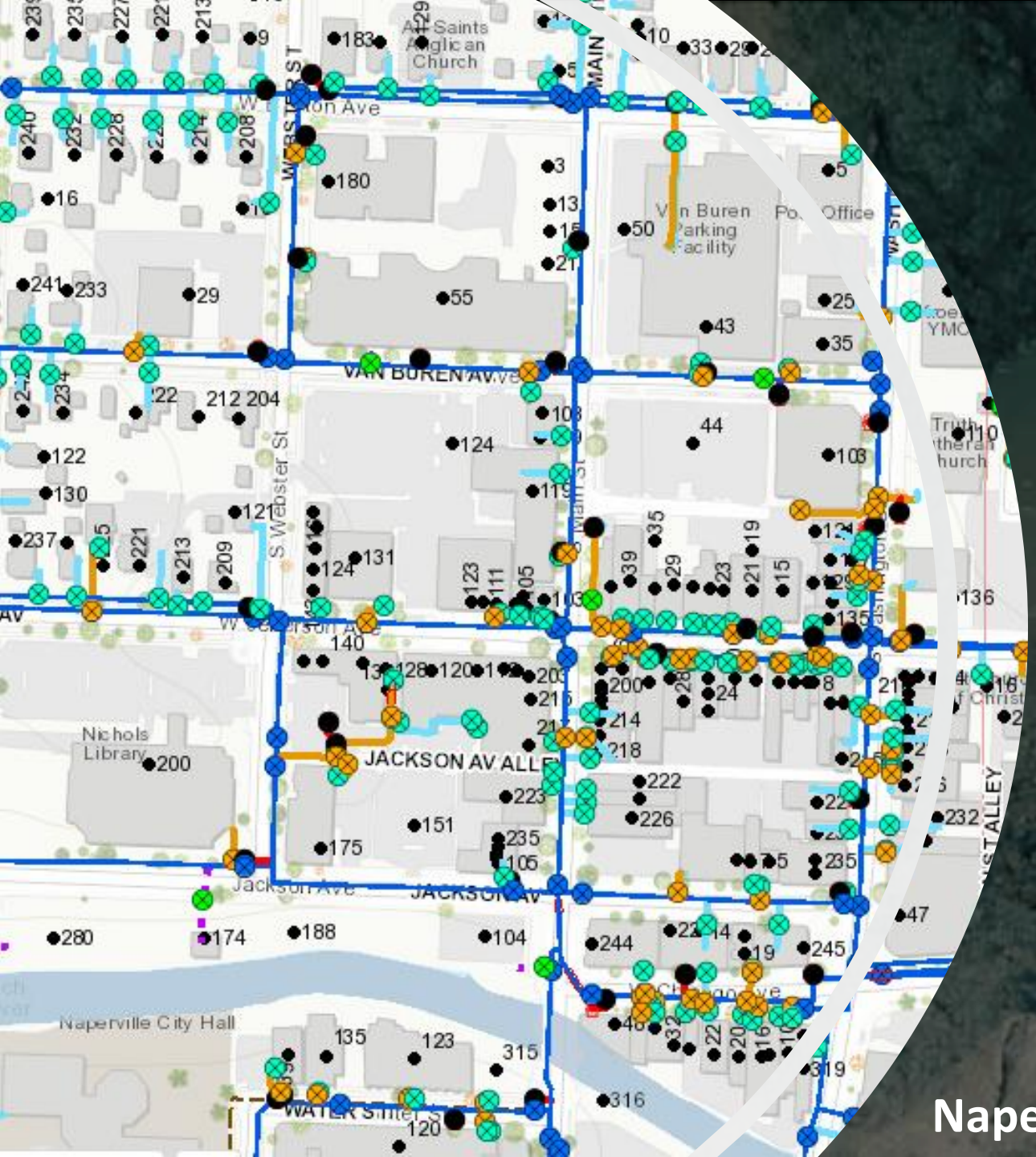


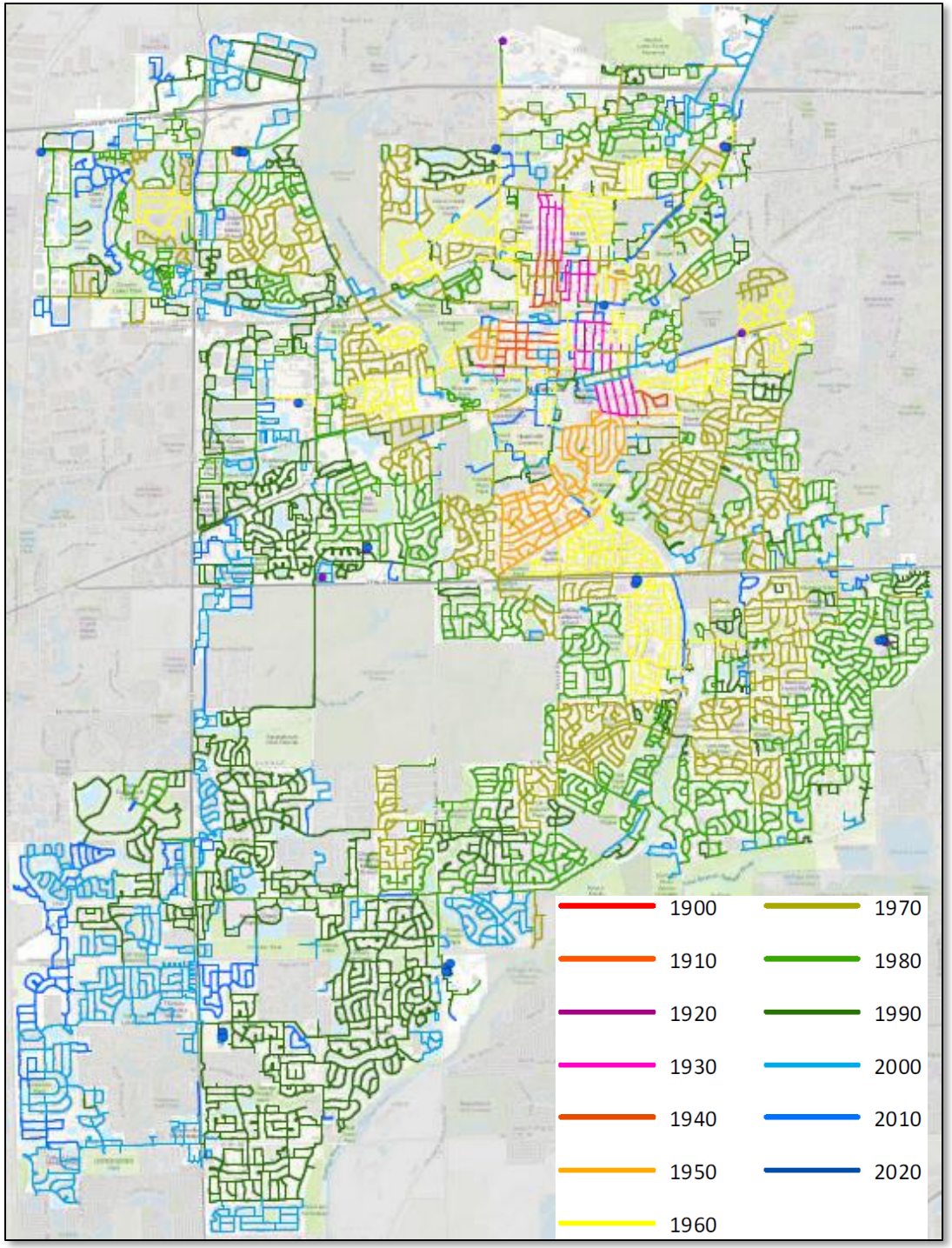
Water Distribution & Supply

Capital Needs and Existing Challenges

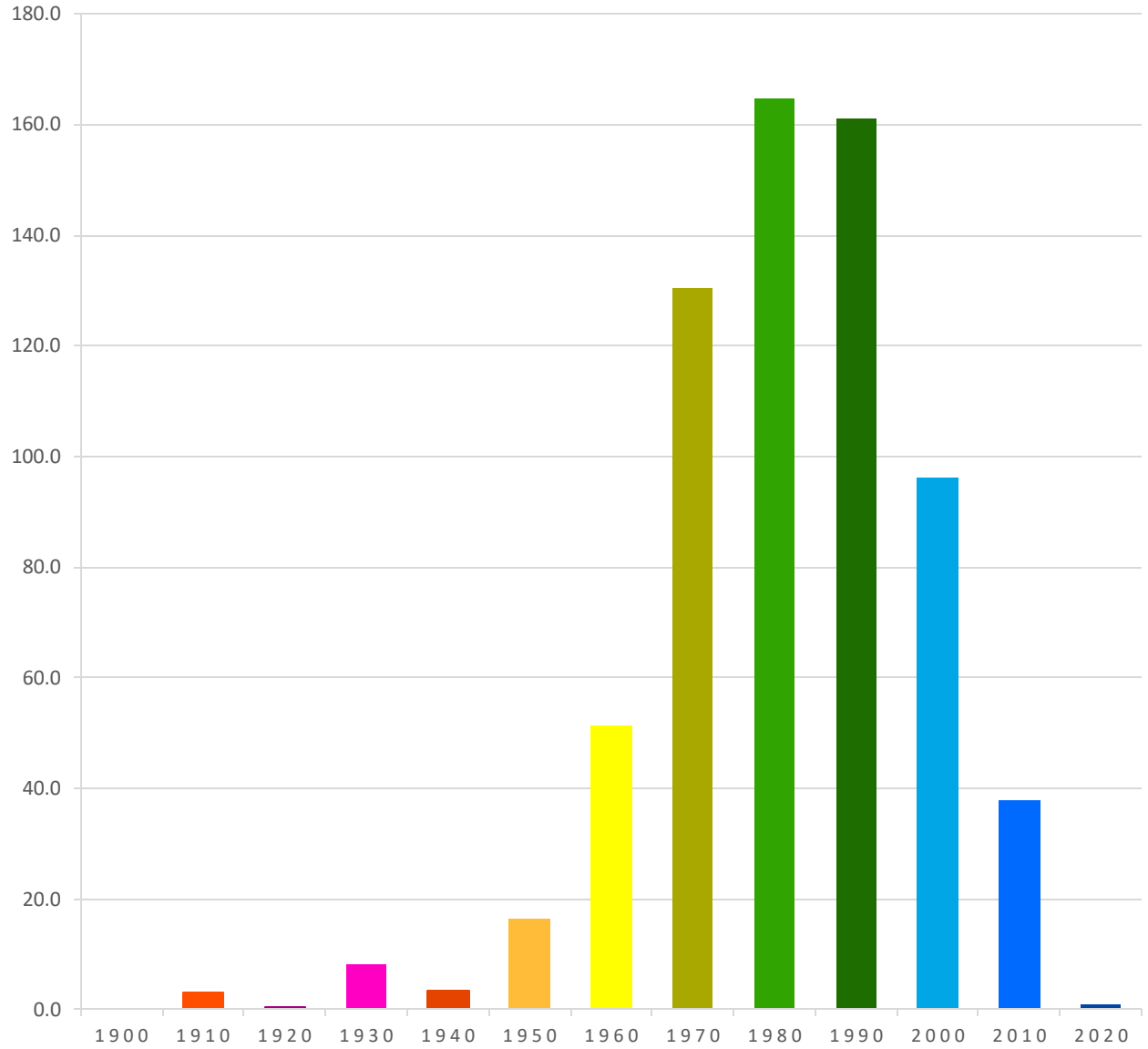
Naperville Water Utilities | April 20, 2021

Water System Profile

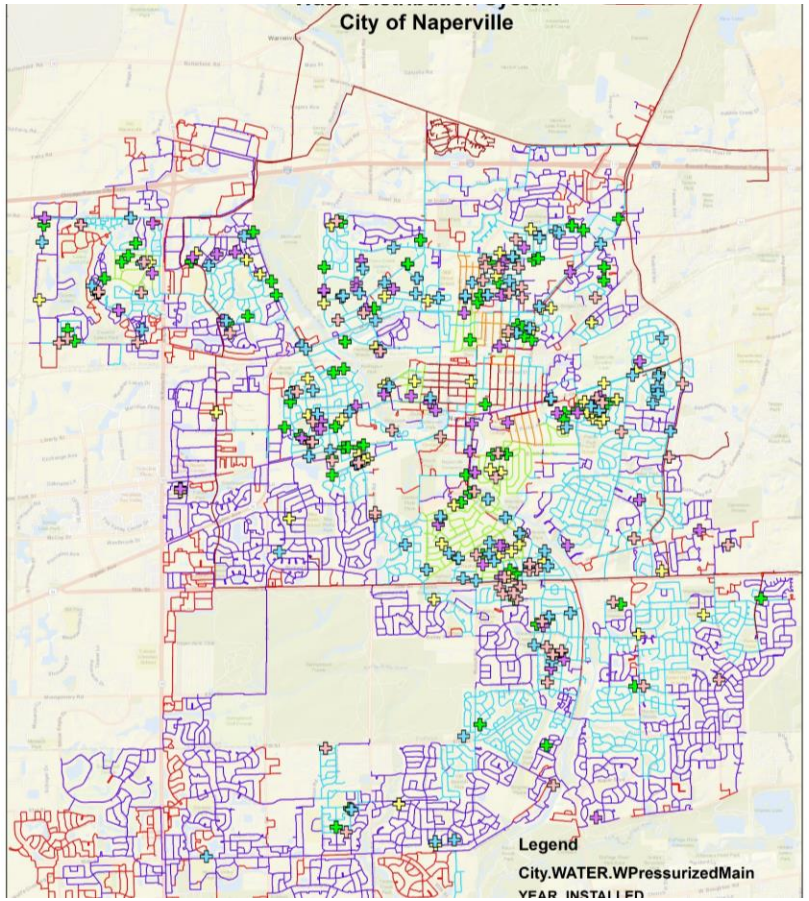
- **9** Pumping Stations
- **8** Pressure Adjusting Stations
- **8** Elevated Storage Tanks
- **9** Ground Storage Reservoirs
- **8** Emergency Standby Wells
- **674** Miles of Water Main
- **7,495** Distribution Valves
- **9,484** Fire Hydrants



WATER MAIN INSTALLED PER DECADE



Methodology



- Risk based approach
- Quantified based on physical condition of the water main and impacts on the community due to a potential water main failure
- 670+ miles of watermain can be effectively prioritized
- A repeatable methodology has been developed for ongoing assessment and management

Likelihood of Failure × **Consequence of Failure** = **Risk of Failure**

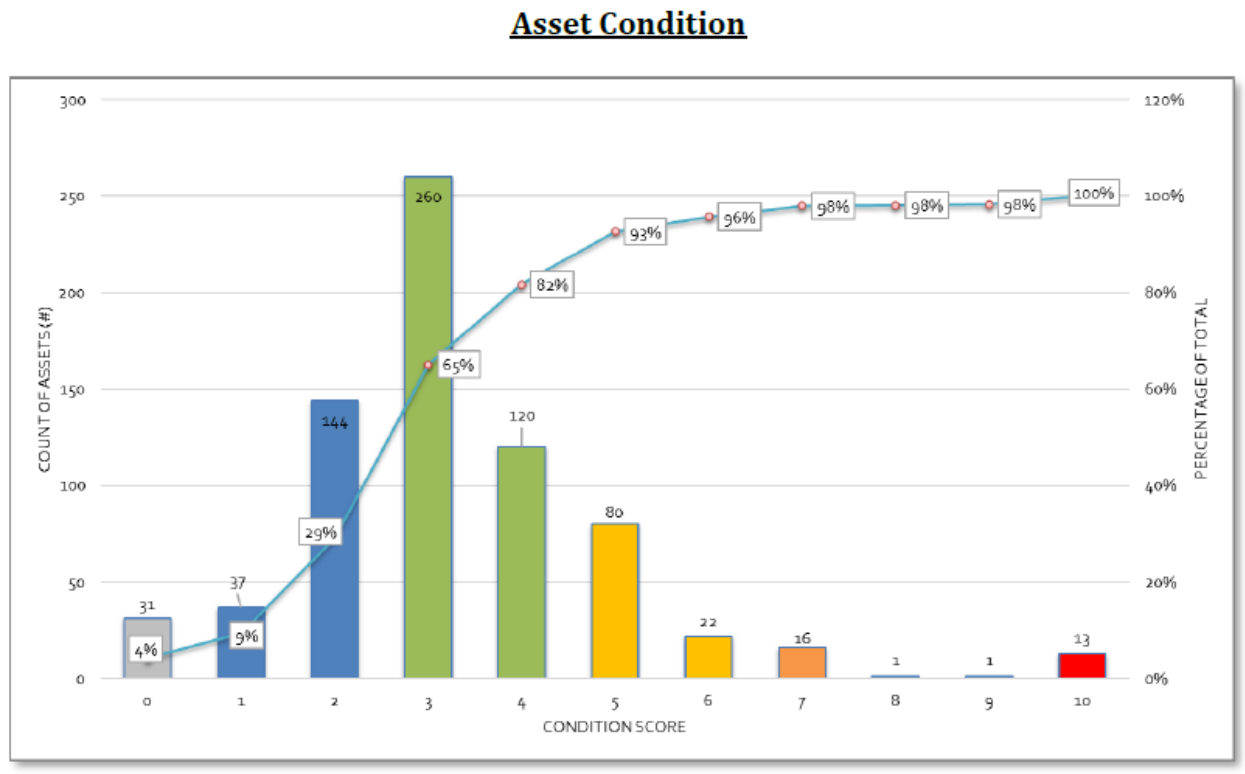
Installation Decade	Estimated Useful Life (years)	Length (miles)	Percentage of System
1900	100	0.0	0.0%
1910	100	3.0	0.4%
1920	100	0.4	0.1%
1930	100	8.3	1.2%
1940	100	3.3	0.5%
1950	100	16.3	2.4%
1960	50	51.3	7.6%
1970	60	130.4	19.4%
1980	80	164.7	24.5%
1990	100	161.0	23.9%
2000	100	96.3	14.3%
2010	100	37.8	5.6%
2020	100	0.8	0.1%
Total	**-**	**673.7**	**100%**

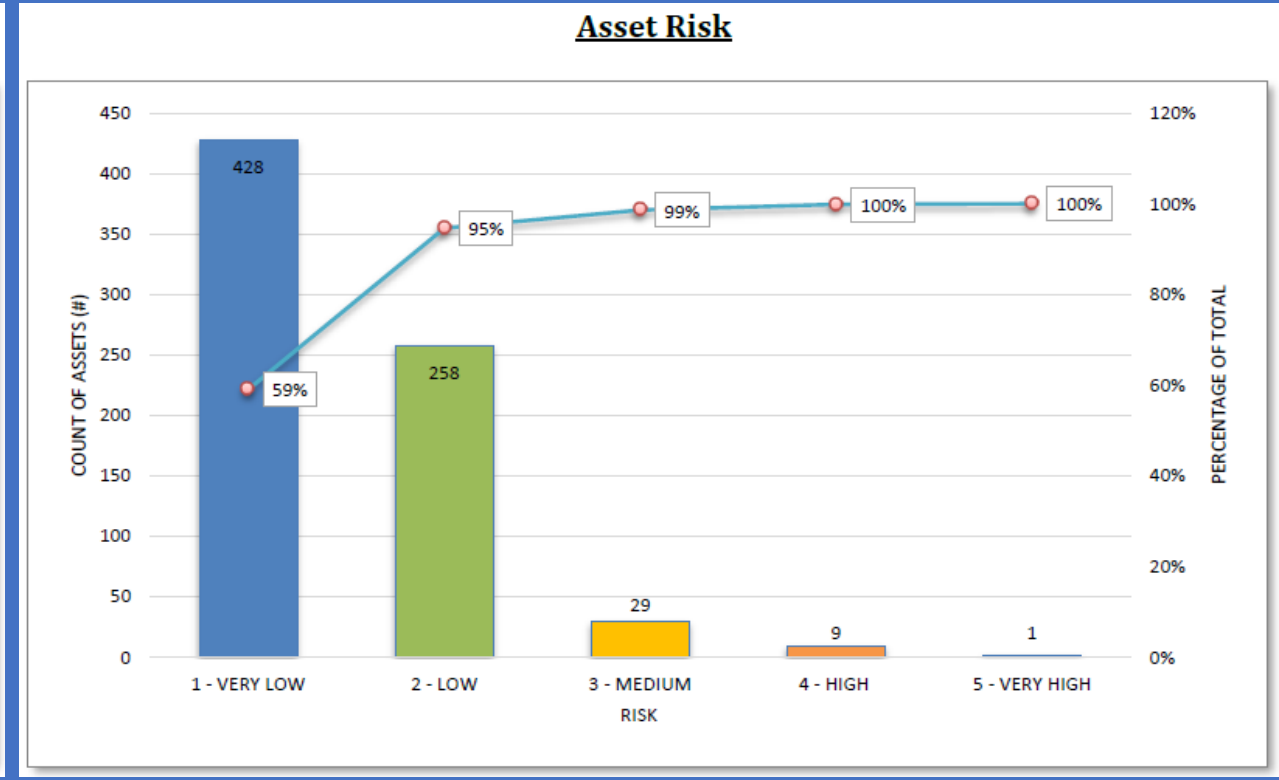
Useful Life of Water Main

Useful Life of Water Supply Assets

Discipline	Class	EUL	Discipline	Class	EUL
Civil	Fence	20	Instrumentation	Remote Telemetry unit	15
Civil	Grounds	30	Instrumentation	SCADA	15
Civil	Pavement	30	Mechanical	A/C Unit	15
Electrical	Breaker	15	Mechanical	Chlorinator	25
Electrical	Control Panel	20	Mechanical	Chlorine Booster System	25
Electrical	Generator	30	Mechanical	Compressor	30
Electrical	Lighting	15	Mechanical	Crane	30
Electrical	MCC	30	Mechanical	Eyewash Station	25
Electrical	Starter	30	Mechanical	Furnace	25
Electrical	Switch	20	Mechanical	HVAC	25
Electrical	Switchgears	30	Mechanical	Motor	20
Electrical	Transformer	25	Mechanical	Pump	20
Electrical	Transmitter	20	Mechanical	Valve	30
Electrical	VFD	15	Structural	Building	50
Instrumentation	Analyzer	15	Structural	Dry Pit	50
Instrumentation	Level Indicator	15	Structural	Tank	50
Instrumentation	Meter	15	Structural	Vault	50
Instrumentation	PLC	20	Structural	Roof	30

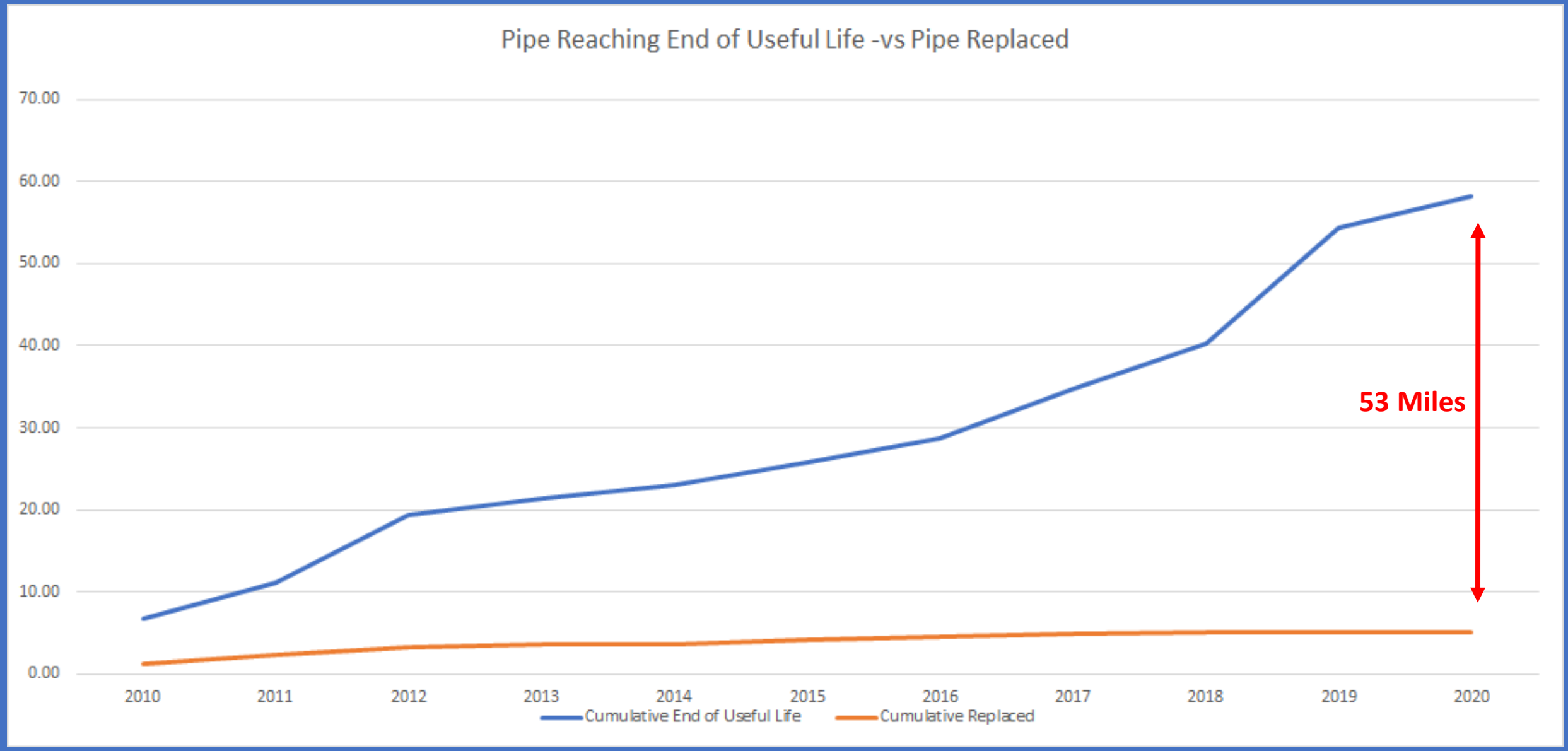
The Good News: Water Supply Assets in Overall Good Condition





*results based on condition inspection by consultant

The Bad News: Water Distribution System is Falling Behind



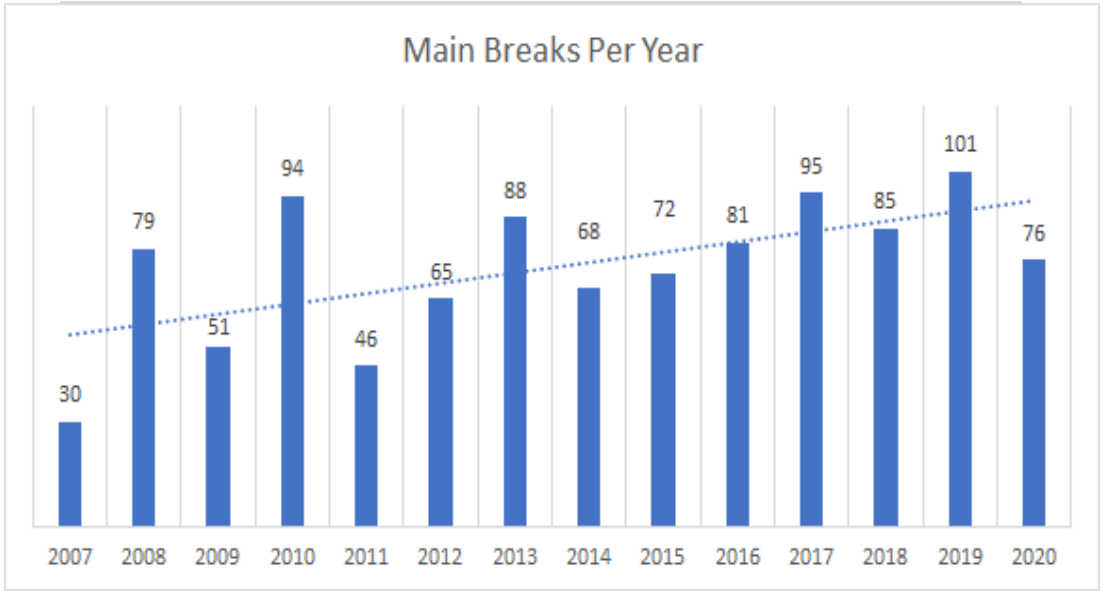
What Have We Been Doing?

In the past decade we have replaced approximately **5 miles** of watermain

- Mostly reactive replacements

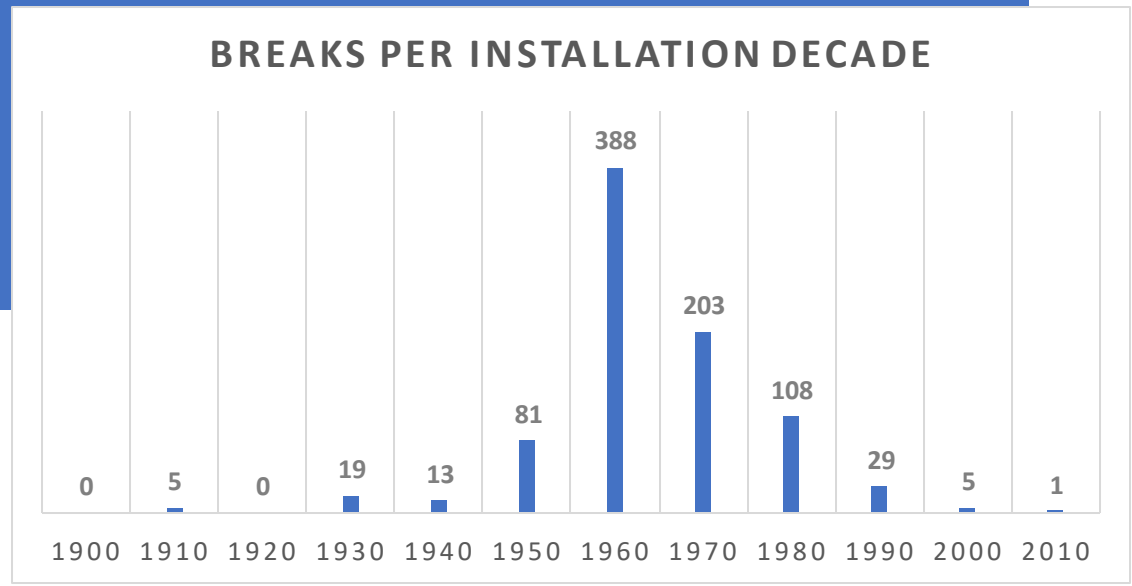
- Need to be more proactive
  - During the past decade approximately **58 miles of pipe reached end of useful life**.
  - We fell 53 miles behind.

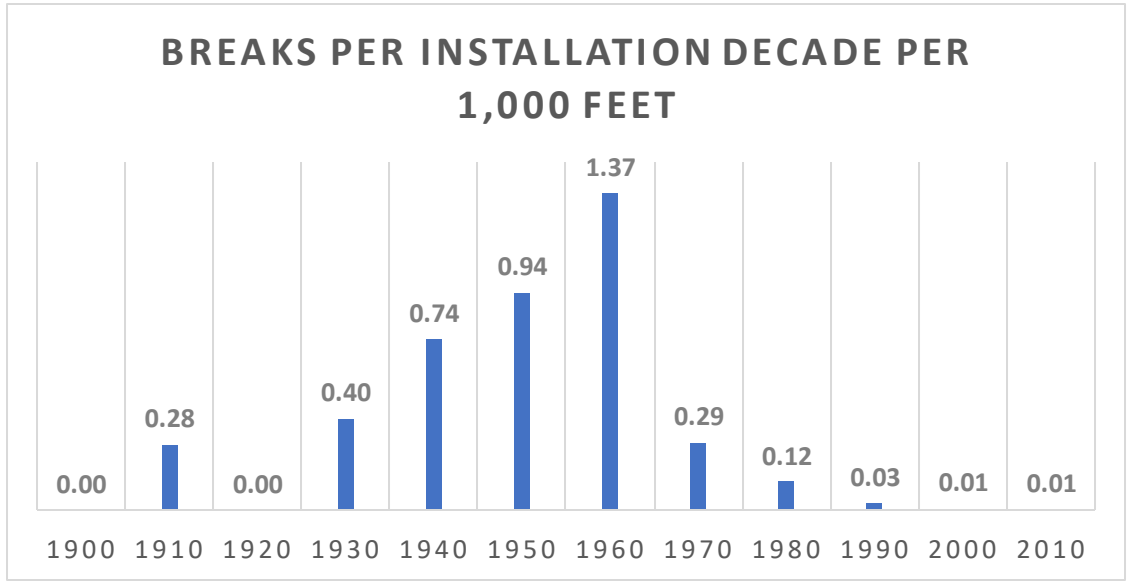
Water Main Break Trends



Currently at 15 breaks/100 miles

AWWA benchmark: less than 25 breaks per 100 miles of main





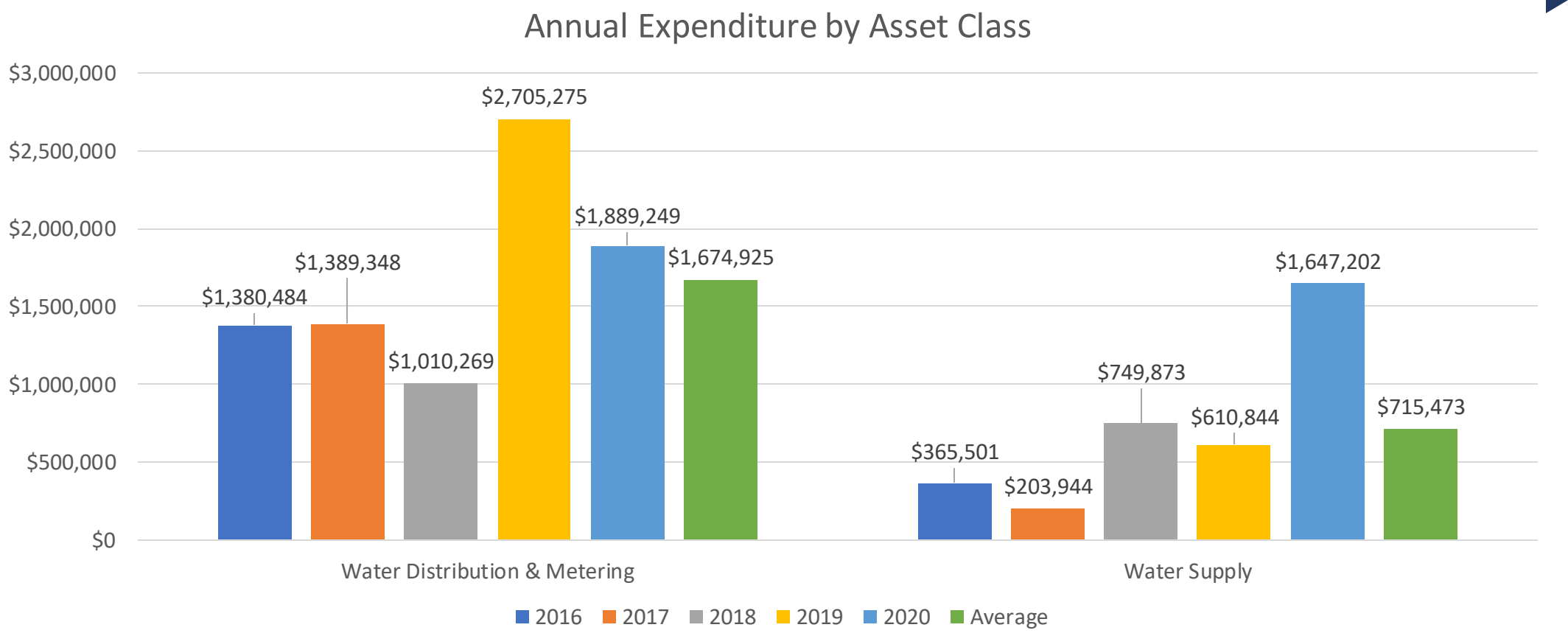
Water Main Break: Impacts

- Customer Service Disruption
- Precautionary Boil Order Advisory
- Damage to Customer Property
- Damage to Other City Infrastructure
- Financial Implications

Goals of an Expanded Water Distribution/Supply CIP

- Minimize disruption to customers while also maintaining our high level of service
- Need to move forward in a financially responsible way by providing best value possible to our customers
- Enhanced coordination with other city departments
  - Requires flexible planning
- Sustainable asset management

Historic CIP for Water Distribution & Supply



Average Annual Water Meter Replacement: $871,005

Combined Annual Average: $2,390,398

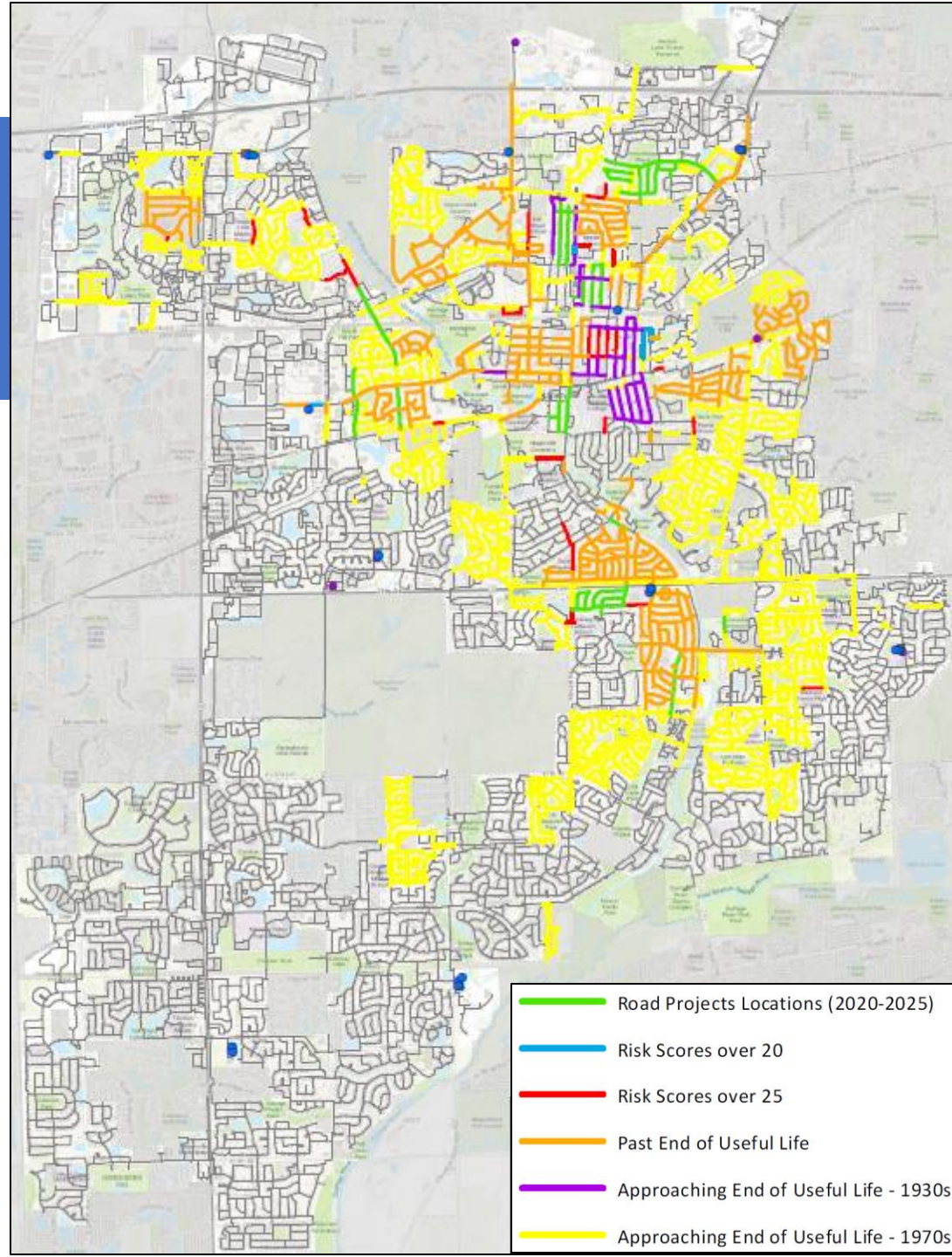
Additional Investment is Required
Scenarios Under Review

- Replacement of highest risk scores (BRE) only
- Coordination with TED roadway projects
- TED Roadway Synchronization & High BRE Scores
- Replacement of 1.5% per year, then 1% per year (Full Program)

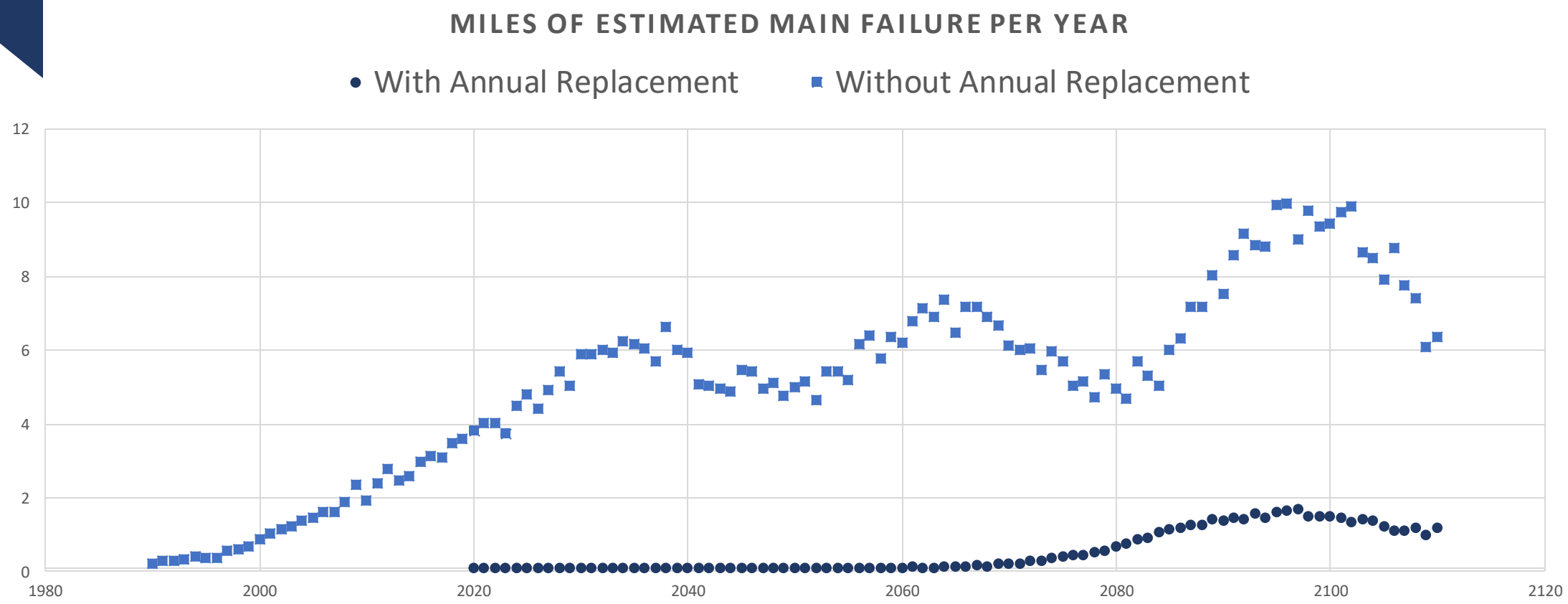
Scenarios Under Review

Category	Length (miles)	Estimated Cost
Road Projects (2020-2025)	9.7	$26,640,000
Locations with Risk Scores Over 25	5.0	$14,150,000
Locations with Risk Scores Over 20	0.8	$2,240,000
Pipes Past End of Useful Life	33	$92,300,000
5 Year Total	**48.5**	**$135,330,000**

Cost estimates are current for 2020. Includes construction and engineering.



Advantage of a Full Program



Community Average Annual Replacement

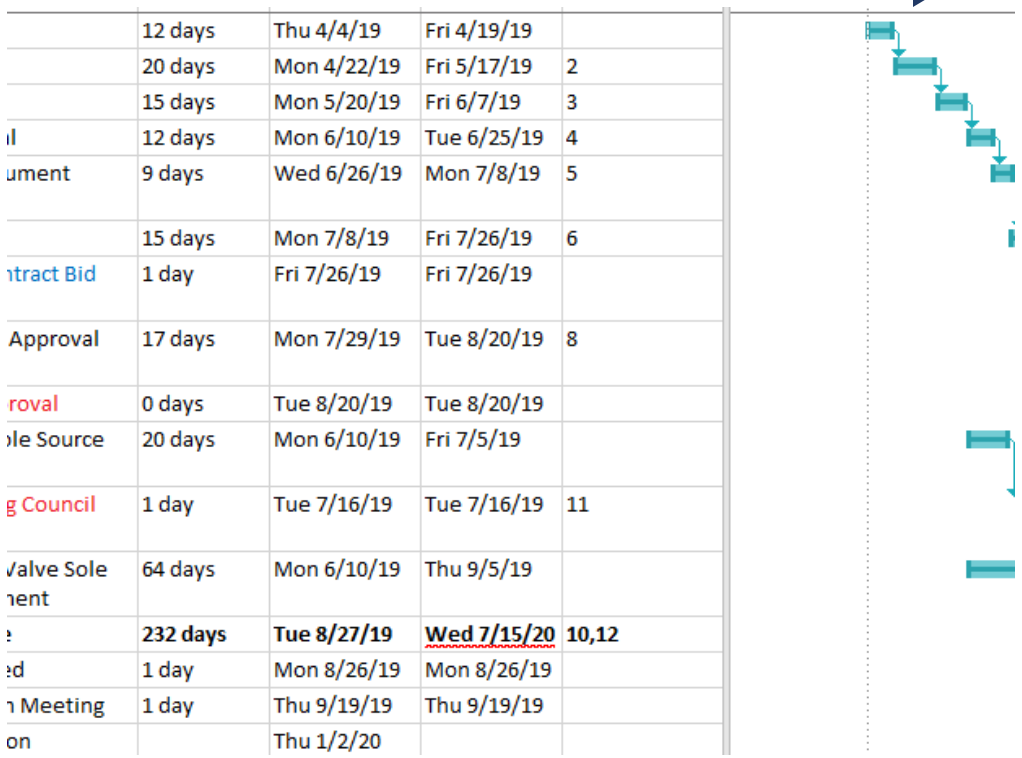
Community	System Size	Average Annual Replacement
Naperville (10-year Avg)	673 miles	0.5 miles
Aurora	780 miles	2.5 miles
Elgin	500 miles	2 miles
Joliet	645 miles	5 miles (planned increase to 10.3 in 2022)
Rockford	830 miles	8 miles

Financial Considerations

- A substantial investment in watermain infrastructure over the next 20 years is required to maintain reliability.
- Current water rates do not support this level of investment.
- Water rate study underway, new rates January 1, 2022.
- Options to fund expanded watermain replacement
  - Infrastructure surcharge
  - Increased volumetric rate
  - IEPA low interest loans
  - Borrowing

Planning & Coordination are Essential

- Watermain projects require several months to design and a minimum of 60 days to permit through IEPA
- Construction is somewhat weather dependent- frost must be out of the ground
- Potential for unknowns- accuracy of record-keeping for old main, assets are buried, utility conflicts. Could cause construction delays.
- Special situations - IDOT or County highway permits, railroad coordination, developer coordination.
- Close coordination with TED and other departments required.



	12 days	Thu 4/4/19	Fri 4/19/19	
	20 days	Mon 4/22/19	Fri 5/17/19	2
	15 days	Mon 5/20/19	Fri 6/7/19	3
l	12 days	Mon 6/10/19	Tue 6/25/19	4
ument	9 days	Wed 6/26/19	Mon 7/8/19	5
	15 days	Mon 7/8/19	Fri 7/26/19	6
ntract Bid	1 day	Fri 7/26/19	Fri 7/26/19	
Approval	17 days	Mon 7/29/19	Tue 8/20/19	8
roval	0 days	Tue 8/20/19	Tue 8/20/19	
le Source	20 days	Mon 6/10/19	Fri 7/5/19	
g Council	1 day	Tue 7/16/19	Tue 7/16/19	11
Valve Sole nent	64 days	Mon 6/10/19	Thu 9/5/19	
	232 days	**Tue 8/27/19**	**Wed 7/15/20**	**10,12**
ed	1 day	Mon 8/26/19	Mon 8/26/19	
Meeting	1 day	Thu 9/19/19	Thu 9/19/19	
on		Thu 1/2/20		

Questions?