

2024 INNOVATION CHAMPIONS CONTEST

City Infrastructure Mapping

CITY: Devils Lake Public Works Department

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PROBLEM STATEMENT: The city's public works department is responsible for the streets, the water/sewer infrastructures, as well as the sanitation, recycling, and the cemetery grounds. The infrastructure for public works waterlines, gate valves for water mains, water hydrants, fire hydrants, manholes, lift stations, and pipes for water, sewer and storm pipes was recorded on paper maps. Information about the infrastructure such as exact location, condition or age, pipe sizes was nonexistent or very minimal. When work was done on the streets or water/sewer infrastructure, updates to the paper maps were sporadic.

Information about the city's public works network was known primarily by only two people. A snowplow operator, unaware of a protruding manhole would in all probability hit the manhole causing damage to the snowplow equipment. Work orders handed off to road personnel were all paper. A break in a water or sewer line, and not having sufficient information readily available on the infrastructure, compounded the challenges for the department.

SOLUTION: Transitioned the city's public works infrastructure mapping from paper to the computer using ESRI ArcGIS mapping software and previously collected infrastructure data. Personnel now have information about the city's public works inventory at their fingertips. Operators have access to the infrastructure on their phones. Work orders are handed off to personnel utilizing a laptop or phone.

Now when there is a break in a water/sewer line, personnel know where the turn off is for that line. Finding the location of the break and the size of the pipe needed for repair has been simplified. They have quick and easy access to accessible ports, inventory of manholes, gate valves for water mains, lift stations, water, sewer and storm pipes, and fire hydrants. Operators doing snow removal can verify where there are protruding manholes. The snowplow blade can be lifted to avoid damaging it.

Having a thorough inventory of the infrastructure gives the department better capability of planning for future projects and needs. Data for the infrastructure is logged for every mile of every street. (Infrastructure data had been previously collected with previously purchased survey equipment. In lieu of survey equipment, data can be collected using a which isn't as precise.)

LABOR, EQUIPMENT, AND MATERIAL:

Equipment used (to build innovation):

Computer

Infrastructure data collected using Trimble Survey Equipment

ESRI ArcGIS Mapping

New material:

ESRI ArcGis mapping software

ESRI ArcGIS Field Applications

ESRI ArcGIS Annual Maintenance

Total Labor Hours: (No. of persons, number of hours for each)

1 person – 100's of hours

Maintenance

1 person – 16 hours/month

6 utility employees – 3 hours/month

COST SUMMARY:

ESRI ArcGis mapping software - \$2,800

Total Cost: \$2,800 plus labor

ESRI ArcGIS License – Maintenance, \$1760/annual (\$440/user)

SAVINGS AND BENEFITS (to agency – monetary and/or safety related):

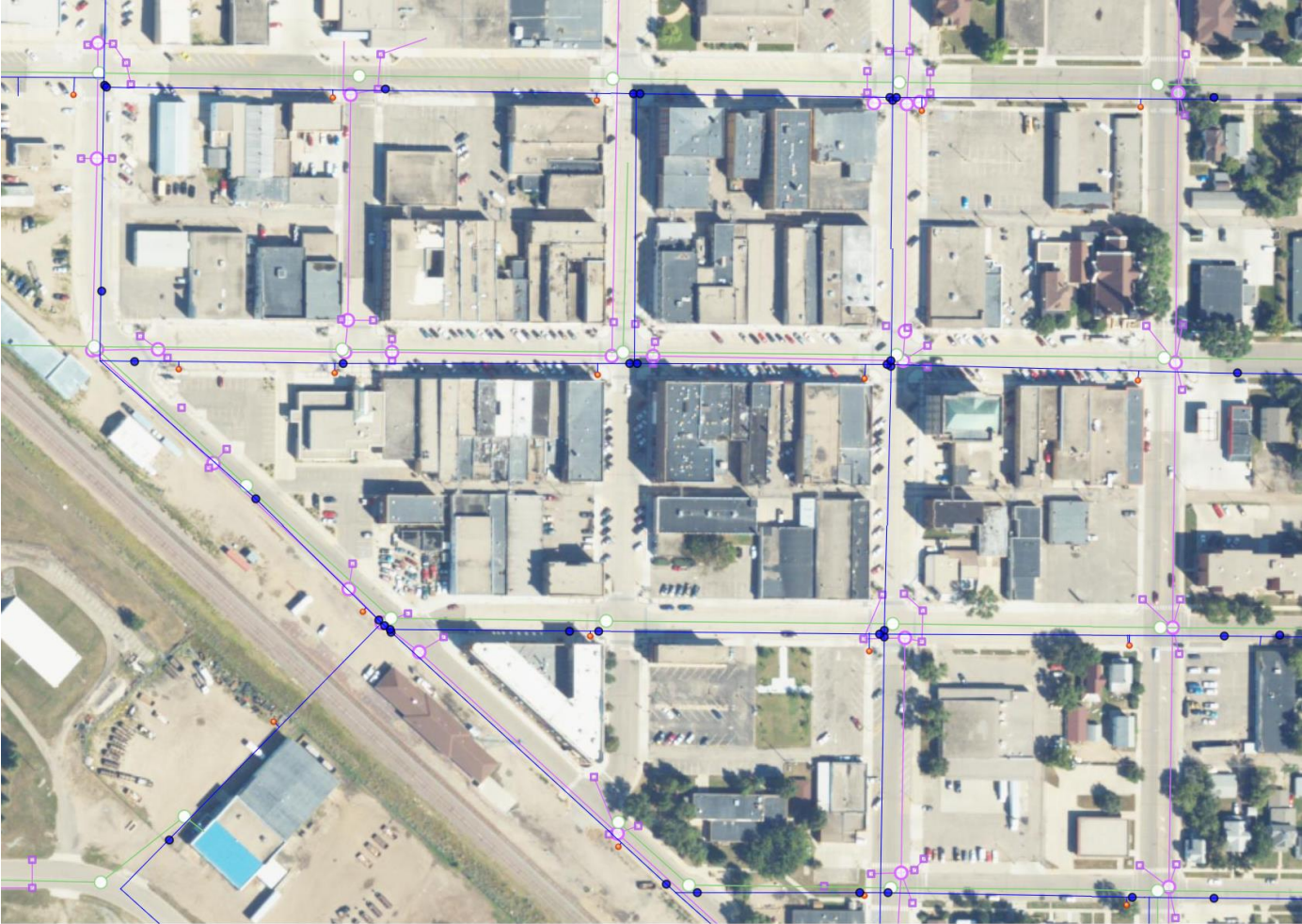
ANNUAL OPERATING COSTS:

Prior to using the innovation – Information about the city’s public works inventory was very minimal. In addition, it had not been kept up to date, and was known well only by 2 personnel within the entire department.

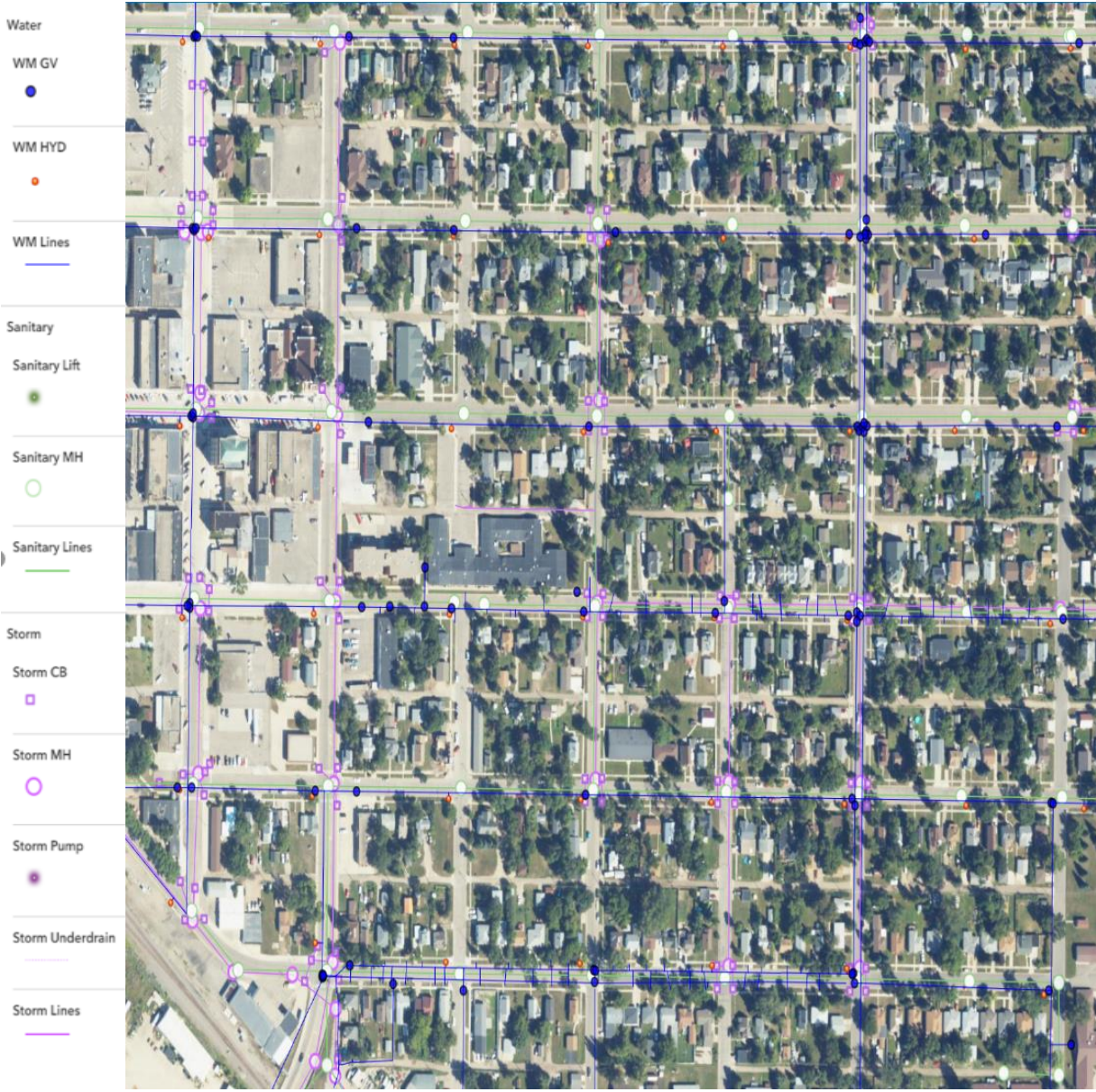
After using the innovation –

Information about the city’s public works inventory is complete. Inventory is kept up to date. Public works department better able to plan for short and long term projects.

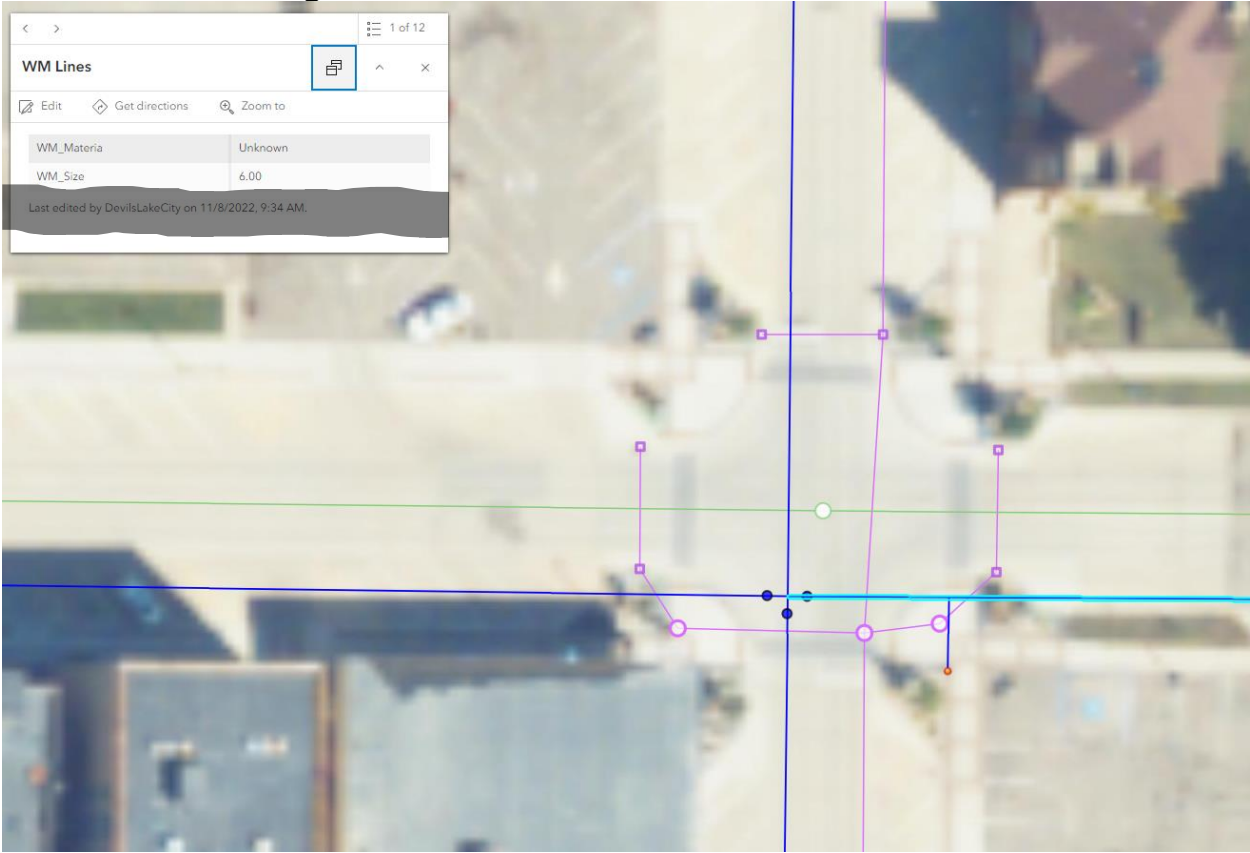
Downtown Utilities Zoomed in



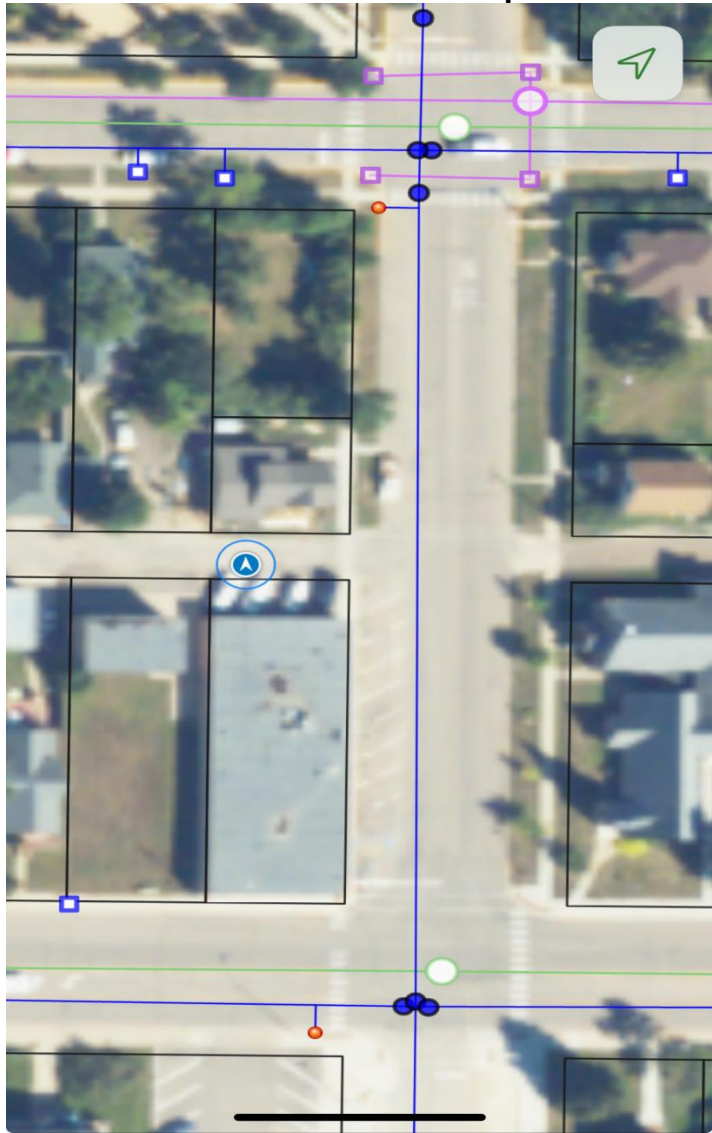
Legend: Green – Sanitary Sewer, Blue = Water, Purple – Storm Sewer



Intersection showing utilities and attributes



Data attributes available to crew personnel



Map with utilities

