Ohio River Terminals Analysis

Ohio Statewide Freight Study
(VAR-STW Freight Study FY2012,
Agreement No. 16750, PID No. 89214)

Ohio River Terminals Analysis
(Phase II - Tasks 2.4, 3.1, 3.2 and 4.2 Only)

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1. Overall ODOT Statewide Freight Plan Study Objectives and Content

1.1 ODOT Statewide Freight Plan Study Objectives:
The purpose of the Ohio Statewide Freight Plan study is to understand, to the greatest detail possible, how Ohio’s freight infrastructure is being utilized. The study will identify and analyze modal freight volumes, commodities, and origins/destinations. The final report will equip the Ohio Department of Transportation (ODOT) with the tools necessary to:
- Plan and prioritize future strategic investments in Ohio’s freight infrastructure, and
- Guide future economic development activities to make the most efficient use of the existing freight infrastructure.

More specifically, the final report will provide input to a future update of the Ohio Statewide Transportation Plan and provide data and trend analysis for ongoing statewide and regional multimodal freight initiatives.

1.2 ODOT Statewide Freight Plan Study Major Content Tasks:

Task 1: Stakeholder Involvement

1.1 Stakeholder Interviews
1.2 Shipper Survey

Task 2: Freight Analysis

2.1 Freight Flow Analysis
2.2 Economic Trends Analysis
2.3 Inventory of Physical Assets, including Capacity of Current Freight Infrastructure
2.4 Needs Assessment

Task 3: Freight Policies and Strategies

3.1 Best Practices and Case Studies
3.2 Transportation Strategies

Task 4: Final Report and Other Deliverables

4.1 Interim Deliverables
4.2 Final Deliverables

The above study content was generally implemented in two phases of work:

Phase I: Task 1 and Task 2 (Stakeholder Interviews and Analysis)
Phase II: Task 3 and Task 4 (Freight Policies and Strategies and Final Report)
1.3 **Ohio River Terminals Analysis Scope and Approach:**

The Ohio River Terminals Analysis followed the overall Ohio Statewide Freight Study methodology and phasing.

**Phase I** - Phase I focused primarily on Stakeholder Interviews and some river freight analysis. The ODOT Statewide Freight Plan – Task 1.1, Task 2.1, 2.2, 2.3 and 4.1 work were authorized with notice to proceed on February 5, 2012.

**Phase II** - Phase II Scope of work component tasks for the ODOT Statewide Freight Plan - Tasks 2.4, 3.1, 3.2 and 4.2 were authorized on September 5, 2012 and were completed in late December 2012. The following is a general overview of the scope of work content for this Phase II Ohio River Terminal Analysis Report

- **Task A** - Review of cargo demand projections affecting Ohio River terminal freight cargo volumes drawn from data gathered during Phase I work and based on Phase I Stakeholder Interview data and information, as well as available public information. The Ohio River stakeholder’s view of future cargo market demand is, in large measure, based on expectations for global and North American trade growth and US Gross Domestic Product (GDP) dynamics. To this end an overview of applicable logistical emerging trade trends was undertaken based on publically available information and internet research.

- **Task B** – Cursory overview of Ohio River Terminal marine and intermodal macromacroeconomic cargo market demand. This market assessment of river terminal trade data was focused on marine transportation and excluded analysis of other transportation modes. The analysis was based on Phase I Stakeholder Interview data and information and information gathered from publically available data and internet research.

- **Task C** - Ohio River Terminal future needs assessment analysis for the Ohio State River Terminals compared publically reported terminal capacity resulting from Phase I Stakeholder Interview data, information and research. As the other modal elements of the Ohio Statewide Freight Study did not prepare an econometric freight market demand analysis, and although not a specified scope of work element in the Ohio River Terminal Analysis, Vickerman & Associates undertook and prepared a cursory macromacroeconomic demand forecast of future Ohio River cargo needs based on the U.S. Department of Transportation’s Freight Analysis Framework (FAF) and US GDP emerging trends to the year 2040.

- **Task D** - Recommended Ohio River Terminal multimodal transport shipping development strategies and logistics options were developed using realistic Ohio River Terminal expansion opportunities based on the Phase I Stakeholder Interview data and information, and the findings in the Phase II Ohio River Terminal Analysis supplemented with publically available information and internet research.

2. **Inland Waterway System Introduction**

Today’s inland waterway system is generally market driven by the fundamental forces of supply and demand influenced by a variety of factors, including local weather patterns, navigation circumstances, domestic and international consumption of agricultural and industrial products, crop production, trade policies, and the price of steel. The Inland Waterway System is primarily a dry bulk and dry-cargo dominated marketplace. The demand for dry-cargo and dry bulk freight on the inland waterways is
driven by the production volumes of dry bulk commodities that require competitive barge transportation to sustain the industry.

Historically, the major commodity groups for dry bulk and dry-cargo inland waterway freight have been:

- Coal for domestic utility companies, industrial and coke producers, and export markets.
- Construction commodities, such as cement, limestone, sand, and gravel.
- Grain and oilseeds, such as corn and soybeans, for export markets.

Other commodities in this marketplace include products used in the manufacturing of steel, finished and partially finished steel products, ores, salt, gypsum, fertilizer, and forest products. The demand for liquid freight is driven by the demand for bulk chemicals used in domestic production, including styrene, methanol, ethylene glycol, caustic soda, and other products. It is also affected by the demand for refined petroleum products and agricultural-related products such as ethanol, vegetable oil, biodiesel, and molasses.

Much of U.S. agricultural production occurs in the middle of the country, far from coastal export gateway port facilities. Our inland rivers, including the Ohio River system, provide bulk long-haul transportation economically, keeping U.S. products competitive in the changing global economy. From the perspective of the shippers (beneficial cargo owners), inland waterway vessels and barges offer a low-cost transportation alternative for bulk goods in the areas near these waterways. In some areas, they offer competition to other long-haul transport modes, keeping rates down. Moving more bulk commodities on the inland waterway system could free capacity of other more congested transportation modes, and improving overall environmental polluting emissions.

The State of Ohio enjoys convenient access to two of the largest inland waterway systems in North America – the Great Lakes System, with subsequent access (via the St. Lawrence Seaway) to the Atlantic Ocean – and the Ohio River Basin System, with subsequent access to the Mississippi River and the Gulf of Mexico.

Except for the implementation of tolls at canals and locks, water transportation has low variable costs to access its rights of way. Modern ships carry large volumes of freight with minimal energy consumption, and can generally be managed with a small personnel complement. These advantages provide water transport with the lowest marginal cost per ton-mile of any freight mode in North America.

However, the ships, vessels, supportive maritime infrastructure (e.g., ports, river terminals, inland ports, etc.) and operating equipment can impose high fixed costs of entry into this freight marketplace, such that long distances are typically required before the advantages from the low marginal operating costs are fully realized. Water transport is also generally slower than other transportation modes, with speeds ranging from 6 knots (for some river barges) to 15 to 24 knots (for sea-worthy ships). Recently the maritime industry has generally adopted slow and extra slow steaming industry wide norms of 19 knots or less, as a general industry transport speed standard. The potential for considerable delays occurring at sea, ports, river terminals, inland waterway locks and dams is always present. For these reasons, intermodal competition (from trucks and railroads) generally results in water transportation handling freight that is long-distance, typically heavy and not necessarily time-sensitive in nature, especially when it relates to river transport.
The embrace of the standard freight International Standards Organization (ISO) container (a “twenty-foot equivalent unit” or TEU) has substantially lowered the cost of international and domestic shipping by making port handling costs more efficient. Further, the transfer of containers directly to trucks or trains has been a key market driver in “intermodalism,” or the efficient use of multiple transport modes in freight trips. Water transportation encompassing ocean, littoral/coastal and river environments provides the long-range, high volume, heavy freight capacity in this dynamic global transport system.

For the Ohio River, the northbound and southbound flows are roughly balanced, and river traffic seems relatively constant along the length of the river. The Great Lakes System, by contrast, seems to be overwhelmingly one-way (i.e., southbound), with the Lake Erie portion seeing a major drop-off in volumes, presumably because it serves as a major maritime destination, particularly at the Detroit/Toledo nexus. In general, inland waterway and river transport freight volumes have declined during the first decade of the 21st century with some noticeable rebound and recovery in river and inland freight volumes in the start of the second decade.

While overall inland waterway freight volumes have remained generally steady over the past decade at about 1 billion tons per year, trends towards much larger ship sizes and the physical limitations of the North American river lock system are expected to result in the region having a declining share of national marine traffic. This share is at 32 percent (down from 36 percent in 2001), and is expected to continue to decline to about 30 percent in 2020. The System’s inherent capacity constraints – in terms of water depth and lock size (along the Ohio River) and the closure of the St. Lawrence Seaway three months a year (affecting Great Lakes traffic) and delays through the inland lock and dam system – are all listed as major factors in this declining share. It should be noted that macroeconomic trends for the 2040 planning horizon show potential market share improvement.

Terminals surveyed by the report’s authors indicated that they are, in the main, currently operating significantly under capacity. As detailed throughout the remainder of the Ohio Statewide Freight Plan analysis, the under-utilization of the state’s water system is a key and significant logistical advantage for Ohio. From Toledo to Conneaut; and East Liverpool to Cincinnati, Ohio ports and river terminals and their terminal operators are researching markets and implementing services to take advantage of the waterborne commerce advantage. The benefits to the state are and could be substantial and significant:

- Ohio’s ports and river terminal capabilities can be a key market differentiator in economic development activities.
- Even a small increase in waterborne commerce can provide very significant relief to railroad and highway congestion and the regional concerns for environmental pollution.
- Waterborne commerce is the most fuel efficient mode, and pollutes far less than trucking and railroad transportation.

3. The Ohio River Inland Waterway System

3.1 Overview

The Ohio River starts at the merging of the Allegheny and Monongahela Rivers in Pittsburgh, and flows nearly 1,000 miles to its confluence with the Mississippi River near Paducah, Kentucky, with tributaries and canals contributing to a total of nearly 2,800 miles of navigable waterways. There is only one rapid elevation change, the falls of the Ohio at Louisville, Kentucky. With a natural depth ranging from 3 to 20 feet, a series of dams were implemented in the mid-20th century (as part of the Ohio River
Navigation Modernization Program) that essentially turned the river into a series of reservoirs, which improved the ability of the river to serve commercial navigation cargo purposes.

The Ohio River system is part of the US Inland and Intra-coastal Waterway Systems, which directly serve 38 states as well as the states on the Atlantic seaboard, the Gulf Coast, and the Pacific Northwest. Shippers and consumers in these states depend on the inland waterways to move approximately 630 million tons of cargo valued at more than $73 billion annually. States on the Gulf Coast and throughout the Midwest and Ohio Valley especially depend on the inland and intra-coastal waterway system and the cargo transfer capabilities of its ports and river terminals.

Texas and Louisiana each ship more than $10 billion worth of cargo annually, while Illinois, Pennsylvania, West Virginia, Kentucky, Mississippi, Alabama, and Washington each ship between $2 billion and $10 billion annually. Another eight states ship at least $1 billion annually. This system provides an average transportation savings of $10.67 per ton over the cost of shipping by alternative transport modes which translates into more than $7 billion annually in transportation savings to the U.S. economy.

Because of its relatively shallow depth, freight transport along the Ohio River is generally limited to flat-bottomed barges. These vessels are well-suited for heavy goods transport, but their slower speeds (relative to other maritime vessels) generally limit them to dry bulk and dry-cargo goods, particularly coal, grain and aggregates. River propulsion vessels designed primarily to push barges throughout the U.S. Inland Waterway System are typically referred to as towboats or tug-barges. These vessels range in size and horsepower dependent upon the area of primary operations. Integrated Tug-Barges (ITB) and Articulated Tug-Barges (ATB) are sometimes deployed to eliminate tow lines and provide better efficiency and barge control particularly where there is deeper water. Hooper and deck barges are the most numerous barge types on the river system. With the upper Mississippi River and the Ohio River having numerous locks and dams to pass through, towboats and tug-barges on these river systems typically range from 3,000 to 5,000 horsepower, while towboats and tug-barges operating on the lower Mississippi River have much greater horsepower. Low overhead bridge clearances on the Upper Mississippi River and the Illinois River System necessitate low profile towboats and tug-barge profiles.

The lower Mississippi becomes much wider and deeper, with no locks and dams, therefore more barges can be pushed by each towboat or tug-barge. A river tow is comprised of barges arranged in longitudinal rows called strings and positioned directly ahead of the towboat. A tow on the lower Mississippi typically consists of 30 – 40 barges, while tows on the upper Mississippi and the Ohio Rivers have a maximum of 15 barges.

The average speed and transit time for a tow is influenced by many factors including (1) river width; (2) number of turns on the river; (3) water depth fluctuations depending on normal, flood or drought conditions; (4) locking time at each lock and dam; (5) horsepower of the towboat; (6) the number of stops at ports and terminals along the transit route, and (7) waterway congestion, anchorages and fleeting operations. The speed of a barge tow varies between 3.5 mph and 10 mph, with a realistic average speed in the mid-point of this range.

The Mid-Ohio Valley water transportation plan studied the feasibility of import/export via the Ohio River from the Marietta area. The study provided a good overview of transit time from Marietta to Mobile, Alabama and New Orleans, Louisiana, which are the two logical deep water port connections for Ohio River terminals: Marietta, OH to New Orleans, LA – 1,607 river miles – 13 locks and dams from Marietta to Cairo, Illinois, none from Cairo to New Orleans.
• Average tow speed of 5 mph = 334 hours transit time.
  o Add 1 hour locking time per lock and dam = 13 hours; total of 347 hours or 14.5 days.
  o Add 2 hours locking time per lock and dam = 26 hours; total of 360 hours or 15 days.
  o Add 3 hours locking time per lock and dam = 39 hours; total of 373 hours or 15.5 days.

• Average tow speed of 7.5 mph = 223 hours transit time.
  o Add 1 hour locking time per lock and dam = 13 hours; total of 236 hours or 9.8 days.
  o Add 2 hours locking time per lock and dam = 26 hours; total of 249 hours or 10.4 days.
  o Add 3 hours locking time per lock and dam = 39 hours; total of 262 hours or 10.9 days.

Marietta, OH, to Mobile, AL – 1,430 river miles – 25 total locks and dams (11 locks from Marietta to the mouth of the Tennessee River, 2 locks on the Tennessee River, 10 locks on the Tennessee-Tombigbee Waterway and 2 locks on the Tombigbee River).

• Average tow speed of 5 mph = 286 hours transit time.
  o Add 1 hour locking time per lock and dam = 25 hours; total of 311 hours or 13 days.
  o Add 2 hours locking time per lock and dam = 50 hours; total of 336 hours or 14 days.
  o Add 3 hours locking time per lock and dam = 75 hours; total of 361 hours or 15 days.

• Average tow speed of 7.5 mph = 191 hours transit time.
  o Add 1 hour locking time per lock and dam = 25 hours; total of 216 hours or 9 days.
  o Add 2 hours locking time per lock and dam = 50 hours; total of 241 hours or 10 days.
  o Add 3 hours locking time per lock and dam = 75 hours; total of 266 hours or 11 days.

These relatively long transit times illustrate the primary characteristics of river barge transportation. Service is at slow speeds, but capacity is very high and variable shipping cost is very low. While this limits barge transportation primarily to bulk cargo, stakeholders have aspirations for more general cargo transport and even container-on-barge (COB). If the transit time can show reliability, advocates envision the river system acting as a virtual warehouse with commodities in motion.

3.2 Strengths and Weaknesses of Ohio’s River Transportation System

In conducting stakeholder outreach for the Ohio Statewide Freight Study, the study team interviewed representatives from the Lawrence County Economic Development Corporation, the Columbiana County Port Authority, Ingram Barge Company, and McGinnis Terminals. In addition, the study team attended a stakeholder outreach session for the Mid-Ohio Valley Freight Transportation Study (sponsored by ODOT), which focused on the Marietta region.

3.2.1 Ohio River Strengths

Invariably, stakeholders noted Ohio’s maritime assets—both lake and river—as a competitive advantage and underutilized asset which deserves more of the state’s transportation policy attention. Secondly, stakeholders note Ohio’s geographic advantages in terms of proximity to major population and consumption centers in the Midwest and east and emerging manufacturing industries. The third major theme was the strength of Ohio’s transportation system—its underutilized maritime infrastructure, its relatively congestion-free marine highway system, and the major Class I railroad investments in integrated logistics centers being made in Ohio.

3.2.2 Ohio River System Competitive Weaknesses

The number one issue for Ohio River stakeholders is lock and dam continuing deterioration, and the lack of adequate maintenance and repair by the US Army Corps of Engineers (USACE) a chronic and
long standing problem. The USACE operates more than 600 hydraulic structures (lock chambers, flood control dams, power houses, etc.), many of which are nearing the end of their design life. To meet the challenge of deteriorating structures, the USACE initiated a Repair, Evaluation, Maintenance, and Rehabilitation (REMR) research program. The USACE has scant funds to repair unexpected maintenance breakdowns at the aging, Depression-era Ohio River navigation facilities. Many times repairs are only made in emergency situations. That lack of investment and continuing deterioration will continue to worsen in the prospects in the future. Federal budgets continue to cut funding for this infrastructure, which will result in ever increasing service reductions on the inland waterway system.

The USACE is hampered by a lack of adequate funding for the lock and dam system. The U.S. inland waterway system consists of 12,000 miles of navigable waterways in four systems—the Mississippi River, the Ohio River Basin, the Gulf Inter-coastal Waterway, and the Pacific Coast systems—that connect with most states in the U.S. The system comprises 257 locks, which raise and lower river traffic between stretches of water of different levels—10 in Ohio alone.

A user fee system was supposed to provide adequate funding for maintenance and rehabilitation. Commercial waterway operators pay a fuel tax of 20 cents per gallon, which is deposited in the Inland Waterways Trust Fund (IWTF). The IWTF funds half the cost of new construction and major rehabilitation of the inland waterway infrastructure.

Forty-seven percent of all locks maintained by the U.S. Army Corps of Engineers were classified as functionally obsolete in 2006. Assuming that no new locks are built within the next 20 years, by 2020, another 93 existing locks will be functionally obsolete—rendering more than 8 out of every 10 locks now in service outdated.

Currently, the Corps has $180 million per year available for lock repairs—half comes from the IWTF revenues and half comes from congressional appropriations. With an average rehabilitation cost of $50 million per lock, the current funding level allows the Corps to fully fund only two or three lock projects each year.

3.2.3 Environmental Regulations
Stakeholders also expressed concern with environmental regulations, including new rules from the US Environmental Protection Agency (EPA) for a Vessel General Permit, which will regulate vessel discharges relating to fuel, engine and oil control, solid and liquid maintenance, “gray water” management, fish hold effluent management, and ballast water. Towboats were previously exempt from these rules, which will be implemented in 2013.

Ohio River stakeholders in South Point and Columbiana County expressed frustration with wetlands and water quality certifications required for new development, as well as other environmental regulations. Some common themes and areas of concern were:

- Length of time to get approval for Section 401 (Ohio EPA water quality certification) and Section 404 (USACE wetland) permits;
- Interdependency between Ohio EPA and USACE to review and approve permits;
- Turnover in staff at Ohio EPA, which causes further unnecessary delays;
- The State of Ohio endangered species list, which is different from the US Fish and Wildlife Service.
3.3 Ohio River Ports and Terminals: Description, and Commodities

The barge terminals along the Ohio River can be considered clustered into three main regions (vicinities) of:

- Cincinnati.
- Portsmouth-Marietta.
- West Virginia Panhandle.

The majority of these terminals are for single-commodity purposes suiting the needs of a single owner, e.g., a coal terminal for an electric generation station. However, there are a number of “public use” terminals that serve multiple users, and handle multiple commodity types (as shown in Figure 1).

To be clear, all river terminals are important parts of the overall freight transportation system and key Ohio freight transport industries—utility generation, steel and other metals production, agriculture, and chemical manufacturing. The focus on public use terminals reflects the fact that these facilities can handle many different types of cargo, and typically serve many different customers rather than just a single business owner.

Figure 1: General Use Terminals along the Ohio River
The characteristics of each of these three clusters are described separately below.

3.3.1 Cincinnati

Being the largest of the study areas in terms of population and employment, the Cincinnati region enjoys a number of intermodal transfer opportunities. I-71, I-74, and I-75 converge in the region, and the I-275 beltway enhances the flexibility of routing opportunities. CSX and Norfolk Southern both operate major rail lines in the region, as does a regional carrier, RailAmerica.

The Metropolitan Planning Organization (MPO) for the greater Cincinnati region is the Ohio-Kentucky-Indiana Regional Council of Governments (OKI). In 2011, OKI released a Regional Freight Plan that discussed strategies for enhancing freight movements. River transportation handles about 10 percent of all regional freight movements, by weight. Strategies to strengthen waterborne commerce included activating the Port Authority to promote the region’s water terminals at national and international trade conferences, and investigating the potential for container-on-barge shipments.

In terms of infrastructure improvements, discussions are underway to eliminate short-movement truck hauls by extending RailAmerica’s CIND line directly to the Cincinnati Bulk Terminal.

Of the three primary concentrations of Ohio River terminals, the Cincinnati region contains the largest number, consisting of the following terminals:

<table>
<thead>
<tr>
<th>Name</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kinder Morgan - Queen City Terminal</td>
<td>Chemicals, fuels, petroleum products, liquid fertilizer</td>
</tr>
<tr>
<td>Cincinnati Barge and Rail Terminal, LLC</td>
<td>All general cargo and dry bulk cargo</td>
</tr>
<tr>
<td>Noramco Cincinnati</td>
<td>Steel products, lumber, general cargo, machinery, dry bulk</td>
</tr>
<tr>
<td>Cincinnati Bulk Terminals (CBT), LLC</td>
<td>Dry bulk, packaged commodities, general cargo and steel</td>
</tr>
<tr>
<td>Port of Cincinnati (Subsidiary of CBT)</td>
<td>Dry bulk, packaged commodities, general cargo and steel</td>
</tr>
<tr>
<td>Kinder Morgan - Cincinnati Steel</td>
<td>Break bulk (steel, supersacks, metals), dry bulk commodities &amp; project cargo</td>
</tr>
<tr>
<td>Westway Terminal Co., LLC</td>
<td>Acids, Agricultural Products, Molasses</td>
</tr>
<tr>
<td>Marathon Petroleum, LLC</td>
<td>Petroleum, chemicals, petro-chemicals</td>
</tr>
<tr>
<td>Benchmark River and Rail Terminals, LLC</td>
<td>Bulk liquid chemicals</td>
</tr>
<tr>
<td>Kinder Morgan - River Terminal</td>
<td>Various dry bulk and liquids</td>
</tr>
<tr>
<td>Consolidated Terminals and Logistics Company</td>
<td>Dry bulk agricultural, salt, coke, ore, aggregate and plastic pellets</td>
</tr>
</tbody>
</table>

Each terminal has a mix of cargo specialties and primary customers, so their terminals are designed to service specific markets and customer requirements. Kinder Morgan, Marathon Petroleum, Westway Terminal, and Benchmark River and Rail Terminals are the primary liquid bulk terminals in the region.
Figure 2: Ohio Barge Terminals in the Cincinnati Area
Summary: The Cincinnati region is very well served by the inland waterway system and has a number of competitive advantages:

- A relatively large number of river terminals (both public use and private), which creates a pool of barges for backhaul opportunities;
- A number of options for general cargo handling, which creates a competitive rate environment for shippers;
- A relatively large market area with manufacturing industries (e.g., steel, automotive) that need bulk freight transportation services; and
- Intermodal connections, with major Interstate Highways and three major rail carriers.

3.3.2 Portsmouth-Marietta
The area of southern Ohio from Portsmouth to Marietta is another distinct area of Ohio River general cargo terminals. Portsmouth is the Ohio terminus of US 23 at the Ohio River, providing a limited access, four-lane route to Columbus. At the southern tip of Ohio is South Point, in the Huntington, West Virginia metropolitan region, with close access to I-64. Marietta sits at the intersection of I-77 and the Ohio River. General-purpose terminals associated with this cluster include the following:

Table 2: Portsmouth-South Point-Marietta Terminals

<table>
<thead>
<tr>
<th>Name</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soioto Docking, Inc. (Wheelersburg Terminal)</td>
<td>Dry bulk</td>
</tr>
<tr>
<td>Soioto Docking, Inc. (McGovney River Terminal)</td>
<td>Limestone, fertilizer, bauxite, ferro, ores, pig iron, sand, and other bulk products</td>
</tr>
<tr>
<td>McGinnis, Inc.</td>
<td>Bulk materials</td>
</tr>
<tr>
<td>The Point Industrial Park (South Point)</td>
<td>(Available for development)</td>
</tr>
<tr>
<td>Marietta Industrial Enterprises, Inc.</td>
<td>All types</td>
</tr>
<tr>
<td>Price Inland Terminal Company</td>
<td>Dry bulk, aggregates, steel, general commodities</td>
</tr>
</tbody>
</table>
Figure 3: Ohio Barge Terminals, Portsmouth-to-Marietta
3.3.3 Eastern Ohio/West Virginia Panhandle

The Ohio River from East Liverpool, Ohio south to Wheeling, West Virginia is a heavily industrialized area, with steel, electric utility and aluminum manufacturing plants. Cleveland, Youngstown, and Pittsburgh markets are readily accessible from the area, with major highway connections including SR 7 along the river itself, SR 11 north to Youngstown, US 22 to Pittsburgh, and I-70 as the major east-west highway. In addition to numerous coal, iron ore and limestone terminals, the following table lists the general-purpose terminals within this cluster:

<table>
<thead>
<tr>
<th>Name</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>S. H. Bell Company</td>
<td>Bulk, packages, semi-finished steel</td>
</tr>
<tr>
<td>D. W. Dickey &amp; Son, Inc.</td>
<td>Dry bulk, fertilizer, aggregates</td>
</tr>
<tr>
<td>Parsons Coal Company</td>
<td>Clay, spar, alloys, ferromanganese, steel, phosphates, Carbo coke, aggregates, pipe, coils, sands, gravel</td>
</tr>
<tr>
<td>Wellsville Terminals Company</td>
<td>Lime, steel, coal, slag, talc, MgO (cement material), bane</td>
</tr>
<tr>
<td>L &amp; J Bowers, Inc.</td>
<td>Dry bulk, steel, scrap, heavy machinery</td>
</tr>
<tr>
<td>Bellaire Harbor Service</td>
<td>Fleeting, heavy lifts, direct access to I-70, unloading</td>
</tr>
<tr>
<td>Columbiana County Port Authority (Wellsville)</td>
<td>Dry bulk, coal, heavy lift capacity</td>
</tr>
</tbody>
</table>

A number of US and State Highways offer access to nearby interstates such as I-70, I-77, and I-79. A moderate number of rail lines operated by CSX and Norfolk Southern converge on the planning area.

BHJ Freight Study: This study area is generally associated with the Brooke-H Hancock-Jefferson Metropolitan Planning Commission (BHJ), the area’s bi-state Metropolitan Planning Organization (MPO). BHJ has put considerable effort into a freight transportation plan, and a report of issues and recommendations was published in January 2011 (BHJ Freight Study: Issues, Opportunities, Recommendations and Strategies[“BHJ Study”]), found at http://www.bhjmpc.org/Newsite2/Planning/freight.html. The study area went slightly outside of the formal MPO boundaries.

With regards to waterborne transportation, the BHJ study notes that there are a total of 52 terminals in the cluster, most of which are privately owned and operated (and single-use); 15 of these terminals have rail connections. The Columbiana County Port Authority (where the Ohio River first enters Ohio from Pennsylvania) is very active, leading to an interview by the project team (detailed below); by contrast, the Weirton Port Authority (which includes the two Ohio counties of the MPO, Brooke and Hancock) is relatively inactive. The BHJ study reports that the two proximate locks are operating at about half-capacity, potentially indicating underutilization of this section of the River.
Figure 4: Ohio Columbiana County Terminals
According to the BHJ study, coal, lignite, and coke shipments make up about three-quarters of the tonnage passing through the locks, with raw materials making up the majority of the remaining tonnage. Primary manufactured goods constitute about 5% of the tonnage. These findings are consistent with the discussion of relative modal advantage (which for water transport, is low marginal cost per ton-mile) discussed at the beginning of this paper. Iron ore usually ships up the river from New Orleans; it is notable that iron ore is also shipped through this region via the Great Lake System and associated rail service. Coal traffic on the river has seen a decline, due to higher demand for alternative, cleaner sources of electric production. From 2000 to 2009, this section of the River experienced a 30% decline in tonnage moved.

The BHJ Study notes that the two locks – the Pike Island Locks and Dam and the New Cumberland Lock and Dam – have reached the end of their design life, thus raising the issue of funding for the maintenance and improvement. The Study notes that garnering the consensus necessary to fund improvements will be hampered by the declining level of river traffic. The Study’s waterborne freight recommendations revolve around intermodal connectivity (to rail and highway modes) and the establishment of a Bi-State Port Authority.

Columbian County Port Authority: Columbian County’s southern border has modern industrial parks and river ports on the Ohio River. The port system of Columbian County, which provides year round international cargo service via the Ports of New Orleans and southwest Louisiana, feeds the industrial base of Northeast Ohio. If combined with the adjacent 10 county Port of Pittsburgh system, Columbian County would constitute the 7th largest Port in the United States.

The Columbian County Port Authority was established in 1976, and promotes economic development with Columbian County and commerce on the Ohio River. The Port also develops industrial parks and works with local and foreign companies on retention and expansion as well as new plant locations offering a full range of incentives which include statewide tax credits, local Enterprise Zone Tax Abatements and local utility incentive programs. There are two Foreign Trade Zone sites available to companies engaged in international trade.

Columbian County is located in the heart of the Cleveland-Pittsburgh Industrial Corridor in a location well-suited to serve the region’s cluster industries of automotive, aerospace, polymer, chemical and metals.

Together, the region has a population of 6.5 million. The Columbian County Port Authority has developed and controls two major industrial park and intermodal terminal development centers. The Trade Park in Leetonia, Ohio, which has 130 acres of Greenfield, ideal for large plants and distribution facilities, and the Intermodal Park in Wellsville, Ohio. The Port Authority’s 70-acre Wellsville Intermodal Facility is located at Ohio River Mile Post 49, which is the northernmost point of the river in the U.S., (being in the last pool before barge tow must be broken down to move south into the Pittsburgh port system.)
The facility is just off Route 7 with a dedicated interchange, and is 40 miles north and south respectively of I-70 and I-76/80 by four-lane highway. A 3,500 foot rail siding (expandable) is on site that connects to Norfolk Southern’s dual river mainline tracks. A 60 ton state of the art bridge crane has just been installed that can load from barge to truck (also with direct loading to rail car when the next phase is completed.)

The facility was constructed to handle multiple cargos including containers. Adjacent acreage on the river, including warehouse space and bulk facilities that are owned by the Port Authority, is currently under lease to third parties who may desire cargo handling services. There are approximately 2,000 acres of developable land across Route 7 from the facility.

In May 2012, the Columbiana Port Authority Board entered into a loan commitment with the Ohio Department of Development for $3.5 million from the logistics and distribution stimulus loan fund for improvements in the Wellsville Intermodal Park. The loan will be used to construct a bulk cargo handling conveyor system and for rail siding improvements, and will assist a joint effort by Cimbar Performance Materials and Anchor Drilling Fluids USA Inc. to process drilling fluid for the oil and gas industry. Interviews with the Port Authority echoed common issues and concerns about Ohio’s freight system, with the strengths being Ohio’s location in regard to railroad investments (NS Heartland Corridor and CSX National Gateway), and opportunities afforded by water transportation access and global supply changes—“near shoring”—which is pulling manufacturing closer to US markets.

Area Summary: There are seven Ohio terminals in the area between East Liverpool, Ohio and Wheeling, West Virginia, which handle general cargo such as packaged commodities, steel, and other dry bulk products.

4. Revitalizing and Funding the U.S. Inland Waterway System

4.1 Current Issues and Conditions for River Terminals along the US Waterway System

The US Inland Waterways System rely primarily on public investment and have suffered from chronic underfunding, seriously affecting the nation’s potential to participate in a highly competitive global market for exportable commodities that may be in great demand in the future. This failure to adequately invest in a publically managed inland waterway system affects the nations’ ability to export key commodities like grain, energy, and specialized manufactured goods. In contrast, the investment in America’s marine ports is dominated by public port authorities and private port operating companies.

The U.S. economy relies on low transportation costs and an efficient transportation network for its exports to offset higher wage levels and costs of production when compared with its global competitors. If the nation does not invest in its waterways infrastructure, transportation costs will undoubtedly increase and export costs will therefore increase, and thus, the increased costs to export goods will affect the nation’s ability to compete in global markets for goods produced in the U.S.

If current needs and investment trends for inland waterways and river terminals continue over time, the nation’s competitiveness will erode, affecting its ability to sustain well-paying jobs, especially in export sectors.

If the U.S. only maintains its current level of investment in its inland waterway and river system, the losses to its economy will increase shipping costs annually. If our inland waterway system were to be abandoned by the government and chronically underfunded, recent studies by the American Society of Civil Engineers (2012) show that by 2020 the lost value of exports will be $270 billion and will rise to
almost $2 trillion by 2040. With this reduction in production, income, and spending there are projected to be 738,000 fewer jobs in 2020.

One of the greatest threats to the performance of the inland waterway system is scheduled and unscheduled delays. The delays are caused by insufficient funding for the operation and maintenance needs of the locks that govern the traffic flow on the nation’s inland system. When a lock or dam reaches a state of poor repair, waterborne traffic must stop to allow for more frequent scheduled maintenance. Although this delay imposes some level of cost on industries that rely on waterborne commodities, the greatest cost is imposed when an unscheduled delay occurs. Unscheduled delays interrupt business operations for entire supply chains dependent on waterborne shipments. However, with adequate investment these delays are preventable.

### 4.2 The Inland Waterway System Trust Fund (IWTF)

The Inland Waterway Trust Fund was established in 1986. The Inland Waterway Trust Fund supports, by law, 257 locks at 212 sites on more than 12,000 miles of inland waterways. The funds are generated by a 20-cent per-gallon diesel fuel tax. The funds are meant to pay for one-half of the cost of new construction and major rehabilitation of locks and dams. The other half of the cost, reflecting the broad distribution of all those who benefit from the other uses of the waterways like national defense, water supply, flood control and recreation, is paid from general revenues. The operation and maintenance (O & M) for the inland waterway system is funded 100% by the federal government.

Since the mid-1980s, dwindling federal resources have limited funds available for water infrastructure operations, maintenance, and rehabilitation. Much of the USACE water resources infrastructure is deteriorating and wearing out faster than it is being replaced. Existing water infrastructure cannot be maintained with the annual funding currently being allocated by Congress. The USACE faces a massive backlog of authorized, unfunded projects; those that have begun often start and stop depending on whether money is available. Maintenance projects are frequently delayed as was evidenced by the temporary closures of the system during the summer of 2012 during periods of extreme low flows on the Mississippi River.

The most commonly cited example of this failed system of funding allocations is the Olmsted Lock on the Ohio River. Since the project began, it has used up almost the entire USACE capital budget, leaving little to no allocations for other projects. Originally projected to cost $775 million when it began in 1988, the project now has a price tag of $3.1 billion and a construction plan expected to stretch on for another decade, resulting in even more costs.

Congressional appropriations in support of navigation O & M have been flat in nominal terms and have actually declined in real terms as prices for labor and materials have increased through the years. In real dollars, O & M funds supporting navigation grew from the later 1970s until the middle 1990s, when expenditures then fell through 2008.

### 4.3 Inland Waterway Trust Fund History and Projections

It is clear that failure or closure of a lock would result in increased costs to shippers resulting in decreased cost advantages to Midwestern producers. Additionally, Midwest producers would still need to transport their goods, inadvertently leading to the long term transport of goods shifting to road and rail. Deterioration of road and rail infrastructure would occur more quickly and would result in financial strains on state resources and railroad capital. New approaches to fund operations, maintenance and infrastructure replacement are needed to keep water transportation viable and revitalize the Inland Waterway Trust Fund (IWTF).
Funds available for new construction and major rehabilitation projects on the inland waterway and river terminal system are limited due to:

- A 20 cent per gallon tax only on fuel taxed waterways that has remained unchanged since 1995.
- Declining tax revenues and inflation. Tax collections have declined due to:
  - Towing industry consolidations
  - Less long haul grain traffic
  - More efficient towboats
  - Fewer empty moves
  - Deeper draft barges

Due to the congressional stopgap measures, the trust fund balances appear to have stabilized. However, without changes to IWTF financing, funding for new projects is expected to be extremely limited in the foreseeable future, with most of the expected funding going to one project, the Olmsted Lock and Dam project.

In 2011, the Inland Waterways Users Board (IWUB) created and transmitted to Congress a proposal of its own to solve the funding issue. The proposal has come to represent the preferred alternative of much of the inland waterway user industry. It has not been endorsed by the USACE or the current Administration; but it is the basis for H.R.4342. The reports general funding recommendations include:

- Increase the fuel tax by $0.06 to $0.09 per gallon
- Increase the Federal share of inland waterway costs
- Increase overall spending on inland waterways

4.4 Emerging Approaches to Funding the Inland Waterway System

New approaches to fund operations, maintenance, and infrastructure replacement are needed to keep inland waterway and river terminal transportation viable. Funding, operations, maintenance and construction of water resources projects is typically authorized in a Water Resources Development Act (WRDA) bill. The last WRDA bill to be approved by Congress was in 2007.

Currently, the U.S. Senate is considering a WRDA bill for 2013. The draft bill currently resides in the Senate Environment and Public Works Committee. An opportunity for a non-traditional approach to management of the inland waterway system does exist within the draft 2013 WRDA.

Because operations, maintenance, rehabilitation and replacement of locks and dams is a primary USACE mission, Congress would need to authorize and appropriate all of the funds needed to permit, design and construct the necessary upgrades to the lock and dam system. Should a lock and dam rehabilitation be approved as a pilot project, funding appropriated by Congress would be passed through to the non-federal sponsor via the USACE.

The State of Ohio and the Ohio River Terminals along the Ohio River have a pressing and strategic interest in seeing the continued, effective maintenance, operations, and modernization of the nations’ inland waterway navigation system. An opportunity to facilitate the future of our waterway system currently exists with the draft WRDA of 2013.
4.5 The WAVE 4 Act (H.R. 4342) - A Brief Overview Summary

Waterways are Vital for the Economy, Energy, Efficiency, and Environmental Act of 2012 was submitted to the US House of Representatives on March 29, 2012. The sponsor of this legislation indicated that it represents a comprehensive effort among key stakeholders to more efficiently use the resources dedicated to improving our inland waterway system. Importantly, the industry has committed to paying more to meet the maintenance challenges we face, and addressing how projects are prioritized should be a part of this process.

The underlying intent of this legislation is to achieve comprehensive long-term inland waterway system modernization. The bill requires the Secretary of the Army, working with the IWUB, to submit to Congress, within one year of the date of enactment of the WAVE 4 Act, a twenty-year capital investment program for the inland waterways.

The legislation would:

- Preserve the existing 50% industry/50% federal cost-sharing formula for new lock construction and major lock rehabilitation projects costing $100 million or more.
- Adjust the current model to provide 100% federal funding for dam construction and major rehabilitation and smaller lock rehabilitation projects, recognizing the value derived by other beneficiaries from dams and the pools created by dams.
- Include a cost share cap on new lock construction projects to incentivize keeping projects on budget and prevent shippers from bearing the burden of paying for unreasonable cost overruns.

The legislation increases the user fee on fuel used in commercial transportation on the inland waterways to 26 cents per gallon from its current 20 cents per gallon, beginning January 1, 2013. The current Washington Administration generally opposes the legislation and its approach. The Administration has submitted proposals to increase trust fund revenues with new user fees in addition to the fuel tax. It has included new revenues from an unspecified new inland waterways fee structure program in its FY2013 budget request.

To date none of these changes have been enacted. Some groups also argue that an increased share of waterway costs should be borne by users, and have suggested that operations and maintenance costs (currently a 100% federal cost) should also be a user responsibility.

5. Macro Demand Forecast of Future River Terminal Cargo Needs

5.1 Demand Forecast Preamble

Although a comprehensive econometric future cargo market forecast was not a part of the scope of the Ohio Statewide Freight Study and was not prepared for the Ohio River Terminals, the following analysis of the U.S. Department of Transportation’s Freight Analysis Framework (FAF) was undertaken to provide a cursory macro demand forecast indication (tonnage and market growth) of future river terminal cargo needs by looking at domestic and international water borne cargo flows characteristics between selected regions and states within the FAF data.

This macro demand forecast was not a part of the scope of work for the Ohio River Terminals Analysis for the Ohio Statewide Freight Study. This analysis was prepared to provide valuable insights into future cargo flow demands on the Ohio River and the anticipated needs of the River Terminals in Ohio. Without this analysis only speculation and supposition would indicate the need for investment in the
State’s Ohio River Terminals. The following is a summary of this effort which provides market demand insights into the potential growth for river borne cargoes along the Ohio River, bordering on the State of Ohio.

5.2 Forecasted Growth for the Inland Waterway System and Ohio River Terminals

The primary source of the following Ohio River Terminal cargo forecasts is the U.S. Department of Transportation’s Freight Analysis Framework (FAF). The data includes both historic information as well projections out to 2040.

A solid starting point for compiling macro level freight flow information and forecasts related to tonnage, value and trading partners by mode is the nationally developed FAF data. FAF integrates data from a variety of sources to create a comprehensive macro level picture of freight movement among states and major metropolitan areas by all modes of transportation. With data from recent Commodity Flow Surveys, as well as additional sources, FAF estimates for tonnage and value, by commodity type, mode, origin, and destination can provide reasonable forecast estimates through 2040.

This analysis only considers waterborne transport and uses waterborne river cargo flows from Louisiana to each up river state, and waterborne river cargo flows from each state down river to Louisiana. For the Mississippi River (Upper and Lower Reaches) the following states have been used: LA, MS, TN, AR, MO, IL, IA, WI, MN. For the Ohio and Lower Mississippi River the following states have been used: LA, MS, AR, TN plus: KY, IN, OH, WVA, PA.

The analysis is divided into three major macro cargo demand forecast regions to fully appreciate and compare and contrast the future inland waterway cargo demand forecast estimate requirements:

1. **Ohio River Region:** (Ohio River + Lower Mississippi River Reaches - No Upper Mississippi River Contribution)

2. **Mississippi River Region:** (Upper and Lower River Reaches)

3. **Combined Mississippi River and Ohio River Basin Inland Waterway Region** (Ohio River + Lower and Higher Mississippi River Reaches)

The following data represents the sum of all the commodities moved from and to the indicated states in the inbound and outbound directions for the Ohio River Region:
### Table 4: Ohio River Waterway System FAF Origin & Destination States

**Ohio River Waterway System**  
Freight Analysis Framework (FAF) - Origin & Destination States  
(Inter and Intra State Regional Analysis including Domestic and International Cargo)

#### Flow of Commodities FROM the following Lower Mississippi River States:

<table>
<thead>
<tr>
<th>States FROM:</th>
<th>Louisiana</th>
<th>Mississippi</th>
<th>Arkansas</th>
<th>Tennessee</th>
<th>Kentucky</th>
<th>Indiana</th>
<th>Ohio</th>
<th>West Virginia</th>
<th>Pennsylvania</th>
</tr>
</thead>
</table>

#### Flow of Commodities TO the following Ohio River States:

<table>
<thead>
<tr>
<th>States TO:</th>
<th>Kentucky</th>
<th>Indiana</th>
<th>Ohio</th>
<th>West Virginia</th>
<th>Pennsylvania</th>
</tr>
</thead>
</table>

**PLUS:** Flow of Commodities FROM the following Ohio River States:

<table>
<thead>
<tr>
<th>States FROM:</th>
<th>Kentucky</th>
<th>Indiana</th>
<th>Ohio</th>
<th>West Virginia</th>
<th>Pennsylvania</th>
</tr>
</thead>
</table>

**PLUS:** Flow of Commodities TO the following Lower Mississippi River States:

<table>
<thead>
<tr>
<th>States TO:</th>
<th>Louisiana</th>
<th>Mississippi</th>
<th>Arkansas</th>
<th>Tennessee</th>
<th>Kentucky</th>
<th>Indiana</th>
<th>Ohio</th>
<th>West Virginia</th>
<th>Pennsylvania</th>
</tr>
</thead>
</table>

The FAF data indicates a projected reduction in overall waterborne tonnage from 2010 to 2020 and 2030 with a substantial increase at the planning horizon of 2040.

### Table 5: Ohio River Projected Waterway Tonnage

**Projected Waterway Tonnage for the Five States Located on the Ohio River to Other Ohio River & Lower Mississippi River States**

<table>
<thead>
<tr>
<th>Year</th>
<th>Tonnage (1000s of Tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010 Act.</td>
<td>94,000</td>
</tr>
<tr>
<td>2020 Est.</td>
<td>96,000</td>
</tr>
<tr>
<td>2030 Est.</td>
<td>98,000</td>
</tr>
<tr>
<td>2040 Est.</td>
<td>100,000</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 6: State of Ohio Forecasted Tonnage Shipments by Mode with 30 Year Growth Rate

<table>
<thead>
<tr>
<th></th>
<th>2010 Actual</th>
<th>2040 Forecast</th>
<th>Growth Rate over 30 years</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Water</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Domestic</td>
<td>43,479</td>
<td>46,864</td>
<td>11%</td>
</tr>
<tr>
<td>Imports</td>
<td>374</td>
<td>1,248</td>
<td></td>
</tr>
<tr>
<td>Exports</td>
<td>325</td>
<td>804</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>44,177</td>
<td>48,916</td>
<td></td>
</tr>
<tr>
<td><strong>Rail</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Domestic</td>
<td>105,818</td>
<td>112,869</td>
<td>13%</td>
</tr>
<tr>
<td>Imports</td>
<td>3,874</td>
<td>9,058</td>
<td></td>
</tr>
<tr>
<td>Exports</td>
<td>1,799</td>
<td>4,086</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>111,491</td>
<td>126,013</td>
<td></td>
</tr>
<tr>
<td><strong>Truck</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Domestic</td>
<td>573,243</td>
<td>869,596</td>
<td>55%</td>
</tr>
<tr>
<td>Imports</td>
<td>18,149</td>
<td>41,264</td>
<td></td>
</tr>
<tr>
<td>Exports</td>
<td>11,374</td>
<td>26,307</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>602,766</td>
<td>937,167</td>
<td></td>
</tr>
</tbody>
</table>

Waterborne cargoes and movement by inland waterway represent approximately 8 to 10 percent of all Ohio commodities shipments.

Table 7: Ohio River Transport Mode of Shipment for All Commodities

The following data represents the sum of all the commodities moved from and to the indicated states in the inbound and outbound directions for the Lower Mississippi River Region:
### Table 8: Lower Mississippi River Waterway System FAF Origins & Destinations

**Flow of Commodities FROM the following Lower Mississippi River States:**

<table>
<thead>
<tr>
<th>States FROM:</th>
<th>Louisiana</th>
<th>Mississippi</th>
<th>Arkansas</th>
<th>Tennessee</th>
<th>Missouri</th>
<th>Illinois</th>
<th>Iowa</th>
<th>Wisconsin</th>
<th>Minnesota</th>
</tr>
</thead>
</table>

**Flow of Commodities TO the following Ohio River States:**

<table>
<thead>
<tr>
<th>States TO:</th>
<th>Mississippi</th>
<th>Arkansas</th>
<th>Tennessee</th>
<th>Louisiana</th>
</tr>
</thead>
</table>

**PLUS: Flow of Commodities FROM the following Ohio River States:**

<table>
<thead>
<tr>
<th>States FROM:</th>
<th>Mississippi</th>
<th>Arkansas</th>
<th>Tennessee</th>
<th>Louisiana</th>
</tr>
</thead>
</table>

**PLUS: Flow of Commodities TO the following Lower Mississippi River States:**

<table>
<thead>
<tr>
<th>States TO:</th>
<th>Louisiana</th>
<th>Mississippi</th>
<th>Arkansas</th>
<th>Tennessee</th>
<th>Missouri</th>
<th>Illinois</th>
<th>Iowa</th>
<th>Wisconsin</th>
<th>Minnesota</th>
</tr>
</thead>
</table>

The FAF data indicates a projected increase in overall waterborne tonnage from 2010 to 2040 for the Lower Mississippi River Region with a substantial increase at the planning horizon of 2010 - 2020.

### Table 9: Lower Mississippi River Waterway Projected Tonnage

#### Projected Waterway Tonnage for the 4 States on the Lower Mississippi River to other States along the Mississippi

<table>
<thead>
<tr>
<th>Years</th>
<th>1000s Tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010 Act.</td>
<td></td>
</tr>
<tr>
<td>2020 Est.</td>
<td></td>
</tr>
<tr>
<td>2030 Est.</td>
<td></td>
</tr>
<tr>
<td>2040 Est.</td>
<td></td>
</tr>
</tbody>
</table>
Waterborne cargoes and movement by inland waterway on the Lower Mississippi River represented by growth rates to the planning horizon of 2040 is illustrated below.

**Table 10: Lower Mississippi River Waterway Projected Tonnage Growth Rates**

![Projected Waterway Tonnage Growth Rate for the Four States Along the Lower Mississippi River to the States Located on the Mississippi](chart)

Please note the gradual slowing of growth rates over the planning horizon.

The following data represents the sum of all the commodities moved from and to the indicated states in the inbound and outbound directions for the Upper Mississippi River Region:

**Table 11: Upper Mississippi River Waterway FAF Origin & Destination States**

<table>
<thead>
<tr>
<th>Upper Mississippi River Waterway System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freight Analysis Framework (FAF) - Origin &amp; Destination States</td>
</tr>
<tr>
<td>(Inter and Intra State Regional Analysis including Domestic and International Cargo)</td>
</tr>
</tbody>
</table>

<p>| Flow of Commodities FROM the following Lower Mississippi River States: |</p>
<table>
<thead>
<tr>
<th>States FROM:</th>
<th>Louisiana</th>
<th>Mississippi</th>
<th>Arkansas</th>
<th>Tennessee</th>
<th>Missouri</th>
<th>Illinois</th>
<th>Iowa</th>
<th>Wisconsin</th>
<th>Minnesota</th>
</tr>
</thead>
</table>

<p>| Flow of Commodities TO the following Ohio River States: |</p>
<table>
<thead>
<tr>
<th>States TO:</th>
<th>Missouri</th>
<th>Illinois</th>
<th>Iowa</th>
<th>Wisconsin</th>
<th>Minnesota</th>
</tr>
</thead>
</table>

**PLUS:** Flow of Commodities FROM the following Ohio River States:

<table>
<thead>
<tr>
<th>States FROM:</th>
<th>Missouri</th>
<th>Illinois</th>
<th>Iowa</th>
<th>Wisconsin</th>
<th>Minnesota</th>
</tr>
</thead>
</table>

**PLUS:** Flow of Commodities TO the following Lower Mississippi River States:

<table>
<thead>
<tr>
<th>States TO:</th>
<th>Louisiana</th>
<th>Mississippi</th>
<th>Arkansas</th>
<th>Tennessee</th>
<th>Missouri</th>
<th>Illinois</th>
<th>Iowa</th>
<th>Wisconsin</th>
<th>Minnesota</th>
</tr>
</thead>
</table>
The FAF data again indicates a projected increase in overall waterborne tonnage from 2010 to 2040 for the Upper Mississippi River Region with a substantial increase at the planning horizon of 2010 - 2020.

**Table 12: Upper Mississippi River Waterway Tonnage**

![Projected Growth for Waterway Tonnage for the Five States on the Upper Mississippi](chart)

Waterborne cargoes and movement by inland waterway on the Upper Mississippi River represented by growth rates to the planning horizon of 2040 is illustrated below:

**Table 13: Upper Mississippi River Waterway Projected Growth Rates**

![Projected Growth Rate for the Five States on the Upper Mississippi to Other States Along the Mississippi](chart)
5.3 Combined Mississippi River and Ohio River Basin Inland Waterway Region

The following analysis results are for the combined Mississippi River and Ohio River Basin Inland Waterway Region (Ohio River+ Lower and Higher Mississippi River Reaches) and reflects the total cargo growth potential for the Inland Waterway and River Terminal.

The FAF data indicates an overall projected increase in waterborne tonnage from 2010 to 2040 for the combined Mississippi River (Lower and Upper River Reaches) and Ohio River Systems with substantial increase at the planning horizons between 2020 and 2030.

Table 14: Combined Mississippi River and Ohio River Basin Tonnage

| Waterborne cargoes and movement by inland waterway for the combined Mississippi River and Ohio River Systems represented by growth rates to the planning horizon of 2040 is illustrated below: |

Table 15: Combined Mississippi River and Ohio River Basin Tonnage

| Projected Waterway (Tonnage) Growth Rate for 14 States Located Along the Ohio & Mississippi Rivers |

Waterborne cargoes and movement by inland waterway for the combined Mississippi River and Ohio River Systems represented by growth rates to the planning horizon of 2040 is illustrated below:
Similar to the Ohio River System the waterborne cargoes and movement by inland waterway represent approximately 7 to 10 percent of all Mississippi River and Ohio River Commodities shipments.

### Table 16: Combined Mississippi River and Ohio River Basin Shipment Modal Ratios

<table>
<thead>
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</thead>
<tbody>
<tr>
<td>Waterways</td>
<td>7%</td>
<td>9%</td>
<td>10%</td>
<td>9%</td>
<td>9%</td>
</tr>
<tr>
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<td>7%</td>
<td>4%</td>
<td>5%</td>
<td>5%</td>
<td>4%</td>
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<td>88%</td>
<td>86%</td>
<td>85%</td>
<td>90%</td>
<td>96%</td>
</tr>
</tbody>
</table>

Includes all River States from Minnesota to Louisiana

#### 5.4 Macro Demand Market Forecast Summary

This Ohio River Basin macro demand future cargo flow forecast supports continued development of the Ohio River Terminal System affording significant opportunities on the Ohio River. This effort provides market demand insights into the potential growth for river borne cargoes along the Ohio River, bordering on the State of Ohio over the planning horizon to 2040.

Consider the following summary market demand forecast findings:

- The projected tonnage and growth rate for the nine inland waterway river states is increasing over the 30 year planning horizon of 2040.

- State of Ohio Forecasted River Based Tonnage Shipments within, from and to the states will grow over the next 30 years at approximately 11 percent. (2010 actuals to 2040 forecast) The 30 year growth rate will nearly approach that for railroad operation within the State of Ohio.

- Ohio waterborne cargoes and movement by inland waterway represent approximately 8 to 10 percent of all Ohio commodities shipments.

- The FAF data indicates a projected reduction in overall waterborne tonnage from 2010 to 2020 and 2030 for the Ohio River Basin with a substantial increase at the planning horizon of 2040.
Ohio River Terminals Analysis  Ohio Statewide Freight Study

- The State of Ohio has an opportunity to grow its international business – especially from its waterborne transportation base.

- The expansion of the Panama Canal will create additional growth opportunities not accounted for in the FAF analysis that can be capitalized on by the State of Ohio particularly in energy and agricultural commodity movements along the Ohio River. The 2015 expansion of the Panama Canal is noted by Ohio River terminal stakeholders as the potential for establishing container-on-barge (COB) operations for non-time sensitive river cargo movements.

- Ohio has the potential to grow the volume of waterborne traffic on the Ohio River. However, this growth is dependent on a fully functioning waterway system, and the focus of the State in increasing both imports and exports volume, as well as enhancing efficient interstate freight flows.

6. Emerging Inland Waterway Markets and Opportunities Summary

6.1 Current Commodity Flow Overview in the Ohio River Basin

By the end of the last decade, over 259 million tons of commodities moved on the waterways of the Ohio River Basin. These commodities had a combined value of over $30 billion. Coal made up 58% of this tonnage, followed by aggregates with 17%. The Ohio River Basin is located in an area that accounts for a high volume of river dry bulk and dry-cargo shipping traffic, including coal ... but not to a significant degree food and farm products. Most of the utility coal moving by barge in the Ohio River basin originated on the Ohio River Basin. Some of this coal actually was mined in the western United States and moved by rail to terminals on the Ohio River, where it was loaded into barges to complete the trip to power generating plants.

The State of Ohio boarders 452 miles of the Ohio River, from river mile 41 to river mile 492. The Ohio River in this reach carries mostly coal, but other valuable commodities such as aggregates, petroleum, iron, steel and chemicals are also transported by barge. Generally in the first decade of the 21st century over 64 million tons of commodities moved to, from and within the State of Ohio. Coal made up just over 73% of this tonnage, followed by aggregates at 5.7%. About two thirds of all the tonnage moved was received into the State of Ohio, and about 20% was shipped out of the State of Ohio. There were over 108 manufacturing facilities, terminals and docks in Ohio that shipped and received tonnage by the end of the first decade in the 21st century.

The Port of Cincinnati (which includes 27 miles of the Ohio River), shipped and received over 13.3 million tons of commodities in the beginning of this century, making it the 3rd largest river terminal port in the Ohio River Basin. More coal is moved by water in the Ohio River Basin that any other commodity. Generally speaking, over 13 million tons of Ohio coal is shipped by barge to 22 power plants in the Ohio River basin with ten Ohio power plants receive coal by barge. These plants received over 7.5 million tons of coal during this time period.

Ohio River Terminals have shipped commodities by barge to 15 states, and received commodities from 14 other states. Of those states, West Virginia received the most cargo. The leading state shipping by barge to Ohio was also West Virginia, and predominantly coal. Louisiana shipments to Ohio of high value commodities such as ores, iron, steel, and chemicals have historically been worth over $1.2 billion.
6.2 Ohio River Basin Energy Resources Overview

In the Ohio River Basin energy resources are plentiful and provide many current river transportation operations and transport routings and offer substantial future transportation options. Consider these energy resource facts for the three dominant states in the upper reach of the Ohio River:

West Virginia:

- West Virginia is the largest coal producer east of the Mississippi River.
- West Virginia leads the Nation in coal production from underground mines.
- West Virginia’s recoverable coal reserves at producing mines are the second largest in the nation after Wyoming.
- Coal-fired plants account for nearly all of the electricity generated in West Virginia.
- West Virginia ranks second in the nation in interstate sales of electricity.

Pennsylvania:

- Pennsylvania ranks second in the nation in nuclear power generating capacity.
- Pennsylvania is a major coal-producing state sells about one-half of its coal output to other throughout the East Coast and Midwest.
- Pennsylvania is the leading petroleum-refining state in the Northeast.

Ohio:

- Energy consumption in Ohio’s industrial sector ranks among the highest in the nation.
- Ohio has the second-highest refining capacity in the US Midwest.
- The completion of a pipeline from the Rocky Mountains could increase Ohio’s total natural gas supply in the near future.
- Coal typically fuels close to nine-tenths of net electricity generation in Ohio.
The following map depicts the Ohio River Basin Coal Reserves by Sulfur Content:

6.3 **Utica Source Shale & Marcellus Shale Formation Project Cargo Opportunities**

According to the USEPA in 2009 the Marcellus Shale formation and the Utica Source Shale below and underpinning it in the Ohio River Basin encompasses 95,000 sq. mi. and could produce approximately 1500 trillion cubic feet (tcf) of gas and represents approximately 489 tcf of recoverable gas which could equate to more than 20 years of total U.S. gas consumption.

Three factors made shale gas production economically viable:

- Advances in horizontal drilling
- Advances in hydraulic fracturing
- Increases in natural gas prices
- Sustainability of natural gas supply

There is the potential for additional transportation of coal and the transportation of equipment to extract gas within the Ohio River Basin.

The Marcellus Shale formation and the Utica Source Shale below it offers potential substantial opportunities for the Ohio River Terminals and logistical support for the natural gas extraction process. Much of the shale deposits and drilling sites are located in Southwest Pennsylvania and much of the drilling material (steel pipe and drillings rigs) can be shipped from the manufacturer via the inland waterway system at low logistical costs.
516 trillion tcf of natural gas is available in the Marcellus Shale formation alone according to the American Association of Petroleum Geologists. Utica Shale is the rock layer under the Marcellus Shale and is quickly becoming the next big play in the natural gas market.

Liquified natural gas (LNG) is projected to create a potential new era of LNG powered international and domestic maritime powered cargo vessels. LNG may become the marine fuel of the future for global vessel shipping. Tote Lines, a domestic ocean carrier in North America, has ordered two new LNG powered container ships and two Roll On/Roll Off (RO/RO) ship conversions establishing Tote Lines as the largest LNG powered vessel operator in the World.

### 6.4 Wind Energy Project Cargo Opportunity

Wind energy is a growing market sector in the US with a majority of the projects in their infancy or in development stages. The cost and efficiency of electrical energy transmission to power the electrical grid is a significant consideration. Proposed major projects in Lake Erie could foster domestic manufacturing and parts distribution potential for the US Inland Waterway System.

A potential opportunity for the Ohio River Terminals is the receiving and processing of material to support the logistics for Offshore Wind projects in the Great Lakes. Offshore wind energy projects are being developed in the Great Lakes region. The Great Lakes region, and particularly Lake Erie, have a sustainable strong wind pattern and shallow lake beds that are advantages to developing major offshore energy projects.

Emerging potential projects include: The Trillium Power Corporation has planned 150 wind turbines on Lake Ontario which would be the largest wind energy project in North America. New York Power Authority has developed the Great Lakes Offshore Wind (GLOW) project that has identified promising sites along Lake Ontario and Lake Erie for potential wind farm locations. A LEEDCO site near Cleveland with 5 windmills has been proposed with turbines manufactured by General Electric overseas and delivered all-water to the Great Lakes region.

### 6.5 Ohio River Basin Utility Coal Transport Opportunity

The Ohio River Basin is a major coal producing and power generating area. Utility companies have historically been attracted to a plentiful supply of water for plant use. The utilities also take advantage of the transportation savings provided by barges and the lock and dam system on the basin’s waterways.

In 2008 the US Army Corps of Engineers found that coal shipments on the Ohio River basin’s waterways totaled almost 150 million tons, or about 58% of all barge cargo. Of this amount, more than 116 million tons were destined for coal-fired power plants. In 2008, this coal moved to 40 power plants along the Ohio River and its tributaries (see map below). Coal moving in the Ohio River basin destined for power plants had a value of almost $4.4 billion.
Most of the utility coal for electric power generation that moves by barge in the Ohio River basin originated on the Ohio River. Some of this coal actually was mined in the western United States and moved by rail to docks on the Ohio River, where it was loaded into barges to complete the trip to power plants.

Most of this coal tonnage moves through Emsworth, Dashields and Montgomery Locks, which are the first three navigation projects on the Ohio River. These three projects are the only remaining navigation projects on the Ohio River that do not have a 110’ x 1200’ lock chamber. The costs associated with major rehabilitation and major maintenance over a 50 year economic design life may exceed the cost of replacement with new larger facilities. Any closures of the main chambers for repairs force greater future reliance on the very small auxiliary chambers. As part of the Ohio River Main Stem Study of navigation modernization, replacement plans involving 2 or 3 projects have been evaluated.

With over 116 million tons of utility coal moving on the Ohio River, any delays encountered by barges factor into the efficiency and cost of electric power generation. At John T. Myers and Greenup Locks and Dams, major repairs of the main chambers associated with heavy use and age force greater future reliance on the inadequately-sized auxiliary chamber. This results in accelerating transit costs.
6.6 America’s Marine Highway and Marine Highway Corridor

Expanding the US’s waterways facilities represents a viable alternative to meet the nation’s future transportation needs. The expansion can be done in a way that reduces emissions, will require less new infrastructure than land transportation alternatives, generates significant fuel savings, and can increase resiliency in the surface transportation system.

It is apparent that the existing road and rail infrastructure cannot adequately meet our future transportation needs. Land based infrastructure expansion opportunities are limited due to geography and very high right of way acquisition costs. Accordingly, new road and rail investments may not be feasible, desirable or cost beneficial in many instances.

Policy makers and investors are therefore re-focusing on the underutilized transportation capacity of the Nation’s inland waterways. Expanding the inland waterways can be done in a way:

- that reduces emissions,
- requires less new infrastructure that land transportation alternatives,
- generates significant fuel savings, and
- can increase resiliency in the current surface transportation system

The nation’s marine highways consist of more than 25,000 miles of inland, intra-coastal and coastal waterway. The inland river system, Great Lakes and coastal fleets move a billion metric tons of cargo each year, but this is less than 4% of the nation’s domestic freight (by volume). In 1957 31% of the nations domestic freight moved by water.
Congress, in recognition of the growing need to address concerns about land based transportation efficiencies and sustainability, enacted the Energy Independence and Security Act of 2007 to establish a short sea transportation program and designate short sea transportation projects to be conducted under the program to help mitigate surface congestion. In October 2008, the Department of Transportation established America’s Marine Highway Program.

America’s Marine Highway Programs supports growth and improvements along the Ohio River. “Under the America’s Marine Highway Program, the Secretary will designate marine corridors and identify and support short sea transportation projects to expand domestic water transportation services as an alternative means of moving containerized and wheeled freight cargoes...” “The America’s Marine Highway Program envisioned by the Department of Transportation will implement the Energy Act’s requirements for short sea shipping by working to bring about a seamless, energy-efficient, and climate-friendly transportation system through the creation and expansion of domestic water transportation services.”

The Marine Highway Program was fully implemented in April 2010 through publication of a Final Rule in the Federal Register. On August 11, 2010, U.S. Transportation Secretary Ray LaHood identified 18 marine corridors, 8 projects, and 6 initiatives for further development as part of “America’s Marine Highway Program.”

Marine Highway Corridors: These all-water routes consist of 11 corridors, 4 connectors and 3 crossings that can serve as extensions of the surface transportation system. These corridors identify routes where water transportation presents an opportunity to offer relief to landside corridors that suffer from traffic congestion, excessive air emissions or other environmental concerns and other challenges. Corridors are generally longer, multi-state routes whereas connectors represent shorter routes that serve as feeders to the larger corridors. Crossings are short routes that transit harbors or waterways and offer alternatives to much longer or less convenient land routes between points.

The Ohio River M-70 Marine Highway Corridor: The M-70 Corridor includes the Ohio, Mississippi, and Missouri Rivers, and connecting commercial navigation channels, ports, and harbors, from Pittsburgh to Kansas City. It spans Pennsylvania, Ohio, Indiana, Illinois, and Missouri, connecting to the M-55 Corridor at St. Louis, MO. This corridor contains major freight truck bottlenecks at numerous points, including Kansas City, St. Louis, Louisville, Dayton, Cincinnati, Columbus, and Pittsburgh.

According to the U.S. Department of Transportation, long haul truck volumes are expected to reach 25,000 per day along major segments by 2035. Similarly, rail congestion is evident in and around Kansas City, St Louis, and several points along the corridor in Ohio. This Marine Highway corridor has the potential to help alleviate a portion of the congestion from the existing landside routes, while at the same time reducing emissions, conserving energy, improving safety, and reducing highway maintenance costs. It can also contribute to increased economic and commercial activity in the region by removing barriers to efficient freight transportation.

However, there is an issue with all these expansion ideas – funding. Funding for America’s Marine Highway initiative and general infrastructure enhancements would need to rise considerably for these programs to meet their full potential for relieving congestion and reducing pollution from America’s highways and railways. There’s also a crucial need to develop more cargo capacity as the nation’s population rises in years to come.

Inland waterway improvements would help smooth the way for the 73 percent increase in cargo traffic that’s expected over the next 25 years.
6.7 **Agricultural Commodity Flow Opportunities**

An analysis of the transportation of soybeans and soybean products, by Informa Economics (July 2012) for the United Soybean Board declared that “The Soybean Industry is dependent on an efficient fully functioning Waterway System.”

The Midwest focus of US soybean and grain agricultural production and the nexus with the US inland waterway systems are critical to the success of the industry. Soybean production is expected to expand over the next decade, and the industry feels is it is very important that the transportation infrastructure be able to accommodate the movement of soybeans and grain products. Soybean barge movement is predominantly destined for the Central Gulf to be exported to foreign countries. A minority of the barge movements are used for domestic placement of soybeans.

One conclusion / recommendation from the Study - enhance the attractiveness of waterborne transportation as a viable mode of agricultural transportation.

Transportation infrastructure projects were identified that can significantly reduce the costs of moving soybeans and gain commodities to the international market. The cost savings is expected to result directly from the enhanced attractiveness in water transportation as a mode of transportation.

Cost savings are most likely to be derived from:

- Improved reliability in the delivery time of soybeans and grains
- Reduced travel time and transit times
- Improved efficiencies at ports for using larger, more efficient ocean going vessels
- Potential reassignment of rail traffic to barge traffic for freight currently utilizing rail to avoid deficiencies at key lock and dam facilities

The improvements proposed would involve $467.2 million of construction outlays on an annual average (over a 5 year construction period for locks and over a 10 year period for dredging) in the U.S. economy, and would be expected to increase the output of water transportation by approximately $43.3 million annually.

7. **Recommended River Terminal Transport Shipping Development Strategies**

7.1 **Competitive Ohio River Multimodal Freight Facility Landscape**

Modal transit times and transportation costs are important key factors in determining the specific mode of transport for cargo delivery. The following basic modal criteria are paramount factors that should be considered in any modal transport trade off and selection.

- **Travel distances:** Overall inland waterway barge distances were 1.5 to 2 times higher for alternative other transport modal routes than for truck or rail.
- **Transit times:** Truck and intermodal rail are competitive and are considerably faster than inland waterway barge, but may be multiples of the barge transport cost.
- **Operational Costs:** Due to economies of scale, barging freight provides the lowest cost per ton.

The feasibility of a new Ohio River port terminal, intermodal terminal or logistics facility along the Ohio River will be determined, in large part, by its competitive market landscape. The following are major terminals and facilities (active or proposed) that could compete with a bulk cargo logistics development along the Ohio River Upper Reach.
Virginia Inland Port – Front Royal, VA
CSXT Intermodal Terminal – Chambersburg, PA
CSXT Northwest Ohio Intermodal Terminal – North Baltimore, OH
NS Roanoke Region Intermodal Facility – Roanoke, VA
NS Franklin County Regional Intermodal Facility – Greencastle, PA
South Point Industrial Park – South Point, OH
Columbiana County Port Authority – East Liverpool, OH
Port of Pittsburgh – Pittsburgh, PA
American Port Holdings Inc. (APHI) – Weirton, WV (River Liner Services)
Port of Cincinnati

The State of West Virginia created the West Virginia Public Port Authority (WVPPA) to champion the development of intermodalism by combining all modes of the state’s transportation network to maximize the state’s economic advantages. The West Virginia Multimodal Ohio River Freight Strategy is to develop regional multimodal freight facilities on both sides of the Ohio River. The WVPPA Statewide Strategic Port Master Plan recommends the following regional river terminal freight development focus areas as follows:

- **Huntington WV / Prichard WV / U.S. Highway 35 Corridor**
- Martinsburg, WV
- **Weirton, WV**
- Clarksburg, WV

The **bold** WVPPA freight development areas identified above are considered direct Ohio River Terminal competitors to the South Point Port Authority and the Columbiana County Port Authority in the State of Ohio, respectively.

### 7.2 Preparation of a Comprehensive Ohio River Terminal Strategic Development Plan

Ohio is a maritime state and is surrounded by navigable waterways on three sides. The Ohio River terminals represent freight operations on two of the three sides. Ohio is 8th in the nation for total water tonnage moved. Ohio and its maritime ports and river terminals handle over 103 million tons of commodities valued at $11 Billion worth of cargo per year. The maritime state should have a comprehensive River Terminal Strategic Development Plan.

The process used in this assessment of future Ohio River Terminal infrastructure opportunities and development is only an initial cursory evaluation and a starting point for the identification, targeting and development of the spectrum of emerging market opportunities available to Ohio’s river terminals. It is recommended that the State of Ohio sponsor and lead a comprehensive statewide Ohio River Terminal Strategic Development Plan and marketing strategies to carefully evaluate and target market driven opportunities that are consistent with the overall fabric of the Ohio Statewide Freight system and provide a coordinated and synchronized tapestry of vital inland waterway development projects. This statewide river terminal master plan would be a partnership with the Ohio River Terminal Authorities and river terminal operators.

Working in partnership, Ohio River port terminal operator senior management and Ohio State DOT leadership should prepare a market driven comprehensive river port development master plan that should routinely be revisited and updated on a five year basis. This Ohio River Terminals analysis should not be considered as a single attempt to provide strategic market direction; but rather it must be viewed as an initial step in an ongoing, continuous state led economic development process, which
must be adapted to market changes both externally and internally to the Ohio River port terminal system.

The following river terminal strategic planning axioms should be embraced and deployed to guide Ohio River Terminal Operators and State DOT officials in preparing a Comprehensive Ohio River Terminal Strategic Development Master Plan:

- Any Ohio River terminal development strategy should be viewed as a future development policy statement of importance and should intentionally embody flexible development guidelines, not rigid river port development doctrine. As market demands change over time, the Ohio River Terminal Operator in partnership with Ohio DOT officials, will need to adapt to these future market demands with agility. Thus, future adjustments to the river terminal development strategy recommendations are inevitable and should be a natural expression of a balanced strategic river port terminal planning process.

- A Comprehensive Ohio River terminal development strategy, above all, must be market driven providing a flexible “road map” for future river terminal development along the Ohio State boundary utilizing long term proven business risk principles to create a sustainable and durable port development and operational market driven solution for all river terminal participants. Future econometric market forecasts should be prepared.

- For the Ohio River terminal development strategy to be truly successful it must ensure that any adopted development planning meets current river terminal customer’s needs. These current port tenants and customers drive current port river terminal revenues. Only after current port customer needs are met should the Ohio River Terminal Operators or Ohio State DOT officials pursue future Ohio River development opportunities.

- Maximize the use of existing river terminal capabilities and assets first. The river terminal development strategy should first focus on and align current river terminal systems in management, operations, information technology, pricing, etc. in their existing facilities with the future vision of a comprehensive Ohio River Terminal Strategic Port Development Plan.

- Finally, and only after all the above steps have been taken and after all other practical options have been successfully pursued and explored, only then should the River Terminal Operators or the Ohio DOT invest in new river terminal facilities and infrastructure.

The expansion of the Ohio River terminal system must be timed to effectively respond to marketplace conditions while attempting to optimize Ohio River terminal economic development benefits and return on investment. It is recommended that all options to increase operational efficiency and productivity through tools such as reduction of terminal dwell times must be used before any new physical expansion is commenced.

### 7.3 Recommended General Ohio River Terminal Development Strategies

In Phase I of the ODOT Statewide Freight Plan Tasks (Task 1.1, Task 2.1, 2.2, 2.3. and 4.1) two major Ohio River terminal area stakeholder groups were interviewed and the resulting interview information analyzed. Please refer to the Phase I Stakeholder Interview summaries, analysis, findings and recommendations.

The deliverables for the Phase I work on the Ohio River Terminal Analysis to the Ohio Statewide Freight Plan were conducted as follows:
Based on the conclusions and findings included in Phase I and II of the Ohio River Terminals interviewed for the Ohio Department of Transportation (ODOT) Statewide Freight Study, the following general Ohio River Terminal Development Strategies are recommended.

The general criteria for the Ohio River Terminal Strategic development strategies focuses on capturing current freight logistics opportunities identified in the Phase I and II report and adds logistics value and system capacity to the network of the Ohio State River terminal operations. These development strategies are organized into the following categories:

- **Current River Terminal Bulk Commodity Flows** and preparing for future current bulk commodity growth trends and industry needs along the Ohio River for the existing Ohio River Basin waterborne commodity flows.

- **Emerging New River Terminal Commodity Opportunities**:
  1. **Prepare for Utica and Marcellus Shale Formation** - Oil & Gas Production Support Logistical Services and multimodal river terminal infrastructure for future Shale Gas Production Plays (Pipe Imports, Drilling Rig support materials, etc.).
  2. **Prepare for emerging new agricultural commodity flow opportunities** (i.e., Soybean export barge movements.) The United Soybean Board (USB) Freedom to Operate Action Team is examining the feasibility of a privately financed process for dredging and deepening the lower Mississippi River to 50 foot depth in order to increase the economic viability of soybean and grain exports in the Mississippi and Ohio River Valleys. This opportunity could represent a “game changing” environment for both agricultural products and potential Container-On-Barge (COB) opportunities. The expanded Panama Canal will be able to accommodate vessels requiring 50 feet of draft. Each foot of draft provides an additional 2,000 metric tons (75,000 bushels of soybeans) of loading capacity for a vessel. Therefore, increasing the loading of a vessel from 45 foot depth to 50 foot depth, would amount to 10,000 additional metric tons (approximately 400,000 bushels) with an approximate additional value of $5 million per vessel.
  3. **Prepare for Lake Erie Wind Energy Generation development logistical support** and value added services when these wind energy opportunities materialize.
  4. **Prepare for the 2015 opening of the Panama Canal Third Lane Expansion project** with a focus on the resultant increase in non-time sensitive bulk and possible containerized cargoes as a result of the potential increased river traffic demands related thereto.
  5. **Prepare for future Container-On-Barge (COB) operations in partnership with Lower Mississippi River Ports and Terminals**, perhaps using Public Private Partnership (PPP) arrangements to foster and capture emerging new COB opportunities along the Ohio River. In all instances, the above Ohio River Terminal strategic development strategies must be predicated on a market driven criteria using proven business planning tools.
The above Ohio River terminal development strategies provide general guidance and market focus to the ODOT officials and the Ohio River terminal operators in order to increase and diversify the operational efficiency and capacity of the river port terminal facilities to enable the Ohio River terminal infrastructure to handle the anticipated business growth in the future.

A common and overarching potential cited by all Ohio River terminal operators is the potential for improved intermodal (multimodal) facilities that link rail and barge operations and hold promise for the entire Ohio River terminal system along the Ohio State border. Recommended Ohio River terminal multimodal transport shipping development strategies are summarized below. These initiatives should seek to take advantage of the region’s transportation assets by focusing on improving operations of the multimodal freight transportation system, and by deploying excess transport capacity in the current transportation network and having multijurisdictional support and cooperation.

- Develop required highway and rail access to foster intermodal and multimodal river terminal operations.
- Develop as a staging and transhipment point for supporting and supplying the Marcellus Shale extraction industry logistical requirements.
- Develop logistics infrastructure and services to support and supply the extraction, processing and distribution of natural gas.
- Improve waterside modal transfer capacity by directly linking river transportation capabilities to Class I railroad services for Ohio River cargo flows.
- Evaluate developing an information center to collect and coordinate the region’s logistics information and data activities as added value logistical capability.
- Develop information technology capabilities on the river and multi-modally.
- As the M70 corridor of the Marine Highway emerges, consider developing a multimodal cargo transfer facility for service to the Pittsburgh metropolitan area.
- Develop information technology capability on the river and multi-modally.

### 7.4 Future Container-On-Barge (COB) Strategic Planning Development Considerations

With the growing discussions regarding the potential for future Container-On-Barge (COB) services on the Ohio River by numerous Ohio River terminal operators, it was deemed appropriate to briefly discuss the dynamics of and the requisite steps needed for successful COB service initiation on the Mississippi and Ohio Rivers.

Containerized freight offers a significant potential for economic development in the Ohio River basin region. For the Ohio River Terminals, the most advantageous approach to the realization of COB services on the river will come from the combination and integration of Ohio River cargo operations and the landside container intermodal transfer facility capabilities. Specifically the viability of an intermodal rail terminal (container and trailer on flat cars) for COB services should be evaluated as a River terminal function by analyzing various criteria for location and intermodal railroad cooperation.

In addition to the previous market driven river terminal development recommendations, there are four primary criteria for the development of COB intermodal container services that should be considered:

- **Ohio River Terminal Economics:** The COB river terminal services must be market driven and produce the “Lowest Cost - Best Service Levels” for container traffic within a regional area fully integrated into the total logistics costs from origin to destination for a Shipper/BCO (Beneficial Cargo Owner.)
- **Ohio River Terminal Location:** The COB river terminal should be predominantly located on or close to a Class I rail intermodal network.
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- **Ohio River Terminal Volume**: The COB river terminal throughput container volumes must be significant and sufficient to support frequent, long trains supported by sufficient barge fleeting operations to maintain constant train transfer capabilities.

- **Ohio River terminal Proximity to Other Competitors**: COB River terminals should avoid overlapping geographic catchment areas with other similar terminals.

- **Ohio River Terminal Container Import/Export Balance**: The flows of inbound and outbound containers need to be approximately balanced to produce terminal efficiencies and revenues.

Given all of the above criteria, the current marketplace demand has not materialized to propel forward the development of viable COB services on the Mississippi and Ohio Rivers. Until this critical market economic threshold is reached, Ohio River Terminals should continue to plan for future implementation of COB intermodal rail services without speculative river terminal project development.

7.5 **Ohio Led Coalition of Ohio River States to Support New Funding for the Ohio River Lock and Dam System**

The State of Ohio and its river terminal operations has a significant and compelling interest in seeing the continued maintenance, operations, and modernization of our nations’ inland waterway navigation system on the Ohio River. The state could proactively initiate and undertake activities that may help realize improvements to the inland waterway navigation system.

Specific actions that the State of Ohio can take to protect and further its interests in the Ohio River lock and dam system include:

- Explore the possibility of a coalition of Ohio River states (Pennsylvania, West Virginia, Indiana, Kentucky) and inland waterway interest groups (energy and agriculture producers/businesses, barge operators, shippers, environmental stakeholders) to drive a legislative agenda in Washington, DC to address funding and legislative changes needed to modernize the Ohio River system of locks and dams.

- Express interest to the Secretary of the Army and seek non-federal sponsorship for implementation of a pilot project outlined in Title II, Section 2019 of the draft WRDA 2013 bill.

- An opportunity to facilitate the future viability of Ohio River inland waterway operations currently exists with the draft WRDA of 2013 legislation. New approaches to fund operations, maintenance, and infrastructure replacement are needed to keep inland waterway transportation viable. Funding, operations, maintenance and construction of water resources projects are typically authorized in a WRDA bill.

It is recommended that the State of Ohio pursue actions to encourage the US Congress to:

1. Ensure passage of a WRDA bill in 2013 now that the US Senate version has been passed.
2. Ensure the existence of opportunities for pilot programs that would allow non-federal sponsors the ability to rehabilitate, improve, operate and maintain federal projects. It is recommended that such opportunities be identified and presented to legislators for sponsorship.
3. Ensure opportunities for alternative project delivery and funding mechanisms (user fees, private investments) for existing and proposed civil works and navigation projects.
4. Ensure adequate funding for both ongoing and pilot USACE Civil Works and Navigation programs.
5. Raise the excise tax on diesel fuel from $.20/gallon to $.30/gallon and index the tax for inflation, to provide more adequate funding for the Inland Waterway Trust Fund.

6. Authorize the USACE to study additional funding mechanisms (recreational fees, lockage fees, tonnage fees, etc.) to provide for more adequate funding for the Inland Waterway System.

Much remains to be decided with the federal government regarding the overall operation of the Ohio River lock system. However, it is clear that the existing inland waterway navigation system is nearing a tipping point in terms of funding for necessary repairs, maintenance and system enhancements.

End of Document