



CONNECTING
TRAINS
 AND
TRUCKS

How Michael Baker is helping two major rail companies develop a new generation of efficient, cost-effective intermodal rail terminals that connect cities, producers and consumers

For 25 years, an old rail yard straddling McKees Rocks and Stowe Township, Pa., along the Ohio River just beyond Pittsburgh's city limits, sat vacant, an overgrown reminder of the region's once-thriving steel industry. The rail yard – located on a flat, industrialized edge of the borough known as The Bottoms, had served over the previous century as a rail interchange, locomotive rebuilding facility and rail maintenance shop for the former Pittsburgh and Lake Erie (P&LE) Railroad, which hauled coal, coke, steel and passengers. Until it didn't. That was in 1992.

Twenty-five years later, you might hardly recognize this 70-acre site amidst what could be described as another remarkable riverfront transformation for the Pittsburgh region led by visionary business, civic and community leaders and Michael Baker International. That is, except for the site's railroad tracks.





Loading a tractor-trailer at the Pittsburgh Intermodal Rail Terminal.

“Intermodal terminals are critical to the efficient movement of containerized freight and consumer goods,” says Tom Zagorski, practice lead, construction services for Michael Baker. “I like to call them inland ports. You get the same benefits, except there’s not a boat involved.”

TRAINS, TRUCKS... AND GROWTH OPPORTUNITIES

Development of intermodal terminals has become a key priority for the freight transportation sector, providing a variety of benefits. They facilitate transport, of course, ultimately helping industry reduce costs and pass along savings to consumers – while delivering significant environmental and public benefits.

U.S. freight railroads, projecting solid growth over the next 30 years, have been investing significantly in maintaining and modernizing rail infrastructure. According to the American Society of Civil Engineers, in its 2017 Infrastructure Report Card, the freight railroad industry in 2015 spent \$27.1 billion on maintaining, growing and modernizing the railroad system. And the U.S. freight industry projects a 40 percent increase in shipments over the next 30 years.

Michael Baker’s involvement with rail yards and terminals began in 2006 with a small Ohio project – Gest Street Yard expansion in Cincinnati – for railroad giant Norfolk Southern Corp. This was an expansion of an existing intermodal terminal that enabled Michael Baker to build a foundation for rail yard and terminal design experience. The size of the projects and complexity grew, as did Michael Baker’s collective experience and credibility (see sidebar article).

“We designed access roadways, drainage, tracks, rail bridges, walls, tunnels, lighting and power and air systems, and we handled environmental permitting,” says Kirsten Bowen, a project manager in Michael Baker’s Cleveland office, of those earlier projects. “That enabled us to put our finger on the pulse of client needs.”

From those experiences, Michael Baker has established itself as a major player in rail yard and terminal development. Working with clients Norfolk Southern and CSX, Michael Baker is providing such services as design, permitting, pre-construction, construction, construction management, quality assurance and inspection.

Today, the site – developed by railroad giant CSX into a state-of-the-art intermodal rail terminal as part of its \$850 million National Gateway Initiative – stands as a testament to the resurgent freight transportation industry and the importance of moving raw materials and manufactured goods efficiently and cost-effectively across the country and around the world. But we’ll come back to that.

It also speaks to the opportunities ahead for Michael Baker to help engineer and manage the construction for such intermodal transformations – a notion for which Michael Baker has prepared well when it comes to amassing the right expertise and experience to take on these unique engineering and construction management challenges.

Here’s a look at four of these innovative projects – three completed, one in the pipeline:

DEVELOPING CSX'S NEW PITTSBURGH TERMINAL

CSX, based in Jacksonville, Fla., considers intermodal terminals so vital that it created the \$850 million National Gateway Initiative, a public-private partnership, to develop an interconnected network of strategically located terminal sites and routes with double-stack clearance for intermodal trains, maximizing the ability to efficiently serve markets in the Midwest and mid-Atlantic corridors.

For the new Pittsburgh-area facility, which opened in September 2017, CSX acquired a vacant, 70-acre rail yard, located just west of Pittsburgh’s city limits along the river in Allegheny County, to support its hub-and-spoke approach to national intermodal freight transportation. Then it engaged Michael Baker to help develop its state-of-the-art terminal and serve as the owner’s representative in overseeing the construction of the project.

“CSX is committed to serving the growing needs of our current intermodal customers and others who can benefit from the speed and efficiency of intermodal service,” says Fredrik Eliasson, CSX executive vice president and chief sales and marketing officer. “Our newest facility in Pittsburgh will connect southwestern Pennsylvania to markets across the country and around the world.”

CSX describes the Pittsburgh facility, which required a \$60 million investment by the rail company, as the “last key component” of CSX’s national initiative, a public-private partnership designed to create what the company describes as a highly efficient network of double-stack rail and intermodal terminals. By design, CSX notes, the network will connect East Coast markets to consumers, manufacturers and businesses in the Midwest.

AN 'AMAZING TRANSFORMATION'

Preparing the long-vacant industrial site in the Pittsburgh area, though, did pose its share of challenges for Michael Baker and its construction partners. As is the case with most brownfield sites, years of industrial operations can leave behind contaminants and old materials that require removal and mitigation measures. So the Michael Baker team worked to ensure the site was fully restored in a safe, environmentally friendly manner, navigating strict guidelines and preserving an important Stowe Township water line that runs through the site.

“The key to the success of the project,” says Giuseppe Mammana, project manager for Michael Baker in Pittsburgh, “was working closely with the owner and the construction team members and being able to roll up our sleeves and work side by side with the team.”

After two years’ construction, the Pittsburgh Intermodal Rail Terminal debuted in September 2017, featuring two processing tracks, one support track, one lead track and four administration/operations buildings. The site also includes three

large, rubber-tired gantry cranes capable of stacking containers four high between trucks and trains, which gives the facility an annual lift capacity of 50,000 intermodal containers.

“To witness the amazing transformation from a vacant, overgrown rail yard to this clean, high-tech intermodal facility has been a fulfilling experience,” says Adam Walkowiak, on-site construction engineer from Michael Baker’s Pittsburgh office. “Even more rewarding now is seeing the final completion of the project and knowing the positive impact it will have on this community.”

“Our newest facility in Pittsburgh will connect southwestern Pennsylvania to markets across the country and around the world.”

Fredrik Eliasson | CSX



Giuseppe Mammana (left), project manager for Michael Baker, and Adam Walkowiak, Michael Baker's on-site engineer at the Pittsburgh Intermodal Rail Terminal.

Says Allegheny County Executive Rich Fitzgerald: "The terminal will not only help connect Western Pennsylvania's businesses to the global marketplace, it also will help stimulate McKees Rocks' and Stowe's economies."

PUTTING SHIPPERS CLOSER TO THEIR MARKETS

Norfolk Southern, based in Norfolk, Va., meanwhile has established, with help from Michael Baker and others, an East Coast artery it calls the Crescent Corridor, a 2,500-mile grid of rail and intermodal terminals that facilitates shipping, diverts long-haul trucks from roadways and sparks local economic development across 11 states, spanning Louisiana to New Jersey.

"Norfolk Southern has invested in the Crescent Corridor to provide customers with a fast, direct route between the Southeast and the Northeast while offering a range of truck-competitive shipping options that include connections to the West Coast and Mexico," says Christine Traubel, assistant vice president, intermodal and automotive, for Norfolk Southern. "The intermodal facilities we've developed on the corridor have created

additional freight capacity, improved transit times, and put shippers closer to their markets, which helps reduce their overall supply-chain costs."

As part of the \$2.5 billion public-private partnership, Norfolk Southern has introduced four new intermodal facilities along the Crescent Corridor, including in Birmingham, Ala.; Memphis, Tenn.; Charlotte, N.C.; and Greencastle, Pa., near Pennsylvania's capital of Harrisburg. Michael Baker provided engineering and construction management services for the Greencastle facility.

Norfolk Southern located its \$97 million Greencastle facility on a 200-acre greenfield. Development therefore brought a different set of environmental considerations, including wetlands and stream relocations.

"We were connecting with the local water and sewer systems and affecting local roadways," says Will Snyder, a project manager for Michael Baker who managed the project. "We met regularly with the township to discuss these matters."

RAILROAD RESOLVE

How Michael Baker built its reputation in rail yard engineering



Norfolk Southern's Moorman Rail Yard in Bellevue, Ohio.

Photo courtesy Norfolk Southern

Michael Baker International project manager Kirsten Bowen remembers well her early work with Norfolk Southern Corp. to expand what today is called the Moorman Rail Yard in Bellevue, Ohio. And why shouldn't she? After all, this and several other successful rail projects, she says, helped build the experiential foundation for Michael Baker to take on the recent state-of-the-art intermodal facility development work for Norfolk Southern and CSX.

"It was a fairly complex project, especially from an environmental standpoint, and we had to become more creative in our design to minimize the footprint," Bowen, based in Michael Baker's Cleveland office, says of the Bellevue project. "It was a major accomplishment."

As part of the multi-faceted project, the Michael Baker team helped Norfolk Southern expand the classification yard from 42 tracks to 80 tracks and added external tracks, for a total of 37 miles of new track on the 620-acre site. And the project had to be completed in six months.

Michael Baker provided surveying, geotechnical investigation, utility identification and relocation

coordination; environmental and construction permitting; class yard analysis and rollability studies as a subconsultant; and design of the air system, lighting and electrical power distribution and civil site design.

Bowen says one of the biggest challenges for her was coordinating the work among a large number of team members to complete the project in a timely fashion and "learning better ways of communication and coordination.

"At any given time, we had 40-plus people from seven different offices working on the project to meet our schedule requirements," says Bowen, who joined Michael Baker in 2001. "So we leveraged our 'Bigger Baker' and our work-share capability. Performance was the key."

That experience, she says, has paid off significantly in landing even bigger and more complex rail projects over the past couple of years.

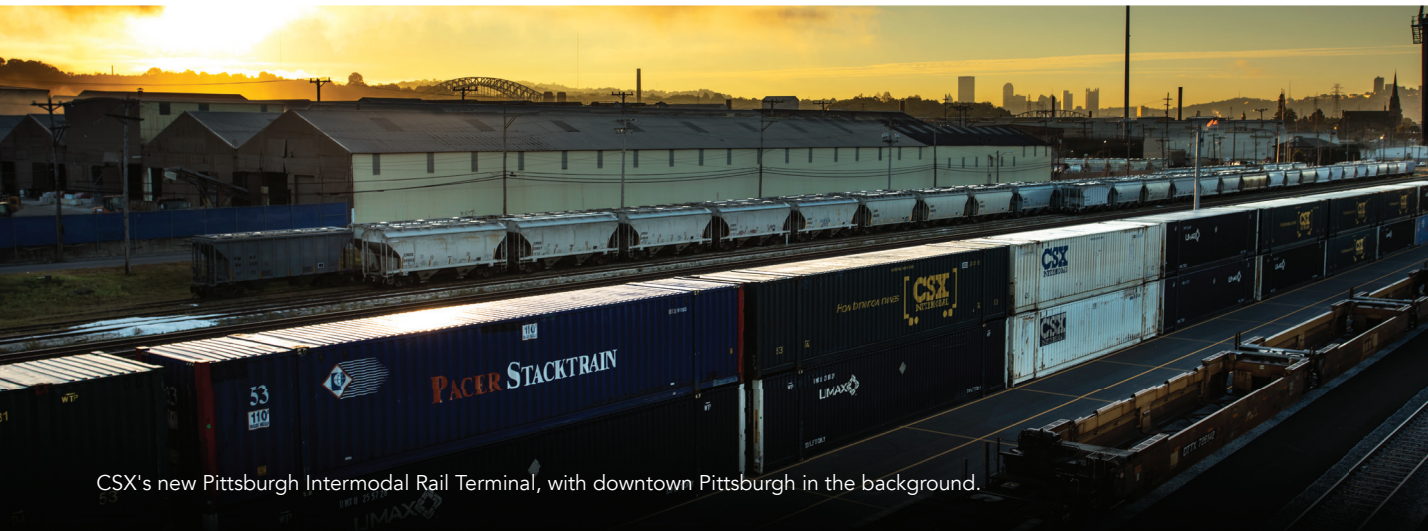
"You need time to show your capabilities," Bowen says. "But it's really about building relationships and how we respond to our clients and manage our projects."

Michael Baker also faced another construction management challenge during the Greencastle build: maintaining railroad traffic during construction – an objective that became particularly difficult when Michael Baker realized it would need to shut down a mainline track to install a 72-inch drainage pipe. But it solved the problem.

“We took that track out of service and ran the trains on the new yard track so that we could install the drainage facility,” says Pat Gardiner, construction services manager in Michael Baker’s Harrisburg office. That sequencing helped minimize disruptions to rail traffic.

THE CAROLINA CONNECTOR . . . AND BEYOND

Of all the intermodal facilities in the works, CSX’s Carolina Connector (CCX) in Rocky Mount, N.C., may prove the most ambitious. The \$270 million CCX project, funded in part through the state of North Carolina’s Strategic Transportation Investment program, will result in an innovative, state-of-the-art intermodal hub and transfer facility that will leverage the economic and environmental benefits of rail while connecting North Carolina ports, businesses and consumers to hundreds of domestic and international markets. The Carolina



CSX’s new Pittsburgh Intermodal Rail Terminal, with downtown Pittsburgh in the background.

When the facility was completed in January 2013, it offered 670 paved trailer/container parking spots and capabilities that, when combined with other Norfolk Southern terminals in Pennsylvania, now can divert as many as 800,000 long-haul trucks from the Commonwealth’s roadways.

In Rutherford, Pa., about an hour’s drive from Greencastle, Michael Baker worked with Norfolk Southern on a \$60.5 million expansion of this existing intermodal facility. As at Greencastle, the partners emphasized development in harmony with the environment.

The expanded terminal, which features an annual lift capacity of about 350,000 intermodal trailers, opened in 2015. It’s expected to generate 48 direct jobs and as many as 400 spinoff jobs.

Connector is expected to create about 300 long-term terminal operations jobs and, over time, more than 1,500 additional long-term jobs across the state.

For the initiative, Michael Baker is serving as “owner’s representative.” The project will feature a “construction manager-at-risk” approach that allows for construction to begin before plans are finalized, with the construction manager locked in – with some exceptions – to the contracted fee. Michael Baker has served successfully as a construction manager-at-risk and brings valuable experience to the selection/oversight role.

“We’ve grown rapidly to become a premier provider of intermodal construction management services,” Zagorski says. “It’s an important business for us, and it’s very exciting.”



One of three gantry cranes at CSX’s new Pittsburgh Intermodal Rail Terminal.