

# Container-On-Barge Port Concept Paper

June 2008



This photo is from the U.S. Department of Transportation Maritime Administration website [www.marad.dot.gov](http://www.marad.dot.gov). The photo from 2005 shows a Osprey Line, LLC, tow barge moving the largest single container movement (375 containers) in the history of the U.S. Inland Waterway System. The 15-barge tow carried 750 twenty-foot equivalent units (TEUs) from Memphis to New Orleans and Houston.



## Purpose

This concept paper is a preliminary investigation of the possibilities of a container-on-barge service and requisite port facilities on the Ohio River. It is the hope of the Southeastern Ohio Port Authority that this report will be used to inspire government officials, business leaders and entrepreneurs to further investigate the possibilities of container-on-barge transportation in light of extraordinary fuel prices, congested freight corridors and the struggles of the State of Ohio to build and maintain a primarily truck-based freight transportation network.

The information contained in this report was assembled from cursory research over the Internet. Although the source information is deemed reliable, the Southeastern Ohio Port Authority cannot vouch for its accuracy.

## The Global Economy Moves By Containers

- “Containerization has revolutionized cargo shipping. Today, approximately 90% of non-bulk cargo worldwide moves by containers stacked on transport ships. As of 2005, some 18 million total containers make over 200 million trips per year. *Source: “Containerization,” [www.wikipedia.com](http://www.wikipedia.com)*



Photo: A Hanjin container ship from [www.Hanjin.com](http://www.Hanjin.com).

- “Today’s merchant fleet worldwide consists of 3,375 containerships with a capacity of 7.2 million Twenty-foot Equivalent Unit (TEU) containers. They are divided into four distinct categories: “feeder” ships, those that carry less than a thousand TEUs and are designed to shuttle containers to and from small ports to larger ports; “handy-size” vessels of one to three thousand TEUs; “Panamax” ships (maximum size for the Panama Canal) of up to four thousand TEUs; and finally, “post-Panamax (up to 7,000 TEUs and too big for Panama Canal).” *Source: The Container Revolution, Salvatore R. Mercogliano, assistant Professor, the United States Military Academy at West Point.*

## The Growth of Container Shipments is Straining Ports, Railroads and Highways

- “In 2004, the port of Los Angeles/Long Beach alone accounted for 8.6 million containers, or thirty-six percent of the more than twenty-three million containers that moved in and out of the United States. That translates to over 23,000 containers per day, with each TEU capable of carrying up to twenty tons of cargo—equal to loading/offloading approximately forty-five freighters daily.” *Source: The Container Revolution, Salvatore R. Mercogliano, assistant Professor, the United States Military Academy at West Point.*
- “With the prediction that the volume of international trade through our ports will double 2001 volumes by the year 2020 and the volume of containerized volumes might well triple within that time frame, our nation's infrastructure will be challenged to accommodate this increase in freight movement, especially given the growing congestion caused by other commercial and passenger traffic.” *Source: American Association of Port Authorities [www.aapa-ports.org](http://www.aapa-ports.org)*



Photo: Hanjin Terminal at Port of Long Beach, CA, from [www.aapa-ports.org](http://www.aapa-ports.org)

- “Despite the increasing demand, North American container ports and their supporting distribution network have not expanded capacity to match the volume growth. One study indicates that most major North American ports are already operating at or near full capacity and will have significant capacity deficits by 2010 (National Chamber Foundation of the U.S. Chamber of Commerce 2003). Exacerbating the problem is the fact that railroad and truck carriers serving the ports are also facing severe capacity shortages (“Capacity Crunch Continues” 2004; Kulisch 2004b) and that supporting road infrastructure suffers from increasing congestion problems (Federal Highway Administration 2004; Texas Transportation Institute 2004). The current capacity situation even has foreign shippers questioning imminent North American capabilities to meet capacity requirements (Armbruster 2004a).” *Source: Michael Maloni and Eric Jackson, Transportation Journal, March 22, 2005*

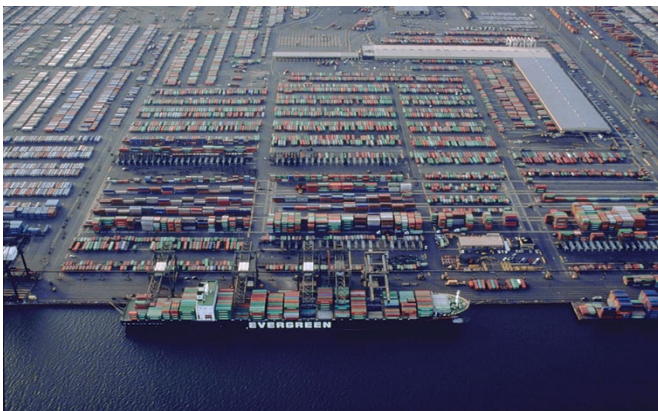


Photo: Evergreen Ship at Port Newark/Elizabeth, NJ, from [www.aapa-ports.org](http://www.aapa-ports.org)

- “A two-week labor strike at U.S. West Coast ports in 2002 stranded more than 200 ships and 300,000 containers (Gooley and Cooke 2002) because other ports did not have the capacity to accommodate redirected shipments. The strike required presidential intervention as the delays cost an already weak U.S. economy \$1 billion a day (Keane 2004). 2004 peak season volumes at Los Angeles and Long Beach, the largest North American ports, more than doubled projections, causing severe congestion (Mongelluzzo 2004b).” *Source: Michael Maloni and Eric Jackson, Transportation Journal, March 22, 2005*



Photo: Container ship at dock from [www.portoflosangeles.org](http://www.portoflosangeles.org)

- The growth in rail traffic threatens to create log jams in the nation’s 140,000-mile network of rails. The U.S. Chamber of Commerce predicts demand for freight cars will double in the next 25 years. An Associated Press story reported industry analysts are concerned about a “meltdown.” “The damage to the U.S. economy could climb to billions of dollars. A lone train stopped in Chicago can force other trains to stop or slow as far away as Los Angeles or Baltimore.” *Source: Michael Tarm, AP, “Busy U.S. Rail Network Creaking Under Strain,” Columbus Dispatch, June 11, 2008*



Photo: double stack containers on rail from [www.aapa-ports.com](http://www.aapa-ports.com)

### River Barges Could Reduce Loads on Congested Ports & Railroads

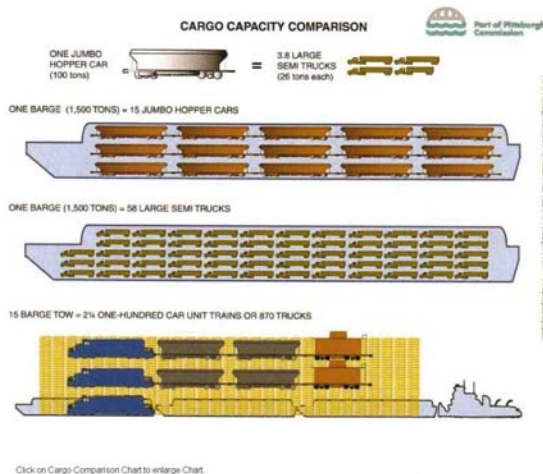
- The Inland Waterway System allows freight to be transported via the Intracoastal Waterway, Mississippi and Ohio rivers using tow barges. Via this network, freight can be moved between Houston, Minneapolis, Chicago, and Pittsburgh.

- Shipping bulk freight via barge is typically more efficient than rail or truck transportation. A 15-barge tow can move as much bulk freight as 870 trucks. *Source: Pittsburgh Port Commission*



Map from <http://sea-point.net>.

- Shipping containers via barge has been tried previously with mixed success. One of the biggest challenges is reaching a critical mass of regular users. How do you get the container-on-barge service without market demand? Conversely, how do you create market demand without the container-on-barge service being readily available?



Graphic from [www.port.pittsburgh.pa.us](http://www.port.pittsburgh.pa.us).

- Osprey Line of Houston, Texas, ([www.ospreyline.com](http://www.ospreyline.com)) is a company that has been shipping containers on barges (COB) for six years. According to Osprey Line's website, the company's COB service "connects Houston, Lake Charles, New Orleans, Memphis, Chicago, Mobile, Pascagoula, and other Gulf Coast and inland river ports." Osprey Line claims to have handled over 70,000 containers in the last two years. In 2004, Osprey opened a COB terminal in Memphis ([www.portofmemphis.com](http://www.portofmemphis.com)). Osprey runs a weekly route between New Orleans and Memphis. Cincinnati and Pittsburgh are listed as possible locations under "inducement based services."



Photo from [www.ospreyline.com](http://www.ospreyline.com).

### Special Challenges of the Ohio River

The journey from New Orleans to Belpre, Ohio, covers approximately 1,656 river miles. No locks and dams exist on the Mississippi River. Over 981 miles of the Ohio River, 21 locks and dams must be traversed by barge tows, including 14 locks over about 700 miles between Belpre and the Mississippi River. Barge tows typically travel about 100 miles a day, according to Price Inland Terminal. Travel time between New Orleans and Belpre, without any unusual delays at the Ohio River locks would be between two to three weeks. *Source: McDonough Company and Price Inland Terminal*

## Proposed Ship-to-Barge Container Port at Mouth of Mississippi

- Sea Point is a floating deep-sea dock proposed to be built at the mouth of the Mississippi River. The State of Louisiana is currently considering issuing bonds in support of the project. On one side of the port, deep-sea container ships would load and unload containers. Overhead cranes would transfer the containers to and from the other side of the dock where the containers would be loaded on and unloaded from barges for transport up and down the Mississippi River or the Gulf Coast.



Graphic from <http://sea-point.net>

Sea Point's website reports the following:

- Standard hopper barges can carry 1,600 short tons (2,000 lbs) on its 9' draft. A standard river box barge can carry 81 twenty-foot containers or 50 combined twenty and forty-foot containers. Northbound barge tows routinely push 20 loaded barges.
- Inland river shipping is more cost effective than rail, which is more cost effective than trucks. However, inland river shipping up the Mississippi River requires more time. It takes nine days longer for an Asian shipment to reach New Orleans by way of the Panama Canal than by Long Beach, California. However, 4-to-7-day delays from dock to railhead are normal at Long Beach.

- Sea Point reports rail shipment is the most expensive leg of a container's journey. Sea Point estimates \$1,100 to \$1,200 per container can be saved by way of COB transport to Memphis vs rail shipment from California. Source: Sea Point [www.sea-point.net](http://www.sea-point.net)



Photo from [www.ospreyline.com](http://www.ospreyline.com)

## U.S. Maritime Administration Vision

"The greater use of America's Marine Highways is one answer to congestion on our highways and railroads. The use of vessels could reduce major bottlenecks, such as bridges and tunnels, as well as congested interstates, such as I-95 which parallels the U.S. Atlantic coastwise routes. Properly developed, the Marine Highway can greatly relieve the increased stress on the overall transportation system. The use of Marine Highways can reduce overall fuel consumption and limit the amount of air pollution. Moreover, studies have shown the fuel efficiency and pollution reduction benefits by switching to newer, environmentally friendly vessels." Source: "A Vision for the 21st Century: The Maritime Administration and the U.S. Marine Transportation System," U.S. Department of Transportation, Maritime Administration, [www.marad.dot.gov](http://www.marad.dot.gov)

## Fuel Usage Comparison

Marine Highway 1 Barge =  
 456 40' Containers = 75 Barrels of Oil  
 Rail 228 Railcars DBL Stacked =  
 456 40' Containers = 300 Barrels of Oil  
 Truck 456 Trucks =  
 456 40' Containers = 645 Barrels of Oil

Source: U.S. Department of Transportation, Maritime Administration

## Learning from the Port of Pittsburgh

The Port of Pittsburgh commissioned a “Container-On-Barge Pre-feasibility Study” that was released in July of 2003. It can be found at [www.port.pittsburgh.pa.us/docs/cobreport-june26-final.pdf](http://www.port.pittsburgh.pa.us/docs/cobreport-june26-final.pdf). Some pertinent highlights are listed below:

- “COB service is a widely used and rapidly growing means of transportation throughout Europe, the Pacific Northwest and Asia.”
- “Successful COB operators are not only successful towing operations, but they are successful logistical operations that combine transportation modes, promoting COB in an integrated way.”
- The ports of Houston and New York have successfully accessed federal Congestion Mitigation and Air Quality funds from the Transportation Efficiency Act for intermodal enhancements.
- The report recommended a demonstration project as the next step to promote COB.



Photo from [www.ospreyline.com](http://www.ospreyline.com)

## COB Problems Identified

- The need for easily obtainable, prompt information on barging costs, transit times, and intermodal connections.
- The lack of a one-stop provider for intermodal bookings, scheduling, customer service and bills of lading.
- Questions of insurance responsibility when handling multiple shipments on one barge.
- Dunning and existing barges to handle containers.
- Barge operators are reluctant to establish COB service on the Ohio River because of the number of locks and the unreliability that locks introduce to the logistics chain.
- Container owners and shippers are very interested in turn-around time. It may be necessary to create pools of containers at or near ports to allow quick loading of outbound containers.

- Ensuring terminals have equipment, facilities and technical know-how to move containers.

## Equipment Requirements

“In order to be cost efficient, a terminal requires sufficient space to store the containers, a 20-30-ton overhead crane or a mobile crane, spreader bars for 20 and 40 foot containers, a 20-30-ton container forklift and ground strength sufficient to support the concentrated wheel points of the forklift carrying a loaded container. Know-how in working and stowing containers is essential.

- Ground Storage. A terminal is typically required to provide 2.5 times the ground storage to work a vessel.
- Cranes. A 20-ton crane would be able to lift most highway-weight containers, but a 30-ton crane would handle most overweight containers. Mobile cranes have reduced the start up costs for a terminal entering this market
- Container Forklift. Container forklifts are more efficient for moving the containers within the port terminal.”

“Obstacles to starting a COB service are more economic than technical. Perhaps it would be even more accurate to say that the obstacles are more business practices than business costs. Starting a COB service where a traditional bulk barge operation exists presents a classical ‘chicken and egg’ dilemma. Carriers say that if there is a demand, they will provide the service. Shippers say that if there were a service they would use it. There is a role for the public sector to move both the chicken and the egg as close to each other as possible.”

- *Container-On-Barge Pre-Feasibility Study, Final Report, Port of Pittsburgh Commission, July 2003*

## Next Steps in Ohio

1. ODOT assistance to conduct a detailed feasibility and market research study.
2. Building Ohio Jobs grant assistance to provide an existing port with required infrastructure and equipment.
3. Demonstration project to aggregate demand and prove concept.