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PROTECTING CALIFORNIA'S MOST CRITICAL RESOURCE

The Story of an Innovative Approach to Asset Management Planning

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April 19, 2023

Outline

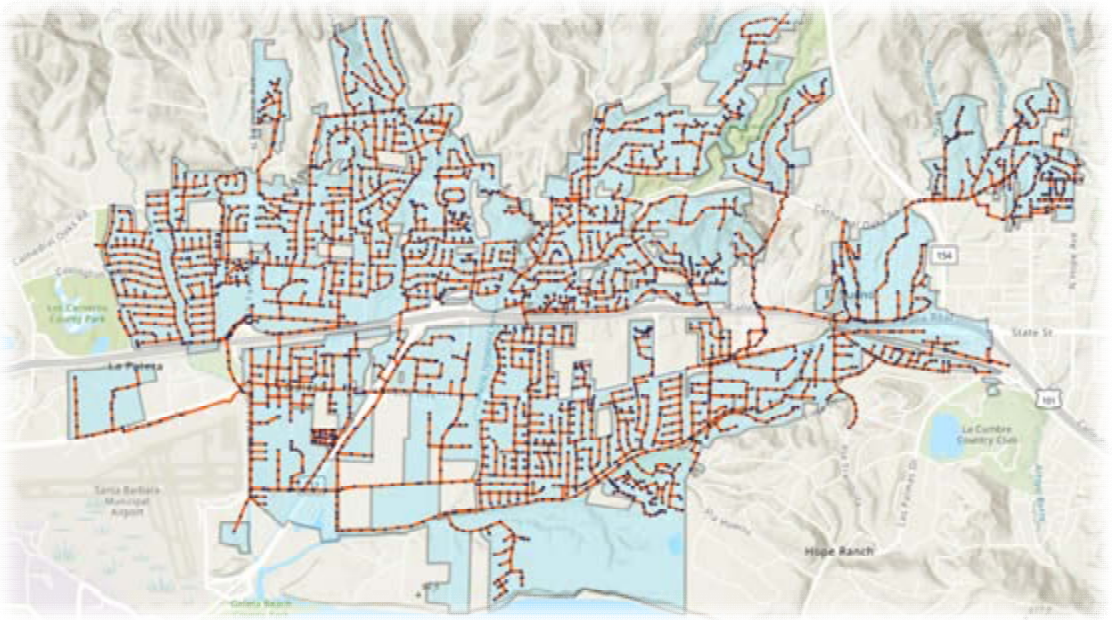
- Phased Approach (Pilot)
- Data-Driven Approach
- Understanding which assets are critical for sustained performance
- Maximizing Value of Data Collected
- Visualize Data to Maximize Communication with All Levels of Stakeholders

Introduction / Background

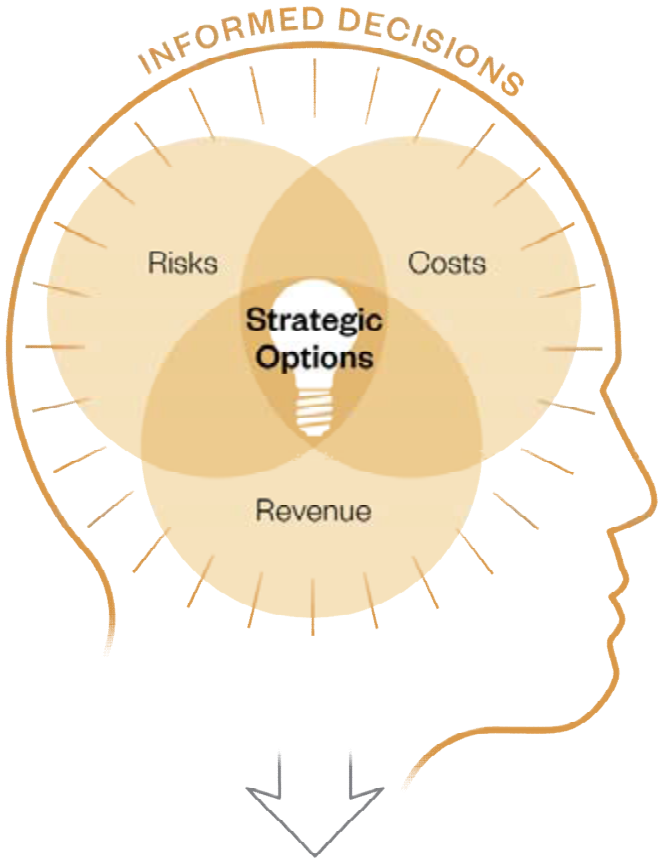
- **1950** — Construction of Goleta Sanitary District
- **1988** — Plant Expansion
- **1994** — Addition of Water Reclamation Facility
- **2013** — Plant Upgrades
- **2021** — BESP Project

Sewer Collection System Overview

- Service for eastern portion of Goleta Valley – Santa Barbara City limits to SB Airport/UCSB
- 132 miles of gravity pipes ranging from 6" to 36" dia sewer
- 75% of pipes are 8" VCP
- 2 lift stations, 2,400 LF total of force main
- 11,250 connections, 80% residential, 100 FSEs, 45,000 population
- System scheduled for cleaning every 3 years, typically completed every 2, CCTV scheduled for 5 years, done 2 x since 2018
- Near zero recurring SSO rate
- CS staff involvement with planning, construction and O&M



Main Drivers



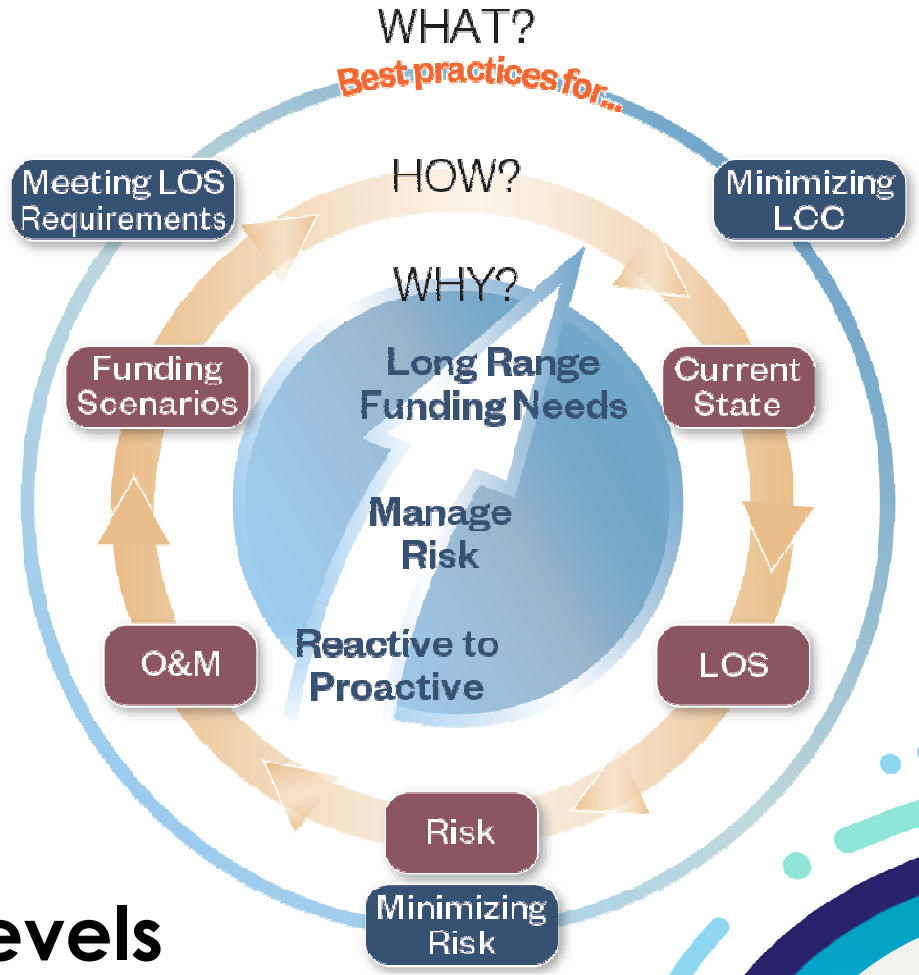
- Lack of data
- Aging infrastructure
- Long-range funding needs
- Prioritize CIP
- Increase reliability
- Capture institutional knowledge

Challenges of Asset Management

- Perceived as being a long and extensive process
- Understanding the value of Asset Management
  - Buy-in from staff
  - Buy-in from senior management
  - Buy-in from elected officials
- How to prevent it from becoming a snapshot in time vs. a continued process
- How to communicate the results

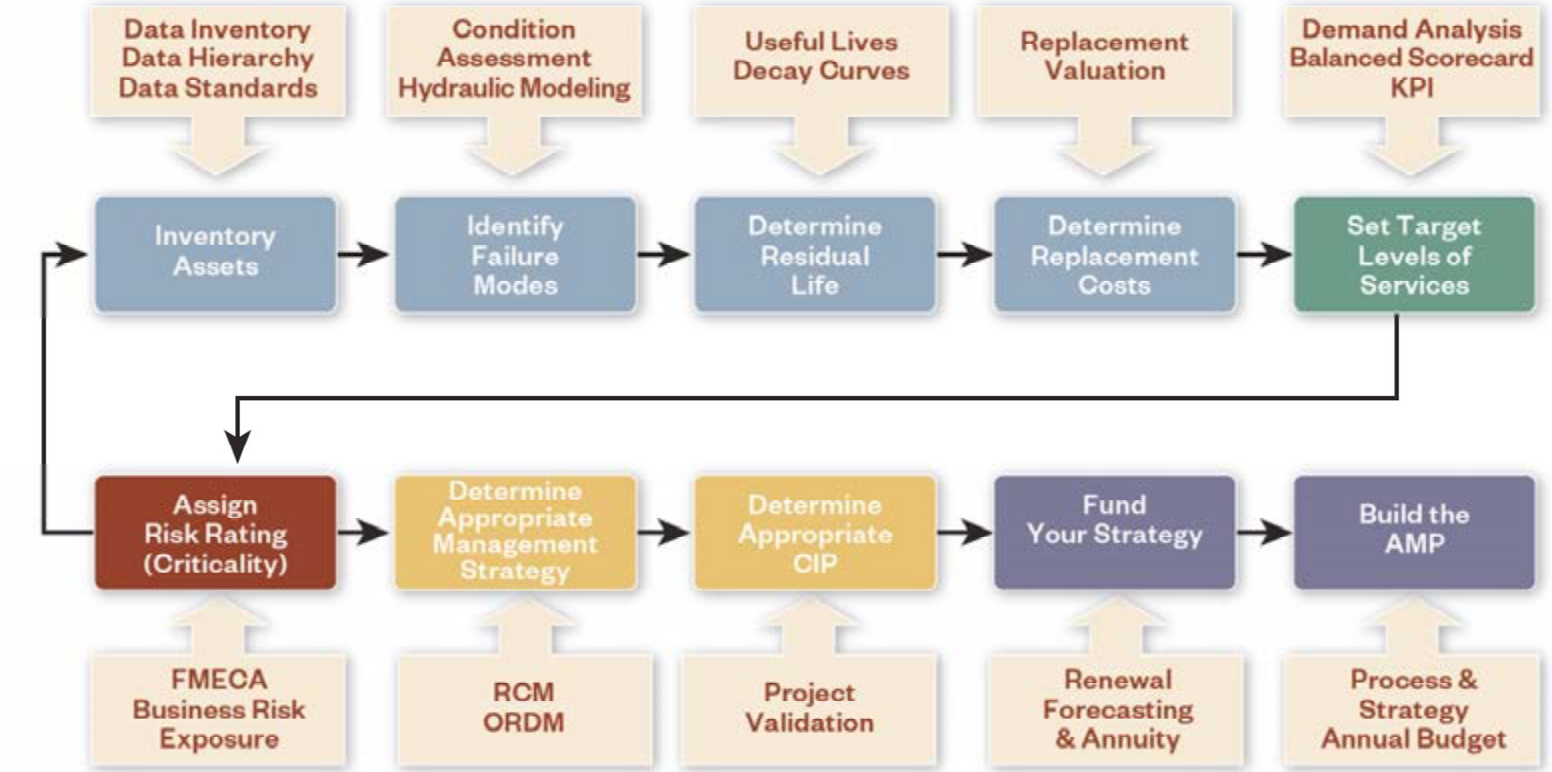
Values of Asset Management is Demonstrated

- What is the current state of my assets?
- What is my required "sustainable" level of service?
- Which assets are critical to sustained performance?
- What are my minimum life-cycle costs?
- What is my best long-term funding strategy?



Buy-in from all levels of the organization

Implement all the steps in a short time-frame



USEPA 10 Steps of Asset Management

Benefits of a Phased Approach

- Efficient use of District resources
- Ability to refine process for future expansion
- Ability to adjust approach to better suit needs of District staff
- Demonstrate the results in a short period of time
- Staff buy-in and transfer of knowledge

Data-Driven Approach

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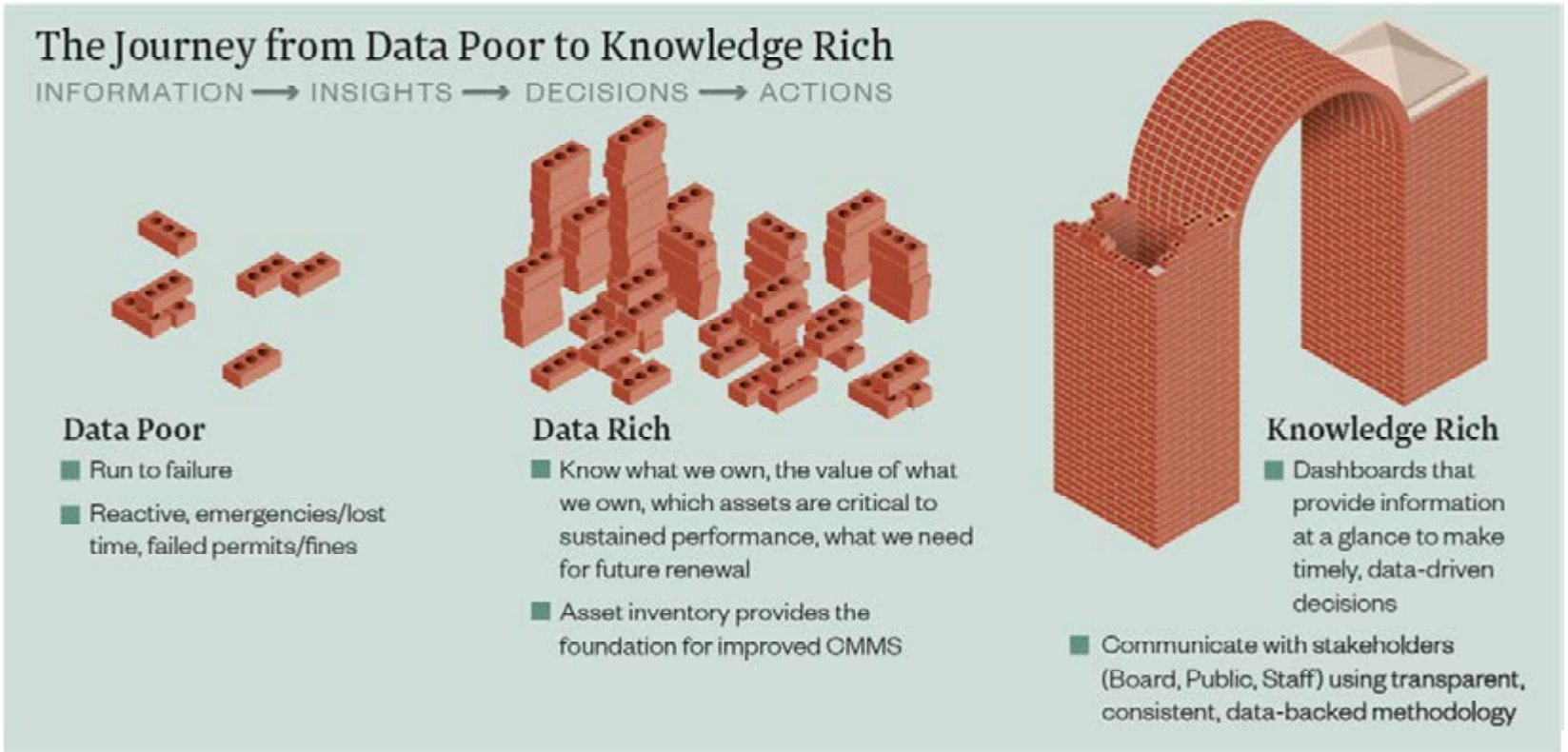
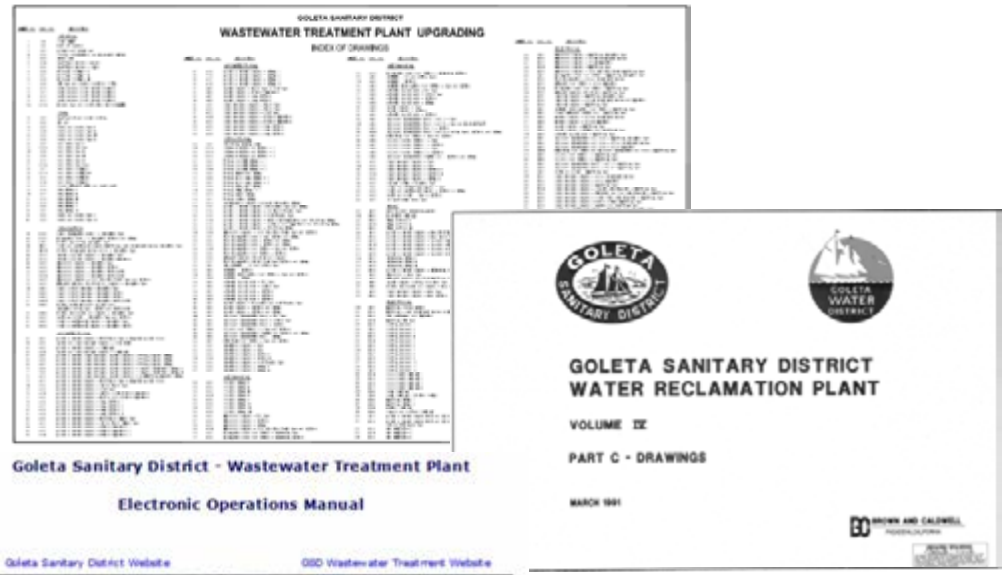
Data Poor to Knowledge Rich



Strategizing the Data Collection

- As-Builts
- Design drawings
- EOM
- Manufacturer manuals
- Bid documents
- Photos/videos
- Staff



Tools and Technology

- Photographic evidence of condition score
- Increased efficiency
- Reduced time on site by 25%
- Reduced time to transfer and QC data by 25%
- Increased data quality and consistency

Paperless

360-degree photos will be taken from each facility

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Centralized Database of High-Quality Data

Asset Description	Quantity	Asset ID	PhotoLink	Discipline	Asset Class	Asset Type	Asset Classification	Asset Tag	Asset SN	Manufacturer	Asset Model	Asset Material	Asset Size 1	Asset Size 1 Units	Asset Size 2	Asset Size 2 Units	Asset Size 3	Asset Size 3 Units	Attribute Information	Asset Condition	Install Year
Interior Door	3	WW		Architectu	Interior Do	Single						Solid Core	3	ft	7	ft	0			3-Fair	1988
Interior Wall	1	WW		Architectu	Interior Wall							Painted G	1233	sf	9	ft	9	0		2-Goo	1988
Isolationtemp BOD Incubator	1	WW		Mechanics	Lab Equip	Isolationtemp BOD Inc			114139-6	Fisher Sci	3720		0		0		0			2-Goo	2011
Lab Area Eyewash Station	1	WW		Mechanics	Safety Wa			MME-1001					0		0		0			2-Goo	1988
Laboratory Analytical Balance	1	WW		Instrument	Lab Equip	Analytical Balance			D35064	Mettler	AE160		115	V	10	VA	0			2-Goo	1983
Laboratory Centrifuge	1	WW		Mechanics	Lab Equip	Centrifuge			72001503	Thermo Sc	Sorvall ST		120	VAC	5	amps	0			2-Goo	2015
Laboratory Econotherm Oven	1	WW		Mechanics	Lab Equip	Econotherm Oven			601994-2	Thermo El	1025 (653		115	V	11.3	amps	0			2-Goo	2006
Laboratory Electrical Panel	1	WW		Electrical	Lighting P			LPA3		Mettler	AE160	Steel cabir	300	amps	10		0			3-Fair	1988
Laboratory Furnace	1	WW		Mechanics	Lab Equip	Furnace			12570507	Barnstead	Thermolyn		120	V	12	amps	0			3-Fair	2005
Laboratory Hood 1	1	WW		HVAC	Lab Equip	Fume Hood		CKT-1		LABCONC			525	cfm	0		0			4-Poo	1988
Laboratory Hood 2	1	WW		HVAC	Lab Equip	Fume Hood				Labconco	Basic-47		115	V	0		0			2-Goo	2013
Laboratory top loading balance	1	WW		Instrument	Lab Equip	Analytical Balance			J06648	Mettler	BasBal Ty		115		10		0			4-Poo	2002
Laboratory Water Bath	1	WW		Mechanics	Safety Wa				9504-401	Precision	270		120	V	13	amps	0			2-Goo	1995
Quanti-Tray Sealer	1	WW		Instrument	Lab Equip	Quanti-Tray Sealer			15-064-0	IDEXX	2X		0		0		0			2-Goo	2015
Staff Supervisor Office Floor Carp	1	WW		Architectu	Flooring							Carpeting	10	ft	0		0			4-Poo	2010
Steam Sterilization - Auto Clave	1	WW		Mechanics	Lab Equip	Steam Sterilization				Market For	STM-F	Stainless S	18.75	in	31	in dee	27.5	in high		5-Repl	1989
Turbidimeter	1	WW		Instrument	Lab Equip	Turbidimeter				Hach	2100N		0		0		0			2-Goo	1996
Wall Cabinets/Counter	2	WW		Architectu	Cabinets	Laboratory						Aluminum	102	ft	3	ft	0			4-Poo	1988
Ceiling	1	WW		Architectu	Ceiling							Acoustic F	21	ft	14	ft	0			3-Fair	1988
Floor	1	WW		Architectu	Flooring							Clay Tile	21	ft	14	ft	0			3-Fair	1988
Interior Wall	1	WW		Architectu	Interior Wall							Painted G	21	ft	14	ft	9	ft		2-Goo	1988
Ceiling	1	WW		Architectu	Ceiling							Acoustic F	21	ft	17	ft	0			3-Fair	1988
Floor	1	WW		Architectu	Flooring							Vinyl	21	ft	17	ft	0			4-Poo	1988
Interior Door	1	WW		Architectu	Interior Do	Single						Solid Core	3	ft	7	ft	0			3-Fair	1988

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Understanding which assets are critical for sustained performance

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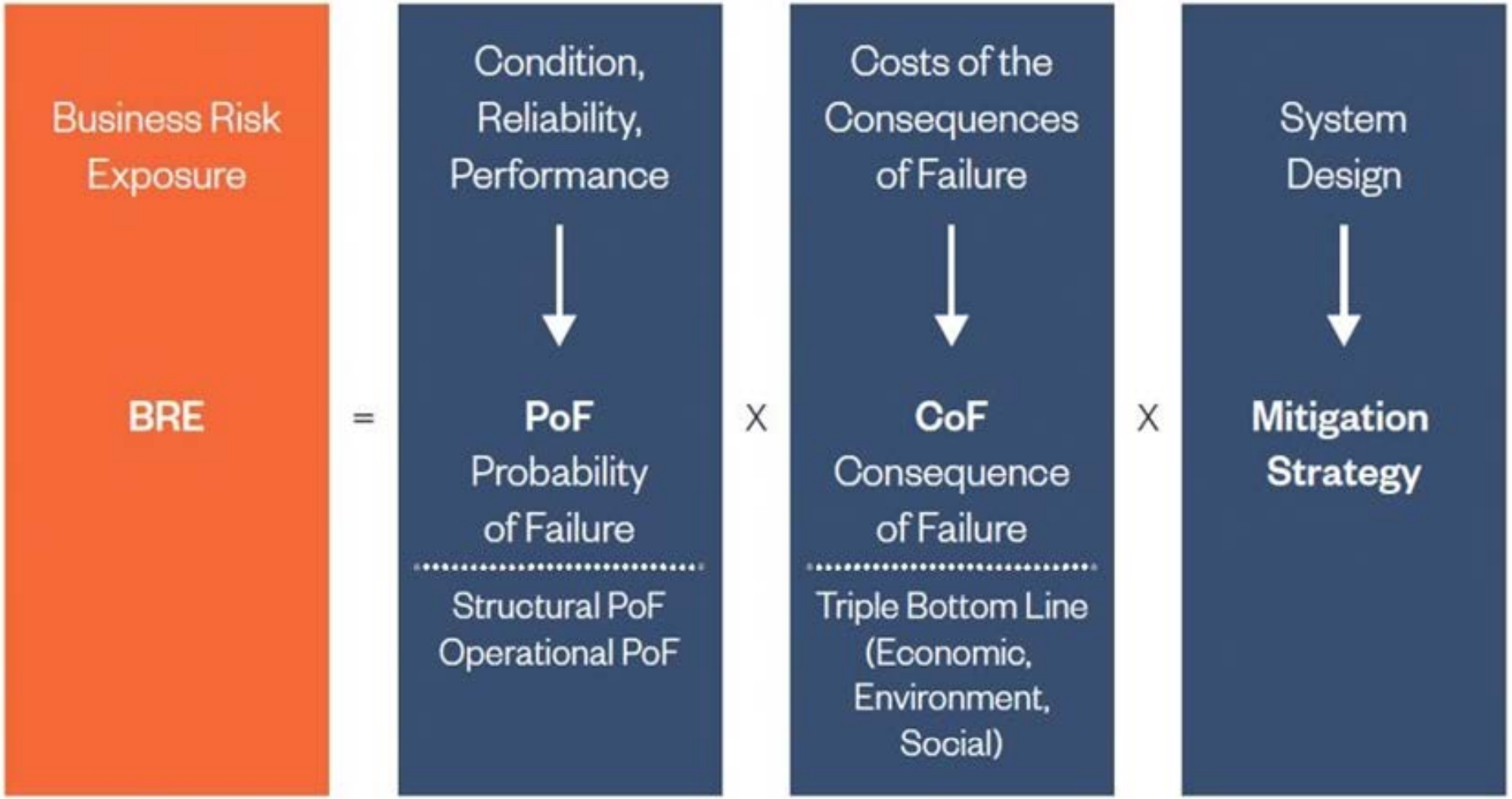
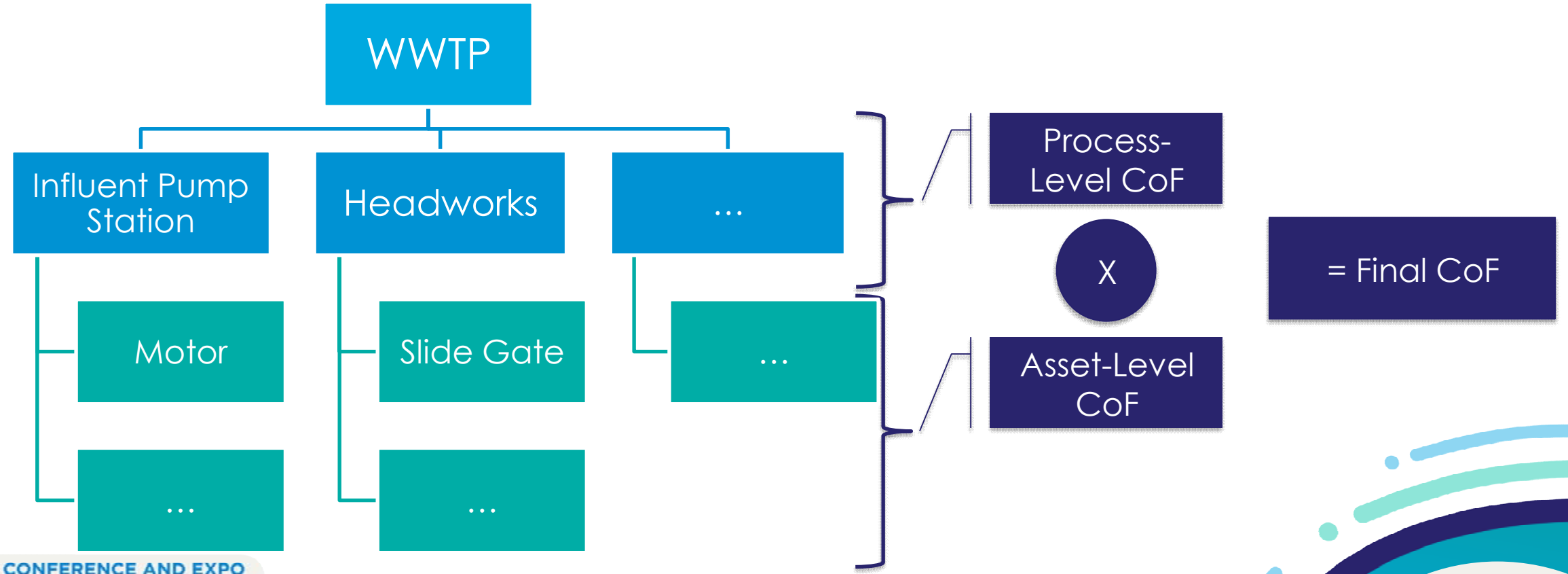
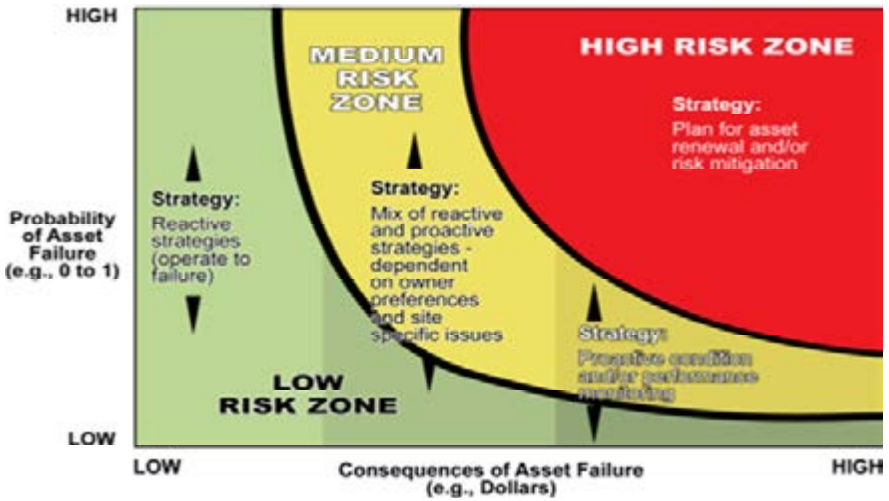
What is the greatest threat to the organization?



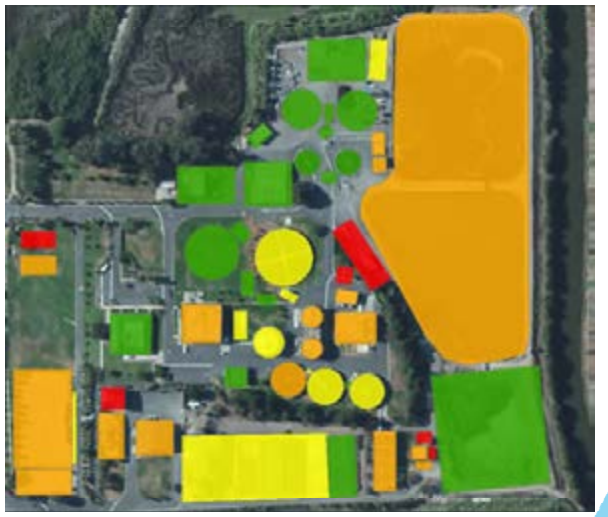
Consequence of Failure Analysis



Visualizing Risk Assessment – Risk Matrix

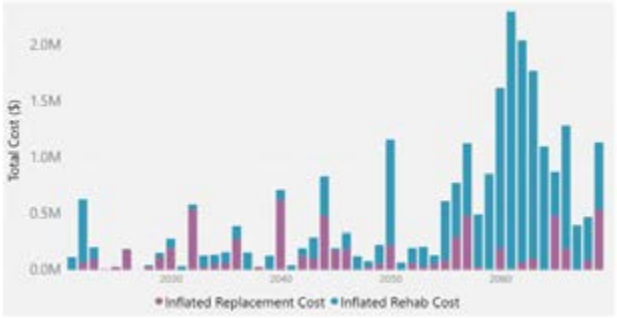


PoF												
	100%	-	16	15	6	3	2	-	-	-	-	-
	90%	15	9	8	2	8	6	4	3	4	1	-
	80%	16	4	7	9	22	45	45	25	6	-	-
	70%	38	12	60	23	36	37	43	19	11	-	1
	60%	45	85	152	28	37	104	6	2	2	2	1
	50%	34	37	36	14	58	23	7	17	4	1	-
	40%	5	13	32	7	35	19	12	6	2	2	1
	30%	24	13	42	49	226	75	57	39	17	3	6
	20%	61	58	49	32	44	15	9	4	2	-	-
	10%	-	2	3	-	1	-	-	-	-	-	-
	0%	-	6	9	17	3	29	9	-	2	-	-
Count of Assets: 2296		0	1	2	3	4	5	6	7	8	9	10
		CoF										

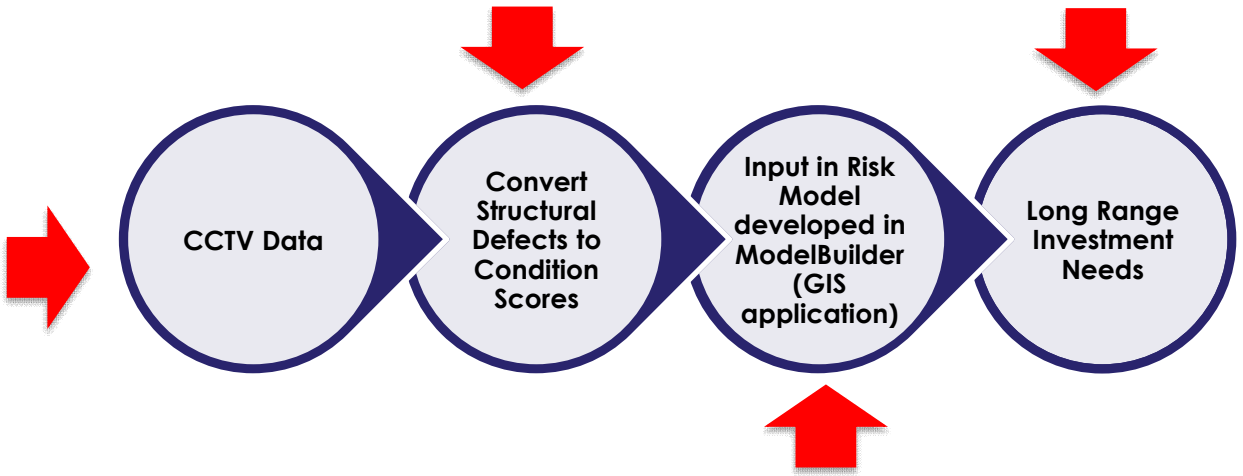


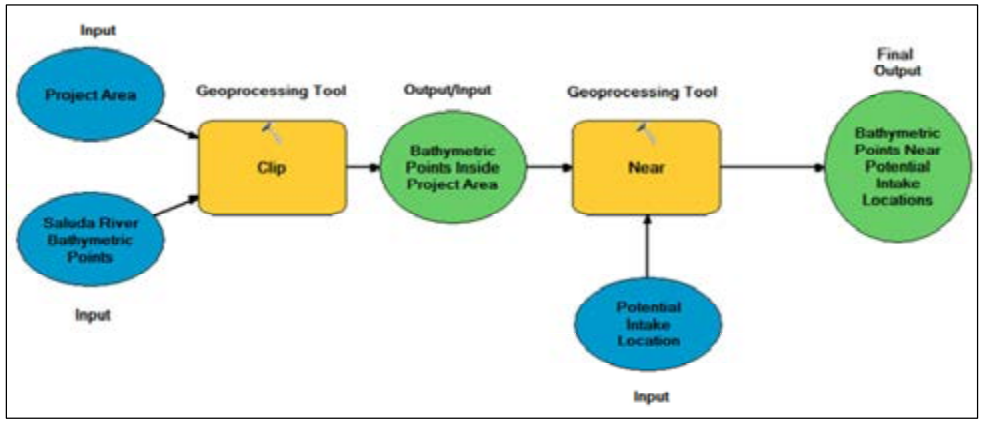
Sewer Collection System Risk Analysis

Condition Grade	Definition
5	Immediate attention needed
4	Poor; will become Grade 5 in near future
3	Fair; moderate
2	Good; has not begun to deteriorate
1	Excellent; minor defects



Examples of Service Defects in a Pipe





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Maximizing Value of Data Collected

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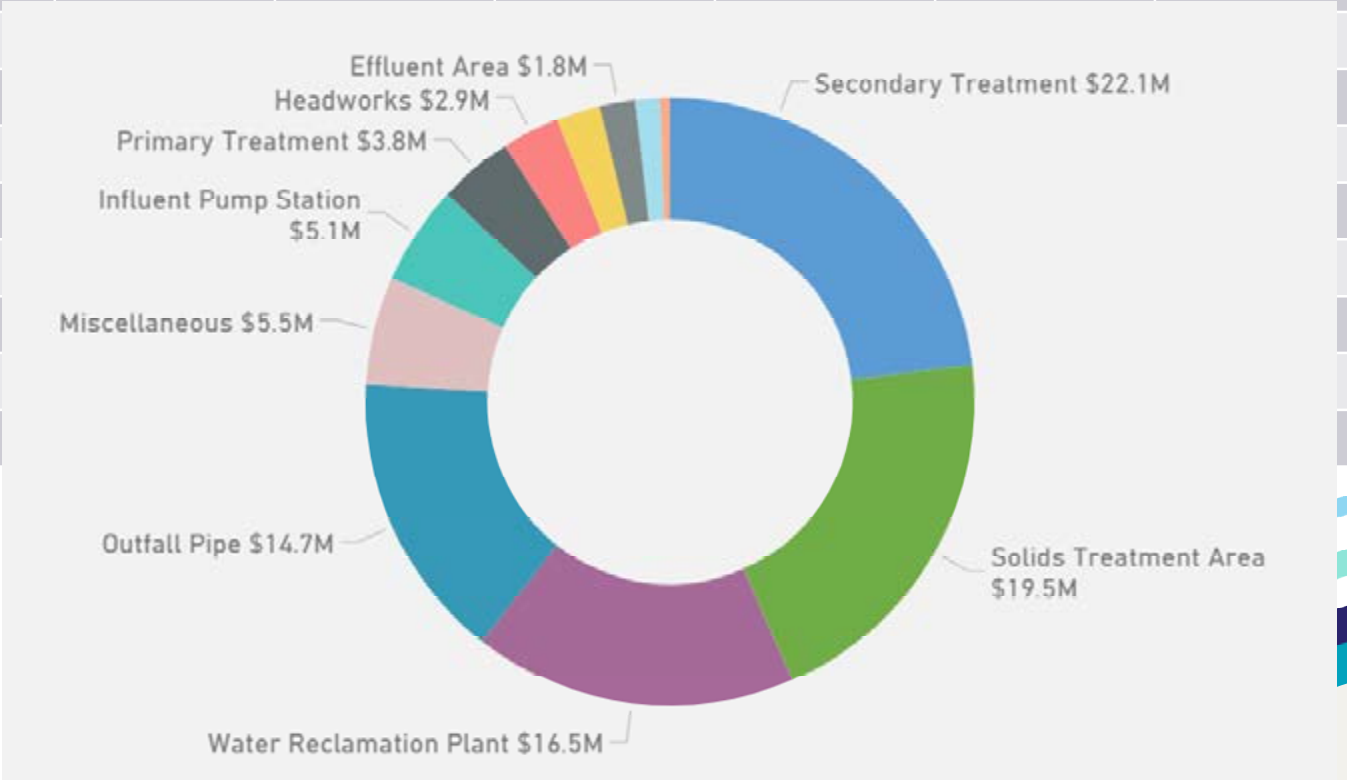
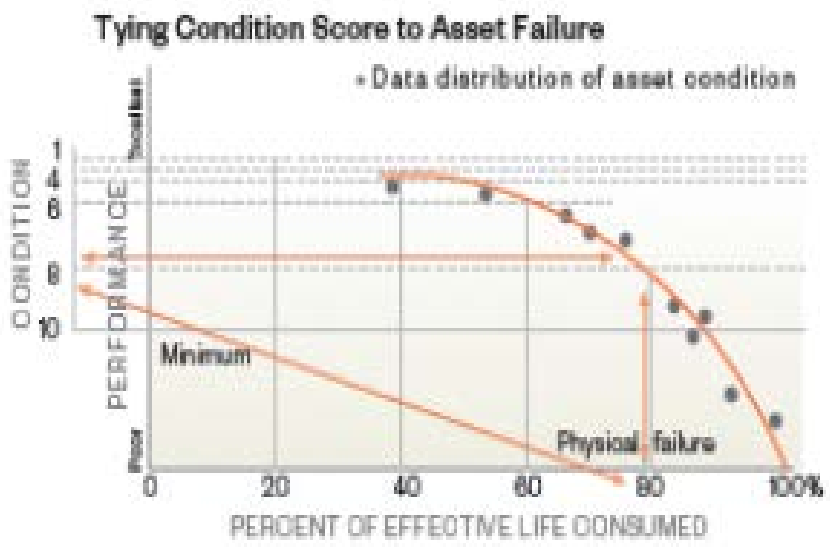
Asset Valuation

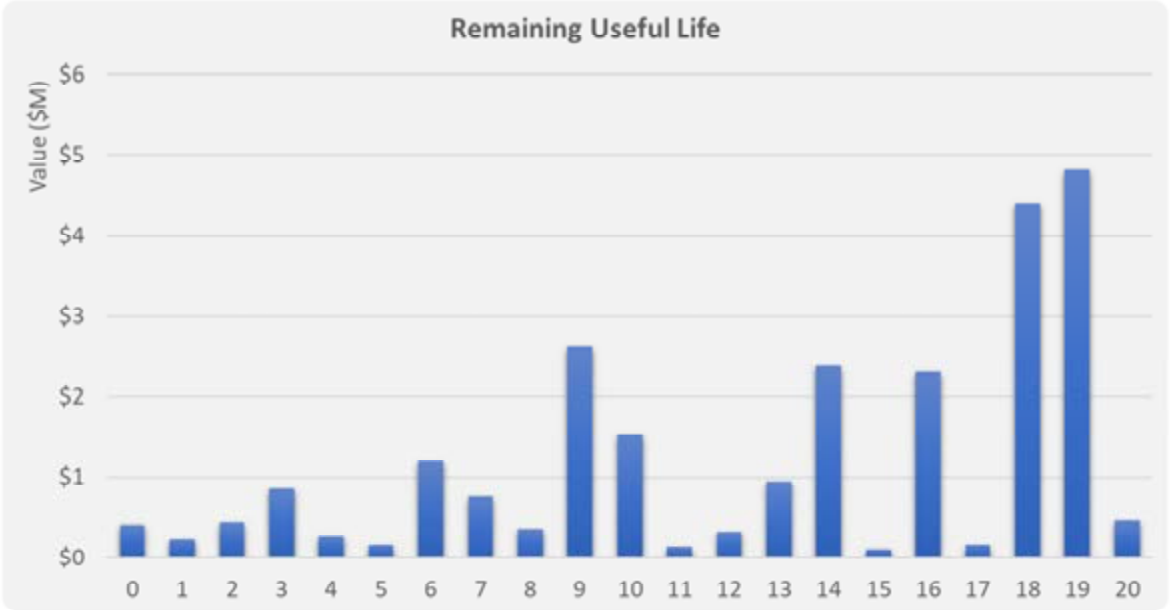
Occur/ Crewday $	Productivity	Labor Unit Cost	Material Unit Cost	Equipment Unit Cost	Total Unit Cost	Labor Total	Material Total	Equipment Total	Total Cost
4938.138	2000	2.469069	100	1.560931	104.03	0	0	0	104.03
4237.704	1	4237.704	3500						
4938.138	2000	2.469069	100						
4938.138	2000	2.469069	100						
4938.138	2000	2.469069	100						
3912.323	2	1956.162	2150						
3912.323	2	1956.162	4100						
3912.323	0.5	7824.646	7600						
3912.323	0.5	7824.646	9100						



Higher Level of Confidence in Predicting Remaining Useful Life

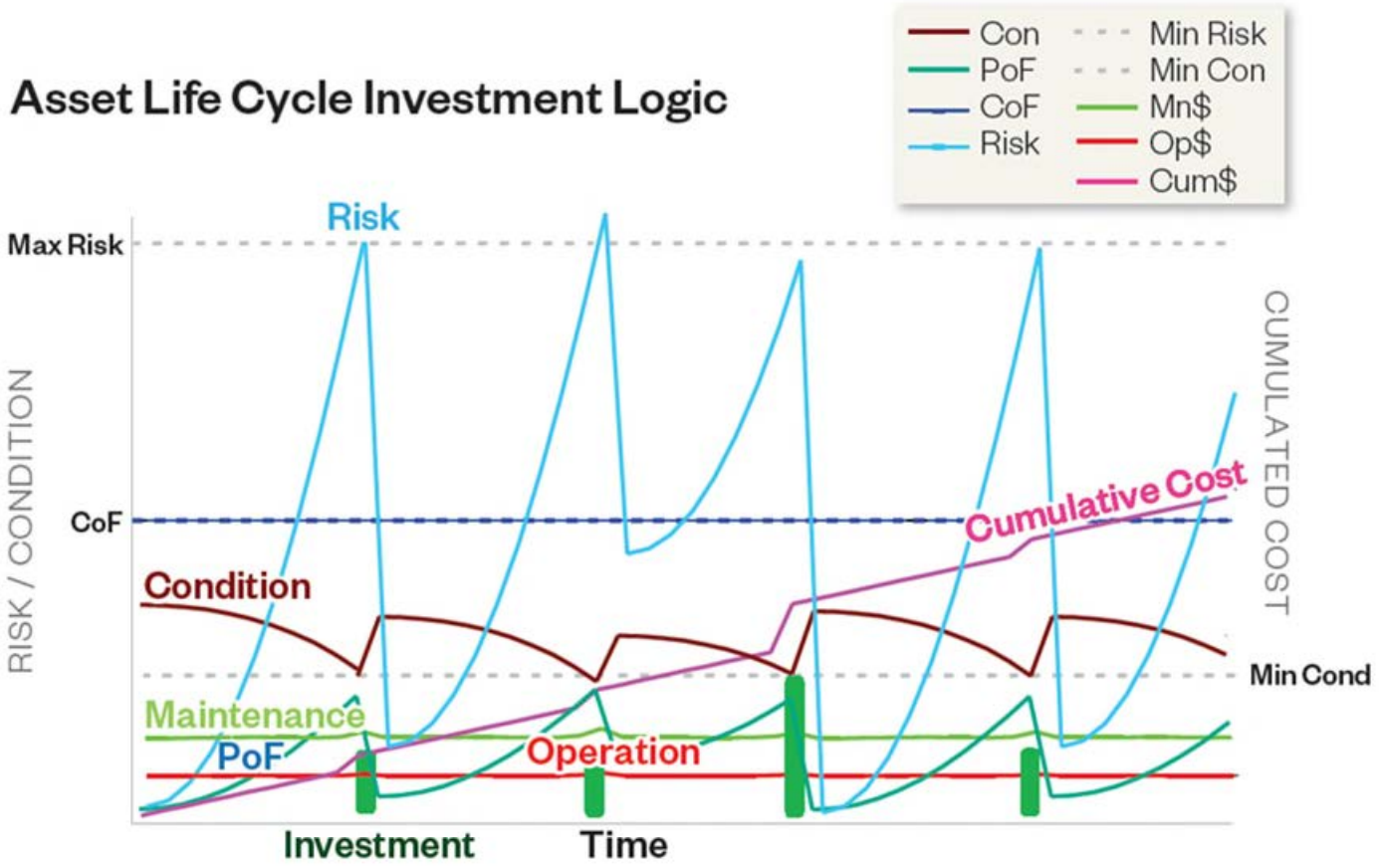


Customizing Useful Lives

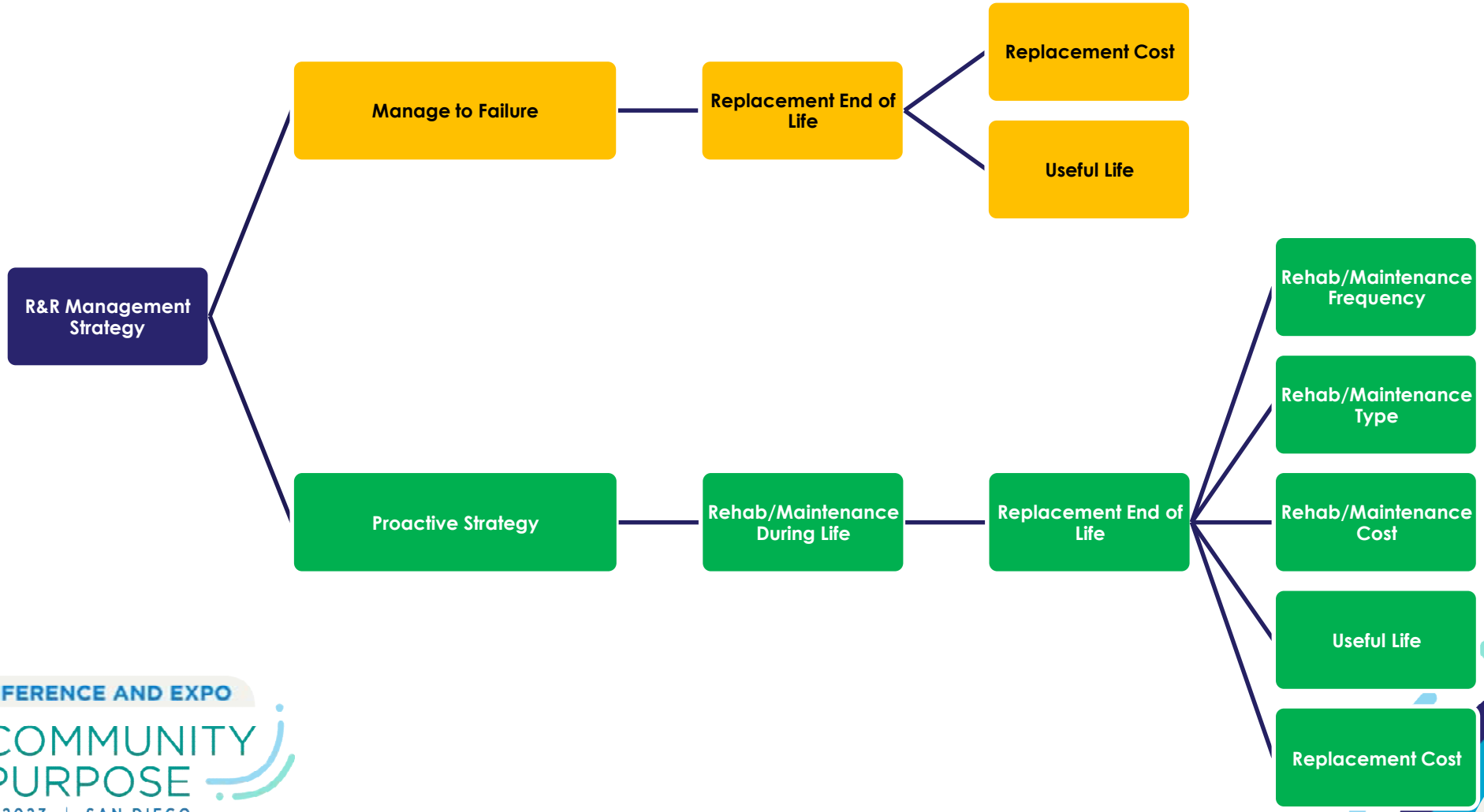


Condition-Based Remaining Useful Life

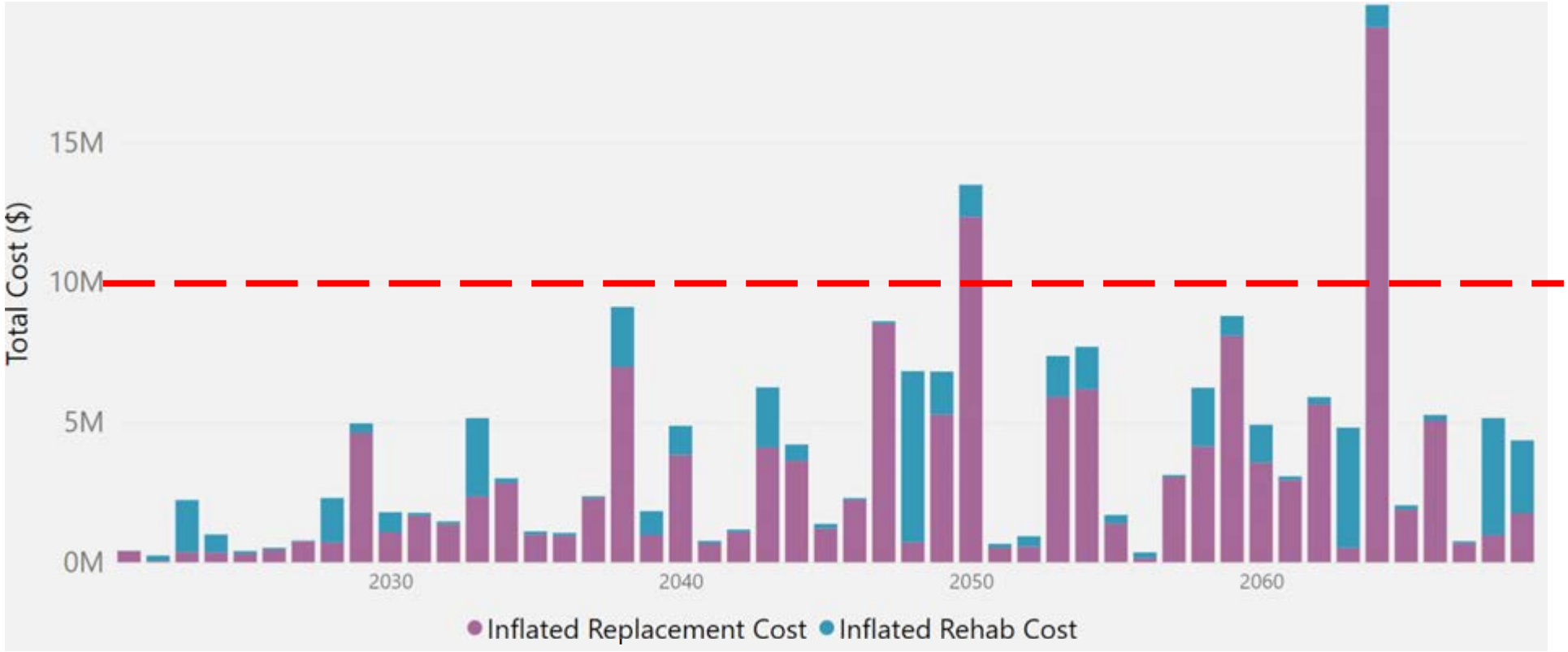
Asset Life Cycle Investment Logic



Replacement and Rehab (R&R) Management Strategy



Determining Where to Spend, When and How Much



Visualize Data to Maximize Communication with All Levels of Stakeholders

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Values

Data Rich

- What they own
- Value of what they own
- What assets are critical to sustained performance

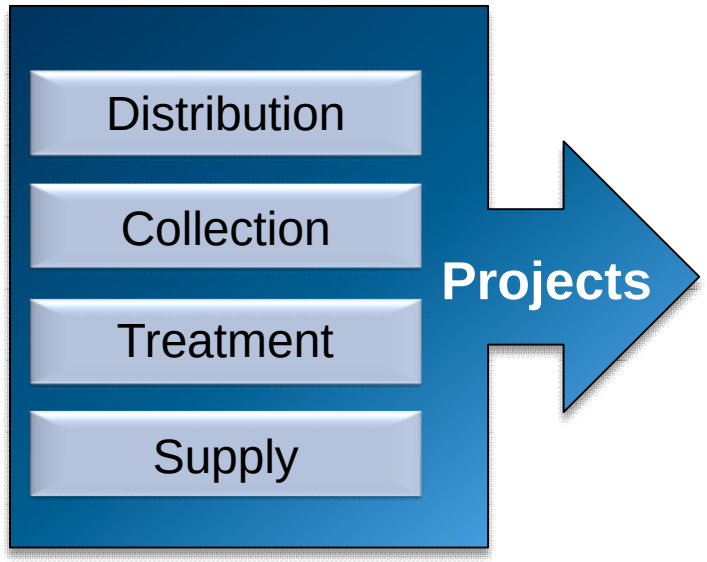
Knowledge Rich

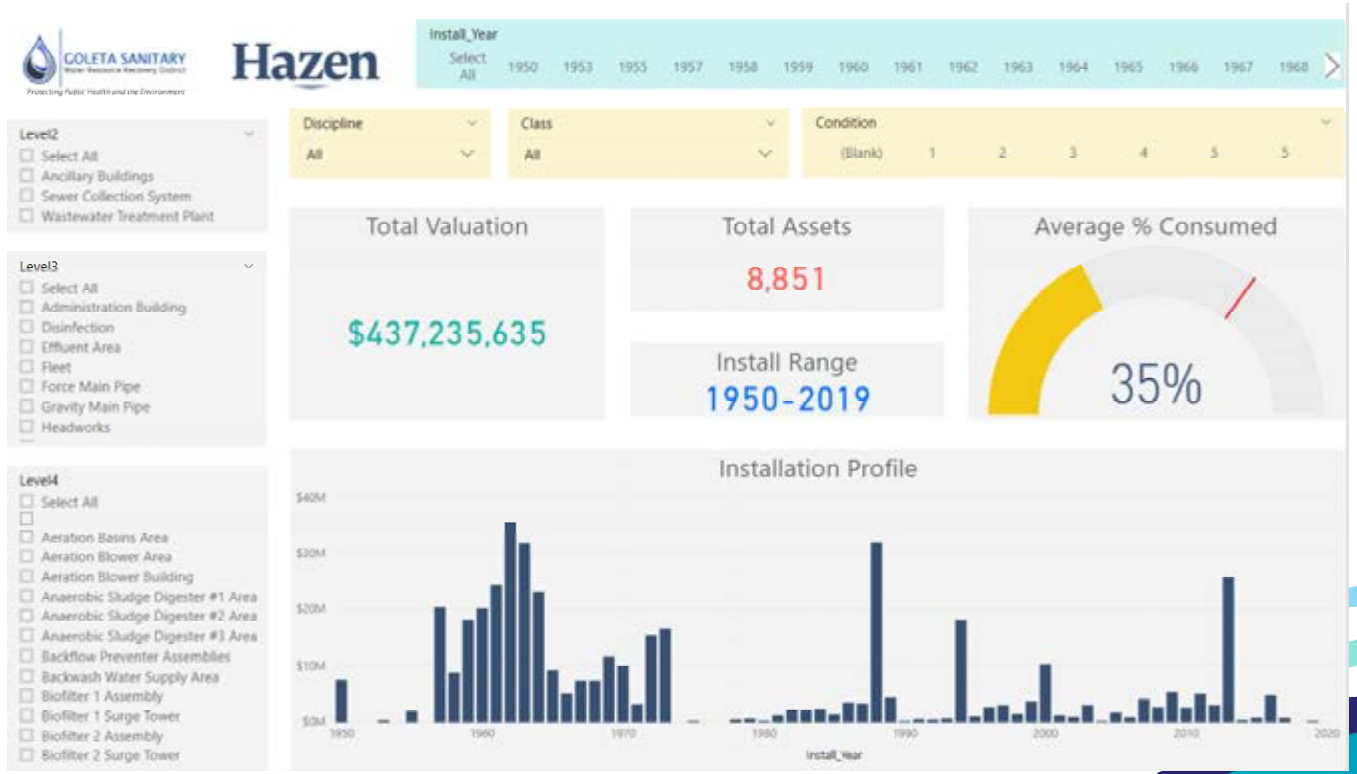
- Defendable data backed renewal projects developed through a transparent, consistent methodology

Rich in Tools

- Dashboards that provide information at a glance to make informed, timely, data-backed decisions

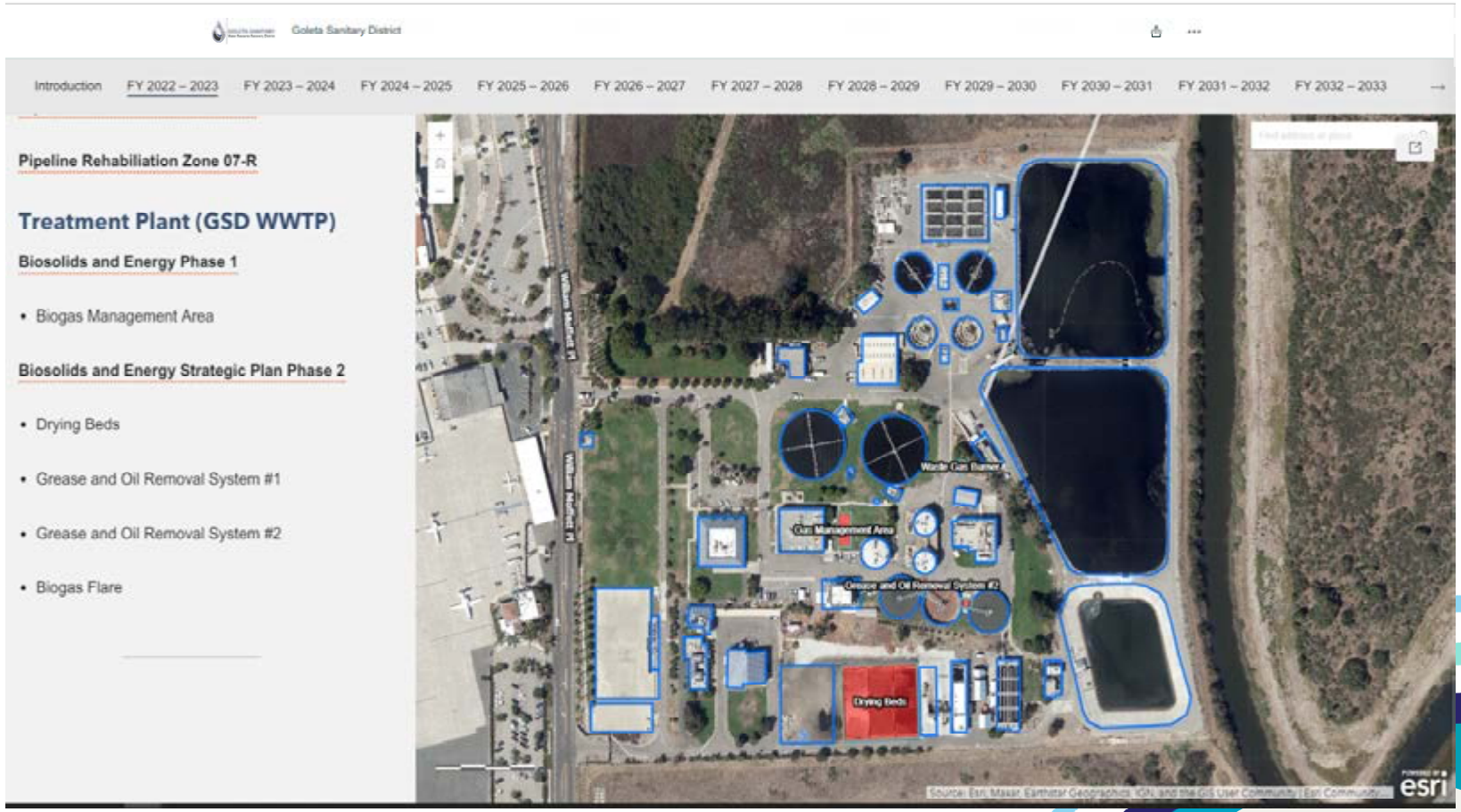
Defensible and Transparent Decision-Making Process (Dashboards)





Digital Storytelling using StoryMaps to help communicate with stakeholders

- Digital storytelling using interactive maps, text and other multimedia content.
- Provides a visual roadmap of future planned capital improvements to enhance transparency and accountability.
- Navigate and update CIP projects, when needed.
- Easily share the Story Map with internal and external stakeholders.



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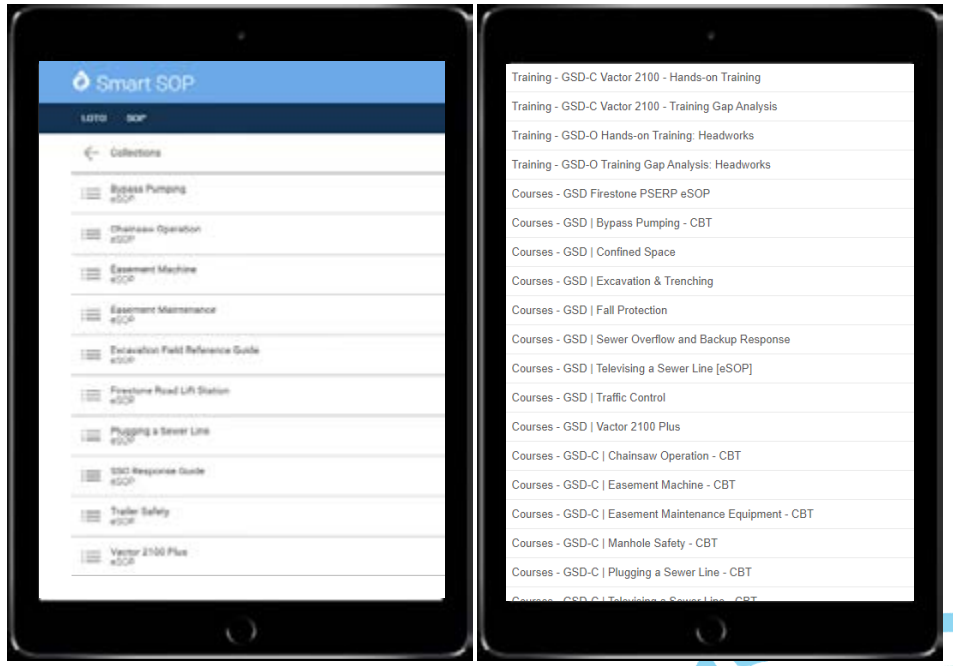
Sewer Collection System-Continuous Improvement

- Consolidation of various databases into one centralized location
- Relatively new staff, transfer of tribal knowledge
- Incorporation of college level educated, computer literate, mechanically inclined workforce into field which traditionally has been manual labor based
- Transition into new training/learning mediums – CBT, web-based instruction and routine use of tablets



Helping Public Utilities Communicate Better

Acknowledgments

Goleta Sanitary District Staff

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- Steven Workman
- Chris Portner
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