# High Accuracy Data Collection for Utilities with ESRI Field Maps

**TEXIAN GEOSPATIAL**

*GIS & Asset Solutions*

# High Accuracy Data Collection for Utilities with ESRI Field Maps

Why High Accuracy

Field data collection and attributes

GNSS and RTK

Esri ArcGIS Solutions for Utilities
◦ Water/WW
◦ AEC

Laser offsets and other tools

Why High Accuracy RTK?
Which size shovel do you need?

# Field Data Challenges

-Collecting field data presents many challenges. Weather, rugged terrain, being close to traffic, wildlife, and achieving an appropriate accuracy can all be difficulties in the field. It is important to wear appropriate protective clothing (boots, long pants, hat) when collecting data because you may be walking through brush, or come across a snake. Many times, especially in utility mapping, a feature can be buried and you may need to dig up a valve with a shovel or use a line locator to find your feature

# Attribute Importance

-Another challenge to collecting field data is collecting the correct data. There is a big chance that what is in the field is not what is represented in the As-builts or designs. If everything was we wouldn't have a job! Valves may be across the street from where it is I the design, or could be a different size. Features like the water meter, being collected in the bottom right, can be tricky. I needed to be sure this meter was the correct size, make and for the correct address. In areas like this that have construction, a meter or valve could be covered up by supplies, or the meter could serve a house that hasn't been built yet. One of the most important factors in Data collection are making sure you are recording the correct attributes.
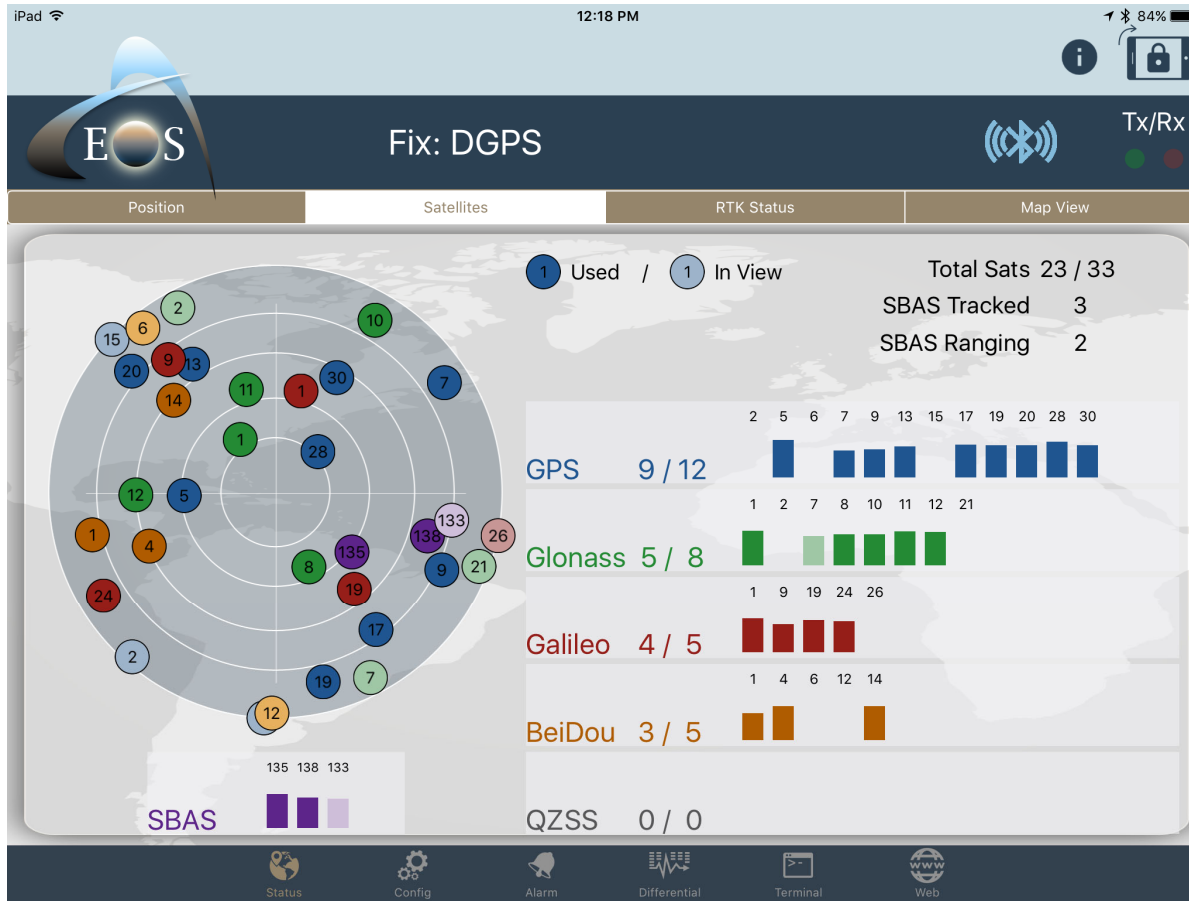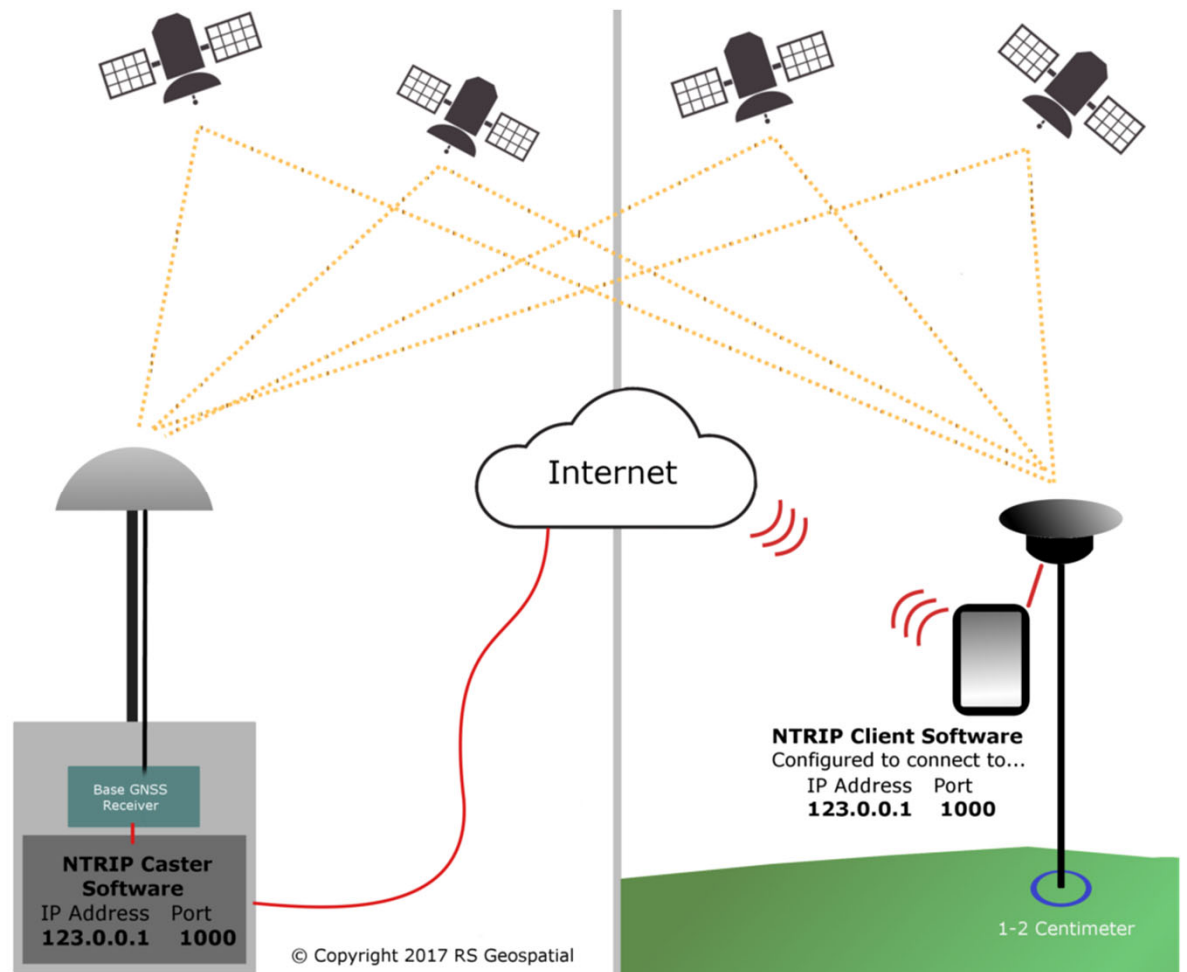
# What is GNSS?

- ◆ **GNSS = Global Navigation Satellite System**
    - ◆ **Multi-constellation**
        - ◆ **GPS, Glonass, Galileo, Beidou, more coming**
- ◆ **L1/L2 RTK = Dual Frequency Real Time Kinematic Receiver**
    - ◆ **High Precision with high productivity compared to L1 only**
    - ◆ **Typical 1-2 centimeter horizontal accuracy in real-time**
    - ◆ **Requires a L1/L2 correction source delivered in real-time**
- ◆ **NTRIP = Network Transport of RTCM via Internet Protocol**
    - ◆ **RTCM = Radio Technical Commission for Maritime Services**
    - ◆ **Stream GNSS/RTK corrections over internet to connected device**
- ◆ RTN = Real Time Network
    - ◆ Subscription RTK correction services are available
    - ◆ Many states now have free public RTNs

# RTK



Internet

Base GNSS
Receiver

**NTRIP Caster
Software**
IP Address   Port
**123.0.0.1   1000**

**NTRIP Client Software**
Configured to connect to...
IP Address   Port
**123.0.0.1   1000**

1-2 Centimeter

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# States with RTK Networks

- Alabama
- Alaska (Plate Boundary Observatory)
- Arizona
- California (CRTN and PBO)
- Colorado
- Florida
- Idaho (PBO)
- Indiana
- Iowa
- Kentucky
- Louisiana
- Maine
- Massachusetts
- Michigan
- Minnesota
- Mississippi
- Missouri

- Montana
- Nevada
- New Mexico
- New York
- North Carolina
- Ohio
- Oregon (ORGN)
- Texas (DOT employees and contractors)
- Vermont
- Washington (PBO free; WRN fee based)
- West Virginia
- Wisconsin
- Wyoming

# ArcGIS Solutions

ArcGIS Solutions reduces the time it takes to deploy location-based solutions in your organization and increases the impact they make. Expand your reach with the rich collection of mapping solutions that use the latest ArcGIS capabilitie
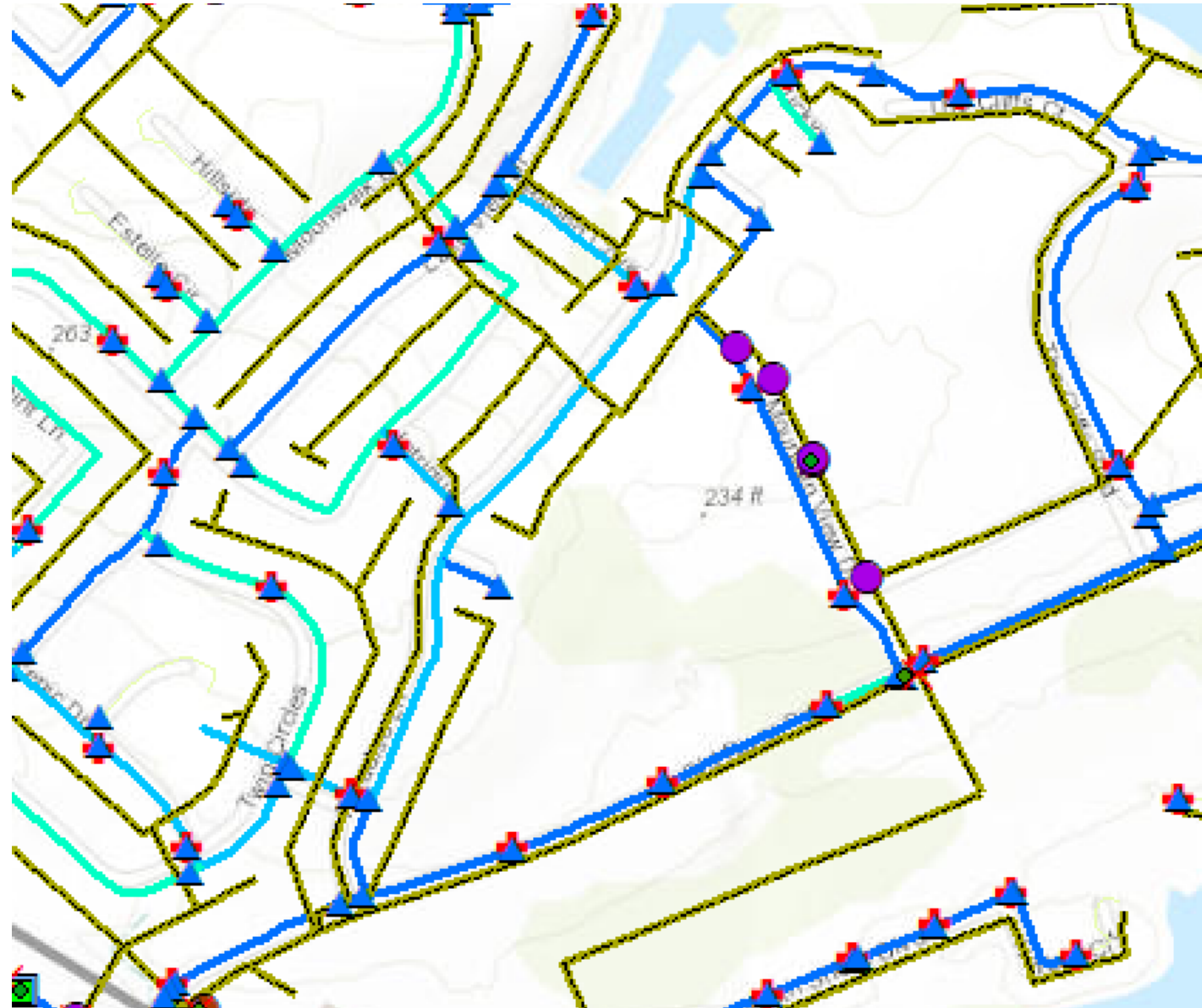
# ArcGIS Solutions

Utilities
- ◦ Reporting
- ◦ Tracking
- ◦ Capital Project Planning
- ◦ ROW and Easement
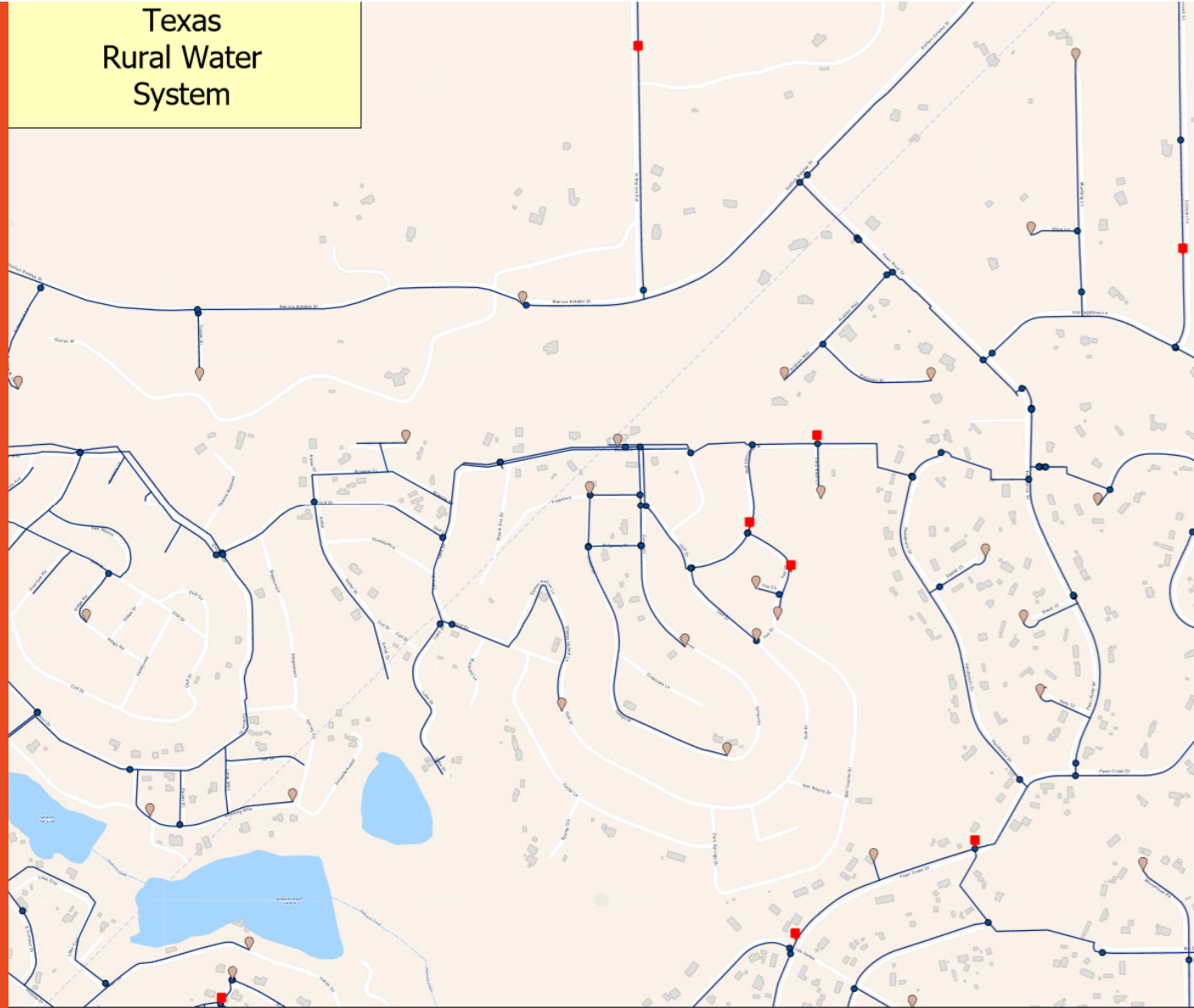- ◦ Water, WW, Gas Distribution
- ◦ Hydrant Inspections

# Water System Mapping

# Water Systems

# Architecture, Engineering & Construction

*Capital Projects
Inspections
As-builts*

# Laser Offset Solutions

Laser-mapping solutions enable field crews to easily, quickly, and safely capture assets location. Laser Offset Mapping solutions are for field crews that need to map hard-to-occupy assets without occupying every single point. Data collection crews regularly run into these situations when assets are located on busy highways, streets, swamplands/vegetation, downtown areas, and in other hard-to-reach, unsafe, or GNSS-impaired environments.
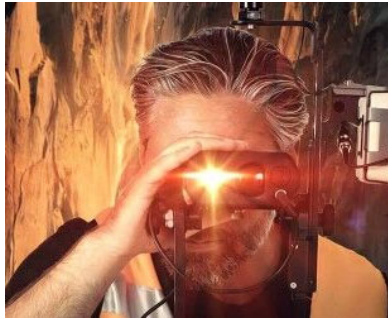
# Questions?

Texian Geospatial
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Feel free to come visit us!

# Eos Locate



With Eos Locate for Field Maps, utilities can map their buried infrastructure (e.g., electric, gas, water, telecommunications infrastructure and more) with submeter or centimeter accuracy. All a field worker needs is an Eos Arrow GNSS receiver, Field Maps for ArcGIS, and a compatible locator device.