



A Perpetual Harmony of Infrastructure Asset Management

Bottom-Up Approach to Achieving Citywide Asset Management
and Coordinated Infrastructure Renewal Planning

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Presenters

BTX

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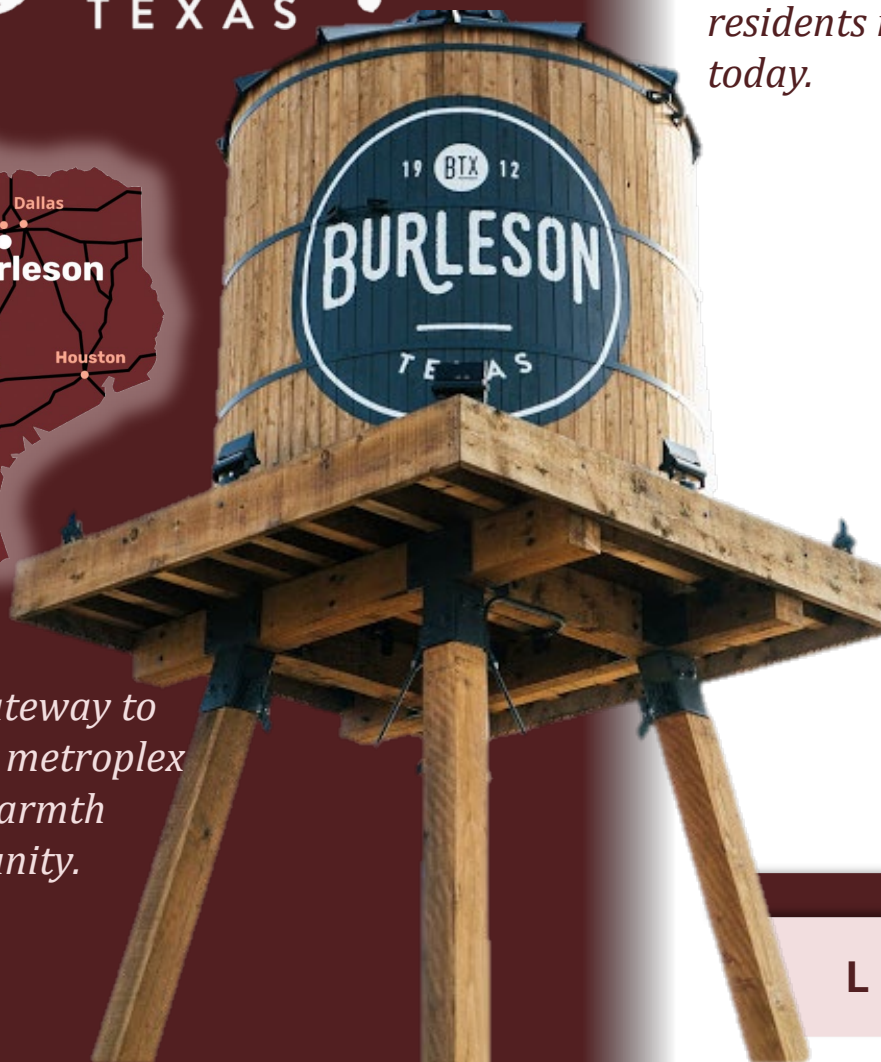
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THE CITY OF BURLESON TEXAS



A thriving southern gateway to the Dallas-Fort Worth metroplex – where small-town warmth meets big-city opportunity.



AT A GLANCE A Community on the Rise

Located 14 miles south of Fort Worth along Interstate 35W, Burleson spans roughly 28 square miles. The City has grown from a rural rail stop of 200 residents in 1890 to one of the fastest-growing communities in North Texas today.

 **~58,300**

RESIDENTS
Growing ~3.7% annually

 **28 sq mi**

LAND AREA
Johnson & Tarrant Counties

 **550+ ac**

PARKLAND
Across 20+ City parks

 **Top-rated**

SCHOOLS
Burleson & Joshua ISDs

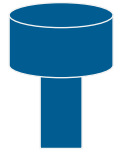
LIVE · WORK · PLAY IN BURLESON

Project Goals



City's W/WW Infrastructure Overview

Water

-  228 miles of **Water Mains**
-  2 **Elevated Storage Tanks**
-  5 **Ground Storage Tanks**
-  4 **Pump Stations**
-  1,782 **Hydrants**
-  16,397 **Water Meters**
-  2,044 **Hydraulic Valves**

Wastewater

-  229 miles of **Sewer Mains**
-  3,749 **Manholes**
-  3 **Wet Wells**
-  3 **Lift Stations**

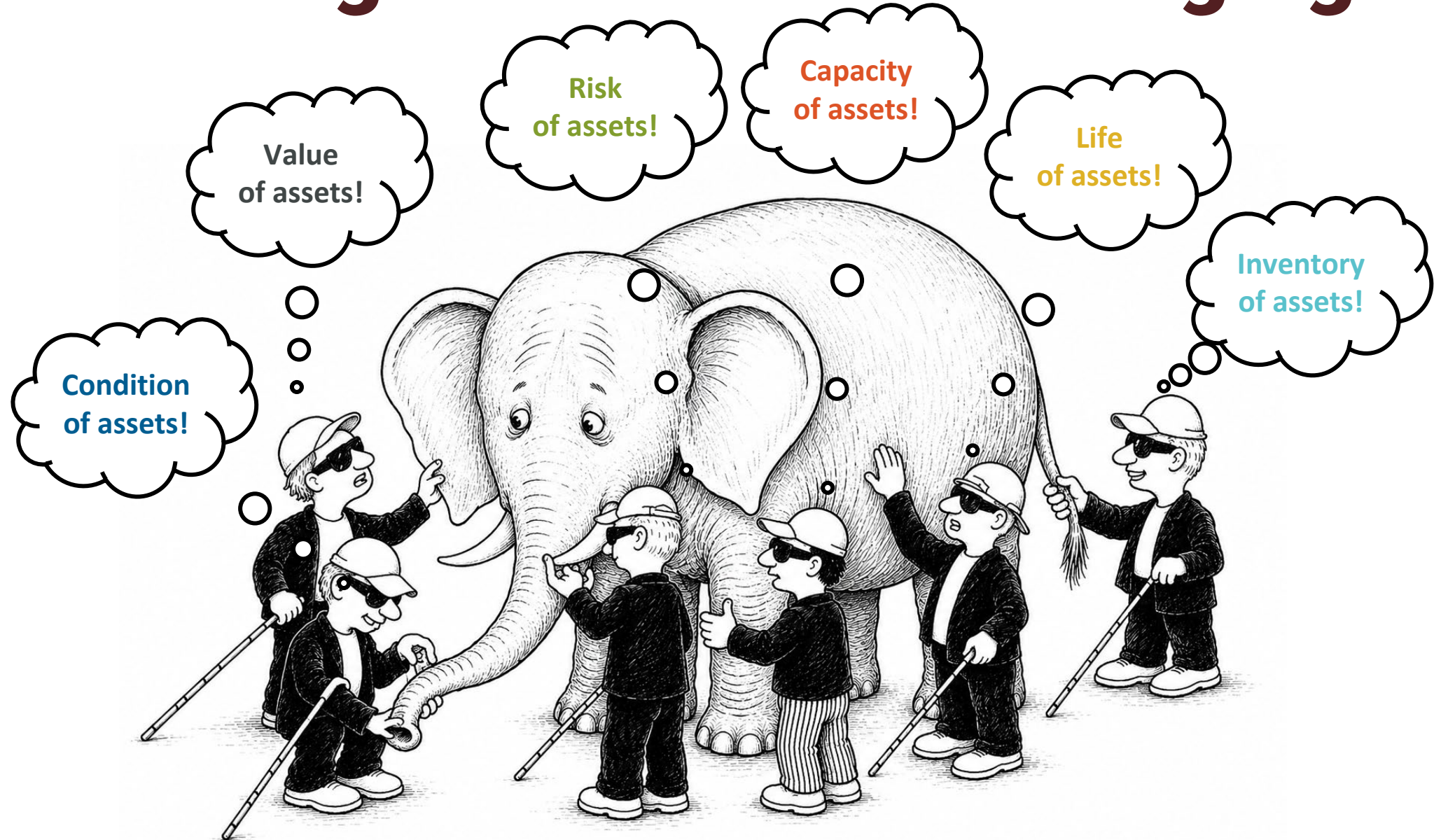
City utilizes OpenGov Cartegraph to manage all these assets digitally.



Asset Management means managing...

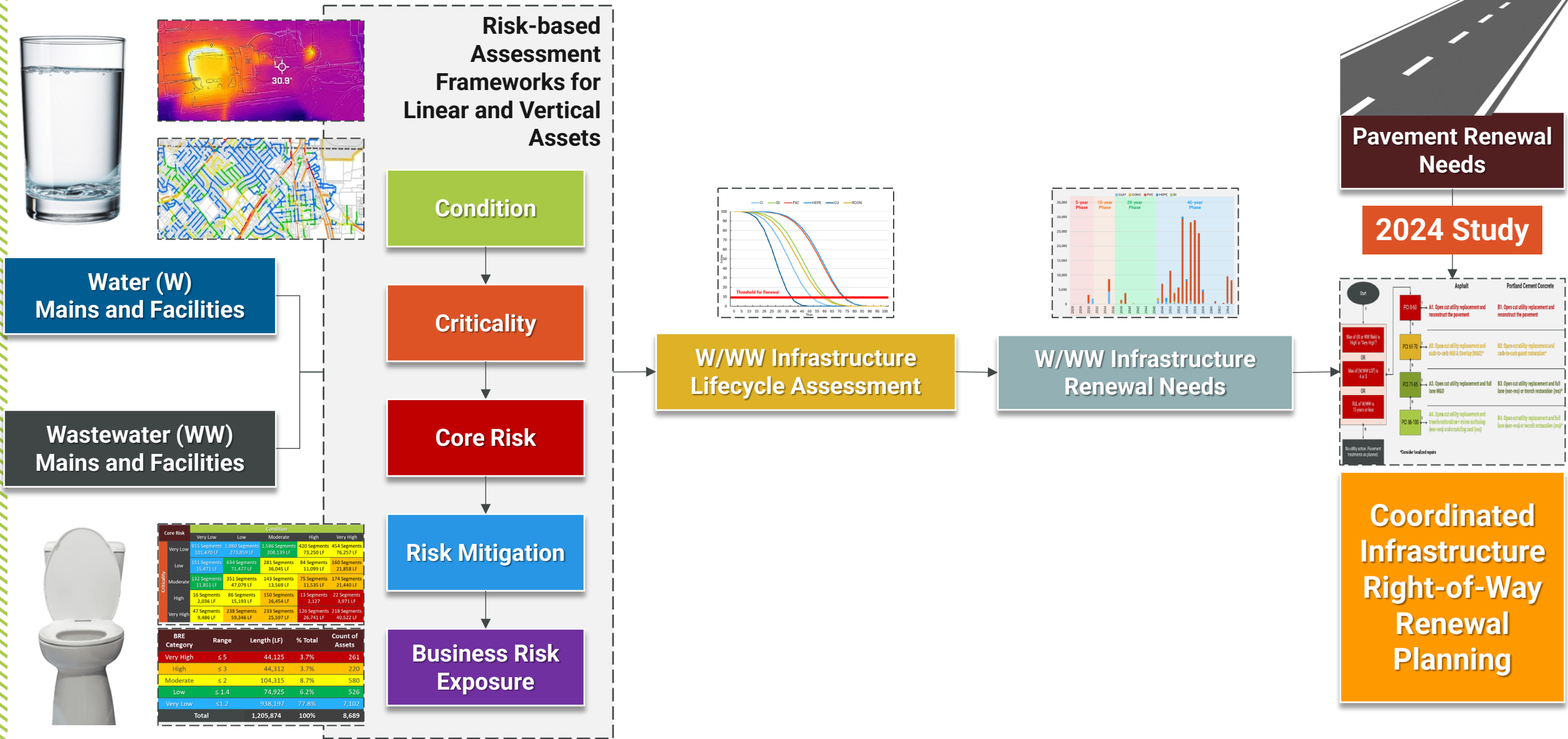
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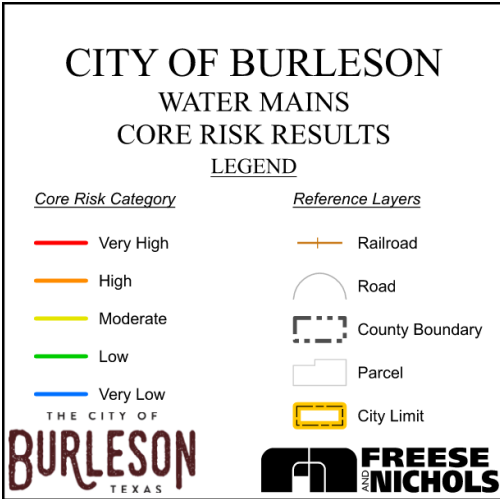
SIX BLIND MEN AND THE ELEPHANT

Project Methodology

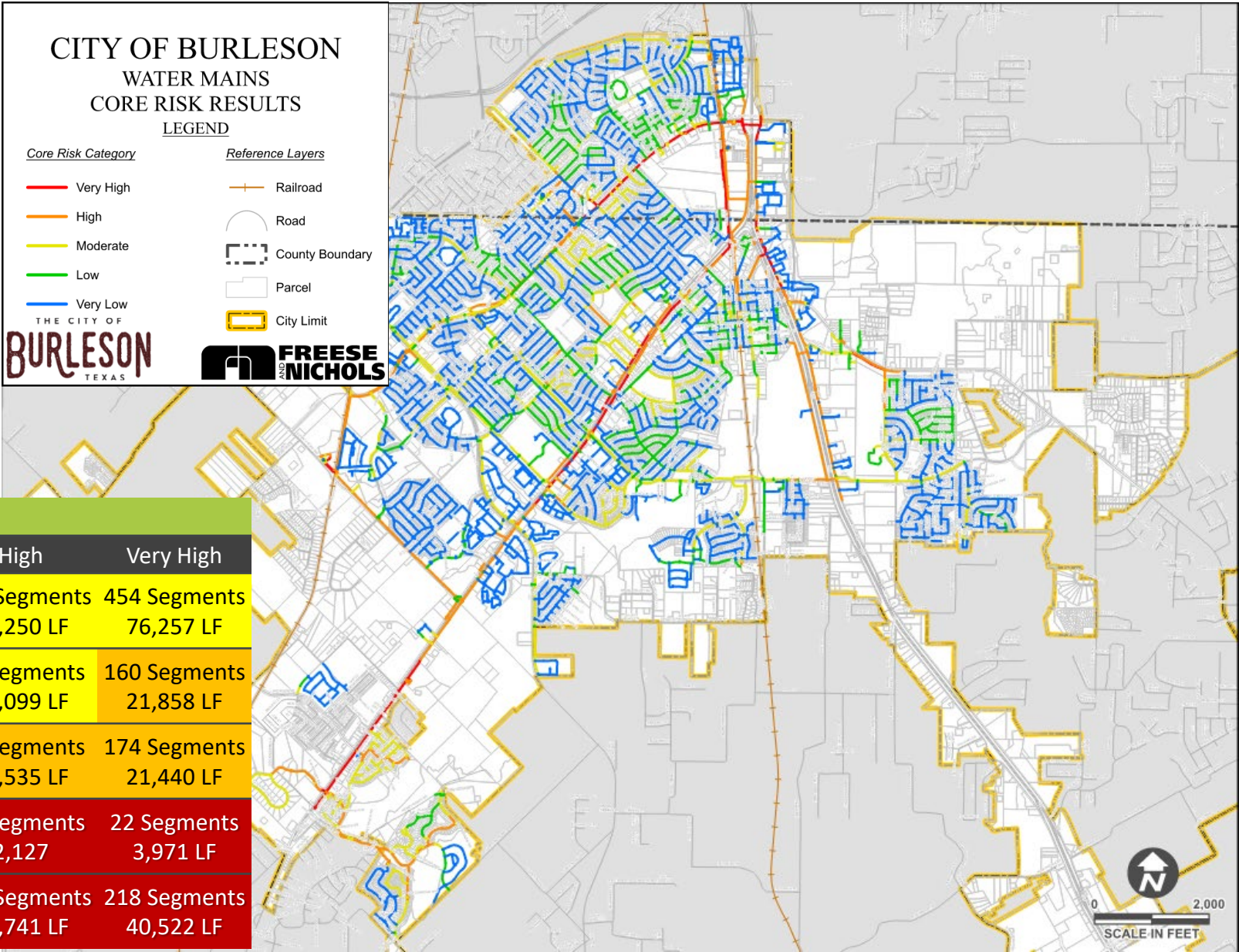


Core Risk of Water Mains

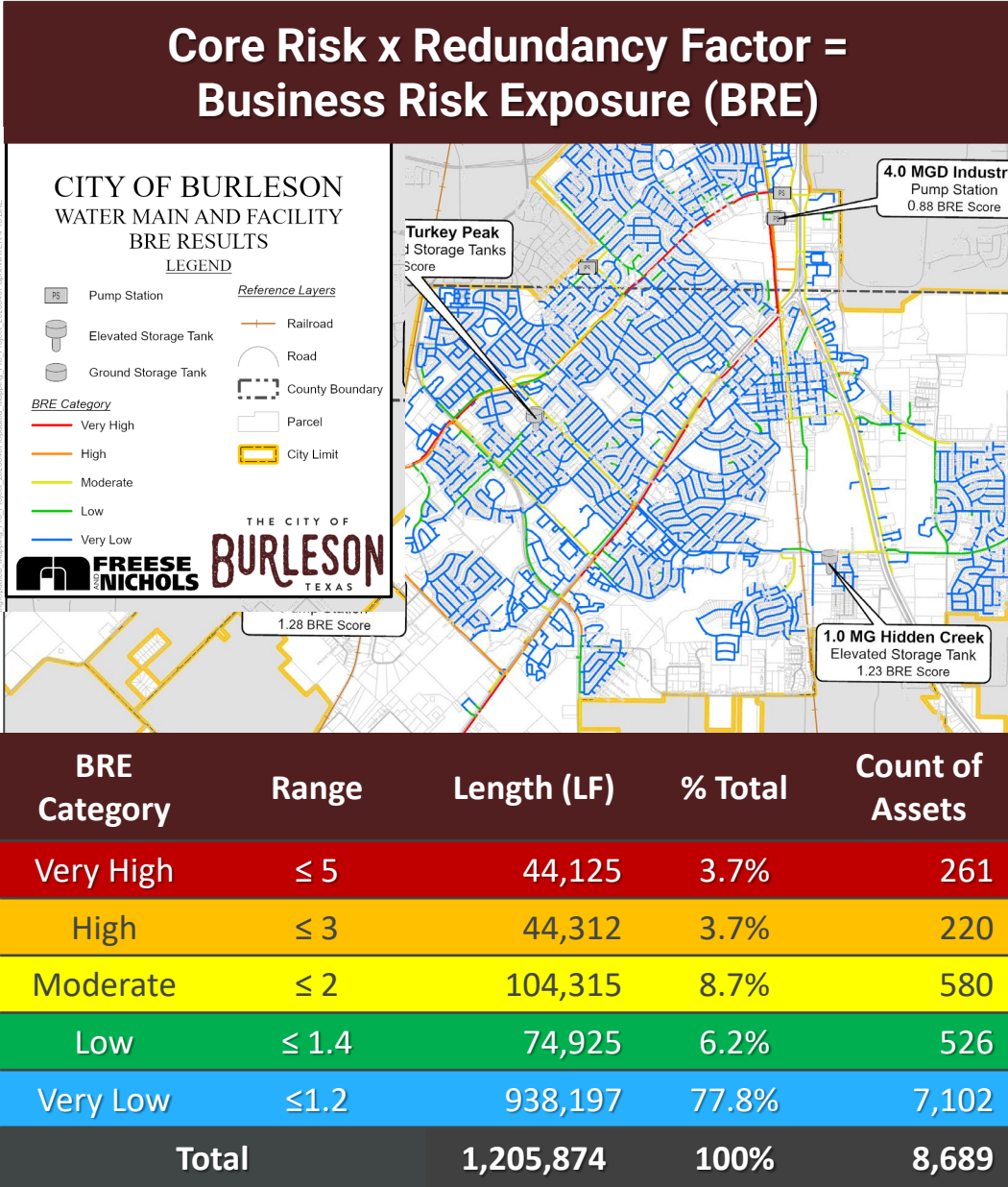
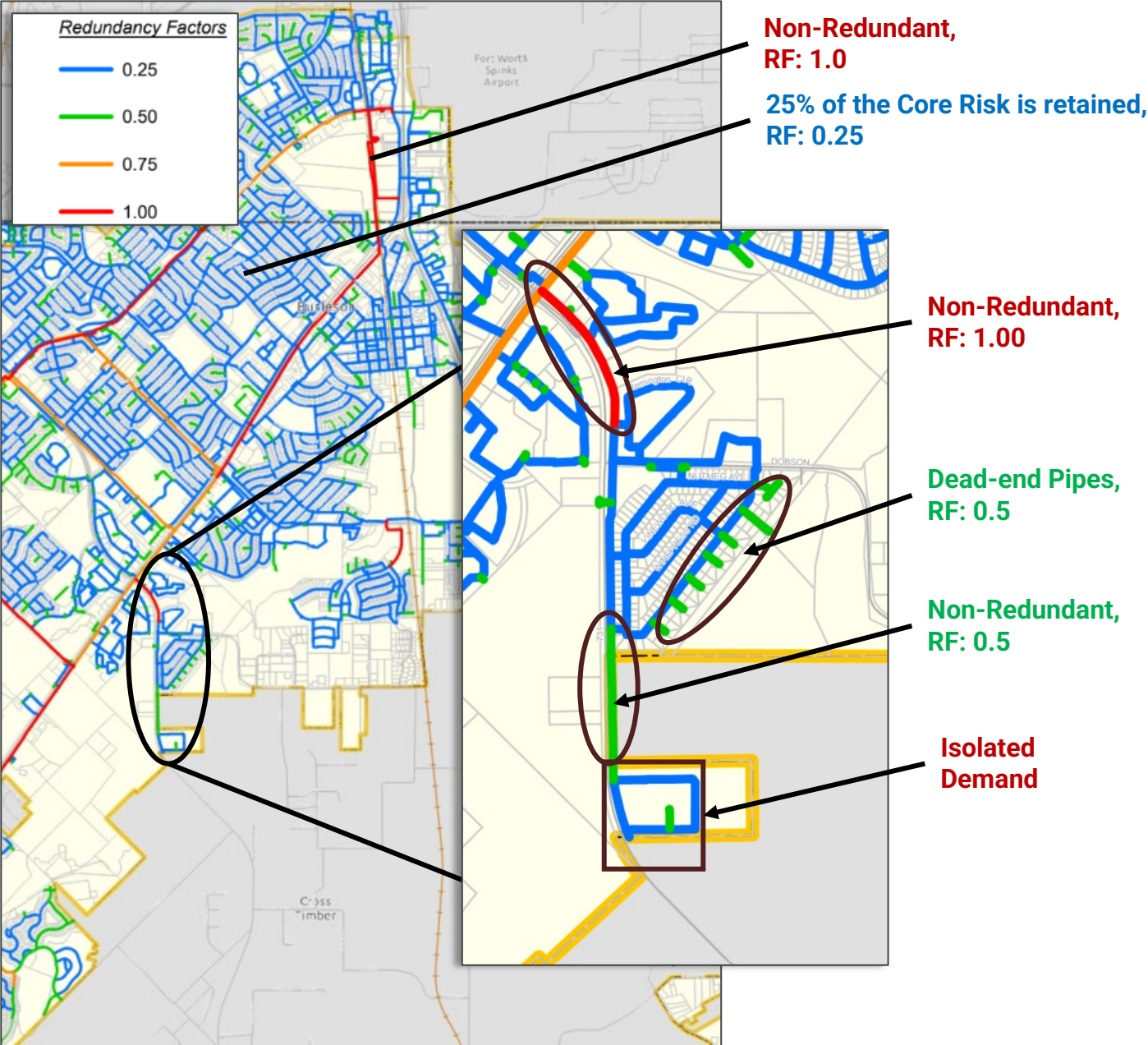
- **Core Risk = Condition x Criticality**
- Condition based on modeled pressures, install year, and material.
- Criticality based on impacts on health & safety, service delivery, and operations.
- **The core risk does not always reflect the actual risk exposure of the assets.**



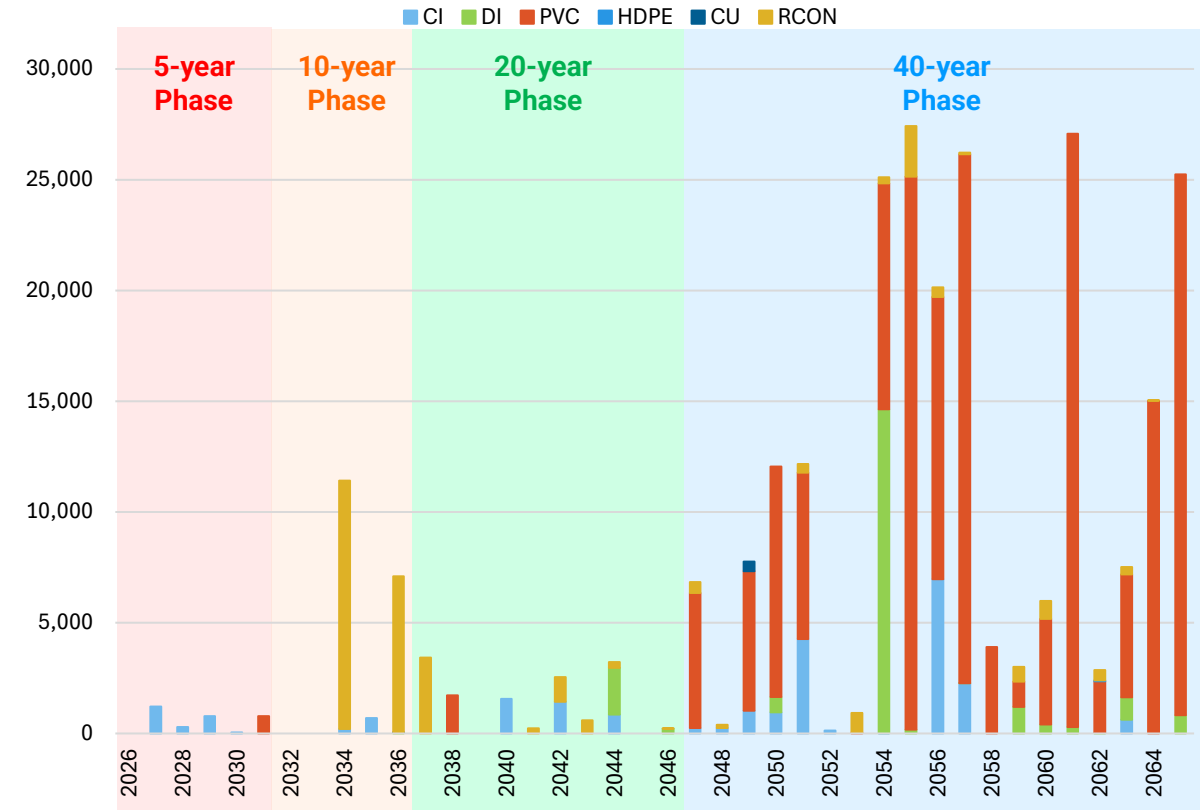
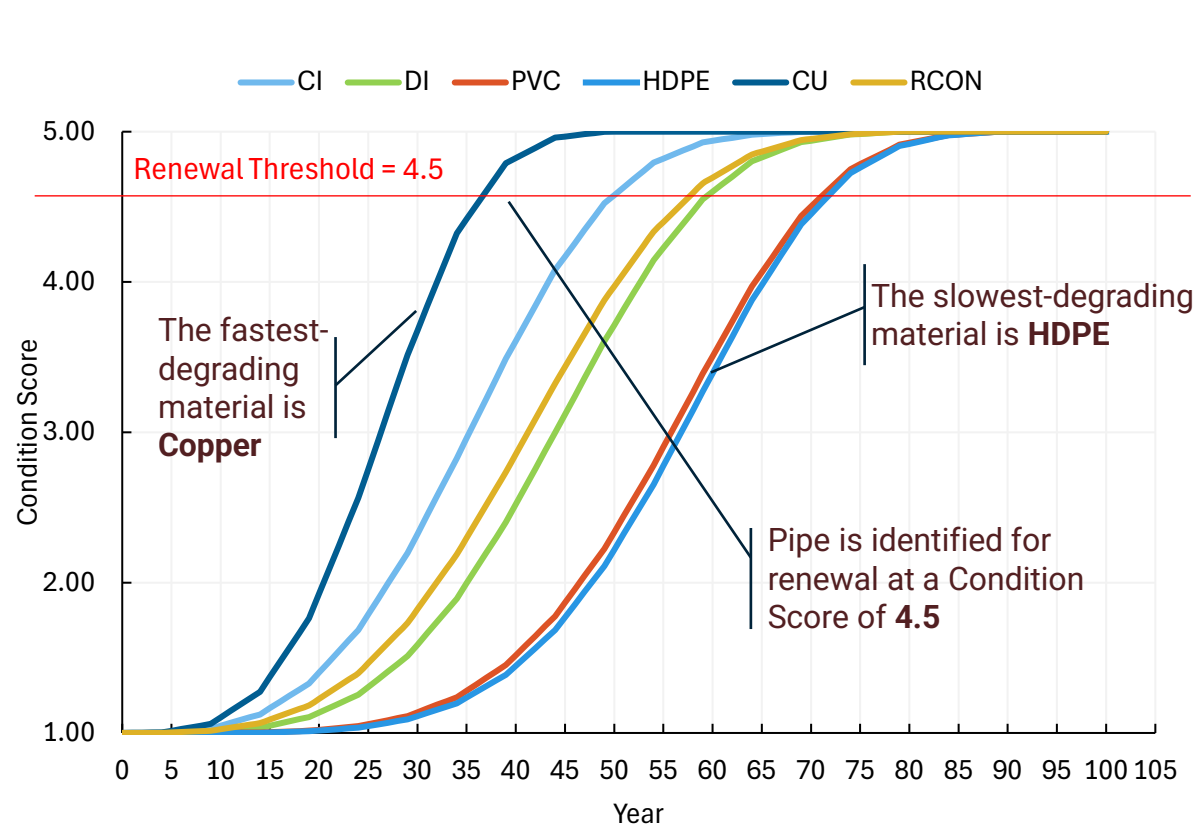
Core Risk		Condition				
		Very Low	Low	Moderate	High	Very High
Criticality	Very Low	915 Segments 101,470 LF	1,980 Segments 273,859 LF	1,586 Segments 208,139 LF	420 Segments 73,250 LF	454 Segments 76,257 LF
	Low	151 Segments 15,471 LF	634 Segments 71,477 LF	281 Segments 36,045 LF	84 Segments 11,099 LF	160 Segments 21,858 LF
	Moderate	132 Segments 11,851 LF	351 Segments 47,079 LF	143 Segments 13,569 LF	75 Segments 11,535 LF	174 Segments 21,440 LF
	High	16 Segments 2,036 LF	86 Segments 15,193 LF	150 Segments 26,454 LF	13 Segments 2,127	22 Segments 3,971 LF
	Very High	47 Segments 9,486 LF	238 Segments 59,346 LF	233 Segments 25,597 LF	126 Segments 26,741 LF	218 Segments 40,522 LF



Risk Exposure of Water Mains



Water Mains Renewal Planning

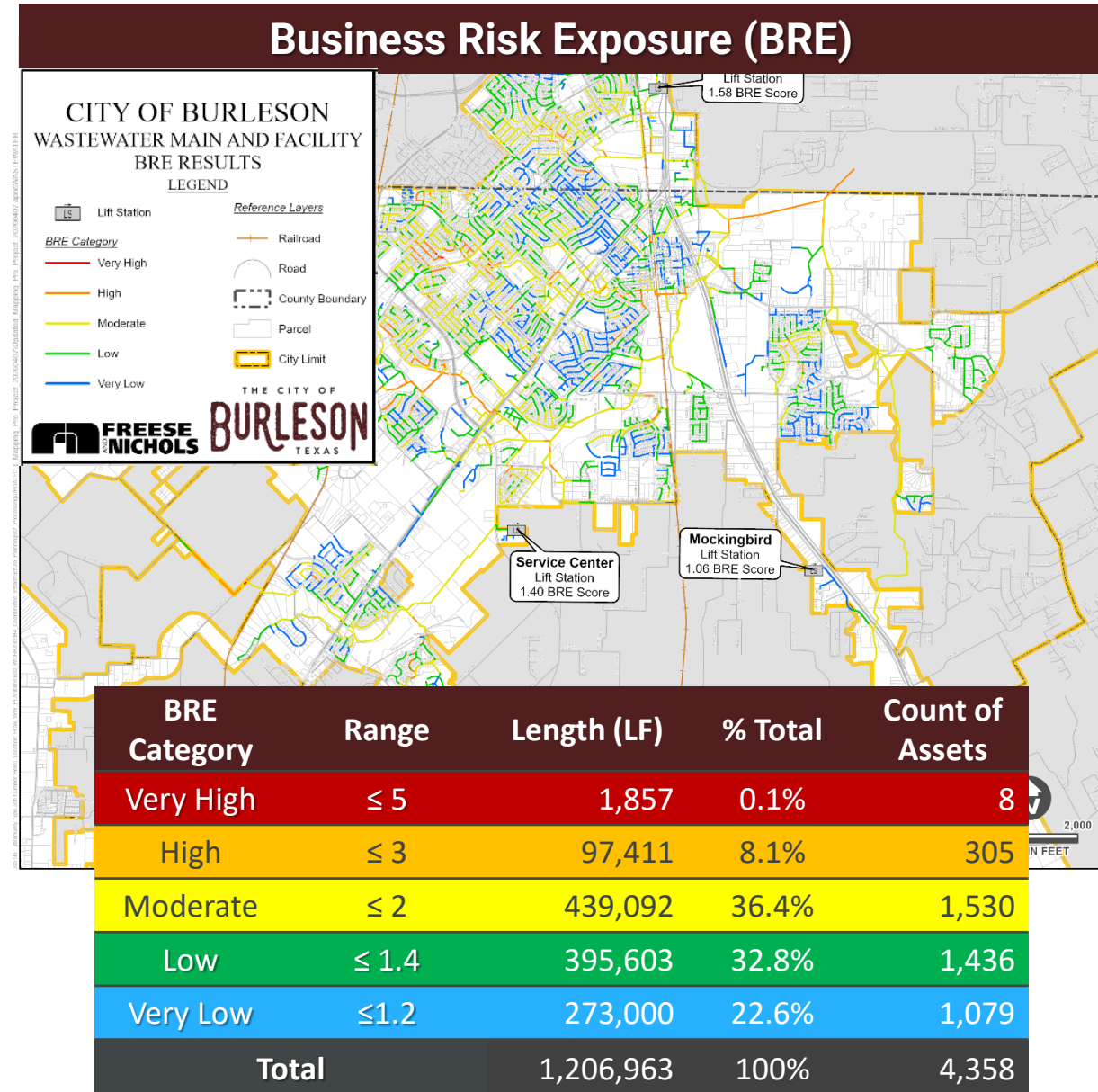


- Reinforced Concrete pipes are estimated to reach the end of life in the next ten years
- Plan a condition assessment program in the next 5 years
- PVC pipes reach the end of life in the next 40 years
- Plan a system-wide water loss leak-detection program in the next 15-20 years

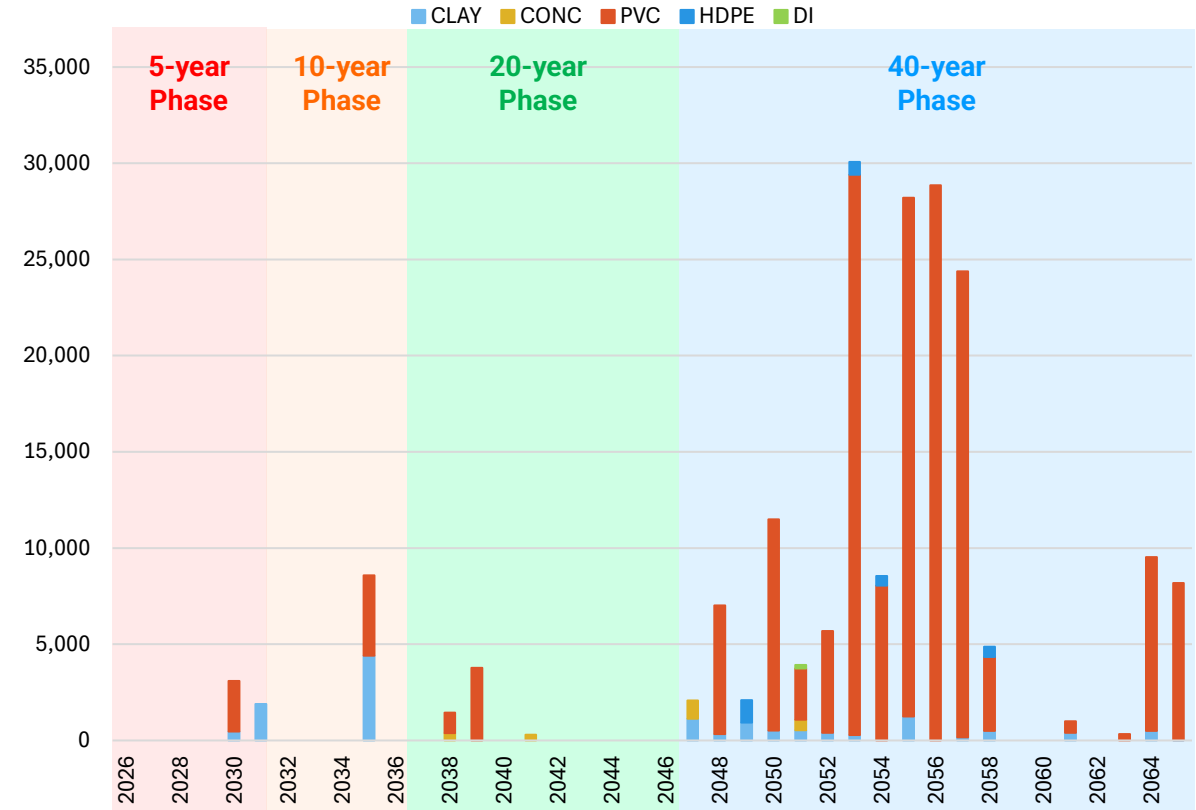
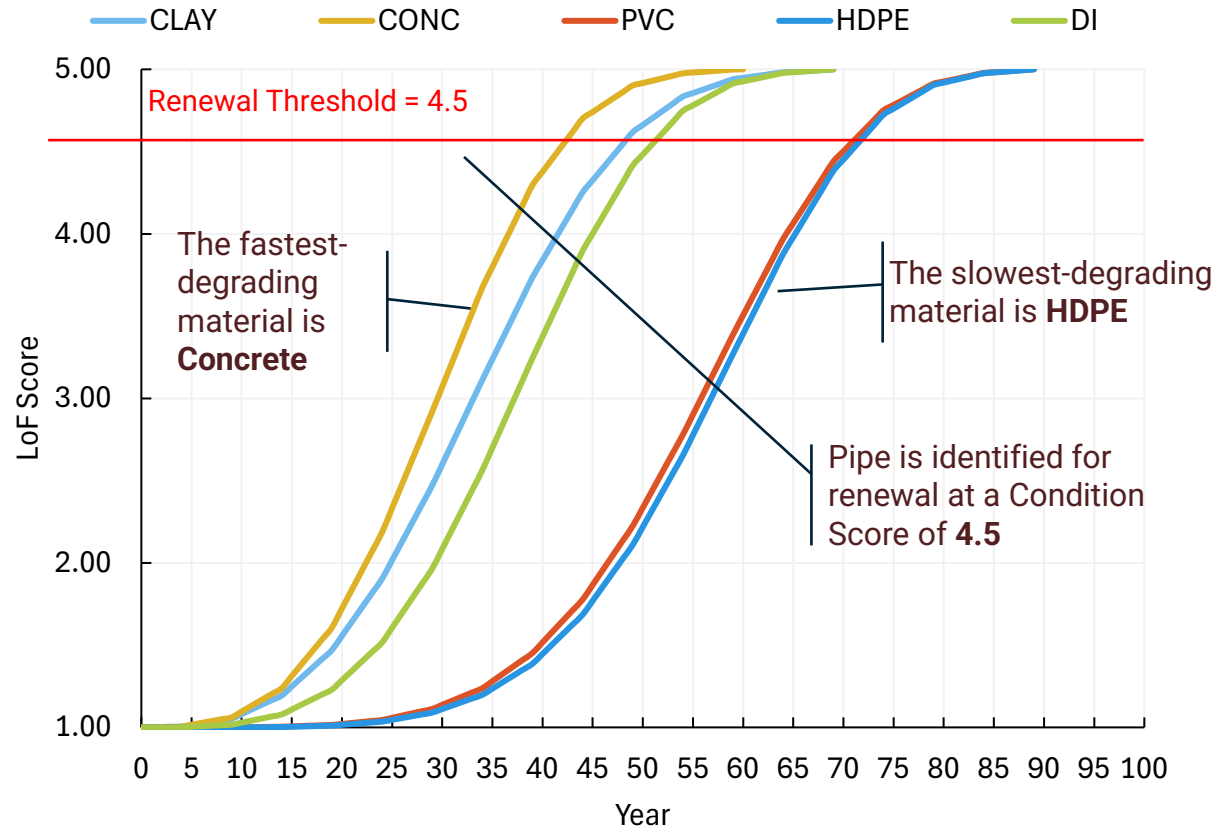
Risk Exposure of Wastewater Mains

Core Risk		Condition				
		Very Low	Low	Moderate	High	Very High
Criticality	Very Low	159 Segments 38,108 LF	300 Segments 85,195 LF	178 Segments 59,673 LF	118 Segments 35,744 LF	48 Segments 14,633 LF
	Low	620 Segments 149,697 LF	968 Segments 272,575 LF	122 Segments 36,831 LF	351 Segments 107,864 LF	42 Segments 13,857 LF
	Moderate	290 Segments 63,354 LF	457 Segments 117,786 LF	87 Segments 24,751 LF	64 Segments 20,163 LF	13 Segments 5,229 LF
	High	134 Segments 41,475 LF	155 Segments 39,813 LF	10 Segments 6,288 LF	4 Segments 1,565 LF	Segments 0 LF
	Very High	58 Segments 20,193 LF	163 Segments 48,293 LF	9 Segments 2,016 LF	6 Segments 1,601 LF	2 Segments 256 LF

- Condition based on install year and material.
- Criticality based on impacts on health & safety, service delivery, and operations.
- **No redundancy factors for WW mains.**
- **Core risk and BRE may align; here, the BRE values are influenced by the data distribution.**



Wastewater Mains Renewal Planning



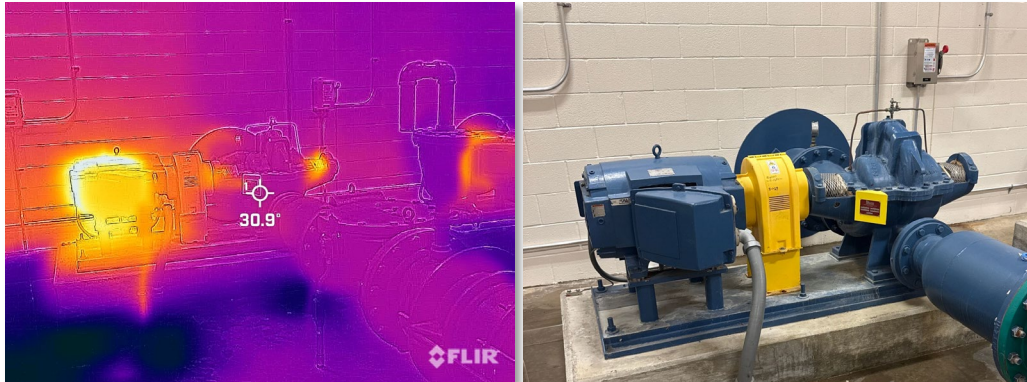
- A wave of Clay and PVC pipes reaching end of life in the next 5-10 years
- Some of the Clay mains may have been misclassified as PVC
- Plan a SSES condition assessment program in the next 5 years

Condition of Water Facilities

① Drones captured high-resolution photos of inaccessible components



③ FLIR camera attachments captured thermal images of the pumps, allowing for a snapshot view of the operating conditions.



② Mobile Field Maps application to collect condition data during site visits

A series of four screenshots from the Mobile Field Maps application. The first screenshot shows a map view with a red outline of a facility labeled 'HULEN PUMP STATION'. The second screenshot shows the 'Asset Inspection Form' with fields for 'Take Photo' and 'Attach', and a list of 'Required Photos'. The third screenshot shows the 'Condition Rating' section with a dropdown menu and a list of 'Inspection Observation' items. The fourth screenshot shows the 'Maintainability' section with a list of 'Inspection Observation' items and a 'Done' button.

Select facility

+ Add photos

100 Rate the condition

Rubric and guidance within the app

Criticality of Water Facilities

The criticality framework aligns with the City's Corporate Risk Matrix, as outlined in City Council Policy #43

Consequence Category	Very Low	Low	Moderate	High	Very High
Regulatory Compliance	No impact	Minor non-compliance requiring notification of the regulatory entity.	Moderate non-compliance triggering internal investigations and potential regulatory scrutiny.	Significant violation requiring external regulatory intervention and potential legal consequences.	Severe non-compliance resulting in legal actions, fines, and severe damage to reputation.
Financial	No impact	Low financial loss, manageable through existing resources and budget adjustments.	Moderate financial impact necessitating reallocation and cost-cutting measures.	Significant financial loss, requiring external funding and long-term financial	A severe financial crisis demanding immediate financial intervention and
Delivery of Services	No impact	Slight service disruption with minimal impact on end-users, recoverable through swift corrective actions.	Moderate disruption service quality and timelines, requiring attention and reco	CITY COUNCIL POLICY 43 City of Burleson Asset Management Policy Adopted date: March 4, 2024 Revised date: NA CITY OF BURLESON ASSET MANAGEMENT POLICY Purpose 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.	
Operational Impact	No impact	Minor disruptions to routine operations, recoverable through prompt corrective actions.	Moderate disturbance operational processes requiring comprehensive coordinated recovery		
Environmental	No impact	Low environmental impact, with limited harm and manageable mitigation measures.	Moderate environmental damage that has short-term effects and is reversible		
Reputation	No impact	No reputational harm with limited impact on public perception.	Moderate reputational impact with limited impact on public perception, manageable through strategic communication efforts.	Significant reputational impact, necessitating a comprehensive reputation management strategy.	Severe reputational impact, necessitating immediate and sustained reputation repair initiatives.

Note: This matrix defines consequence severity levels across six categories to support risk-based asset management decision-making. Severity increases from left (very low / no impact) to right (very high).

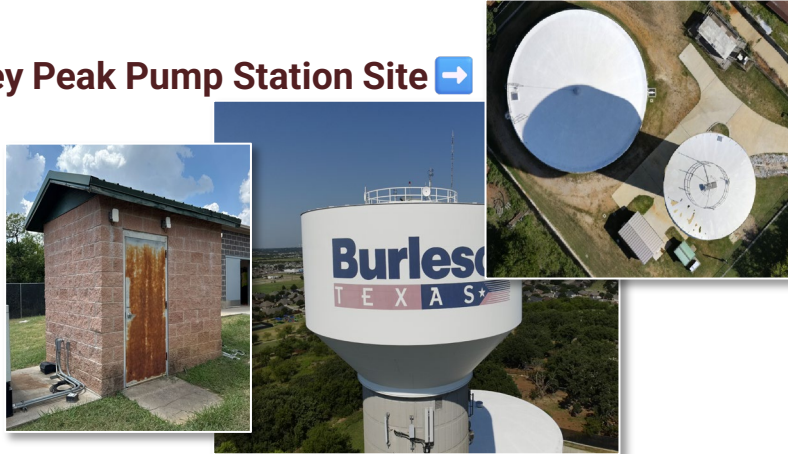
Hulen Pump Station Site →



← Hidden Creek EST Site

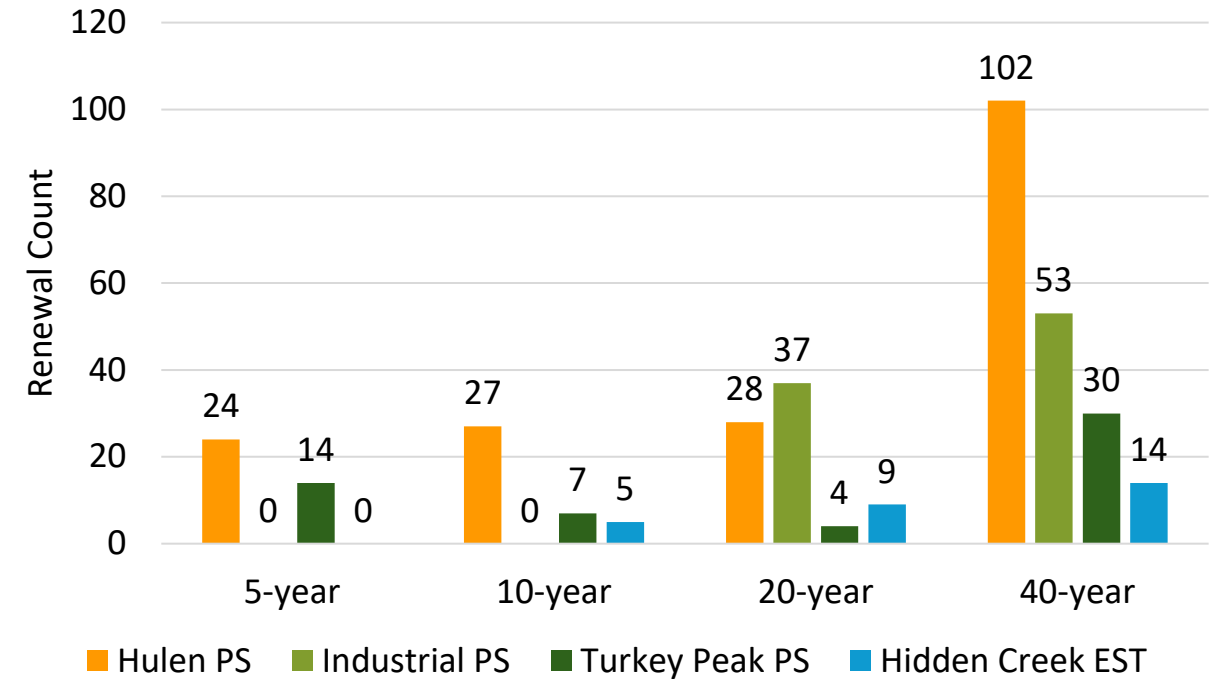


Turkey Peak Pump Station Site →



W Facilities BRE and Renewal Needs

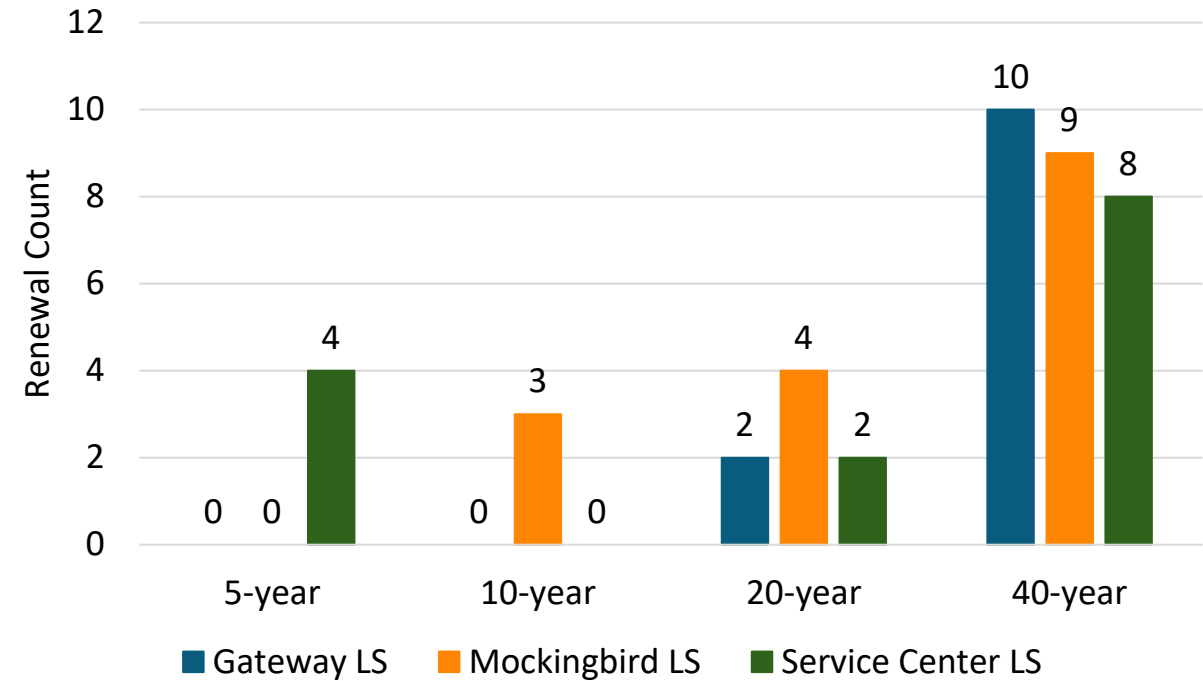
Core Risk		Condition				
		Very Low	Low	Moderate	High	Very High
Criticality	Very Low	-	-	-	-	-
	Low	-	-	-	-	-
	Moderate	Industrial Park PS Hulen PS GST#2 Industrial PS GST#1 Industrial PS GST#2 Industrial PS GST#3	Hulen PS - LPP Hulen PS - UPP Turkey Peak GST Hidden Creek EST	Turkey Peak PS Hulen PS GST#1	-	-
	High	-	Turkey Peak EST	-	-	-
	Very High	-	-	-	-	-



- Assigned service life and estimated end of life for all equipment inside each facility
- Hulen GST and Turkey Peak EST require paint recoating
- Pump station roof inspection and potential replacement
- MCC and Transfer Switch are at the end of useful life

WW Facilities BRE and Renewal Needs

Core Risk		Condition				
		Very Low	Low	Moderate	High	Very High
Criticality	Very Low	-	-	-	-	-
	Low	-	-	-	-	-
	Moderate	-	-	-	Gateway LS Service Center LS	-
	High	-	-	Mockingbird LS	-	-
	Very High	-	-	-	-	-



- Assigned service life and estimated end of life for all equipment inside each facility
- The 2022 condition assessment program identified improvements needed to address the aging infrastructure issues

BIG WORK BELOW. BIG IMPACT ABOVE.



THE CHALLENGE:

Renew aging W/WW infrastructure while minimizing community impact and preventing accelerated pavement degradation after cuts are made.

STAKEHOLDER CONCERNS:

- ☐ Traffic Delays
- ☐ Service Interruptions
- ☐ Business Access
- ☐ Economic Impact

COMMUNITY IMPACTS:

- ☐ Higher Long-Term Maintenance Costs
- ☐ More Disruption for the Community
- ☐ Shorter Pavement Life
- ☐ Wasted Investment

THE SOLUTION:

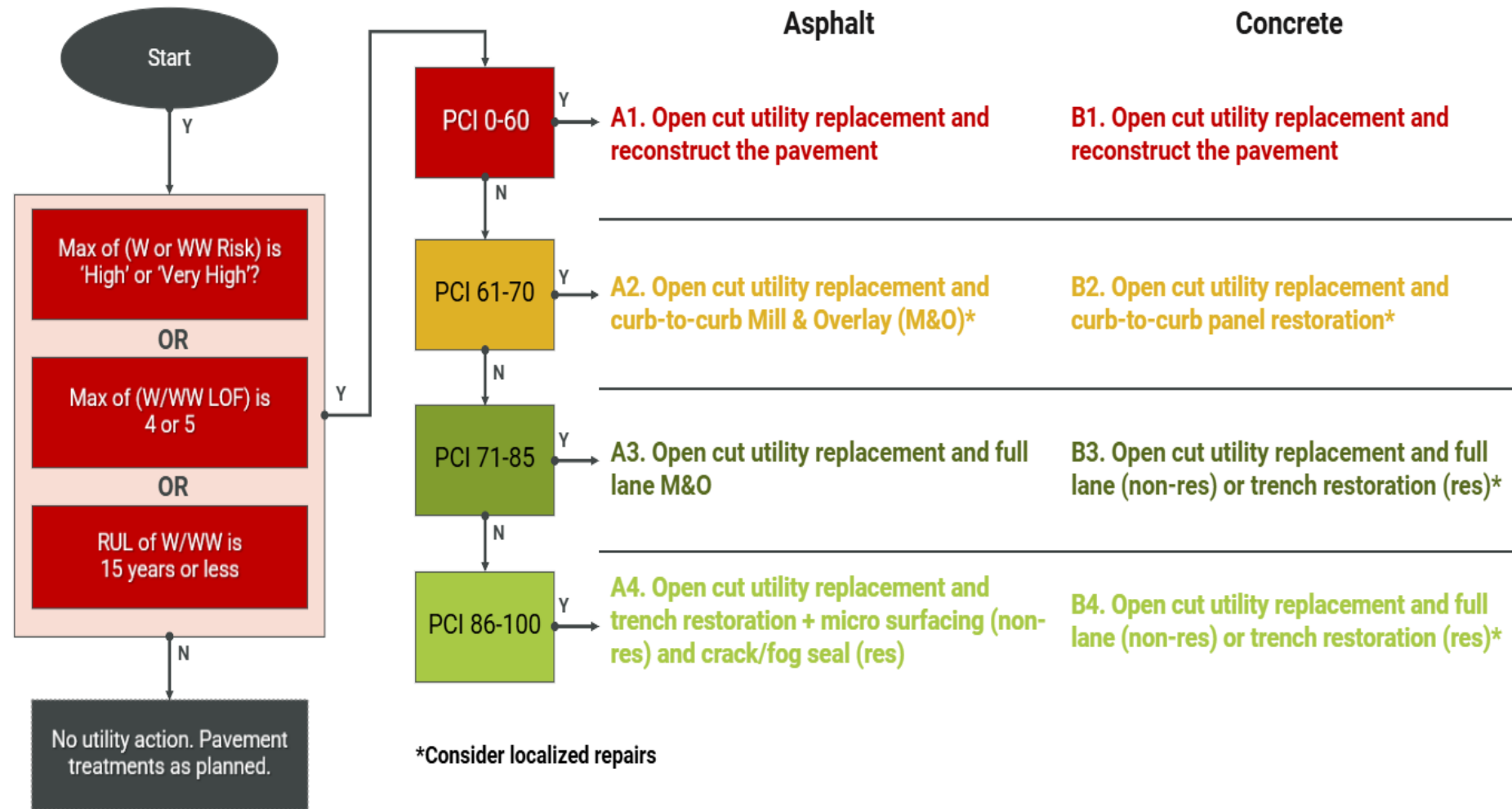
Coordinated efforts minimize disruptions and promote stronger, sustainable infrastructure.

Coordinated Right-of-Way (ROW) Renewal Framework

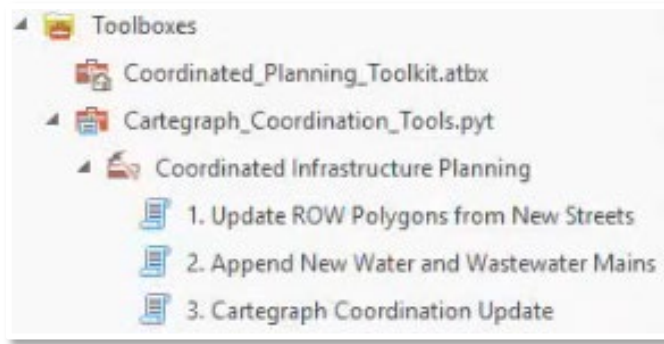
✓ Focus areas:

- W/WW risk, condition, remaining useful life (RUL)
- Consideration of pavement condition (PCI)

✓ Restoration extent based on initial condition and roadway type



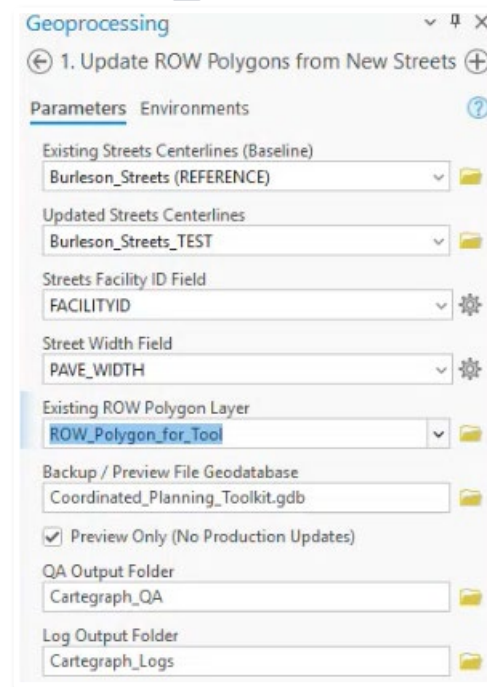
Tool for Coordinated Renewal Planning



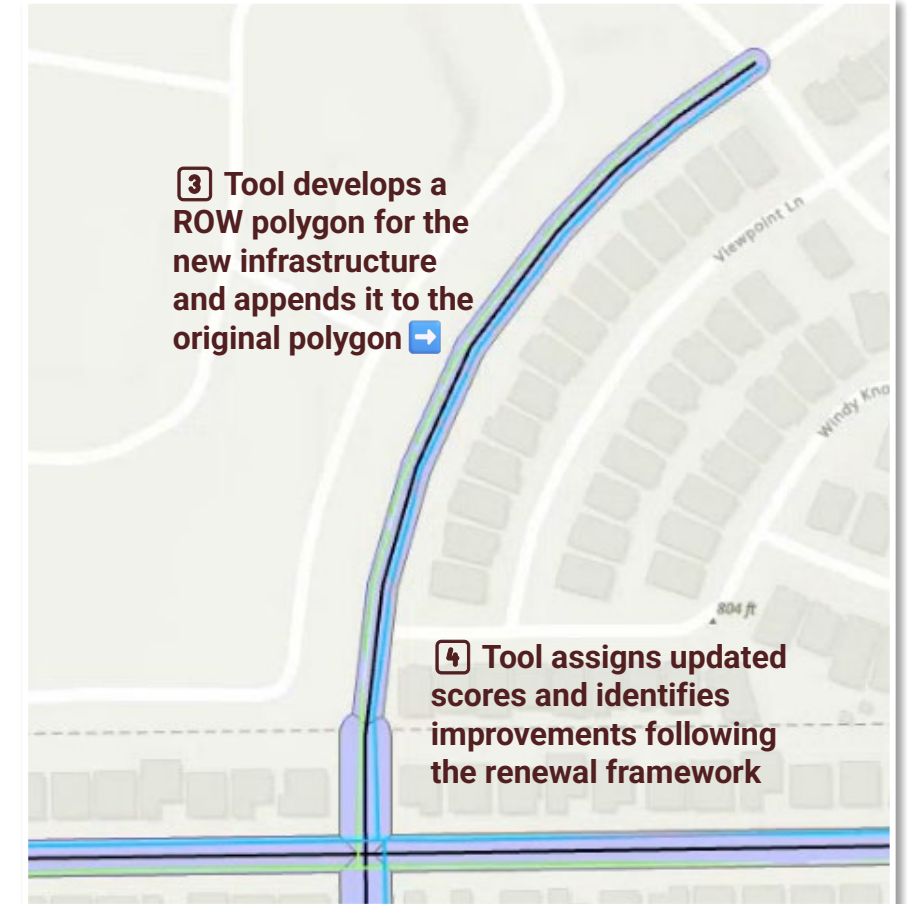
1 City adds a new street and W/WW main into GIS



2 City runs the tool within GIS



3 Tool develops a ROW polygon for the new infrastructure and appends it to the original polygon



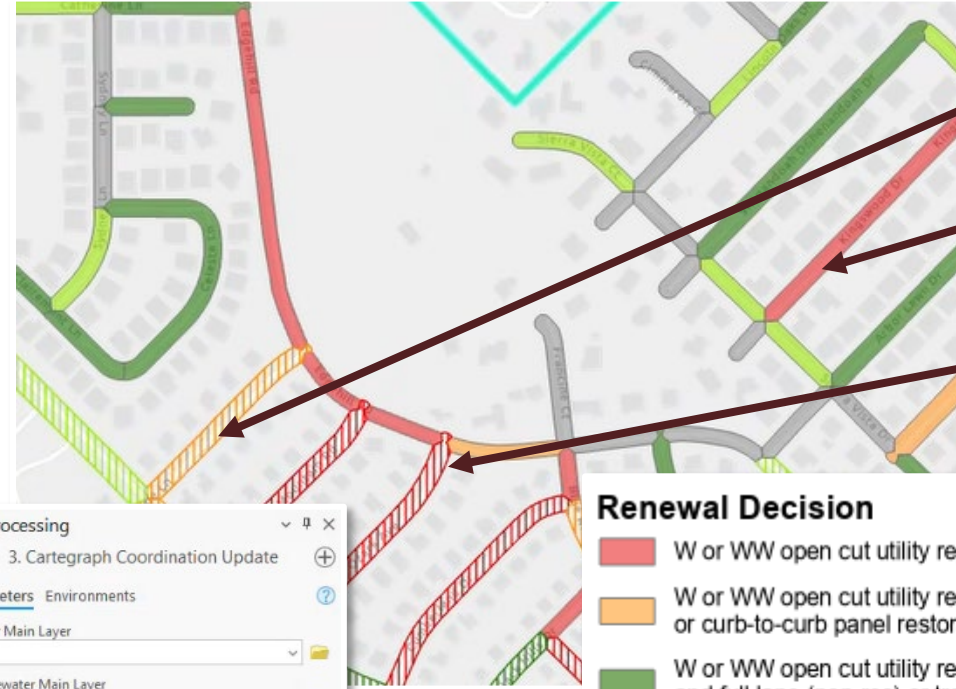
- Developed a GIS-based tool to spatially join pavement and w/ww main asset data to ROW polygon features, then assign updated scores, renewal improvement, and symbology
- Leveraged the City's existing tools (OpenGOV and GIS) to maintain asset data over time

Lessons Learned

- Asset Management can provide meaningful insights even with imperfect data
- Lots of technology available, but spend time to understand what decisions it does (and doesn't) drive
- Fully utilize existing software systems to automate asset data management as much as possible



GIS-based Coordinated Right-of-Way Renewal Planning Tool Outcomes



Examples:

Both W/WW Open cut utility replacement and curb-to-curb Mill & Overlay

W or WW Open cut utility replacement and reconstruct the pavement

Both W/WW Open cut utility replacement and reconstruct the pavement

Renewal Decision

- W or WW open cut utility replacement and reconstruct the pavement
- W or WW open cut utility replacement and curb-to-curb Mill & Overlay (Asphalt) or curb-to-curb panel restoration (Concrete)
- W or WW open cut utility replacement and full lane Mill & Overlay (Asphalt) or and full lane (non-res) or trench restoration (res) (Concrete)
- W or WW open cut utility replacement and trench restoration + micro surfacing (non-res) and crack/fog seal (res) (Asphalt) or full lane (non-res) or trench restoration (res) (Concrete)
- Both W and WW open cut utility replacement and reconstruct the pavement or full lane (non-res) or trench restoration (res) (Concrete)
- Both W and WW open cut utility replacement and curb-to-curb Mill & Overlay
- Both W and WW open cut utility replacement and full lane Mill & Overlay (Asphalt) or and full lane (non-res) or trench restoration (res) (Concrete)
- Both W and WW open cut utility replacement and trench restoration + micro surfacing (non-res) and crack/fog seal (res) (Asphalt) or full lane (non-res) or trench restoration (res) (Concrete)
- No utility action. Pavement treatments as planned.

Geoprocessing

3. Cartograph Coordination Update

Parameters Environments

* Water Main Layer

* Wastewater Main Layer

* ROW Pavement Polygon Layer

Backup File Geodatabase
Coordinated_Planning_Toolkit.gdb

Water Cartograph CSV
H:\W_WW_PLANNING\00_WORKING\B4_Coordinated

* Wastewater Cartograph CSV

* Pavement Cartograph CSV

☒ Create QA Reports

QA Output Folder
Cartograph_QA

☒ Preview Only (No Production Updates)

Log Output Folder
Cartograph_Logs

Questions?

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