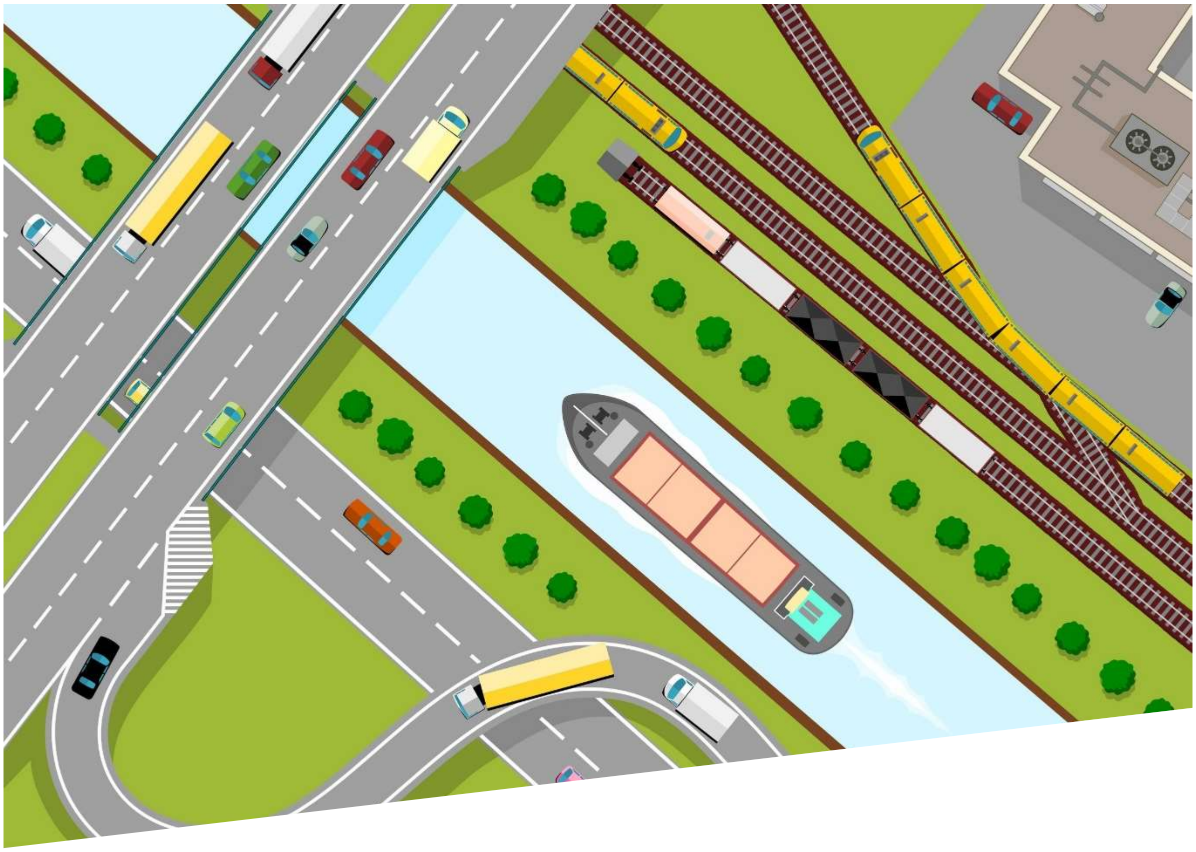

Joliet Regional Port District – Port District Master Plan

Final Report

October 2024 | Prepared by Quetica, LLC and its Partners

quèt•ica Consulting & Engineering · Primera · Stantec · Ann L. Schneider & Associates LLC

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Executive Summary

The Joliet Regional Port District (JRPD) was created by the Illinois General Assembly in 1957. JRPD is one of 19 public port districts in Illinois that were created to support economic development and job creation linked to use of the state's waterways. While there are over 30 river terminals located within JRPD boundaries, the district itself does not own any water port or terminal facilities. JRPD owns and operates Lewis University Airport; JRPD is one of three port districts in the state that own airport facilities.

A primary goal of the Joliet Regional Port District (JRPD) Master Plan is to identify and prioritize river related transportation projects that could support industrial economic development within the JRPD boundaries, primarily along the riverfront. This final report also makes policy and program recommendations to support river port related operational needs in the future. The approach taken to identifying potential market opportunities for new transportation relies on data and network optimization modeling. The approach for this study was conducted in three primary phases, as shown in the graphic of Exhibit ES-1, and described in more detail in the text below.

Exhibit ES-1: High-level Overview of the Joliet Regional Port Master Plan Process

1. Discovery: Initial months of the project included a review of twelve previous planning studies completed in the Region. Phase 1 also included substantial stakeholder outreach including nineteen business interviews, a regional business forum and a facilitated small group meeting with representatives from local governments. The stakeholder input gathered was used to assemble a Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis. Exhibit ES-2 shows a summary of key stakeholder input in the SWOT Format. Strengths included access to a broad array of freight services and multimodal infrastructure. The biggest weaknesses identified were traffic congestion and rail yard management. Opportunities included the new Houbolt Bridge and container on barge. Continued growth in the area's truck traffic was viewed as a threat, as was inland waterway invasive species.

Exhibit ES-2: Stakeholder SWOT Summary

S Strengths	W Weaknesses	O Opportunities	T Threats
• Multi-modal access & connectivity • Class 1 railroads access • Ample supply of local trucking firms • Direct access to major consumption, transport, and transshipment facilities • Proximity to renewable energy production hubs	• Truck traffic / congestion – growth in warehousing continues to increase traffic • Local rail switching is a big constraint. • Rail yard management favors unloading trains ASAP over yard fluidity. • Rail service – missed deliveries common	• New Houbolt Bridge should reduce congestion & trucks on commuter routes • Demand for renewable energy • Containerized agriculture exports • Container on barge • Rail to barge, barge to rail transload	• High & increasing volumes of truck traffic • Invasive species / Asian Carp • Specific Bottleneck - 127th and New Avenue - safety issues, needs a stop light.

To support the data analysis in the next phase of the project there was also a focus in Phase 1 on assembling three datasets used to populate the optimization model: 1) *Freight demand* derived from the 2019 Illinois Transearch database[1]; 2) *Multimodal freight network (supply)* taken from public GIS data sources and, 3) *Cost and equipment benchmarks* derived from private sector shipping records.

2. Design: After assembling the data modules necessary to support the model, algorithms and parameters were established and the baseline model was used to perform a greenfield analysis (GFA). A GFA is a common first step in optimization modeling to examine freight transportation demand, without constraints on the existing multimodal networks. It seeks to identify the locations where freight demand should be aggregated within the existing multimodal network as well as the types of modes and services that should be available. Based on the results of the greenfield analysis, four optimization scenarios were recommended for further analysis using the Joliet Regional Supply Chain Optimization Model (JRSCOM):

    - Truck to Barge Transload
    - Truck to Rail Carload Transload
    - Cross-dock /consolidation – partial truckload to full truckload
    - Cross-dock /consolidation – partial truckload and full container

    Using JRSCOM, each scenario examined the total cost shippers in the region pay for their existing modal services. In most scenarios the model seeks more cost-effective ways to move long distance truck freight by asking; "What if" new infrastructure nodes are introduced to the network? JRSCOM's machine learning algorithms examine all the ways existing freight demand can be satisfied using alternative modes, or alternative transportation services at a lower cost.

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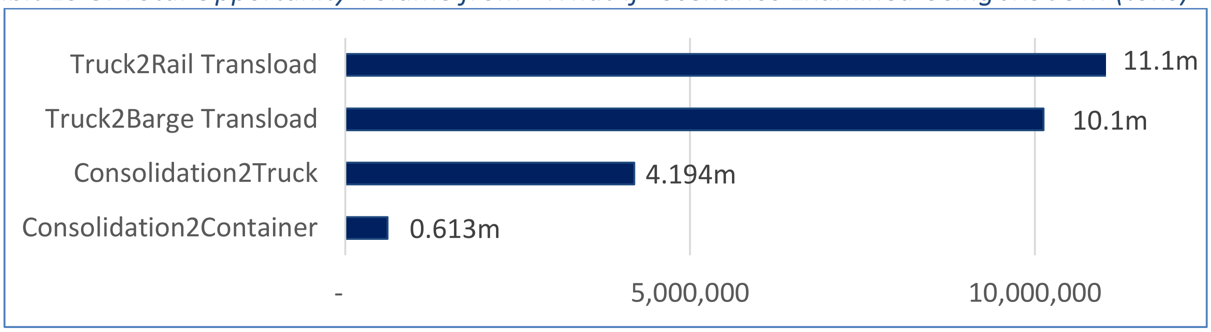
[1] S&P Global Transearch database obtained by Illinois Department of Transportation for the 2023 Illinois State Freight Plan

The bar chart in Exhibit ES-3 displays the high-level results from the four *what-if* scenarios run using JRSCOM. Overall, moving additional freight from truck to rail via transload operations comes out as the top volume opportunity, followed closely by truck to barge transload. The chart suggests that over 20 million tons of freight could transition to either rail or barge through additional transloading. An additional five million tons could potentially be transported more cost effectively through cross-dock consolidation.

The conversion of long-haul truckload freight to either rail or barge modes is dependent upon three primary factors: a) the nature of the commodity; 2) their price, and 3) the ability of the alternative mode to serve the origin/destination markets. For the Joliet region, rail exhibits greater transload opportunities than barges due to the broader network coverage and low rail rates. Rail rates for the Joliet Region are among the most competitive in the nation.

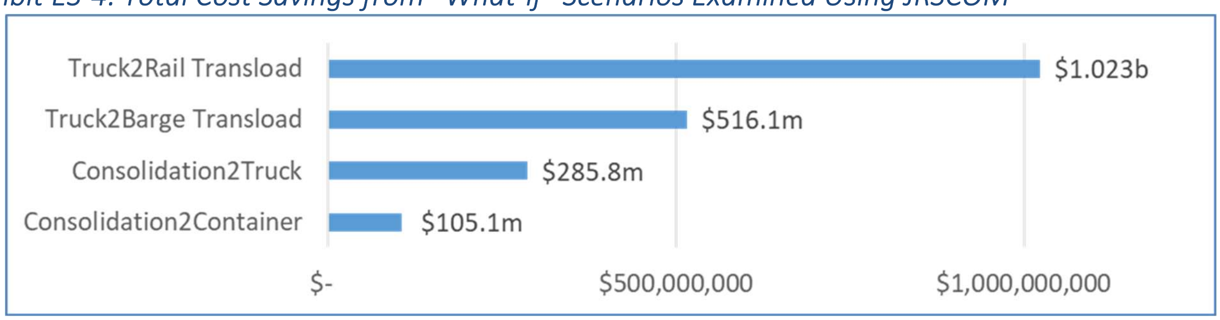
Exhibit ES-3: Total Opportunity Volume from "What-if" Scenarios Examined Using JRSCOM (tons)



Source: Quetica

Exhibit ES-4 displays the maximum cost saving opportunity associated with each of the four *what-if* scenarios. With Will County hosting the largest inland rail port complex in North America, the results favoring truck to rail transload are not surprising. The second largest opportunity to convert more long-haul truck freight to a less costly, more efficient mode results from truck to barge transload operations. The potential volumes and cost savings from truckload consolidation are less than transload opportunities, but still offer the potential for significant annual cost savings.

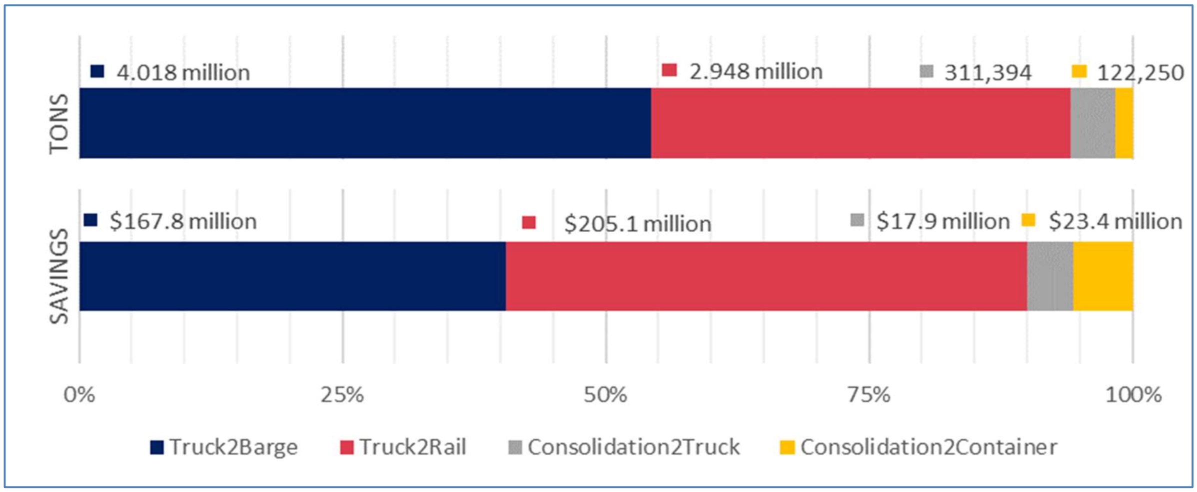
Exhibit ES-4: Total Cost Savings from "What-if" Scenarios Examined Using JRSCOM



Source: Quetica

When these four scenarios are examined by commodity, *Waste and Scrap* is the region's biggest opportunity for further reducing freight costs primarily through transloading, and it is also among the top opportunities for both consolidation scenarios (Exhibit ES-5).

Exhibit ES-5: Total Waste/Scrap Opportunities Across All Four Scenarios



Source: Quetica

In 2020, the City of Chicago alone generated over four million tons of municipal solid waste.[2] In 2022, the eight county Chicago Metropolitan Area[3] generated nearly 10 million cubic yards (cy) of waste.[4] Currently, only about 10 percent of Chicago's municipal solid waste gets recycled, with the remainder going to landfills. The *Illinois Landfill Disposal Capacity Report* indicates the total remaining capacity in the Chicago Region is just 18.6 million cy, far less than many other regions in the state. In total, the opportunity for transporting the region's *Waste and Scrap* products more efficiently represents freight volumes approaching eight million tons (7.7 million) or the equivalent of approximately 425,000 truckloads annually.

3. Development: Phase 3 of the study effort focused on resources and policies for supporting port operations in the district and capital projects to support waterway commerce.

   Designing and constructing port terminals are major investments as every site has its own challenges and barriers. Using the survey of local governments conducted earlier in the study, 15 high priority land parcels were initially identified as potential sites for future port/terminal and/or industrial development.[5] To assist the JRPD further evaluate, and rank river adjacent parcels based on their shovel-readiness, the study team conducted a sketch-level parcel evaluation using the following criteria:

   - Presence of existing structures
   - Area under the 100-year floodplain
   - Wetlands

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[2] Delta Institute. City of Chicago Waste Strategy, Existing Conditions: Waste in Chicago. July 2021. Pg. 9.

[3] Illinois EPA Region 2 is made up of McHenry, Lake, DuPage, Cook, Kane, Kendall, Grundy and Will Counties.

[4] Illinois Environmental Protection Agency, *Illinois Landfill Disposal Capacity Report. June 2023.*

[5] Prior to the analysis, individual, adjacent parcels belonging to the same owner were joined resulting in 17 parcels. After further analysis it was discovered that two parcels were duplicated during initial feedback, reducing the total parcel count to 15.

- Soil composition
- Land ownership
- Rail spur access
- Parks/Open space
- Presence of public utilities
- Other - existing and future land uses/developments, proximity to residential areas, presence of brownfield sites.

Applying the evaluation criteria to each parcel resulted in scores that ranged from 12 to 27. The 15 parcels were then tiered into three categories: Tier 1 – parcel scores between 24-30; Tier 2 - parcel scores between 21-23; and Tier 3 - parcel scores below 20. A total of five parcel groups were identified as Tier 1, five parcel groups identified as Tier 2, and five parcel groups identified as Tier 3. The five Tier 1 parcels are shown in the table of Exhibit ES-6.

Exhibit ES-6: Tier 1 River Adjacent Potential Land Development Parcels in the JRPD

Site Rank	Parcel Name / Owner	Parcel size in acres	Total Parcel Group Score
1	Walker Phoenix LP	10	27
2	Oil Tanking Joliet LLC	456	26
3	Alpont Realty	86	25
4	Chevron Environmental Inc	202	25
5	City of Lockport	238	24

Going forward, the parcel analysis should provide JRPD and its partner agencies with a concise starting point for future port development discussions. However, any future industrial or transportation development in the JRPD will need to be weighed against the principal concern voiced by local government representatives that any new river adjacent development should not generate significant volumes of new truck traffic in the region.

Key Study Findings

The JRPD Port Master Plan generated a substantial volume of economic and transportation data about the region. Stakeholder outreach and discussions with local public and private officials also generated a wealth of information regarding local government concerns, and views on future development in the region. Highlights from the data analysis and stakeholder outreach efforts included key findings that helped shape the projects and recommendations presented to the JRPD Board:

1. Mississippi River System (MRS) commercial navigation is facing difficult challenges.

   Discussions with stakeholders involved in commercial navigation on the Mississippi and Illinois River, as well as those charged with maintaining navigation on inland waterways, almost always raises the long-standing issue of inadequate investment in the nations aging lock and dam system. In 2021, the American Society of Civil Engineers gave U.S. inland waterway infrastructure a “D+” in its report card published every four years. The report notes that; *Locks constructed on the Upper Mississippi, Illinois, and Tennessee Rivers were built in the 1930s*…[6]

Several locks on the Illinois River have undergone extensive rehabilitation in recent years, and the Bi-partisan Infrastructure Law has directed significant investment in lock and dam infrastructure. Much of the investment is focused on rehabilitation and maintenance; however, funding has been provided by Congress to modernize lock and dam 25 on the Mississippi River and the LaGrange locks on the Illinois River downstate. Yet despite recent investments to modernize the inland waterway system, research conducted for the JRPD Port Master Plan identified additional challenges:

a. Climate impacts – In 2023, a study demonstrated that between 1963 and 2020 the Mississippi River System (MRS) showed: "a decreasing pattern in the number of days without any navigation operational restriction for the Illinois River and the Mississippi River between downstream Pool 10 [northern Iowa] and Memphis, TN. Overall, the researchers concluded the MRS had lost more than a month and half of free navigation days in some stretches of the river. The analysis showed the MRS continues to move the same volume of commerce as it has in the past, but with less consistency. While shippers are always seeking lower cost means of moving goods, reliability is also a significant factor in mode choice.

b. Volatile price swings – During interviews with barge operators and barge transportation users several referenced extremely high barge rates experienced over the past two fall harvest seasons. In October of 2022, the index price of grain shipping by barge soared to over 2,000 percent of tariff, or approximately $85 per ton, to ship from St. Louis to Memphis. During the past two years low water levels on the Mississippi River below St. Louis have coincided with peak harvest season resulting in severe price spikes as barge tows had to reduce loads to navigate the shallow river.

c. Changing markets – For most of the twentieth century, energy products including coal and petroleum were the top commodities moved by barge on inland waterways. Changes to state and federal environmental regulations for both clean air and clean water have resulted in the retirement of many coal-fired power plants. According to the National Resources Defense Council, Illinois closed 19 coal fired power plants between 2011 and 2021. Additionally, according to U.S. Energy Information Administration, coal's contribution to in-state generation declined significantly from 46 percent of electricity net generation in 2009 to 15 percent in 2023, as about 9,000 megawatts of coal-fired generating capacity shut down during that period in response to stricter emissions regulations and economic pressures. About 2,700 megawatts of coal-fired capacity shut down in 2022[7] .

d. Invasive species – Due to concerns over the potential for Invasive Carp migration into Lake Michigan and the other Great Lakes, Congress passed a law in 2007 (Public Law 110-114, Section 3061) calling on the U.S. Army Corp of Engineers (USACE) to create a barrier to prevent Invasive Carp from entering Lake Michigan. The Brandon Road Lock and Dam near Joliet was identified as a critical location where a layered system of technologies could be deployed to deter Invasive Carp. Pre-construction and engineering design was initiated in 2020. The project stalled for several years while the funding was debated, however during the summer of 2024 an agreement was reached to fund the $1.2 billion Brandon Road Interbasin Project.

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[6] America Society of Civil Engineers, 2021 Infrastructure Report Card, pg. 65

[7] U.S. Energy Information Administration - EIA - Independent Statistics and Analysis accessed 10/20/2024.

e. Major lock and dam rehabilitation and maintenance – The summer of 2023 marked the completion of a four-year, two-phase lock and dam maintenance project on the Illinois River. Maintenance to the LaGrange, Starved Rock, Marseilles, and Dresden Island locks resulted in months long closures of the Upper Illinois River to commercial navigation during 2020 and 2023. Less extended closures and restrictions were also experienced in 2019 to conduct prerequisite work prior to the major work performed in 2020. Less extensive closures are also anticipated in future years as maintenance will be conducted on Lockport and T.J. O'Brien lock and dams.

2. Barge operations on the Illinois River differ from operations on the Mississippi River.

   a. The MRS, including the Illinois River, is a vital conduit for the nation's grain exports – About 60 percent of all U.S. grain exports are barged down the Mississippi River to port facilities in the Gulf of Mexico. Corn and soybeans are the top commodities moving by barge at the confluence of the Illinois and Mississippi Rivers; however, at the Lockport lock and dam near Joliet, petroleum and aggregates are the top commodities. Stakeholders familiar with Illinois/Des Plaines River operations noted the considerable differences between Mississippi River tows and Illinois River tows. The Lower Mississippi tows (south of St. Louis) often consist of 35 to 40 barges. There are no locks and dams below St. Louis. Upper Mississippi tows are typically 15 barges. Upstream from the Brandon Road Lock and Dam on the Illinois/Des Plaines River tows are reduced to six barges, and between T.J. O'Brien Lock and Dam and Lake Michigan are frequently moved as singles or doubles due to the tighter confines of the river. Barge operations in the Joliet Region often serve as an intra-regional conduit for moving bulk commodities within the urban area of Chicago, reducing already high volumes of truck traffic.

   b. Trucks contributing to more congestion is a big concern among citizens in the Joliet Region – The CenterPoint Intermodal Center (CIC) in Joliet and Elwood is advertised as "North America's largest master-planned inland port." The 6,400-acre CIC campus moves over 20 million tons of intermodal cargoes by rail annually, with all that volume coming into or going out of the region by truck. Local government representatives repeatedly noted that citizens are increasingly concerned about future industrial development that would create more truck traffic on local and regional road networks.

3. As some traditional barge markets decline, new opportunities are emerging.

   a. Coal was once the top commodity on U.S. inland waterways – Several decades ago, coal made up about one-third of all commodity volumes on U.S. inland waterways. In 2021, Illinois lawmakers passed a clean energy bill that will ban most coal-fired power generation in the state by 2030[8]. In 2021, NRG Energy also announced it was closing two coal-fired power plants in Illinois, including the Will County Electric Generating Station on the I&M Canal in Romeoville. Since 2007, all or parts of 23 coal-fired power plants have been closed statewide. Coal, once a significant commodity movement on the Illinois River, has contracted significantly. As the state and national economies transition to low carbon energy sources, it is likely that petroleum transport volumes by barge will also decline.

   b. Waste disposal is a mounting issue for the Chicago Urban Area – Based on the analysis conducted for the JRPD using supply chain optimization modeling, *Waste and Scrap* presents an

[8] Climate and Equitable Jobs Act (illinois.gov)

immediate opportunity to convert bulk materials currently moving in the region by truck, to barge transport.

c. **The green economy may provide new opportunities for river transport of raw materials** – As the green economy expands, new markets for large volumes of raw materials such as copper, nickel, manganese, graphite, lithium, zinc, and silicon will be required for new technologies manufacturing. Wind farm components such as blades, towers and nacelles are an example of green economy project components increasingly moving by barge transport.

d. **Emerging technologies could help the region better manage truck flows** – The emergence of real-time data sources such as electronic manifests and the internet of things (IOT) provide opportunities to reduce unnecessary or redundant truck trips serving rail and barge terminals in the region. New riverfront terminals should consider employing such technologies to reduce unnecessary truck traffic and prevent trucks from using routes through or near residential neighborhoods. Currently, a number of federal grant programs are encouraging next generation technologies to be incorporated into future port operations.

e. **The Joliet Regional Supply Chain Optimization Model (JRSCOM) should be viewed as a resource/tool for evaluating future opportunities** – The creation of JRSCOM is a tool that can be reused and refreshed with more current commodity data to re-evaluate new opportunities for barge transport and related economic development in the future.

Conclusions and Recommendations

Once known as a steel town, today Joliet is known as a major transportation hub, with the CenterPoint Intermodal Center (CIC) in Joliet and Elwood referenced as "*North America's largest master-planned inland port.*" The CIC moves over 20 million tons of intermodal cargoes by rail annually, but all that volume comes into the intermodal facilities or goes out of the region by truck. During meetings with local governments for the Port Master Plan, truck traffic and traffic congestion were repeatedly noted as top concerns of area citizens. In February of 2024, representatives from Joliet and Will County issued a news release announcing official discussions had started with IDOT to pursue efforts to reduce truck traffic in the region.

The Illinois River is also well established as a vital transportation conduit for commerce, especially agriculture crops. In 2022, Illinois farmers exported about $8.4 billion dollars' worth of soybeans and corn,[9] with much of that grain barged on the Illinois and Mississippi Rivers to port facilities in the Gulf of Mexico. While agriculture crops comprise the largest volume of commodities moving by barge on the lower Illinois River, at the Lockport lock and dam near Joliet, petroleum and aggregates are the top barge commodities. In the Joliet Region, the Illinois and Des Plaines Rivers play a different but no less vital role in supporting commerce: **Currently barge traffic in the JRPD boundaries displaces over one-half million truck trips in the region annually**. In addition, the Illinois Marine Transportation System Plan completed by IDOT in 2021 notes that marine cargo activities within the JRPD boundaries support over 11,000 jobs in the state, paying over $709 million in wages and contributing $1.1 billion towards State Gross Domestic Product (GDP).[10]

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[9] US Department of Agriculture, State Agriculture Trade Data. https://www.ers.usda.gov/data-products/state-agricultural-trade-data/

[10] Illinois Department of Transportation, Illinois Marine Transportation System Plan and Economic Impact Analysis, March 2021. Pg. 70.

The JRPD Port Master Plan was undertaken to explore the possibilities for the district to take a more active role in river related development. The data analysis and network optimization modeling identified several potential investment opportunities that have been identified and discussed in this report. A business case supporting one of the most promising river terminal investments is detailed in an appendix to this report.

The following recommendations are based on the research, outreach and data analysis conducted for the Port Master Plan. The JRPD has been very successful as the owner and operator of Lewis University Airport; however, JRPD starts from ground zero as a water port owner/operator. As the JRPD contemplates its role in the future of Illinois/Des Plaines River commerce, it must navigate a complex environment of local attitudes towards additional transportation centric industrial development, and an inland waterway system undergoing significant changes. It is intended that these recommendations provide a path forward for navigating this environment. A summary of responses from JRPD Board members to the vision survey conducted is presented in Appendix B.

Recommended Policy Area #1: Seek Out Partnerships to Support Regional Economic Development

The legislation creating the JRPD provides broad powers to the district, from issuing permits for waterway structures to owning and operating an airport. However, the primary purpose of the JRPD is to act as a facilitator and catalyst for economic development and job creation. It is a purpose that is similar in mission to the Will County Center for Economic Development (CED): "*The CED exists to improve the quality of life for all residents of Will County by recruiting new companies offering high-quality jobs and a solid tax base while assisting existing businesses to grow, enabling the retention and addition of jobs.*"

1.1: Become an active member of the Will County CED

Most cities, towns, villages and other governmental entities in Will County belong to the CED; JRPD does not. Given the parallel goals of the two entities there appear to be synergies that can be gained from working cooperatively together. The Joliet Regional Supply Chain Optimization Model developed for this planning study mines a voluminous set of transportation demand data organized by major surface transportation modes for both domestic and international trade to over 40 countries. The JRSCOM tool and the data behind it can provide valuable insights to Will County CED's business assistance and site location efforts.

1.2: Become a supporting member of the Will County Governmental League

The JRPD was created to be an economic catalyst, primarily through transportation investment in the region. The Will County Governmental League (WCGL) Transportation Committee is one of eleven regional councils in the Chicago metropolitan region with delegated authority to administer a portion of the region's federal funds under the Surface Transportation Program. This funding can be designated for investments in eligible roadways, bridge projects, transit capital projects, or intracity and intercity bus terminals and facilities. Eligible projects can include waterway structures and truck route improvements.

1.3: Share and maintain the parcel inventory for future development

Outreach with county, city, and village representatives in the region resulted in additional effort being given to a more comprehensive inventory and parcel analysis to identify waterway adjacent land parcels that maybe developed or preserved as open space opportunities. The existing parcel inventory can be used as a resource to inform current and future land use discussions and decisions in Will County.

1.4: Consider working with regional partners to pursue Federal competitive grants to reduce drayage trips

Will County boasts being host to North America's largest master-planned inland port. However, the two Class 1 intermodal yards and associated warehousing and distribution activity generate significant truck traffic. Federal research has demonstrated that drayage route optimization can significantly reduce empty or deadhead truck movements.[11] Air cargo airports and deep-water ports have begun adopting Community Cargo Systems (CCS) that use a digital platform to provide real-time information about the status of shipments coming in and out of these gateways, to provide real-time visibility to shipment status. "Digital Twins" is an emerging big data concept where real-time information is used to provide adaptive routes and traffic optimization on a modeled network. A digital twin for Will County could apply advanced data analysis and technology to address issues related to traffic congestion, container staging, truck parking needs, provide supply chain transparency and reduce paperwork.

This technology would be an eligible project under the USDOT SMART grant program and Reducing Truck Emissions at Port Facilities grant program. Working with regional partners the JRPD could lead an application to pursue a digital cargo management system.

Recommended Policy Area #2: Become a Resource for Waterway Commerce in the Region

A key finding from the JRPD Port Master Plan is that the Mississippi River System (MRS), including the Illinois River System is facing significant challenges. Climate change, invasive species, as well as lock and dam maintenance and modernization needs have resulted in volatile price swings and changing markets for inland barge operations.

2.1: Share Port Master Plan results with state and regional partners

A key element of the JRPD Port Master Plan was the development of a regional network optimization model to evaluate markets for freight infrastructure investments that can lower shipping costs, reduce long-haul truck miles, reduce fuel consumption and lower emissions. The model was used to run a variety of transload and freight consolidation scenarios.

The results of this analysis can provide valuable information and insights to state and regional planning agencies to help address a growing issue facing the region. The consultant team will prepare a summary presentation of the study results that JRPD staff and board members can use to discuss the data analysis, key findings and recommendations of the effort.

2.2: Work with state and regional partners to promote a Maritime Center of Excellence in the Region

The USDOT Maritime Administration has developed a Center of Excellence (CoE) Program "*to support maritime workforce training and education at designated CoEs, including efforts of the designees to admit additional students; recruit and train faculty; expand facilities; create new maritime pathways; and award students' credit for prior experience, including military service.*"[12] The 2021 Illinois Marine Transportation System Plan estimated that port and marine activity in the JPRD supports over 11,000 jobs in the state, paying out over $709 million in wages and contributing $1.1 billion towards state GDP.[13] Given the

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[11] *Analyses of drayage optimization applications shows that the required logistics fleets can be reduced by 21 percent*. USDOT, ITS Deployment Evaluation. 09/14/2013. https://www.itskrs.its.dot.gov/2014-b00919

[12] https://www.maritime.dot.gov/maritime-workforce/maritime-centers-excellence

[13] Illinois Department of Transportation. Illinois Marine Transportation System Plan and Economic Impact Analysis. March 2021.

importance of waterway commerce to the Joliet regional economy state and regional partners should petition the USDOT Maritime Administration to identify a CoE candidate institution in the region.

2.3: Market the benefits of commercial navigation on the Illinois and Des Plaines Rivers

Despite many challenges facing navigation on the Illinois and associated river systems, barge transport remains a critical conduit for keeping heavy loads off the Joliet regional highway network and moving bulk materials to domestic and international markets. Our analysis of barge commodity volumes moving on the river in the Joliet region found that in 2021 over nine million tons of goods had moved through the Joliet section of the river. Assuming 18 tons per truck trip, the same volume of goods moved over highways in the Joliet Region would generate an additional 500,000 truck trips per year.

In recent years, several coalitions among Illinois river ports have formed to combine their resources to promote broader recognition of waterway benefits. In 2023, the Illinois Legislature created the Illinois Waterway Ports Commission. Commission membership includes Seneca Regional Port District, Ottawa Port District, Illinois Valley Regional Port District, Heart of Illinois Regional Port District, and Havana Port District, as well as Fulton, Mason, Tazewell, Peoria, Woodford, Marshall, Putnam, Bureau, LaSalle, and Grundy counties. The enabling legislation calls on the Commission to coordinate and synchronize common efforts and initiatives with the Mid-America Port Commission (Quincy Illinois) and the Joliet Regional Port District. Given JRPD is specifically named as an entity the Commission should coordinate with, JRPD could consider seeking an amendment to the legislation, adding the district as a full member.

Another recent coalition, the Corn Belt Ports, includes about twenty ports, and dozens of other entities like port districts, port authorities, counties, cities, townships and economic development agencies, all with an interest in promoting further port development on the Upper Mississippi and Illinois Rivers. In September of 2024, the Corn Belt Ports signed a "cooperative endeavor agreement" (CEA) "*to advance the economic and operational capabilities of ports up and down the Mississippi River.*"[14]

More recently a new coalition has formed in Illinois called the Illinois River Cities and Towns Initiative (IRCTI): "*IRCTI is a coalition of more than 12 mayor-led cities and towns along the Illinois River that will serve as a unified and independent voice advocating for the economic, environmental and political interests of the Illinois River region.*"[15]

2.4: Foster communication with industry about current and future challenges to commercial navigation

Given the breadth of challenges impacting Illinois River navigation in Joliet and Chicagoland Area, in addition to better marketing about the benefits of commercial navigation on the Illinois and Des Plaines Rivers, there is also a need to communicate waterway needs, challenges and status to regional users. The JRPD should consider ways it can be a conduit for the navigation industry in the Joliet Region, especially as the USACE Brandon Road Interbasin Project is now fully funded with work getting underway soon. The JRPD could approach the USACE Rock Island District to discuss opportunities to post links to USACE progress reports on its website or host periodic information updates from the USACE at Lewis University Airport facilities.

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[14] Progressive Railroading Magazine, *Corn Belt, Louisiana ports sign pact to improve Mississippi River Trade routes. September 23, 2024.*

[15] The Waterways Journal Weekly, *Illinois River Port Communities Form Coalition.* September 20, 2024.

Recommended Policy Area #3: Seek Revenue Opportunities to Fund a Waterways Staff Person

Many of the recommendations made under the previous two policy areas will require staff support, and preferably support by staff knowledgeable of waterway operations. Riverports generate revenue through a variety of channels, leveraging their strategic locations and infrastructure to support different types of commerce and transportation. Some of the primary ways ports generate operating revenue include:[16]

- Cargo Handling Fees
- Storage Fees
- Leasing Land and Facilities
- Service Fees
- Transportation and Logistics
- Public-Private Partnerships and Grants
- Economic Development Initiatives

These revenue streams help riverports maintain and expand their operations, ensuring they remain vital hubs for trade and transportation. Because JRPD does not currently own or operate any port or warehouse facilities, the list of currently available options is limited. The following recommendations may provide near term options for generating revenue from waterway related activities for JRPD:

3.1: Supporting a grant application for the BL Duke Barge Modernization Project

The JRPSCOM identified Scrap and Waste as a commodity group that holds the potential to support additional barge service demand in the Joliet Region. Following the scenario runs the consulting team invited area businesses interested in exploring the modeling results in more detail to reach out for one-on-one meetings. BL Duke, a Chicago Area full-service metals recycling company with facilities in Forest View and Joliet, requested a meeting. After presenting the study area results, members of the study team met for a site visit at BL Duke's Joliet Scrap Recycling facility.

Given JRPD's previous experience administering federal grants for the Lewis University Airport, the District is in a good position to act as a grant sponsor for BL Duke barge dock modernization project. The project would be eligible for MARAD's Port Infrastructure Development Program (PIDP) or the RAISE grant program through USDOT.

3.2: Consider inviting transportation infrastructure grant application proposals

The legislation creating the JRPD specifically grants the Port District the "power to apply for and accept grants, loans or appropriations from the Federal Government…" This is an ability the Will County CED does not enjoy. Competitive grant programs have become a prominent means for distributing federal funding for transportation investment beginning with the American Recovery and Reinvestment Act (2009) and the FAST Act enacted in late 2015 in. While some forms of congressional earmarks remain, the federal government distributes billions of dollars each year through several forms of federal funding/financing programs: 1) Discretionary grants, 2) Formula grants, 3) Credit assistance/loans; and 4) Public-Private-Partnerships (P3). The most popular of these financing vehicles is discretionary grant

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[16] Kentucky Transportation Cabinet, Kentucky Riverports, Highway and Rail Freight Study, 2021

programs. These programs administered by agencies of USDOT provide tens of billions of dollars in transportation related infrastructure investment each year. Federal discretionary grant programs require a government organization to be the primary applicants, including state, county, city or township governments, special district governments (e.g., JRPD), and Native American tribal governments.

The Infrastructure Investment and Jobs Act increased the number of discretionary grant programs available through USDOT to at least 39 different opportunities. Additionally, a structured program of Community Project Funding and Congressionally Directed Spending opportunities (aka earmarks) have become more prevalent in each year's Federal Consolidated Appropriations Act.

As a special district government created by the Illinois Legislature, JRPD can act as an additional conduit in Will County to access freight infrastructure. These federal grant programs usually require a non-federal funding match, which can come from a private sector partner. Previous experience administering federal grant programs is often a plus when applying for funding, and JRPD has experience and a good history administering discretionary grants administered by the Federal Aviation Administration (FAA). The JRPD could periodically issue a Request for Information (RFI), potentially in concert with the Will County CED seeking potential waterway related projects it could consider sponsoring for state or federal grant funding.

3.3: Work with the City of Joliet to explore a public boat launch and marina

During outreach to government entities in the JRPD region, the City of Joliet noted a desire to create a public use marina and boat launch facility in the northern section of downtown. This is a project that fits well within the purview and authority of JRPD, and the parcel inventory developed for the Port Master Plan can support the potential development. The JRPD's involvement in this type of project can also ensure that recreation facilities be designed and operated in a fashion so that conflicts between recreational facilities and commercial barges are minimized.

Introduction and Background

The Joliet Regional Port District (JRPD) was created by the Illinois General Assembly in 1957. JRPD is one of 19 public port districts in Illinois that were created to support economic development and job creation linked to use of the state's waterways. While there are over 30 river terminals located within JRPD boundaries, the district itself does not own any water port or terminal facilities. JRPD owns and operates Lewis University Airport, JRPD is one of three port districts in the state that own airport facilities.

JRPD boundaries include the townships of DuPage, Lockport, Joliet, Troy, and Channahon; the cities of Joliet, Lockport and Crest Hill; and the villages of Bolingbrook, Romeoville, and Rockdale, all within Will County. JRPD boundaries include 10 miles of the Chicago Sanitary and Ship Canal, and 15.5 miles of the Des Plaines River. Just south of Joliet, the Des Plaines River joins the Kankakee River to form the Illinois River. Together, the Illinois River, Des Plaines River, and Sanitary and Ship Canal form a navigable waterway between Lake Michigan and the Mississippi, frequently referenced as the Illinois Waterway.

Over the past decade Will County outpaced the rest of Illinois and the nation in terms of job growth, adding 45,000 jobs in the past ten years. The county's robust economic growth is frequently attributed to its high-quality transportation assets that include the largest inland port in North America, a complex that includes five Class 1 railroads, three intermodal rail yards and numerous warehouses, four interstate highways and numerous terminals on the Illinois Waterway.

The goal of the Joliet Regional Port District (JRPD) Master Plan is to identify and prioritize river related transportation projects that could support industrial economic development within the JRPD boundaries, primarily along the riverfront. The approach taken to identifying potential market opportunities for new transportation relies on data and network optimization modeling. The approach for this study was conducted in three primary phases: Phase 1: Discovery, Phase 2: Data and Modeling Development, and Phase 3: Development Opportunities and Recommendations Forward.

Phase 1: Discovery

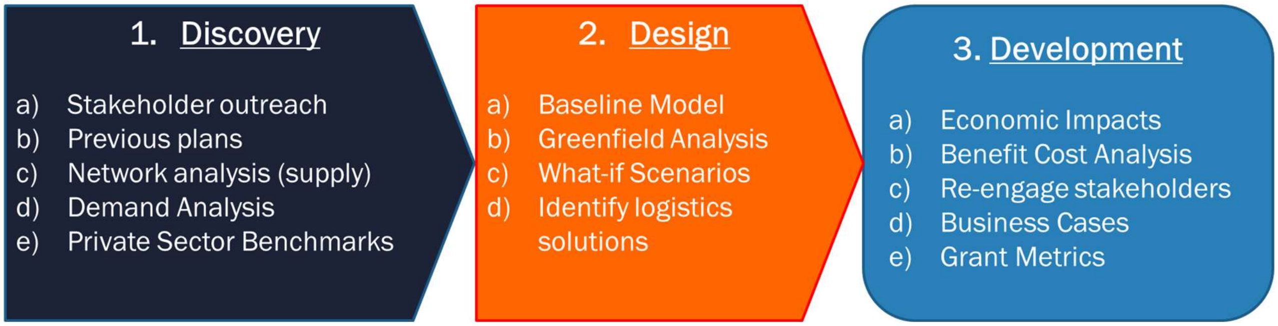
During the initial months of the project, the focus was on assembling three datasets used to populate the optimization model: 1) *Freight demand* derived from the 2019 Illinois Transearch database; 2) *Multimodal freight network* (supply) taken from public GIS data sources and, 3) *Cost and equipment benchmarks* derived from private sector shipping records. Phase 1 also included substantial stakeholder outreach efforts in the form of business interviews, regional discussion forums with the public and private sectors. At the conclusions of phase 1, a previous Technical Memorandum (Tech Memo) dated November 2023, presented findings of the Discovery process in Phase 1 and included an analysis of commodity flows for Will County, a summary of stakeholder interviews and feedback received during two regional forums.

A second report, the Baseline Optimization Tech Memo was the first deliverable of Phase 2 that described the modelling parameters, data used to model freight flows in the Study Area and presented a greenfield analysis, the first step in the network optimization modeling process. This Tech Memo is the third report; the JRPD Optimization Scenario Analysis Summary which presents findings from optimization model scenario runs and makes recommendations for Phase 3 of the project.

Overview of Study Approach

JRPD's Strategic Marine and Port Master Plan using the JRSCOM within the project's Design Phase is displayed in Exhibit 1.

Exhibit 1: JRPD's Strategic Marine and Port Master Plan Three-Phased Process



Key Milestones and Findings from Phase 1

Phase 1 of the Master Plan sought to *discover* information from previous related study efforts, engage in conversations with regional freight stakeholders and assemble data resources. During this discovery effort, findings were reported to the JRPD and Technical Working Group through several working papers, and findings from the entire Phase 1 effort was reported on in a *Technical Memorandum: Joliet Regional Port District – Commodity Profile.* The following section provides an overview of Phase 1 activities and findings.

Previous Plans and Studies

An initial step taken by the consultant team was to review previous studies and plans that had been completed in the Joliet/Will County region. Previous studies were assembled from web searches of planning agencies in the region, input from the Technical Working Group and through discussions with local officials. Twelve prior studies were identified, reviewed and summarized, shown in Exhibit 2: [17]

Exhibit 2: Planning Studies Reviewed for JRPD Master Plan (Listed Alphabetically)

1	Brandon Road Interbasin Project, USACE (Several phases completed 2019-2023)
2	City of Crest Hill, Illinois (May-14)
3	CMAP 2050 Comprehensive Regional Plan: OnTo 2050 (Oct-18)
4	Illinois Marine Transportation System Plan (Mar-21)
5	Illinois State Freight Plan (Oct-17)
6	Lewis University Romeoville Campus Plan 2040 (Jun-21)
7	Metropolitan Water Reclamation District Strategic Plan (Sept-22)
8	Re-imagine: Channahon comprehensive plan (Dec-19)
9	Romeoville Comprehensive Plan (Jul-17)
10	Star Innovation District Master plan, City of Lockport, IL (May-22)
11	Will County Community Friendly Freight Mobility Plan (Sept-17)
12	Will County Joliet Intermodal Transportation Master Plan (Jan-22)

Key Takeaways from Prior Plans Review

1. Most land use and long-range planning efforts in the Joliet region acknowledge the important role freight plays in job creation and economic activity. However, negative externalities associated with

[17] The complete prior plan summary was submitted as Working Paper #1 and can be found on the JRPD website at: www.flylot.com

freight transportation, in particular high truck volumes and congestion, along with airborne emissions, noise, and safety concerns were frequent concerns cited by citizens. Several previous plans recommended that trucking contributions to congestion be addressed through better land-use coordination and project development policies.

2. Comprehensive plans conducted by local jurisdictions frequently cited a need to balance more traditional commercial/industrial development with non-traditional opportunities for recreation, tourism, and hospitality to diversify the regional economy and maintain balanced land-uses for the county's residents.
3. Congestion from local truck traffic is often cited as a challenge that should be addressed by strategic truck routes and infrastructure investment to create more capacity on key routes.
4. Several local, regional and federal agencies have identified key infrastructure investments that address mobility and environmental issues related to freight movement and commerce. The JRPD Port Master Plan should acknowledge and track progress on these strategic investment priorities to ensure regional coordination moving forward. These key projects include:
    - Houbolt Road Bridge: Referred to as the Houbolt Road Extension, the toll bridge creates a faster, more efficient route between I-80 and CenterPoint Intermodal Center. A joint venture between United Bridge Partners and CenterPoint Properties in partnership with Joliet, Will County and IDOT, created the extension. The privately funded bridge project created a 1.5-mile extension of Houbolt Road and a 0.4-mile bridge over the Des Plaines River. The facility opened to traffic on April 27, 2023.
    - Laraway Road Corridor Project: County Highway 74 (Laraway Rd) is a two-lane road in a lesser developed region of Will County, which is expected to attract future growth and higher traffic demands. The Will County Division of Transportation is evaluating existing capacity and future improvements to accommodate future anticipated levels of traffic demand. The corridor project is currently in the design phases, with the construction phase scheduled to begin in 2026.
    - Brandon Road Lock and Dam – Interbasin Project: Invasive carp from Asia were first identified in the Mississippi River System (MRS) in southern Illinois in 2003. Currently, four different species of invasive carp have been identified in the MRS: Bighead, Silver, Grass and Black Carp. As the invasive carp population grew, so have fears that the Illinois River System could become a conduit for introducing invasive carp to the Great Lakes. To fight back, in 2007 Congress authorized the U.S. Army Corp of Engineers (USACE) to undertake the Great Lakes and Mississippi River Interbasin Study (GLMRIS). Results of the study were published in 2014 after a multi-year effort. The report presented a range of options and technologies to prevent further invasive species migration into the Great Lakes. The Brandon Road Lock and Dam near Joliet was identified as a critical location where a layered system of technologies could be deployed to deter invasive carp. Pre-construction and engineering design was initiated in 2020.

      In recent years, the Brandon Road Interbasin Project has stalled over funding responsibilities for the $1.1 billion project construction costs. The federal government has committed $1 billion to the project, while the states of Illinois and Michigan have been called on to fund the roughly $114.6 million required to cover the remainder of the project. In 2021 Governor Whitmer of Michigan agreed to contribute Michigan's share. Illinois Governor Pritzker signed the agreement on July 1, 2024, allowing the project to move forward.

Stakeholder Outreach

Exhibit 3: Flyer for Stakeholder Forum

Involving key stakeholders in in the JRPD master plan process was an important activity designed to ensure that future infrastructure decisions are made in "*consideration of and to benefit public needs and preferences.*"[18] One of the primary goals for engaging stakeholders in this effort was to provide an opportunity for those likely to be impacted or affected by project outcomes to participate in and provide input to the planning and project identification process. For this freight centric planning effort, involvement by the business community was important. The *Stakeholder Outreach Plan* developed for JRPD included targeted interviews with regional businesses, as well as several public meetings open to any attendees. These public forums were held early in the day as opposed to evenings, to make it a more responsive time for business and local government representatives. A meeting with local public officials was designed to understand the most pressing concerns about future commercial/industrial development in the communities that reside within JRPD boundaries.

The goal of business outreach efforts encouraged stakeholders to share their knowledge and perspectives about regional infrastructure conditions and existing supply chain operations. Participants were also encouraged to share their thoughts about the challenges and opportunities affecting transportation, quality of life and economic development in the region.

Regional Stakeholder Forums

Outreach activities for the JRPD Port master plan included several regional forums to share information about study progress and receive feedback from stakeholders. Both events were conducted as open meetings allowing anyone to attend, but it was marketed through emails distributed by the Will County Center for Economic Development, the Three Rivers Manufacturers Association and the Will County Governmental League.

The first regional forum was held on January 5, 2023, as a kick-off to the planning process. The meeting held at Romeoville City Hall ran from 7:30 – 9:00 am, with a total of 29 people in attendance. During the meeting, attendees were asked to review several poster sized maps of commercial/industrial parcels along the Des Plaines River within the JRPD boundaries and provide updates or additional information about existing land uses. During the meeting, the consultant team made a slide presentation about the upcoming study process and answered audience questions.

The second forum conducted on April 12, 2024, was to share results from the freight network optimization modeling and data analysis performed for the study. Nineteen people attended the second forum, with attendees again representing a mix of local, state and federal agencies, along with area businesses.

Public Officials Forum February 23, 2023

Based on feedback received during the first regional stakeholder's forum, the consultant team decided to hold a facilitated small group meeting specifically for local government representatives to dig deeper into existing land-use plans and develop better intelligence about the draft parcel inventory being assembled for

[18] FHWA Public Involvement web page: https://www.fhwa.dot.gov/planning/public_involvement/

the study. The Public Officials Forum was arranged and marketed by the Will County Governmental League. Dr. Ann Schneider was the meeting facilitator. Eleven participants attended the public official's forum held at the Lockport City Hall. The meeting sought to validate key messages from the previous plans reviewed and identify any plans not included in the initial review. The meeting also sought to identify additional businesses the study team should interview and get feedback related to waterway adjacent parcels, as well as access issues to any existing parcels.

Exhibit 4: Public Officials Forum Lockport City Hall, February 23, 2023

A consensus formed among the public officials at the forum related to concerns about additional commercial truck traffic in their communities and on the regional highway system resulting from potential logistics developments on the waterways. Some attendees also reiterated the desire to consider recreational activity, other industries that would not impact the roadway network, or logistics developments that would lessen the impacts of heavy trucks on the system.

Reclaiming parcels for open space as parks, expanding the Will County Forest Preserve District, and other non-commercial uses were expressed as opportunities to consider related to waterway development. There was also a discussion about the process for decommissioning the Midwest Generation, LLC – Will County site in Romeoville and potential opportunities there for a solar power generation facility or a battery storage facility.

Business Interviews

Members of the Technical Working Group, and area groups like the Will County CED and Three Rivers Manufacturers Association provided recommendations and contact information for companies they believed should be interviewed for the study.

Exhibit 5 displays the organizations that agreed to supply chain interviews.[19] Seventeen individuals representing fifteen organizations participated in the interview process. Most of the interviews were conducted virtually as video conferences, however several were conducted in person at Joliet business locations. The purpose of interviews was to:

- Collect information about key supply chains in the Joliet / Will County Region.
- Gather input about the regional freight network relative to river access and specific commodities moving in large quantities to and from the Region.

[19] It should be noted that stakeholder outreach will continue throughout the duration of the study effort.

- Discuss the possibility of providing a sample of shipping records to support optimization analysis of the regional freight transport system.

Key Insights from Business Interviews

Interviews with freight stakeholders, both in-person and virtual, provided the ability to collect real-world views from supply chain practitioners and collect data to support optimization modeling. Company representatives who agreed to an interview were promised anonymity regarding specific comments.

The companies interviewed for the project cover a wide range of commodities and services. Commodities included aggregates, agriculture, energy products and chemicals. Services included barging, trucking and warehousing.

To help provide consistency among a very diverse group of representatives, the interview format loosely followed a Strengths, Weaknesses, Opportunities and Threats (Exhibit 6) question and answer format. Companies were also asked to share shipping records for the purpose of developing benchmarks for modal cost and equipment type used in the optimization modeling. Companies who agreed to share shipping records signed a non-disclosure agreement (NDA) with Quetica.

Exhibit 5: Company Interviews (Listed Alphabetically)

Companies Interviewed for Master Plan	
1	A & M Intermodal
2	BL Duke
3	Cadence Premier Logistics
4	Canal Barge Company
6	CITGO Lemont Refinery
7	Delong Company Inc.
8	Illinois Marine Towing
9	Illinois & Michigan Oil Co
10	International Matex Tank Terminals
11	Legacy Express
12	Middle River
13	NRG – Joliet
14	Ozinga
15	Rho Chemicals
16	Three Rivers Manufacturers Assoc.
17	Touchpoint Logistics
18	US Army Corp of Engineers
19	Zenith Energy Terminals

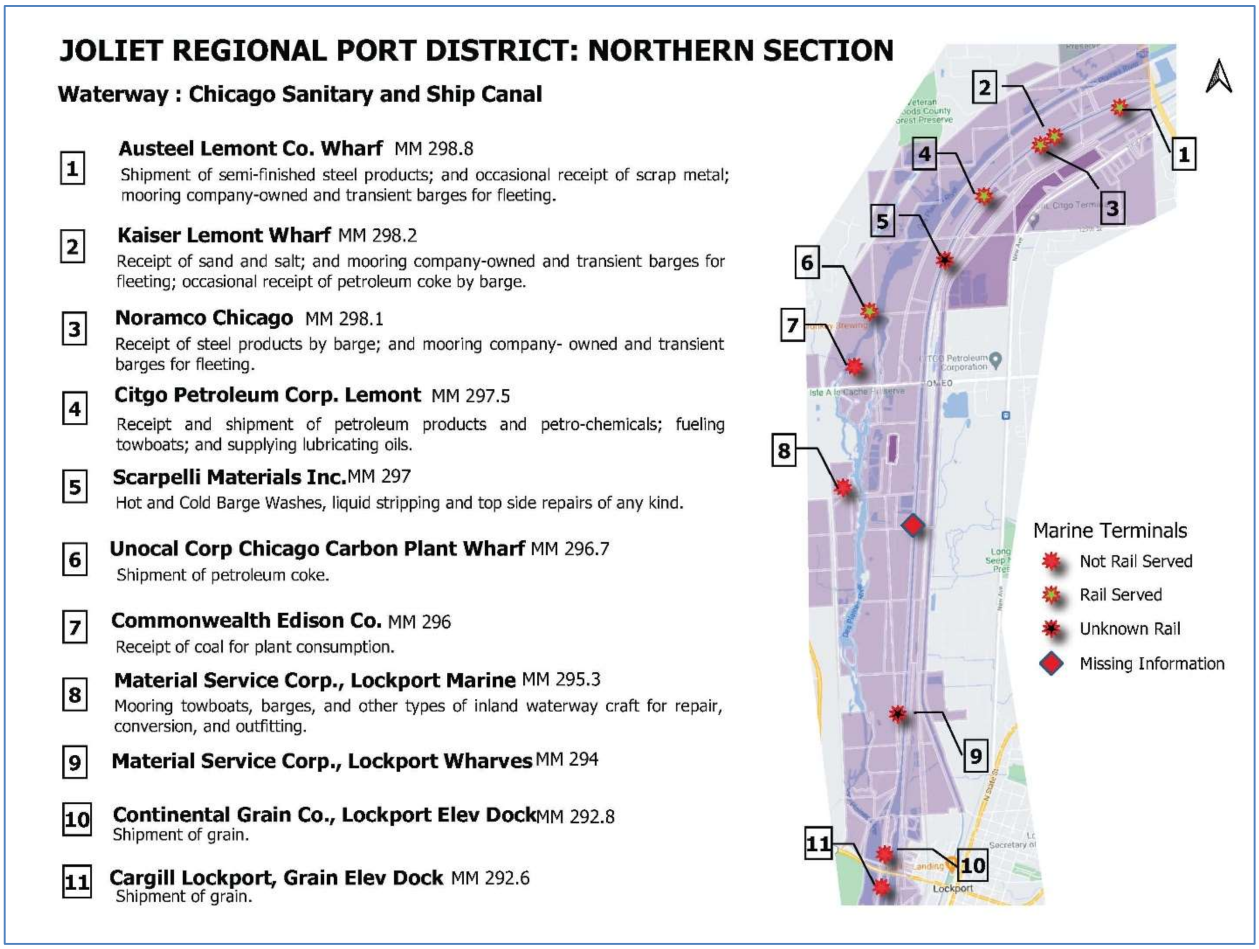
Exhibit 6: SWOT Summary from Stakeholder Interviews Conducted for JRPD Master Plan

S Strengths	W Weaknesses	O Opportunities	T Threats
• Multi-modal access & connectivity • Class 1 railroads access • Ample supply of local trucking firms • Direct access to major consumption, transport, and transshipment facilities • Proximity to renewable energy production hubs	• Truck traffic / congestion – growth in warehousing continues to increase traffic • Local rail switching is a big constraint. • Rail yard management favors unloading trains ASAP over yard fluidity. • Rail service – missed deliveries common	• New Houbolt Bridge should reduce congestion & trucks on commuter routes • Demand for renewable energy • Containerized agriculture exports • Container on barge • Rail to barge, barge to rail transload	• High & increasing volumes of truck traffic • Invasive species / Asian Carp • Specific Bottleneck - 127th and New Avenue - safety issues, needs a stop light.

Parcel Maps and Updates to Existing Inventory of River Facilities in the JRPD

Future land-use is a key concern among local units of government in the JRPD region. For the first regional stakeholder forum, poster sized maps were prepared showing existing commercial/industrial land parcels adjacent to or contiguous to parcels adjacent to the Des Plaines River/Chicago Sanitary and Ship Canal. The maps divided the JRPD region into three subareas highlighting existing facilities and vacant properties along the Des Plaines River. These maps are shown on subsequent pages in Exhibits 7 through 9. Parcels owned by the Metropolitan Water Reclamation District (MWRD), park districts, Forest Preserves or Federal Lands were not included. Known properties and property ownership along the river were labeled. Attendees to the forum were invited to leave comments on the maps with markers to add information about parcel ownership or correct existing information presented on the maps.

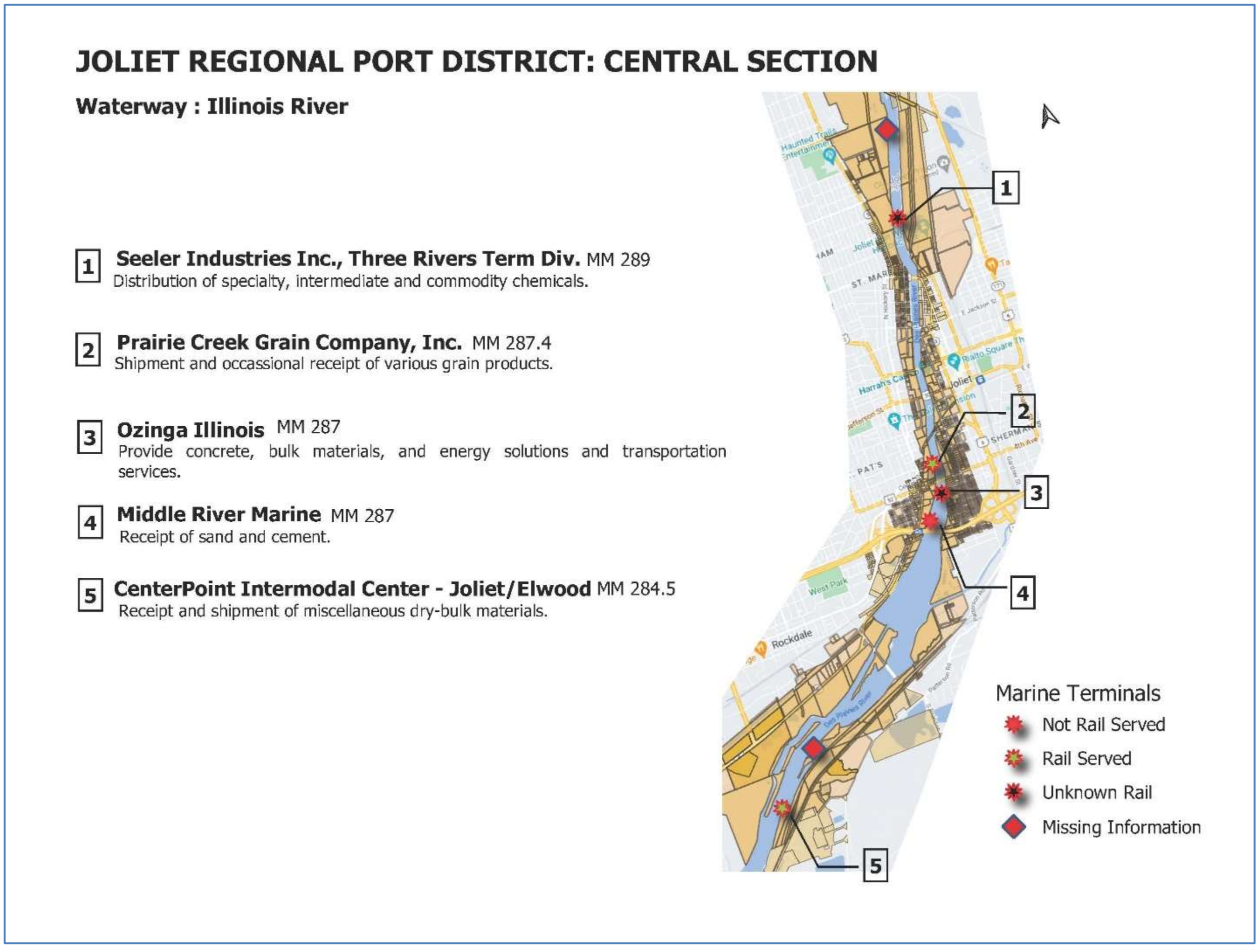
Exhibit 7: River Adjacent Land Parcels, Northern Section of the JRPD



Source: Quetica

The map presented at the Regional Stakeholder Forum for the Northern Section of the JRPD is shown in Exhibit 7 and includes the Village of Lemont in the northern most section south of I-355, the Village of Romeoville from I-355 to the 9th Street Bridge, and the City of Lockport in the southeast corner of the map. In total, 11 marine terminals were highlighted: five with rail service, three that were unknown, and three that were missing data at that point in time. These terminals handle a variety of commodities including grains, semi-finished and finished steel, scrap metal, salt, sand, fuel, petroleum coke, and petroleum chemicals. Additional services provided include barge mooring, fleeting, and cleaning. No feedback was provided during the forum.

Exhibit 8: River Adjacent Land Parcels, Central Section of the JRPD

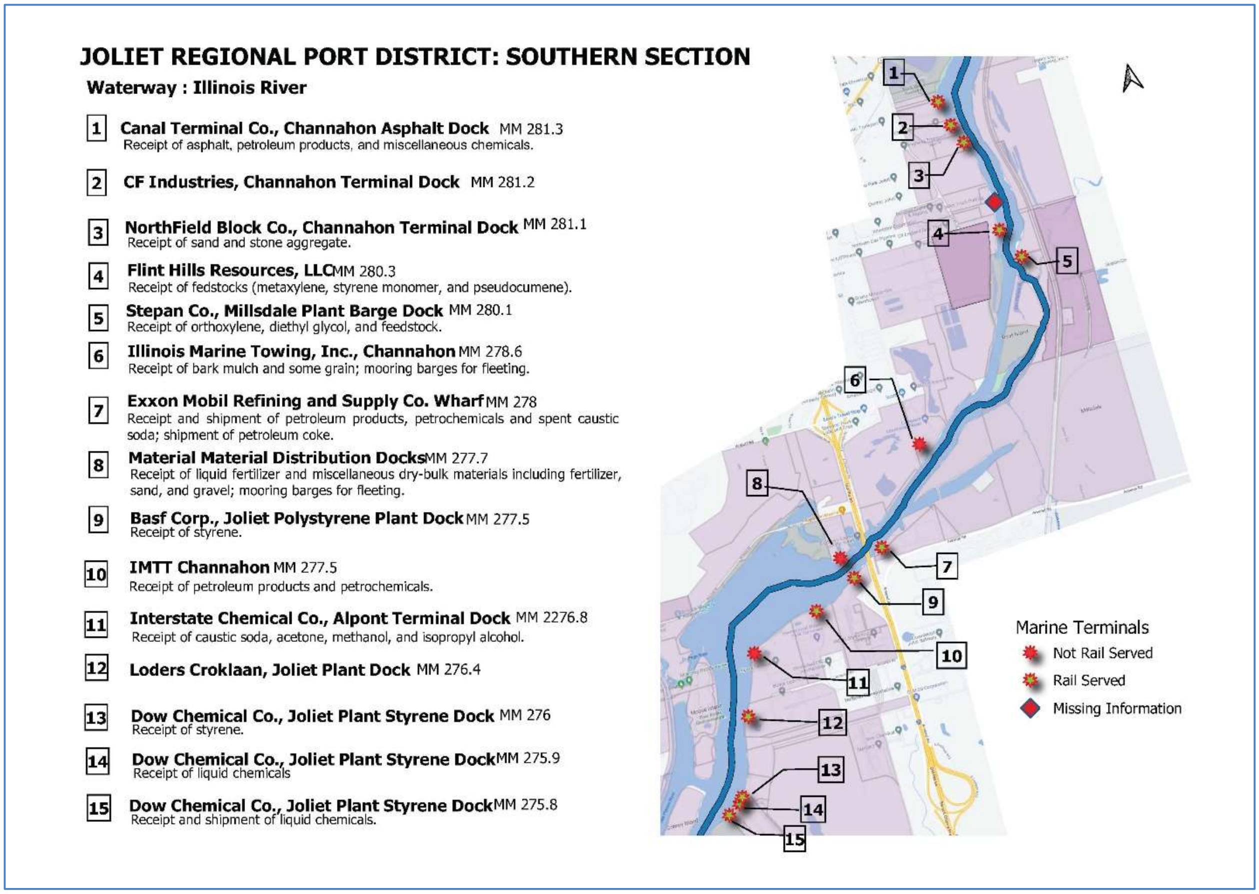


Source: Quetica

The map presented at the Regional Stakeholder Forum for the Central Section of the JRPD is provided in Exhibit 8 and extends from just south of the BNSF railroad bridge in the northern most portion to the CenterPoint Intermodal Center in the south. It is predominantly covered by the City of Joliet along with the Village of Rockdale. The map identified five marine terminals with two being rail served. Commodities serviced include various chemical products, grains, aggregate materials such as sand, concrete, and cement, and other dry bulk materials. Stakeholders commented that the Seeler Industries terminal was now BL Duke, the CenterPoint terminal should be Zenith Materials, and that Illinois Marine Towing should be added to the map at mile marker 287.1.

The Southern Section of the JRPD is shown in Exhibit 9.

Exhibit 9: River Adjacent Land Parcels, Southern Section of the JRPD



Source: Quetica

The map exercise generated several edits, additions, and comments. Some attendees also noted that it would be helpful to see all parcels without the enumerated exclusions for context. It was also suggested that parcel pin numbers be added.

Comments identified some developed parcels have become vacant and may be appropriate for redevelopment or to expand open space opportunities. It was also noted that the MWRD is interested in leasing properties it owns for development. Specific mark-ups included:

- Mayor Streit of Lockport indicated that the City owned approximately 180 acres between the 9th Street Bridge and the former Texaco tank farm. Hugh O'Hara from the WCGL indicated he would share PIN #s in the JRPD zone.
- Additional developed properties that are or will be available for redevelopment include the Hollywood Casino property and the Joliet Park District, which is seeking legislation to allow it to sell a shuttered waterpark along the river.
- The group was interested in the type of feedback the consultant team received from the shippers that were interviewed. There was a discussion of the importance of looking just beyond the boundaries of the Port District.
- An additional contact shared at the meeting for a potential shipper interview was Midwest Tankermen in Lockport. The request for additional contacts included those industries or shippers that may not currently use the waterways.

The prepared parcel maps were also used during a Public Officials Forum that was held with representatives from local units of government and with a subsequent survey of public entities to identify those properties considered “off-limits” to commercial/industrial development.

Based on the interest among local communities in further analysis of river adjacent parcels, a multifactor analysis was conducted to identify those parcels most appropriate for future development. That analysis is presented in Section 3.d of this report.

Phase 2: Data and Modeling Development

The Joliet Regional Supply Chain Optimization Model (JRSCOM) has three primary data modules: 1) Demand data consisting of county-to-county commodity flows in tonnage and value; 2) Supply data describes the multimodal freight transportation network, including nodes where goods are transferred between modes; and 3) Benchmark data providing the comparative cost of moving goods by each mode, and the prominent equipment types used for transporting different commodities.

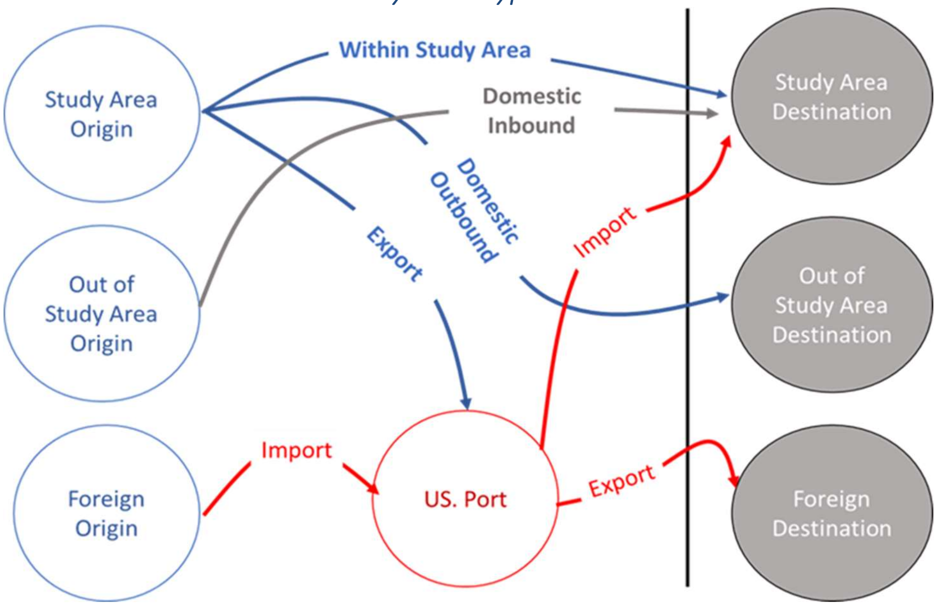
Demand Data Module

All domestic origin/destination commodity flows are derived from Illinois Transearch data with a base year of 2019. There are five types of freight movement or commodity flows that can be analyzed between the seven node types in the in the model (see Exhibit 10):

1. Domestic Inbound – Freight is transported from a domestic out-of-state node to Will County.
2. Domestic Outbound – Freight is transported from Will County to a domestic out-of-state node.
3. Within Study Area– Freight is transported between two locations in the study area.
4. Import – Freight is transported from a foreign node to a U.S. port node first, then from the U.S. port node to the study area.
5. Export – Freight is transported from the study area to a U.S. port node first, then from the U.S. port node to a foreign node.

A key data enhancement when developing the JRSCOM was the normalization and integration of Illinois Transearch data with import / export data from USDOT’s Freight Analysis Framework (FAF). The Study Area geography includes Will County and six adjacent counties: Cook, DuPage, Grundy, Kane, Kankakee, and Kendall counties. The demand module includes both domestic and import/export commodity flows moving into, out of and within the Study Area. As illustrated in Exhibit 10, domestic flows include shipments of inbound commodities, outbound commodities, and internal flows (those occurring within the Study Area). The import/export demand is modeled as commodity flows to and from the study area through U.S. ports, as shown in the exhibit flow chart.

Exhibit 10: JRSCOM Commodity Flow Types



Source: Quetica

Export trade is a key economic driver for many states and industries, especially for inland ports and terminals like those in the Joliet Region. Federal import/export data reported through FAF comes from the U.S. Census Bureau, which assembles the data from the online Electronic Export Information (EEI) form exporters must submit through the Automated Export System. Export information assembled from EEI reporting can be misleading because federal regulations allow exporters to cite a consolidation or processing location when reporting the origin of export shipments.[20] A common example can be found in agriculture: Soybeans grown in Illinois are transported by rail to a Pacific Northwest port, where the grain is transloaded to an ocean ship along with soybeans owned by the same exporter from other locations; rather than complete multiple export declarations for each location, the exporter completes a single declaration naming the coastal consolidation/transload location as the origin of the export.

The JRSCOM's import and export data were enhanced and adjusted using WISERTrade data which more appropriately assigns exports to their true domestic source. WISERTrade data also more appropriately assigns the foreign end of import and export flows from FAF's eight international regions to 41 different countries and country groups. Using other data sources like US Department of Agriculture crop receipts adjustments were made to more accurately represent the truck origin of exports.

The JRSCOM network is comprised of seven different node types shown in the diagram in Exhibit 10.

1. Study Area Origin: Domestic commodity flow origins are modeled at the county level. For the JRPD port master plan, the multi-county study area is the primary origin location for the model. The remaining counties in Illinois are treated the same as all other domestic commodity flow origins. Outside of Illinois, origins are modeled at the Transearch region level defined in the database.[21] Study Area flows have inbound, outbound, and within (intra-area) commodify flows.
2. Study Area Destination: Same as above, study area destinations are modeled at the county level.

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[20] Similar reporting biases are experienced with regard to the destination of some import commodities.

[21] Transearch regions in the Illinois database are reported at the state or Bureau of Economic Analysis (BEA) region.

3. Out-of-State Origin: A domestic out-of-state origin is modeled at the Transearch region level. There are approximately 312 Transearch regions in the U.S.
4. Out-of-State Destination: Same as above, a domestic out-of-state destination is modeled at the Transearch region level.
5. U.S. Port: Will County import/export commodity flows are modeled to include two legs: a domestic leg between a Will County site and a U.S. port and an international leg between a U.S. port and a foreign site. This design allows trade route analysis in the optimization process. Like the domestic out-of-state origin/destination (O/D), U.S. ports are modeled at the county level with a ZIP3 assigned in this study. In the instance that a port spans multiple counties, the county that provides more multimodal connection points is selected to represent the port in JRSCOM. A connection point is either a rail station defined in the Standard Point Location Code (SPLC) database from the National Motor Freight Traffic Association (NMFTA), Inc.[22] or a dock defined in the U.S. Army Corps of Engineers Complete Dock List. [23] These connection ports enable multimodal transportation combinations, such as truck-rail or truck-water.
6. Foreign Origin: There are 41 foreign countries or country groups in the model for import/export analysis. Each foreign O/D pair is modeled using the geographic location of the largest port city in the area. A list of the foreign countries or country groups is provided with a full listing of the countries to country groups in Appendix A.
7. Foreign Destination: Same as above, there are 41 foreign countries or country groups in the model for import/export analysis. Each foreign destination is modeled using the geographic location of the largest port city in the area.

JRSCOM Network (Supply) Module

The JRSCOM supply module is a digital description of the multimodal freight network including road, rail, inland waterways, and ocean gateways. Domestic road, rail, and inland waterway networks are defined at a county level. The ocean network is defined as hub-to-hub pairs between U.S. seaports and key seaports in the 40 plus export markets included in the model. Goods moving between an origin and a destination are viewed as either a single mode or a combination of modes (multimodal). JRSCOM treats a multimodal movement in multiple legs; with each leg representing a single mode. JRSCOM's network within Will County is depicted in Exhibit 11.

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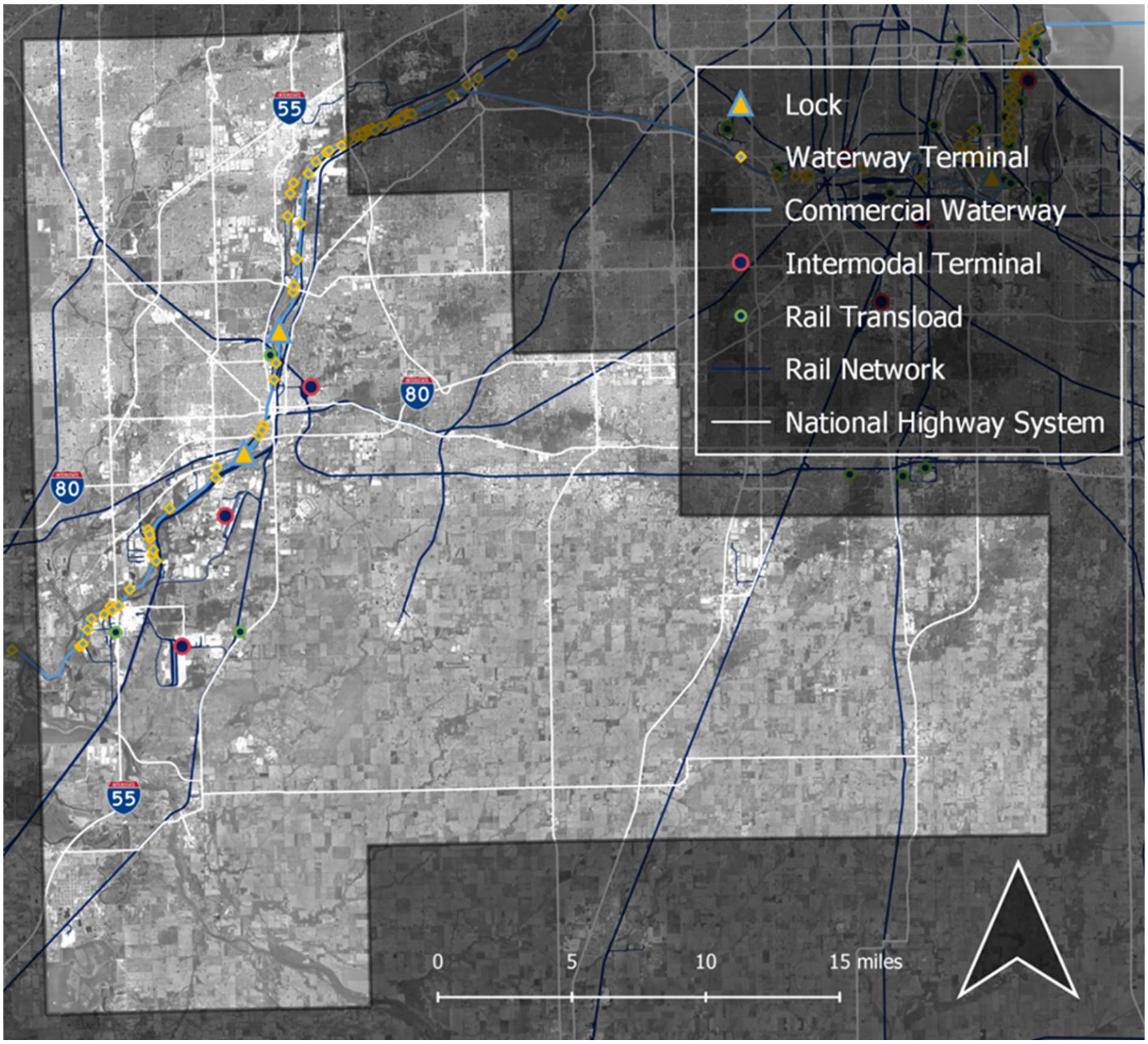
[22] https://store.nmfta.org/Products/ProductDetail?SKU=SPLC_ONLINE

[23] http://www.navigationdatacenter.us/ports/ports.htm

Exhibit 11: JRSCOM Network Module, Will County



Networks for road, rail, inland water and intermodal networks are modeled with the travel distance between network nodes. If there is no network connectivity between nodes in the same network, the matching record is not included in the table. There are approximately 193 intermodal facilities in the U.S. The intermodal network is modeled as records in a database table with the distance between two areas with intermodal facilities in the U.S. The intermodal network constrains the optimization process from using the intermodal services for freight transportation between those nodes. The ocean network is consisted of port-to-port pairs between U.S. seaports and the representing seaports in the 41 countries/country groups in scope. This network includes all possible ocean freight shipment options in import/export.

JRSCOM Benchmark Module

The JRSCOM cost benchmark module includes three components: linehaul costs, fuel surcharges, and common accessorial charges. Linehaul charges are based on the distance and quantity (weight or space occupied) of commodities transported between two market points. Carriers impose fuel surcharges to adjust the contract rate to account for variations in fuel prices. The fuel surcharge benchmark was based on the fuel price in 2019.[24] Accessorial charges are fees assessed for freight services beyond normal pick-up, transport, and delivery (e.g., stop-off, transload and cross dock fees). It should be noted that linehaul benchmarks for truckload, less-than-truckload, rail carload, rail intermodal and container drayage where relatively easy to assemble, considerable research was required to establish relevant barge rates for Upper Illinois/Des Plains River barge operations. Of the over two million private shipping records purchased to support the development of benchmarks for the study, none of the records contained barge shipments on the Illinois River. The final benchmarks used in the model were derived from an analysis of USDA barge rates for grain movements and records provided under an NDA from a barge company with operations on the Illinois River.

Greenfield Analysis (GFA)

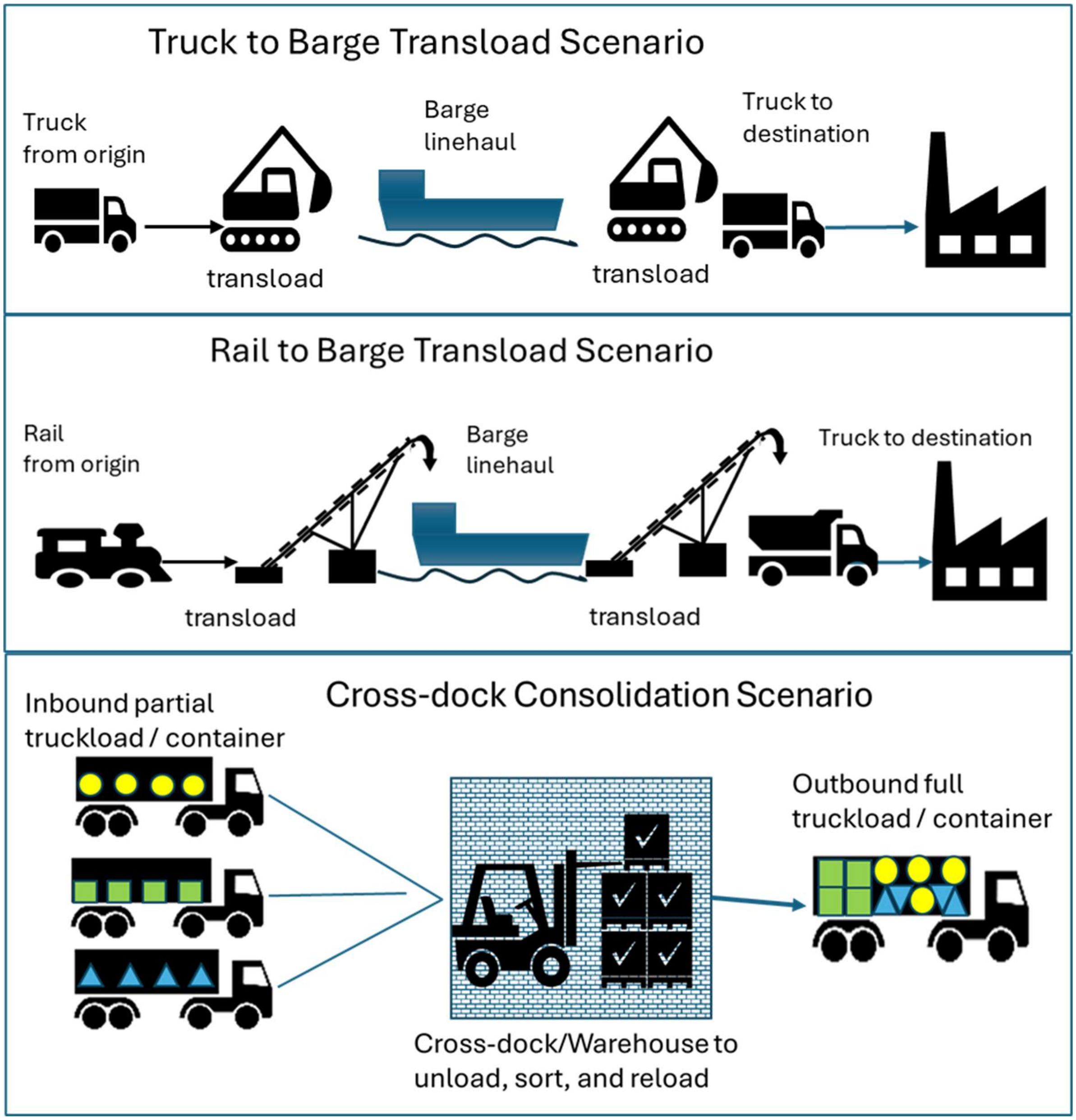
Once completed, JRSCOM's first application was to conduct a greenfield analysis (GFA) of the study area. A GFA is a common freight step in optimization modeling to examine freight transportation demand, without constraints on the existing multimodal networks. It seeks to identify the locations where freight demand should be aggregated within the existing multimodal network as well as the types of modes and services that should be available. The results of the GFA are then compared to the existing network to identify potential gaps or capacity issues in services available. The greenfield analysis seeks to answer a number of key questions, including:

1. In what locations should freight demand be aggregated within the existing multimodal network?
2. What types of freight services (infrastructure) should be available at each node in the network?

Identifying and evaluating network design alternatives to address constraints and achieve the optimization objectives: lower freight transportation costs in theJRPD Study Area. Based on the stakeholder feedback received in Phase 1, it also became clear that any successful strategies would also need to reduce truck traffic and congestion in the Joliet Region. The graphic in Exhibit 12 illustrates several examples of design alternatives that could both lower shipping costs and reduce regional truck traffic.

[24] The fuel surcharge is typically based on fuel price data from the Energy Information Administration (EIA). Fuel surcharge data from the private sector shipment data is used in this study.

Exhibit 12: "What-if" Network Optimization Scenario Examples



Source: Quetica

The GFA modeling is based on assumptions about the suitability of freight demand to be included in the results. These assumptions include demand characteristics such as the distance between the origin and destination county of the commodity flow (line-haul), as well as the local distance the freight must move to access a transfer node (first and last mile truck drayage), and type of commodity. For JRPD, the GFA required line-haul travel greater than 500 miles to reflect regional market dynamics making barge and/or rail transport competitive with the door-to-door nature of truck. Flows were included only where the truck drayage to/from Joliet, the transload hub, is less than 50 miles. Finally, the GFA focuses on commodities that commonly use rail or barge transport. Consolidation assumptions are based on the average weight of full trucks and containers.

GFA Results

The GFA identified a total potential market of more than 245 million tons of freight that could be moved to and from the region by barge via a transload in the JRPD, equating approximately 140,000 barges annually. The GFA suggests that most of the potential barge volume is currently moving by rail: 243.8 million rail tons versus 1.4 million truck tons.

The results from the Truckload to Container Consolidation GFA identified a total of 217,725 tons of freight for consolidation from 17,700 outbound partial truckload movements in the JRPD. A “What-if” scenario would not only look at the potential for consolidation from current outbound partial truckload shipments but also current intermodal shipments for additional volumes to utilize the service. Given the extensive rail network within the Joliet region, a “What-if” scenario to examine opportunities to transload commodities from truck to rail also makes sense. Both the consolidation and rail transload scenarios also seemed to align with comments heard from multiple stakeholders related to the need to lessen truck trips within the region and the associated negative impacts on congestion and the road network.

Based on the results of the greenfield analyses, the following optimization scenarios are recommended to size the potential markets for additional logistical services in the Joliet Regional Port District:

1. Barge Transload – domestic and international markets
2. Rail Carload Transload
3. Consolidation – partial truck and container consolidation

What-If Scenario Analysis Using JRSCOM

Scenario analysis is used to explore the size of potential markets and examine whether sufficient demand exists to support the addition of new freight infrastructure and services in the Joliet Regional Port District. For each scenario setup, commodity groups that typically use a proposed logistics solution are loaded into the model. Each scenario setup establishes assumptions about variables such as:

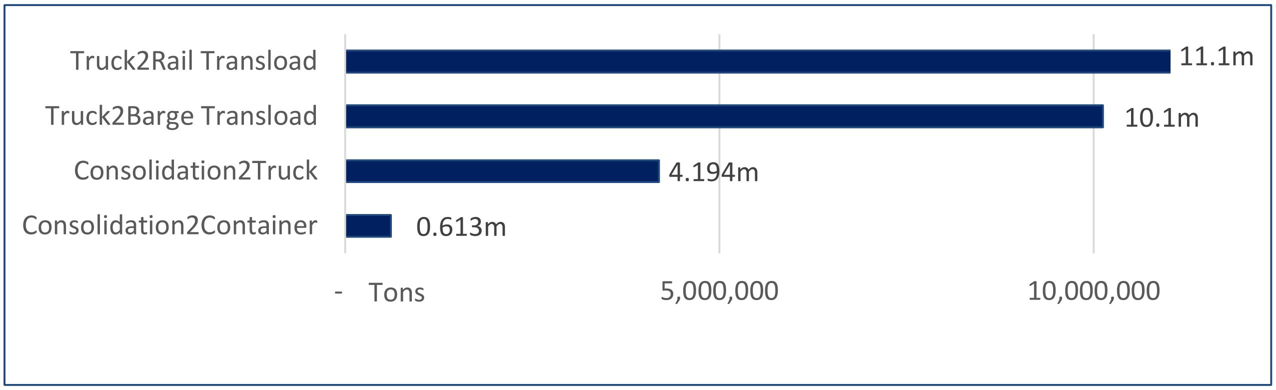
- Average shipment weight
- Modal cost per ton transportation charges
- Drayage distance
- Drayage charges
- Accessorial or handling charges

Each scenario examines the total cost shippers pay for existing modes, i.e., truck expenditure to move the volume of commodities in each scenario. The model is then run assuming new infrastructure is introduced. Using machine learning, the model examines all ways the new modal service could satisfy existing transportation demands at lower costs. The model also disregards commodity volumes that fail to meet a minimum threshold of cost savings for each commodity/market mix.

The bar chart in Exhibit 13 shows the high-level results from the four *what-if* scenarios run using JRSCOM. Overall, moving additional freight from truck to rail via transload operations comes out as the top volume opportunity, followed closely by truck to barge transload. The chart suggests that over 20 million tons of freight could transition to either rail or barge through additional transloading. An additional five million tons could potentially be transported more cost effectively through cross-dock consolidation.

The primary reason for rail exhibiting a higher transload opportunity than barges is the greater extent of the rail network and its ability to reach more domestic markets than the inland waterway network via connections to the Illinois River. In either case, transload facilities provide the infrastructure needed to transfer the linehaul portion of freight movements from highways to rail or barge.

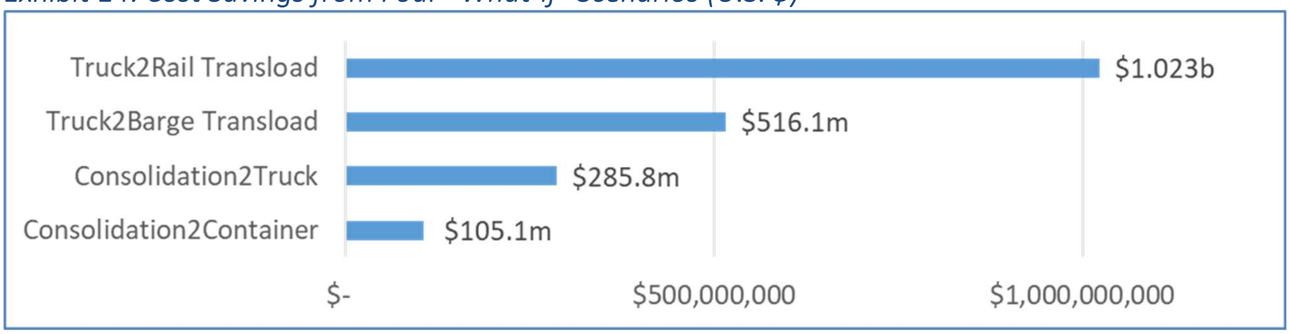
Exhibit 13: Summary of Opportunity Volume from Four "What-if" Scenarios (tons)



Source: Quetica

Exhibit 14 displays the cost savings opportunity associated with each of the four *what-if* scenarios. With Joliet hosting the largest inland port rail complex in North America, the results showing more than $1.02 billion in potential cost saving opportunities associated with truck-to-rail transloading are not surprising. The second largest opportunity to convert more long-haul truck freight to a less costly, more efficient mode results from truck to barge transload operations. The potential volumes and cost savings from consolidation facilities are far less than transload opportunities; however, combining the two consolidation scenarios could provide savings approaching $400 million per year.

Exhibit 14: Cost Savings from Four "What-if" Scenarios (U.S. $)

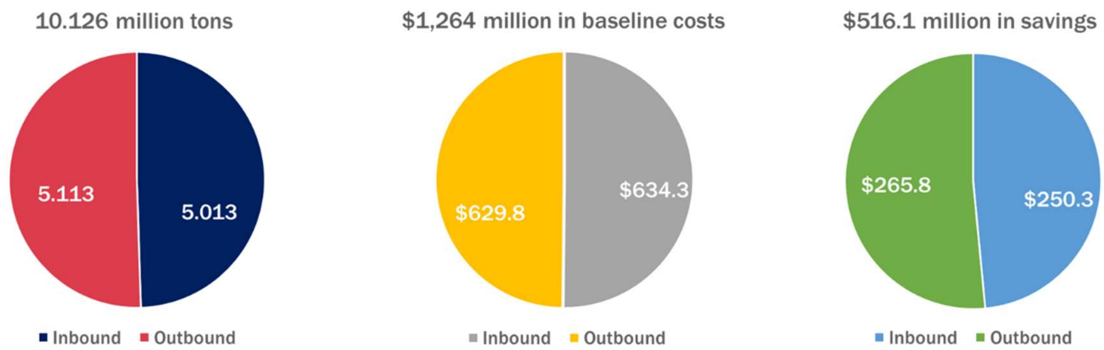


Source: Quetica

Truck to Barge Transload Scenario

The truck to barge transload scenario results provide insights about the products, key trade lanes and markets that would benefit most from additional truck to barge transload services in the region. The JRSCOM truck to barge transload scenario identified over 10 million tons of freight per year, or more than 500,000 truck trips, which would benefit Joliet shippers with lower transportation costs by incorporating a truck to barge transload service within their supply chains (Exhibit 15). Transportation cost savings for these freight movements, which currently move by truck at a total baseline cost of $1.264 billion, total $516 million.

Exhibit 15: Truck to Barge Transload Overall Results



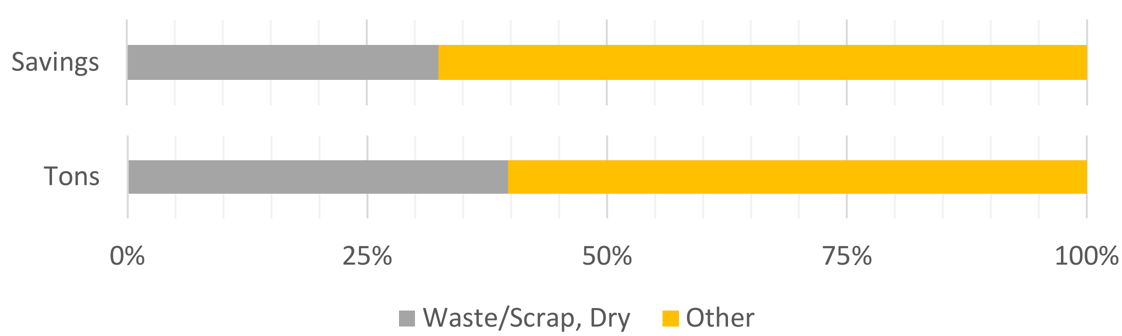
Source: Quetica

The JRSCOM found 2.63 million tons of freight moving between the Joliet region and Michigan would offer shippers potential cost savings of $125.8 million annually, equating to a 41 percent reduction in shipping costs. Michigan represents roughly one-quarter of the total potential volume and cost savings opportunities identified by JRSCOM. However, outbound volumes from the Joliet region to Michigan exceed inbound volume more than two to one, resulting in significant imbalance in the Joliet/Michigan trade lane.

Wisconsin is the second largest potential market with 1.02 million tons more evenly split between inbound and outbound demand, with a ratio of 1.3 to 1.0. The states of Ohio, Missouri, Texas, and Iowa all represent potential barge markets exceeding 500,000 tons per year. Commodity movements to the "Rest of Illinois" from the Joliet Region equals 476,087 tons; however, all the volume to the Rest of Illinois is moving in a single direction outbound from Joliet. After Michigan, the biggest cost saving opportunities are Gulf Coast destinations including the states of Texas and Louisiana.

From a commodity market perspective *Waste/Scrap* represents the largest opportunity at nearly 4.02 million tons with potential savings of $167.8 million and an average length of haul if 403 miles. Four million tons equates to approximately 223,000 truck trips and 2,300 additional barges annually. Of the total opportunity, Waste/Scrap alone accounts for roughly 40 percent of the volume and 33 percent of the projected savings (Exhibit 16).

Exhibit 16: Truck to Barge Transload Top Commodity

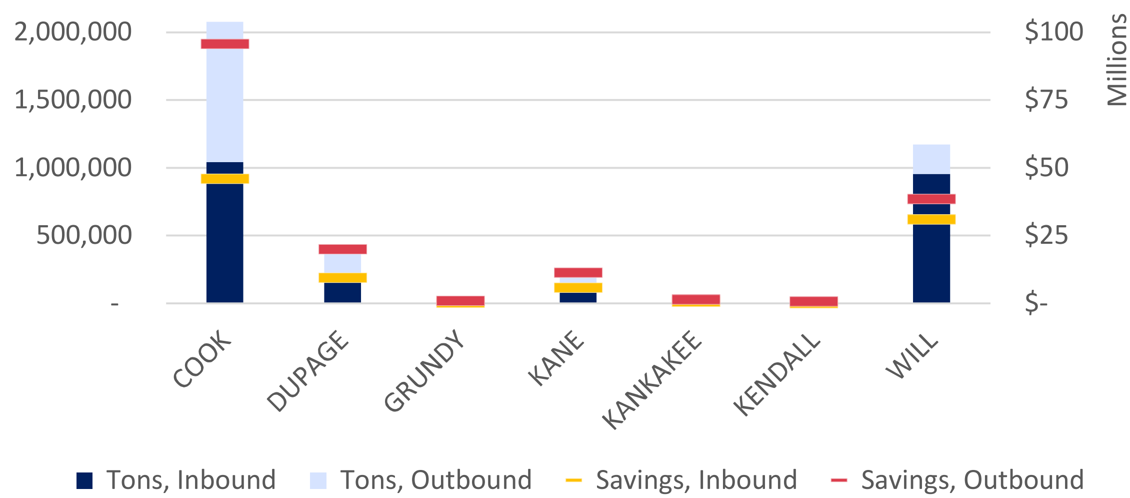


Source: Quetica

While liquid Chemical Products ranked as the second highest opportunity by volume with roughly 890,000 tons with $35.5 million in associated transportation cost savings, dry commodities represent 88 percent of the optimized volumes and 91 percent of the savings. Other top commodities included 745,500 tons of Plastics/rubber with $41.6 million in cost savings, 621,400 tons of and $36 million from Chemical Products, 583,000 tons of and $35.6 million from base metals, 514,300 tons of and $26.3 from Gravel, and 508,600 tons of and $30.9 million from Articles-base metal, and more.

Most optimized flows of *Waste/Scrap* originate or terminate within the region from Cook or Will County (Exhibit 17). Roughly 2.1 million tons with potential savings of more than $95.6 million are associated with Cook County, while 1.17 million tons and $38.5 million in savings are associated with Will County.

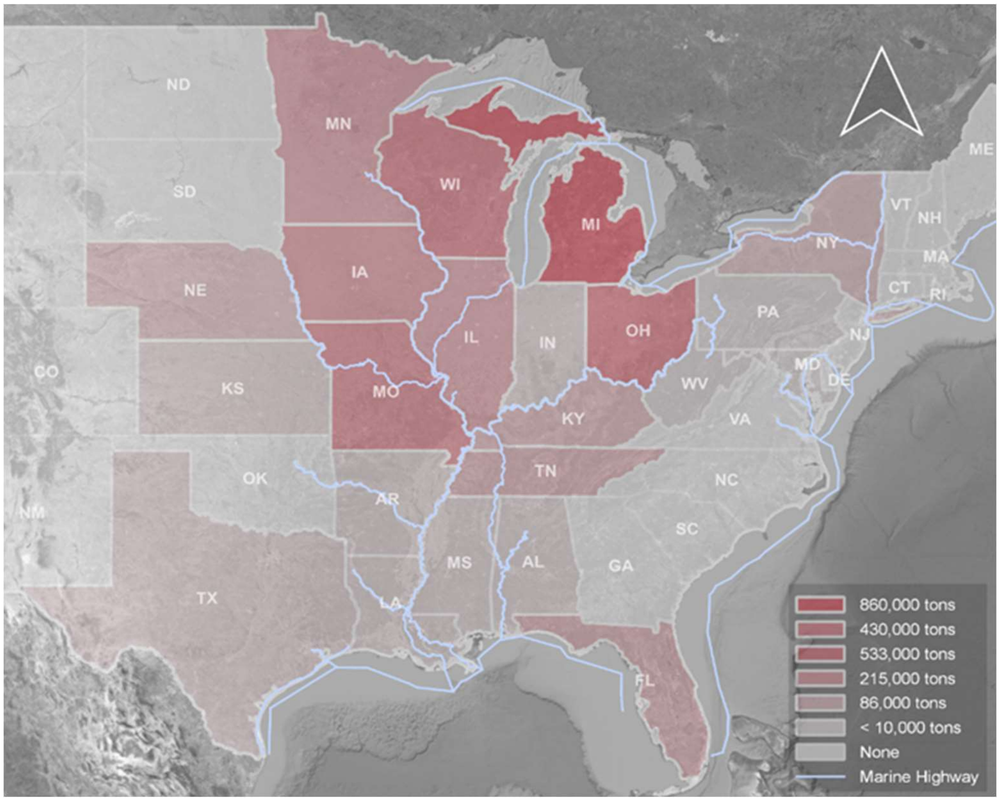
Exhibit 17: Truck to Barge Transload Dry Waste/Scrap Regional Origins and Destinations



Source: Quetica

The state of Michigan was identified as the top potential trade partner for the truck to barge transload of dry Waste/scrap products with 859,000 tons (Exhibit 18). These flows are balanced with outbound flows slightly higher at 434,900 tons versus 424,400 tons of inbound flows. The optimized cost savings total is $32.56 million. Ohio, Wisconsin, and Missouri were the next top trade partners with 533,000 tons, 503,000 tons and 435,000 tons respectively. However, the flows of *Waste/Scrap* to and from these states are not balanced like the flows with Michigan: 87 percent of flows with Ohio are outbound from the region while 71 percent with Wisconsin and 77 percent with Missouri are inbound into the region.

Exhibit 18: Truck to Barge Transload Dry Waste/Scrap National Origins and Destinations

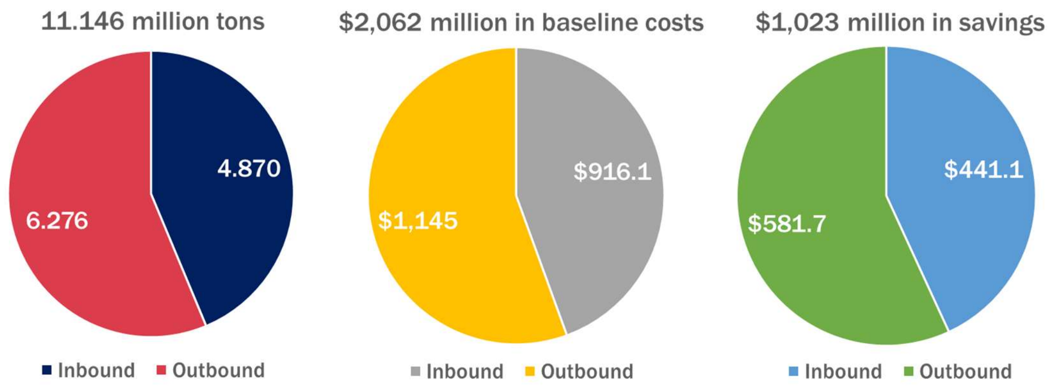


Source: Quetica

In terms of the 890,000 tons of liquid *Chemical Products* and $35.5 million in potential savings, Michigan is also the top opportunity with volumes totaling 164,000 tons providing total savings of $3.655 million. Illinois was the second ranked opportunity with nearly 110,000 tons. Shipments between the JRPD region and states further south, such as Louisiana, Texas, and Tennessee, also provide opportunities for truck to barge transloading with potential volumes all exceeding 70,000 tons on an annual basis.

The JRSCOM truck to rail transload scenario identified more than 11 million tons of freight that would lower transportation costs for regional shippers by incorporating truck to rail transload operations in their supply chains (Exhibit 19). Total flow volumes are split 1.3 to one, with inbound flows totaling 6.276 million tons and outbound flows of 4.87 million tons. The existing use of trucks to move this freight represents a total baseline cost of $2.062 billion dollars. Incorporating trucks to rail transload under an optimized supply chain to move the same freight would reduce costs to shippers by half, or $1.023 billion. Dry commodities account for 88 percent of the total volumes and 92 percent of the total cost savings.

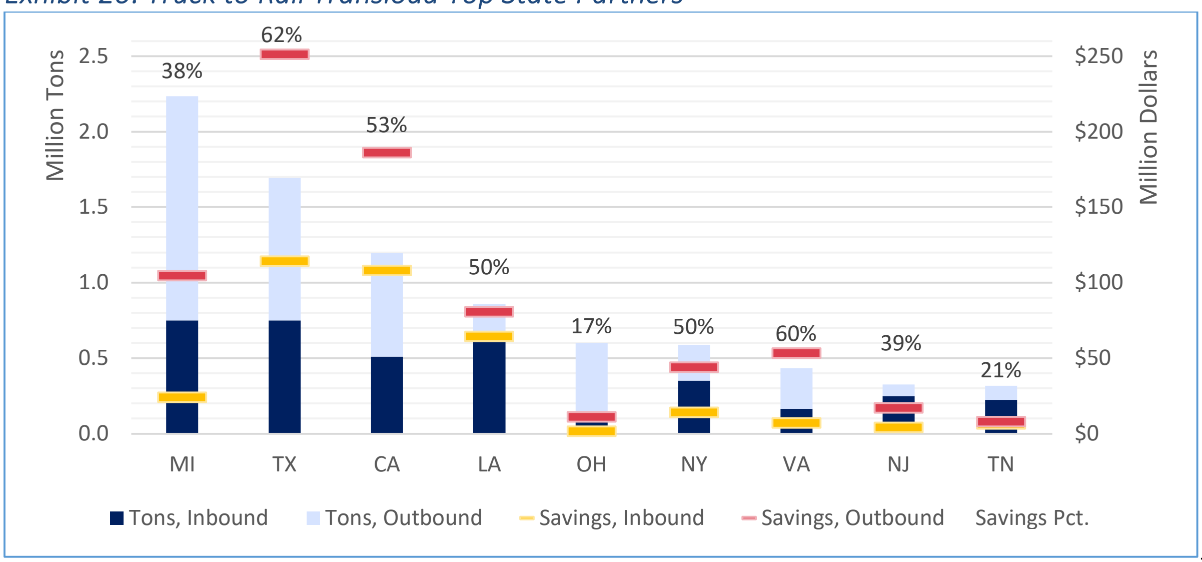
Exhibit 19: Truck to Rail Transload Overall Results



Source: Quetica

Optimized flows utilizing a truck to rail transload between the Joliet region and Michigan total 2.23 million tons, the equivalent of 27,630 railcars, and represent potential cost savings of $104.5 million to shippers, a 38 percent reduction (Exhibit 20). These flows account for 20 percent of the total optimized volume opportunity and 10 percent of the cost savings. Flows between the JRPD region and Michigan favor outbound flows over inbound flows by almost two to one. The scenario identified Texas as having the second highest optimized volumes with nearly 1.694 million tons and the largest opportunity for cost savings with more than $251 million, a potential reduction of 62 percent. Flows between the JRPD region and Texas are modestly balanced in terms of flow direction with 945,000 tons of outbound flows and 749,000 tons of inbound flows. Large opportunities also exist with freight shipments headed to and coming from California with a total of 1.2 million tons and $186 million in cost savings, a 53 percent reduction.

Exhibit 20: Truck to Rail Transload Top State Partners

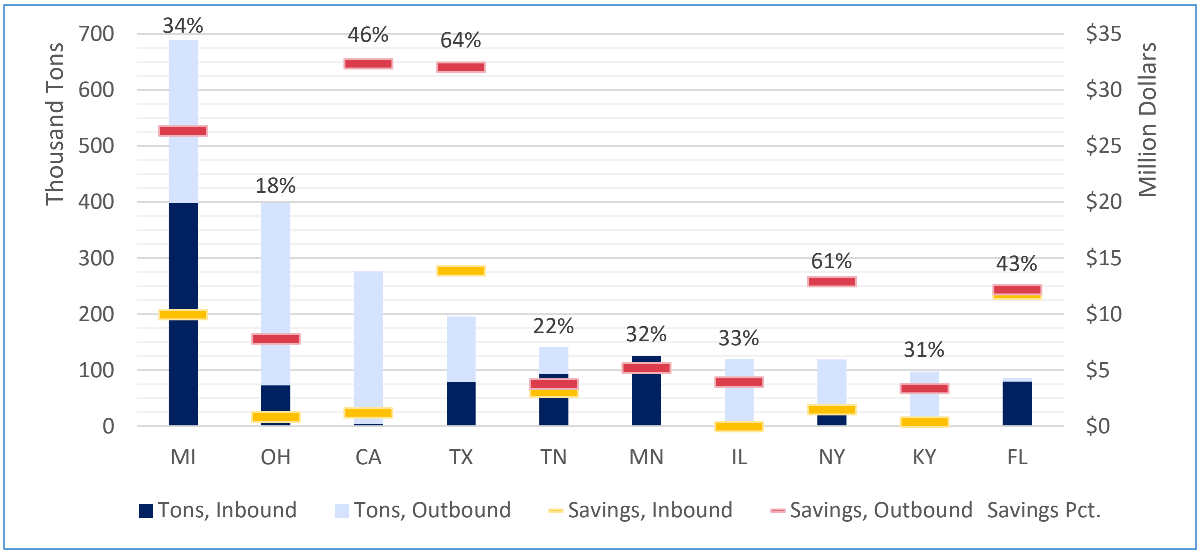


Source: Quetica

Like the truck to barge scenario, the movement of dry *Waste/Scrap* products is the top commodity opportunity identified by the JRSCOM for truck to rail transload with a total of three million tons and $205 million in cost savings. It is important to note that the volumes identified under this scenario do not overlap with the truck to barge scenario. The three million tons identified in this scenario would fill approximately 36,000 railcars on an annual basis. Michigan was again the top trade partner by volume with 688,795 tons with associated transportation cost savings totaling $26.4 million representing a 34 percent reduction

(Exhibit 21). California and Texas represent the largest opportunity in terms of transportation cost savings with more than $32 million per year for each state.

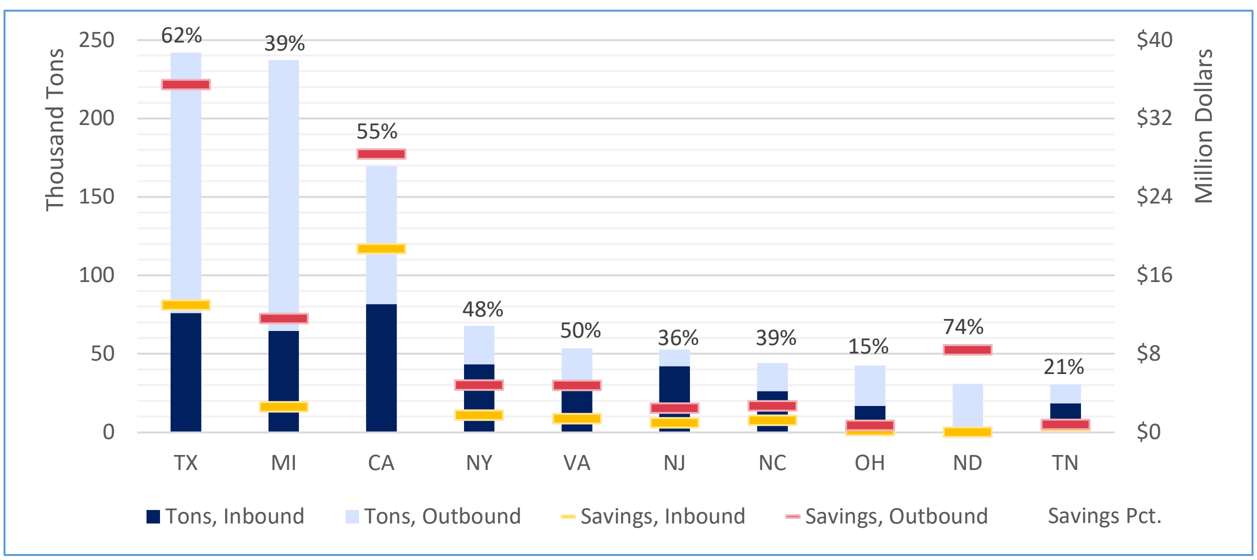
Exhibit 21: Truck to Rail Transload Waste/Scrap Top Trade Partners



Source: Quetica

The JRSCOM identified 1.187 million tons of dry *Plastics/rubber* products that could lower costs by more than $120 million for regional shippers. In addition, the model identified 61,783 tons and $3.734 million in savings for liquid *Plastics/rubber* products (Exhibit 22). Texas and Michigan were the top ranked states by volume of optimized *Plastics/rubber* product flows- both accounting for 19 percent. However, the associated transportation cost savings for Texas flows totals $35.4 million, while the savings for Michigan total $11.6 million due to the considerably shorter shipment distances. California flows represent regional shippers a $28.4 million transportation cost savings opportunity.

Exhibit 22: Truck to Rail Dry and Liquid Plastics/Rubber Products Top Trade Partners



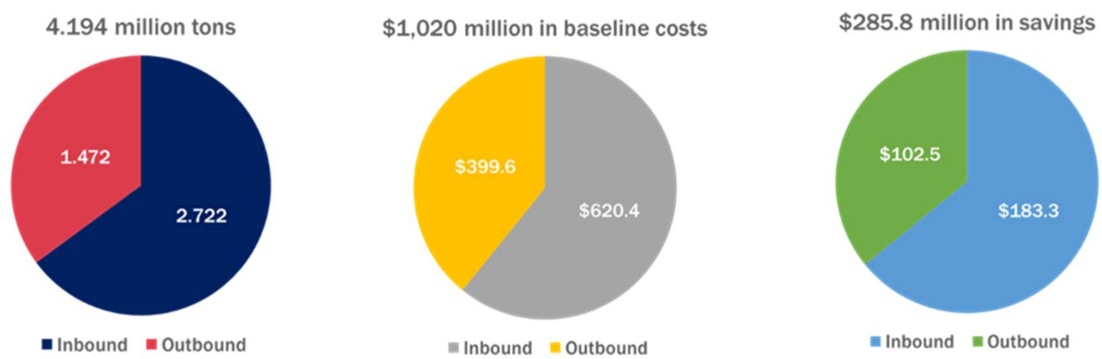
Source: Quetica

Beyond *Waste/scrap* and *Plastics/rubber* products, the model identified 900,000 tons of both liquid and dry Chemical products that could be optimized with cost savings totaling $57 million and $86 million, respectively. Other optimized freight movements include 840,000 tons of *Articles-base metal* with cost savings of $96.5 million; 776,000 tons of *Base metals* with $73.9 million in cost savings; 492,000 tons of *Animal feed* with $62.8 million in savings; and 475,000 tons of *Basic chemicals* with $57.7 million in savings.

Freight consolidation services using a cross-dock operation have become popular as a proven means of improving freight services while also reducing costs. Cross-dock consolidation facilities have grown in response to customer demands for higher velocity in supply chains. For example, many e-retail establishments promise next day delivery, resulting in more frequent smaller shipments. The Joliet Region currently has several cross-dock facilities serving more traditional manufacturing and retail sectors. And the data analysis suggests that excess capacity is very low for trucks serving manufacturing industries in electronics, automotive, and medical sectors. However, theJRSCOM and assembled data suggests that opportunities may exist to consolidate truck freight in several industries.

The JRSCOM partial truckload to full truckload consolidation scenario identified 4.2 million tons of freight that would benefit shippers by lowering costs if they were to incorporate a consolidation operation within their supply chains (Exhibit 23). The balance of flow volumes is tilted towards shipments headed into the JRPD region with 2.722 million tons inbound compared with 1.472 million tons leaving the region – a 1.85 to one ratio. Using partial truckloads to make deliveries under the current operations equates to a total baseline cost of $1.02 billion dollars. Under an optimized supply chain, the model estimates the same freight if consolidated would reduce shipping costs by 28 percent, or $285.8 million.

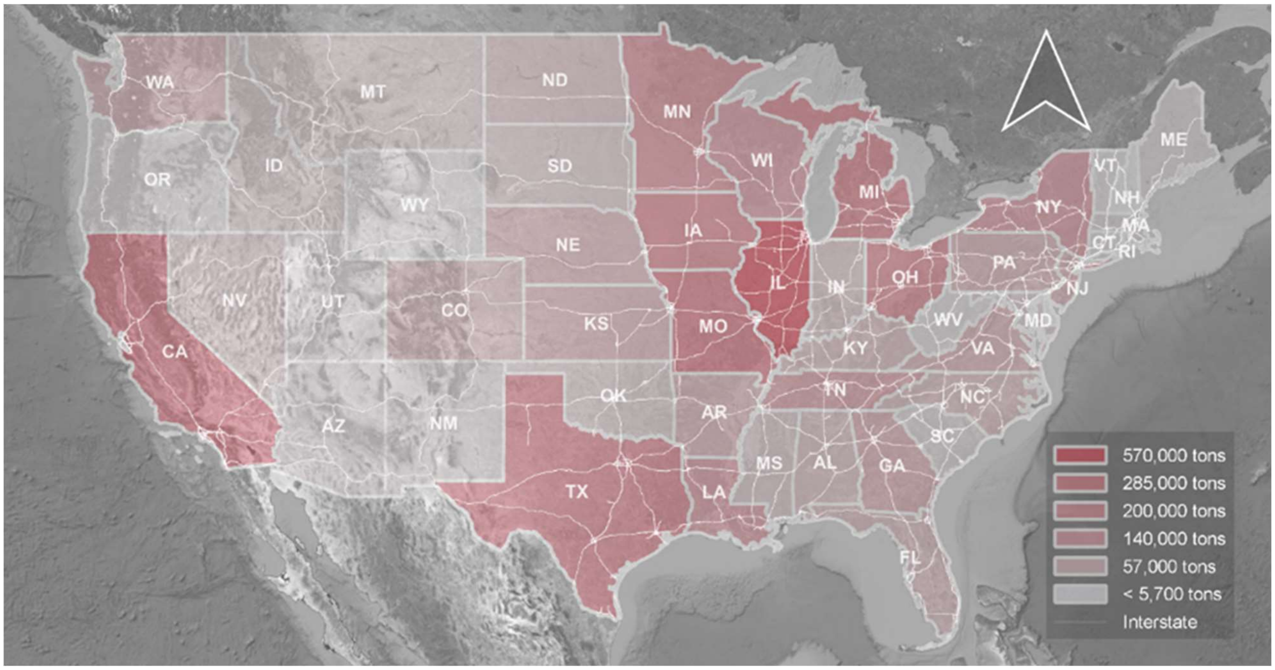
Exhibit 23: Partial Truckload to Full Truckload Consolidation Overall Results



Source: Quetica

Flows to and from areas outside of the JRPD region in Illinois represent the largest opportunity for partial truckload to full truckload consolidation with the volume totaling 570,000 tons and cost savings of $8.2 million (Exhibit 24). This tonnage equates to 31,700 full truckloads. Inbound flows to the region outnumber outbound flows from the region by more than five to one with 477,000 tons on inbound flows compared to 92,000 of outbound flows. The scenario identified California as having the second highest optimized volumes with 316,000 tons, 17,600 trucks, and the largest opportunity in terms of cost savings with nearly $52 million, a potential reduction of 36 percent. Besides Texas, with 263,000 tons and $23.8 million in cost savings, the remaining top opportunities are midwestern states including Missouri, Michigan, Iowa, Ohio, and Minnesota.

Exhibit 24: Partial Truckload to Full Truckload Consolidation Total Volumes

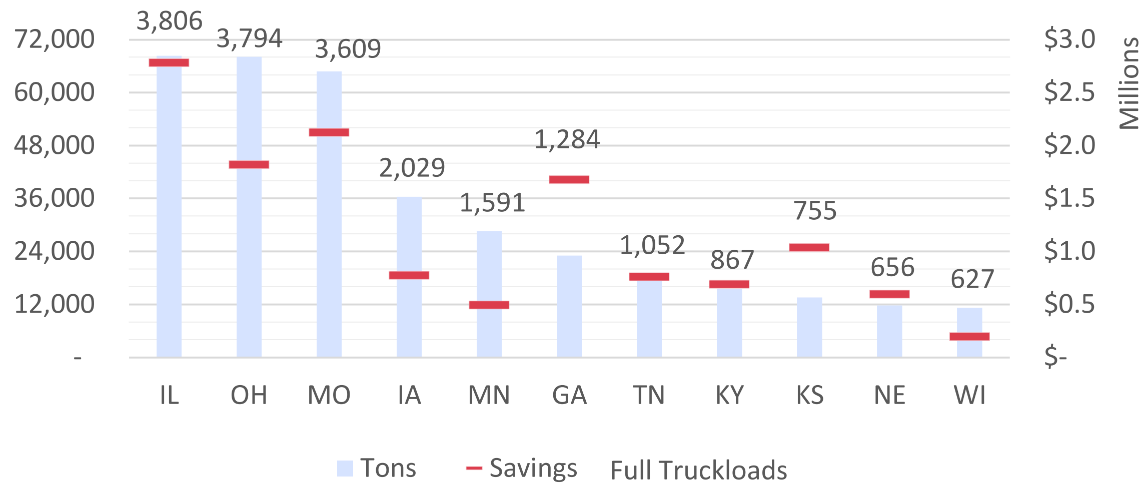


Source: Quetica

In terms of commodities, the top truck consolidation opportunity identified by JRSCOM was the movements of Mixed freight totaling 425,500 tons representing 23,700 truckloads and $18.6 million in potential cost savings to shippers. Waste/Scrap is the second largest opportunity with 311,400 tons, the equivalent of 17,350 truckloads, and $17.9 million in savings. *Other foodstuffs* were the third ranked opportunity totaling 154,000 tons and $12.7 million in savings. Other opportunities include 101,000 tons, or 5,630 full truckloads, of *Plastics/rubber* with an associated $9.6 million in savings and 80,600 tons of *Animal feed* representing cost savings of $6.76 million.

The JRSCOM identified a total of 201,200 tons of outbound Mixed freight leaving the JRPD region and headed to the states of Illinois, Ohio, and Missouri (Exhibit 25). The volume equates to more than 11,200 full truckloads and represents potential cost savings to regional shippers of $6.73 million. Volumes to other midwestern states such as Iowa, Minnesota, and Wisconsin represent an additional 76,000 tons, filling 4,250 truckloads, and $1.47 million in savings. Opportunities for outbound flows to southeastern states including Georgia, Tennessee, and Kentucky total 57,500 tons, 3,200 truckloads, and $3.1 million in savings to regional shippers.

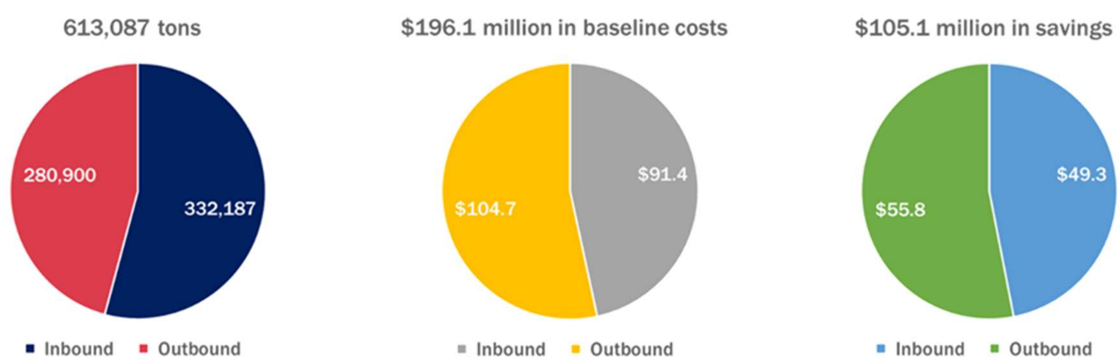
Exhibit 25: Partial Truckload to Full Truckload Consolidation of Outbound Mixed Freight



Source: Quetica

The JRSCOM partial truckload to full container consolidation scenario identified more than 613,000 tons of freight that would benefit shippers with lower costs if they were to incorporate a consolidation operation within their supply chains (Exhibit 26). The overall flow volumes are weighted towards shipments headed into the JRPD region with more than 332,000 tons compared with 280,900 tons leaving the region – a 1.18 to one ratio. Using partial truckloads to make deliveries under the current operations equates to a total baseline cost of $196.1 million dollars. However, under an optimized supply chain, the same freight flows would reduce costs to shippers by 54 percent, or $105.1 million.

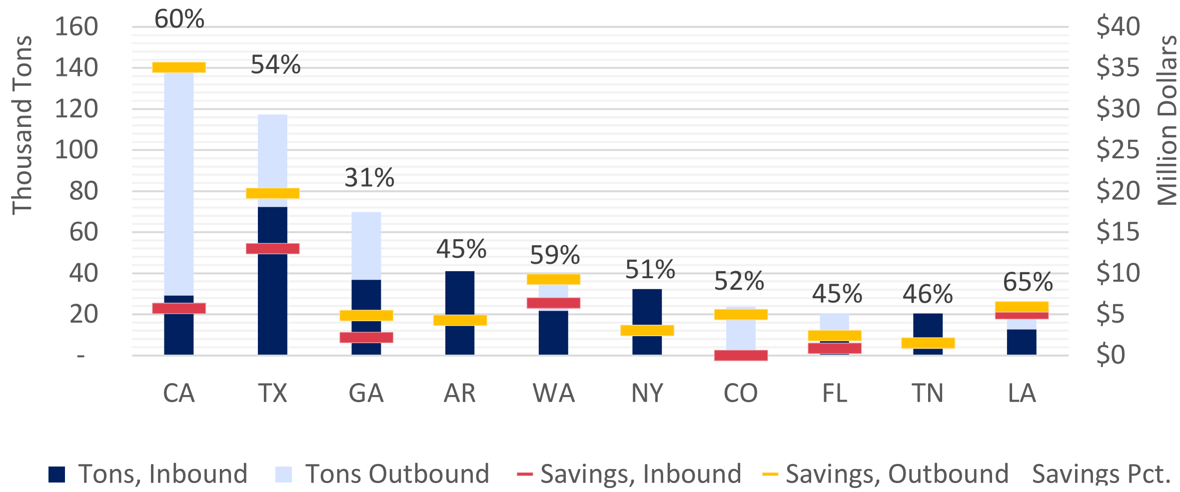
Exhibit 26: Partial Truckload to Full Container Consolidation Overall Results



Source: Quetica

Flows to and from California represent the largest opportunity by both volume and cost savings for the partial truckload to full container consolidation scenario with the volume totaling 141,600 tons and $35.1 million in cost savings (Exhibit 27). This tonnage equates to 7,900 full containers and a 60 percent savings in costs. Outbound flows from the region headed to California outweigh inbound flows to the region by more than 3.85 to one. Texas was found to have the second highest optimized volumes with 117,000 tons, and cost savings totaling more than $19.76 million, a potential reduction of 54 percent. Flows with Texas are more balanced compared to California with inbound flows outweighing outbound flows on a 1.6 to one ratio. The scenario identified 69,800 tons between the JRPD region and Georgia that equate to $4.88 million in cost savings to regional shippers.

Exhibit 27: Partial Truckload to Full Container Consolidation Top Trade Partners

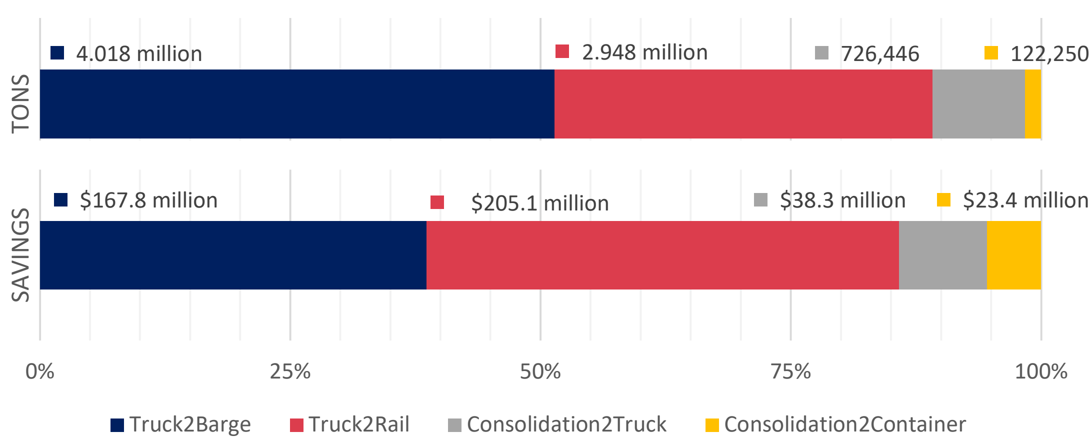


Source: Quetica

In terms of commodities, the top container consolidation opportunity identified by the JRSCOM was the movements of *Waste/scrap* totaling 122,250 tons representing 6,800 containers and $23.4 million in potential cost savings to shippers. The average length of haul for these movements is over 1,330 miles meaning the opportunity to reduce truck miles traveled totals more than 9 million miles. *Mixed freight* is the second largest opportunity with 84,000 tons and $10.8 million in savings. Consolidating into full containers would fill 4,680 containers and reduce truck miles traveled by 4.34 million due to an average length of haul of nearly 930 miles. Other top commodities include 60,570 tons and $9.96 million in cost savings of *Newsprint/paper*; *Other foodstuffs* with 58,520 tons and $10.3 million in cost savings; *Plastics/rubber* with 52,400 tons and $8.9 million in cost savings.

When the results from these four scenarios are examined by commodity, *Waste/scrap* is the region's biggest opportunity for further reducing freight costs with more than 7.8 million tons, primarily through transloading (Exhibit 28). These flows represent an opportunity to reduce transportation costs for regional shippers by more than $434 million per year.

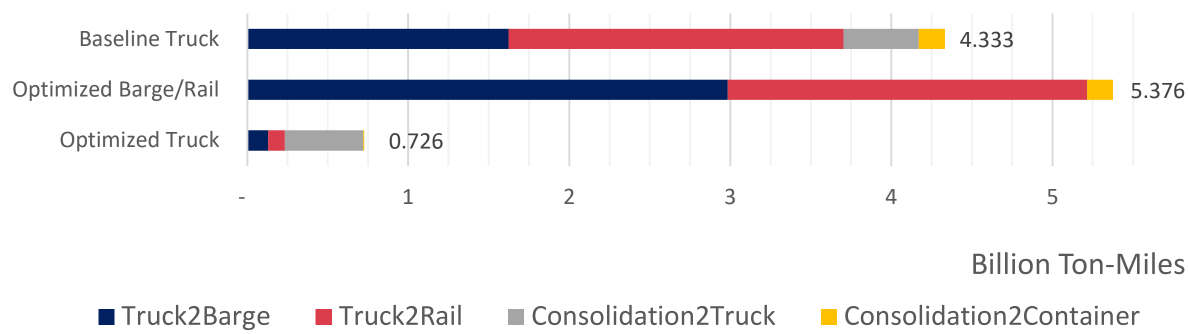
Exhibit 28: Total Waste/Scrap Opportunities Across All Four Scenarios



Source: Quetica

In 2020, the City of Chicago alone generated over four million tons of municipal solid waste.[25] In 2022, the eight county Chicago Metropolitan Area[26] generated nearly 10 million cubic yards (cy) of waste.[27] Currently, only about 10 percent of Chicago's municipal solid waste gets recycled, with the remainder going to landfills. The *Illinois Landfill Disposal Capacity Report* indicates the total remaining capacity in the Chicago Region is just 18.6 million cy, far less than many other regions in the state. In total, the opportunity for transporting the region's *Waste/Scrap* products more efficiently represent freight volumes approaching eight million tons (7.7 million) or the equivalent of approximately 425,000 truckloads annually (Exhibit 29). Based on the average lengths of haul, the JRSCOM estimates that shippers could reduce the total truck miles associated with *Waste/scrap* from 4.333 billion ton-miles to 726 million on an annual basis if all flows were to be optimized with the different scenarios. In its place would be 5.376 billion ton-miles utilizing the inland waterway and rail networks.

Exhibit 29: Modal Ton-Mile Comparison for Waste/Scrap Shipments



Source: Quetica

Phase 3: Development Opportunities and Recommendations Forward

Throughout the course of the effort to complete the Port District Master Plan, the need to balance additional freight generated economic activity with the negative externalities associated with those freight movements has been emphasized. In reviewing previous planning efforts and during the stakeholder outreach conducted as part of this master planning effort, a common theme emerged over community concerns about transportation related industrial development that would create more truck trips and more traffic congestion on already congested local roadways.

In response to the need to balance freight related economic activity and the associated negative externalities, the JRSCOM was used to run 'What if' scenarios that looked to move freight to modes other than the road network. Two of the top opportunities included expanded use of the inland waterways to move waste/scrap materials via barges and the consolidation of truck freight from less than full truckload to full truckload movements to improve asset utilization of trucks that are not fully loaded. Exhibit 30 compares the Total Market Opportunity (TMO) of the optimized results to the current baseline for those two scenarios in terms of volume, costs, and modal miles.

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[25] Delta Institute. City of Chicago Waste Strategy, Existing Conditions: Waste in Chicago. July 2021. Pg. 9.

[26] Illinois EPA Region 2 is made up of McHenry, Lake, DuPage, Cook, Kane, Kendall, Grundy and Will Counties.

[27] Illinois Environmental Protection Agency, *Illinois Landfill Disposal Capacity Report. June 2023.*

JRSCOM results show the TMO for the truck-to-barge transload of Waste/Scrap materials to be more than 4 million tons with savings to regional shippers totaling more than $167.7 million on an annual basis (Exhibit 30). Introducing a truck to barge transload and utilizing the inland waterways would reduce the total truck miles required to transport these materials from roughly 90.3 million under the baseline scenario to just 7.3 million in the optimization scenario. **Utilizing the Illinois/Des Plaines River/Chicago Sanitary and Ship Canal to move Waste/Scrap could reduce regional truck traffic by roughly 83 million miles, to be replaced by 41,261 miles of new barge traffic.**

Under the consolidation scenario for Mixed Freight, improving asset utilization for 1.263 million tons currently being transported in partial loads could reduce costs for regional shippers by nearly $48 million annually and reduce truck traffic by an additional 35 million miles.

Exhibit 30: Total Market Opportunity for Two What-if Scenario Results

Metric	Truck2Barge Waste/Scrap	Truck Consolidation Mixed Freight
Tons	4,018,392	1,263,147
Baseline Total Costs	$454,571,685	$218,073,734
Optimized Total Costs	$286,795,396	$170,188,436
Total Savings	$167,776,289	$47,885,299
Baseline Truck Miles	90,344,966	70,490,436
Optimized Truck Miles	7,335,941	35,426,858
Reduction in Truck Miles	83,009,025	35,063,578
Optimized Barge Miles	41,264	0

Source: Quetica

Business Case: Market Opportunities

Capturing the entire TMO is not a realistic assumption when making infrastructure investment decisions. Instead, a Market Capture Rate (MCR) based on similar real-world experiences is applied to the TMO to produce a more realistic and more fiscally conservative estimate of annual volumes and savings from the proposed network enhancement. MCRs can be based on a percentage of the entire TMO or based on a subset of the TMO related to specific trade lanes.

Exhibit 21 shows the estimated tonnage, cost savings to regional shippers, and modal miles using 10 and 15 percent MCRs. In other words, if expanded transloading services in the Joliet region captured just 10 percent of the existing truckload movements of Waste/Scrap, it would result in roughly 401,839 additional tons moving by barge, enough to fill 268 barges and save regional shippers more than $16.7 million in transportation costs annually. In addition to the reduction in transportation costs, the transloading of Waste/Scrap materials would replace roughly 8.3 million truck miles with 4,126 barge miles. A 15 percent MCR equates to 602,759 tons, transportation cost savings of more than $25.1 million, and the replacement of more than 12.4 million truck miles with 6,190 barge miles.

A full business case was developed as part of this master planning effort for a truck-to-barge transload operation moving metal waste products into and out of the Joliet region (Appendix X). In addition to the market opportunities, the business case quantifies and monetizes public benefit estimates from the reduction in truck miles traveled such as the reduction in truck related traffic accidents and reductions in emissions. The business case also provides sketch-level engineering cost estimates related to site preparation, permitting, construction, and equipment costs. The benefits and costs are then combined to produce a benefit-cost analysis (BCA) in a format suitable for federal and state funding applications and an estimated return on investment (ROI) metric, or the payback period for the proposed project, often preferred by the private sector financing or investment.

Exhibit 21: Business Case Market Opportunities for Truck-to-Barge Transload of Waste/Scrap

Metric	Market Capture Rate (MCR)	
	10 Percent	15 Percent
Tons	401,839	602,759
Baseline Total Costs	$45,457,168	$68,185,753
Optimized Total Costs	$28,679,540	$43,019,309
Total Savings	$16,777,629	$25,166,443
Baseline Truck Miles	9,034,497	13,551,745
Optimized Truck Miles	733,594	1,100,391
Reduction in Truck Miles	8,300,903	12,451,354
Optimized Barge Miles	4,126	6,190

Source: Quetica

Exhibit 32 shows the estimated tonnage, cost savings to regional shippers, and truck mile reduction for the consolidation of only outbound truck shipments of Mixed freight using 20 and 30 percent MCRs. In other words, if expanded truck consolidation services in the Joliet region were provided, it is estimated that between 171,265 and 256,897 tons of Mixed Freight would be captured and provide transportation cost savings ranging from nearly $5.1 million to $7.6 million annually. The increased utilization of truck capacity would result in the reduction of truck miles between 4.2 and 6.3 million.

Exhibit 32: Business Case Market Opportunities for Truck Consolidation of Outbound Mixed Freight

Metric	Market Capture Rate (MCR)	
	20 Percent	30 Percent
Tons	171,265	256,897
Baseline Total Costs	$27,579,449	$41,369,173
Optimized Total Costs	$22,491,458	$33,737,187
Total Savings	$5,087,991	$7,631,986
Baseline Truck Miles	8,550,153	12,825,229
Optimized Truck Miles	4,335,945	6,503,918
Reduction in Truck Miles	4,214,207	6,321,311

Source: Quetica

GKM WI TEU Platform – Freight Consolidation Facility

The Fox Valley Region of northeastern Wisconsin is a hub for industrial manufacturing. In 2001, the Canadian National purchased regional rail carrier, Wisconsin Central and promptly closed two intermodal terminals serving the Fox Valley Region. The loss of local rail services required Fox Valley shippers to truck shipments between northeast Wisconsin and Chicago rail yards. To improve access to intermodal services, GKM Wisconsin Global Supply Chain LLC, created the WI Circuitous Platform to improve the flow of containerized freight into and out of CIC Joliet Elwood.

The Platform improves efficiencies by "reversing the origin" and places shippers close to intermodal ramps, giving companies more control over costs. For example, before the GKM facility opened Fox Valley companies would dispatch a truck from northeast Wisconsin to pick-up a container at a Chicago intermodal yard, dray it back to Wisconsin to be unloaded, and then return the empty container to Chicago. Now, a truck is dispatched locally from the consolidation center in Joliet to the yard, the container is brought to the consolidation center, emptied, and returned to the yard. Being closer to the intermodal ramps also allows containers to be recovered during off-peak hours when congestion is low, avoiding demurrage and detention fees. Shipments between the consolidation center and northeast Wisconsin can also begin or end during off-peak hours to reduce congestion, ensure daily line hauls will depart and arrive on schedule, and ensure drivers adhere to hours-of-service regulations.

The Wisconsin Platform has served multiple shippers in the Fox Valley allowing for partial shipments to be combined. Data analytics are used to track performance improving inventory management and asset utilization and reducing truck miles traveled. To meet the various business needs, the Platform offers additional logistical services such as kitting (creating a kit by putting multiple products in a single box or container) and light assembly. The Platform has been successfully servicing Wisconsin-based importers and exporters through the largest inland port in North America for 10 years and recently announced the expansion of the Platform to include importers and exporters across the Midwest, including Kansas, Michigan, Missouri, Illinois, Iowa, Indiana, Kentucky, Minnesota, Ohio, and Tennessee.

JRPD Development Parcel Property Mapping

Designing and constructing port terminals are major investments as every site has its own challenges and barriers. Based on feedback received during meetings with community leaders, a multi-factor parcel evaluation process was undertaken to assist the JRPD to evaluate, and rank parcel groups based on their shovel-readiness.

At the outset of the Port Master Plan the number of parcels identified in JRPD boundaries was 548. In an early step of the parcel inventory process, to make the inventory manageable, discrete parcels belonging to a single entity were joined or dissolved into 134 aggregated parcels.

When meeting with city and county representatives, the 134 aggregated parcels were presented for feedback. Feedback from city and county representatives, along with a high-level evaluation of transportation and utility resources, resulted in 17 parcels being identified as "high priority" areas for potential terminal facilities. During the subsequent multi-factor analysis described below, the total number of high-priority parcels was decreased to 15, due to the same parcels being identified by multiple jurisdictions.

Multifactor Parcel Evaluation

Various factors can be considered when determining parcels' shovel readiness. The evaluation criteria categories were identified based on readily available public data and focused on resources/features that would need to be addressed if the parcel group was to be developed at a high-level; a desktop review was completed and further review and analysis are recommended to determine specific impacts (i.e., wetland delineation, geotechnical analysis, surveying, etc.). The following evaluation categories were identified to determine the optimal potential sites:

- Presence of existing structure
- Area under the 100-year floodplain
- Wetland
- Soil composition
- Land ownership
- Rail spur access
- Parks/Open space
- Presence of public utilities
- Other considerations - existing and future land uses/developments, proximity to residential areas, presence of brownfield sites.

Most evaluation criteria categories were assigned a score based on a scale between one *and* five – with one being the least desirable and five being the most desirable. A few categories were given a score of either one *or* five, (equating to yes or no). Parcel groups received an overall score by summing up the individual category scores; maximum score of 30 was possible for each parcel group. Exhibit 33 provides a summary of the scoring ranges for each of the quantitative evaluation categories. Additional explanations of each category are provided below the table.

Exhibit 33: Criteria Applied to JRPD Parcel Scoring

Scoring 1 to 5	Percent area available w/o structures	Percent of area outside of FEMA designation	Percent area less wetlands	Proximity to Rail	Soil drainage (1 or 5)	Presence of park (1 or 5)
5	100%	91-100%	100%	< 0.1 mile to a spur line	Well-drained	Absence of Park
4	91-100%	81 to 90%	91-100%	< 0.5 mile		
3	81 to 90%	71 to 80%	75 to 90%	0.5 to 1 mile		
2	71 to 80%	61 to 70%	60 to 75%	>1 mile		
1	< 70%	< 60%	< 60%	Rail access issues	Poorly drained	Presence of Park

Source: Stantec

Presence of an existing structure: Presence of an existing structure can hinder the development of a parcel as the existing structures may not be suited for the proposed development. Demolition and decommissioning of existing infrastructure such as water, sewer, gas and electricity are additional costs that would need to be considered for developers. For the selected 15 parcel groups, the existing structures ranged from industrial facilities such as storage tanks to buildings used for maintenance and operation. The most desirable parcel groups are those that do not have any existing structures, while the least desirable parcels have more than 30 percent of the parcel area occupied by existing structures.

100-Year Floodplain: Parcel groups located within the 100-year floodplain are susceptible to environmental and safety hazard, especially with frequent flooding experienced by communities nationwide along bodies of water. The Federal Emergency Management Agency (FEMA) recommends verifying the type of flood zone in the parcel with the local Floodplain Administrator (FPA). This involves coordination with both FEMA and FPA and occurs before construction. Getting approval from FEMA is essential to understand the impact of construction and sustainability of developments in the flood plain. This incurs additional cost such as purchasing flood insurance known as the Increased Cost of Compliance (ICC) coverage for construction that is anticipated to have substantial damage due to flooding (NATIONAL FLOOD INSURANCE PROGRAM, n.d.)and additional compliance during construction. The FEMA maps are updated regularly, and it is important to keep track of the latest updates. Any changes in the flood zones influences flood insurance costs (Substantial Improvement / Substantial Damage Desk Reference, n.d.).

Wetlands: Defined as areas where soil is covered by water or present near a water surface either permanently or during varying periods of the year. The presence of wetland hinders the ideal development of the parcel and might require additional permits at local, state, and/or federal levels.

The appropriate agencies such as U.S. Fish and Wildlife Service and Illinois Department of Natural Resources, U.S. Army Corps of Engineers, the Office of Water Resources, and Environmental Protection Agency need to be contacted to seek approval whenever impacts to wetlands are anticipated. Typically, construction near a wetland also requires local authorization; and sanitary sewer and water mains typically also require additional permitting and mitigation efforts.

Parcel groups were ranked from most desirable to least desirable based on wetland coverage within the area –lower scores were given to parcel groups with higher percentage of wetland coverage.

Soil Composition: The type of soil often reveals existing conditions on the site such as groundwater presence, soil conditions, drainage patterns, etc. Soil type has the potential to anticipate the bearing capacity of structures, influencing the type of construction and materials used for development and construction cost (i.e., ground stabilization, fillings etc.).

Parcel groups were assigned a score of five if the soil type is well-drained and one if the soil type is poorly drained. This is not a comprehensive geotechnical analysis and should be regarded as parameters that can provide a high-level insight on constructability of infrastructure on these parcels.

Proximity to Rail: Having rail access has many benefits: transportation of large amounts of goods, reduce greenhouse gas emissions, alleviate roadway congestion, etc. While proximity to a rail line is considered an advantage, railroads are exclusively owned by private companies. Negotiating easements and right-of-way acquisitions with railroad companies can be challenging. Recognizing that the presence of any railroad will be a challenge, scoring was solely based on the parcel's proximity to a rail line in the event future developers would like to explore access to the railroad.

Parcel groups that were located closer to the railroad were given higher scores as they would have better access, if interested. However, this is all under the assumption that the future developer would be interested in initiating conversations with the railroad companies of potential rail access. The scores could be reversed if the proximity to rail is deemed a disadvantage.

Parks/Open Space: Public green spaces owned by local, regional, and state entities and usually reserved for public recreational activities. Parks and open spaces are protected under federal law and require much coordination with the appropriate agencies when there are anticipated impacts; similar to wetland impacts, any impacts to parks will need to be mitigated through replacement.

Using a parcel that is partially or completely designated as a park requires evaluation of constructive usage of the property and additional right-of-way acquisition. Any parcel groups that are occupied partially or completely by a park is not preferred and ranked the lowest (one). All other parcels were ranked five.

Other Considerations: Several additional factors were reviewed at a cursory level, including:

- *Public Utilities:* The presence of existing public utilities such as water, sewer, electricity and natural gas is beneficial because it reduces future costs for developers. Further utility reviews are recommended as a project moves forward.
- *Brownfield sites:* Brownfields can pose formidable barriers for future development, as significant resources may be required for cleanup. There are also legal and procedural steps involved in cleaning up brownfield sites that can result in delays. Liability remains a concern even after a site cleanup due to apprehensions surrounding brownfield sites. (A list of JRPD brownfield sites is included in Appendix B).
- *Proximity to Neighborhoods:* Opposition from neighborhood organizations and current residents are anticipated with certain types of developments due to potential increase in congestion, traffic noise, loss of aesthetics, alteration to the neighborhood, etc. There are also agricultural lands present less than half-a-mile from the proposed sites that may need to be addressed if impacted.

Parcel Scoring Results

Upon completion of the evaluation criteria, scores ranged from 27 to 12. Based on the scores, parcels were tiered into three categories: parcel groups with scores between 30-24 were categorized as Tier 1; parcel groups with scores between 23-21 were categorized as Tier 2; and parcel groups with scores below 20 were categorized as Tier 3. There is a total of five parcel groups identified as Tier 1, five parcel groups identified as Tier 2, and five parcel groups identified as Tier 3. The scoring rank of the 15 JRPD river adjacent parcel groups is provided in Exhibit 34.

Exhibit 34: JRPD Parcel Group Scoring

Rank	Parcel Owner	Parcel size (acres)	Structure Coverage Score	FEMA Score	Wetland Score	Park Presence	Park Score	Soil Score	Rail Access Score	Road Access	Public Utilities	Total Parcel Group	Tier
1	Walker Phoenix LP	10	4	5	3	No	5	5	5	Yes-Improved	Water, Sewer, Electricity, Natural Gas	27	Tier 1
2	Oil Tanking Joliet LLC	456	5	5	2	No	5	5	4	No issues	No sewer or water	26	Tier 1
3	Alpont Realty	86	3	5	3	No	5	5	4	No issues	No sewer or water	25	Tier 1
4	Chevron Environmental Inc	202	5	3	3	No	5	5	4	None	None	25	Tier 1
5	City of Lockport	238	5	4	4	No	5	5	1	2nd Street	Water/Sewer	24	Tier 1
6	Illinois Marine Towing Inc	18	5	3	4	No	5	5	1	Access on west edge of property	No sewer or water	23	Tier 2
7	Imtt Lemont	73	2	5	4	No	5	1	5	No issues	No sewer or water	22	Tier 2
8	DDP Spclty Elect Mtrls US Inc	135	4	5	3	No	5	1	3	No issues	No sewer or water	21	Tier 2
9	Hoffman Rail Distrb Center LLC	41	5	5	3	No	5	1	2	No issues	No sewer or water	21	Tier 2
10	Ineos Nova LLC	104	3	5	4	No	5	1	3	No issues	No sewer or water	21	Tier 2
11	Exxon Mobil Oil Corp	149	5	5	3	No	5	1	1	Access on north and west edge	Access to municipal water and sewer at north edge of property	20	Tier 3
12	Dow Chemical	102	3	4	3	No	5	1	4	No issues	No sewer or water	20	Tier 3
13	LC USA LLC	96	1	4	3	No	5	1	4	No issues	No sewer or water	18	Tier 3
14	PDV Midwest Refining	132	4	1	3	No	5	1	4	None	None	18	Tier 3
15	Metro Water Recl Dist	775	4	1	1	Yes	1	1	4	Access to New Ave via Cico Rd	Lemont water & sewer adjacent; approx 500 feet to east.	12	Tier 3

Conclusions and Recommendations

The MRS, including the Illinois River, is a vital conduit for the nation's grain exports – About 60 percent of all U.S. grain exports are barged down the Mississippi River to port facilities in the Gulf of Mexico. And, while corn and soybeans are the largest volume of commodities moving by barge at the confluence of the Illinois and Mississippi Rivers, at the Lockport lock and dam near Joliet, petroleum and aggregates are the top commodity volumes. In this regard, the Illinois and Des Plaines Rivers are also vital resources for the Joliet Region. Current barge traffic in the JRPD boundaries displaces over one-half million truck trips in the region annually.

Trucks contributing to more congestion is a top concern among citizens in the Joliet Region – The CenterPoint Intermodal Center (CIC) in Joliet and Elwood; "*North America's largest master-planned inland port*" moves over 20 million tons of intermodal cargoes by rail annually, but all that volume comes into or goes out of the region by truck. During study outreach with local governments, representatives repeatedly noted that citizens were increasingly concerned about future industrial development that would create more truck traffic on regional road networks. To help address traffic congestion concerns, the study team asked local governments to identify river parcels deemed appropriate for future industrial development, as well as those considered "off-limits."

Among some of the key finding from the data analysis, stakeholder outreach and desk research:

- Climate impacts – A 2023 study analyzed five decades of data about the volume of goods moving through the MRS (including the Illinois River). The study found that high and low water events are making navigation less reliable: "*Overall, we observe more fragmentation of the navigable periods, with losses of more than a month and halving the annual duration of free navigation days in some stretches of the river.*"[28] Despite the variation in navigational periods, the authors noted the volume of cargo moved through the river has remained stable.
- Volatile price swings – During interviews with barge operators and shippers for the Port Master Plan, several noted extreme high barge rates during the past two fall-harvest seasons, caused by drought in southern states and low water levels on the Lower Mississippi. Because the MRS is generally responsible for conveying over half of all US grain exports, the U.S. Department of Agriculture tracks barge rates for grain using a benchmark rate indexed on a tariff rate of $3.99 per ton. In October of 2022 the index soared to over 2,000 percent of tariff, or approximately $85 per ton to ship grain by barge from St. Louis to Memphis.
- Changing markets – For most of the 20th Century energy products including coal and petroleum were the top commodities moved by barge. Changes to state and federal environmental regulations for both clean air and clean water have resulted in the retirement of many coal-fired power plants. Others have converted to natural gas. Midwestern states have passed legislation to phase-out coal-fired plants. According to the National Resources Defense Council, Illinois closed 19 coal fired power plants between 2011 and 2021. While petroleum products remain as key commodities moving on barge, the "Green Economy" is likely to erode petroleum volumes in the future.
- Invasive species – Asian Carp were introduced to the MRS in the 1970's by aquatic farms in the southern U.S., as a means of controlling noxious aquatic plants. Asian carp escaped into the Mississippi River eco-system during high water/flood events and have since migrated north

[28] R. Amorim, G. Villarini, W. Veacth, and K. White. (2023) *Reduced and More Fragmented Mississippi Navigability by Rising Flow.* Geopolitical Research Letters. 10.1029/2023GL104619.

throughout the MRS. Due to concerns over the potential for Asian Carp to enter the Great Lakes, Congress called on the U.S. Army Corp of Engineers (USACE) to create a barrier to prevent carp from entering Lake Michigan. The Great Lakes and Mississippi River Interbasin Study (GLMRIS) published in 2014, presents a range of options for preventing further migration of invasive species into the Great Lakes. The Brandon Road Lock and Dam near Joliet was identified as a critical location where layered technologies could be deployed to prevent invasive carp from moving further upstream. Pre-construction and engineering design were initiated in 2020. In July 2024 a funding agreement was finally reached between Illinois, Michigan and the federal government allowing the $1.1 billion project to move forward.

- Major lock and dam rehabilitation and maintenance – The summer of 2023 marked the completion of a four-year, two-phase lock and dam maintenance project on the Illinois River. Maintenance on four lock and dam facilities resulted in months long closures of the Illinois River to commercial navigation in 2020 and 2023. Minor closures and restrictions also occurred in 2019 for pre-work and less extensive closures are anticipated in the future for maintenance on Lockport and T.J. O'Brien lock and dams.

Recommendations

Joliet has become known as a major transportation hub with the CenterPoint Intermodal Center (CIC) in Joliet and Elwood "North America's largest master-planned inland port." The CIC moves over 20 million tons of intermodal cargoes by rail annually, but all that volume comes into or goes out of the region by truck. During study outreach with local governments, representatives repeatedly noted that truck traffic and traffic congestion were among the top concerns of area citizens. Local officials noted that industrial development that would create more truck traffic on regional road networks would likely see stiff opposition. In February of 2024, representatives from Joliet and Will County issued a news release announcing official discussions had started with IDOT to pursue efforts to reduce truck traffic in the region.

The Illinois River is also well established as a vital transportation conduit for commerce, especially agriculture crops. In 2022 Illinois farmers exported about $8.4 billion dollars worth of soybeans and corn, with much of that grain barged on the Illinois and Mississippi Rivers to port facilities in the Gulf of Mexico. While agriculture crops comprise the largest volume of commodities moving by barge on the lower Illinois River, at the Lockport lock and dam near Joliet, petroleum and aggregates are the top barge commodities. In the Joliet Region, the Illinois and Des Plaines Rivers/Chicago Sanitary and Ship Canal play a different but no less vital role in supporting commerce: Currently barge traffic in the JRPD boundaries displaces over one-half million truck trips in the region annually. In addition, the Illinois Marine Transportation System Plan completed in 2021 notes that marine cargo activities within the JRPD boundaries support over 11,000 jobs in the state, paying over $709 million in wages and contributing $1.1 billion towards State Gross Domestic Product (GDP).

The JRPD does not own or operate any existing marine terminals or port facilities. JRPD owns and operates the Lewis University Airport, which not only generates economic activity in the Joliet Region, but also gives the port district valuable experience administering state and federal grant programs.

The JRPD Port Master Plan was undertaken to explore the possibilities for the district to take a more active role in river related development. The data analysis and network optimization modeling identified several potential investment opportunities that have been identified and discussed in this report. A business case supporting one of the most promising river terminal investments is detailed in an appendix to this report.

The following recommendations are based on the research, outreach and data analysis conducted for the Port Master Plan. The recommendations were also shaped by a survey of JRPD Board Members and staff regarding their future vision for JRPD. The Illinois Legislature created port districts to support economic development. In this regard, JRPD has been very successful as the owner and operator of Lewis University Airport. However, JRPD starts from ground zero as a water port owner/operator. As the JRPD contemplates its role in the future of Illinois River System commerce, it must navigate a complex environment of local attitudes towards additional transportation centric industrial development, and an inland waterway system undergoing significant changes. It is intended that these recommendations provide a path forward for navigating this environment.

Recommended Policy Area #1: Seek Out Partnerships to Support Regional Economic Development

The legislation creating the JRPD provides broad powers to the district, from issuing permits for waterway structures to owning and operating an airport. However, the primary purpose of the JRPD is to act as a facilitator and catalyst for economic development and job creation. It is a purpose that is similar in mission to the Will County Center for Economic Development (CED): "*The CED exists to improve the quality of life for all residents of Will County by recruiting new companies offering high-quality jobs and a solid tax base while assisting existing businesses to grow, enabling the retention and addition of jobs.*"

1.1: Become an active member of the Will County CED

While most cities, towns, villages and other governmental entities in Will County belong to the CED, JRPD does not. Given the parallel goals of the two entities there appear to be synergies that can be gained from working cooperatively together. Using state funds to conduct the JRPD Port Master Plan developed a supply chain optimization model for the Will County Region. Applying mathematical models to optimize global supply chains, reducing costs and carbon-based emissions has become a common practice for private sector carriers, shippers and third-party logistics (3PL) providers. For example, the 2023, the 27th Annual Third-Party Logistics Study found that 48 percent of shippers surveyed cited *Advanced Analytics and Data Mining Tools* were "Must Haves" when seeking to hire a 3PL, and 54 percent of 3PLs offer those services.

The JRSCOM mines a voluminous set of transportation demand data organized by major surface transportation modes for both domestic and international trade to over 40 countries. The flows represented in the demand data are conflated with transportation price benchmarks by mode, commodity group and trade lane making the JRSCOM database a powerful tool for economic development intelligence. Similar tools developed for other state and regional entities have often involved an economic development agency. This JRSCOM tool and the data behind it can provide valuable insights to Will County CED's business assistance and site location efforts.

1.2: Become a supporting member of the Will County Governmental League

The JRPD was created to be an economic catalyst, primarily through transportation investment in the region. The Will County Governmental League (WCGL) Transportation Committee is one of eleven regional councils in the Chicago metropolitan region with delegated authority to administer a portion of the region's federal funds under the Surface Transportation Program. This funding can be designated for investments in eligible roadways, bridge projects, transit capital projects, or intracity and intercity bus terminals and facilities. Eligible projects can include waterway structures and truck route improvements.

1.3: Share and maintain the parcel inventory for future development.

Outreach with county, city, and village representatives in the region resulted in additional effort being given to a more comprehensive inventory and parcel analysis to identify waterway adjacent land parcels that maybe developed or preserved as open space opportunities. The existing parcel inventory can be used as a resource to inform current and future land use discussions and decisions in Will County.

1.4: Consider working with regional partners to pursue a federal grant to reduce drayage trips

There are competitive federal grants that JRPD may wish to consider for mitigating heavy vehicle congestion. Possible federal grant opportunities include the *Strengthening Mobility and Revolutionizing Transportation* (SMART) discretionary grant program and the *Reducing Truck Emissions at Port Facilities* (RETEPF) program, created under the Bipartisan Infrastructure Law (BIL).

> "*The SMART program was established to provide grants to eligible public sector agencies to conduct demonstration projects focused on advanced smart community technologies and systems in order to improve transportation efficiency and safety.*"[29]

The RTEPF program focuses on technologies and projects that reduce emissions from idling trucks at port facilities, which includes intermodal transfer facilities. "*Eligible uses will include projects that test, evaluate, and deploy projects that reduce port-related emissions from idling trucks, including through port operations efficiency improvements. The program also includes a study to address how ports and intermodal port transfer facilities would benefit from increased opportunities to reduce emissions at ports, and how emerging technologies and strategies can contribute to reduced emissions from idling trucks*"[30].

SMART grants are limited by law to certain types of technology areas. Exhibit 35 illustrates the technology areas that are eligible for SMART funding. The POLARIS solution described here would qualify as part of the technology area for *Commerce, Delivery and Logistics*.

Exhibit 35: Technology Areas Eligible for SMART Funding

Technology Area	Description
Coordinated Automation	Use of automated transportation and autonomous vehicles while working to minimize the impact on the accessibility of any other user group or mode of travel.
Connected Vehicles	Vehicles that send and receive information regarding vehicles in the network and use vehicle-to-vehicle and vehicle-to-everything communications to provide advanced and reliable connectivity.
Intelligent, Sensor-based Infrastructure	Deployment and use of a collective intelligent infrastructure that allows sensors to collect and report real-time data to inform everyday transportation-related operations and performance.
Systems Integration	Integration of intelligent transportation systems with other existing systems and other advanced transportation technologies.
Commerce, Delivery and Logistics	Innovative data and technological solutions supporting efficient goods movement, such as connected vehicle probe data, road weather data, or global positioning data to improve on-time pickup and delivery, improved travel time reliability, reduced fuel consumption and emissions, and reduced labor and vehicle maintenance costs.
Leveraging Use of Innovative Aviation Technology	Leveraging the use of innovative aviation technologies, such as unmanned aircraft systems, to support transportation safety and efficiencies, including traffic monitoring and infrastructure inspection.

[29] USDOT SMART Grants Program web page: SMART Grants Program | US Department of Transportation

[30] https://www.transportation.gov/rural/grant-toolkit/reduction-truck-emissions-port-facilities See Eligibility Information, accessed 10/20/2024.

Smart Grid	Developing a programmable and efficient energy transmission and distribution system to support the adoption or expansion of energy capture, electric vehicle deployment, or freight or commercial fleet fuel efficiency.
Smart Technology Traffic Signals	Improving the active management and functioning of traffic signals, including through: • Use of automated traffic signal performance measures. • Implementing strategies, activities, and projects that support active management of traffic signal operations, including through optimization of corridor timing; improved vehicle, pedestrian, and bicycle detection at traffic signals; or the use of connected vehicle technologies. • Replacement of outdated traffic signals; or • For an eligible entity serving a population of less than 500,000, paying the costs of temporary staffing hours dedicated to updating traffic signal technology.

Will County hosts North America's largest master-planned inland port. However, two Class 1 intermodal yards and associated warehousing and distribution generate significant truck traffic. During outreach with local governments, they repeatedly raised citizen concerns over additional industrial development that would create more truck traffic increasing heavy vehicle congestion on local and regional roads. Drayage carriers serving the Joliet - Elwood intermodal yards also noted during interviews that many avoidable trips are generated to temporarily stage containers or chassis around intermodal facilities.

Federal research has demonstrated that drayage route optimization can significantly reduce empty or deadhead truck movements.[31] Air cargo airports and deep-water ports have begun adopting Community Cargo Systems (CCS) that use a digital platform to provide real-time information about the status of shipments coming in and out of these gateways, to provide real-time visibility to shipment status. "Digital Twins" is an emerging big data concept where real-time information is used to provide adaptive route and traffic optimization on a modeled network. A digital twin for Will County could apply advanced data analysis and technology to address issues related to traffic congestion, container staging, truck parking needs, provide supply chain transparency and reduce paperwork.

During the study, members of the consulting team met with representatives of the Argonne National Laboratory, Transportation and Power Systems Division. Researchers at Argonne, located in Lemont, IL, have developed the POLARIS Transportation Simulation Tool. Originally, created for USDOT; "*to analyze transportation system management strategies involving emerging vehicle and information technologies. It has evolved into a high-performance, computationally efficient tool that implements advanced travel and freight demand modeling, dynamic traffic assignment, and transportation simulation into an integrated modeling platform.*[32] During the meeting Argonne Staff noted they would be interested in exploring the concept of using the Joliet Region as a case study for POLARIS.

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[31] *Analyses of drayage optimization applications shows that the required logistics fleets can be reduced by 21 percent*. USDOT, ITS Deployment Evaluation. 09/14/2013. https://www.itskrs.its.dot.gov/2014-b00919

[32] Argonne National Laboratory, Vehicle and Mobility Systems Department webpage: https://vms.taps.anl.gov/tools/polaris/

Recommended Policy Area #2: Become a Resource for Waterway Commerce in the Region

A key finding from the JRPD Port Master Plan is that the Mississippi River System (MRS), which includes the Illinois River System, is facing significant challenges. Climate change, invasive species, as well as lock and dam maintenance and modernization needs have resulted in volatile price swings and changing markets for inland barge operations. For example, energy products like petroleum and coal have been among the largest commodity groups moved on inland waterways. In 2011, nearly four million tons of Coal was transported by barge on the Joliet portion of the Illinois River. A decade later in 2021, just 11,000 tons of Coal moved through the Joliet section of the river.[33]

For the MRS, agriculture comprises the largest commodity movement on the river and Illinois farmers have been the primary users. An analysis conducted by the USDOT Bureau of Transportation Statistics in 2022, found that of the 12 states served by the MWS, Illinois shipped the most freight to Louisiana by water – 44 million tons. The river carried 93 percent of the cereal grain (including barley, corn, oats and wheat) between Illinois and Louisiana, compared to six percent by rail, and it carried 82 percent of "other agricultural products" (including fruits, vegetables, nuts and soybeans) between those two states, compared to 15 percent by rail and three percent by truck.[34]

2.1: Share Port Master Plan results with state and regional partners

A key element of the JRPD Port Master Plan was the development of a regional freight network optimization model to evaluate markets for freight infrastructure investments that can lower shipping costs, reduce long-haul truck miles, reduce fuel consumption and lower emissions. The model was used to run a variety of transload and freight consolidation scenarios. One of the biggest commodity opportunities that would benefit from the ability to use barge transportation in lieu of trucking is Scrap and Waste. How to dispose of the municipal solid waste is also a mounting issue for the Greater Chicago Region.

In 2020, the City of Chicago alone generated over four million tons of municipal solid waste.[35] In 2022, the eight county Chicago Metropolitan Area[36] generated nearly 10 million cubic yards (cy) of waste.[37] Approximately 90 percent of Chicago's municipal solid waste goes to landfills. The *Illinois Landfill Disposal Capacity Report* indicates the total remaining capacity in the Chicago Region is just 18.6 million cy, far less than many other regions in the state. In total, the opportunity for transporting the region's *Waste and Scrap* products more efficiently represents freight volumes approaching eight million tons (7.7 million) or the equivalent of approximately 425,000 truckloads annually.

The results of this analysis can provide valuable information and insights to state and regional planning agencies to help address a growing issue facing the region. The consultant team will prepare a summary presentation of the study results that JRPD staff and board members can use to discuss the data analysis, key findings and recommendations of the effort.

2.2: Work with state and regional partners to promote a Maritime Center of Excellence in the Region

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[33] USACE, Waterborne Statistics.

[34] *Low Water on the Mississippi Slows Critical Freight Flows,* Bureau of Transportation Statistics, Wednesday, November 16, 2022: https://www.bts.gov/data-spotlight/low-water-mississippi-slows-critical-freight-flows

[35] Delta Institute. City of Chicago Waste Strategy, Existing Conditions: Waste in Chicago. July 2021. Pg. 9.

[36] Illinois EPA Region 2 is made up of McHenry, Lake, DuPage, Cook, Kane, Kendall, Grundy and Will Counties.

[37] Illinois Environmental Protection Agency, *Illinois Landfill Disposal Capacity Report. June 2023.*

The USDOT Maritime Administration has developed a Center of Excellence (CoE) Program "*to support maritime workforce training and education at designated CoEs, including efforts of the designees to admit additional students; recruit and train faculty; expand facilities; create new maritime pathways; and award students' credit for prior experience, including military service.*"[38] The 2021 Illinois Marine Transportation System Plan estimated that port and marine activity in the JPRD supports over 11,000 jobs in the state, paying out over $709 million in wages and contributing $1.1 billion towards state GDP.[39] Given the importance of waterway commerce to the Joliet regional economy, state and regional partners should petition USDOT Maritime Administration to identify a CoE candidate institution in the region.

2.2: Market the benefits of commercial navigation on the Illinois and Des Plaines Rivers

Despite many challenges facing navigation on the Illinois and associated river systems, barge transport remains a critical conduit for keeping heavy loads off the Joliet regional highway network and moving bulk materials to domestic and international markets. Our analysis of barge commodity volumes moving on the river in the Joliet region found that in 2021 over nine million tons of goods moved through the Joliet section of the river. **Assuming 18 tons per truck, the same volume of goods moved over highways in the Joliet Region would generate an additional 500,000 truck trips per year.**

Recent headlines in the Chicagoland press have cited Illinois' long-awaited commitment to a partnership agreement allowing the construction of the $1.15 billion Brandon Road Interbasin Project to fight migration of Asian Carp into Lake Michigan. Other headlines noted that a plan to move municipal waste via barge and reduce diesel fuel consumption by one million gallons annually, has been delayed or possibly scrapped due to concerns over blowing trash and stirring up of toxic chemicals in the Sanitary and Ship Canal.

Joining an existing coalition offers one approach to marketing the waterway. In recent years, several coalitions among Illinois river ports have formed to combine their resources to promote broader recognition of waterway benefits. In 2023, the Illinois Legislature created the Illinois Waterway Ports Commission. Commission membership includes Seneca Regional Port District, Ottawa Port District, Illinois Valley Regional Port District, Heart of Illinois Regional Port District, and Havana Port District, as well as Fulton, Mason, Tazewell, Peoria, Woodford, Marshall, Putnam, Bureau, LaSalle, and Grundy counties. The legislation lays out the following duties for the Commission, within its powers designated by the Act:

- Coordinate and synchronize common efforts and initiatives within the areas over which it has jurisdiction.
- Make recommendations to the Governor, the General Assembly, Congress, and federal agencies on regional issues that impact multimodal transportation, economic development, environmental sustainability, and climate resiliency within the areas over which it has jurisdiction.
- Coordinate and synchronize common efforts and initiatives with the Mid-America Port Commission (Quincy IL) and the Joliet Regional Port District.
- Coordinate and synchronize federal activities associated with the nonfederal sponsorship and development of the M-55 Illinois-Gulf Marine Highway.
- Request funding or assist in requesting funding, as it deems necessary, for those areas over which it has jurisdiction.

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[38] https://www.maritime.dot.gov/maritime-workforce/maritime-centers-excellence

[39] Illinois Department of Transportation. Illinois Marine Transportation System Plan and Economic Impact Analysis. March 2021.

Given JRPD is specifically named as an entity the Commission should coordinate with, *JRPD could consider seeking an amendment to the legislation, adding the district as a full member*.

Several years ago, a small group of port authorities on the Illinois and Upper Mississippi Rivers formed a coalition called the *Corn Belt Ports.* Today the Corn Belt Ports coalition includes about twenty ports, and dozens of other entities like port districts, port authorities, counties, cities, townships and economic development agencies, all with an interest in promoting further port development on the Upper Mississippi and Illinois Rivers. One initiative the group has been successful is getting federal recognition that together this group of disparate river ports together comprise a significant element of U.S. export infrastructure.

In 2020, the group was successful in adding the JRPD to the list of federally recognized ports by tonnage in the U.S. (In 2022 Joliet ranked 48th among all U.S. ports in tonnage).[40] The Corn Bent Ports have several staff and maintain a website: [Home - cornbeltports.com](https://cornbeltports.com). While agriculture products are not the largest commodity moving in the Joliet Region, Will County farmers in 2023 produced over 17 million bushels of corn and 6 million bushels of soybeans.[41] In September of 2024, the Corn Belt Ports signed a "cooperative endeavor agreement" (CEA) "*to advance the economic and operational capabilities of ports up and down the Mississippi River.*"[42]

More recently a new coalition has formed in Illinois called the Illinois River Cities and Towns Initiative (IRCTI): Modeled on the existing Mississippi River Cities and Towns Initiative, "*IRCTI is a coalition of more than 12 mayor-led cities and towns along the Illinois River that will serve as a unified and independent voice advocating for the economic, environmental and political interests of the Illinois River region.*"[43]

JRPD should consider joining one or more of these coalitions to further advance the Illinois River System as a viable transportation alternative for freight moving in, to, from and through the region and promote IRS-based economic development opportunities.

2.3: Foster communication with industry about current and future challenges to commercial navigation.

Given the breadth of challenges impacting Illinois River System navigation in Joliet and the greater Chicagoland Area, in addition to better marketing about the benefits of commercial navigation on the Illinois and Des Plaines Rivers, there is also a need to communicate waterway needs, challenges and status to regional users. Through the USACE there is an email subscription service for interested users, stakeholders and organizations. The service provides weather briefings, maintenance activities, and other operational conditions to a wide list of users. JRPD could consider signing up for the service and posting notices of significance to the region on its website.

Another opportunity for JRPD to be a conduit for the navigation industry in the Joliet Region is the Brandon Road Interbasin Project. With the project now fully funded, and work getting underway soon, the JRPD could approach the USACE Rock Island District to discuss opportunities to post links to USACE progress reports on its website or host periodic information updates from the USACE at Lewis University Airport or other local facilities.

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[40] USDOT, Bureau of Transportation Statistics, Tonnage of Top 50 U.S. Water Ports, Ranked by Total Tons.

[41] USDA, National Agricultural Statistics webpage: https://www.nass.usda.gov/Statistics_by_State/

[42] Progressive Railroading Magazine, *Corn Belt, Louisiana ports sign pact to improve Mississippi River Trade routes. September 23, 2024.*

[43] The Waterways Journal Weekly, *Illinois River Port Communities Form Coalition.* September 20, 2024.

Recommended Policy Area #3: Seek Revenue Opportunities to Fund a Waterways Staff Person

Many of the recommendations made under the previous two policy areas will require staff support, and preferably support by staff knowledgeable of waterway operations. The consulting team conducting the JRPD Port Master Plan conducted a review of prevalent revenue models for river ports.

Our research found that riverports generate revenue through a variety of channels, leveraging their strategic locations and infrastructure to support different types of commerce and transportation. Here are some of the primary ways ports generate operating revenue:[44]

a) Cargo Handling Fees: Riverports charge fees for loading and unloading cargo from ships/barges. This includes bulk commodities like coal, grain, and chemicals, as well as containerized goods.

b) Storage Fees: Ports often have warehouses and storage facilities where goods can be stored temporarily. They charge fees based on the duration and volume of storage.

c) Leasing Land and Facilities: Ports lease land and facilities to businesses for various purposes, such as manufacturing, distribution, and logistics operations.

d) Service Fees: Additional services like maintenance, repair, and fueling of vessels also generate revenue. Ports may offer specialized services such as cold storage for perishable goods.

e) Transportation and Logistics: Ports often provide integrated transportation solutions, including rail and truck services, to move goods to and from the port. They may charge for these logistics' services.

f) Public-Private Partnerships and Grants: Many riverports receive funding through public-private partnerships and government grants aimed at improving infrastructure and boosting economic development.

g) Economic Development Initiatives: By attracting businesses and industries to the port area, riverports can stimulate local economies, which in turn can lead to increased revenue through taxes and other economic activities.

These revenue streams help riverports maintain and expand their operations, ensuring they remain vital hubs for trade and transportation. Because JRPD does not currently own or operate any port or warehouse facilities, the list of currently available options is limited. The following recommendations may provide near term options for generating revenue from waterway related activities for the JRPD:

3.1: Supporting a grant application for the BL Duke Barge Modernization Project.

The JRPSCOM identified *Waste/Scrap* as a commodity group that holds the potential to support additional barge service demand in the Joliet Region. Following the scenario runs, the consulting team invited area businesses interested in exploring the modeling results in more detail to reach out for one-on-one meetings. BL Duke, a Chicago Area full-service metals recycling company with facilities in Forest View and Joliet, requested a meeting. After presenting the study area results, members of the study team met for a site visit at BL Duke's Joliet Scrap Recycling facility.

Company officials noted that BL Duke had obtained a permit from the City of Joliet to operate a metal shredder at its Joliet facility. BL Duke's proposed shedder operation comes on the heels of a Chicago based operator who had closed a shredder operation in Lincoln Park, with a plan to open a new facility on the South Side of Chicago. After initially approving the permit for the South Side facility, the City later withdrew

[44] Kentucky Transportation Cabinet, Kentucky Riverports, Highway and Rail Freight Study, 2021

the approval due to neighborhood opposition and environmental concerns. BL Duke noted that the City of Chicago's reversal on the shredder permit resulted in only one shredder operating in the Chicagoland Region, an area with a population of over nine million people. As a result, scrap vehicles, appliances and other metal products must be trucked to areas and states beyond the Chicagoland Region to be shredded.

After the site visit BL Duke transmitted company transportation data with Quetica, under a non-disclosure agreement. Using the JRSCOM and BL Duke's proprietary data the consulting team assembled a business case for a barge dock modernization project at the Joliet property. BL Duke's current plans call for a scalable shredding operation. Materials currently collected at the Forest View location and trucked to Joliet, will in the future be barged between the two locations, removing hundreds of weekly truck trips from the Joliet area's roadway network.

Given JRPD's previous experience administering federal grants for the Lewis University Airport, the District is in a good position to act as a grant sponsor for BL Duke barge dock modernization project.

3.2: Consider inviting transportation infrastructure grant application proposals

The legislation creating the JRPD, specifically grants the District the "*power to apply for and accept grants, loans or appropriations from the Federal Government…"* This is an ability the Will County CED does not enjoy. Competitive grant programs have become a prominent means for distributing federal funding for transportation investment in the modern era. While some forms of congressional earmarks remain, the federal government distributes billions of dollars each year through several forms of federal funding/financing programs; 1) Discretionary grants, 2) Formula grants, 3) Credit assistance/loans; and 4) Public-Private-Partnerships (P3). The most popular of these financing vehicles for local agencies and other eligible entities is discretionary grant programs. These programs are generally administered by agencies of USDOT and provide tens of billions of dollars in transportation related infrastructure investment opportunities each year. Other entities that offer discretionary grants for transportation-related purposes include USEPA, the US Department of Energy and the Economic Development Administration. Federal discretionary grant programs typically require a government organization to be the primary applicant, including state, county, city or township governments, special district governments (e.g., JRPD), and Native American tribal governments.

As a special district government created by the Illinois statutes, JRPD can act as an additional conduit in Will County to access freight infrastructure grants. These federal grant programs usually require a non-federal funding match, which can come from a variety of sources including a private sector partner. Previous experience administering federal grant programs is often a plus when applying for funding, and JRPD has experience and a good history administering discretionary grants from the Federal Aviation Administration (FAA). A previous tech memo (JRPD – Optimization Scenario Analysis Summary, August 2024) compiled for this study identified and discussed a variety of freight infrastructure eligible discretionary grant programs in some detail. A list of just some of these programs is provided below:

1. USDOT Nationally Significant Multimodal Freight & Highway Projects (INFRA): INFRA awards competitive grants for multimodal freight and highway projects of national or regional significance to improve the safety, efficiency, and reliability of the movement of freight and people in and across rural and urban areas. The Infrastructure Investment and Jobs Act (IIJA) authorized $1 billion per year between FY 2023 and FY 2026, of which up to 30% can be used for multimodal projects (ports and rail).
2. USDOT Rebuilding American Infrastructure with Sustainability and Equity (RAISE): The goal of the RAISE program is to fund eligible surface transportation projects that will have a significant local or regional impact that advance USDOT priorities of safety, equity, climate and sustainability, and

workforce development. RAISE grants are capped at $25 million and focus on multimodal projects. IIJA authorized $1.5 billion per year for FY 2023 – FY 2026.

3. USDOT FHWA Reduction of Truck Emissions at Port Facilities (RTEPF): Provides funding to reduce truck idling and emissions at ports, including through the advancement of port electrification and improvements in port operations efficiency. Intermodal transfer facilities and areas surrounding them are considered eligible under this program. Funded through the IIJA, $80 million per year for FY 2023 – FY 2026 was authorized.
4. USDOT Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation (PROTECT): Established by IIJA this program aims to make surface transportation more resilient to natural hazards, including climate change, sea level rise, flooding, extreme weather events, and other natural disasters through support of planning activities, resilience improvements, community resilience and evacuation routes, and at-risk costal infrastructure. IIJA authorized $250 million for each year for FY 2022 and FY 2023, and $300 million each year for FY 2024 – FY 2026.
5. USDOT Maritime Administration (MARAD) Port Infrastructure Development Program (PIDP): This program funds projects that improve the safety, efficiency, or reliability of the movement of goods through ports or intermodal connections to ports. The minimum award is $1 million, and the maximum award is $11.25 million for small projects at small ports. IIJA includes $450 million annually from FY 2022-FY 2026 for the program.
6. USDOT Maritime Administration (MARAD) Marine Highway Grant Program: Funds are awarded to projects that provide a coordinated and capable alternative to landside transportation or that promote marine highway transportation. Through the development and promotion of marine highway transportation, the program aims to relieve landside congestion, reduce air emissions, and generate other public benefits by increasing the efficiency of the surface transportation system. The Illinois River system has been designated Marine Highway 55. In 2024 $4.85 million was available through the program.
7. USEPA Clean Ports Program: The U.S. Environmental Protection Agency's (EPA) Clean Ports Program is a $3 billion program established by the Inflation Reduction Act (IRA) to fund zero-emission (ZE) port equipment and technology and assist U.S. ports develop climate action plans to reduce air pollution. Reauthorization of this program depends on Congressional action and Administration priorities.
8. Consolidated Rail Infrastructure and Safety Improvements (CRISI) Grant Program: Administered by the Federal Railroad Administration, CRISI provides funding for projects that improve the safety, efficiency, and reliability of intercity passenger and freight rail. Eligible projects include safety technology, grade crossing separations, rail line relocation or improvements, etc. Nearly $2.5 billion was available in FY 2023-2024.

The JRPD could periodically issue a Request for Information (RFI), potentially in concert with the Will County CED seeking potential waterway related projects it could consider sponsoring for state or federal grant funding.

3.3 Work with the City of Joliet to explore a public boat launch and marina.

During outreach to government entities in the JRPD region, the City of Joliet noted a desire to create a public use marina and boat launch facility in the northern section of downtown. This is a project that fits well within the purview and authority of JRPD, and the parcel inventory developed for the Port Master Plan can support the potential development. The JRPD's involvement in this type of project can also ensure that recreation facilities be designed and operated in a fashion so that conflicts between recreational facilities and commercial barges are minimized.

Conclusions

The Illinois River is a critical corridor of commerce for both the domestic leg of international trade in bulk commodities like grains and fertilizer, but also as an inter-regional conduit for aggregates and energy products. This study has identified a variety of challenges facing both the Illinois River and the broader Mississippi River System. While many of these challenges to inland waterway commerce can be blamed on climate change and invasive species, the lack of adequate infrastructure investment cannot be understated. In a 2022 report published by the Eno Center for Transportation, the authors state:

> *"The* [US Inland Waterway] *network moves over 500 million tons of freight annually, constituting mostly bulk goods, and is a low-cost route for exporters… However, there are two main threats to these strategic trade and military advantages. First, underinvestment in the system's infrastructure, maintenance, and operations has degraded the service levels on the rivers, making it less reliable and less competitive… The second threat is external. While the United States has been upgrading domestic inland waterway infrastructure, other countries have been doing the same for their own military and commercial advantage."*[45]

During the initial stages of the JRPD Port Master Plan, the concept of container on barge (COB) held great promise for new cargos and commercial uses for the Illinois and Mississippi Rivers. However, despite significant federal funding to several demonstration projects on the lower Mississippi River, the high handling costs, longer transit times and lower reliability has discouraged private sector adaptation of COB services. While some COB operations are active on intra-coastal waterways, we were unable to confirm any active COB demonstration projects on the MRS.

For the JRPD, Illinois/Des Plaines River, commerce is also under threat due to changing public attitudes regarding appropriate uses of the river, but mostly due to the prospect that additional river activity will inherently also result in more truck traffic. Joliet has gained the reputation as North America's largest planned inland port due to several large rail intermodal campuses. As an intermodal rail center, the Joliet Regional also offers shippers some of the most competitive rates in the nation. None the less, the Illinois and Des Plaines Rivers play a vital role as an inter-regional alternative to trucks in Joliet. Our analysis found that current barge volumes in the JRPD boundaries displace more than one-half million truck trips in the region annually. The proposed scrap metal project can displace additional truck traffic in the region.

The Illinois Marine Transportation System also found that commercial waterway activities in the JRPD support over 11,000 jobs that pay over $709 million in wages and contribute $1.1 billion in State GDP.[46]

The sensitivity among regional communities to additional truck traffic suggests that the JRPD will proceed cautiously in supporting new commercial industrial activities on the river, but the tools and analysis produced by this Port Master Plan, provide the data and resources to begin educating the region about the benefits of commercial navigation. The JRPD is strongly encouraged to take a more active partnership role with other regional entities such as the Will County Government League and Will County Center for Economic Development, to promote the benefits of inland waterway commerce.

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[45] Eno Center for Transportation. *Waterborne Competitiveness; U.S. and Foreign Investments in Inland Waterways,* May 2022. Pg. 1.

[46] IDOT, Illinois Marine Transportation System Plan and Economic Impact Analysis, March 2021. Pg. 70.

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Appendix A – BL Duke Business Case

This appendix will be added as soon as the Benefit Cost Analysis is completed. It is currently underway.

Appendix B: Detailed Parcel Inventory Maps

Appendix C: Summary of Vision Survey with JRPD Board Members

1) The JRPD Port Master Plan has developed several resources (supply chain optimization model and parcel inventory). How might you envision these resources being used or providing benefit to other entities in Will County?
   - *A vision for the Port District Master Plan is to work collaboratively with other municipalities, townships, park districts, and forest preserves to increase shipping products and supplies on waterways to reduce the number of trucks on our highways, and trains on the tracks, to promote economic growth throughout the region.*
   - *These resources could be used to assist the Will County CED and communities along the waterway to demonstrate to prospective project* [stakeholders] *that are considering locating in the area, the benefits of proximity to the waterway. These tools can also be used to demonstrate to traditional truck shippers the benefits of waterway shipping.*
   - *I don't see much value other than when non-public entities want to do something whether it will further justify a project or not.*
   - *JRPD could foster development of these resources if called upon. If revenue bonds were the best financial option JRPD could assist and be a catalyst.*
   - *JRSCOM is an interesting tool. Enjoyed the tour of Touchpoint's Logistics Platform. Understanding how businesses like Touchpoint work in the JRPD can help shape future opportunities for similar businesses.*
   - *Unsure what "other entities" are being referred to too. Barges of oil will reduce trains and trucks and residents will be happy.*

2) In your view, what are the most appropriate roles for JRPD in land-use planning? (e.g. Industrial development, commercial development, recreational activities)
   - *The JRPD bonding ability could help support development that aids the JRPD pursuits.*
   - *Would like to see JRPD grow its presence along the waterway. The ability to help facilitate industrial development seems to present the most opportunity currently.*
   - *Working collaboratively with the park district to install walking trails, biking trails, skate parks, etc.; working with municipalities and their economic development directors for industrial developments; and working with Will County for another access over the waterway by either adding a lane to an existing bridge or building a new bridge over the waterway. Developing land along the waterways and increasing the number of ports throughout the region would produce better opportunities for growth.*
   - *Based on the lack of property available I think the role should consist of advocacy both politically and through grant capital that the port has access to. It will also give a strong voice for where something should or should not be made. Such as recreational activities in the main tow boat area.*
   - *JRPD can be a resource to the county and communities along the waterway. Land* [use] *planning should be left to those with more defined statutory authority and planning expertise.*
   - *JRPD is an economic development unit of government chartered to assist if called upon.*

3) This study has found that the Illinois / Des Plaines River is a complex waterway undergoing significant changes due to climate change, lock and dam maintenance, invasive species, etc. What thoughts do you have about the JRPD being a conduit for information sharing with local governments and businesses?

- *The Waterway lacks a local united voice with enough influence to get things done. Unless someone is stuck at a bridge not much thought is given. There is a 1.1 Billion Dollar Project about to start at Brandon Rd Lock and Damn and few people know about it.*
- *Being a conduit involves more than passing along press releases; to be successful as a conduit JRPD will need to engage knowledgeable professionals to analyze and explain the information. This may be better left to state and federal government officials better equipped to fulfill this role.*
- *Local governments take relationship building. Through the course of time the JRPD will need to gain credibility in the region. One good project can make a difference.*
- *Sharing information from JRPD to municipalities and businesses would be an asset. The dissemination of information would be a benefit for the entire region, along with their involvement.*
- *Maybe online information sources that would allow the sharing of confidential information, with other pages available to the public.*
- *JRPD should be open to working with other government agencies and businesses to help ensure the waterway is viable for commerce and potential recreational uses well into the future.*

4) The enabling statute provides the JRPD to apply for and administer federal grants? How might you see the Port District using this authority to benefit the region?
   - *Coordinate with other public entities and private developers to see what the needs are and provide advice / suggestions.*
   - *The biggest huddle for the JRPD is raising revenue to potentially reinvest in constructing a terminal. If a project of that nature would qualify for federal grants there could be benefits from bringing and facilitating more commerce to the JRPD.*
   - *JRPD can be the conduit for grant administration and a successful community project creating jobs and economic benefit will be key.*
   - *JRPD has a federal lobbyist with many contacts in Washington D.C. All federal monies that could be attained through grants would be beneficial to the entire region to spur economic growth for all municipalities along the waterways. Federal funding along with state and county funding would be necessary to secure funding for major expenses.*
   - *This question is likely a matter of resources; grant application and administration can be an expensive endeavor. JRPD can make itself a resource to others applying for or receiving grants. An appropriate role for JRPD may be as a co-applicant to provide additional support to another agency that can carry more of the administrative burden.*
   - *Green energy and facility improvements at locations. Things such as dock wall improvements to electric cranes and Tow boats.*

5) Previously, the Port District furnished its industrial bonding authority as a conduit for private investment through the issuance of industrial revenue bonds on behalf of the private entity; this activity generated issuance income to the Port District. Although the tax advantage from this has changed over the years, would the Port District consider this activity again for future private industrial development?
   - *Need more education on this topic before consideration.*
   - *I would support the JRPD serving as a true conduit for bond issuance – the last opportunity presented to the board involved a great deal of risk. The JRPD should not put itself at risk over bonding.*
   - *The JRPD has implemented its industrial bond authority in the past for private investment, however it raises concerns about possible liability from having JRPD bond out private industrial development. It is a question that should be directed to legal counsel.*

- *Should be considered; like anything else if its good business then its good business.*
- *Yes, this combined with some brown water grant money would have a positive impact on the region.*
- *Yes – as long as JRPD benefits.*

6) As a Board Member involved in JRPD operations and strategic direction, do you think the District should establish an operating port on the waterway with enough land for related industrial development?
   - *If a project proved value yes.*
   - *Believe that JRPD should be open to exploring all options that would create the potential to generate revenue to improve upon its assets, with the caveat that the district would need to be cautious about exposure to liability from these operations. As local road infrastructure is increasingly limited in the surrounding area, the opportunity to shift road commerce to waterways makes good sense for the region.*
   - *Unfamiliar with what liabilities the JRPD may incur.*
   - *Possibly as a Public-private-partnership option, but not a wholly government owned entity.*
   - *Any such port should be either entirely private or entirely public – don't really see JRPD involved in any public/private partnerships at this point.*
   - *Maybe in the future but not currently. A steady source of revenue must be available if bonds are issued and payments due in 25 years.*

7) What does success for JRPD look like 20 years from now? What would the headlines be?
   - *The JRPD would play a greater role in exciting future projects. In the next 20 years the region may see an additional southern airport and potentially the extension of the I-355 Tollway connecting I-65 in Indiana. If those projects move forward, the JRPD could see an increased need to facilitate waterway uses.*
   - *Visionary planning creates a better transportation system in Will County.*
   - *Positive headlines*
   - *"The JRPD yet again wins another grant for its port with upgrades at the XX terminal, which now makes it carbon neutral and removed 5,000 trucks off the road annually."*
   - *Assisted and participated in several economic development projects within the District.*
   - *Not sure what the headline reads, but the success of the JRPD should be measured by financial stability and providing the best possible service.*

8) Additional thoughts and comments:
   - *Establish communication links with all units of government and chambers of commerce to support transparency and better understand everyone's long term goals.*
   - *The board is suffering an identity crisis from lack of participation and community involvement. Administration of a couple new projects the participation of a couple new State or Federal Grant projects can change the course of its current identity.*
   - *I think JRPD has all the runway in the world to grow. There are no other government bodies trying to be in this space. The market (as defined by townships and Industry) is small enough you can get everyone in the same room. There is a large amount of Grants and funding out there. There is a need to grow and improve the waterway which is seen by these massive lock and damn projects.*