

# WELCOME

Municipality of Lakeshore

## Shoreline Management Plan

Virtual Council Presentation

March 15, 2022



# Project Team Introduction



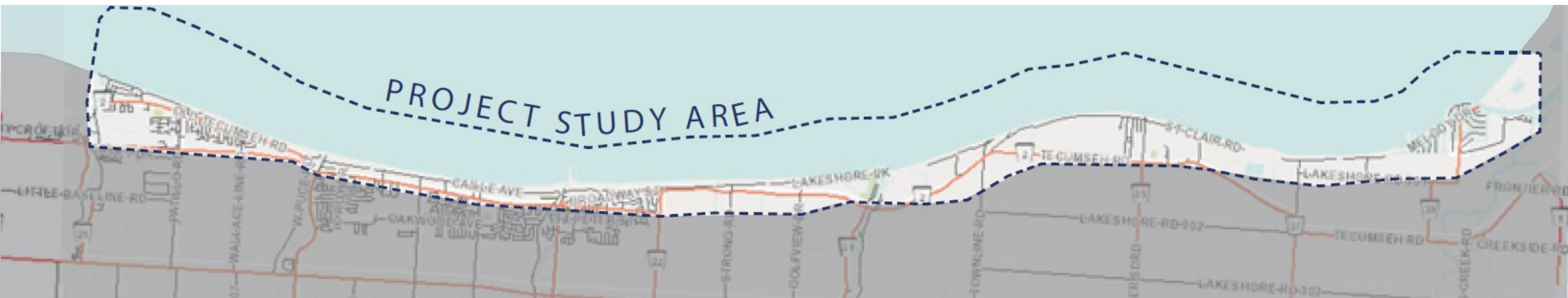
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RPP, MCIP



# Objectives of the Shoreline Management Plan



## Prevention

of existing development from natural hazards through the application of structural and non-structural measures (including acquisition)



## Protection

of new development from locating within areas subject to loss of life and property damage from natural hazards



## Emergency Response

to prepare for emergency situations through flood forecasting and warning systems and implement appropriate emergency response procedures such as evacuating areas and disaster relief.



## Public Education

to increase awareness of challenges and risks associated with shoreline hazards



## Environment

to ensure that no adverse environmental impacts result from actions



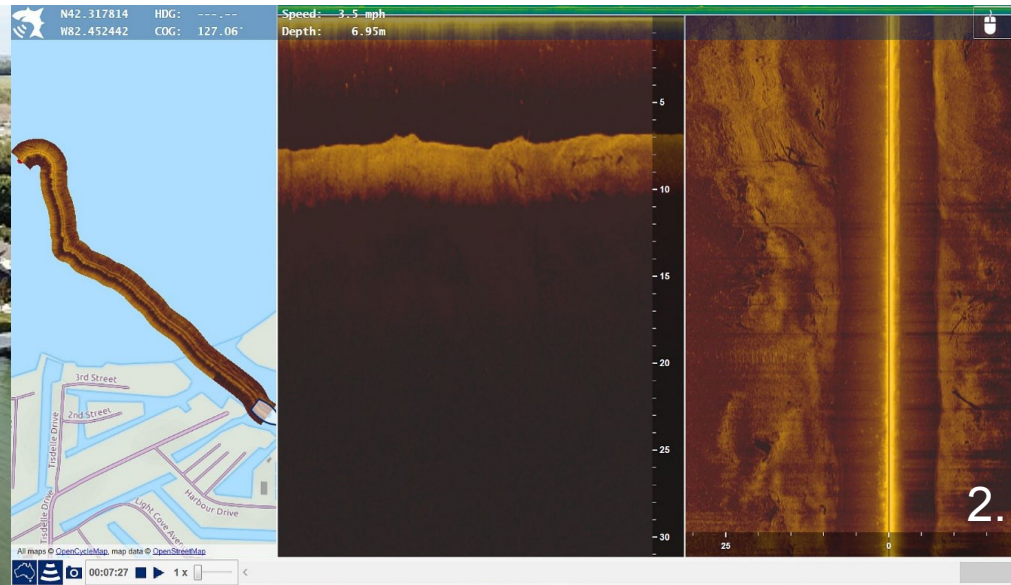
## Monitoring

the implementation of the Shoreline Management Plan and the effectiveness of the recommendations



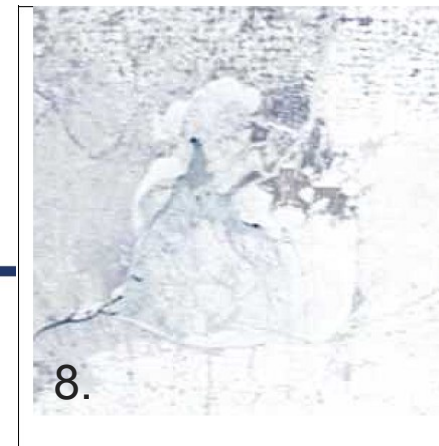
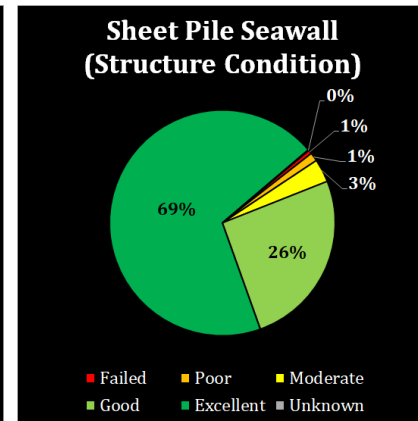
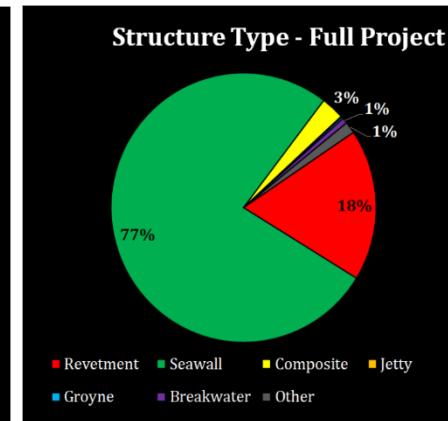
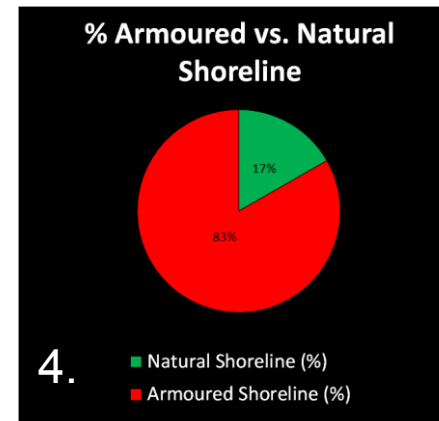
# Analysis – Data Collection

1. Oblique photographs with a Drone over the lake
2. Nearshore Water Depth Survey (Thames River Mouth shown)
3. Update to Buildings Layer (revised Buildings Layer at Belle River shown)



# Analysis – Technical

4. Shoreline Protection Data Base
5. Historical Shoreline Change Rates
6. Water Level Statistical Analysis
7. Nearshore Waves and Runup
8. Climate Change Impacts (i.e. reduced lake ice coverage projected for the future)





# Hazard Mapping

## Flood Hazard Limit

### LEGEND:

- Erosion Hazard Limit
- Dynamic Beach Hazard Limit
- ERCA-LTVCA Boundary
- Municipal Boundary
- 100-year Flood Hazard with Run-up



# Video: Fly-Over Showing Flood Risk





# Hazard Mapping

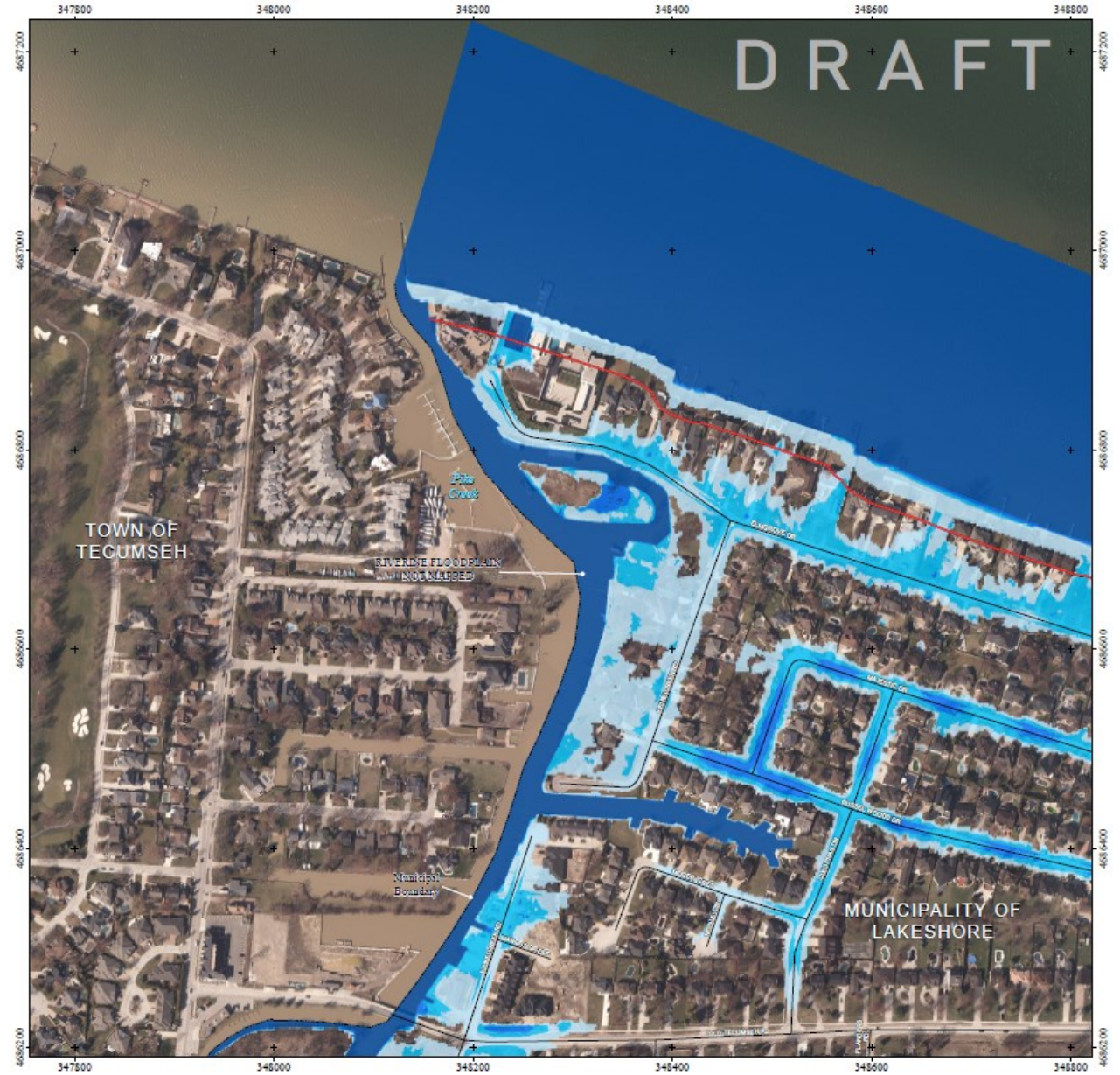
## Depth of Flooding

### LEGEND:

- Erosion Hazard Limit
- Dynamic Beach Hazard Limit
- ERCA-LTVCA Boundary
- Municipal Boundary

### 100-year Flood Hazard - Depth of Flooding (m)

- 0 - 0.3 m (Up to ~1 ft)
- 0.31 - 0.6 m (Up to ~2 ft)
- 0.61 - 0.9 m (Up to ~3 ft)
- > 0.9 m (> ~3 ft)





# Pike Creek Average Summer Water Level Visualization





# Pike Creek 100-year Flood Visualization





# Pike Creek 100-year Climate Change Flood Visualization

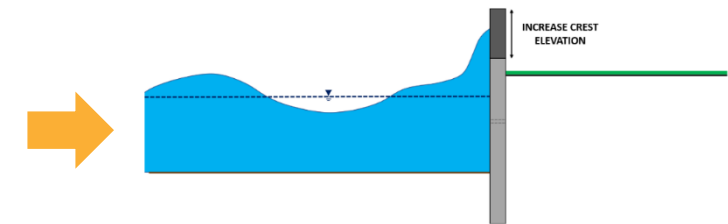




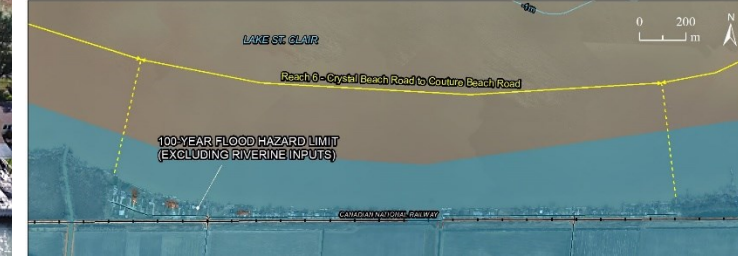
# Pike Creek to Puce River



- Adopt standard engineering criteria for shoreline protection structures and flood mitigation
- A reach-scale program to flood proof existing buildings is required.
- Further assessment of emergency vehicle access is required, as water depths are significant in some areas of Reach 1 (e.g., 0.6 to 0.9 m). An emergency response plan is needed if vehicle access is not possible in these areas.
- Future residential or commercial development should not proceed in Reach 1 unless emergency vehicle access is attainable during the 100-year flood.







# Crystal Beach Road to Couture Beach Road

- Adopt standard engineering criteria for shoreline protection structures and flood mitigation requirements for lakefront properties. Pursue a community scale flood mitigation solution for Reach 6
- Development materials and recommendations for flood proofing of residential buildings.
- Emergency ingress and egress to Reach 6 and along the lakeshore should be restored with a large-scale mitigation strategy to protect people and property.
- Future development should not proceed on hazardous lands in Reach 6 unless the flood risk is mitigated and emergency vehicle access is attainable
- If community scale shoreline protection upgrades are not attainable and emergency vehicle access can not be restored to Reach 6, a property acquisition program from willing sellers should be developed.
- Private septic systems that are flooded during the 100-year static lake level should be upgraded (i.e., flooded during non-storm conditions).

# Land Use Recommendations

- The following land use recommendations can be considered to accompany the shoreline protection and management recommendations
- Focus of recommended updates to ensure that the **long-term** land management practices do not create similar issues to what is being experienced along the shoreline today
- Examines policies related to growth management, natural hazard management, and residential intensification





# Strategic Direction on Growth Management

- Prohibit the conversion of agricultural lands within the hazard areas to growth lands (e.g. settlement expansions and/or growth nodes)
- Recognize the 100-year climate change flood as a strategic screening tool for all growth-related decisions (infrastructure, settlement expansions, secondary planning area, transportation)
- Focus on increasing coastal resilience and 'preparing for the impacts of a changing climate' as required by the 2020 PPS
- Transportation system policies should recognize potential inundation during flood events; working to update key roadway infrastructure that recognizes the 100-year climate change flood

# Natural Hazard Policies

- Two types of ‘natural hazards’ were addressed – **flooding** and **erosion**
- Two other important coastal risks/vulnerabilities were also identified through the study, which require action:
  - shoreline flooding associated with the anticipated impacts of a changing climate
  - emergency access challenges when areas are rendered inaccessible to people and vehicles during floods

## *Recommendations for Section 5.4 of Official Plan:*

- To update the mapping for the “Lake St. Clair Floodprone Area”
- To recognize that development and site alteration should not be permitted where there are coastal risks/vulnerabilities – access restricted during hazard events
- To allow for the identification of mapping overlays that have an ‘enhanced’ Floodprone Area that considered the risk of climate change (+38cm).



# Residential Intensification

- It is recommended that the policies supporting development on hazardous lands be reviewed in order to provide guiding policies that:
  - Strengthen site planning requirements to allow for elevations of not only buildings, but emergency access roads to be assessed based on the flood hazard limit;
  - Discourage conversion of basement to habitable spaces (e.g. additional residential units)
  - Require accessibility to the outside from second storeys to provide evacuation opportunities
  - Assess policies for additional residential units (both detached and within existing residences) to discourage these uses within hazard areas.
- Section 4.3.1 of the Official Plan is recommended to be reviewed, based on the final recommendations

# Concluding Remarks



- The coastal vulnerabilities within Lakeshore for people and property are significant; a **multi-fold approach** to shoreline management is necessary – it will take engineering/structural mitigation, long-term management planning, re-naturalization/restoration efforts, and land use planning for the future
- In the short-term, **emergency access** will need to be investigated, including ingress and egress on a reach-by-reach basis
- **Community-scale** studies, and standardized shoreline protection, should be investigated on a reach basis
- Development should not be permitted in the hazard areas and/or where development is inaccessible during a hazard event
- The Municipality of Lakeshore should work with the Conservation Authorities (CAs) to update the regulated areas in a manner that reflects the refined hazard mapping



# Project Next Steps – Phase 3 Wrap-Up

- This meeting to Lakeshore Council
- The report will be taken to the two Conservation Authority Boards (ERCA and LTVCA)
- Municipality starts work on short- and medium-term projects to reduce coastal risks and increase community resilience to storms



Thank you!