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PNCWA Webinar

Computerized Maintenance Management Systems (CMMS) Benefits to Smaller Agencies

January, 2015

Presentation Outline

- Introduction – Jeremy Coles
- What is a CMMS – Brown and Caldwell (BC)
- How can a CMMS help my utility – (BC)
  - Manage information about your assets
  - Manage work information and history
  - Track customer complaints
- How can a CMMS help my utility – (BC)
  - Case Study – Santa Barbara
- Case Study – Tony Bisson, Clark Regional WWD (WA)
- What does a utility need to get started? – BC
- Q&A – Jeremy Coles

Our assets – their ownership and care

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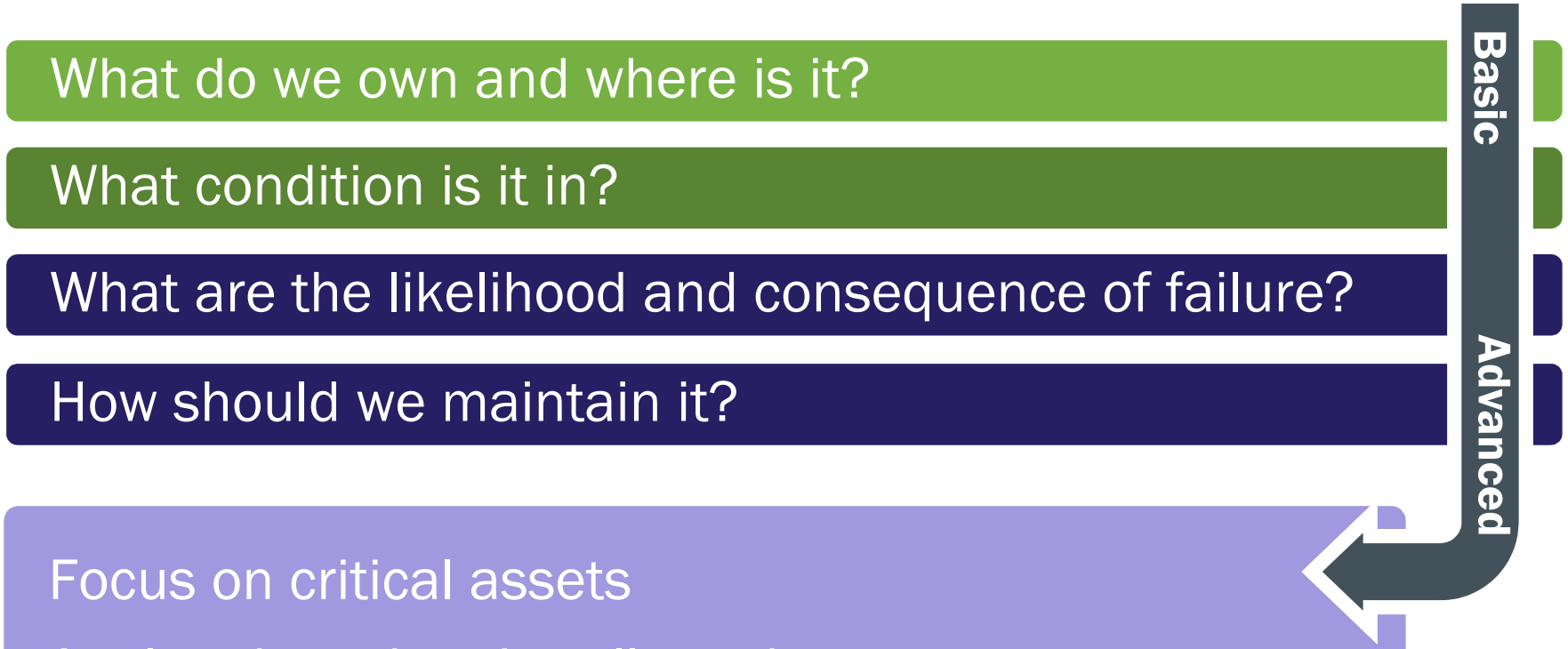
Agency assets – what we all would like to know…..



Focus on critical assets

Analyze how data is collected

Work Orders (WO's) go to prioritized assets

Better updates for financial forecasting (and rates)

Why is AM important?.....without it the owner could be:

Not saving enough $$ for maintenance

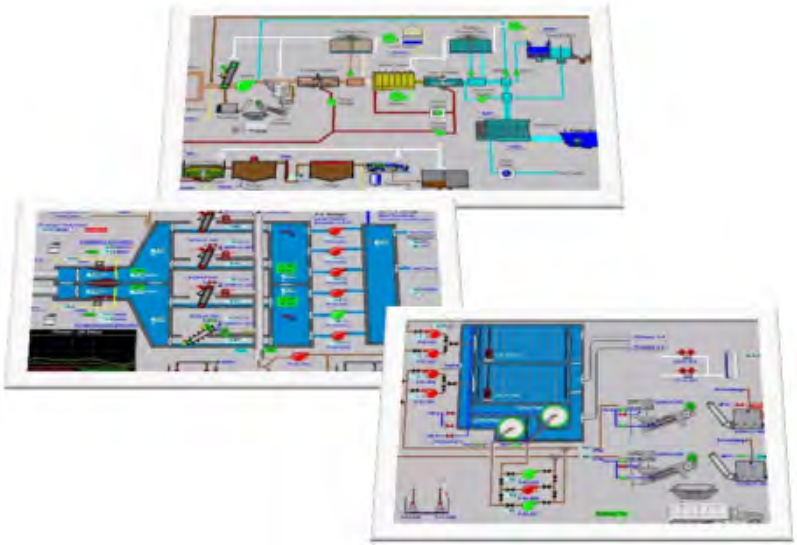
Putting level of service (LOS) at risk (e.g. boil notice)

Not have enough $$ for replacements

Operating inefficiently

Over/under-charging rate-payers

Data – best to store and manage asset information somewhere other than our heads…..



Goals (Purpose) for AM Program

From "Effective Utility Management, a Primer for Water and Wastewater Utilities"

- Operational optimization – timely, cost-effective, reliable operations (efficient work, right time)

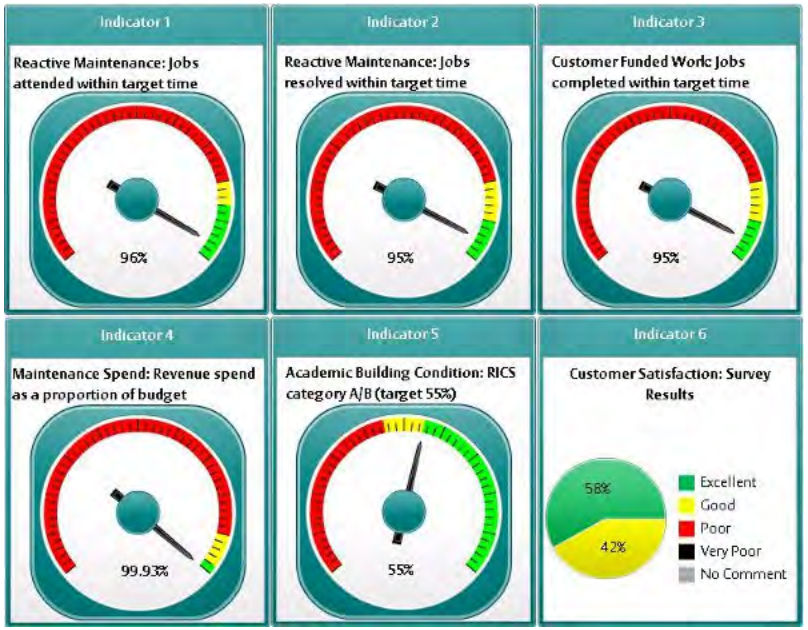
- Infrastructure stability – High service level, low cost, reliable/low risk water delivery

- Measurement and continuous improvement

What is a CMMS system?

A software package designed to manage high volumes of asset information

- Data Driven
  - Houses the asset register
  - Detailed information about an agencies assets (size, HP, condition etc.)
  - Schedule and history of the work performed on those assets



Goals are to better manage our utilities – where does the CMMS fit in?

Five fundamental areas to a well run utility:

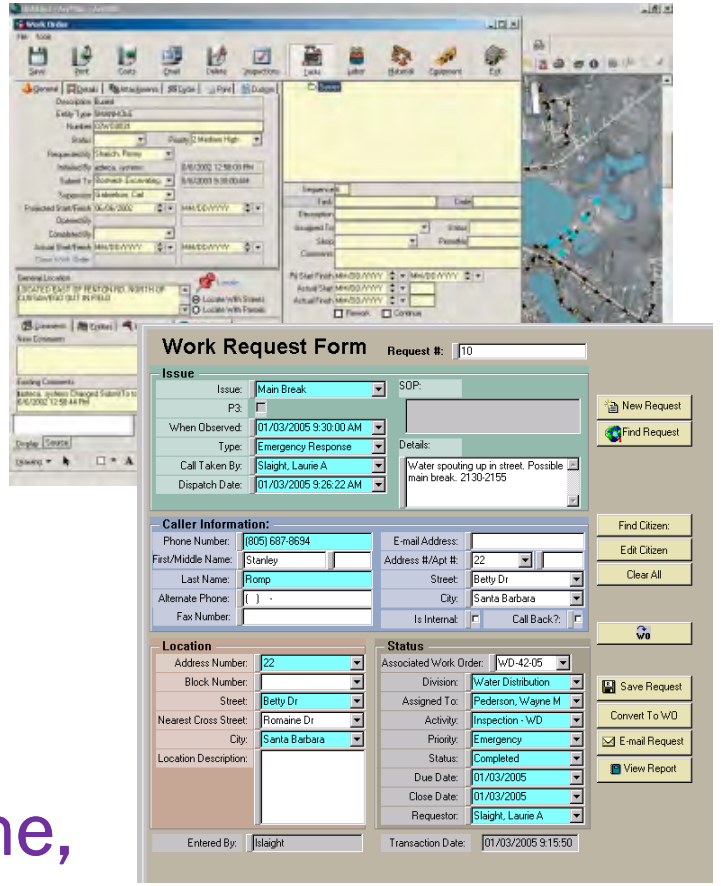
1. Agency policies and procedures
2. Equipment data
3. Work order control
4. Preventative maintenance practices
5. Materials control

CMMS systems strongly support these

CMMS systems - manage the detail of both assets and the work performed

The "What and When"

- Detailed asset inventory
- Maintenance history
- Maintenance and budget planning tool
- Generates reports
- Dynamic/transactional
- What you own, what you've done, what you have to do



How can a CMMS help my utility?

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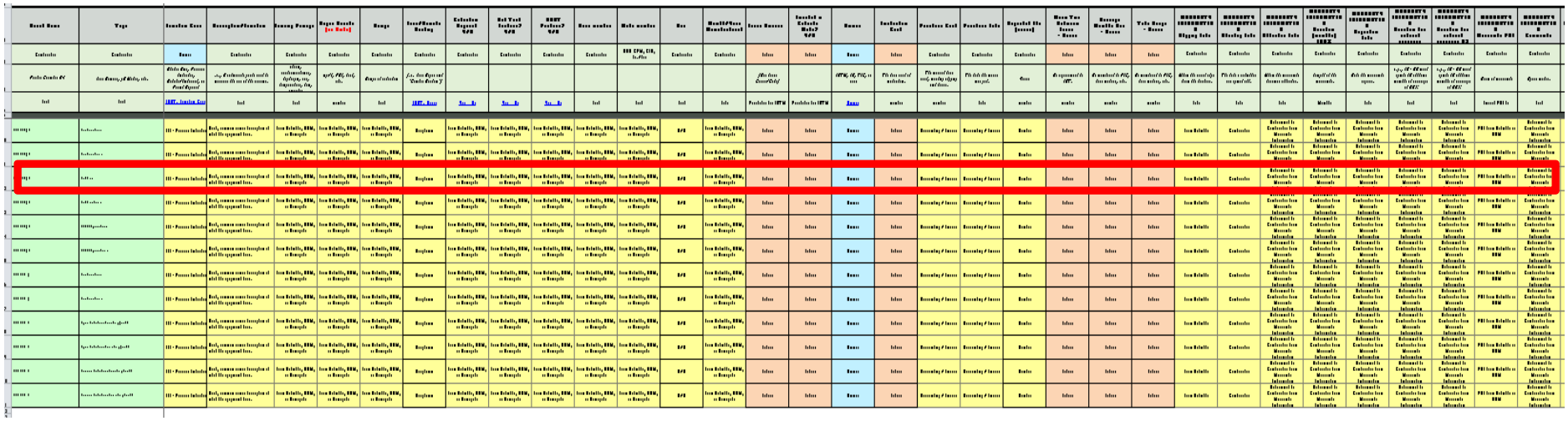
Even the smallest agencies can have thousands of assets worth hundreds of millions of $$$



"RAW-02-VTP-101-M"

400HP Motor 1 – Vertical Turbine Pump

Each individual asset has it's own set of detailed information

- Asset ID
- Asset Name
- Type
- Description/Function
- Design Type
- Design Voltage
- Phase
- Rated AMPs
- HP
- Watt/KW
- RPM
- Service Factor
- Efficiency
- Power Factor
- Thermal Protection Y/N
- Ambient Temperature (Max.)
- Design Code
- NEMA Insulation Class
- Frame number
- Drive End Bearing #
- Non Drive End Bearing #
- Serial number
- Model number
- Size
- Frame number
- Month/Year Manufactured
- Failure Analysis
- Included in Criticality Model? Y/N
- Drive End Bearing Bearing manufacturer
- Drive End Bearing Bearing number
- Opposite Drive End Bearing Bearing manufacturer
- Opposite Drive End Bearing Bearing number
- Owner
- Installation Cost
- Purchase Cost
- Purchase date
- Expected life (years)
- Mean Time Between Failure - Hours
- Average Monthly Use - Hours
- Total Usage - Hours

HP, Voltage, RPM

Serial Number, Model Number, Year made

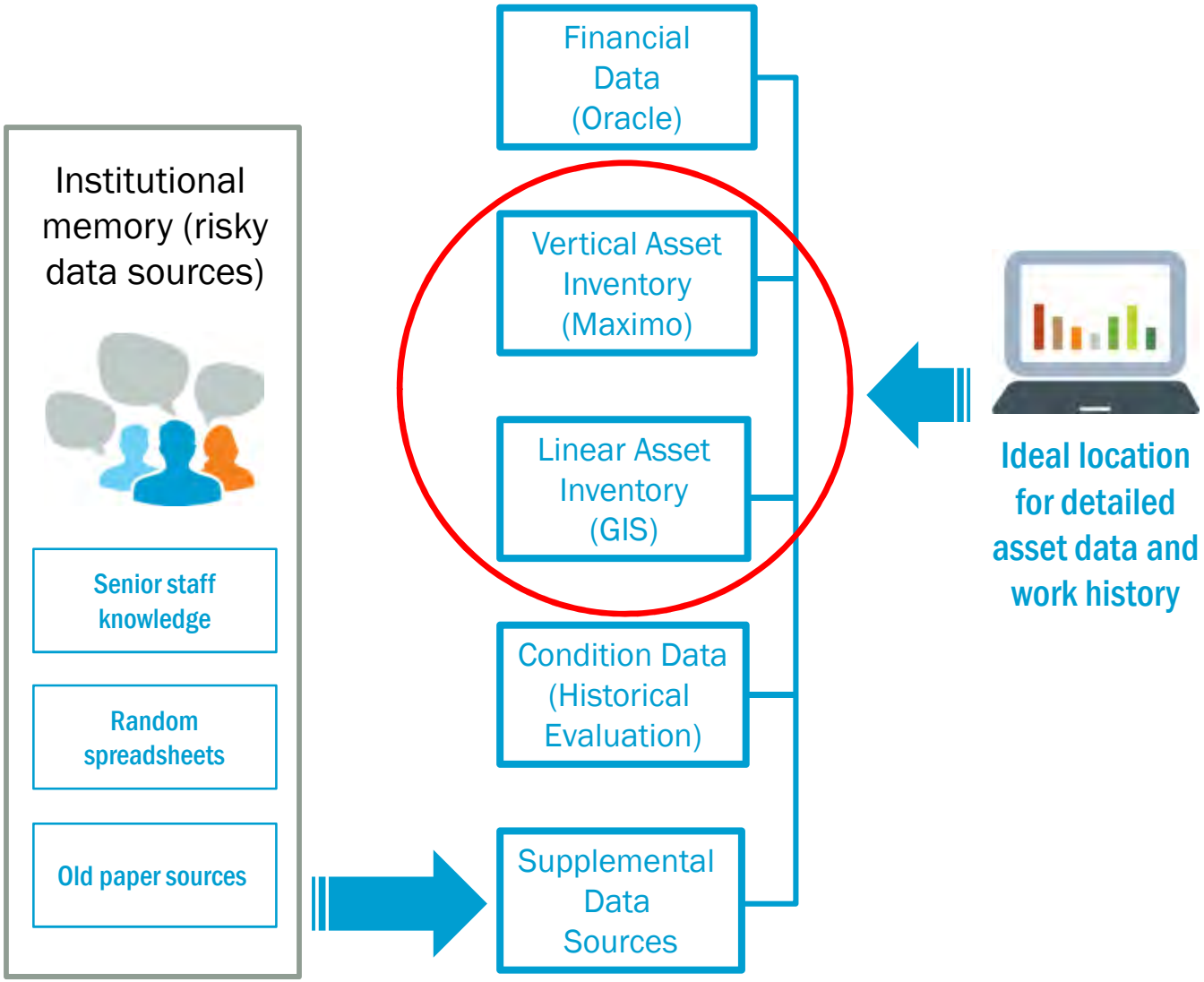
Purchase Cost, Date and Expected Life & Owner!

- WARRANTY INFORMATION Shipping date
- WARRANTY INFORMATION Startup date
- WARRANTY INFORMATION Effective date
- WARRANTY INFORMATION Duration (months) 100%
- WARRANTY INFORMATION Expiration date
- WARRANTY INFORMATION Duration for reduced coverage
- WARRANTY INFORMATION Duration for reduced coverage #2
- WARRANTY INFORMATION (Warranty PDF)
- WARRANTY INFORMATION Comments
- LOCATION INFORMATION Address
- LOCATION INFORMATION City, ST, Zip
- LOCATION INFORMATION Location
- LOCATION INFORMATION Area #
- LOCATION INFORMATION Sub - Area
- LOCATION INFORMATION Room
- LOCATION INFORMATION Level
- LOCATION INFORMATION Direction
- LOCATION INFORMATION GPS - Latitude
- LOCATION INFORMATION GPS - Longitude
- MANUFACTURER
- MANUFACTURER Address
- MANUFACTURER City, ST, Zip
- MANUFACTURER Phone #
- MANUFACTURER Fax #
- MANUFACTURER email
- MANUFACTURER Web site
- VENDOR
- VENDOR Address
- VENDOR City, ST, Zip
- VENDOR Phone #
- VENDOR Fax #
- VENDOR email
- VENDOR Web site
- Notes

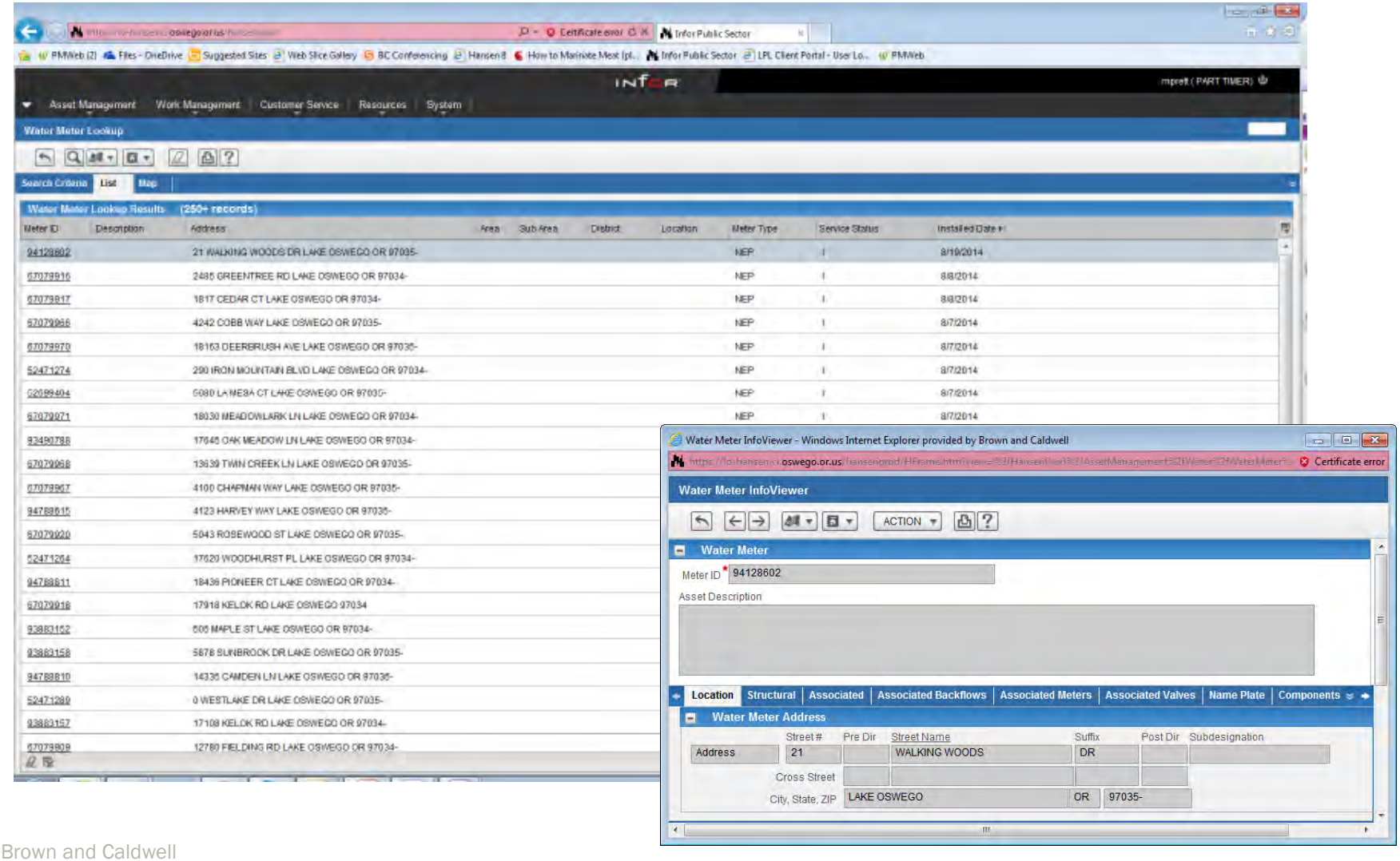
Warranty Information – Effective Date, Expiration Date

Manufacturer & Vendor Information

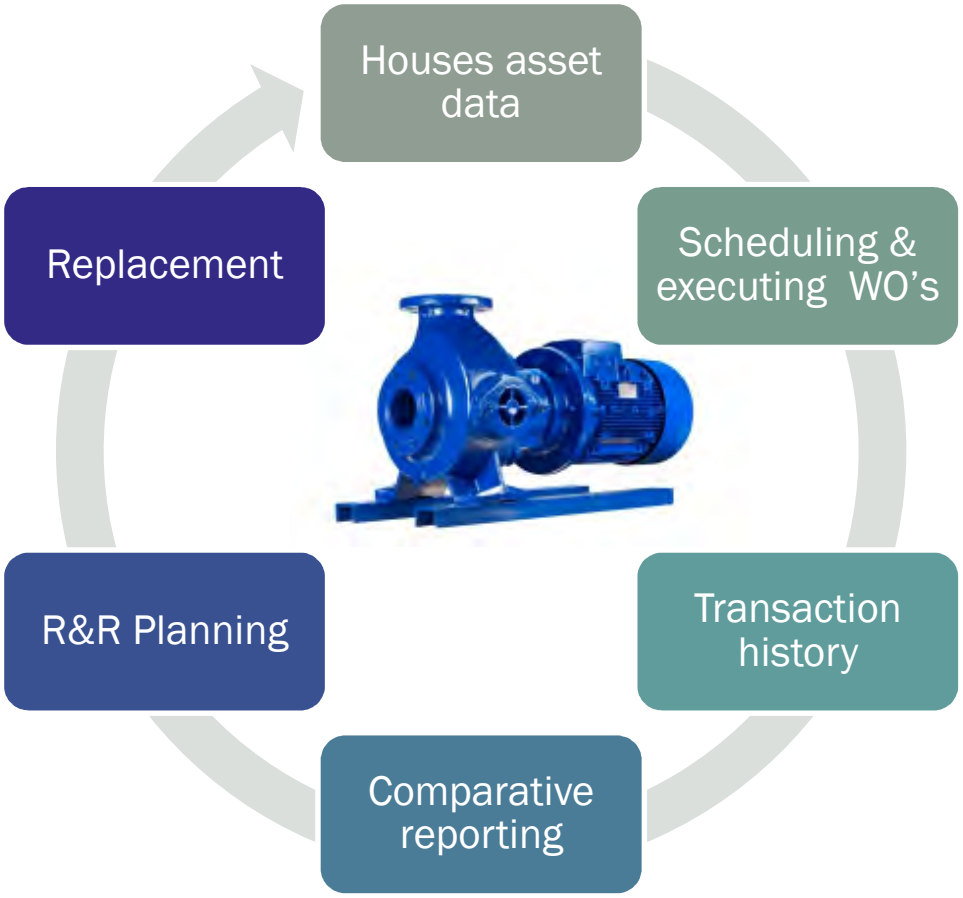
All of that asset information can live in many different places…..(or not be captured at all)

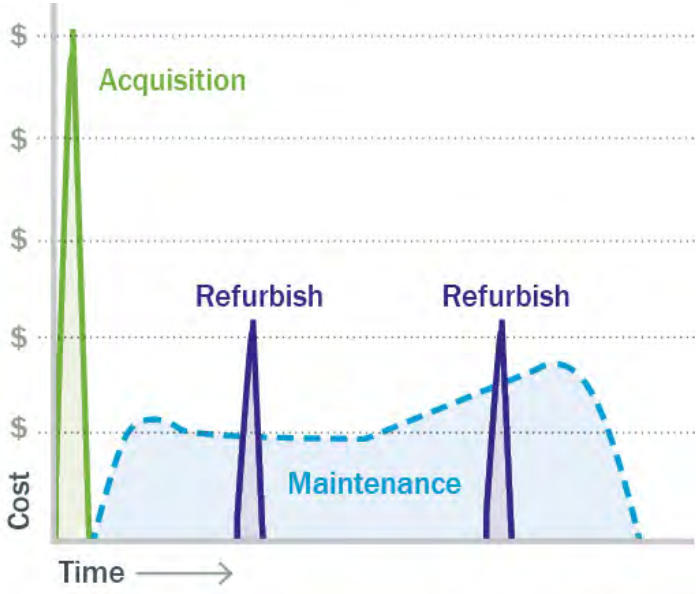


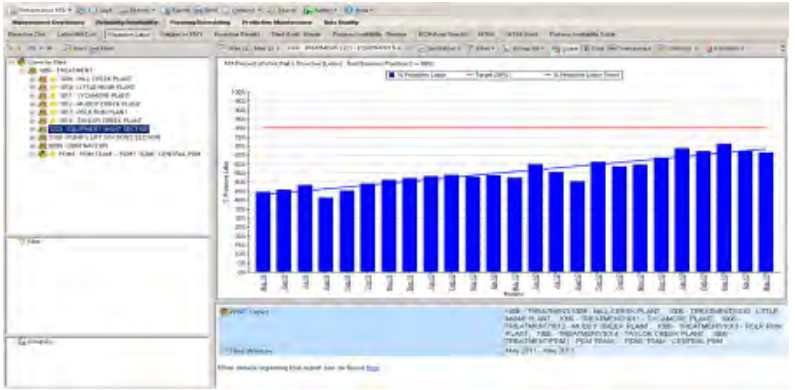
CMMS systems provide a clean & standardized platform for information management



CMMS can track the full life of each asset and report on it (and across all assets)







If my CMMS was fully populated with asset and work information benefits can include…

streamline and focus work management

systematically prioritize work and record work history

Can report across groups of assets

Easier to find information gaps

Good data to other systems (e.g. financial or HR/staffing

Maintenance work

Scheduling, completing, tracking and reporting

Prioritizing, managing and reporting on work can be tough to track

CMMS systems help organize work management (and show trends)

- Preventative Maintenance (PM's)
- Corrective Maintenance (CM's)
- Predictive Maintenance (PDM's)
- Emergencies (out of service/shut-downs etc.)

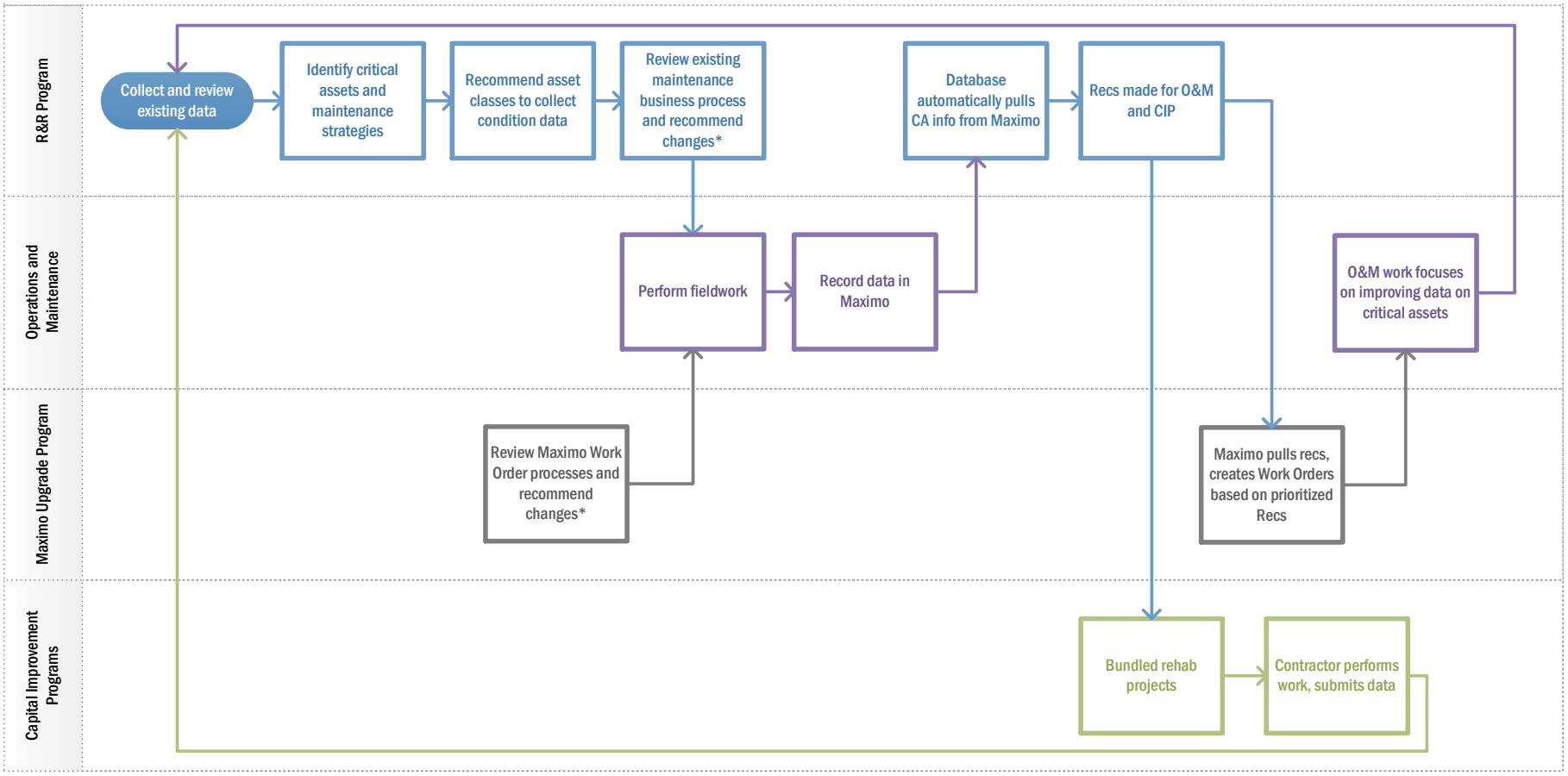
- Want to comply with warranties and perform the RIGHT amount of maintenance over the asset life-cycle

CMMS - Planning, tracking and executing PM's (warranty and beyond)

- One asset
- One maintenance schedule
- One start date

- Thousands of assets
- Different maintenance schedules
- Different start dates
- Reporting & regulatory requirements

CMMS systems provide a vehicle for work structure including schedules, prompts etc.



* This is an ongoing process that will take several iterations before the process changes are made

Key Performance Indicators (KPI's) – prove you are efficient…..or that you need more resources

Measurement	Goals**
Work Order Backlog	Planned 6 weeks (SMRP 5.4.8) Ready to schedule 2-3 weeks (SMRP 5.4.9)
Overtime	<5% (SMRP 5.5.8)
Preventive Maintenance Compliance	>90% (SMRP 5.4.14)
Schedule Compliance	>90% (SMRP 5.4.4) Report as to why the schedule was broken (equipment not ready, emergency breakdown, staffing etc..)
Planned Maintenance Ratio	85% (AWWA benchmark)
Reactive Work	<10% (SMRP 5.4.1)
Mean Time Between Failure (start on critical assets)	Higher the better. Don't want failures between PM's
Budgeted vs Actual	95%-100% of Budget

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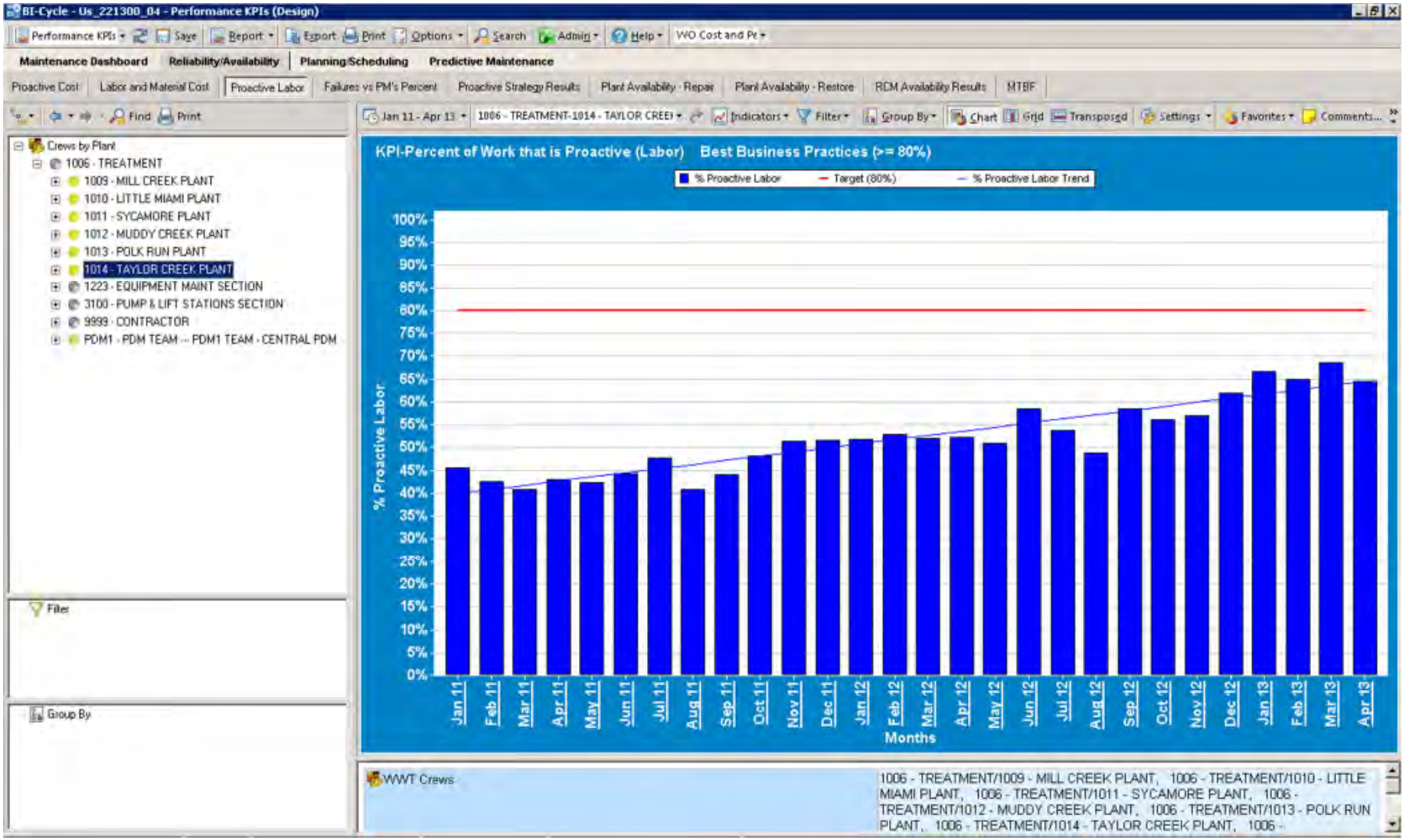
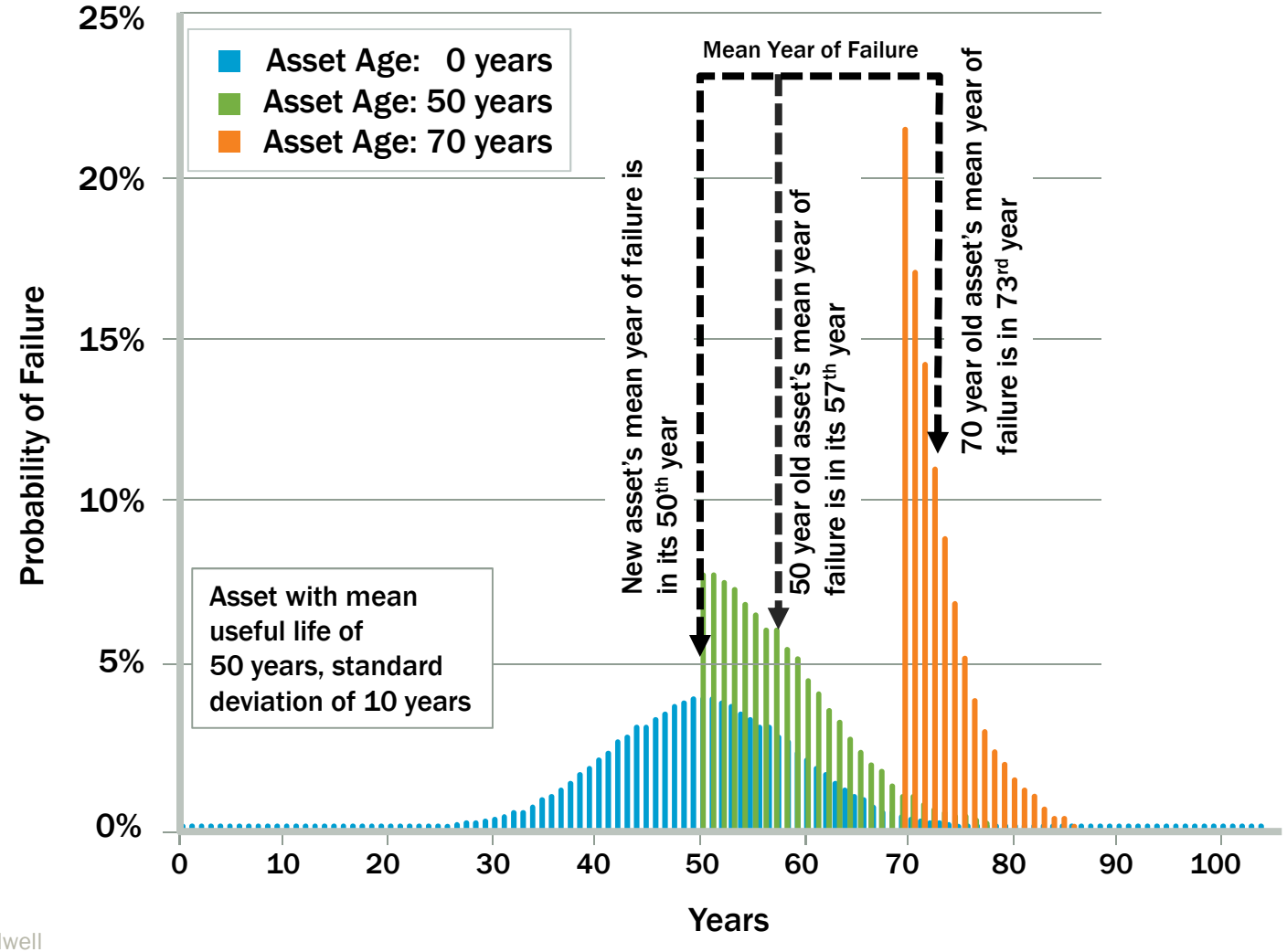
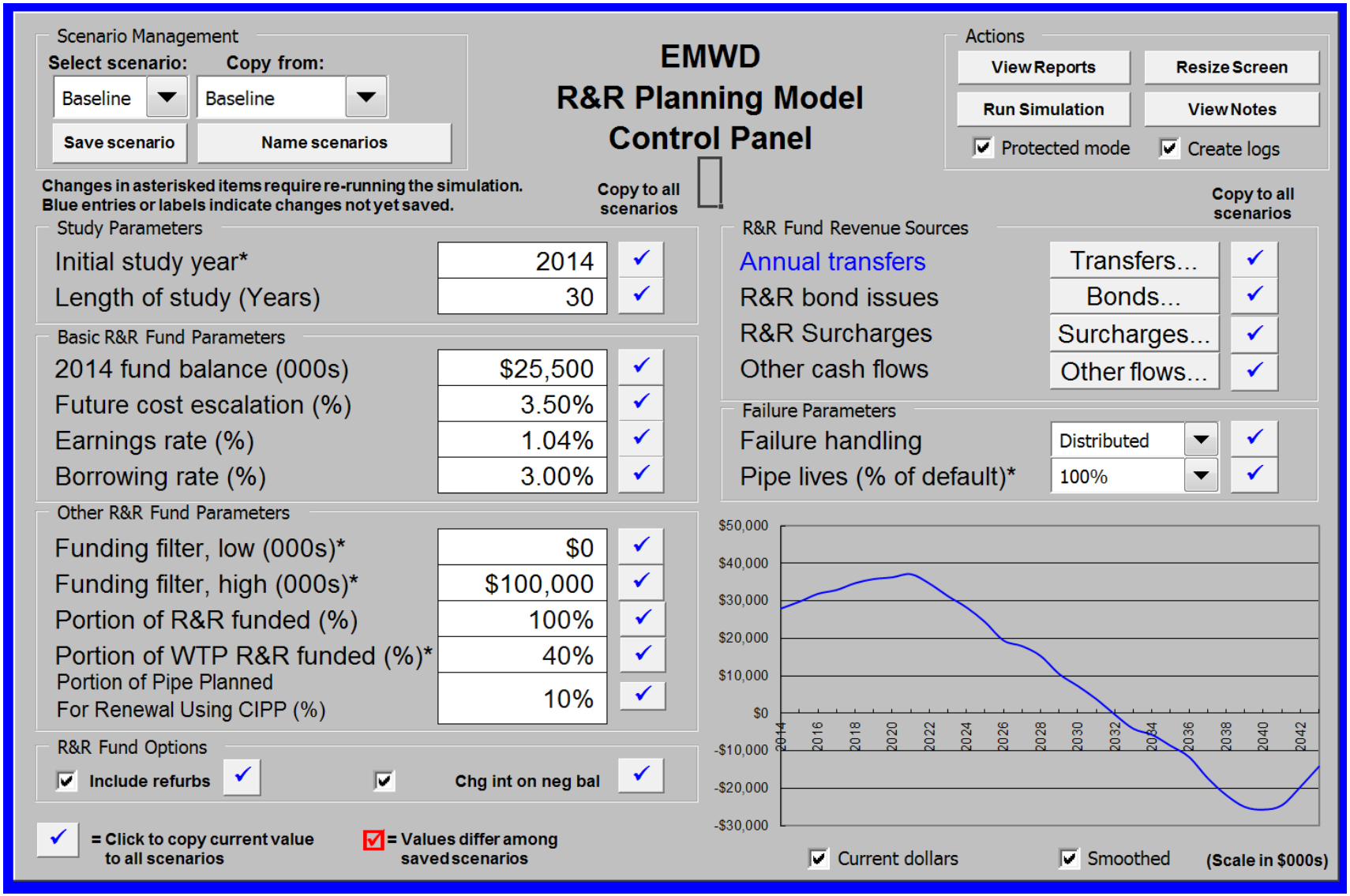
CMMS reports can show performance against industry benchmarks.....and trends



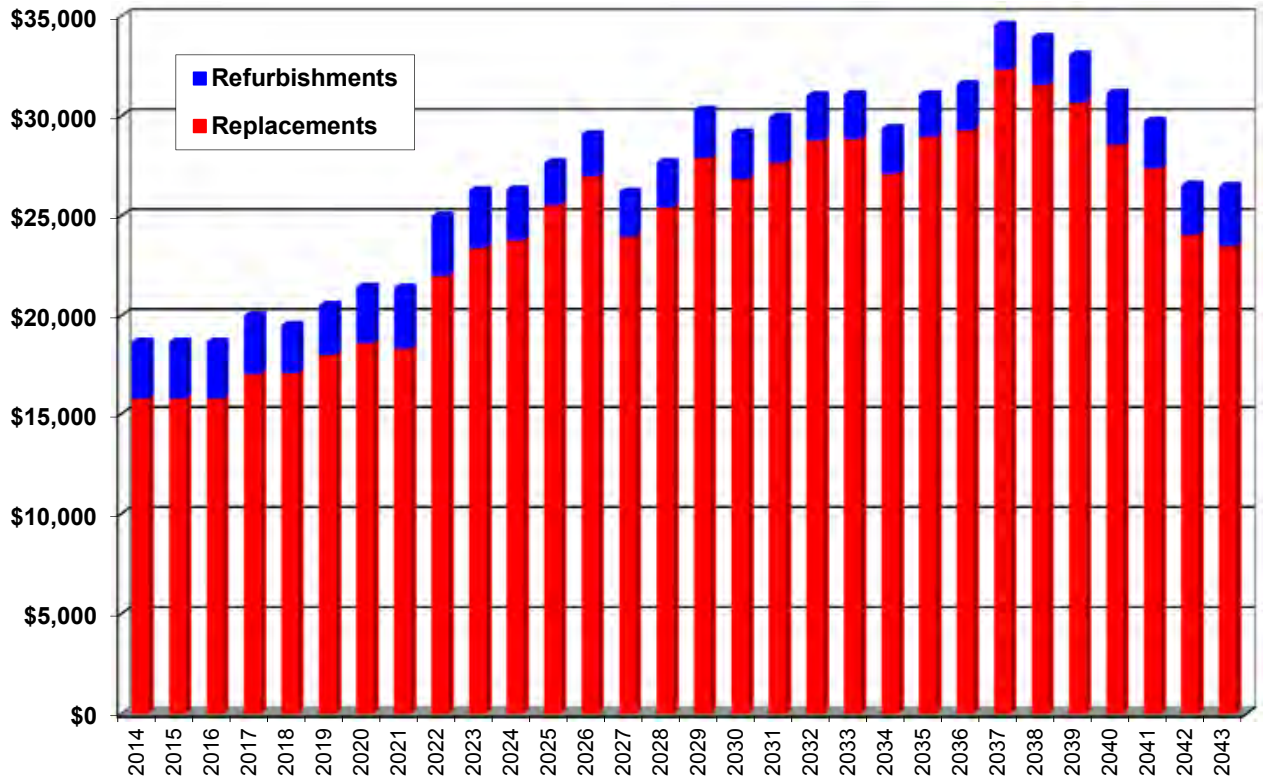
Organized CMMS information (pipe age, condition, material etc.) supports Replacement and Rehabilitation (R&R) modeling



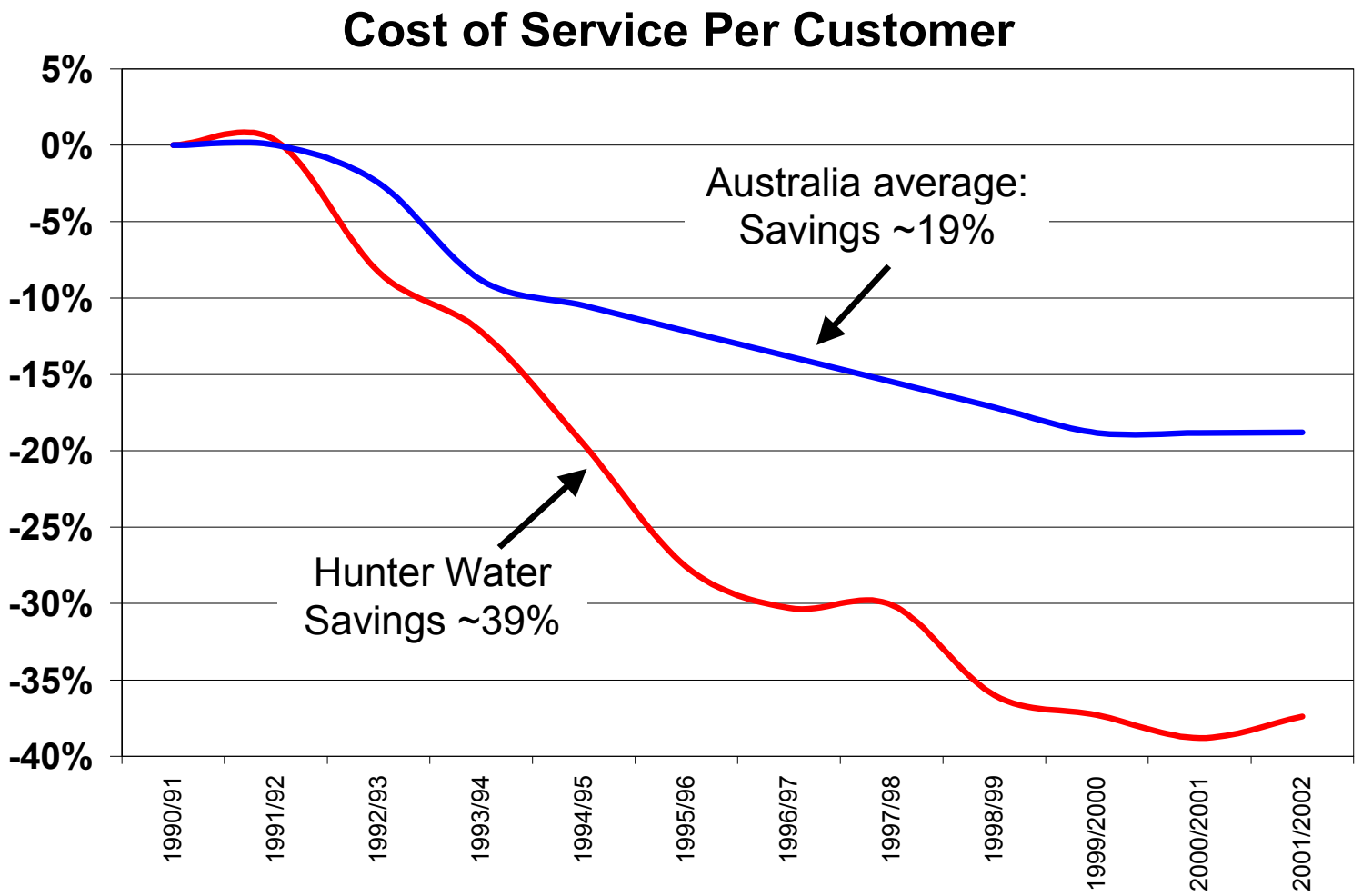
More realistic R&R planning supports financial forecasts……



Which leads to more accurate and defensible rate adjustments and CIP funding



Opportunity to capitalize on (and quantify) savings



Case Study –Allan Scott – Santa Barbara

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Benefits to Small Agencies

- Provides visibility and transparency
  - Management understands what is happening in the field
  - Field crews understand what is important for effective utility management
- Collect reliable data to measure performance
  - Workload backlog
  - Productivity
  - Effectiveness of preventative maintenance
  - Improves focus on critical assets
  - True O&M costs
- Standardize O&M practices
  - Extend useful life and reduce O&M-related equipment failures
  - Facilitates continual improvement
  - Captures system O&M knowledge
  - Streamline work practices

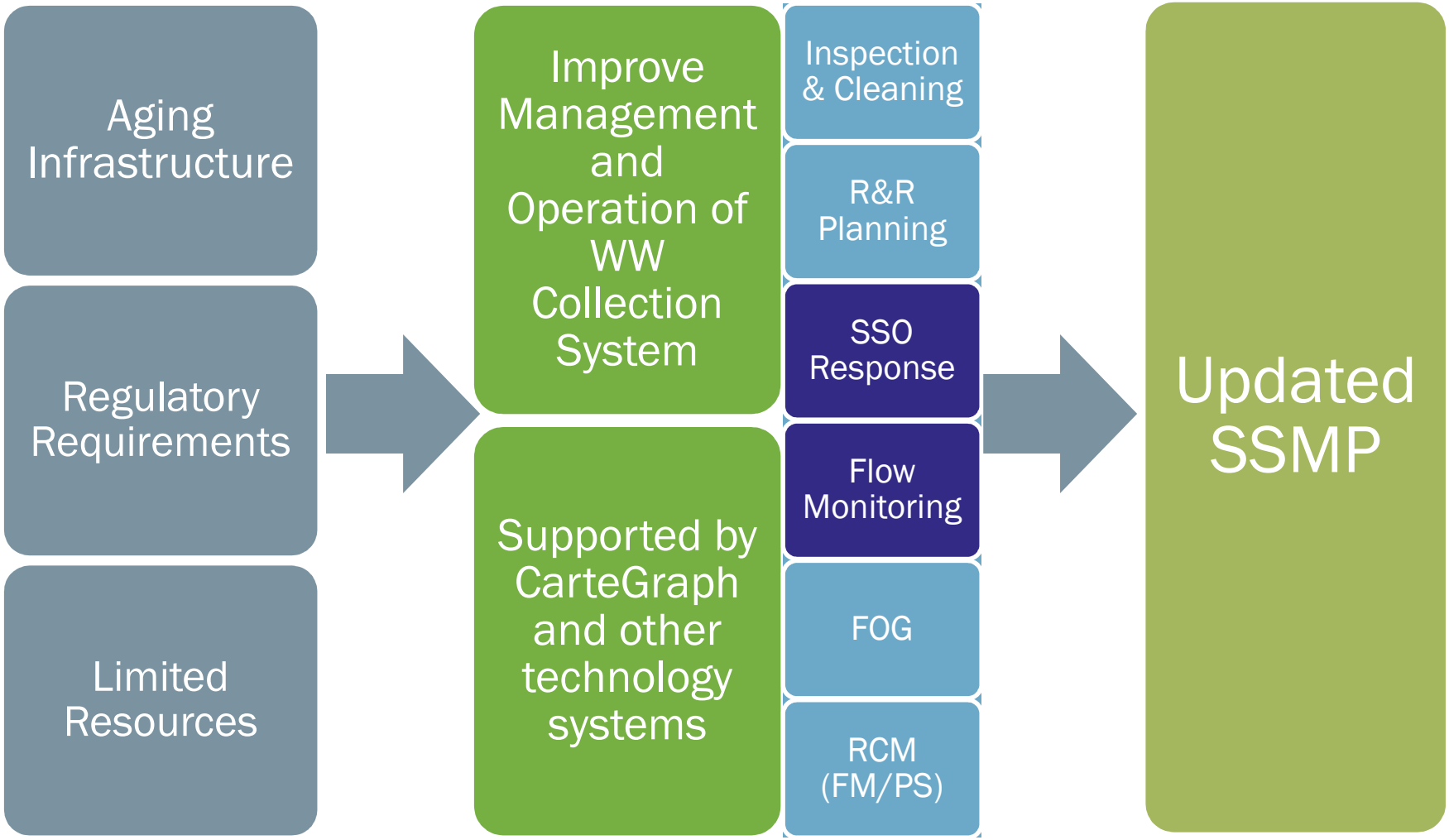
Santa Barbara Case Study

- Implemented Cartegraph CMMS for Sewer Collection System Group and for Water Distribution
- About
  - 95,000 customers
  - 260 miles of gravity sewers
  - 298 miles of water distribution pipe

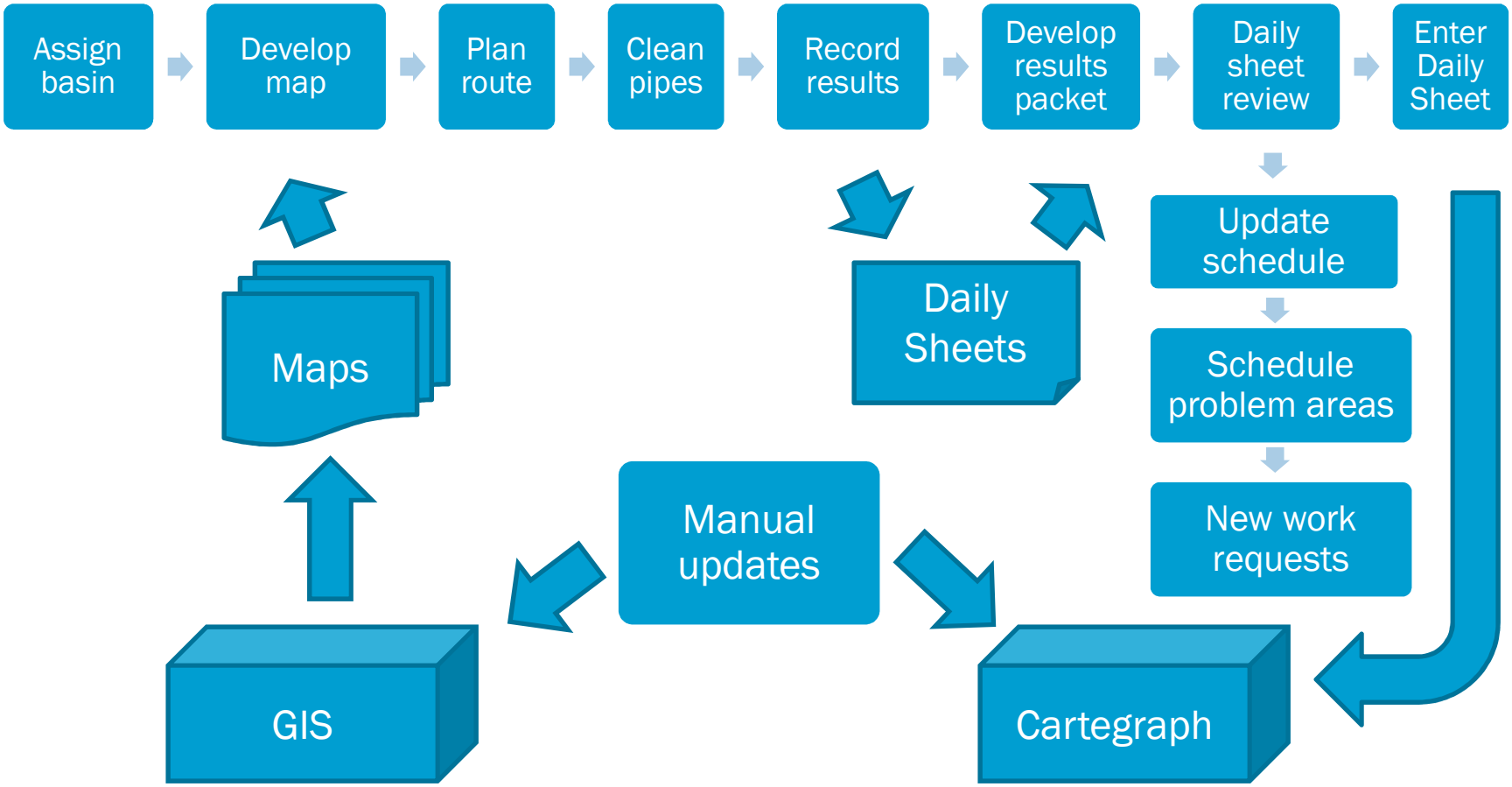
Key Challenges

- Waste water SSO consent decree requiring increased performance for sewer pipe cleaning and inspection
- Aging water infrastructure and O&M resource limitations raised concerns over effectiveness of O&M program and identification of future needs.

Standard Workflows Supported by Technology Helped Santa Barbara Achieve its Goals



Streamlining Work Practices By Aligning Technology and Data With Efficient Work Processes



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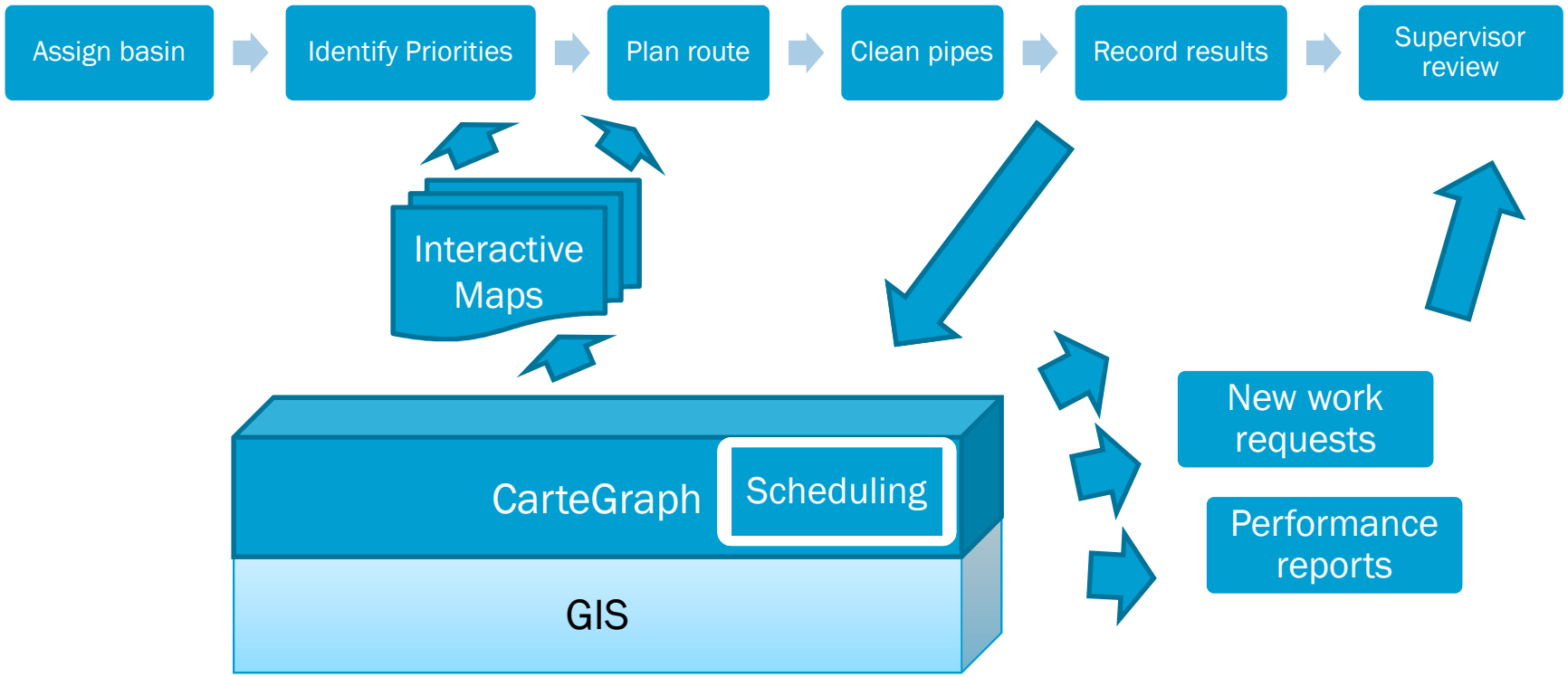

Preventative Maintenance Metrics

Facility	User Requested Reporting Date Range (i.e. 1/12 to 12/12)									
	PMs Planned	PMs Completed	%PMs Completed	Hours Estimated	Hours Actual	Hours Actual vs. Estimated	PMs Total Hours	CMs Total Hours	% CMs vs. PMs	CM/PM vs. PMs Completed
Bothin Pump Station	89	67	75%	40	67	168%	40	67	168%	167 : 75
Escondido Pump Station	88	67	76%	88	67	76%	88	67	76%	76 : 76
Rocky Nook Pump Station	78	67	86%	99	67	68%	99	67	68%	67 : 85
Alameda Well	140	130	93%	170	130	76%	170	130	76%	76 : 92
San Roque Well	150	130	87%	120	130	108%	120	130	108%	108 : 86

- **PMs Planned:** The number of schedule PMs for the time period defines the overall maintenance plan.
- **PMs Completed:** How many of the planned PMs were actually completed?
- **%PMs Completed:** How well was the plan followed?
- **Hours Estimated:** Number of planned hours for preventative maintenance
- **Actual Hours:** Number of hours spent on preventative maintenance
- **Hour Actual vs. Estimated:** How close is the plan to the actual execution?
- **PMs total hours:** Same as Actual Hours.
- **CMs Total Hours:** Number of hours spent on corrective maintenance.
- **% CMs vs. PMs:** Helps identify high areas of unplanned maintenance.
- **CM/PM vs PMs Completed:** Compares areas of high unplanned maintenance with how effective the planned preventative maintenance program is being executed.

Performance Analysis of Preventative and Corrective Maintenance

Station Number	PM Count	CM Count	Total	% CM	Total Cost	Unit Cost
20	124	28	152	18%	$ 58,000	$ 381.58
21	169	129	298	43%	$ 179,000	$ 600.67
22	110	18	128	14%	$ 55,000	$ 429.69
23	102	5	107	5%	$ 41,000	$ 383.18
24	100	8	108	7%	$ 27,000	$ 250.00
25	104	6	110	5%	$ 41,000	$ 372.73
26	115	18	133	14%	$ 42,000	$ 315.79
27	108	10	118	8%	$ 120,000	$ 1,016.95
28	119	47	166	28%	$ 185,000	$ 1,114.46
29	144	32	176	18%	$ 102,000	$ 579.55

- Where are my highest failure rates and why?
- Where are my most expensive maintenance costs?
- Which assets are the most expensive to maintain?
- What changes can I make to reduce failure rates?
- What do I need to do to reduce costs of my problem assets?

Accomplishments for Collections

- Improved business processes (pipe cleaning, CCTV inspection, FOG Management, SSO Response, R&R planning)
- Improved use of GIS and CMMS
  - “Dynamic” cleaning schedules
  - Risk-based CCTV inspections
  - Streamlined SSO documentation
  - Implemented Sewer Lateral Inspection Program
  - Implementing R&R Program

Collections Results

- New processes and systems in use for 2 years
- Decreased annual SSOs over 40% (on average)
- Successfully meeting Consent Decree requirements
- On track to clean entire system over 5 years
- On track to inspect entire system over 10 years
- Developed new Sewer CIP process that is managed by Engineering instead of Collection Systems
- Formalized FOG Restaurant Inspection program
- Developed Sewer Lateral Inspection Program
- Updated and audited Sewer System Management Plan

Accomplishments for Water Distribution

- Early stages of implementation
- Developing visibility of what it really takes to maintain system
- Standardized work processes improves performance and versatility
- Starting to see and react to patterns, inefficiencies and costs
- Improved communication and visibility between work groups and management

Case Study – Tony Bisson, Clark Regional WW District

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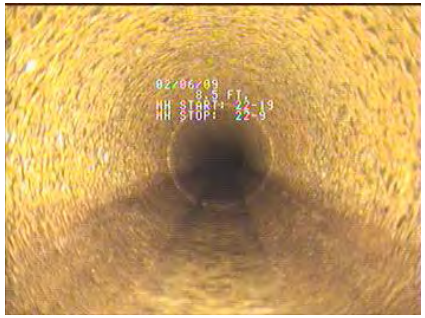
Today's Topics

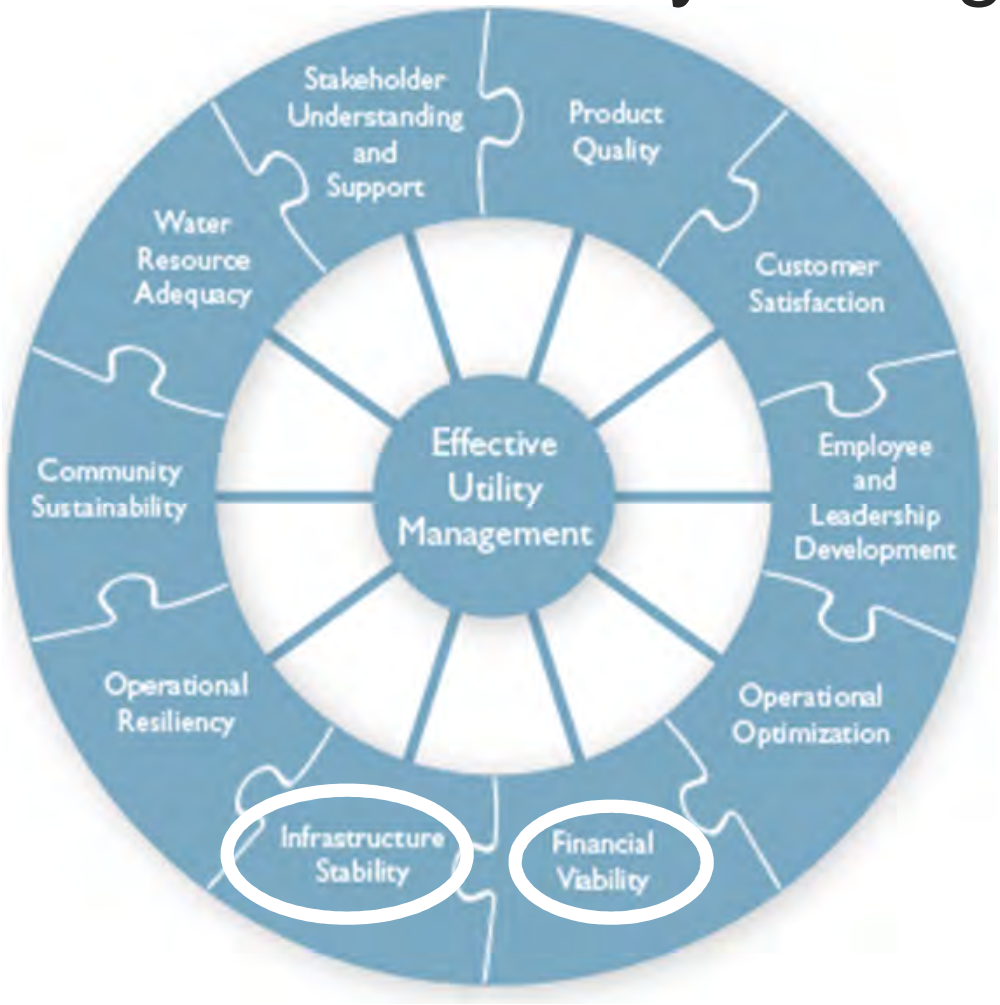
- Vision
- Program Development
- Buy In
- Existing Data
- Staff usage
- Engineering and Maintenance working together!
- Condition Assessment
- Asset Risk
- Project Scoring
- Next Steps



Vision

Vision

- 10 Attributes of Effectively Managed Utilities



Vision

- Financial Viability
  - Understand full life-cycle cost of utility
  - Establish & maintain effective balance between:
    - Long-term debt
    - Asset values
    - Operations / maintenance expenditures
    - Operating revenues
  - Establish predictable rates (consistent with community expectations / acceptability) adequate to recover costs
  - Provide for reserves
  - Maintain support from bond rating agencies
  - Plan / invest for future needs

Vision

- Infrastructure Stability
  - Understand condition of & costs associated with critical infrastructure assets
  - Maintain / enhance condition of all assets
    - Over long-term at lowest possible life-cycle cost
    - Acceptable risk consistent with customer, community & regulator-supported service levels
    - Consistent with anticipated growth & system reliability goals
  - Assure asset repair, rehabilitation & replacements are coordinated to minimize disruptions & other negative consequences

Vision

- Customer Focused
  - Meet customer expectations - public values survey
- Environmental Stewardship / Protecting Water Resources
  - Proactive management of the system minimizes backups, I&I and unexpected pipe failures
- Financial Responsibility
  - Stable rates
  - Staffing and workload planning
  - Minimize the high cost of emergency repairs and overflows
  - Prioritizing limited resources - Fix the Worst First!
- Responsible Management
  - Practicality of managing 9,500 main line pipes segments
- Supporting Economic Development
  - Reliable sewer system
  - Targeted investments

Program Development

Program Development

- Develop a ground level record system capable of

Work order and asset management

AND

- Critical Sewers Analysis
- Condition Assessment
- Asset Risk
- Project Prioritization Process
- Program Level Project Scoping
- Documentation

Program Development

- Program Outline
  - ☑ Identify Existing Data
    - GIS and CCTV Investments
    - Historical data and “tribal Knowledge”
  - ☑ Critical Sewer Analysis
    - Consequence of Failure (GIS Analysis)
  - ☑ Asset Condition
    - Probability of Failure (CCTV Data)

Program Development

- Program Outline
  - ☑ Asset Risk
    - Combining Condition and Criticality (GIS Analysis)
  - ☑ Develop Prioritization Concept
  - ☑ Define R&R Projects
  - ☑ Prioritize R&R Projects
  - ☐ Project Priority Array

Existing Data

Gaining Staff Buy In

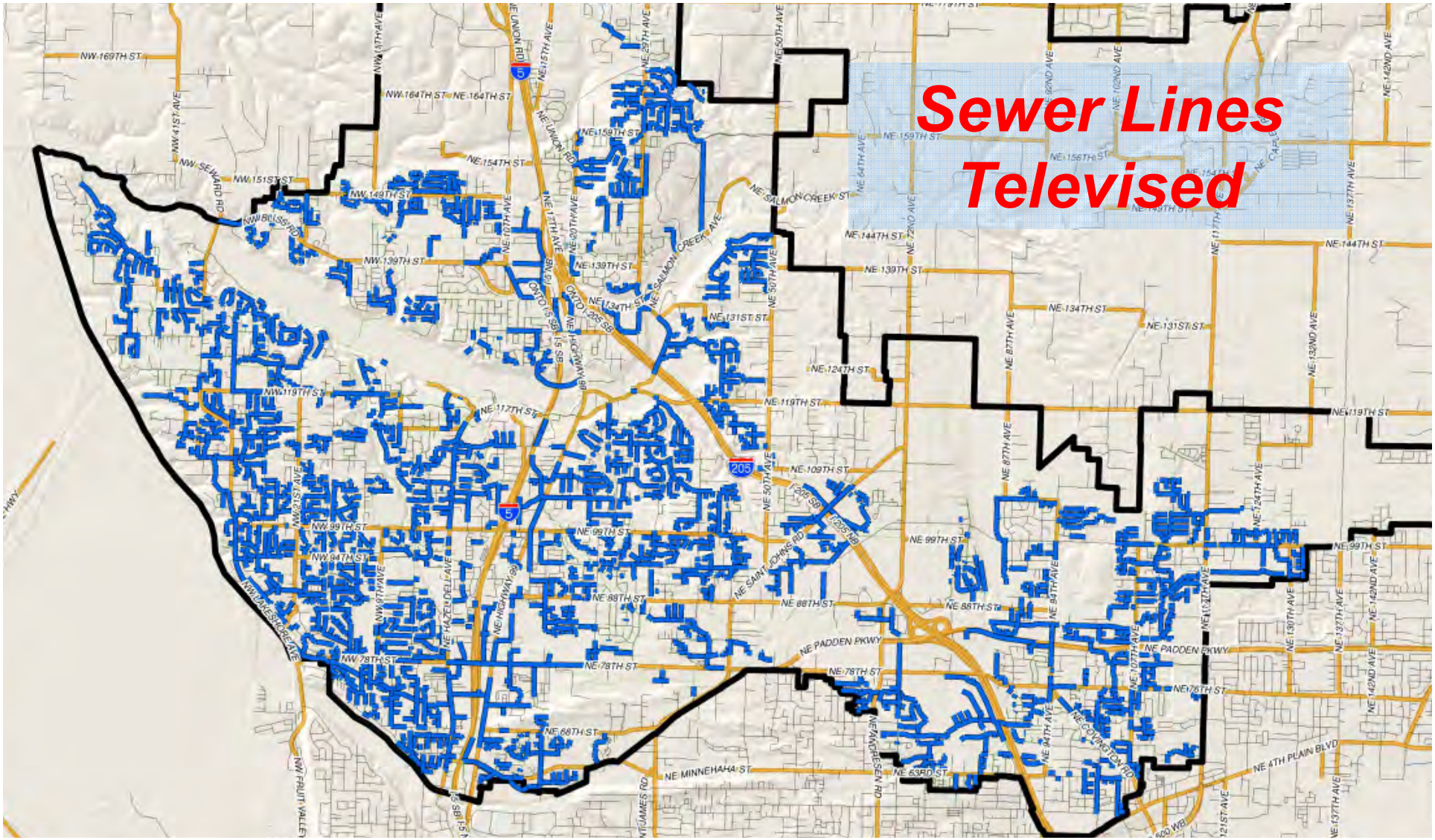
Non Tech Savvy?

Giving Ownership

Existing Data

- Identify Existing Data
  - Assets
    - GIS
    - Hand written WO
  - Asset Condition
    - CCTV Data
      - 475 miles of CCTV in Maintenance Management System (Granite & Lucity)
      - Data collected since 2005, 95% of main lines
      - All lines televised at some point
    - Tribal Knowledge of known defects

Existing Data

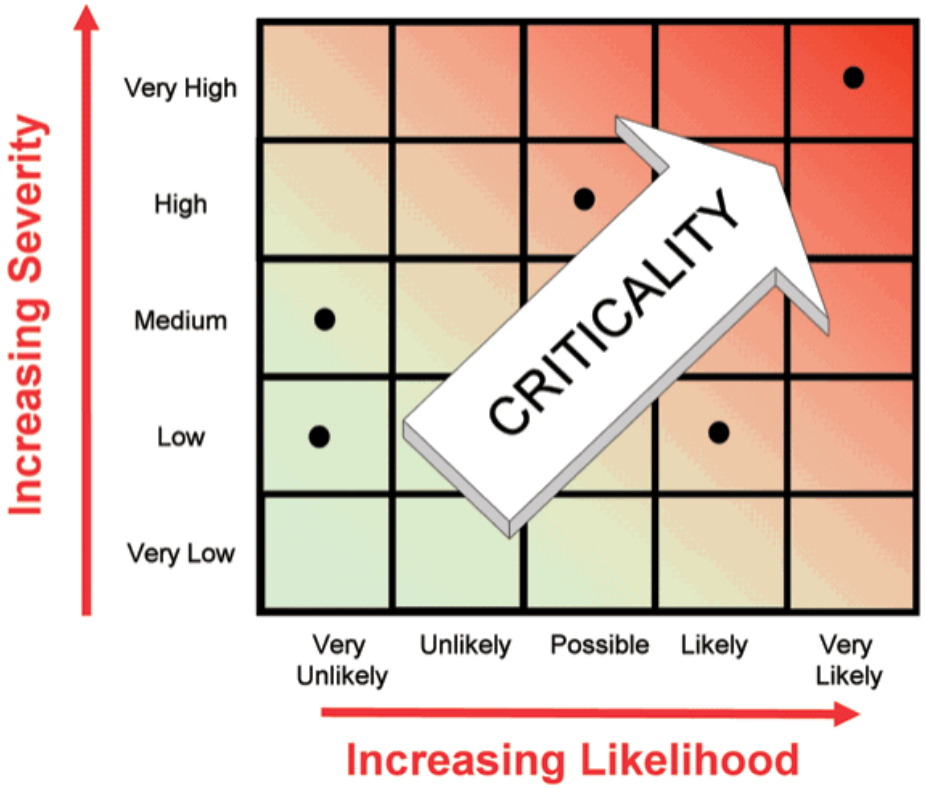


An example of non Work Order usage:

Critical Sewer Analysis

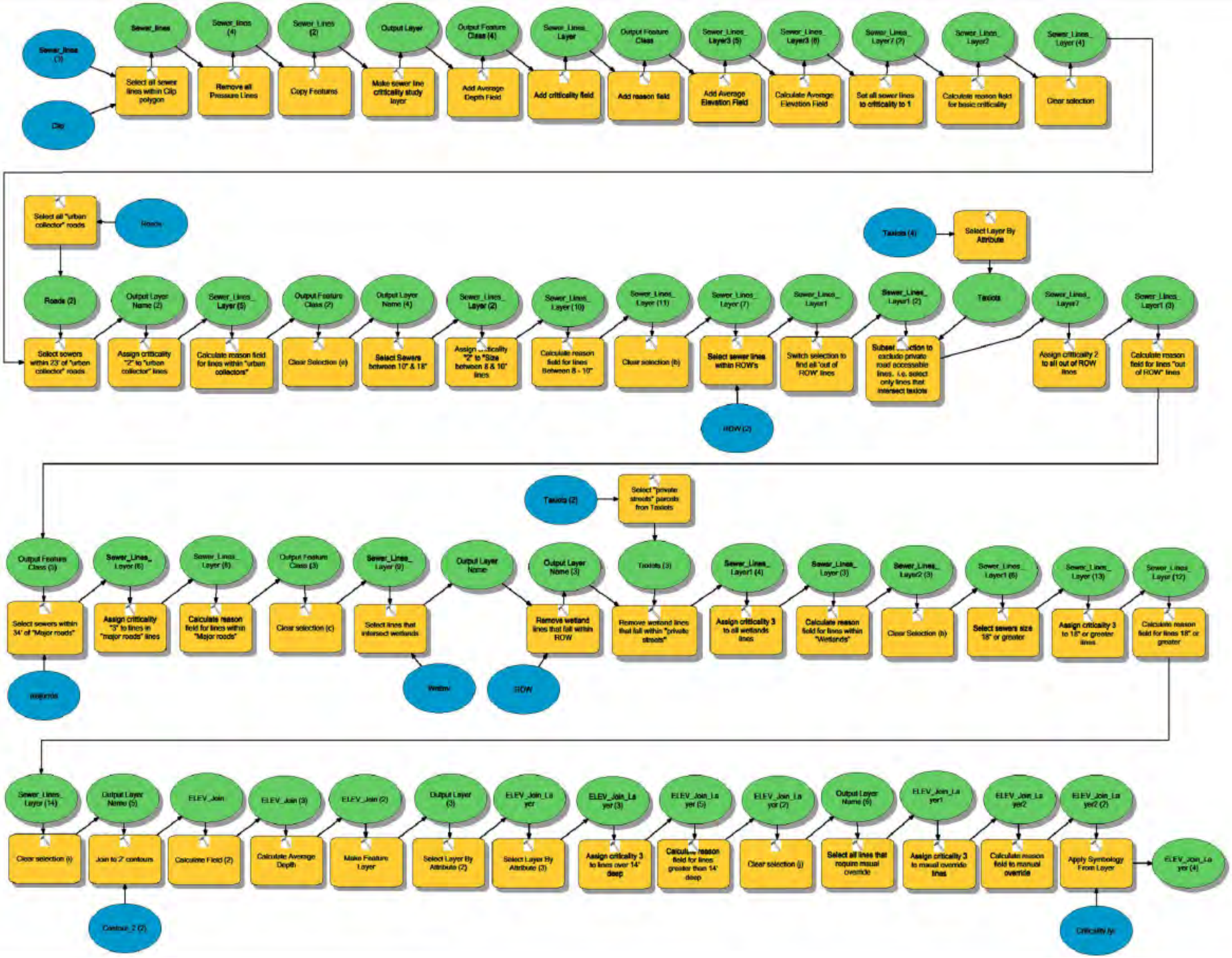
Critical Sewer Analysis

- Defining Criticality
  - 1 to 3 scoring scale based on potential impact of asset failures or "consequence of failure"

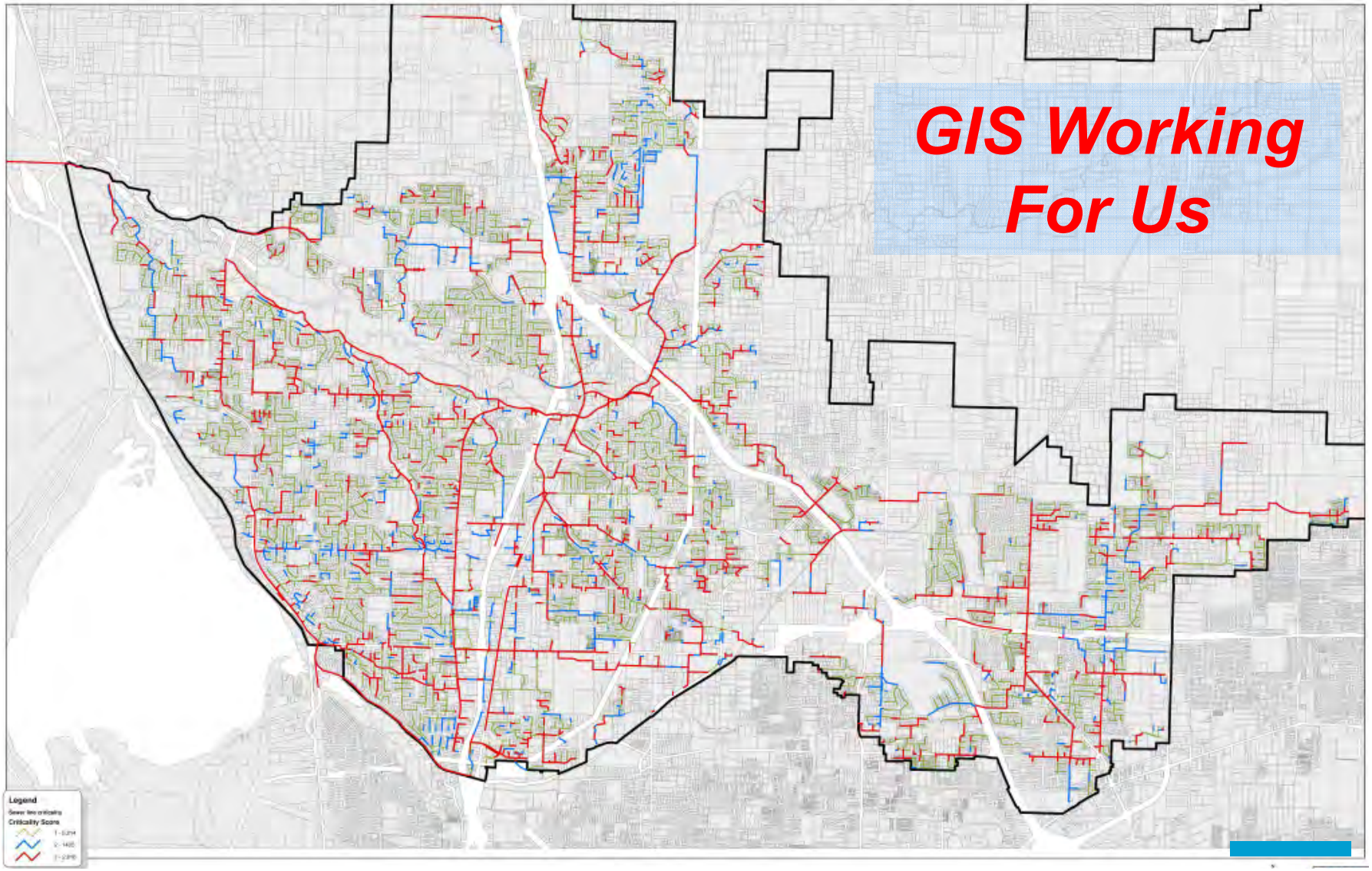


Critical Sewer Analysis

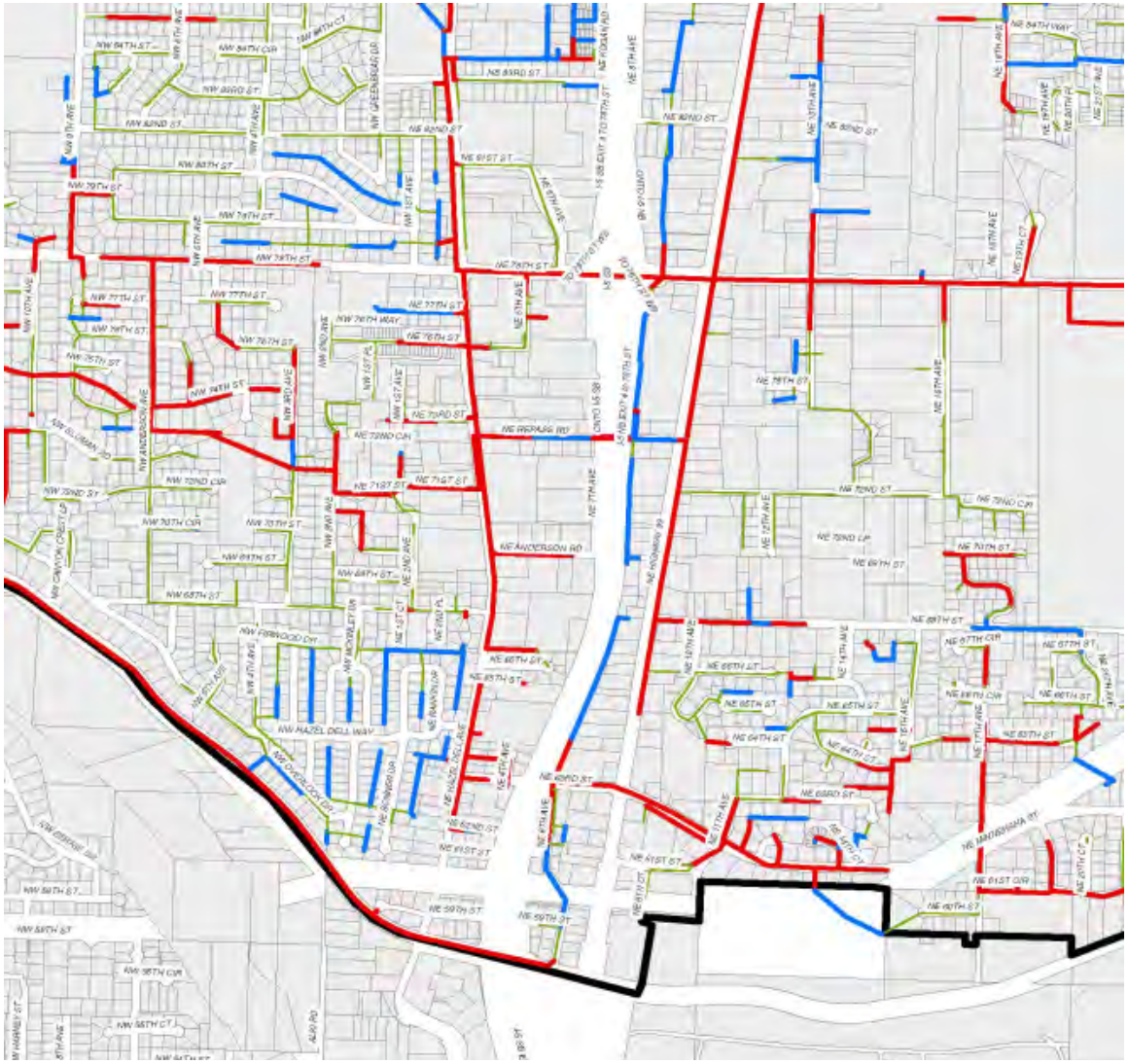
- Score of 3 includes pipes:
  - in major roads (parkways, arterials)
  - in environmentally sensitive areas
    - Includes all difficult to access canyon lines
  - Greater than 18" diameter
  - More than 14’ deep
- Score of 2 includes pipes:
  - In urban collectors
  - Inaccessible lines
  - 10” to 18 ” diameter
- Score of 1 includes all other pipes


Sewer_lines (3)
Clip
Sewer_lines
Select all sewer lines within Clip polygon
Sewer_lines (4)
Remove all Pressure Lines
Sewer_Lines (2)
Copy Features
Output Layer
Make sewer line criticality study layer
Output Feature Class (4)
Add Average Depth Field
Sewer_Lines_ Layer
Add criticality field
Output Feature Class
Add reason field
Sewer_Lines_ Layer3 (5)
Add Average Elevation Field
Sewer_Lines_ Layer3 (6)
Calculate Average Elevation Field
Sewer_Lines_ Layer7 (7)
Set all sewer lines to criticality to 1
Sewer_Lines_ Layer2
Calculate reason field for basic criticality
Sewer_Lines_ Layer (4)
Clear selection
Select all "urban collector" roads
Roads
Roads (2)
Select sewers within 23' of "urban collector" roads
Output Layer Name (2)
Assign criticality "2" to "urban collector" lines
Sewer_Lines_ Layer (5)
Calculate reason field for lines within "urban collectors"
Output Feature Class (2)
Clear Selection (e)
Output Layer Name (4)
Select Sewers between 10" & 18"
Sewer_Lines_ Layer (2)
Assign criticality "2" to "Size between 8 & 10" lines
Sewer_Lines_ Layer (10)
Calculate reason field for lines Between 8 - 10"
Sewer_Lines_ Layer (11)
Clear selection (b)
Sewer_Lines_ Layer (7)
Select sewer lines within ROW's
ROW (2)
Sewer_Lines_ Layer1
Switch selection to find all "out of ROW" lines
Taxlots (4)
Select Layer By Attribute
Sewer_Lines_ Layer1 (2)
Subset selection to exclude private road accessible lines. i.e. select only lines that intersect taxlots
Taxlots
Sewer_Lines_ Layer2
Assign criticality 2 to all out of ROW lines
Sewer_Lines_ Layer1 (3)
Calculate reason field for lines "out of ROW" lines
Output Feature Class (3)
Select sewers within 34' of "Major roads"
majorrds
Sewer_Lines_ Layer (6)
Assign criticality "3" to lines in "major roads" lines
Sewer_Lines_ Layer (8)
Calculate reason field for lines within "Major roads"
Output Feature Class (3)
Clear selection (c)
Sewer_Lines_ Layer (9)
Select lines that intersect wetlands
Wetlnd
Output Layer Name
Output Layer Name (3)
Remove wetland lines that fall within ROW
ROW
Taxlots (2)
Select "private streets" parcels from Taxlots
Taxlots (3)
Remove wetland lines that fall within "private streets"
Sewer_Lines_ Layer1 (4)
Assign criticality 3 to all wetlands lines
Sewer_Lines_ Layer (3)
Calculate reason field for lines within "Wetlands"
Sewer_Lines_ Layer2 (3)
Clear Selection (h)
Sewer_Lines_ Layer1 (6)
Select sewers size 18" or greater
Sewer_Lines_ Layer (13)
Assign criticality 3 to 18" or greater lines
Sewer_Lines_ Layer (12)
Calculate reason field for lines 18" or greater
Sewer_Lines_ Layer (14)
Clear selection (i)
Output Layer Name (5)
Join to 2' contours
Contour_2 (2)
ELEV_Join
Calculate Field (2)
ELEV_Join (3)
Calculate Average Depth
ELEV_Join (2)
Make Feature Layer
Output Layer (3)
Select Layer By Attribute (2)
ELEV_Join_La yer
Select Layer By Attribute (3)
ELEV_Join_La yer (3)
Assign criticality 3 to lines over 14' deep
ELEV_Join_La yer (5)
Calcul... reason field for lines greater than 14' deep
ELEV_Join_La yer (7)
Clear selection (j)
Output Layer Name (6)
Select all lines that require maual override
ELEV_Join_La yer1
Assign criticality 3 to maual override lines
ELEV_Join_La yer2
Calculate reason field to manual override
ELEV_Join_La yer (2)
Apply Symbology From Layer
Criticality.lyr
ELEV_Join_La yer (4)

Critical Sewer Analysis



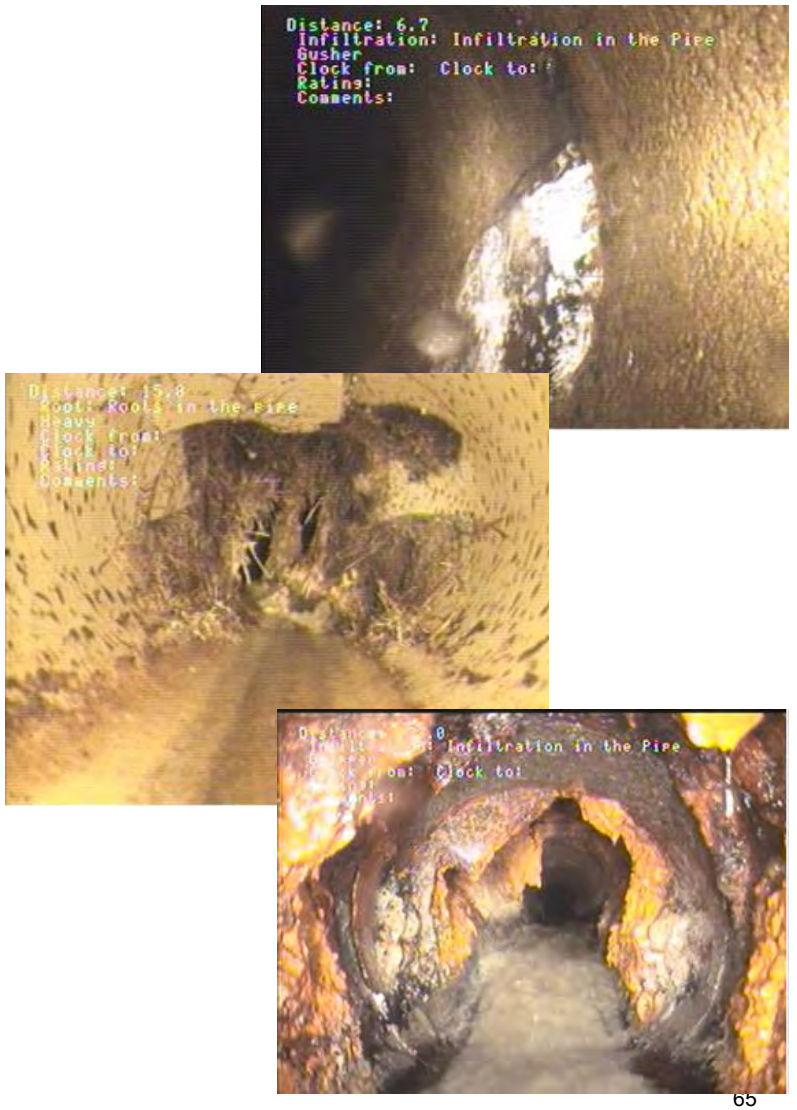
Critical Sewer Analysis



Condition Assessment

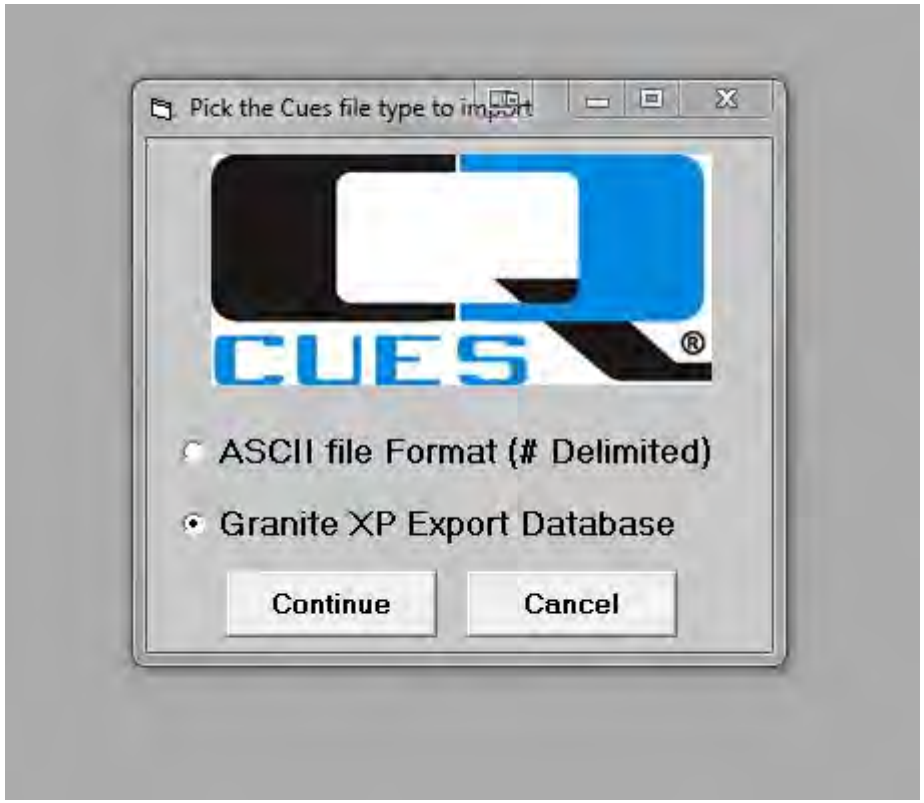
Condition Assessment

- CCTV Data
  - Infiltration / Inflow
  - Structural – Cracks / Shears
  - Sags
  - Roots
  - Fats, Oils, Grease (FOG)



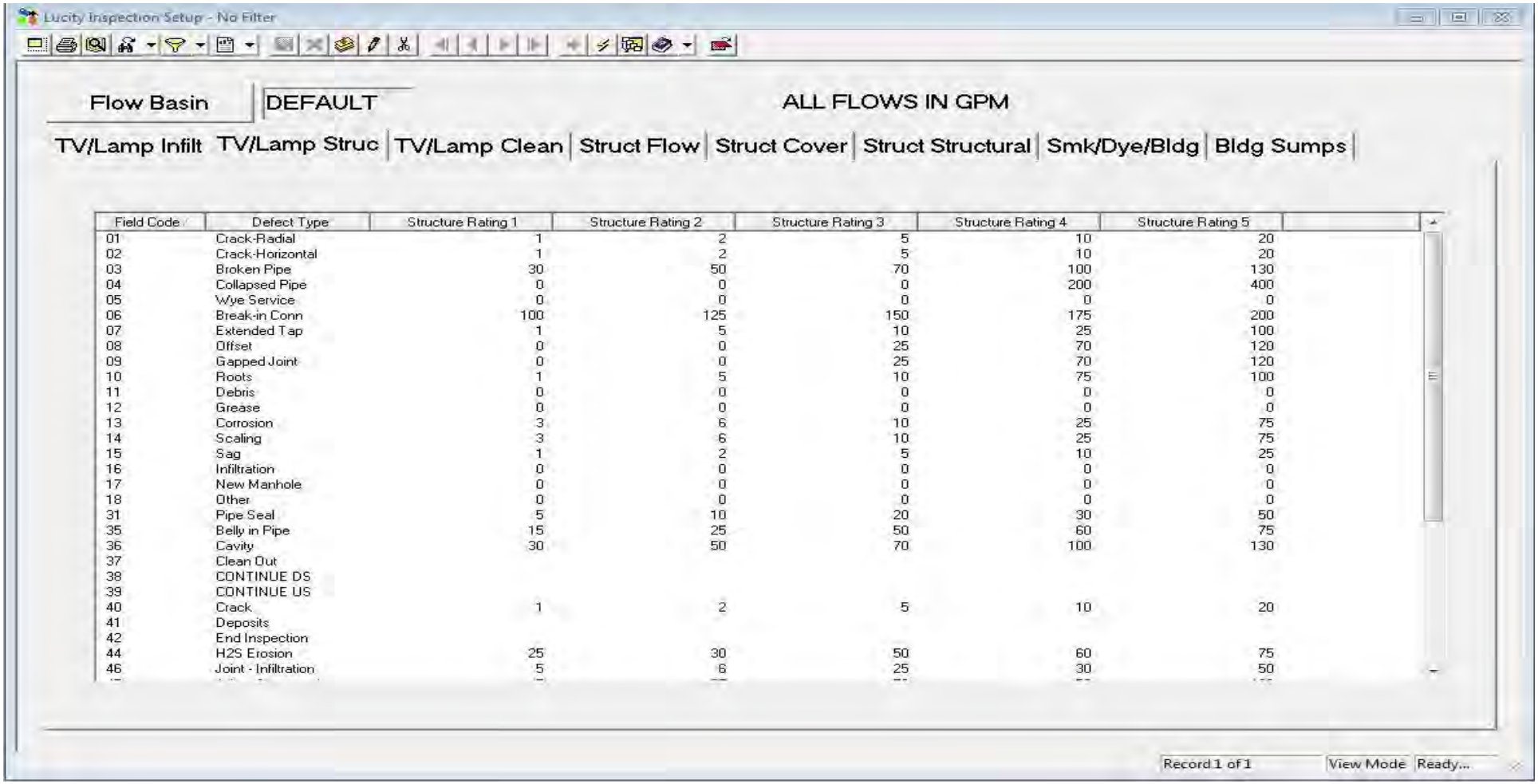
Condition Assessment

- CCTV Data Collected from Cues CCTV trucks.



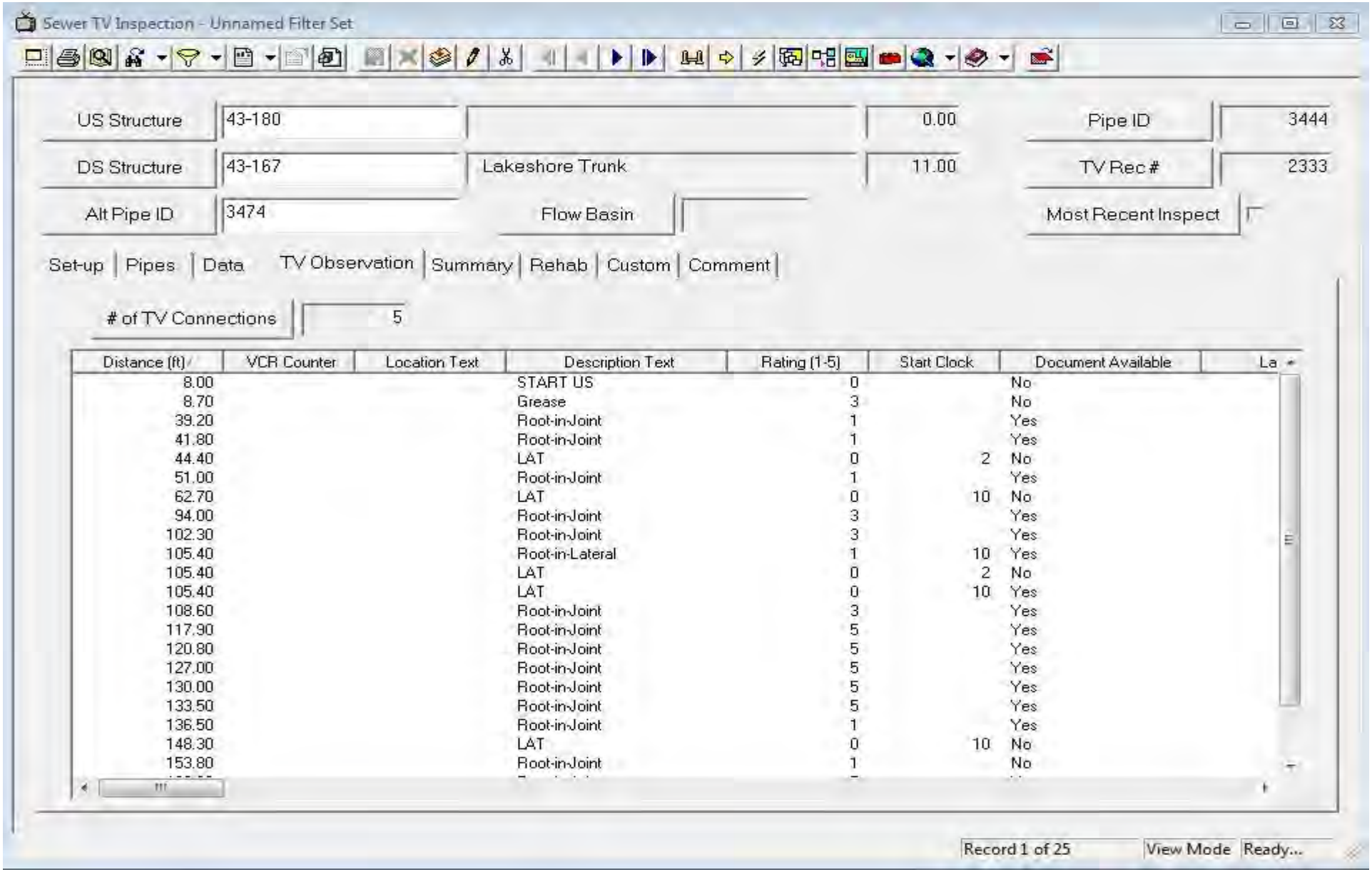
Condition Assessment

- CCTV Data Scoring “Weight”

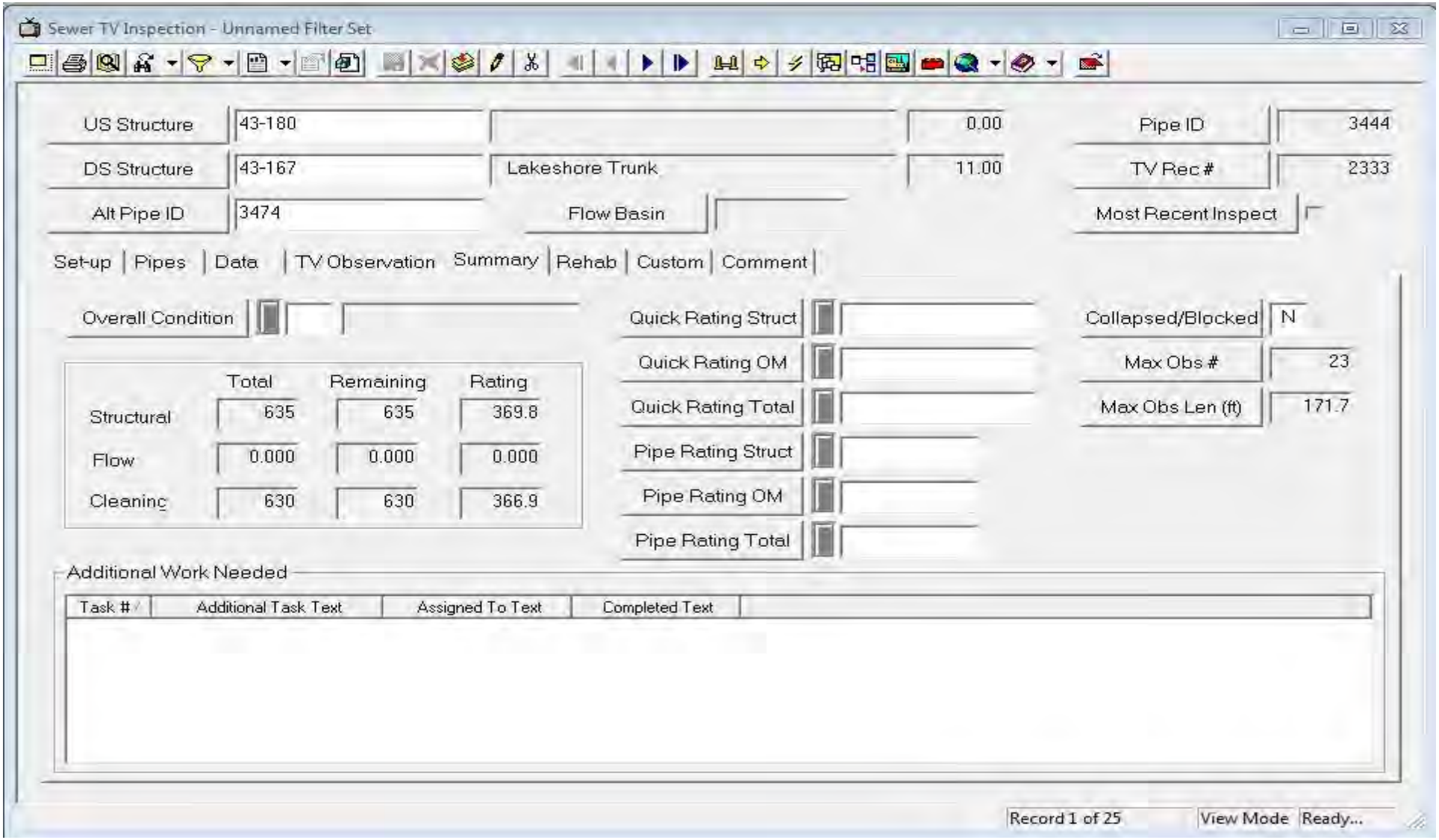


Field Code	Defect Type	Structure Rating 1	Structure Rating 2	Structure Rating 3	Structure Rating 4	Structure Rating 5
01	Crack-Radial	1	2	5	10	20
02	Crack-Horizontal	1	2	5	10	20
03	Broken Pipe	30	50	70	100	130
04	Collapsed Pipe	0	0	0	200	400
05	Wye Service	0	0	0	0	0
06	Break-in Conn	100	125	150	175	200
07	Extended Tap	1	5	10	25	100
08	Offset	0	0	25	70	120
09	Gapped Joint	0	0	25	70	120
10	Roots	1	5	10	75	100
11	Debris	0	0	0	0	0
12	Grease	0	0	0	0	0
13	Corrosion	3	6	10	25	75
14	Scaling	3	6	10	25	75
15	Sag	1	2	5	10	25
16	Infiltration	0	0	0	0	0
17	New Manhole	0	0	0	0	0
18	Other	0	0	0	0	0
31	Pipe Seal	5	10	20	30	50
35	Belly in Pipe	15	25	50	60	75
36	Cavity	30	50	70	100	130
37	Clean Out					
38	CONTINUE DS					
39	CONTINUE US					
40	Crack	1	2	5	10	20
41	Deposits					
42	End Inspection					
44	H2S Erosion	25	30	50	60	75
46	Joint - Infiltration	5	6	25	30	50

Condition Assessment



Condition Assessment



Condition Assessment

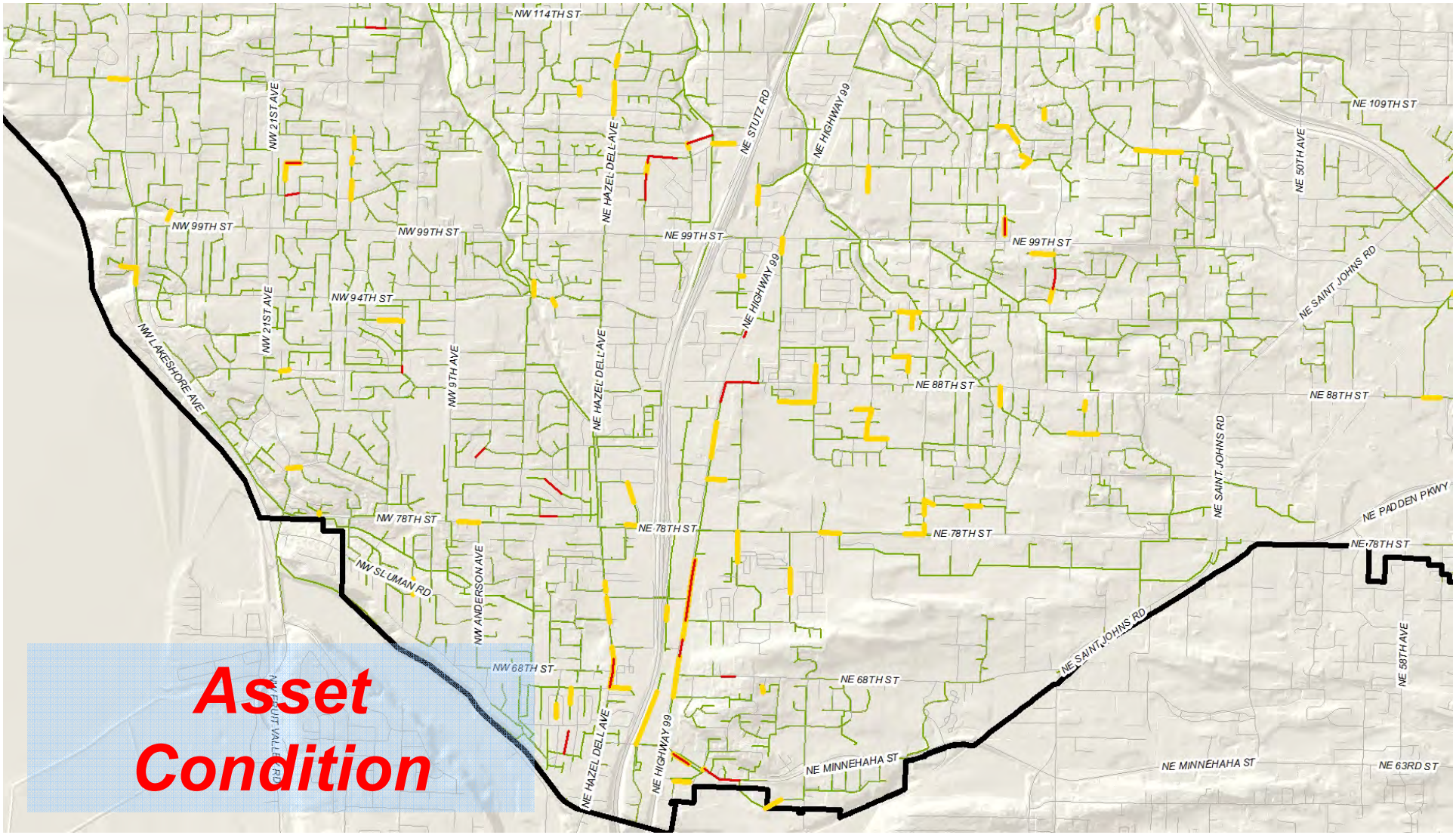
- CCTV Data Simplified Based on Score

= Failing: Imminent failure

= Poor: Monitor, proactive repairs

= Good: No concerns

Asset Assessment



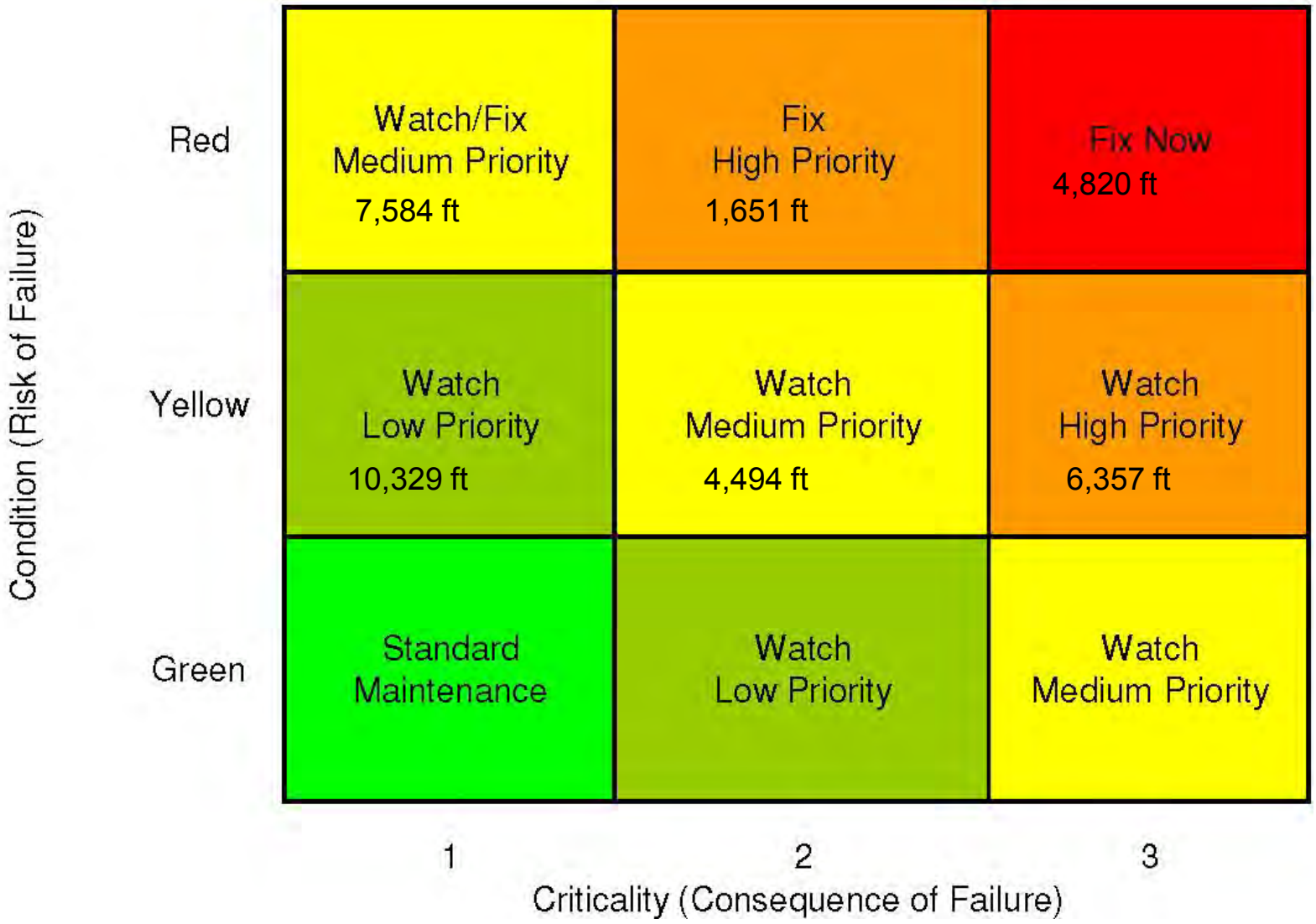
Asset Risk

Asset Risk

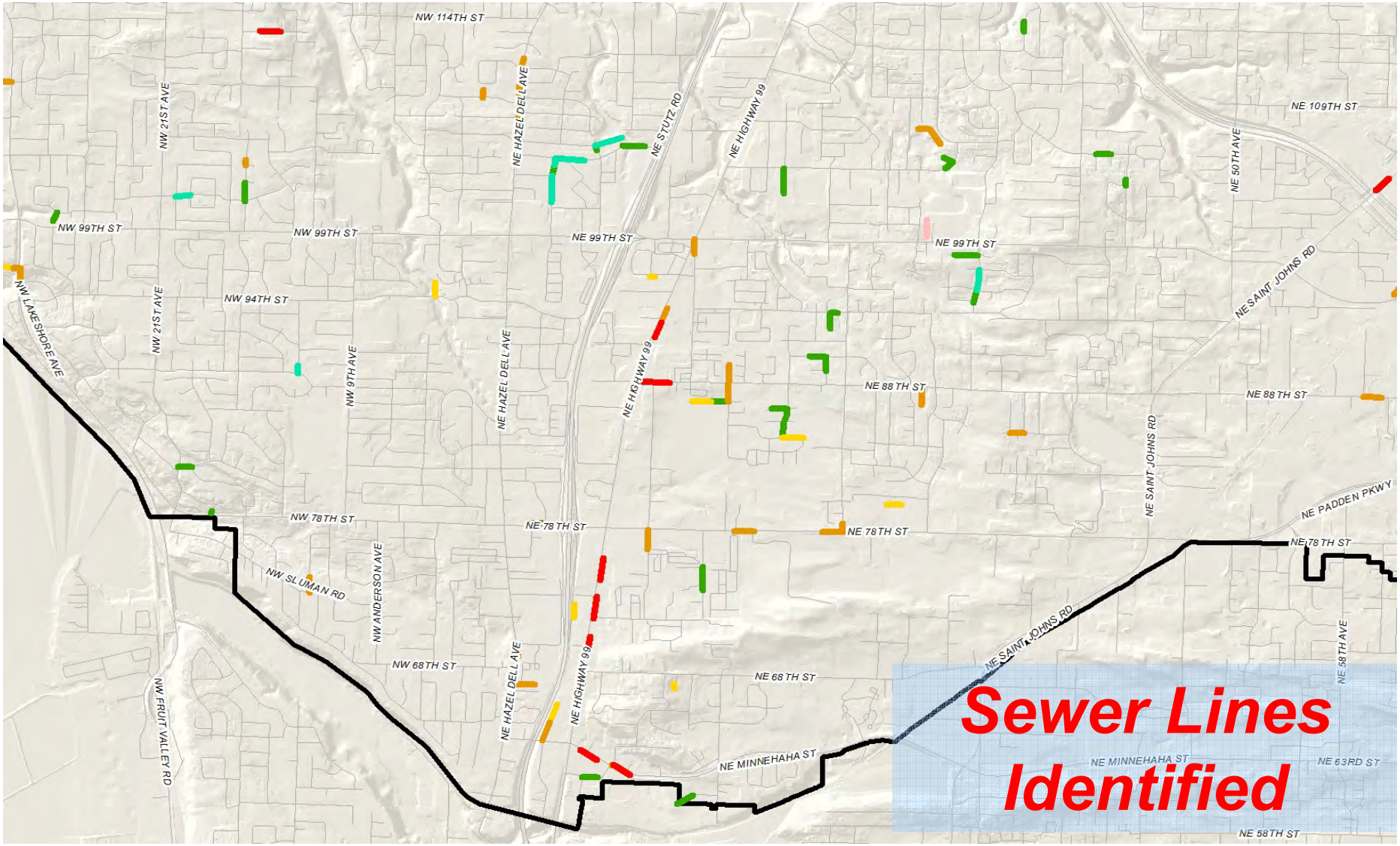
- Integrating Criticality & Condition
  - Criticality – Consequence of Failure
    - Score 1, 2, or 3
  - Condition – Risk of Failure
    - Score Red, Yellow, Green
  - Extra point, or fraction of a point added for hot spots.

Asset Risk = Criticality + Condition

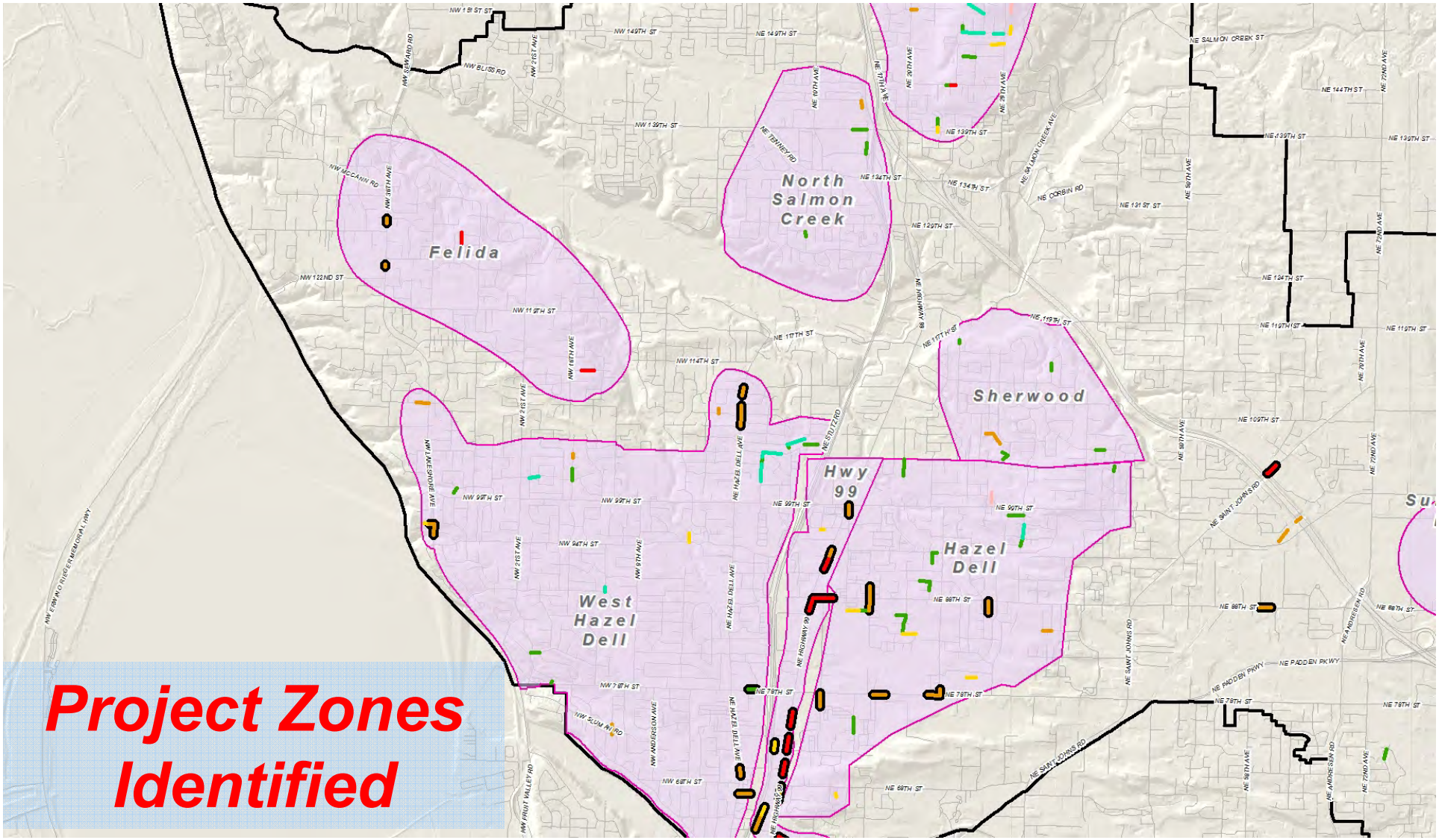
Asset Risk


Condition (Risk of Failure)
Red
Yellow
Green
Watch/Fix
Medium Priority
7,584 ft
Fix
High Priority
1,651 ft
Fix Now
4,820 ft
Watch
Low Priority
10,329 ft
Watch
Medium Priority
4,494 ft
Watch
High Priority
6,357 ft
Standard
Maintenance
Watch
Low Priority
Watch
Medium Priority
1
2
3
Criticality (Consequence of Failure)

Asset Risk

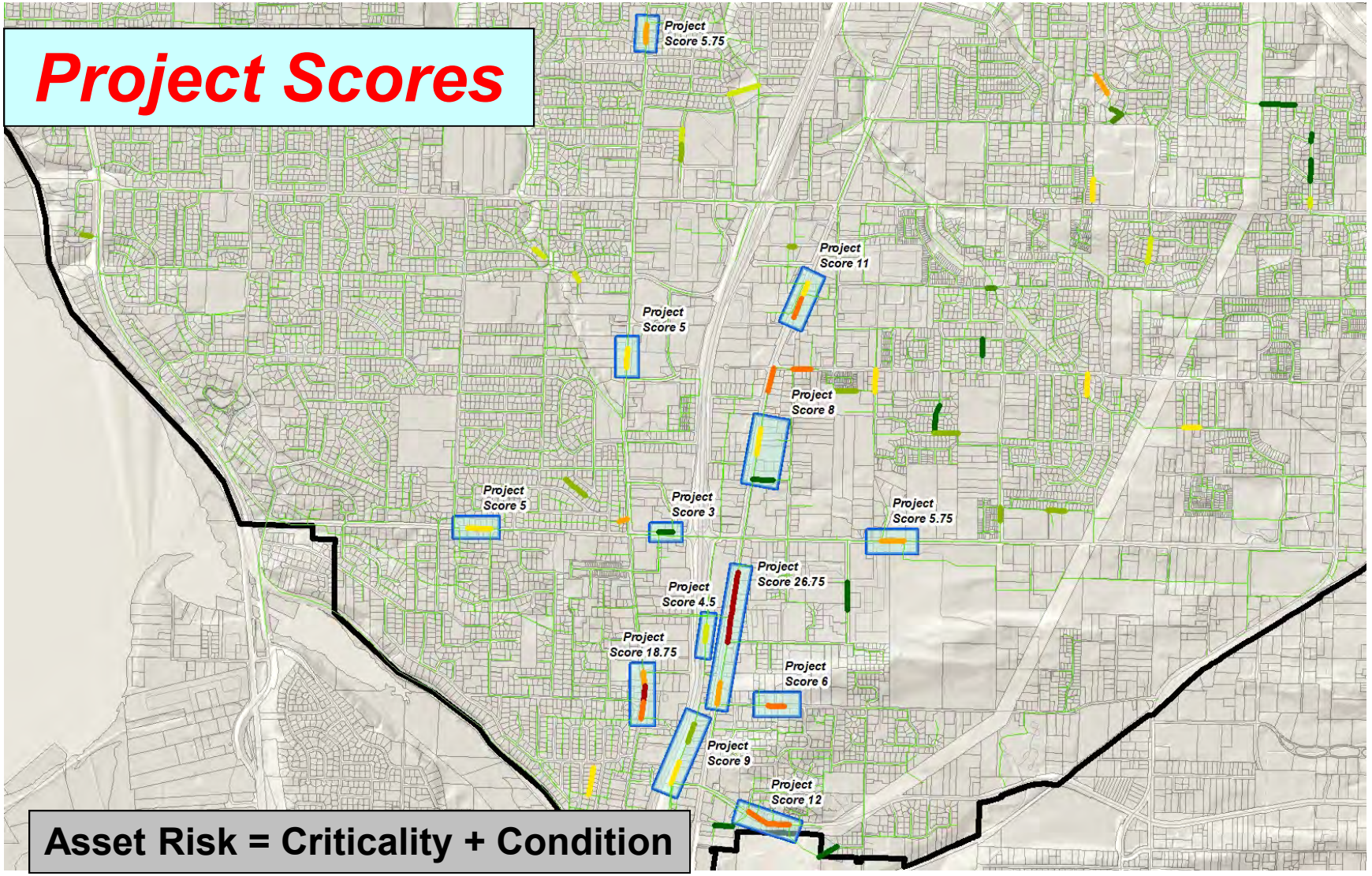

NW 114TH ST
NW 21ST AVE
NE HAZEL DELL AVE
NE STUTZ RD
NE HIGHWAY 99
NE 109TH ST
NE 50TH AVE
NW 99TH ST
NW 99TH ST
NE 99TH ST
NE 99TH ST
NE SAINT JOHNS RD
NW LAKESHORE AVE
NW 21ST AVE
NW 94TH ST
NW 9TH AVE
NE HAZEL DELL AVE
NE HIGHWAY 99
NE 88TH ST
NE 88TH ST
NE SAINT JOHNS RD
NE PADDEN PKWY
NW 78TH ST
NE 78TH ST
NE 78TH ST
NE 78TH ST
NW SLUMAN RD
NW ANDERSON AVE
NE SAINT JOHNS RD
NW 68TH ST
NE 68TH ST
NE 58TH AVE
NW FRUIT VALLEY RD
NE HAZEL DELL AVE
NE HIGHWAY 99
NE MINNEHAHA ST
NE MINNEHAHA ST
NE 63RD ST
NE 58TH ST
Sewer Lines Identified

Asset Risk


Felida
North Salmon Creek
Sherwood
Hwy 99
Hazel Dell
West Hazel Dell
Project Zones Identified

Project Scoring

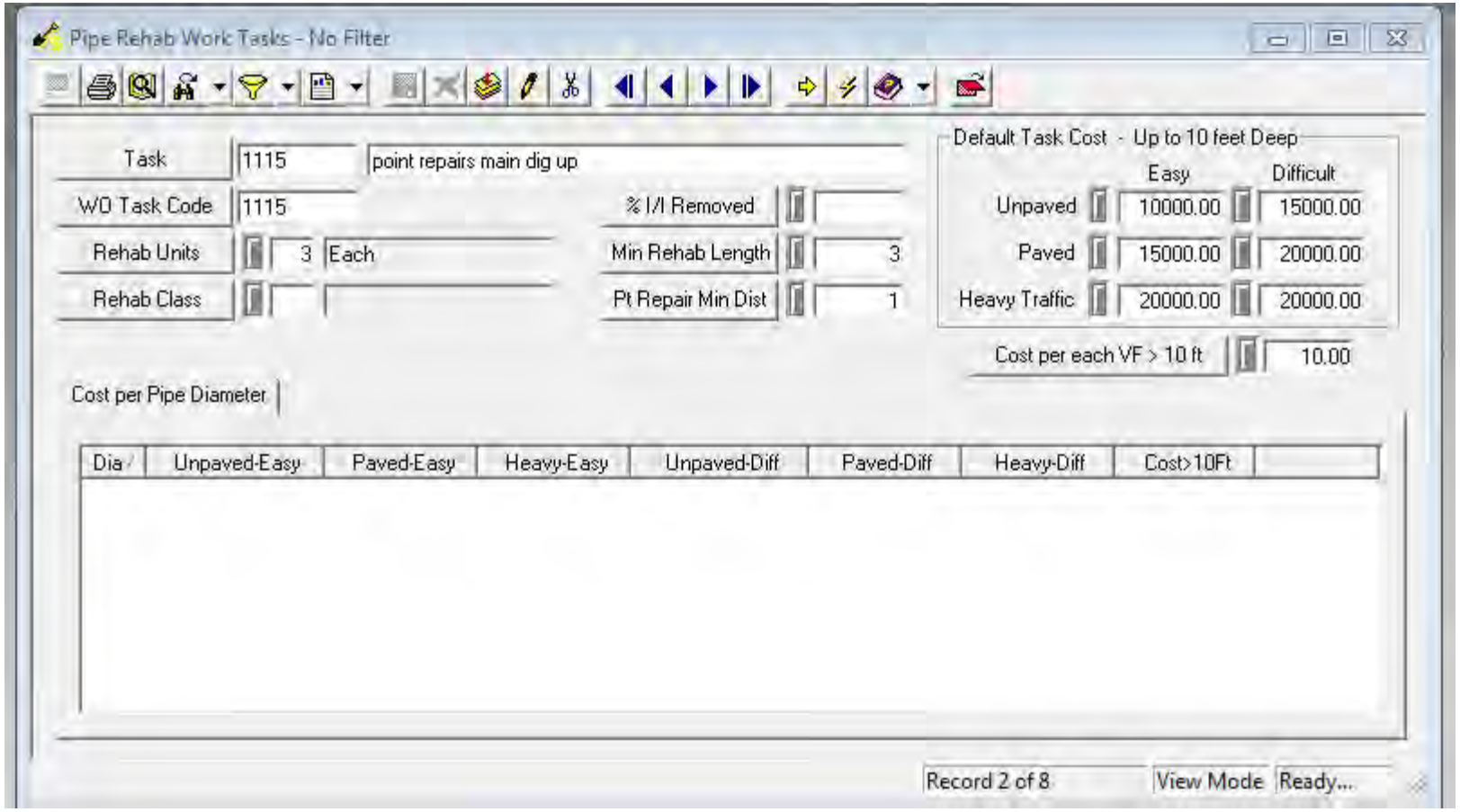
Project Scoring



Next Steps

Lucity Rehab module

- Expand on our use of the rehab module.



Next Steps

- Project Priority Array
- Capital Project component
- Pump Stations
- Force Mains
- Rework codes/weights to work with PACP

Lessons Learned

- You have more data collected than you realize even before implementation
- Staff support and Management buy in is crucial to any systems success
- CMMS systems, once populated, save time, money.
- Adds quantifiable data to back rehab needs and cost allocation.
- Provides an easily searchable data base to provide history on work/assets, customer issues and inquires, and any other data you may want to “gather”

CMMS systems - What does a utility need to get started?

Brown AND Caldwell

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1935

AM programs – agency specific, one size does not fit all – CMMS systems are just one component

- Consequence of Failure (COF) and Probability of Failure (POF)
- Focus on a critical asset class to collect additional data
- Update CMMS
- Update financial

- COF and POF
- Asset Management Program Evaluation (AMPE)
- Business Process Analysis (BPA)
- Collect additional data
- Update CMMS
- Update financial

- COF+ and POF+
- BRE
- AMPE
- Teams
- BPA
- BCE
- SAMPs
- Resiliency
- ISO
- IIMM
- ISI
- CMMS
- Financial

Getting started – CMMS implementations are journeys.....not destinations

- Identify & Evaluate
  - Existing data sources and inventories
  - Existing work practices
  - Look for gaps (e.g. collections, vertical, work history etc.)
  - How are you currently reporting (communicating with decision makers)?

- 1st round goals for system
  - Consolidated asset database
  - Basic work management
  - Basic reporting

Starting slowly and simply is the key to success!

Choose a CMMS system that meets your agencies needs/goals now.....but is expandable

- Evaluation considerations
  - Flexible reporting
  - Modular (can add assets/users)
  - Ease of use
  - Vendor support
  - Mobile applications
  - Cost

PRODUCT Attribute	Advantis	Infor	Hansen	GBA Master Series	CityWorks	MUNIS Work Management	Maximo
Plant-Asset Focused		✓	✓			✓	✓
Linear-Asset Focused	✓	✓	✓	✓	✓		✓
Client-Server			✓	✓	✓	✓	
Web-Based	✓	✓	✓				✓
Relative Cost of Licensing & Implementation	Med	High	Med	Med	Med	Low	High

Learn from others……..and find a champion

- Benchmark
  - What systems are neighboring/similar agencies using?
  - How is it working for them?
  - Information sharing/user group potential

- Identify an internal “champion(s)”
  - Day jobs will continuously get in the way
  - One or more individuals needs to be focused on the effort and own it
  - Other departments (e.g. IT) will need to be on board
  - Business processes needed to support the tools

CMMS systems – Benefits Recap

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Benefits to Small Agencies

- Collect reliable data to measure performance
  - Workload backlog
  - Productivity
  - Effectiveness of preventative maintenance
  - Improves focus on critical assets
  - True O&M costs
- Standardize O&M practices
  - Extend useful life and reduce O&M-related equipment failures
  - Facilitates continual improvement
  - Captures system O&M knowledge
  - Streamline work practices

Benefits to Small Agencies (cont.)

- Quantify needs to decision makers
  - demonstrate the need for more resources
  - prove warranty compliance or regulatory compliance
  - Support rate adjustments to decision makers
- Provides visibility and transparency
  - Management understands what is happening in the field
  - Field crews understand what is important for effective utility management

Questions

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