



# Project Profiles for Niagara & Orleans Region





# TABLE OF CONTENTS

---

Olcott Harbor .....	4
Village of Youngstown Waterfront.....	8
Lewiston Landing .....	10
Village of Wilson WWTP.....	12
Olcott Beach Berm .....	16
Sunset Island West Barrier Bar .....	18
Townline Pier .....	20
Town of Somerset Multiple Use Site (MUS) .....	22
YMCA Camp Kenan .....	24
Wastewater Infrastructure .....	26
Submerged Structures .....	28
Lakeshore Rd. (Route 97) .....	30
Lakeside Park Rd. East.....	32
Yates Town Park and Expansion .....	34
Lakeside Park Rd. West .....	36
Public Town Rd. Ends/Culverts .....	38
Thompson Dr. ....	40
Route 237 Right-of-way .....	42
Publicly Owned Regional Docks and Boat Launches .....	44

# ICONS/ACRONYMS FOR NIAGARA & ORLEANS REGION



Project location



Project owner



Approximate cost

Acronym	
ft	Feet
IMA	Intermunicipal Agreement
LF	Linear Feet
MOU	Memorandum of Understanding
MUS	Multiple Use Site
NEC	National Electric Code
NEPA	National Environmental Policy Act
NTS	Not to Scale
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOS	New York State Department of State
NYSDOT	New York State Department of Transportation
REDI	Resiliency and Economic Development Initiative
SEQR	State Environmental Quality Review Act
TPA	Tourism Promotion Agent
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
UV	Ultraviolet
WWTP	Wastewater Treatment Plant

# OLCOTT HARBOR

Olcott Harbor, a recreational harbor located at the mouth of Eighteenmile Creek, was subject to flooding and wind-driven waves in both 2017 and 2019. This project seeks to mitigate negative effects from flooding of Olcott Harbor through a comprehensive approach to address critical assets.



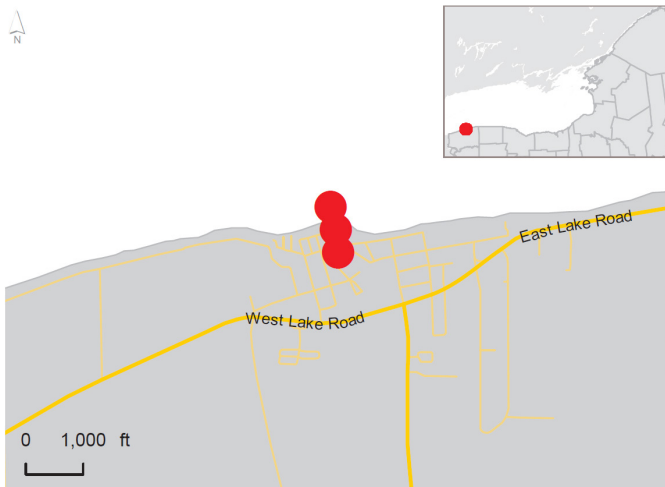
Town of Newfane,  
Niagara County



Town of Newfane



15,707,000



*Western extent of Olcott Harbor  
with high water condition*

## Mitigation Measures

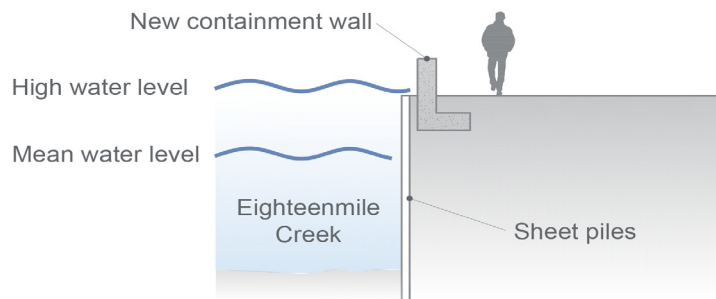
Proposed mitigation measures in the project will consist of:

- Olcott Harbor pump station 6 is adjacent to the shoreline, and high water level(s) and flooding have threatened its function. Pump station 6 is at a high risk of failure posing an immediate public health risk that would result in limited sanitary sewer service for the Hamlet of Olcott and additional residences in the Town of Newfane.
- Modifications to the eastern and western containment walls would consist of modifying sheet pile walls and/or modifications of existing bulkhead(s) to achieve a recommended flood protection elevation. The footprint of the eastern extent would be approximately 670 ft in length; the western containment wall would extend 750 ft from the Olcott Harbor Yacht Club and connect to an existing concrete structure (providing shoreline protection to the yacht club).

- The existing federal piers at the mouth of Olcott Harbor provide protection from easterly and westerly winds. However, there is currently a lack of protection from northerly winds and associated wave action. Installation of an offshore breakwater approximately 200 ft north of the existing federal piers, oriented to protect against northerly winds, would reduce the amount of wave action and flooding in the harbor.

This breakwater is proposed to be 650 ft in length and would provide for a maximum of one-foot waves in the harbor, consisting of a cellular steel sheet pile with a concrete cap. The offshore breakwater design has been completed. In addition, replacement of permanent dock structures with floating docks and construction of new dock structures is included in this scope of work to increase the recreational value of Olcott Harbor.





*Containment wall along eastern and western harbor (Principle sketch, NTS)*

### Public Support and Asset Owner

The Olcott area has been a recreational destination since the 1800s, and contains numerous small businesses, including McDonough Marine, Hedley Boat Company, and the Olcott Yacht Club, which are all at risk. The town operates a marina on the western side of the harbor, and the area is densely populated with small cottages and homes. Many properties have been affected by erosion, and there has been structural damage to nearly every property in the harbor. In May 2019, the town had to close the popular Olcott Beach for the season due to extensive erosion and unsafe conditions. Additionally, the existing pump station is a critical part of the community's sanitary sewer system as it takes all the sewage from Olcott, both the east and west sides of the harbor, and north of Newfane to the town's wastewater treatment plant (WWTP). If the pump station fails, the entire hamlet is at risk. This infrastructure and these businesses are critical to the local economy, which depends on outdoor recreation, boating, and sport fishing. Therefore, the

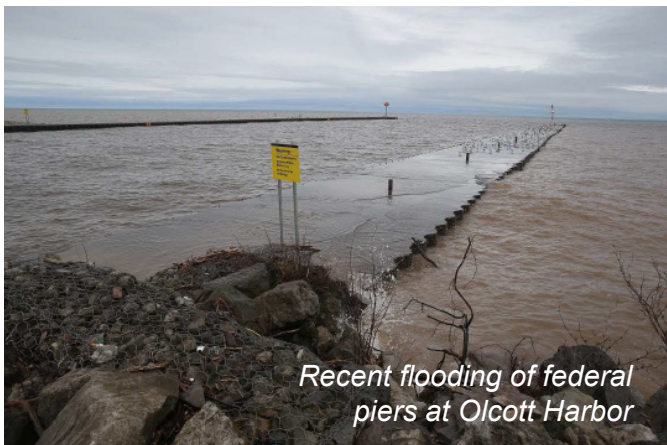
project is supported by all stakeholders involved. The asset owners are public.

### Permitting and Feasibility

Relocation of the pump station will require engineering approval and multi-jurisdictional permit review by New York State Department of Environmental Conservation (NYSDEC) and the United States Army Corps of Engineers (USACE). Stabilization of the pump station in place will require permits from NYSDOS and USACE. Multi-jurisdictional permit (NYSDEC, USACE, and New York State Department of State (NYSDOS)) and environmental review will be needed for containment walls. Cooperation of multiple private/public landowners is necessary for the overall project. Multi-jurisdictional permit (NYSDEC, USACE, and NYSDOS) and environmental review is needed for the offshore breakwater. The Town of Newfane has been meeting with involved agencies for more than a year. Project plans are being developed along with necessary engineering/environmental studies.



*Eastern extent of Olcott Harbor*



*Recent flooding of federal piers at Olcott Harbor*



*Olcott Harbor pump station 6*

State Environmental Quality Review Act (SEQR)/ National Environmental Policy Act (NEPA) review and permitting is also anticipated.

### **Benefits**

Pump station improvements will protect the sanitary sewersystemfunctionandprovidereliableoperations into the future. The containment walls will provide flood protection for critical infrastructure and public and private businesses. The offshore breakwater will protect businesses and property owners from wave-induced water damage during periods of high water. Olcott Harbor generates an estimated \$5.8 million in economic benefits, supporting more than 100 local jobs. Approximately 10,000 people live in the Town of Newfane and would benefit from this project. The harbor is a major year-round launching point for fishing in Lake Ontario; more than two dozen fishing charters operate from Olcott Harbor and help generate millions in economic impact to the area. Further disruptions to harbor operations pose a public safety concern, as the United States

Coast Guard (USCG), New York State (NYS) Police Marine Detail, and Niagara County Sheriff's Office Marine Division utilize the harbor and conduct patrols from this location.

### **Flexibility**

Various upgrades to pump stations can be considered for flood resiliency and equipment protection. As most of the proposed work for Olcott Harbor is in the design phase, project elements can be adjusted and modified during design (height, material composition, and position of the offshore breakwater), and addition/removal of project elements.

### **Durability**

This comprehensive approach will increase the durability of Olcott Harbor by providing flood protection measures to adjacent businesses, private properties and critical infrastructure, including the existing pump station that serves the Olcott service area.



## **Economic Development Potential**

The Niagara County Center for Economic Development has estimated the economic value of sport fishing to the local economy at \$30 million per year. Protecting the neighboring businesses and private establishments will enable continued growth of the local economy.

## **Environmental Considerations**

This project will avoid adverse impacts on the environment. Consideration of impacts to sediment fluxes, if not currently completed, may be needed.

## **Alternatives Considered**

No action; near-term actions to remove debris, protect against scour, and installing safety markers during high water level(s) to permit safe recreational boating; relocate pump station 6. Wendell Engineering is evaluating designs for addressing pump station 6. Alternatives include moving the pump station inland or leaving it in place with stabilization of the pump station foundation.

# VILLAGE OF YOUNGSTOWN WATERFRONT

The Village of Youngstown waterfront along the Niagara River has been negatively impacted by flooding due to high water level(s). Tourism has suffered with lost revenues to the Village of Youngstown and the Town of Porter with reduced recreational activity along the waterfront, as well as lost revenue to a privately owned jet boat business, and reduced use of the Youngstown Yacht Club facility.



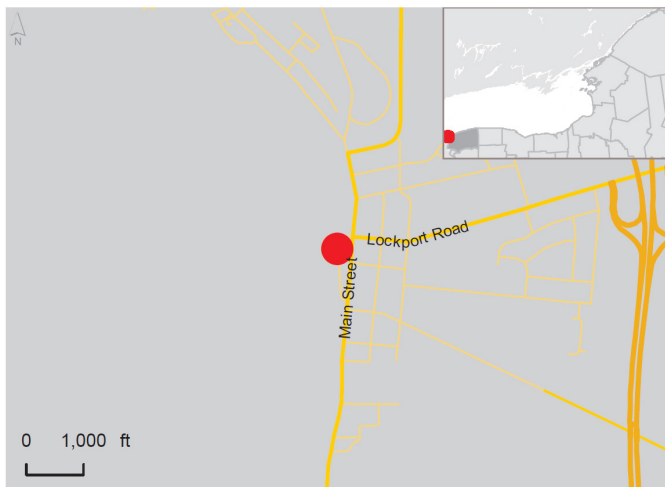
Town of Porter/Village of Youngstown, Niagara County



Town of Porter/  
Village of Youngstown



2,103,000



## Mitigation Measures

Proposed mitigation measures in the project will consist of:

- Installing shoreline stabilization measures where necessary to a higher elevation along approximately 700 LF of riverfront, matching other sections set at a higher elevation; increasing the elevation of the shoreline stabilization measure would include shoreline associated with the Youngstown Yacht Club and municipally owned waterfront adjacent to the jet boat business
- Installation of new floating dock structures to provide increased resiliency during high water level(s) to permit recreational activity to continue when river water level(s) are elevated

## Public Support and Asset Owner

Public support exists to provide shoreline protection in order to prevent future flooding of the Youngstown

waterfront. In addition, recreational boat users would benefit from floating dock structures, allowing for recreational activities to continue when water level(s) are high. The asset owner is public.

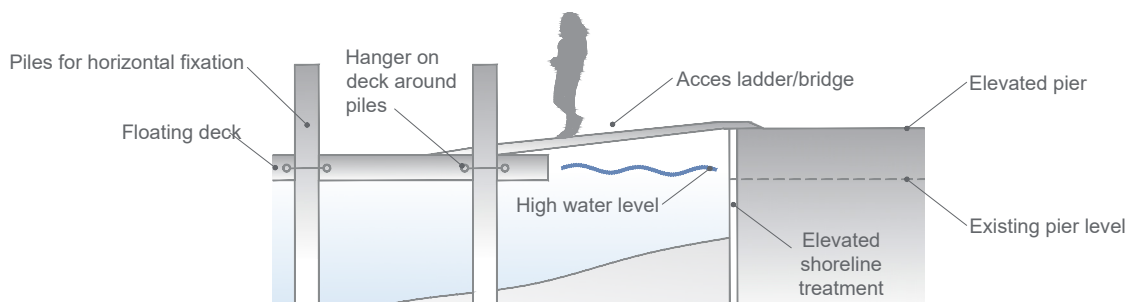
## Permitting and Feasibility

Multi-jurisdictional permit review is needed. Note that a similar scope of work is currently being constructed upstream at the Village of Lewiston. Similar permit and construction conditions exist at the Youngstown waterfront, and the ongoing Lewiston project can serve as a permitting and feasibility model for the Youngstown area along the lower Niagara River waterfront. Asset ownership is mixed, public and private.

## Benefits

Raising the shoreline protection along the waterfront provides protection to multiple assets, including village-owned property such as a boat launch and parking lot area, the Youngstown Yacht Club property, and the waterfront of a privately





*Elevated shoreline treatment and new floating docks (Principle sketch, NTS)*

owned jet boat business. This site provides a key public refueling station on the U.S. side of the lower Niagara River, which is also used by the USCG.

### Flexibility

Design and engineering will need to be completed. As noted, the scope of work is similar to the construction ongoing in the Village of Lewiston. The approach and design to the Lewiston waterfront can inform the path forward and methods used in Youngstown. In addition, the installation of new floating dock structures can be modeled after the constructed docks upstream in the Village of Lewiston.

### Durability

Once completed, the new shoreline protection will require minimal maintenance, and potential upgrades to the waterfront infrastructure (e.g., boat fueling pump and tank, and electrical) can be addressed during the removal and replacement of the existing low-elevation shoreline treatment.

### Economic Development Potential

The Youngstown waterfront is a driver of the local economy, drawing visitors and residents to the waterfront for recreation, fishing, sight-seeing, and use of the privately owned jet boat business. Protecting the waterfront area from future flooding is important to maintain water-based revenue generated by this area.

### Environmental Considerations

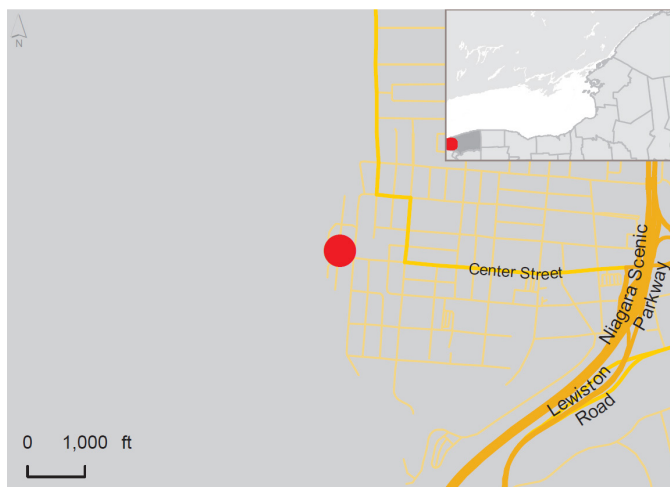
During construction, the project will avoid environmental conditions such as impacts to fish and wildlife.

### Alternatives Considered

No action; during design, consider feasibility of alternative shoreline treatments including nature-based features, habitat enhancement, or soft engineering designs.

# LEWISTON LANDING

The Village of Lewiston is rich in history and culture and home to thousands of visitors each year. Lewiston Landing, situated directly on the shoreline of the Niagara River, provides public access, is home to waterfront Whirlpool Jet Boats, and a municipal boat launch and slips. The high water level(s) from flooding along the riverfront have resulted in lost revenue due to decreased tourism.



## Mitigation Measures

Proposed mitigation measures in the project will consist of:

- Installing shoreline stabilization measures
- Construction of a new landing/pathway with railings (encompassing a middle section comprised of concrete, with brick pavers along each edge)
- Replacing existing boat docks with floating structures
- Installing new utilities for the area; fill behind the pathway to meet adjacent grades

Construction is currently ongoing, with village-owned boat slips being replaced with floating structures, and the installation of shoreline stabilization measures.



Village of Lewiston,  
Niagara County



Village of Lewiston



1,214,688



## Public Support and Asset Owner

The project is supported by local elected officials. It is in the public interest to proceed with the project, but financial support is needed to help alleviate the financial burden for the village. Asset ownership is mixed, public and private.

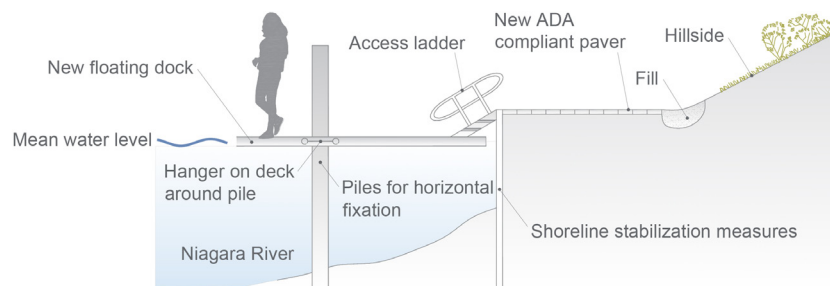
## Permitting and Feasibility

This project is ongoing. Permits have been granted to implement shoreline stabilization measures along the waterfront, and installation of the new floating docks is complete. Improved stabilization of the shoreline for the landing and the installation of floating docks helps mitigate flooding and requires relatively low maintenance once constructed.

## Benefits

Installing new shoreline stabilization measures for the Lewiston Landing area will facilitate access to several facilities along the waterfront and protect the area from future flooding. Additionally, the installation of floating docks increases the resiliency





*Shoreline stabilization measures, new paver and floating docks (Principle sketch, NTS)*

of the waterfront by allowing recreational boating during high water level(s). Bank stabilization would further strengthen the shoreline and reduce the possibility of future erosion.

### Flexibility

The construction of shoreline stabilization measures is currently permitted and underway, and the old boat slips have been removed and replaced with floating structures. Designs to reconstruct the pathway directly behind the waterfront are completed.

### Durability

This project has evaluated the appropriate height of the shoreline stabilization measures for maximum protection and to provide longevity of the work. Once completed, the shoreline stabilization measures will require minimal maintenance. Also, updated plumbing and electrical utilities in the area will be protected from flooding.

### Economic Development Potential

The Lewiston Landing is the main access to numerous waterfront activities, fishing and boating activities, and restaurants. Loss of access to these activities would reduce the overall quality of life in the area and impact the revenue earned by the Village of Lewiston. The village relies on the revenue from 28 leased boat slips and the lease from the Whirlpool Jet Boat to maintain its operating budget.

### Environmental Considerations

The project will avoid adverse environmental impacts. The project to implement shoreline stabilization measures is currently permitted, with consideration of environmental conditions.

### Alternatives Considered

No further action; if additional design is required for shoreline stabilization consider feasibility of alternative shoreline treatments including nature-based features, habitat enhancement, or soft engineering designs.

# VILLAGE OF WILSON WWTP

This project seeks to address the recurring damage and risk of flooding of critical infrastructure at the Village of Wilson WWTP. This project also seeks to provide a significant economic development opportunity by re-purposing the WWTP property adjacent to Wilson Harbor.



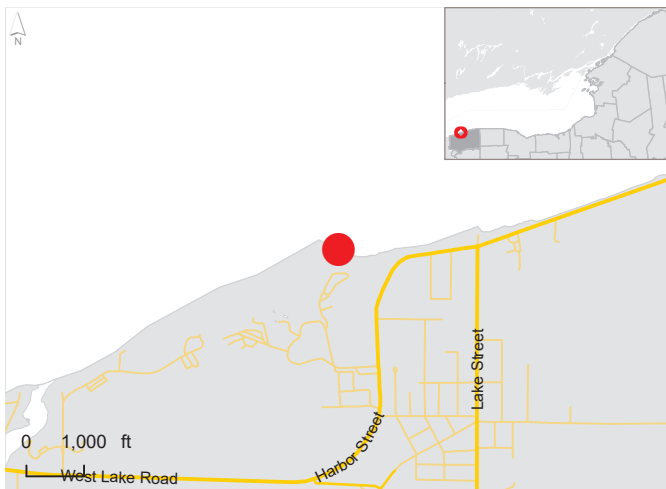
Village of Wilson,  
Niagara County



Village of Wilson



4,461,000



## Mitigation Measures

Proposed mitigation measures in the project will consist of:

- Placing additional riprap in front of the WWTP electrical box to protect sensitive electrical equipment. Protecting the electrical equipment is deemed necessary for potential future development of the site
- The village is seeking to decommission the WWTP and divert wastewater flow to the Town of Newfane WWTP through an intermunicipal agreement (IMA)
- Installing a pump station at the existing Village of Wilson WWTP
- Conveying water through a new sewer network with force mains, gravity lines, and intermediate pump stations

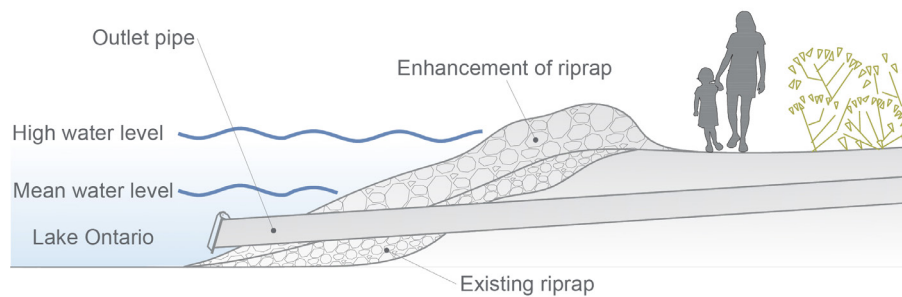
## Public Support and Asset Owner

Public support exists for this project because of the risk posed if the WWTP continues to incur damage. The location of the WWTP is not sustainable in current conditions, presenting a significant threat to public health and safety. The asset owner is public.

## Permitting and Feasibility

The installation of additional riprap to protect current electrical infrastructure at the site is considered highly feasible. Decommissioning of the WWTP and pumping to the Town of Newfane has been through conceptual design and feasibility analysis (Wendell Engineering) and is considered feasible, provided financial support is available. The Engineering Planning Study determined that the Town of Newfane WWTP has the capacity to accept wastewater from the Village of Wilson and would benefit both communities. Multi-jurisdictional permit review is needed.





*Enhancement of riprap (Principle sketch, NTS)*

## Benefits

The proposed riprap enhancement protects the electrical equipment and other flood-prone areas at the WWTP. Ultimately, decommissioning the WWTP eliminates risk of failure at this site that is directly on the Lake Ontario waterfront, and in a high-risk location from flooding. High water level(s) prevent gravity outflow(s) from the WWTP causing the potential for damage to the ultraviolet (UV) treatment system and for inadequate treatment.

## Flexibility

The riprap materials used for additional protection of the electrical infrastructure would be evaluated to allow for flexibility during implementation. In addition, conceptual designs and alternatives have been considered for the decommissioning of the WWTP and pumping to the Town of Newfane. Additional elements that maximize this approach can be identified through full engineering and design documents.

## Durability

The additional riprap material may need to be replaced over time, and proper placement and functionality verified after construction. However, there is no required routine maintenance for this aspect of the project, once proper placement of additional riprap is confirmed. Infrastructure associated with connecting to the Town of Newfane WWTP (e.g., pump station(s) and sewer network) would be designed to provide the maximum durability of the engineered structures.

## Economic Development Potential

The Village of Wilson depends on this WWTP for health and safety and it is considered critical infrastructure. Removing the risk of failure of the WWTP through decommissioning will open the waterfront parcel to future development opportunities, resulting in increased economic drivers for this area. For example, the site is located in close proximity to the Seaway Trail and Niagara

County Wine Trail. Developing the site once the WWTP is decommissioned into an economic asset is possible.

### **Environmental Considerations**

The project will avoid inadequate treatment of wastewater, which can potentially lead to health and safety concerns for the community and aquatic life in the lake. Permitting would be required.

### **Alternatives Considered**

No action; additional upgrades to the current Village of Wilson WWTP, including new methods to protect the UV treatment system (estimated at \$300,000), and additional riprap placed to protect the plant (estimated at \$150,000). Alternative natural and nature-based solutions were identified and are under consideration.





# OLCOTT BEACH BERM

Extreme high water level(s) and waves have eroded the previous berm that protected a town parking lot and a low-lying area with year-round businesses and homes. Buildings were flooded in 2017 and in 2019. This project seeks to address infrastructure and homes at near lake level with no natural protective features. Approximately 900 ft of shoreline is directly exposed to wave action from the lake.



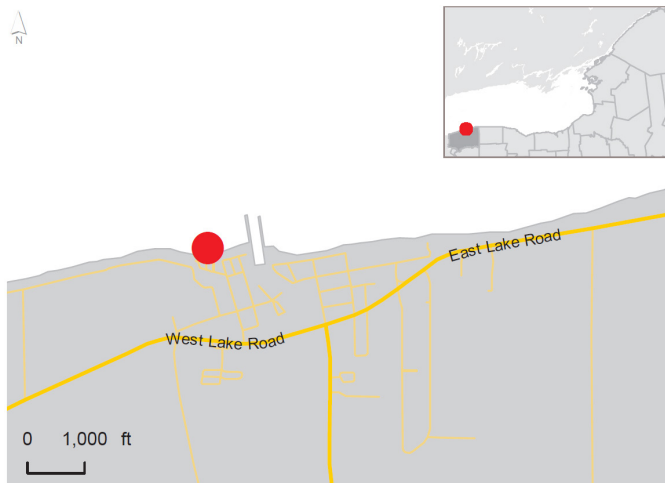
Town of Newfane,  
Niagara County



Town of Newfane



1,814,000



## Mitigation Measures

Proposed mitigation measures in the project will consist of:

- A man-made berm system with a hardened core to protect low-lying homes and other assets in the area
- Additional sand to be placed in the adjacent beach to enhance this area, which is the only swimmable beach for the community

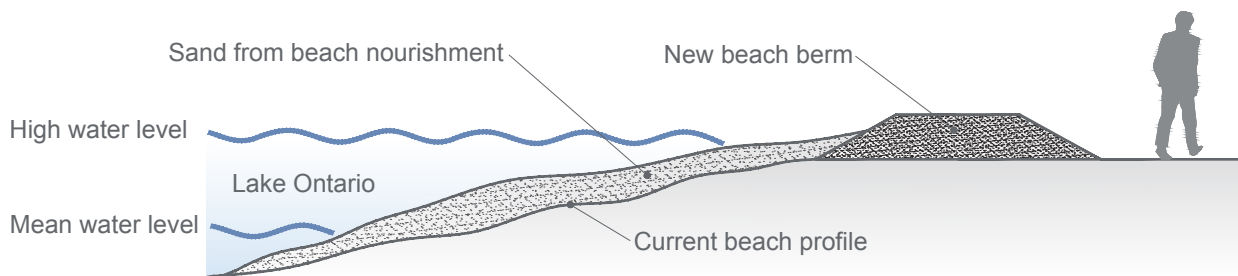
Sediment used for fill may be obtained from the dredging of Olcott Harbor, assuming the material is suitable to be used. The berm could be part of a larger flood prevention strategy, including elements behind it, such as elevated roads and a pump system. The enhancement of the beach and construction of the berm would create a long term solution to strengthen the resiliency of the shoreline and the homes, businesses, and infrastructure currently exposed.

## Public Support and Asset Owner

Public support exists for this project due to the project's ability to prevent flooding of houses, businesses, and infrastructure adjacent to the lake. Previous efforts to combat the issue were unsuccessful. A more reliable long term solution would be welcomed. The asset owners are public and private.

## Permitting and Feasibility

Multi-jurisdictional permit review is needed if berm and beach nourishment is conducted below the ordinary high water line. USACE or NYSDEC permits and NYSDOS review will be necessary for placement of berm and/or beach material below the ordinary high water line. Cooperation of multiple private/public landowners is necessary for overall project implementation.



*New berm and beach nourishment (Principle sketch, NTS)*

## Benefits

The berm protects 10 to 20 houses, businesses, and infrastructure adjacent to the lake from flooding and wave action.

## Flexibility

Elements of this project can be easily adjusted, including height, length, material composition, position, and addition or subtraction of project elements. The design will evaluate various options for equipment and material.

## Durability

The materials of construction and equipment selected would be evaluated during design to maximize durability and longevity of system.

## Economic Development Potential

This project has a moderate economic impact due to the threat to homes and businesses in the area.

## Environmental Considerations

The project will minimize adverse impacts on the environment. Environmental impacts will be evaluated for each step of the process, including berm design, dredging, and placement of material.

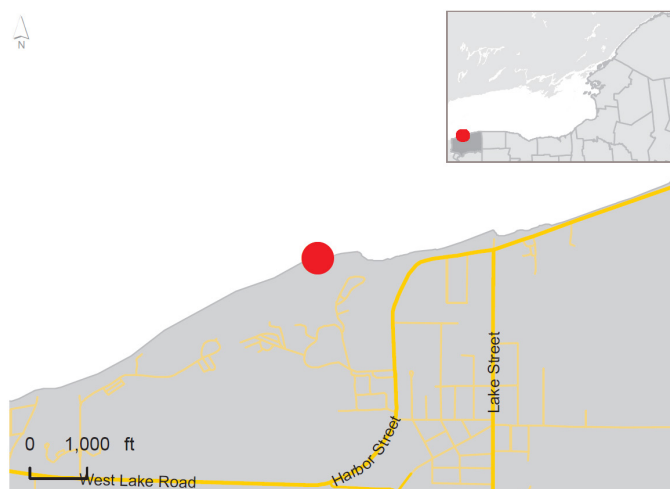
## Alternatives Considered

An alternative would be to extend the Olcott Harbor breakwater to the west to provide protection to this area. However, this approach may lead to unacceptable environmental impacts.

Concrete wave protection structures were placed after the 2017 flooding. However, these structures failed, which suggests the need for a more robust alternative.

# SUNSET ISLAND WEST BARRIER BAR

This project seeks to address the recurring breaches along a barrier bar that divides Tuscarora Bay and Lake Ontario, while maintaining a balance of natural coastal features and processes, protection of habitat, property, and infrastructure, as well as ensuring recreational access and public health and safety. The west side of Sunset Island (western barrier bar) is a low area with a flooded access road and buried utilities.



## Mitigation Measures

Proposed mitigation measures in the project will consist of:

- Modification of the road providing access to Sunset Island (i.e., widened, possibly raised) through grading and resurfacing
- Installation of 135 linear feet (LF) of shoreline stabilization

## Public Support and Asset Owner

Public support exists due to the project's ability to resist breaches and combat high water level(s) while maintaining natural features of the western bar, and provide emergency management access through road modifications. The asset owners are both public and private.



Town of Wilson,  
Niagara County



Town of Wilson



3,362,000



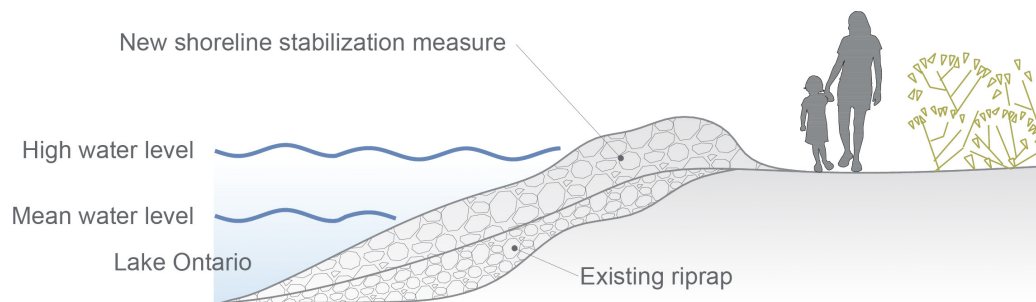
## Permitting and Feasibility

This project is considered moderately to highly feasible due to improved access, low maintenance, and stakeholder/community support. Multi-jurisdictional permit review is needed for any in-water work. The Town of Wilson has an active NYSDEC Protection of Waters permit to install 135 LF of steel pilings with toe stone to protect along the western barrier bar.

## Benefits

The proposed stabilization measure at the western barrier bar offers protection to the harbor and reduces the potential for future breaches. The road modifications will allow access to emergency management vehicles (e.g., fire trucks) and personnel. This project helps to protect more than 60 homes with overall properties valued at more than \$6 million.





*Shoreline stabilization (Principle sketch, NTS)*

### Flexibility

Elements of this project can be easily adjusted during design, including height, length, material composition, position, and addition or subtraction of project elements. This project can also serve as a basis for adaptive management if long-term management goals are not met, requiring an increased level of protection and accompanying justification.

### Durability

The proposed enhancements to the barrier bar may strengthen with time as recruited vegetative growth increases and stabilizes the shoreline. Although maintenance may be required in the short term following construction (when the protective functionality is lowest), maintenance requirements are expected to decrease over time.

### Economic Development Potential

Private homeowners are not visiting summer homes, and this takes a toll on local businesses. The western barrier bar conveys public utilities to Sunset Island and is the only land-based access to emergency management services and residents. In total, the harbor has been recently estimated to generate \$4.7 million in revenue and support around 70 jobs.

### Environmental Considerations

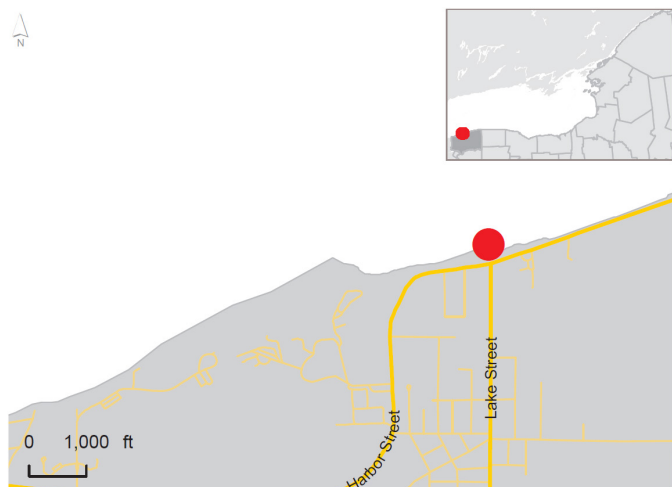
This project will minimize adverse environmental impacts. Impact to littoral and riparian habitats caused by breaches will be evaluated and considered.

### Alternatives Considered

No action; adaptive management; infrastructure protection measures; fortification using rock revetment with armored overflow with and without culvert(s).

# TOWNLINER PIER

The Townline Pier in the Village of Wilson has been negatively impacted by high-intensity wave action and erosion. In 2019, the pier was approximately two feet underwater. Enhancements to protect the pier would increase public use and potential development opportunities in the village.



## Mitigation Measures

Proposed mitigation measures in the project will consist of:

- Additional riprap to stabilize the structure, in addition to further shoreline treatments
- Raising the height of the pier to an appropriate elevation to prevent the structure from being submerged during high water level(s). This approach would permit the pier to be resilient to both high and low water levels

## Public Support and Asset Owner

Improvements that limit the pier from being submerged with high water level(s) are a public safety issue, as the submerged pier becomes a boating hazard when underwater. The asset owner is public.



Village of Wilson,  
Niagara County



Village of Wilson



1,587,000

## Permitting and Feasibility

This project is considered feasible because it will protect the pier from increased wave action, while increasing its height will make the area safe for recreational boating activity. Multi-jurisdictional permit review is needed.

## Benefits

The installation of additional shoreline treatments to stabilize the pier can provide long-term protection to the existing structure. Townline Pier is one of six identified “points of interest” in the Village of Wilson, highlighting its recreational and tourism value.

## Flexibility

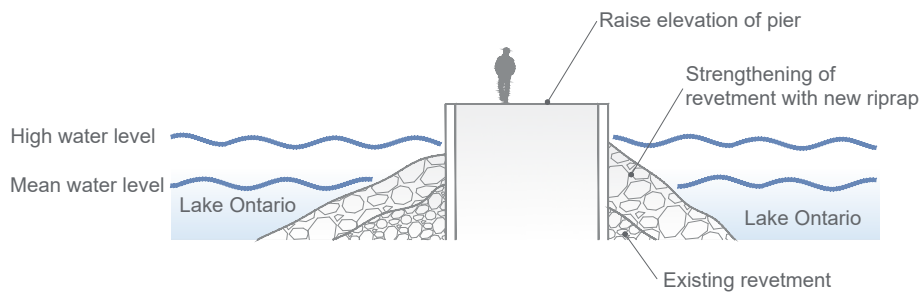
This project can be adjusted, including the height (based on anticipated lake water levels), material composition, position, and addition or subtraction of project elements.

## Durability

The pier enhancements will be made of durable construction materials as appropriate for site conditions and existing structures. Although maintenance may be required in the short term following construction, maintenance requirements are expected to decrease over time once proper construction verification is confirmed.

## Economic Development Potential

The Townline Pier serves as a location for tourism and access to the Lake Ontario waterfront in the Village of Wilson. Loss or instability of the pier would likely reduce tourism and negatively impact the local economy. Raising the pier and additional stabilization would promote public use and access



*Restored and new revetment (Principle sketch, NTS)*

of the pier and Lake Ontario to pedestrians, while protecting recreational boaters. In addition, the pier can be enhanced and promoted through the development of the current village WWTP site, which lies directly to the west of the pier along the waterfront.

### Environmental Considerations

The project will avoid adverse environmental impacts associated with continued deterioration of the pier, negatively impacting nearshore habitat. Because the pier structure is existing, changes in downstream sediment drift are not anticipated.

### Alternatives Considered

No action; mark the pier with temporary buoys when submerged to prevent hazardous condition to recreational boaters. During design, consider feasibility of alternative shoreline treatments including nature-based features, habitat enhancement, or soft engineering designs.



# TOWN OF SOMERSET MULTIPLE USE SITE (MUS)

The Town of Somerset will use property associated with the AES Somerset coal-fired power plant to address shoreline erosion for a future multi-use recreational area. The site comprises historic landfills that have been closed with cooperation from state agencies. This asset is intended to provide additional access to the Lake Ontario waterfront, as well as outdoor space for visitors to experience nature and recreate.



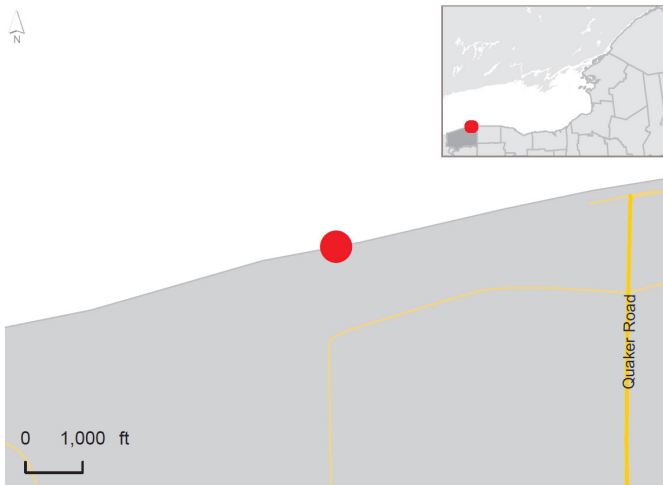
Town of Somerset,  
Niagara County



Town of Somerset



1,334,000



*Lake Ontario view from the site*

## Mitigation Measures

Proposed mitigation measures in the project will consist of:

- Shoreline stabilization along the Lake Ontario waterfront to address shoreline erosion and ultimately contribute to waterfront access from the multi-use property
- Utilizing natural or nature-based shoreline protection measures, including natural vegetative enhancements that provide shoreline stabilization and reduce erosion caused by wave action

## Public Support and Asset Owner

There is public support to provide additional waterfront access to Lake Ontario in the Town of Somerset. In addition, the site provides unique views of the lake that could be leveraged to increase tourism and economic activity, while providing open space recreation. The asset owner is currently private.

## Permitting and Feasibility

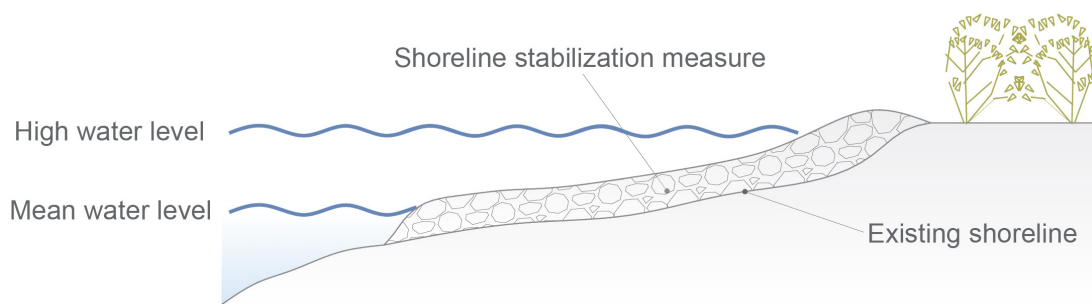
This project is considered moderately to highly feasible because it reduces shoreline erosion without requiring major structural work. The nature-based shoreline enhancements would add to the appeal of the site and allow for an uninterrupted view of the lake. The project is recommended due to the low maintenance and support for nature-based shoreline techniques. The Town of Somerset was awarded NYSDOS funding in 2019 to evaluate development of this property into a multi-use area. Multi-jurisdictional permit review is needed.

## Benefits

Protection of the shoreline will facilitate long-term access to the Lake Ontario waterfront from the multi-use property, as well as provide immediate stabilization to address erosion and bank instability caused by recent high water level(s).

## Flexibility

Elements of this project can be easily adjusted through the engineering design process, including



*Shoreline stabilization (Principle sketch, NTS)*

material composition and vegetation to provide the most effective stabilization. In addition, this potential pilot project can serve as a demonstration of nature-based shoreline techniques and a model for such applications in the Great Lakes region.

### **Durability**

Protection of the shoreline provided by a nature-based approach will increase over time as vegetation establishes and increases in density and abundance. Maintenance and verification will be required in the short term, following construction (when the protective functionality is lowest). However, maintenance requirements are expected to decrease over time.

### **Economic Development Potential**

Waterfront access in the Town of Somerset is relatively limited compared to other nearby municipalities. Creation of the future multi-use recreational area is likely to increase economic activity by driving tourism to this unique location

along the Lake Ontario waterfront (see view of the lake from the property in photo shown on previous page). In addition, there is a long-term opportunity for economic development along the waterfront to capture the anticipated increase in tourism.

### **Environmental Considerations**

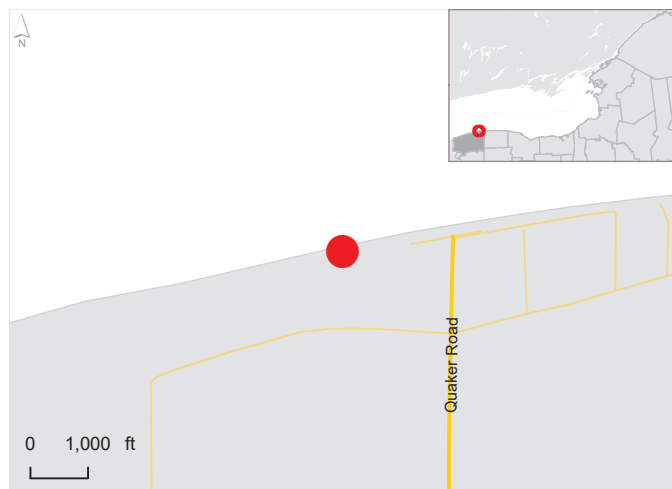
A nature-based shoreline approach will likely increase available habitat along the riparian area of Lake Ontario and the waterfront. Protection of the shoreline will also avoid impacts to the water retention facility located near the bluff edge. Environmental testing will be needed to confirm site suitability for recreational end uses.

### **Alternatives Considered**

No action; proceed with advancement of multi-use site and address shoreline erosion/protection in the future; elevated stairway to provide shoreline access. Examine site planning for multi-use recreational trail prior to finalizing shoreline stabilization designs.

# YMCA CAMP KENAN

YMCA Camp Kenan is situated on Lake Ontario, and includes more than 50 acres of scenic land for young campers to explore. The recreational property is used for camping, programs for children and civic groups, and community enhancement activities. Numerous cabins lie directly adjacent to the shoreline where flooding and erosion occur due to high water level(s) and wave action.



## Mitigation Measures

Proposed mitigation measures in the project will consist of:

- A vegetated embankment and sill along the shoreline (approximately 1,300 LF)

## Public Support and Asset Owner

The YMCA camp is a major seasonal attraction and community asset for the Town of Somerset, and it is in the public interest to proceed with the project. The asset owner is private, not-for-profit.

## Permitting and Feasibility

This project is considered moderately to highly feasible because it reduces negative impacts from high water level(s) to the camp property without requiring major structural work. Multi-jurisdictional permit review is needed.



Town of Somerset,  
Niagara County



YMCA



87,000

## Benefits

The vegetated embankment and sill would strengthen the shoreline and reduce the possibility of future erosion. Camp Kenan attracts hundreds of campers and their families each year.

## Flexibility

Elements of this project can be easily adjusted, including height, length, material composition, vegetation type, position, and addition or subtraction of project elements.

## Durability

The vegetated embankment and sill will strengthen with time as planted and recruited vegetation increases in density and abundance. Although maintenance may be required in the short term following construction (when the protective functionality is lowest), maintenance requirements are expected to decrease over time.

## Economic Development Potential

YMCA Camp Kenan serves as a seasonal socio-economic attraction in the area. Shoreline erosion and land loss threatens camp facilities, and will inhibit usage of parts of the camp property and be a potential loss of revenue.

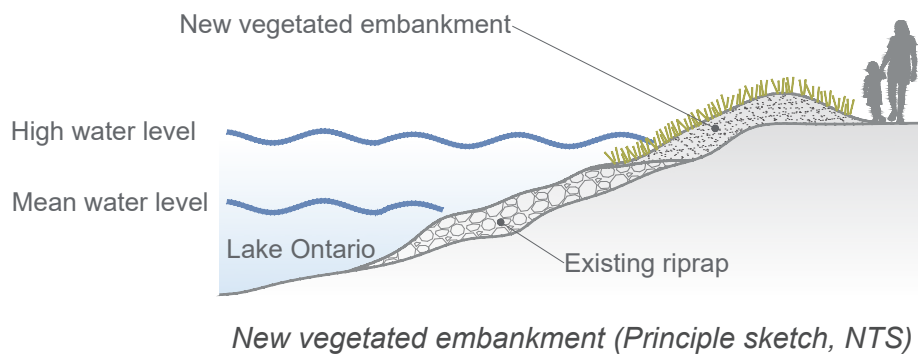
## Environmental Considerations

The project will avoid adverse environmental impacts. The addition of a vegetated embankment will likely increase available habitat for wildlife along the riparian area of the Lake Ontario shoreline.

## Alternatives Considered

No action.





# WASTEWATER INFRASTRUCTURE

Lakeside residences west of West Kendall Dr., including along Lomond Shore West, Endrose Shore, Knapp Shore, Thompson Dr., and near Lakeland Beach Rd. and Bald Eagle Dr. in the Town of Kendall, plus residences near Beachwood Park Rd. in the Town of Hamlin, are subject to reduced septic functioning during high water level(s). This project will connect these areas to a sanitary sewer and convey wastewater to a treatment facility.



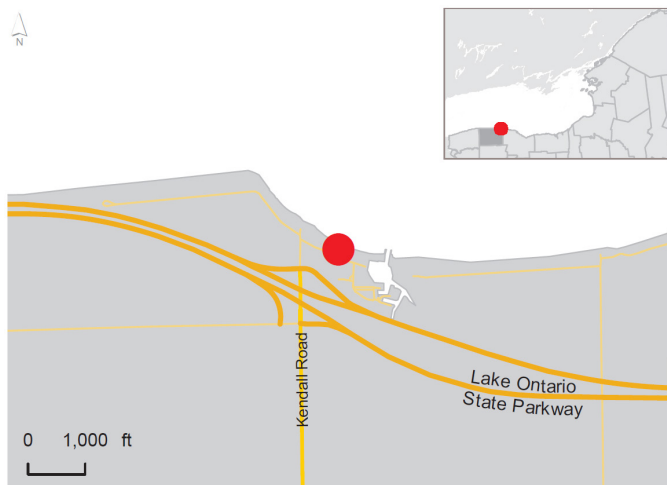
**Town of Kendall,  
Orleans County**



**Towns of Kendall and Hamlin**



**9,053,000**



## Mitigation Measures

Proposed mitigation measures in the project will consist of:

- Disconnecting homes from the septic systems and connecting them to a wastewater system
- A privately owned facility (located at Troutburg in the Town of Kendall) will be turned over to the Town of Kendall, and approximately 125 residences in the Towns of Hamlin and Kendall will be connected to the facility

## Public Support and Asset Owner

Septic system failures in this area pose a public health risk. The project will reduce this risk and it is in the public interest to proceed with the project. The asset owners are public and private.

## Permitting and Feasibility

This project is considered moderately to highly feasible because it will eliminate privately owned septic systems from being compromised when flooding occurs in the area. Eliminating the need for septic tanks and connecting residents to the wastewater system would eliminate this public health concern. Additionally, private septic system maintenance would be reduced and fall under the town's regular maintenance program for public utilities. Multi-jurisdictional permit review is needed.

## Benefits

The removal of privately owned septic tanks would reduce the septic exposure risk from overflowing tanks, protecting the environment and public health.

## Flexibility

Elements of this project can be adjusted by carefully selecting the homes along the lake that are at high risk. Those with septic tanks further from the lake are at a reduced risk of septic overflows and may not require connection to the public wastewater system. The number of homes to be connected will be evaluated during design.

## Durability

Eliminating the need for septic tanks would reduce maintenance costs for owners. Additionally, the material selected for the wastewater piping and the lining will be evaluated during design to maximize durability.



### **Economic Development Potential**

The potential for major health risks due to overflowing septic systems when the area is flooded can pose a strain on the economy. Additionally, removing septic tanks would be a reduced financial strain to homeowners, and a public wastewater system connection increases property value. Inclusion of wastewater infrastructure in this area could facilitate further economic development.

### **Environmental Considerations**

The project will avoid adverse environmental impacts.

### **Alternatives Considered**

No action; relocate or redesign septic systems (if possible).



# SUBMERGED STRUCTURES

In-lake structures throughout Niagara and Orleans Counties, when underwater, may result in hazardous boating conditions. Installing temporary safety markers is a proactive approach to protect public safety.



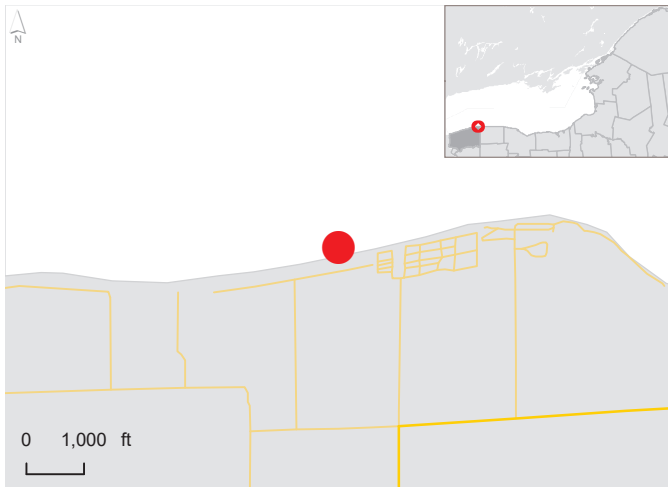
Niagara and Orleans Counties



Niagara and Orleans Counties



50,000



## Mitigation Measures

Proposed mitigation measures in the project will consist of:

- Installation of safety markers on submerged structures (e.g., piers); structures will be clearly marked by installing temporary warning buoys

## Public Support and Asset Owner

This project addresses an immediate safety concern to boaters during high water level(s) by marking submerged structures. Therefore, it is in the public interest to proceed with the project. The asset owners may be both public and private.

## Permitting and Feasibility

This project is considered moderately to highly feasible because it will provide a visible warning to boaters to potential hazards from submerged structures. Installation of temporary warning buoys does not require permits from USACE or NYSDEC, but should be coordinated with the USCG.

## Benefits

The installation of safety markings will serve as a visible warning to boaters of the potential hazard of a submerged structure(s) in the area, increasing public safety.

## Flexibility

The warning markers used for this project can be easily adjusted, including height, length, and material composition to provide the maximum level of warning to boaters.

## Durability

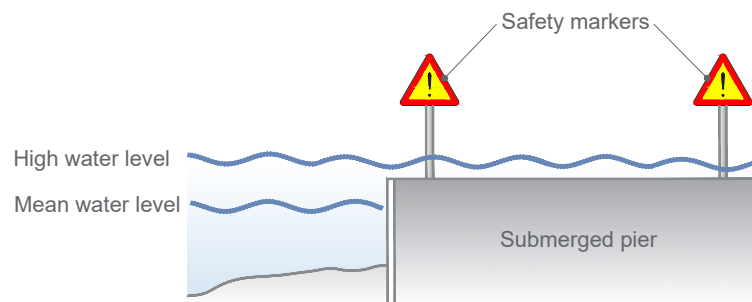
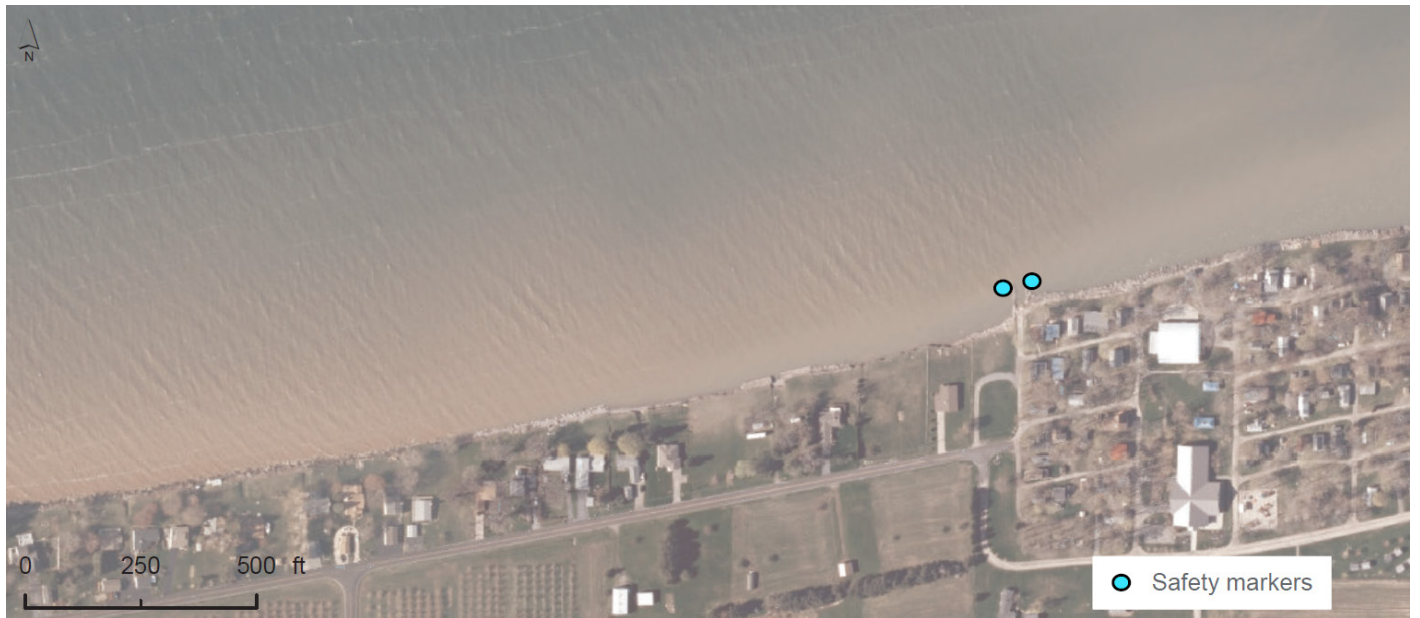
The warning markers shall be made clear, concise, and easy to read. Additionally, the markers will be installed in a manner such that they are not easily removed, hidden, or otherwise obstructed or damaged.

## Economic Development Potential

There is no real quantifiable economic development potential from this project. The safety markers would give boaters the confidence to safely navigate the waterways without fear of damage or injury. In addition, avoiding in-water accidents can provide a measure of safety to avoid mobilization of emergency management services and equipment. This is considered a proactive approach to protect public safety.

## Environmental Considerations

The project will avoid adverse environmental impacts from boaters hitting submerged structures, which may result in the release of undesired material (e.g., fuel).



*Safety marker installation (Principle sketch, NTS)*

## Alternatives Considered

No action.

# LAKESHORE RD. (ROUTE 97)

The bluff adjacent to Lakeshore Rd. (Route 97) is eroding rapidly and creating a hazardous situation for the roadway infrastructure and the water line adjacent to the road. This project seeks to address the erosion of the bluff, as well as the existing failed shoreline protection.



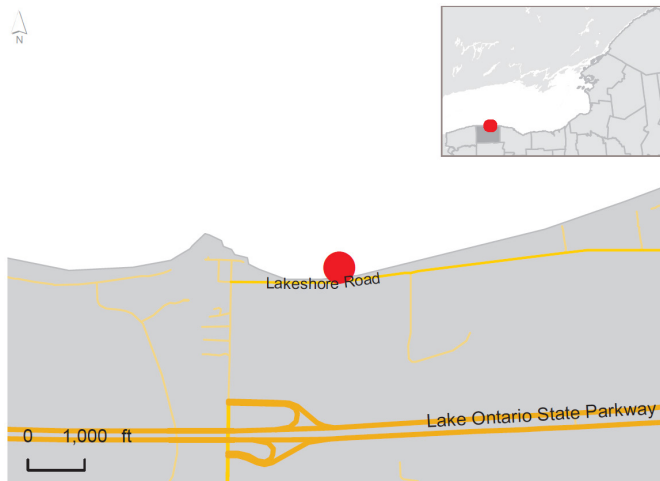
Town of Carlton,  
Orleans County



Orleans County



2,062,000



## Mitigation Measures

Proposed mitigation measures in the project will consist of:

- Protecting the toe of the bluff with shoreline stabilization measures
- Stabilizing the bluff through grading and fill (where possible)
- Vegetation along the embankment

The project assumes 1,500 ft long by 40 ft wide shore stabilization with fill and new vegetation for 10 to 20 ft of the width. During the engineering process, the project should also evaluate potential offshore protection measures.

## Public Support and Asset Owner

Public support exists for this project because Lakeshore Rd. (Route 97) is a major thoroughfare in the Town of Carlton accessed daily by area

commuters. Minimizing erosion along the shoreline would promote continued access along this route. The asset owner is public. Private property exists along the north side of the road, and cooperation will be needed for implementation.

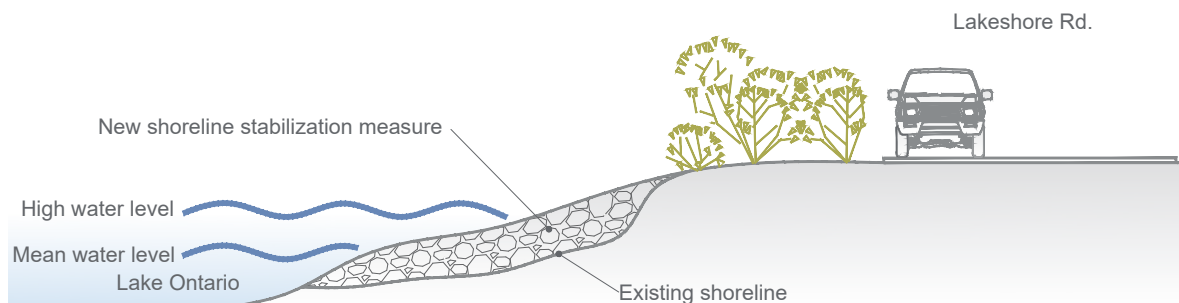
## Permitting and Feasibility

This project is considered moderately to highly feasible due to standard stabilization approaches. The project could also serve as a potential demonstration for an offshore shoal system acting as a wave break and providing fish habitat (see alternatives), should this alternative be considered. Multi-jurisdictional permit review is needed.

## Benefits

The proposed bluff and shoreline stabilization would reduce the erosion of Lakeshore Rd., protecting critical infrastructure and maintaining access along the route. Lakeshore Rd. is a major local thoroughfare. If the road were lost to erosion, approximately 10 miles of detours would be needed on comparable roads. Additionally, more than two





*Stabilized bluff at Lakeshore Rd. (Principle sketch, NTS)*

miles of water lines would need to be re-engineered if lost to erosion.

### Flexibility

Elements of this project can be easily adjusted during design, including height, length, material composition, position, and addition or subtraction of project elements.

### Durability

The shoreline stabilization can help mitigate the erosion that occurs along Lakeshore Rd. Natural vegetation will strengthen with time as planted and recruited vegetation increases in density and abundance. Although maintenance may be required in the short term following construction (when the protective functionality is lowest), maintenance requirements are expected to decrease over time.

### Economic Development Potential

Lakeshore Rd. is a major thoroughfare for numerous residences and is one of the main

routes to Point Breeze. The Town of Carlton has a population of approximately 3,000 people, with a total combined estimated annual income of town residents of \$52 million. Increasing travel time if Route 97 is impassible can have negative economic consequences (e.g., increased travel time of five minutes for half of the Town's residents, valued at approximately \$100,000).

### Environmental Considerations

This project will be reviewed by multiple agencies during permitting, which will serve to reduce environmental impacts.

### Alternatives Considered

An alternative to the onshore stabilization would be a 2,500 ft long segmented offshore shoal to reduce wave action that reaches the shoreline, paired with a minimized bluff stabilization to mitigate the existing erosion hazard. The offshore shoal would be designed to provide fish habitat.

# LAKESIDE PARK RD. EAST

The bluff on which the eastern portion of Lakeside Park Rd. sits has been experiencing erosional impacts, creating a 30 to 40 ft dropoff that has become a hazardous condition for the road and public water line in the area. This project aims to stabilize the bluff to protect these assets.



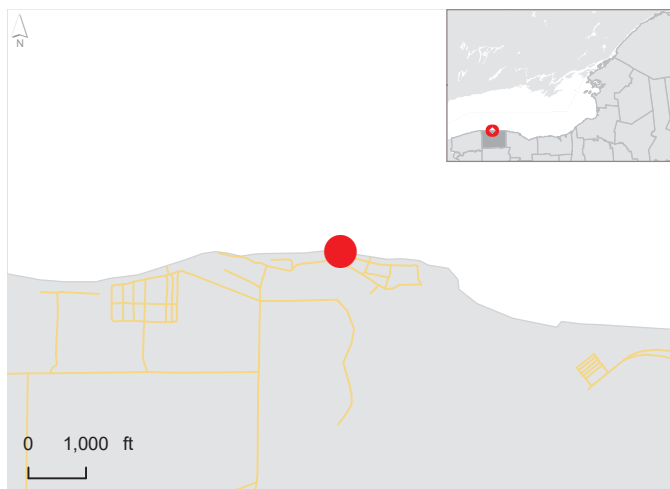
Town of Carlton,  
Orleans County



Town of Carlton



385,000



Lakeside Park Rd. East

## Mitigation Measures

Proposed mitigation measures in the project will consist of:

- Protecting the toe of the bluff with shoreline stabilization; stabilizing the bluff with embankment vegetation
- Where space allows, the bluff will be graded back to a more stable slope

## Public Support and Asset Owner

Public support exists for this project because the erosion along Lakeside Bluff Rd. poses a public safety issue to both nearby residents and vehicles. The protection of the public water line is necessary so that the line is not compromised through further bluff erosion. Minimizing erosion along the route and stabilizing the bluff would promote continued access and maintain critical infrastructure of the public water line. The road is privately owned, and the water line is a public asset.

## Permitting and Feasibility

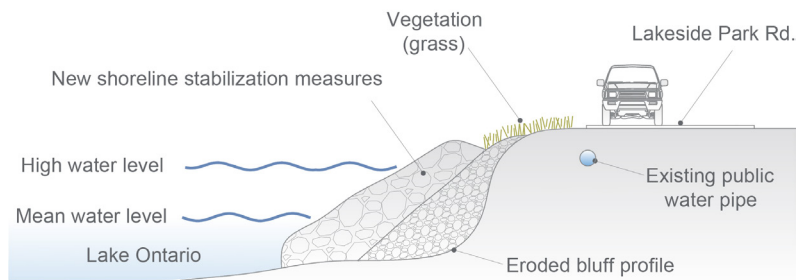
This project is considered moderately to highly feasible due to improved transportation access and public safety, and protection of critical infrastructure. Multi-jurisdictional permit review is needed.

## Benefits

The proposed bluff and shoreline stabilization would reduce the erosion of the bluff directly adjacent to the road and underlying water line, protecting critical infrastructure and maintaining safe access along this route.

## Flexibility

Elements of this project can be easily adjusted during design, including height, length, material composition, position, and addition or subtraction of project elements.



*Restoration of bluff and new shoreline stabilization measures (Principle sketch, NTS)*

## Durability

The shoreline stabilization measures, if properly designed, can help mitigate the erosion that occurs along the route. Although maintenance may be required in the short term following construction, maintenance requirements are expected to decrease over time.

## Economic Development Potential

While Lakeside Park Rd. is not a major access road, it provides critical accessibility for emergency response purposes. Reducing the erosion along the shoreline would maintain this route and protect critical infrastructure and public safety.

## Environmental Considerations

This project will avoid adverse impacts to the environment, including interruption of sediment transport.

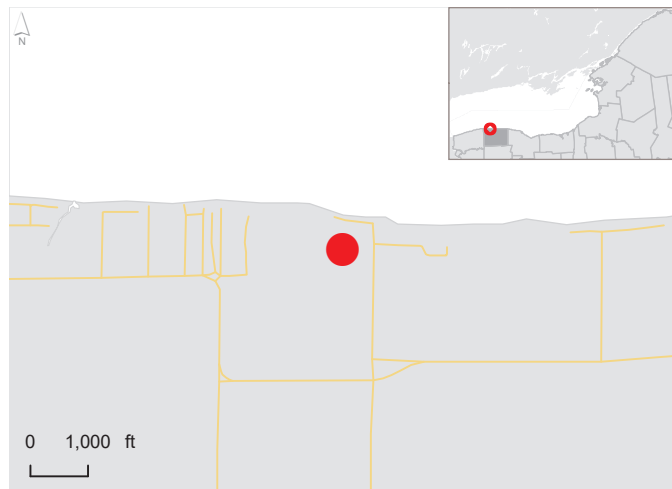
## Alternatives Considered

No action.



# YATES TOWN PARK AND EXPANSION

The Town of Yates proposes to expand the town park with enhanced recreational and water access opportunities. This project seeks to further enhance the park's environmental resiliency, protect and expand its natural and nature-based features, and increase public access to the area's recreational resources.



## Mitigation Measures

Proposed mitigation measures in the project will consist of:

- Installing shoreline stabilization measures to protect the park shoreline and associated features
- Evaluating opportunities to enhance recreation and water access through a new kayak launch and playground
- Installing upgrades to the park's amenities, including an upgraded parking lot area, enclosed pavilion and bathrooms, and a 10 ft wide nature trail

## Public Support and Asset Owner

Public support exists for this project because the park and proposed actions would increase public access to the lakefront and opportunities for outdoor activities. Costs for park improvements,



Town of Yates,  
Orleans County



Town of Yates



2,531,000

including roadway and parking upgrades, erosion control during construction, bank stabilization and protection, and park amenities (pavilion, nature trail, kayak launch, and playground) have been recently estimated (MRG Group) and reflected in the cost estimate presented. The upgrades to the Yates Town Park are recommended in the recently updated Western Orleans Comprehensive Plan (adopted in April 2019). Following the 2017 lakeshore flooding, the town received funding for shoreline remediation, which addressed 600 ft of the town's shoreline at the north terminus of Marshall and County Line (Route 269) roads. The asset owner is public.

## Permitting and Feasibility

Multi-jurisdictional permit review is needed.

## Benefits

The proposed project would protect and expand shoreline access to Lake Ontario and limit shoreline loss through installation of shoreline protection. The project would also provide a safe access for boaters and small water craft (canoes, kayaks, and paddleboards) when needed.

## Flexibility

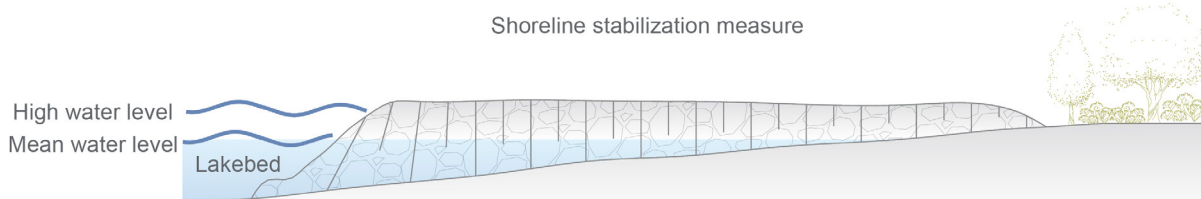
Elements of this project can be modified during further design, including height, length, material composition, and position of shoreline stabilization along Lake Ontario.

## Durability

Upgrades and enhancements will be designed and installed to maximize durability for the environment.



Yates Town Park



Shoreline stabilization (Principle sketch, NTS)

## Economic Development Potential

Through the improvement of the park's environmental resiliency, the public will be provided with a significant increase in recreational opportunities. In addition, business and economic development opportunities can be generated through the redevelopment of the Yates Town Park. For example, additional on-site facilities can support the expansion of a performance venue to host events. Development of the park would improve and increase use of one of the few public lakeshore areas in the Town of Yates.

## Environmental Considerations

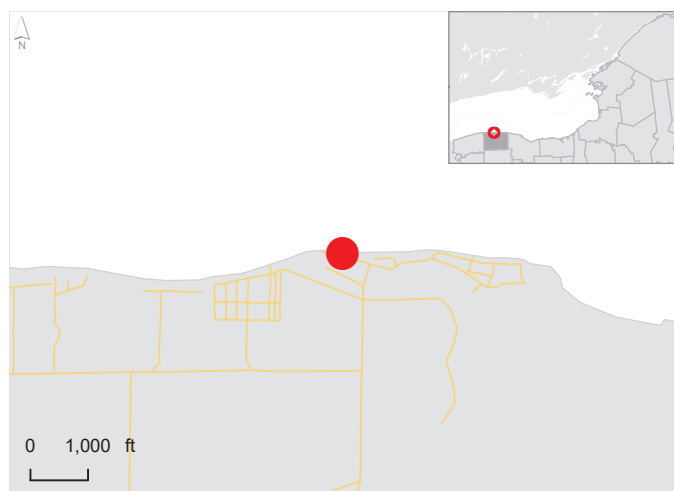
This project will be planned, designed, and implemented to protect and maximize environmental resiliency. In addition, the majority of the waterfront properties in the Town of Yates are privately owned, and the town is seeking to protect access to the Lake Ontario shoreline, while preserving land from further shoreline erosion. Installation of shoreline stabilization should consider possible impacts to downstream sediment supply.

## Alternatives Considered

No action; implement phased park improvement options; continue to explore opportunity of park expansion with purchase of adjacent property.

# LAKE SIDE PARK RD. WEST

The shoreline on which Lakeside Park Rd. sits has been experiencing flooding impacts from both Johnson Creek and Lake Ontario, including the loss of an access road/fire lane, land protecting homes, and public water lines. West of the intersection with Lakeside Rd., there is approximately 300 LF of public water line at risk of being exposed and compromised.



## Mitigation Measures

Proposed mitigation measures in the project will consist of:

- Construct an access road to place protective materials along the shoreline
- Placement of riprap stone to protect the public water line during future high water level(s)

## Public Support and Asset Owner

Public support exists for this project because the erosion along Lakeside Park Rd. poses a safety and access issue for both residents and emergency responders. Also, the public water lines in the area are considered critical infrastructure. Minimizing erosion along the route and stabilizing the shoreline would promote continued access and protect the public water line.



Town of Carlton,  
Orleans County



Town of Carlton



235,000

## Permitting and Feasibility

This project is considered moderately to highly feasible because it would provide critical protection of public infrastructure with standard methods.

## Benefits

The proposed shoreline stabilization would reduce the erosion of Lakeside Park Rd., maintaining safe access for residents and emergency management responders, while protecting buried public utilities.

## Flexibility

The standard shoreline stabilization measures can be adapted as needed to managed dynamic shoreline conditions.

## Durability

The riprap, if properly placed, can help mitigate the erosion that occurs along the route. Although maintenance may be required in the short term following construction, maintenance requirements are expected to decrease over time.

## Economic Development Potential

While Lakeside Park Rd. is not a major public access road, reducing the erosion along the shoreline would maintain this route for several waterfront properties and emergency responders, and protect critical infrastructure and residential safety.

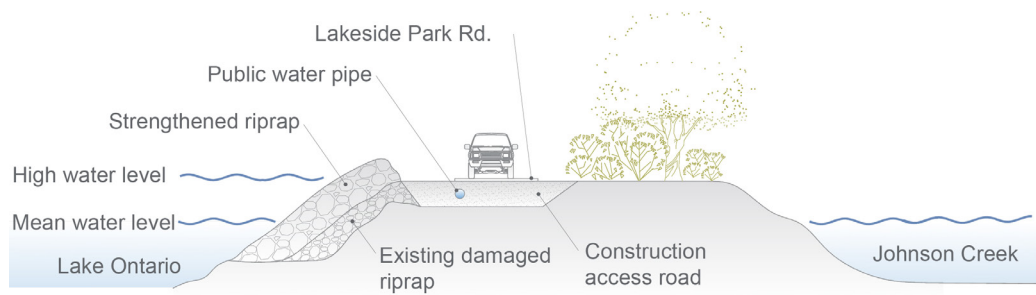
## Environmental Considerations

This project will avoid adverse impacts to the environment, including interruption to littoral drift.

## Alternatives Considered

No action.





*Strengthening of revetment and restoration of road (Principle sketch, NTS)*

# PUBLIC TOWN RD. ENDS/CULVERTS

Culverts adjacent to Edrose Shore, Knapp Shore, and Thompson Dr. are impacted by high water level(s) resulting in culvert ends being clogged with debris. This project will install a more resilient box culvert concept. A culvert located at Lakeland Beach Rd. needs fortification, and riprap will be placed at the outlet of the culvert to provide protection.



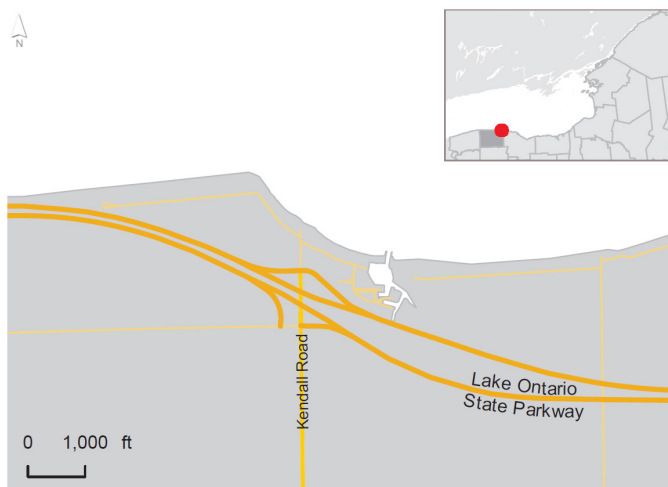
Town of Kendall,  
Orleans County



Town of Kendall



1,500,000



*Box culvert previously installed  
in Town of Kendall*

## Mitigation Measures

Proposed mitigation measures in the project will consist of:

- Replacing end of culverts with box design systems at four locations (Edrose, Knapp Shores, and Thompson Dr.)
- Upgrade stabilization measures at the Lakeland Beach Rd. end of culvert

## Public Support and Asset Owner

There is public support to address these four culverts. Flooding that results from the culverts can negatively impact property owners, and improving the end of pipe functionality of these culverts can reduce the risk of future flooding. In addition, upgrades to the culverts will prevent continued maintenance of these structures. The asset owner is public.

## Permitting and Feasibility

This project is considered feasible because it will facilitate the proper functionality of culvert ends, reducing flooding to nearby properties during precipitation/snowmelt coupled with high Lake Ontario water levels. Current maintenance to clear built up debris at culvert ends would be minimized. Multi-jurisdictional permit review is needed.

## Benefits

Culvert upgrades and protection measures would reduce the risk of flooding, protecting the environment and public health.

## Flexibility

Elements of this project will be adjusted and refined through engineering design of each culvert replacement. The current culverts vary in size, and can be designed to maximize longevity and functionality. The fortification of the Lakeside Beach Rd. culvert can be evaluated to properly design the size and placement of riprap.



### **Durability**

Installing new culvert ends with a box culvert design will prolong the lifespan of these stormwater infrastructure assets. In addition, shoreline stabilization measures are to be placed at the Lakeside Beach Rd. culvert.

### **Economic Development Potential**

The potential for increased flooding and property damage from malfunctioning culverts may result in roadway flooding, limiting tourism and economic opportunities in the Town of Kendall. Installation of updated infrastructure can provide for additional economic development opportunities in the area if designed to accommodate additional capacity.

### **Environmental Considerations**

The project will avoid adverse environmental impacts associated with flooding and the build-up of stormwater debris, and permit stormwater runoff to pass through infrastructure appropriately without accumulating at the end of culverts. The

replacement of culvert ends will be conducted based on guidance from NYSDEC Division of Fish and Wildlife. In addition, New York State Department of Transportation (NYSDOT) new hydraulic standards for culverts, which includes additional climate resiliency flow considerations, will be incorporated into culvert designs.

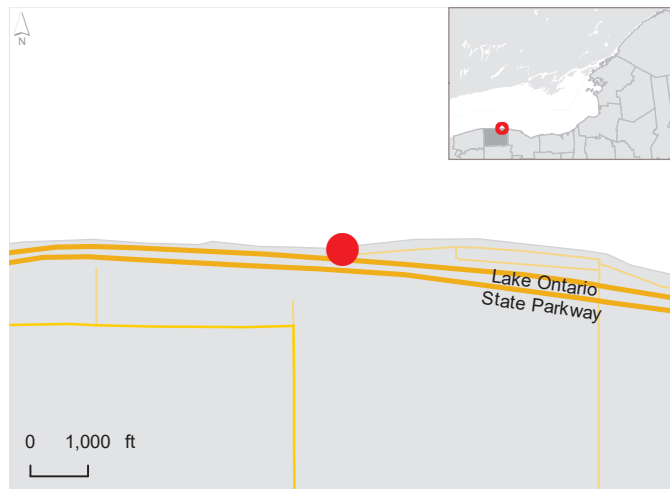
### **Alternatives Considered**

No action.



# THOMPSON DR.

The former Thompson Dr. turnaround provides beach access to the Lake Ontario shoreline. There is an opportunity to turn the former turnaround into beach access, coupled with nature-based shoreline protection.



## Mitigation Measures

Proposed mitigation measures in the project will consist of:

- Installing natural or nature-based shoreline protection addressing the erosion of the turnaround, which is nearing the shoreline edge
- Ensuring and enhancing access to the shoreline

## Public Support and Asset Owner

Public support exists for this project because the turnaround is used by snowplows and school buses. Minimizing erosion along the route would promote continued access along this route. The asset owner is public.

## Permitting and Feasibility

Multi-jurisdictional permit review is needed. Limiting lakeward encroachment with new fill would make the project easier to permit.



Town of Kendall,  
Orleans County



Town of Kendall



131,000

## Benefits

The proposed project would reduce shoreline erosion, protecting local infrastructure and maintaining access along the route.

## Flexibility

Elements of this project can be easily adjusted during design, including height, length, material composition, position, and addition or subtraction of project elements.

## Durability

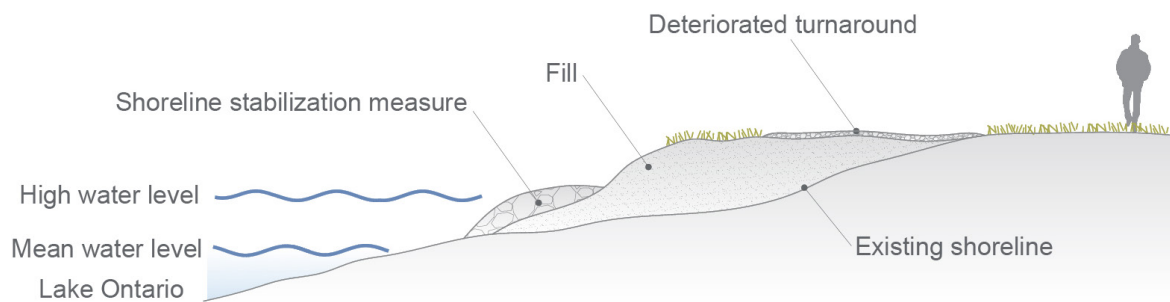
Natural vegetation will strengthen with time as planted and recruited vegetation increases in density and abundance. Although maintenance may be required in the short term, following construction (when the protective functionality is lowest), maintenance requirements are expected to decrease over time.

## Economic Development Potential

Although the Thompson Dr. turnaround is not a major route, it is important for local use. Reducing erosion and stabilizing the shoreline would maintain this route and facilitate additional lakefront access. There is also an opportunity to connect access to this parcel with state land immediately to the west.

## Environmental Considerations

This project will avoid adverse impacts to the environment. Multi-jurisdictional permit review is needed.



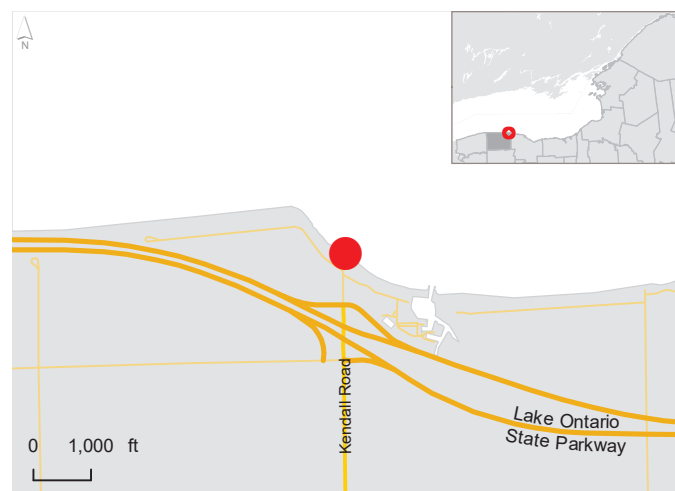
*Restored shoreline and stabilization measure (Principle sketch, NTS)*

### Alternatives Considered

No action; relocating the turnaround. Alternative natural and nature-based solutions were identified and are under consideration.

# ROUTE 237 RIGHT-OF-WAY

The shoreline/waterfront area along the Route 237 right-of-way is experiencing significant erosion as a result of high water level(s), flooding, and wave intensity. A project is currently ongoing to install riprap along the waterfront to protect the eroding shoreline associated with the right-of-way, abutting the riprap of two neighboring private properties.



## Mitigation Measures

Proposed additional mitigation measures in the project will consist of:

- Construction of a berm to further stabilize the shoreline and protect the area from future flooding
- Filling the gap between existing shoreline protection features with additional shoreline protection
- A protective barrier to provide public safety, and limit access from hazardous conditions at the end of the Route 237 right-of-way

## Public Support and Asset Owner

This project is ongoing. The right-of-way area provides public access to the Lake Ontario shoreline in the Town of Kendall. This project helps to build resiliency of adjacent shoreline protection features. The asset owner is public.



Town of Kendall,  
Orleans County



Orleans County



40,000

## Permitting and Feasibility

Permits have been secured and work is ongoing.

## Benefits

The installed shoreline stabilization will increase protection for this portion of shoreline, connecting to shoreline protection measures in adjoining properties to the east and west. The installed berm provides additional protection from future flooding, and the barrier placed at the end of the right-of-way will provide protection to motorists from hazardous conditions at the end of the road. Construction of this project fills in the gap between other shoreline protection projects and avoids lateral erosion of those features.

## Flexibility

The shoreline protection measures can be adjusted as needed to supplement existing, adjacent protections.

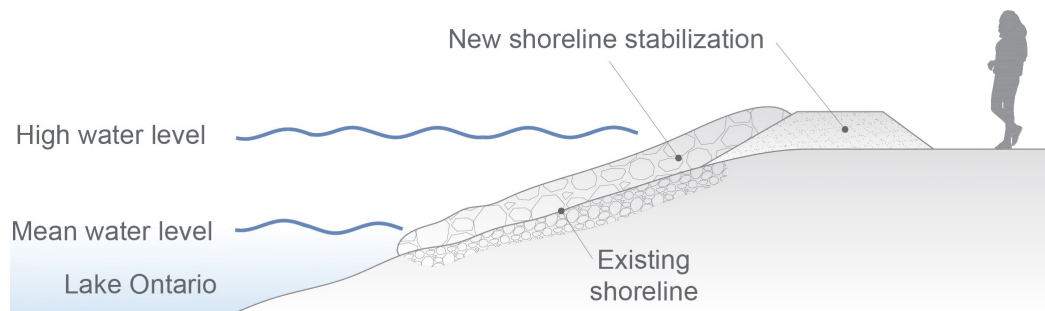
## Durability

Shoreline stabilization will reduce further shoreline erosion and require minimal maintenance in the future after initial verification. Additionally, the installed berm is not anticipated to require long-term operational maintenance, after the initial verification is confirmed. The protective barrier will be comprised of durable material with minimal routine maintenance.

## Economic Development Potential

Protecting the shoreline at the Route 237 right-of-way protects future land loss by minimizing erosion and maintaining public access to the shoreline. Additional site development is possible by





*New shoreline stabilization (Principle sketch, NTS)*

maintaining and enhancing the shoreline condition and preventing additional erosion.

### **Environmental Considerations**

Permitting has been completed. Adverse environmental conditions have been considered and addressed.

### **Alternatives Considered**

The project is in progress.

# PUBLICLY OWNED REGIONAL DOCKS AND BOAT LAUNCHES

Towns of Wilson and Carlton

## Mitigation Measures

Proposed mitigation measures for these projects consist of:

- Replacement of fixed elevation docks with floating docks and slips, inclusive of anchorage and posts to permit only vertical dock movement
- Modification and upgrades to impaired boat launches to increase resiliency

## Public Support and Asset Owner

Public support exists to improve these facilities, which provide substantial impact to the area in the form of jobs, tax revenue, recreation, and tourism. In many communities, these assets are at the core of community identity. The asset owners are public.

## Permitting and Feasibility


These projects are considered moderately to highly feasible due to the type of improvements and work to be conducted, which will occur on assets that have existing impacted facilities. Multi-jurisdictional permit review is needed.

## Benefits


Maintaining these functional facilities is an important regional consideration to Niagara and Orleans counties. These locations provide economic activity, including support of recreational boating access, restaurants, and fuel sales, sustaining tourism.

## Flexibility


The final project components will be determined during design, and tailored for each facility. All electrical work, as needed, will be completed in accordance with National Electrical Code (NEC) standards and in alignment with project funding.



Niagara and Orleans Counties



Public



876,000

## Durability

Infrastructure improvements will be in accordance with national and local codes and generally will have a 20-year design life.

## Economic Development Potential

The Niagara County Center for Economic Development has estimated the economic value of sport fishing to the local economy at \$30 million per year. In 2016, revenue generated by tourism in Niagara County alone was estimated to exceed \$225 million. Maintaining these marine facilities is an important element to sustain (or increase) local revenue generated by tourism and recreational activity in Niagara and Orleans counties.

## Environmental Considerations

Projects will avoid causing harm to adjacent properties through careful design of proposed improvements. Construction will follow appropriate standards and permit requirements.

## Alternatives Considered

No action; short term or emergency actions to maintain functionality of the facilities.

Niagara and Orleans Counties Mitigating Projects – Publicly Owned Regional Docks and Boat Launches				
County	Municipality	Asset	Quantity of Slips	Total Project Cost
Niagara	Town of Wilson	Roosevelt Beach	3	\$125,000
Orleans	Town of Carlton	Point Breeze Boat Launch	72	\$751,000
				<b>\$876,000</b>



