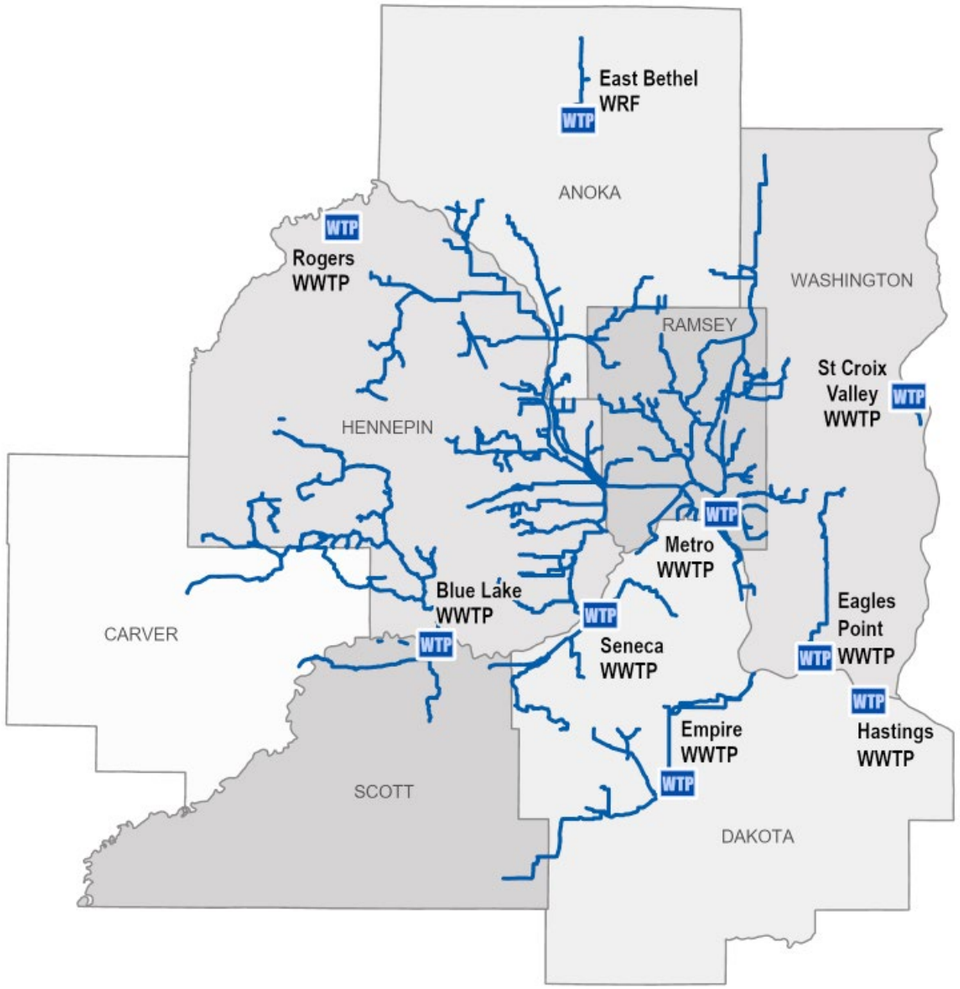
Information Item: Asset Programs for Condition Assessment

METROPOLITAN COUNCIL

Environment Committee: June 27, 2023

Adam Gordon

MCES Wastewater System



MCES Serves ~50% of the State's Population

Protects public health and safety

Protects the environment

Fosters the economic growth of the region

WHO WE SERVE

7-county Twin Cities Metro Area
111 communities
2,700,000+ people

OUR FACILITIES

9 wastewater treatment plants
650 miles of interceptors
250 million gallons per day (average)

OUR ORGANIZATION

600+ employees
$7 billion in valued assets
$160 million / year capital program

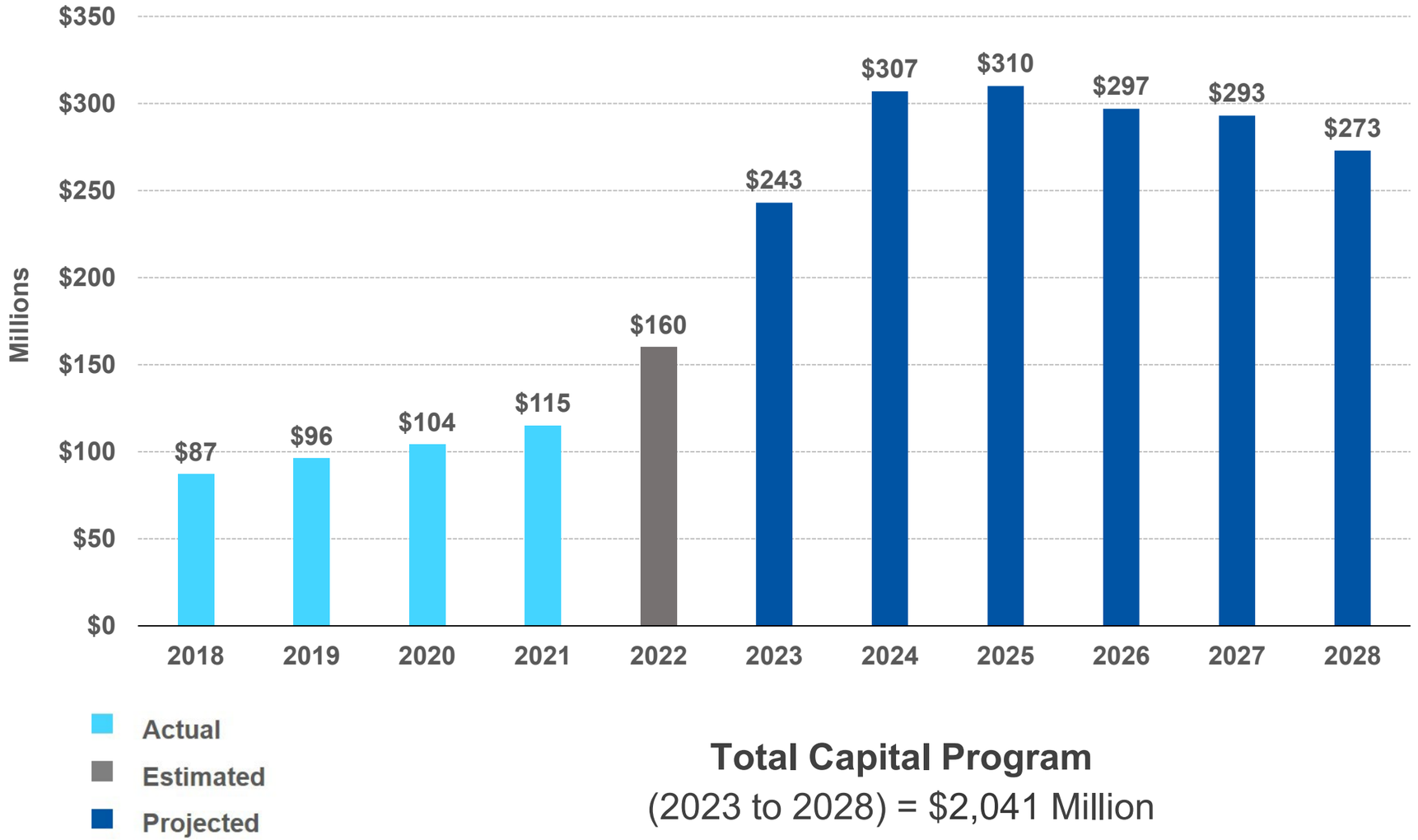
Metropolitan Council

MCES Interceptor System Capital Improvement Program

The details:

- Projected annual spend of $120 million per year for next 6 years
- 37% of the total MCES Capital Improvement Program
- 60% is to rehabilitate or replace assets to preserve value and performance
- Approximately 70 active projects
- 12 Project Managers

Capital Improvement Program -Past Expenditures and Projected Program



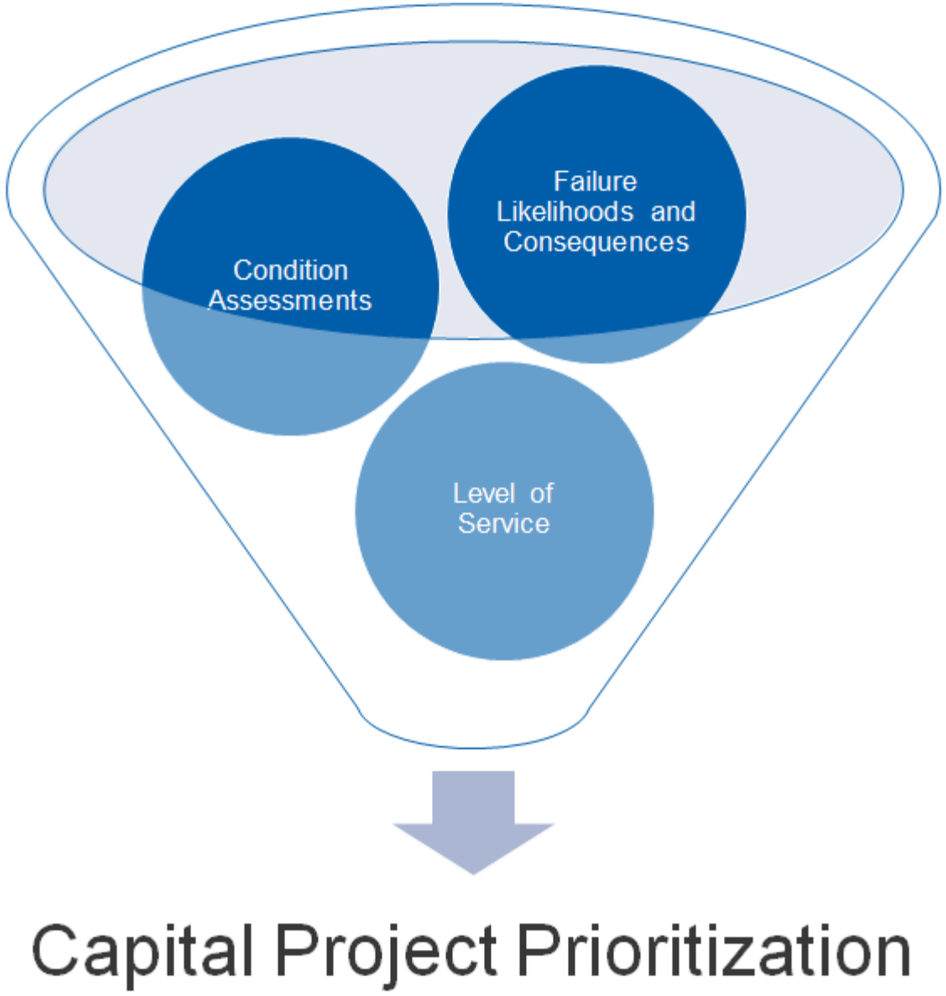
Total Capital Program
(2023 to 2028) = $2,041 Million

Asset Management – Project Prioritization

Many components to a risk evaluation:

Consequence of Failure – Severity – Follows Organization's Level of Service
- Manageable to Unmanageable

Likelihood of Failure – A determination derived from Condition Assessment
- Excellent to Failing



Asset Management – Condition Assessment Planning

Condition assessments drive 2/3 of the Capital Program

Resources:

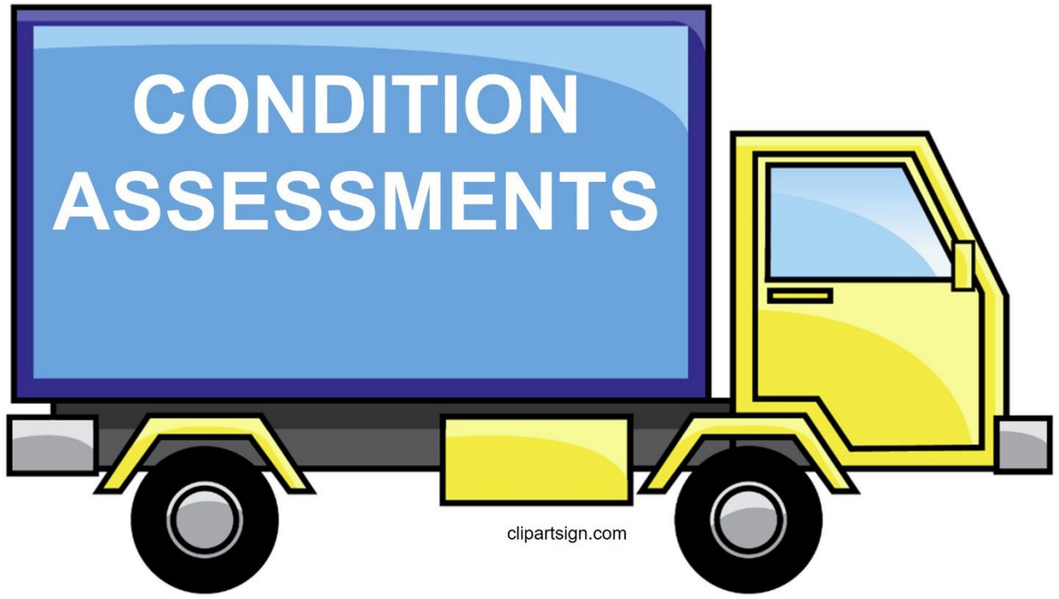
- How much is performed internally?
- How much is contracted?
- Who is responsible?

Schedule:

- When is the assessment work completed?
- When is the data shared?

Data:

- Where is the information kept?
- What is reported out?
- How accessible is the data?
- How is the data updated?



Asset Management – Defining Assets for Condition Assessment

Gravity Interceptor and Lift Station Programs

Asset Management – Defining Assets for Condition Assessment

Pressure Pipe and Cathodic Protection Programs

- Siphons
- Forcemains
- River Crossings

Asset Management – Defining Assets for Condition Assessment

Meter Program

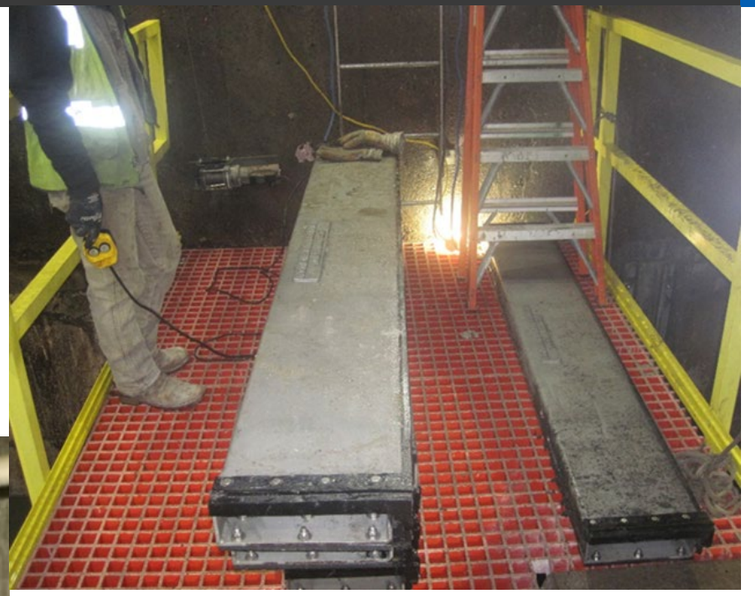
Asset Management – Defining Assets for Condition Assessment

Odor Control Program

Asset Management – Defining Assets for Condition Assessment

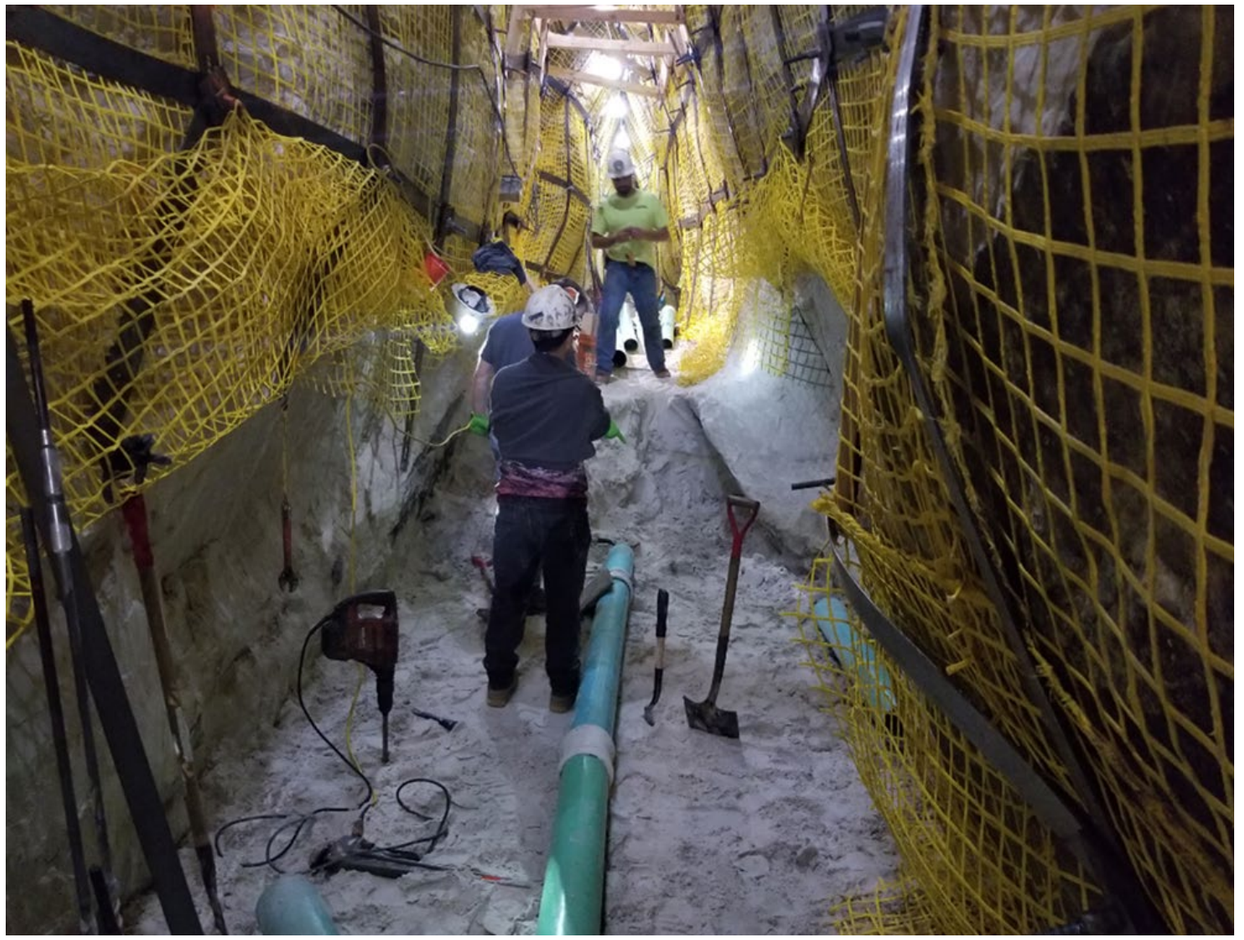
Flow Control Program

Gates, Valves, and Stop Logs



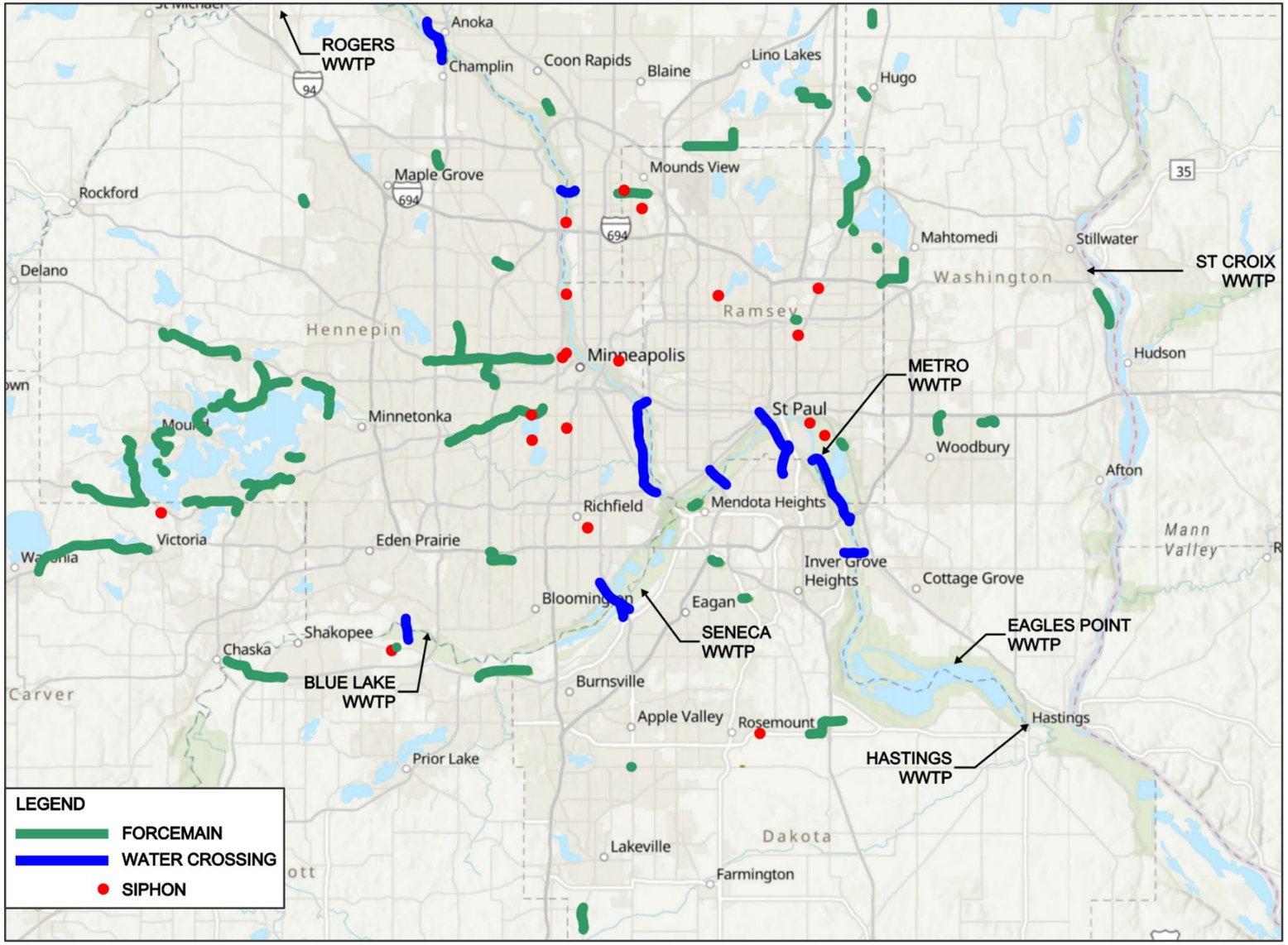
Asset Management – Defining Assets for Condition Assessment

Sandstone Tunnel Program



Pressure Pipe Condition Assessment Programs

Forcemain Locations



Forcemain Inventory

Pipe Material	Feet of Pipe	Miles of Pipe
Cast Iron Pipe (CIP)	41,807	7.92
Ductile Iron Pipe (DIP)	225,812	42.77
Fiber-Reinforced Polymer Matrix (FRPM)	207	0.04
High Density Polyethylene (HDPE)	105,131	19.91
Prestressed Concrete Cylinder Pipe (PCCP)	46,909	8.88
Polyvinyl Chloride (PVC)	250,110	47.37
Reinforced Concrete Pipe (RCP)	5,099	0.97
Steel	67,405	12.77
Total	**742,480**	**140.62**

Forcemain Inspection History

***Based on available records, 96 miles (~66%) of FM have not been inspected in the past 10 years.**

Year	Miles Inspected	New or Rehabbed	% of FMs
Pre-2010 Inspection	0.52	-	0.40%
2010	0.32	2.51	2.17%
2011	0.28	0.64	0.70%
2012	0.17	1.97	1.64%
2013	0.03	11.69	9.00%
2014	-	1.08	0.83%
2015	-	9.43	7.24%
2016	0.52	0.56	0.83%
2017	0.29	0.82	0.85%
2018	-	0.39	0.30%
2019	-	0.02	0.02%
2020	-	0.02	0.02%

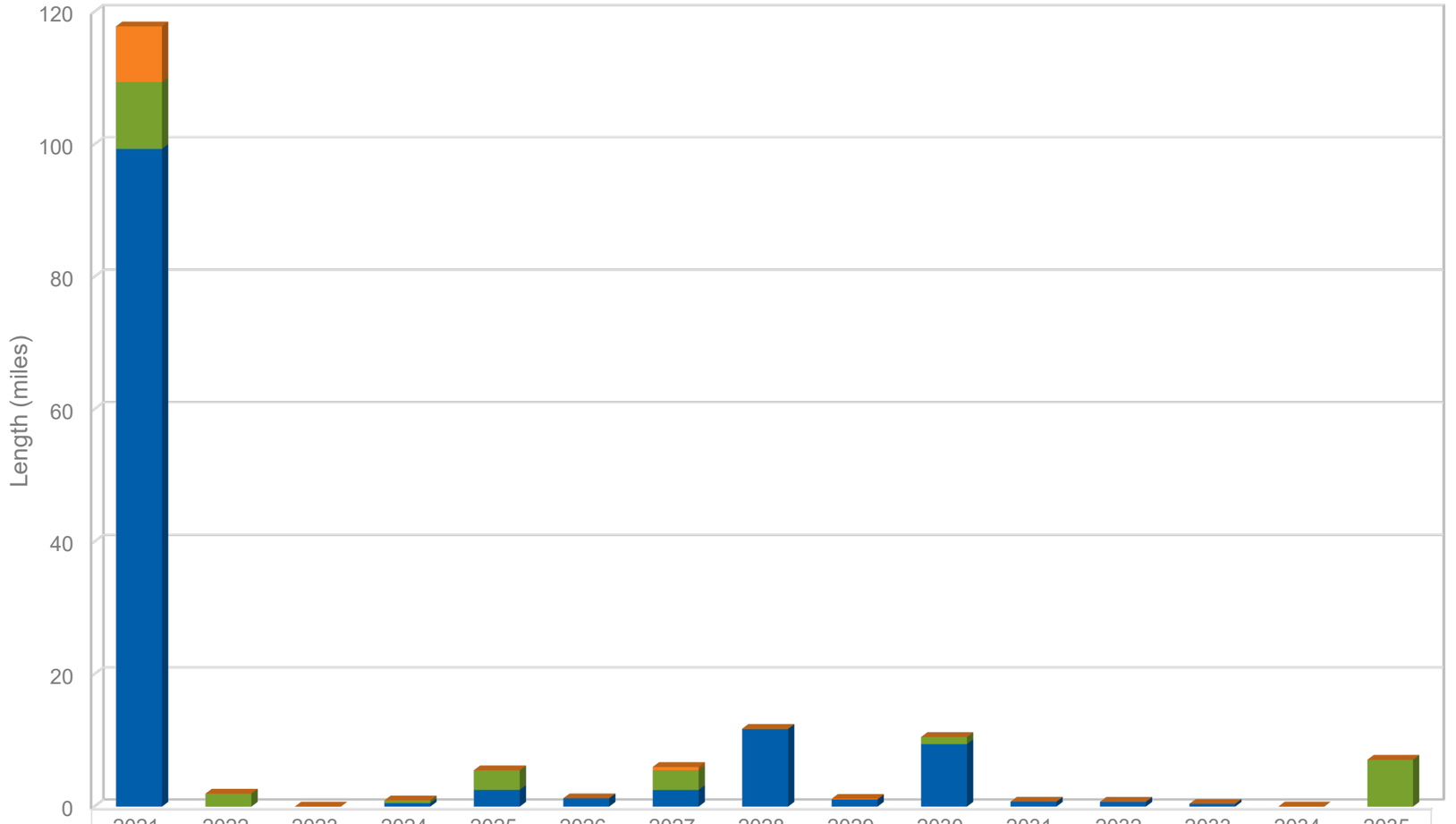
Current Ratings

Condition Rating	Miles of Pipe		
	Forcemain	River Crossing	Siphon
New/Rehab Prior to 2010	29.11	6.70	0.32
1	0.71	0.51	0.03
2	0.62	4.27	-
3	0.45	2.00	0.35
4	0.03	5.21	0.02
5	-	1.51	-
No Rating	99.31	6.33	8.38

Best Practices for Recurrence Interval

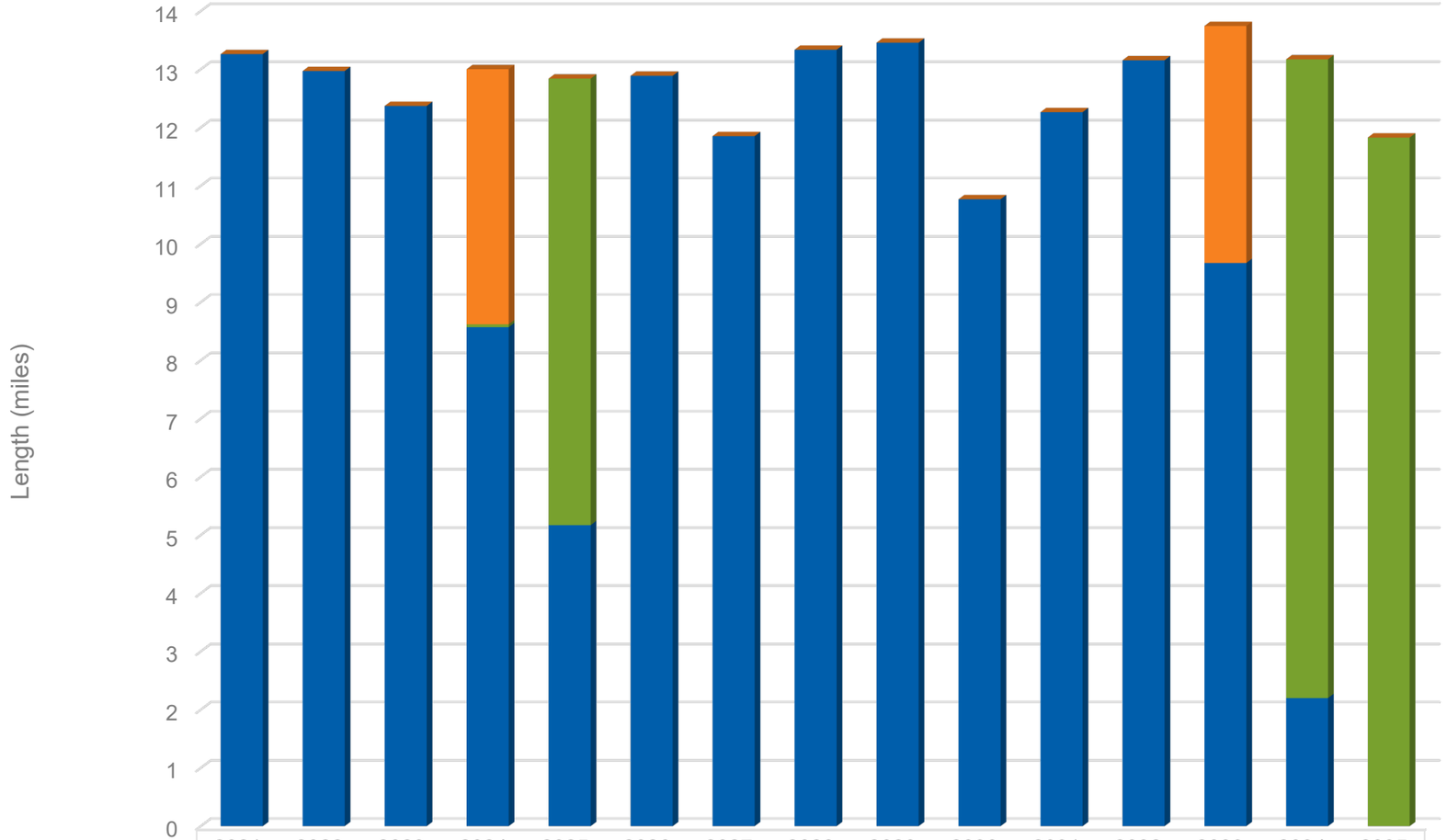
	Recurrence Interval (Years)	
Condition Rating	Concrete, DIP Pipe	Corrosion Resistant Pipe (RPMP/HDPE/CIPP/PVC)
1	10	15
2	10	15
3	10	15
4	5	5
5	Rehabilitate/Replace	Rehabilitate/Replace

Inspection Plan: Based on Current Ratings



	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Siphon	8.42	0.00	0.00	0.02	0.02	0.00	0.48	0.03	0.10	0.01	0.00	0.01	0.00	0.00	0.00
River Crossing	10.08	1.96	0.00	0.39	2.95	0.00	2.99	0.02	0.00	1.07	0.00	0.00	0.00	0.00	7.07
Forcemain	99.31	0.00	0.01	0.52	2.51	1.25	2.51	11.71	1.08	9.43	0.75	0.72	0.42	0.02	0.00

Inspection Plan: Distributed Workload

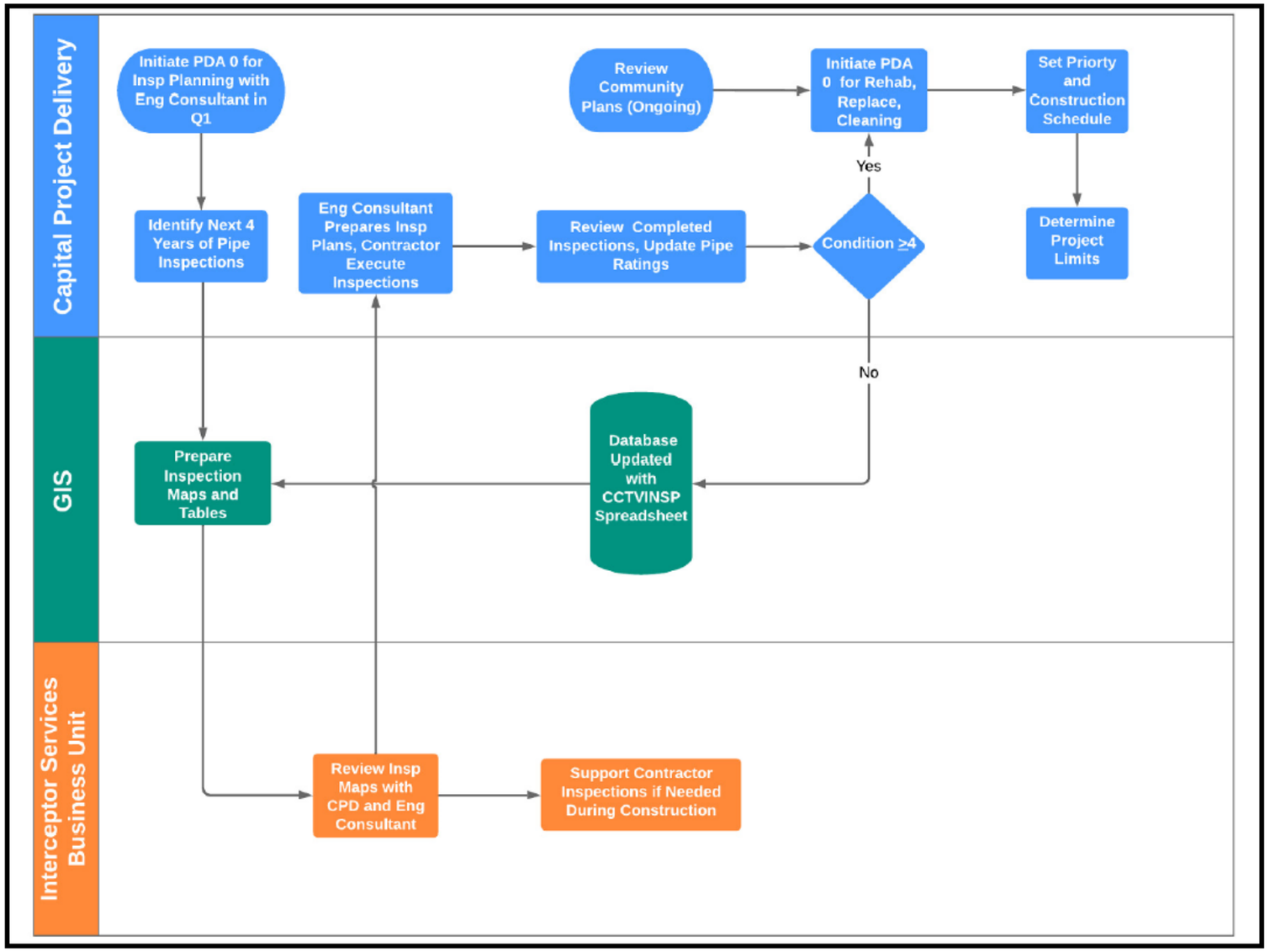


	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Siphon	0.00	0.00	0.00	4.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.07	0.00	0.00
River Crossing	0.00	0.00	0.00	0.05	7.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.97	11.83
Forcemain	13.26	12.97	12.37	8.57	5.17	12.89	11.85	13.34	13.46	10.77	12.26	13.15	9.67	2.20	0.00

Prioritizing

Consequence		Potential Consequence From Failure
5	Severe	Greater than 2 days downtime, over $2.5M in emergency response, impacts to interstate highways and railroads
4	Major	Greater than 8" diameter, loss of private property, impact to county highways, over $1M in emergency response
3	Moderate	Emergency Declaration, truck flows (<= 8"), beach closure, arterial closure, basement impact
2	Minor	Spill contained, short term repair, full redundancy
1	Negligible	Repair included in Capital Project or work order, full redundancy (multi-barrel)
Likelihood		**Potential Condition (without condition assessment)**
5	Certain	40 year agefor DIP/CIP, 20 year without CP, 20 year for PCCP
4	Likely	End of life in 5 to 10 years; 20% or greater capacity loss, monthly AR maintenance
3	Moderate	End of life in 10 to 20 years; less than 20% capacity loss, quarterly AR maintenance
2	Unlikely	Greater than 20 years to end of life; functioning as designed
1	Rare	Like new

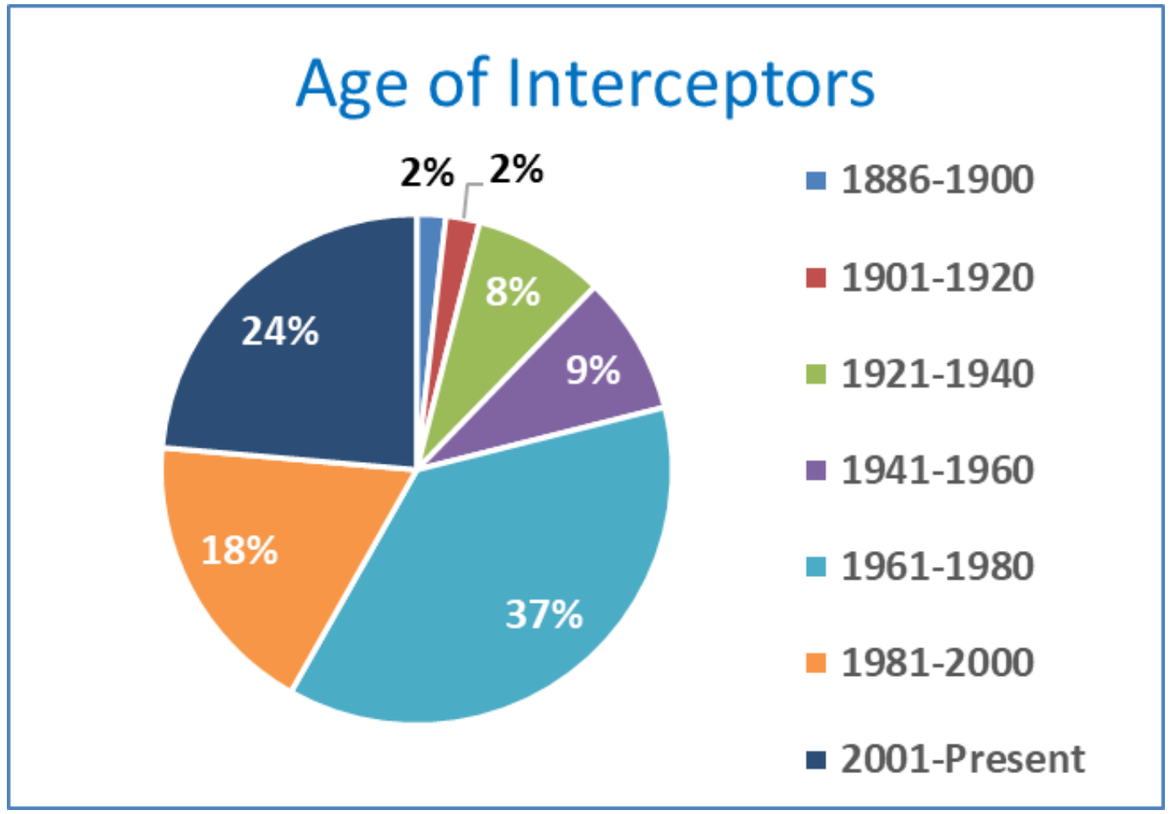
Program Yearly Workflow Diagram

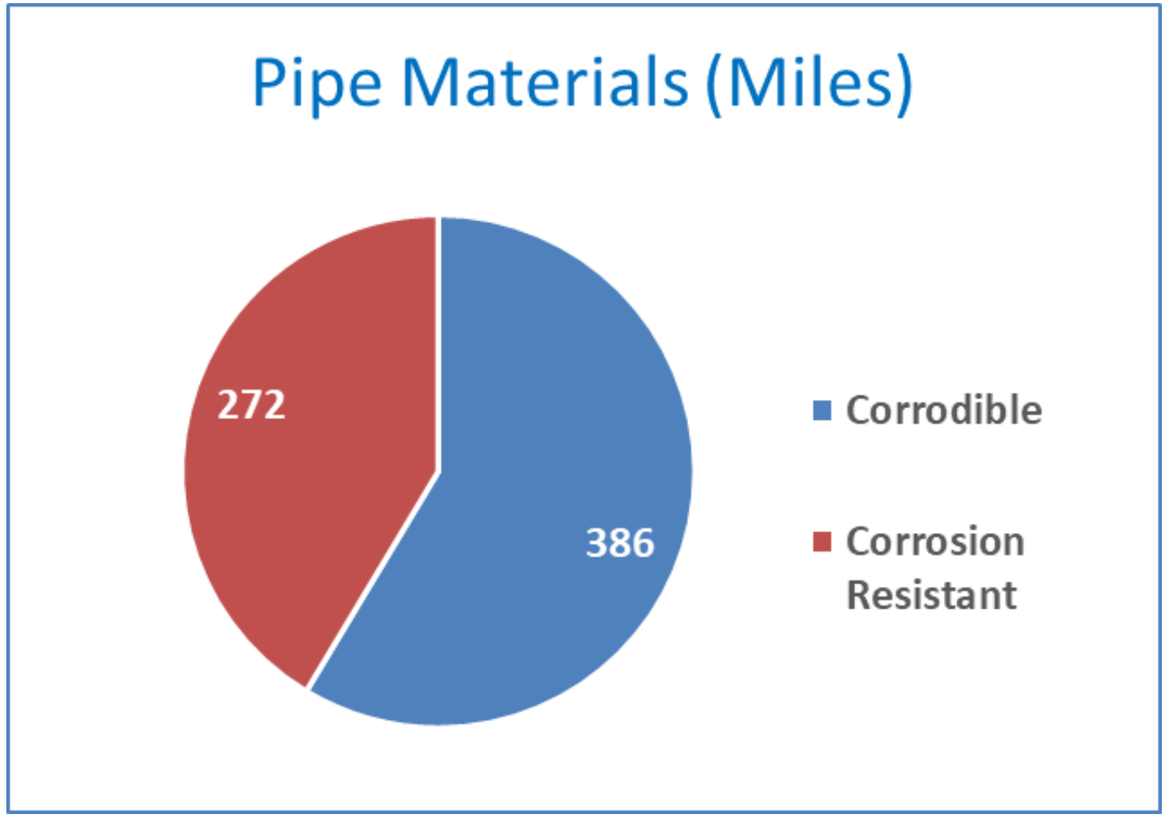


Conclusions

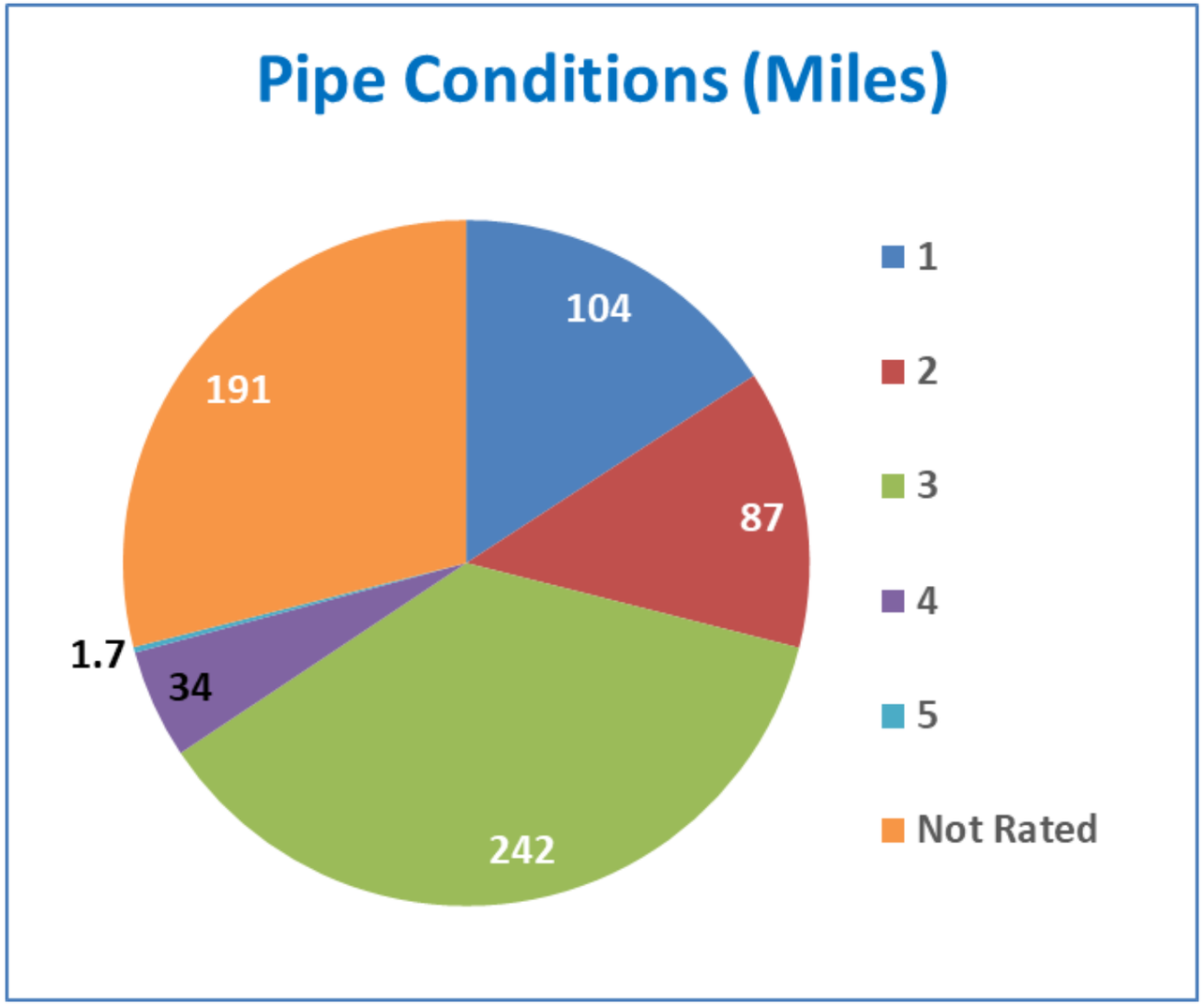
Condition Assessment Programs - Progress

Current System Makeup



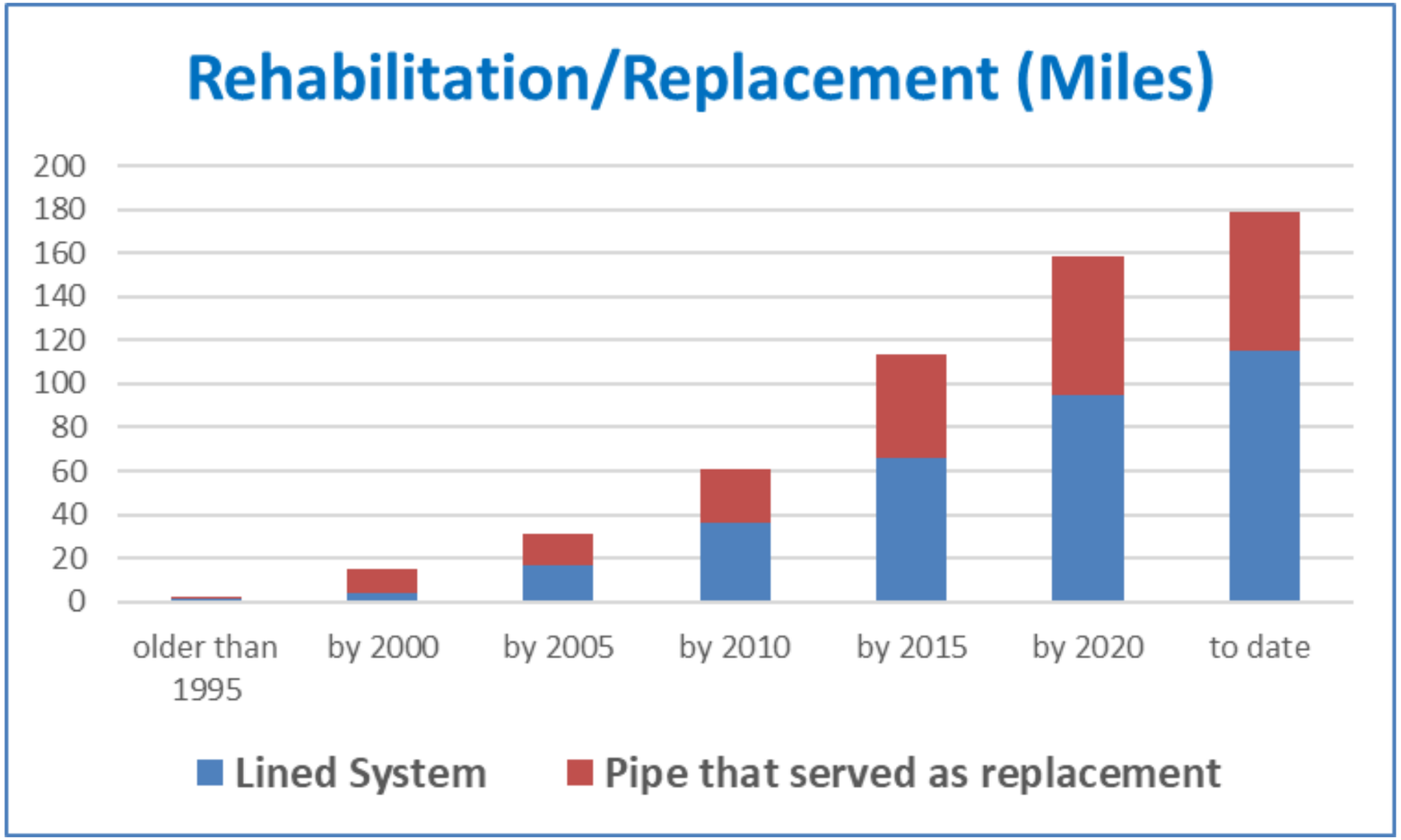


Condition Assessment Programs – Progress



Condition Assessment Programs – Progress

25 Years of progress



Questions?

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