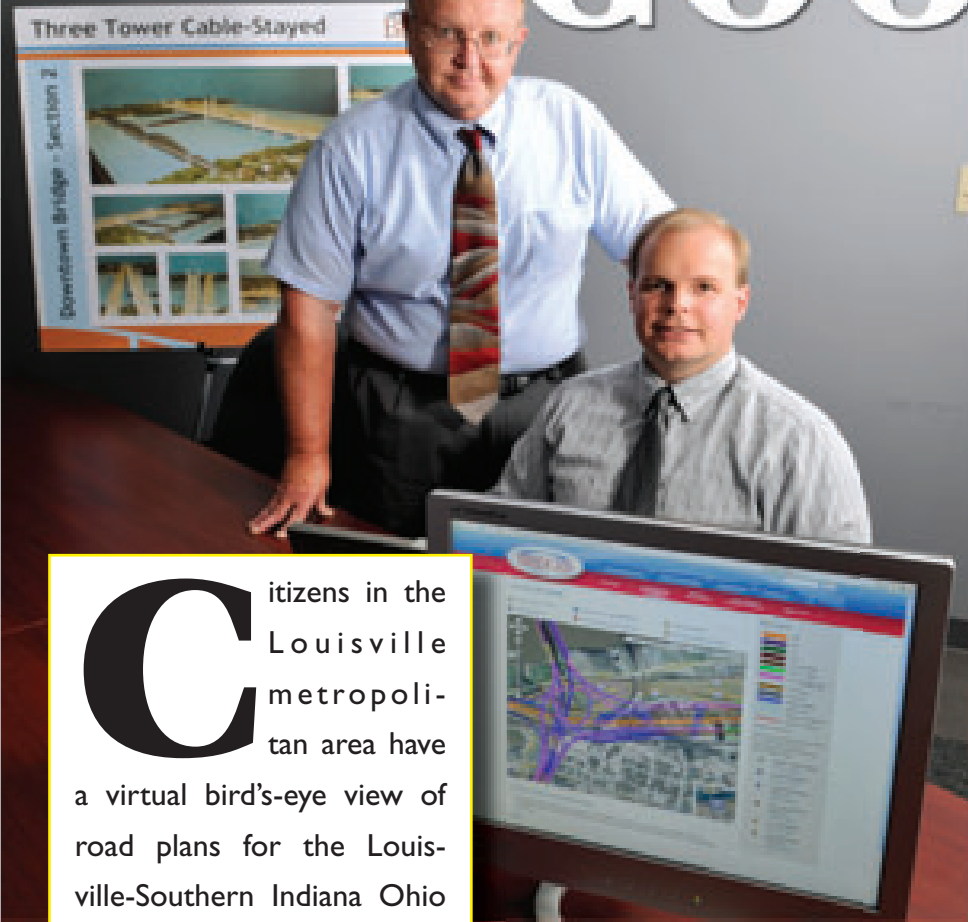


BRIDGE CONSTRUCTION

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GOOGLE bridges



Citizens in the Louisville metropolitan area have a virtual bird's-eye view of road plans for the Louisville-Southern Indiana Ohio River Bridges Project. The megaproject, currently the third-largest federally funded transportation project in the country, has taken unprecedented steps to communicate project road and right-of-way plans to the public with the unique merger of engineering design and Google mapping technology.

"We believe the new mapping function is a landmark way of communicating with the public," said Gary Valentine, project manager for the Kentucky Transportation Cabinet (KTC). "It provides a tremendous level of detail available to the community with the click of a mouse."

That kind of detail is necessary for a project of this magnitude. The Louisville-Southern Indiana Ohio River Bridges Project is currently in the final design phase, with construction scheduled to be complete by 2024. In 2003, the Federal Highway Administration (FHWA), the Indiana Department of Transportation (InDOT) and

Bridge project merger with live mapping breaks new ground in communication with public

the KTC agreed that the only feasible way to meet cross-river transportation needs for the region was to construct two new bridges and rebuild a major interchange in downtown Louisville. Each of the components in the project is large enough to be a major project in itself.

Bridges galore

The project calls for the construction of a new Ohio River bridge linking downtown Louisville and southern Indiana. Also planned is a major redesign of the existing downtown Louisville interchange where I-64, I-65 and I-71 converge. Eight miles upstream, another new bridge is planned connecting Kentucky State Rte. 841 to Indiana State Rte. 265.

The Louisville-Southern Indiana Ohio River Bridges Project is a bi-state effort, managed by KTC, InDOT and FHWA. Community Transportation Solutions (CTS), a joint venture between Beam, Longest & Neff LLC, Parsons Transportation Group Inc. and HMB Professional Engineers Inc., was selected as the general engineering consultant for daily project oversight. CTS works directly with the bi-state management team to

obtain timely reviews and approvals. Design work on the project is divided up into six sections, which include the two bridges and their respective approaches. Each section has an independent team responsible for the design of that section.

The footprint of the project crosses nearly 300 privately or commercially owned pieces of land. Detailed right-of-way plans for expected areas of acquisition have been generated for each of the four approaches, including the largest and most complex section of the project, the redesigned downtown Louisville Kennedy Interchange.

Those plans include miles of complex right-of-way, edge-of-pavement and temporary easement lines—information likely too complex for the average homeowner to navigate without assistance. CTS was not satisfied with the mapping on the project's existing website and began searching for a better way to communicate right-of-way information to the public.

The merger of Google mapping and the project's roadway design plans was the brainchild of CTS Project Website Administrator Paul Hilton and his father, Jim Hilton, the project's deputy manager. "We weren't satisfied with the mapping function that we had on our project website. It limited the information property owners could get. What we wanted didn't exist, so we had to create it ourselves," said Paul Hilton. Father and son brainstormed ways to make improvements, searching for a way to give the public the kind of mapping detail needed without requiring special software. That's when they turned to Google.

"Most everyone knows how to use Google mapping, so it was a natural fit; now all we had to do was find a way to make it work," said Paul Hilton.

In sync

The challenge was to craft the project's preliminary design plans



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as a transparent overlay on Google Maps. CTS obtained a license from Google to incorporate Google Maps and were careful to abide by their terms and conditions.

First, there was the issue of how to get all the different Google map zoom levels to sync with the design plans.

"We had to cut up our design transparencies to match the Google tiles as they came in," explained Paul Hilton, who wrote special software and used other open-source software to accomplish the task. "Just imagine all of the thousands of tiles on all the zoom levels that you can view with Google Maps, add the complex plans of a megaproject and that gives you an idea of the enormity of our task."

The Hiltons created what's known as a "mashup" in the technical world, but on a massive scale. They used Google Maps API to display the transparencies in layers.

The Hiltons faced another challenge when they discovered that Google's mapping coordinates were not quite as precise as the project's design plans. Under the license agreement, CTS wasn't allowed to

make any changes to Google mapping, so Paul Hilton stretched the transparencies to make up for the discrepancies.

"Paul did a great job in making this happen," said CTS Project Manager John Sacksteder. "Our web mapping is one of a kind."

Once the Hiltons had tackled the technical challenges, CTS took the idea to the project's bi-state management team for approval. "We moved forward with their full support. The entire team recognized what a valuable tool this would be for communicating the project to the public," he said.

The Louisville-Southern Indiana Ohio River Bridges Project not only revamped its mapping, but the entire website as well. Both were launched in 2008. Web visitors are able to get a virtual look at the roadway plans. The new mapping function provides users with more accurate information about areas involved in the project. When zooming in, the maps reveal where the roadway and right-of-way lines are planned. The public can see street-level detailing that has not been available until now. The

sophisticated mapping allows visitors to get a wide overview of each of the project's six sections or zoom in tightly to see up-close views of the proposed pavement edges and right-of-way lines.

"To our knowledge, no other highway project in the country has gone to this extent to communicate to the public this level of details in its plans," said Sacksteder. "We get calls from other engineering firms wanting to know how we pulled it off."

Property owners Don and Donna Evans live in a neighborhood potentially affected by the project.

"As soon as we heard about the Google mapping feature, we couldn't wait to find out how close the new road would come to our home," recalled Donna Evans. "We went on-line and found the mapping so easy to use that our nine-year-old son, Michael, even got in on the act,"

she said. "We zoomed right into our neighborhood and saw all of the right-of-way lines; everything we needed was there. We discovered our home isn't directly impacted by the project, but our neighborhood is."


Homeowners like the Evanses used to call the CTS office with their questions.

"We're seeing a drop in the number of calls we receive from homeowners asking about the project's impact on their property," said Jim Hilton.

In addition to the mapping system, the project's website features a significant amount of information about the project. Users can find more than 150 pages of content and 200 downloadable files. All of the project's major and historic documents are available, including the financial plan, Record of Decision and Section 106 Memorandum of Agreement. As part of the project's public involvement

plan, a website was created and has grown exponentially over the years. It serves as a virtual bridge-o-pedia by housing volumes of information about the project from its inception.

The Louisville-Southern Indiana Ohio River Bridges Project is still a few years away from construction, but when that happens, Jim Hilton thinks CTS will be able to further enhance the website's mapping.

"We see the possibility of using more overlays to highlight areas of construction and communicate the maintenance of traffic." 

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