Asset Management & Risk Policies

Agenda

- Asset Management Review

- Asset Management Policy

- Citywide Risk Policy
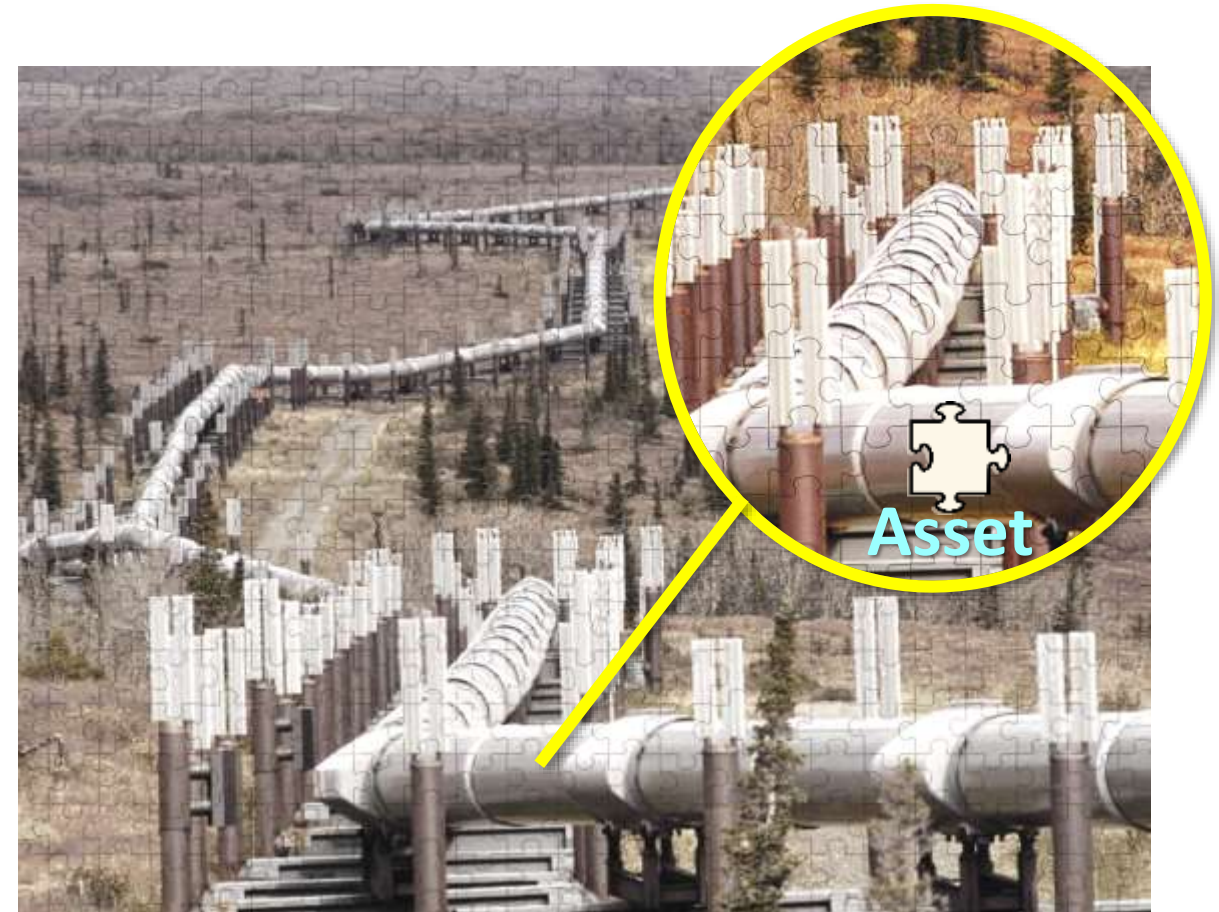
Asset Management Fundamentals

Definitions, basic concepts and necessity

What is an Asset?

▪Building block of any infrastructure system

▪Any physical item that contributes to utility's service

▪Can be an individual unit or a set of numerous similar units

Asset

The concept of an 'Asset' illustrated as a 'piece' of a large jigsaw puzzle.
https://animalsandearth.com/featured/oil-pipeline-crossing-taiga-alaska-gerry-ellis.html?product=puzzle&puzzleType=puzzle-18-24

Examples – Infrastructure Assets

WATER	WASTEWATER	STORMWATER	ROAD	CITY FACILITIES	PARKS/REC.

| WATER	WASTEWATER	STORMWATER	ROAD	CITY FACILITIES	PARKS/REC.
▪ Pumps ▪ Pump stations ▪ Valves ▪ Pipes ▪ Tanks ▪ Meters ▪ WTPs ▪ Etc.	▪ Conduits ▪ Manholes ▪ Cleanouts ▪ Pumps ▪ Lift stations ▪ WWTPs ▪ Wet wells ▪ Sensors ▪ Etc.	▪ Catch basins ▪ Gutters ▪ Inlets ▪ Channels ▪ Drains ▪ Conduits ▪ Lift stations ▪ Detention ponds ▪ Etc.	▪ Traffic signs ▪ Signals ▪ Pavements ▪ Sidewalks ▪ Bus stops ▪ Asphalt ▪ Traffic lights ▪ Speed bumps ▪ Etc.	▪ Police stations ▪ Fire stations ▪ Emergency response centers ▪ City halls ▪ Libraries ▪ Community centers ▪ Public schools ▪ Etc.	▪ Trails/pathways ▪ Playgrounds ▪ Picnic areas ▪ Restrooms ▪ Water features ▪ Dog parks ▪ Lighting/signage ▪ Trash receptacles ▪ Bridges ▪ Etc.

Asset Management means managing…
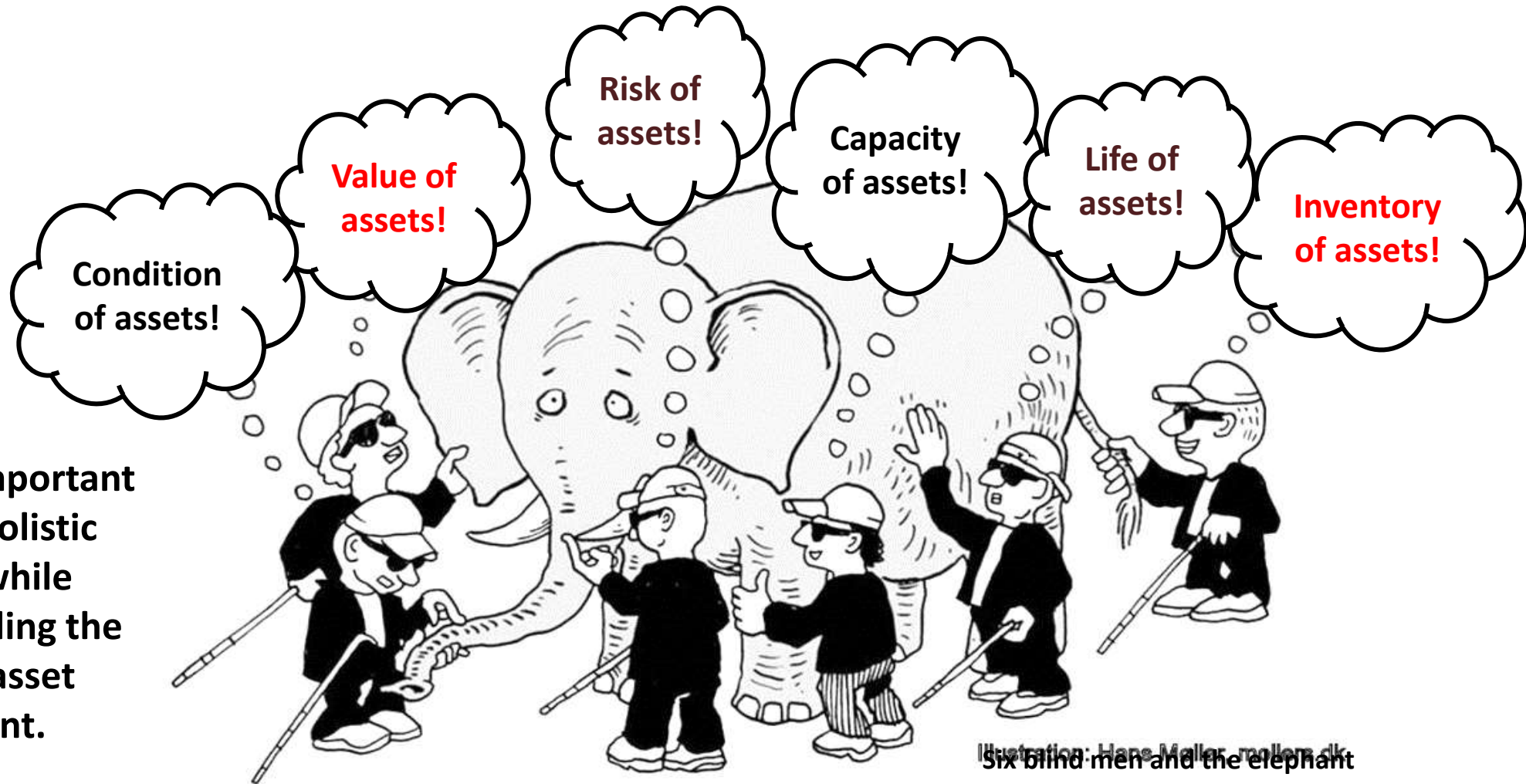
It is very important to have a holistic approach while understanding the science of asset management.

Condition of assets!

Value of assets!

Risk of assets!

Capacity of assets!

Life of assets!

Inventory of assets!

Illustration: Hans Møller, mollers.dk
Six blind men and the elephant

What is Asset Management?

ENVIRONMENTAL PROTECTION AGENCY

"The practice of managing infrastructure capital assets to *minimize the total cost* of owning and operating them, while *delivering the service level* customer's desire."

AMERICAN WATER WORKS ASSOCIATION

"The combination of management, financial, economic, engineering and other practices applied to all assets (**infrastructure, people, processes, and systems**) with the objective of *providing the required level of service at an acceptable level of risk at an optimal lifecycle cost*."
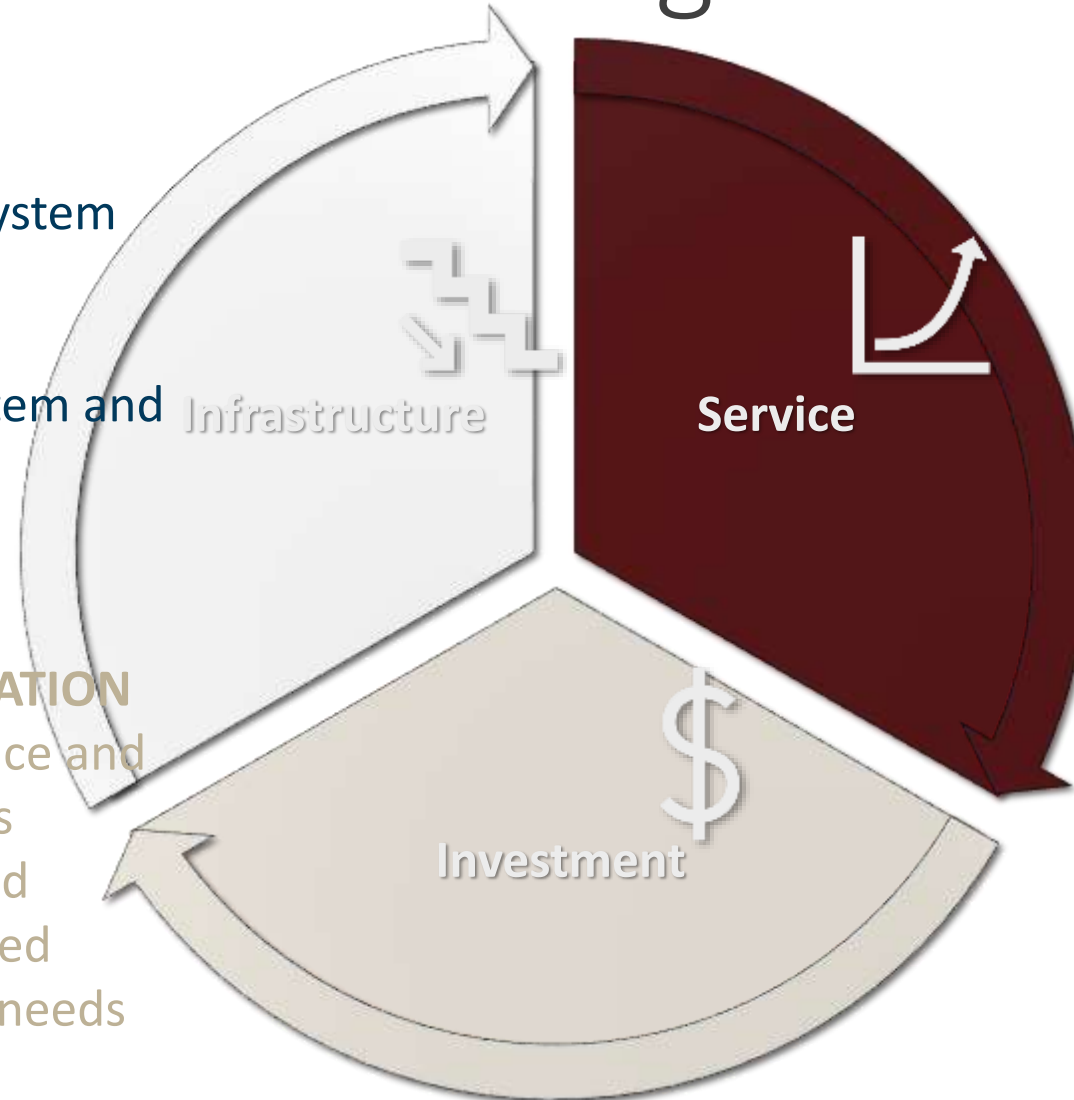
Benefits of Asset Management

THE CITY OF
BURLESON
TEXAS

TACKLING AGING INFRASTRUCTURE
- Maximize value of system renewal dollars, "do more with less"
- Minimize risk to system and community

SERVICE IMPROVEMENT
- Proactive vs. reactive diagnosis of infrastructure needs
- Faster responsiveness and reduced length of outages

INVESTMENT JUSTIFICATION
- Optimize maintenance and capital budget needs
- Provide graphical and operational fact-based answers to renewal needs

Infrastructure

Service

Investment

Asset Management Program

Introduction and Implementation

Citywide Asset Management Program

Aligning City's Strategic Vision to the AM Policy

What are our commitments, expectations and overarching goals and objectives?

STRATEGIC FOCUS AREA 1:
Operational Excellence

OBJECTIVE

STRATEGIC FOCUS AREA 2:
Infrastructure

GOAL 1:
Improve efficiency of travel for citizens by focusing on key improvements within the SH 174 Corridor and coordinating with Regional, State and Federal transportation partners for funding and support.

GOAL 2:
Enhance connectivity and improve mobility by expanding capacity of existing transportation network, evaluating additional thoroughfare improvements, and improving roadway, bicycle and pedestrian infrastructure.

GOAL 3:
Develop and maintain utility services and facilities that meet the needs of the community through strategic planning, long-term planning and best practices.

GOAL 4:
Pursue regional transportation solutions that will assist our residents, visitors and businesses traveling to and from our city.

GOAL 5:
Develop and implement a Capital Improvement Program that improves the quality of life for residents through the completion of projects identified in the city's Master Plans.

Goal 5
Develop and implement a Capital Improvement Program that improves the quality of life for residents through the completion of projects identified in the city's Master Plans.

Work Plan Task		Responsible Department	Target Date
2.5.1	Begin design process to widen and rebuild Wilshire 169 Road to restore failed pavement	Public Works	May 2021
2.5.2	Reconstruct existing street near the SW Johnson Avenue and Renfro Street intersection to restore failed pavement and improve safety	Public Works	April 2021
2.5.3	Improve intersection of County Road 910 and FM 1902 by adding a right turn lane	Public Works	November 2021
2.5.4	Connect 8-inch and 12-inch water lines on Big Horn Drive and Dobson Street to provide additional water line looping, reduce water quality issues and increase fire flow protection	Public Works	April 2022

City of Burleson
Asset Management Policy*
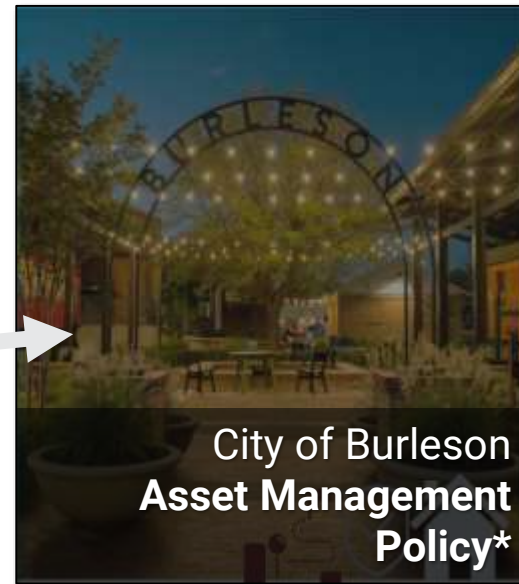
AM Policy contains:

- Purpose
- Background
- Organization Alignment
- Definitions
- Commitment Statement

*to be developed as a part of this project

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Citywide Asset Management Program

ASSET MANAGEMENT POLICY

THE CITY OF BURLESON, TX

POLICY

The City Council is committed to a comprehensive and strategic approach to managing its infrastructure assets. This involves integrating business processes, employing trained and knowledgeable staff, and fostering effective communication with customers and stakeholders to provide an exceptional level of service. From the planning and design phase to disposal, the City will oversee assets throughout their life cycles using a risk-based framework, ensuring responsible use of public resources while meeting the high service standards expected by residents and stakeholders. The citywide asset management program aims to optimize service delivery by balancing level of service delivery, cost considerations, and business risks. The City is dedicated to compliance with relevant laws, regulations, and established policies, with a continual commitment to evaluating and accurately reporting on program performance. Grounded in solid data, the asset management program ensures that investments are made wisely, at the right time and on the right assets, promoting a data-driven and consistent decision-making process.

PURPOSE

Enhance Service Delivery
The Asset Management Policy expresses the commitment of the City of Burleson to guide the effective and sustainable management of the City's infrastructure assets. This policy will inform the City's approach to maintaining, preserving, and enhancing its assets. The primary purposes of this policy are as follows:

- **Optimize asset performance** to ensure the safety and longevity of infrastructure assets, minimizing disruptions, and providing reliable services.

- **Foster fiscal responsibility** to efficiently allocate resources and make informed investment decisions while reducing long-term financial burdens.

- **Enhance resilience and sustainability** to prioritize asset resilience and sustainability in the face of climate change, disasters, and environmental concerns.

- **Align with community goals**, including economic development, quality of life, and environmental stewardship.

- **Promote transparency and accountability** for deeper and stronger community trust and engagement.

- **Enable informed data-driven decision-making** and performance monitoring to support the ever-changing infrastructure needs.

ASSET MANAGEMENT POLICY

ACCOUNTABILITY

The City Council is responsible for adopting the Asset Management Policy and providing authority to the City Manager to implement the Asset Management Program.

The City Manager holds the responsibility for ensuring that the City adheres to the principles and commitments outlined in this Asset Management Policy. Furthermore, the City Manager is entrusted with designating appropriate individuals for the reviews and revisions required by this policy.

The leadership team commits to providing support to the City Manager in the pursuit of compliance with this Asset Management Policy and to actively enforce its implementation within their respective areas of authority.

All employees, without exception, bear the duty of strict adherence to the provisions set forth in this Asset Management Policy. The City administration is dedicated to furnishing its employees with the necessary knowledge, resources, and skills to effectively uphold and execute this policy.

KEY TERMS

An **asset** is a physical or abstract component, system, or resource that plays a crucial role in the operation, maintenance, and delivery of services within an infrastructure network or facility. Assets can include roads, bridges, pipelines, tanks, pump stations, buildings, and equipment. Proper management of assets involves their acquisition, maintenance, and optimization to ensure they effectively serve their intended purpose while aligning with the organization's strategic goals.

Asset management is a holistic and strategic process within an organization that involves various coordinated activities to optimize the value derived from its assets, all while aligning with the organization's overarching goals. This approach encompasses resource allocation, infrastructure upkeep, performance evaluation, and other essential processes designed to ensure the delivery of high-quality services to stakeholders by effectively planning and maintaining assets. Asset management goes beyond simply addressing the age or condition of assets and is primarily concerned with maximizing the assets' overall utility and contribution to the organization's success.

A **customer** typically refers to the residents, businesses, and stakeholders within the community who directly benefit from or are affected by the public services and infrastructure provided by the City. These individuals and entities are the end users of the services and assets, and their satisfaction and well-being are central considerations in setting and maintaining the desired level of service.

Sustainability refers to the practice of responsibly managing and maintaining assets in a way that ensures their long-term viability, value, and functionality. It involves making strategic decisions that consider the environmental, economic, and social aspects of asset performance. Sustainable asset management seeks to balance the need for optimal asset utilization with minimal environmental impact, enhanced energy efficiency, and increased social responsibility. The goal is to preserve and extend the life of assets while aligning with broader sustainability goals and minimizing negative consequences for future generations.

Level of Service represents the established standards for the quality and quantity of public services and infrastructure, guiding resource allocation and ensuring the community's needs are met.

Customer Level of Service refers to the specific standards and criteria established to measure and ensure the quality and effectiveness of public services and infrastructure as perceived and experienced by the residents, businesses, and stakeholders in the City.

Technical Level of Service pertains to the predefined and quantifiable performance requirements of maintaining and delivering public services and infrastructure. These requirements are based on state and federal regulatory laws for operating and maintaining infrastructure systems. The Technical Level of Service guides the management and maintenance of these systems to ensure their compliant and effective operation, often independent of end-user satisfaction, which is addressed by the Customer Level of Service.

Consequence of Failure

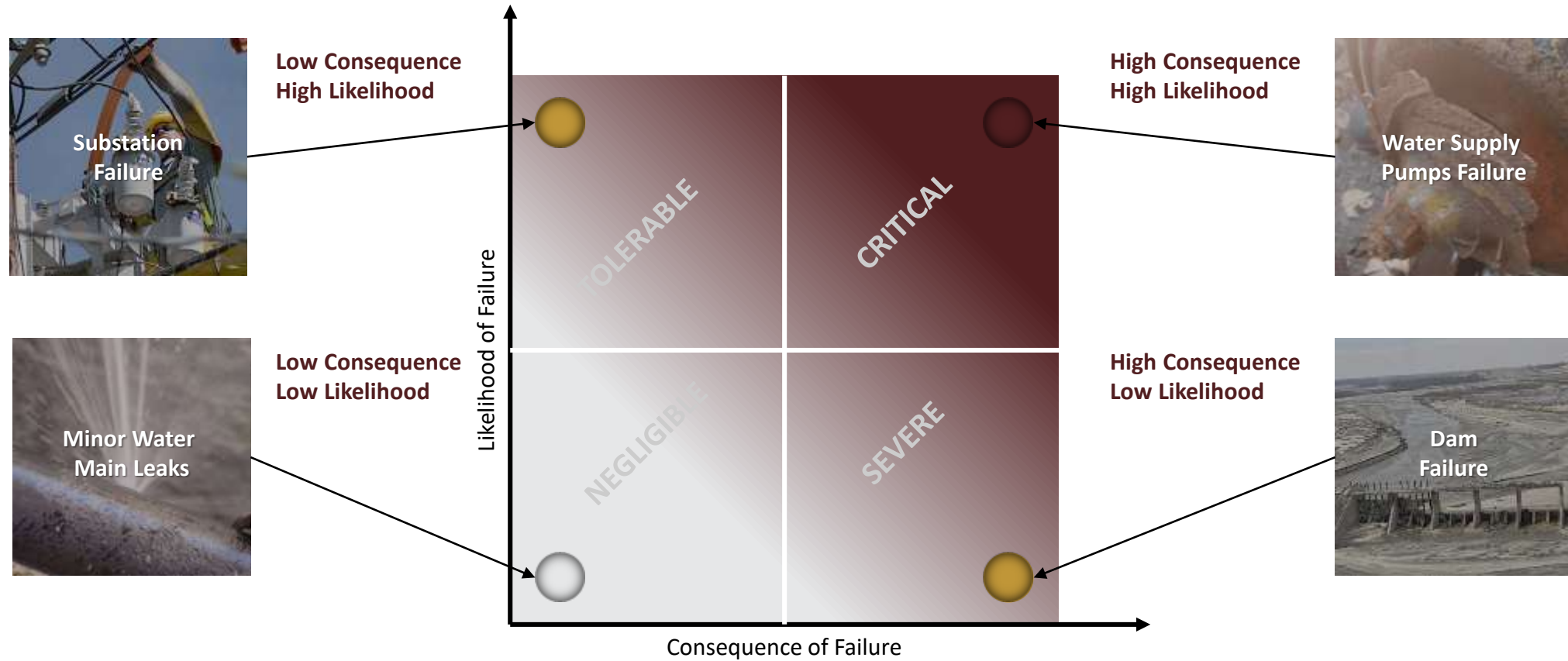| IMPACT TYPE	WATER	WASTEWATER	STORMWATER	ROAD	CITY FACILITIES	PARKS/REC.
Environmental/ Regulatory	Contaminated water supply	Water pollution	Flooding and erosion	Increased air pollution	Inefficient energy use	Deforestation and biodiversity loss
Social (Political, Trust)	Public health crises	Home damage and displacement	Community displacement	Increased commute times	Limited access to services	Reduced recreation opportunities
Municipal	Strained emergency services	Budget strain and repairs	Disaster response costs	High maintenance costs	Costly renovations/ replacements	Decreased property values
Financial	Remediation costs	Frequent repair costs	Damages and decreased property values	High maintenance costs	Costly renovations/ replacements	Decreased revenue

Tolerating the Consequences

Non-Tolerable Outcomes

COF Criteria	Criteria/Definition	Consequence of Failure Score				
		1	2	3	4	5
Regulatory Compliance and Environmental Impact	Impact to land, vegetation, groundwater, waterways, ecosystems and or the atmosphere within the FWW region and adjacent regions.	No Impact	Localized and short-term reversible effects on local ecosystem/amenity value	Widespread but short-term effects on local ecosystem/amenity value	Water - Public Notice (any tier) Wastewater - Regulatory Fines/Aquatic Life Deaths	Widespread and persistent effects requiring specialist and extensive long-term clean up and/or rehabilitation plan
Loss of Service	The maximum time an asset can be out of service due to the operational impacts on the supply of drinking water or sewerage services.	No Impact	Customer impacted for less than 4 hours	Customer impacted for 4 - 11 hours	Customer impacted for 12 - 23 hours	Customer impacted for 24 hours or more
Safety (Staff)	Health and safety impacts to FWW's employees or contractors	No Impact	Minor injury with no associated lost time	Reportable injury with lost time (typically less than 3 days)	Significant injury requiring short-term hospitalization and/or recoverable disability	Serious injury or work related illness causing lifelong disability
Operational and Resource Impacts	Impact to FWW staff resources to respond to failure.	No Impact	Asset outage is tolerable for up to 120 hours	Asset outage is tolerable for up to 48 hours	Asset outage is tolerable for up to 24 hours	Asset outage is tolerable for up to 12 hours
Public Health Impacts	Impacts to the quality of drinking water or sewage services leading to public health impacts or aesthetic impacts	No Impact	No Impact	No Impact	Potential for low impact	Potential for sever impact
Financial Impact	The estimated financial loss or exposure to the enterprise, in event of a failure	No Impact	Less than $100,000	$100,000 - $499,999	$500,000 - $999,999	Greater than or equal to $1,000,000
Public Trust	This estimates the confidence that FWW's services are trusted by the customer and the public. Failures with higher consequences receive more extensive media coverage and have greater impact on FWW's public perception. Media coverage includes social, print, radio, and visual.	No Impact	Alert posted on website but no media attention	Social Media	Local Media Coverage	National Media Coverage

Risk Matrix

**Low Consequence
High Likelihood**

Substation
Failure

**High Consequence
High Likelihood**

Water Supply
Pumps Failure

**Low Consequence
Low Likelihood**

Minor Water
Main Leaks

**High Consequence
Low Likelihood**

Dam
Failure

Likelihood of Failure

Consequence of Failure
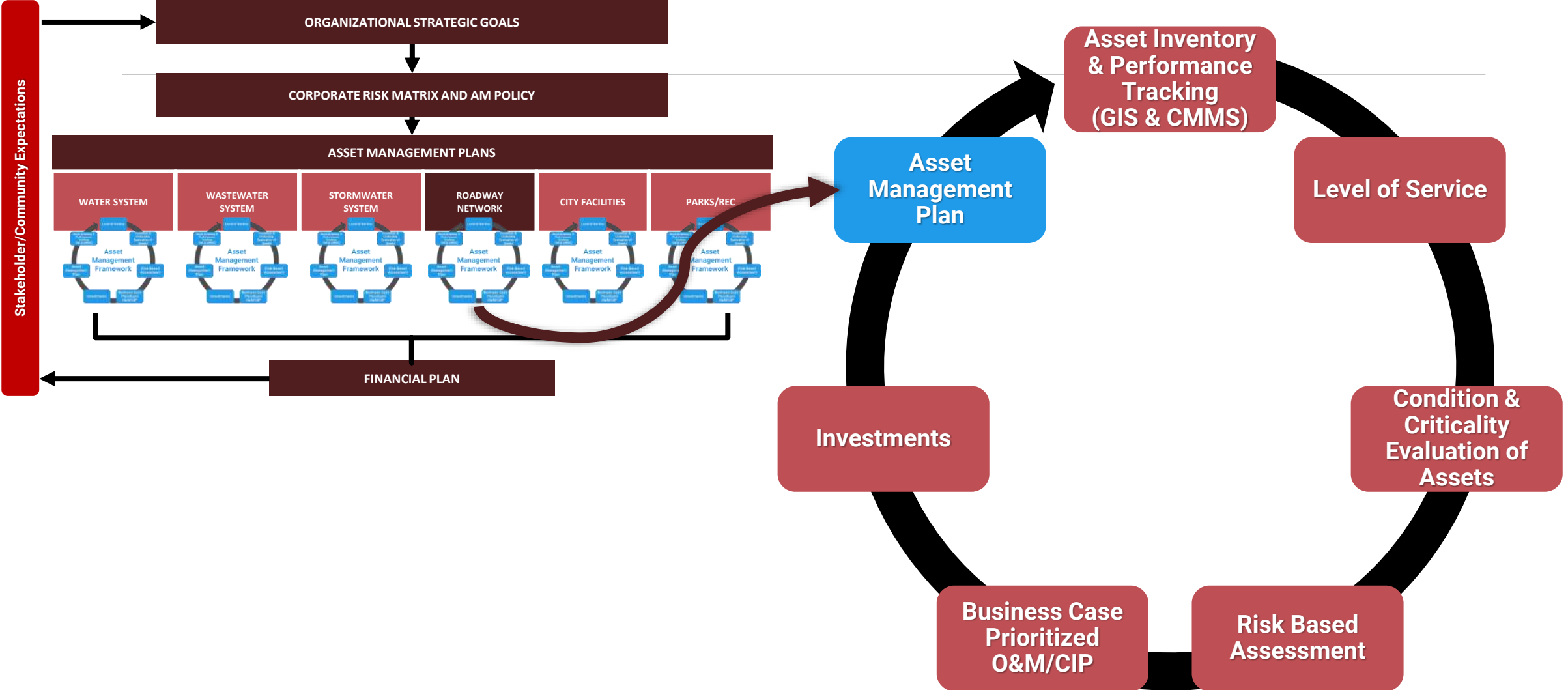
TOLERABLE

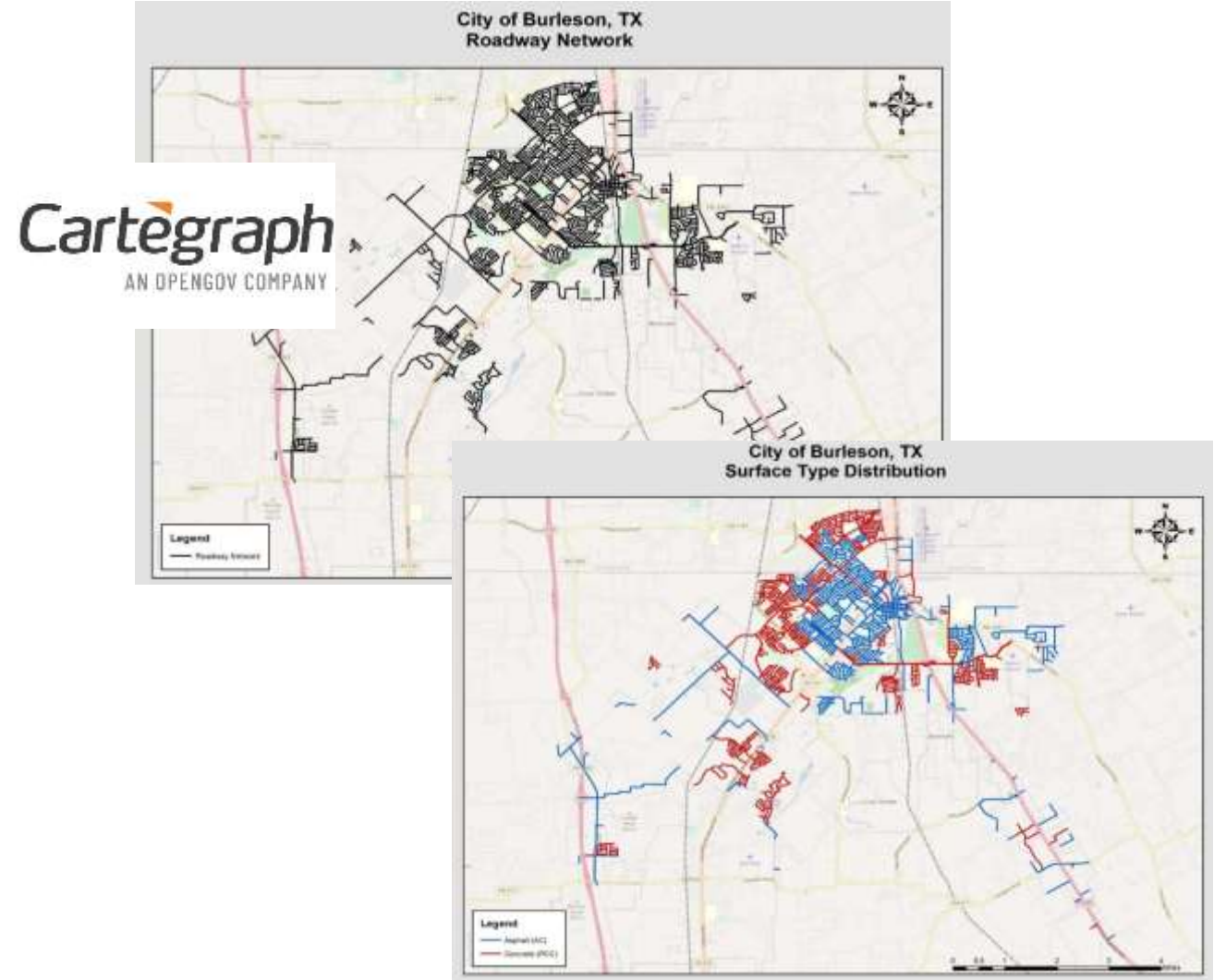CRITICAL

NEGLIGIBLE

SEVERE

Asset Management Framework

Introduction

Asset Management Framework

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Implementing Asset Management Framework

What assets do we have and what do we know about them?

Asset Management Framework

- Asset Inventory & Performance Tracking (GIS & CMMS)
- Level of Service
- Condition & Criticality Evaluation of Assets
- Risk Based Assessment
- Business Case Prioritized O&M/CIP
- Investments
- Asset Management Plan

Cartegraph
AN OPENGOV COMPANY

City of Burleson, TX
Roadway Network

City of Burleson, TX
Surface Type Distribution
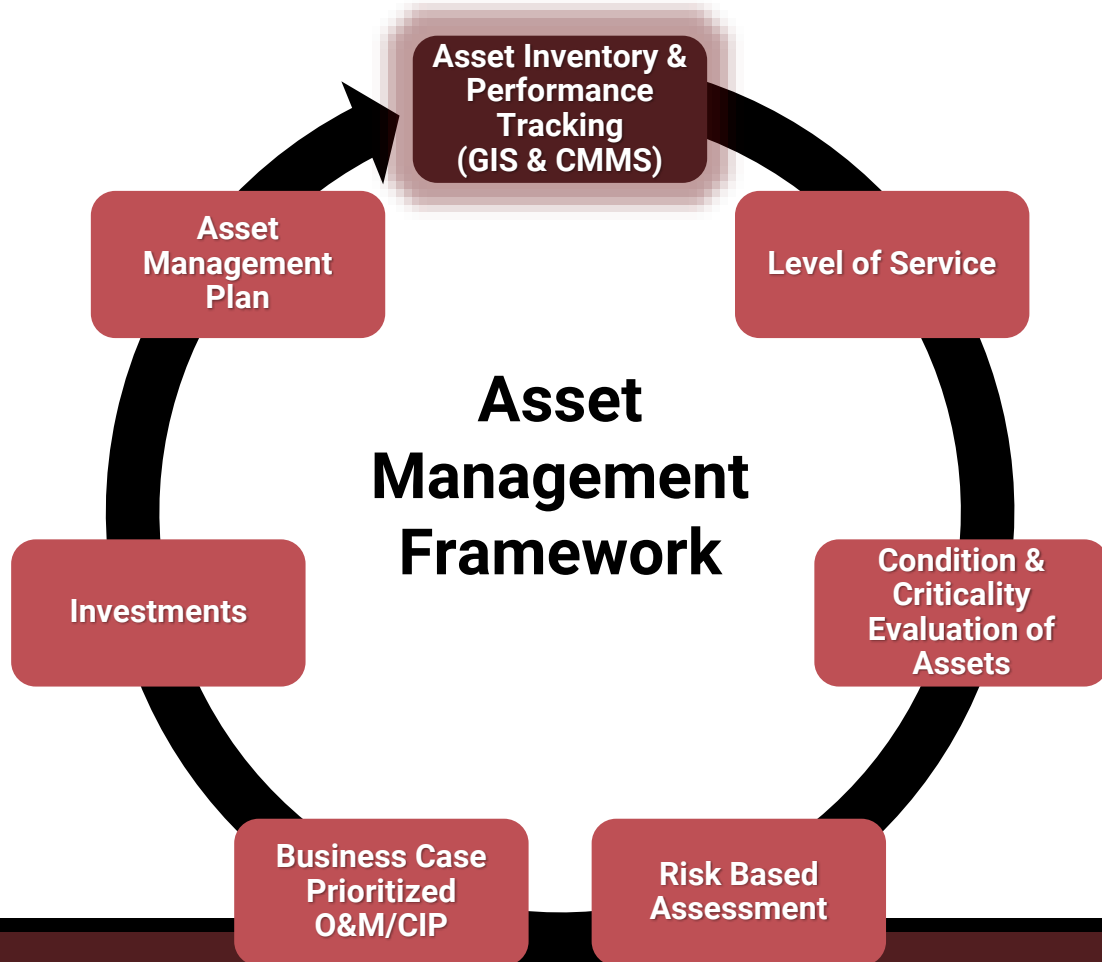
Implementing Asset Management Framework

What is our desired performance targets on high priority assets?

Level of Service - Performance standards or criteria set to assess and measure the quality and effectiveness of the services provided by assets.

Asset Management Framework

- Asset Inventory & Performance Tracking (GIS & CMMS)
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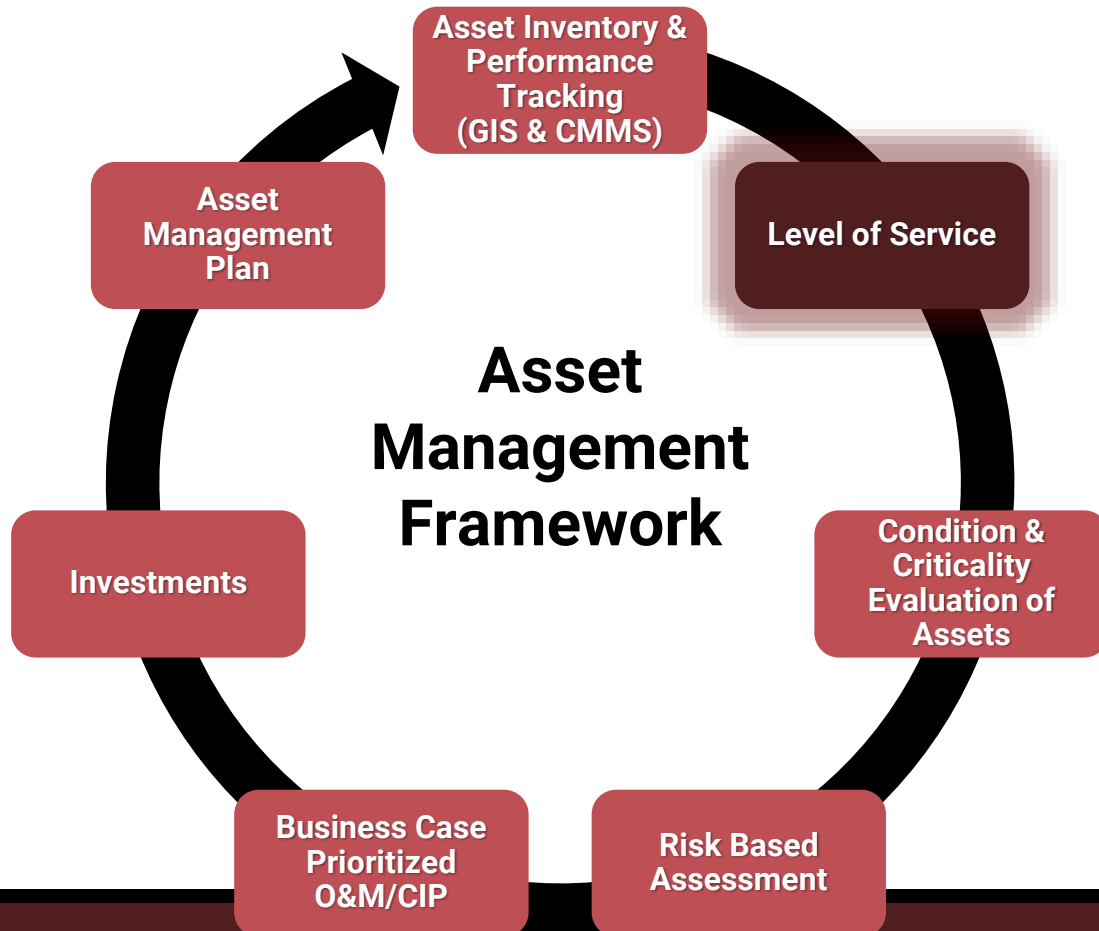
Roads

Average pavement condition index, travel time reliability, number of potholes, etc.

Water supply systems

Water pressure, water quality compliance, number of leaks or breaks, etc.
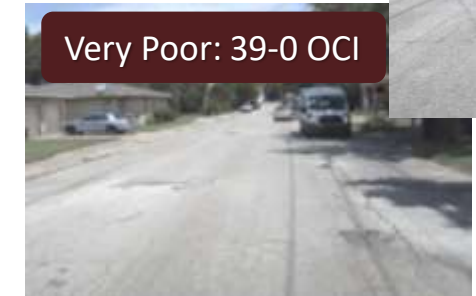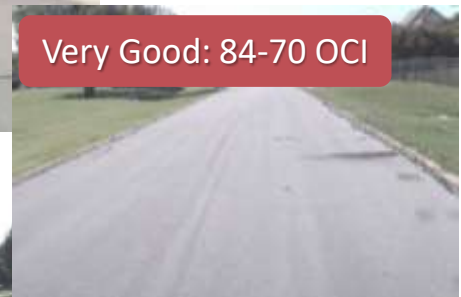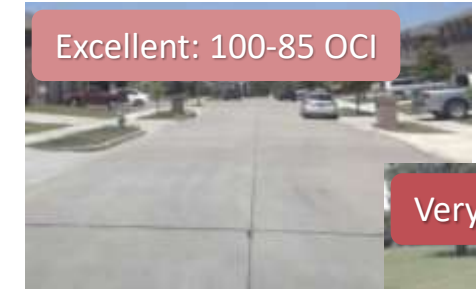
Public transportation

On-time performance, frequency of service, passenger satisfaction, etc.

Parks and recreational facilities

Park maintenance score, number of amenities available, visitor satisfaction, etc.

Implementing Asset Management Framework

THE CITY OF
BURLESON
TEXAS

What is the condition and criticality of the assets that we have?

Asset Inventory & Performance Tracking (GIS & CMMS)

Level of Service

Condition & Criticality Evaluation of Assets

Risk Based Assessment

Business Case Prioritized O&M/CIP

Investments

Asset Management Plan

Asset Management Framework

Excellent: 100-85 OCI

Very Good: 84-70 OCI

Good: 69-60 OCI

Fair: 59-40 OCI

Very Poor: 39-0 OCI
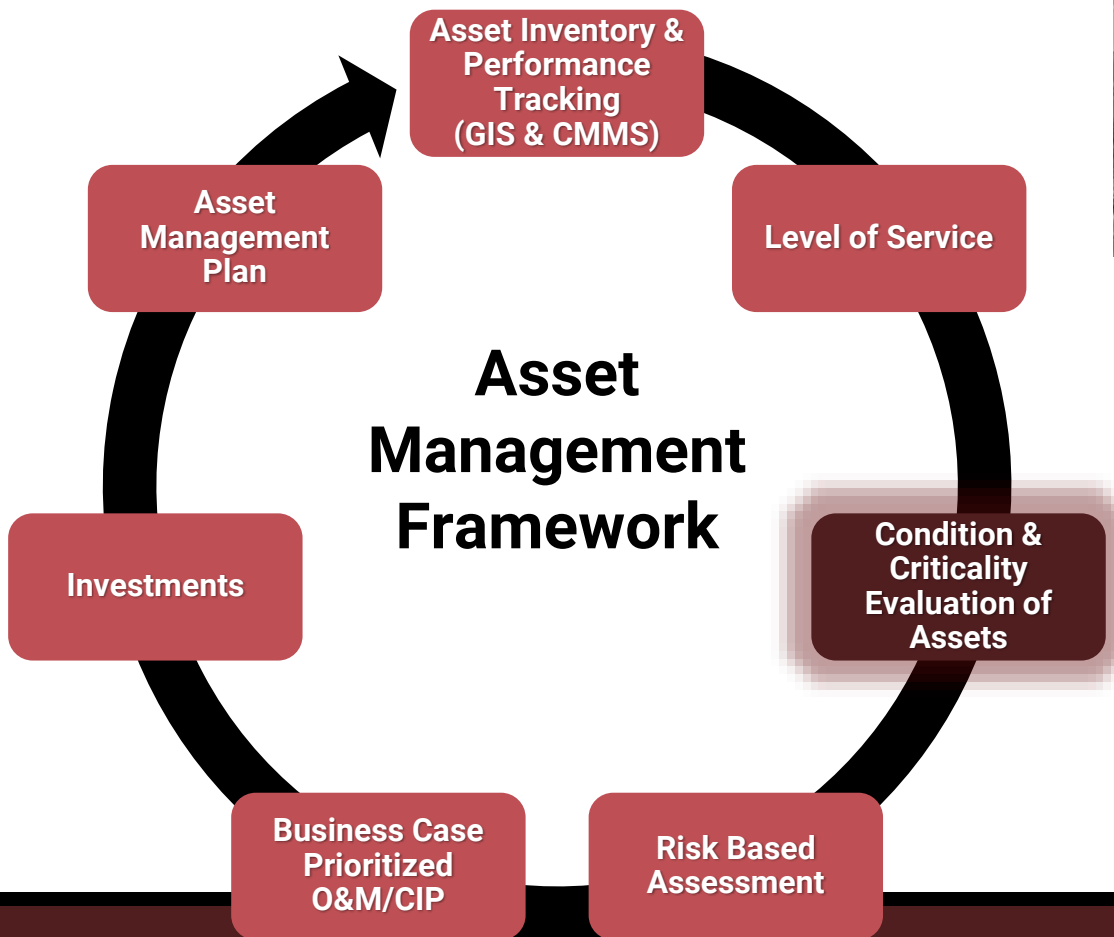
Implementing Asset Management Framework

What combined exposure do we have with each asset?

Risk	Length (Miles)	% of Total Length	Number of Records
1-Negligible	891.6	25.4	58,765
2-Low	1,077.1	30.6	50,677
3-Medium	1,473.3	41.9	40,787
4-High	66.5	1.9	939
5-Extreme	6.7	0.2	66

Asset Management Framework cycle:
- Asset Inventory & Performance Tracking (GIS & CMMS)
- Level of Service
- Condition & Criticality Evaluation of Assets
- Risk Based Assessment
- Business Case Prioritized O&M/CIP
- Investments
- Asset Management Plan

Risk Grade / Condition matrix

Risk Grade	Condition				
Criticality	Very Low 0.0 to 2.0	Low 2.1 to 3.5	Medium 3.6 to 5.0	High 5.1 to 5.5	Very High 5.6 to 10.0
Very Low 0.0 to 2.0	Negligible 20.9 miles	Negligible 51.3 miles	Low 62.7 miles	Medium 8.1 miles	Medium 56.4 miles
Low 2.1 to 3.5	Negligible 819.3 miles	Low 871.2 miles	Medium 473.9 miles	Medium 49.2 miles	Medium 318.8 miles
Medium 3.6 to 5.0	Low 143.2 miles	Medium 319.1 miles	Medium 125.2 miles	Medium 9.9 miles	High 51.4 miles
High 5.1 to 5.5	Medium 16.8 miles	Medium 44.3 miles	Medium 17.8 miles	High 2.7 miles	Extreme 3.6 miles
Very High 5.6 to 10.0	Medium 6.9 miles	Medium 26.8 miles	High 12.4 miles	Extreme 1.3 miles	Extreme 1.8 miles

Implementing Asset Management Framework

How do we justify and phase in infrastructure maintenance and renewal?

Asset Management Framework

- Asset Inventory & Performance Tracking (GIS & CMMS)
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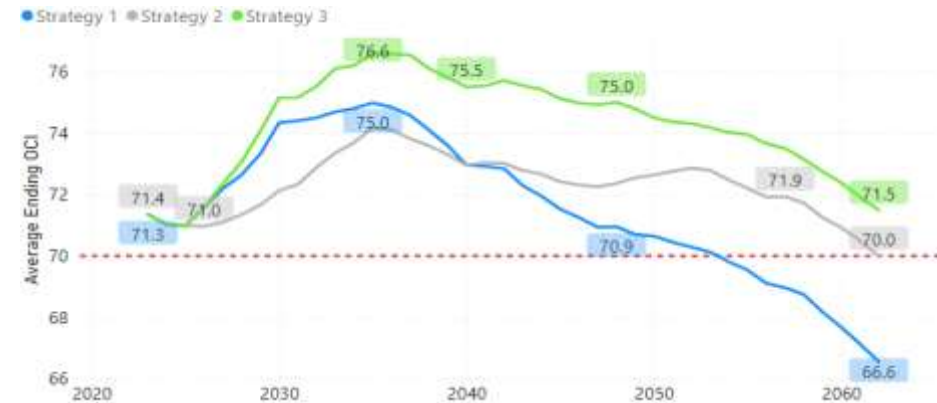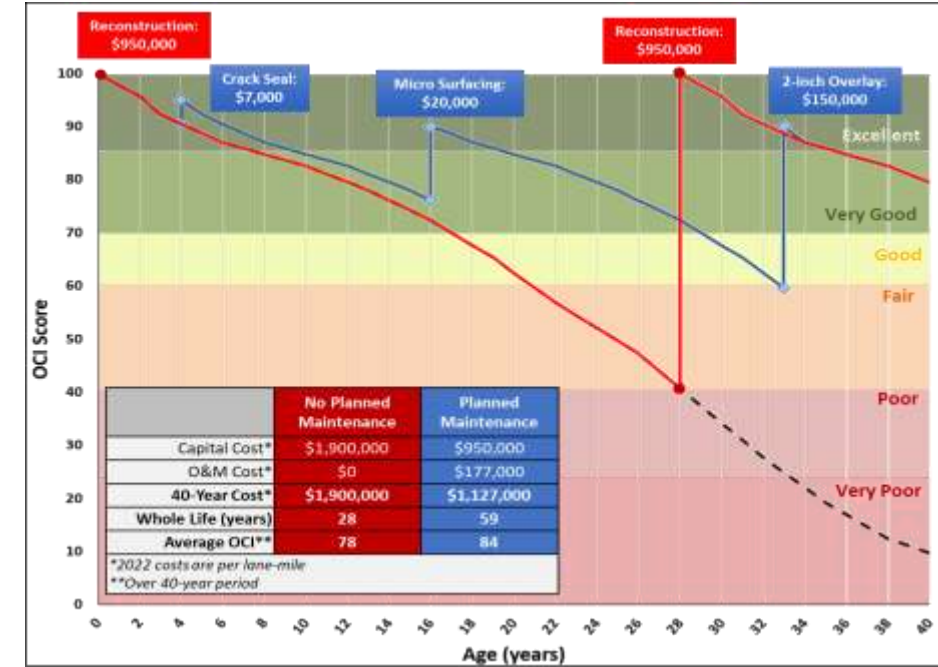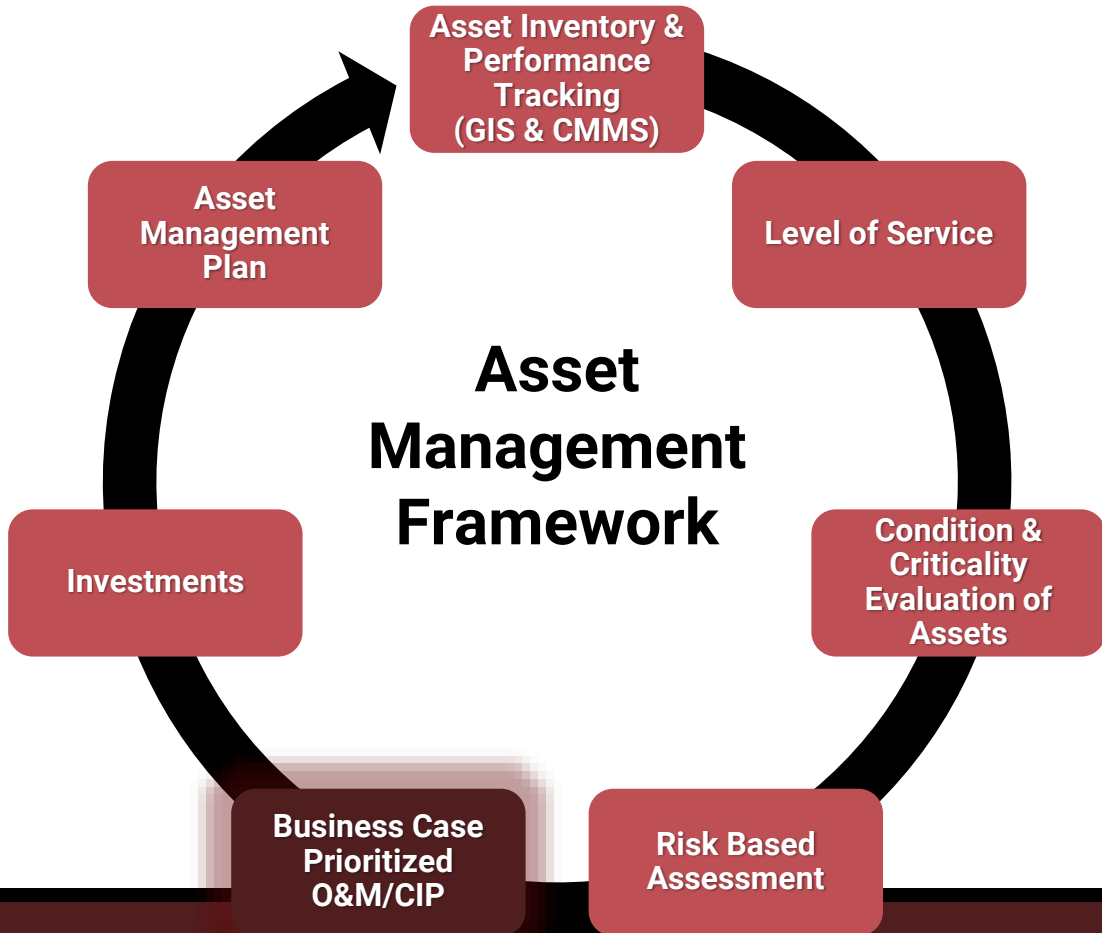
Implementing Asset Management Framework

What are our funding strategies and potential financial investments?
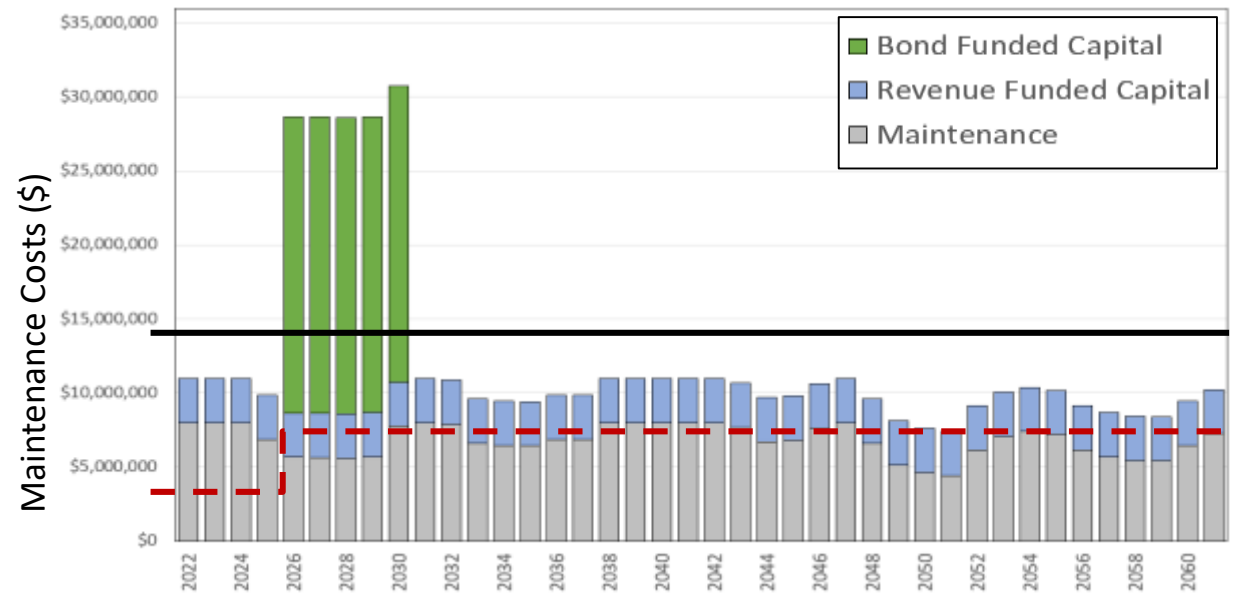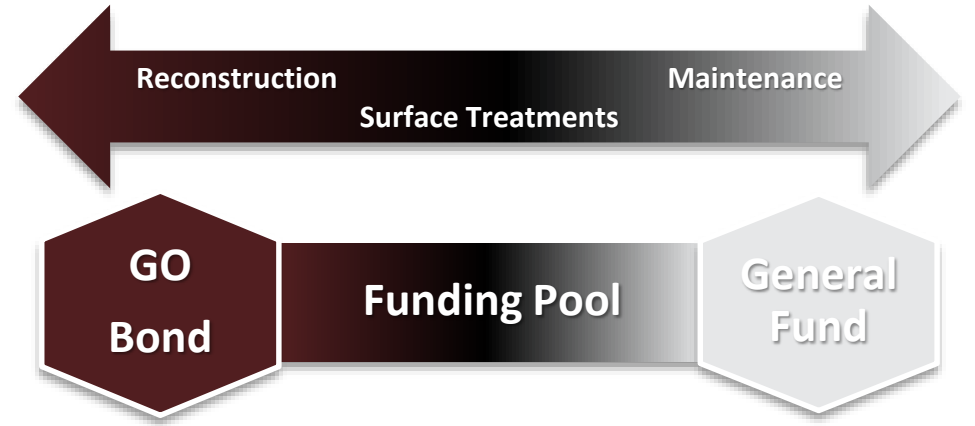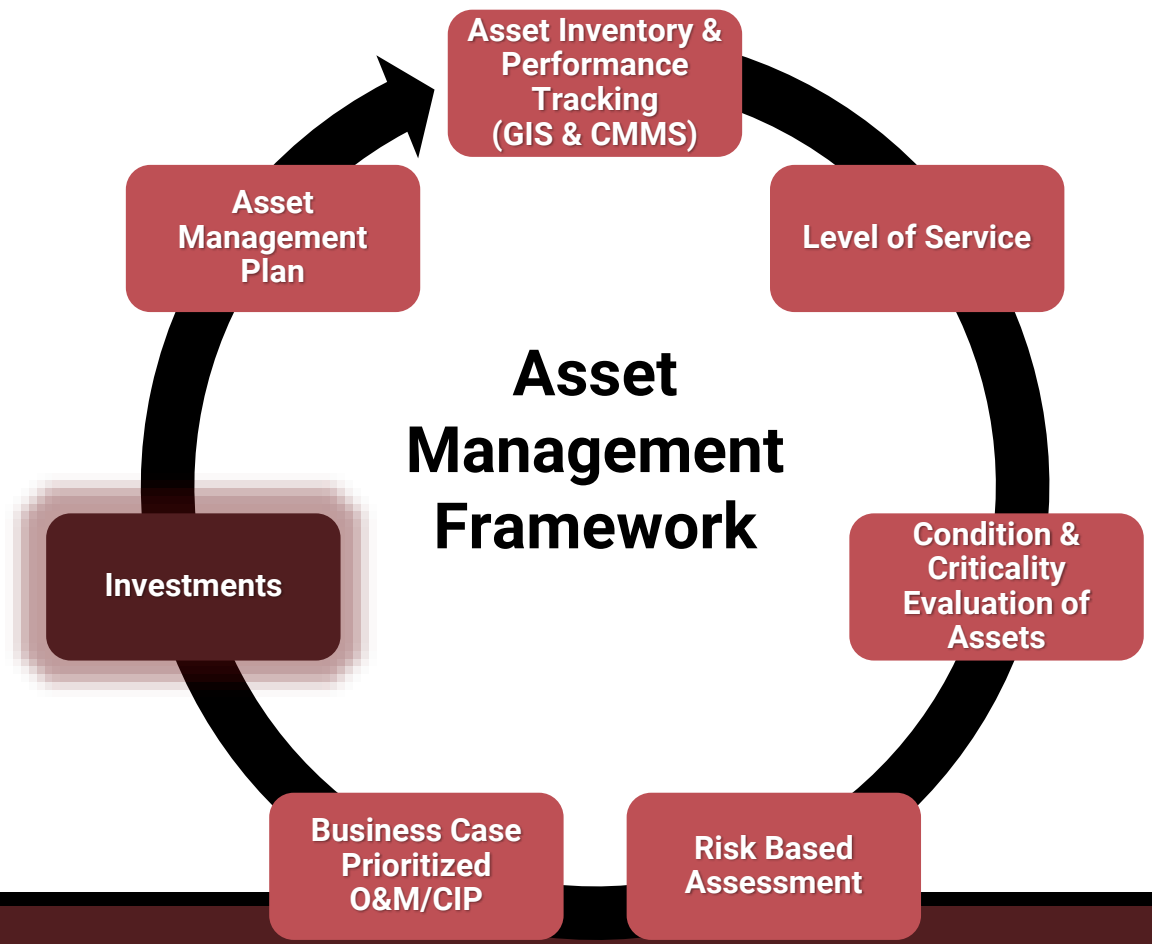
Implementing Asset Management Framework

What is our asset management vision and how do we plan to achieve it?

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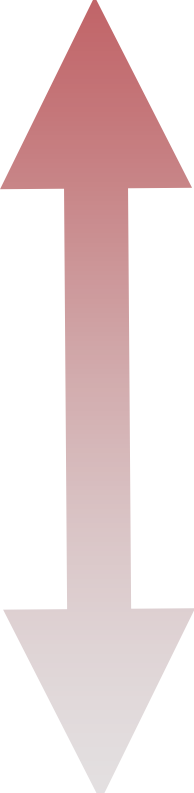- Investments
- Asset Management Plan

Asset Management Plan contains

- State of infrastructure
- Performance targets
- Lifecycle management strategy
- Risk profile
- Gap analysis
- Future improvements
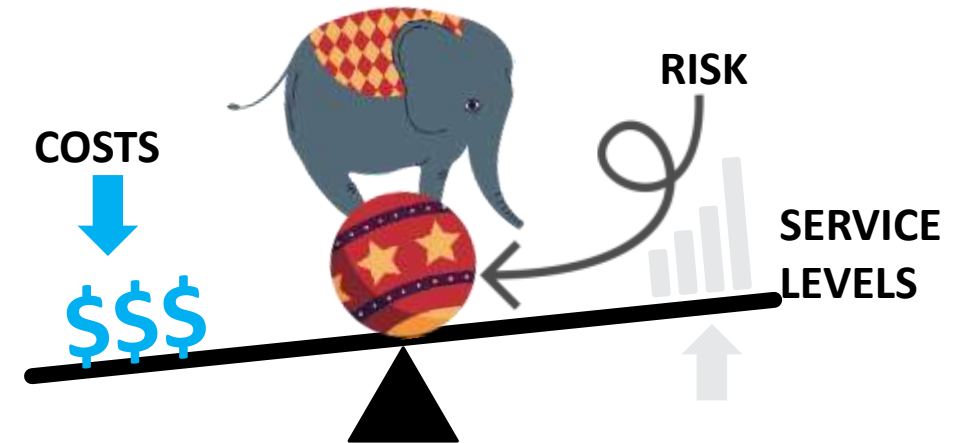- Funding requirements

Citywide Asset Management Program

Outcomes of Asset Management Framework

MAXIMIZE
▪ Network OCI ≥70
▪ Community satisfaction
▪ Roadway safety

MINIMIZE
▪ Backlog % (≤ 10%)
▪ Whole Life Cost
▪ Backlog % achievement timeframe
▪ Backlog Age
▪ Construction fatigue

COSTS

$$$

RISK

SERVICE LEVELS

Risk-based service improvement recommendations

Optimized maintenance activities and costs

Evaluating lifecycle cost scenarios for various LOS at acceptable risk levels

Review Policy and Risk Matrix

ASSET MANAGEMENT POLICY

THE CITY OF BURLESON, TX

POLICY

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ASSET MANAGEMENT POLICY

THE CITY OF
BURLESON
TEXAS

ACCOUNTABILITY

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Corporate Risk Matrix

CONSEQUENCE CATEGORIES	VERY LOW	LOW	MODERATE	HIGH	VERY HIGH
Regulatory Compliance	No Impact	Minor non-compliance requiring notification of regulatory entity. Example: Violation of internal processes	Moderate non-compliance triggering internal investigations and potential regulatory scrutiny. Example: Regulatory violation (SSO)	Significant violation requiring external regulatory intervention and potential legal consequences. Example: TCEQ Administrative Order	Severe non-compliance resulting in legal actions, fines, and severe damage to reputation. Example: EPA Consent Decree
Financial	No Impact	Low financial loss, manageable through existing resources and budget adjustments. Metric: Less than $100,000	Moderate financial impact necessitating financial reallocation and cost-cutting measures. Metric: $100,000 - $299,000	Significant financial loss, requiring external funding and long-term financial restructuring. Metric: $299,000 - $599,000	A severe financial crisis with potential bankruptcy, demanding immediate financial intervention and recovery strategies. Metric: Greater than $600,000
Delivery of Services	No Impact	Slight service disruption with minimal impact on end-users, recoverable through swift corrective actions. Example: Disruption duration less than 4 hours	Moderate disruption affecting service quality and delivery timelines, requiring prompt attention and recovery. Example: Disruption duration 4 – 12 hours	Significant service outage leading to public inconvenience, necessitating urgent and comprehensive restoration efforts. Example: Disruption duration 12 – 23 hours	Catastrophic service failure causing widespread public distress and necessitating a long-term recovery strategy. Example: Disruption duration greater than 24 hours

Corporate Risk Matrix

CONSEQUENCE CATEGORIES	VERY LOW	LOW	MODERATE	HIGH	VERY HIGH
Operational Impact	No Impact	Minor disruptions to routine operations, recoverable through prompt corrective actions. Example: Disruption tolerable for up to 7 days	Moderate disturbances to operational processes, requiring comprehensive and coordinated recovery efforts. Example: Disruption tolerable for up to 2 days	Major disruptions affecting critical operations, necessitating urgent and strategic interventions for recovery. Example: Disruption tolerable for up to 1 day	Catastrophic operational failure jeopardizing core functions, demanding an immediate and sustained recovery plan. Example: Disruption tolerable for less than 12 hours
Environmental	No Impact	Low environmental impact, with limited harm and manageable mitigation measures.	Moderate environmental damage that has short term effects and is reversible.	Significant environmental damage that has long term effects. Likely to lead to fines for regulatory agencies.	Severe and irreversible ecological harm with long-term consequences, demanding urgent and comprehensive environmental restoration strategies.
Reputation	No Impact	No reputational harm with limited impact on public perception. Example: Alert Notification on City Website	Moderate reputational harm with limited impact on public perception, manageable through strategic communication efforts. Example: Social Media Coverage	Moderate damage to reputation affecting a broader audience, requiring a comprehensive reputation management strategy. Example: Local Media Coverage	Significant reputational crisis with widespread negative impact, necessitating immediate and sustained reputation repair initiatives. Example: National Media Coverage

Questions?