

Mamaroneck & Sheldrake Rivers Flood Risk Management General Reevaluation Study



Flood Facts

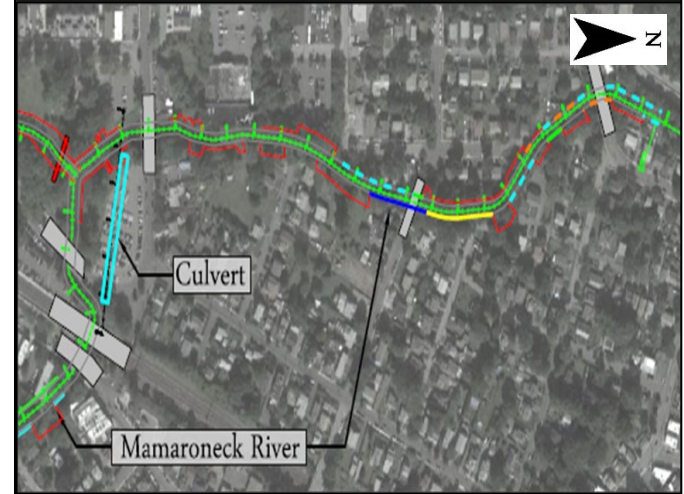
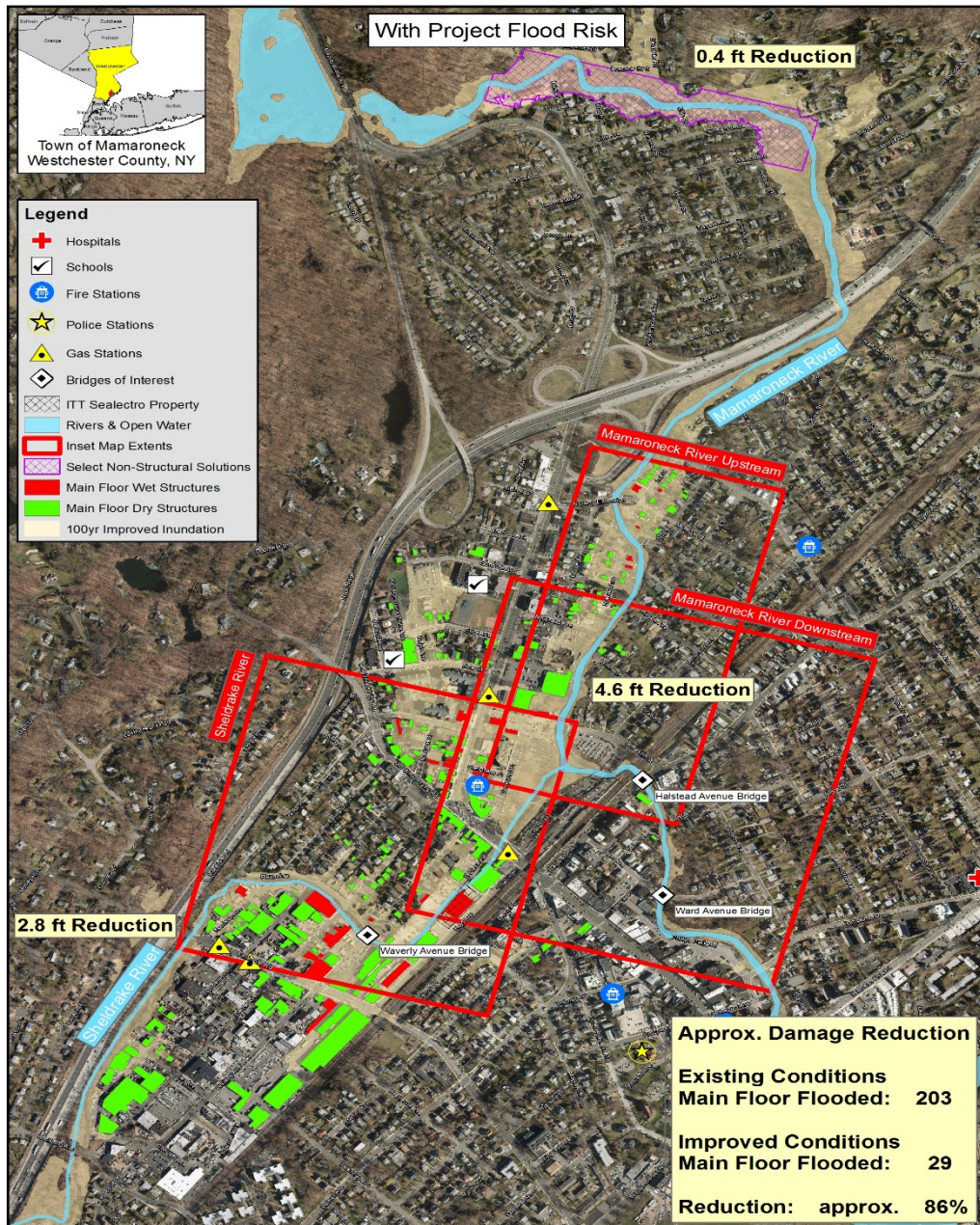
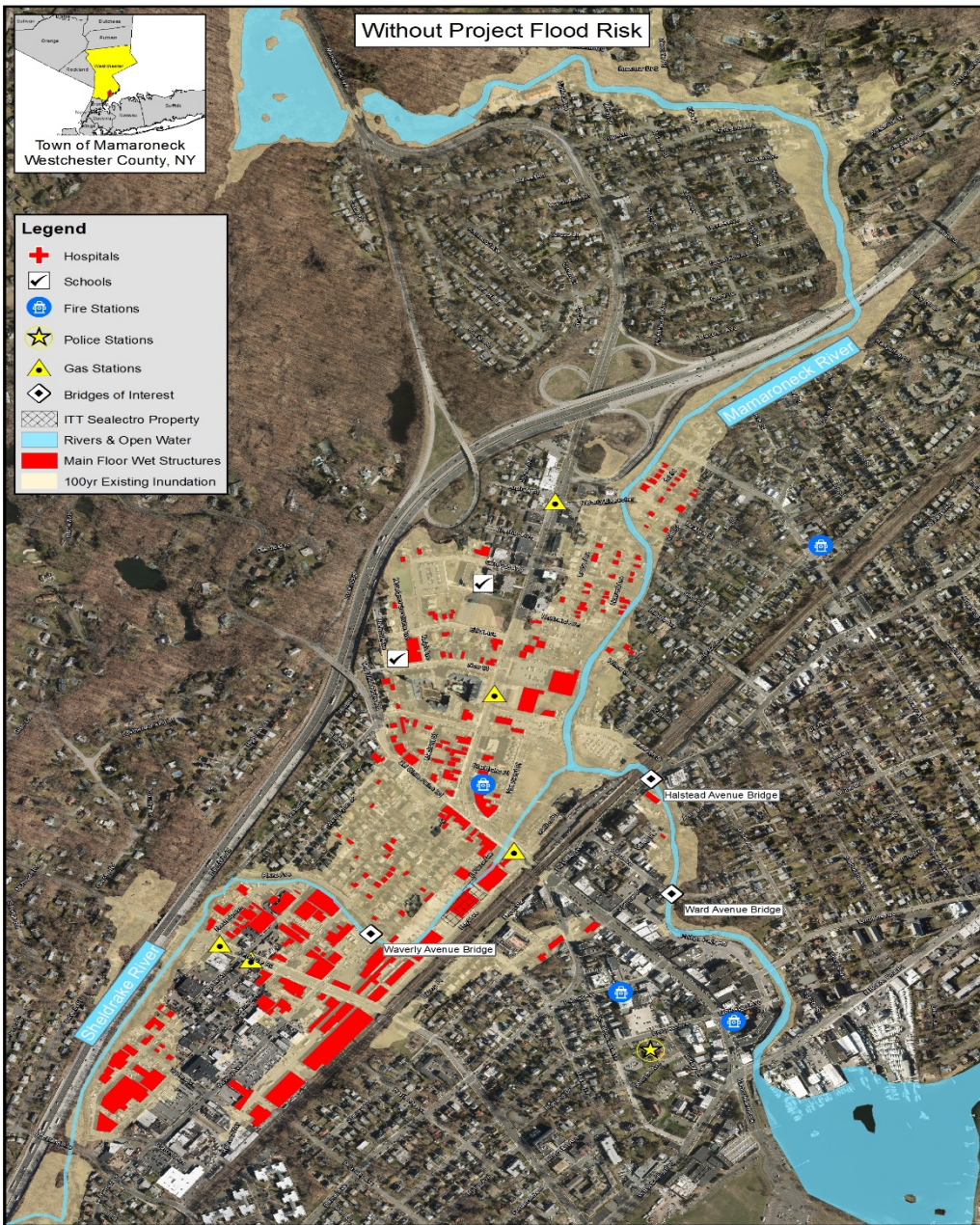
Most damaging floods of record:

- 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



April '07 Flood Facts

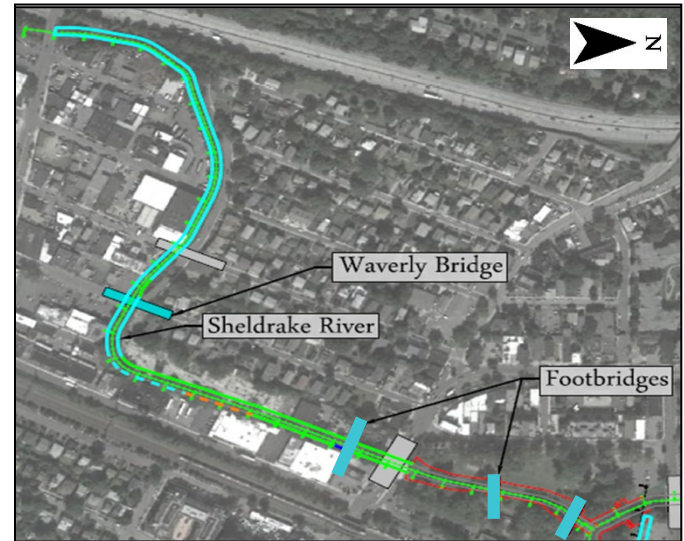
- Record peak flow in the study area peaked in 4-6 hours = Storm of Record
- Damaged over 300 residential and 100 commercial structures
- Over \$50M in damages



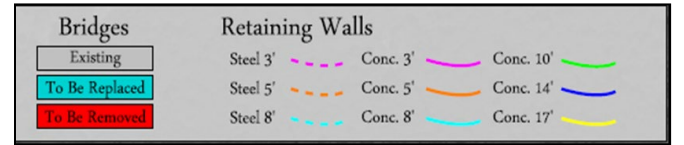
Mamaroneck River Upstream



Mamaroneck River Downstream



Sheldrake River



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

Alternatives Assessed

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

Structural:	Non-Structural:
Floodwalls	Buyouts
Levees	Reservoir management
Retaining walls	Evacuation/flood warning
Diversions	Structure elevation
Channelization	Wet/Dry floodproofing
Bridge modification	

Project Facts

Channel Work:	
Mamaroneck Upstream	2,300 lf
Mamaroneck Downstream	2,400 lf
Sheldrake	2,800 lf
Channel Width Size:	
Mamaroneck	45 lf
Sheldrake	25-33 lf
Retaining Walls	
Mamaroneck	1,545; 1,715 lf
Sheldrake	5,400 lf
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)
- ✓ Resiliency – 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

Project Cost Summary

Project Total First Cost*	\$82,252,000
Federal Project Cost (65%)	\$53,464,000
Non-Federal Project Cost (35%)	\$28,788,000
LERR	\$19,150,000
Lands & Damages	\$4,950,000
Relocations	\$12,000,000
Non-Federal Cash Balance	\$7,140,000
BCR	1.05
Annual Cost	\$3,650,000
Annual Benefits	\$3,820,000
Annual Net Benefits	\$170,000
Annual OMRR&R	\$360,000
Interest During Construction	\$4,110,000

*Based on Chiefs Report signed 14-Dec-17

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

**Based FY 21 price levels and 2.5% discount rate

Real Estate Summary

Type of Easement	Acres
Channel Improvement Easements (73)	14.3
Temporary Work Area Easements (55)	7.8

Significant Dates

Milestone	Date
Chief’s Report & Final ROD signed by ASA(CW)	14-Dec-17
Construction Authorization	23-Oct-18
Investment Decision to start PED	Fed funds in-place; awaiting Non-Fed



Typical Channel with Natural Bottom



Typical Retaining Walls and Side Slope



Typical Retaining Wall and Culvert



Typical Retaining Walls

Study Team, Sponsor & Stakeholders

New York District: as of Sep 2021

Col. Luzzatto, District Engineer
Clifford S. Jones, III, Chief, Planning Division
Mark F. Lulka, 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



Department of Environmental Conservation

Westchester gov.com