TRCA Flood Risk Assessment and Outreach Program – City of Markham

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Toronto and Region Conservation Authority

Presentation Outline

- Overview of riverine flooding in our jurisdiction
- Roles and responsibilities during riverine flood events
- New tools to quantify downstream risks
- Flood Vulnerable Clusters in Markham
- Outreach activities – then and now
- Timelines

Riverine flood risk in TRCA jurisdiction

>14,000 Hectares of floodplain

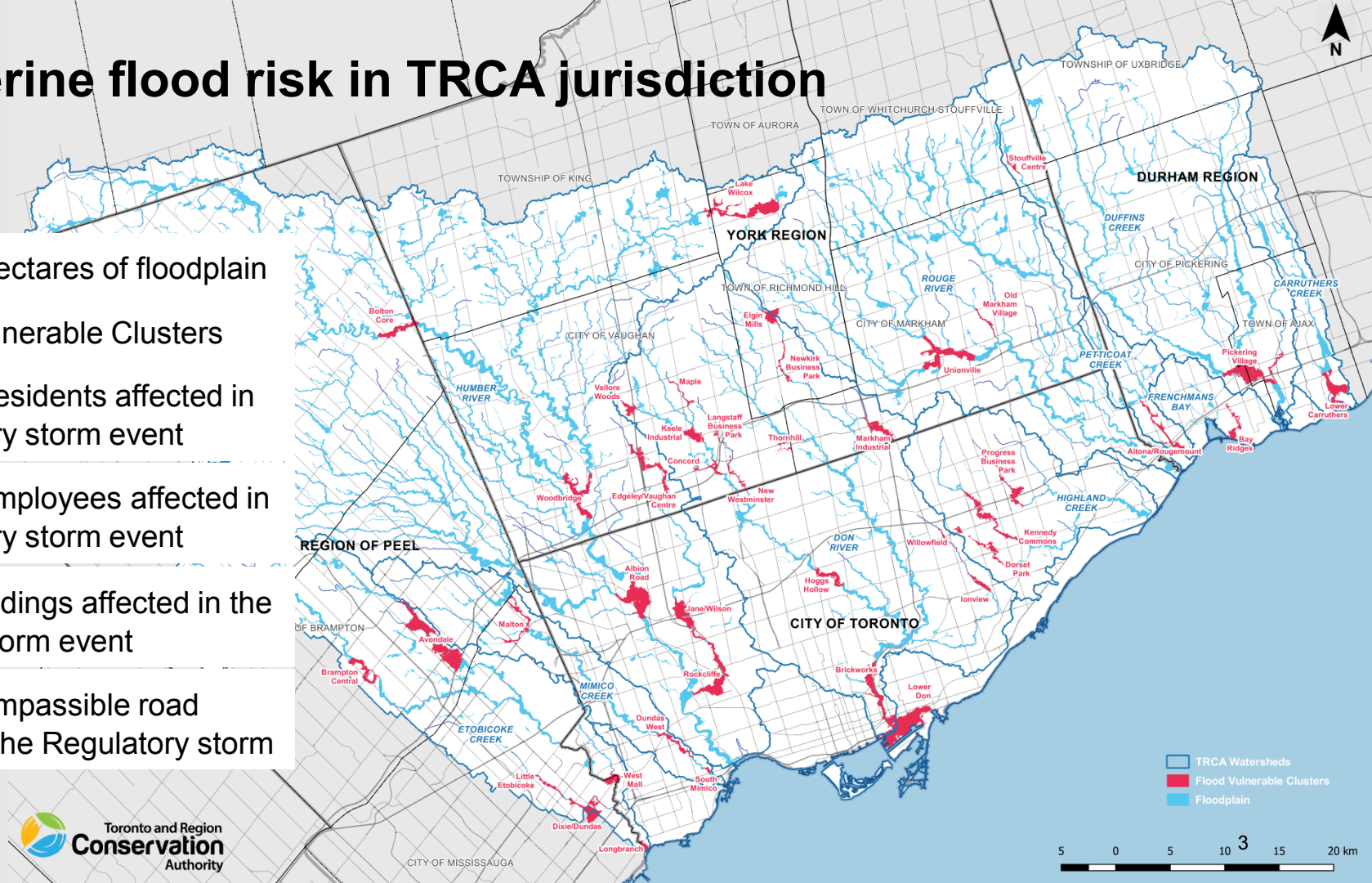
41 Flood-Vulnerable Clusters

>43,000 Residents affected in the Regulatory storm event

>41,000 Employees affected in the Regulatory storm event

>9,900 Buildings affected in the Regulatory storm event

195km of Impassible road segments in the Regulatory storm



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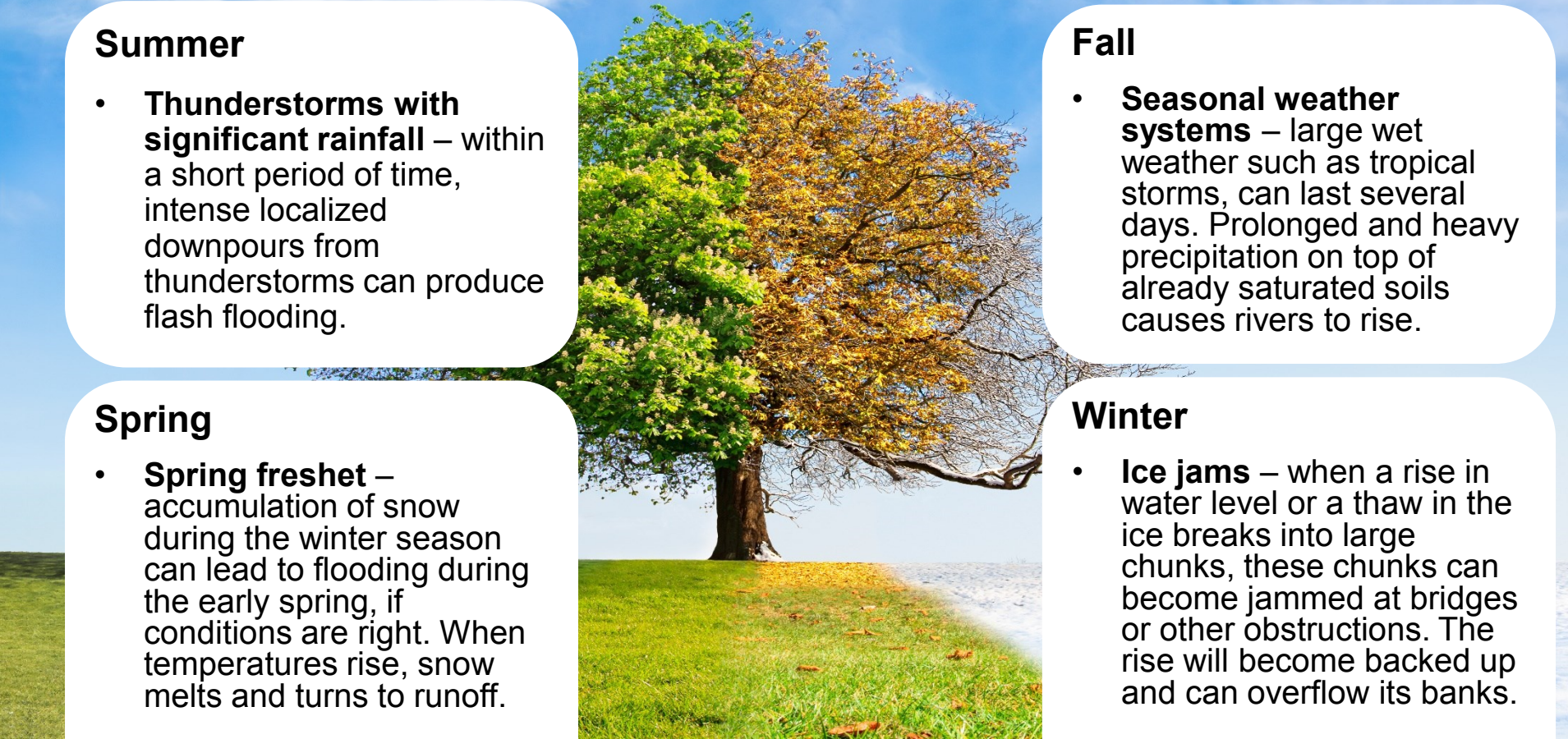
Flooding can happen any time of year

Summer

- **Thunderstorms with significant rainfall** – within a short period of time, intense localized downpours from thunderstorms can produce flash flooding.

Fall

- **Seasonal weather systems** – large wet weather such as tropical storms, can last several days. Prolonged and heavy precipitation on top of already saturated soils causes rivers to rise.



Spring

- **Spring freshet** – accumulation of snow during the winter season can lead to flooding during the early spring, if conditions are right. When temperatures rise, snow melts and turns to runoff.

Winter

- **Ice jams** – when a rise in water level or a thaw in the ice breaks into large chunks, these chunks can become jammed at bridges or other obstructions. The rise will become backed up and can overflow its banks.

No silver bullets…

PREVENTION & MITIGATION

Limiting exposure to risk:
- Implementing TRCA's regulations and policies

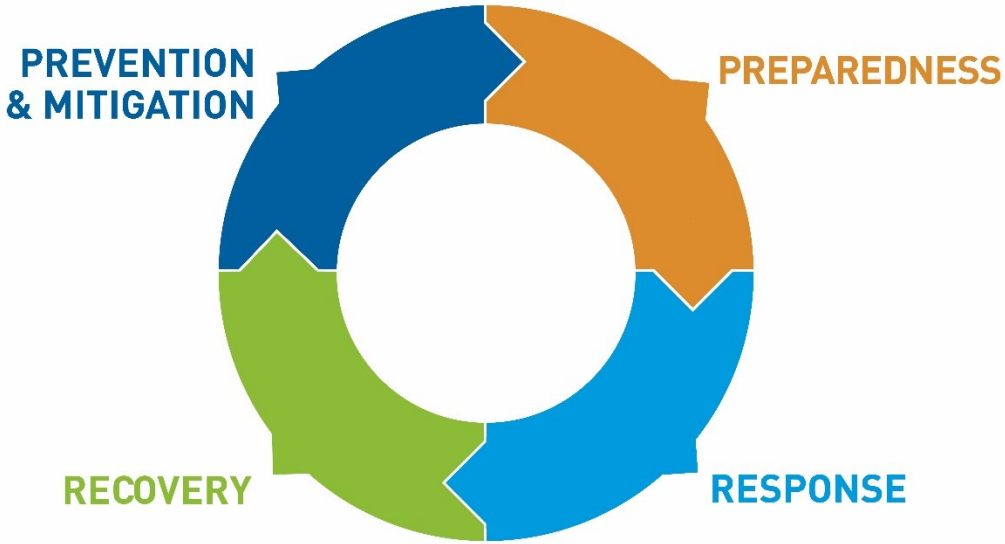
Reducing risk:
- Operating a flood forecasting and warning program
- Maintaining flood control infrastructure
- Creating a flood protection strategy for vulnerable areas
- Implementing remedial works projects

Understanding the risks:
- Climate, geology, watershed response and potential for climate change

Documenting the risks:
- Floodplain mapping, identification of flood vulerable areas

RECOVERY

- Flood event documentation and lessons learned
- Storm analysis



PREPAREDNESS

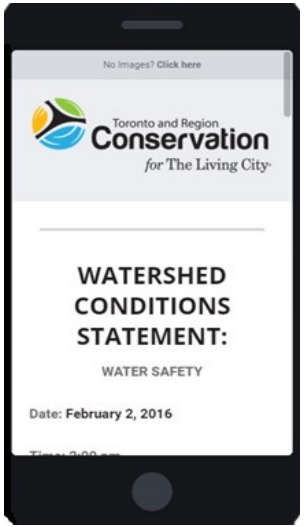
- TRCA's Flood Contingency Plan
- Emergency Plans
- Emergency Operations Centre
- Training
- Public Education

RESPONSE

- Provide Flood Forecasting and Warning (issuing flood messages)
- Operate flood control infrastructure
- Communicate information and advice
- Data management

…but many bronze ones

Flood Response Roles



Conservation Authorities

- **Monitor** watershed and weather conditions and operate a **flood forecasting and warning system**
- **Issue** Flood Messages
- **Operate** Conservation Authority dams and flood control structures
- Provide **technical advice** to municipalities
- Maintain communications with municipalities and other agencies

Municipal Role

- **Notify** appropriate municipal officials, departments and agencies.
- Determine the appropriate response and **deploy municipal resources** to protect life and property.
- If required, **declare a flood emergency** and implement their emergency response plan.
- **Request provincial assistance** if needed

Flood Risk Assessment and Ranking Project Goals

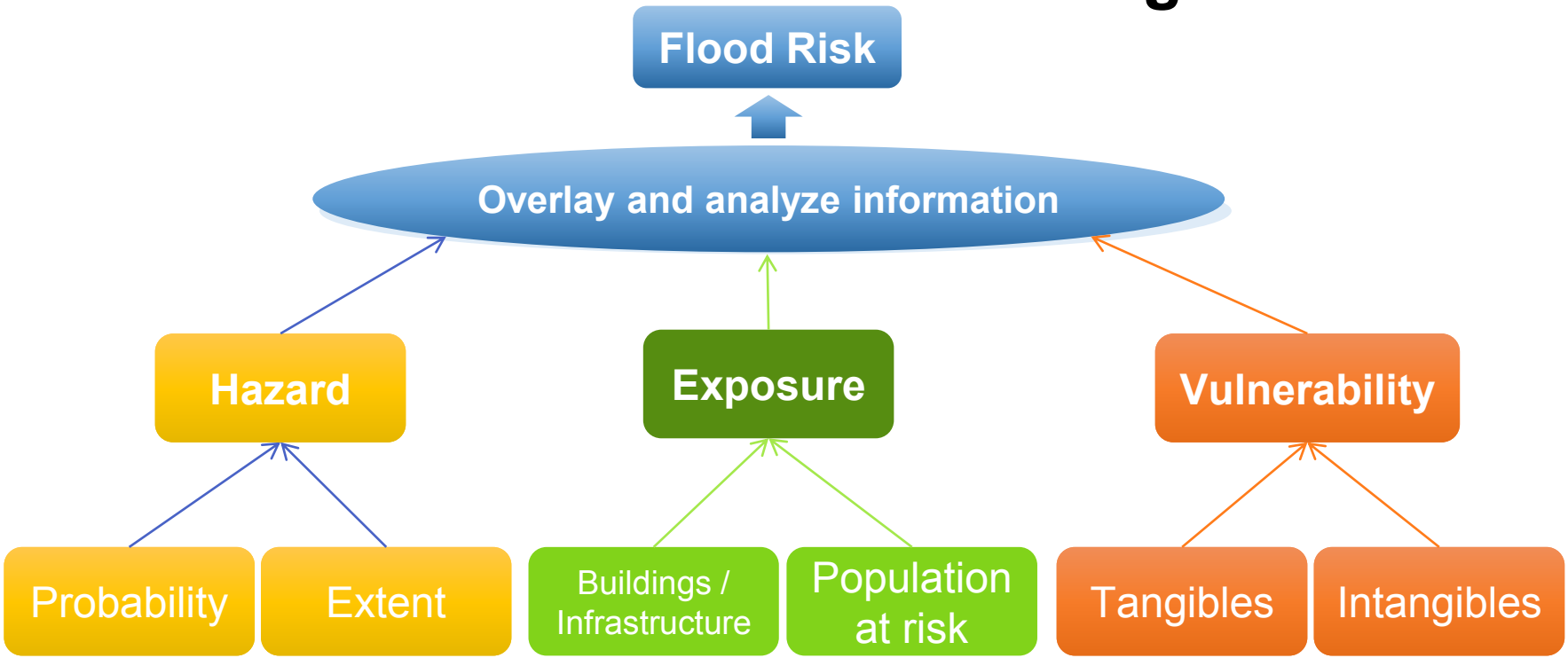
Highlight flood vulnerability thresholds

Support municipal emergency response planning

Support future Cost- Benefit Analysis of Mitigation Works

Prioritize Mitigation

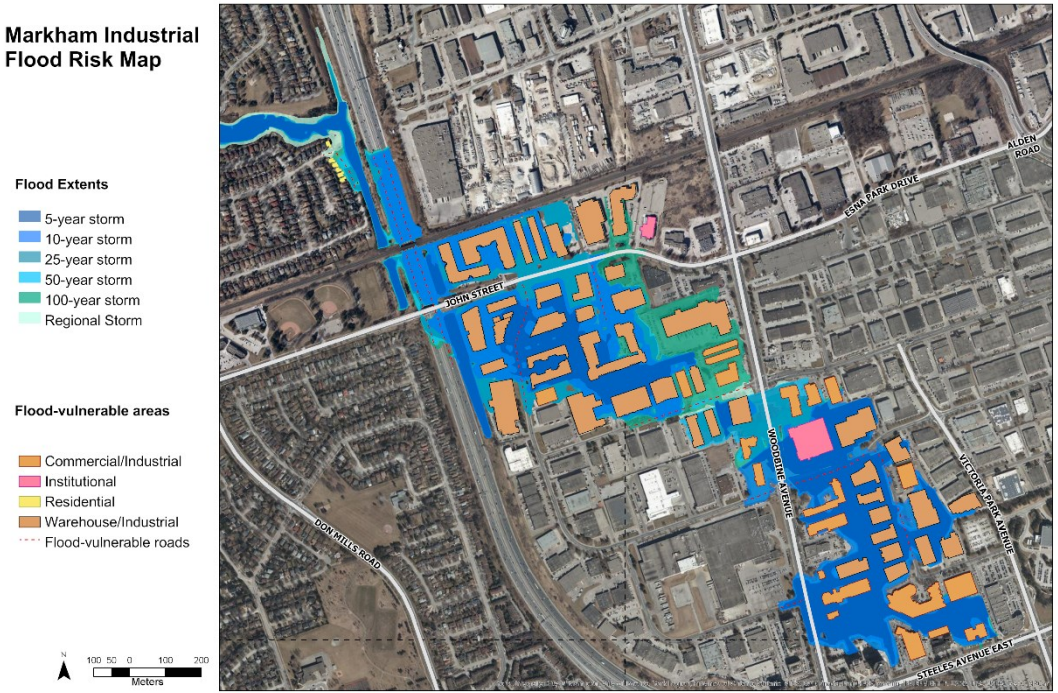
National Disaster Mitigation Program Projects: Flood Risk Assessment and Ranking



Riverine Flooding is the partial or complete inundation of the floodplain, caused by bank overtopping when the conveyance capacity of rivers and streams is exceeded. It falls under the mandate of Conservation Authorities.

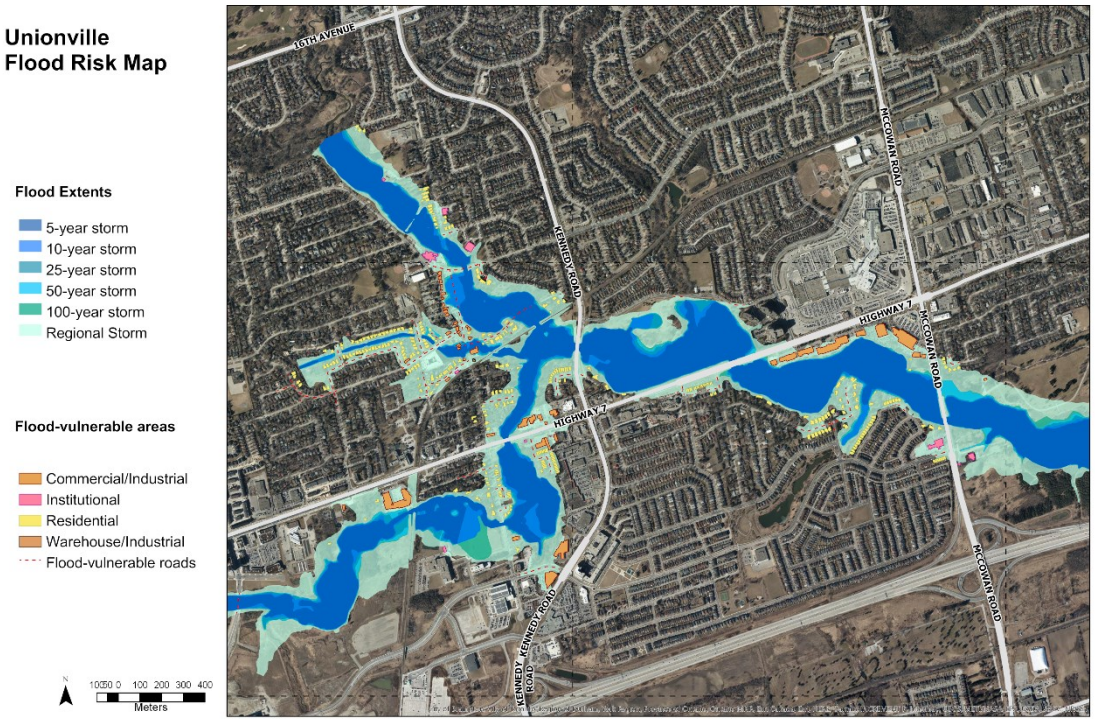
Urban flooding is the inundation of a built environment, caused by rainfall overwhelming the capacity of drainage systems, such as storm sewers and roads. Also called pluvial flooding, it falls under the mandate of municipalities.

FVCs in Markham – Markham Industrial (Don Mills Ditch)



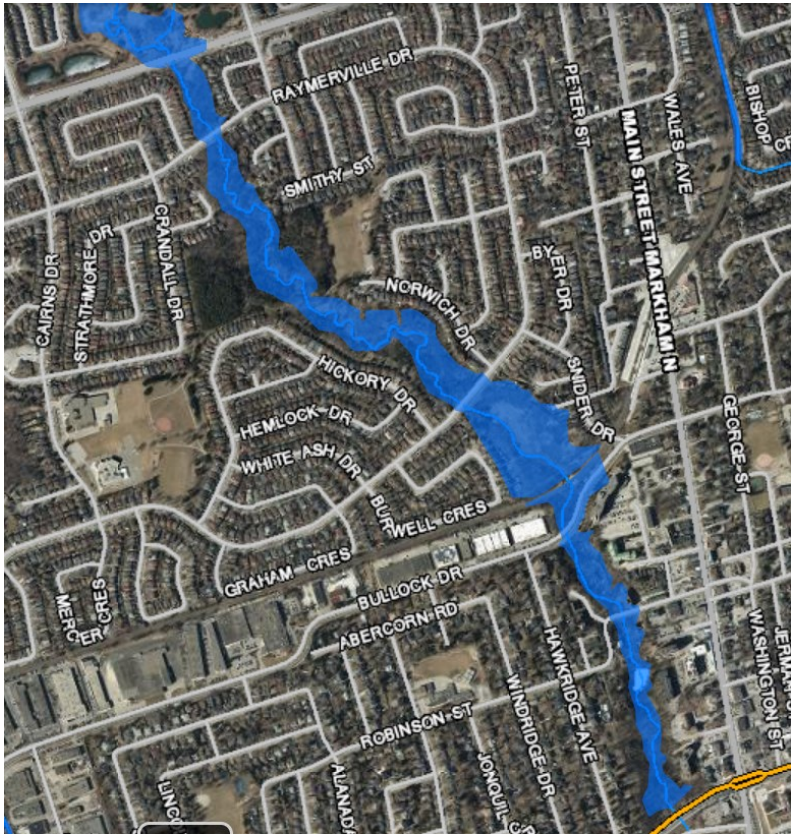
- Ranked **#10 of 41 in TRCA Jurisdiction**
- **Combination of Urban and Riverine Flooding – Urban drainage study has greater detail**
- At-risk from high intensity rainfall events
- Industrial and Commercial uses

FVCs in Markham – Unionville



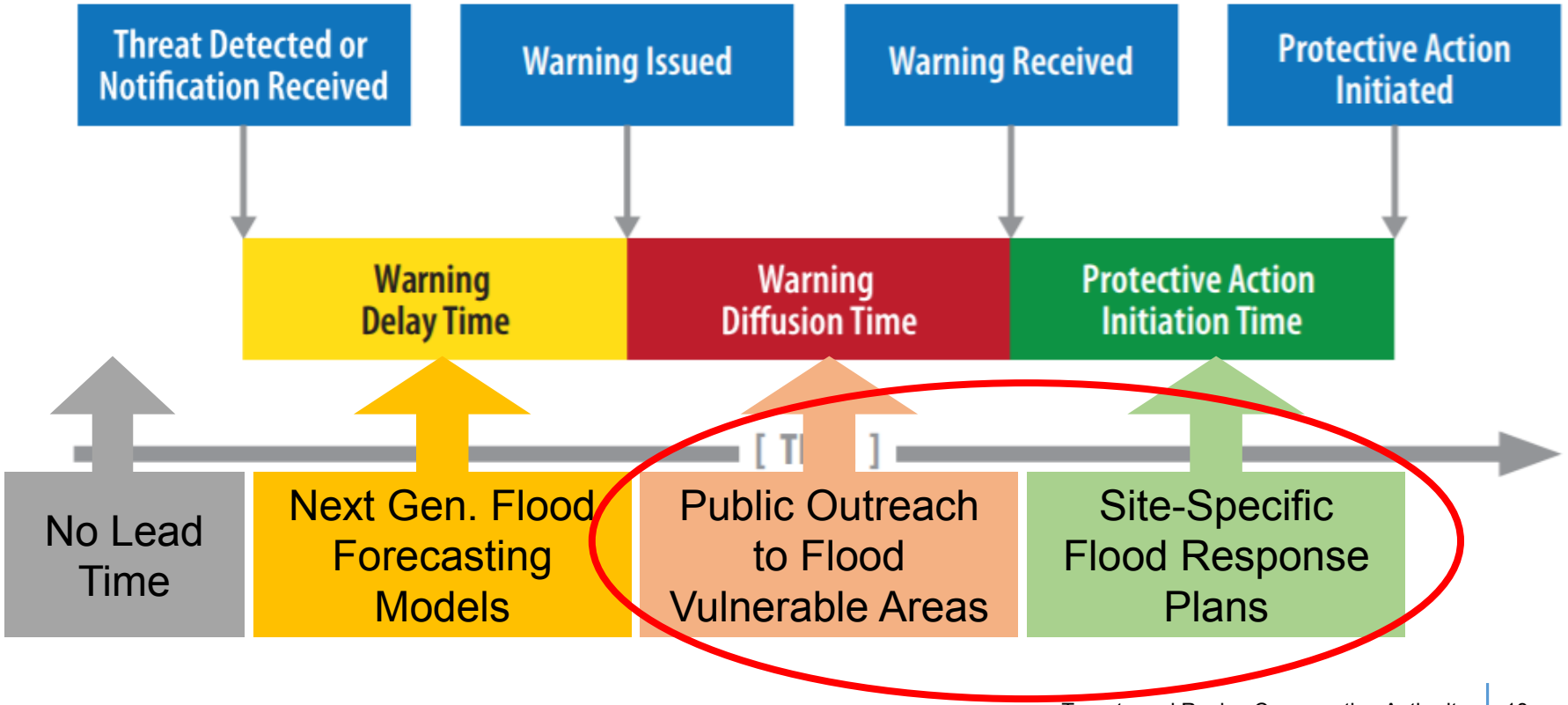
- Ranked **#22 of 41 in TRCA Jurisdiction**
- Historical development in Rouge River floodplain
- Mixed use – historical main-street

FVCs in Markham – Old Markham Village



- Ranked **#38 of 41 in TRCA Jurisdiction**
- Backwater behind rail culvert for Regional flows
- Rouge River Watershed

Focus of National Disaster Mitigation Program Projects



Flood Risk and Emergency Preparedness Plan Outreach

- Communicating risk allows landowners and tenants to undertake protective action
- Target cluster – Markham Industrial (Don Mills Ditch), co-ordinated with City of Markham activities
- 3 components to outreach:
    - Web content with targeted information
    - Print materials for posting
    - Door-to-door campaign

Site-Specific Flood Risk Planning

- Leverages the information collected as part of the flood risk assessment
- Helps co-ordinate emergency response based on location-specific information.
- Intend to develop one for Unionville in partnership with the City of Markham as part of TRCA's NDMP Intake 5 projects.

Thank you

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