

Flood Management and Downtown Revitalization

A Case Study of Land Use Planning in Bridgewater, NS

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Municipal Planner



Outline

- Local Context
- Integrated Community Sustainability Plan (ICSP)
- Municipal Climate Change Action Plan (MCCAP)
- Flood Risk Assessment
- Land Use Planning
- Downtown and Waterfront Master Plan
- Phase 1 – implementing the Master Plan
- Moving forward

Background -Local context



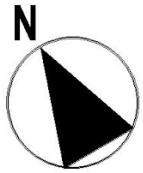
Rail yards on the east side of the LaHave River, c. 1960s

The Town of Bridgewater, Nova Scotia is built along the banks of the LaHave River, about 20 km north west of where the River meets the Atlantic Ocean.

Originally settled in the late 1700s as a transportation hub for the South Shore of Nova Scotia.

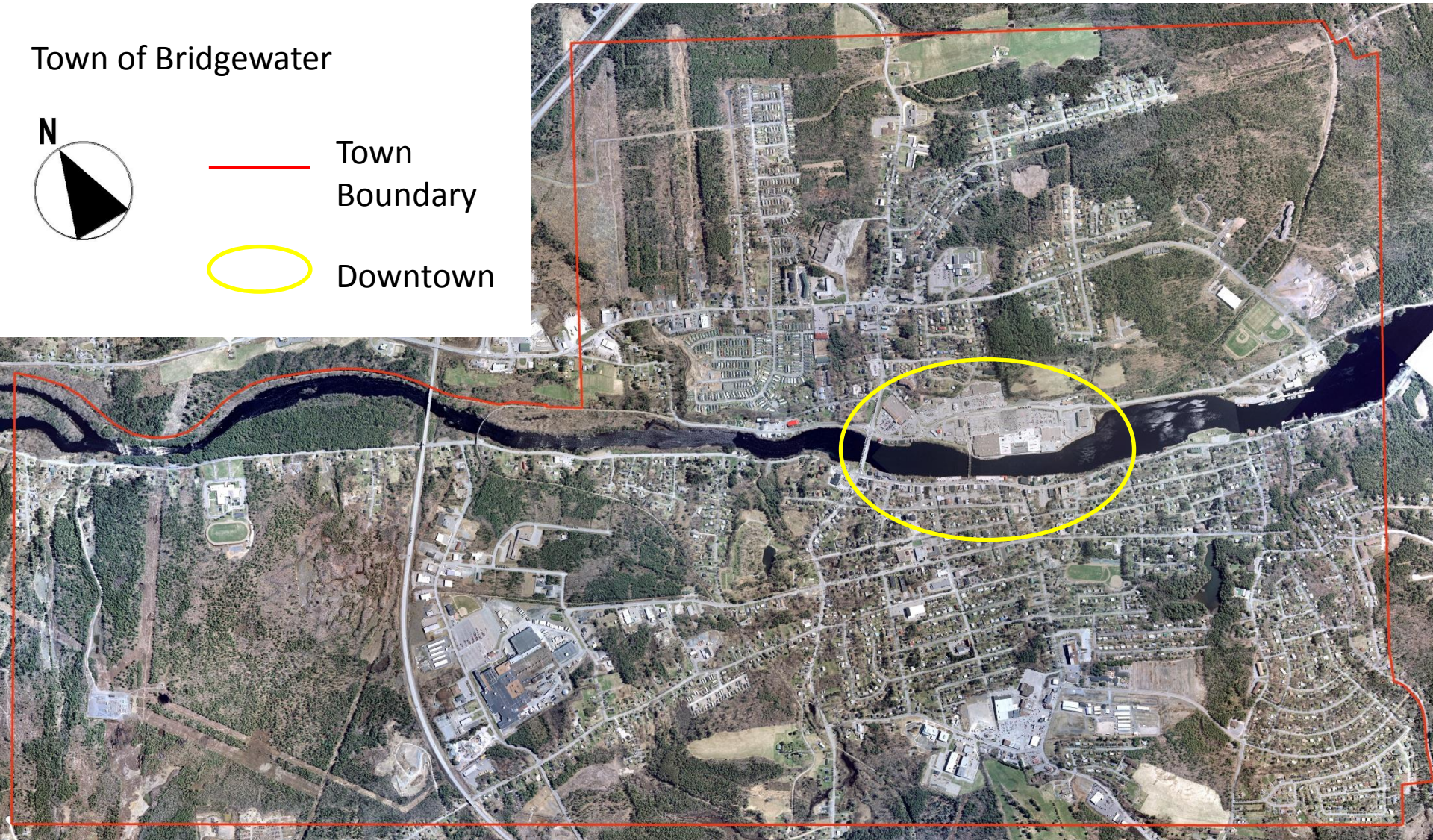
Background -Local context

Town of Bridgewater



— Town Boundary

○ Downtown



Background -Local context

Figure Ground



Background -Local context

- In 2011, population was 8,241, a growth of 3.7% since 2006
- 3,996 private households
- 22.8% of the Town's population is 65 years old or older, 19% is under 20 years old
- Significant number of people commute to Bridgewater to work or shop – total market population is approximately 60,000 people



King Street

Background -Local context

→ Employment in the Town:

1. Michelin Tires
2. Health care sector
3. Retail

→ Population density in the Town is 605.8 people per km², and growing

→ In total, the Town is 13.6 km² in area

→ Urban context with multiple open, dynamic systems, including the LaHave River



Background -Local context

Town currently struggles with several flood related challenges:

- Lack of storm water management in some parts of the Town
- Several large, dynamic brooks, many flooding regularly
- Most development occurs as of right



Wile Brook

Background ICSP

Integrated Community Sustainability
Plan - completed in 2010

Required for environmental
infrastructure funding (federal gas tax)

Long term goals:

- Build a green self-supportive local economy
- Create transportation alternatives
- Educate for sustainability
- Move to efficient renewable energy
- Support healthy affordable local food



Background - ICSP

Bridgewater has a full time sustainability planner whose role is to implement the ICSP

Key ICSP projects

- Energy Management Plan – a key priority
- Bridgewater Community Garden Network
- Annual Sustainability Festival
- Improvements to sanitary and storm sewers



Old Bridge

Background – Flood Risk Assessment

- Flood Risk Assessment Study and flood mapping completed in 2013
- LaHave River watershed covers 1,686 km²
- Employed Light Detection and Ranging (LIDAR) data, bathymetric river data and river cross section information to map and analyze the LaHave River watershed
- Merged data to run an integrated one and two dimensional hydrodynamic model



LaHave River

Background – Flood Risk Assessment

- Low permeability of developed land can contribute to fluvial flooding
- A deeper river channel through Bridgewater's downtown helps **BUT...**
- The downtown area is still vulnerable to flooding resulting from sea level rise and storm surge flooding
- Fluvial flooding from the LaHave is less of a risk in the downtown



LaHave River at Shipyard Landing

Background – Flood Risk Assessment

Properties most at risk of flooding include:

- Bridgewater Mall (infill)
- Shipyards Landing (infill)
- Port of Bridgewater Lands and
- North LaHave Street

Much of the coastline along the waterfront is armored with large granite boulders to protect it from erosion.



Downtown Bridgewater

Background – Flood Risk Assessment



Background – Flood Risk Assessment

- Significant flooding of King Street with a 3.5 m storm surge, or less with Sea Level Rise (SLR)
- Fluvial (rainfall) flooding more likely along three steam-brooks that drain into the LaHave:
 - Wile Brook
 - Hebb Brook
 - Stewart Brook

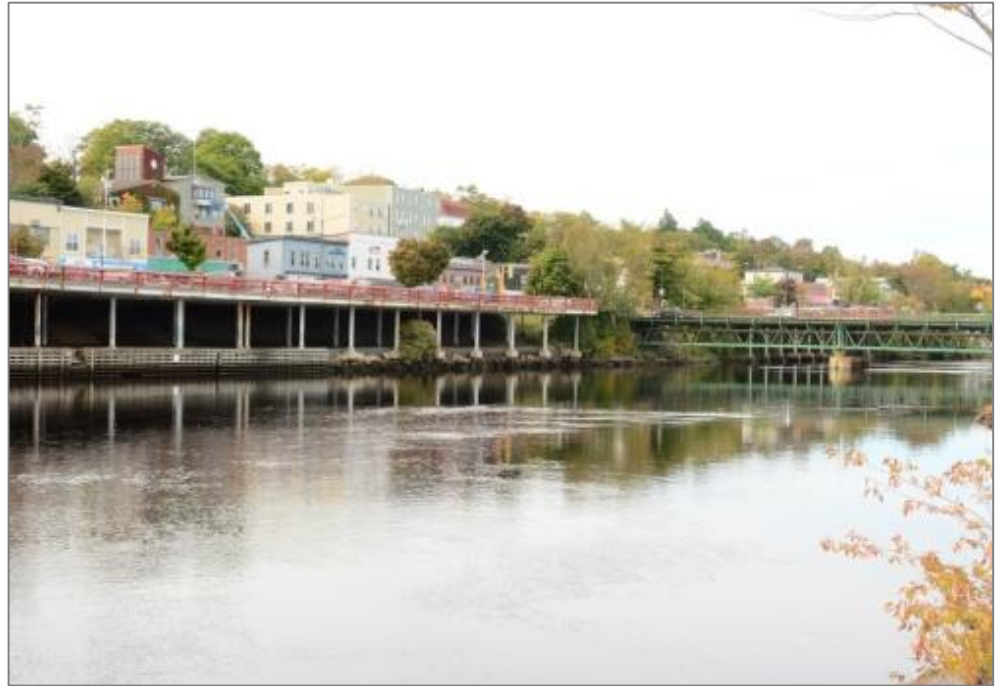


Hebb Brook

Background - MCCAP

Identified priority concerns:

1. Critical and non-critical infrastructure is vulnerable
2. Vulnerability to increasing flood damage, injury, and disruption, especially in the downtown



**Downtown Bridgewater and
the South Parkade**

Background - MCCAP

Identified priority concerns:

3. Lack of local and regional capacity to plan for and respond to climate-related emergencies
4. Population vulnerable to increasing regional economic and social problems caused by climate change



LaHave River, north of downtown

What we're doing – Land Use

New Planning Documents

- Land use controls manage how development interacts with the natural environment
- Can mitigate climate impacts
- New planning documents came into effect on December 24, 2014



Parking at the Bridgewater Mall

What we're doing – Land Use

Municipal Planning Strategy

- Establishes the LaHave River Development Agreement Area (LRDA) in flood risk areas next to the River
- Council must consider purchasing any property for sale in the LRDA
- Most development in the LaHave River Development Area requires a Development Agreement (DA)
- Council must consider the Flood Risk Assessment before approving DAs for the LRDA

LaHave River Development Area



What we're doing

Open space (MPS Section 11)

- Recognizes adaptive capacity of open space
- Calls for more open space along the LaHave River
- Anticipates an Open Space Master Plan
- Recognizes the LaHave River as a public open space



Pinecrest Park

What we're doing

Environmental Management (MPS section 12):

- Previous planning documents had no restrictions with respect to building in areas with high risk of flooding
- As of right construction caused problems with storm water management – especially for those downstream



Residence on Hebb Brook

What we're doing

Environmental Management (MPS section 12):

- New documents include minimum setbacks from significant watercourses, to mitigate risk of flooding and erosion
 - * Minimum 8 meter (26 ft) setback from significant watercourse
 - * No buildings, structures, parking spaces or loading areas on slopes of more than 20%

Town Pond



Shipyard's Landing

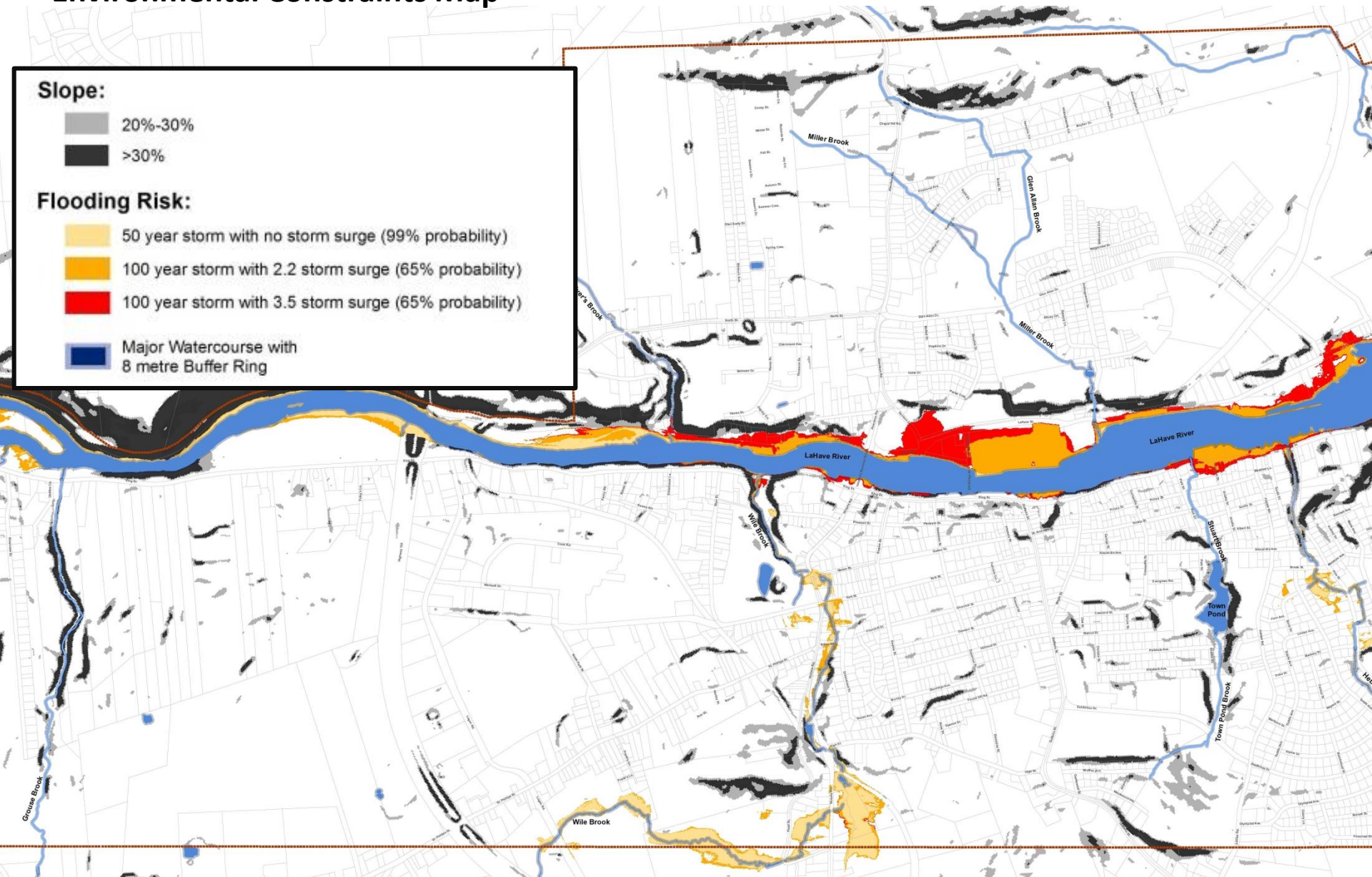
Environmental Constraints Map

Slope:

- 20%-30%
- >30%

Flooding Risk:

- 50 year storm with no storm surge (99% probability)
- 100 year storm with 2.2 storm surge (65% probability)
- 100 year storm with 3.5 storm surge (65% probability)
- Major Watercourse with 8 metre Buffer Ring



What we're doing

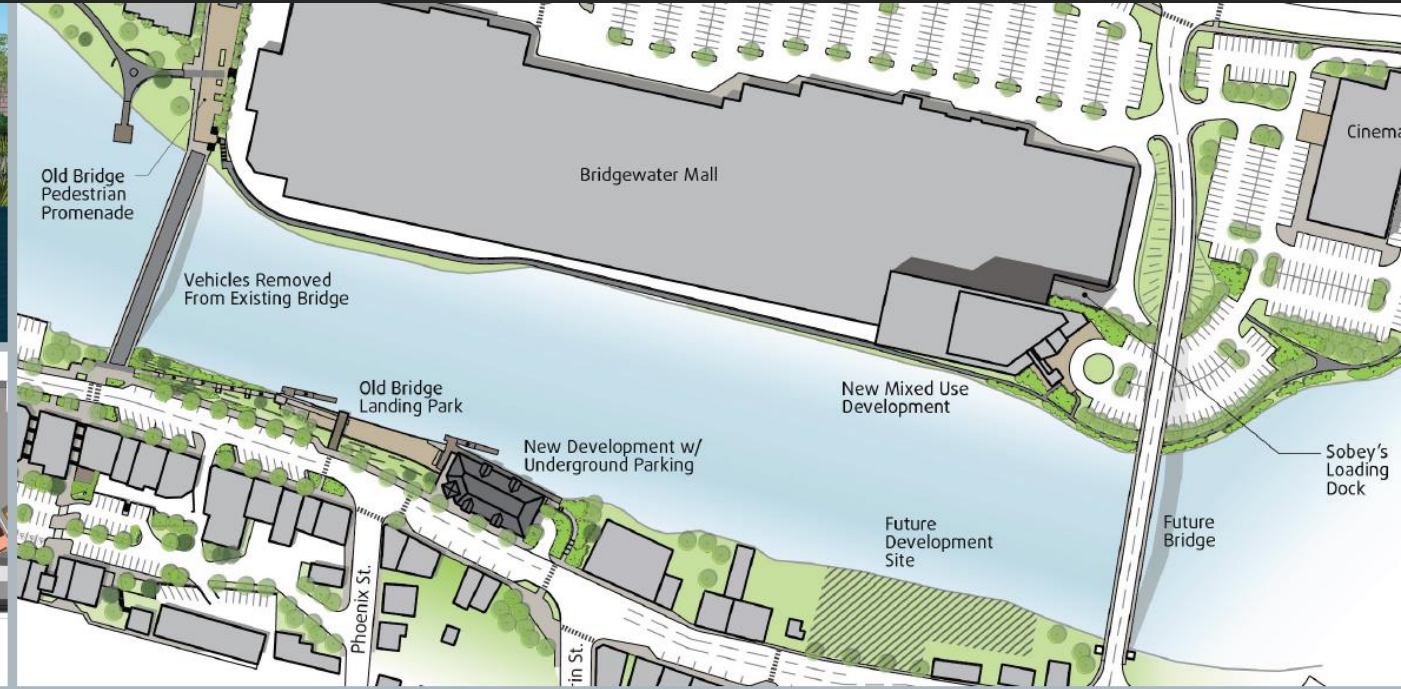
Environmental Management (MPS section 12):



Wile Brook

- Relied on information from Flood Risk Assessment to identify areas at risk of flooding
- Encourages use of natural systems to manage stormwater
- Council must work towards implementing the MCCAP
- Requires Council to commission a stormwater management plan

Downtown Master Plan (2013)



Town of Bridgewater

Downtown & Waterfront Master Plan

>> Final Report



EKISTICS PLANNING & DESIGN

State of Bridgewater's Downtown



How we think of it...

- Defining: *“Main Street of the South Shore”*
- Vital to economic vitality of the region
- Focal point of Bridgewater
- Rich with history and character
- River = beautiful natural asset
- *Endless untapped potential!*

State of Bridgewater's Downtown

Challenges (to name a few)...

- Underutilized land use
- Obstructed access to the River
- Lack of public space
- Poor pedestrian environment
- Infrastructure decay
- Environmental concerns
(e.g., erosion, sea-level rise)



State of Bridgewater's Downtown

Poor Pedestrian Environment...



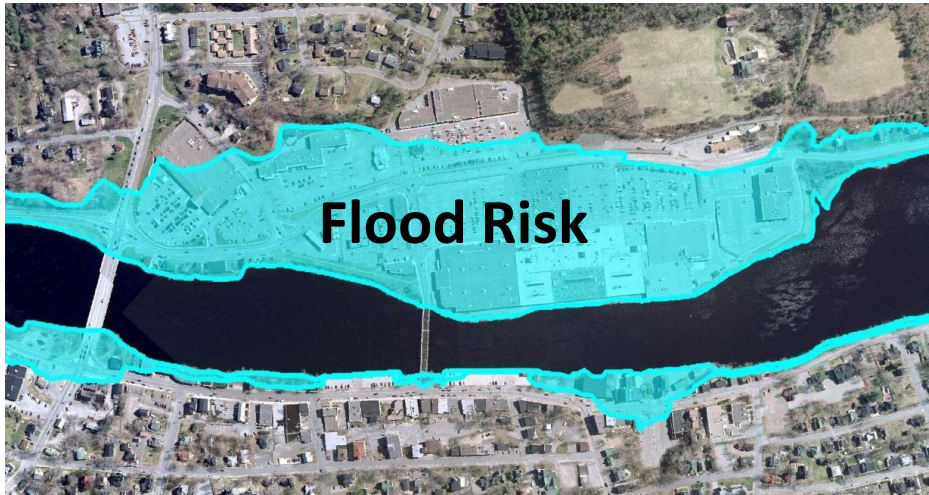
State of Bridgewater's Downtown

Dwindling Business Activity...



State of Bridgewater's Downtown

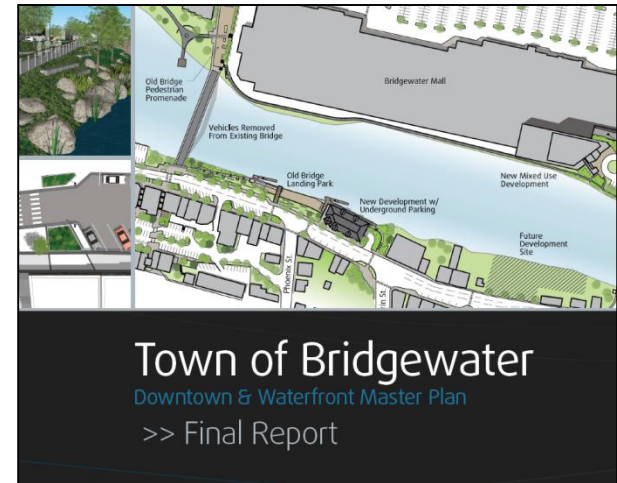
Increasing Risks...



Downtown Master Plan (2013)

Purpose of the Plan:

- Comprehensive long-term plan for Bridgewater's downtown and waterfront which will shape development and open space and provide detailed strategies for achieving improvements over time.
- **Guiding principles:** History / Connection / Sustainability / Identity / Activity / Design
- The development of the Master Plan was highly collaborative, including input from youth, residents, businesses and other stakeholders.

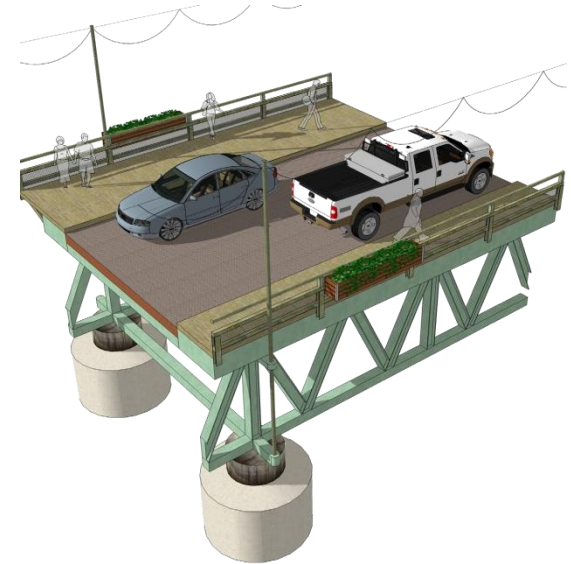


Downtown Master Plan (2013)

**Comprehensive long-term plan for
Bridgewater's downtown and waterfront
which will shape development and open space
and provide detailed strategies for achieving
improvements over time.**

Downtown Master Plan (2013)

Strategic Focus Area #1: Public Infrastructure



Downtown Master Plan (2013)

Strategic Focus Area #1: Public Infrastructure

- **Canadian Urban Institute Report:** Successful downtowns regularly “punch above their weight”, contributing up to **20%** of municipal property tax revenue while occupying just **1%** of the town’s area.
- **Strategic Investment:** Public investment provides a confidence-boosting signal to private investors that it is “safe” to invest in the downtown. Plus, it costs considerably less for towns to construct and maintain municipal infrastructure in the downtown due to the efficiencies created by density.

Downtown Master Plan (2013)

Strategic Focus Area #2: Planning Policy

MUNICIPAL PLANNING STRATEGY



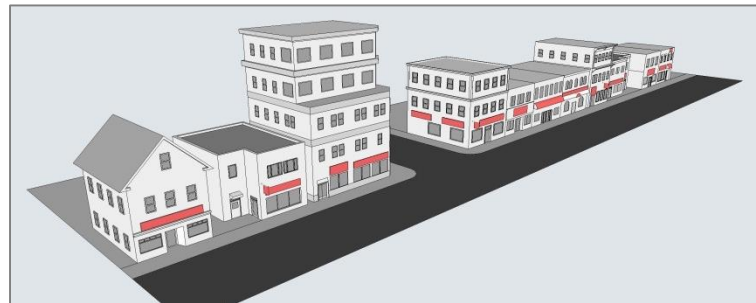
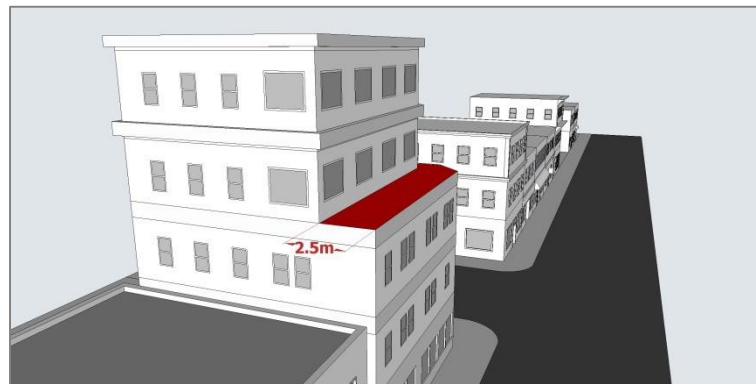
2014

Town of Bridgewater

Approved by Bridgewater Town Council: _____, 2014

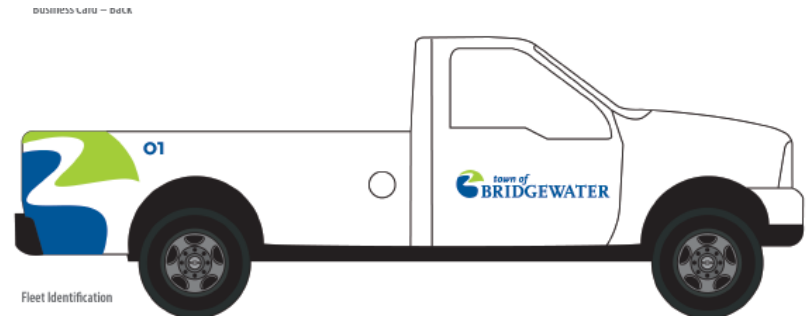
Effective date: _____, 2014

Contains amendments to: _____, 2014



Downtown Master Plan (2013)

Strategic Focus Area #3: Branding



Downtown Master Plan (2013)



Downtown Master Plan (2013)

Public Validation:

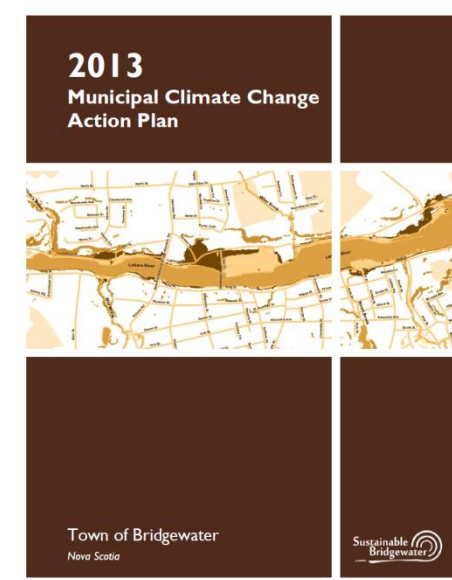
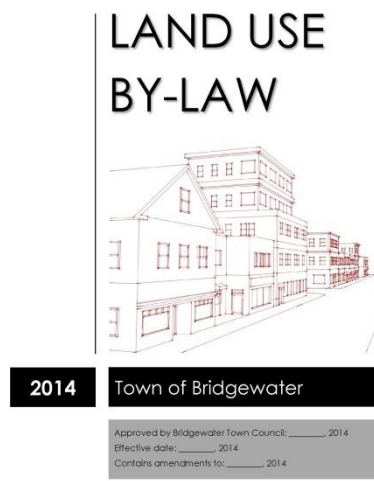
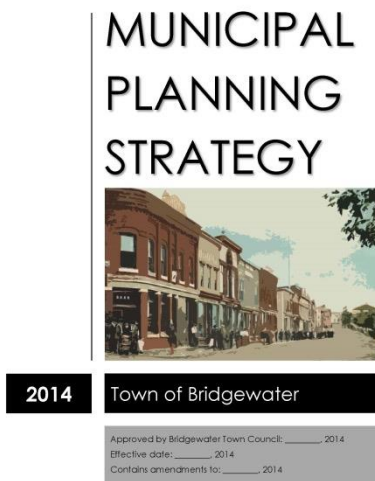
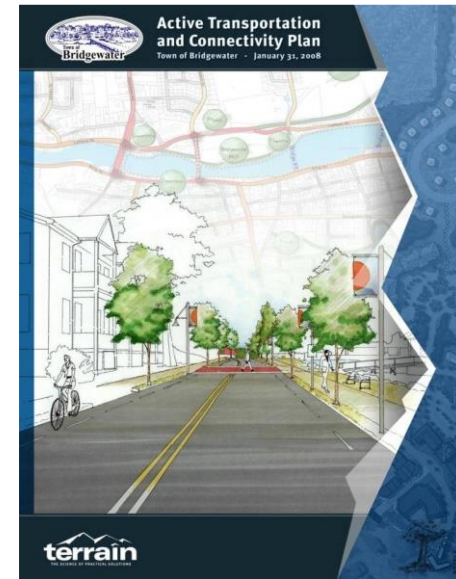
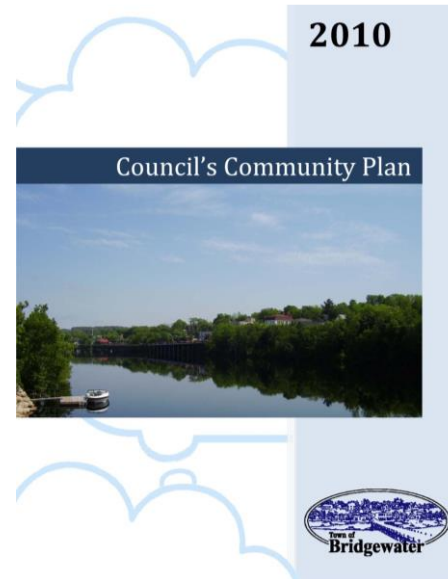
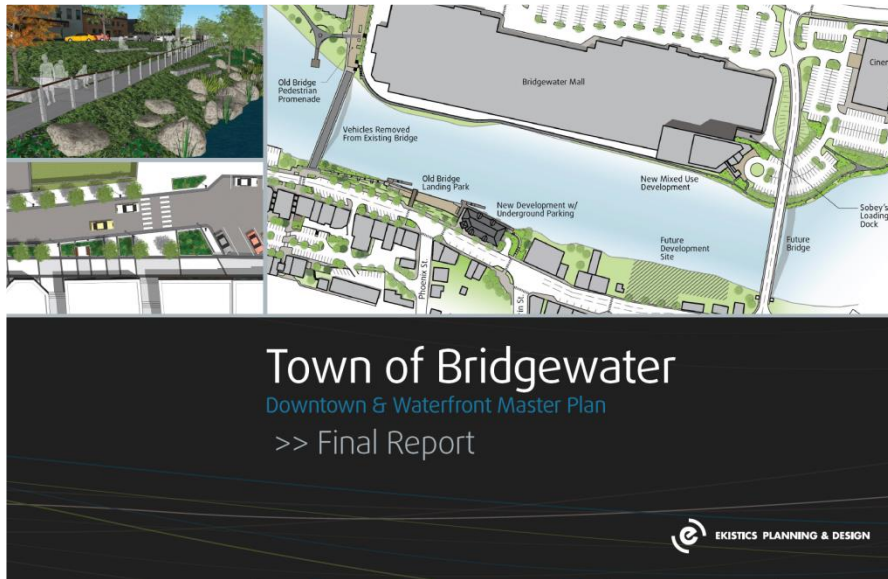
- Excellent attendance at public events. Presentation of the draft Master Plan was met with boisterous applause.



Town Council Endorsement:

- **April 15, 2013:** unanimously approved the Plan in principle and established new committee to work towards its implementation.
- **2014/15 Budget:** approved project budget to undertake a preliminary and detailed design process for Phase 1

Downtown Revitalization is a Priority



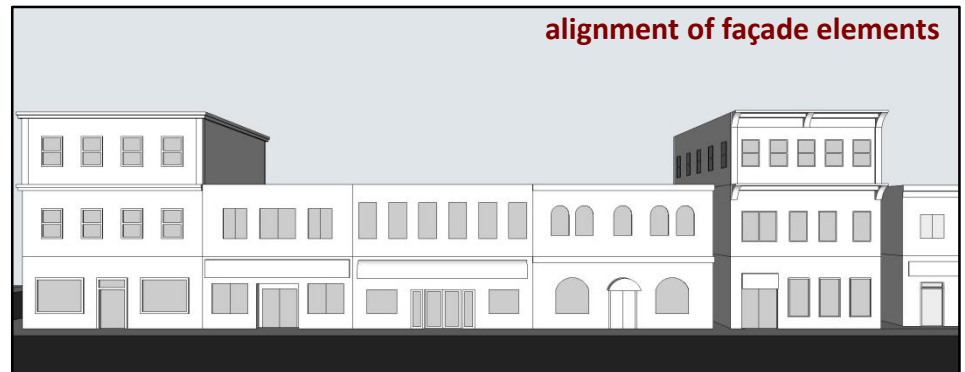
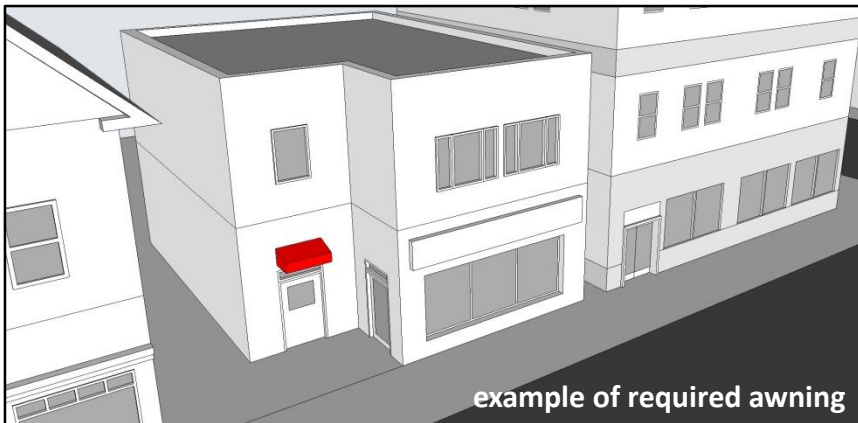
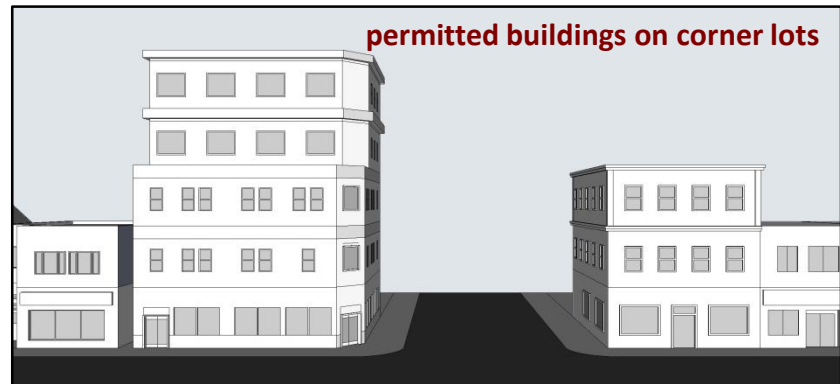
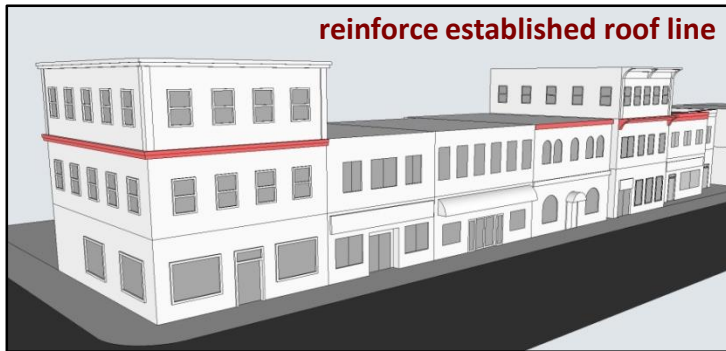
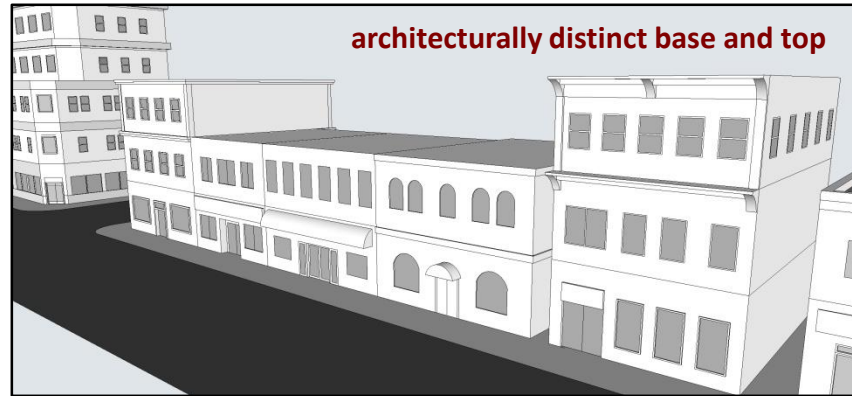
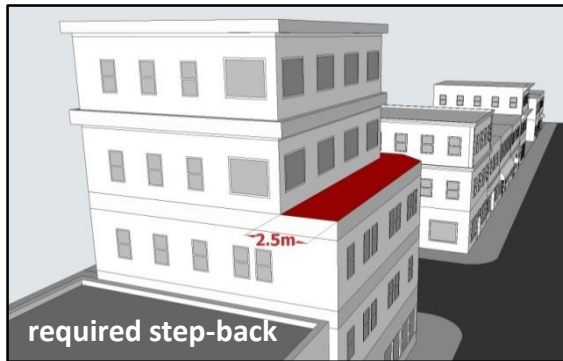
Downtown Master Plan (2013)

- Kings Street is located in the Historic Downtown Commercial (C1) Zone
- Urban Design requirements in the Land Use By-Law support the vision of the Downtown and Waterfront Master Plan
- Section 5.2.7 of the Land Use By-Law includes restrictions with respect to:
 - Building height
 - Step back
 - Setback
 - Building orientation and entryways
 - Building facades and windows

Downtown Master Plan (2013)



Architectural controls



Phase 1 – Changing the downtown

- Reconstruction of King Street to focus on street culture, walkability and active transportation
- Old Bridge Landing – public open space on the LaHave River, in the heart of downtown Bridgewater



Phase 1: Project Area



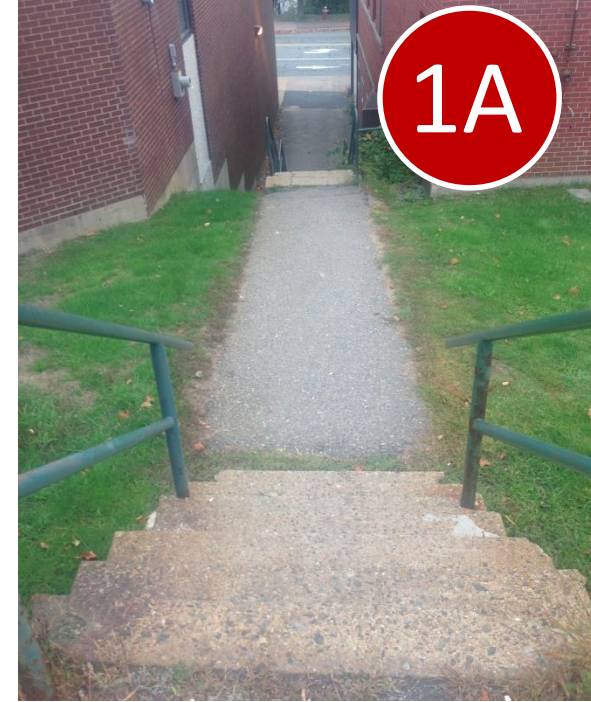
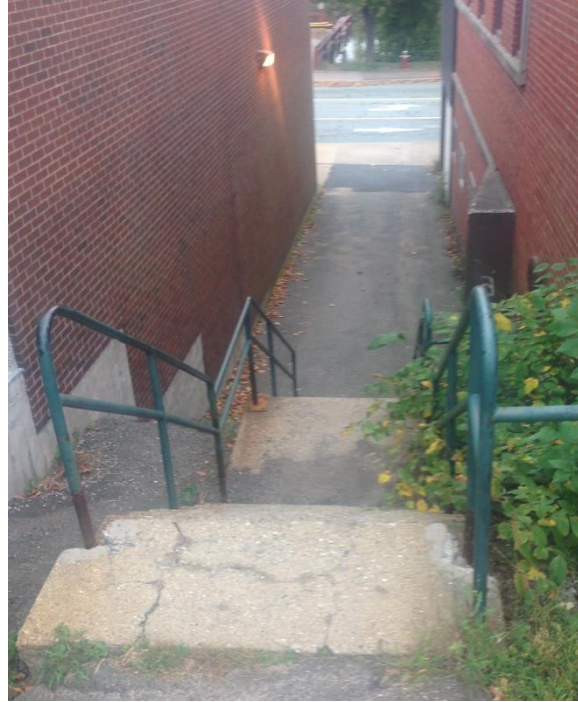
Phase 1: Project Components

1A Off-Street Parking Changes

1B King Street Reconstruction

1C 'Old Bridge Landing'

Phase 1: Project Components

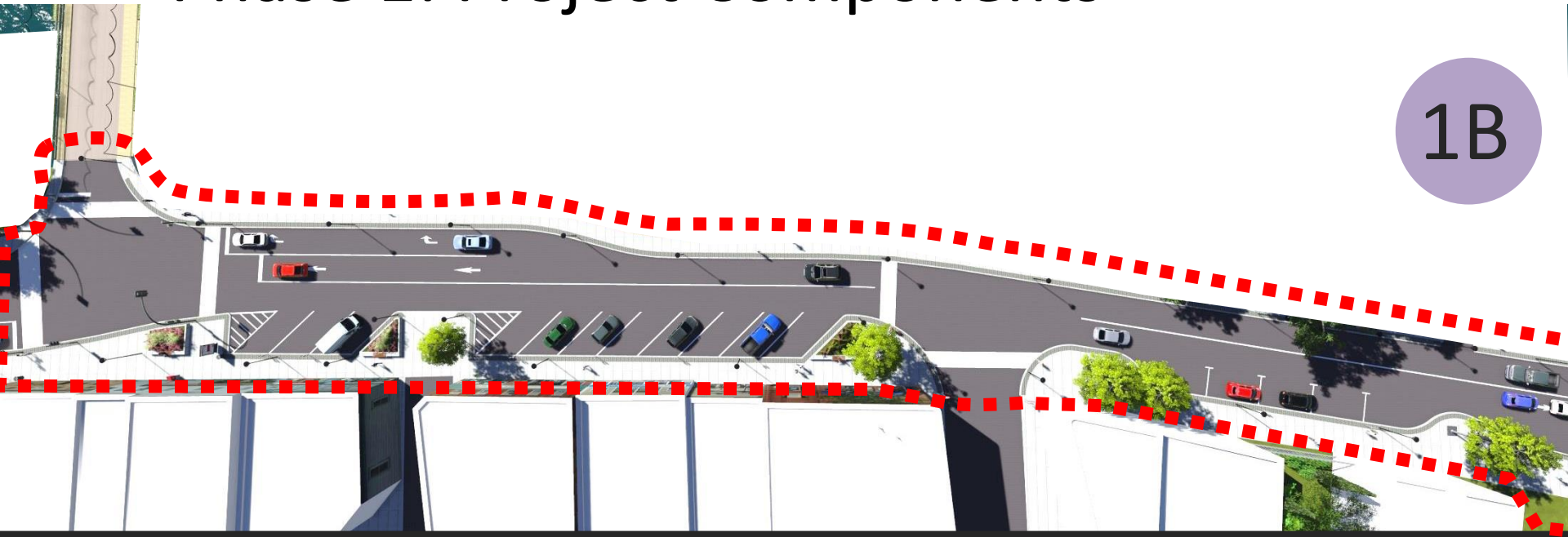


Phase 1A: Off-Street Parking Changes

- Removal of South Parkade (King Street)
- Improvements to Town Hall parking lot (for merchants)
- Pedestrian link between King St. & Town Hall parking lot

Phase 1: Project Components

1B



Phase 1B: King Street Reconstruction

- Extensive pedestrian improvements:
 - Concrete sidewalks (shared use on River side); Bumps-outs; Improved crosswalks and curb-cuts; Trees & raingardens; Street lights; Benches and sitting areas; etc
- Back-in angled parking adjacent to King Street businesses
- Sanitary / water / stormwater upgrades

Phase 1: Project Components

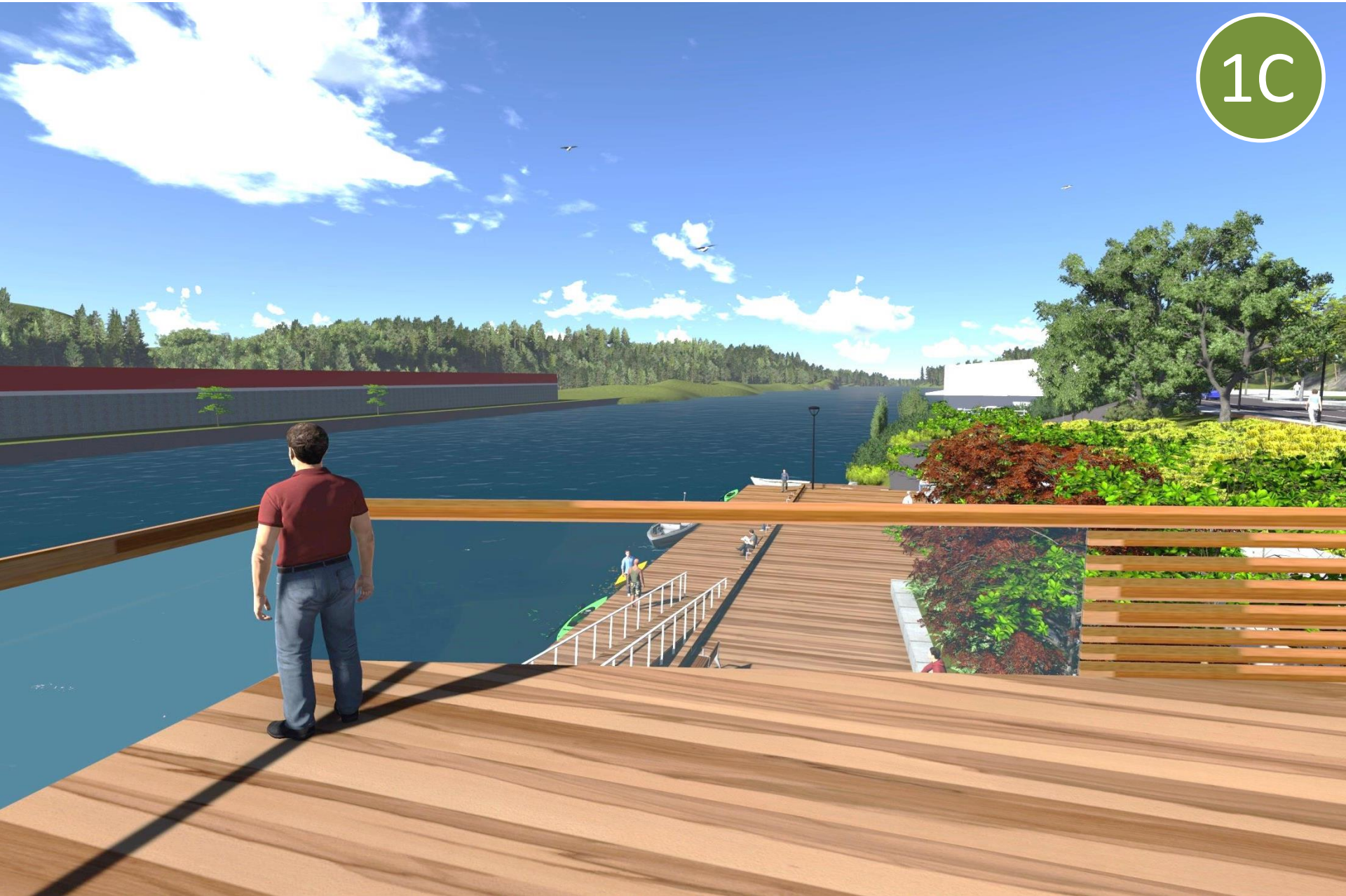


Phase 1C: Construction of 'Old Bridge Landing'

- Destination site: central riverside town square
- Extensive physical and visual access to the River
- Flexible, universal design: wide range of activities

Phase 1: Project Components

1C



Phase 1: Project Components

1C



Phase 1: Project Components

1C



Phase 1: Project Components



Phase 1: Project Components



PHASE 1: COMPLETE

1A

1B

1C

Animated Video – Post Construction

<http://www.youtube.com/watch?v=Rul-CGqZvTY>

Phase 1: Anticipated Outcomes



→ Increased business activity & property values

- *Increased revenues*
- *Increased number of businesses*
- *Increased municipal tax revenue*

→ Healthier downtown

- *Increased active transportation behavior*
- *Reduced pollution / sediment run-off into River*
- *Green*

→ Effective disaster mitigation

- *Managed retreat*
- *Adaptable land use in dynamic flood risk area*
- *Fiscal responsibility*

→ Increased community identity and pride!

Phase 1: Anticipated Outcomes

Economic Impacts of Active Transportation (AT):

Businesses	Wider sidewalks and other efforts to develop pedestrian-friendly shopping districts help shop owners to attract customers
Personal Finances	The annual costs of bike ownership are dramatically lower than the costs associated with individual car ownership.
Public Finances	Costs of maintaining infrastructure for walking & cycling are significantly lower than the costs associated with the infrastructure needed to support motorized traffic & parking
Health & Productivity	There are very significant public health costs related to inactivity. These negative costs can be limited and even countered through investment in active transportation.

Phase 1: Anticipated Outcomes

Economic Benefits of Parks:

- Parks provide intrinsic environmental, aesthetic, and recreation benefits to communities. They are also a source of positive economic benefits – they **enhance property values, increase municipal revenue, bring in homebuyers and workers, and attract retirees.**
- Bottom line: great parks are a good financial investment for a community!



Moving forward - ongoing challenges



→ Limited financial resources to acquire lands in the LaHave River Development Agreement Area

→ Limited resources to implement the Municipal Climate Change Action Plan

→ Limited information on health and function of existing stormwater management system

→ Most development is still as of right

→ Vulnerable to unpredictable weather events

Moving forward – next steps

- ✓ Develop an Open Space Master Plan with a focus on adaptive capacity along the LaHave River
- ✓ Monitor the implementation of the new planning documents and the Downtown and Waterfront Master Plan
- ✓ Continue to implement the ICSP and the MCCAP
- ✓ Develop Stormwater Management Master Plan
- ✓ Continue work to separate sanitary and storm water sewers
- ✓ Continually evaluate progress – is it helping?

Questions?

