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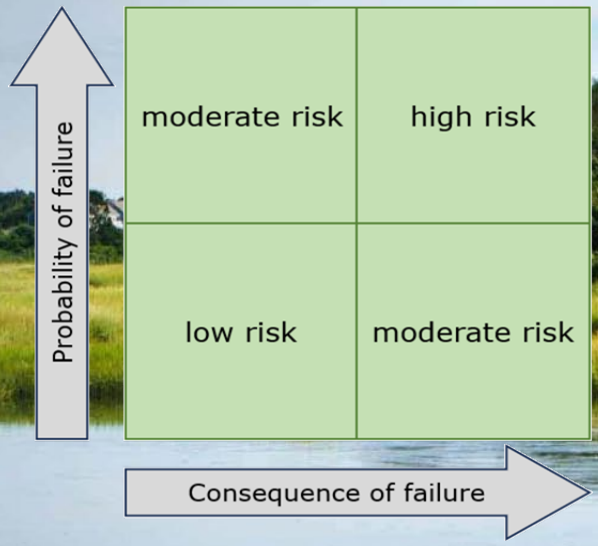

LEVERAGING ASSET MANAGEMENT TO EASE FINANCIAL PRESSURES

CWWA/CTAWWA Fall Conference
October 24, 2025

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Natalie Koncki – Project Manager, Water Resources Data Management Technical Specialist

SHOW OF HANDS…

- What is your role?
- Do you have any experience with asset management?
- Do you have a 5-year capital plan in place?

OVERVIEW

Why asset management?

Technologies and tools to improve workflows

Using risk-based assessment to prioritize spending

WHAT IS ASSET MANAGEMENT?

"**Asset management** is maintaining a desired level of service for what you want your assets to provide at the lowest life cycle cost."

More simply…

Asset management is the process of maintaining the drinking water system to ensure it functions properly, lasts a long time, and provides the best value to customers.

DRIVERS FOR ASSET MANAGEMENT

EXECUTIVE SUMMARY

The nation's water infrastructure is aging and underfunded. More than 9 mil
lead service lines pose health concerns, and in 2023, the Environmental
Agency (EPA) determined that the nation's water infrastructure nee
$625 billion over 20 years. That exceeds EPA's 2018 assessment by mor
billion. The 2021 Infrastructure Investment and Jobs Act (IIJA) invested
$30 billion for drinking water capital improvements, removal of lead servi
addressing emerging contaminants such as per- and polyfluoroalkyl substances (PFAS).
However, funding shortfalls continue in state revolving funds that support drinking water. Challenges to utilities include aging infrastructure, emerging contaminants, and the increasingly severe effects of extreme weather. Many drinking water utilities are actively improving infrastructure through innovations such as asset failure prediction technologies, which improve the ability to identify issues before they become failures. Unfortunately, only about 30% of utilities have fully implemented an asset management plan, and just under half are in the process of implementing one. Federal agencies and programs are also able to provide financial and technical support to utilities meeting new regulations and replacing dangerous pipes, so the burden of rate increases does not fall too harshly on the public water systems of small communities.

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drinking water that meets all applicable health standards, well above the national target of 92%. However, systems are aging and in need of repair, rehabilitation, and maintenance, estimated to cost more than $4 billion over the next 20 years. Leaking watermains contribute to losses estimated between 15 to 20% of total water production. To proactively ensure smart planning decisions about the future of Connecticut's drinking water, the state formally adopted a State Water Plan in 2019. Asset management planning will be required to ensure the limited available funding is used expeditiously.

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DRIVERS FOR ASSET MANAGEMENT

Aging infrastructure

More stringent regulatory requirements

Climate and resiliency pressures

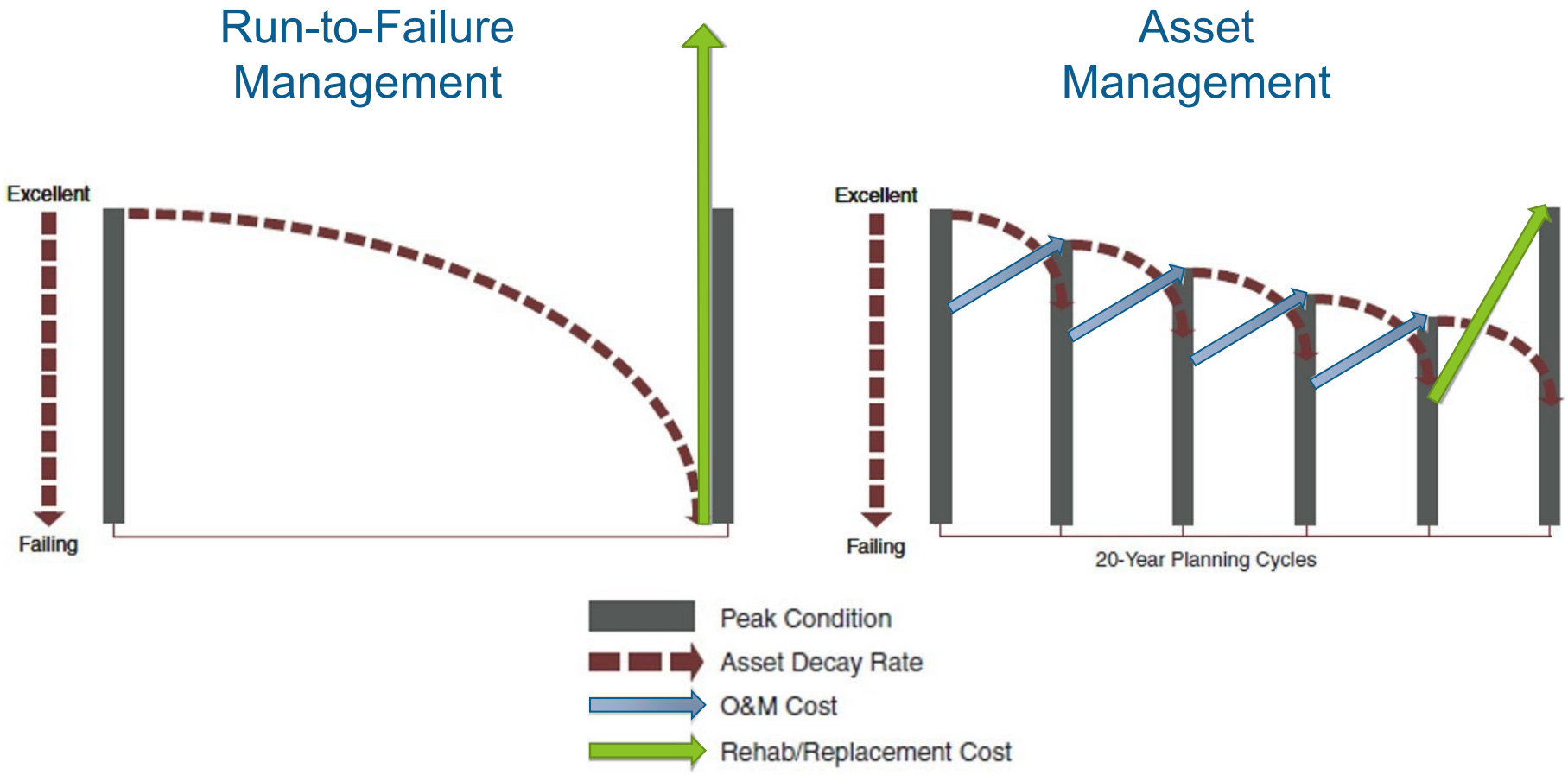
Increased demand

Loss of knowledge

Defensible water rates and spending

- Replaces reactive system management and maintenance with a proactive, planned program
- Creates a centralized location for system management
- Clearly defines critical assets within the system
- Prioritizes infrastructure capital improvements with a defensible strategy
- Increases knowledge of system
- Reduces emergency repairs and system downtime

ASSET MANAGEMENT MODELS



Small, regular renewal investments save money

Source: U.S. EPA, "Fact Sheet: Asset Management for Sewer Collection Systems," April 2002.

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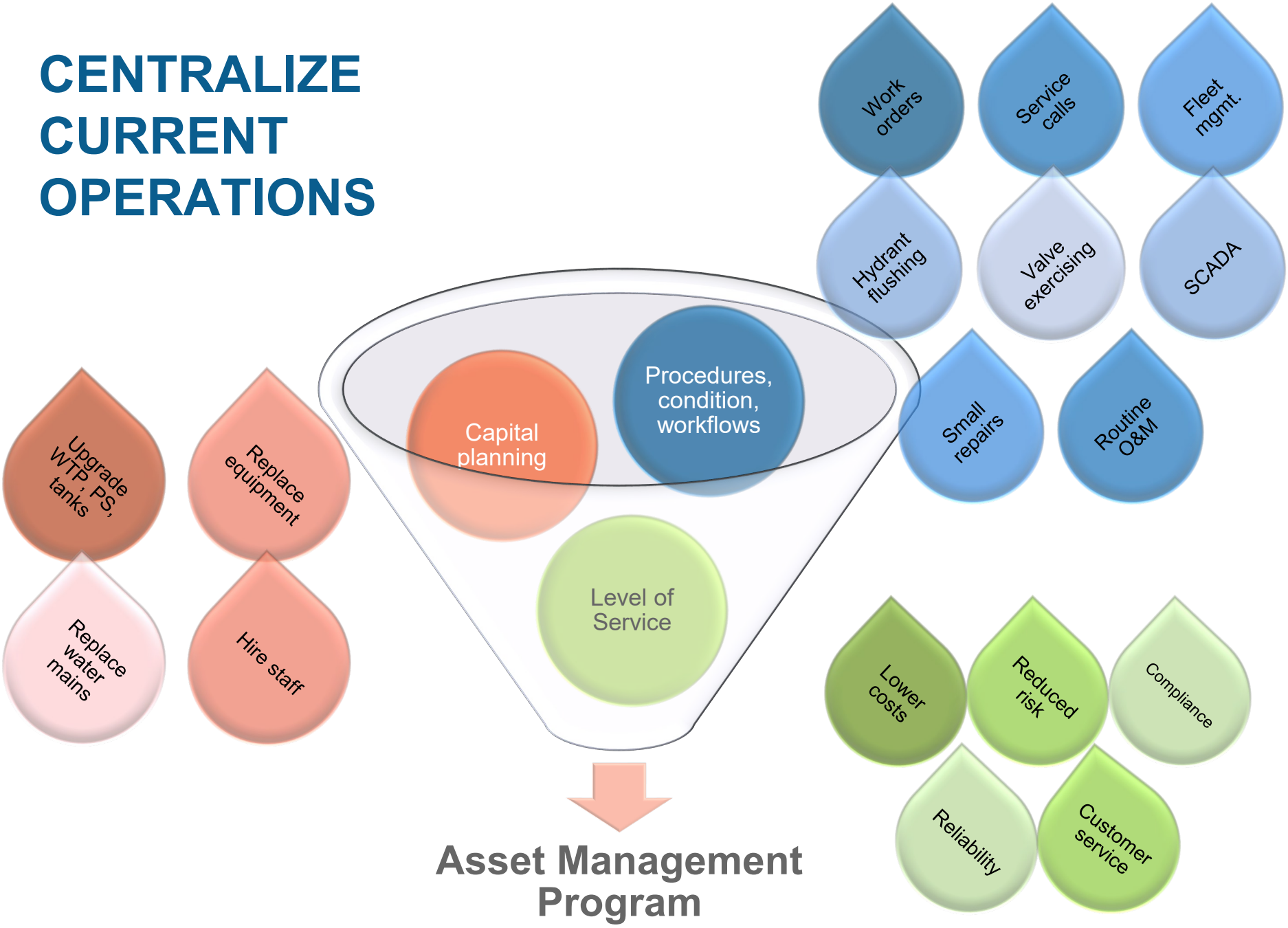
JEREMY DOWNS, P.E.
WESTFORD, MA ASSISTANT TOWN ENGINEER

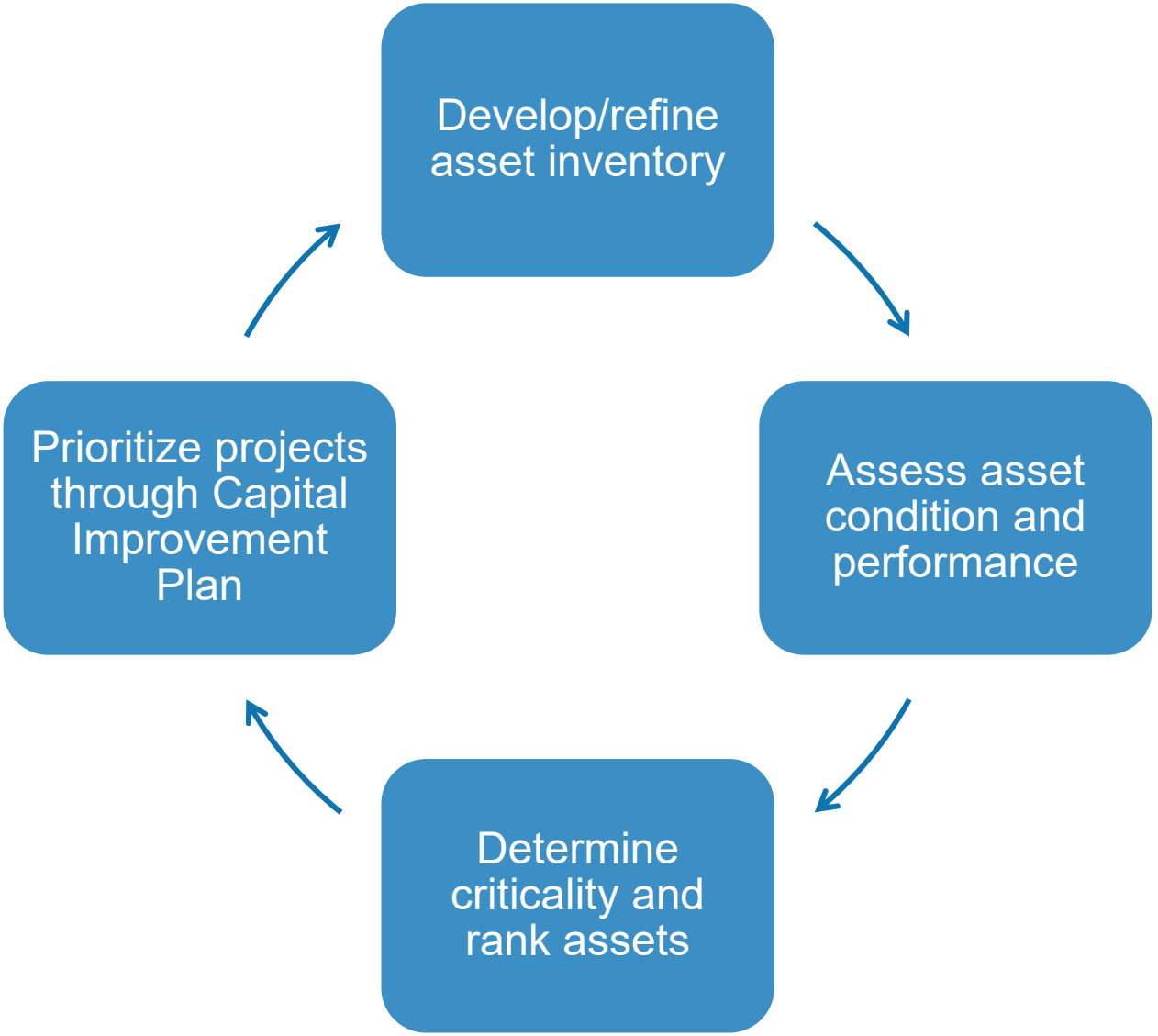
The asset management program enables the Town to **proactively plan** for the repair, maintenance, and replacement of critical infrastructure, rather than waiting for failures to occur. By having a structured plan in place, the Town can better prioritize projects, allocate funding more efficiently, and **reduce unexpected emergency costs**. The program helps **minimize risks** to public safety and service disruptions, supports long-term budgeting and capital planning, and **strengthens applications** for state and federal grant opportunities.

Investing in an asset management program allows the town to make **informed, data-driven decisions** about how to invest available funds in our infrastructure. It ensures that available resources are used effectively, helps **prioritize projects with the greatest benefit**, and provides a **clear plan for future investments**. Without this program, the Town would be making decisions with limited information, risking inefficient spending and missed opportunities to plan responsibly for the future.

CENTRALIZE CURRENT OPERATIONS



INCREASE EFFICIENCIES AT EACH STEP



DEVELOPING AN ASSET INVENTORY

What types of assets are in your system? How many and where?

- Vertical (WTP, pump stations, tanks)
- Horizontal (pipes, hydrants, valves, buried infrastructure)

One Centralized Database

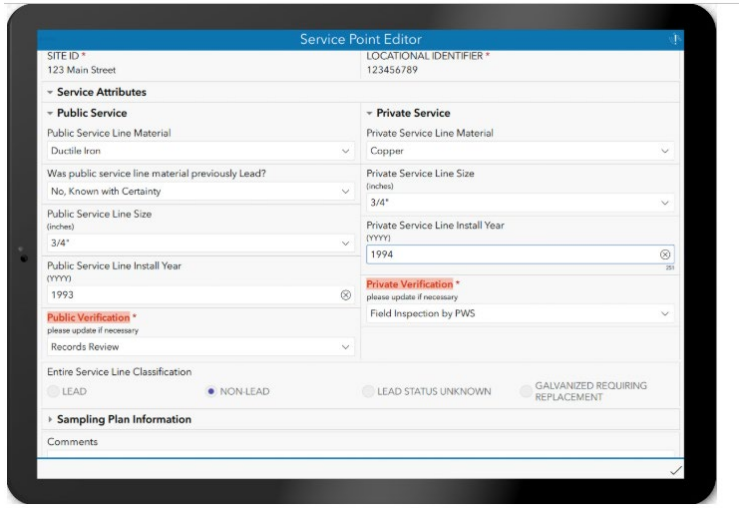
Include relevant historical information

Establish procedures to keep the data up to date!

LEVERAGING TECHNOLOGY

- Horizontal Assets: Digital Tools
  - Collect and manage data more efficiently with GIS
  - Convert tie cards to digital tables using AI

- Vertical Assets: 360 Capture
  - Supplement inventory of vertical assets
  - Accurate depiction of existing conditions
  - Future savings – use scans for design as well as asset management



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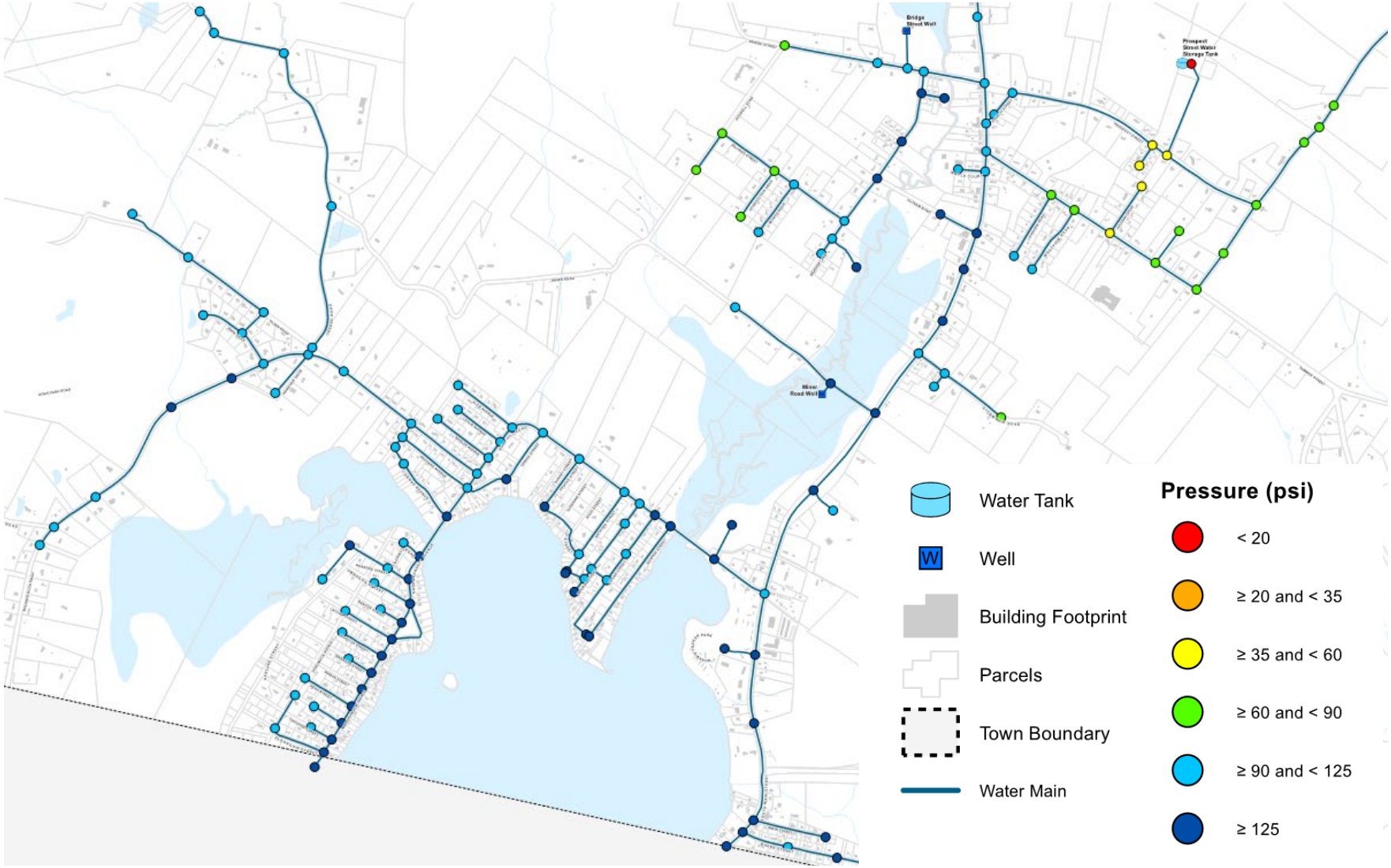
ASSESS CONDITION AND PERFORMANCE

Condition assessments	• Site visits for vertical infrastructure • Operator interviews • Distribution system, pumping, storage, and supply assessments
Data management improvements	• More efficient reporting, data collection, identification when problems arise • Improve in-house workflows
Technology and GIS tools	• Survey123 electronic field forms, Dashboards, and other digital tools to enhance day-to-day operations • Drones (aerial and underwater) can provide data for hard-to-reach areas

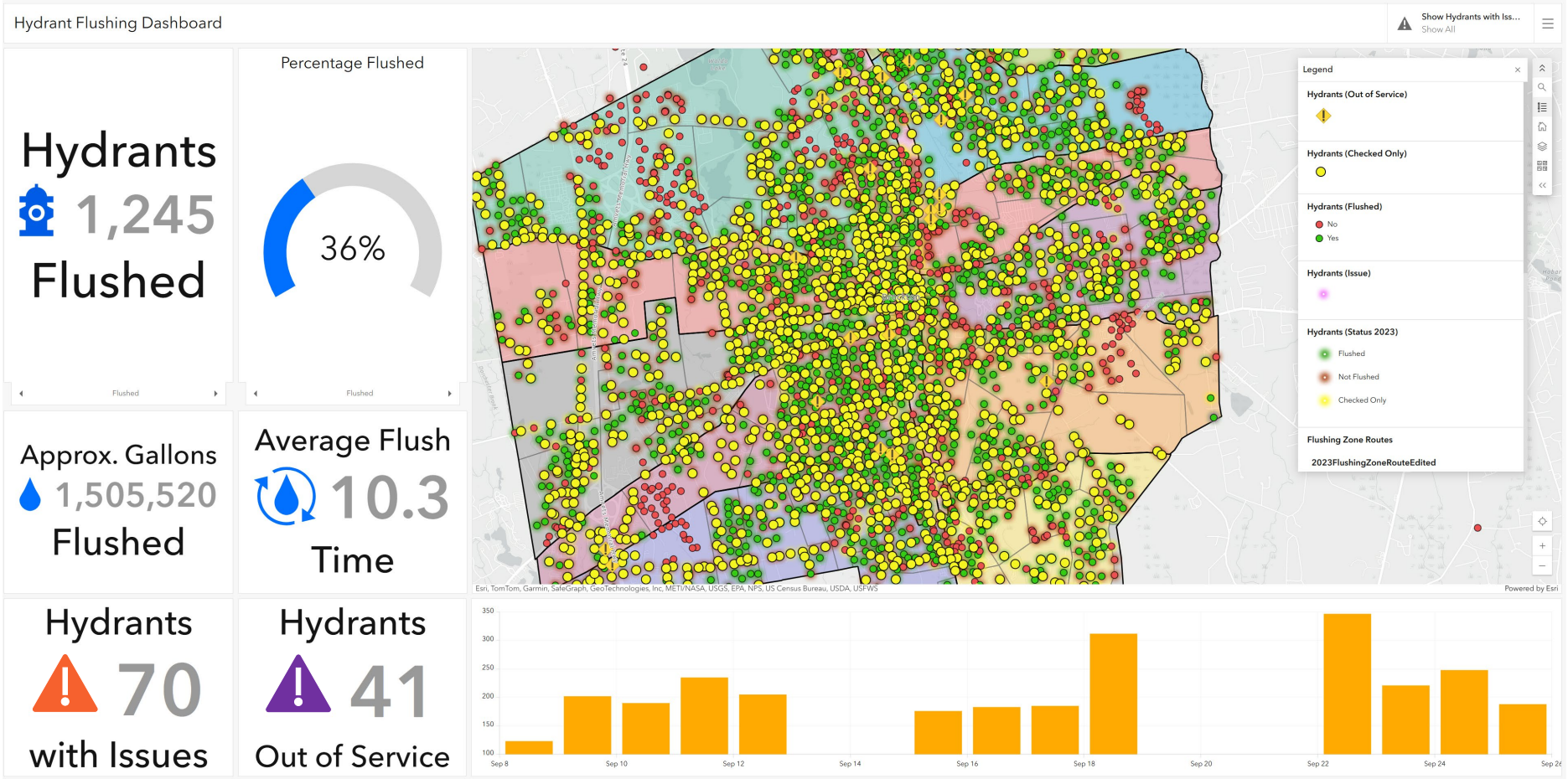
LEVERAGING TECHNOLOGY

Hydraulic Models



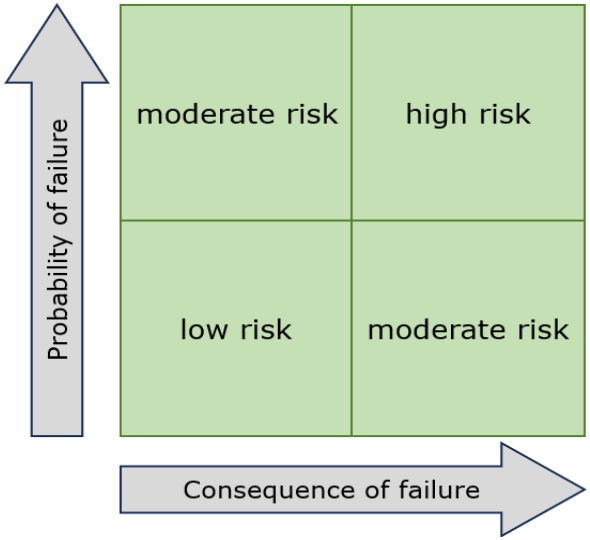
LEVERAGING TECHNOLOGY

GIS Dashboards



CRITICALITY AND RISK ANALYSIS

Assign a risk-based criticality score for each asset – how critical is it to the overall system?



Probability of Failure (PoF)

How likely is an asset to fail?

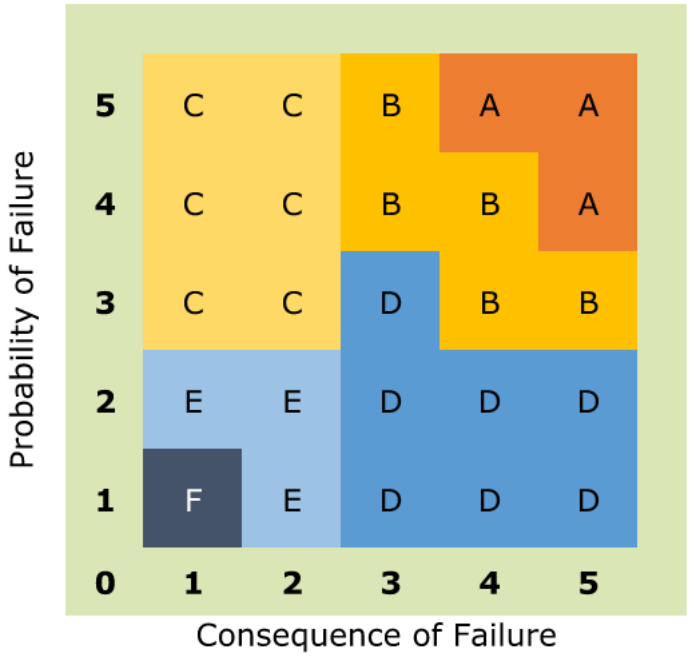
- Condition
- Age, remaining useful life
- Capacity, hydraulic deficiency
- Material, soil conditions
- Reliability
- Regulatory compliance
- Efficiency
- Resiliency adaptation

Consequence of Failure (CoF)

What is the impact if the asset fails?
What is the severity?

- Impacts to critical customers, environment
- Impacts to system operation, ability to maintain service
- Diameter
- Safety & health
- Cost of emergency repair
- Redundancy

CRITICALITY AND RISK ANALYSIS EXAMPLE



Asset Management Strategies

Strategy		
A	Critical Replace/Repair	**Highest risk**; requires immediate attention
B	Priority Replace/Repair	**High risk**; requires attention soon
C	Opportunistic Replace/Repair	**Medium risk**; requires monitoring
D	Priority Maintenance	**Medium risk**; requires maintenance
E	Routine/Preventative Maintenance	**Low risk**; requires routine O&M
F	Run to Failure	**Lowest risk**; no action needed

CRITICALITY AND RISK ANALYSIS EXAMPLE

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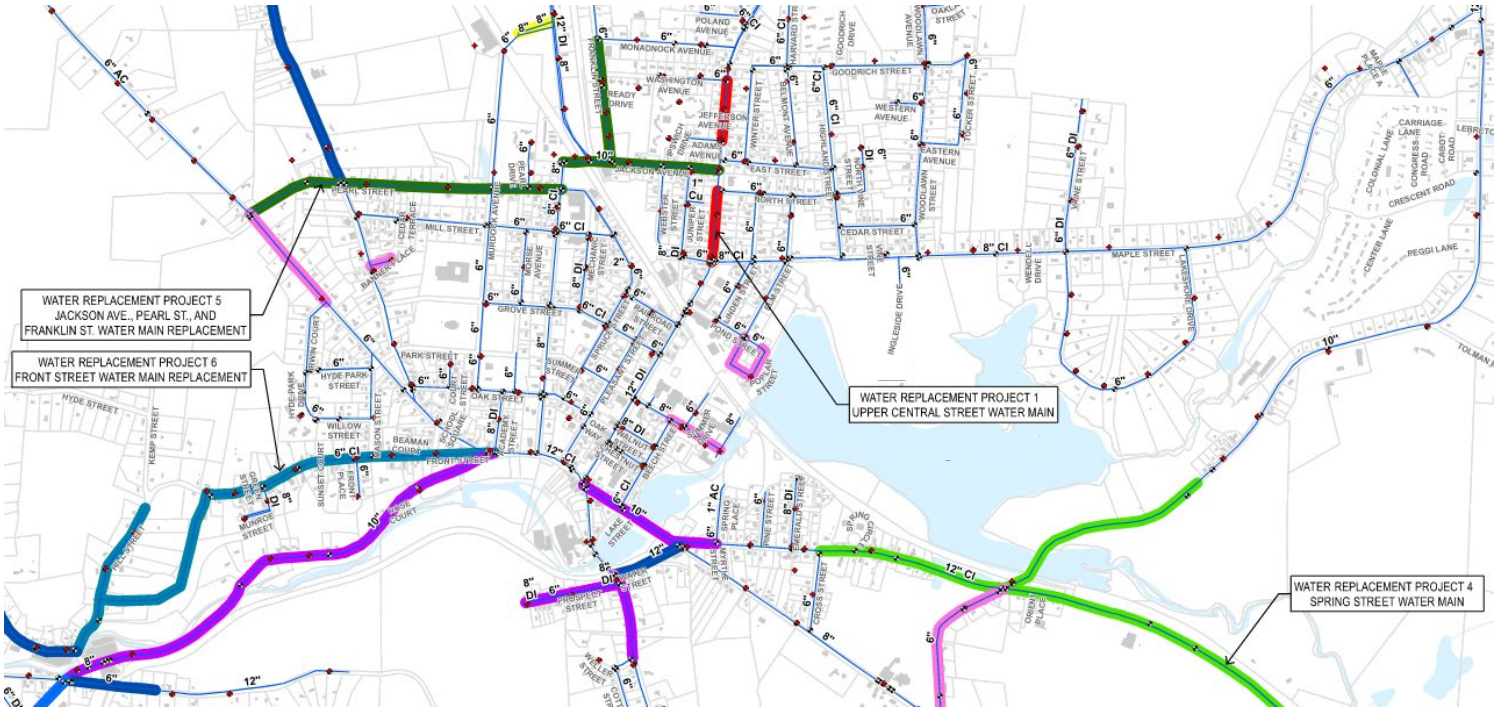
PRIORITIZING IMPROVEMENTS

- Criticality analysis informs a capital improvement plan (CIP) for priority projects
  - Include capital projects, O&M and daily operations, overall program management, etc.
  - Evaluate costs
  - Determine feasible timeline



PRIORITIZING IMPROVEMENTS

Comprehensive capital improvement plan for priority projects

Builds support and understanding for expenditures

Keep track of opportunistic upgrades

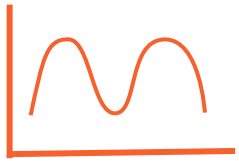
Revisit and update criticality and CIP regularly

RATE IMPACT EVALUATION

- Criticality analysis → CIP → impact on rates

Capital expenses are the biggest driver of rate increases

- Incorporate projects into rate model
  - Recover full cost of service
  - Distribute costs equitably
  - Provide revenue stability



- Identify potential shortfalls

SUPPLEMENTAL FUNDING OPPORTUNITIES

Low interest loans

- CT Drinking Water State Revolving Fund (DWSRF)
  - Small Loan Program for non-construction projects < $100k
- EPA Water Infrastructure Finance and Innovation Act (WIFIA)
- USDA Water & Waste Disposal Grant Program (WEP) (population < 10,000)

Grants

- Subsidies for Lead Service Line Replacement, Emerging Contaminant, disadvantaged community, etc.
- EPA Midsize and Large Drinking Water System Infrastructure Resilience and Sustainability Program (population > 10,000)
- WEP grant funds as available
- CT DEEP Climate Resilience Fund (DCRF)

RECAP

- Use technology strategically to improve workflows and enhance system analysis.
- Keep your data up to date!
- Asset management programs can centralize current practices, save time and money, support spending decisions, and help plan for the future.

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