Stormwater Program
Funding Needs

Village of Niles
Tom Powers, Village Engineer
Jeff Wickenkamp, Hey and Associates, Inc.
Outline

• Niles Historic Context
• General Stormwater Planning
• Determining Program Needs
• Niles Case Study
Historic Context

Niles experienced extensive flooding in:

• 1987 and years prior
• 1996
• 1998
• 2002
• 2008 *
• 2010
• 2011
• 2013

Disaster declarations by President
*Straw that broke the camels back?
Following 2008 storms there appeared to be a paradigm shift…..
Ten Years since 2008 Hurricane Ike

• 2008 - Formed Stormwater Commission
• 2009 - Stormwater Commission Internal Report
• 2010 - Hired Professional Stormwater Experts (Hey and Associates, Inc.)
• 2012 - Stormwater Relief Program
• 2014-2016 - Major Stormwater Projects Construction (expedited by Mayor)
• 2018 - Stormwater Management Plan Update
“Stormwater Management” Planning

- Watershed Plan
- Watershed Based Plan
- Watershed Masterplan
- Subwatershed Plan
- Basin Plan
- Stormwater Management Plan
- Comprehensive Stormwater Management Plan
- Stormwater Master Plan
Interactive Process

- What is being done now?
- What should be done?
- What are the costs of providing these services?
- How will we pay for it?
- When will we do it?

Stormwater Master Planning Effort

Plan Owner Consultant Stakeholders

- Recommended program
- Definition of responsibilities
- Estimated program costs
- Action Plan
Define Required/Baseline Services

• Required programs such as:
  – MS4
  – WMO I&I Control Program

• What are we already doing?
  – Maintenance and repairs
  – GIS upkeep
  – Resident Assistance
Objectives - What are we trying to do?

• Will vary by community, especially desired/expected level of service
Program Needs – System Inventory

• Sewers/outfalls
• Waterways
• Stormwater management facilities
• Open space/ natural areas
• Drainage problems
Program Needs – Residential Assistance

What Can You Do At Home?

Figure 9.1: Types of urban beehives that can affect a residence. (Credit: Modified from Institute for Catanesean City Rehabilitation, 2006)

<table>
<thead>
<tr>
<th>Mitigation Options</th>
<th>Overall</th>
<th>Infiltration</th>
<th>Seepage</th>
<th>Drainage</th>
<th>Estimated Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural protection</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td>$150-$1,000 each</td>
</tr>
<tr>
<td>Rainwater harvesting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attic maintenance</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Downspout disconnection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soaking, dimensional check</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swale gardens</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permeable pavement</td>
<td>x</td>
<td>$50-$200 per square foot</td>
<td>$20-$50 per square foot</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exterior shut off</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheel and floor sources</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seepage pump with check valve</td>
<td>x</td>
<td>$400-$1,000 each</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drainage systems</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Installation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$2,000-$10,000</td>
</tr>
</tbody>
</table>
Program Needs – Environmental Quality

- Water quality improvements
- Addressing degradation
- Restoration/Enhancement
  - Streams
  - Lakes/ponds
  - Wetlands
  - Open space
  - Retrofits
Program Needs – Public Information and Outreach

- Outreach events
- Website
- Guidance documents
Niles Stormwater Program Approach

**Regulatory Program**
- Niles Ordinance
- County Ordinances
- State/Federal Regulations

**Maintenance and Monitoring**
- Slip lining
- Catch basin cleaning
- Flow monitoring

**Capital Improvements**
- Tier 1 Projects
- Tier 2 Projects
- Small Projects

**Flood Control Assistance**
- Flood control systems
- Floodproofing

Village of Niles
Stormwater Relief Program
2012 Program Funding

- Initial funding level of $15 million was established
- 2012 program recommendations were tailored to funding

<table>
<thead>
<tr>
<th>Summary of Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tier 1</strong></td>
</tr>
<tr>
<td>Three projects totaling $14,560,000</td>
</tr>
<tr>
<td>- Cleveland Relief Sewer</td>
</tr>
<tr>
<td>- Lee Street Relief Sewer and Storage</td>
</tr>
<tr>
<td>- West Side Storage Basin</td>
</tr>
<tr>
<td><strong>Tier 2</strong></td>
</tr>
<tr>
<td>Six projects totaling $16,410,000</td>
</tr>
</tbody>
</table>
2012 Niles Implementation Schedule

Year | Construction | Final Engineering and Construction Services | Preliminary Engineering
--- | --- | --- | ---
1 | $500,000 | $150,000 | $50,000
2 | $1,000,000 | $250,000 | $50,000
3 | $1,500,000 | $300,000 | $50,000
4 | $2,000,000 | $400,000 | $50,000
5 | $2,500,000 | $450,000 | $50,000
6 | $3,000,000 | $500,000 | $50,000
Projects Completed

Tier 1 2012-2016
Funding Partners

- Low Interest Loans – IEPA
- Green Infrastructure Grants – RBC, MWRD, & IEPA
- Stormwater Phase II Funds – MWRD
- Community Volunteering - Coke
Flood Control Assistance

- Reimbursement for 50% of cost, up to $4,000 maximum
- Since 2012, program has provided assistance to 406 homes
- Current funding will support flood protection for 12 homes per year

Sewer backflow protection  Overland flood protection
2018 Master Plan Update

• Needed to develop new infrastructure improvement priorities
• Need cost of service analysis to develop implementation schedule and identify funding needs
Process

Data Collection
- Problem Identification
- Sewer Atlas
- Flood Records
- Resident Outreach

Solution Development
- Design Criteria
- Evaluate and Develop Concepts
- Project Prioritization

Reporting
- Open Houses
- Media
- Commission Meetings
- Board Presentation

Project Start August 2016
Planned DC Duration: 2 months
Actual DC Duration: Ongoing

Meetings:
Planned Number of meetings: 5-7
Actual meetings: 11 and counting

Project Complete January 2018
Planned Completion: May 2017
Total Duration 1.5 years
Data Collection

Historic Records
- Permits
- IDOT Drawings
- Field work
- Atlas

Flood Modeling

Operations Staff
“Gut Check”
Project Prioritization

**Key Considerations:**
- Design event/Level of Service
- Structure Flooding vs. Street Flooding
- Frequency of Flooding
- Flood Depth
- Simple is better
- Where to draw the line?
- Consistent Methodology
- Problem vs. Solution Scoring

<table>
<thead>
<tr>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>First floor flooding</td>
</tr>
<tr>
<td>Structure lowest adjacent grade inundated</td>
</tr>
<tr>
<td>Arterial Street inundation Depth (100-yr event)</td>
</tr>
<tr>
<td>Local Street inundation Depth (100-yr event)</td>
</tr>
<tr>
<td>Flooding Duration on Street &gt;12” for over 3 hrs</td>
</tr>
<tr>
<td>Sewer Type</td>
</tr>
</tbody>
</table>

Scenario Modeling
Project Prioritization

Biggest Bang for the Buck!
2018 Infrastructure Improvements Prioritization

Percent of Total Benefits Provided by Project Quartiles 1 through 4

- **Q1**: Cost $16.7M; 49% of Benefits; 176 Homes with flood risk reduction
- **Q2**: Cost $16.6M; 28% of Benefits; 128 Homes with flood risk reduction
- **Q3**: Cost $25.9M; 15% of Benefits; 123 Homes with flood risk reduction
- **Q4**: Cost $29.7M; 9% of Benefits; 75 Homes with flood risk reduction

Legend:
- Quartile 1 Projects
- Quartile 2 Projects
- Quartile 3 Projects
- Quartile 4 Projects
## Six Quartile 1 Priority Projects

<table>
<thead>
<tr>
<th>Proj No.</th>
<th>Project Name</th>
<th>Project Considerations</th>
<th>Next Step for Implementation</th>
<th>Total Project Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>17-3</td>
<td>Seward Relief Sewer Connected to Existing Box Culvert</td>
<td>Proposed sewers will require coordination with Morton Grove and the FPDCC.</td>
<td>Perform expanded feasibility analysis and secure initial approvals before detailed design work is initiated.</td>
<td>$710,000</td>
</tr>
<tr>
<td>17-14A</td>
<td>Churchill Avenue Sewer Overflow Connection</td>
<td>The design for this project has been completed. The benefits for this project would be diminished if project 17-14B was later constructed.</td>
<td>Review 17-14B. Determine if village wishes to proceed with construction.</td>
<td>$170,000</td>
</tr>
<tr>
<td>17-26</td>
<td>Cleveland Sewer Extension - South</td>
<td>This work extends the benefits of the Cleveland Relief sewer further south off its west end. Projects of this nature were anticipated during the planning of the Cleveland Sewer project.</td>
<td>Proceed with preliminary engineering.</td>
<td>$700,000</td>
</tr>
<tr>
<td>17-13</td>
<td>Greenwood and Church Above Ground Storage Basin and Conveyance Improvements</td>
<td>An initial feasibility study was conducted in 2016 for this project. The project proposed at this time consists of an above ground basin which may not be consistent with the village’s ultimate goals for the property.</td>
<td>Determine level of engineering support required as site planning process unfolds. Support as necessary.</td>
<td>$6,680,000</td>
</tr>
<tr>
<td>17-9C</td>
<td>Jonquil Terrace Regrading</td>
<td>Project involves construction of a pedestrian way onto FPDCC property and will require FPDCC approval.</td>
<td>Prepare detailed project concept plan for review and approval by FPDCC.</td>
<td>$350,000</td>
</tr>
<tr>
<td>17-7A</td>
<td>Oconto Conveyance Improvement - Large Sewer</td>
<td>This is a major project that extends storm sewer service in a manner that is similar to the Cleveland Relief Sewer. Complex issues exist regarding alignment, utilities and regulatory approvals.</td>
<td>Conduct expanded feasibility study to further address project complexities and refine cost estimate.</td>
<td>$8,130,000</td>
</tr>
</tbody>
</table>

**Prioritized Quartile 1 Projects Total:**

$16,740,000
# Project Costs and Duration

*(Project17-3 sample)*

<table>
<thead>
<tr>
<th>Phase</th>
<th>Duration (months)</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering</td>
<td>6</td>
<td>$78,000</td>
</tr>
<tr>
<td>Permitting</td>
<td>6</td>
<td>$9,000</td>
</tr>
<tr>
<td>Bidding/Contracting</td>
<td>4</td>
<td>$5,000</td>
</tr>
<tr>
<td>Construction</td>
<td>12</td>
<td>$615,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>28</strong></td>
<td><strong>$710,000</strong></td>
</tr>
</tbody>
</table>
Costs for Current Program

- Identify costs of "wants"
  - $500,000
  - $1,000,000
  - $1,500,000
  - $2,000,000
  - $2,500,000
  - $3,000,000
  - $3,500,000

5-Year Implementation Schedule

- Construction
- Bidding/Contracting
- Permitting
- Engineering

Months:
- 6
- 12
- 18
- 24
- 30
- 36
- 42
- 48
- 54
- 60
Next Steps (for Niles)

• Present Plan for adoption by Board of Trustees
• Continue to establish annual budgets for Maintenance and Cost Share Program elements
• Coordinate with Finance director and Finance Committee on future infrastructure improvements program and funding.
• Discuss prospect of additional dedicated revenue source for stormwater management capital needs
Summary

- History
- Stormwater Master Planning
- Nile case study
  - Defining need
  - Solutions Engineering
  - Project Prioritization
  - Implementation Schedule

Questions?