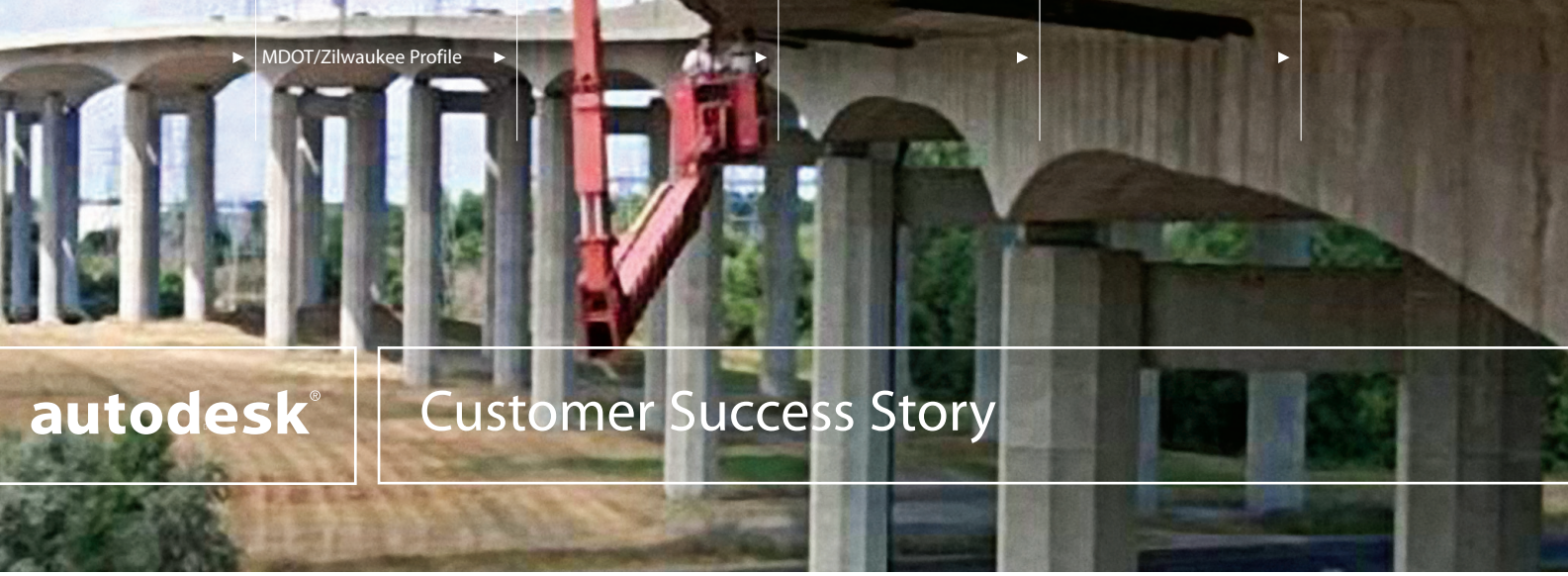

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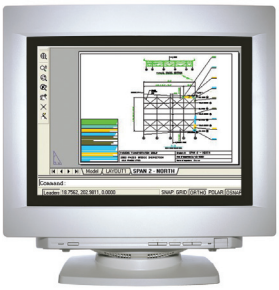
Customer Success Story

Image courtesy of: Advitam

Michigan DOT builds a technological bridge to improved efficiency Re-engineering a paper standard



"I was rather skeptical going into this contract that it would perform as touted. As it turned out, the Advitam/Autodesk system worked very well and seems to be exactly what we had hoped for. We're able to share our information across a wider range of people, allowing staff to access and obtain the specific information they need, which has brought more people to the table. I don't see any reason why we wouldn't use it again for future inspections"

— Richard M. Smith, P.E., Michigan Department of Transportation's (MDOT) Bridge Inspection Program Manager

A lot rides on a bridge. Families, commuters, delivery trucks packed with corporate livelihoods, tourists, and buses of school children on a field trip. Each and every one of them depends on the sound structure of the bridge to carry their weight and safely support them from one side to the other. Michigan's Zilwaukee Bridge – better known locally as the "Z" Bridge – has been successfully supporting its share of significant weight since it opened to two-way traffic in September 1988. An 8,000-foot twin concrete viaduct, the monstrous Zilwaukee Bridge stretches 75 feet in each direction, provides six lanes of traffic along Interstate 75 – Michigan's major North/South artery - and carries 90,000-100,000 vehicles over the Saginaw River each day. In addition to being a substantial example of cutting-edge engineering, its importance to the state's regular travelers is undisputed – a fact that is not lost on the bridge inspection teams and design engineers of the Michigan Department of Transportation (MDOT). Tasked with ensuring the Zilwaukee Bridge remains safe for travelers, inspection officers perform varied bridge inspections on every inch of the twin bridge. The National Bridge Inspection Standards designed to assess the safety of the bridge is performed every two years, and a detailed engineering inspection to ascertain any bridge deterioration and assess its long-term health is carried out every four years. July 2001 marked the launch of the Zilwaukee Bridge's third detailed engineering inspection since it opened. And traditionally that meant another forest of paper would be produced.

Although a categorical necessity to ensure the Bridge remains sound, each detailed engineering inspection has produced thousands of paper documents – enough to fill nine three-inch-thick bound binders. Creating these binders entailed about two months and hundreds of hours of work, interpreting people's handwriting and resolving any discrepancies to produce clean, accurate copies of the field work. The result was a heavy, intimidating book of bridge schematics and notations that could leave staff overwhelmed by the prospect of having to search through the binder to find the one schematic or piece of information they needed.

That all changed with July's inspection. Recognizing the gains that could be achieved by overhauling their paper-based information management system, the MDOT chose to adopt technology that would allow its staff to perform their jobs with more efficiency and accuracy. A plan to displace the clipboards, paper schematics and templates and pens with pen-tablet computers and electronic templates, MDOT wanted to create an advanced, electronic system that would be a supportive tool to the expertise of inspectors and would bring more efficiency to data collection. The July 2001 inspection was the first test of this objective and a successful one at that. Armed with a new electronic information system, bridge inspectors were able to capture their work in the field on a computer, upload that information to a database in minutes, and create a central repository of the bridge inspection data for colleagues to access from their own desktop. A first for MDOT, and one of the first in the country to use an advanced electronic system for bridge inspection, the MDOT's system has significantly reduced its paper trail and increased the speed with which information can be retrieved and reviewed.

MDOT/Zilwaukee Profile

Crossing the paper chasm

In January 2001, the MDOT issued a RFP for an engineering inspection of the Zilwaukee Bridge. The MDOT needed a system that would enable them to capture the inspection data electronically, to upload the collected information into a central database every night and email that fieldwork data to design engineers for evaluation. In addition, the MDOT wanted a system based on software with a strong history and future.

In July 2001, MDOT awarded the contract to the Tallahassee, Fla.-based Parsons Bridge and Tunnel Division of Pasadena-based Parsons, Corp. In advance of the July inspection, Parsons, in conjunction with personnel from Advitam, employed Autodesk solutions to create electronic templates of all the bridge elements to inspect and loaded them onto tablet PCs. In addition, they loaded the previous inspection data for easy access during the inspection.

Once in the field, Parsons used the ScanPrint software developed by Advitam, headquartered in Velizy, France, in combination with Autodesk Map to record electronically the inspection data using pen-tablet computers. Once the inspection was complete, the electronic information was printed into a report format and included in the inspection report.

"The Advitam/Autodesk electronic system allows us to better assess the long-term health of the Zilwaukee Bridge, to better understand whether problems are static or dynamic and to plan for maintenance activities and prioritize them according to the results of the inspection," says Richard M. Smith, P.E., MDOT's Bridge Inspection Program Manager. "With the paper-based system of the past, it took us much longer to reach those same conclusions."

The "Z" from a new perspective

Four, 2-man inspection crews worked 10-hour days, six days a week, combing the Bridge to examine both the interior and exterior conditions of the structure, down to its bearings and joints. But this time, instead of taking volumes of documents to the field, Parsons' inspectors downloaded pertinent records, as-built plans and report forms for each day's job list onto pen-tablet computers. More importantly, they had a complete update of the previous day's inspection so they had the most accurate and up-to-date information when they began their inspection assignment. With the pen computers, inspectors could retrieve the required electronic templates and record their observations directly onto the templates. By having the inspection data of the previous inspections immediately available, they could also compare historical data with their observations. And with Advitam's integrated software platform and user-friendly graphical user interface, inspectors could record their findings in a variety of formats – Autodesk's DWG format, Microsoft Word, Access, Excel formats – all of which was seamless to the user accessing the information.

As each day's inspection data was uploaded into a central server and made available to design engineers via an FTP site, conditions needing immediate attention could be addressed as soon as the data was filed.

The engineers immediately evaluated the information as it was received and by the next morning, inspectors had the engineers' feedback and would be informed if any problems needed to be revisited. That could then be scheduled into the day's inspection – an interactive capability impossible to achieve historically with paper.

Perhaps the most significant benefit of the MDOT's new system is its central repository of inspection data. A single source of up-to-date information allows personnel to use the data in their business tasks more effectively and easily. Most importantly, the complete database also can be used as a lifecycle tool to define repairs and maintenance and enable cost calculation, scheduling and budgeting for long-term facility management.

"The use of the Advitam/Autodesk software provided many benefits to the inspectors and to the MDOT," says Phil Hartsfield, Parsons' MDOT Project Manager. "The inspectionwas essentially paperless, allowing the inspectors to concentrate more on inspecting rather than leafing through papers to find and record information. With the dynamic nature of the system, inspectors could quickly bring up a variety of data in the field, such as the last inspection report and construction documents, and then comment or take pictures – all of which could be uploaded into one database. In addition, information collected by different crews could be combined automatically instead of manually as it was done in the past."

"As Autodesk strives to provide solutions to our customers that can help make their businesses more efficient, we were honored to be a part of such a groundbreaking solution for the Michigan DOT," says Michel Rives, Autodesk Sales Development Manager for EMEA.

More bridges in the future?

"I was rather skeptical going into this contract that it would perform as touted," says Smith. "As it turned out, the Advitam/Autodesk system worked very well and seems to be exactly what we had hoped for. We're able to share our information across a wider range of people, allowing staff to access and obtain the specific information they need, which has brought more people to the table. I don't see any reason why we wouldn't use it again for future inspections."

Indeed a lot rides on the stability of a bridge. With the creation of its new bridge inspection system, MDOT is perhaps building its own bridge to what may become the standard for bridge inspection data collection and management.

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