City of Grosse Pointe Park

Sanitary Sewer System Improvements
August 4, 2021
Presentation Overview and Desired Outcomes

- Provide City Council an update of the recommended approach for a multi-phase sewer system improvement.
- Gain Council concurrence with the approach.
- Engage with Council for feedback on areas of focus and ideas.
- Review Schedule and Reporting.
Goals

1. “Dry out” the sanitary sewer system through removal of inflow and infiltration.

2. Model the system to optimize existing assets for wet weather capacity and storage.

3. Create system relief points to control system surcharge under extreme events.
Overview of Tasks

**Asset Management**
- Asset Inventory and Mapping Improvements
- Condition Assessment
- System Rehabilitation

**Targeted Inflow Removal**
- Connected impervious
- Ordinance Updates
- Sewer Lining

**Operations and Optimization**
- Instrumentation
- Modeling

**Resiliency**
- Plan for Management of Extreme Events
- Storage Capacity
- Outfalls and Additional Pumping

**Public Engagement**
- Education, Materials, Messaging
- Level of Service
- Annual Capital Improvement Program
- Revenue Requirements

Goal Alignment
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- 3
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Goals

1. “Dry out” the sanitary sewer system through removal of inflow and infiltration

2. Model the system to optimize existing assets for wet weather capacity and storage

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Sanitary Sewage Components

- Sanitary Sewerage (use from homes and businesses)
- Dry weather inflow/infiltration (groundwater from infiltration, foundation drains)
- Rain Dependent Inflow/infiltration (stormwater runoff, downspouts, footing drains, pipe and manhole leaks)
Common Sources of Inflow and Infiltration (I/)

On Private Property:
1. Improper foundation or roof drain connections
2. Uncapped cleanout
3. Root intrusion
4. Breaks or open joints in service lateral

In Public System:
1. Breaks or open joints in lateral or main pipes
2. Faulty manhole covers
3. Open joints or cracks in service chamber
Why should we focus on I/I removal?

• Inflow creates a higher burden on sewer infrastructure resulting in higher pump usage and system strain.
• Inflow accounts for higher annual costs for city to discharge flow to GLWA system.
• Inflow is the major source for basement backups.
• State (EGLE) requires remedial action to consider additional outfall-based resiliency improvements.
BENCHMARKING
How does the Grosse Pointe Park system compare to other communities?
GLWA Service Area
Comparison of Separated and Combined Communities

*Estimated* Average Sewer Use by Community for 2020
(gallons per capita per day)
Observation of Flow Data

Grosse Pointe Park - Average Daily Flow (MGD)
Observation of Flow Data

Grosse Pointe Park - Sanitary Sewer Components

- Sanitary
- Dry Weather I/I
- Wet Weather I/I
## Partners in Wet Weather Management

<table>
<thead>
<tr>
<th>Group</th>
<th>Actions</th>
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| **Grosse Pointe Park**             | Advance policies and projects that reduce wet weather impacts on sewer systems.  
|                                    | Develop procedures and mechanisms to optimize the existing system for storage.  
|                                    | Construct additional outfalls                                           |
| **GLWA and Adjacent Communities**  | Reduce reliance on regional system for management of extreme events.  
|                                    | Collaborate on Regional Solutions to System Relief                     |
| **Property Owners and Residents**  | Disconnect impervious areas.  
|                                    | Consider basement protective measures (check valves and sump pumps)     |
ACTION

What can the City do to advance efforts to remove I/I from the system?
Immediate Efforts to Reduce Wet Weather Inflow

- Follow up on previously completed sanitary sewer evaluations (contact downspout connections and connected parking lots).
- Perform inspections of bulkheaded connections between storm and sanitary sewer system.
- Identify inflow sources within pipes and manholes through condition assessment (Bid: Sewer Assessment Contract)
Short Term Action (Fall/Winter 2021)

• Receive CCTV (sewer assessment) inspections and issue bid for pipe and manhole condition assessments within problematic sewer districts and City at-large. *(Bid: Sewer Rehabilitation Contract)*

• Perform as-needed emergency repairs to system.
Medium Term (Construction Projects)

- Complete separation of remaining areas of connected impervious (alleys, private parking lots, street catch basins)

- Advance sewer lining and manhole rehabilitation to remove I/I
Goals

1. “Dry out” the sanitary sewer system through removal of inflow and infiltration

2. Model the system to optimize existing assets for wet weather capacity and storage

3. Create system relief points to control system surcharge under extreme events.
What is optimization?

• Operating the current sewer system to provide the maximum capacity for wet weather management.
• Identify improvements that allow for existing assets to be leveraged to accommodate larger rain events.
• Document water level within the system to align improvements with level of service goals.

Optimization requires models and system instrumentation
Instrumentation and Models

- EGLE requires calibrated hydraulic models for outfall projects like EERV.
- Models are also helpful in evaluating system operations and vetting concepts.
- Models provide an opportunity to document operational improvements and to evaluate effectiveness of new design scenarios.
ACTION

What can the City do to advance efforts to improve sewer operations?
Short Term: System Optimization

• Develop a flow metering plan and procure meters.

(Bid: Sewer Assessment Contract)

• Complete a calibrated system hydraulic model to evaluate performance and identify trends and areas of concern.

• Coordinate with GLWA on future instrumentation within and around the City.
Medium Term: System Optimization

• Design, bid and construct in-system sewer improvements to relieve over-capacity areas.
• Share findings and work with GLWA/peer communities on projects with shared benefits.
Goals

1. Dry out the sanitary sewer system.

2. Model the system to optimize existing assets for wet weather capacity and storage.

3. Create system relief points to control system surcharge under extreme events.
The case for system resiliency investments

- Rainfall events of past 10 years demonstrate that precipitation frequently exceed prior design thresholds.
- City reliant on function of surrounding systems.
- Regulatory climate is changing to be more open to relief systems.
- Feedback reveals strong community support.
What can the City do to boost system resiliency?
Resiliency Starts with Community Engagement

Education and Outreach
Web Content, Newsletters and Outreach Tools, Workshops and Work Groups

Dialogue on “Level of Service”
Identify design objectives
Develop understanding of infrastructure options and effectiveness

Rate Sufficiency Review and Funding Alternatives
Align funding with Level of Service
Identify funding sources
Resiliency: From Dialogue to Construction

- Model system and replicate conditions to satisfy regulatory requirements.
  - Develop multiple concepts for consideration
    - EERV
    - Pumping Systems
    - Additional In System Storage
    - Basement protection (check valves/sump pump retrofits)
- Evaluate based on effectiveness for design event and present to community as a level of service discussion
  - Perform rate sufficiency analysis
  - Select preferred alternative
- Permit and Construct improvements
REPORTING

How should we track progress and keep the community informed?
Monitoring Progress and Planning

Updates
• Periodic project updates to Council

Dashboard
• Annual metrics reporting with check-ins

Master Plan
• Development of a Sanitary Sewer Master Plan that can be integrated into City Infrastructure CIP to coordinate projects (reduce impacts to residents)
# Benchmarking and Goals

## Example Reporting

<table>
<thead>
<tr>
<th>Unit of Measure</th>
<th>Reporting Metric</th>
<th>Target</th>
<th>Trend</th>
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</thead>
<tbody>
<tr>
<td>1-5 (score)</td>
<td>Average condition rating of sewer system based on CCTV analysis</td>
<td>TBD</td>
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<tr>
<td>Square Feet</td>
<td>Impervious areas disconnected from the sanitary sewer system</td>
<td>TBD</td>
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<tr>
<td>Gallons per year</td>
<td>Estimated (computed) volume removed from the sanitary sewer system</td>
<td>TBD</td>
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<tr>
<td>Gallons per capita</td>
<td>Average gallon per capita per day based on GLWA flow balance computations.</td>
<td>TBD</td>
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<tr>
<td>Downspout (each)</td>
<td>Total number of downspouts connected/disconnected</td>
<td>TBD</td>
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REVIEW OF SCHEDULE

What does the next year look like for this effort?
## Project Schedule

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<thead>
<tr>
<th>Task</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
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<tbody>
<tr>
<td></td>
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<td>Fall</td>
<td>Winter</td>
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<tr>
<td>Asset Inventory</td>
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<tr>
<td>Sewer Condition Assessment</td>
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<td>Sewer Rehabilitation</td>
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<td>Sewer Flow Metering</td>
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<td>Model Development</td>
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<td>Alternatives Analysis</td>
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<td>Level of Service and Funding</td>
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<td>Resiliency Projects*</td>
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*Pending EGLE approval

- **Design/Study**
- **Bidding**
- **Construction**
DISCUSSION AND QUESTIONS