



Form to Function: an Asset Management Approach

Erik Green

Asset Management Program
Manager, M.S.

AEC Forum 2025



Region – Greenville, South Carolina, USA

- Roughly Equidistant from Atlanta, GA and Charlotte, NC



Renewable Water Resources (ReWa)

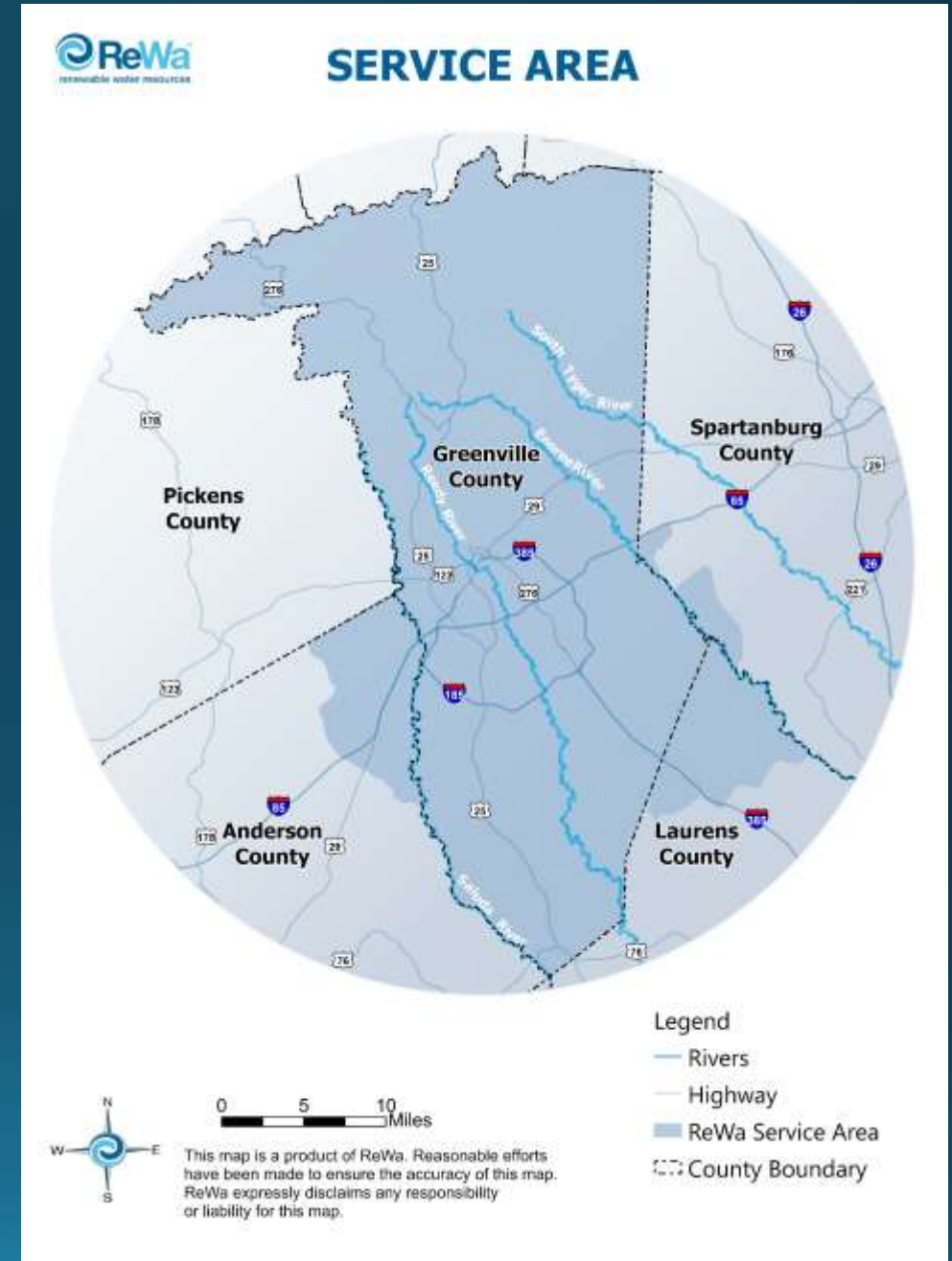
We serve over 162,000 customer accounts -

Residential, Commercial, Industrial

- Serving roughly 500k population in Greenville County
- Processing over 44 million gallons of wastewater a day (166m Liters)

Assets:

- 919 sq mi service area (238,020 Hectares)
- 84 Pump Stations
- 9 Water Resource Recovery Facilities
- 430+ miles of gravity and force mains (692 kilometers)



What is an asset?

Critical for safety & reliability

Replacement value >\$5K or is difficult to obtain

Estimated Useful Life (EUL) >1 year

Lowest hierarchy level where a WO is generated

Critical to maintain LoS (resource needs, what if disruptors? & pinch points?, spares?)

Critical to maintaining regulatory compliance

ReWa Asset Inventory

Vertical

- 9 WRRFs (Water Resource Recovery Facilities)
 - WRRF Assets – 13,855
- 84 Pump Stations
 - PS Assets – 3,000
- 8 Other Operational Facilities
 - Other Facility Assets – 680

Horizontal

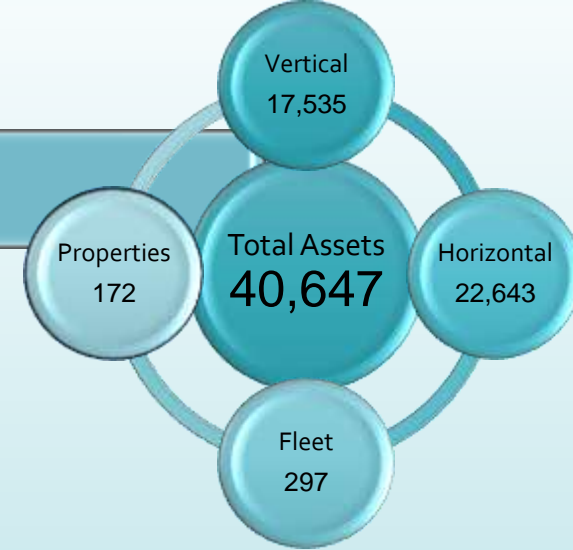
- Gravity Main Segments – 10,535 (384mi)
- Manholes – 10,052
- Force Main Segments – 1,202 (125 Km)
- Air Release Valves (ARV) – 196
- Isolation Valves (IVs) - 6
- Flow Meters – 154

Fleet

- Equipment – 133
- Vehicles – 100
- Trailers – 64

Property

- *172 ReWa-Owned Properties – 1,880.4 acres, includes 124.3 acres of Protected Wetlands
- Storm Water – 3 Plants have been mapped
 - Line segments - 263
 - Structures – 33
 - Devices – 202



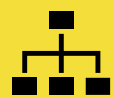
Note: All number counts listed are assets unless otherwise noted by asterisk



GIS is more than just mapping – it's a foundational tool for asset intelligence.



Moving from static records to functional, decision-driving systems.



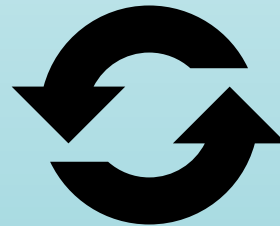
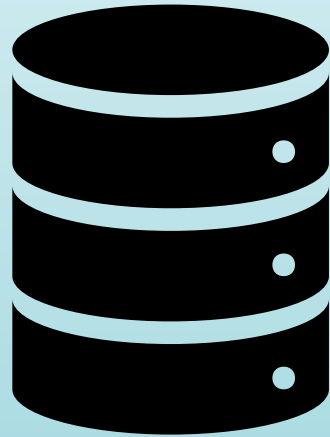
Understanding how GIS integrates with asset management workflows.

Introduction

GIS Centric Approach to Asset Management



Cityworks
Database
Work Activity



Geodatabase
With Spatial
Asset Data

CMMS is GIS Centric – Uses GIS Information

The screenshot displays the Cityworks CMMS interface. At the top, the 'Cityworks' logo is visible. Below it, a navigation bar includes 'Inbox', 'Inspection', 'Service Request', 'Work Order', 'Permit Create', 'View Reports', and 'Storeroom'. A secondary bar contains 'Create', 'Search', 'Create', 'Search', and 'Select' buttons.

The main interface is divided into two panels:

- Feature / Object Selection:** A hierarchical tree view showing the structure of assets. The tree is expanded to show 'WRRF (1)' > 'Georges Creek' > 'Process (15)' > 'Subprocess (6)' > 'Instrumentation and Control' > 'Component (2)' > 'PLCs' > 'PLC (1)' > 'PLC 1'. The 'PLC 1' item is selected and highlighted in blue.
- Feature / Object Field Values:** A table displaying the metadata for the selected 'PLC 1' asset.

Field	Value
OBJECTID	11
Asset ID	GEOR-PLC-003
Asset Name	PLC 1
Asset Class	Instrumentation
Asset Type	PLC
Component ID	GEOR-018-142-491
Operational Status	Operational
Lifecycle Status	In Service
Business Risk Exposure	
Consequence of Failure	5
Age	6.80821918

An 'Open' button is located at the bottom of the table.

Work Order

Details

Description
FACILITY HVAC Contract...
Number
250616
Sid
250616

Entity Type
HVAC
Category
Reactive-Asset Failed/Ca...

Change

Initiated By
PRITCHETT, JOSH
Date Initiated
Jul 07, 2025, 12:00 PM

Status
03 In Progress
Priority
5-Issues requiring imme...

Requested By

Supervisor
STEPHENS, JAY

Submit To
STEPHENS, JAY
Submit Date
Jul 07, 2025, 12:00 PM

Opened By
STEPHENS, JAY
Open Date
Jul 16, 2025, 9:31 AM

Projected Start
Jul 07, 2025, 12:00 PM
Projected Finish
Jul 14, 2025, 12:00 PM

Project

Account

Contract

Contractor
Waldrop Mechanical Ser...

Legal Billable
 Contractor Billable
 Update map layers

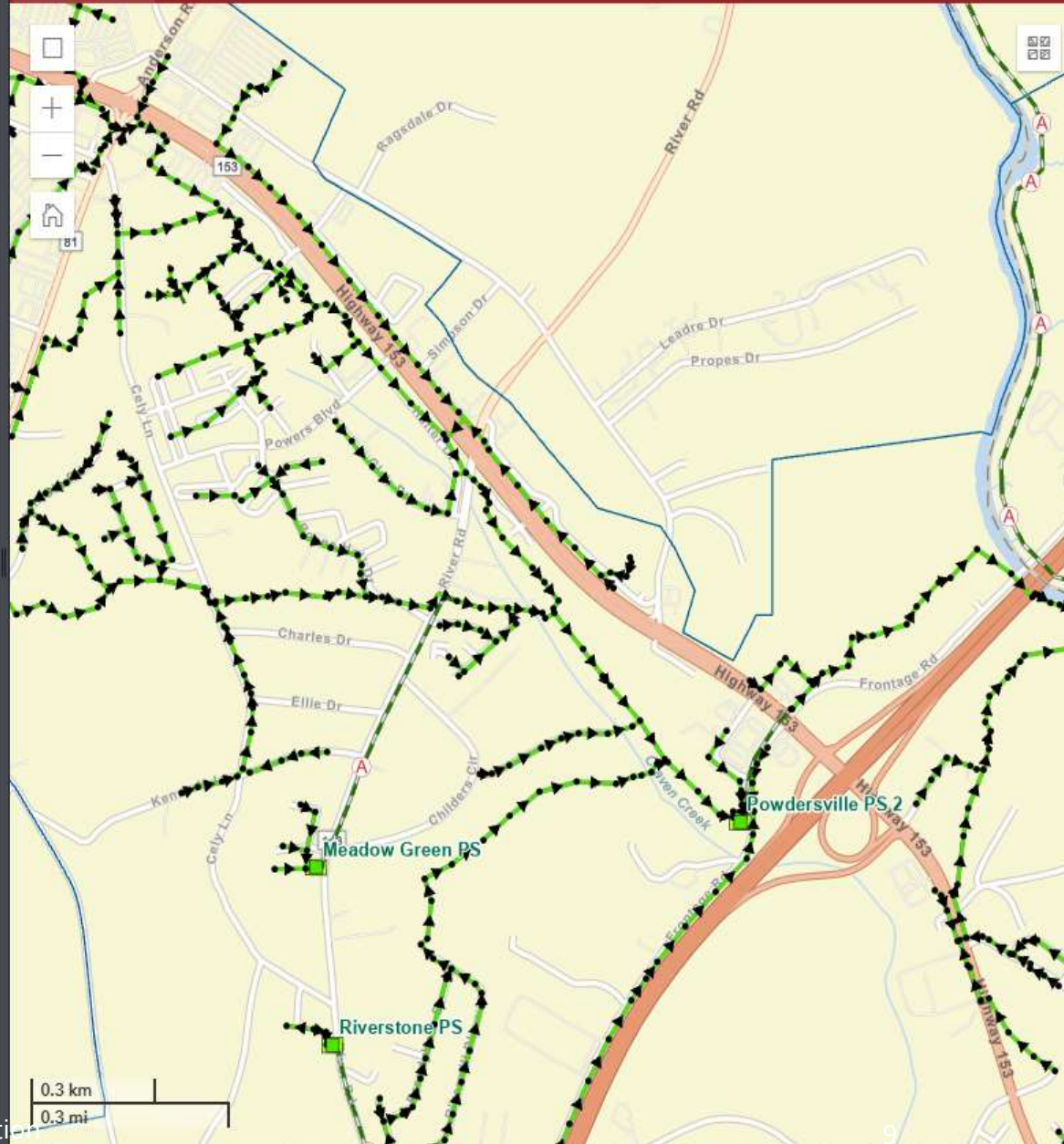
Cancel

Units Accomplished
0
Description

Budget

Lock Units Description

Labor Cost
\$0.00
Material Cost
\$0.00



September 12, 2025

Name of Presentation



VISUALIZE AND INVENTORY ALL
ASSET TYPES GEOGRAPHICALLY
OR VERTICALLY



SUPPORT CONDITION
ASSESSMENT, LIFECYCLE
PLANNING, AND FIELD
OPERATIONS



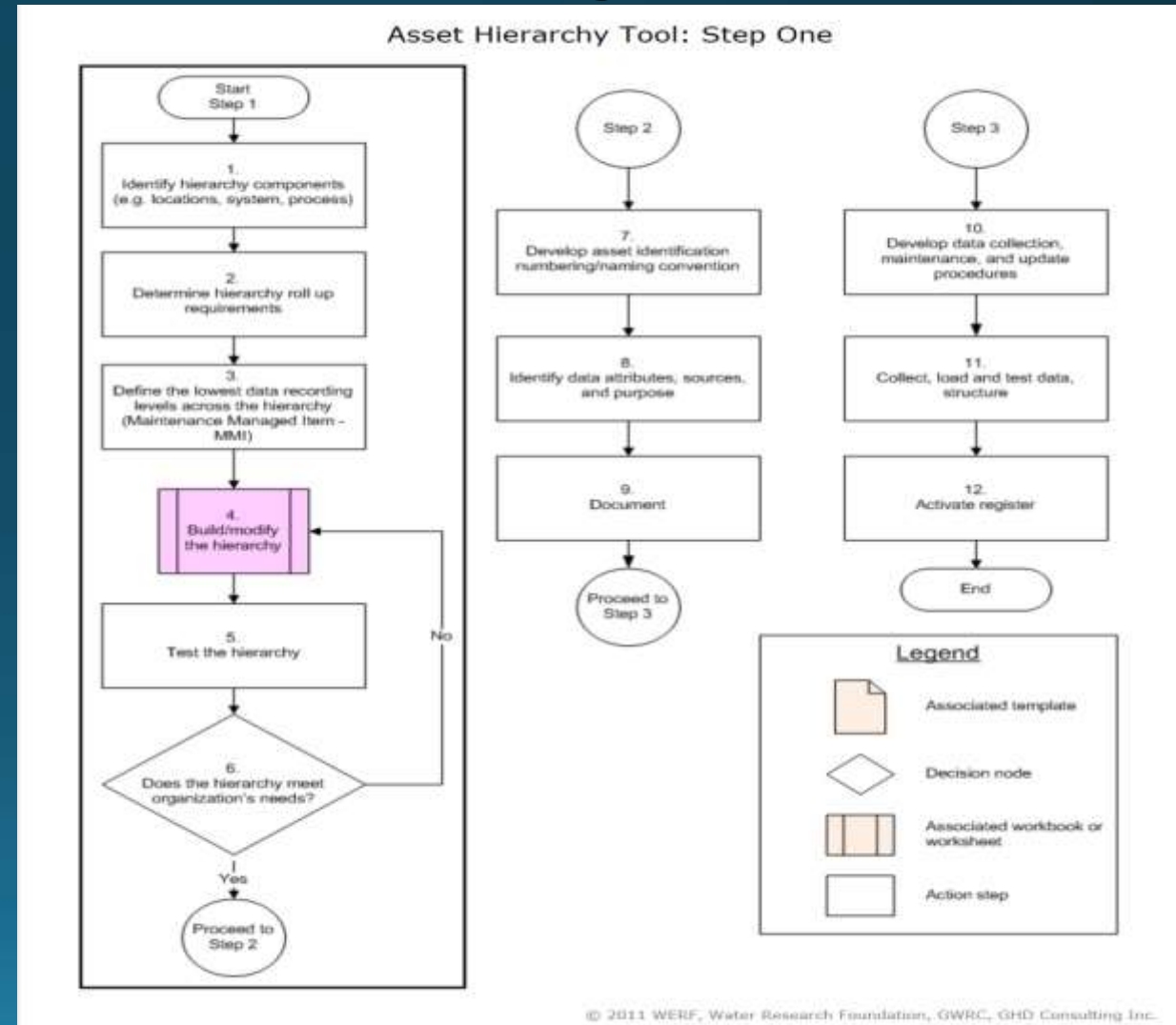
ENABLE LOCATION-AWARE RISK
ANALYSIS AND INVESTMENT
PRIORITIZATION

The Role of GIS in Asset Management

Vertical Assets - Development of our Asset Hierarchy

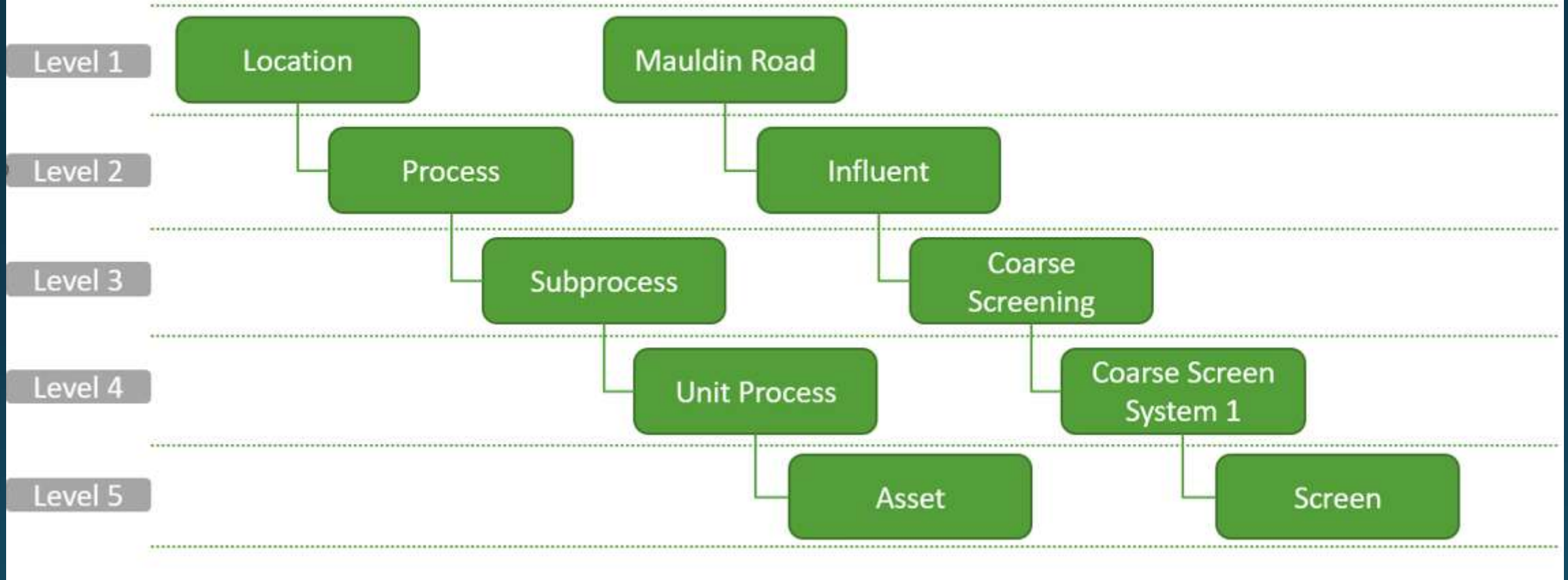
WERF SIMPLE

- Developing and managing the Asset Inventory
- Underlies all other aspects of asset management
- **What do we consider an Asset?**
- Inventory the assets in GIS and setup in Cityworks
 - Where Are My Assets?
 - What Condition are they in?
 - How well are they performing?
 - How do I prioritize this work?
 - Where are the most CRITICAL sets?



Asset Hierarchy Development

Typical Hierarchy Organization



From Form to Function



FORM: TRADITIONAL GIS AS
DIGITAL PAPER MAPS.



FUNCTION: INTERACTIVE
DASHBOARDS, LIVE SYSTEM
INTEGRATION, AND MOBILE
DATA COLLECTION.



USING GIS DATA TO DRIVE
MAINTENANCE, CIP PLANNING,
AND EMERGENCY RESPONSE.

AssetType

All

Asset Risk Matrix Evaluation

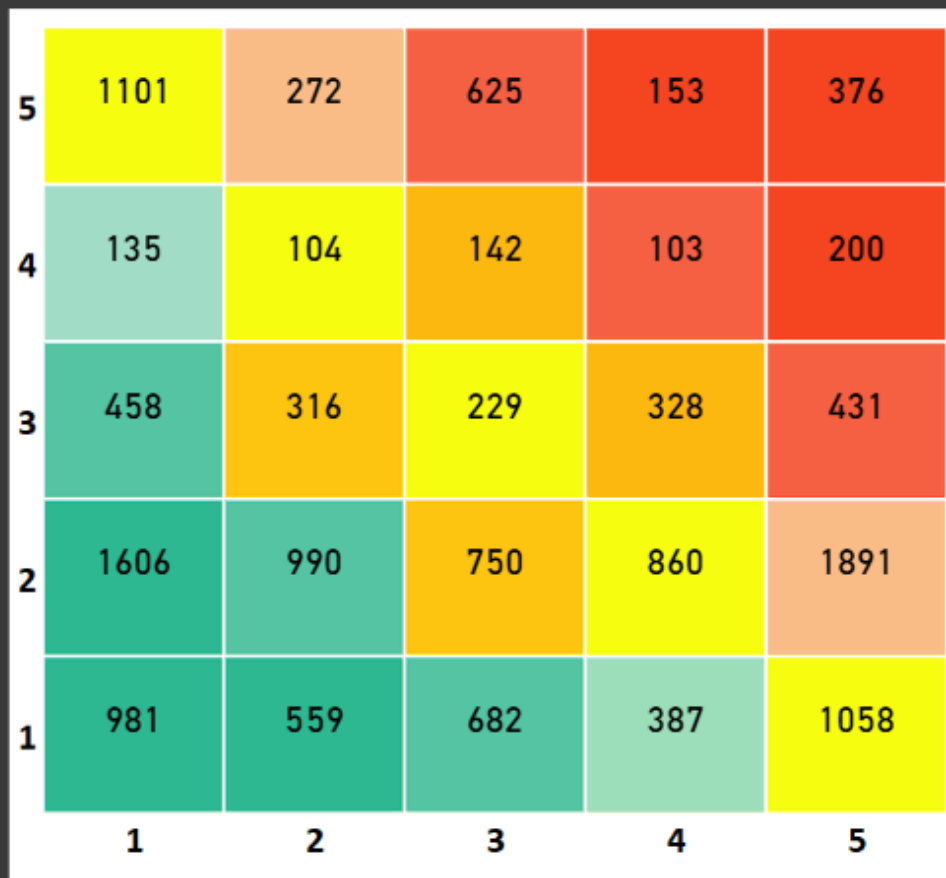
COF

All

POF

All

Asset Risk Matrix

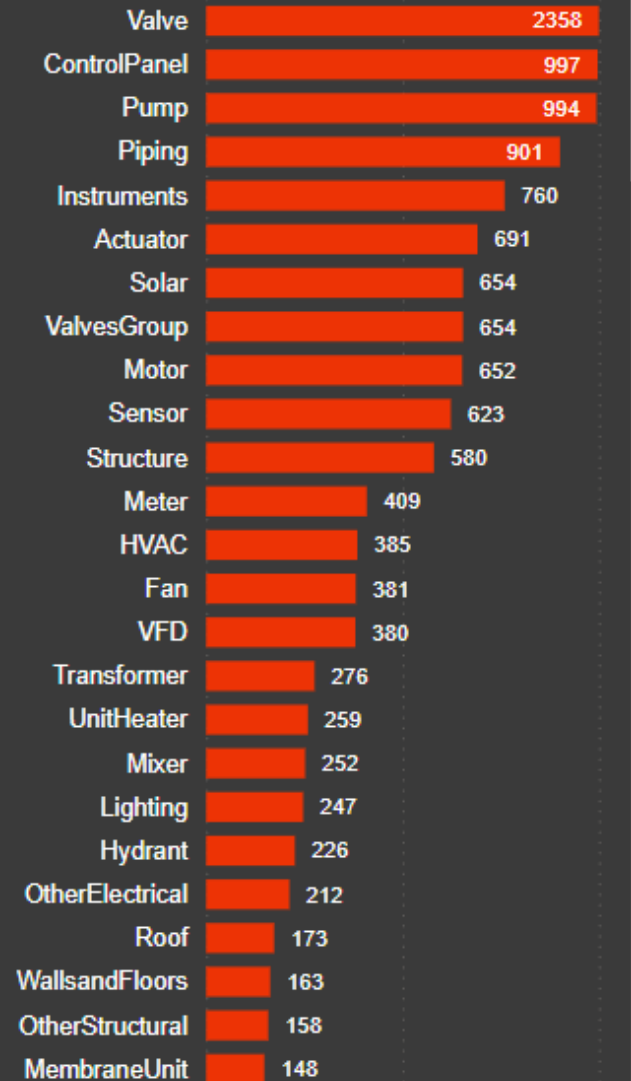


Low

C.O.F

High

of Asset Types



Name of Presentation

0

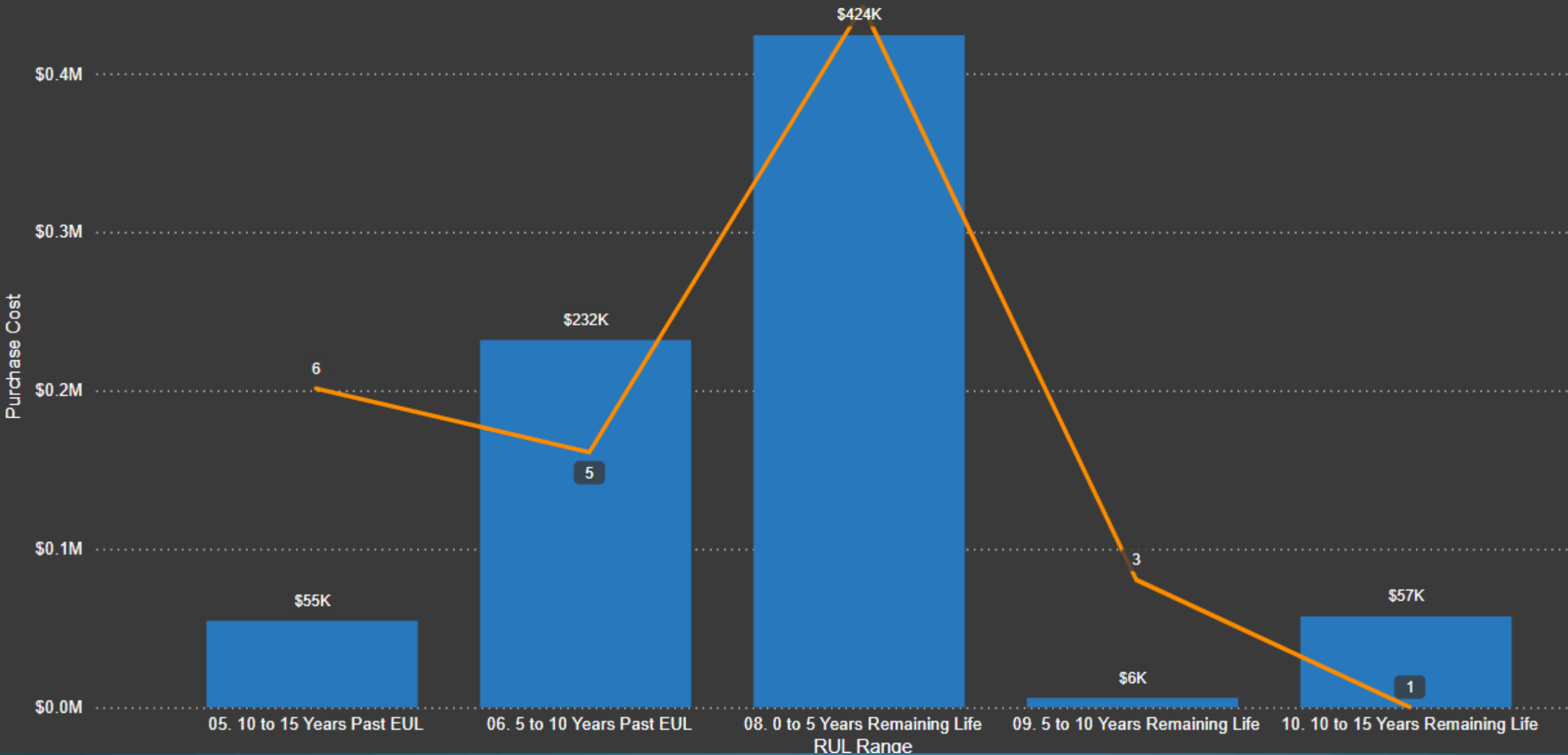
500

1,000

# Assets	AssetID	COF	POF	BRE
32	BLANK			
1	101-ATS-001	2.00	1.00	2.00
1	101-ELO-001			
1	101-ENC-001	2.00	3.00	6.00
1	101-FEN-001	1.00	2.00	2.00
1	101-GEN-001	3.00	2.00	6.00
1	101-LEC-001	2.00	2.00	4.00
1	101-LIG-001	1.00	5.00	5.00
1	101-LWN-001			
1	101-MOT-001	2.00	2.00	4.00
1	101-MOT-002	2.00	4.00	8.00
1	101-MSC-001	2.00	0.00	0.00
1	101-PIP-001	2.00	2.00	4.00
1	101-PMC-001	2.00	5.00	10.00
1	101-PMP-001	2.00	1.00	2.00
1	101-PMP-002	2.00	1.00	2.00
1	101-RDS-001	1.00	2.00	2.00
1	101-SEO-001			
1	101-STA-001	2.00	5.00	10.00
1	101-STA-002	2.00	2.00	4.00
1	101-STR-001	2.00	2.00	4.00
1	101-V4L-001			
1	101-VAL-001	2.00	3.00	6.00
1	101-VAL-002	2.00	2.00	4.00
1	102-ACT-001		2.00	2.00
1	102-ATS-001	1.00	2.00	2.00
1	102-CMP-001	1.00	2.00	2.00
1	102-CMP-002	1.00	2.00	2.00
1	102-ELO-001			
1	102-FAN-001	1.00	2.00	2.00
1	102-FEN-001	1.00	4.00	4.00
1	102-LCP-001	1.00	1.00	1.00
17531				

of Assets & Cost (Only includes assets with purchase cost)

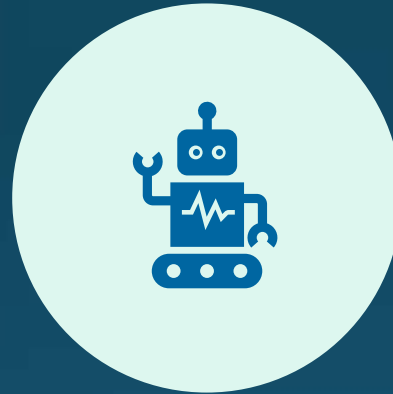
● Purchase Cost ● AssetID Count with Cost



Looking Forward



INTEGRATING AI AND MACHINE
LEARNING WITH GIS FOR
PREDICTIVE ANALYTICS.



USING DIGITAL TWINS AND 3D GIS
TO SIMULATE ASSET BEHAVIOR.



DRIVING ENTERPRISE DECISION-
MAKING WITH SPATIAL
INTELLIGENCE.

Thank You

