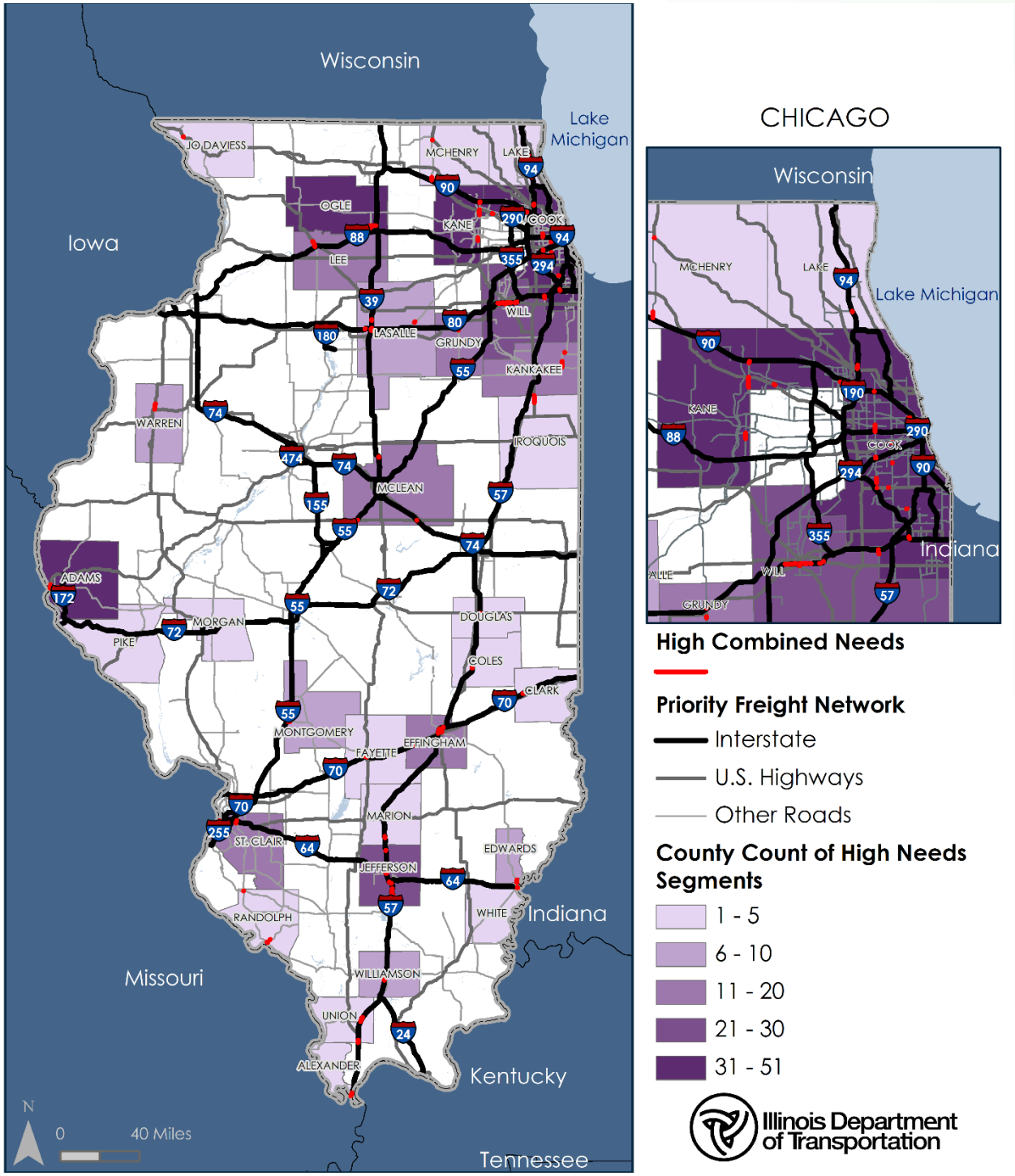


FIGURE 8.6 NUMBER OF HIGH COMBINED NEEDS SEGMENTS BY COUNTY



Freight Rail Needs

Freight rail needs were identified through a review of the *2022 Illinois Rail Needs Assessment* and the *2023 Illinois Rail Plan*, and supplemented by data analysis and stakeholder engagement undertaken for this Freight Plan. Five key needs categories were included: safety, system condition, reliability, technology, and connectivity to the freight system.

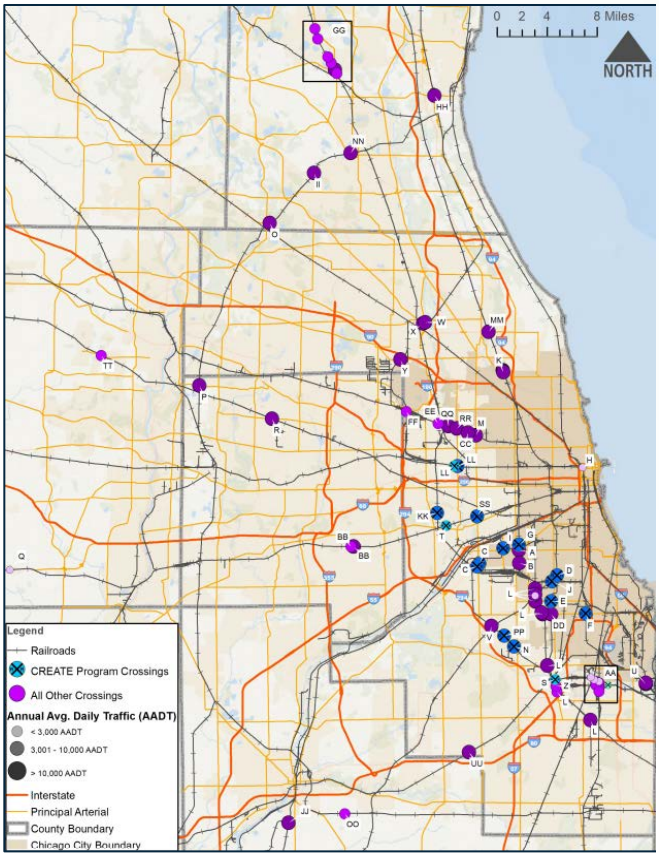
Freight rail is a particularly safe mode of transport, with only about a quarter of the fatalities per ton-mile transported as compared to trucking. Rail safety incidents occur, primarily, where rail intersects with other modes, particularly highway-rail at grade crossings. The *2022 Illinois Rail Needs Assessment* details safety concerns across the Illinois rail network and has identified the highest incident at-grade rail crossings as areas for investment. Regionally, the agencies in northeastern Illinois, along with IDOT, identified a list of priority grade crossings using several factors, including safety and delay. Figure 8.7 shows the northeastern Illinois priority grade crossings.

While most of the freight rail infrastructure in Illinois is in good condition, there are areas in which system condition limits the use of rail for freight movements. The *2022 Illinois Rail Needs Assessment* identified over 20 projects or combinations of projects to bring Illinois rail assets to a state of good repair. These include 12 track improvements, eight bridges, three grade crossings, and three rail yard projects. Vertical clearances are a particular issue for Illinois, as overhead crossing rail facilities or other legacy obstructions limit rail line capacities. Addressing these types of issues are important to maintaining Illinois' unique position and competitive advantage as rail hub of the Nation.

Maintaining and expanding rail capacity is also critical for Illinois, particularly in the congested Chicago region. The Chicago Region Environmental and Transportation Efficiency (CREATE) Program is an ongoing public-private partnership between the State, local agencies, and Class I railroads to ensure the reliability of rail within the region. Of the 70 CREATE projects, 31 are complete, 20 are in process, and 19 still require action. Outside of Chicagoland, there are numerous short lines and regional railroads that require investment to allow for efficient freight movement and connection to key freight facilities.

Technology is a critical factor in rail freight. While overall more efficient than trucks in general (railroads can transport a ton of freight nearly 500 miles on a gallon of fuel),

FIGURE 8.7 NORTHEASTERN ILLINOIS PRIORITY GRADE CROSSINGS (2019)



Source: Northeastern Illinois Priority Grade Crossing Study.

investments in technology such as anti-idling units, zero- or low-emission yard equipment, and alternative fuels can help further increase the sustainability and competitiveness of rail. [47] Furthermore, technology such as geolocation and intermodal communication can help modernize rail service, increasing its competitiveness with trucking and logistics providers. Railroads are also increasingly using autonomous equipment to increase efficiency of activities such as track inspection and maintenance. Finally, the 2020 completion of deployment of Positive Train Control (PTC) in Illinois, which was a mandate of the 2008 Rail Safety Improvement Act, provided the State's rail network with enhanced communications to remotely control locomotives to prevent train-to-train collisions, overspeed derailments, incursions into work zones, and movements of trains through switches in the wrong direction.

Marine Freight Needs

Marine freight needs were identified through a review of the *2021 Illinois Marine Transportation System Plan* (*IMTS Plan*) and supplemented by data analysis and stakeholder engagement undertaken for this Freight Plan. There are 50 rail-served marine terminals within the State with a variety of rail infrastructure that supports them. Expanding and improving rail facilities at marine terminals can open terminals to higher volumes or new customers. Key areas of need include both multimodal infrastructure within the port districts as well as infrastructure condition and reliability issues on the waterways.

In order for a marine terminal to operate efficiently, multimodal port assets, including road, rails, and waterway infrastructure, must be maintained in a state of good repair and have efficient access to the various modal networks. There are numerous needs in port districts across the State, including repair or rehabilitation of dock walls, dock surfaces, or other marine infrastructure; repair, rehabilitation, or reconstruction of roadways and railroad tracks within port districts; and increasing connectivity between port districts and the highway and rail networks. Additionally, there are numerous needs to expand or repair storage and transfer facilities located at ports throughout the State.

Across Illinois, there are over 1,100 miles of commercially navigable waterways. While there are many more miles of rivers throughout the State, only these 1,100 miles can handle barges or larger vessels. This is mainly due to the lock and dam system throughout the IMTS. Without the locks and dams, the IMTS would not be commercially navigable. The locks and dams are owned by the USACE and fall under their responsibility. There are numerous needs on the inland waterway system to ensure reliability of freight movements. There are 27 locks and dams on the Illinois waterway, and numerous additional locks and dams on the Mississippi River System and Great Lakes/St. Lawrence Seaway that impact Illinois freight shippers. Many of these locks and dams were constructed in the 1930s and 1940s, outliving their engineered lifespan, and requiring periodic scheduled and unscheduled maintenance to ensure they can function correctly. In 2020, Illinois locks were closed for unscheduled maintenance for 897 hours. Whenever the locks are closed, vessels cannot travel through them, hindering the movement of commodities, which can significantly impact supply chains. The need to rehabilitate or reconstruct many of these locks and dams is required to ensure commodities can move throughout the IMTS reliably. Many locks and dams need repair or a complete overhaul.

[47] Association of American Railroads, https://www.aar.org/wp-content/uploads/2020/06/AAR-Sustainability-Fact-Sheet.pdf.

Additionally, commercially navigable waterways require maintenance of channels deep enough for commercial traffic. Barges need a 9-foot draft, and larger lake-going vessels require a 27-foot draft for navigation. The means of addressing this issue is through dredging, which removes the sedimentation allowing for the navigable channel to remain. The USACE is responsible for maintaining a navigable channel along the waterways, while terminal operators are responsible for their approach channels. The *IMTS Plan* identified a set of programmatic issues that highlight the needs of the marine system (Table 8.3).

TABLE 8.3 IDENTIFIED NEEDS ON ILLINOIS MARINE FREIGHT SYSTEM

Type	Description
Port Development	Funding and implementation support for port districts to develop, expand, and/or improve their terminal facilities, truck and rail access, berths, and channels, supporting logistics facilities, and water-dependent non-freight activities
	Technical support for port districts to document and communicate their capabilities, assets, and economic importance to a broad range of public and private stakeholders
	Improved definition of port districts to capture IMTS opportunities and deliver IMTS improvements and services
Waterway Maintenance and Operations	Improved regulatory, management, and funding practices for channel and berth maintenance dredging
	Improved delivery of critical lock and dam maintenance, resiliency, and other projects through close collaboration with Federal Agency partners and through multistate partnerships
Statewide Planning and Funding	Improved IMTS planning capacity within IDOT
	Improved IMTS planning coordination across Illinois agencies
	Establishment of sustainable IMTS funding program

Source: Illinois Marine Transportation System Plan.

The marine assessment also examines asset preservation, lock and dam improvements, channelization, storage infrastructure, and connectivity to the freight system as categories of need. The assessment identifies the need for repairs and improvements to existing infrastructure as the primary component of ensuring competitive marine freight activity in Illinois. With this acknowledgment, the assessment also recognizes the need for intermodal connectivity inherent to marine transport. As mentioned above, there are 50 rail-served marine terminals within the State with a variety of rail infrastructure that supports them. Expanding and improving rail facilities at marine terminals can open terminals to higher volumes or new customers. Port districts have identified 18 projects that would develop or improve rail infrastructure.

Air Cargo Needs

Air cargo needs were identified through a review of the *2021 Illinois Aviation System Plan* (IASP) and supplemented by data analysis and stakeholder engagement undertaken for this Freight Plan. While Chicago's O'Hare International Airport is dominant not only in the State but the entire Midwest for air cargo, numerous other airports within the State fulfill additional roles, particularly Chicago Rockford International Airport, which serves as a fast-growing and vital connection to package shippers, including UPS and Amazon, whose presence has grown substantially due to the e-commerce economy. The aviation freight needs assessment identifies

system condition, technology and connectivity to the freight system as key target needs to support air cargo in the State.

Airport infrastructure condition is vital to supporting the air cargo market. The IASP identified $312 million in rehabilitation and reconstruction projects needed as of the current year at 85 airports across the State. Airport managers' three top infrastructure concerns were: pavement (handling heavier air cargo aircraft), the useful life of hangers, and overall runway conditions.

Aviation technology, particularly unmanned aerial systems (UAS) have significant potential to impact freight within the State. Illinois currently is studying how UAS can be used in first- and last-mile deliveries, potentially helping alleviate congestion on the roadway network. The FAA conducted a series of pilot programs with nine nationwide implementation partners from 2017 to 2020 in its Integration Pilot Program (IPP). This program transitioned to the BEYOND program in October 2020, and eight of the nine IPP participants are continuing to explore UAS challenges.[48] This research will continue to advance the state of technology and policy to enable future logistics applications of UAS.

At the same time, Transportation is the most significant contributor to the United States' greenhouse gas (GHG) emissions, and aviation is the most greenhouse gas emitting mode. The FAA published the United States Aviation Climate Action Plan in November 2021. The plan includes the following actions to decrease emissions associated with air transportation:[49]

- Development of new, more efficient aircraft and engine technologies.
- Improvements in aircraft operations throughout the National Airspace System.
- Production and use of Sustainable Aviation Fuels (SAF).
- Electrification and, potentially hydrogen, as solutions for short-haul aviation.
- Advancements in airport operations across the United States.
- International initiatives such as the airplane CO_2 standard and the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA).
- Support for research into climate science.

Roadway connectivity is also a critical factor in the success of air cargo movements. Relative to other modes, goods shipped via air cargo are highly perishable, valuable, and/or time-sensitive. If roadway connectivity near air cargo facilities or between the facility and the shipment's final destination is problematic, the value of shipping goods by air cargo decreases, and ultimately the air cargo facility becomes less competitive with other air hubs located in nearby states.

Pipeline Needs

Pipeline needs were identified through a review of the *2022 Illinois Pipeline Study* and supplemented by data analysis and stakeholder engagement undertaken for this Freight Plan.

[48] FAA, Unmanned Aircraft Systems, BEYOND. https://www.faa.gov/uas/programs_partnerships/beyond/. 2021.
[49] FAA, Aviation Climate Action Plan, 2021. https://www.faa.gov/sustainability/aviation-climate-action-plan.

Although pipelines have a low risk of incidents considering the total mileage of the network and volume of product transported, when incidents do occur they can have severe consequences.[50] Minimizing risk of incidents across the pipeline network must continue to be a priority for IDOT and Illinois overall. The storage, use, and transportation of HazMat exposes many communities to increased risk, particularly low-income and historically marginalized neighborhoods.

There are several precautions that governments and pipeline operators and users can take to improve safety throughout the network. Pipeline terminals can develop secure rail car storage facilities rather than exposed rail spurs to minimize exposure of HazMat products to neighboring communities. Local governments should be aware of all pipeline easements and seek to prevent encroachment through local utility identification and marking, as well as safety programs. It is also critical to prohibit the development of residences and other sensitive facilities, such as hospitals, schools, or prisons, within a half mile of a pipeline in the event of a serious incident requiring immediate evacuation.

Due to continuing and growing demand for natural gas, the need for new, expanded, or upgraded pipeline infrastructure is increasing. In addition, increased domestic and Canadian crude oil production has shifted the origins and destinations of crude oil. As a result, pipeline companies have responded by developing new pipelines, upgrading pipelines to increase capacity, or reversing the direction of existing pipelines.

Pipeline-related facilities—such as refineries, terminals, and storage facilities—can be served by several modes of freight transportation. Truck access is a particularly important consideration both because trucks are ubiquitous in the last mile of supply chains and trucking is the mode of transportation where the physical infrastructure (roads) are shared with non-freight uses. The policy imperative in first- and last-mile networks involves balancing a range of competing interests and needs—between freight stakeholders, commuters/passenger vehicles, and local communities.

The roads that are within the vicinity of strategic pipeline-related facilities (or other important intermodal facilities such as airports, ports, rail yards, and intermodal terminals) may not necessarily all be within IDOT's jurisdiction, as some of these may be locally owned and maintained. Nonetheless, departments of transportation can play a strategic planning function by undertaking studies to determine the adequacy of road networks serving key freight hubs.

Image of a Truck Being Loaded at a Grain Farm in Illinois

[50] The Watershed Council. Accessed 01/27/2022. https://www.watershedcouncil.org/pipeline-risks.html.

Strengths, Weaknesses, Opportunities, and Threats (SWOT)

A robust SWOT analysis was conducted to understand what stakeholders identify as the most critical needs, issues, and opportunities related to freight in Illinois. Over 130 stakeholders participated in the SWOT process, including members of the ISFAC and local stakeholders taking part in nine District Freight Forums. The SWOT analysis process is summarized in Figure 8.8 and findings are presented in Figure 8.9, which shows issues that were identified as statewide priorities and/or priorities in three or more districts.

SWOT ANALYSIS

- Over 20 freight-related reports were reviewed
- Over **130 industry representatives** provided input to the SWOT analysis process
- 1 Statewide and 9 District-level SWOT analyses were developed
- Over **100 elements** were identified in the statewide SWOT analysis

FIGURE 8.8 ILLINOIS FREIGHT PLAN SWOT ANALYSIS PROCESS

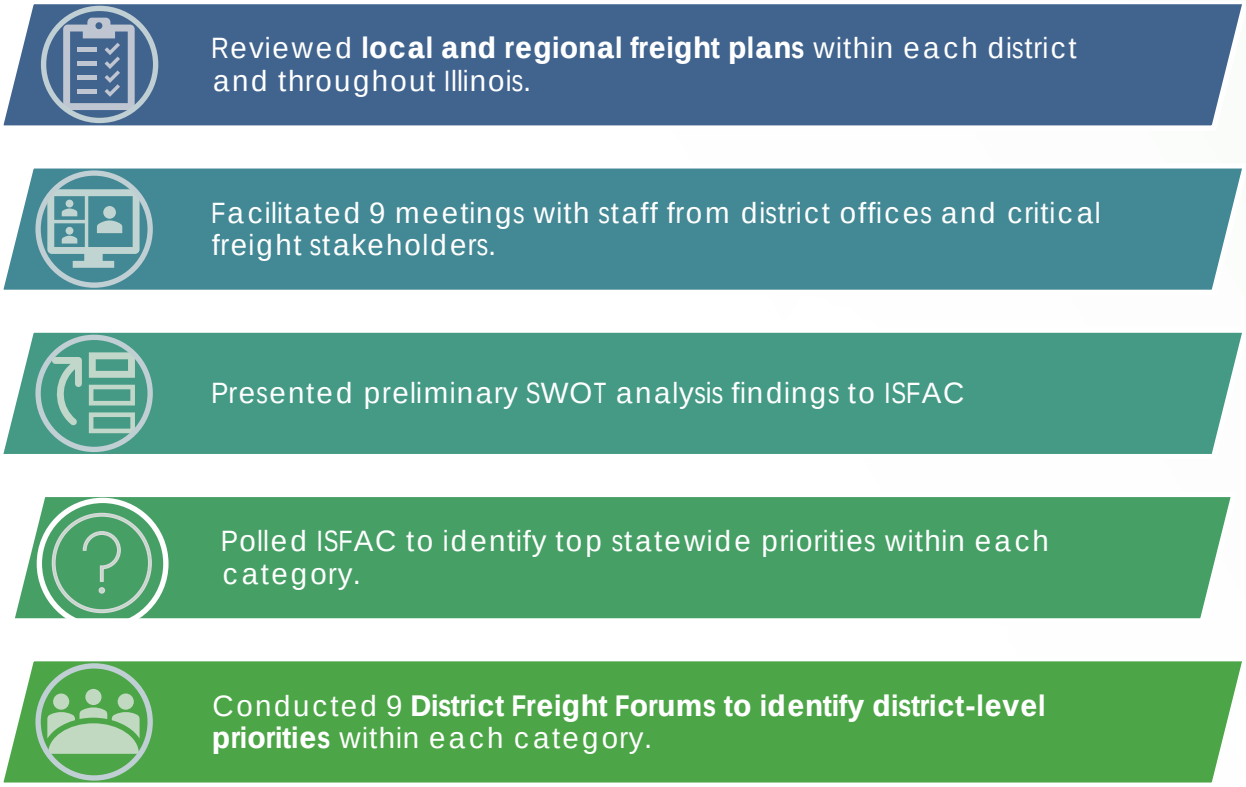


FIGURE 8.9 ILLINOIS FREIGHT PLAN SUMMARY OF SWOT ANALYSIS FINDINGS

STRENGTHS	
S, D1, D3, D4, D6, D7, D8	**Transportation focused capital programs to advance freight projects.** *Rebuild Illinois*
S, D4, D7, D8	**IDOT planning efforts recognize the full multi-modal freight network**
S, D3, D5	**Most pavements and bridges meet acceptable conditions under TAMP guidelines**
S	**Best in class electronic permitting** *OS/OW permitting, routing, and staff communication*
S, D1, D4, D5, D6	**IDOT conducts regular freight planning initiatives**
D5, D6, D7, D8	**IDOT regularly facilitates coordination on freight needs and planning between divisions and districts**
D2, D3, D4, D6	**Illinois River System** *Connections to the Great Lakes/Atlantic Coast and Mississippi River/Gulf of Mexico and the Ohio, Kaskaskia and Illinois Rivers*

WEAKNESSES	
S, D1, D3, D5, D7	**Lack of response from utilities, pipelines, railroads** *Impacts the timely advancement of state and local projects*
S, D5, D6, D7, D8	**Lack of truck parking and limited real time data on availability**
S, D6	**Lack of coordination between jurisdictions and agencies**
S, D7, D8	**Lack of data collection and sharing** *Little to no commodity flow or OD data for district use*
S, D7	**Lack of guidance from IDOT regarding how to utilize freight data in project development and programming**
D1, D2, D3, D4, D5, D7, D8	**Lack of department staff to develop and deliver projects**
D4, D6, D8	**Lack of funding for bridges, viaducts and Intelligent Transportation Systems**

OPPORTUNITIES	
S, D3, D4, D7, D8, D9	**Expanded use of Illinois' four marine highways for freight**
S, D4, D5	**The emergence of electric vehicles** *Truck electrification, EV manufacturing and supporting supply chains with EV*
S, D2, D4, D7, D8	**Access to all 7 Class 1 railroads** *Regional and short line railroads offer online shipper access to many of these railroads*
S, D2, D3, D4, D5, D6, D7	**Infrastructure Investment and Jobs Act (Bipartisan Infrastructure Law)**
S, D5, D6, D9	**Developments in truck automation to advance operational efficiencies and safety** *Lane technology and in-cab cameras*
D2, D4, D9	Continued growth in e-commerce
S, D3, D7	**Ancillary benefits of freight commercial services** *Truck stops*

THREATS	
S, D1, D2, D3, D4, D5, D6, D7, D9	**Supply chain disruptions** *Due to the pandemic, climate change, disasters, terrorism, war, or other world events*
S, D8	**Increasing flooding events** *Strain on infrastructure and will require more resilient systems*
S, D1, D2, D3, D4, D5, D6, D7, D8, D9	**Inadequate truck driver workforce** *Due to aging workforce, poor working conditions, turnover and economic pressures*
S, D3, D6, D8	**Aging lock and dam system** *Most locks and dams were built between 1940-1960*
S	**High water levels and increased damage inflicted by storms**
D1, D2, D4, D6, D7, D9	**Lack of community consensus on how to best accommodate freight**
D1, D4, D5, D6	**General labor shortages affecting worldwide supply chains**

8.6 Freight Performance Measures and Metrics

This section discusses Illinois' freight performance measures and metrics. These were designed to align with the goals of this Freight Plan, as well as those of FHWA and USDOT. The FHWA maintains a list of recommended performance measures organized into the categories of safety; maintenance and preservation; mobility, reliability, and congestion; accessibility and connectivity; and the environment.[51] These, as well as the National Multimodal Freight Policy Goals related to improving infrastructure, safety, economic efficiency and competitiveness, and reliability of the National Multimodal Freight Network[52] and National Highway Freight Network[53], were reviewed and used to inform IDOT's performance measures.

IDOT is focused on identifying and tracking performance measures that help ensure that its freight-related investments support the state's economy, as well as providing measurements to help understand impacts of other influencing factors, such as economic trends and technology adoption. IDOT has selected targeted measures and metrics that are broadly implementable and informative throughout the state, and easy to track through existing data sources. Other performance measures considered during the development of this Freight Plan will be kept as recommendations for future implementation.

As discussed below, ten state-level performance measures are used to quantify the state's performance in six goal areas: Freight Safety, Freight Reliability and Congestion, Freight System Condition, Intermodal Capacity/ Mode Shift, Freight System Operational Sufficiency, and Truck Parking. IDOT also used performance metrics within these goal areas, as well as that of Environmental Impacts of Freight, as part of the Competitive Freight Program (CFP) which was used to develop the Freight Investment Plan. The CFP metrics are summarized below and the program itself is discussed in Chapter 9.0.

State Level Performance Measures

This section presents state-level freight performance measures for use in tracking freight performance within the state. These are designed to be broadly implementable by IDOT and its Districts, focusing on use of existing data and geographies (i.e., the NHS)[54], and alignment with other IDOT Plans (i.e. the Transportation Asset Management Plan (TAMP)). The state-level freight performance measures are included in Table 8.4.

TABLE 8.4 SUMMARY OF ILLINOIS FREIGHT PERFORMANCE MEASURES

Goal Area	Recommended Performance Measures	Data Source / *Update Frequency*	Current Measure
Freight Safety	Total number of truck-involved crashes resulting in a fatality or serious injury	IDOT Crash Database /*Annual*	99 fatal and 408 severe injury truck-involved crashes (2015 – 2019 annual average)

[51] https://ops.fhwa.dot.gov/publications/fhwahop16089/fhwahop16089.pdf
[52] 49 USC 70101(b)
[53] 23 USC 167(b)
[54] These performance measures were used at a narrower geography for the needs assessment within this plan, i.e. at the Priority Freight Network (PFN) level. However, for ease of long-term implementation, it was determined that these measures should be adjusted to be representative of the NHS and/or Interstate network.

Goal Area	Recommended Performance Measures	Data Source / *Update Frequency*	Current Measure
	Crash rate (per 100 million truck VMT) of truck-involved crashes resulting in a fatality or serious injury	IDOT Crash Database */Annual*	0.81 fatal crashes and 3.21 severe injury crashes per 100 million truck VMT (2019)
Freight Reliability and Congestion	Truck Travel Time Reliability (TTTR) Index for the Interstates	National Performance Management Research Data Set */Annual*	1.34 for 2019, 1.24 for 2020, and 1.29 for 2021 (partial year)
Freight System Condition	Number of bridges on the Interstates and NHS with any component in poor condition	IDOT Structures Database */With TAMP plan updates*	174 (8.3%) bridges on Interstates and 405 bridges (9.7%) on the NHS (2020)
	Miles of roadway on the NHS with pavement in poor condition (CRS less than 5.0 on non-Interstates or less than 5.5 on Interstates).	IDOT IRIS Roadway Inventory */With TAMP plan updates*	1,401 (20%) of miles on the NHS (2020)
Intermodal Capacity / Mode Shift	Volume and Value of Commodities Shipped by Mode (Truck, Rail, Marine, Air, Pipeline)	S&P Transearch */With Freight Plan Updates*	Baseline commodity flow data is listed in detail in Chapter 7.0.
Freight System Operational Sufficiency	Number of bridges with a posted load limit on the NHS	IDOT Structures Database */With Freight Plan Updates*	27 bridges (0.6%) (2020)
	Number of bridges with a vertical clearance limitation (16 feet or less) on the NHS	IDOT Structures Database */With Freight Plan Updates*	150 bridges (3.6%) (2020)
	Number of structures on the NHS that block more than 100 OSOW routes per year in urban areas or more than 200 OSOW routes per year in rural areas.	IDOT Permitting Office */With Freight Plan Updates*	36 bridges (0.9%) (2020)
Truck Parking	Number of truck-involved crashes involving parked trucks that result in a severe injury or fatality	IDOT Crash Database */Annual*	2.4 fatal and 12.9 severe injury truck-involved crashes (2015 – 2019 annual average)

Investment-Level Performance Metrics

This section will discuss the performance metrics used in to identify needed freight investments as part of this Freight Plan. Each subsection below summarizes one of seven goal areas, including linking to the state-level measures, summarizing the calculation methodology, and presenting the thresholds used in the CFP.

Freight Safety

The first goal area, Freight Safety, focuses on improving the safety of truck and intermodal movements within the state. While there are two state-level freight safety measures listed in Table 8.4, six metrics were used to identify areas for safety investments as part of the CFP. Table 8.5 lists the three metrics used to evaluate highway projects and Table 8.6 lists the three metrics used to evaluate intermodal projects.

Highway projects are evaluated using the total number of crashes, crash rate, and fatal and severe injury crash rate, calculated using IDOT crash data from 2015 – 2019. Intermodal projects are evaluated based on the reduction in truck Vehicle Miles Traveled (VMT), additional safety benefits beyond reduced truck VMT alone (such as from reduced conflict points between vehicles), and safety benefits from potentially reduced hazmat cleanup costs.

TABLE 8.5 INVESTMENT LEVEL FREIGHT SAFETY HIGHWAY METRICS

Metric	Methodology	High Scoring Criteria	
		Urban	*Rural*
Truck Involved Crashes	Crashes per mile were calculated by adding up the number of truck crashes on a corridor and dividing by the length in miles	> 6 Crashes per mile	> 1 Crash per mile
Truck Involved Crash Rate	Truck-involved crash rate was calculated by dividing the total truck crashes by the total truck VMT	> 700 Crashes per Million Truck VMT (MTVMT)	> 180 Crashes per MTVMT
Truck Involved Severe Injury or Fatal Crash Rate	The fatal and severe injury truck-involved crash rate was calculated by dividing the number of truck crashes that involved a fatality or serious injury by the total truck VMT	> 30 Crashes per MTVMT	> 20 Crashes per MTVMT

TABLE 8.6 INVESTMENT LEVEL FREIGHT SAFETY INTERMODAL METRICS

Metric	Methodology	High Scoring Criteria
Reduction in Truck Vehicle Miles Traveled (VMT)	Projected change in truck VMT was estimated from the number of truck trips avoided to and from major origins and destinations	Annual truck VMT reduction > 50% OR > 7.2 million truck VMT
Reduction in Fatalities, Injury, and Other Crashes	Additional reduction in the number of fatalities, injuries, or crashes expected from non-VMT related sources, such as reduced conflict points, hazardous material movement by trucks, or operator fatigue	Annual change in fatalities, injury and other crashes >50%
Reduction in Hazmat/ Environmental Risk	The estimated reduction in hazmat cleanup costs due to the implementation of risk reduction tools and/or processes	Annual change in hazmat clean-up costs >50%

Freight Reliability and Congestion

The second goal area, Freight Reliability and Congestion, captures the parts of the freight network where delays and unreliability add to the cost of transporting goods. While there is one state-level reliability measure listed in Table 8.4, three metrics, listed in Table 8.7, were used in the CFP to evaluate how a project would improve the reliability on Illinois' highways. The first two metrics are the truck bottleneck locations and the user cost of congestion (both from the 2021

Truck Bottleneck Study). The third metric captures truck delay that occurs at at-grade highway railroad crossings.[55]

TABLE 8.7 INVESTMENT LEVEL FREIGHT RELIABILITY AND CONGESTION HIGHWAY METRICS

Metric	Methodology	High Scoring Criteria	
		Urban	*Rural*
Truck Bottleneck Locations	Truck bottlenecks identified under the 2021 IDOT Truck Bottleneck Study	Good or potentially good candidate for project development	Good or potentially good candidate for project development
User Cost of Congestion	The methodology is presented in NCHRP Research Report 925[56]	> $5,000 dollars per day	> $1,000 dollars per day
At-Grade Highway-Rail Crossings	Calculates the truck hours of delay per day at at-grade highway railroad crossings using the data and methodology established by the Chicago Metropolitan Agency for Planning (CMAP)[57]	***Chicago Area Criteria***	***Outside of Chicago Area Criteria***
		> 10 Hours	> 3 Hours

Freight System Condition

The third goal area, Freight System Condition, tracks the condition of the assets that are most likely to be impacted by freight movements. There are two state-level freight safety measures listed in Table 8.4, which are similar to the two metrics, listed in Table 8.8, used in the CFP. These metrics score how a project would improve bridge and pavement conditions. These criteria awarded more points to projects based on truck volume, with higher volume facilities receiving more points because those volumes would have a greater impact on asset condition compared to lower volume facilities.

TABLE 8.8 INVESTMENT LEVEL FREIGHT SYSTEM CONDITION HIGHWAY METRICS

Metric	Methodology	High Scoring Criteria	
		Urban	*Rural*
Bridge Condition	Bridges where any component is in poor condition	Heavy Commercial Volume (HCV) > 5,000	HCV > 2,500
Pavement Condition	Pavement that has a Condition Rating Survey less than 5.5 (on Interstates) or less than 5.0 (on non-Interstates)	HCV > 5,000	HCV > 2,500

Intermodal Capacity / Mode Shift

The fourth goal area, Intermodal Capacity / Mode Shift, will track the growth and distribution of goods movements across the different modes in Illinois. At the state level, performance measures in Table 8.4 focus on the overall volume and value of goods moved throughout the state. For the CFP, two metrics, listed in Table 8.9, focused on the project's impact on modal

[55] In the CFP, the criteria for the third metric differ based on whether or not the project is in the Chicago area, unlike all of the other highway criteria, which differ based on urban and rural areas.
[56] https://www.trb.org/NCHRP/Blurbs/180007.aspx
[57] https://www.cmap.illinois.gov/documents/10180/905585/FINAL+Indicators+Appendix.pdf/ae234d88-74c0-7a94-f70d-ea350c999810

connectivity as well as increased intermodal volume. These criteria reflect how individual projects were evaluated to achieve the goal of mode shift away from trucks.

TABLE 8.9 INVESTMENT LEVEL INTERMODAL CAPACITY / MODE SHIFT METRICS

Metric	Methodology	High Scoring Criteria
Intermodal (Rail-Truck, Water-Truck, Water-Rail) Connections Added to the Network	Evaluates the increased connections between freight modes at a given facility	Adds one or more intermodal connections
Increased Intermodal Volume	Evaluates the increased intermodal capacity based on the increased volume of annual intermodal freight movement	Volume increase > 50% or > 500,000 tons per year

Freight System Operational Sufficiency

The fifth goal area, Freight System Operational Efficiency, tracks the barriers and factors that prevent efficient operation of truck movements in Illinois. The three state-level freight operations measures listed in Table 8.4 incorporate three metrics used in the CFP, listed in Table 8.10. The first metric on bridge weight restrictions incorporates the Priority Freight Network (PFN) score, used to establish the PFN described in Chapter 5.0, in order to capture the infrastructure most critical to freight movement. The remaining two metrics evaluate vertical clearance limitations, awarding more points to lower height restrictions, and OSOW routing restrictions.

TABLE 8.10 INVESTMENT LEVEL FREIGHT SYSTEM OPERATIONAL SUFFICIENCY HIGHWAY METRICS

Metric	Methodology	High Scoring Criteria	
		Urban	*Rural*
Bridge Weight Restrictions	Bridges that have a posted load limit that may restrict truck movements	Priority Freight Network (PFN) Score > 60	PFN Score > 60
Vertical Clearance Limitations	Bridges have a vertical clearance limitation that may restrict truck movements	<= 13.5 Feet	<= 13.5 Feet
OSOW Restrictions	Bridges that routinely block the routing of OSOW loads	> 200 OSOW Routing Failures	> 400 OSOW Routing Failures

Truck Parking

The sixth goal area, Truck Parking, tracks whether Illinois is providing an adequate supply of truck parking. Though there is one state-level truck parking measure listed in Table 8.4, the CFP used three metrics, listed in Table 8.11, to measure the impacts highway projects have on truck parking. Data for these metrics is only available on Interstates. This includes evaluating projects based on the truck parking demand-to-capacity ratio, whether the project was on a segment identified as having a significant number of fatigue-related crashes, and the number of crashes involving parked trucks.

TABLE 8.11 INVESTMENT LEVEL TRUCK PARKING HIGHWAY METRICS

Metric	Methodology	High Scoring Criteria	
		Urban	*Rural*
Truck Parking Demand-to-Capacity Ratio	A ratio of available truck parking (capacity) relative to the amount needed by carriers (demand)	Demand to Capacity Ratio > 1.2	Demand to Capacity Ratio > 1.2
Fatigue-Related Crashes	Identifies Interstate segments which saw a significant number of fatigued-related crashes involving trucks in the 2022 IDOT Truck Parking Study	On an identified segment	On an identified segment
Crashes Involving Parked Trucks	The number of crashes involving parked trucks per mile. Fatal crashes were given 4x the weight	> 0.1 Crashes per Mile	> 0.05 Crashes per Mile

Environmental Impacts of Freight

The final goal area, Environmental Impacts of Freight, would track the carbon emissions and air quality impacts of freight movements in Illinois. In 2021, Governor JB Pritzker enacted the Climate and Equitable Jobs Act, which committed Illinois to move to 100% clean energy by 2050.[58] While no state-level performance measures for this goal area have yet been identified, IDOT included one metric related to environmental impacts in the CFP, listed in Table 8.12. This metric scores intermodal projects for their use of technology to reduce emissions at freight facilities.

TABLE 8.12 INVESTMENT LEVEL ENVIRONMENTAL IMPACTS OF FREIGHT INTERMODAL METRICS

Metric	Methodology	High Scoring Criteria
Technology Enhancements Supporting Emissions Reductions at Freight Facilities	Evaluates the impact of tools, technologies, or vehicles and infrastructure that will improve the fleet fuel efficiency at intermodal facilities	Deployment of zero-emission vehicles that operate inside the boundaries of intermodal facilities

Additionally, the CFP includes a "cross-cutting measure" applicable to all projects that awards additional points to projects that show a reduction or mitigation of environmental or other community impacts in Environmental Justice areas as defined by the Illinois EPA. Additional cross-cutting measures in the CFP were used to identify disadvantaged communities (as defined by USDOT Justice40 Initiative, the Illinois EPA, and the Illinois Department of Commerce and Economic Opportunity) that may be potentially impacted by freight.

[58] https://www.illinois.gov/news/press-release.23893.html

9.0 Freight Project Identification, Prioritization, and Investment

In 2021, the Infrastructure Investment and Jobs Act (IIJA) continued the funding provided under the FAST Act, providing about $7.15 billion to states between FY22–FY26 through the National Highway Freight Program (NHFP). Illinois is set to receive $256.6 million in funding. For the State of Illinois, the allocated amount of these funds are shown in Table 9.1. [59]

TABLE 9.1. IIJA NATIONAL HIGHWAY FREIGHT PROGRAM FORMULA FUNDING—ILLINOIS ALLOCATION

Year	Illinois Total Allocation of NHFP Funds
FY2022 (continuation from FAST Act)	$49,306,725
FY2023	$50,292,860
FY2024 (est)	$51,298,717
FY2025 (est)	$52,324,691
FY2026 (est)	$53,371,185
Total (FY2022–FY2026)	$256,594,178

IIJA continues the requirement that states adopt a fiscally constrained Freight Investment Plan (FIP)indicating how their freight formula funds will be used. In general, funds must be used on the National Highway Freight Network (NHFN) portions consisting of the Primary Highway Freight System (PHFS), and Critical Urban and Rural Freight Corridors (CUFCs and CRFCs). IIJA also allows states to use up to 30 percent of their funding for intermodal projects, including projects within the boundaries of public or private freight or water facilities.

With the requirements of IIJA and FHWA in mind, Illinois designed a Competitive Freight Program (CFP), which was used within the state to identify and prioritize projects for inclusion in the FIP. The following sections describe the 2023 Illinois Competitive Freight Program and development of the FIP.

9.1 Illinois Competitive Freight Program

Program Overview

As presented in the previous chapters, IDOT has worked in conjunction with its partner agencies, freight operators, and other stakeholder to identify key freight needs and issues within the State. Similarly, IDOT has taken a collaborative approach in identifying freight projects and developing the fiscally constrained Freight Investment Plan (FIP) for this State Freight Plan.

In November 2022, IDOT launched the second Illinois Competitive Freight Program (CFP), which served as the foundation for development of the FIP. The goals of the CFP were to:

» Operate in accordance with the Infrastructure Investment and Jobs Act (IIJA).

[59] https://www.fhwa.dot.gov/bipartisan-infrastructure-law/funding.cfm.

- Support objectivity, equity, and transparency in project selection.
- Leverage funds through local or private participation.
- Provide the opportunity for the Illinois State Freight Advisory Council (ISFAC) to provide input into the development and delivery of the program.
- Align with the goals of the 2023 Illinois State Freight Plan.

State and local applicants submitted projects for funding under the CFP, which were scored and selected using a robust set of highway, intermodal, and cross-cutting measures. Projects were evaluated based on both qualitative and quantitative factors, and IDOT used the scoring as a basis for selecting the projects most critical to addressing Illinois' freight needs. Information about the CFP can be found on the Program Website.

Application and Scoring Criteria

Application Overview and Project Eligibility

Applicants to the 2023 Illinois Competitive Freight Program filled out an online application consisting of 40 questions plus two sets of scoring criteria (scoring criteria differed for highway or intermodal projects). Applicants were asked to provide supplementary information about their project, including funds requested, finance and cost estimate forms, and financial assurance. Applicants were also required to justify the importance of their project to Illinois' freight system. An overview of the application structure is shown in Table 9.2.

TABLE 9.2 2023 ILLINOIS COMPETITIVE FREIGHT PROGRAM APPLICATION OVERVIEW

Section	Content
1. Applicant Information	Project Title, Contact and Agency Information
2. Project Information	Description, Sketch, Location, Inclusion in Plan, Municipality/Township, Facility Name, Sponsor, Letters of Support
3. Registration Information	Registration Numbers
4. Project Funding Information	Total Cost, Funds Requested, Finance and Cost Estimate Forms, Funding Eligibility, Financial Assurance Letters
5. Supplementary Freight Information	Urban versus Rural, On versus Off Priority Freight Network (PFN), Project Importance to Freight, Highway vs. Intermodal Project
6. Highway OR Intermodal Scoring	Score the project in up to five Highway Goal Areas or up to three Intermodal Goal Areas
7. Crosscutting Measures	Applicable Partnerships, Project Readiness, Equity and Environmental Justice Impacts
8. Submittal Page	Upload any additional supporting information and submit application

IDOT distributed information about the program widely throughout the State, conducted an informational webinar, and maintained a website with all program information. IDOT encouraged applicants to submit projects that were on the Priority Freight Network (PFN), and provided an Priority Freight Network Map online tool to assist applicants in scoring these projects. For intermodal projects, and highway projects not on the PFN, applicants were encouraged to submit their own data to support their application, as well as provide a justification for the freight significance of

their project. IDOT worked with applicants to ensure project funding eligibility, including the criteria that highway projects must be located on the PHFS, or identified as a CUFC or CRFC.

Highway Project Scoring Criteria

To ensure that projects aligned with both their own goals and those of U.S. DOT, IDOT created five goal areas for highway projects. Each goal area included a qualitative justification and several quantitative metrics, as shown in Table 9.3.

TABLE 9.3 2023 ILLINOIS COMPETITIVE FREIGHT PROGRAM HIGHWAY PROJECT SCORING CRITERIA

Goal Area	Qualitative Justification	Quantitative Measures
1. Safety	1a. Describe how the project enhances the safety of the Illinois highway system.	1b. Truck Involved Crashes
		1c. Truck Involved Crash Rate
		1d. Truck Involved Severe Injury or Fatal Crash Rate
2. Reliability	2a. Describe how the project enhances the reliability of the Illinois highway system.	2b. Truck Bottleneck Locations
		2c. User Cost of Congestion
		2d. At-Grade Highway-Related Crossings (Truck Hours of Delay per Day)
3. System Enhancements	3a. Describe how the project enhances the condition and/or technology of the Illinois highway system.	3b. Bridge Condition
		3c. Pavement Condition
		3d. Traveler Information Needs
		3e. Traffic Incident Management Needs
4. Operational Needs	4a. Describe how the project addresses operational needs on the Illinois highway system.	4b. Bridge Weight Restrictions
		4c. Vertical Clearance Limitations
		4d. Oversize/Overweight (OSOW) Restrictions
		4e. Inadequate Travel Lanes
		4f. Inadequate Shoulder Lanes
5. Truck Parking	5a. Describe how the project improves truck parking on the Illinois highway system.	5b. Truck Parking Demand-to-Capacity Ratio
		5c. Fatigue-related Crashes
		5d. Crashes Involving Parked Trucks

Intermodal Project Scoring Criteria

Similarly, IDOT created three intermodal goal areas to ensure the same alignment with IDOT's and U.S. DOT's goals. Each goal area included a qualitative justification and several quantitative metrics, as shown in Table 9.4.

TABLE 9.4 2023 ILLINOIS COMPETITIVE FREIGHT PROGRAM INTERMODAL PROJECT SCORING CRITERIA

Goal Area	Qualitative Justification	Quantitative Measures
1. Safety	1a. Describe how the project contributes to improving the safety of the Illinois freight network, including roadways, rail crossings, and rail and marine freight facilities.	1b. Reduction in Truck VMT
		1c. Reduction in fatalities, injury, and other crashes
		1d. Reduction in hazmat environmental risks

Goal Area	Qualitative Justification	Quantitative Measures
2. Modal Connectivity	2a. Describe how the project contributes to improving the capacity for modal connectivity within the Illinois intermodal freight system.	2b. Intermodal (rail-truck, water-truck, water-rail) connections added to the network
		2c. Increased intermodal volume
3. Mode Shift	3a. Describe how the project enhances the condition and/or technology of the Illinois highway system	3b. Change in truck equivalencies
		3c. Technology Enhancements Supporting Emissions Reductions at Freight Facilities
		3c. Avoided truck volumes at nearby sensitive intersections

Crosscutting Measures

Finally, IDOT identified three goal areas that applied to all projects. Titled *crosscutting-measures,* these allowed IDOT to understand the significance of the project by identifying partnerships, ensure that the project would move forward in a timely fashion by aligning current status with the funding request, and identify whether a project was located in an area flagged as an equity or environmental justice location. In order to score points for the Equity and EJ Impact goal area, applications also must describe how their project provides a benefit to or mitigates the impact of freight to these communities. Crosscutting measures are shown in Figure 9.1.

FIGURE 9.1 2023 ILLINOIS COMPETITIVE FREIGHT PROGRAM CROSS-CUTTING PROJECT SCORING CRITERIA

Goal Area 1—Applicable Partnerships

» Based on the number and nature of material partnerships in the project

Goal Area 2—Project Readiness

» Based on if the following elements are complete:
- Site Plan, Corridor Plan, Feasibility Studies, Master Plan or other planning work completed
- Phase I (Prelim Engineering, NEPA) completed
- Phase II (PS&E, Ready for Construction Letting) completed
- Right-of-Way or Easements acquired or N/A
- Railroad Approvals (if required) acquired or N/A
- If Phase I is not begun or underway, please identify NEPA Class of Action

Goal Area 3—Equity and Environmental Justice Impacts

» All applicants must describe the impacts the project will have on the surrounding communities

» Points may be awarded if project mitigates freight impacts and is located in:
- A Justice40 Transportation Disadvantaged Community; and/or
- An Illinois EPA Environmental Justice Area; and/or
- A DCEO Opportunity Zone

Competitive Freight Program Project Statistics

A total of 35 applications were submitted to the 2023 Illinois Competitive Freight Program. Twenty-five of the applications were highway projects and 10 were intermodal projects. Applications were received from seven of the nine IDOT Districts and numerous local agencies. The total project value of all applications was $3.96 billion, with $405 million in NHFP funds requested. The average request per project was $11.6 million, and the median was $7 million. The highest requested amount was $65.1 million, and the lowest requested amount was $139 thousand. A summary of applications by geographic location is shown in Figure 9.2.

Highway project applications included requests for various project types, including new highway connections, bridge replacement, interchange projects, highway-rail grade separations, and other various highway improvements. Intermodal project applications included requests for both improvements at intermodal facilities and on freight rail corridors within the State. Applications by project type are shown in Table 9.5 and in Figure 9.3.

TABLE 9.5. 2023 ILLINOIS COMPETITIVE FREIGHT PROGRAM APPLICATIONS BY PROJECT TYPE

Project Type	Number of Applications
Highway	
Highway Projects	13
New Highway Connections	3
Bridge Replacements	4
Interchange Projects	3
Highway-Rail Grade Separations	2
Intermodal	
Intermodal Facility Improvements	8
Intermodal Corridor Projects	2

2023 CFP applications requested funding for various activities from preliminary engineering and NEPA compliance (Phase I) through final design (Phase II) and construction, as shown in Table 9.6 and Figure 9.3.

TABLE 9.6. 2023 ILLINOIS COMPETITIVE FREIGHT PROGRAM APPLICATIONS BY TYPE OF FUNDING REQUESTED

Funding Request	Number of Applications
Phase I Only	8
Phase I, II, and Construction	4
Phase II and Construction	3
Construction Only	20

FIGURE 9.2 2023 ILLINOIS COMPETITIVE FREIGHT PROGRAM APPLICATIONS BY AGENCY AND TYPE

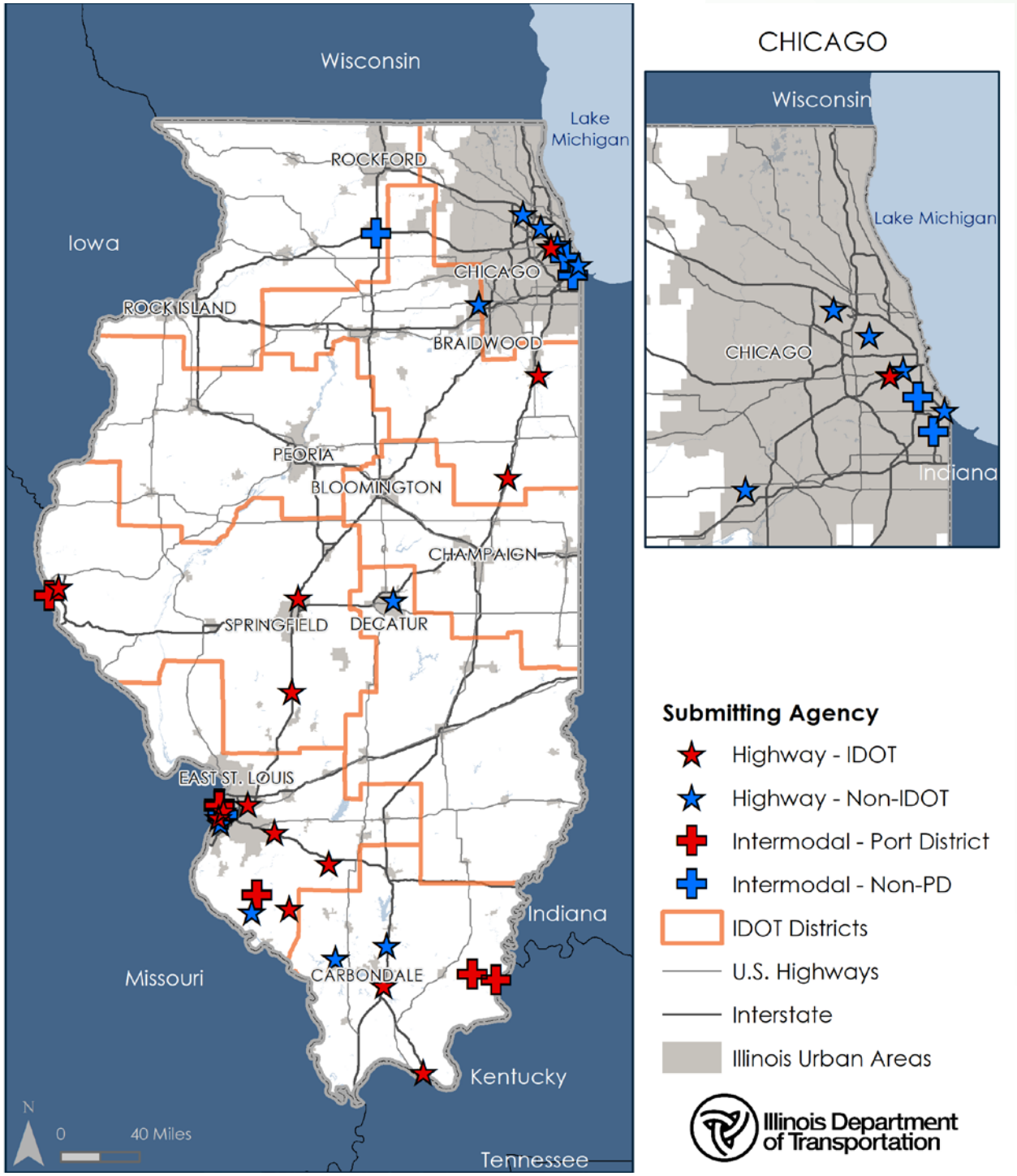


FIGURE 9.3 2023 ILLINOIS COMPETITIVE FREIGHT PROGRAM APPLICATIONS BY PROJECT TYPE

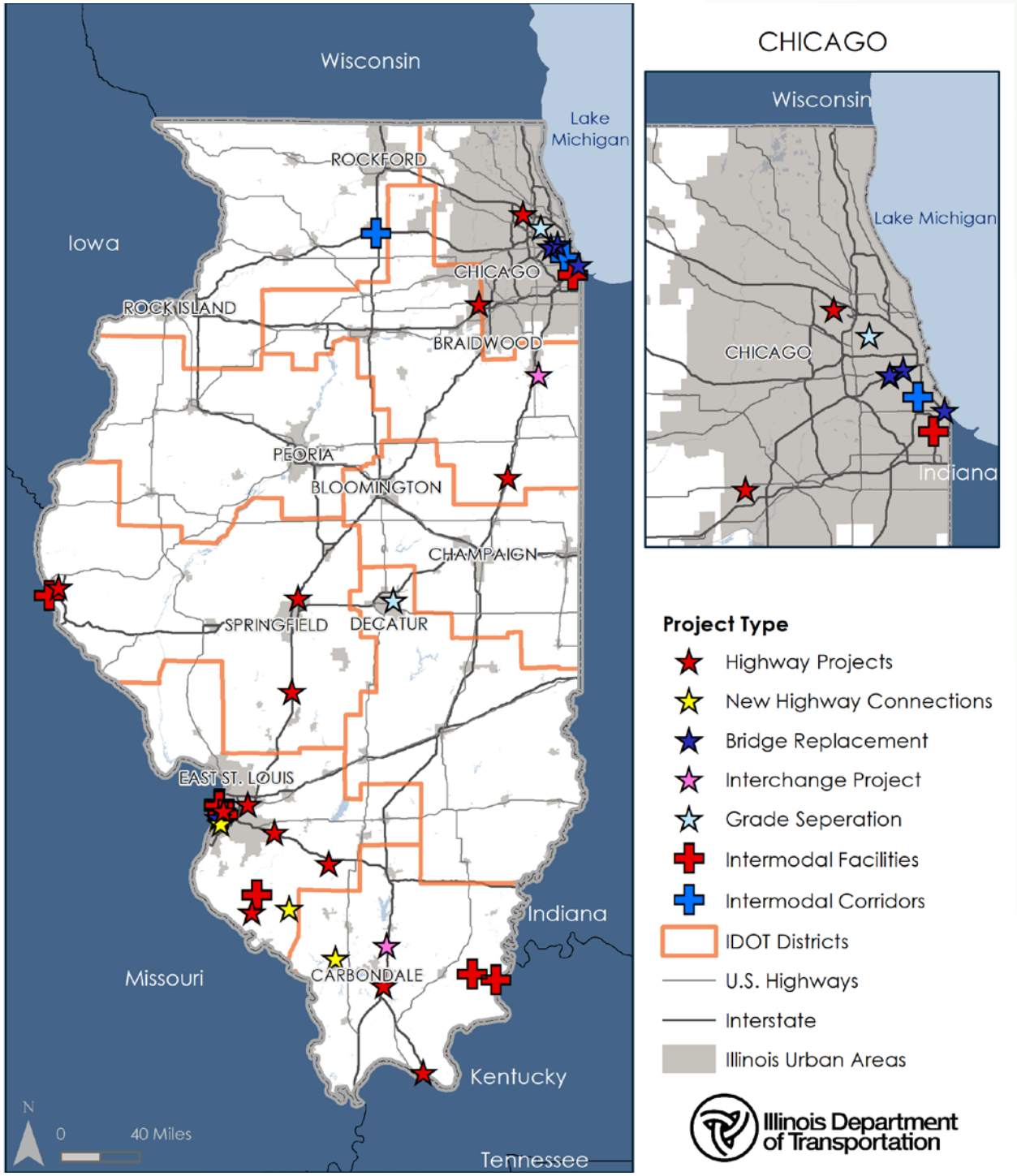
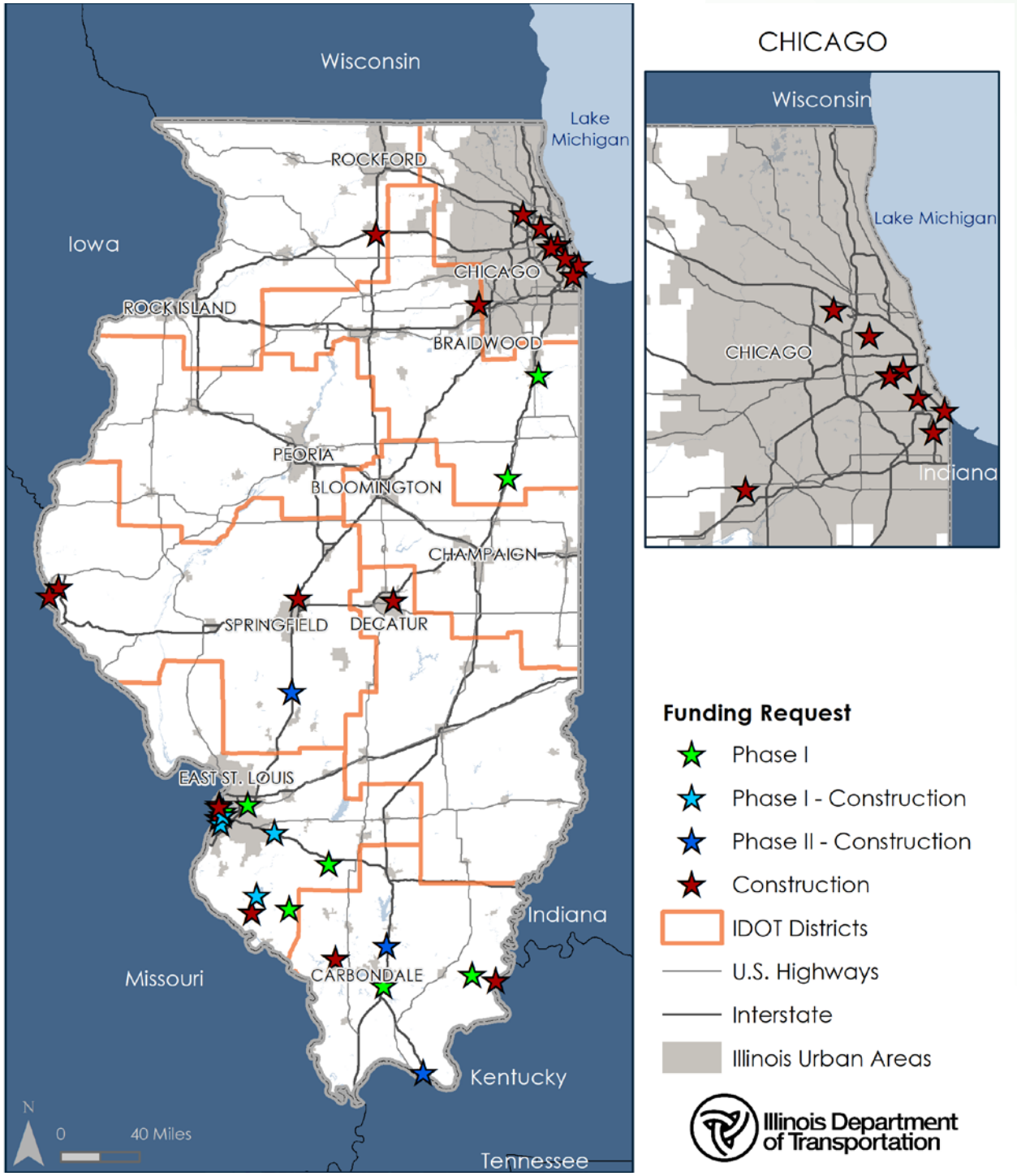


FIGURE 9.4 2023 ILLINOIS COMPETITIVE FREIGHT PROGRAM APPLICATIONS BY TYPE OF FUNDING REQUESTED



Of the applications received, the vast majority scored well in at least one of the five highway, three intermodal, and one cross-cutting scored goal categories. Most applications scored in multiple categories. For highway projects, the goal areas with the most well-scoring applications were reliability (84 percent of applications), safety (72 percent), and operational needs (52 percent). For intermodal projects, over 90 percent of applications scored in each of the three categories, with all projects scoring in the modal connectivity category. Over 80 percent of all projects also received points in the equity and environmental justice crosscutting measure. Table 9.7 presents a summary of the applications scoring within each goal area.

TABLE 9.7 2023 ILLINOIS COMPETITIVE FREIGHT PROGRAM APPLICATIONS SCORING WITHIN EACH GOAL AREA

Project Type	Percent of Applications
Highway	
Safety	72%
Reliability	84%
System Enhancements	36%
Operational Needs	52%
Truck Parking	32%
Intermodal	
Safety	90%
Modal Connectivity	100%
Mode Shift	90%
Cross-cutting	
Equity and EJ	84% (highway) 90% (intermodal)

2023 Illinois Competitive Freight Program Project Selection

A project ranking and selection committee consisting of Illinois Department of Transportation Planning, Programming, Local Roads and/or District staff reviewed all applications and the individual scores in each goal area, as well as the total scores. The Illinois State Freight Advisory Council (ISFAC) was engaged to provide feedback on project scoring and provide input into project selection.

In addition to the scoring criteria, the evaluation committee used a wide range of considerations, including full use of annual apportionment of available freight formula funds, geographic distribution, leverage of funds and addressing all goal areas of the program, to select projects for inclusion in the FIP.

9.2 Fiscally Constrained Investment Program

The 2023 Illinois Competitive Freight Program project ranking will be the basis for development of a fiscally constrained five-year program. These funds will be programmed based on state fiscal year. Freight formula funding amounts will be set based on IIJA funding levels of approximately $50 million per year for FY23–FY26. FY22 funding has been previously programmed for projects described below.

Table 9.8 presents the Illinois FY23-26 Freight Investment Plan. Highway projects are shown first, followed by intermodal projects. There are 13 highway projects totaling $147,697,960 in federal funding, and 9 intermodal projects totaling $49,830,676 in federal funding.

TABLE 9.8 FY 23-26 FREIGHT INVESTMENT PLAN

Sponsor Name	Project Name	Project Type	Phase(s)	Federal NHFP Amount	Federal Other Amount	Match Amount	Matching and Other Funds	Total Project Cost	Status (or Start Date)
Highway Projects									
Chicago	Cicero over Sanitary and Ship Canal	Bridge	Construction	$18,800,000	$0	$14,860,000	Local/State	$33,660,000	2023 Construction
Decatur	Brush College Road/Faries Parkway	Grade Separation	Construction	$10,000,000	$27,800,000	$24,000,000	State/CFP 2018/FRA/NS/ Local/ICC	$61,100,000	2023 Construction (Total cost provided by grantee)
IDOT	IL Rt. 127 Reconstruction*	Highway	Phase I	$4,000,000	$0	$1,000,000	State	$5,000,000	2023 Phase I
IDOT	IL Rt. 203 Profile Raise*	Highway	Phase I	$1,600,000	$0	$400,000	State	$2,000,000	2023 Phase I
IDOT	I-57 Safety Improvements	Highway	Construction	$30,000,000	$0	$18,000,000	State	$48,000,000	2024 Construction
IDOT	Railsplitter Rest Area	Truck Parking	Construction	$2,200,000	$0	$17,950,000	State	$20,150,000	2024 Construction
IDOT	Fort Massac Rest Area	Truck Parking	Construction	$2,000,000	$0	$9,679,234	State	$11,679,234	2025 Construction
IDOT	Coalfield Rest Area	Truck Parking	Construction	$3,000,000	$0	$15,500,000	State	$18,500,000	2025 Construction
IDOT	I-55/I-70	Highway	Phase I	$10,000,000	$0	$2,500,000	State	$20,000,000	2025 Phase I (Total cost is estimate for full Phase I effort)
IDOT	IL Rt. 50 (Cicero Ave) @ I-55	Interchange	Construction	$7,000,000	$0	$1,750,000	Local	$8,750,000	2025 Construction
IDOT	I-57 and IL Rt. 17 interchange	Interchange	Construction	$40,000,000	$22,700,000	$10,000,000	NHPP/State	$95,000,000	2026 Construction (Total cost is engineer's estimate)
Sauget	IL Rt. 3 Diversion	Grade Separation	Phase I	$771,960	$1,103,040	$525,000	Local/ CFP 2018	$2,400,000	2023 Grade Separation
West Frankfort	I-57 and IL Rt. 149 Interchange*	Interchange	Phase II, Land Aq., Utility, Construction	$18,326,000	$0	$6,409,000	Local/State FFM	$24,735,000	2023 Phase II 2023 Land Aq. 2025 Utility 2025 Construction
HIGHWAY TOTALS				**$147,697,960**		**$122,573,234**		**$350,974,234**	

Sponsor Name	Project Name	Project Type	Phase(s)	Federal NHFP Amount	Federal Other Amount	Match Amount	Matching and Other Funds	Total Project Cost	Status (or Start Date)
Intermodal Projects									
America's Central Port	Road Improvement Phase III	Port	Construction	$2,100,000	$0	$525,000	ACPD	$2,625,000	2025 Construction
America's Central Port	Dock Phase II	Port	Construction	$3,636,000	$0	$909,000	ACPD	$4,545,000	2025 Construction
Bi-State Dev.	TRRA 3rd Main	Rail	Phase I Wetlands, Construction	$15,197,719	$0	$13,493,281	TRRA	$25,730,000	2025 Wetland Mitigation 2026 Construction (Total Cost Includes construction plus locally funded all Phases))
Cook County	75th Street CIP	Grade Separation	Land. Aq.	$14,000,000	$0	$5,938,801	Local/Railroad/ TBD	$19,938,801	2023 Land Aq.
Cook County	Butler Drive	Port	Construction	$4,822,147	$10,937,853	$4,740,000	Local/EDP/2018 NHFP Award $10.937,853	$24,440,000	2025 Construction (Total cost is full cost for construction including local and previous NHFP award)
KRPD	Congestion Reduction & Safety	Port	Phase I, II, Construction	$4,323,800	$0	$1,080,950	State	$5,404,750	2023 Phase I 2024 Phase II 2025 Construction
Mid-America Port District	Intermodal Project	Port	Phase I	$145,440	$0	$36,360	MAIAPD, BJRY	$181,800	2023 Phase I
Rochelle	NE IL Transload Intermodal Expansion	Rail	Construction	$5,205,570	$0	$1,644,424	Local/BJRY	$6,849,994	2024 Construction
Shawnee-town	New Port Access Road	Port	Phase I	$400,000	$0	$100,000	Local	$500,000	2023 Port
INTERMODAL TOTALS				**$49,830,676**		**$28,467,816**		**$90,215,345**	
GRAND TOTAL				**$197,528,636**		**$151,041,050**		**$441,189,579**	

Total project cost may differ than a summed federal and match amount due to overmatch.

Rounding may affect federal and match amount sums.

**Indicates project is located on a segment that will be designated by IDOT as part of the NHFN. All other highway projects are currently located on the NHFN.*

Table 9.9 presents the Freight Investment Plan projects from FY18-22 that are still underway.

TABLE 9.9 FY 18-22 FIP PROJECTS STILL UNDERWAY

Sponsor Name	Project Name	Project Type	Phase(s)	Federal NHFP Amount	Federal Other Amount	Match Amount	Matching and Other Funds	Total Project Cost	Status (or Start Date)
Chicago DOT	Columbus Avenue & Belt Railway Company of Chicago (BRC) Grade Separation (a.k.a. GS-11)	IA	Phase II, ROW Aq., Utility Relocation, Construction	$49,000,000	$600,000	$13,500,000	State Funds, STP Urban (STU Phase I)	$63,480,000	2022 06-17-20 (Phase II). 09-16-21 (Land Aq.) (AC)
City of Peru, IL	Peru Intermodal, Safety, Congestion, and Energy Security Project (PISCES)	IA	Phase II, ROW Aq., Utility Relocation, Construction	$2,644,063		$1,762,709	City of Peru, Private Funds	$4,406,772	Roadway Construction underway. 08-15-19 (Phase II, Utility Relocation, Construction)
City of Decatur	Brush College Road/Faries Parkway Grade Separation Project	IA	Phase II, ROW Aq., Utility Relocation, Construction	$34,000,000		$3,600,000	City of Decatur, ICC Funds, Private	$39,900,000	2023 03-05-19 (Phase II). 09-19-19 (ROW Aq., Utility Relocation). 12-06-21 (Construction) (AC)
Cook County (formerly Village of Justice)	88th/Cork Avenue at I-294 Interchange	BR	Construction	$13,443,680		$2,234,972	Village of Justice General Funds, ISTHA Interchange Matching	$29,552,703	2023 (Construction)
IDOT	IL Rt. 3 Diversion Loop & Grade Separation	BR	Phase I	$1,103,040		$1,654,560	ICC Funds, State Funds	$2,757,600	Phase I in procurement. 12-02-21 (Phase I)
Cook County on behalf of the Illinois International Port District	Butler Drive/Stony Island Avenue Reconstruction Project	IA	Phase II, Construction	$10,937,853		$2,734,463	State Economic Development Program (EDP) Funds, City of Chicago, Cook County	$13,672,316	2023 (Phase II); 2025 (Construction)
Village of Franklin Park	Franklin Avenue Reconstruction	BR	Phase II, ROW Aq., Utility Relocation, Construction	$26,318,000	$784,000 (CMAQ - construction), $2,040,000 (STU for Ph I and II)	$9,538,208	Cook County, Franklin Park, State Economic Development Program (EDP), STP Urban, CMAQ	$35,856,208	Phase II/ROW Underway. 2022 02-01-22 (AC)

Sponsor Name	Project Name	Project Type	Phase(s)	Federal NHFP Amount	Federal Other Amount	Match Amount	Matching and Other Funds	Total Project Cost	Status (or Start Date)
IDOT	I-270 at IL Rt. 111 Interchange Reconstruction	BR	Construction	$18,000,000		$4,500,000	State Funds	$19,000,000	2023 (Construction)
Village of Plainfield	IL Rt. 126 Re-route - 143rd Street Extension	BR	Phase II, Construction	$20,328,000	$ 27,116,385	$8,582,000	Village of Plainfield, STP (Urban), INFRA	$43,880,175	2022 Amounts adjusted by CMAP eTIP. 09-20-21 (Construction) (AC)

Total project cost may differ than a summed federal and match amount due to overmatch.

Rounding may affect federal and match amount sums.

9.3 Illinois Critical Urban and Rural Freight Corridors

The CUFCs and CRFCs were originally developed under the guidance of the FAST Act during development of the 2017 Illinois State Freight Plan. IDOT will update the CUFCs and CRFCs to meet the guidelines specified under IIJA, including ensuring that the highway segments containing projects in the FIP that are not currently part of the NHFN will be designated as a CUFC or CRFC to comply with FHWA requirements.

10.0 Freight Strategies and Actions

Illinois freight stakeholders, the Illinois State Freight Advisory Council (ISFAC), and IDOT staff were engaged in discussion throughout the development of the Plan to identify needs, issues and opportunities on the freight system. In consultation with these stakeholders, a set of strategies, and actions were identified to guide IDOT and its partners in addressing the needs of and supporting opportunities for freight within Illinois. The remainder of this chapter discusses the development of the strategies and actions identified for this Freight Plan.

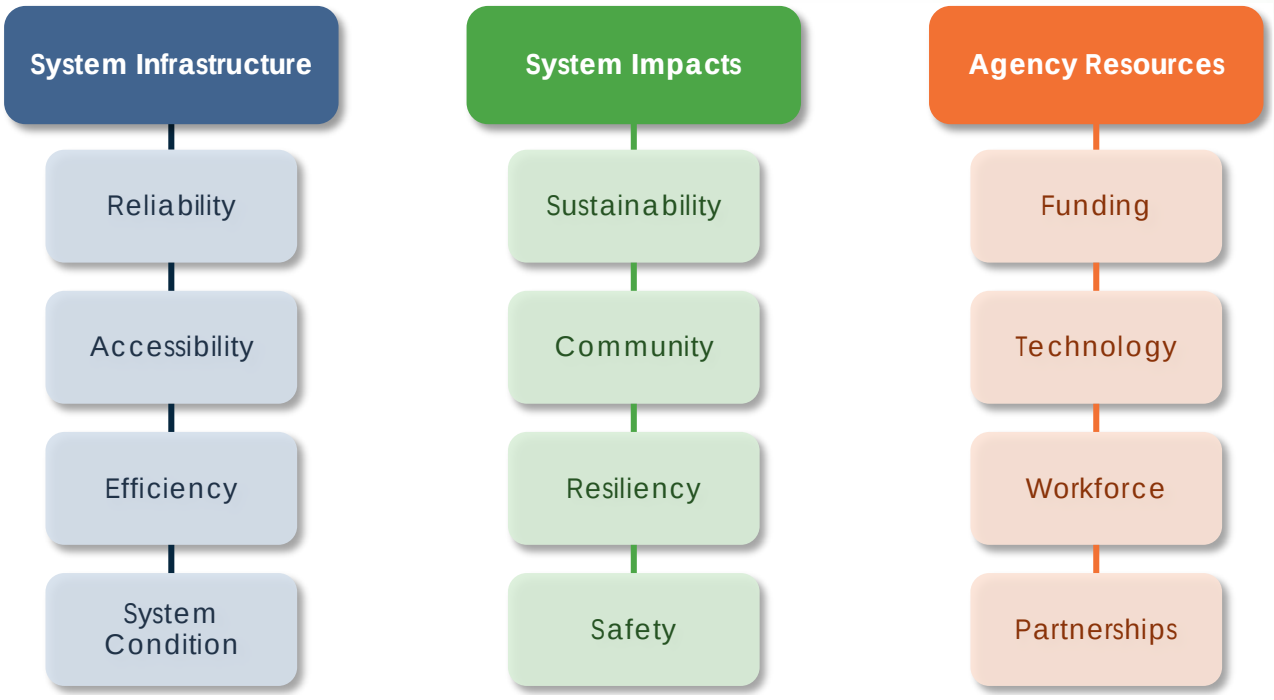
Input from stakeholders noted above was combined with technical findings to form a comprehensive list of potential strategies and actions. These were then organized within a framework of three organizing principles, which are shown in Figure 10.1 and described below:

1. System Infrastructure, which includes objectives, strategies and actions to improve freight system physical resources, such as physical condition or reliability;

2. System Impacts, which includes objectives, strategies and actions designed to address the *outcomes* of the system, such as safety and sustainability; and

3. Agency Resources, which includes objectives, strategies and actions to improve the ability of IDOT and other agencies within the state to accomplish their missions and achieve the objectives of this Freight Plan.

FIGURE 10.1 ORGANIZING PRINCIPLES FOR THE FREIGHT STRATEGIES AND ACTIONS



Stakeholders and IDOT staff then vetted this list to drill down to the items that were most critical for this Freight Plan. Finally, these strategies, and actions were organized into objectives, then screened and categorized according to the 2023 Illinois Freight Plan goals, which are listed below:

1. Prioritize the development of plans, policies and deployment of innovative technologies that help achieve the vision of the State Freight Plan.

2. Drive collaboration and foster partnerships with public agencies and private sector freight stakeholders throughout Illinois.

3. Make investments and implement policies that improve the safety, resiliency, and reliability of access to the multi-modal freight system.

4. Implement a data informed approach to freight asset management, preservation of the multi-modal freight system, and stewardship of public funds.

5. Consider socioeconomic and environmental impacts in freight related decision making.

The final list of strategies, and actions developed for the 2023 Illinois State Freight Plan represent a combination of infrastructure, impact, and resource-focused recommendations across all modes of the freight transportation system. These are aligned closely with the goals of the freight plan, and ultimately are designed to guide and serve as a resource for IDOT during implementation of this plan.

Each objective and its corresponding strategies and actions are listed in the tables below. Whenever possible, each strategy has a recommended set of actions designed to be implementable by IDOT and its partners. A lead agency and a potential timeframe is also identified as part of each action. Some actions IDOT can undertake by itself, while others will require close partnerships from other agencies or the private sector. In some cases, IDOT has an opportunity to build upon the momentum of this freight plan and its partnerships to convene, educate, or support other agencies at the state and local level in taking action to achieve the goals of this plan.

While some of the objectives identified in the following tables are longstanding, such as preserving system infrastructure, others are closely aligned with recent trends or newly identified needs, such as addressing the increasing need for system resiliency in light of climate change and increasing severe weather across the nation. In either case, each action has a recommended timeframe:

- *Ongoing* refers to actions that are already begun or underway;
- *Short* refers to actions that have few barriers to implementation and can be undertaken quickly, within the next 1-3 years;

- *Medium* refers to actions that require some advance work or a higher level of coordination or resources, and are more closely aligned with the 3-5 year timeframe; and

- *Long* refers to actions that will need significant amounts of work or coordination to get underway, and are opportunities beyond 5 years.

The following three tables contain the list of objectives, strategies and actions developed as part of this plan, as well as suggestions for lead and/or supporting agencies and timeframes. Specifically, Table 10.1 describes the objectives, strategies, and actions related to system infrastructure. Table 10.2 does the same for system impacts, while Table 10.3 does the same for agency resources. IDOT may choose to do additional screening or prioritizing of these recommended objectives, strategies and actions in order to create a short list of items to move forward for implementation.

TABLE 10.1 STRATEGIES AND ACTIONS: FREIGHT SYSTEM INFRASTRUCTURE

Objective	Strategy	Action	IDOT/Agency Role *(Lead Agency in Bold)*	Timeframe
Reliability				
Track, plan and build infrastructure for growing freight volumes and vehicle size	Prioritize addressing freight infrastructure needs, such as vertical and horizontal clearances, bridge weight restrictions, lane/shoulder width, rail and marine infrastructure	» Implement a competitive, data driven competitive funding program that addresses identifies freight infrastructure needs as goal areas	**IDOT**	Ongoing
	Identify freight-friendly design policies, encourage innovation and flexibility to incorporate needed freight elements	» Survey ISFAC and industry for concerns regarding freight related roadway design elements and provide feedback to IDOT Bureaus	**IDOT** (Bureau of Design and Environment - BDE, Office of Planning and Programming - OPP)	Medium
	Design, build and operate infrastructure to safely accommodate emerging technologies	» Study opportunities for implementing EV charging for heavy vehicles and identify Illinois-specific opportunities and the role of IDOT	**IDOT** Illinois Environnemental Protection Agency (IEPA)	Medium
		» Identify and implement Unmanned Aerial Systems (UAS) infrastructure needs; ensure regulations and policies align with current and future UAS use	**IDOT** (Aviation)	Medium
		» Work with research institutions and the private sector to advance IDOT awareness and role in connected and autonomous vehicle testing and deployment	**IDOT** ICT Private Sector	Ongoing
Mitigate freight bottlenecks and non-recurring congestion	Address bottlenecks across the modes and at freight nodes	» Implement a competitive, data driven competitive funding program that identifies freight bottlenecks and congestion needs as goal areas	**IDOT** MPOs, Railroads, Port Authorities	Ongoing
		» Implement the strategies of the Transportation System Management and Operations Plan	**IDOT**	Ongoing
		» Develop a statewide Resilience Improvement Plan to focus investments of PROTECT funds	**IDOT**	Short

Objective	Strategy	Action	IDOT/Agency Role *(Lead Agency in Bold)*	Timeframe
	Expand regulation harmonization and streamlining to facilitate reliable and efficient freight movements throughout Illinois	» Review regulations policies, and waivers issued by neighboring states to reduce conflicts that negatively impact shippers	**IDOT**	Short
		» Leverage Multistate organizations, e.g., the American Association of State Highway and Transportation Officials (AASHTO) and the Mid-America Association of State Transportation Officials (MAASTO) to harmonize regional freight-related regulations	**IDOT** MAASTO/AASHTO	Ongoing
Accessibility				
Improve access to the multimodal facilities on the freight system	Prioritize strategies and investments to improve access to port and airport freight facilities and pipeline terminals	» Implement priority actions and investments identified in the Marine and Aviation System Plans	**IDOT** Illinois Department of Commerce and Economic Opportunity (DCEO)	Short
Efficiency				
Ensure capacity of the multimodal freight system to handle current and future freight demand	Address issues related to multimodal nodes capacity, including air cargo and marine landside facilities, rail and drayage equipment (chassis, containers and power units) availability, and workforce availability	» Continue to support completion of the Chicago Region Environmental and Transportation Efficiency (CREATE) Program	**CREATE Partnership**	Ongoing
		» Address air cargo needs identified as part of the Illinois Aviation System Plan	**IDOT** (Aviation)	Ongoing
		» Address marine freight needs identified as part of the Illinois Marine Transportation System Plan	**IDOT** (Marine)	Ongoing
		» Work with ISFAC and Illinois shippers to identify barriers to multimodal shipping options to relieve congestion and address bottlenecks in the system	**IDOT, ISFAC** Private Sector, Local Agencies	Medium
	Cultivate P3s to expand infrastructure capacity and efficiency projects (e.g., CREATE, Merchants Bridge, lock expansion projects, truck parking expansion)	» Study freight issues for potential P3 opportunities, develop strategic plan for implementing that includes incentives, favorable policies and strategic investments	**IDOT** Private Sector, Local Agencies	Medium

Objective	Strategy	Action	IDOT/Agency Role *(Lead Agency in Bold)*	Timeframe
	Mitigate conflicting demands on the shared system	» Prioritize highway-rail grade separation projects	**IDOT** Illinois Commerce Commission (ICC), Local Agencies, Railroads	Ongoing
System Condition				
Preserve the freight system infrastructure	Ensure marine system availability for Illinois shippers and customers	» Support investments on the inland waterway system (e.g., lock and dams, channel maintenance) and facilitate communication between USACE, the ISFAC, and other freight stakeholders	**United States Army Corps of Engineers (USACE)** IDOT, Port Authorities	Ongoing
	Ensure road and bridge adequacy for freight	» Incorporate freight related criteria into Transportation Asset Management planning	**IDOT** (Programming)	Short

TABLE 10.2 STRATEGIES AND ACTIONS: FREIGHT SYSTEM IMPACTS

Objective	Strategy	Action	IDOT/Agency Role *(Lead Agency in Bold)*	Timeframe
Sustainability				
Reduce the environmental impacts of freight transportation within Illinois	Actively support deployment of zero or near-zero emission vehicles/equipment and expanded use of renewable energy at terminals and parking facilities	» Support local agency and industry development and implementation of heavy vehicle EV capabilities	**IDOT** ICC	Medium
		» Implement Executive Order 2021-08 and create a program to procure zero or near-zero emission vehicles for state purposes	**CMS**	Short
		» Support development of an Illinois heavy duty truck electric vehicle voucher program	**IEPA** IDOT	Ongoing
	Develop strategies to consider and decrease environmental impacts of freight (e.g., local air pollution, impacts to wildlife habitat loss, impacts of flooding and stormwater runoff)	» Develop policies and processes to incorporate environmental considerations (e.g., local air pollution, impacts to wildlife habitat loss, impacts of flooding and stormwater runoff) into alternatives analysis and operations/maintenance	**IDOT** IEPA	Medium
		» Expand Data Driven Decisions (DDD) tool to include air quality metrics	**IDOT** IEPA	Short
	Encourage mode shift for applicable cargoes	» Implement a competitive, data driven funding program that identifies mode shift as a goal area for intermodal projects	**IDOT** (Planning)	Medium
Community				
Ensure equitable development of the multimodal-freight system	Consider the distribution of benefits and burdens on communities when making freight investments	» Incorporate socioeconomic factors into scoring for competitive investment programs	**IDOT**	Long
	Improve communications between freight stakeholders and community representatives	» Develop a comprehensive "Freight Moves Illinois" public awareness campaign that addresses the role of freight and how to better facilitate safe and efficient freight transportation and mitigate the potential negative impacts of freight on communities and the environment	**IDOT** (Communications, OPP)	Short

Objective	Strategy	Action	IDOT/Agency Role *(Lead Agency in Bold)*	Timeframe
Resiliency				
Reduce impacts of natural, manmade, and technology disasters/disruption on freight infrastructure	Understand the severity of impacts of extreme weather and natural disasters on freight mobility and needs in the state and take action to avoid, minimize, or mitigate these impacts	» Develop and implement a Resilience Improvement Plan to focus investment of PROTECT funds	**IDOT**	Ongoing
		» Identify and implement strategies for improving freight resiliency (e.g., identifying alternate route/modes, notification systems, cameras or flood sensors) and enhancing of infrastructure (e.g. pervious pavement, landscaping, tree canopy, riprap) on key corridors and at key facilities	**IDOT**	Medium
		» Consider increased flexibility in OSOW operations and permitting during times of disruption	**IDOT**	Ongoing
Safety				
Enhance safety of freight operations within Illinois	Prioritize safety investments on areas of the PFN which have high levels of truck-related fatalities, injuries, and crashes	» Incorporate safety criteria into scoring for competitive investment programs	**IDOT**	Short
		» Update and maximize ITS to mitigate safety issues related to construction, incident management, disrupting events/natural disasters	**IDOT**	Medium
Minimize risks to users of the shared system	Increase public awareness and institute best practices for operating on corridors shared with trucks and other heavy vehicles	» Expand education efforts focused on safety concerns (e.g., Operation Lifesaver, trespassing at and around freight facilities, sharing system with heavy vehicles, etc.)	**IDOT** (Safety and Communications) ICC	Medium
		» Enhance public awareness program on "Sharing the Road" with trucks	**IDOT** (Safety and Communications)	Long
		» Add safety signage on Illinois' PFN about safe traveling distances and passing guidelines related to truck large trucks	**IDOT** (Safety and Operations)	Medium

Objective	Strategy	Action	IDOT/Agency Role *(Lead Agency in Bold)*	Timeframe
	Eliminate or upgrade at-grade highway-railroad crossings and address safety issues created by blocked crossings. Plan and develop mitigating measures to address trespassing on RR ROW	» Continue to maintain and implement the priorities identified in the Illinois Highway-Rail Grade Crossing Action Plan	**IDOT** ICC, FRA	Ongoing
		» Coordinate with ICC to identify and prioritize top riskiest grade crossings statewide, develop mitigating strategies and track progress	**IDOT** ICC, Local Agencies	Ongoing
Expand truck parking infrastructure	Continue to identify and address truck parking needs	» Invest in truck parking facility construction or enhancement of existing facilities in areas of need.	**IDOT**	Ongoing
		» Research P3 truck parking models and develop implementation strategy	**IDOT** Private sector	Long

TABLE 10.3 STRATEGIES AND ACTIONS: FREIGHT AGENCY RESOURCES

Objective	Strategy	Action	IDOT/Agency Role *(Lead Agency in Bold)*	Timeframe
Funding				
Develop stable, dedicated, predictable and meaningful approach to funding to support freight transportation infrastructure	Continue to provide state and local investment in freight programs	» Continue to fund multimodal freight projects through the Competitive Freight Program and other state initiatives	**IDOT**	Ongoing
		» Study partnership models for commercial navigation maintenance with action plan recommendations for IDOT and stakeholders to participate in addressing issues on the inland waterway	**IDOT** USACE, MAATO/AASHTO	Long
	Continue to promote the Illinois Competitive Freight Program for future freight projects	» Continue outreach strategy to increase publicity and transparency of the program and provide pro-active technical support to less sophisticated project sponsors	**IDOT**	Ongoing
Maximize and leverage Federal and private investment	Develop strategies to maximize and leverage Federal and private investment with State freight funding and policies	» Develop investment strategy for prioritized freight infrastructure projects that aligns needs with competitive grant opportunities, Federal loan programs and private investments	**IDOT** (OPP)	Short
Workforce				
Identify workforce challenges in the freight transportation sector and related industries	Engage with partner state agencies to understand and address workforce needs related to freight	» Participate in potential multi-agency working group to study freight workforce needs and develop sector-specific, implementable action items to mitigate issues and create workforce mobility, training, education opportunities	**IDOT, DCEO, Illinois Department of Employment Security (IDES), Illinois State Board of Education (ISBE), Illinois Board of Higher Education (IBHE), Illinois Community College Board (ICCB)**	Medium

Objective	Strategy	Action	IDOT/Agency Role *(Lead Agency in Bold)*	Timeframe
	Reduce barriers to entry and sustainability of the workforce in freight-adjacent industries, such as warehouses and manufacturing	» Study scholarship programs in targeted skills to incentivize public service upon graduation	**IDOT, Illinois Central Management Services (CMS)**	Medium
Partnerships				
Increase transparency and communication statewide around freight issues and opportunities	Understand and communicate the importance and impacts of the freight system	» Create public outreach strategies such as a public facing dashboard to highlight and maximize the State's freight assets	**IDOT**	Short
	Continue engaging with the ISFAC	» Using Freight Plan recommendations and actions as a foundational plan for ISFAC	**IDOT** ISFAC	Medium
Technology				
Enhance available data and data standards	Monitor emerging technologies for impacts to the freight system for safety, efficiency, system condition/needs (AV, UA, EV, terminal automation, first mile/last mile, data use/management, 3D printing, RR Information and location system modernization, train control systems, Advanced Air Mobility Integration, etc.)	» Continue to work with the Illinois Center of Transportation and other research institutions to identify transportation innovation and emerging technologies, methods and materials	**IDOT** ICT	Ongoing
	Address data availability and standards to measure, manage and plan performance of the freight system, including proprietary data for pipeline commodities, data integrity and reliability, hourly truck volumes, data regarding non-recurring congestion, supply chain implications, parking availability, traffic management)	» Maintain and enhance IDOT's technical capabilities in freight planning, forecasting, modeling, and data	**IDOT** (OPP)	Ongoing
		» Maintain and expand IDOT's data repository for Illinois' freight transportation system	**IDOT** (OPP)	Ongoing

Appendix A. IIJA Requirements Reference Table

Table A.1 provides a guide to the location of IIJA requirements within the 2023 Illinois State Freight Plan.

TABLE A.1 2023 ILLINOIS STATE FREIGHT PLAN IIJA COMPLIANCE MATRIX

Item	IIJA Requirement	State Freight Plan Reference(s)
A	Identification of significant statewide freight trends, needs and issues	***Chapters 4.0, 5.0, 6.0, 7.0 and 8.0***
B	Description of freight policies, strategies and performance measures that will guide freight-related transportation investment decisions	***Chapters 8.0 and 10.0***
C	Critical multimodal rural freight facilities and rural and urban freight corridors	***Chapter 5.0***
D	Link to national multimodal freight policy and highway freight program goals	***Chapter 2.0***
E	Description of how innovative technologies and operational strategies (including intelligent transportation systems [ITS]) that improve the safety and efficiency of freight movements were considered	***Chapters 5.0, 8.0, 9.0, and 10.0***
F	Description of improvements to reduce roadway deterioration by heavy vehicles (including mining, agricultural, energy cargo or equipment and timber vehicles)	***Chapters 5.0, 8.0, 9.0, and 10.0***
G	Inventory of facilities with freight mobility issues and a description of the strategies the State is employing to address the freight mobility issues	***Chapters 5.0, 8.0, 9.0, and 10.0***
H	Description of significant congestion or delay caused by freight movements and any mitigation strategies	***Chapters 5.0, 8.0, 9.0, and 10.0***
I	Freight investment plan that includes a list of priority projects and describes investment and matching funds	***Chapter 9.0***
J	Consultation with the State freight advisory committee	***Chapter 3.0***
K	Assessment of commercial motor vehicle parking facilities	***Chapters 5.0 and 8.0***
L	Description of supply chain cargo flows	***Chapters 4.0 and 7.0***
M	Inventory of commercial ports	***Chapter 5.0***
O	Discussion of the impacts of e-commerce on freight infrastructure	***Chapters 4.0 and 8.0***
P	Considerations of military freight	***Chapters 5.0 and 8.0***
Q	Strategies and goals to decrease a) the severity of impacts of extreme weather and natural disasters on freight mobility; b) the impacts of freight movement on local air pollution; c) the impacts of freight movement on flooding and stormwater runoff; and d) the impacts of freight movement on wildlife habitat loss	***Chapters 6.0, 8.0, and 10.0***