

# GLWA Sewer Collection System Assessment Program

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*2016-2018*



**GLWA**

*Great Lakes Water Authority*

# Goals of Condition Assessment

- Know state of sewer collection system to create a baseline
- Build foundation for Asset Management Program
- Prioritize repair, rehabilitation and maintenance efforts
- Improve CIP expenditure and priorities
- Mitigate emergency repairs
- Reduce Infiltration and Inflows

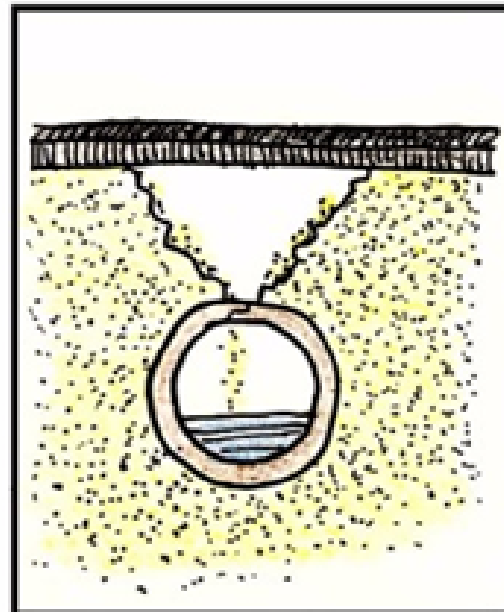
# Why is Inspection Important?

## Sinkhole Formation

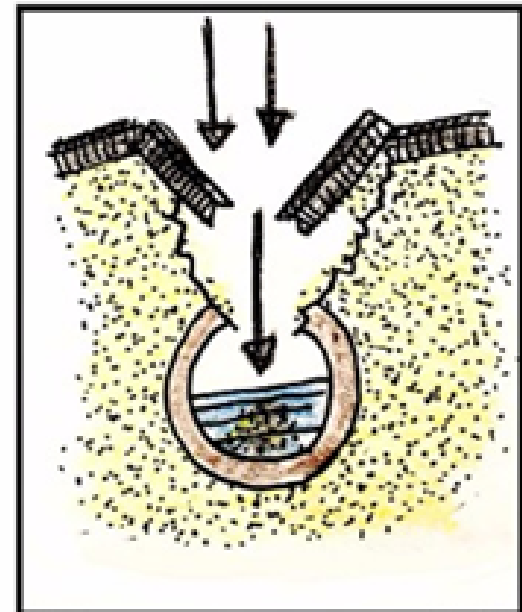
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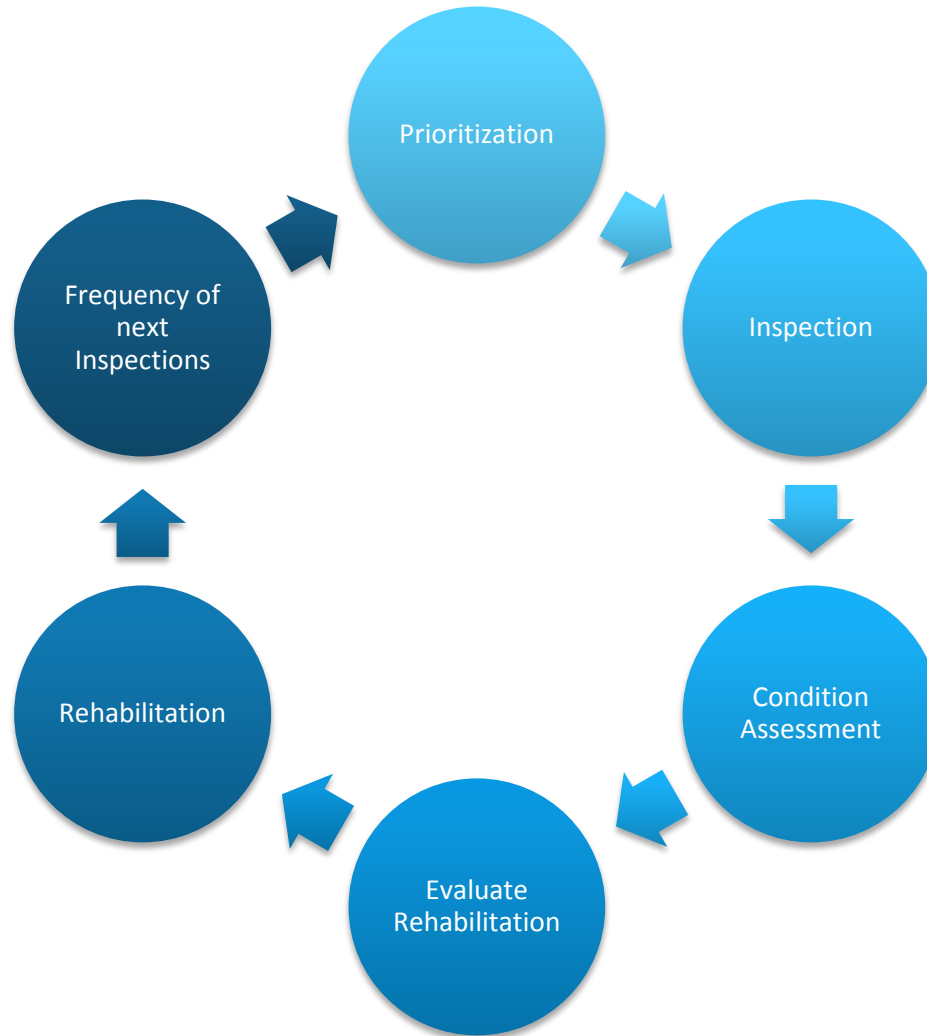


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# Condition Assessment Process



# Condition Assessment Benefits

## *Direct*

Capital work prioritization

Budget setting and/or justification

Asset Condition Ratings

Demonstration of Asset Stewardship

## *Indirect*

Extension of asset life

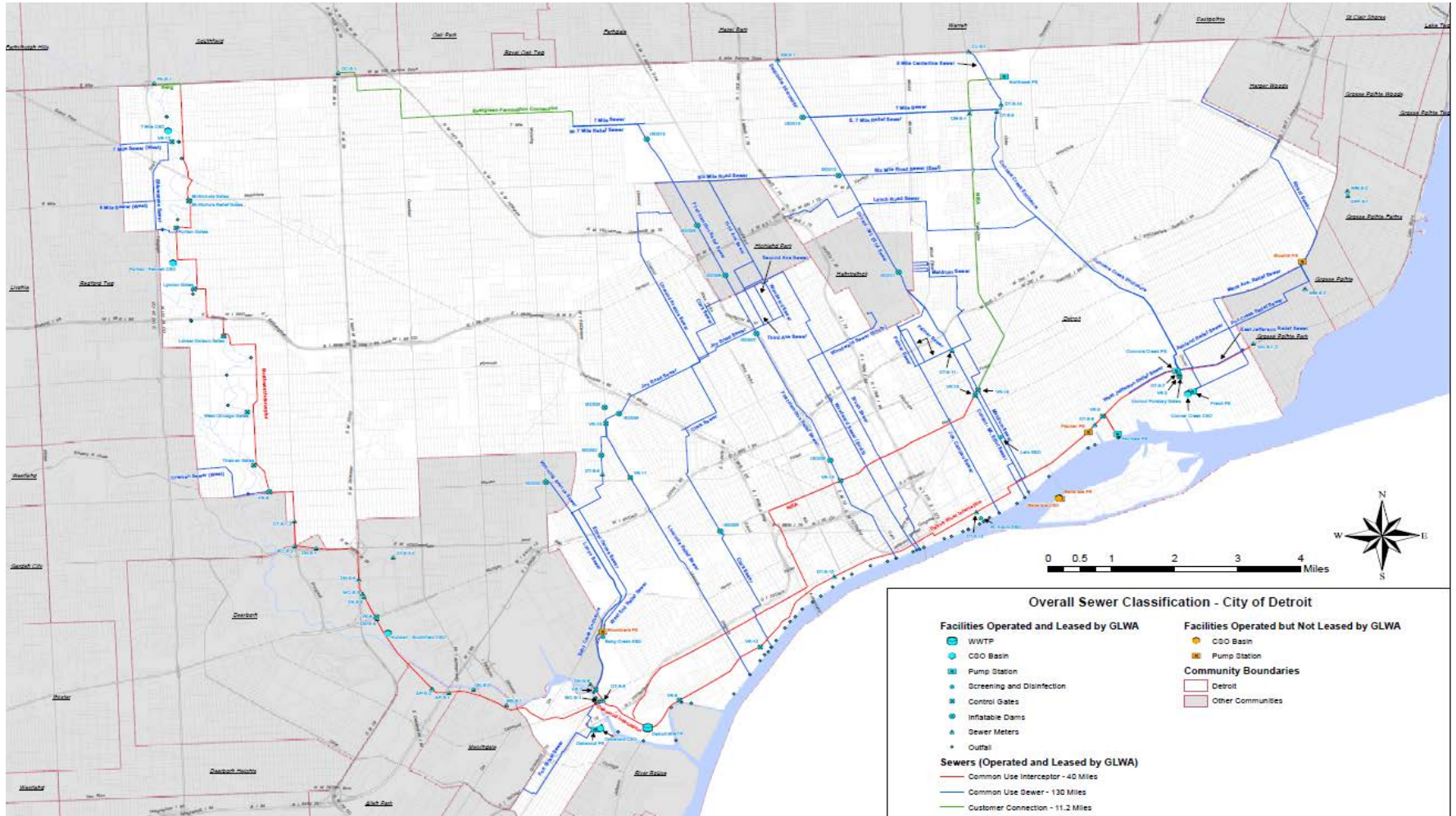
Reduced risk asset failure

Improved lifecycle cost management

Improved levels of service

Improved financial analysis

# GLWA Collection System Map



# GLWA Collection System Age

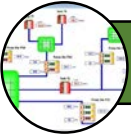
Period Sewer Installed	# of Miles	% of Total System
Before 1900	10.24	6.54
1901-1910	0.15	0.1
1911-1920	14.43	9.21
1921-1930	55.56	35.48
1931-1940	15.37	9.82
1942-1950	2.14	1.36
1951-1960	22.22	14.19
1961-1970	23.07	14.74
1971-1985	7.41	4.73
No Data	5.99	3.82

\* Between 2012-2018, 99% of sewers have been inspected

# Inspection Sequencing



Traffic Control



Flow Control



CCTV inspection for pipes



CCTV inspection for Manholes



GIS Mapping of Manholes



Updating Drawings/Maps





# NASSCO PACP Grading

- **National Association of Sewer Service Companies (NASSCO) Pipeline Assessment Certification Program (PACP) grades range from 1 to 5 with 5 being the most severe.**
- By NASSCO's definition
  - 1= minor defect grade
  - 2 = minor to moderate defect grade
  - 3 = moderate defect grade
  - 4= significant defect grade and
  - 5 = most significant defect grade.
- Typically, defects with grade 4 and 5 require prompt attention to prevent further deterioration and potential failure of the pipe system.

# PACP Defects

## *Structural (CIP)*

- Cracks
- Fractures
- Broken Pipe
- Holes
- Surface Damages
- Missing and Displaced Bricks

## *Operations & Maintenance (O & M)*

- Infiltration
- Defective and Intruding Taps
- Attached Deposits
- Settled Deposits

# Sewer Assessment – Overall Condition of the Interceptors

Interceptor	Condition
Detroit River Interceptor (DRI)	Fair
North Interceptor East Arm (NIEA)	Good
Northwest Interceptor (NWI)	Fair

# Sewer Inspection & Emergency Repair Contracts

	CON-068 “Inspection of Collection System Interceptors and Trunk Sewers”	CON-149 “Emergency Sewer Repairs”
Total Contract Value	\$1.037M	\$26.8 M
Contract Duration	10/2016 – 4/2018	7/2017 – 7/2019 with two one year renewal options

- Total Cost of Inspection: \$6,500,00.00
- Total Rehabilitation and Repair Expenditure: \$5,093,000.00
- Average Cost per foot: \$9.50/linear foot

\* On time and in budget

# Rehabilitation Projects

*From inspections*



# CS-168/CON-260 Outfall Rehabilitation



Running Infiltration



Missing Bricks



Deteriorated regulator chamber



Poor manhole condition

# CS-168/CON-260 Outfall Rehabilitation



Exposed rebar



Accumulated Debris in the conduit



Accumulated Debris



Deteriorated Backwater Gate

# Interceptor Rehabilitation

## *Major Defects*

- Longitudinal and Spiral Fractures
- Surface Spalling
- Several cracks Extended through the Section of Interceptor
- Infiltration and Deposits





# Interceptor Rehabilitation



# Interceptor Rehabilitation



# Sewer Rehabilitation



# Inflow/Infiltration Investigation



# Inspection findings



Roots



Infiltration



Defective Tap



Defective Tap

# Next steps

- Baseline for Asset Management
- Prioritize sewers for rehabilitation and repairs
- Estimate capital and O&M requirements
- Determine inspection frequency for future assessment

**Excerpt of Wastewater Projects with 2019-2023 CIP Total Greater than \$30M**

CIP #	Project Title	FY18	FY19	FY20	FY21	FY22	FY23	FY24
260200	Sewer and Interceptor Rehabilitation Program	\$7,751	\$10,601	\$10,400	\$11,400	\$11,400	\$11,400	\$11,400
222022	Detroit River Interceptor (DRI) Evaluation and Rehabilitation	2,232	1,084	8,052	10,187	10,187	10,187	2,491

# Current CIP Projects 222022 and 260200

<b>CIP #222022</b>	<b>FY18</b>	<b>FY19</b>	<b>FY20</b>	<b>FY21</b>	<b>FY22</b>	<b>FY23</b>	<b>FY24 and Beyond</b>
Phase: Design and Build, CS-183	2,232	0	0	0	0	0	0
	<b>FY19 Proj</b>	<b>FY19 Proj</b>	<b>FY19 Proj</b>	<b>FY19 Proj</b>	<b>FY19 Proj</b>	<b>FY19 Proj</b>	<b>FY19 Proj</b>
	2,232	1,084	8,052	10,187	10,187	10,187	2,491

<b>CIP #260200</b>	<b>FY18</b>	<b>FY19</b>	<b>FY20</b>	<b>FY21</b>	<b>FY22</b>	<b>FY23</b>	<b>FY24 and Beyond</b>
Phase: Study and Design and Construction Assistance, CS-168	494	1,201	1,000	0	0	0	0
Phase: Construction, CS-068	1,000	0	0	0	0	0	0
Phase: Study and Design and Construction Assistance, PO-005030	57	0	0	0	0	0	0
Phase: Construction, UALLOCATED		2,000	2,000	11,400	11,400	11,400	11,400

# Conclusion

- A well-run Condition Assessment and Rehabilitation Program provides a systematic, consistent, and cost-effective approach to asset management
- Supports long term capital expenditure planning
- Effective in forecasting future maintenance needs, prioritizing resource allocation, and costs based on inspection and asset condition ratings
- Reduces Infiltration and Inflows





**GLWA**

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