

Leveraging Big Data for Intelligent Asset Management

July 26, 2019



WATER
OUR FOCUS
OUR BUSINESS
OUR PASSION

 **carollo**
Engineers...Working Wonders With Water®

Agenda

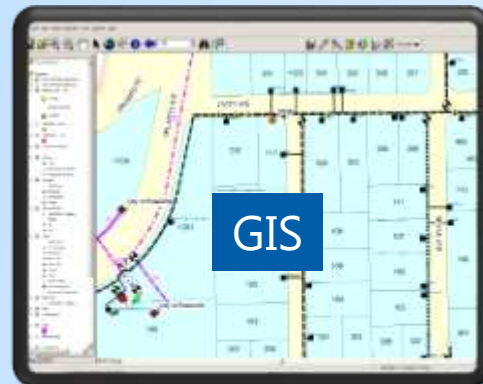
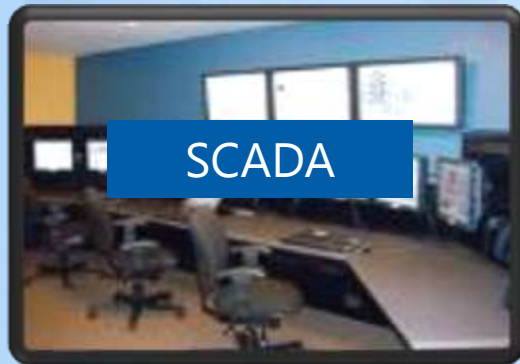
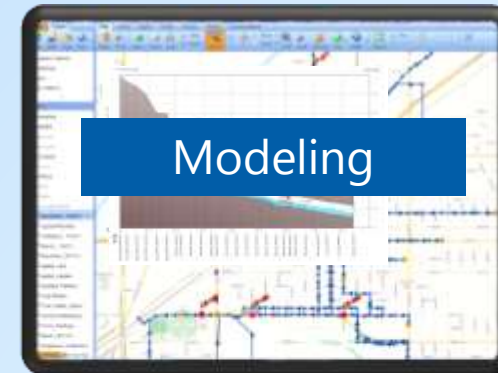
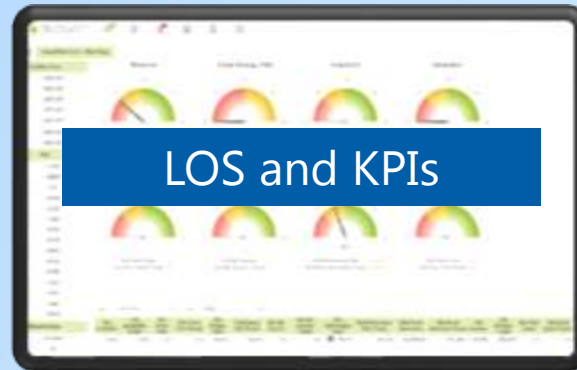
- Data inputs
- Data management
- Data analysis
- Data visualization
- Data quality





Data Inputs

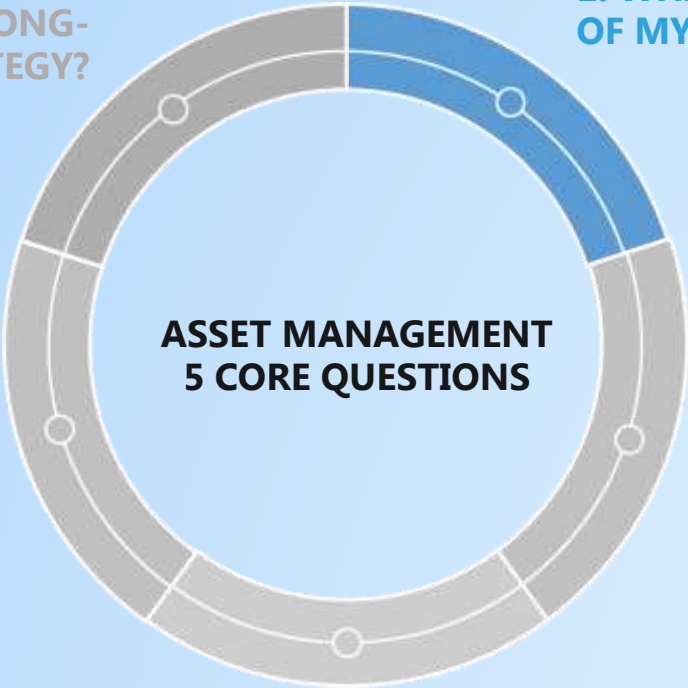
Strategic asset management relies on available data to effectively manage assets throughout their life cycle.



GIS and CMMS are typically the “database of record” for reporting quantity, type, and condition of assets.

5. WHAT IS MY BEST LONG-TERM FUNDING STRATEGY?

1. WHAT IS THE CURRENT STATE OF MY ASSETS?



4. WHAT ARE MY BEST O&M AND CIP INVESTMENT STRATEGIES?

3. WHAT ARE MY BUSINESS RISKS?

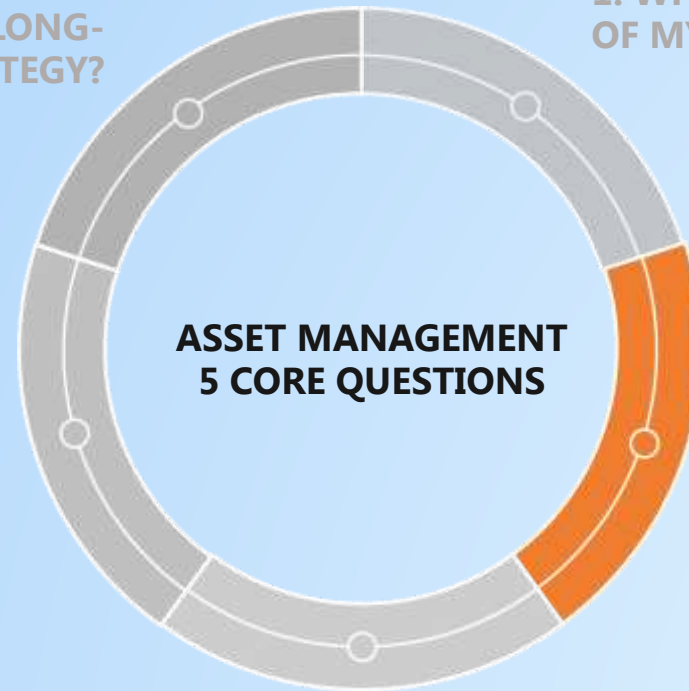


2. WHAT LEVEL...

Desktop dashboards are used to report the status of Level of Service (LOS) requirements and KPIs.

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2. WHAT IS MY REQUIRED LEVEL OF SERVICE?

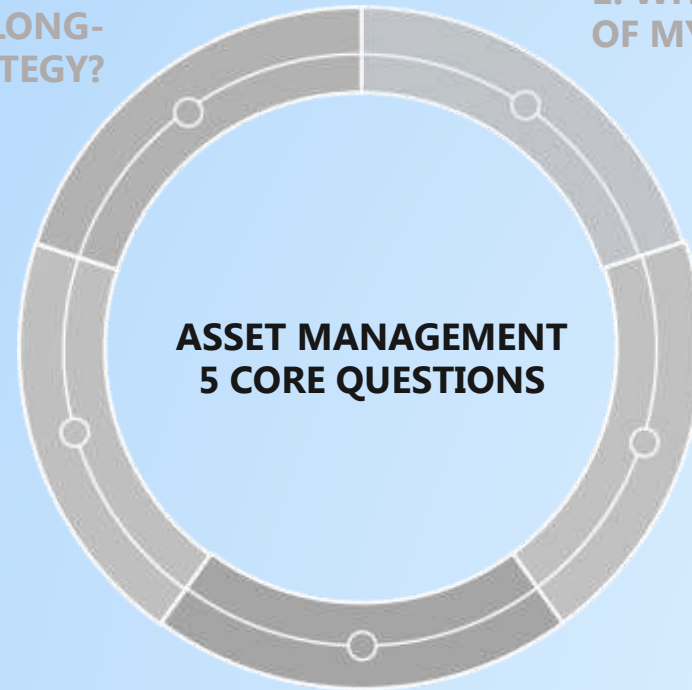
3. WHAT ARE MY BUSINESS RISKS?



Understanding the failure consequences and probabilities helps identify high risk concerns.

5. WHAT IS MY BEST LONG-TERM FUNDING STRATEGY?

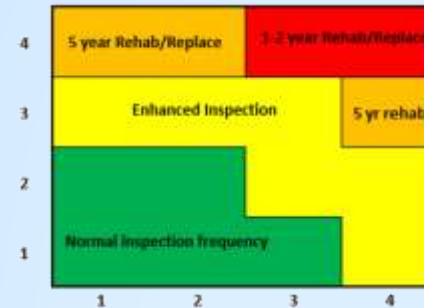
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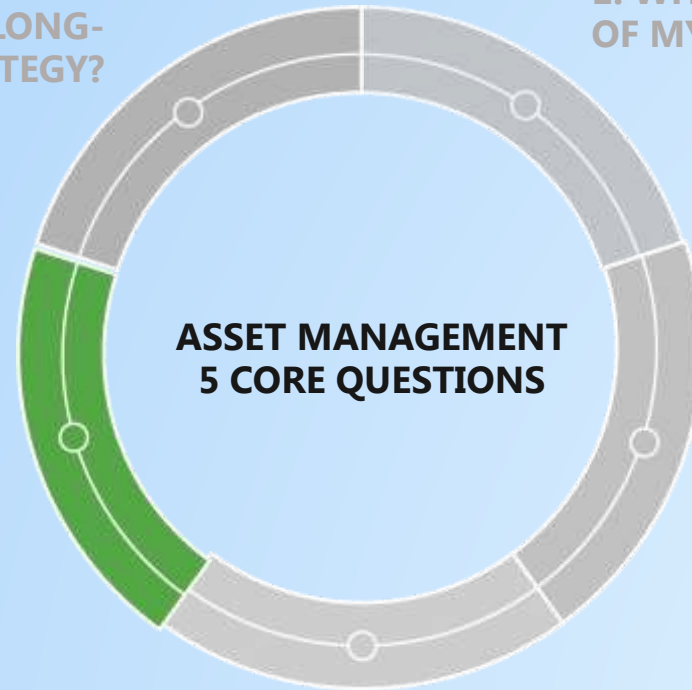
3. WHAT ARE MY BUSINESS RISKS?



Established R&R and O&M strategies optimize the lifecycle costs of the assets while managing and mitigating risks.

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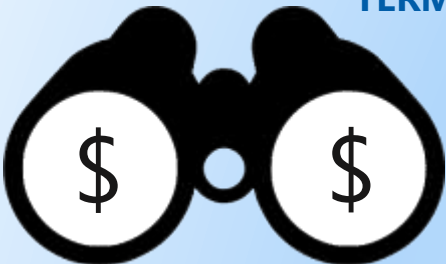
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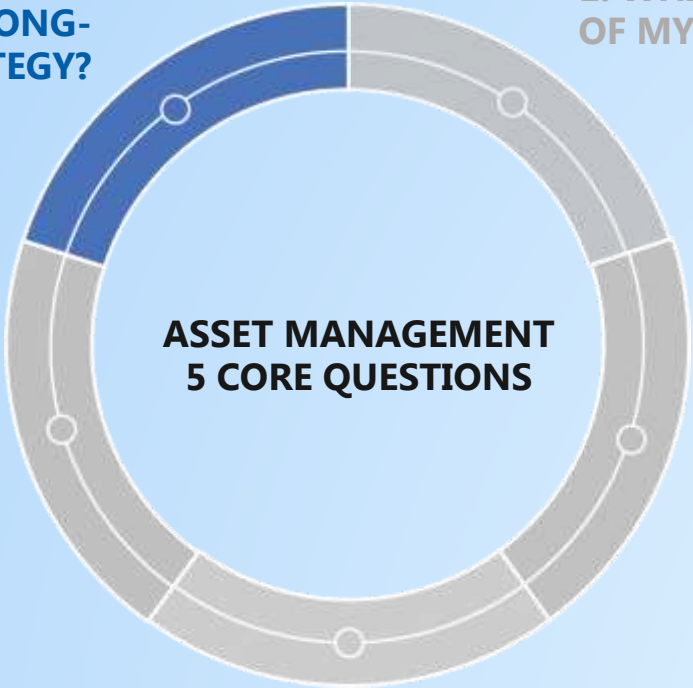


Knowing the near- and long-term needs for managing risk while meeting level of service supports budget requests.



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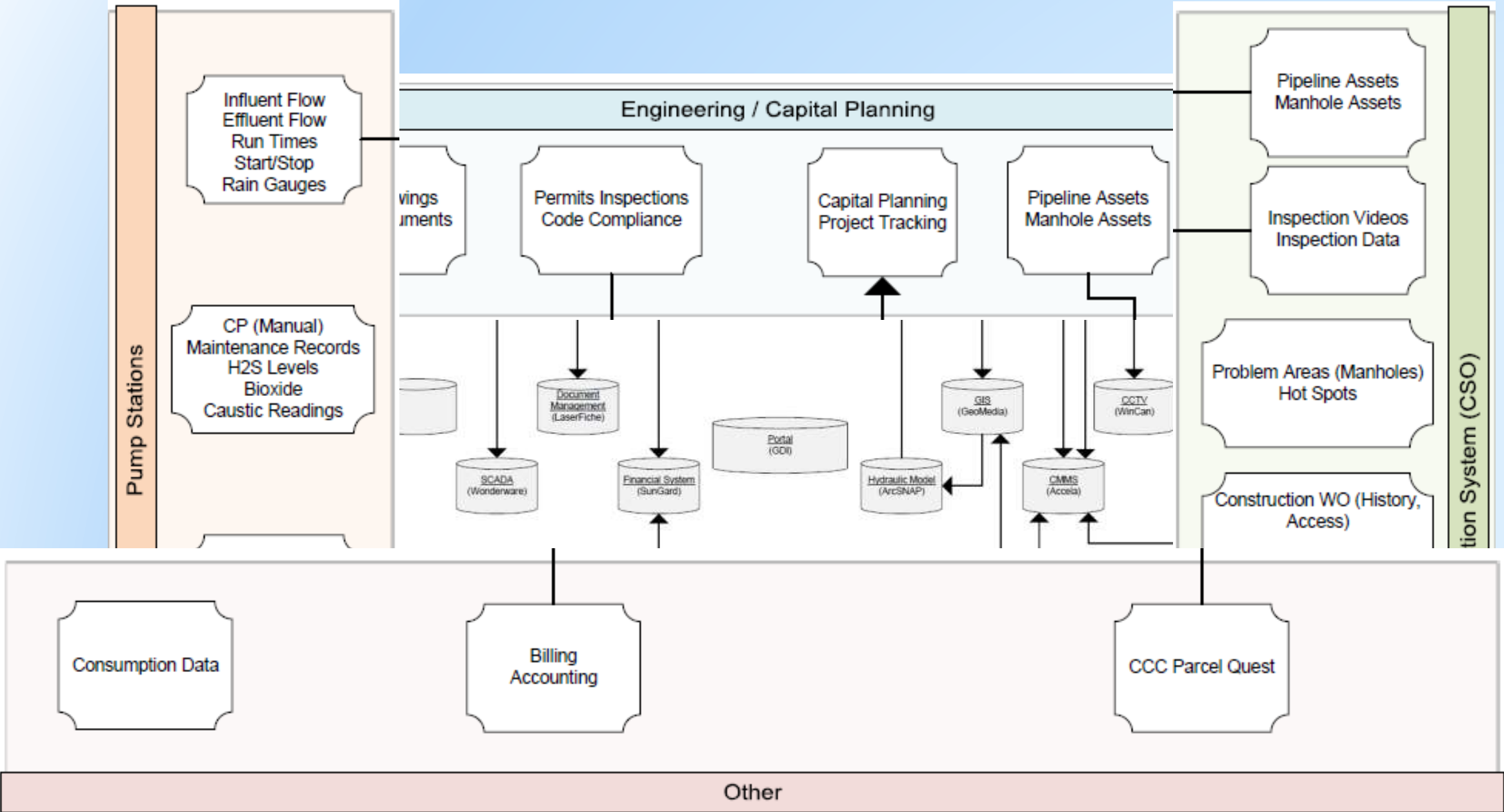
Access to quality data provides confidence that the right decisions are made at the right time for the right reasons.



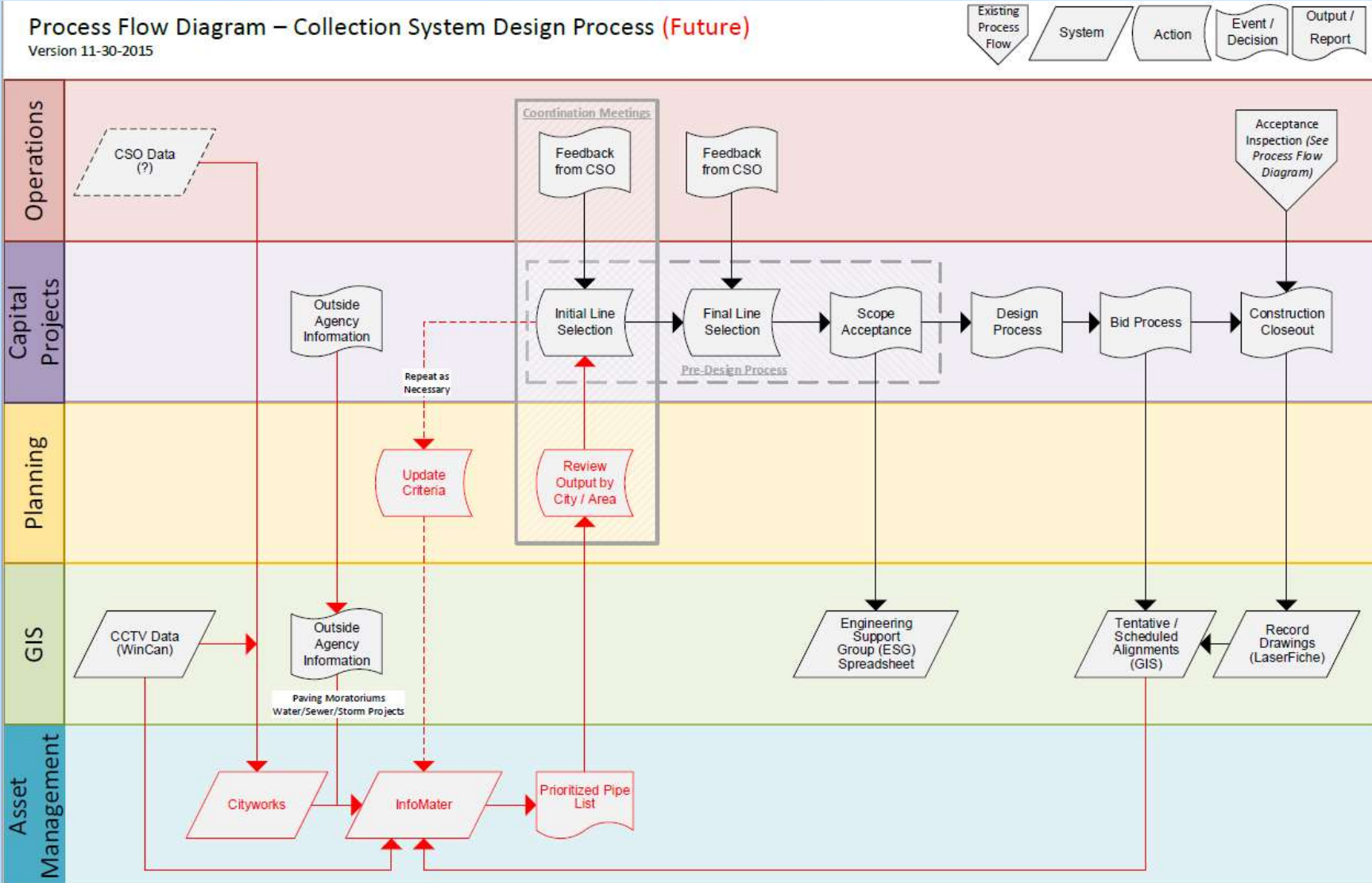


Data Management

Abundant data is created between installation and retirement



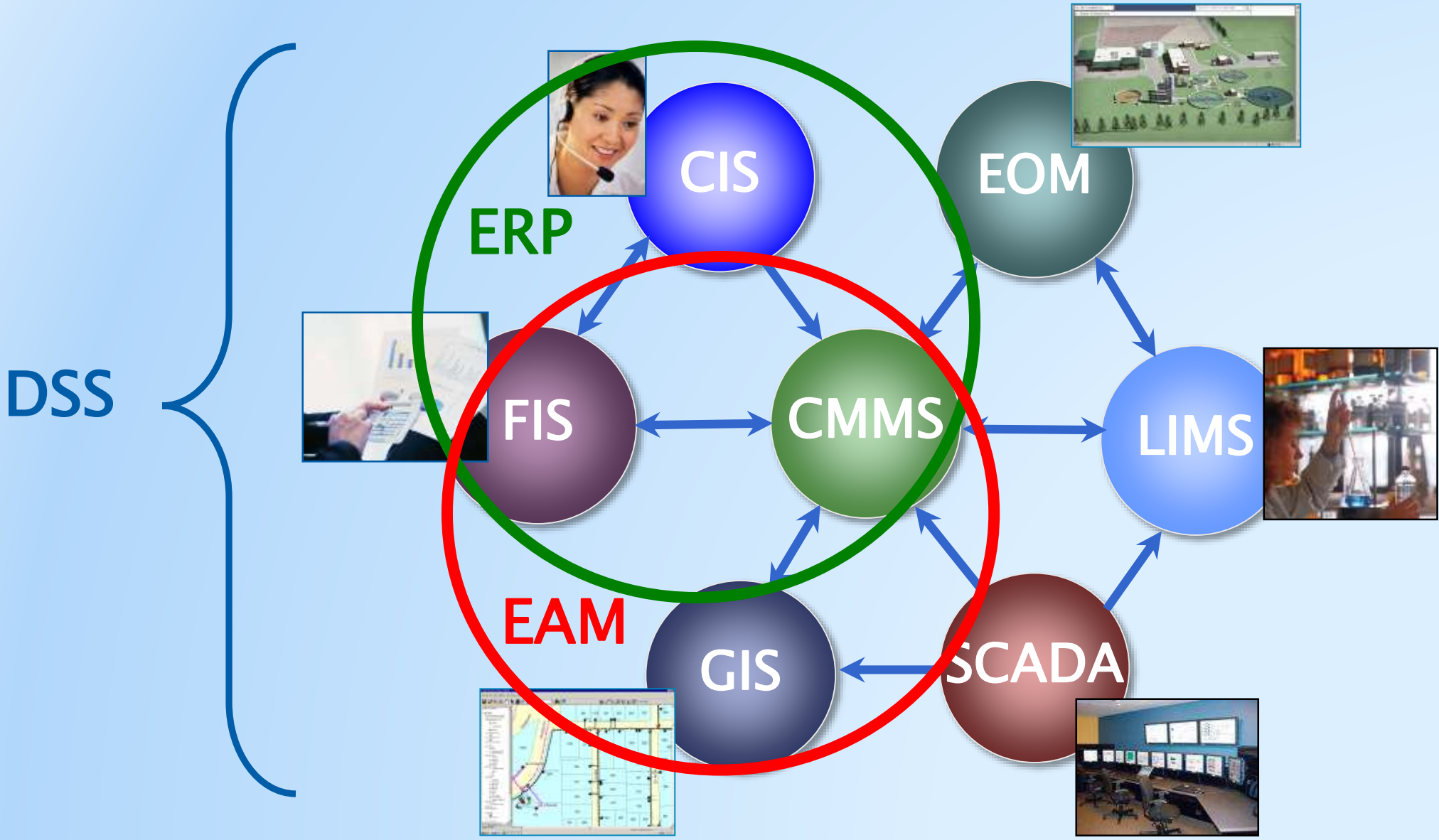
A clear understanding of data responsibilities improves data quality and decision-making





Data Analysis

Acronym soup of asset and maintenance management systems



MAINTSTAR tyler technologies

Beehive industries SEDARU

Cityworks Empowering GIS MAINTENANCE CONNECTION



esri



Power BI

lucidity emaint

InfoAsset Planner

infor

IBM maximo

Optimatics PLAN SMARTER

tableau

ORACLE

POWERPLAN

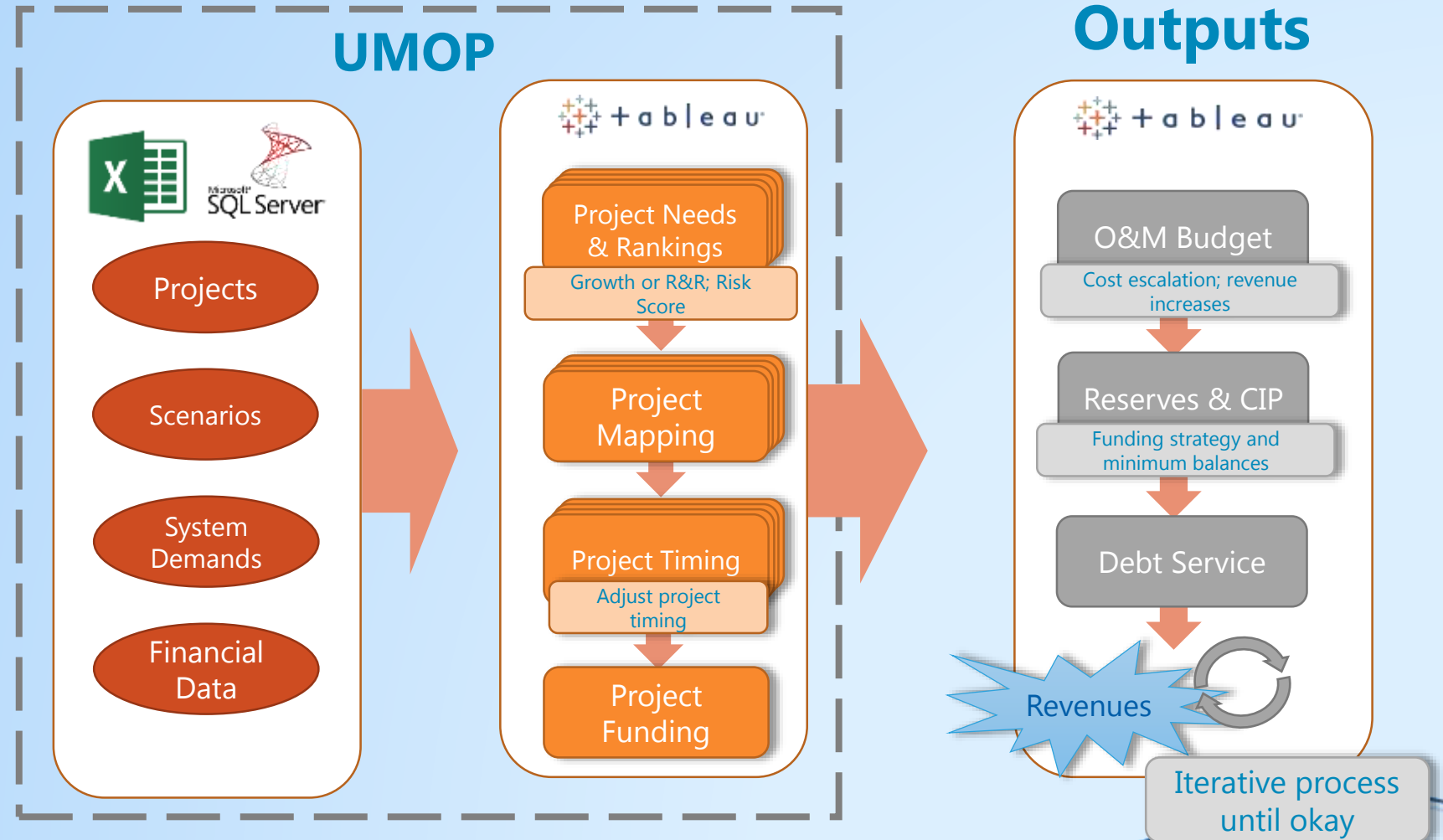
CMMS (Work Orders)

DSS (Risk Analysis & Prioritization)

Reporting (KPIs & Communication)

Utility management optimization connects the various data sources to support scenario planning and decision-making.

Engineering Models, GIS, and Financials



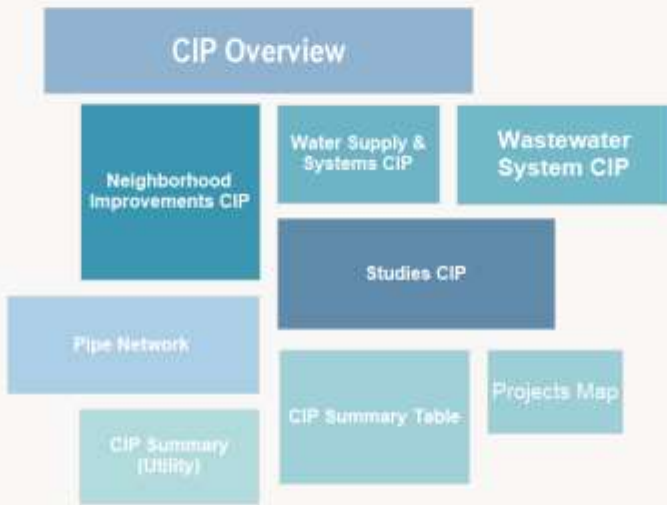


Data Visualization



Utilities Management
Optimization Planning Tool

Navigation Panel



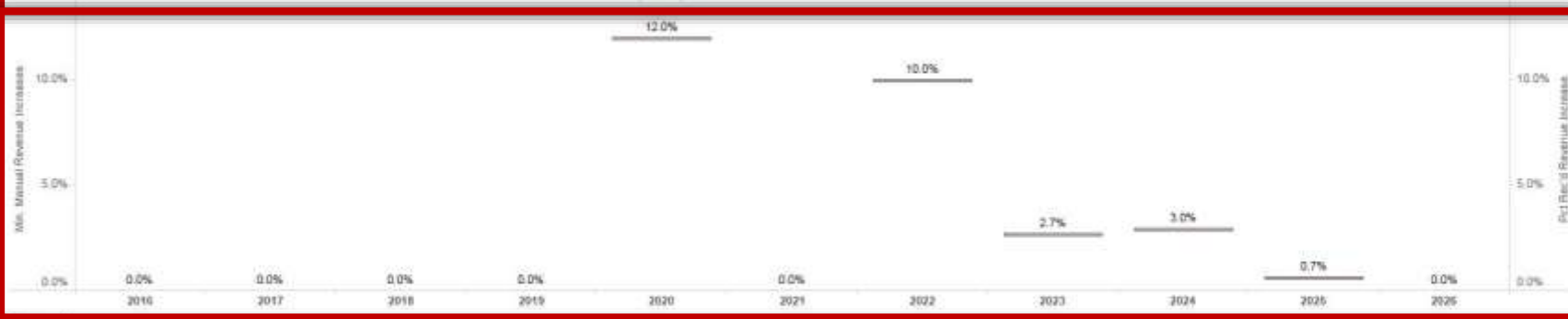
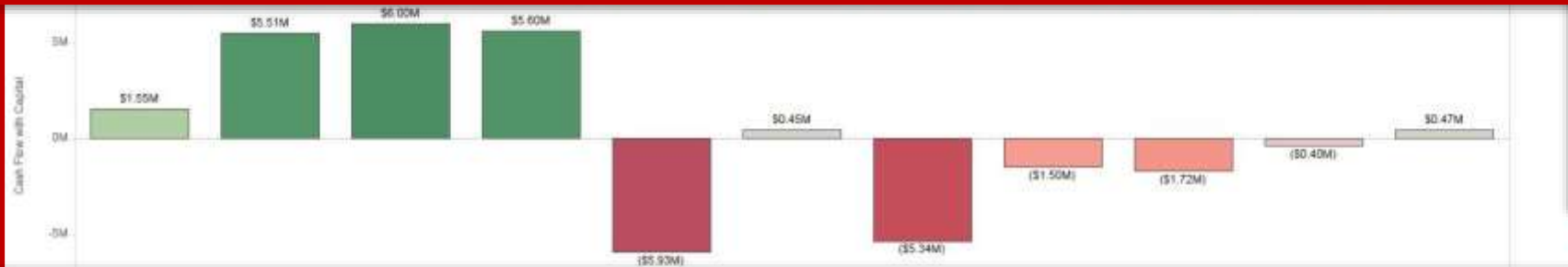
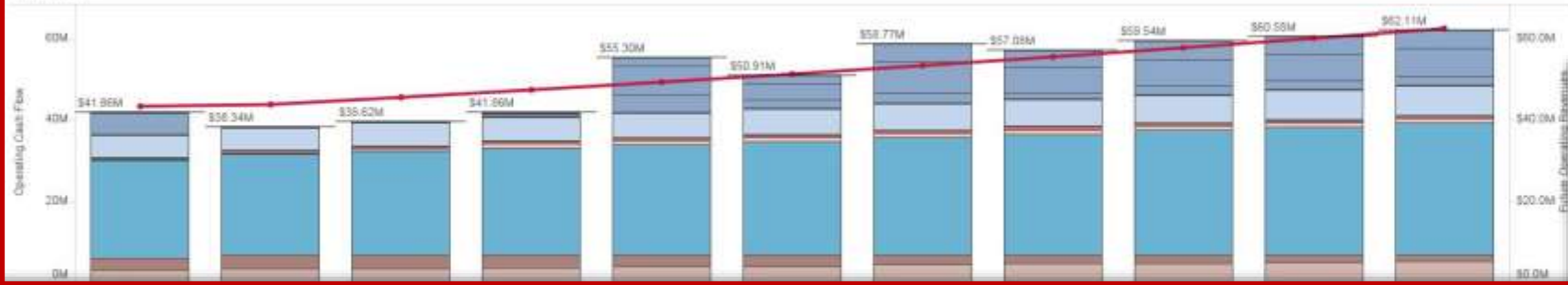
Cash Flow Overview

Home

Operating Fund (401)

Rate Summary

Cash Flow



- Measure Names
- Capital Funding
 - Reuse Capital Fin.
 - 401 Target
 - OSM Expenses
 - Operating Revenue
 - Wastewater Capl.
 - Transfer to Gener.
 - Bond Coverage
 - Min. Interest Am.
 - Manual Revenue I.
 - Stormwater Capl.
 - SCRWWTP Contr.
 - Future Debt Serv.
 - Min. Principal Am.
 - Pol Rec'd Revenu.

Control Panel
Fiscal Year Ending for Rate Setting

2017

Annual Rate Increase Control

Year 1	0%
Year 2	0%
Year 3	0%
Year 4	0%
Year 5	0%
Year 6	0%
Year 7	0%
Year 8	0%
Year 9	0%
Year 10	0%
Beyond 10 Years	0.0%



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Cash Flow Overview

Cash Flow



Control Panel
Fiscal Year Ending for Rate Setting
2017

Annual Rate Increase Control

Year 1	<input type="text" value="0%"/>
Year 2	<input type="text" value="0%"/>
Year 3	<input type="text" value="3%"/>
Year 4	<input type="text" value="3%"/>
Year 5	<input type="text" value="0%"/>
Year 6	<input type="text" value="0%"/>
Year 7	<input type="text" value="0%"/>
Year 8	<input type="text" value="0%"/>
Year 9	<input type="text" value="0%"/>
Year 10	<input type="text" value="0%"/>
Beyond 10 Years	<input type="text" value="0.0%"/>

Cash Flow
(\$2.92M) to \$7.02M

Cash Flow Overview

Operating Fund (401)

Rate Summary

Cash Flow



- Measure Names**
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 - SCRWWTP Contr.
 - Future Debt Serv.
 - Min. Principal Am.
 - Per Rec'd Revenue



Data Quality

Collect and maintain data on asset condition and performance



1 Very Good		Generally installed within the last 1-2 years Does not require immediate maintenance Has none of the following attributes: a. Excessive noise b. Excessive vibration c. Excessive corrosion d. Excessive leaks e. Rattling/tal
2 Good		Generally installed within the last 3-10 years Requires minimal maintenance May or may not have one of the following attributes: a. Excessive noise b. Excessive vibration c. Excessive corrosion d. Excessive leaks e. Rattling/tal
3 Fair		Generally installed within the last 10-20 years Requires moderate maintenance Has several of the following attributes: a. Excessive noise b. Excessive vibration c. Excessive corrosion d. Excessive leaks e. Rattling/tal
4 Poor		Generally installed within the last 15-25 years Requires regular, intensive maintenance Has many of the following attributes: a. Excessive noise b. Excessive vibration c. Excessive corrosion d. Excessive leaks e. Rattling/tal
5 Very Poor		Generally installed within the last 20+ years Requires extensive maintenance Has most of the following attributes: a. Excessive noise b. Excessive vibration c. Excessive corrosion d. Excessive leaks e. Rattling/tal



Scoring roll-up provides hierarchical approach to facility ranking



Questions?

Thank you!

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