

CITY OF OREM, UTAH

How a GIS Solution Creates a Pothole-Free City

With more than 550 lane miles of roadway to maintain,¹ the city of Orem, Utah's Streets Section in the Department of Public Works has set a bold goal: a pothole-free city in which any reported pothole is repaired in under 48 hours. Considering the high costs of repaving roads and the fact that pavement failures usually start with potholes, it's an important goal — not only for saving money over the long run but also for preventing traffic hazards and contributing to the community's overall quality of life.

To help meet this goal, the Streets Section has created an end-to-end Report a Pothole solution that relies on VertiGIS Studio and Novotx's Elements XS program, which enables web-based pothole reporting, detailed tracking, record-keeping, updates and more.

Crafting a Powerful, Location-Centric Solution

Prior to the Report a Pothole program, the Streets Section did not have an easily accessible, methodical way of reporting potholes, notifying repair crews and tracking repairs. Additionally, the Streets Section wasn't maintaining historical information about potholes. "That was an issue because potholes tell a bigger story of how your road is doing," says Cody Steggell, Streets Section manager for the city of Orem. "Generally, when you start getting a lot of pothole reports on the same street, that tells you that your street or parts of it are starting to fail."²

Steggell went to Roger Dunn, the city's geographic information system (GIS) administrator at the time, with the idea for the Report a Pothole program. "If we could give information live to our team in the field, that would give us an opportunity to respond quicker, and that's what the public wants. You don't want people hitting a pothole and damaging their cars," says Steggell.

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Cody Steggell, Streets Section Manager, Orem

The city had been using VertiGIS Geocortex Essentials,³ which is built on Esri's highly scalable ArcGIS platform, to enable online mapping of bad spots in roads, utility trenches that needed patching and more. Building the Report a Pothole workflow on the same software was a natural fit.

"We were already familiar with the VertiGIS software, and it had proven to be a powerful tool that could be customized for our needs," says Steggell.

Using the VertiGIS software as a starting point, the IT team built a centralized, public-facing map application that residents can access by logging in through their web browser. Residents drop a point on a map to report a new pothole. A workflow then automatically creates a service order within Novotx's Elements XS asset management software and sends a confirmation email to the resident.

The workflow also automatically sends a pothole repair notification via email and text to everyone on the asphalt crew so they can perform the repair as promptly as possible. Once they complete the repair, they simply note it on the solution's GIS map. The workflow automatically notifies the resident and updates records to reflect repair completion. Rich record-keeping and reporting capabilities allow managers and crew to track both historical data and live, in-progress activity.

Enhancing Visibility and Decision-Making with Digital Map Points

The digital map points are part of a user-friendly workflow that can provide varying levels of detail, depending on what users want to know or do. Service orders include information about everything from when and where a pothole was repaired to how much hot mix was used to fill that pothole. Authorized employees can add, view and update service orders and other details associated with a specific location, pothole, street segment, block of streets or other asset.

Having multiple ways to access and track data simplifies and improves decision-making. For example, if users click on a segment to see how many potholes exist within that area, they can also see the associated service order. To get a clear picture of when and where larger “remove and replace” pavement jobs may be needed, users can also search for segments of road that have had more than 10 potholes in the last year.

“Tying the VertiGIS and Novotx solution together provides a better way of tracking tasks. Now, we can all see what’s getting done and have the history right there,” says Steggell.

Better Record Keeping Delivers Huge Benefits

In addition to automating workflows and keeping residents better informed about pothole repairs, the solution has yielded important benefits related to record-keeping and planning.

“Having information about the tasks that we’re doing is the biggest win. This morning, I went into the Elements XS software and turned on one of my filters to see we have eight water utility trenches that need patching. Being able to show that to all the team members so everyone is on the same page is a huge win. The crew leader can see exactly what’s on his plate so he can organize how he’s going to tackle all those repairs and be more efficient with his crew,” says Steggell.

Other benefits include:

✓ **Greater satisfaction for the crew.** “The crew can see what repairs are planned and what needs to be accomplished. They love clicking a point on the map to complete a work order and seeing tasks drop off the list,” says Steggell.

✓ **Meaningful insights into costs.** A “cost per task” tool breaks down costs for materials, equipment and labor. The feature encourages efficiency and provides objective data for budgeting projects and charging other utilities for work such as patching trenches. “It opens a team’s eyes to work costs and gets them to think about ways to be more efficient,” says Steggell. “Now we might choose a method that costs more upfront but has a better financial impact over time.”

✓ **Better coordination with other departments.** The solution can track every utility trench that the Streets Section patches. For example, when the city’s water utility section digs up a road to repair a water leak, they

can use the solution to notify the Streets Section when the repair work is done so the road can be patched.

✓ **Clear views into project status.** Elements XS has helped track the Street Section’s work so well that Steggell was able to lend some of his crew to a special project recently. “We were asked to help demo sod and concrete around one of our schools. It was a few weeks of work, but Elements XS gave me enough visibility into what we had going with our own projects that I felt very comfortable letting our team do that work. It freed us up, where normally I would say we can’t do that,” says Steggell.

Moving Toward a More Collaborative Future

The Streets Section is taking it upon themselves to innovate and evolve their Novotx solution as new opportunities arise. Besides using the solution for its Report a Pothole program, the Streets Section also uses it for maintaining 500 linear miles of sidewalks, walking paths, ramps and gutters.⁴ Steggell envisions integrating the solution across other public works sections to improve reporting, planning and collaboration.

This piece was developed and written by the Government Technology Content Studio, with information and input from VertiGIS.

¹ <https://orem.org/streets/>

² Center for Digital Government interview with Cody Steggell, November 2022.

³ VertiGIS Geocortex Essentials is now branded as VertiGIS Studio.

⁴ <https://orem.org/streets/>

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