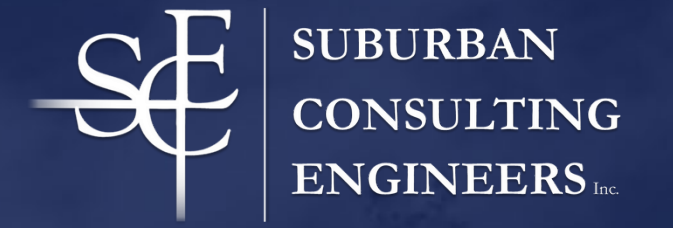


GIS SOLUTIONS FOR WATER DISTRIBUTION AND STORMWATER CONVEYANCE

Presented By: Michael

**AND SANITARY
SEWER!!!**



ABOUT THE PRESENTER



Michael T. Kolody, GISP
GIS Department Manager

EDUCATION

Bachelor of Arts, Geography with GIS Major
West Virginia University

CERTIFICATIONS/TRAINING

- Geographic Information Systems Professional (GISP)
- Leadership in Energy and Environmental Accredited Professional (LEED AP)
- Parsons Project Management Certification (PMC)
- Trimble Mapping Grade GPS Certified
- Locus EIM SuperUser
- Cartegraph Operation Management Software (OMS)
- CPR/First Aid Certified
- Smith System Defensive Driver

PROFESSIONAL AFFILIATIONS

- URISA
- MAC URISA
- NJ Geospatial Forum

ABOUT SCE



Founded in 1986 as a Civil Engineering Consulting Company

Active Projects Nation Wide

Strategic Plan of Serving Utility Infrastructure Clients

Licensed Professionals in Multiple States

Full-Service Solutions on Water Wastewater Engineering & GIS

Recognized Women Business Enterprise through the WBENC



EMPLOYEES

165+

OFFICES

4

ACTIVE PROJECTS

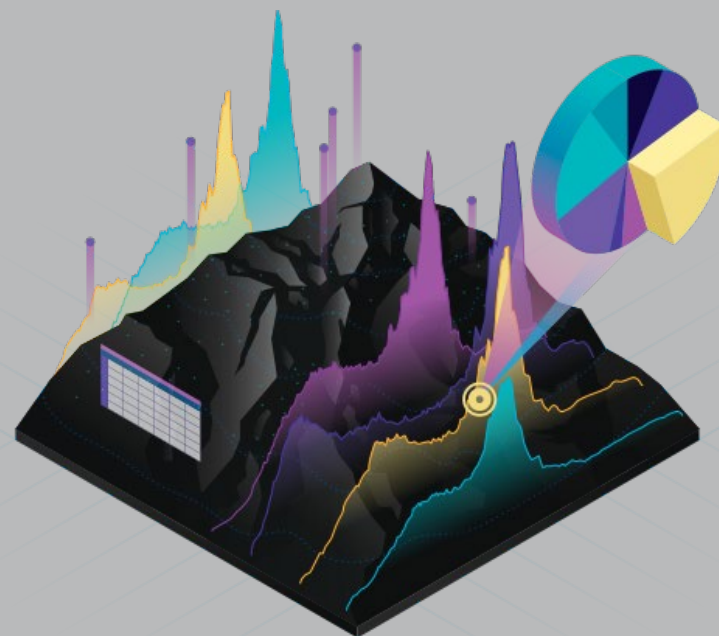
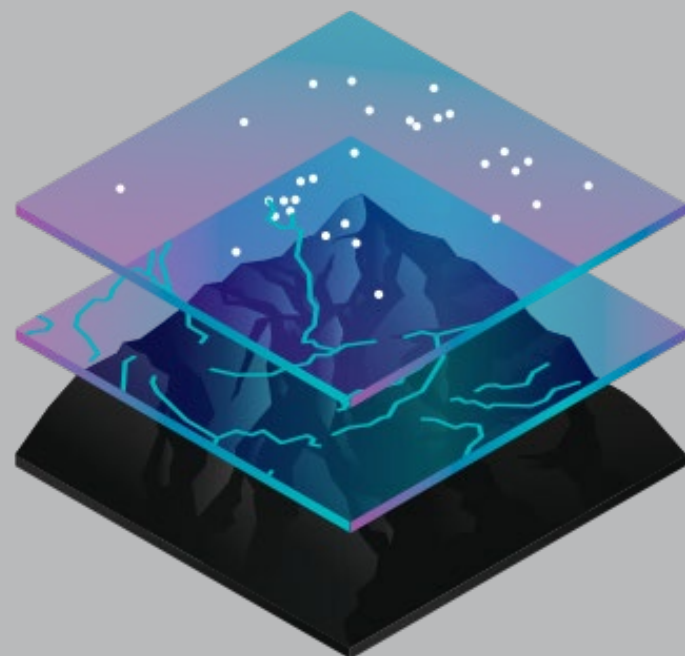
1,025+



Geographic

Information

Systems

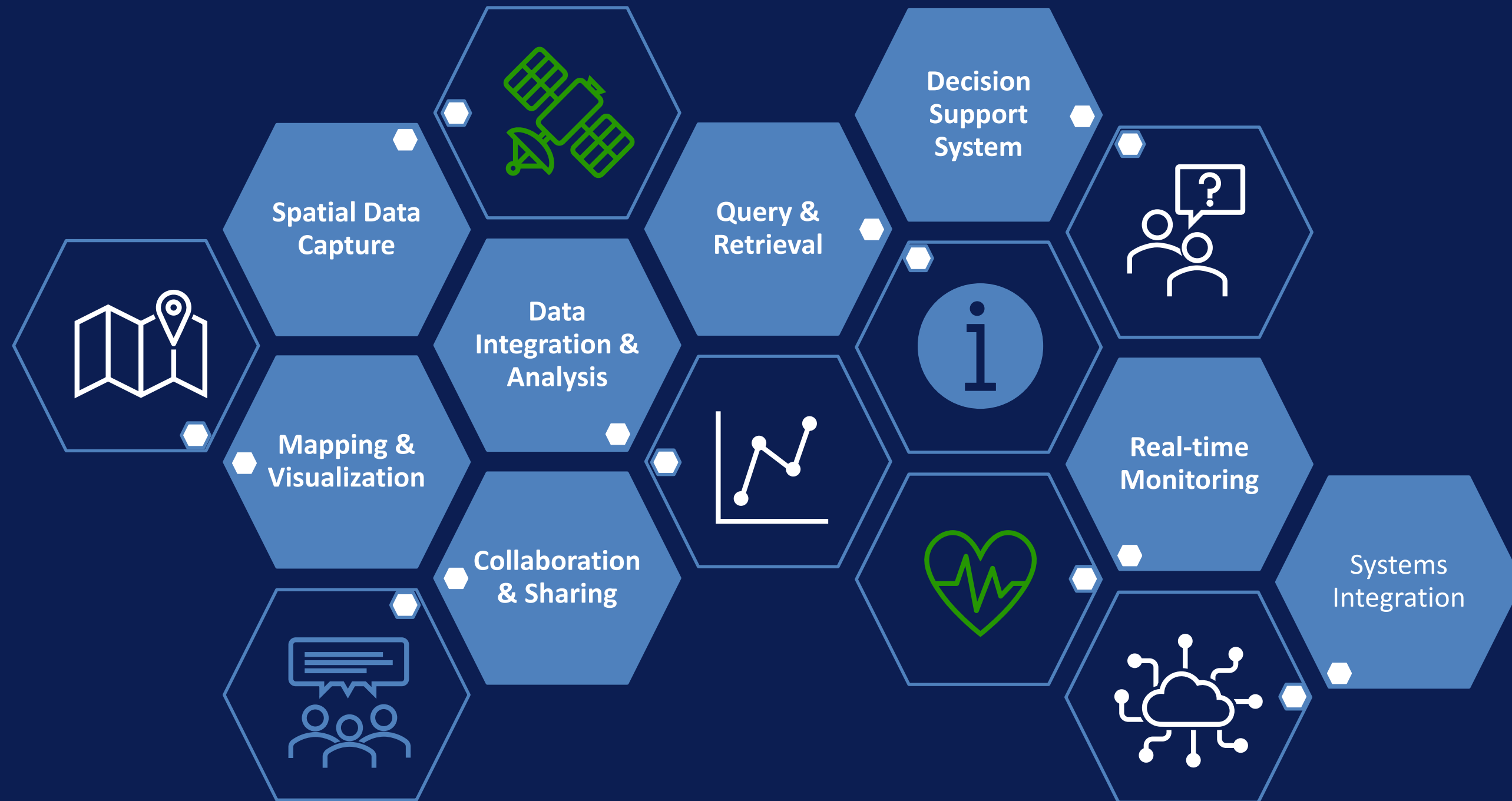


ArcGIS

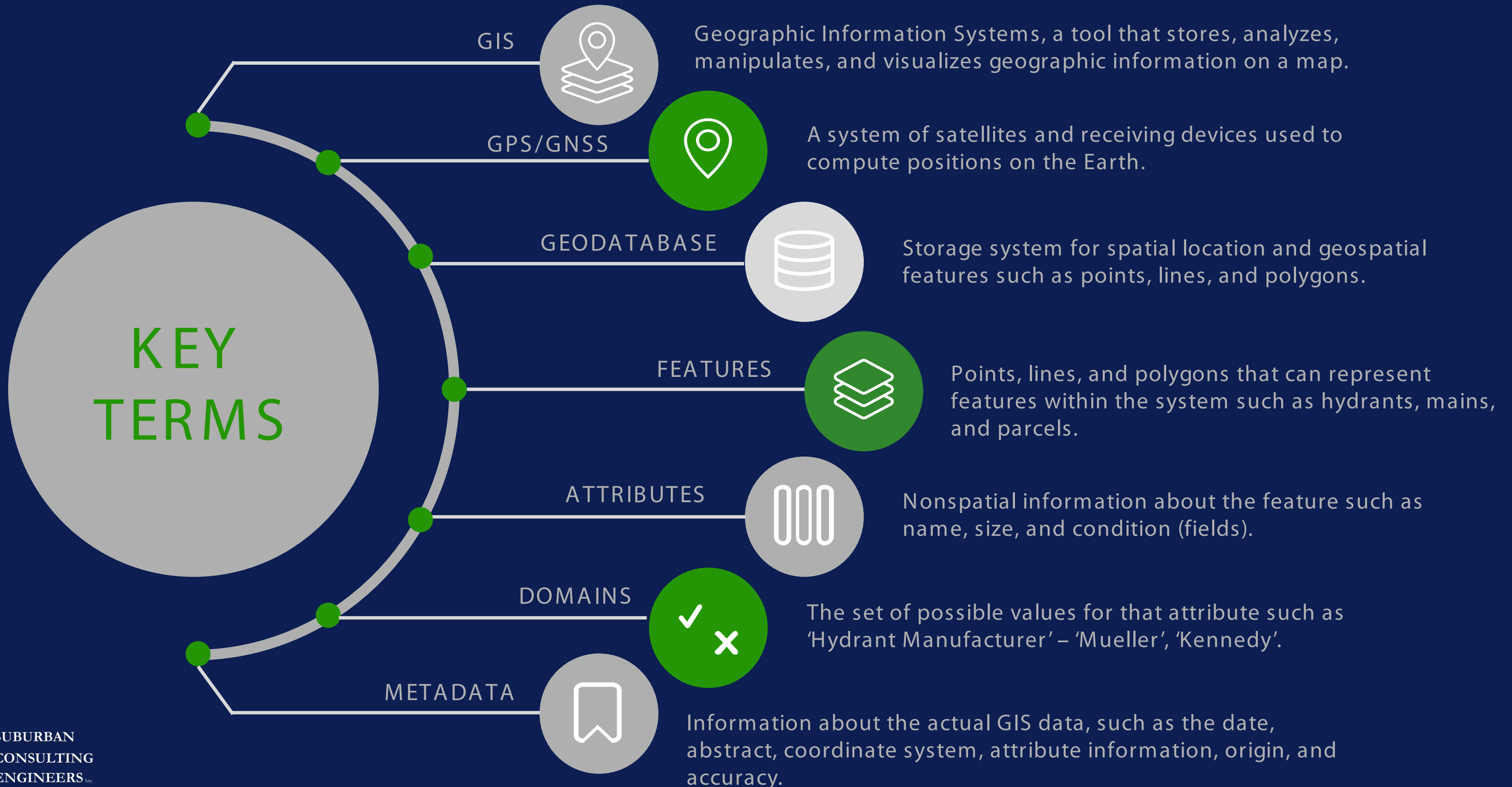
WHAT IS GIS?



SUBURBAN
CONSULTING
ENGINEERS Inc.



GIS TERMINOLOGY



ASPECTS OF GIS

DATA COLLECTION

GPS Equipment, Digital
Inspection Forms, As-Built
Drawings, Historical Records,
and Institutional Knowledge

PEOPLE

GIS Professionals, IT, SMEs

MAPS

Web Applications, PDFs,
Dashboards

SCHEMA

Standards, Attributes,
Domains, Modeling, Scripting

INFRASTRUCTURE

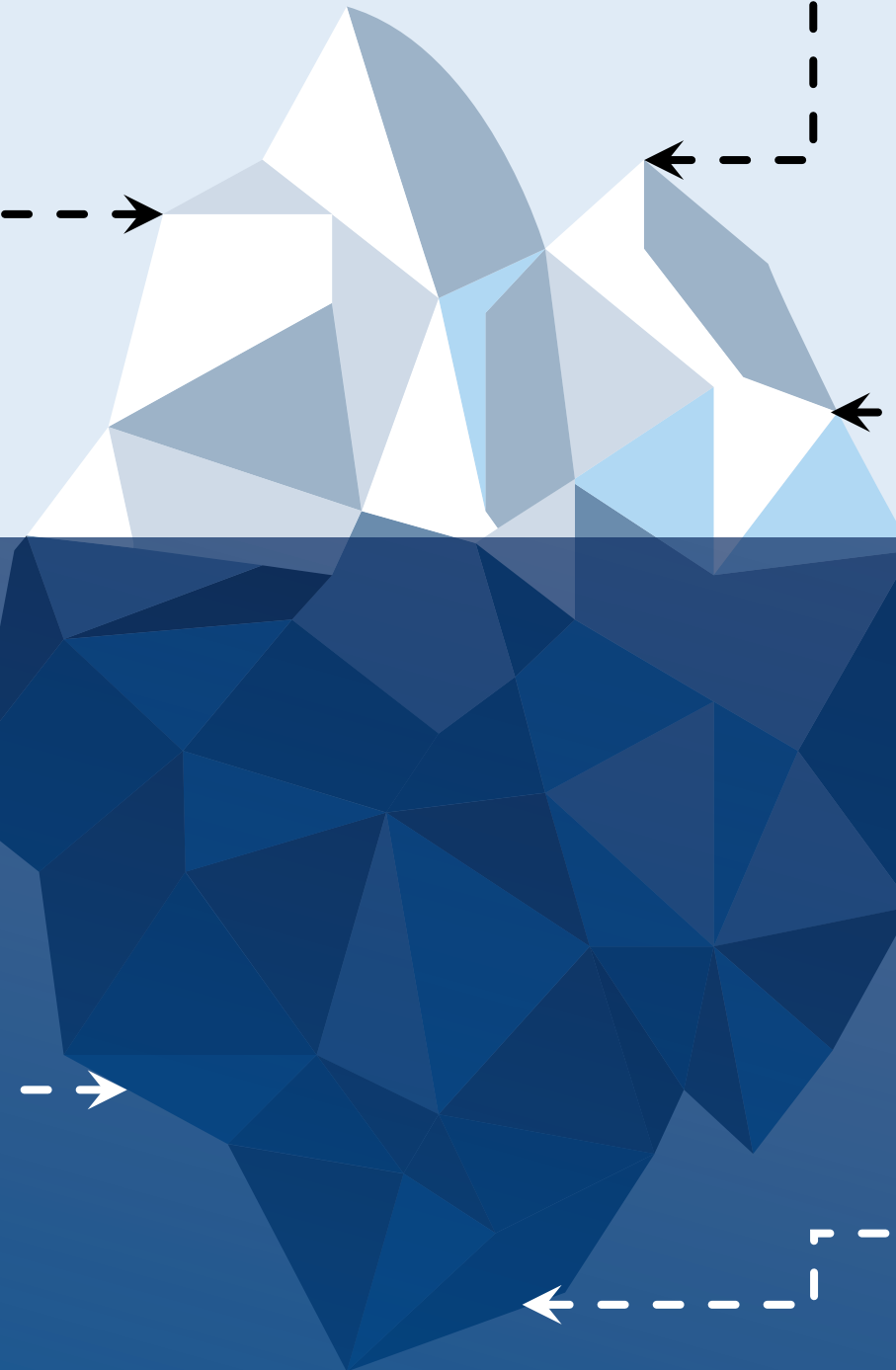
Hardware and Software,
Workforce, Network and
Mobile Connection

EXTERNAL DATA INTEGRATION

Asset Management, SCADA,
Third Party Systems and
Software

DATA MANAGEMENT

Geodatabases, Datasets, File
Structures, QA/QC



WHY GIS?



SUBURBAN
CONSULTING
ENGINEERS INC.



EFFICIENT ASSET MANAGEMENT

Obtain a comprehensive view of the location, condition, and age of your assets.

Minimize downtime, reduce maintenance costs, and extend overall lifespan of your infrastructure.

IMPROVED DECISION MAKING

Identify patterns, trends, and correlations.

Optimize water distribution, storm water management, and plan for emergency response.

ENHANCED OPERATIONAL EFFICIENCY

Field crews can access real time spatial information.

Perform digital inspections and maintenance.

Integrate with other systems, sensors and software.

REGULATORY COMPLIANCE

NJDEP Water Quality Accountability Act (WQAA)

EPA Lead and Copper Rule

NJDEP Tier A Municipal Separate Storm Sewer (MS4) Permit.

REGULATORY REQUIREMENTS

NJDEP WQAA

Effective October 19, 2017. Requires implementation of an asset management plan, valve exercising and hydrant flushing, and cybersecurity. Map the location of valves and hydrants.

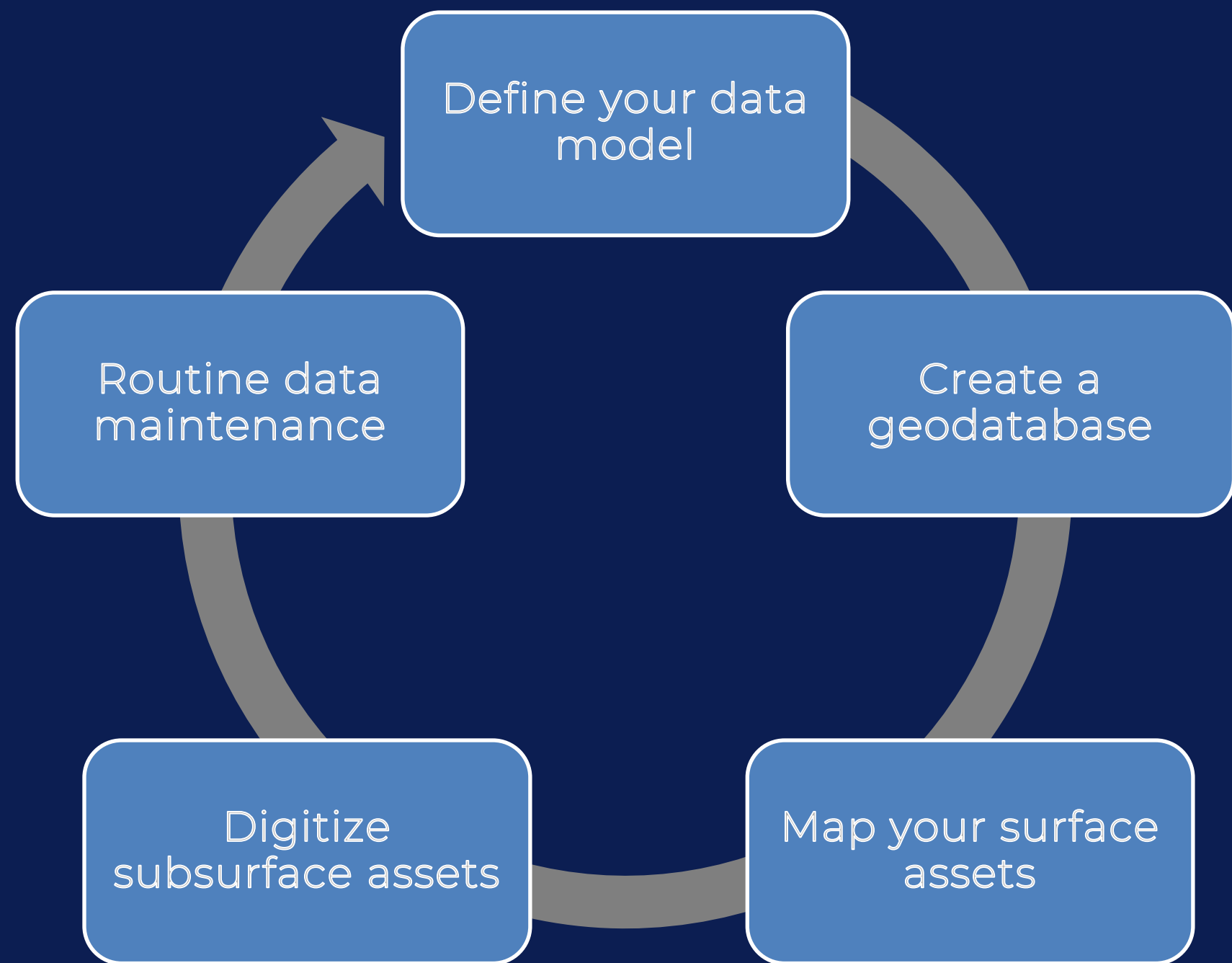
NJDEP TIER A MS4

Effective January 1, 2023. Authorizes the discharge of storm water from MS4. Requires record keeping and reporting, public education and outreach and more.

EPA LCRR

Established in 1991. Compliance required by October 2024. Requires the preparation and submittal of the Lead Service Line Inventory (LSLI), Lead Service Line Replacement Plan (LSLR), Public Communications Plan, and Water Sample/Testing Plan.

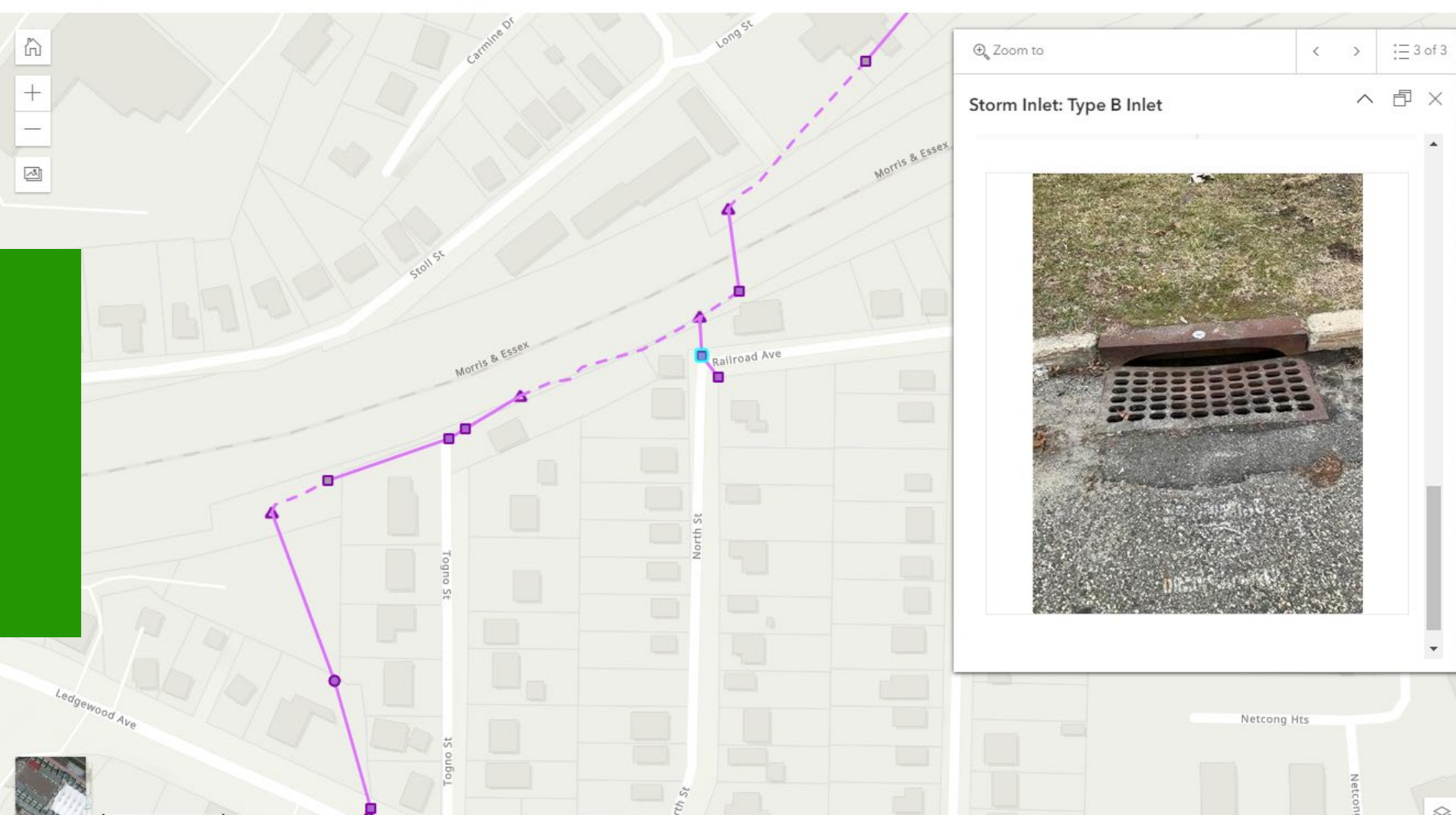
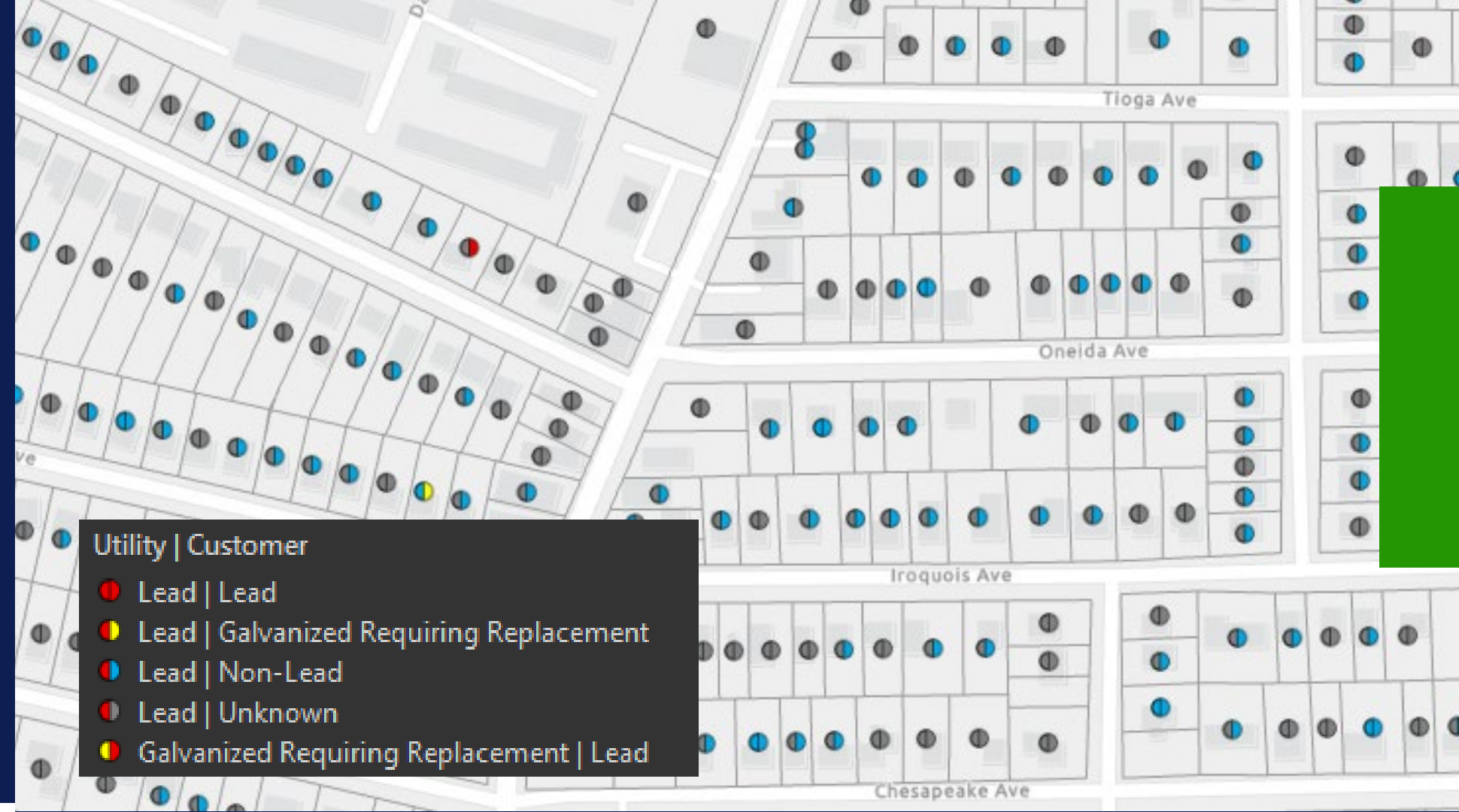
MAP & INVENTORY YOUR SYSTEM



DATA MODELS

WATER DISTRIBUTION

- Valves
- Hydrants
- Mains
- Laterals
- Meters



STORMWATER CONVEYANCE

- Outfalls
- Inlets/Catch Basins
- Manholes
- Conveyance
- Pump Stations
- Stormwater Facilities & Maintenance Yards
- Groundwater Discharge Points
- MS4 Interconnections

Storm Structure: Manh...
No location

ADD POINT

TAKE PHOTO **ATTACH**

Label/Asset ID
Test

Style *
Manhole (and Chamber)

Asset Type
Manhole

Material
Reinforced Concrete

Structure Size
No value

Structure Shape
Cylinder (round)

Manhole Diameter (inner)
48"

Cover Depth
No value

Status
Installed

Install Date
09/01/2022

Filter Asset Type

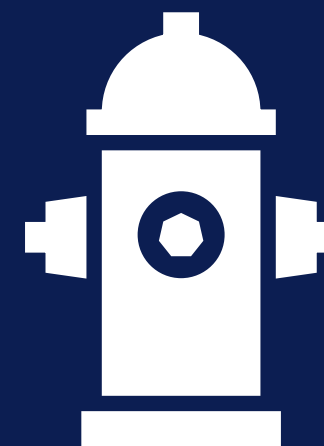
- No value
- Manhole
- Type A Inlet
- Type B Inlet
- Type E Inlet

Filter Manhole Diameter (inner)

- No value
- 48"
- 60"
- 72"
- Other
- Unknown

ATTRIBUTES

- Non-spatial information about a feature
- Attributes are crucial for querying and analyzing spatial data.



- Manufacturer
- Install Date
- Ownership
- Flow Rate
- Flushing Status and History

THINK ABOUT IT:

**GIS is a tool that can help us
build a more sustainable and
resilient future.**

Jack Dangermond

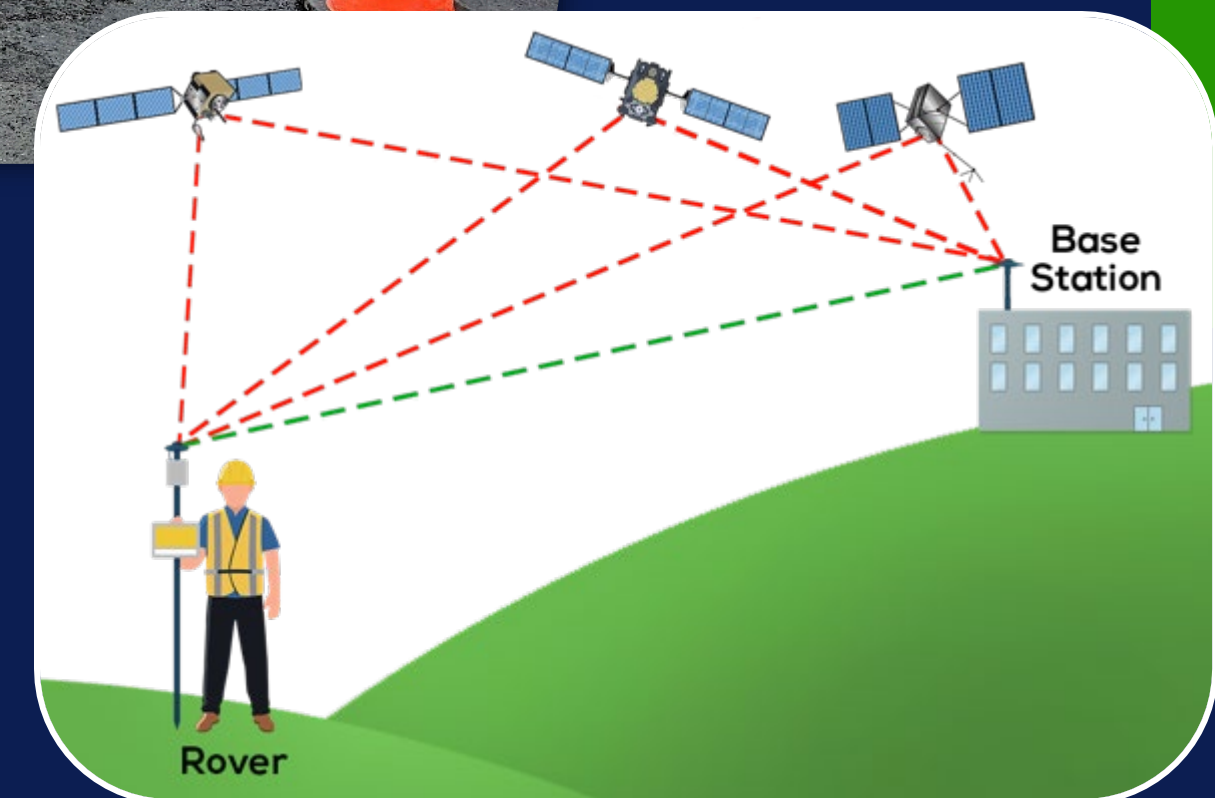
FIELD DATA COLLECITON

GPS/GNSS Hardware

- Submeter to Centimeter grade
- Required to map the location of assets
- Integrates directly with GIS

Mobile Devices

- Can be used to map approximate location of assets
- Utilized to capture attribute information, photographs and videos
- Capture maintenance and inspection data



DIGITAL INSPECTIONS



ArcGIS Survey123

EASY TO USE

User friendly interface. Configurable logic-based forms. Cross-platform compatibility.

IMPROVED DATA QUALITY & ACCESS

Collect data once in the field. Automated data validation. Real time collaboration between office and field. Automated workflows.

SPATIAL INTEGRATION

Maintenance and inspection records are linked to spatial data within your GIS. Data can be imported to maps and dashboard views.

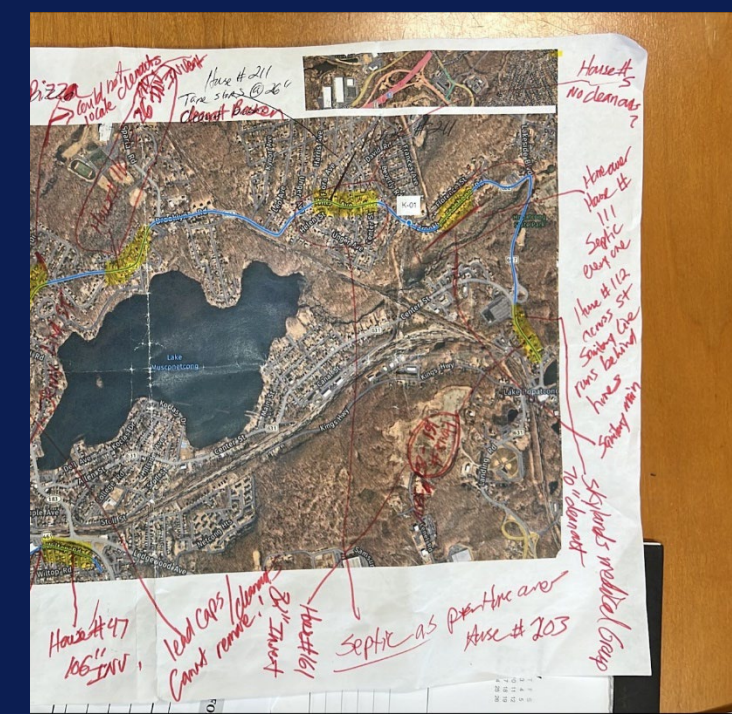


POOR DOCUMENTATION LEADS TO ERRORS

Sequence of construction for VTRM
manhole installation

- 1) Pump down pump station
- 2) remove temporary gly/bypass connection
- 3) Set manhole w/ new OIL
- 4) Align new OIL beam w/
- 5) Reset bypass to downstream manhole
- 6) Test pump station & pump
- 7) Remove new temporary
- 8) Tie new OIL into body simultaneously
line downstream of manhole
- 9) Provide temporary connection to bypass
of existing line Sta. 95+00 to Sta. 5+00

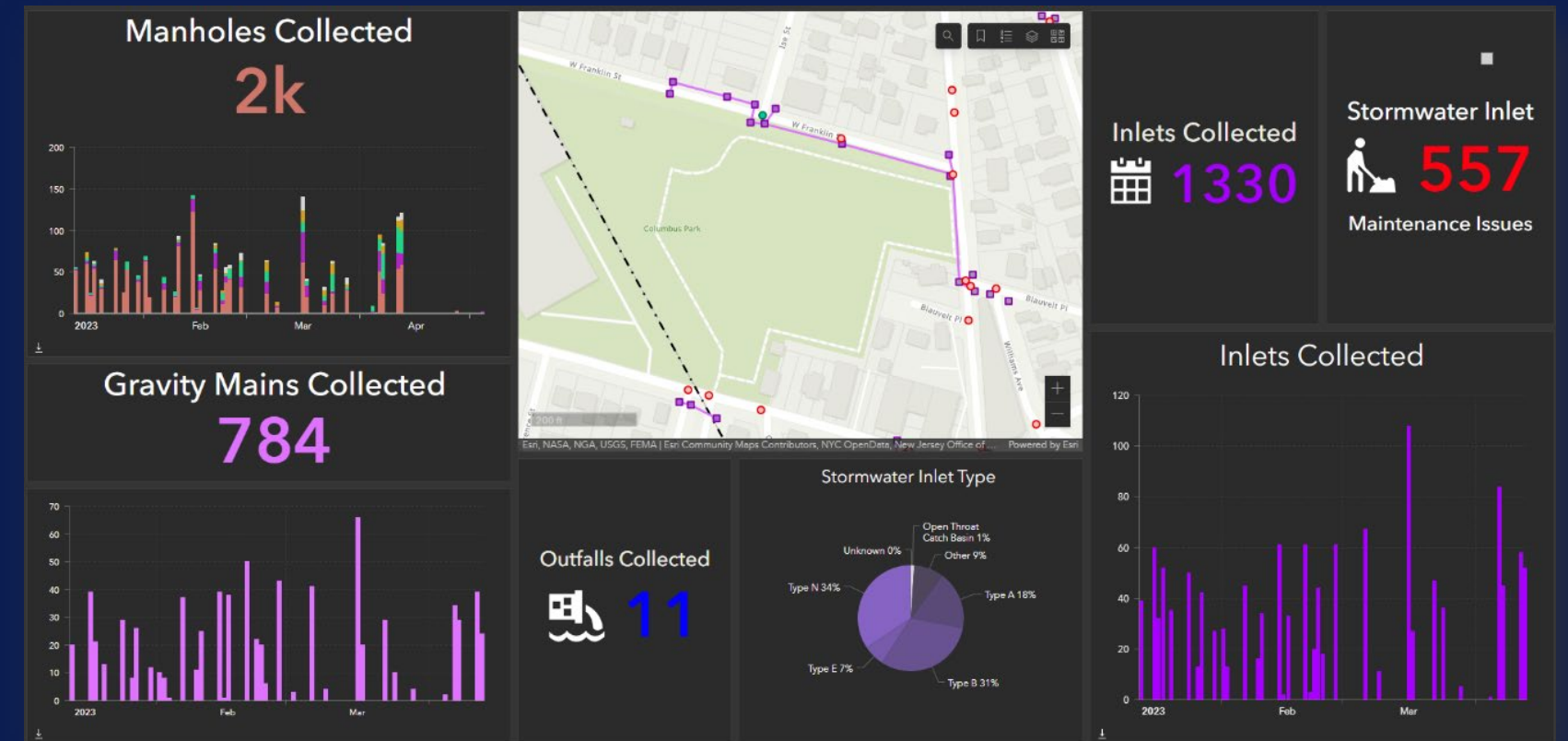
summary
Self ✓ calibration
- 10' offset reading
- layout 10' off reading
- 5ft off edge of drawing
- More from generator APT station to SCADA
Foster Wheeler strategy
(3) w/ spark
Jim / Kelly
2) w/ PSE
Vince / AOD / Miller Energy
Simulated all existing pumps on
Turned Sackage off can create Pumped
Average velocity @ 100% speed Pump 2
Average velocity @ 100% speed Pump 1
AM ACTIVE Sackage @ 100% Run Rate
Kicker on
DeLuge off / booster on → N by A.S.



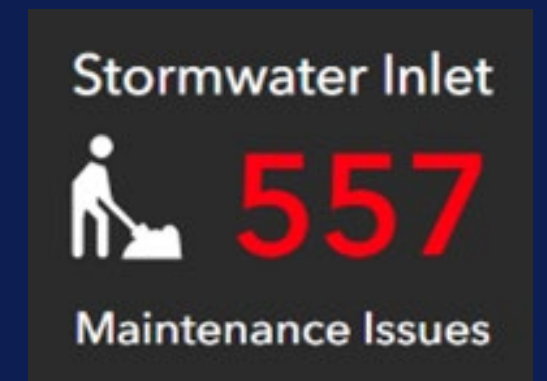
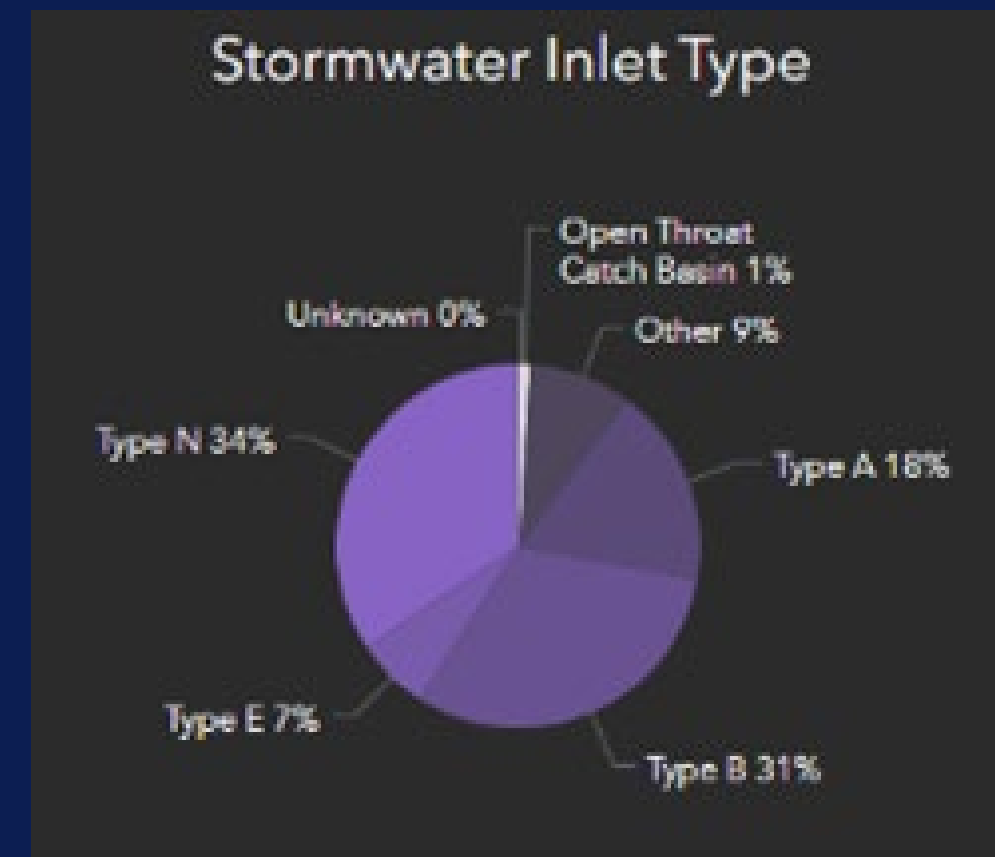
DASHBOARDS



ArcGIS Dashboards



- Interactive and visual displays that present data in a dynamic and comprehensive way
- Leverage the spatial component of GIS to provide insights into geographic patterns, trends, and relationships.
- Help users monitor, analyze, and understand complex spatial data through a combination of maps, charts, graphs, and other visual elements



Water Distribution Maintenance & Inspections Dashboard

Hydrant Flushing
1/1/2023 - 12/31/2023

Valve Exercising
No date selected



Fire Hydrants Flushed
Click on a hydrant to view the details:
Hydrant Flushed on 10/18/2023

Hydrant Flushed on 10/18/2023

Select an entry above to view the details here:

Selection required on one or more elements

Fire Hydrants Requiring Maintenance
Click on a hydrant to view the details:
Hydrant Flushed on 10/18/2023
Hydrant Flushed on 10/18/2023
Hydrant Flushed on 10/18/2023

Select an entry above to view the details here:

Hydrant Inspection/Flushing 10/18/2023

| | |
|-------------------|---------------------|
| Inspection Date | 10/18/2023, 1:09 PM |
| Inspector | Adam |
| Maintenance Issue | None |
| Notes | |
| Open Direction | Left |

Hydrants Valves Mains

Hydrants

Flushed
693

Requiring Maintenance
13

Total
942

Valves less than 12"

Exercised
1.8k

Requiring Maintenance
1

Total
2279

Valves greater than or equal to 12"

Exercised
338

Requiring Maintenance
0

Total
357

Hydrant - Out of Service

✕

Valve - Out of Service

✕

Hydrant Requiring Maintenance

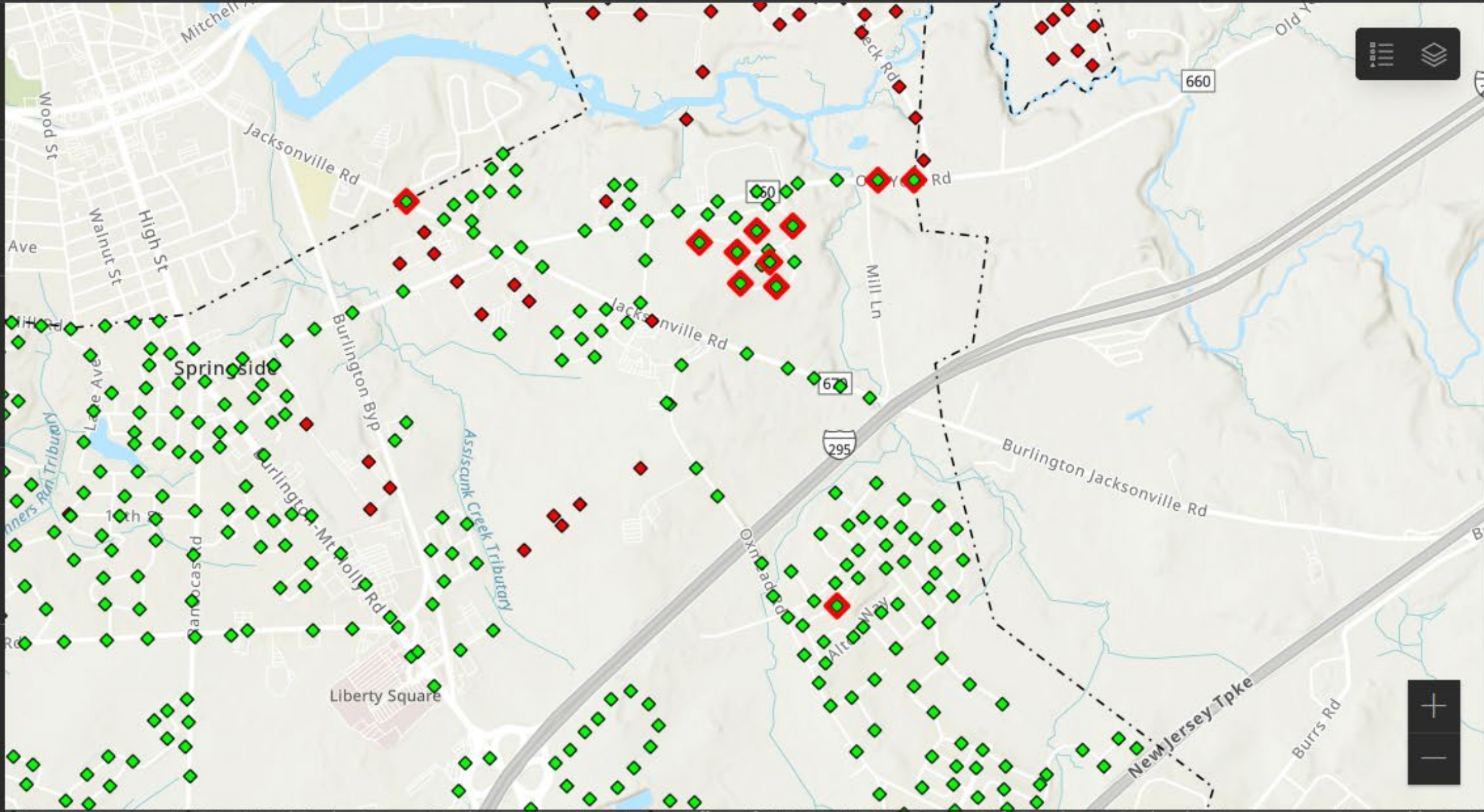
◆

Hydrant

- ◆ Not Flushed
- ◆ Flushed

Municipal Boundary

▭



Key Takeaways

SYSTEM OF RECORD

Map and
inventory your
system.

Store
maintenance
history.

SYSTEM OF ENGAGEMENT

Non-GIS
Professionals can
interact with web
maps, dashboards
and more.

Field staff can
perform
inspections and
store
maintenance
records.

REGULATORY COMPLIANCE

Complete GIS
specific
requirements.

GIS supports
other regulatory
requirements.

GIS MAKES SENSE!

GIS makes
everyone's job a
little bit easier and
more interesting!

Connect With Us



WWW.SUBURBANCONSULTING.COM