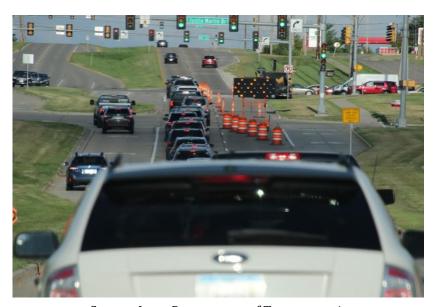![WZDx - Work Zone Data Exchange logo]

IOWA DOT HITS BULLSEYE WITH WZDX AND SMART ARROW BOARDS

WZDx project highlight: Iowa

Source: Iowa Department of Transportation

The Iowa Department of Transportation (DOT) and its stakeholders are key players in developing and building the next big thing in work zone safety. It's called the Work Zone Data Exchange (WZDx) — a user-friendly, uniform data standard that makes work zone data available to all.

Iowa DOT is one of 13 State and local DOTs across the country participating in a demonstration grant program, funded by the Federal Highway Administration (FHWA), to implement WZDx.

A uniform language

Infrastructure owners and operators, DOTs, and construction companies across the country currently report work zone data (such as lane closures) in varying formats. Think of them as different languages. End users of the work zone data, like mapping services and automated vehicles, are not "multilingual," so to speak. To communicate this data efficiently, data producers and consumers all need to speak the same language.

"We talked with a trucking company who crosses multiple State lines for deliveries," says Skylar Knickerbocker, a research engineer at Iowa State University Institute for Transportation – an Iowa DOT

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partner on the project. "Every State has different ways to communicate data on road or lane closures. While it's beneficial to have this information, it's a heavy lift to integrate and consume different data sources from one State to another."

The goal of WZDx is to make travel on public roads safer, particularly in work zones, by providing real-time, accurate information across jurisdictional boundaries – all in the same, universal language.

Pointing in the right direction

Before you can improve how data is shared, you have to get better data. Enter the smart arrow board, a focus of Iowa DOT's grant-funded demonstration project. The Iowa DOT has begun requiring the use of smart arrow boards for DOT projects that will channel better work zone data, like lane shifts, into their statewide Advanced Traffic Management System (ATMS). The ATMS combines the smart arrow board information with existing work zones in the system to produce a WZDx data feed with additional, verified data. The assumption is that this real-time data will improve traffic flow and safety for travelers and work zone workers.

Sinclair Stolle is the traffic management systems engineer and WZDx grant project manager for Iowa DOT. Stolle explains that by using smart arrow boards as a data tool within Iowa DOT's ATMS, Iowa DOT can provide information such as Global Positioning System (GPS) locations pinpointing where a work zone begins, what pattern (left or right direction) the arrow board is displaying, and whether the board is stowed or deployed in the "active" position.

Installing a combination of hardware and software turns any existing arrow board into a smart one — much like turning an everyday television (TV) into a smart TV by using an aftermarket device. By doing this, an arrow board, turned smart, can send real-time information to be used in the WZDx feed.

"Smart arrow boards provide more accuracy and better define the beginning of a work zone for both drivers and automated vehicles," says Stolle. "Work zones have been a challenge in providing accurate and timely data, and we've been working to hone that in over the past several years."

The need is real

There is an average of [seven fatal crashes, 188 injury crashes, and 463 property damage crashes per year](#) in Iowa work zones. The work Iowa DOT is doing with WZDx is important to increase safety and save lives. Their demonstration grant project will continue to build out a system that is not overly burdensome to workers in the field, is sustainable, and can act as a template for DOTs in other States. Beginning in 2022, Iowa will require smart arrow boards for all work zone projects on State and local roadways.

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Building together

Iowa DOT has been at the forefront of this emerging technology for the past several years. Beginning with the creation of version 1.0 of WZDx nearly 4 years ago, Iowa DOT was one of five other DOTs participating in the initiative from the start. The group of five evolved into the [Work Zone Data Working Group](#), coordinated by the Intelligent Transportation Systems Joint Program Office (ITS JPO). Today, more than 100 agencies and organizations are working to refine the specification and support each other in implementation planning.

With WZDx's version 4.0 set to roll out soon, Iowa DOT has continued to engage with the working group to find more ways to improve accuracy, improve the specification, and increase adoption of the technology.

Knickerbocker also says the partnerships are invaluable. "In talking with stakeholders such as car manufacturers, I take what they say to heart because they see things differently. If we are producing data that doesn't meet their needs or provide value, then we can take that feedback to adjust the quality and what data we produce in WZDx. We need something that all of us can work with."

Iowa has recently completed peer exchanges with DOTs in other States such as Wisconsin, Colorado, Minnesota, and Massachusetts. By paving the way and sharing lessons learned with the Working Group, the hope is that more DOTs, transportation agencies, mapping companies, and original equipment manufacturers (OEMs) adopt WZDx. All are welcome and encouraged to participate.

The biggest lesson learned

Take a page from the Iowa DOT handbook and just get started. Technology is always evolving so quickly, there is no "right" time to jump in. The Iowa team says, "Taking the first steps to build a WZDx feed may not be as difficult as some may think. Don't let perfection be the enemy of progress."

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