

BARRELS of fun

Ayres' crews help keep projects on track across the country

By Tom Paquin



As the U.S. economy continues to slowly pull out of the Great Recession, statistics show the construction industry is starting to jump on the recovery bandwagon.

The construction jobless rate fell throughout the spring and summer, according to the federal Bureau of Labor Statistics. One of the strongest segments in the industry has been heavy-civil engineering construction, a bit of good news for companies that oversee transportation and municipal construction projects.

When local governments, state and federal agencies, and private clients want to make sure their construction projects run smoothly, they hire qualified consultants to handle duties such as preconstruction meetings, project layout, public relations, materials

testing, construction inspection, review of contractor pay requests, and final project approval.

Each job has different challenges – the safety of pedestrians, a difficult work environment, high-speed traffic, worker safety – to name a few. And weather conditions undoubtedly play a role in how construction jobs come together.

From the Midwest (with construction projects in the Cities of Green Bay, Madison, Marinette, and Reedsburg and Door, Eau Claire, Lincoln, and Waukesha counties in Wisconsin) to the West (with projects in Cheyenne, Wyoming, and Weld County, Colorado), crews from Ayres Associates have construction on the mind. Here are some cases in point:

US HIGHWAY 41, NORTHEAST WISCONSIN

A little past the halfway point of the massive upgrade of US 41 in Brown County, those traveling on the City of Green Bay's west side must wonder if bulldozers, cranes, and orange barrels have become a permanent part of the landscape.

Construction on the busy 14-mile north-south stretch of road began in 2010. But a light at the end of the tunnel does exist. The Wisconsin Department of Transportation (WisDOT) says the work should be complete by spring 2017.

Behind all the madness of a construction zone this size, a method is in place. Construction engineers are on site, inspecting the work and communicating with contractors and clients to make sure everything goes according to plan.

Michael King, US 41 construction supervisor for WisDOT, said he relies heavily on the construction inspection engineers on site.

Inspections required climbing into tub girders.
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"They are the key cog in finding small issues in the field and getting them addressed right away," King said. "Their role is really twofold. No. 1 is the construction inspection, and it's a critical task, making sure everything is done correctly. It's critical for the inspector to ensure the end product is going to give you the life span that we're expecting from the job we're constructing."

In this case the state is expecting this construction to outlive most everyone reading this – at least 75 years, King said.

"The other important role is just to be always on alert for unsafe situations – hazards for motorists and workers," said King, who has been working on US 41 since 2008.

Eric Gwidt, US 41 construction project manager for WisDOT, referred to construction inspection engineers as WisDOT's eyes and ears in the field.

"Their job is essential to making sure our projects are built according to our plans and specifications," he said. "Every day, we rely on them to work with the contractor to resolve issues and keep the project on schedule."



1.8 Million
Square Yards of
Concrete Pavement

30,400
Shrubs and Plants

84
Bridge Structures

\$1.005
Billion Budget

6.8 Million
Cubic Yards of Excavation

Brown County
U.S. Highway

41

By the Numbers

Source: Wisconsin Department of Transportation

3.4 Million
Tons of Base

337,000
Tons of Asphalt

90
Retaining Walls

4,100
Trees

115,000
Annual Average Daily Traffic
(Projected 2035)

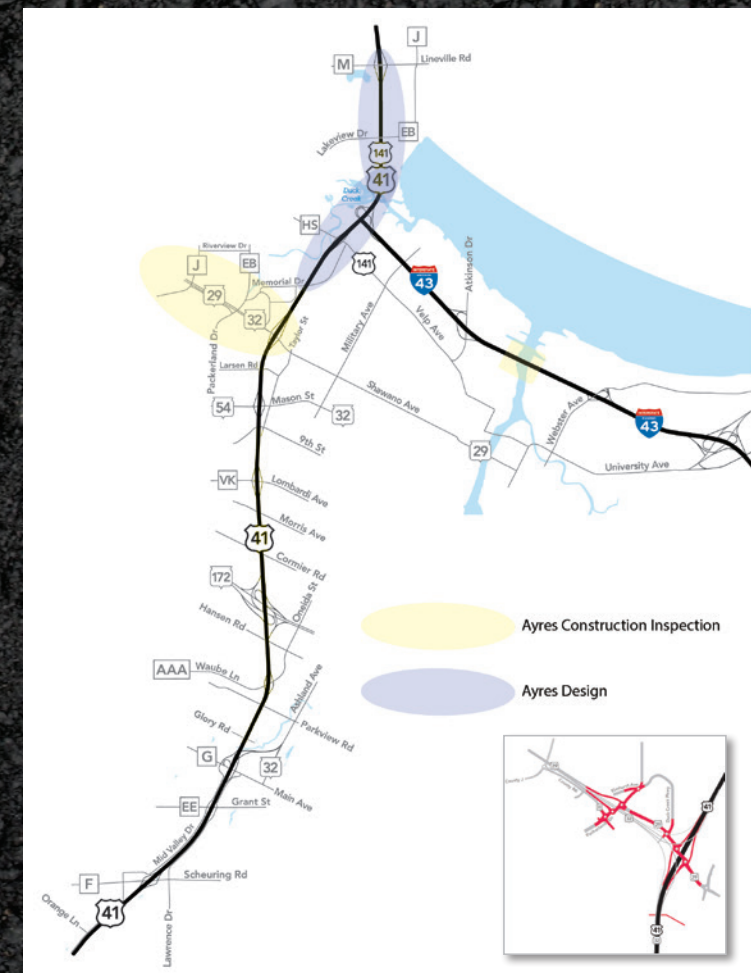
Ayres Associates has played a large role in the rebuilding of US 41, from survey to design of portions to construction engineering. Cory Thomson, a transportation construction engineer at Ayres, has been working at or around the US 41 interchange at State Highway 29 since 2011. His main job is inspecting placement of storm sewers and electrical systems – along with filling in wherever needed on grading and paving operations.

"Construction engineers play a huge role in any construction job," Thomson said. "If there are issues, we work with the contractors to make sure things are done right."

King said Thomson and others like him have a tough job because construction on US 41 is a 24-hour operation, and much of the work is completed at night.

"The most challenging part is getting access into the work site for the workers and the materials – just making sure we have safe access in and out," King said. "It's a 24-hour-a-day struggle."

Flyover ramps at the US 41-State Highway 29 interchange in Brown County, Wisconsin, opened to traffic in late June.





TRANSPORTATION IMPROVEMENTS, MADISON, WISCONSIN

After five years of helping to improve East Washington Avenue on Madison's east side, construction engineers in Ayres' Madison office have turned their attention to Madison's west side for much of the past five construction seasons.

Beginning with Pleasant View Road in 2010-11 and continuing through this construction season with Mineral Point Road and South Junction Road, three Madison streets on the far west side have undergone significant changes. Ayres Associates construction engineers, led by

Top: A new interchange connects Mineral Point Road and South Junction Road on the west side of Madison, Wisconsin. **Middle left:** Construction along Mineral Point and South Junction Roads wraps up this fall. **Middle Right:** The project includes replacement of storm sewer, sanitary sewer, and water main.

project manager Kim Ballweg, have been overseeing the upgrades, which included an extension of Pleasant View Road and a new "jug-handle" interchange at Mineral Point and South Junction Roads. The jug-handle interchange reduces left-turning conflict points by providing a ramp to connect the roads at points west and south of where they used to meet.

Chris Petykowski, principal engineer with the City of Madison, said the end of construction and subsequent planting on Mineral Point and South Junction Roads this year completes a long 2½-year process.

"It's just very big," Petykowski said about the project's most demanding aspect. "The scheduling of the whole thing between two different contracts was challenging. It's just a massive amount of work, almost 2 miles of urban arterial roadway."

More construction is expected in the area next year with plans to upgrade the next section of Pleasant View Road from Prairie Hill to Cross County Roads.

The projects on Madison's west side, much like the upgrades to East Washington Avenue from 2004 to 2009, are a joint venture between the City of Madison and WisDOT.

Ballweg said she enjoys working on these urban construction projects.

"The adjustment of utilities, underground construction, and reconstruction of the roadway in a tight space provide dimensions to engineering," she said. "It's always interesting to drive down a completed roadway and

remember the challenges found during construction. The City of Madison and WisDOT have been very good to work with over the years."

Petykowski said he values the work of construction engineers for their ability to manage and keep track of the schedule and deal with all of the issues that come up day by day.

"I think Kim and her team have always done a great job of keeping me involved," he said. "She's been wonderful to work with and a great asset to the project. They definitely do a good job at representing both the City and WisDOT's interests." ■

Transportation planning plays key role in construction projects

Construction zones often require a detailed plan of the temporary traffic control measures and devices, laying out how that particular project will keep traffic flowing through it while keeping workers and pedestrians safe.

In Florida, this plan is called a maintenance of traffic (MOT) plan. The Florida Department of Transportation offers a certification for those who design MOT plans, and Ayres Associates has six employees with advanced MOT certification and another with intermediate certification.

One part of the training involves instructing those being certified in proper and effective documentation in the event of a dispute or possible litigation.

"That's where engineering firms can get into trouble," said David Hayward, a transportation engineer in Ayres' Tampa office who is certified in advanced MOT. He said the best traffic plan can be ruined by one person driving recklessly through a work site, not paying attention to warning signs. "And sometimes contractors do field adjustments and change the MOT plan. Those can cause problems too," he said.

Those designing MOT plans have to consider a variety of factors – lane changes, traffic speed, pedestrian movement, access to businesses and residences – often spread out over multiple phases of a construction project.

Hayward said MOT gives engineers a lot to think about, but a good plan begins with solid roadway design. It's all part of keeping movements of motorists, workers, and

pedestrians safe during the construction season. In Wisconsin, traffic engineers in Ayres' Waukesha office incorporate a similar traffic control plan into a much broader document called a transportation management plan (TMP). A TMP is a document that presents a set of coordinated transportation management strategies and describes how they will be used to manage work zone impacts of a road project. Transportation management strategies for a work zone include MOT plans or temporary traffic control measures and devices, public information and outreach, and operational strategies such as transportation operations and incident management strategies.

"The TMP will take that (traffic control) component and expand its scope of influence," said John Davis, who manages Ayres' traffic engineering group. Davis said TMPs can range from simple (Type 1) to complex (Type 4) and can incorporate advanced traffic engineering tools such as computer modeling of traffic patterns affected by the construction.

"Is traffic going to be diverted by this construction project? What impact will it have to adjacent routes? Who will be affected?" Davis said. "These are some of the things we look at in a TMP."

Through their plans, Hayward, Davis, and others at Ayres are able to anticipate traffic movements throughout the construction process to protect the public.

– Tom Paquin

TALL orders

High above the ground on northeastern Wisconsin's first "flyover" ramps, construction engineer Cory Thomson of Ayres Associates has a workplace and view few others get to experience.

Part of Thomson's job at the interchange of US Highway 41 and State Highway 29, where he's worked since 2011, was inspecting placement of electrical conduit inside the ramps' tub girders, some of which sit as high as 75 feet off the ground. Tub girders are the long U-shaped pieces placed on the ramps' piers. The girders sit between the piers and the road surface. Electrical wiring inside the tub girders supplies power to lights needed for routine inspections inside the steel girders.

The interchange's flyover ramps opened to traffic in late June. Flyover ramps, typically found at major highway interchanges, are structures that cross over other roads and allow drivers to exit onto connecting roadways without the need to slow down or stop.

Scaffolding and safety harnesses were used to gain access to the tub girders. Thomson said his electrical inspections involved "reading the plans and making sure things are put in the right location" as well as checking the size and color of the wires used. "We just make sure that everything is put in correctly," he said.

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Inspection services on the new Brown County flyover ramps included work inside the white tub girders.