

**CASE STUDY**

# As Port Muskogee Recovers From Historic Flooding, the Waterway Looks to Mitigate Future Weather-Related Events While Supporting Continuous Growth

A strategic plan that focuses on current and future needs of the key inland port in Muskogee, Oklahoma, outlines flood mitigation measures and infrastructure improvements while positioning the port for future success.

**Challenge**

Centrally located within the United States where the Arkansas, Grand and Verdigris rivers meet, Port Muskogee in Muskogee, Oklahoma, is a multimodal hub for the transport of goods via barges, rail and trucks. One of the farthest inland all-weather ports, the port offers easy access to the Gulf of Mexico as well as other inland ports on the Ohio, Illinois and Mississippi rivers.

Port Muskogee opened in December 1970. Today, many industries rely on the waterway for the shipment of commodities, such as agricultural products, asphalt, coal and construction materials. Cargo tonnage by barge increased more than 18% from 2020 to 2021, with 539,401 tons moving through the port in

**Project Stats****Client**

Port Muskogee

**Location**

Muskogee, Oklahoma

**10**

**MAJOR INFRASTRUCTURE  
IMPROVEMENTS  
RECOMMENDED**

**25+**

**STRATEGIES IDENTIFIED**

**10**

**NEW RAIL SERVICE  
OPPORTUNITIES**

2021. The fact that Port Muskogee was operational in 2020 was a considerable feat after the port sustained significant damage due to historic flooding in May 2019. Underwater for nearly two weeks, barges broke loose and damaged downstream infrastructure, portions of the dock and wharf collapsed, electrical systems stopped working, and water flushed out sediment beneath railways, rendering them unusable. Operations on the river were delayed for several months, costing Oklahoma more than \$20 million in GDP each day.

Once floodwaters receded, the amount of port infrastructure that needed to be rebuilt or replaced — along with previously undetected underwater issues — became clear. In February 2021, the Muskogee City-County Port Authority contracted with Burns & McDonnell to complete a comprehensive infrastructure assessment and resiliency study, develop flood mitigation measures and craft a strategic plan to help the port prioritize improvements and maximize its potential moving forward.

## Solution

Port Muskogee desires another 50 years of service life from infrastructure assets and plans to implement measures to help mitigate future environmental impacts and support continuous growth. It was vital that an effective strategic plan be developed alongside flood mitigation efforts. A critical infrastructure assessment and resiliency study was conducted to prioritize necessary repairs and replacements, as well as to identify mitigation measures to see that these assets can withstand future flooding events. The study identified 10 recommended major infrastructure projects.

Next, we developed and delivered to the port a strategic plan that builds on those studies to document the current state of port assets and make recommendations for the port's future development and economic growth. Our teams surveyed and interviewed port staff and local partners to complete the comprehensive study and develop the strategic plan. The strategic plan illustrates past, current and future needs with a guide to achieving port goals — with site-specific opportunities, facility constraints, existing systems and safety taken into consideration.

Our team analyzed current crane and other cargo-handling equipment for replacement or upgrade and identified additional infrastructure and equipment strategies to achieve safety, throughput and air quality goals. These strategies included locating critical infrastructure at an elevation above the new FEMA 100-year flood plain and introducing flood protection measures in areas where this is not possible due to site restrictions.

The port is well positioned to provide container-on-barge services, so we developed a potential site layout for a container yard and provided recommendations on the necessary dockside and roadway infrastructure upgrades. Open parcels within the port have the potential to be rail-served and represent an opportunity for air quality improvements through modal efficiency, expansion of cargo handling capabilities and increased throughput. Our team identified multiple new rail service opportunities and developed track layouts.

With an understanding of the port's financial constraints, our team also developed an approach to leverage federal funding opportunities available through the passage of the Infrastructure Investment and Jobs Act (IIJA). We identified grant opportunities and mapped them to eligible port projects, providing a guide for the port to follow. Our team also partnered with the port to develop grant applications for several U.S. Department of Transportation programs, such as PIDP and INFRA.

## Results

The strategic plan delivered to the port highlights potential new development and areas for expansion, including ways in which the plan can improve economic opportunities, beautification and environmental resources. The plan includes a phased approach to project implementation to allow the port to remain operational. Planned repairs account for future growth and expansion, as well as potential new tenants as market demands change.

The strategic plan we developed is essential for the port to be prepared for the ever-changing landscape of development opportunities driven by fluctuating supply chains, resilient infrastructure needs to combat weather-related events, and an unprecedented amount of federal funding opportunities.

## About Burns & McDonnell



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