Crossroads

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Computer images help get road projects on the ground

Anyone who has tried to describe what a roadway reconstruction project will look like knows: one picture is worth a thousand words. But how do you take a picture of what isn't there yet? The new answer is: computer images.

Combining engineering, art and software wizardry, engineers and technicians can now produce photographs showing how the proposed project will actually look. One group making these images is SEH engineering consultants.

Rebuilding HWY 93 in Trempeleau County was Wisconsin's largest single-season earth moving project ever. The original road is shown on the left; the computer enhanced image of the completed project is on the right.

WisDOT used them to help explain the proposed rebuilding of Highway 93 near Arcadia. This scenic, wooded, winding road first built in the 1850s had become a major truck route between La Crosse and Eau Claire. It was clearly unsafe, but rebuilding it would be the largest single-season earth moving project in Wisconsin's history.

"It involved moving two million yards of material, blasting all summer, and one cut of 105 feet and several 100-foot fills. Naturally people were worried," says Lorraine Riedl, the WisDOT District 5 engineer who supervised the project. Computer-generated images of the completed project helped show the abutting landowners where the road would be in relation to their houses, barns and fields.

"On a job that big, it is hard to use your imagination to figure out what it will look like," Riedl says. "People are mostly worried because they don't know. The pictures help allay their fears."

Images help with decisions

Engineers and designers also benefit from using computer images, as a project near Monroe showed. Highway 81 had been rebuilt in the late 1970s as a 4-lane limited access highway, but suddenly narrowed to two lanes with an at-grade intersection right at the city's north edge. The situation was unsafe but nobody could agree on how to fix it.

"The local officials wanted a full interchange. We proposed five or six alternatives, with different locations and schemes, but none was generating support," says Guy Meyer, WisDOT District 1 Design Supervisor. "We were putting in a lot of work and time and not getting anywhere."

Working with aerial photos of the existing situation, engineering consultants added computer-generated images of the different proposals. "It helped the engineering staff too," says Meyer. "They were leaning toward leaving it as an at-grade crossing." Together the road designers and the community decided on a full interchange.

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Gravel road Q&A

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What experience have you had paving gravel roads?

A good gravel road is not necessarily a good base for asphalt. There are problems with excess fines, crown, and depth. While surface gravel needs a good percentage of fines to give it a binding characteristic, base material needs cleaner material with fewer fines.

Gravel roads have a greater crown than you want on an asphalt surface. Unless you reshape them you can have problems. For example, I've seen some sealcoated roads where after ice storms cars would slide off.

An average gravel road has about four inches of surface gravel. This is not adequate base for an asphalt surface. If you have any truck traffic at all, you need a minimum of six inches of base, and preferably eight. Otherwise you will have tremendous breakup problems.

What good binding material can we add to the ¾ inch gravel for our roads?

Clay is the best natural binder, but be careful. It can be easy to mistake silts and clay when you're out in the field. Take the material to a lab. Clay, which you want, will have tremendous cohesion which shows up on lab tests as a good plasticity index (P.I.).

When preparing a subgrade we ran across clay pockets. To what depth should we excavate to remove the clay and replace it with cleaner material such as sand?

You may not need to excavate if the road is a minimum of two feet above the surrounding terrain and you have good ditches. Otherwise, excavate six inches and install a geotextile. Cover it with any type of gravel, then put two to three inches of surface gravel over that. The geotextile prevents the clay from pumping up through the gravel. If you're not using geotextile, excavate down two feet.

If you would like to learn more about gravel roads, sign up now for one of the T.I.C.'s August ***Maintaining Gravel Roads*** *workshops. See the Calendar, page 6.*

The T.I.C. bulletin ***Gravel Roads, No. 5,*** *is also helpful. Use the form on page 7, call or e-mail to get your copy.*

Computer road images

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"After using these images, I felt a lot more confidence in the decision," says Meyer. "It was well worth the money we spent because we were spending a lot on indecision. This helped bring the process to a conclusion." The images cost about $3000 each and they developed four of them.

Helping with complex projects

Rebuilding Highway 59 west of Milwaukee was WisDOT's top priority project in 1971. But the project was shelved due to lack of local support. WisDOT has tried to improve the highway several times since then, with the same result. The road is located half in New Berlin and half in Brookfield, and it marks the edge between suburban and urban areas. The project was resurrected again in 1993 and is needed to increase safety and capacity and to replace deteriorated pavement.

"There has been a lot of controversy about what it should look like," says Don Berghammer, the WisDOT District 2 manager for the project. "We developed a set of plans and computer images for five major intersections and one mainline section. They showed the proposed road along with landscaping and side paths so people could see what was being proposed." Designers worked hard to make the designs blend with the road's suburban character. The resulting public support helped gain state financing for the project which is now scheduled for construction in 2000.

The photos, which are supposed to give a general idea, are so realistic that sometimes people think they actually show which specific trees will be cut, Berghammer cautions. But he's convinced that they are worth it anyway.

"When you just narrate plans, people get this picture of huge disturbance and hardship, and then when they see it, they can tell that it is a reasonable thing to do," Berghammer says.

Local projects could benefit from computer imaging techniques when they are complex or controversial. Depending on the quality of the image and the complexity of the project, images may cost from a few hundred to several thousand dollars each. The relatively minor costs can produce a major effect.

Contact your engineering consultant or the local WisDOT District office for more information on computer visualizations. SEH produced all the images described in this story.

ROADWARE to become PASERWARE

Due to a trademark conflict, the T.I.C.'s pavement management computer program formerly known as ROADWARE will now be called PASERWARE.

Nothing else about the program has changed. To learn how PASERWARE can help you manage your streets and highway system call Steve Pudloski at 800/442-4615.