**Flood Facts**

Most damaging floods of record:
- Oct 1955 (depths of flooding over 8 feet)
- Jun 1972 (over 50% of the Village was damaged)
- Sep 1975 (over $100M in damages)
- 2 reported deaths

**Record peak flow in the study area peaked in 4-6 hours = Storm of Record**

- Damaged over 300 residential and 100 commercial structures
- Over $50M in damages

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**Study Area Facts**

- 24 sq mile study area
- Flood-prone, high risk area due to low-lying topography
- 100yr floodplain almost equals 500yr floodplain
- Constricted flow due to:
  - Small bridge openings
  - Inadequate channel flow capacity
  - Channel constrictions and severe bends
  - Fully developed floodplain
- Over 700 structures are in 100 yr floodplain
  - 70% residential
  - 30% commercial

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**Alternatives Assessed**

The GRR Analyzed 8 alternatives, one of which was optimized, using the following methods:

- Structural:
  - Floodwalls
  - Buyouts
  - Levees
  - Retaining walls
  - Diversions
  - Channelization
  - Bridge modification

- Non-Structural:
  - Buyouts
  - Reservoir management
  - Evacuation/flood warning
  - Structure elevation
  - Wet/Dry floodproofing

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**Project Facts**

Channel Work:
- Mamaroneck Upstream 2,300 ft
- Mamaroneck Downstream 2,400 ft
- Sheldrake 2,800 ft

Channel Width Size:
- Mamaroneck 45 ft
- Sheldrake 25-33 ft

Retaining Walls:
- Mamaroneck 1,545; 1,715 ft
- Sheldrake 5,400 ft

Bridge Removal/Replacement:
- Ward Ave., Waverly Ave., 3 pedestrian bridges
**Recommended/NED Plan**
- Estimated to reduce damages by $3.4 million annually
- 87% reduction (percent risk) in main floor flood damage of structures
- Provides approx a 4.6 ft reduction in water surface elevations at the confluence (Columbus Park area) thereby reducing the risk of damages associated with flood events
- Provides approx a 2.8 ft reduction along the upper Sheldrake River thereby reducing the risk of damages associated with flood events
- Provides a non-structural solution in Harbor Heights (floodproofing and/or elevation out of 100 yr floodplain) reducing the risk for damages associated with flood events
- Reduces risk of failing existing project components such as retaining walls
- Provides flood risk mgt from a 2% to a 0.5% flood event (50 yr flood event up to a 200 yr flood event)

**Feasible**
- Plan is technically feasible
- Plan is economically justified (NED Plan)
- Cost-shared 65% Fed, 35% Non-Fed; Fed fully funded, awaiting NF share; Governor commitment 3 Sep 2021

**Acceptable**
- Plan is environmentally acceptable
- Plan is NEPA compliant; ATR and IEPR are complete
- NAD and HQUSACE reviews show policy compliance
- Public meetings/comments indicate public support
- NYSDEC and Westchester Co. have fiscally and contractually supported the Feasibility Study and the PED Phase of the authorized project

**Sustainable**
- No Federal long-term requirements
- Sponsor OMRR&R; NYS; County and Village have full capability

**Suitable**
- Residual Risk - annual exceedance probability 0.5-2% (50 to 200-yr event)
- Resilience – economic resiliency of businesses; allows emergency vehicles to respond in prev. flooded areas; recovery is accelerated due to improved drainage
- Reliability – based on a proven engineering solution that will be able to withstand multiple storms
- Adaptability – channel modification and non-structural project features can be modified to address climate change, if required

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**Study Team, Sponsor & Stakeholders**

**New York District: as of Sep 2021**
- Col. Luzzatto, District Engineer
- Clifford S. Jones, III, Chief, Planning Division
- Mark F. Lukia, Project Manager
- Karen Baumert, Project Planner
- Matthew Voisine, Project Biologist
- Warren LaRiviere, Real Estate Division
- Jamal Sulayman, Project Engineer

**New York State Department of Environmental Conservation**

**Westchester County**

**Village of Mamaroneck**

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**Project Cost Summary**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
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</thead>
<tbody>
<tr>
<td><strong>Project Total First Cost</strong></td>
<td>$82,252,000</td>
</tr>
<tr>
<td><strong>Federal Project Cost (65%)</strong></td>
<td>$53,464,000</td>
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<tr>
<td><strong>Non-Federal Project Cost (35%)</strong></td>
<td>$28,788,000</td>
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<tr>
<td><strong>LERR</strong></td>
<td>$19,150,000</td>
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<tr>
<td><strong>Lands &amp; Damages</strong></td>
<td>$4,950,000</td>
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<tr>
<td><strong>Relocations</strong></td>
<td>$12,000,000</td>
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<tr>
<td><strong>Non-Federal Cash Balance</strong></td>
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<tr>
<td><strong>BCR</strong></td>
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<tr>
<td><strong>Annual Cost</strong></td>
<td>$3,650,000</td>
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<tr>
<td><strong>Annual Benefits</strong></td>
<td>$3,820,000</td>
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<td><strong>Annual Net Benefits</strong></td>
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<td><strong>Annual OMRR&amp;R</strong></td>
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<tr>
<td><strong>Interest During Construction</strong></td>
<td>$4,110,000</td>
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</tbody>
</table>

*Based on Chiefs Report signed 14-Dec-17

**FY21 First Costs**
- BCR 1.3**
- **$88,057,000** (at 7%) 0.6

**Real Estate Summary**

<table>
<thead>
<tr>
<th>Type of Easement</th>
<th>Acres</th>
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<tr>
<td>Channel Improvement</td>
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<tr>
<td>Easements (73)</td>
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<tr>
<td>Temporary Work Area Easements (55)</td>
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**Significant Dates**

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<thead>
<tr>
<th>Milestone</th>
<th>Date</th>
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<tbody>
<tr>
<td>Chief’s Report &amp; Final ROD signed by ASA(CW)</td>
<td>14-Dec-17</td>
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<tr>
<td>Construction Authorization</td>
<td>23-Oct-18</td>
</tr>
<tr>
<td>Investment Decision to start PED</td>
<td>Fed funds in-place; awaiting Non-Fed</td>
</tr>
</tbody>
</table>

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**Typical Channel with Natural Bottom**

**Typical Retaining Walls and Side Slope**

**Typical Retaining Wall and Culvert**

**Typical Retaining Walls**