

CASE STUDY

Millions in Cost Savings Delivered for North America's Largest Intermodal Logistics Center

As the largest inland port in North America, the CenterPoint Intermodal Center in Joliet, Illinois, was experiencing unmanageable congestion due to inadequate road networks connecting with nearby interstate highways and several major rail hubs. Today, thanks to the efficiencies gained from a collaborative design-build project, public safety issues are a thing of the past.



Challenge

By early 2021, up to 20,000 large tractor-trailer trucks were entering and leaving the CenterPoint Intermodal Center each day, because of its location at the confluence of navigable waterways connecting with Lake Michigan and near major intermodal hubs operated by Union Pacific and Burlington Northern Santa Fe (BNSF) railroads. Many of the trucks were exiting off interstates 55 and 80, traveling down narrow rural roads and crossing bridges that were not designed for this type of heavy traffic. Local residents were dealing with progressively more congestion and safety hazards with each passing year.

Though it was clear that a major infrastructure upgrade was needed to better accommodate traffic flow into the logistics center, there were still a number of

Project Stats

Client

CenterPoint Properties,
United Bridge Partners

Location

Joliet, Illinois

\$16M

TOTAL PROJECT SAVINGS

1,900

TOTAL BRIDGE
LENGTH IN FEET

3.5M

TWENTY-FOOT EQUIVALENT
UNITS OF FREIGHT
ANNUAL CAPACITY

challenges facing the owner/operator. One of the most significant was obtaining approvals and permits from various stakeholders with jurisdictional authority over waterways, railroads and the roadway network that would be impacted by the project. Because the upgrades would include a bridge across a navigable waterway, permits were needed from the U.S. Coast Guard, the U.S. Army Corps of Engineers, the Illinois Department of Natural Resources and the City of Joliet.

Solution

The Houbolt Road Extension was planned to incorporate a new 1,900-foot, eight-span four-lane bridge and approach roadways, providing safer and faster access to I-80. An accelerated schedule was mandated for project completion, leaving only a 40-day window for development of alternative technical concepts and the design advancement necessary for pricing estimates.

Because of the accelerated schedule, a collaborative design-build project delivery model was needed. Following local and state legislative approvals, it became the first transportation project in Illinois authorized to proceed under the design-build method.

This delivery model proved to be ideal to expedite construction, which required advancing permit approvals required from government agencies and other stakeholders. The integrated design-build method allowed several design and construction phases to overlap and expedited permit and construction packaging approvals, with over-the-shoulder reviews and walk-throughs with stakeholders conducted in advance of permitting submittals.

This method paid dividends, given the pressure of the accelerated schedule. The last approval of eight construction packages was received within nine months of the beginning of design.

Thanks to the collaborative nature of the design-build method, a number of design improvements were developed that achieved significant cost savings while speeding up the schedule. These design innovations included elimination of multiple bridge spans, removal of several retaining walls which helped balance earthwork, new cost-saving girder designs and an innovative in-river pier construction method. These features improved overall quality and are expected to extend the life span of the bridge and related infrastructure.

Other design improvements included new stormwater conveyance systems that eliminated unnecessary detention basins, as well as an enclosed drainage system on the bridge. These solutions will reduce impacts to downstream swales maintained by the Illinois Department of Transportation as well as impacts to the Des Plaines River.

The bridge was designed to meet or exceed the Coast Guard standards including horizontal and vertical clearances over navigable waterways, as well as clearance standards specified by the BNSF Railway. The new roads incorporate safety features that include wider outside lanes and shoulders, larger turning radii for trucks, extended acceleration lanes and an adjusted vertical profile to lessen gradients and balance earthwork on both sides of the river.

Results

A number of design improvements and a range of value engineering innovations resulted in total project savings of more than \$16 million. These were achieved through refinement of certain infrastructure elements and improved utilization of equipment and resources during the construction phases. As a bonus, design changes will reduce future maintenance costs and issues.

The project design remained focused on the primary goal of relieving extreme traffic congestion in the area by providing direct access to the intermodal center for truck traffic coming from all directions. However, the design has also delivered flexibility for future improvements that will be needed if the area around the intermodal center is developed as anticipated.

With the improvements, this 6,400-acre intermodal facility now has capacity to handle than 3.5 million twenty-foot equivalent units (TEUs) of freight annually with a value of more than \$600 billion. The bridge is relieving congestion from heavy truck traffic, resulting in an average of 25 minutes in reduced transit times for trucks entering and leaving the intermodal facilities. The time savings should result in an estimated reduction of 50,000 tons of total greenhouse gas emissions by 2030.

The demonstrated efficiency and benefits of the design-build method incorporated on the Houbolt Road Extension project has persuaded the Illinois legislature to approve a bill that gives full authority to utilize design-build methodology for future public infrastructure projects throughout the state.

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