SEWER ASSESSMENT PROJECT
DIVISION OF WATER POLLUTION CONTROL
PURPOSE

- Have a better understanding of the condition of the existing sewer system
- Address critical issues
- Prioritize CIP projects
WPC’s responsibilities include the management of the sanitary & stormwater collection system in the City of Cleveland

- 1,436 miles of sewers
- 36,857 manholes
- 43,500 catch basins
- 12 pump stations
SEWER ASSESSMENT PROJECT

- Project consists of providing services necessary to conduct a condition assessment and Sewer System Evaluation survey of the sewers 100 years and older.

- Extends over a 5-year period.

- 27% of the system exceeded its useful life of 100 years.

- It includes 388 miles of sewers and 13,047 manholes.
Installed Sewer Pipes (by Decade, Length and Material)

Linear Feet (in thousands)

Install/Replace Decade

1870s 1880s 1890s 1900s 1910s 1920s 1930s 1940s 1950s 1960s 1970s 1980s 1990s 2000s

VCP
Brick
Reinforced Concrete
Unknown
Process

- Identify 100 years sewers and older
- Develop sewersheds of the area to be inspected
- Prioritize areas and establish schedule
- Collect and store data
- Provide an engineering recommendation as necessary
YEAR 1
PROJECT ELEMENTS

- Infrastructure Inspection
  - Manhole inspection and pipe screening
  - Condition Assessment

- SSES Evaluation
  - Flow Monitoring
  - Smoke and Dye Testing
  - Public Information Program
  - Hydraulic Model Analysis
  - Rehabilitation Recommendations

- Report Submittals & Deliverables
Manhole and pipe screening

- Manhole inspection
  - Manhole materials
  - Condition assessment of all components (cover, frame, chimney, wall, bench…)
  - Rating of the structure

- Pipe screening
  - Pipe materials
  - Condition assessment (structural issues, maintenance issues, seal, I/I…)
  - Rating of the pipe
<table>
<thead>
<tr>
<th>Manhole Facility ID</th>
<th>Type of O&amp;M Issue</th>
<th>Location of O&amp;M Issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>wpcMANH–1129</td>
<td>Cracked Frame</td>
<td>Hamilton Ave.</td>
</tr>
<tr>
<td>wpcMANH–15607</td>
<td>Collapsed Frame with Missing Mortar</td>
<td>Clark St.</td>
</tr>
<tr>
<td>wpcMANH–17268</td>
<td>Missing Mortar around Frame</td>
<td>W. 3rd St.</td>
</tr>
<tr>
<td>wpcMANH–25502</td>
<td>Cracked Cover</td>
<td>Trowbridge Ave.</td>
</tr>
<tr>
<td>wpcMANH–26240</td>
<td>Cracked Cover</td>
<td>Marcella St.</td>
</tr>
<tr>
<td>wpcMANH–26726</td>
<td>Corroded Cover</td>
<td>Castle Ave.</td>
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<tr>
<td>wpcMANH–28407</td>
<td>Collapsed Frame with Missing Mortar</td>
<td>Riverbend St.</td>
</tr>
<tr>
<td>wpcMANH–30730</td>
<td>Missing Mortar around Frame</td>
<td>W. 3rd St.</td>
</tr>
<tr>
<td>wpcMANH–33677</td>
<td>Corroded Cover and Missing Mortar</td>
<td>W. 3rd St.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Pipe Stub ID</th>
<th>Type of O&amp;M Issue</th>
<th>Location of O&amp;M Issue</th>
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<tbody>
<tr>
<td>wpcGRAM–11434</td>
<td>Collapsed Pipe</td>
<td>W. 38th St.</td>
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<tr>
<td>wpcGRAM–11435</td>
<td>Damaged Pipe</td>
<td>W. 5th St.</td>
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<tr>
<td>wpcGRAM–20508</td>
<td>Collapsed Pipe</td>
<td>Auburn Ave.</td>
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<tr>
<td>wpcGRAM–30395</td>
<td>Damaged Pipe with Hole in Road</td>
<td>Detroit Ave.</td>
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<tr>
<td>wpcGRAM–31031</td>
<td>Damaged Pipe</td>
<td>Huron Rd.</td>
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<tr>
<td>wpcGRAM–31766</td>
<td>Collapsed Pipe</td>
<td>Scranton Ave.</td>
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<tr>
<td>wpcGRAM–33704</td>
<td>Collapsed Pipe</td>
<td>E. 57th St.</td>
</tr>
<tr>
<td>wpcGRAM–3723</td>
<td>Damaged Pipe</td>
<td>Eglindale Ave.</td>
</tr>
<tr>
<td>wpcGRAM–409</td>
<td>Collapsed Pipe</td>
<td>Fulton Ct.</td>
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<tr>
<td>wpcGRAM–6369</td>
<td>Collapsed Pipe</td>
<td>W. 32nd St.</td>
</tr>
<tr>
<td>wpcGRAM–7690</td>
<td>Damaged Pipe</td>
<td>E. 38th St.</td>
</tr>
</tbody>
</table>
Pipe and Manhole Inspections Summary

**TOTALS**
- **Manhole Inspections:** 2901
  (23% of the manholes associated with the 100 year old sewers)
- **Pipe Screening:** 110 miles
  (29% of the 100 year old sewers)

- **Sewershed J**
  - Manhole Inspections: 2027
  - Pipe Screening: 75 miles
- **Sewershed M**
  - 70% Complete in year 1
  - Manhole Inspections: 874
  - Pipe Screening: 35 miles
Sewer Cleaning Summary:

- A total of 10,112 Linear Feet of sewer were cleaned during Year 1 field work.

CCTV Inspections Summary:

- A total of 18,890 Linear Feet of sewers were inspected

Findings

- 80% of the pipes were scored as structural grades 2 or 3 (good or fair condition)
- 8% were scored as structural grade 4 or 5 (poor condition/failure likely or within 5 years)

Distribution of CCTV work
Flow Monitoring Summary

• 6 flow meters installed
• 1 rain gauge
• Surcharging observed at flow meter 2 and flow meter 3 in the vicinity of south of Clark and Scranton Road
• Monitoring and analysis is ongoing to capture additional storms
Year 1 – Recommendations

- **Manholes monitor, clean, and general spot repairs:**
  A total of 25 manholes were identified to need future monitoring to evaluate for further deterioration, cleaning, or localized.

- **Manhole lining and sealing:**
  A total of 32 manholes were identified for lining and sealing the structure’s inner components to address noted structural/material deficiencies and to help limit inflow and infiltration.

- **Manhole replacement:**
  Includes 12 manholes that need excavation, demolition, installation, back fill, and site restoration to provide a complete replacement.

![Pie chart showing recommended manhole rehabilitation levels: 1 - Monitor 6%, 2 - Clean 7%, 3 - Spot Repair 23%, 4 - Line 46%, 5 - Replace 18%]
Sewers monitor, clean, and general spot repairs:
A total of 48 sewer segments were identified to need future monitoring to evaluate for further deterioration, cleaning or localized repairs.

Sewer lining:
Install lining membrane on the inside of the sewer and reconnecting the laterals to restore the sewers reliability for 17 sewer sections.

Sewers replacement:
Replace 10 sewers that need excavation, demolition, installation, back fill, and site restoration to provide a complete replacement.
YEAR 2 – TARGET MANHOLE & PIPE SCREENING

- Field Activities
  - Inspections – M, G, H, K
  - CCTV Inspection and cleaning
  - Flow Monitoring
    Install flow monitors in:
    - areas North of Chester Ave
    - West of Scranton Road
### YEAR 2 - TARGET MANHOLE & PIPE SCREENING

<table>
<thead>
<tr>
<th>Sewershed</th>
<th>Manholes for inspection</th>
<th>Sewers to be screened</th>
<th>CCTV Inspection</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>372</td>
<td>633</td>
<td>15,000</td>
</tr>
<tr>
<td>H</td>
<td>629</td>
<td>588</td>
<td>15,000</td>
</tr>
<tr>
<td>G</td>
<td>680</td>
<td>675</td>
<td>15,000</td>
</tr>
<tr>
<td>K</td>
<td>605</td>
<td>630</td>
<td>15,000</td>
</tr>
</tbody>
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QUESTIONS