Faster—Better—and Cheaper!

Expressway project fits two construction seasons worth of work into two months.

By Matt Bullock and Mike Baron

Everyone knows the old customer service adage: "You want it faster, better, cheaper? Pick two!" Well, in the case of the restoration of I-64 along the Louisville, KY, riverfront, the customer was lucky, getting all three!

Thanks to innovative design and construction planning, combined with effective traffic mitigation and public communication efforts, the Kentucky Transportation Cabinet (KYTC) was able to complete the equivalent of two construction seasons on the Restore 64 project in just two months—and within budget.

The $53-million project involved replacement of 132 expansion joints for the 14 bridges that make up the Riverside Expressway (I-64), as well as structural steel repairs, and facility upgrades, including overhead signage and guardrail end treatments. In addition, nine lane miles of pavement were removed and replaced with a new asphalt pavement section and the entire 24-lane miles of the project received a new riding surface.

In 2004, KYTC selected Parsons Brinckerhoff (PB, www.pbworld.com) to inspect the 14 Riverside Expressway bridges. Areas in need of repair were identified along the entire project length, including the pavement, which was determined to be in poor condition and was included in the overall repair strategy. Based on these findings the KYTC initiated a repair program to ensure the long-term safe operation of the bridges and pavement that make up the expressway.

PB was tasked with preparation of final construction drawings and maintenance of traffic plans for the restoration of one of Louisville's main traffic arteries along the Ohio River. This facility, which carries over 100,000 vehicles per day, has elements that were original to the 40-year-old highway. Debris falling onto the roads, recreational areas, and parking lots below had not only become a maintenance headache, but there was also the danger of it becoming a major public safety hazard.

A one-step waterproofing/wearing course system—Rosphalt 50—was used for the new riding surface so the work could be completed during the time allotted.

Due to the significance of this stretch of I-64 to the local economy, it was specified that the highway could not be closed down in its entirety for more than 30 days. In addition, on/off ramps at both ends of the project had to remain open during times of full shut-down to allow travelers throughout the region to access downtown Louisville.

What was the design team to do? After studying a total of seven alternate traffic maintenance scenarios, including traditional lane-by-lane, continuous phased full closure, phased full-closure on weekends, and bi-directional closures with all ramps closed or open, a two-phased full closure integrated solution was proposed. Over three consecutive weekends starting on June 8, 2007, the entire length of I-64 from Preston Street westward to the Shawnee Expressway would be closed. During this time, the contractor would perform the necessary work on the on/off ramps at the perimeter of the construction zone to ensure that motorists would be able to reach downtown Louisville during the 30-day shut-down. During Phase II, which would run from July 5 through August 5, 2007, the expressway would be completely closed between 3rd Street and 22nd Street. Balancing factors such as user costs, construction duration, construction access, and public access in and out of downtown, the two-phased full closure solution was deemed the most efficient and cost-effective approach. It ended up saving money while greatly minimizing the potential for construction-related crashes and driver-frustration over what would otherwise have been an extended period of road closure.

To be able to complete the work during the allotted time-span, the design

team proposed the use of Rosphalt 50, (Royston, www.roystonlab.com) a one-step waterproofing/wearing course system, for the new riding surface, in lieu of the more traditional overlay material, concrete. Unlike concrete, this dry-mix asphalt additive does not have to be cured and has minimal temperature restrictions for application. As a result, work crews put the material down at all times during the closures, not just when temperatures were below the maximum threshold of 85 degrees F for a concrete overlay.

The $53-million Riverside Expressway (I-64) project included the replacement of 132 expansion joints for 14 bridges plus structural steel repairs and facility upgrades.

Since this material was relatively new to the KYTC and given the large tonnage required for the project, an inspection of an existing Rosphalt 50 application was arranged so the project team would be confident of the material's efficacy. The Wisconsin DOT hosted a site tour of a Rosphalt 50 application in Milwaukee that had been applied in a similar scenario 11 years prior. Typically, KYTC wants to achieve a 20- to 30-year life-span history for all resurfacing materials. Since Rosphalt is a relatively new product, this data is not yet available. However, given the positive experience the Wisconsin DOT has with the product, the favorable per unit cost and the time savings it would yield, KYTC approved the recommendation.

Creating a Smooth Ride

The 30-day shut-down of the Riverside Expressway in Louisville was the first long term full (seven days a week/24 hours per day) shut-down of an interstate in the history of KYTC. Thanks to the comprehensive communication efforts of the project team, the majority of residents and commuters in the region were supportive of the project. Working closely with the local government, the FHWA, Traffic Response Information Management Assisting the River City (TRIMARC), the region's ITS system, as well as the Transit Authority of River City, the public transit agency, a public information and communication program was launched about six months before the start of construction.

As part of this effort, three open houses were conducted in the greater Louisville area. The dates and locations of the meetings were publicized in local newspapers. Similarly, during the drive times of the actual construction, announcements were broadcast on the major radio stations serving the Louisville market. Roughly 2,600 fifteen-second media spots were generated. In addition, 100,000 tear-away maps were produced and distributed at major rest areas and truck stops along the interstates leading to and from Louisville. These maps provided schematic diagrams outlining the primary suggested detour route that would ensure that all ingoing and outgoing traffic, including trucks, would be able to circumvent construction.

A dedicated 800 number recorded messages and complaints from residents and commuters throughout the construction. All calls were answered personally within a 24-hour period, and additional information was made available through the Restore 64 website.

The decision to schedule the shut-down for the summer was at least partially driven by the expected ten percent reduction in traffic—due to vacation time and school closings. Based on computer modeling, likely trouble spots were identified that would benefit from additional police presence, which was paid for by the contractor. To alleviate traffic along the detour, PB worked with Louisville Metro Traffic Operations to retime about 160 traffic lights and with TRIMARC to update dynamic message signs along the route. Coordination with local utility companies ensured that typical summertime maintenance work would not be scheduled within the construction zone and along the alternate route, unless it was an emergency.

Beyond that, the local government took steps to see that already existing parking rules along the detour were strictly enforced. By the same token, local business owners were made aware of the need to find ways of receiving their deliveries. Local employers were also encouraged to offer expanded flex-time and telecommuting options to their employees, a suggestion that was followed by quite a few.

Working with a contractor with ample experience in full-closure scenarios certainly helped bring the project to a successful conclusion. Gohmann Asphalt & Construction of Clarksville, IN, had the necessary manpower and industry contacts to lease equipment and bring in additional resources as necessary. The contractor's ability to mobilize as many as 500 workers from as far away as Michigan allowed the project to be completed slightly ahead of schedule, earning the firm an incentive bonus of approximately $2 million.

The Restore 64 project demonstrates that another old adage can often ring true—necessity is the mother of invention. In this case, a seemingly impossible construction schedule for large-scale repairs of a vital urban expressway was planned and executed within the allotted time. GE

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