GRESHAM SMITH REVITALIZES STRETCH OF KY 9 IN NEWPORT, KENTUCKY

PHOTO CREDIT: DRONEGENUITY

The city of Newport, Kentucky is bounded on the west by the Licking River. Just to the north, across the Ohio River, lies Cincinnati. Several attractions populate the area, including the Newport Aquarium and Newport on the Levee. However, for years, the area's infrastructure made it hard for residents to reach these popular spots. Deteriorating roadways saw significant truck traffic, and the area was surrounded by abandoned factories, fenced-in areas, and dumping sites.

To improve traffic flow and make the attractions easier to reach, the Kentucky Transportation Cabinet (KYTC) wanted to improve connectivity between I-275 and Newport by giving Kentucky Route 9 (KY 9) a major facelift. Revitalizing the run-down area was also a significant goal.

"Some projects are purely transportation projects. Some are purely economic development projects," says Jeremy Kubac, senior transportation engineer for Gresham Smith, the engineering firm selected to work on the project. "This one was both. Although it addressed a transportation need, it also served as a catalyst for development."

Using design software from Bentley, Gresham Smith was ultimately able to reimagine KY 9 to provide Newport with a safe and modern roadway that has breathed new life into the area.

PHOTO CREDIT: GRESHAM SMITH

Newport's Lowell Street, before and after. Since the new multimodal roadway has revitalized the shuttered industrial corridor, a new distillery and several new businesses have sprung up along the south section of KY 9.

A DIFFERENT APPROACH

While the project had been under consideration by KYTC since the early 2000s, it had been shelved due to budgetary reasons. Around 2010, the project finally achieved funding.

By then, a private developer was already working on a large tract of land along the waterfront, and that was right in the path of where the upgraded KY 9 needed to go. "There was a lot of back and forth to get things worked out," says Kubac. "All this existing infrastructure needed to be tied into the ongoing mixed-use development."

A primary consideration was making the roadway both safe for pedestrians and efficient for motorists. "Pedestrian safety and mobility were huge," says Kubac. "In previous years, that's typically been overlooked on highway projects. However, KYTC's District 6 has forward-thinking staff and truly understood the needs of an urban roadway." Another important goal involved moving truck traffic out of residential neighborhoods and running it down an industrial corridor instead.

Gresham Smith brainstormed an unusual approach: adding two traffic roundabouts along the length of KY 9. This solution would provide smooth access to multiple connecting roadways while ensuring that traffic was slowed to a safe speed in areas traversed by pedestrians. "It's been difficult to implement roundabouts in Kentucky," notes Kubac. "Other states had adopted this method much more quickly, but in this environment, it was a novel concept. We built two of the first multi-lane roundabouts in the state."

THE CHALLENGES

Roundabouts can have complex grading plans, Kubac notes. These ones included five connection points in an area that was fairly flat. For that reason, concrete was chosen for the paving material instead of asphalt. "In Kentucky, you don't see a lot of road construction done with concrete," he says. "However, it allows more accurate grading than asphalt, and that helps maintain drainage and keeps the roadway from ponding." In the future, concrete will also create fewer challenges with resurfacing and maintaining grade.

Gresham Smith encountered issues with the underground drainage system as well. The area has old sewers that were initially built for storm drainage and that were later adapted to also serve as sanitary sewers. "We needed to build an all-new storm sewer," says Kubac. "The old portions were 100 years old — brick outfall sewers that were put in before the flood protection system that now encircles Newport. And any time you need to tie into a brick structure, it can be problematic. They hold together well until you start picking at them, and at that point, any damage can cascade."

The old sewers were buried 20 feet deep and required shoring so that Gresham Smith could tie pipes into them. The design called for connections to the old outfalls downstream from the combined sewer diversion structure, yet upstream from flood protection gates. To ensure that no new load was added to the existing sewers, they created concrete bunkers to support the additional weight. Removing KY 9 from the city's combined sewer

PHOTO CREDIT: GRESHAM SMITH

Gresham Smith removed KY 9 from the city's combined sewer system, requiring connections to century-old brick outfalls downstream from combined sewer diversion structures, yet upstream from the flood protection gates.

PHOTO CREDIT: DRONEGENUITY

Completed in 2018, the reconstructed KY 9 provides the city of Newport with a safe, modern, and efficient roadway that enhances travel for commercial vehicles, maximizes residential safety, and improves both regional and multimodal connectivity.

system helped the Kentucky Sanitation District satisfy a consent decree order with the U.S. Environmental Protection Agency.

Gresham Smith used Bentley's OpenRoads storm and sanitary solution for the storm sewer design. This application enabled them to detect clashes and display all the drainages as 3D solids so they could check them against utilities. "There was a significant benefit in having integrated roadway and drainage software," says Kubac.

THE RIGHT TOOLS FOR THE JOB

Gresham Smith designed the entire KY 9 project using Bentley's digital platform, starting with MicroStation. "We fully modeled this project from beginning to end — every bit of it, including regrading plans for old pavement," says Kubac. That was important for meeting ADA guidelines for pedestrian infrastructure.

Based on the 3D models, the firm identified and resolved conflicts early in the design process that ultimately saved USD 3.5 million in underground network relocation and shaved 18 months off the schedule. The project was so successful that it was submitted for consideration by Bentley's Year in Infrastructure and the 2021 Going Digital Awards in Infrastructure Awards.

The firm has since moved all its projects to ProjectWise, using the platform to manage their data and collaborate in the cloud. "Since the pandemic, that's been a lifesaver," notes Kubac. "Having so many people working remotely, we literally couldn't have functioned otherwise."

What has Kubac learned from working on the KY 9 project? "I came to recognize the importance of model and file management," he explains. "These transportation projects can take a long time — years or even decades — and it's important to have a good file management system to keep track of everything and ensure consistency, even if people come and go on the project or a question comes up years later."

Almost as soon as the northern section of the KY 9 roadway project was done, it catalyzed the development of the area. He adds, "Once the roadway was cleaned up, private investment just took off. It's easy to get behind a project like this that has a lot of good benefits on multiple levels. That's what drives me." ■