

Wastewater Collection System Master Plan

August 12, 2025



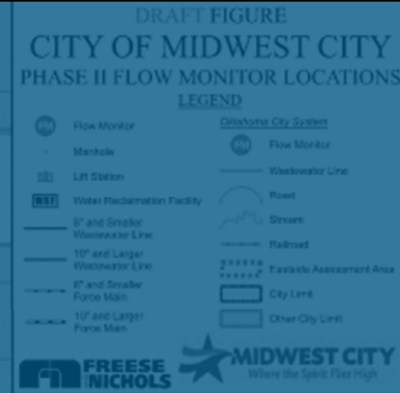
Introductions



Cullen Carlson
Project Manager

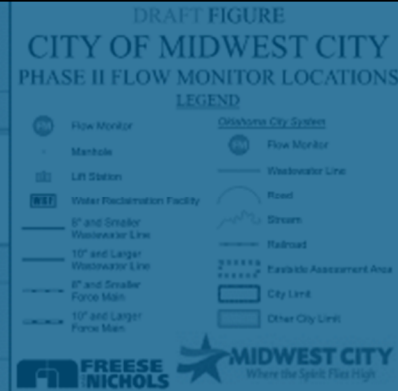


Clay Herndon
Technical Lead



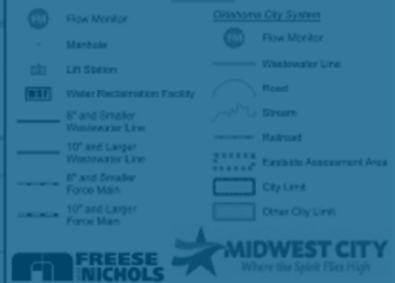
Agenda

- Overview
- Wastewater Collection System Master Plan
- Recommendations
- Q&A



Overview

DRAFT FIGURE
CITY OF MIDWEST CITY
PHASE II FLOW MONITOR LOCATIONS



Wastewater Collection System Overview



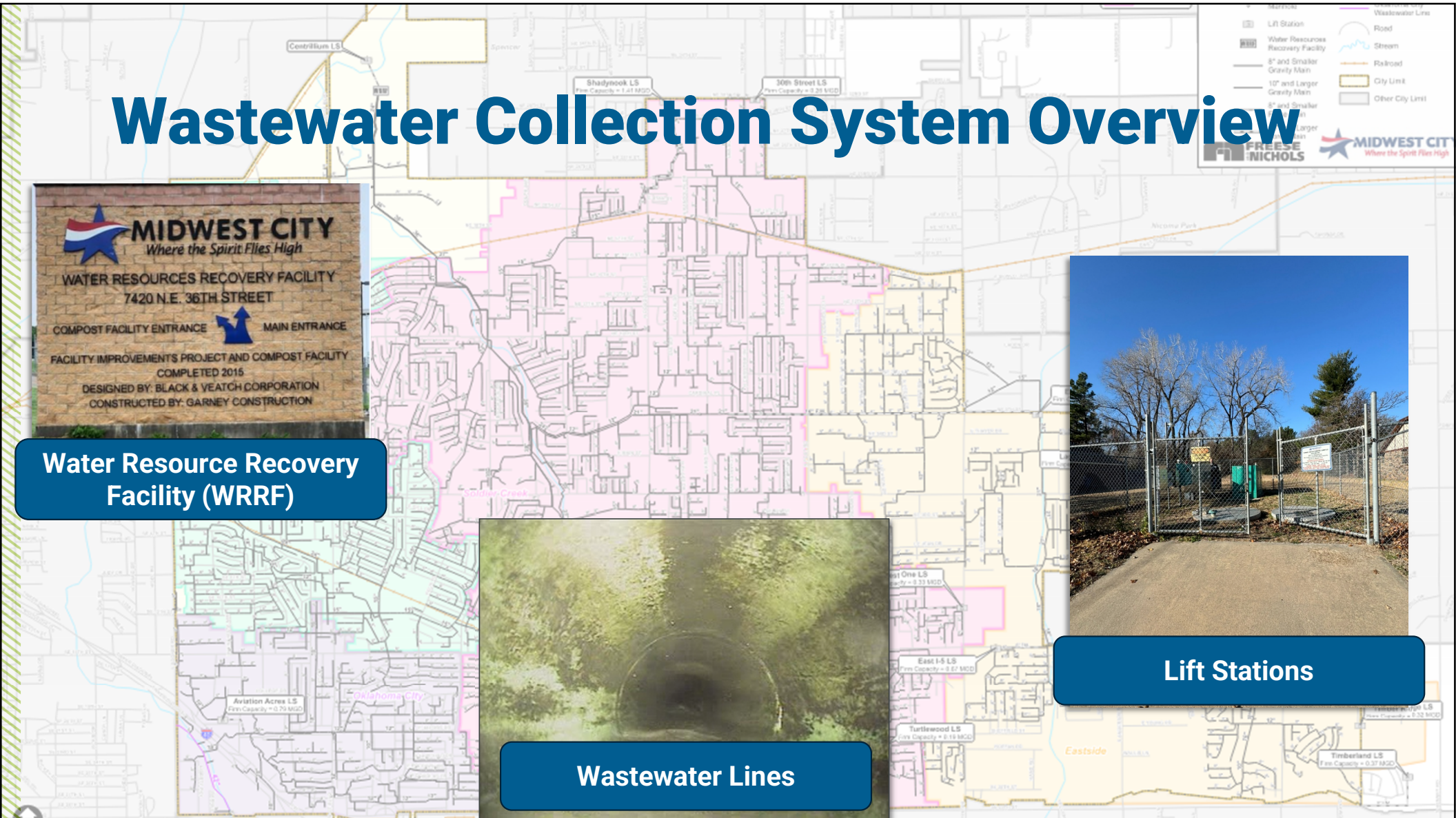
Water Resource Recovery Facility (WRRF)



Wastewater Lines



Lift Stations



Why is Master Planning Important?

Identifies System
Deficiencies

Maintains
Regulatory
Compliance

Supports
Sustainable
Growth

Protects Public
Health and the
Environment

Guides Strategic
Investment

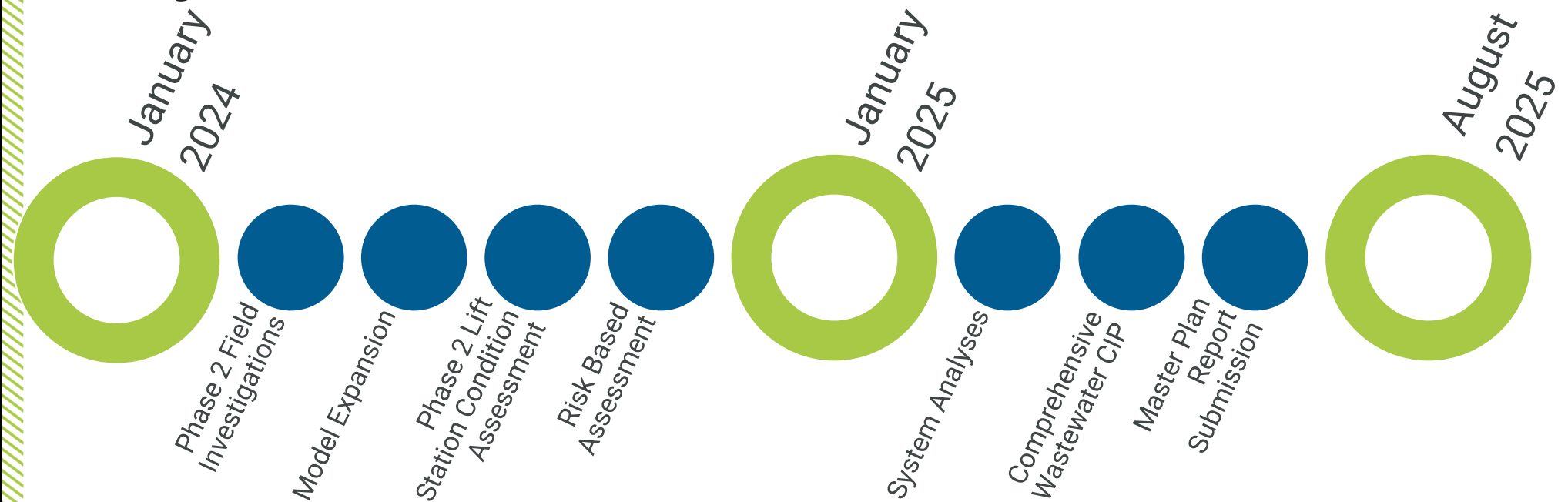
Increases
Operational
Efficiency

Promotes
Transparency
and
Accountability

Phase 1 – Eastside Sewer Study

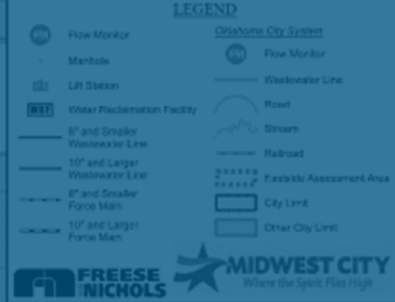


Phase 2 – Wastewater Collection System Master Plan

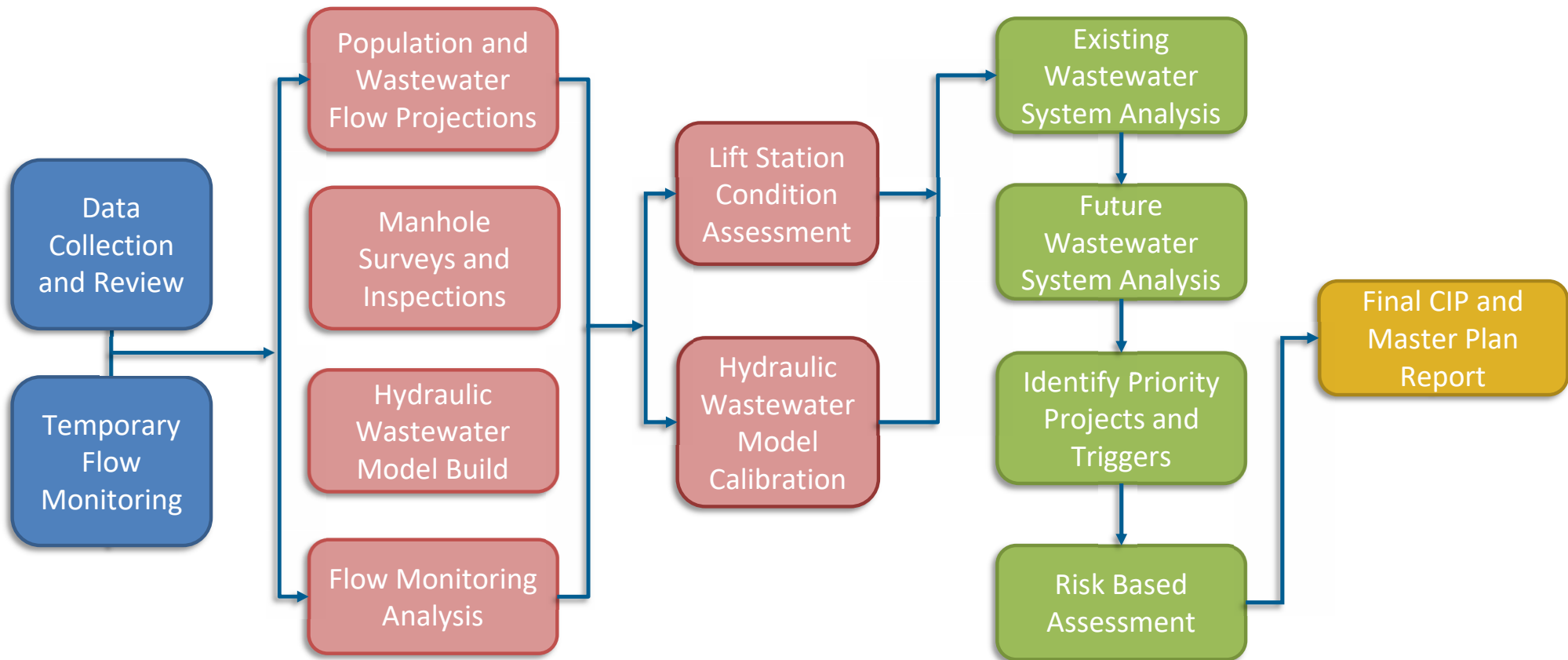


Wastewater Master Plan

DRAFT FIGURE
CITY OF MIDWEST CITY
PHASE II FLOW MONITOR LOCATIONS

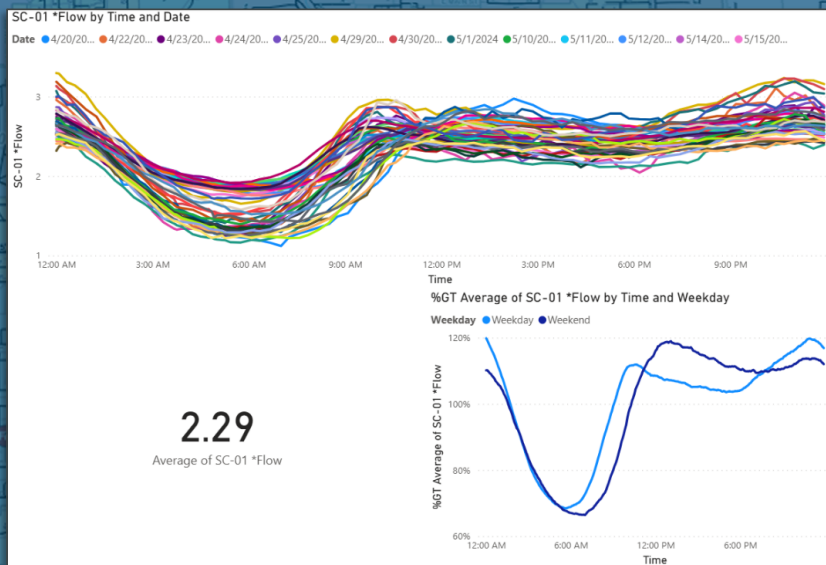


Wastewater Master Plan



Flow Monitoring

- 18 Flow Meters and 4 Rain Gauges installed for 60 days in Spring 2024
- Identify Inflow and Infiltration (I/I)
- Calibrate the Hydraulic Wastewater Model



Freese & Nichols Midwest City Phase 2		Site Name CC-03
Project No. 30-0937-01	Site Code 1	
System Information		
Project Pipe Dia. (in) 36.0	Area Location Map	
Municipality Midwest City	Area View Picture	
Street RG-03	Top View Picture	
Assigned Rain Gauge RG-03	Investigation Photo	
Current Manhole or Gully Connecting MH I.D. 36in-72in	Installation Photo	
System Characteristics <input checked="" type="checkbox"/> Inflow <input checked="" type="checkbox"/> Infiltration <input checked="" type="checkbox"/> Combined <input checked="" type="checkbox"/> Hydraulic	Hydraulic Characteristics	
Location Information		
Site Address 8625 NE 50th St, Oklahoma City, Oklahoma	Site Information	
City Address 09 Ave	Pipe Height (ft) 33.00	
Longitude -87.4310200	Pipe Width (in) 36.25	
Latitude 35.47340000	Pipe Type Iron	
MH Type Precast Concrete	Pipe Slope 0.00	
Manhole Depth (ft) 12.00	CIP 100%	
Manhole Width (ft) 6.0	R25 0.0	
Elevation (ft) 6.0	R25 0.0	
Height (ft) 6.0	R25 0.0	
Structural Integrity Safe	Hydraulic Information	
Flow Depth (ft) 2.87		
Instant Velocity (ft/s) 2.73		
Surge Height (ft) 0.00		
LSI Type None		
LSI Depth (ft) 0.00		
Needs Cleaning No		
Backwater No		
Pipe Path Straight		
Pipe Material No		
Hydraulic Rating Good		
Installation Notes		
Location in Pipe (ft) 2.0		
Location from Manhole Upstream		
Access Pressure, Velocity, and UTM		
Access Surface (Optional) Code: Structure Cover		
Signal Strength 75		
Post Installation Notes		
Meter Type A01		
Meter Model A01		
Installation Date 4/20/2024		
Approvals		
Recommended by F&N		
Client Approval		

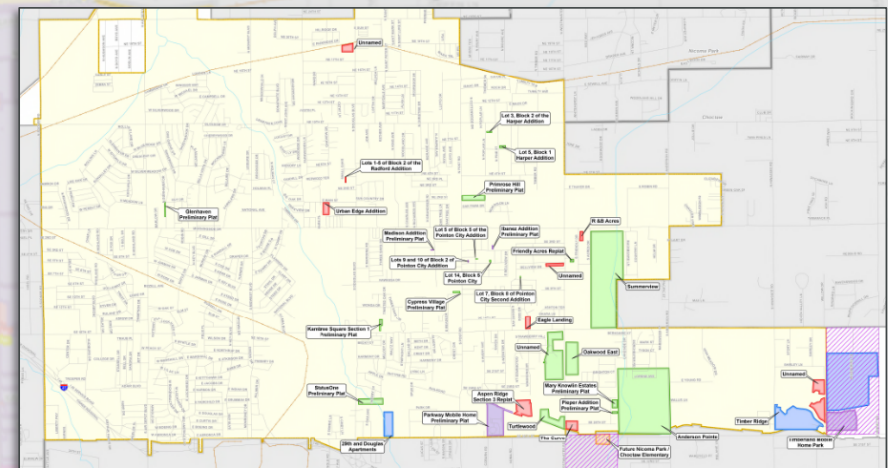
Manhole Inspections

- Inspected 300 Manholes
- Gathered data for model building
 - Depth
 - Connectivity
 - Condition

A screenshot of a digital inspection report form for Freese & Nichols. The form is titled "Midwest City WW Assessment Ph 1" and includes fields for "Inspected By", "Inspected Date/Time", "System Information", "Location Information", "Site Information", "Area Location Map", "Area View Picture", "Top View Picture", "Investigation Photo", "Installation Photo", "Install Plan Sketch", "Install Cross-Section Sketch", and "Approvals". The form is filled out with data for a specific manhole inspection.

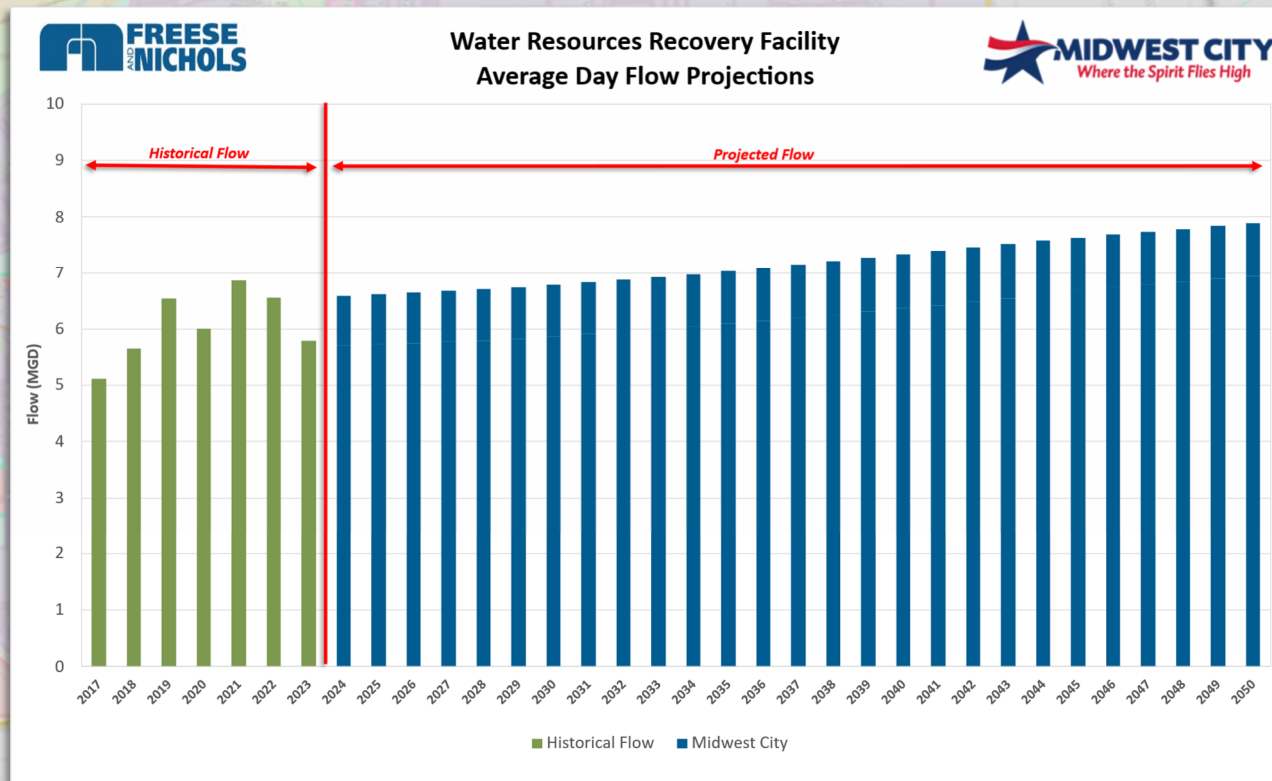
Population Projections

- Built upon Eastside Sewer Study
- Coordination with Community Development Department
- Coordination with Comprehensive Planning team
- Parcel level projections



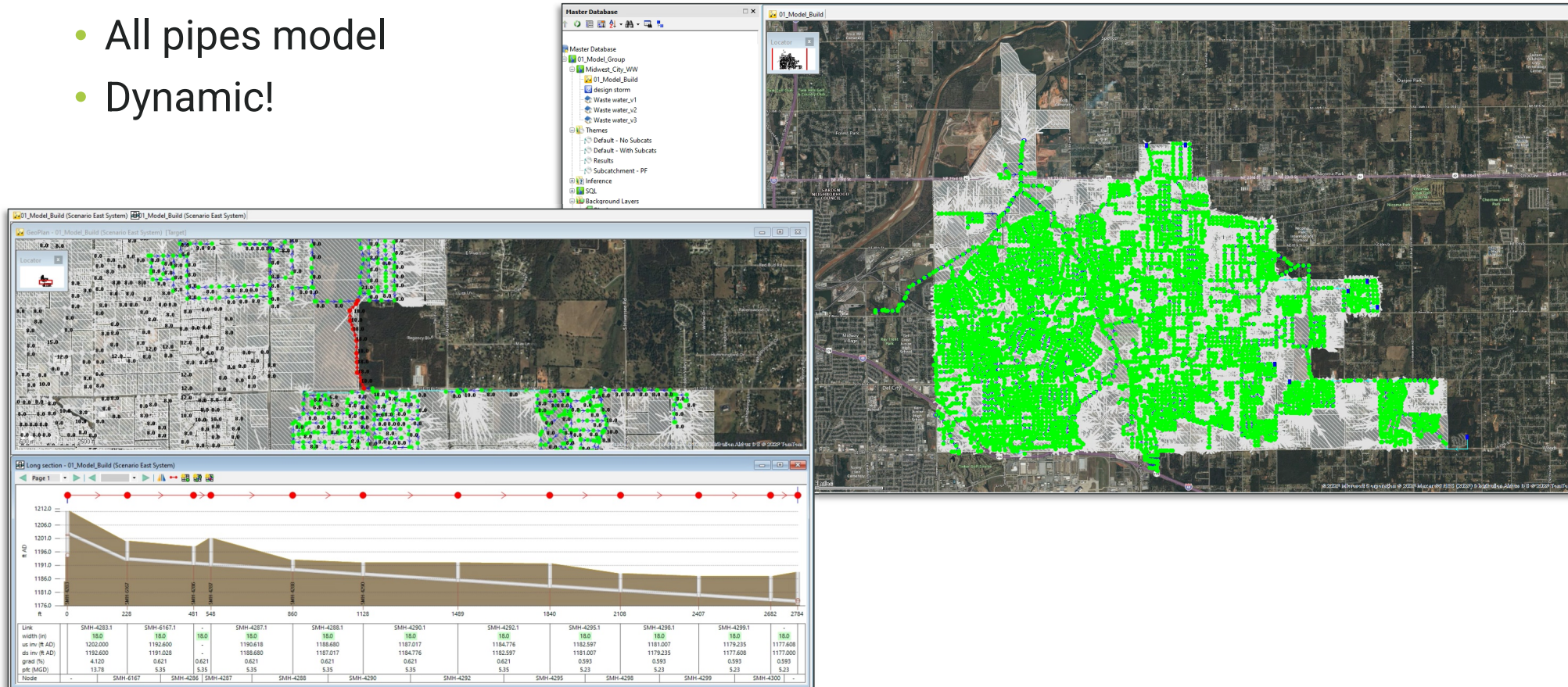
Wastewater Flow Projections

- Reviewed Historical WRRF Flows and Projected Future Flows



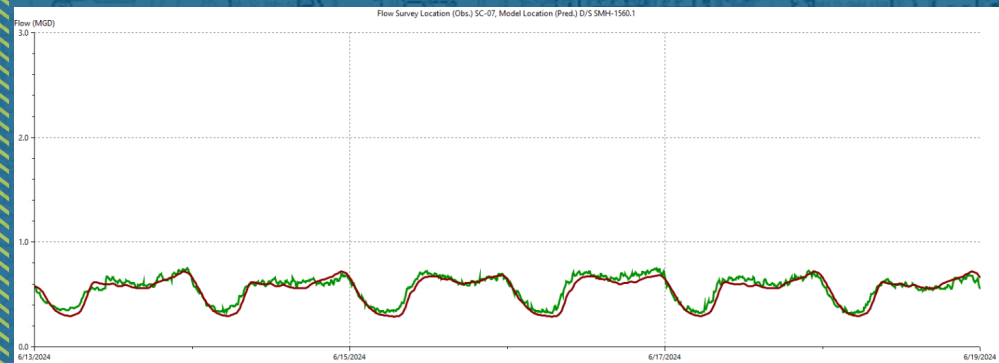
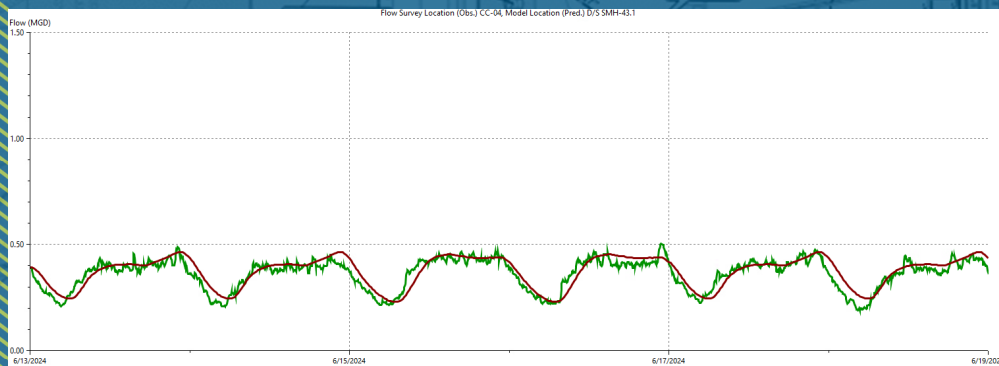
Wastewater Model Development

- All pipes model
- Dynamic!

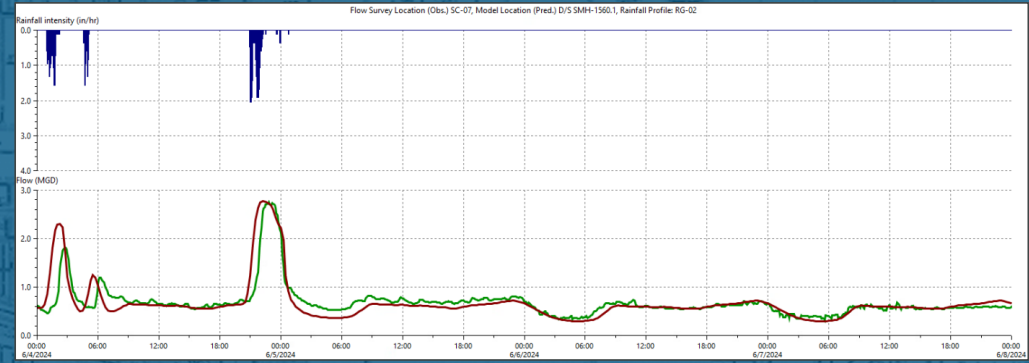
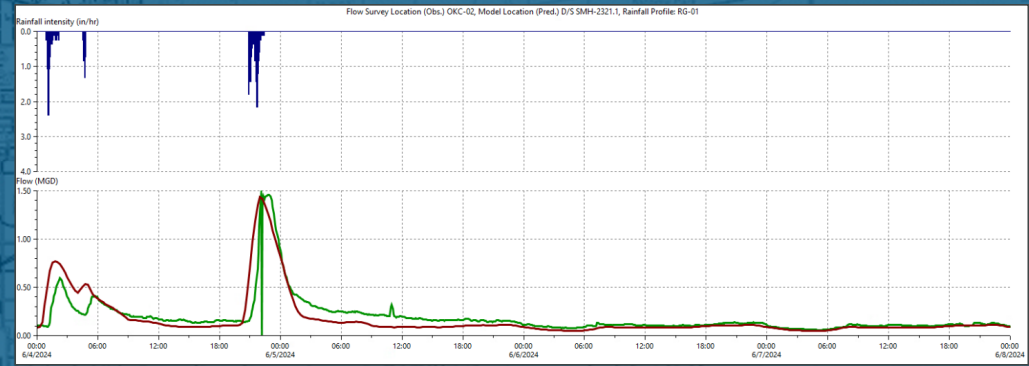


Model Calibration

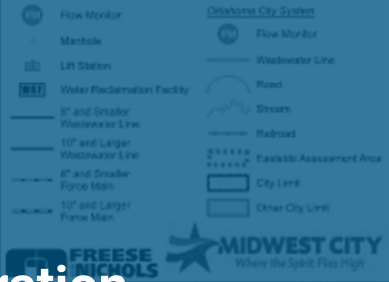
Dry Weather Calibration



Wet Weather Calibration

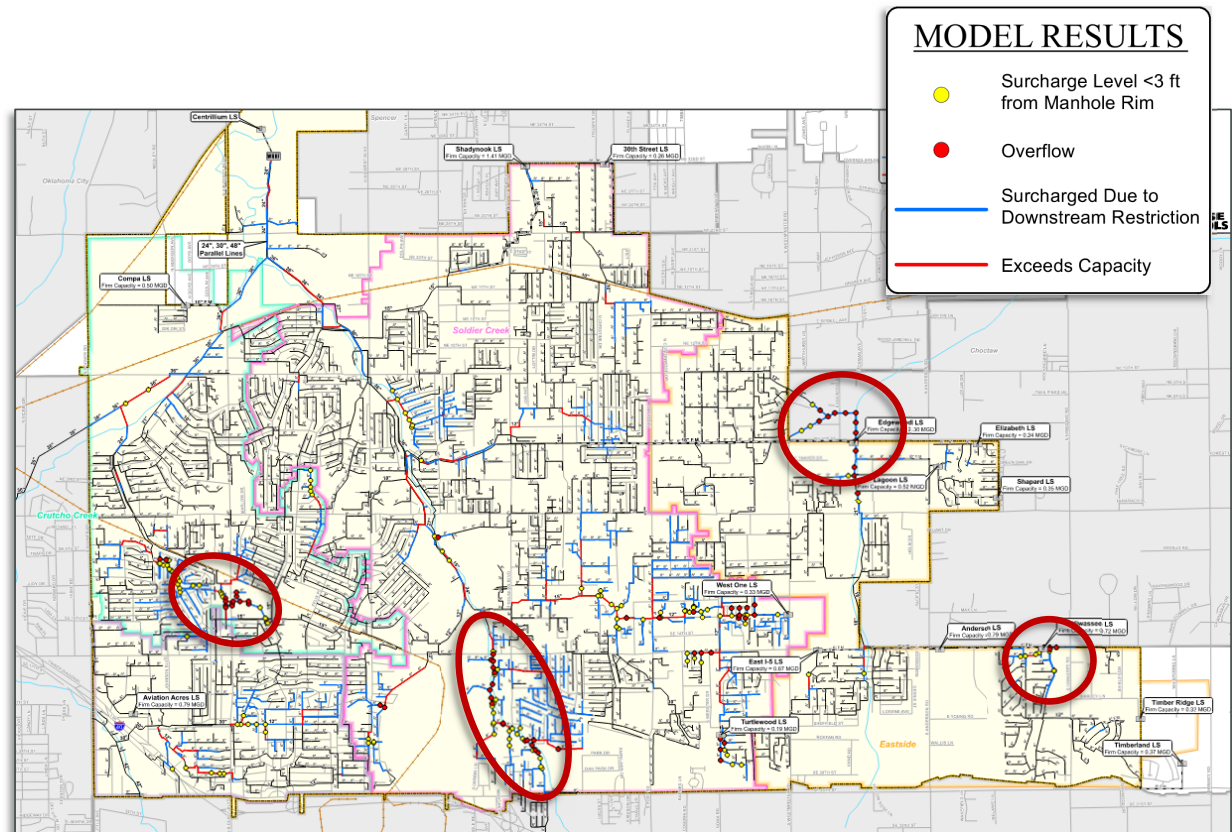


DRAFT FIGURE
CITY OF MIDWEST CITY
PHASE II FLOW MONITOR LOCATIONS
LEGEND



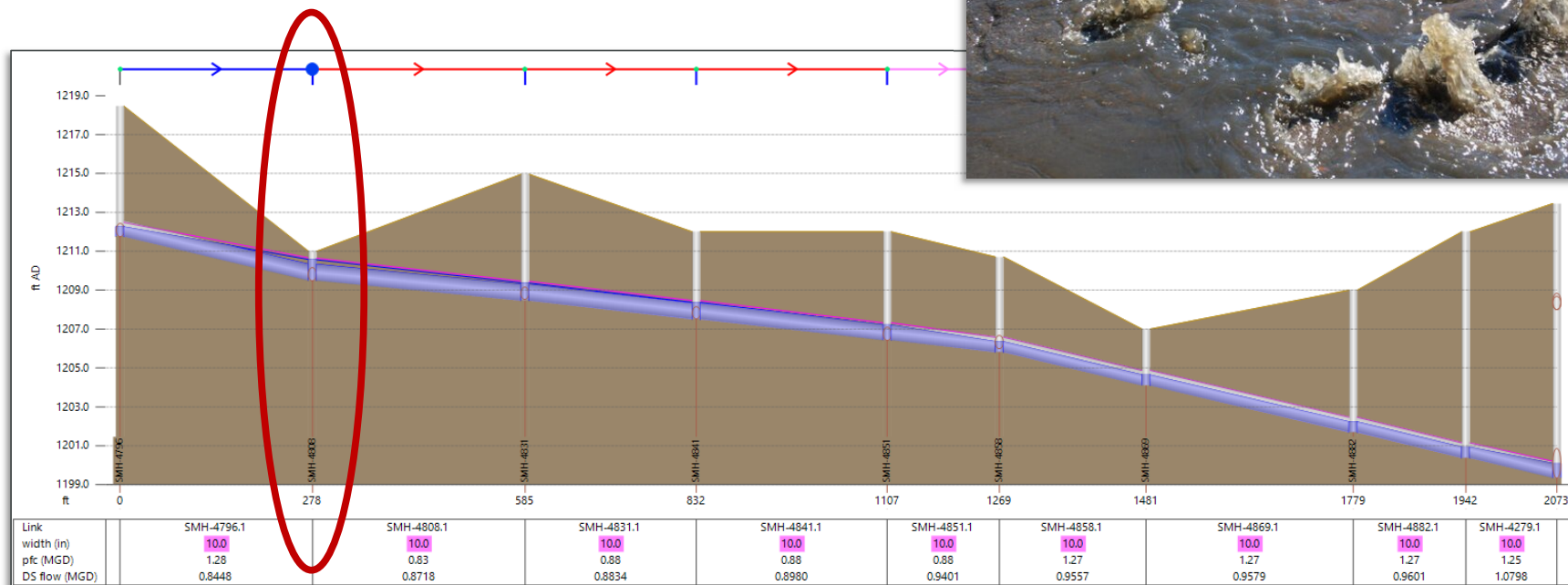
Collection System Analysis

- Existing and Future
- “Model Predicted” Areas of Concern
- Soldier Creek Trunk Sewer
- Lift Stations



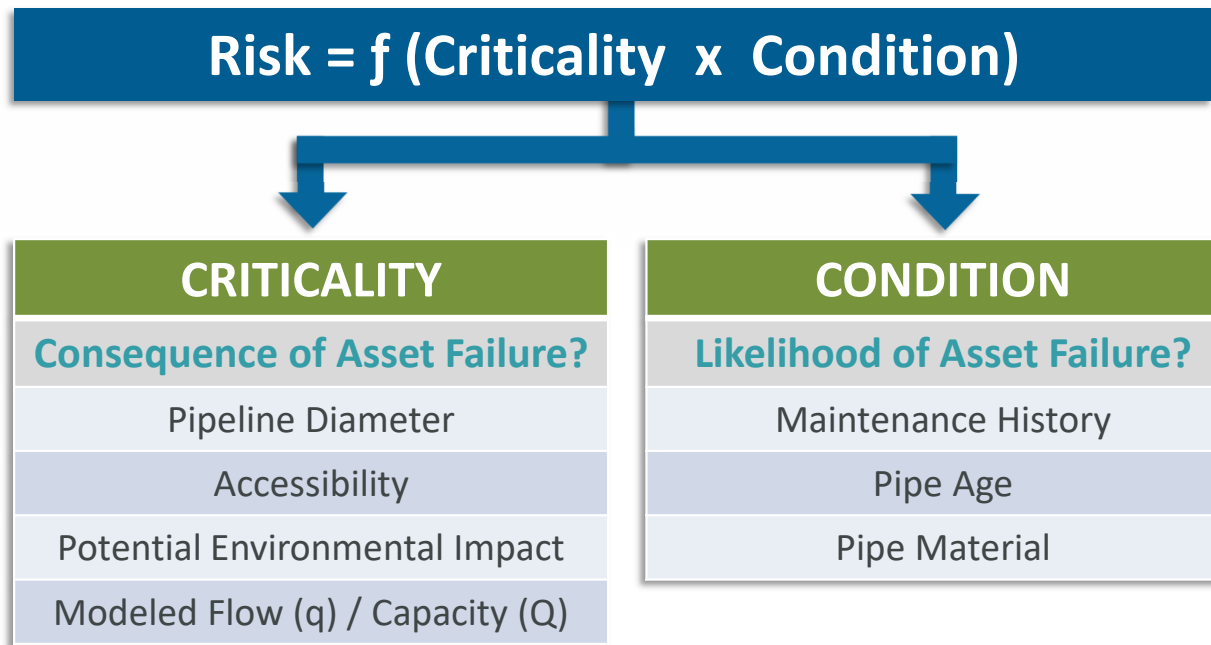
Collection System Analysis

- Identify excessive surcharging
- Model Predicted Overflows

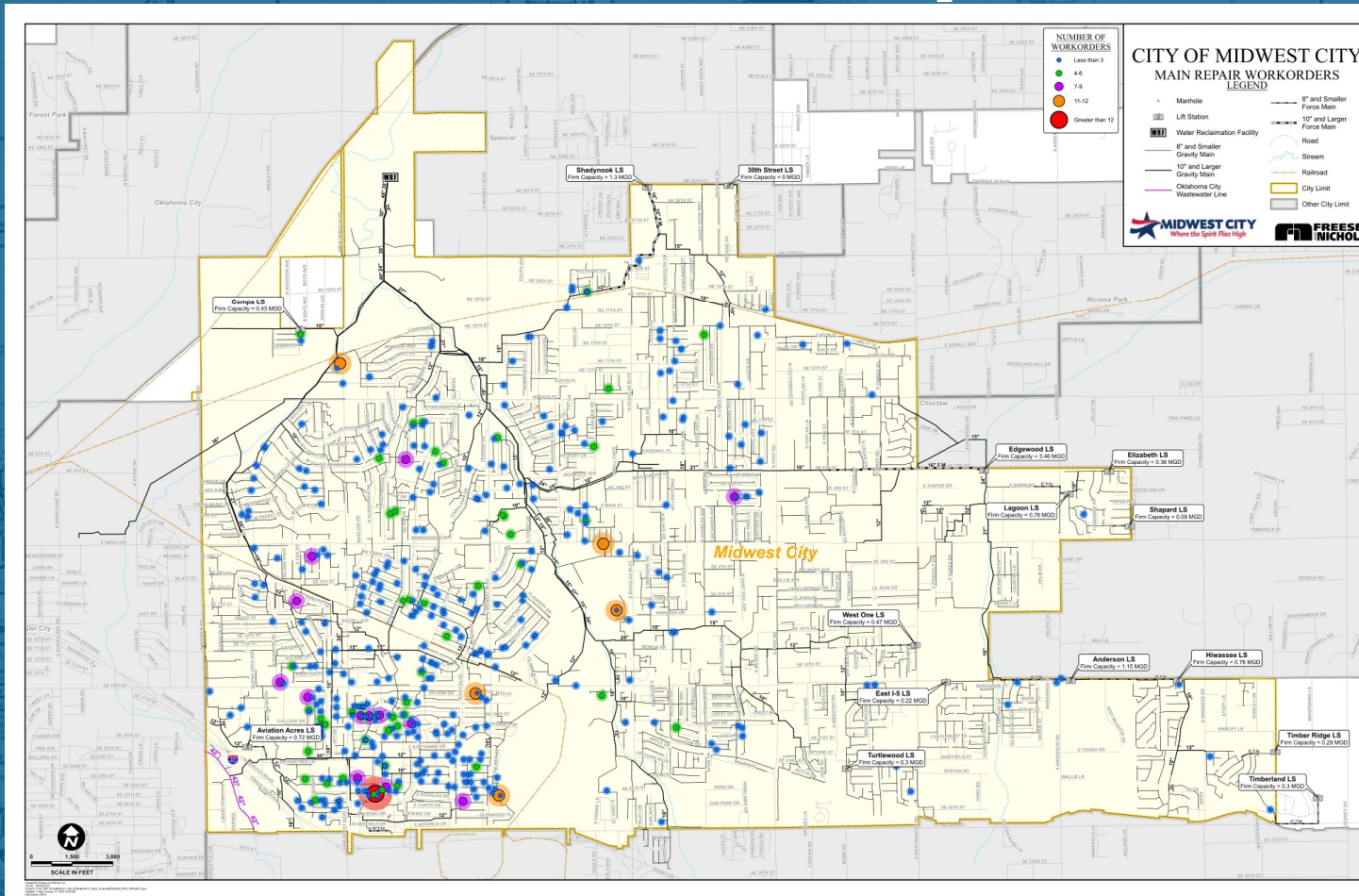


Wastewater Main Risk Assessment

- Determining **Criticality** and **Condition** for wastewater asset risk



Work Orders – Mainline Repair



DRAFT FIGURE

CITY OF MIDWEST CITY

PHASE II FLOW MONITOR LOCATIONS

LEGEND

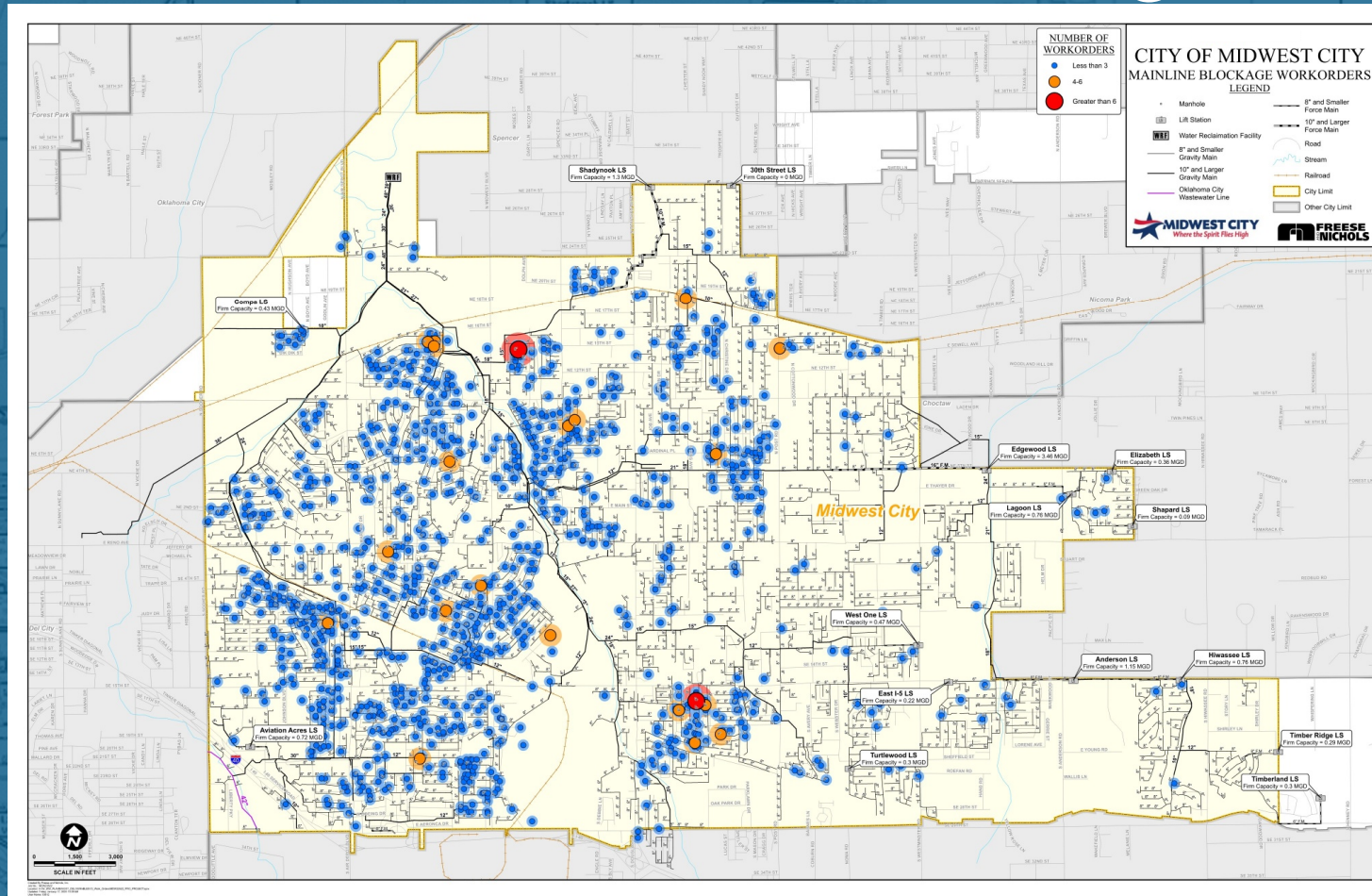


FREESE NICHOLS

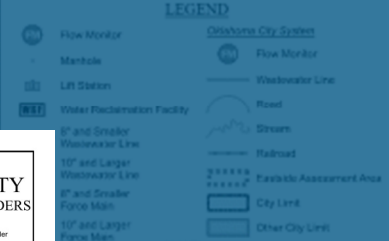
MIDWEST CITY

Where the Spirit Flies High

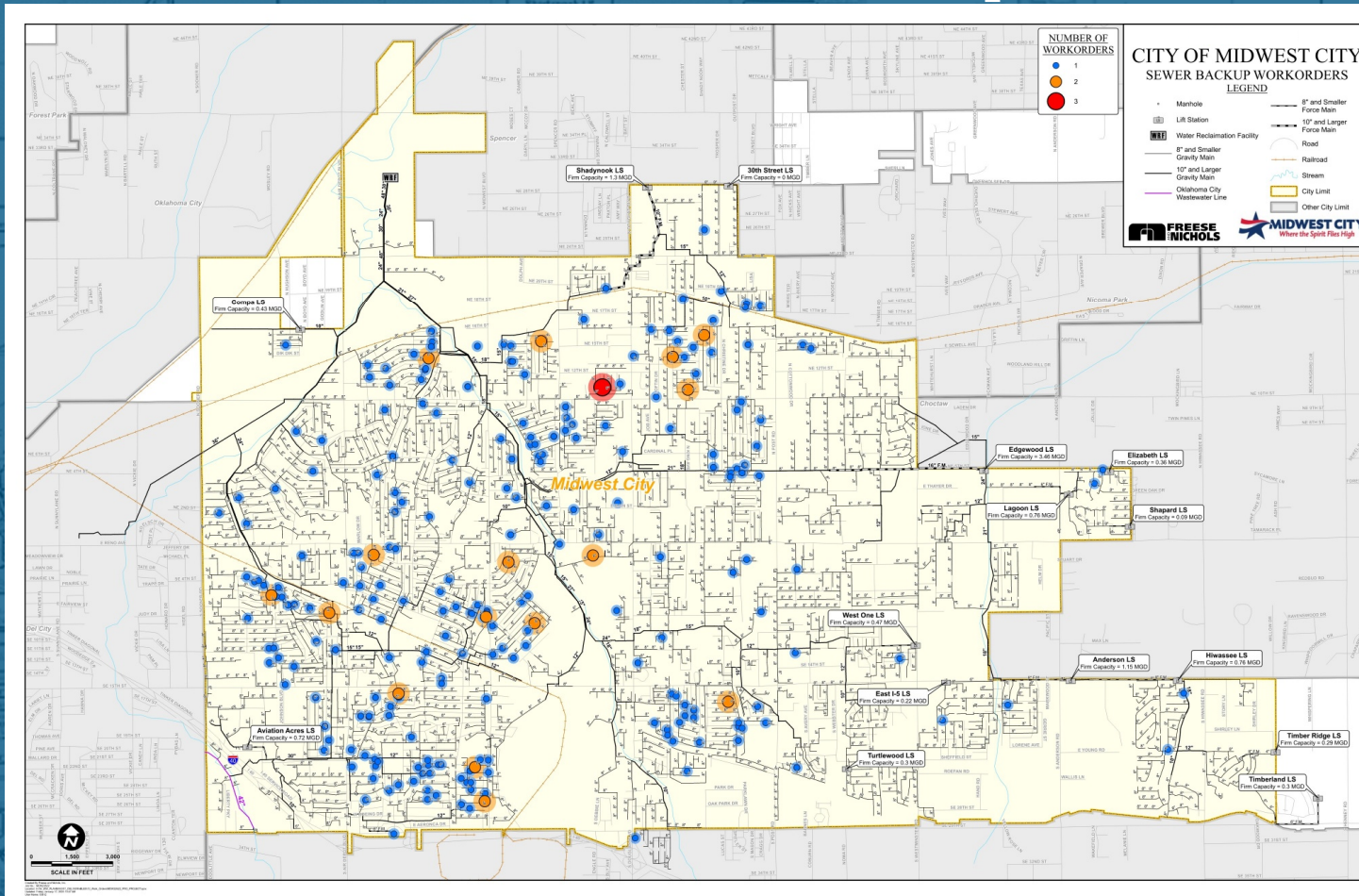
Work Orders – Mainline Blockage



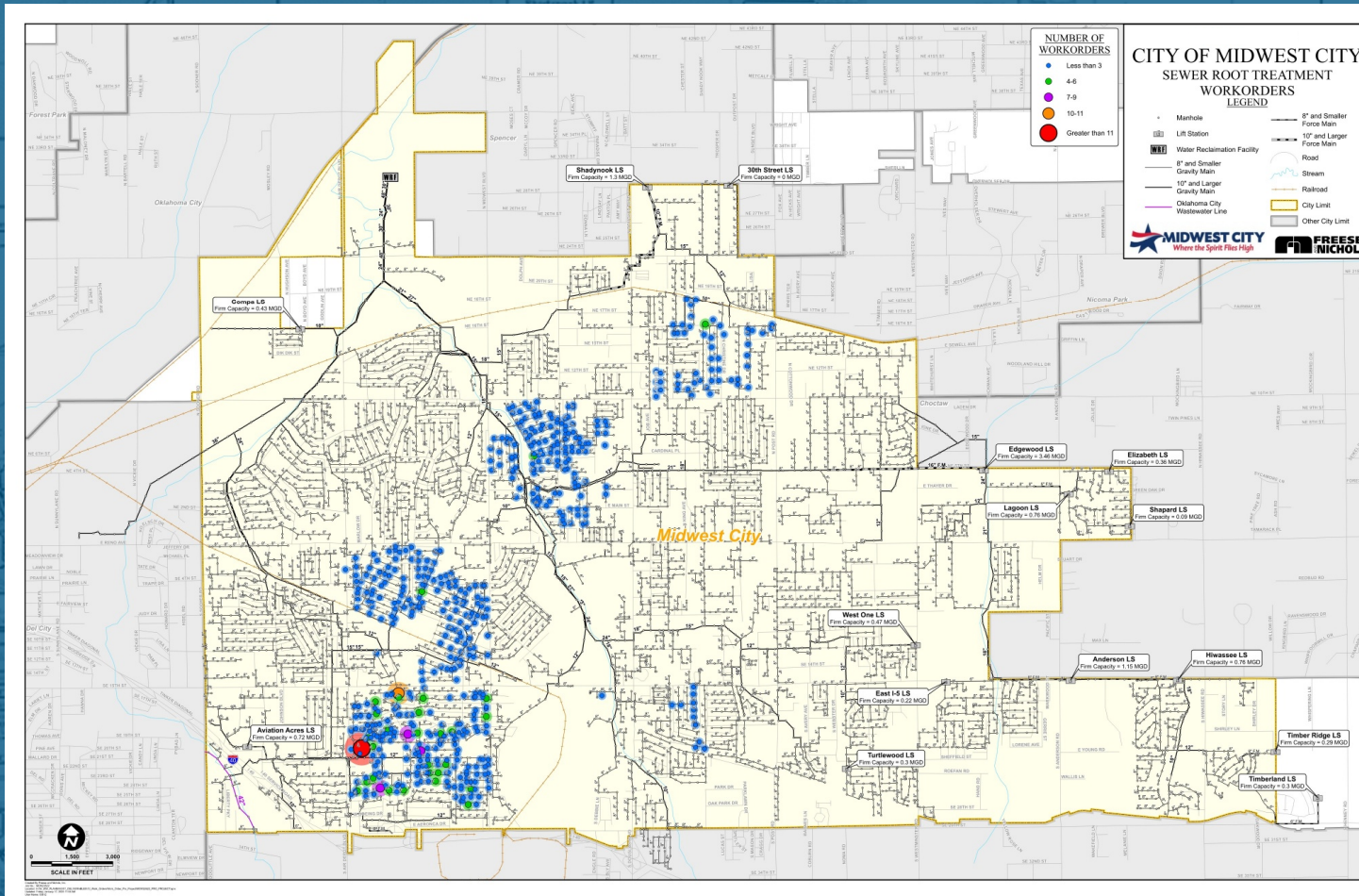
DRAFT FIGURE
CITY OF MIDWEST CITY
PHASE II FLOW MONITOR LOCATIONS



Work Orders – Sewer Backup



Work Orders – Root Treatment



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**CITY OF MIDWEST CITY
PHASE II FLOW MONITOR LOCATIONS
LEGEND**

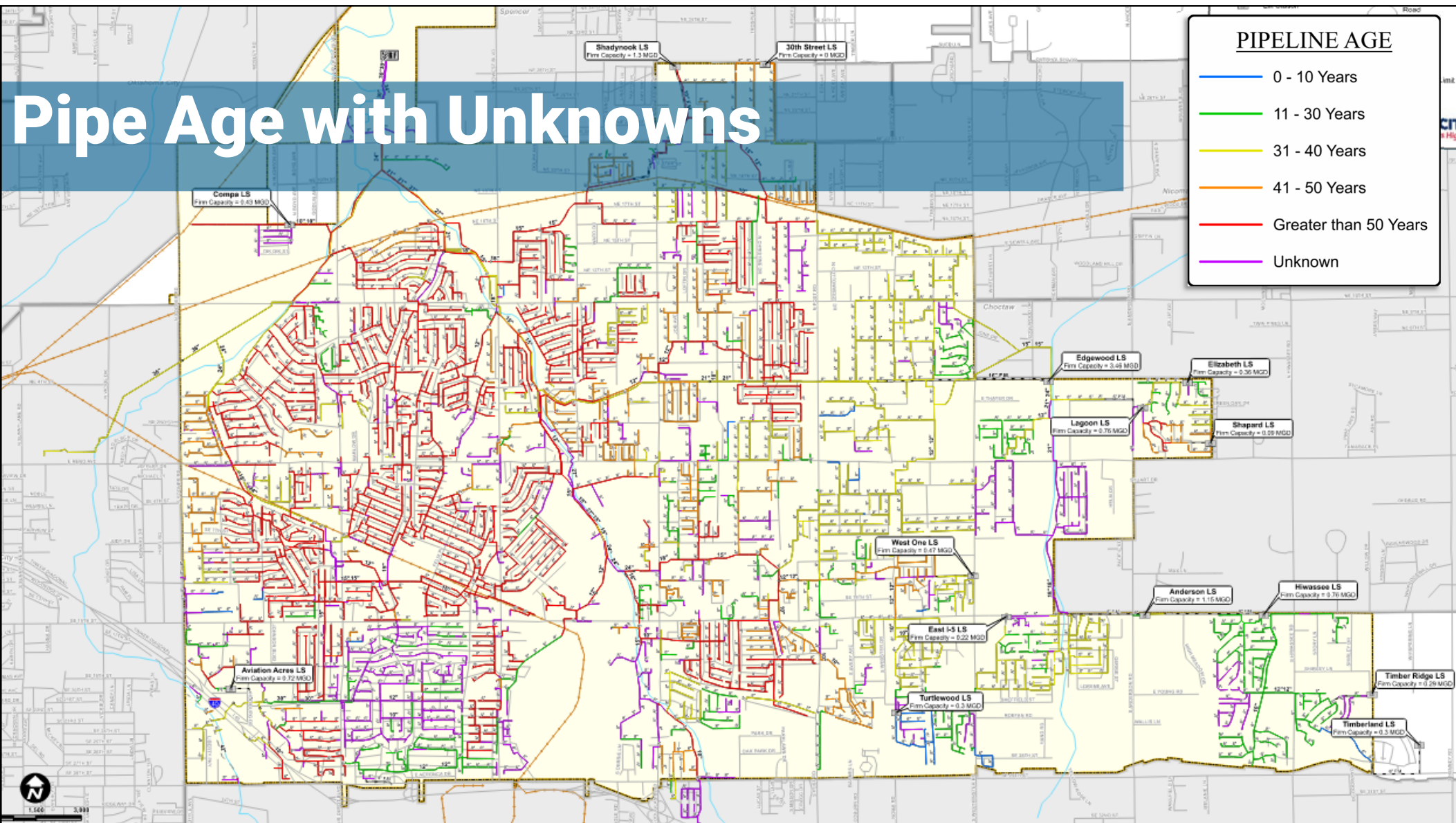


FREESE NICHOLS
Where the Spirit Flies High

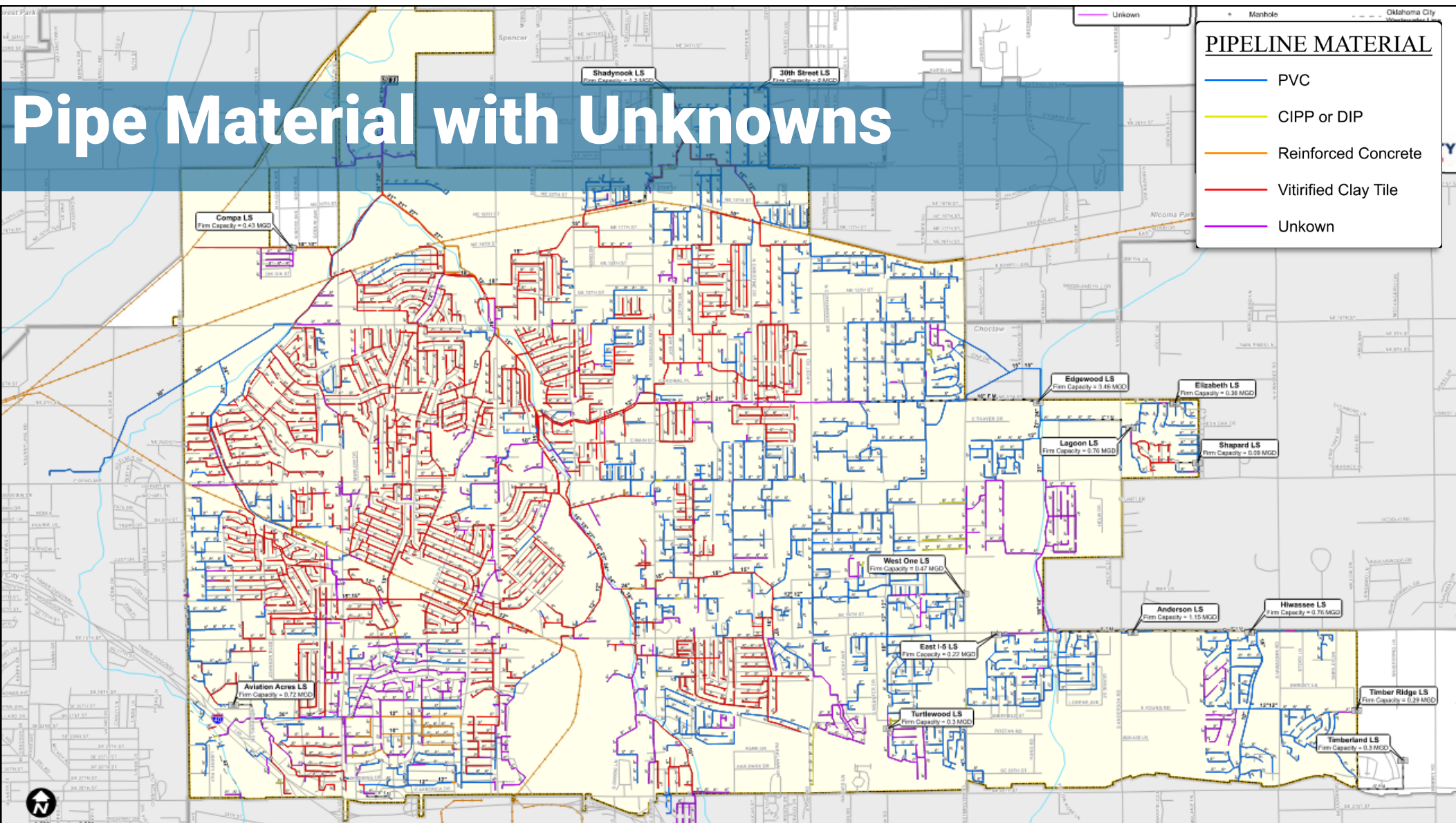
Pipe Age with Unknowns

PIPELINE AGE

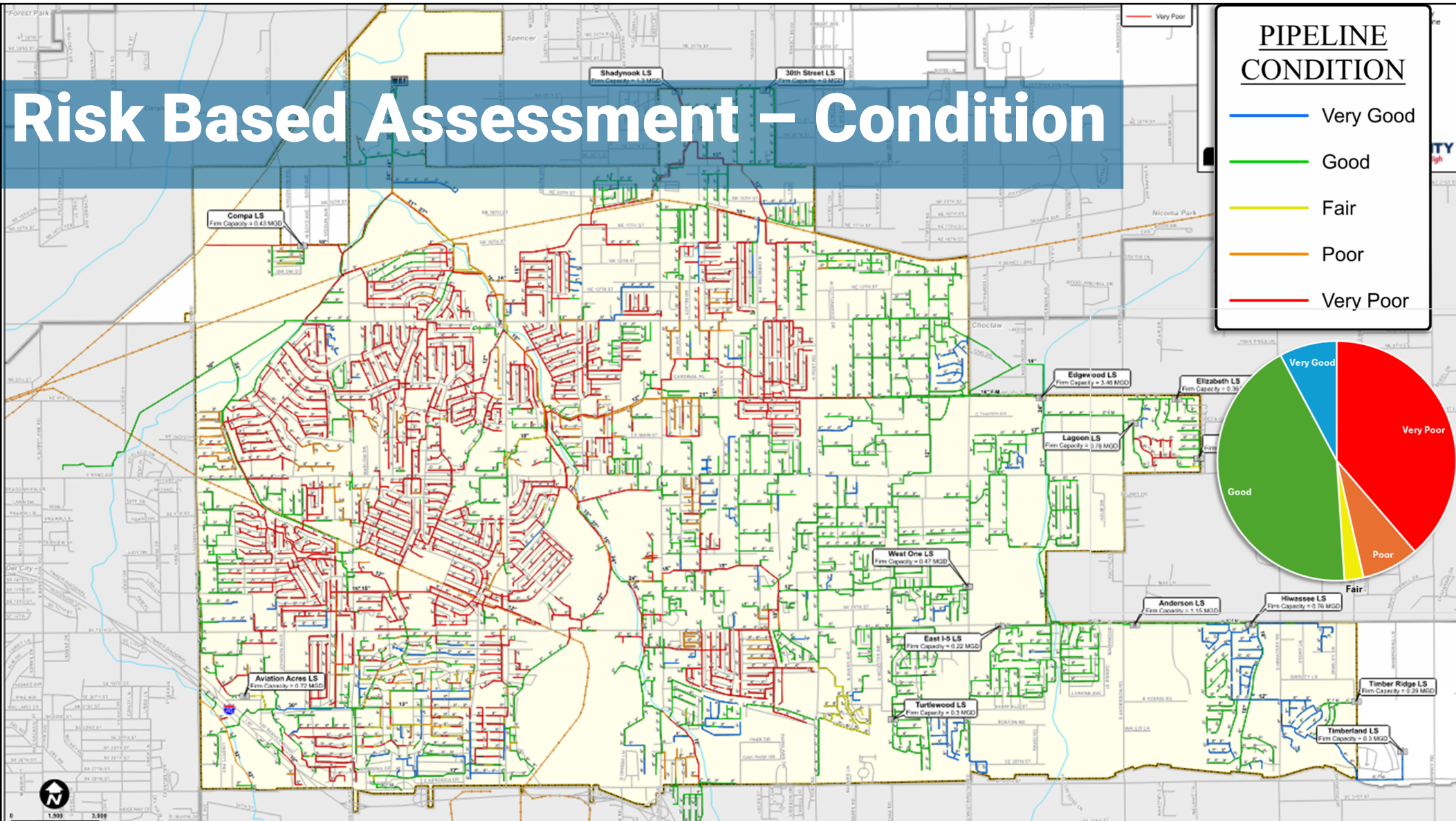
- 0 - 10 Years
- 11 - 30 Years
- 31 - 40 Years
- 41 - 50 Years
- Greater than 50 Years
- Unknown



Pipe Material with Unknowns

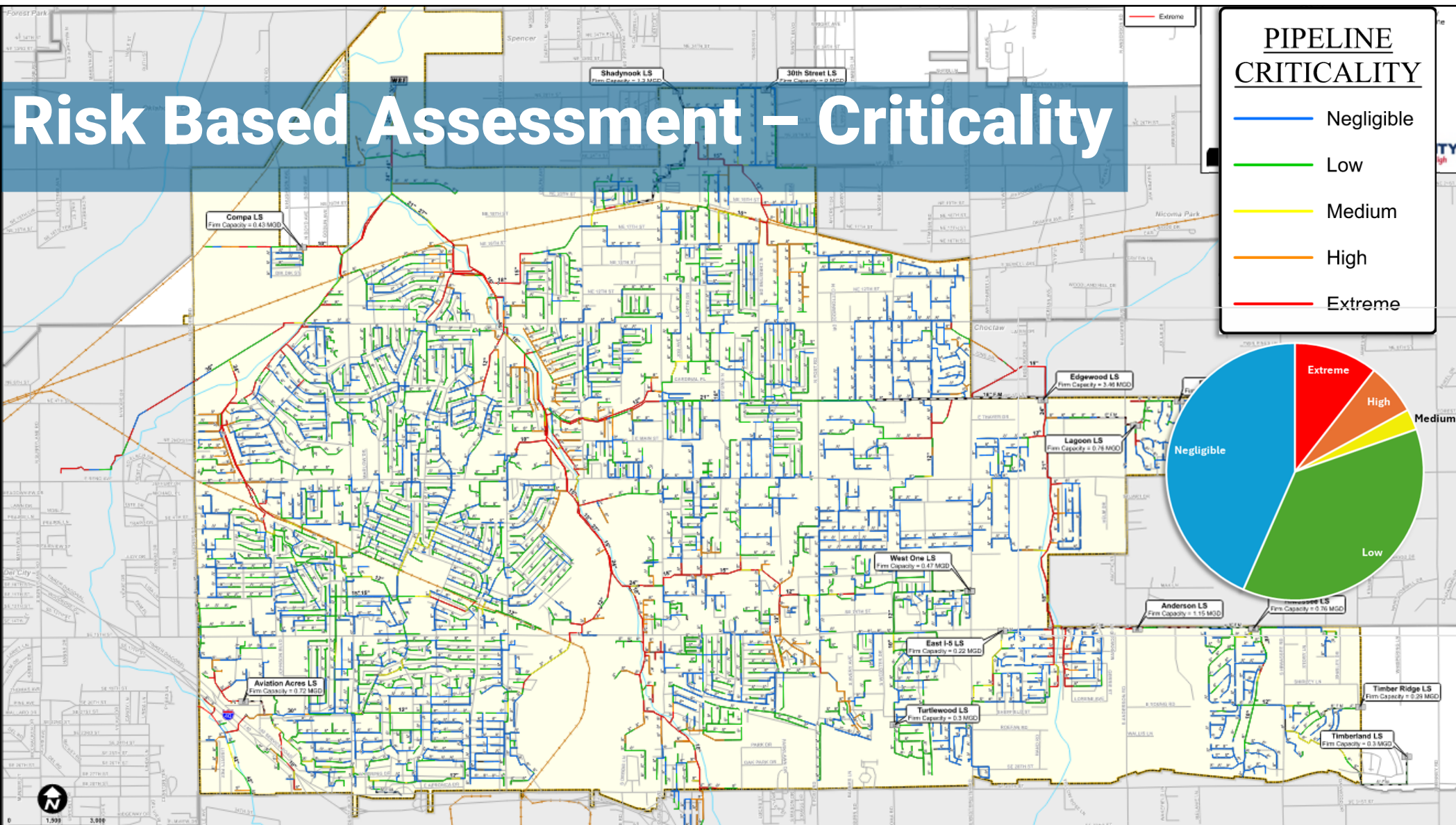
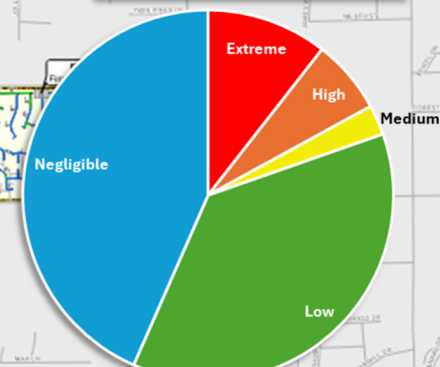
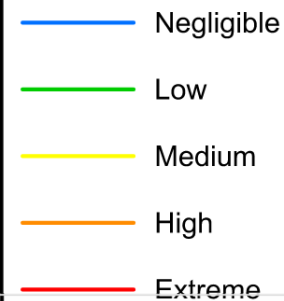


Risk Based Assessment – Condition



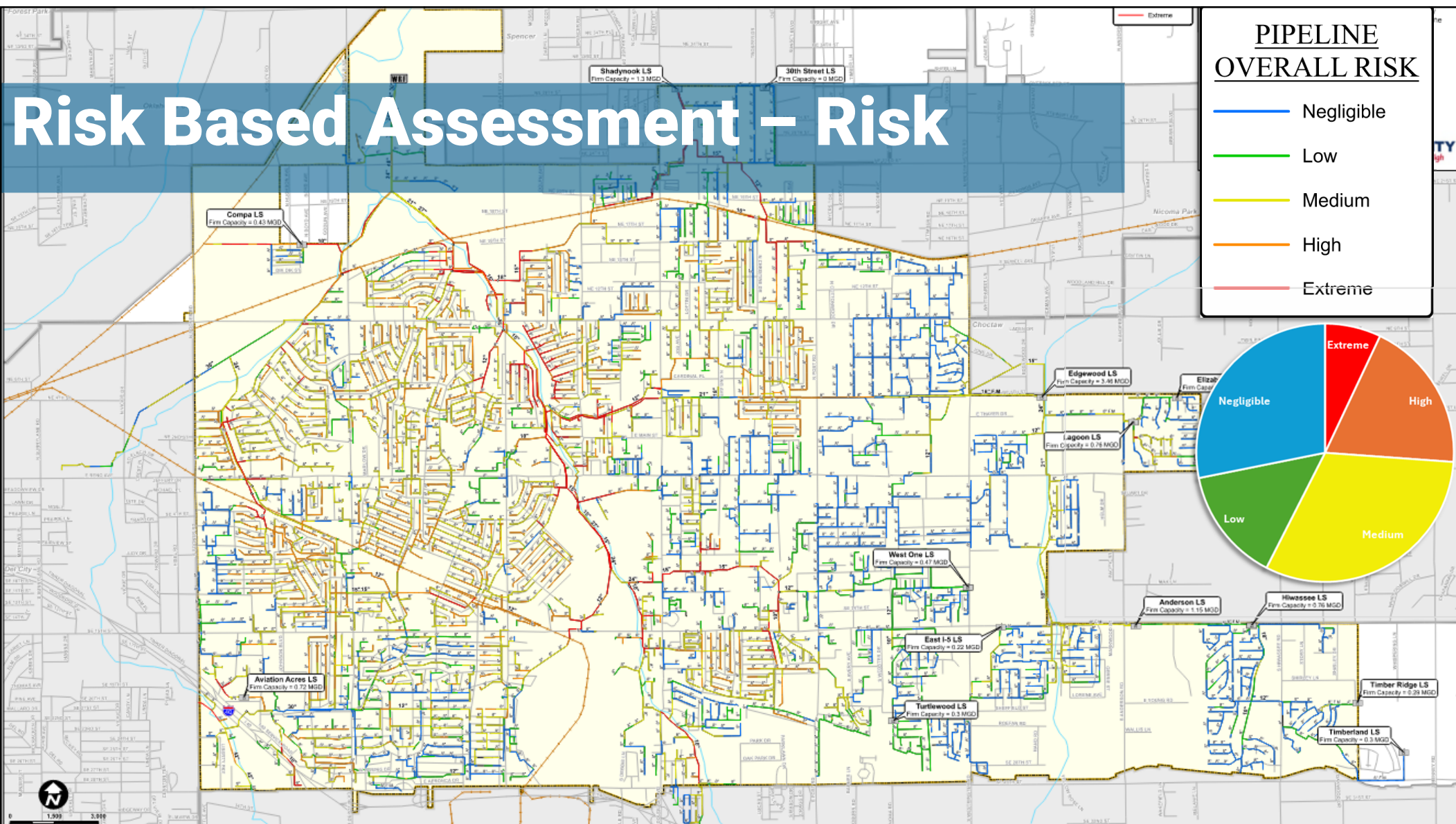
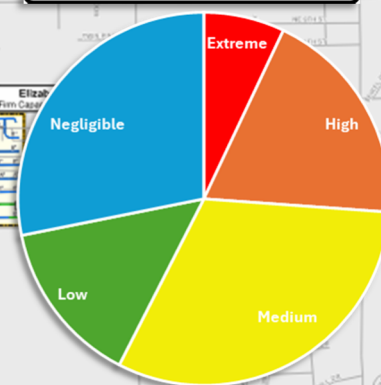
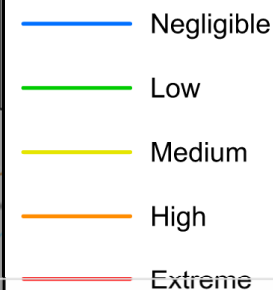
Risk Based Assessment – Criticality

PIPELINE CRITICALITY



Risk Based Assessment – Risk

PIPELINE OVERALL RISK



Lift Station Condition Assessments

- Inspected 15 Lift Stations
- Weighted condition scores for prioritization
- Identified general site recommendations

Inspection Date: December 16, 2024 Address: 201 1/2 Shepard Dr.

Facility Information

Install Year: 1976
 Number of Pumps: 2
 Pump Installation Date: 2010
 Pump Brand: Flygt NP30RS MT1
 Design Point (GPM): 60 GPM @ 52' TDH
 Horsepower: 7
 Calculated Capacity (GPM): 240 GPM @ 45' TDH
 Existing (2025) Peak Flows (GPM): 21
 Future (2044) Peak Flows (GPM): 21
 Effluent (in): 8
 Force Main Diameter (in): 4.0
 Construction Replacement Cost: \$ 157,500.00
 Generator: N/A

Drawdown Testing

Drawdown Testing Capacity (MGD): 0.16

Inspection Scoring Guidelines

1 New condition, no improvements recommended to maintain function
 2 Good condition, minor improvements recommended to maintain performance
 3 Fair condition, improvements recommended to improve performance or efficiency
 4 Poor condition, improvements recommended to maintain reliability
 5 Eminent failure, rehabilitation or replacement required

CONDITION ASSESSMENT

Component Group	Component Condition	Weight Factor	Weighted Component Rating	Comments
Pumps and Motors	1	20%	0.20	Factories were good no signs of corrosion, very mild corrosion on piping in wet well. Pumps appear to be in good condition at time of site visit.
Electrical - MCC, Back-up Power, Cables	2	20%	0.40	Electrical was updated during the rehab in 2010. Electrical is in good condition. The alarm system, including wet well and power failure alarms, remain unchanged.
Instrumentation - SCADA, Alarms, Controls	2	15%	0.30	No flow meters or pressure gauges.
Structure - Hatches, Corrosion, Cracks, Leaking	2	25%	0.50	New wet well in 2010. Pump rails and fasteners in good condition. Pump chains are in not installed.
Piping and Valves	2	10%	0.20	There is no discharge isolation. Gate and Check valves are in good condition.
Manhole/Vault - Access	2	10%	0.20	No HVAC in the enclosed structure.
			0.10	No known issues on site. Site is in residential neighborhood. Passive Ventilation on site. Site location would accommodate large truck access with parking on Shepard Dr.
			.70	

Condition Rating	-	100%	1.70	-
Additional Inspection Notes:				
The 2010 rehabilitation included a new wet well, electrical systems, valves, and other components.				
Debris Notes:				
No fog or debris issues.				
General Recommendations:				
Add Force Main Isolation Valve, Bypass Piping, Pressure Gauge, Flowmeter and Flowmeter Vault.				

Lift Station Condition Assessments

- Assessed Condition of:
 - Pumps and Motors
 - Electrical
 - Instrumentation
 - Structure
 - Piping and Valves
 - Mechanical
 - Site

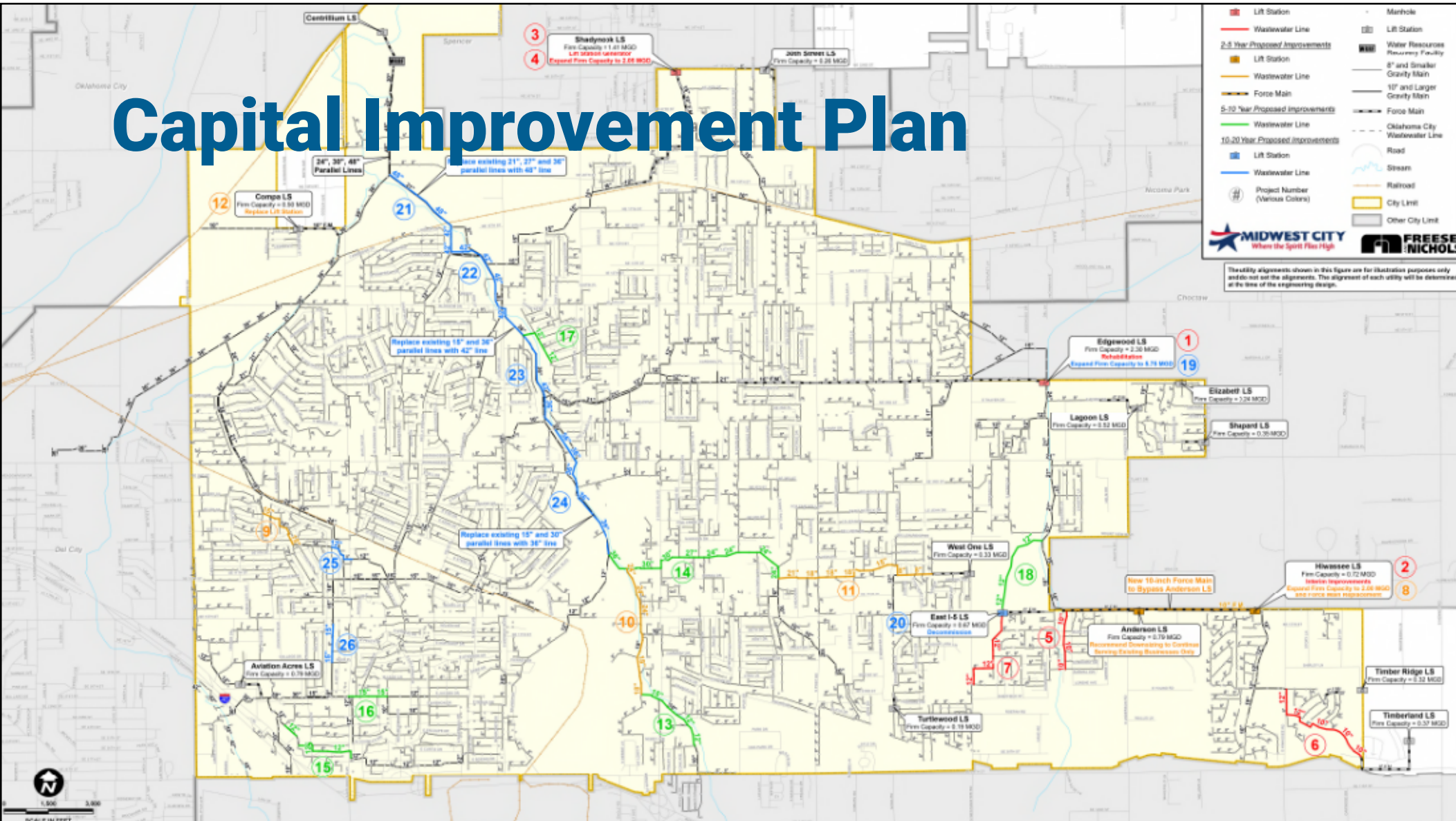


Lift Station Condition Assessments

- Lift Station Risk Matrix

		Condition				
		Very Good	Good	Fair	Poor	Very Poor
Criticality	Negligible Impact	-	-	-	-	-
	Low Impact	-	30 th Street, East 1-5, Shapard	Elizabeth, Timber Ridge, West One	-	Compa
	Medium Impact	-	Timberland, Turtlewood	Anderson, Aviation Acres, Lagoon	-	-
	High Impact	-	-	Hiwassee	Shadynook	-
	Extreme Impact	-	-	-	-	Edgewood

Capital Improvement Plan



Recommendations

- Implement Annual Rehabilitation Program
 - Lift Station Improvements
 - Pipeline Inspection Program
 - Pipe Rehabilitation and Replacement Program
- Complete Capacity Improvement Projects

Cost Summary – 0-5 Years

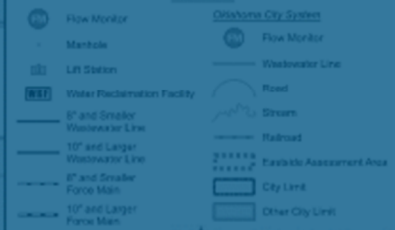
Project Number	Capacity CIP Project Name	Funding Status	Cost
0-2 Year CIP			
1	Rehabilitation of Edgewood Lift Station	Construction Funded	\$ 1,681,900
2	Hiwassee Lift Station Interim Improvements	Design Funded	\$ 2,500,000
3	Shadynook Lift Station Generator	Grant Funded	OEM Grant - No Direct City Cost
4	Expansion and Rehabilitation of Shadynook Lift Station to 2.05 MGD	Design Funded	\$ 1,500,000
5	10-inch Sewer Line along Dorchester Road	Design Funded	\$ 1,121,300
6	10- and 12-inch Sewer Lines along Timber Ridge Boulevard	Design Funded	\$ 2,685,100
7	East 1-5 12-inch Sewer Line	Design Funded	\$ 2,027,300
R1	Annual Wastewater Collection System Improvement Program		\$ 7,000,000
0-2 Year Total			\$ 18,515,600
2-5 Year CIP			
8	New 2.0 MGD Hiwassee Lift Station; 10-inch Force Main		\$ 7,101,300
9	15-inch Sewer Line near Bomber Rail Trail		\$ 1,394,900
10	18-, 21-, and 24-inch Sewer Lines		\$ 6,448,000
11	8-, 15-, 18-, and 21-inch Sewer Lines		\$ 5,262,400
12	Replace Compa Lift Station		\$ 350,000
R2	Annual Wastewater Collection System Improvement Program		\$ 10,150,000
2-5 Year Total			\$ 30,706,600

Cost Summary – 5-20 Years

5-10 Year CIP			
13	12- and 15-inch Sewer Lines		\$ 2,036,200
14	24-, 27-, 30-, and 36-inch Sewer Lines		\$ 7,466,100
15	12-inch Sewer Line along West Curtis Drive		\$ 1,995,900
16	15- and 18-inch Sewer Lines along West Jacobs Drive		\$ 1,269,300
17	12-inch Sewer Line along Soldier Creek Trail		\$ 1,285,700
18	12-inch Sewer Line near Southeast 15th Street		\$ 2,308,300
R3	Annual Wastewater Collection System Improvement Program		\$ 17,500,000
5-10 Year Total			\$ 33,861,500
10-20 Year CIP			
19	New 5.75 MGD Edgewood Lift Station		\$ 12,894,400
20	Decommission East 1-5 Lift Station		\$ 373,800
21	48-inch Sewer Line		\$ 7,451,100
22	Soldier Creek 42-inch Sewer Line Part 1		\$ 10,426,200
23	Soldier Creek 42-inch Sewer Line Part 2		\$ 7,896,600
24	36-inch Sewer Line along Soldier Creek		\$ 12,480,300
25	12-inch Sewer Line near Eddie Drive		\$ 985,300
26	15-inch Sewer Line along Sandra Drive		\$ 1,013,700
R4	Annual Wastewater Collection System Improvement Program		\$ 35,000,000
10-20 Year Total			\$ 88,521,400
Capacity CIP Total			\$ 171,605,100

Questions?

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FREESE NICHOLS **MIDWEST CITY**
Where the Spirit Flies High

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Thank you

