

*Crystal City, Missouri*

# COMPREHENSIVE MARKET STUDY

Jefferson County Port Authority | June 2021

**Tran**Systems

EXPERIENCE | Transportation



# COMPREHENSIVE MARKET STUDY

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*Crystal City, Missouri*

REPORT PREPARED FOR:

**Jefferson County Port Authority**

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# COMPREHENSIVE MARKET STUDY - EXECUTIVE SUMMARY

*Crystal City, Missouri*

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## EXECUTIVE SUMMARY

### Regional Profile & Commodity Flows

At the request of Jefferson County Port Authority (JCPA) in partnership with support from the Missouri Agricultural and Small Business Development Authority (MASBDA), the objectives of the Comprehensive Market Study Crystal City, MO Port are to provide a high-level description of prospective port users from the surrounding thirteen-county region that could potentially utilize the Crystal City, MO Port development concept for outbound and/or inbound shipments of commodities, products, and raw materials.

Key characteristics of waterborne commerce through the greater St. Louis region include::

- Outbound cargo is the dominant flow. (23.4 million tons compared to 6.7 million tons inbound)
- Grains are the largest outbound commodity. (50% of outbound shipments)
- Outbound profile is also dominated by raw materials and intermediate products for industry and construction.
- Fertilizers are the largest inbound commodity group. (28% of inbound cargo)
- Inbound profile is primarily basic and intermediate commodities for use in agriculture, industry, construction, and energy generation.

As such, the primary markets for a new port at Crystal City will be in bulk commodities moving in and out of the surrounding region, and the industries that use those commodities. Southeast Missouri (SEMO) Regional Port Authority is presented as comparable to JCPA's development vision for Crystal City in terms of commodities and operations.

To gain a better understanding of the economies more closely surrounding the Crystal City Port project, the Comprehensive Market Study examined commodity flows for 13 nearby counties as requested by JCPA and of interest to MASBDA.

Based on their proximity to Crystal City, these 13 counties were subdivided into three areas: north, central, and south. The counties in the north area are Lincoln, St. Charles, St. Louis, and Warren. The central counties are Franklin, Jefferson, St. Francois, St. Genevieve, and Washington. The counties to the south are Cape Girardeau, Mississippi, Perry, and Scott. Generalized characteristics of each subarea are as follows:

## North Area

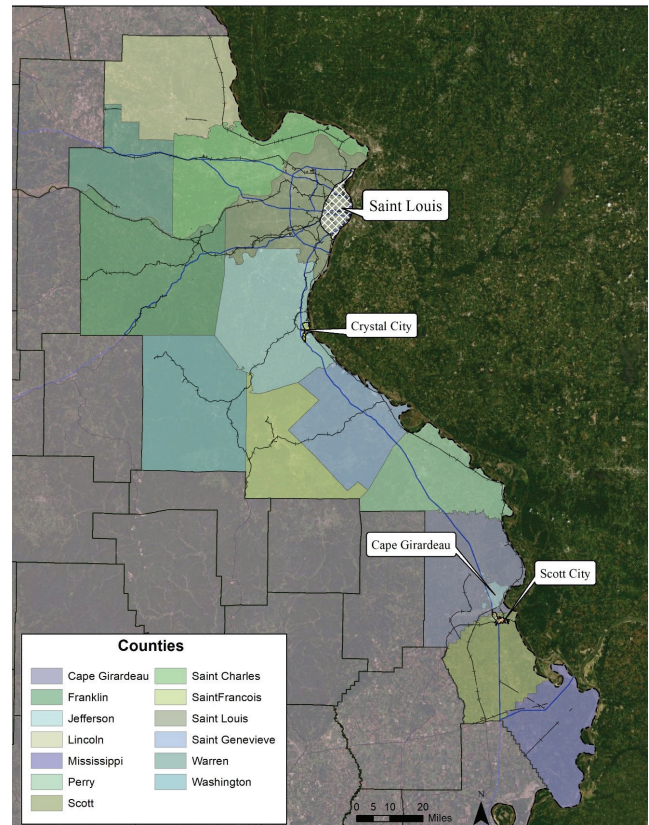
- Agriculture (corn, wheat, soybeans);
- Food product manufacturing;
- Light industrial development; and
- Manufacturing and warehousing.

## Central Area

- Strongest truck-served market opportunities within these counties;
- Aggregate and stone industry could benefit from access to barge transport; and
- Mining sector may offer opportunities for outbound bulk cargo.

## South Area

- Agriculture (corn, soybeans, wheat);
- Large manufacturing companies (food manufacturer, auto industry, popcorn/cereal/baking mix); and
- SEMO Port provides truck-served market for port operations.



The Missouri counties in the market study area are Jefferson, St. Louis, Ste. Genevieve, St. Francois, Washington, Franklin, Perry, Cape Girardeau, Scott, Mississippi, St. Charles, Warren, and Lincoln

## Stakeholder Input

A key component of this study is the thorough stakeholder analysis conducted by interviewing port-related industries and economic development agencies such as agricultural and rock/earth shippers, barge and river terminal operators, energy and utility companies, Class 1 railroads, port landlords, and developers. This targeted input helps to directly solidify the following, specifically for advancement of a Crystal City port:

- Short-, medium-, and long-term development strategies;
- Marketing strategies;
- Site selection criteria and opportunities;
- Port business models; and
- Viable and non-candidate commodities.

## Development and Opportunities Matrix

The development strategies and market opportunities identified from the interview survey are summarized in the following table.

Relative Level of Effort Key:



STRATEGY:	SHORT-TERM	MEDIUM-TERM	LONG-TERM
Market Sector:	Local Bulk Shippers	Rail-Served / Agriculture Shippers	Light Industrial / Manufacturing
Opportunity	Consider local rock company interested in shipping to the Gulf that current ports cannot handle.	Consider grain companies that do not have established grain transportation assets in St. Louis.	Consider, for example, battery manufacturing and aluminum manufacturing for area bottling and canning plants.
Port Selection Factors (Transportation cost, port capabilities, reliability, etc.)	Mineral and rock shippers responded favorably to Crystal City due to perceived lower trucking costs to/from the port and additional truck turns.	St. Louis has established infrastructure operated by large grain companies; these are unlikely candidates for Crystal City. However, companies that are not aligned with St. Louis grain terminals might consider a third-party independent grain terminal at Crystal City. The terminal would need to be cost effective, efficient, and reliable.	The main competition is from sites in St. Louis. Crystal City should consider traditional incentives (e.g., tax abatements, and build-to-suit lots) to alleviate port financing commitments.
Awareness of the Crystal City Port Project	Local awareness includes operators/users of port in Herculaneum, MO. Communicate with local economic development agencies to expand awareness regionwide.	None - Engage railroads, economic development agencies, and industry groups.	Crystal City is not recognized as an industrial center vs. St. Louis. Communicate detailed development plans and milestones to economic development agencies, industry publications, industrial real estate brokers, etc.
Port Access (Road, Rail and Barge)	Not yet established – Identify “date-certain” highway access and implement roadway improvements to promote a Crystal City port.	Focus on road access, and unit train rail capabilities to compete with St. Louis, and to serve Midwest markets. Develop relationships with railroads and agriculture companies.	Prioritize truck and rail over river access, generally. Identify “date certain” road and rail, utilities, and shovel-ready site availability.
Proximity to Population Center	N/A	N/A	Build upon existing labor force in St. Louis bi-state area, mindful of competition with manufacturers who distribute locally in St. Louis. Consider companies who distribute nationally.
River Access	Channel depth near Crystal City is an advantage.	Channel depth near Crystal City is an advantage.	River access is not typically a priority for manufacturing companies; however, companies that can accept or distribute materials by barge would be candidates. Brokers noted there are not too many river sites available.

Source: GKSF from Interview Survey



## Operational Resources

This study provides an overview of potential business models, fee structures, funding mechanisms, development opportunities, costs estimating guidance, potential staffing, and equipment. The operational resource section of the study is intended to be a reference to make informed decisions to advance port development in Crystal City for the benefit of JCPA and the greater community. In addition, conceptual layouts were updated from the 2011 Master Plan with supporting descriptions of likely terminal operational needs by commodity type to support port planning and interactions with prospective port users via easily referenced, concise, order of magnitude context.

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## Action Items

Actionable items are outlined for JCPA within two areas of focus: *Marketing* and *Port Administration*. These items guide JCPA's vision development with near-term objectives to strategically support long-term goals for growth and advancement of a Crystal City port.

### Marketing

- Adopt port development vision;
- Evaluate internal and external resources to support marketing;
- Create marketing deck to illustrate development potential, capacity, and transportation assets;
- Communicate progress of port development to local, regional, state, and federal agencies;
- Cultivate relationships with Class I railroads;
- Communicate port development vision to industry groups, shippers, industrial real estate brokers, and developers; and,
- Monitor marketing progress by tracking internal results and external feedback to modify strategies for improvements and expansion.

### Port Administration

- Determining a port operating structure;
- Establish immediate port staffing needs understanding that when the port does grow, these roles and responsibilities will increase as well;
- Develop a community engagement plan or process that establishes the port as a community partner;
- Determine how site improvements such as road access will strategically guide site development;
- Work with both Class I railroads to foster a relationship and establish sites that can become part of their rail site selection programs; and
- Pursue funding opportunities for the growth of the port over time.

# COMPREHENSIVE MARKET STUDY

## *Crystal City, Missouri*

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### COMMODITY FLOWS AND REGIONAL PROFILE

#### Introduction

At the request of Jefferson County Port Authority (JCPA) in partnership with support from the Missouri Agricultural and Small Business Development Authority (MASBDA), the objectives of the Comprehensive Market Study Crystal City, MO Port are to provide a high-level description of prospective port users from the surrounding thirteen-county region that could potentially utilize the Crystal City, MO Port concept for outbound and/or inbound shipments of commodities, products, and raw materials. The Missouri counties included in the market study area are Jefferson, St. Louis, Ste. Genevieve, St. Francois, Washington, Franklin, Perry, Cape Girardeau, Scott, Mississippi, St. Charles, Warren, and Lincoln. However, a more expansive review of regional commodity flows was undertaken to assist in identification of market trends and opportunities that could impact port development. The review is primarily based on data from the U.S. Army Corps of Engineers (USACE) and the TranSystems team's experience in the region. Findings are blended with stakeholder inputs from the interview survey to arrive at the short-, medium- and long-term market opportunities for the Crystal City Port presented in the Market Opportunities and Projections section of the report.

#### Port of St. Louis Commodities

The review of waterborne commerce statistics collated by the USACE provides insight into the type of commodities moving by barge through the St. Louis region. Data are presented for the period 2015 to 2019, the latest year available, and for 2010. Inbound and outbound traffic are for the Port of St. Louis, MO and IL (Port of St. Louis) as defined by the USACE to include:

- Right bank of Mississippi River from mile 138.8 to mile 171 above Ohio River Junction; and
- Both banks of Mississippi River from mile 171 through mile 208.8 above Ohio River Junction.

The brief review presented below of outbound and inbound traffic at the Port of St. Louis strongly suggests that the primary markets for a new port at Crystal City will be in bulk commodities moving in and out of the surrounding region, and industries that use those commodities. The interview survey explores some of the main market sectors to determine likely opportunities and challenges for Crystal City.

#### Outbound

Outbound cargo is the dominant flow at the Port of St. Louis and amounted to 23.4 million tons in 2019, compared to 6.7 million tons received at the port. The total outbound was down from nearly 30 million tons a year earlier due to disruption to U.S. grain exports caused by a trade dispute with China. Grain shipments to China have recovered in the current crop year.

Grains are the largest commodity group and accounted for 50 percent of outbound shipments in 2019. Large volumes of grain are railed to elevators in St. Louis for loading to barge and shipment downriver to the export terminals on the Gulf of Mexico (Gulf). There are seven main grain terminals for storing and loading into barges; six of the terminals are on the Illinois bank and one on the Missouri side. As discussed later in the interview survey findings (Section 2), the grain terminals are mostly associated with or controlled by major agricultural and food companies that buy, sell and trade grains in the domestic and international markets. Smaller volumes of grain may be handled by the general cargo terminals in the St. Louis area.

Apart from grain, the commodity profile is dominated by raw materials and intermediate products for industry and construction; for example, cement and industrial sands. A notable trend has been the collapse in outbound coal shipments, 1.4 million tons in 2019 compared to 8.3 million tons in 2010, due to the structural decline in coal use for energy production nationwide..

**Table 1:** *Outbound Shipments at Port of St. Louis*

<b>COMMODITY GROUP (000 TONS)</b>	<b>2010</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Oilseeds (Soybean, Flaxseed and Others)	3,713	4,506	7,354	6,096	7,148	5,962
Corn	4,692	4,856	5,021	4,399	6,148	3,961
Building Cement & Concrete; Lime; Glass	445	3,089	3,237	3,668	3,571	3,608
Crude Petroleum	893	2,477	1,366	1,072	2,991	2,905
Petroleum Pitches, Coke, Asphalt, Naptha and Solvents	1,239	1,696	1,772	1,686	1,906	1,657
Coal, Lignite & Coal Coke	8,317	4,749	1,824	3,092	2,841	1,369
Sand, Gravel, Stone, Rock, Limestone, Soil, Dredged Material	282	791	246	862	1,165	1,187
Animal Feed, Grain Mill Products, Flour, Processed Grains	997	1,856	1,086	1,217	1,288	815
Wheat	1,548	1,104	824	1,022	857	696
Distillate, Residual & Other Fuel Oils; Lube Oil & Greases	348	699	661	720	615	629
Other Chemicals and Related Products	1,251	547	859	731	439	332
Iron Ore and Iron & Steel Waste & Scrap	293	159	274	414	356	218
Fertilizers	193	51	152	95	128	102
Non-Ferrous Ores and Scrap	24	73	72	58	45	70
Other Agricultural Products; Food and Kindred Products	0	1	2	0	63	52
Others	404	250	93	226	93	109
<b>Total All Commodities</b>	<b>24,639</b>	<b>26,905</b>	<b>24,842</b>	<b>25,358</b>	<b>29,652</b>	<b>23,671</b>

Source: Waterborne Commerce Statistics, USACE

## Inbound

Inbound shipments by barge are primarily basic and intermediate commodities for use in agriculture, industry, construction, and energy generation. Total inbound shipments were 6.7 million tons in 2019, similar to the two previous years, and well above the recession-related weakness evident in 2010 when total receipts were 4.9 million tons. Shipments within individual commodity groups can be volatile due to changes in specific industry requirements. Fertilizers for the regional agriculture industry are the largest commodity group accounting for 28 percent of inbound cargo in 2019.



**Table 2:** Inbound Shipments at Port of St. Louis

COMMODITY GROUP (000 TONS)	2010	2015	2016	2017	2018	2019
Fertilizers	1,003	1,917	1,789	1,837	1,757	1,874
Coal, Lignite & Coal Coke	1,423	1,262	1,127	1,237	1,190	1,429
Other Chemicals and Related Products	336	409	406	383	485	546
Sulphur (Dry), Clay & Salt	6	571	369	419	252	546
Sand, Gravel, Stone, Rock, Limestone, Soil, Dredged Material	374	793	602	703	652	531
Petroleum Pitches, Coke, Asphalt, Naptha and Solvents	424	361	438	524	656	446
Primary Iron and Steel Products (Ingots, Bars, Rods, etc.)	103	530	534	564	407	332
Slag	0	243	270	321	325	241
Building Cement & Concrete; Lime; Glass	217	359	377	238	303	190
Distillate, Residual & Other Fuel Oils; Lube Oil & Greases	404	253	188	245	115	165
Iron Ore and Iron & Steel Waste & Scrap	36	88	46	47	132	150
Gasoline, Jet Fuel, Kerosene	72	117	87	25	10	116
Forest Products, Lumber, Logs, Woodchips	7	8	72	79	78	58
Oilseeds (Soybean, Flaxseed and Others)	30	8	3	2	18	41
Crude Petroleum	5	145	0	0	87	26
Others	441	210	92	86	165	55
<b>Total All Commodities</b>	<b>4,879</b>	<b>7,277</b>	<b>6,400</b>	<b>6,710</b>	<b>6,633</b>	<b>6,749</b>

Source: Waterborne Commerce Statistics, USACE

## Case Study: Southeast Missouri Port Commodities

Southeast Missouri Regional Port Authority (SEMP Port) offers a comparable case study and prospective competitor assessment for the Crystal City Port. SEMO Port is approximately 85 miles south of Crystal City and is located near Cape Girardeau at Scott City. The port has a slackwater harbor, public terminals, interstate access, connections to two Class I railroads, and industrial sites. Switchboat and barge fleet services are provided by a private operator. For reporting of cargo data, the port is defined by USACE as:

- An off-river slack water harbor channel located at mile 48 of the Upper Mississippi River, 1,800 feet long and 230 feet wide. Maintained depth of 9 feet and a tidal range to 4 feet at mean higher water.

### Outbound

Outbound is the dominant direction at SEMO Port with just over 1.0 million tons shipped in 2019. The largest commodity is sand and gravel, 43 percent of shipments. The other major commodities are non-ferrous ore, corn, soybeans, and woodchips as shown in Table 3.

### Inbound

Annual inbound cargo at SEMO Port has been volatile and totaled 176,000 tons in 2019. As shown in Table 4, the largest commodity is fertilizers, 41 percent of inbound cargo, for distribution to the agriculture sector surrounding the port.

**Table 3:** *Outbound Shipments at Southeast Missouri Port*

<b>COMMODITY GROUP (000 TONS)</b>	<b>2010</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Sand, Gravel, Stone, Rock, Limestone, Soil, Dredged Material	49	96	192	379	337	456
Non-Ferrous Ores and Scrap	70	249	228	182	32	176
Corn	155	136	164	130	163	171
Oilseeds (Soybean, Flaxseed and Others)	153	117	185	147	167	120
Forest Products, Lumber, Logs, Woodchips	222	211	244	243	173	88
Wheat	31	10	28	41	45	46
Vegetable Products	0	0	0	0	0	4
Animal Feed, Grain Mill Products, Flour, Processed Grains	0	0	0	27	0	0
Barley, Rye, Oats, Rice and Sorghum Grains	16	26	6	6	0	0
Building Cement & Concrete; Lime; Glass	0	0	0	5	0	0
Other Non-Metal. Min.	18	0	0	0	0	0
Primary Iron and Steel Products (Ingots, Bars, Rods, etc.)	3	0	0	0	0	0
<b>Total All Commodities</b>	<b>714</b>	<b>845</b>	<b>1,048</b>	<b>1,160</b>	<b>917</b>	<b>1,061</b>

Source: Waterborne Commerce Statistics, USACE

**Table 4:** Inbound Shipments at Southeast Missouri Port

COMMODITY GROUP (000 TONS)	2010	2015	2016	2017	2018	2019
Fertilizers	99	97	70	93	53	72
Primary Iron and Steel Products (Ingots, Bars, Rods, etc.)	13	34	37	32	45	44
Slag	0	0	6	19	2	14
Sulphur (Dry), Clay & Salt	0	28	3	8	3	14
Non-Ferrous Ores and Scrap	2	0	0	6	5	13
Other Chemicals and Related Products	48	42	12	3	13	10
Iron Ore and Iron & Steel Waste & Scrap	0	0	0	0	0	7
Oilseeds (Soybean, Flaxseed and Others)	2	0	0	0	0	3
All Manufactured Equipment, Machinery and Products	7	2	1	11	5	0
Building Cement & Concrete; Lime; Glass	0	0	0	0	3	0
Corn	1	0	0	2	2	0
Other Non-Metal. Min.	5	0	3	3	0	0
Wheat	0	0	0	0	7	0
<b>Total All Commodities</b>	<b>175.8</b>	<b>202.6</b>	<b>131.3</b>	<b>178.4</b>	<b>136.7</b>	<b>175.9</b>

Source: Waterborne Commerce Statistics, USACE

## Thirteen County Region Review

The Missouri counties in the market study area are Jefferson, St. Louis, Ste. Genevieve, St. Francois, Washington, Franklin, Perry, Cape Girardeau, Scott, Mississippi, St. Charles, Warren, and Lincoln (Figure 1). Commodities moving via river terminals in and out of these counties would typically be handled by truck due to their proximity to the river. Therefore, truck cost will be an important element in river terminal selection, alongside other factors including terminal capacity, terminal equipment, land availability, etc. (see Port and Site Selection Criteria section). For this review of economic activity, the 13 counties have been allocated to three groups that roughly reflect their proximity to the proposed port at Crystal City:

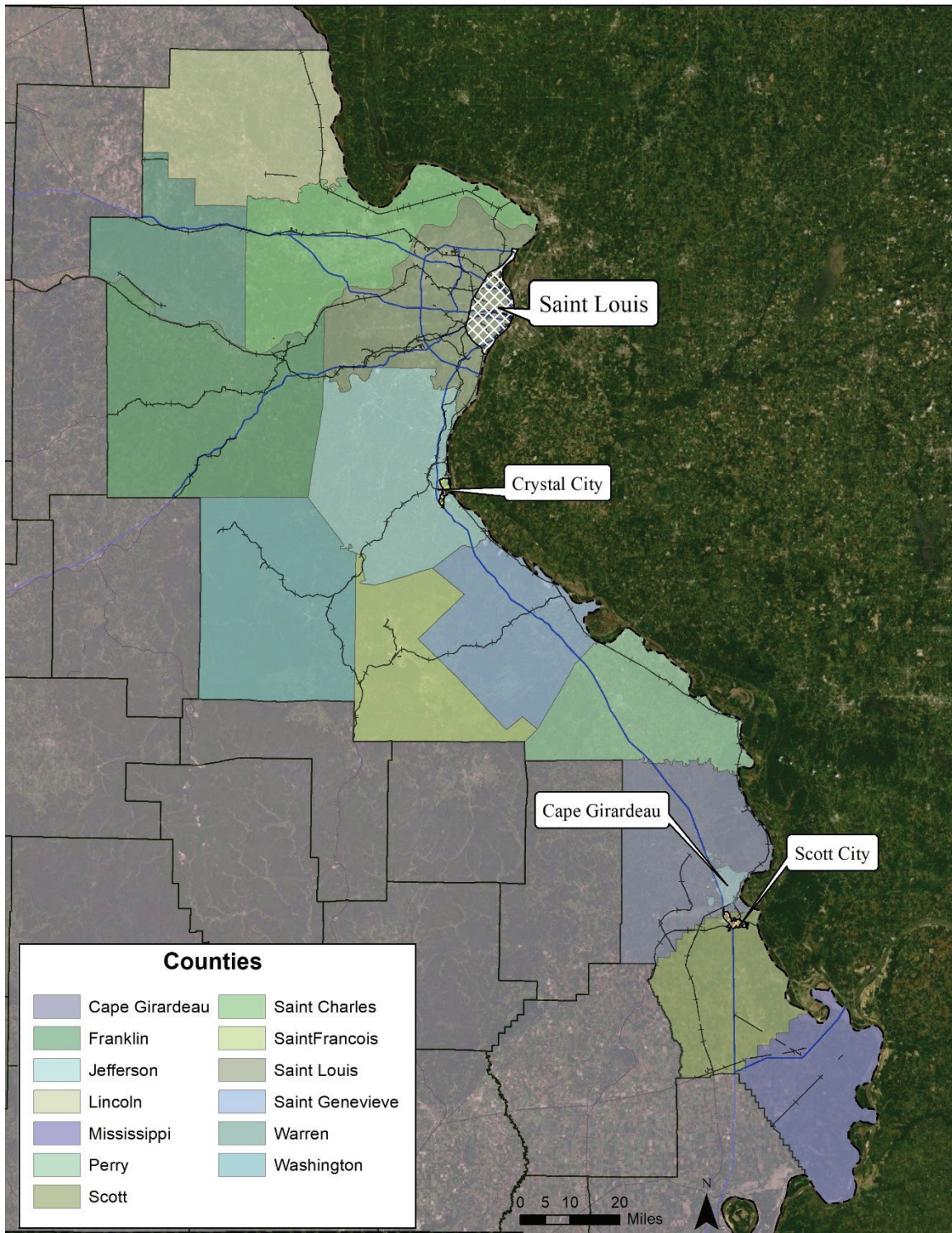
- **North** – Lincoln, Warren, St. Charles, and St. Louis
- **Central** – Jefferson, Franklin, Washington, St. Francois, and Ste. Genevieve
- **South** – Perry, Cape Girardeau, Scott and Mississippi

### **North – Lincoln, Warren, St. Charles, and St. Louis**

The counties of Lincoln, Warren, St. Charles, and St. Louis are located west and northwest of St. Louis City, and generally closer to the river terminals in St. Louis than to Crystal City. Lincoln County is situated along the Mississippi River and north of the Chain of Rocks (Lock No. 27), the final southbound lock on the Mississippi River. The county’s principal industry is agriculture with major crops including corn, wheat, and soybeans. Warren County borders Lincoln to the north and the Missouri River to the south. Located along I-70, the county is marketed for light industrial development at lower site cost than in St. Louis. Agriculture includes crops of corn and soybeans, and food product manufacturing.



Figure 1: Missouri Market Study Area



St. Charles County is a suburban area to the north of St. Louis. The county is a location for manufacturing and warehousing, and in late 2020 had a reported 27 million square feet of rentable industrial space with a 2.6 percent vacancy rate (Source: *industrial real estate market reports*). Industrial space is approximately divided into 87 percent warehouse/distribution, 9 percent manufacturing and 4 percent R&D/Flex. Overall, the county provides approximately 12 percent of the industrial space in the St. Louis metropolitan market. The county's location, with land for development, provides access to the multimodal transportation options (barge, intermodal rail, etc.) and the labor force in the St. Louis metropolitan area.

St. Louis County, west of the St. Louis City and bordering Jefferson to the south, is the principal industrial center in the region outside of downtown St. Louis, MO and East St. Louis, IL. The county provides 45 to 50 percent of the industrial space in the metropolitan St. Louis market (Source: *industrial real estate market reports*).

The above four counties offer the strongest competition to the development of industrial/light manufacturing activities at Crystal City. They have direct access to the labor force and multimodal transportation options in St. Louis. However, other factors are important in industrial site selection (for example, land cost, site size and rail access) and they could favor Crystal City. Additionally, Crystal City's location 35 miles south of downtown St. Louis does provide access to the metropolitan area's labor force. The findings from interviews indicate that Crystal City could be an attractive location for industrial uses in the future.

#### **Central – Jefferson, Franklin, Washington, St. Francois, and Ste. Genevieve**

Jefferson and the four counties bordering it to the west and south are likely to offer the strongest truck-served market opportunities for a port at Crystal City. Local companies that require port access will prefer the shorter route and lower cost of trucking to Crystal City than to terminals in St. Louis. For example, the aggregate and stone industry in these counties could benefit from access to barge transport at Crystal City.

The mining sector may also offer opportunities for outbound bulk cargo at the proposed port (see Stakeholder Input Section). The Southeast Missouri lead belt is the country's primary deposit of lead minerals, producing lead, zinc, and copper concentrates for shipment to U.S. and world markets. Although outside the 13-county region highlighted by JCPA for this study, the mines are close to Crystal City. The active mines in Iron and Reynolds counties are 85 to 100 miles from the port. Exploration continues in the region for other minerals, including the evaluation of rare earth deposits. These could present other cargo opportunities if positive results are realized and if mine locations favor Crystal City over other ports. Figure 2 illustrates all permitted mine sites under the Land Reclamation Act within the state of Missouri. The commodities that are listed in the database provided by the Missouri Spatial Data Information Services included are:

- Clay;
- Granite;
- Gravel;
- Limestone;
- Sand;
- Sandstone; and
- Shale.

#### **South – Perry, Cape Girardeau, Scott and Mississippi**

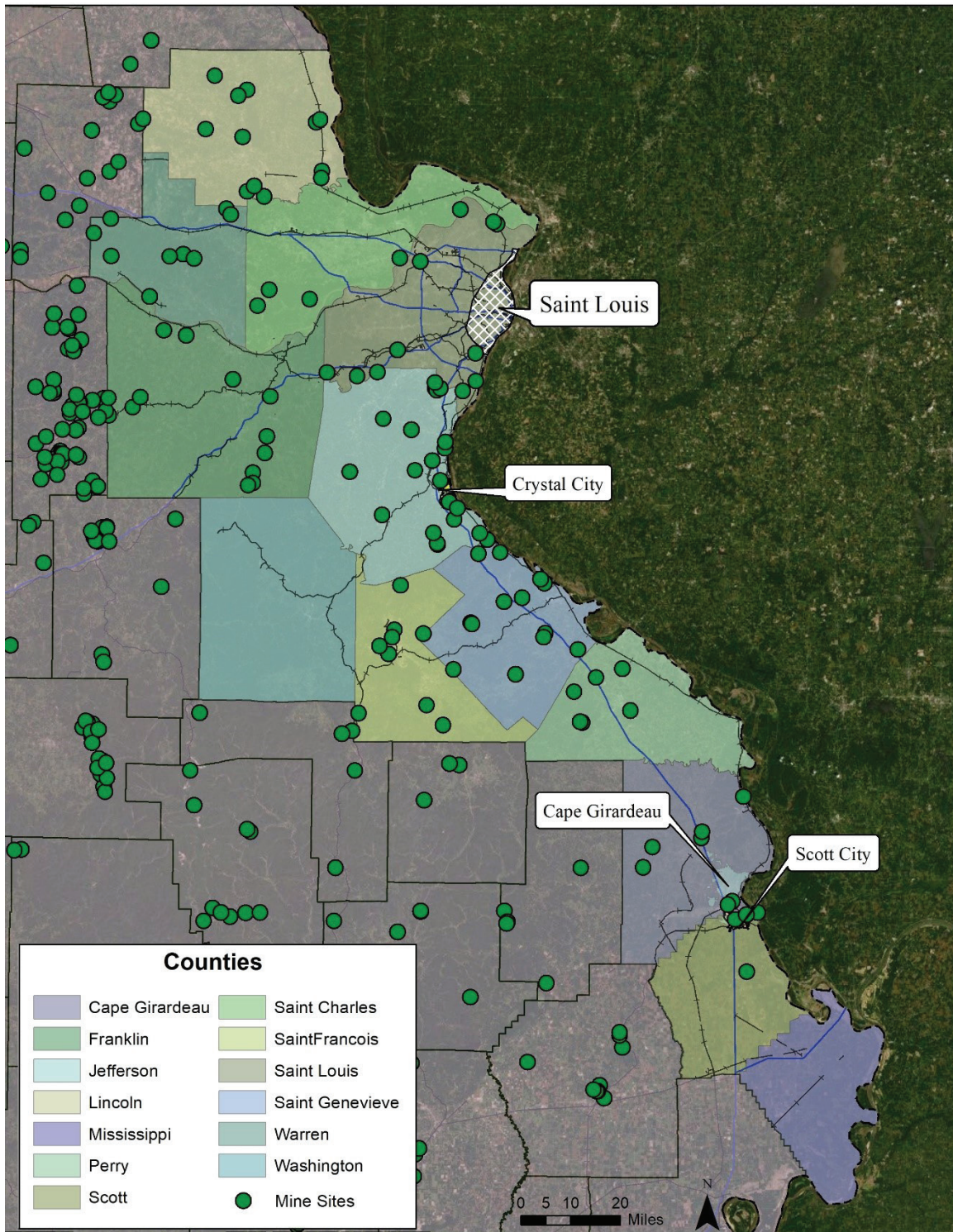
Moving south along the I-55, the proposed port at Crystal City encounters competition in the truck-served market from SEMO Port located in Scott City, MO.

Perry County is roughly midway between the two ports. The county's agriculture production includes corn, soybeans and wheat. A few large manufacturing companies are located in the county. Gilster-Mary Lee is a nationwide private label, contract and food manufacturer with two plant locations, McBride and Perryville, that produce popcorn, cereals, and baking mix. TG Missouri, a division of the Toyota Group, manufactures components for the auto industry.

Further south, SEMO Port would be the preferred gateway for bulk commodities received or shipped by industries located in Cape Girardeau, Scott and Mississippi counties.



Figure 2: Missouri Mine Site Locations, Missouri Spatial Data Information Service



# STAKEHOLDER INPUT

## Introduction

An interview survey was conducted of freight and port-related industries, and economic development agencies, as input to the development and marketing strategies appropriate for a Crystal City Port. In-depth interviews were conducted with representatives of industries including barge and terminal operators, bulk shippers, industrial real estate brokers, local business development experts, and railroad companies including and beyond the highlighted 13 Missouri counties. The respondent types are listed in Table 5.

The overall message that emerged is that several development strategies for a Crystal City Port are possible, especially if a long-term development view is considered. Target industries depend on the desired time to initiate and complete development. A desire to establish port operation in the near-term favors a bare-bones design that accommodates local trucking of bulk commodities to the port. Interest and tolerance for a longer-term and riskier development strategy allows for more ambitious objectives (for example, mixed-use bulk handling/light industrial uses) but it also requires a higher degree of port development, such as on-site rail and build-ready sites. Crystal City was generally viewed positively by respondents; however, caveats relating to publicizing a vision of the port and its capabilities were strongly emphasized. As expected, bulk cargo handling at a Crystal City Port was perceived to be the obvious use, while other uses in competition with operations in St. Louis were considered to be more ambitious, yet possible. Feedback from the interview survey, opportunities and development timelines, marketing strategies are presented below.

**Table 5:** Survey Respondents

RESPONDENT TYPE	N =
Agricultural Shipper	3
Barge Operator	1
Barge Operator (for Agriculture Company)	3
Class I Railroad	1
Developer	1
Economic Development Agency	2
Energy Company	1
Industrial Real Estate Broker	1
Ocean Carrier	1
Port Landlord	1
River Terminal Operator	1
Rock/Earth Shipper	3
Utility Company	1

## Port Development Strategies

Port developer and other interviews suggest that it is important to communicate specific port use plans and capabilities to attract potential users. Plans must consider developments extending 20 to 30 years to allow the Port to establish a reputation as a viable alternative to ports and manufacturing centers in the region. Building in flexibility and anticipating needs, such as land availability or river access requirements, expands the number of market opportunities.

“ Don’t limit yourself. Look at all options, opportunities. What might look daunting today isn’t in the future. Don’t create something that might limit you in ten years...Leave room in port design for the ‘reach’ industries, e.g. manufacturing or food processing. Also consider setting aside lots with water access to accommodate future needs....

*Flexibility is key – consider plans to accommodate the maximum number of future cargo handling opportunities e.g. ...[we] designed a looped roadway [around the development perimeter] with multiple access points and rail crossing, in anticipation of possible future obstructions caused by new buildings, facilities, etc.*

”  
- Port Developer

Preliminary elements of the development strategy for Crystal City are outlined below:

- JCPA should adopt a development vision to guide a Crystal City Port development over several decades that blends near-term objectives and longer-term goals. Interviewees advised it is important that JCPA communicate specific port use plans and capabilities to attract potential users; however, plans must have flexibility to accommodate developments and future growth extending 20 to 30 years (subject to factors that include site size and rate of build-out). A longer-term perspective makes several development strategies possible and will broaden the Crystal City Port’s appeal to as wide an audience as possible.
- Target industries depend on the desired time to initiate/complete development. A desire to establish port operations in the near-term favors a bare-bones design that accommodates local trucking of bulk cargo to Crystal City. Tolerance for a longer-term and possibly riskier development strategy allows for more ambitious objectives (e.g., mixed-use bulk handling/light industrial uses), but it also requires a higher degree of port development, such as on-site rail and build-ready sites.
- Communicating the Crystal City Port strategy in its entirety, to local and regional business development agencies is necessary to elevate the visibility of Crystal City as a viable port on the Mississippi River, and to build momentum for the development of a Crystal City Port. This requires JCPA to have credible “date-certain” availability of access roads, rail access, shovel-ready sites, and utilities. Without this level of conceptual detail, the market cannot evaluate a Crystal City Port with specific customers or uses in mind.
- Communicating the progress of developments and successful site selections at the Crystal City Port demonstrates viability to the market in general and is an essential component of the marketing plan. As one developer noted,  
.....  
*“No one wants to be first. It is important to build on momentum; therefore, establishing and communicating the first successful site selection at the port is critical.”*  
.....
- In particular, the above communication objectives elevate the importance of addressing road access to the port site and being able to communicate a viable timeline for road access to the broad market and to potential customers. The market and local communities have strong preference for road access that has limited comingling of private and commercial vehicle traffic because of safety and congestion concerns.
- Additionally, the identification and preservation of any easements required for short-, medium- and long-term development is important. For example, allowing for possible future pipeline capabilities in the port design ensures the flexibility to respond to any future market opportunities that have a pipeline requirement.

The entire vision of a Crystal City Port development plan must be articulated; however, interviews suggest that expectations for successful site selections at Crystal City should allow for different time horizons. Accommodation of short-, medium-, and long-term goals should enhance the potential for a successful Crystal City Port and economic development for the surrounding area.



### Short-term Development

- Focus on obvious port advantages and on customers/uses that can be quickly implemented. Marketing to local shippers who can save on trucking costs over area ports is an example of a near-term marketing effort (e.g., local shippers of rocks and minerals).
- Local rock and mineral shipper interview respondents expressed interest in services at Crystal City using truck-based cargo delivery, and basic conveyor cargo handling systems.

.....  
*“We need space to store rock, and additional space to load on the barge, probably a couple front-end loaders to handle large rock. The closest terminal doesn’t have the equipment to handle large rocks. Terminal storage and cargo handling costs and barge and truck transportation costs are key considerations as well.”*  
.....

- The marketing strategy leverages local and regional business development agencies to identify and canvas traditional river port bulk cargo shippers who can save on trucking expenses as compared to area ports, or who can take advantage of cargo handling systems not available elsewhere.

### Medium-term Development

- Promote rail access and cargo handling facilities, and the multimodal (road, rail, and barge) strengths of the Crystal City Port. Few greenfield terminal opportunities come up on the Mississippi River; therefore, the Crystal City Port could be attractive to a broad range of interests. Rail access and accommodation of unit trains can dramatically increase the inland market reach of the Crystal City Port.

.....  
*“Having rail dramatically increases capacity and reach of terminals to states extending to the upper-Midwest. The number of terminals with on-dock rail is limited though, and may offer a competitive advantage.”*  
.....

- The longer development timeline allows JCPA to solidify necessary shipper and railroad relationships required to elevate awareness of the port. A central marketing component is the cultivation of relationships with the Class I railroads who have intimate knowledge of rail-served shippers and their needs (e.g., companies in the agricultural sector).

.....  
*“It’s important to work with the railroads to get an understanding of the opportunities that their customers may be thinking of.” - Railroad*  
.....

- A pipeline dedicated to on-terminal liquid cargo handling and storage would be a requirement for liquid cargoes (e.g., vegetable oil for a food processing facility). This requirement is typically a specific design requirement of an identified shipper. Allowing for pipeline capabilities in the port design ensures the flexibility to respond to any future pipeline requirements.

### Long-term Development

- Significant marketing efforts are likely required for non-port-related purposes, such as light industrial and manufacturing (including an industry cluster), where awareness of the area as an industrial center has yet to be established. The opportunity for light industrial and manufacturing could also be broader and occur sooner if the development of port infrastructure (e.g., road access) opens up non-port land for development. In effect, JCPA acts as an economic development catalyst for the Crystal City area surrounding the port site.
- Rail access can positively differentiate Crystal City from non-rail served industrial parks in the region.

.....  
*“There aren’t many river sites available that aren’t crowded, and if Crystal has a rail spur – it differentiates itself from most industrial parks in the region...Water/ barge access might be a requirement of a very small percentage of the light industrial target market; however, it might also be critical to a decision to locate at Crystal City. (For this reason) leave a site with water access...”*  
.....



- Options include approaching the Crystal City Port as traditional industrial development by emphasizing more common requirements, such as tax abatement programs, an enterprise zone, construction-ready lots, established or date-certain availability of utilities and road infrastructure. Offer a build-to-suit option which would remove up-front financing challenges for the JCPA. Partnering with a local/regional developer who is familiar with the site can also assist with build-to-suit planning and design.
- The strategy may also include certification of Crystal City as a mega-site, but that requires a specific port design, established access, utilities, etc. The site would be from 300 to 1000 acres and is usually focused on a single use.

.....  
*“Have something to sell before you approach the market...Make sure to publicize successful site selections to promote area viability”*  
 .....

## Port Marketing Strategies

In addition to the port development strategies described above, interviewees advised that the basic marketing sequence should be as follows:

- Establish port features;
- Communicate port features and successful site selection progress to local and regional Economic development agencies, brokers, industrial media, and trade magazines; and
- Stay in contact.

Respondents with an economic development background encouraged the JCPA to refine and communicate port development plans, architectural renderings, and successful site-selections to area economic development and industrial real estate companies. Companies choosing sites have typically narrowed their search to two or three states based on internal site-selection analysis. These companies typically approach state economic development agencies to inquire about available properties and can be referred to known industrial developments meeting search criteria.

Industrial real estate brokers and site selection firms also generally approach economic development agencies for available sites meeting search requirements. The larger brokers have international reach; however, economic development agencies remain the best source of likely interested parties. This is true for companies interested in either bulk or light industrial use at the port.

Companies that do require rail to barge tend to know where they want to locate and go directly to the port or developer.

.....  
*“Legit leads mostly came from companies actively looking to either expand or establish terminal space on the river.” - **Economic Developer***  
 .....

These agencies can also place calls to local companies that fit a profile of companies likely to choose Crystal City based on existing or planned port characteristics. Local mineral and rock companies that rely on trucking is an example of a Crystal City shipper profile.

The overall approach to marketing a Crystal City Port includes:

- Establish general port features and reasonable timelines for implementation of critical infrastructure (e.g., road access). Emphasize opportunity to develop modern and “green” port facilities and operations at the port site, including opportunities to accommodate unit trains.
- Refine and communicate port development plans, architectural renderings, and successful site-selections to area economic development agencies, state agencies, industrial real estate companies, industry groups and trade media.

- Collaborate with one or more local economic development agencies (EDA) to extend the marketing reach of JCPA. A local EDA may assist with “cold call” promotion to local/regional businesses.
- Emphasize that Crystal City is competitive with other ports in the region and it can satisfy the port selection criteria of many shippers seeking to improve their supply chains. Criteria include port efficiency, port capacity, quality of facilities, rail access, land and river transportation costs, truck turn times, etc.
- Emphasize medium to long-term opportunity to establish a rail-to-barge river site, especially if the cargo isn’t currently being handled in the St. Louis area. The availability of such suitable sites may be limited in the marketplace and thus increases the appeal of Crystal City.
- Generally, concentrate on industries/shippers that align with the development timeline and features offered by Crystal City.

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## Port and Site Selection Criteria

Transportation and industrial real estate professionals were interviewed to identify key decision criteria to evaluate and choose among competing facilities and developments. Transportation representatives offered opinions from the cargo handling perspective, while industrial real estate interviews provided site-selection objectives from the light industrial and manufacturing operation point of view.

Transportation respondents were asked an open-ended question: **“Why do shippers and transportation providers choose one Mississippi port over another?”** Responses to this question provided basic port selection criteria that Crystal City will need to meet to attract future port users. The unanimous answer is that the decision to add a port depends on lowered transportation costs, assuming port efficiency, reliability, and transit time requirements are met.

Industrial real-estate site selection criteria share similar requirements to port selection, such as lowest transportation costs to and from the site; however, requirements are expanded to include an available labor force, favorable tax and business environment, and competitiveness with regional manufacturing centers.

Crystal City must satisfy various port selection criteria to attract firms seeking to initiate port operations among competing locations. According to an industrial real estate respondent, firms looking for port services typically have narrowed their search to a general region or area that satisfies port location requirements. Crystal City is, therefore, in competition with all ports offering similar services in the St. Louis area, which respondents suggest covers ports between St. Louis and Cape Girardeau. Factors related to land and river transportation costs, port services such as fleeting, and an established cargo-handling infrastructure further narrow the site-selection decision.

Crystal City offers cost and reliability competitive advantages simply due to its location below the Mississippi lock system, which enables ice-free, lock-free, and deep-water access to and from the Gulf. Deep water at Crystal City makes barge load capability competitive with load capacity at St. Louis

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## Land Transportation Reliability

The most basic and expected terminal requirement is reliable access. A direct truck or rail route with limited comingling of private and commercial vehicle traffic is the strong preference of both local communities and transportation providers because of safety and congestion concerns.

As mentioned above, transportation costs are the primary consideration when comparing ports once a decision to locate in a particular area has been finalized, assuming terminal service capabilities are equal. Ports in closest proximity to cargo origin or destination points have the land transportation advantage.

## Local and Regional Trucking

The consistent message from the interview survey, as well as separate studies conducted by the TranSystems team, is that ports that facilitate lowest cost cargo transportation costs are preferred, and port proximity to inland pick-up or delivery points drive lowest cost trucking. Proximity to bridge crossings to access crops on the eastern side of the Mississippi is also a factor. As such, interviews indicate that competition with Crystal City for these cargoes is, therefore, ports between St. Louis and Cape Girardeau.

Interviews with rock and mineral shippers who currently truck cargo indicate that they are likely to consider a port move if shorter transits prove to lower trucking expenses – terminal costs and capabilities being equal. Shorter truck transits have the added benefit of reducing turn-times, thereby increasing the number of possible truck trips. Local shippers who are in closer proximity to Crystal City than to ports they currently use would be prime marketing target candidates.

.....  
*“Of course a company would consider a port move if it lowered trucking costs. We would want to make sure it had the proper facilities, but we would simply bid out our business in the next cycle” - Rock/Mineral Shipper*  
.....

A possible exception to local trucked commodities near the Crystal City Port is sand and gravel. The sand and gravel supply chain is described as a short haul from a river dredge to a nearby asphalt plant and delivered from there by trucks to project sites in the vicinity of the plant. Sand and gravel handling is, therefore, generally tied to the existence of a cement plant according to a barge operator interview.

## Rail Access

On-dock rail capabilities dramatically increase the market reach, the velocity and volume of terminal cargo handling, and deliver a lower per ton transportation costs compared to trucking. Rail is not a requirement for many firms seeking new port locations; however, offering rail capabilities increases the port’s viability to the widest array of potential customers and can accommodate long-range plans to expand port capabilities. Large volume bulk cargo shippers would likely not consider a port without rail access, including the ability to accommodate unit trains.

On-dock rail expands the Crystal City Port’s service area reach to markets hundreds or even thousands of miles away. Nearby transcontinental rail interchange capabilities in St. Louis open markets in the East according to a terminal operator who works closely with the railroads to accommodate national shipping networks. A terminal operator also emphasized the ability to access Western grain markets using the rail mode:

.....  
*“Having rail dramatically increases capacity and reach of terminals to states extending to the upper-Midwest. The number of terminals with on-dock rail is limited though, and may offer a competitive advantage”*  
**- Terminal Operator**  
.....

An obvious advantage of rail is the amount of freight that the mode is capable of handling as compared to trucking, leading to cost per ton savings and operational advantages. Rail delivery volumes made possible by unit trains facilitates the efficient transfer of cargo to barges. An international grain shipper notes substantial barge loading efficiency advantages of rail, explaining that up to 80 trucks are needed to fill a single barge, while a unit train can fill an entire forty-barge tow.

Grain shippers are interested in maintaining options even as the freight is in-transit. Unexpected high or low-water events may interrupt transloading cargo at river ports, and shippers may opt to rail cargo to an alternative port, or even rail to the Gulf for export. The flexibility to rail “thru” to downstream ports and avoid “dead-ending” is a very attractive port feature.

Further, the absence of a loop track and direct rail-barge connectivity will put a port at Crystal City at a disadvantage with other regional ports that handle agricultural products with capacity for unit trains and the ability to provide rail to barge transload capabilities.

## Pipeline

A pipeline dedicated to on-terminal liquid cargo handling and storage would be a requirement for liquid cargoes, for example, vegetable oil for a food processing facility. However, this requirement is typically a specific design requirement of an identified shipper. Allowing for pipeline capabilities in the port design plan ensures the flexibility to respond to a future pipeline requirement.

Crystal City's lack of connectivity to national oil pipelines eliminates crude oil as a target cargo. The massive investment needed to establish pipeline connectivity may be cost prohibitive.

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## Company Owned vs. Third Party Terminals

Respondents offering their perspective on grain shipper needs are comprised of grain shippers, grain barge operators, and grain terminal operators. Views on Crystal City as a viable port option differed depending on whether a grain company owned or controlled cargo handling and transportation assets, including silos, cargo handling equipment, or rail sidings.

### Shipper Owned/Controlled Transportation Facilities

Agriculture companies operating terminals in St. Louis can receive unit train loads of grain, can quickly fill silos, and load barge tows exceeding forty barges. Once loaded, these barges go non-stop to the Gulf, without diverting to ports along the way that slow transits and incur additional costs. Interviews suggest these companies are not likely to use third-party grain handling facilities outside of their company-owned or -controlled networks because of the additional costs to use third parties. St. Louis area silos generally operate with plenty of available capacity, and the three-or-so week period during peak season when they do approach full utilization is not enough of an incentive to explore alternative port options. Respondents further indicate that large grain companies such as Cargill and ADM, or companies with grain operations in both St. Louis and Memphis are not likely to utilize another port between the two.

.....  
*"Similar to railroad unit and container train scheduling strategies, diversions increase transportation cost, and slow transits. We can also put a large tow together in a week because of 4 silos in STL - it would take a long time for Crystal City to accumulate enough cargo...Silo's that aren't owned by the grain company/barge operator cost extra to call; therefore, large operators are not likely to divert to silos outside of the barge operators network."*  
**- Barge Operator**  
.....

### Third Party Shipper Use Facilities

Shippers that are not affiliated with terminal networks have more flexibility to consider port alternatives. Several interviews suggest that the use of Crystal City will be driven strictly by the market; a barge company will serve any port if it demonstrates cost and efficiency capabilities sufficient to attract enough cargo. Respondents note additional port services and conditions that facilitate port call consideration, such as fleeting capabilities, and establishing relationships with barge operators to maintain empty barge availability:

.....  
*"Even though St. Louis is preferred, barge companies would divert to pick up a load in Crystal City as long as the port provided fleeting service. Grain barges for example are picked up from Cape Girardeau today. Shippers generally dictate port call requirements based on sufficient quantities of cargo at each port; therefore port storage must accommodate accordingly. We might even drop a northbound fertilizer barge if a shipper required it."*  
**- Barge Operator**  
  
*"The port would ... need a relationship with a single barge operator because companies are not likely to tow a competitor's barge."*  
**- Port Developer**  
.....

Shippers looking for flex grain capacity during peak season may also seek out third-party terminal operators if the facility were reliable and efficient, and demonstrated multiple commodity handling capabilities, e.g., corn, soybeans, or DDGS (dry distillers grain with solubles). Terminal services include sufficient silo storage and cargo handling capabilities.

This suggests that agriculture companies that do not own transportation infrastructure assets would be more willing to consider a port outside of St. Louis if cost and efficiency requirements are met. Connectivity between the existing railroads and the port facility would be a requirement for Crystal City if it were to be considered an alternative to grain terminals in St. Louis. A terminal operator cautioned that a port would be advised to have a contract in hand before commencing with large scale port development.

### Third Party Port Opportunity

Establishing a viable alternative to St. Louis as a grain port requires substantial cargo handling, rail infrastructure, and barge fleet services. However, a competitive dynamic emerging in the market could present opportunities for Crystal City. Recent mergers and acquisitions of agricultural cargo handling infrastructure means that grain companies without extensive transportation-network assets use their competitors' barges and facilities. They may have interest in a third-party independent facility:

.....  
*“The grain shipper landscape is changing – Bunge for example just sold their river transportation division to CBG, so they might have to use a terminal owned by ADM or Cargill. If they want to bypass those two competitors, they might be interested in an independent terminal such as Crystal City, providing that transportation mode connectivity, reliability, and operations and cost efficiency are complete with terminals in St. Louis.” - Barge Operator*  
.....

## Non-Candidate Commodities

A broad selection of transportation professionals was contacted to assess the port's cargo-handling suitability for a wide array of commodities. Respondents advised on two traditionally large commodity sectors that are not recommended for Crystal City:

- Coal is in “structural” decline due to the energy industry replacing coal with alternative fuels, so it is not likely to expand cargo handling beyond the existing river terminal infrastructure. Environmental concerns also constrain new terminal facilities construction. A coal company interview says that coal should be way down the cargo target mix.
- Crystal City's lack of connectivity to national oil pipelines eliminate crude oil as a potential target cargo. The massive investment needed to compete with existing pipeline infrastructure maybe cost prohibitive.

## Light Industrial

The site selections made by manufacturers and other light industrial firms expands decision criteria to include factors beyond transportation considerations, such as an available labor-force, favorable tax and business environment, or competitiveness with regional manufacturing centers. This group tends to prioritize highway and rail over river access, although a small percentage will likely seek river access as well. An economic development agency offered that few good river sites are available:

.....  
*“There aren’t many river sites available that aren’t crowded, and if Crystal has a rail spur – it differentiates itself from most industrial parks in the region...Water/ barge access might be a requirement of a very small percentage of the light industrial target market; however, it might also be critical to a decision to locate at Crystal City. (For this reason) leave a site with water access... Real competition for manufacturers are ports in Memphis, or Arkansas, and other ports in ‘Right to Work’ states.”*  
– **Economic Development Agency**  
.....

A strong recommendation was offered by a few respondents to “have something to sell”; meaning to provide a vision of a Crystal City Port that includes date-certain site-ready parcels, utilities, and transportation access that includes highway, rail, and river access. A respondent considering a manufacturing possibility for the Crystal City Port said his company “wouldn’t consider” a Crystal City location without a clear understanding of what the site can offer.

A critical element of site selection decision making is the quality and availability of a labor pool. Economic development agency representatives suggest that Crystal City-based manufacturers would have access to the St. Louis area labor force, which is highly trained and available due to the existing automotive manufacturing sector in the area. The commute from St. Louis would likely be under an hour, which is considered to be acceptable.

The consensus of business development and port developers is that mixed-use light industrial is viable at Crystal City, provided a long-term view is taken of the market. Respondents offered manufacturing examples:

- Battery manufacturing using locally sourced lead concentrates, processed using clean technology because regulations calling for increased use of clean energy have the potential to increase the demand for batteries both domestically and internationally; and
- Beer can manufacturing at a port facility using raw materials delivered by barge and distributed to local breweries.

.....  
*“The point is to manufacture as cheap as possible. Maybe a small 50k footprint metal fabrication company or international company that needs river access (would be interested).”* – **Economic Development Agency**  
.....

Crystal City as a location for distribution center space was discouraged because St. Louis offers cheap and readily available space, and highway and rail access in St. Louis is excellent. Interviewees suggest that only environmentally clean manufacturing opportunities should be perused due to the site’s proximity to the river.



## Development and Opportunities Matrix

The development strategies and market opportunities identified from the interview survey are summarized in Table 6.

**Table 6:** Development Strategies and Market Opportunities Matrix

Relative Level of Effort Key:



STRATEGY:	SHORT-TERM	MEDIUM-TERM	LONG-TERM
<b>Market Sector:</b>	<b>Local Bulk Shippers</b>	<b>Rail-Served / Agriculture Shippers</b>	<b>Light Industrial / Manufacturing</b>
Opportunity	Consider local rock company interested in shipping to the Gulf that current ports cannot handle.	Consider grain companies that do not have established grain transportation assets in St. Louis.	Consider, for example, battery manufacturing and aluminum manufacturing for area bottling and canning plants.
Port Selection Factors (Transportation cost, port capabilities, reliability, etc.)	Mineral and rock shippers responded favorably to Crystal City due to perceived lower trucking costs to/from the port and additional truck turns.	St. Louis has established infrastructure operated by large grain companies; these are unlikely candidates for Crystal City. However, companies that are not aligned with St. Louis grain terminals might consider a third-party independent grain terminal at Crystal City. The terminal would need to be cost effective, efficient, and reliable.	The main competition is from sites in St. Louis. Crystal City should consider traditional incentives (e.g., tax abatements, and build-to-suit lots) to alleviate port financing commitments.
Awareness of the Crystal City Port Project	Local awareness includes operators/users of port in Herculaneum, MO. Communicate with local economic development agencies to expand awareness regionwide.	None - Engage railroads, economic development agencies, and industry groups.	Crystal City is not recognized as an industrial center vs. St. Louis. Communicate detailed development plans and milestones to economic development agencies, industry publications, industrial real estate brokers, etc.
Port Access (Road, Rail and Barge)	Not yet established – Identify “date-certain” highway access and implement roadway improvements to promote a Crystal City port.	Focus on road access, and unit train rail capabilities to compete with St. Louis, and to serve Midwest markets. Develop relationships with railroads and agriculture companies.	Prioritize truck and rail over river access, generally. Identify “date certain” road and rail, utilities, and shovel-ready site availability.
Proximity to Population Center	N/A	N/A	Build upon existing labor force in St. Louis bi-state area, mindful of competition with manufacturers who distribute locally in St. Louis. Consider companies who distribute nationally.
River Access	Channel depth near Crystal City is an advantage.	Channel depth near Crystal City is an advantage.	River access is not typically a priority for manufacturing companies; however, companies that can accept or distribute materials by barge would be candidates. Brokers noted there are not too many river sites available.

Source: GKSF from Interview Survey

# MARKET OPPORTUNITIES AND PROJECTIONS

## Short-Term Development

The short-term development strategy focuses on obvious port advantages and on customers/uses that can be implemented in a reasonably short timeframe, subject of course to environmental, planning and construction requirements, and the provision of road access to the site. Short-term development focuses on truck-served business in the region around Crystal City. The marketing strategy leverages local and regional business development agencies to identify and canvas traditional river port bulk cargo shippers who can save on trucking expenses as compared to area ports, or who can take advantage of cargo handling systems not available elsewhere.

The market sectors described below are viewed as offering potential for Crystal City, based on the findings of the interview survey and past regional freight analysis conducted by the TranSystems team. Development of a Crystal City port focuses on dry bulk handling facilities for commodities that may include aggregates such as sand, rocks, and minerals. Individual shippers will have input to terminal requirements, equipment, and expansion needs over time. Other areas of interest include fertilizer, scrap metal, heavy lift/project cargo, and the provision of barge services.

The market opportunities discussed below initially generate up to 1.35 million tons of cargo. Realization of these opportunities will require negotiations with individual shippers on specific volumes, facility and service needs, and costs. Based on the information provided by interviews and analysis of regional freight, the opportunities would require a dry bulk/general cargo terminal facility, offering open storage and barge loading/discharge, and some closed storage for selected commodities. The equipment required for barge loading/discharge will be driven by the types of commodities, for examples, conveyors for aggregates and sand, and a grapple and magnet for scrap metal.

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### Aggregates and Sand

Local shippers of aggregates and sand could benefit from a terminal at Crystal City, lowering their trucking costs compared to other river terminals in the region. A relatively inexpensive terminal system is required with a loading conveyor and storage area. Sand must be kept free of contaminants, so an operation where trucks deliver directly to covered hoppers is preferred. Shippers of aggregate, including ballast stone for railroads, would require open storage. Longer term, rail access may also be desirable as it allows shippers of aggregates and sand transportation options for some of their customers. The cargo forecast for port development, based on interview findings and previous master planning, assumes:

- Initial requirement to ship up to 500,000 tons per year;
- Medium to long-term shipments of 1,000,000 tons per year; and
- Planning should accommodate initial volume and area set aside for potential expansion.

### Rock

Findings from the interview survey indicate a need for terminal facilities to handle outbound shipments of locally sourced oversized rock. The large rocks can be used in the construction of coastal and river protection structures on the Gulf Coast and along the inland river system. The business requires terminal equipment that can handle and load the over-sized and heavy rock; currently this capacity is not available in the area. Open storage area is also a requirement. The cargo forecast for port development, based on interview findings and previous master planning, assumes:

- Initial requirement to ship up to 500,000 tons per year;
- Medium to long-term shipments of 1,000,000 tons per year; and
- Planning should accommodate initial volume and area set aside for potential expansion.

## Minerals

Crystal City may offer a more efficient routing for mineral concentrates from Missouri's mining district, including lead, zinc, and copper. The Crystal City Port could allow for customized solutions for handling, storage, and product containment and prevention of cross contamination of minerals. Strong environmental regulations and protections for handling minerals would have to be addressed in facility planning in collaboration with shippers. The cargo forecast for port development, based on interview findings and previous master planning, assumes:

- Initial requirement to ship up to 100,000 tons per year;
- Medium to long-term shipments of up to 200,000 tons per year; and
- Planning should accommodate initial volume and area set aside for potential expansion.

## Fertilizer

Fertilizer is an important inbound barge cargo to the Midwest region. The opportunity lies in serving demand from the agriculture sector in the Missouri counties surrounding Crystal City, and other truck-served markets. The requirements are for discharge of barges to open and covered storage, and bagging operations. Based on the regional market and previous master planning, the cargo forecast for port development assumes:

- Initial requirement to discharge up to 100,000 tons per year;
- Medium to long-term inbound shipments of up to 200,000 tons per year; and
- Planning should accommodate initial volume and area set aside for potential expansion.

## Scrap Metal

Scrap metal is shipped by barge from the St. Louis area to steel mills with river access. Metal scrap for export is another segment of the market with product barged down to New Orleans for transfer into ocean going vessels. Scrap can be loaded directly from truck to barge, but the preference is to have storage at the terminal. A grapple is required to load the scrap and a magnet for small pieces and clean up. Longer term, rail access would provide additional flexibility to the shippers. The cargo forecast for port development, based on interview findings and previous master planning, assumes:

- Initial requirement to ship up to 150,000 tons per year; and
- Stable shipments, but with some ability to expand built into facility planning.

## Heavy Lift/Project Cargo

The Crystal City Port development strategy should incorporate an option to accommodate heavy lift/project cargo moving through the region. The market is unpredictable as cargo is typically tied to one-off projects. Examples include industrial equipment, wind turbines, and construction components. Requirements include a heavy lift capability (for example, a mobile harbor crane), a cargo set down/storage area, and truck access for oversized loads. The heavy lift/project cargo requirement can be provided as a component of dry bulk/general cargo planning and development.

## Dry Bulk Terminal

A dry bulk terminal can receive a variety of commodities including scrap metal, stone, and coarse aggregate for shipment by barge to downstream ports on the Mississippi River. The terminal is designed to load materials that can be delivered by truck, stored in an open yard, and handled by wheeled equipment and mobile cranes on a quay wall barge loading wharf. The terminal could also be used to unload barges by mobile crane. The open storage area is designed for materials that would not incur measurable damage from exposure to weather or inundation. Terminal particulars include:

- Heavy truck access road with scales for measuring cargo delivery and empty truck tares and a small administration building with facilities for the terminal workers;
- Fifteen acres of heavy pavement for surface storage of cargo and for circulation and operation of dump trucks and front end loaders;
- Two mobile harbor cranes having a net duty cycle load capacity of 15 tons; and
- Material handling equipment to include grabs, clamshell buckets, or magnets as needed.

Additional short-term development activities to occur at the Crystal Site include, but are not limited to:

- Environmental Clearance and Permitting – JCPA should initiate National Environmental Policy Act (NEPA) requirements in anticipation of federal participation;
- Land Acquisition – During this phase, parcels should be consolidated to the greatest extent possible, and owner-operator agreements should be pursued;
- Utilities – Verify that the capacity of existing power, sewer, and water utilities will support port operations;
- Ancillary Facilities – Identify the operational requirements for barge handling, fleet, cleaning, and servicing, including service providers;
- Roadway Access Improvements – Begin facility road construction and realignment; and
- River Access Improvements – Upgrade existing bulk loading pontoons and cells, and install service pontoon and switch boat mooring.

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## Medium-Term Development

Medium-term development and market opportunities center on the provision of rail infrastructure to accommodate unit-train service, and extend inland market reach, and the promotion of the Crystal City Port’s multimodal (rail, road, and barge) benefits to shippers. Additionally, there are few greenfield terminal opportunities with on-dock rail along the Mississippi River; therefore, a Crystal City port could be attractive to a broad range of interests. Central to success is the cultivation of relationships with the Class I railroads who have intimate knowledge of rail-served shipper demand and requirements, and the marketing of the Crystal City Port’s potential with economic development agencies, industry groups, and industrial real estate brokers.

Given the uncertainty surrounding the timing of on-dock rail capacity, the following discussion focuses on the types of terminals that could be attracted to the port under positive market conditions, rather than projections of commodity volumes.

### Agriculture/Food Processing

The region surrounding Crystal City hosts several proprietary riverfront plants for companies in the agriculture/food processing sector. These plants move raw materials and final products by truck, rail, and barge. Two examples are:

- In the St. Louis area, Italgrani operates the largest semolina and durum flour mill in North America, which incorporates a storage facility that receives wheat by rail and barge. In 2017, Italgrani expanded the plant with additional storage, milling and bagging capacity; and
- At Southeast Missouri Regional Port (Cape Girardeau), Semo Milling operates a dry corn mill and bagging facility that processes corn from local farms into corn meal, corn flour and other products.

The JCPA’s should allocate and market sites suitable for proprietary operations. As stated elsewhere, the marketing effort will be with economic development agencies, industrial real estate brokers, railroads, and relevant industry groups. Interaction with the local and regional agriculture community is viewed as essential.

## Liquid Bulk

Consumer liquid bulk products, such as gasoline are adequately served by the existing river terminals in the St. Louis area. The market opportunity primarily lies in the provision of sites and infrastructure for liquid bulk tied to manufacturing, such as the receipt of vegetable oil to a food processing plant. Site location could be upland, away from the waterfront, with a pipeline for transfer from the waterfront to plant storage. The marketing approach is the same as discussed above.

The infrastructure needed for a basic liquid bulk terminal would be:

- On-shore tank farm to store liquids;
- Containment berm around the tank farm;
- Roadway or rail access to the tank farm;
- Pumping equipment and pipelines; and
- Barge berth.

## Grain Terminal

Most major grain companies have direct control of grain terminals in the St. Louis area and are not viewed as candidates for a grain terminal at Crystal City. However, there are asset-light grain trading companies that may find access to a third-party grain facility beneficial to their business needs. Realization of such an endeavor is challenging due to the amount of grain terminal capacity in the St. Louis area and will require extensive marketing by the JCPA with the grain industry and railroads. The basic parameters for a grain terminal are provided below to assist in guiding port development.

The purpose of the grain terminal will be to receive wheat, corn, and other granular agricultural products for shipment by barge downstream to export terminals on the Gulf, and to some domestic markets. The terminal is designed to load products that can be delivered by rail or truck, stored in a mechanized silo complex, and handled by conveyors to the barge loading point. The silo storage site will be constructed on fill and elevated above the 500-year river flood level. Terminal particulars include:

- Capacity of 2,000,000 tons per year on a site of 15 acres;
- Rail car unloading track with two hopper car dump pits, each having a capacity of 1,000 tons per hour;
- Heavy truck access road with scales for measuring cargo delivery and empty truck tare, and one dump pit having a capacity of 1,000 tons per hour. The truck scale area would also have an administration building for documentation and terminal worker facilities;
- Thirty-two silos that are 90 feet in diameter and 80 feet high, having an approximate capacity of 8,000 tons each;
- A head house with elevators and scales that can load the silos at a gross rate of 4,000 tons per hour and discharge the silos at a gross rate of 1,500 tons per hour;
- An elevated conveyor from the head house to the barge loading point with a gross rating of 1,500 tons per hour and a net rating of 1,000 tons per hour;
- A fixed cellular cofferdam support structure with two movable loading spouts capable of loading 1,000 tons per hour into either of two barges rafted together; and
- Barge mooring floats with approximately 500 feet of barge berthing.

Additional medium-term development activities to occur at the Crystal City Site include, but are not limited to:

- Upland Site Work – Grading;
- Fleeting Locations – Shift to Crystal City for fleeting;
- Roadway Access Improvements – Complete facility roadway circulation; and
- Railroad Access Improvements – New track installation to serve the facility.

## Barge Services

The dominant cargo flow for barges on the Mississippi River is southbound towards the Gulf of Mexico. As a result, approximately 80 percent of the barges moving northbound on the river are empties being repositioned for freight to be shipped southbound. Before these barges can be loaded, they must be stored, cleaned, and possibly repaired. Additionally, loaded barges will be held near the terminal awaiting a down-river tow. As business develops at Crystal City, demand may emerge for the fleeting and cleaning of barges at Crystal City.

Common practice for fleeting is to provide anchored mooring buoys or permanent mooring cells along the river to hold the barges in fleet. With six barges moored side by side, five fleeting positions would support 30 barges for every 1,000 feet of river shoreline. Fleeting areas may be found on both sides of the river and must avoid the USACE channelization wing dams and be clear of the normal navigation channel. Additionally, fleeting must be planned with upstream navigation in mind which does not always follow the deeper, faster flowing main channel.

A facility will be required to perform cleaning and servicing of the barges prior to loading. This activity could initially take place on the general terminal site; however, longer term a dedicated float may be required to accommodate increases in barge activity. The facility should be capable of cleaning six to eight barges per day and must be expandable to ten or twelve barges per day based on a 25 percent to 50 percent rate of empty barges requiring service before they can be reloaded. Solid waste may be removed at the port terminal and trucked inland for disposal or may be sold to a salvage company. The barge cleaning facility would likely include a mooring for one to four switch boats, which are smaller tugs for moving barges .

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## Long-Term Development

As stated earlier in the report, significant marketing efforts are likely required for non-port-related purposes, such as light industrial and manufacturing (including an industry cluster), where awareness of the area as an industrial center has yet to be established. The opportunity for light industrial and manufacturing could also be broader and occur sooner if the development of port infrastructure (e.g., road and rail access) opens non-port land for development. The strategy may also include mega-site certification, normally focused on a single use.

### Site Development

The provision of sites suitable for manufacturing and warehousing should include production and shipping facilities for value-added activities such as light manufacturing, sub-assembly preparation, repackaging and localization. Sites are designed to receive and ship freight by truck, but there may also be a market requirement for rail served sites. Site development particulars include:

- Utilities – Increase power service required to support expansion and serve industrial facilities and operations;
- Site Work – Prepare sites for manufacturing and warehousing facilities;
- Ancillary Facilities – Shift to Crystal City for services upon completion of the slackwater harbor;
- Railroad Access Improvements – Install rail spur to serve any rail-dependent manufacturing and warehousing;
- A fixed cellular cofferdam quay wall with load capacity to handle appropriate equipment movements from the river to rail or truck.



# CRYSTAL CITY OPERATIONS

## Business Model

The Port Reform Toolkit outlines factors that influence the way ports are organized, structured, and managed, including the socioeconomic structure of the country/region, historical developments, location of the port (urban or isolated), and types of cargoes handled.<sup>1</sup> The American Association of Port Authorities and Maritime Administration describe three primary roles that a port authority can assume, including a landlord port, an operating port, or the limited operating port.<sup>2</sup> The role the port authority ultimately takes will define the nature of its interaction with port users, service providers, and the financial community. The Port Reform Toolkit suggests these varying types of models are distinguished by how they differ with respect for characteristics, such as:

- Public, private, or mixed provision of service;
- Local, regional, or global orientation;
- Ownership of infrastructure, including land;
- Ownership of superstructure and equipment (particularly ship-to-shore handling equipment sheds, and warehouses); and
- Status of dock labor and management.

## Landlord

Due to the strategic significance of land, port property is rarely sold outright to private parties. Typically, this property has direct and indirect effects on the regional and national economies, public welfare, intrinsic value, and scarcity. Given these considerations, port authorities assume the status of landlord with a responsibility to manage the real estate within the port area. Landlord ports represent the most common type of management model. Infrastructure, particularly terminals, are leased to private operating companies, and the port authority retains ownership of the land. Typically, leases take the form of a concession agreement, granting a private company long-term lease in exchange for rent. The rent owed is primarily a function of the size of the facility as well as the investment needed to build, renovate, or expand the terminal.

<sup>1</sup> Port Reform Toolkit Second Edition (2007). Module 3 Alternative Port Management Structures and Ownership Models

<sup>2</sup> The Geography of Transport Systems: Public and Private Roles in Port Management. <https://transportgeography.org/contents/chapter6/port-terminals/public-private-roles-ports/>

The port authority's principal relationship under the landlord model is with the terminal operator and stevedore. Private operators are responsible for hiring labor, providing terminal equipment to ensure operating standards are maintained, and negotiating contracts with shippers and barge operators for the loading, unloading, and storage of cargo. The port authority retains little operational control and is insulated from many of the issues associated with operations. Its primary focus is long-term construction and capital improvements, planning, and financing.

Most Missouri ports that previously assumed the role as operator have moved towards the landlord structure. This shift has relieved the ports of certain financing, construction, and operating risks. The three other ports in the region, St. Louis Port Authority, America' Central Port (ACP), and aforementioned SEMO Port are all landlord port authorities.

A landlord port is also responsible for environmental stewardship of the local community, wildlife, air, soil/sediment, and water by protecting against any harmful impacts of port development and operations. Sustainable terminal design and development can help protect against the harmful impacts before operations begin. Advanced and new technologies can minimize port impacts by lowering emissions. A landlord port works as an environmental steward by ensuring that all regulatory compliance is followed and met. Lastly, it is important to maintain ongoing education programs for the community about port development and environmental compliance.

As a landlord port, for example, JCPA would consider itself an economic development agency and work closely with the Economic Development Corporation of Jefferson County to promote growth. Jobs for the local economy will enhance the lives of the region significantly. JCPA would be ready to both foster and promote this employment growth.

Security will be imperative to protect equipment, commodities, and personnel. A landlord port is responsible for security throughout the port and will need to either contract or hire staff for these services.

## Operator

Operating ports, or service ports, have a predominantly public character. The number of ports using this administration model is declining because of inefficiencies that are typical within this structure. As operator, the port authority offers the complete range of services necessary for the functioning of the port system. In this scenario, the port authority also owns all the port infrastructure, including equipment. Their primary relationship is with the user and they have direct operational control/oversight; hence, the port authority focuses on daily operations and long-term issues.

## Limited Operating Port

The final port-operating model is that of a limited-operating port. In this model, a port authority leases facilities to others, but continues to operate one or more facilities with port employees.

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## Potential Fee Structures

A landlord port provides infrastructural and other services to three primary groups of port users, including the cargo owner, the ship-owner/operator, and the concessionaires. Typical revenues within a landlord port structure may include cargo dues, marine charges, and concession/land fees. Together, the cargo dues and marine charges constitute the port dues.

Port Economics, Management and Policy provides a good understanding of port pricing and fee structures.<sup>3</sup> Tonnage dues/marine charges are indivisible charges calculated on the basis tonnage. The basis for calculating marine charges is typically the gross tonnage or net tonnage of the vessel; however, other measurements may be used, such as deadweight tonnage. The operator, owner, charterer, master, or authorized representative must submit the international tonnage certificate at the time of first call at the port, or when a change in the measurements occur.

Marine charges may vary by type and size. Tariff setting for specific types or sizes is influenced by market forces, such as level of competition among competing ports in accommodating similar vessel class. It is also common for liner ships to incur different marine charges. Discounted rates may apply to shipping lines that exceed an established threshold related to number of vessel calls, based on the cargo volume handled at the port, or a time period/season discount.

Cargo or berthing/wharfage dues are indivisible charges calculated based on the number of loaded or unloaded tons as reported on the manifest and registry. Tariff amounts charged by the port authority will often vary depending on the type of cargo. It is important to note that total port costs for the user are not limited to the port dues collected by the port authority. The terminal operator will collect fees associated with cargo handling at the terminal. Operators also pay costs for marine and nautical services, such as pilotage, berthing, and towage. These costs are usually incurred when entering and leaving the port and based on vessel size. These services are offered by the local government, port authority, and one or more private companies. Finally, many ports also have separate charges for waste at port reception facilities. These can be fixed, floating, or mobile facilities that carry out the reception of waste or cargo residues. Additionally, wastes include sludge, bilge water, used engine oil, garbage, domestic waste, and maintenance waste from the engine room.

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<sup>3</sup> Notteboom, T. and Pallis, A., Port Economics, Management and Policy. Chapter 5.4 – Port Pricing. Retrieved from: (<https://portecomonomicsmanagement.org/pemp/contents/part5/port-pricing/>)

Port authorities, acting in the capacity of landlord, set the fees and fee structure for port land commissioned or leased to terminal operators and other companies active in ports. The competing interests of maximizing valuable port land by deferring to the market to adjust fees, or providing users with transparent, uniform, and stable fee system are common discussion points.

There are several examples of pricing systems for the leasing of port land. A fixed rent per year charged to the operator is often determined based on operating footprint, infrastructure investments made by the port authority, site location, and types of activities performed at the site. A second example is a lump sum payment paid annually, independent of financial results from operations, plus a variable payment. Third, port authorities can charge a fixed rent per year with an added percentage of revenue fee. Finally, a fixed rent may be adjusted based on incentive/penalty systems dependent on annual throughput or activity as compared to predetermined guaranteed volume/activity.

The pricing structure, including number of charges, types of charges, and charging base of a port should be developed to last over an extended period of time. Although modifications may occur over time, changing pricing structure at a port is a complex process, and frequent changes may become confusing or onerous for port users.

Ideally, the charging bases will rely on measures or data that is accurate and easily accessible. As an example, gross tonnage or net tonnage of vessels is readily available and supported by documentation. Pricing systems should be understandable and port authorities should clearly explain each charge, specifying included and excluded services.

There are several additional considerations for port authorities when establishing pricing for port dues and land fees. While not mutually exclusive, the port authority must consider its ultimate objective(s). Examples include:

- Macro-economic – support for the economic development of the region, including maximizing port employment;
- Economic-logistic – engraining the port into supply chains in an efficient manner;
- Port-centric – prioritizing a high utilization of port resources and assets;
- Financial – building financial reserves for future investments and as a cushion against unexpected reduction in revenue or cost increases; and
- Sustainability – supporting green supply chain management and energy transition.

## Funding Mechanisms

The type of operating structure employed by a port will influence the nature and frequency in which a port authority will engage in varying types of capital improvement projects. Capital expenditures on new construction and modernization/rehabilitation of port infrastructure typically fall within one or more of the following categories:

- Cargo facilities;
- Other infrastructure – Including structures, land, and fixtures not directly related to the movement of cargo, such as maintenance and administrative facilities;
- Dredging – Associated with local port expenditures on deepening or maintenance of federal and non-federal channels, connecting channels and berths, and local costs for land, easements, rights-of-way, disposal areas, and mitigation; and
- Security – Expenditures for all security-related capital expenditure projects (e.g., fencing, access controls, lighting, or surveillance).

The JCPA Master Plan suggests developing funding and leasing strategies for infrastructure development. A primary objective for JCPA is to secure sufficient return to cover debt service (principal plus interest payments) and day-to-day operating expenses.<sup>4</sup> As part of its role as an economic development agency, and often with access to lower cost financing, the port authority has a reduced financial return threshold than the private sector. Much of the benefits or return on investments for JCPA will come from the broader economic impacts on the local and regional communities – including direct and indirect jobs, tax revenue, use of services and so forth.

There are several potential avenues of funding capital investments. The American Association of Port Authorities and the Maritime Administration (MARAD) identify the following methods used to finance port capital improvements:

- Port Revenues – Income generated by the port through its activities;
- General Obligation Bonds – Issued by a state, city, or local government, these bonds are secured by the taxing and borrowing authority of the issuing jurisdiction, rather than the revenue from a given project;
- Revenue Bonds – Issued by a state, city, or local government to finance a public works project; however, bond principal and interest are secured by the revenues of a given project;
- Loans – Short or long-term;
- Grants – A contribution of cash by one government entity or organization to another, often originating from the state or federal level, and distributed to local governments; and
- Others – Includes all financing sources that were not described above, such as transportation trust funds, state appropriations, and taxes.<sup>5</sup>

The State of Missouri authorizes JCPA to develop a port improvement district granting the ability to levy on property within the district. The following sources of revenue are allowed:

- Sales tax;
- Use tax; or a
- Real property tax.<sup>6</sup>

To assist JCPA in evaluating options and eligibility for prospective funding sources, several examples are provided below as reference. This list should not be considered exhaustive, but as a starting point for future discussions. Available funding programs and criteria may be updated annually; therefore, the funding sources in this summary should be verified through the pursuit initiatives for the most current information regarding eligibility, application guidance, etc.

<sup>4</sup> Jefferson County Port Authority Master Plan (March 2011)

<sup>5</sup> U.S. Public Port Development Expenditure Report (FYs 2006 & 2007-2011), Maritime Administration

<sup>6</sup> <https://revisor.mo.gov/main/OneSection.aspx?section=68.025>

The Jefferson County Port Authority Master Plan (2011) incorporated feedback from USACE related to potential project funding sources:

- Under the Continuing Authorities Program - Section 107 of the Rivers and Harbors Act of 1960;
- USACE like funding; and
- Planning Assistance to States Program - Section 22 of the Water Resources Development Act of 1974.

There are several federal funding opportunities related to port and rail capital improvement projects for consideration by JCPA. Several examples of applicable federal grant programs are described below:

- RAISE – The Rebuilding American Infrastructure with Sustainability and Equity (RAISE), formerly Better Utilizing Investments to Leverage Development (BUILD) grant provides financial assistance through competitive grants to invest in road, rail, transit, and port projects that achieve national objectives (previously Transportation Investment Generating Economic Recovery);
- INFRA – The Infrastructure for Rebuilding America grant program provides funding for highway and freight projects of national or regional significance;
- CRISI – The Consolidated Rail Infrastructure and Safety Improvements Program funds projects that improve the safety, efficiency, and reliability of intercity passenger and freight rail; and
- PID – The Port Infrastructure Development Program provides financial assistance through competitive grants to invest in projects that improve safety, efficiency, or reliability of the movement of goods within or outside the boundary of a port.

In addition to these federal grant programs, MARAD's Marine Highway Program works with public and private organizations to provide funding for projects that expand the use of America's navigable waters. Established by Section 1121 of the Energy Independence and Security Act of 2007, the Marine Highway Program is intended to reduce landside congestion through the designation of Marine Highway Routes. Eligible project types should meet the following objectives:

- Develop and expand marine highway service options and facilitate their further integration into the current U.S. surface transportation system, especially where water-based transport is the most efficient, effective, and sustainable option; and
- Highlight the benefits, increase public awareness, and promote waterways as a viable (in some cases a superior) alternative to landside shipping and transportation options.<sup>7</sup>

The Missouri Department of Economic Development's Advanced Industrial Manufacturing (AIM) Zones Act establishes the Port Authority AIM Zone Fund consisting of 50 percent of the state withholding tax from new jobs within the zone, following the beginning of development or redevelopment. Money from this fund must be used for expenses that support continued expansion, development, or redevelopment of the zone. Sites are selected by the port authority board of commissioners. Any Missouri businesses subject to state tax withholdings are eligible to participate in the program. Criteria for expansion requires that there must be an increase in the number of full-time employees at the project facility less any decrease in employees at related facilities. The deadline for establishment of AIM zones is August 28, 2023. Further information may be obtained via the Missouri Department of Economic Development Division of Business and Community Services Development Finance Team.

As part of the Missouri Department of Transportation's Innovative Finance programs, the Missouri Transportation Development District (TDD) Act for State Highway System Projects creates special political subdivisions to facilitate specific transportation related projects and generate funding for these efforts. Revenues from TDDs, commonly occurring as a sales tax, can only be used for public transportation and

<sup>7</sup> U.S. Department of Transportation Maritime Administration, Marine Highway Program <https://www.maritime.dot.gov/grants/marine-highways/marine-highway>

other transportation improvements. The TDD may also issue notes, bonds, and other debt securities. A TDD can be formed by registered voters, a local transportation authority, a multi-jurisdictional transportation authority, and property owners.

Establishing a mix of funding strategies is critical in creating consistent fiscal resources to support the development of port infrastructure. Similar to the region's landlord ports, JCPA is encouraged to pursue a blend of operating income, public grants, and revenue bonds to implement a capital improvement program. Examples of funding mechanisms employed by the region's other ports are provided below.

The St. Louis Port Authority obtains revenue from the leasing of city-owned waterfront property for cargo handling, storage, and barge fleeting activities under the St. Louis Development Corporation. The Port Authority Fund was established to manage all aspects of operations for the harbor and wharf, including enforcement of all regulations.<sup>8</sup> Over the years they have also received state and federal grant funding including but not limited to the Port Security Grant Program (PSPG) of the American Recovery and Reinvestment Act (ARRA). The St. Louis Port Authority:

- Writes state and federal grants applications;
- Develops AIM Zones;
- Manages port district bond activities; and
- Develops port improvement districts.

ACP funds infrastructure projects via a variety of methods, including revenue from the lease of facilities and sites, revenue bonds, low-interest loans from Illinois state agencies, commercial loans, and grants from state and federal entities. ACP has successfully been recipients of more than one BUILD [formerly Transportation Investment Generating Economic Recovery (TIGER) and now Rebuilding American Infrastructure with Sustainability and Equity (RAISE)] grant award to implement improvements including but not limited to new harbor, new/upgraded railroad track, terminal access roadway improvements, barge-to-rail receiving belt system, barge loading system replacement, rail car load-out upgrades from storage domes, multi-modal transfer equipment modernization, bulk storage, and employee safety upgrades.

<sup>8</sup> City of St. Louis, Missouri FY 2021 Annual Operating Plan

The Southeast Missouri Regional Port Authority leases out its public dock to Girardeau Stevedores and Contractors, Inc., a private stevedore who provides cargo handling and storage services for users of the dock. Historically, SEMO Port has also utilized Sales Tax Revenue Bonds to raise funds for capital improvements. For example, a one-quarter cent sales tax was enacted for a limited period for the issuance of \$4.85M in revenue bonds. Various grant funding opportunities have been successfully pursued by SEMO Port. Awards have been received from the Missouri Statewide Transportation Improvement Program, U.S. Department of Commerce's Economic Development Agency, the Missouri Department of Economic Development's Community Development Block Grant, the Transportation Security Administration, and other public sources. Recently, SEMO Port was awarded a BUILD grant from which funds were to be directed toward the construction of two 12,000-foot rail loops near the port.

### **Foreign Trade Zone**

Located in or near US Customs and Border Patrol (CBP) ports of entry, Foreign-Trade Zones (FTZ) function as free-trade zones. Within an FTZ, CBP entry procedures and payments of duties are not required on foreign merchandise unless and until it enters CBP territory for domestic consumption. The importer then typically has the choice of paying duties at the rate of either the original foreign materials or the finished product. Domestic goods moved into the zone for export may be considered exported at the time they enter the zone for purposes of excise tax rebates and drawback. FTZ offer additional security as merchandise is under the security requirements of CBP. Goods may remain in a FTZ indefinitely.



## Rail Site Certification

An important step, in terms of rail facility development and promotion at the Crystal City site, will involve coordination with the two major carriers in the area (BNSF and UP) to have their site certified by the rail companies. Certification represents a status of a pre-qualified rail-ready and development-ready property. Certification increases the marketability of a location by providing site visibility and informing potential tenants that rail operations have been green-lighted at the particular location. During this process, discussions on rail switching services with the Class I railroads would occur. If the Class I railroads do not want to handle switching, then service providers such as WATCO may handle this type of activity.

As a benefit of being designated as a certified site, facilities are featured on marketing materials produced by the rail carrier and promoted by their sales and marketing teams. Projects at certified sites can move forward quickly because risk factors have been previously identified and reduced, and potential issues resolved. As a result, certified sites incur reduced development time and increased speed to market. This process of advanced due diligence heightens interest among potential buyers and increases demand.

BNSF's Economic Development Team works with various entities, including companies, communities, and consultants through their Cite Certification Program. This program identifies optimal rail-served sites and conducts in-depth reviews based on economic development criteria to determine if the site would qualify as a certified site.<sup>9</sup>

UP Railroad offers a Focus Site program highlighting shovel-ready sites on the carrier's rail network. This program, as with similar certification initiatives, increases site visibility to potential users, decreases the risk, and improves speed to market. Additional Focus Sites are added to UP's database of locations on an ongoing basis.<sup>10</sup>

<sup>9</sup> <https://www.bnsf.com/bnsf-resources/pdf/ship-with-bnsf/rail-development/bnsf-premier-certified-sites-overview.pdf>

<sup>10</sup> [https://www.up.com/customers/within-reach/focus\\_launch/index.htm](https://www.up.com/customers/within-reach/focus_launch/index.htm)

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## Development Areas

The Crystal City Port development areas in this report suggest how the land could be potentially developed over time. These suggestions do not dictate a chronological order of how and when sites will develop. The market and funding will dictate which parcels should be developed first and, as such, development may occur on different areas at different times. Site use will also be dictated by the market and the examples shown in this report suggest where sites may be established for a business.

Parcels 4 through 9 are owned by the City of Crystal City. All of these parcels labeled on Figure 3 could have development opportunities and/or could serve as areas for roadway access, river access facilities, or mitigation areas. The potential footprint for the development has increased since the Master Plan (2011) from 410 acres to 613 acres.

Depicting zones for development helps to conceptualize at a very high level how the land may be developed. It also helps to visualize where preservation for future development or infrastructure could occur. For instance, in Figure 4, Zone A should be preserved for a rail loop track and facilities. If a slackwater harbor is desired, Zone B should be preserved for that river access and associated facilities. Zone C should include corridor preservation for a new roadway that will handle heavy vehicles and tie back into Interstate 55 or Highway 61. Zones B1 and B2 focus on more specific areas to move a variety of dry bulk cargo to and from the water. Zone D, with the Platin Creek and other wetlands, may be best suited as a mitigation area.

Figure 3: Study Area Port Parcels





Figure 4: JCPA Development Zones

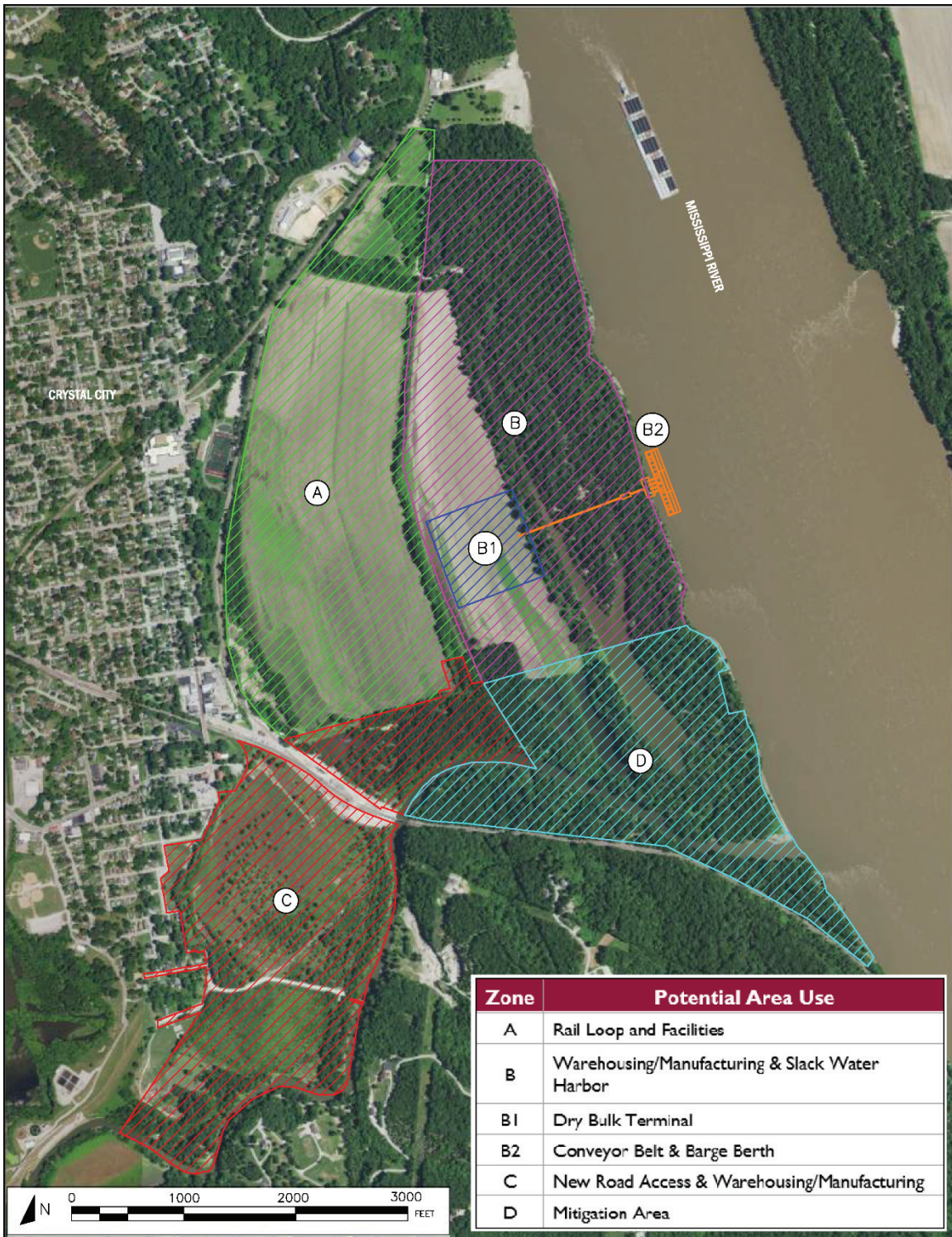


Figure 5 was created with consideration for the following:

- JCPA will continue exploring a long-term roadway access solution that will connect to the interstate by advancing the roadway location study initiated by the Preliminary Environmental Assessment and Preliminary Access Justification Report. Selecting the best alternative for access while working to secure funding is imperative to move forward;
- Federal funding may be pursued for preliminary engineering, NEPA, final design, and construction to advance the new roadway access to the interstate. This will likely entail procurement of an engineering firm to support these efforts. NEPA readiness is a factor in selection for competitive federal funding programs to complete final design and construction.
- A mix of commodities including aggregates, stone and minerals will be moved by water and truck;
- Initial site development will have the ability to expand incrementally with additional sites depending on market demands;
- At-grade railroad crossing improvements would be needed;
- Limit initial startup costs by not building facilities and limiting the length of a roadway as much as possible; and
- Preservation of land for a loop track and slack water harbor.

Table 7 depicts the general site improvements that are displayed in Figure 5. A dry bulk storage area of 15 acres can accommodate up to 500,000 tons of aggregate and stone per year, which is the max recommended for the short-term development. The other two storage areas would accommodate medium to long term growth for aggregates by adding capability to grow the site incrementally to accommodate up to 1,000,000 tons of aggregate per year. A conveyor belt to a floating berth is an economical and environmentally friendly way to move aggregates.

While the initial roadway access is shorter than an interstate option, it is limited to truck movements through Crystal City. After crossing the rail, trucks would traverse down Bailey Road to move to and from the port. These through movements would be seen as temporary until a new roadway can be built in the future.

**Table 7:** *Crystal City Potential River Access Improvements*

FACILITY	AREA	UNIT
Potential Roads	9,300	LF
Conveyor	1,350	LF
Floating Berth	68,400	Sq./Ft.
Storage Area	15	Acres
Expanded Storage Area	7.5	Sq./Ft. (Each)



Figure 5: Crystal City Potential River Access Development

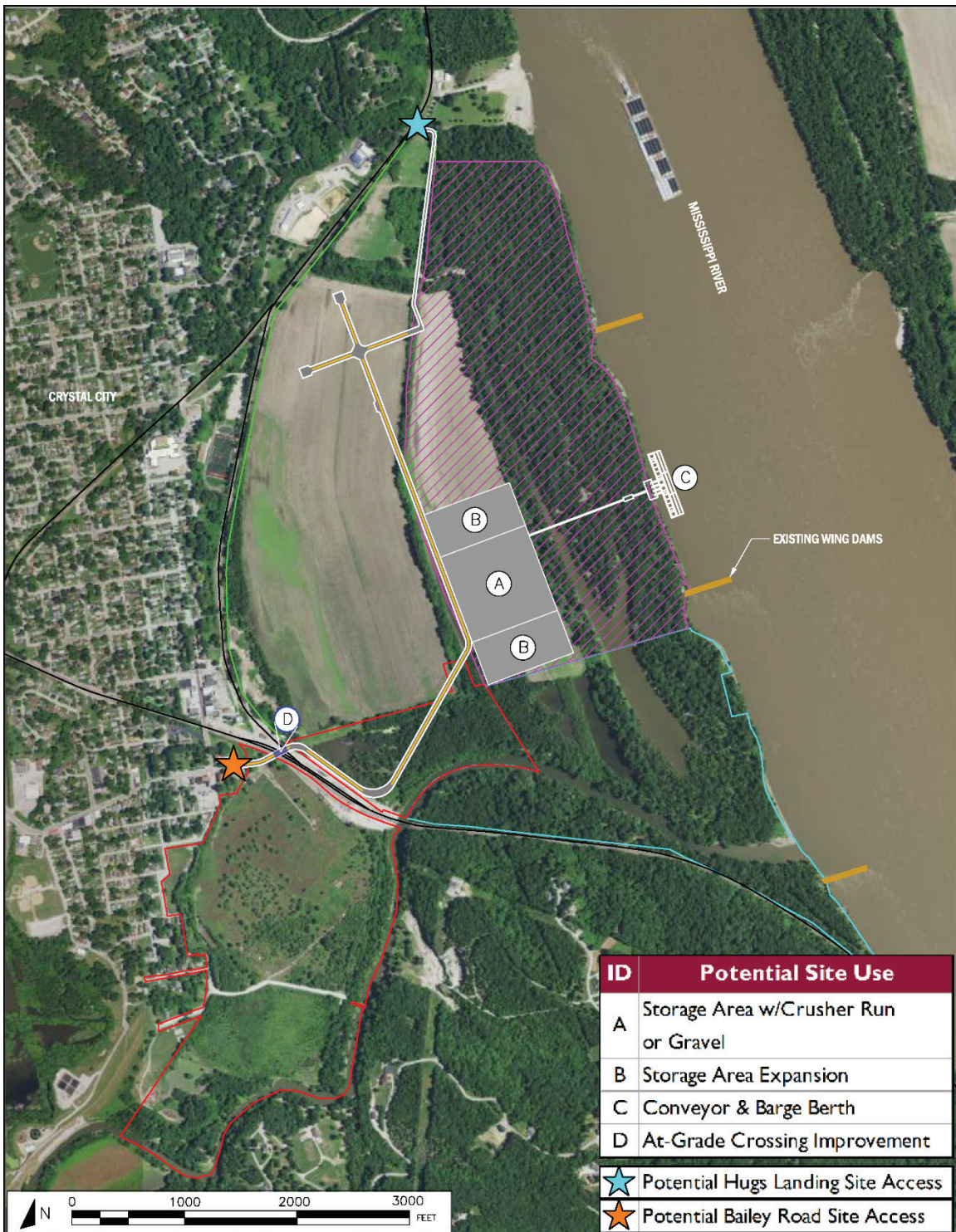


Figure 6 was created with the following improvements:

- Procure engineering firm and potentially a construction firm to complete final designs and begin construction on a new roadway from the interstate to the port;
- Barge fleeting capability; and
- Rail loop and facilities are important for the expansion of the port.

Table 8 depicts the general site characteristics shown in Figure 6. Improvements consist of 4 facilities that can be used for warehouse or manufacturing facilities to the north, a rail loop and facility, and a barge fleeting operation.

**Table 8:** *Crystal City Potential Rail Dependent Improvements*

FACILITY	AREA	UNIT
NW Facility	120,000	Sq./Ft.
NE Facility	80,000	Sq./Ft.
SW Facility	120,000	Sq./Ft.
SE Facility	80,000	Sq./Ft.
North Pad Site	1,100,000	Sq./Ft.
Rail Access Pad	1,964,500	Sq./Ft.
Rail Track	36,800	LF

Figure 7 was created with the following improvements:

- New roadway and bridges that connect the interstate to the port;
- At-grade crossing;
- Facilities developed for warehousing and manufacturing;
- Facility with rail access to the south;
- Slack water harbor capability; and
- Land area for potential mitigation.

Table 9 depicts the general site characteristics for Figure 7. The south area adds another rail served facility to the site. The primary function of the south area is to potentially serve facilities with rail and to build access to the interstate so that trucks can avoid movements through Crystal City. A potential slackwater harbor is also shown. Figure 8 shows the entire layout with all facilities, roadways, and water improvements labeled.

**Table 9:** *South Area and Slackwater Harbor Potential Improvements*

FACILITY	AREA	UNIT
Potential Roadways	22,000	LF
Facility w/Rail Access	575,000	Sq./Ft.
Rail Track	6,000	LF
North Facility	250,00	Sq./Ft.
Remaining Facilities	75,000	Sq./Ft. (Each)
Pad Sites for Facilities	1,850,000	Sq./Ft.
Slack Water Harbor	39	Acres



Figure 6: Crystal City Potential Rail Dependent Development

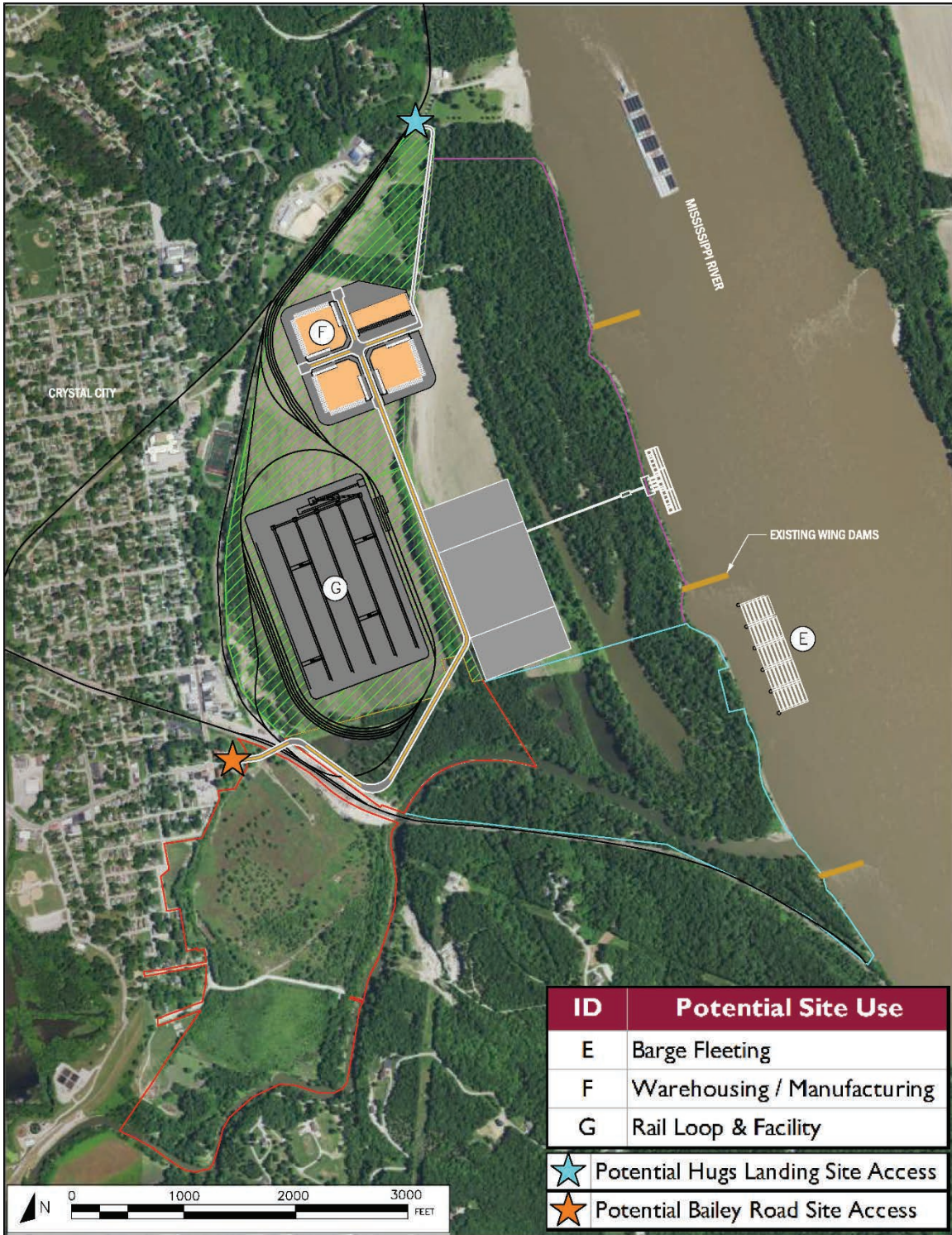




Figure 7: Crystal City South Area and Slackwater Harbor Potential Development

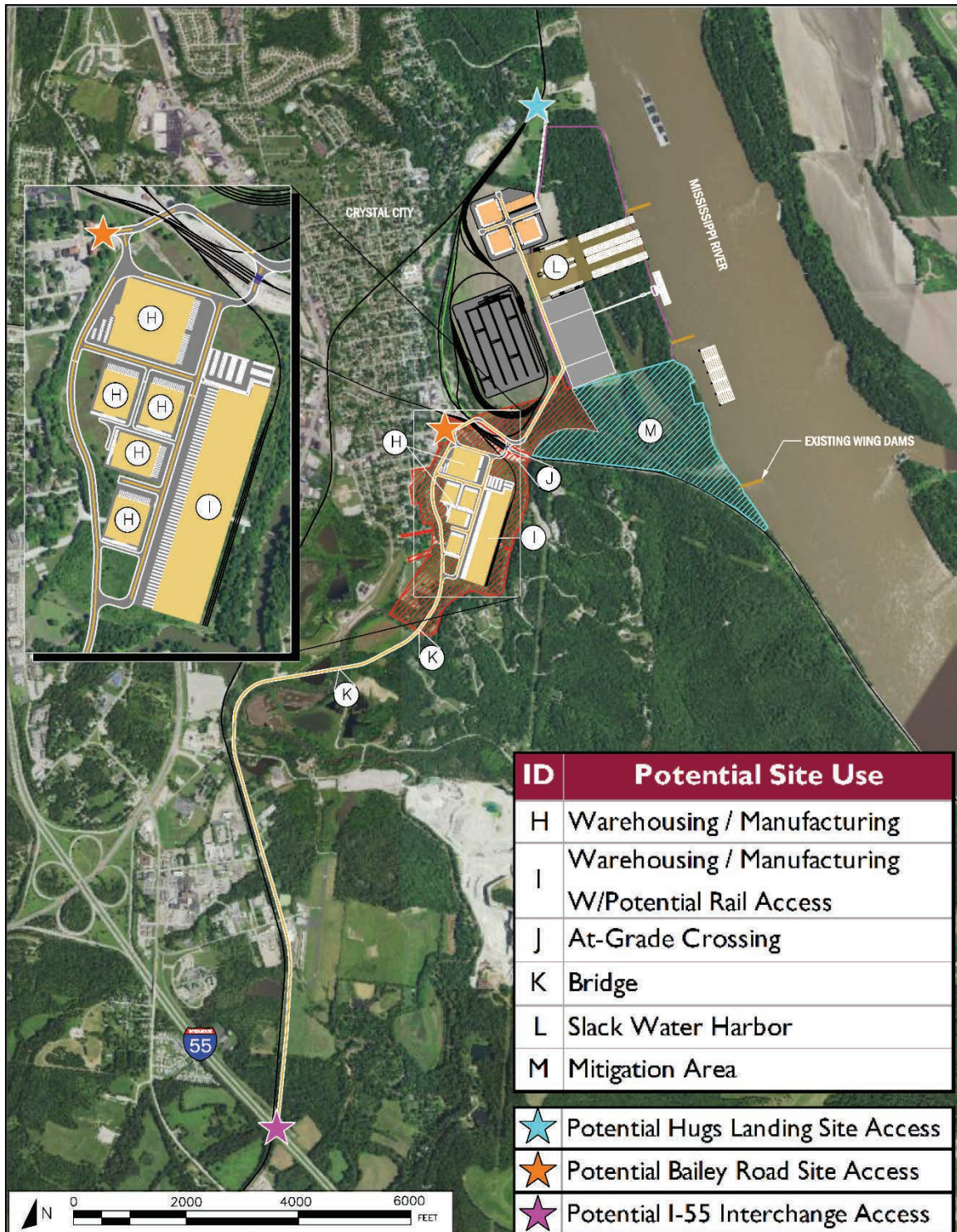




Figure 8: Crystal City Potential Full Site Buildout



## Planning Level Cost Estimates

The planning level cost estimates may be developed by estimating construction costs using the units provided in Table 10. In order to give site specific cost estimates for construction, a geotechnical report would need to be completed to gain a better understanding of subsurface conditions and the properties of soil and rock as well as survey to quantify grading and fill to elevate facilities from the 100-year floodplain. Table 10 provides a means to approximate general order of magnitude in the interest of budgeting for phased implementation and initial planning for future funding pursuits. These are 2021 dollars; it is recommended to consider inflation when conceptualizing the cost of future development.

**Table 10:** *Planning Level Construction Cost Estimates 2021*

PLANNING LEVEL CONSTRUCTION COST ESTIMATES	
Excavation	\$20 CY
Embankment	\$15 CY
Aggregate Base	\$50 CY
Rail	\$200 TF
At-Grade Crossing Improvements	\$800 TF
Subballast	\$50 CY
Turnouts	\$75,000 EA
Derails	\$15,000 EA
Onsite Roads	\$100 SY
Offsite Roads	\$120 SY
Conveyor	\$4,000 LF
Hopper	\$850,000 EA
Dust Suppression System	\$170,000 Each
Gates and Fencing	\$50 LF
Utilities	\$5,000,000 LS
Mobilization	3% of Overall Cost

## Staffing and Equipment

To begin, minimally, a landlord port authority business model will need to be operate with the following duties:

- Executive Director;
- Marketing; and
- Grant Writing.

Currently, JCPA performs these duties with the Executive Director and Executive Assistant. However, part-time or on-call resources may be beneficial to advance the marketing and funding pursuits. Eventually, these positions could be filled by multiple people as expansion of the port may provide enough revenue to do so. The marketing role at a port would focus on marketing land sites to prospective developers and businesses, promoting the goals and successes of the port to the public, and developing all industry relationships. Grant writing would focus on opportunities for funding infrastructure and general site improvements.

After some growth occurs at the port, JCPA will need internal resources and then contracted resources to staff the port. Generally speaking, landlord ports will have the following structure:

- **Board of Directors:**
  - Chief Executive Officer;
  - Chief Financial Officer; and
  - Chief Operating Officer.
- **Internal Staff:**
  - Executive Director;
  - Engineer;
  - Marketing Manager;
  - Office Manager;
  - Facilities Manager; and
  - Security Manager.
- **Internal duties that will need to be covered:**
  - Grant Writer;
  - Sales Manager;
  - Project Manager;
  - Finance Manager;
  - Environmental Manager;
  - Project Coordinator; and
  - Receptionist.

The JCPA structure already has some of these positions and will be easily transitioned as growth occurs.

JCPA will also need to enter into an agreement with a terminal operator, preferably with an existing, local presence operating in the region. Under this type of landlord port arrangement, JCPA would provide the terminal space, land, and some equipment, while the contracted company would perform operations. Terminal operators could include, but are not limited to:

- SCF Lewis & Clark;
- Kaw Valley Companies;
- Girardeau Stevedores and Contractors, Inc.;
- Watco Terminal and Port Services; and
- American Commercial Barge Line.

Duties for the terminal operator that should be considered:

- Terminal Manager;
- Human Resource Manager;
- Procurement Manager;
- Budget & Finance Manager;
- Communications & Technology Manager;
- Administrative Assistant;
- Security & Operations Director;
- Security Staff Manager;
- Security Staff;
- Safety Manager;
- Environmental Compliance Officer;
- Marine Manager;
- Dock Foreman;
- Dock Personnel;
- Rail Manager;
- Load Master;
- Rack Manager;
- Facility Maintenance Supervisor;
- Maintenance Foreman;
- Maintenance Staff;
- Electrician;
- HVAC Mechanic;
- Lead Mechanic; and
- Terminal Mechanics.

Not all of these jobs will be necessary as some roles in the organization may cover multiple duties. The idea was to cover as many duties as possible to be as expansive as possible so that JCPA can be prepared with information when they look to secure a terminal operator.

The terminal operators will also provide an extensive inventory of equipment for terminal, warehousing, and construction operations. The equipment is dependent on the commodities that will be moved at the port and can include, but not be limited to:

- Cranes;
- Material handling equipment;
- Boom trucks;
- Rigging;
- Trucking trailers and flatbeds;
- Bulldozers;
- End loaders;
- Excavators; and
- Road Graders.

Once operations are underway at the initial site, JCPA can begin further marketing efforts to additional tenants for the facility. This provides the Crystal City site with an ability to advertise the available green field, waterfront, rail-serve sites within an operating port – providing substance to the Crystal City story. Communications staff should involve local shippers, real estate professionals, and developers as part of their outreach efforts. It is also imperative that JCPA work closely with local and state-level partners, such as economic development organizations to enlist their help in marketing the many advantages of Crystal City.

# ACTION ITEMS

## Marketing

### Adopt Port Development Vision

JCPA should adopt a development vision to guide the Crystal City Port over several decades that blends near-term objectives and longer-term goals. It is important that JCPA communicate specific port use plans and capabilities to attract potential users; however, plans must have flexibility to accommodate developments and future growth extending 20 to 30 years (subject to factors that include site size and rate of build-out). A longer-term perspective makes several development strategies possible and will broaden the Port's appeal to as wide an audience as possible.

### Evaluate Internal Resources to Support Marketing

Review JCPA's internal resources (staffing, financial budget, etc.) available to support marketing the development of Crystal City Port. Identify gaps and solutions, including collaboration with local/regional economic development agencies that could bridge resource gaps. Consider creating a position dedicated to the marketing effort, at least part time initially.

### Create Marketing Deck

Create electronic and hard copy marketing decks that communicate the port development vision, strengths and opportunities offered by a new port at Crystal City. The marketing deck should incorporate credible timelines for availability of access roads, rail access, shovel-ready sites, and utilities. Without this level of conceptual detail, the market cannot evaluate the port with specific customers or uses in mind. Elements to include are:

- Overall vision and timelines;
- Short-term port development strategy;
- Medium and long-term development strategy;
- Geographic location in region, and relative to River, Highway and Rail transportation corridors;
- Port site characteristics (river frontage, acreage, etc.);
- Road access – immediate and longer term road corridor;
- Utilities;
- Port authority structure;
- Funding resources; and
- Partnership opportunities for development.

Regular updates of marketing deck and other marketing materials to ensure aligned with progress of port development and successful site selections.

### Communicate Progress of Port Development

Refine and communicate port development plans, architectural renderings, and successful site-selections to area economic development agencies, state agencies, industrial real estate companies, industry groups and trade media.

### Communicate Port Development Vision to State and Federal Agencies

Identify pertinent state and federal agencies that can support development, and hold discussions on potential for funding and other support.

### Communicate Port Development Vision to Local and Regional Economic Development Agencies

Communicating the port strategy in its entirety, to local and regional business development agencies is necessary to elevate the visibility of Crystal City as a viable port on the Mississippi River, and to build momentum for a Crystal City Port. Engage local economic development agencies as marketing resources to assist in identification and canvassing of individual shippers.

### Cultivate Relationships with Class I Railroads

Communicate the port development vision and develop close relationships with the Class I railroads who have intimate knowledge of rail-served shippers and their requirements.

### Communicate Port Development Vision to Industry Groups/Shippers

Engage with industry groups (agriculture, mining, etc.) in the State to ensure visibility for a Crystal City Port. Generally, concentrate on industries/shippers that align with the development timeline and features offered by Crystal City.



## Communicate Port Development Vision to Industrial Real Estate Brokers and Developers

Interact with traditional industrial real estate brokers and developers to market the industrial development elements of the port development strategy. This may include certification as a mega-site if sufficient land can be allocated to a single use on a large site.

## Monitor Marketing Progress

The various marketing initiatives should be periodically reviewed for progress and modification in response to feedback from stakeholders and prospective customers. Conduct internal evaluation of potential follow-on steps; for example, obtaining mega-site certification and shift of resources to specific industries or industry clusters based on market feedback.

## Port Administration

### Port Operating Structure

It is recommended that JCPA employ the landlord model of operations. Retaining ownership of local land while transferring operational risk provides strong incentives for pursuing this type of arrangement. This structure allows the port authority to primarily focus on financing, planning, and the construction of capital improvements for the operations of the port function.

### Port Staffing

Determine the internal staffing needs and duties that need to be performed by creating a matrix. As a smaller organizational unit, it is ok for an individual to hold many different duties, especially as the port is starting out. Once the matrix is complete, begin to hire for necessary positions. Once internal staff is set, then look to engage contracted staff for the terminal operations.

### Community Engagement

After internal staff has been brought on board, develop a community engagement plan that will help keep neighboring businesses and residents in the loop and engaged as community partners. The community engagement plan will establish how to and who to communicate with as developments or changes in operations occur. The community engagement plan should include promoting periodical updates on economic and environmental benefits to the local community.

## Site Development

The market analysis recommends initial focus on a dry bulk operation for a blend of commodities – aggregates, stone, minerals, etcetera. It is recommended that JCPA focus on a single site to provide roadway access, utilities, and water access for the movements of these commodities regionally. The initial development is not fully dependent on a new external roadway that connects to a highway and can use existing roadway infrastructure through Crystal City. However, it is important a new roadway be planned and constructed in the future to expand market appeal and to lessen commercial truck travel through the City. This is a near term plan to get the port running and operational in an effort build momentum for funding opportunities, future tenants, and to help build the case for future infrastructure improvements.

### Rail Site Selection Program

Engage early with both UP and BNSF to understand their requirements to certify sites for rail. Develop and nurture long term relationships through this process. Currently BNSF only has two sites that are certified in Missouri (Hayti and Joplin) while UP has none. To contact each rail company:

- <https://www.bnsf.com/bnsf-resources/pdf/ship-with-bnsf/rail-development/bnsf-premier-certified-sites-overview.pdf>
- [https://www.up.com/customers/within-reach/focus\\_launch/index.htm](https://www.up.com/customers/within-reach/focus_launch/index.htm)

### Funding Opportunities

Explore state and federal opportunities for funding on site improvements as well as offsite roadway or rail facilities. Having a dedicated grant administrator or writer on staff will be a huge bonus. However, working with a consultant of choice who has experience in grant writing is a good way to go after federal funds as well.