Foth Establishes a City-scale Digital Twin in Iowa to Better Manage Green and Grey Infrastructure

Bentley Applications Helped Gather Siloed Data and Provide the Framework for a Smart City, Improving Preparedness, Response to Environmental Emergencies, and Architectural Preservation

Digitizing Data in a Small City

Officials of the city of Perry, Iowa wanted to improve both its city planning and the quality of life for residents. In a previous collaboration with engineering firm Foth, they used a mobile LiDAR system to quickly evaluate all streetside pedestrian ramps and ensure compliance with the Americans with Disabilities Act, providing better access to all while eliminating the need for individual evaluations. Encouraged by that success, Perry city officials partnered with Foth again to gather more data about all city assets, including trees, traffic signs, and downtown structures, to help them undertake additional projects to benefit residents, such as establishing more green space and preserving historic architecture. However, the city's asset information was incomplete and siloed.

A Digital Twin of a New Area

The two partners soon realized that the best way to leverage city data would be to create a city-scale digital twin. With all asset information in one place, the city could easily manage their green and grey infrastructure, and allow them to improve assessments of potential environmental damage. Additionally, the city could explore the use of autonomous vehicles for transportation needs as well as the role that property data could play in making Perry a smart city. However, the digital twin would be the first of its kind in Iowa and one of only a handful in the Midwestern United States. As a result, Foth had to determine how to build the digital twin without relying on precedent.

Delivering Data to Support New Projects

A longtime user of Bentley technology, Foth knew that Bentley applications could enable them to create an accurate city-scale digital twin in an unfamiliar environment. Using a mobile command center to perform a quality control check, Foth performed image capture of the entire city. They used ContextCapture to process 375,788 images and 4.1 terabytes of information, then they used the open MicroStation and OpenRoads applications to prepare the data for easy extraction via a third-party application. The completed digital twin can easily deliver data as needed.

Unlocking New Beneficial Initiatives

By creating a digital twin of Perry, city officials can more efficiently undertake a wide variety of new projects, such as environmental initiatives for tree planning, restorative needs, and non-native species mitigation. They can also more easily preserve Perry's architectural history by

aiding restoration efforts and improving energy efficiency. In the process, they can minimize negative environmental incidents and improve disaster preparedness. Additionally, the digital twin creates a framework for making Perry a true smart city, in which the information housed in the digital twin could improve operational efficiency and provide better services to citizens, such as autonomous transportation and smart emergency vehicle routing.

Project Playbook: ContextCapture, MicroStation, OpenRoads, ProjectWise

Outcome/Facts:

- Foth used Bentley applications to process 375,788 images and 4.1 terabytes of information, creating a city-scale digital twin of Perry, Iowa.
- Perry officials are using the digital twin to undertake a wide variety of new projects, such as environmental initiatives and architectural preservation.
- The digital twin creates a framework for making Perry a true smart city to provide better services to citizens, such as autonomous transportation and smart emergency vehicle routing.

Quote: "Bentley technology allowed Foth to achieve what was once impossible just a few short years ago – the creation of a digital twin of an entire city. The compatibility and flexibility to work with a wide array of cutting-edge technologies and bring it all together in the form of a digital twin is transformational to the future of the world's infrastructure." – Blaine Buenger, Senior Technology Manager, Foth

Image Link: https://cdn2.webdamdb.com/1280_QolhOXYB4Rb21w2d.jpg?1676990982

Image Caption: Foth used Bentley applications to process 375,788 images and 4.1 terabytes of information, creating a city-scale digital twin of Perry, Iowa. *Image courtesy of Foth.*

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