

Plano

City of Excellence

Dirty Data: Assessing Sewer Main Conditions

ABBY OWENS

*PW Strategic Planning &
Compliance Manager, City of Plano*

STEPHEN JOHNSON, PE

Project Manager, Freese & Nichols

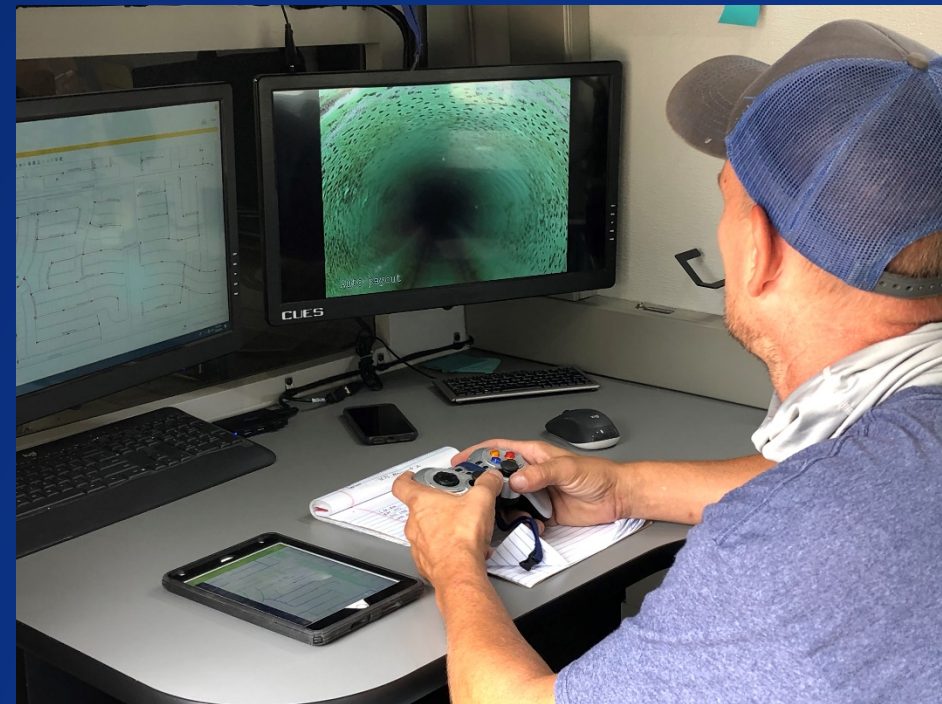
About the City of Excellence

- 72 square miles
- Population of 285,000
- Maintain over \$2 billion of infrastructure
 - 607,000 assets (40 types)
 - 1,800 miles of streets/alleys (3,000 lane miles)
 - **1,000 miles sanitary sewer mains**
 - 1,500 miles water mains
 - 860 miles of storm mains
- CMOM Plan adopted in 2017



The Problem:

Too Many Data Sources and No Plan



Data Sources



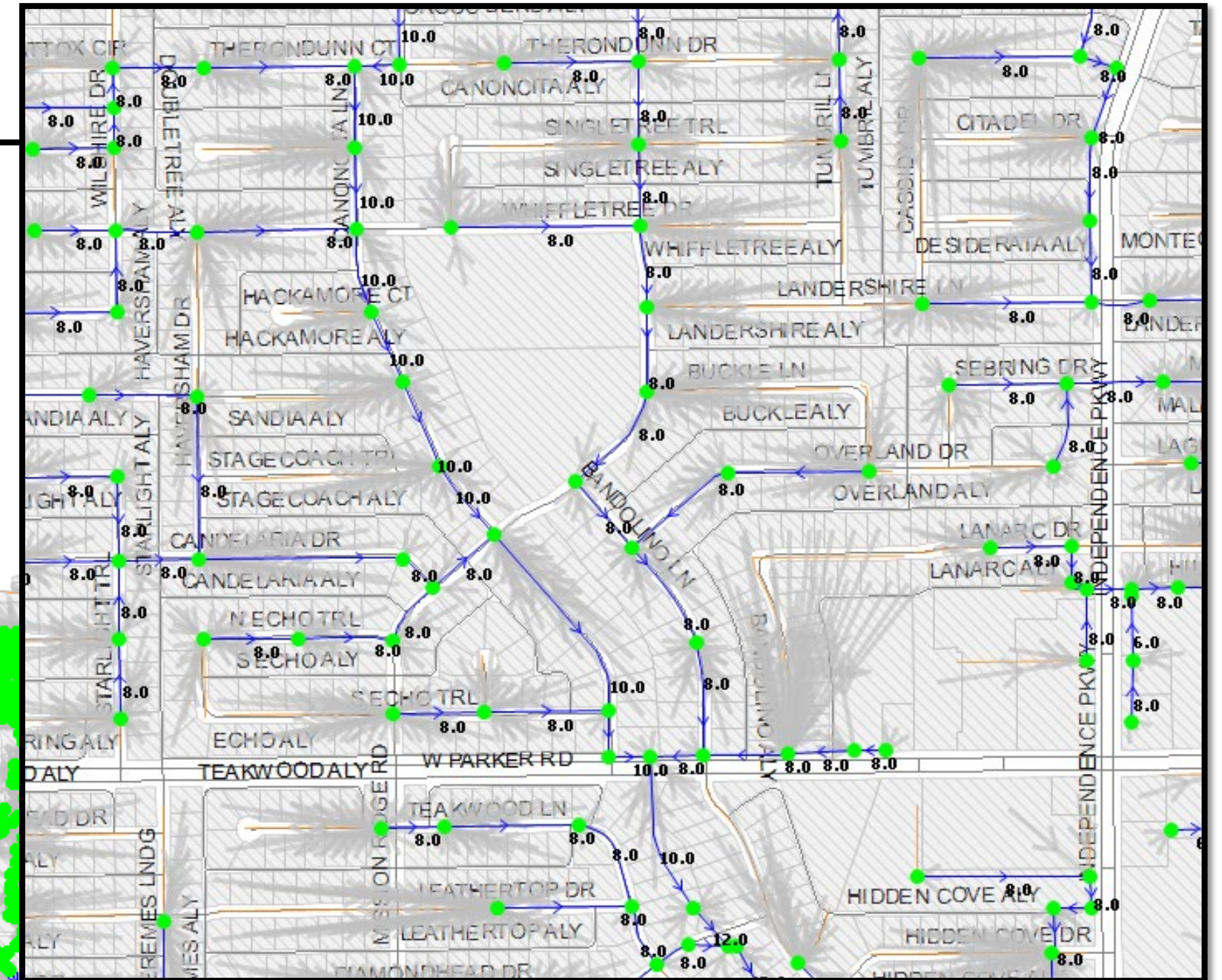
The Cleanup: **Freese & Nichols to the Rescue**

Wastewater Master Plan

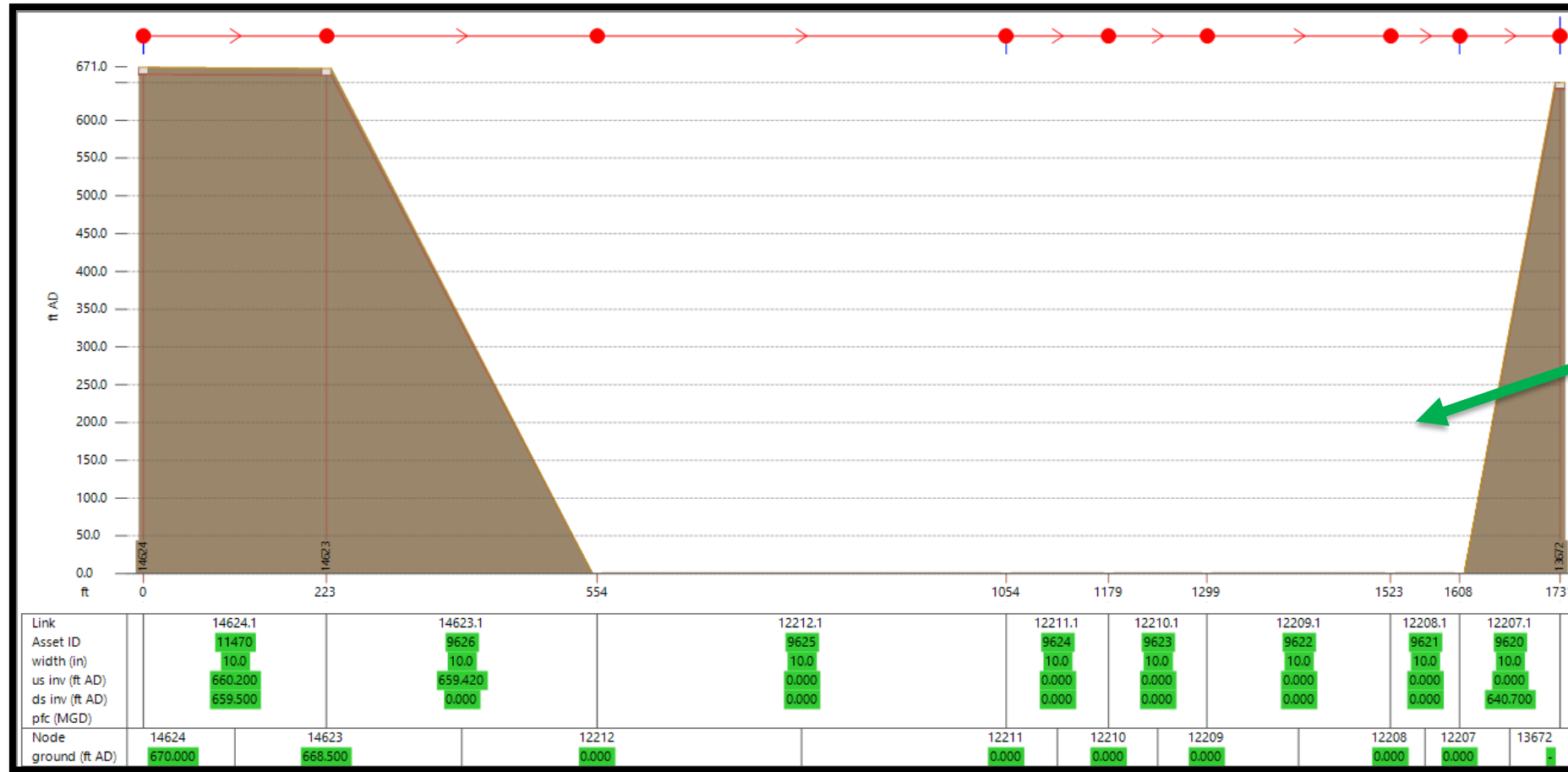
- Flow Monitoring & I/I Characterization
- Population & Wastewater Flow Projections
- Wastewater Model Development & Calibration
- Wastewater System Performance Analysis
- **Wastewater Collection System Renewal Planning**
- Community Investment Program and WW Modeling Services Report



Hydraulic Model Development and Analysis

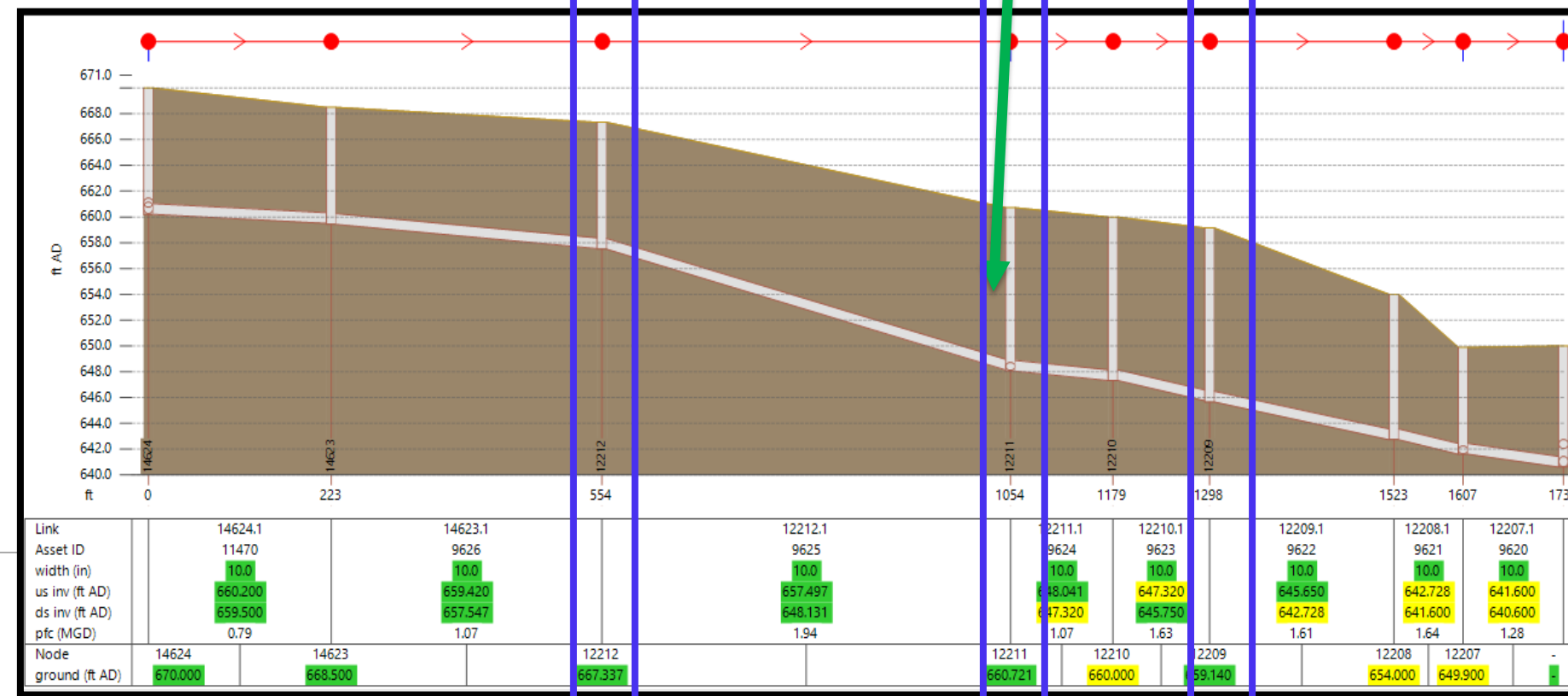


Attribute Review/ Update

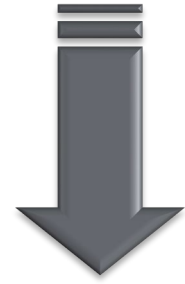


Missing GIS Data Corrections

Fields survey data



Risk = f (Criticality **x**



**What is the Consequence
of Asset Failure?**

- Environmental Considerations
- Access Issues
- Customers Served

Condition)



**What is the Likelihood
of Asset Failure?**

- Inspection Data
- OR -
- Asset Age
- Asset Material
- OR -
- Rehab Age
- Rehab Material



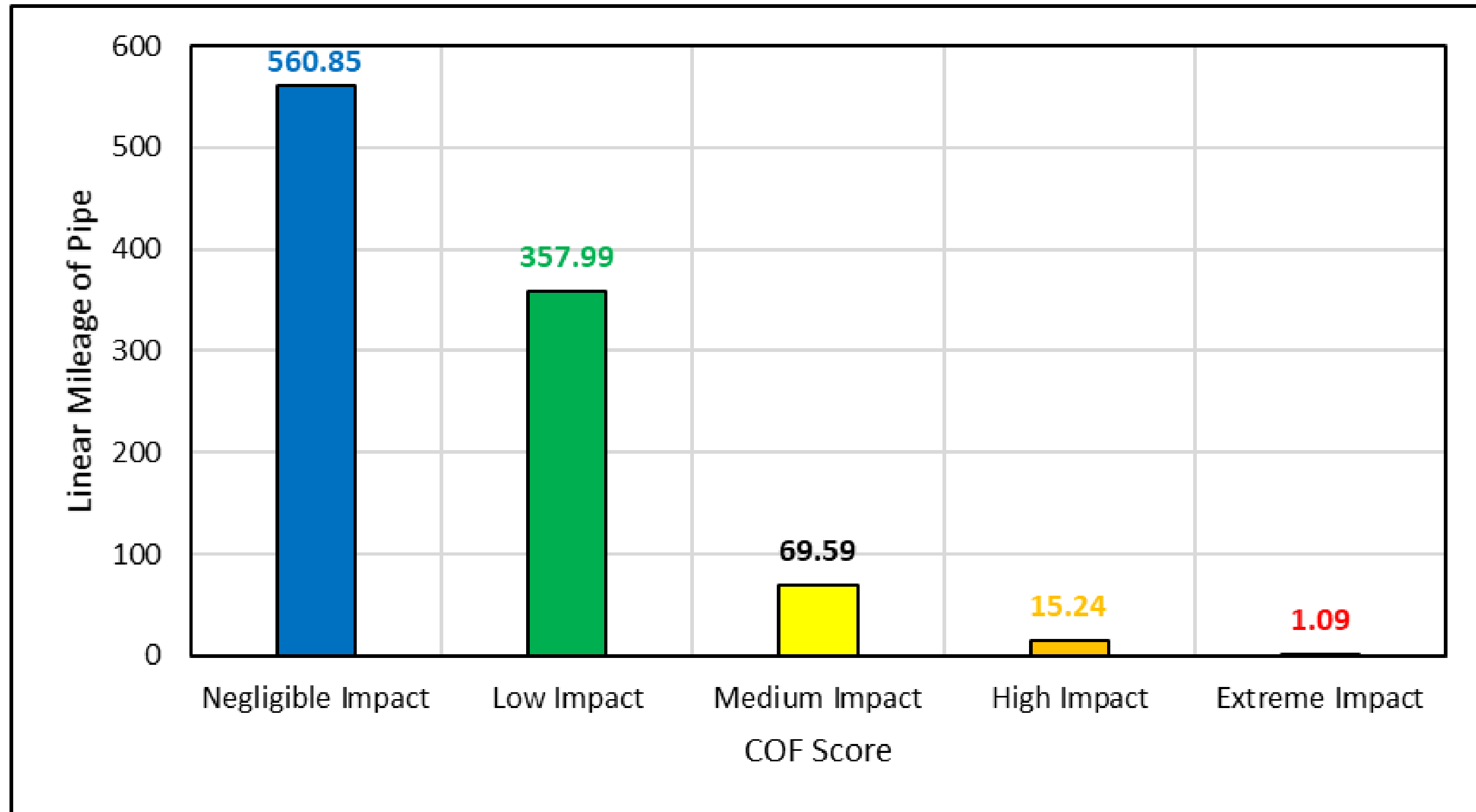
Criticality Methodology

- Access Issues
- Environmental Concerns
- Customers Served

Weighting	Parameter	Criteria	Score
30%	Access Issues	River / Stream / Railroad	10
		Interstate / State Highway	7
		Golf Course	5
		Major Collector / Arterial Road	3
		Alleyways	2
		No Crossing	1
20%	Customers Served	Greater than 30-inches	10
		30-inches	8
		24-27-inches	6
		15-21-inches	4
		Less than 15-inches	1
20%	Environmental Concerns	Within 500 ft of water body	10
		Within FEMA 100-year floodplain	8
		Within Open Space	5
		Within Parks	2
		None	1
20%	Critical Customers	Hospitals, Police, Fire Stations	5
		Schools, City Hall	4
		Major Development	3
10%	q/Q	Greater than 1.0	10
		0.9 - 1.0	8
		0.75 - 0.9	6
		0.5 - 0.75	3
		Less than 0.5	1



Criticality Results



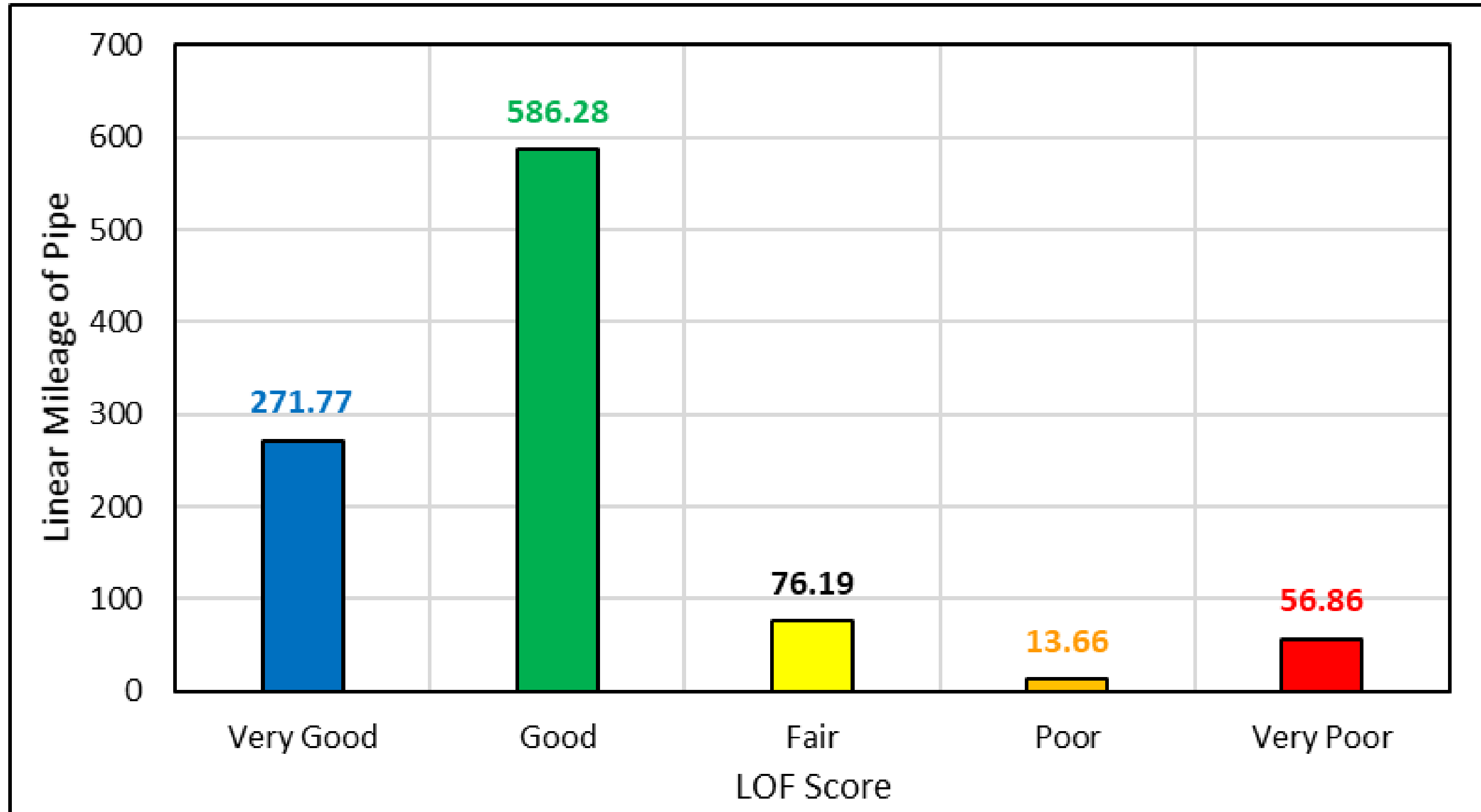
Condition Methodology

- Pipe Material
 - Pipe Age
- OR-
- Rehab Material
 - Rehab Age
- OR-
- PACP Inspection Results

	Weighting	Parameter	Criteria	Score
Desktop Scoring: No CCTV/MSI Data Available	50%	Material	Vitrified Clay	10
			Cast Iron, Ductile Iron	8
			Unknown	8
			RCCP, RCP	5
			HOBAS, HDPE, Steel, ABS, CIPP, PVC, UR	1
	50%	Age	Older than 50 years	10
			41 – 50 years	8
			Unknown	8
			31 – 40 years	6
			21 – 30 years	4
			0 – 20 years	2
	50%	Rehab Material	Vitrified Clay	10
			Unknown	8
			HDPE	3
			CIPP, PVC	1
	50%	Rehab Age	Older than 25 years	10
			21 - 25 years	8
			Unknown	8
16 - 20 years			6	
11 - 15 years			4	
0 - 10 years			2	
Inspection Scoring: Supersedes Desktop Scoring	100%	PACP Inspection Results	PACP Score 5	10
			PACP Score 4	8
			PACP Score 3	6
			PACP Score 2	4
			PACP Score 1	2

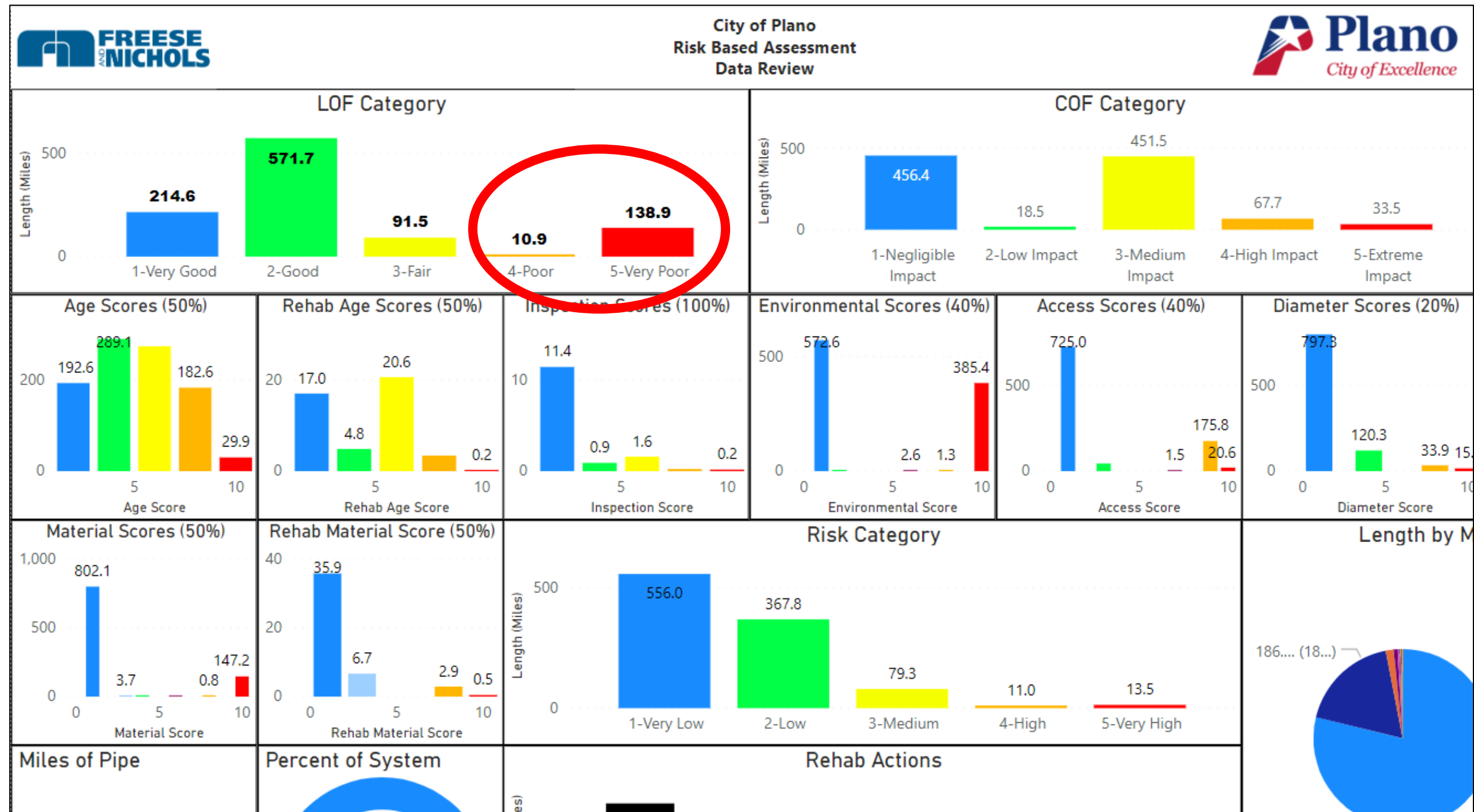


Condition Results



First RBA Data Review

- Why do we have so many poor condition pipes???



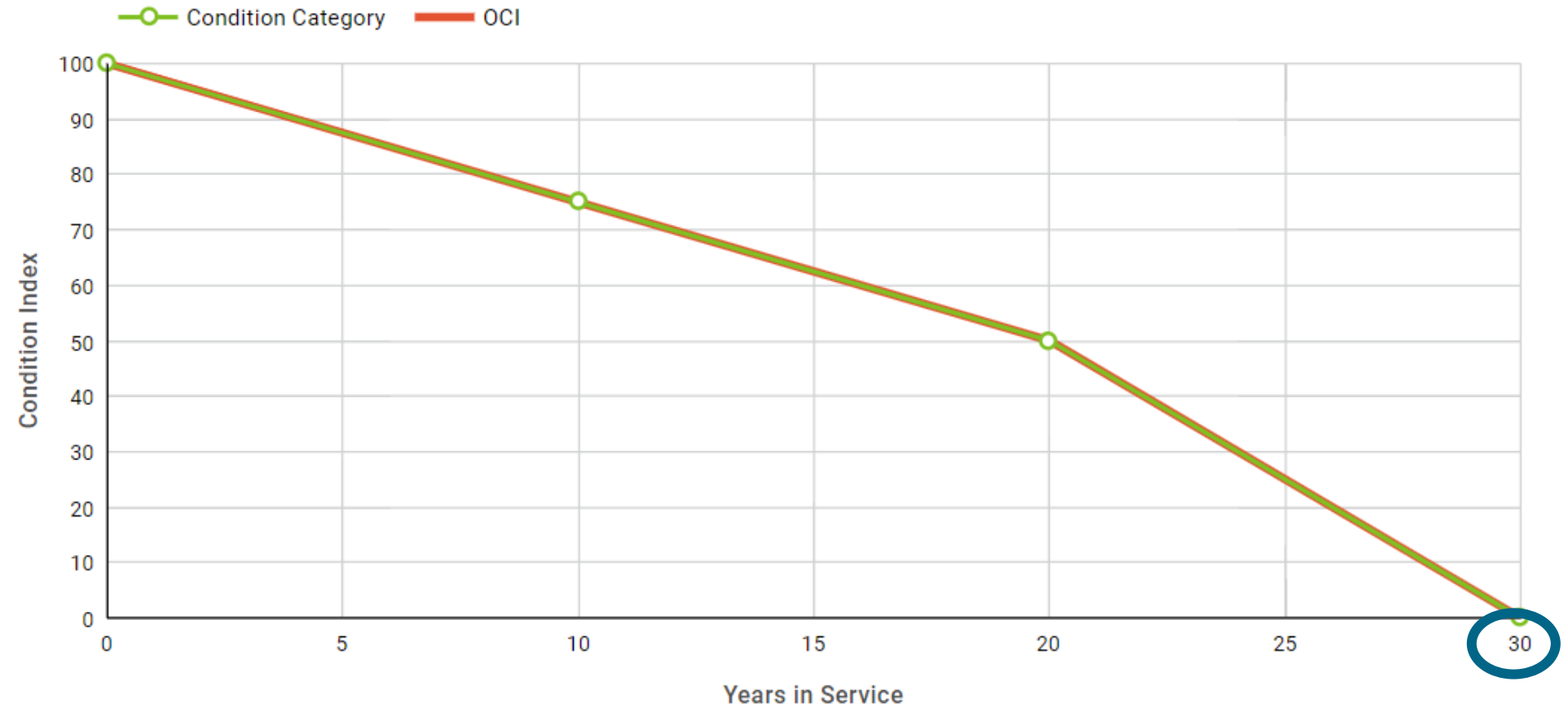
Cartegraph:

The Magic Behind the Scenes

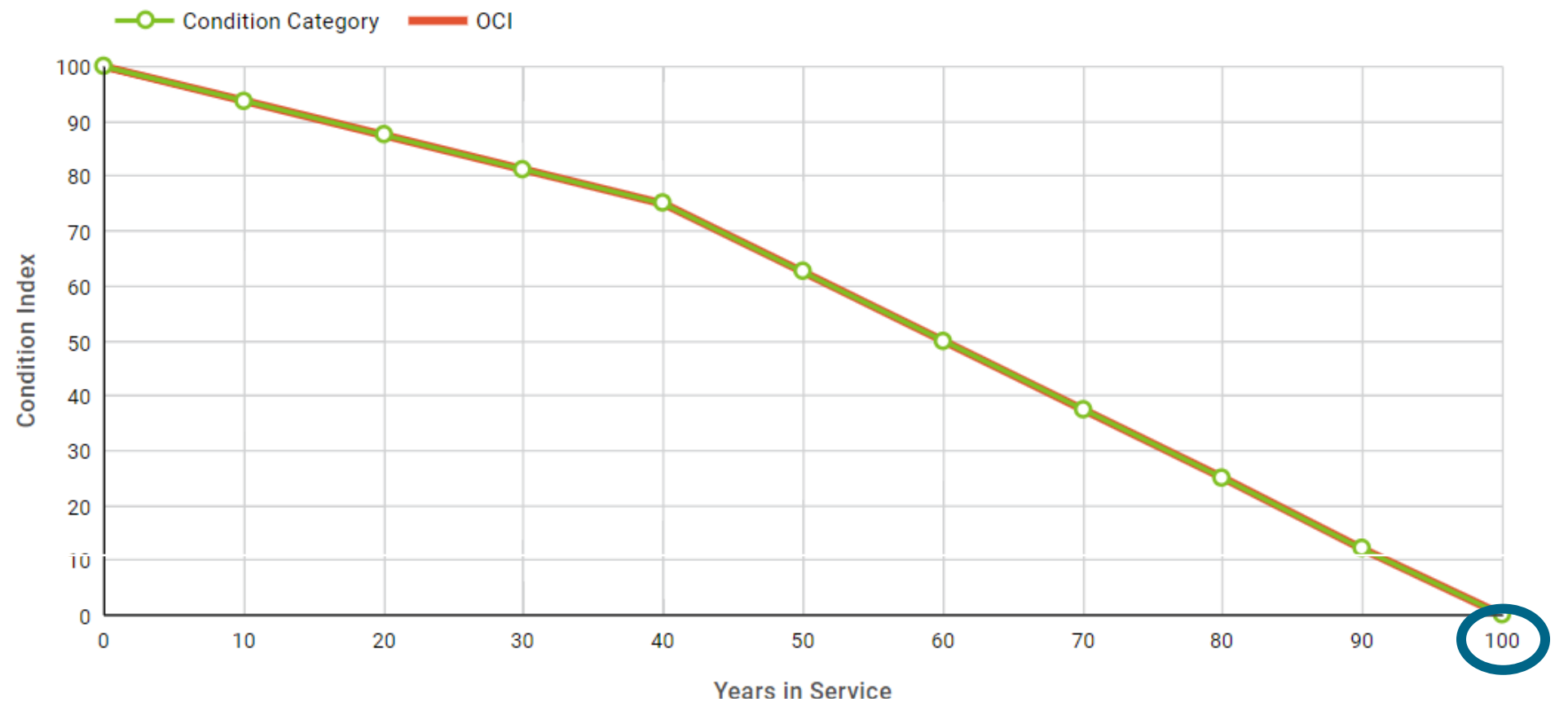
Cartegraph OCI

- Criticality Imported
- Deterioration Curves – material type & age
- Import PACP Structural Ratings Index as Inspection Condition Category
- Impact Tasks
 - Reline = Replacement Date

Expected Performance

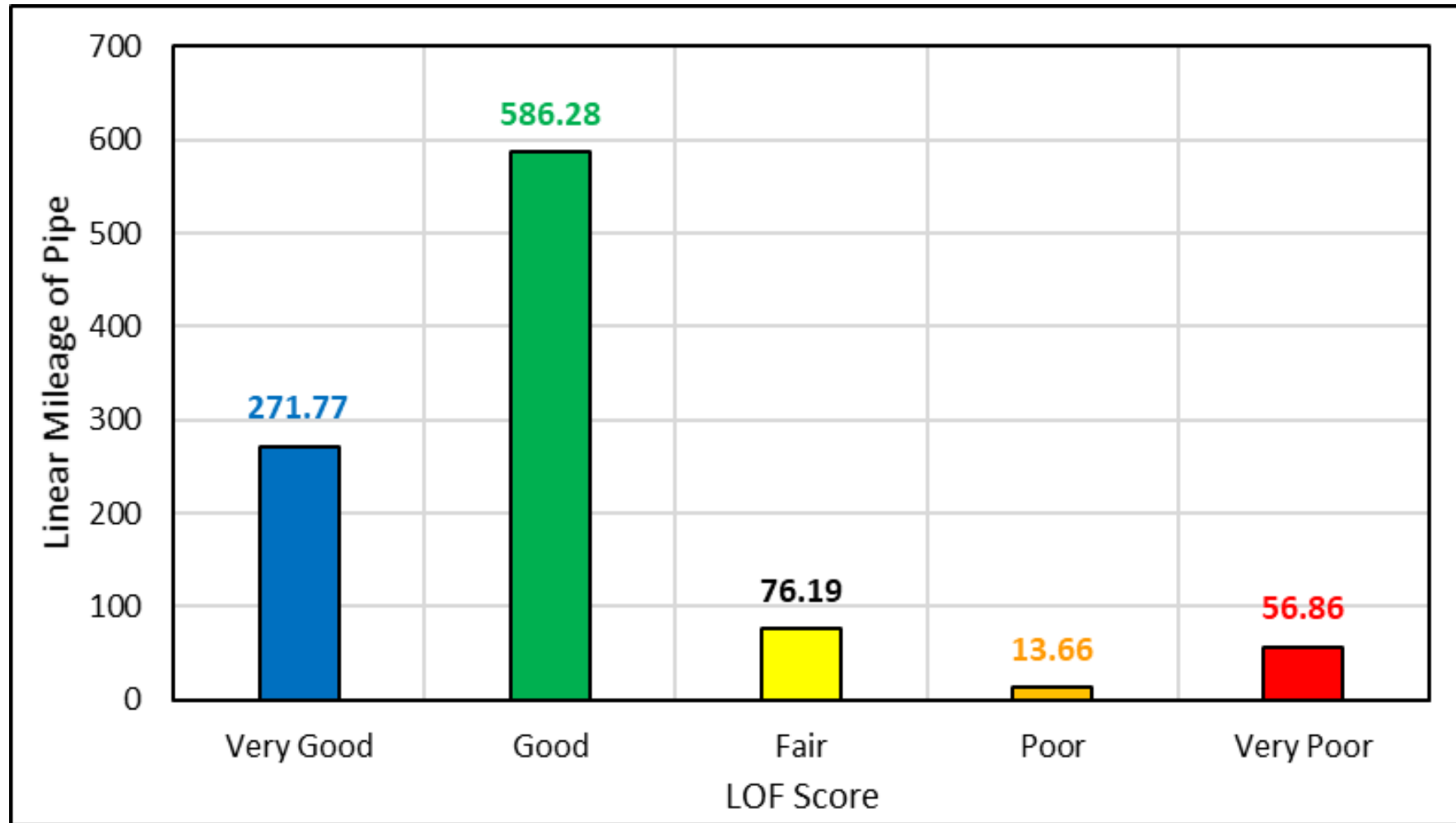


Expected Performance

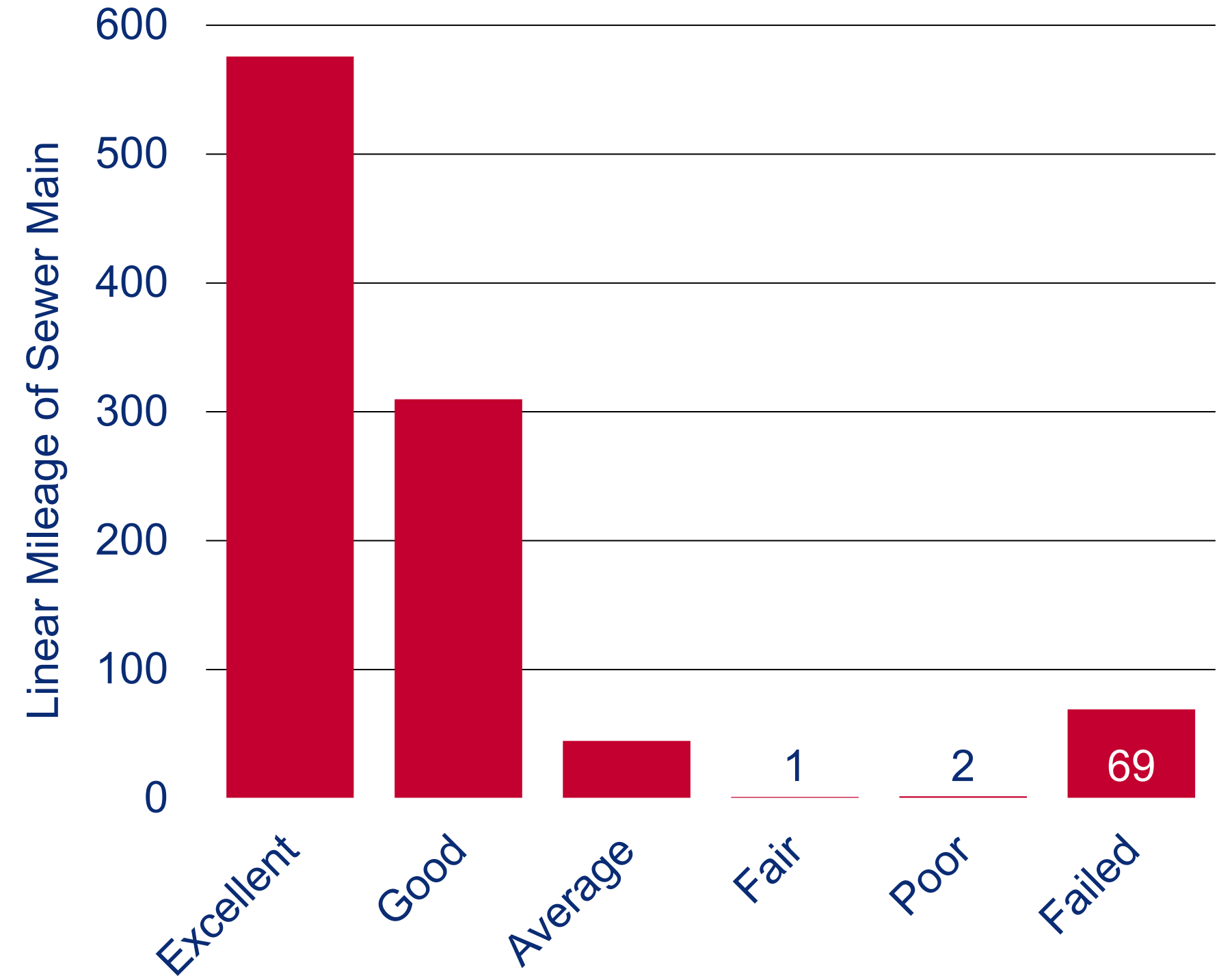


How did we do?

Sewer Master Plan Modeling

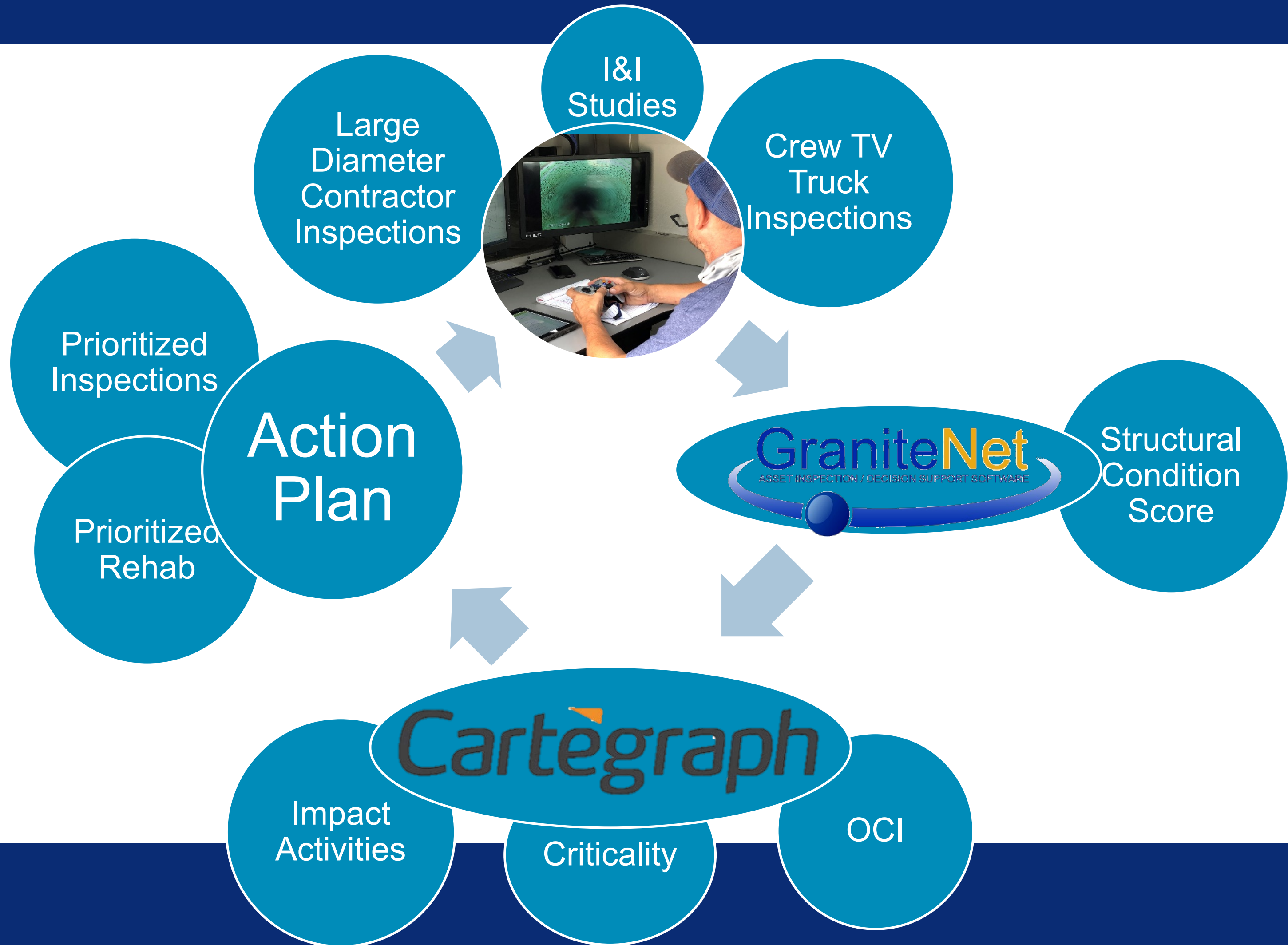


Cartegraph Condition Manager



Next Steps:

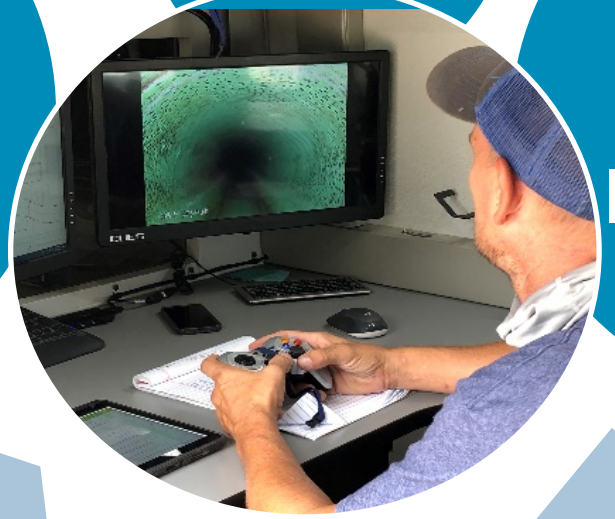
A Plan of Action



I&I Studies

Large Diameter Contractor Inspections

Crew TV Truck Inspections



Prioritized Inspections

Prioritized Rehab

Action Plan

GraniteNet
ASSET INSPECTION & DECISION SUPPORT SOFTWARE

Structural Condition Score

Cartegraph

Impact Activities

Criticality

OCI

Next stop for dirty movies...

- **Large Diameter
Poor/Failed**

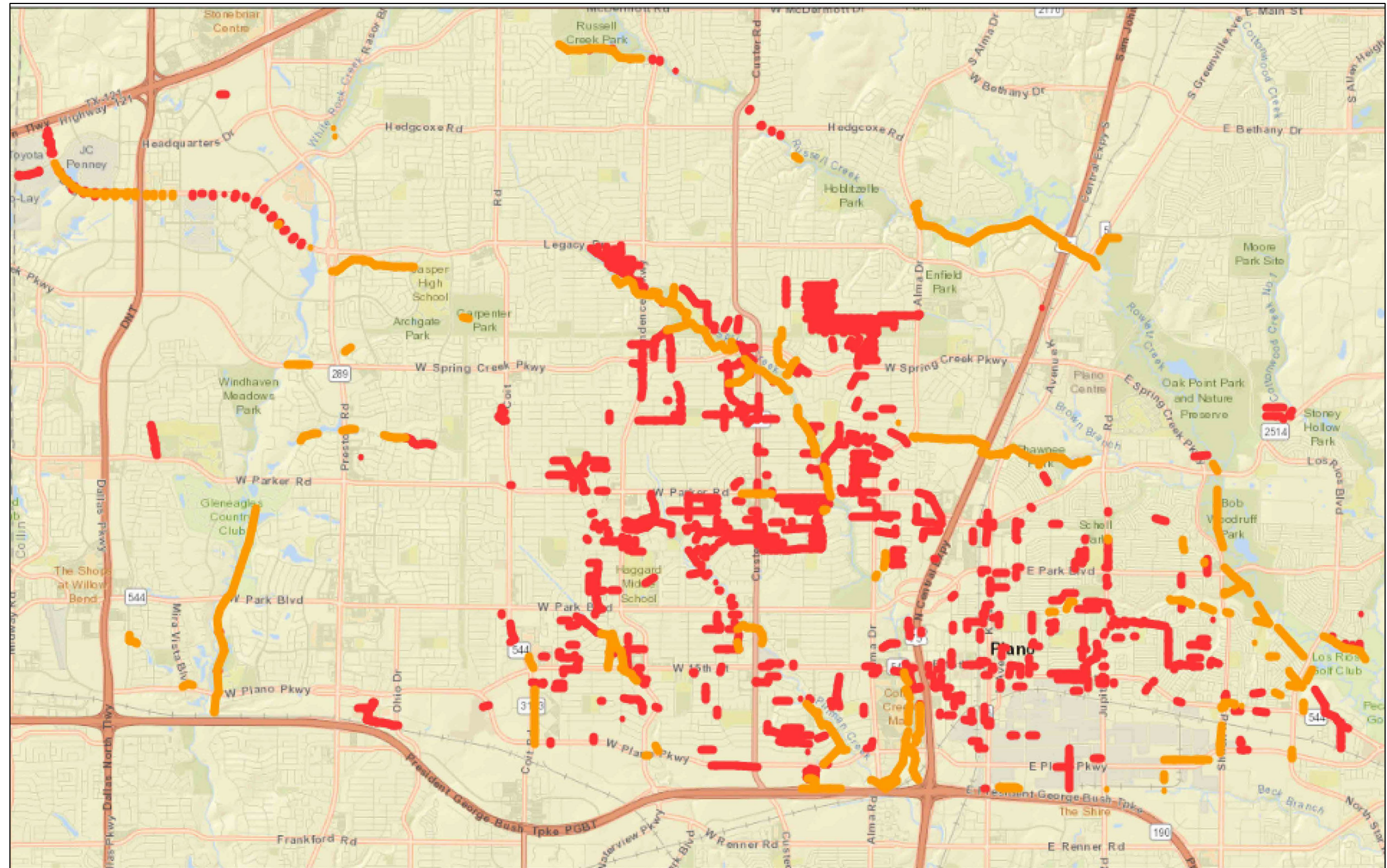
~121,000 linear feet

~Contractor (Oct 2020)

- **Small Diameter
Poor/Failed**

~253,000 linear feet

~Prioritize City TV Trucks





Plano

City of Excellence

Questions?

ABBY OWENS

PW Strategic Planning & Compliance

Manager, City of Plano

abbyo@plano.gov

972.769.4468

STEPHEN JOHNSON, PE

Project Manager, Freese & Nichols

stephen.johnson@freese.com

817.735.7375
