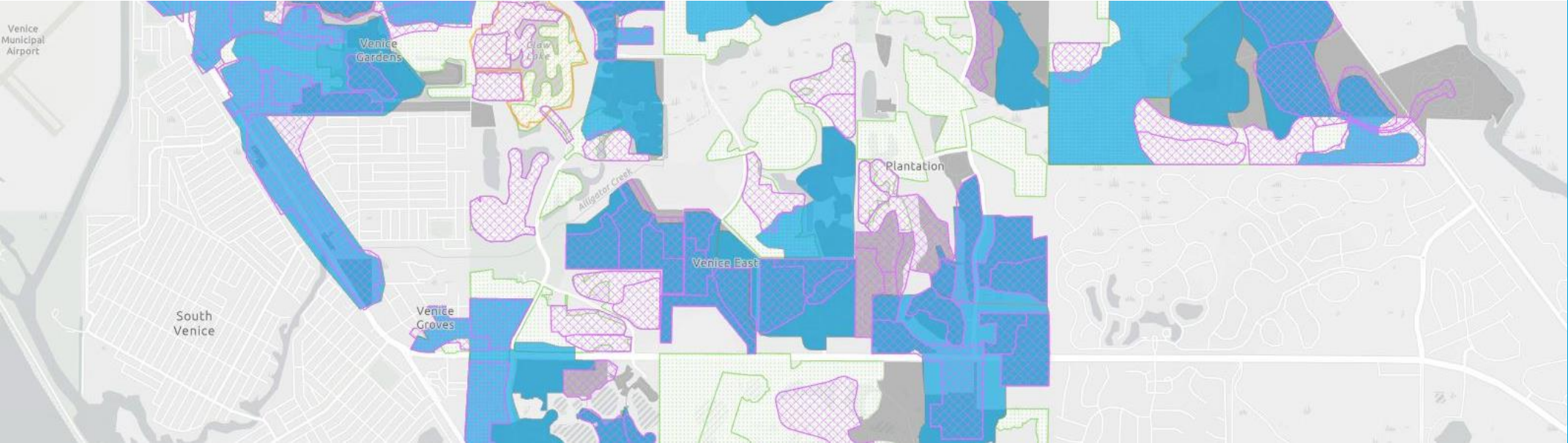


Innovative Uses of GIS for Collection System O&M

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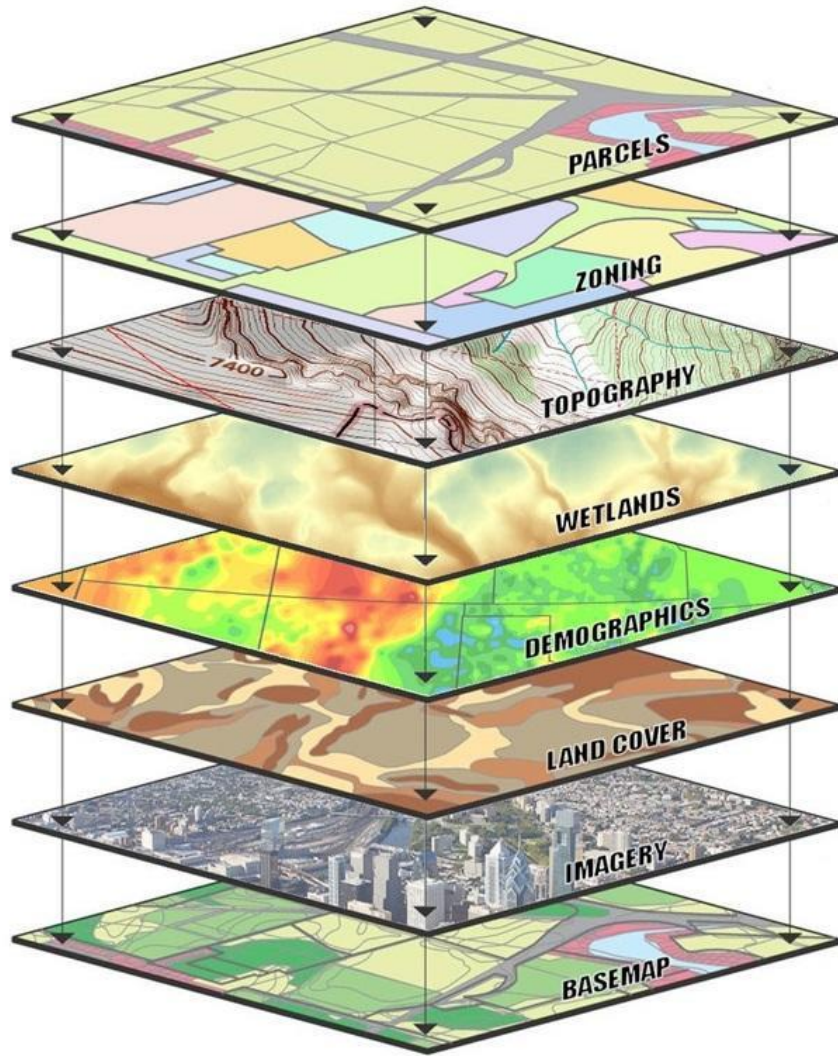


WRICHT

Introduction to GIS
Site Selection for SSES Work
Field Records in Real Time
OSHA Compliance
Thank You

Engine

What is a Geographic Information System?



- Allows you to visualize spatial data
- Is map-based
- Allows for the overlay of multiple datasets
- Can be updated in real time, from the field
- Leads to location-based insight for assets

Every town can (and should) develop a GIS database of its assets

Image Credit: USGS

RIGHT Engine



Mapping

- Know where structures and pipes are
- See how structures and pipes connect to each other
- Identify basins or sewer subareas

Engine



Benefits

- Forces unique IDs
- Supports asset management programs
- Assists in finding missing features
 - Look for pipe between two manholes
 - Look for a manhole at pipe intersection
- Can trace flow when investigating backups or overflows

Engine

WRIGHT

1

Site selection
for planning
SSES work

2

Field records
for smoke and
dye testing

3

OSHA compliance
for confined
space entry

Engine



- Pipes with highest I/I are typically selected by night flow isolation during high groundwater
- When groundwater is low, an alternative is needed to select pipes
- GIS analysis used to select pipes

Engine



Age

- Prior to 1930
- Prior to 1960



Material

- VCP
- Clay Tile



Proximity to Water

- Wetlands
- Streams
- Ponds



Proximity to Drains

- Formerly combined areas
- Possible cross-connections
- Near former overflows
- Drain pipe closer to building than sewer pipe

Engine

The Selection Details

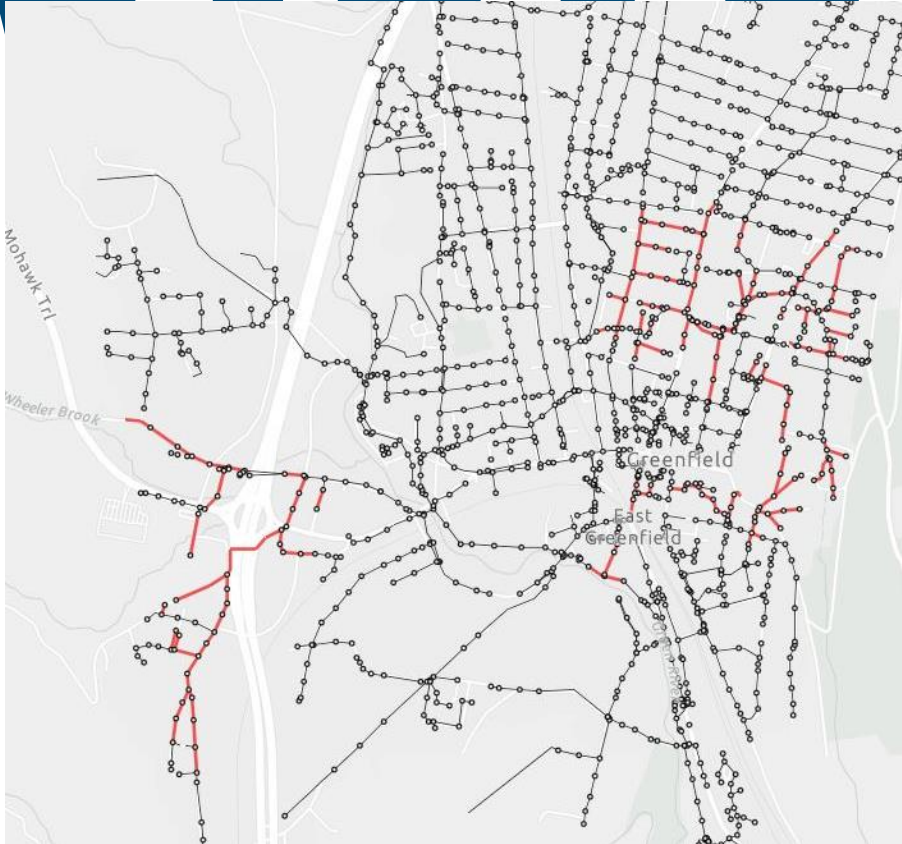
Proximity to Water



Proximity to Drain Lines



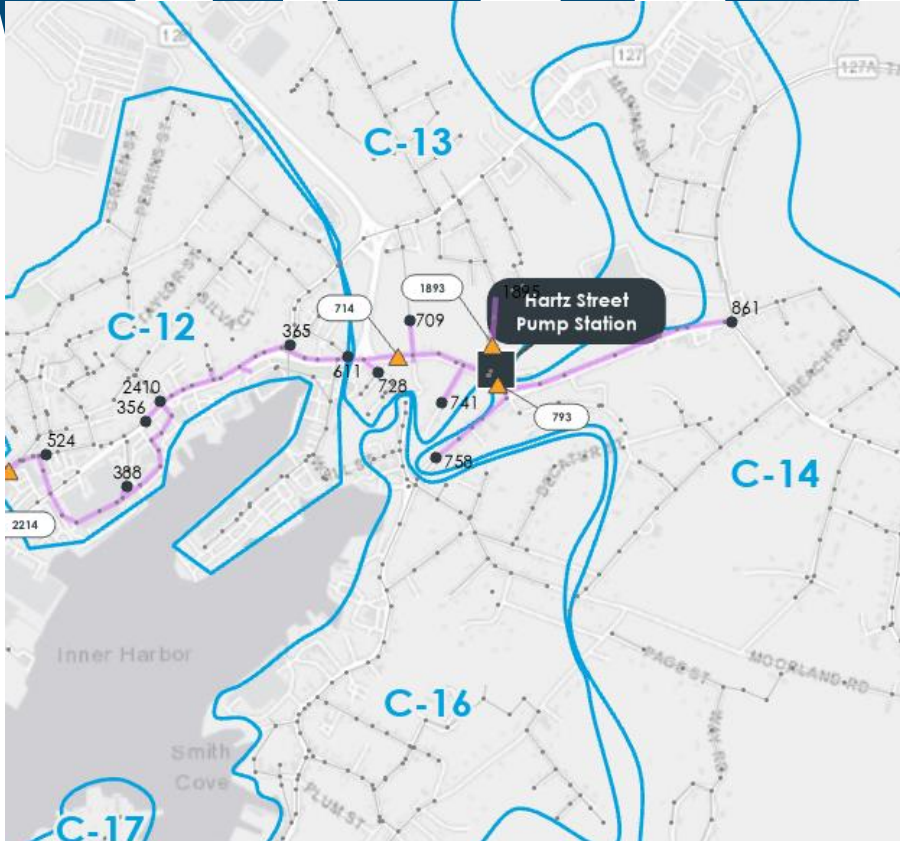
Engine



- Selection set was created and used for CCTV inspections.
- About 50% of the pipes selected for inspection needed repair or immediate corrective action.

Engine

Why Use Digital Forms?



Forms and GIS Mapping

- Conducting fieldwork is a perfect time to investigate how your community is represented with GIS data.
- Standardizing and digitizing your practice can help maximize efficiency in the field and back in the office.
 - Remove time for processing.
 - Obtain near real-time insight.
- By utilizing spatial data, we can see patterns in particular aspects of your system that we might otherwise miss.
 - Location can inform what sorts of defects are possible.
 - Collection systems are inherently spatial. Assets have physical locations.

Engine

W W R R I I G G H H

1

Efficiency – Tracking workflow through space and time

2

Gain New Insights – Understand the spatial qualities of your system

3

Data Resiliency – Digital data lives longer

Engine

Recording Data in the Field



- Data recorded on iPads or on cell phones with Collector app
- Digital forms allow us to record data, and utilize it, in minutes.
- Forms allow us to capture a greater range of data than a traditional item/asset-based GIS layer.

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Worcester, MA Dye Testing

Dye Testing Form

Survey Date/Time
Tuesday, January 11, 2022 11:50 ...

Inspector

Tested Structure's ID

Nearest Address

Checked Structure

Checked Structure Type

- Catch Basin
- Sewer Manhole
- Drain Manhole
- Other

Checked Structure ID

- This form connects the dyed (tested) feature, to the places where they are observed.

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Sample Definition, Maine Smoke Testing

Street	-
CART_ID	FMH00002
SmokeTestStatus	MH - Smoked
SmokeTestComments	Light smoke coming from under the edges of the manhole cover.
SmokedBySetup	JHD
Traffic Control Needed	



- Large Combined Sewer System
- We expect certain features to smoke
 - Catch Basins connected by combined sewer pipes to Sanitary Manholes

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Example: OSHA Compliance, Confined Space Entry Permitting

- Many of the spaces in which we work are Confined Spaces and require a Permit (example: Manholes).
 - In order to break the plane of a manhole, we must permit that entry as a legal requirement per OSHA.
- Safety conditions related to CSE can be monitored in real time.
- Data can be used to digitally track compliance with safety protocols.
- Reports are generated immediately and digitally available to safety monitors/attendants and authorities.
 - Many of our clients require a copy of these reports as well.

Engine

Confined Space Entry Permit

Confined Space Entry Permit

▼ Identification

Project Number

Entry Date

Entry 1 Time In

Entry 1 Time Out

Entry Purpose

Loc/Desc of Space

Entry Location

📍 📄

🚫 Position source closed error

Permit Duration

Expiration Date

Non-Entry Rescue
 Entry Rescue

Method to Reach Rescue
 2-Way Radio
 Cell Phone
 Land Line

Rescue Service Eval Complete?
 Yes
 No

Completed By

Emergency Direct Dial Number

▼ Hazardous Atmospheres

Monitor continuously, Ensure Alarms Set

Entry 1

O2 - initial reading
Acceptable range 19.5-23.5

VOC/PID - initial reading
Acceptable range <100ppm

Utilizing GIS makes collection systems O&M more efficient and cost-effective.





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Engine

WR

RIGHT

THANK YOU

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