

Brock District Plan



Brock District Plan

// Contents

Introduction // 5

Precedents // 13

7 Frameworks // 21

Guidelines // 65

Implementation // 71

// A Map Book is provided under separate cover



Twelve Mile Creek

Lake Moodie

Lake Gibson

Glenridge Quarry
Naturalization Site

10

Glenridge Ave

Merriville Highway

Samson Parkway

Sir Isaac Brock Way

406

58

14

12

406

15

11

9

7

8

8

4

5

6

3

2

1

The Demonstration Plan

- 1 Brock University Campus Plan long range demonstration plan
- 2 Long term intensification
- 3 Mixed use retail centre
- 4 New civic park
- 5 Niagara Region Headquarters
- 6 Mixed use development
- 7 Intensification of Brock Business Park
- 8 New linear park
- 9 Active transportation connections
- 10 Glenridge Avenue Gateway
- 11 Merriville Highway Gateway
- 12 Enhanced landscape and gateway from 406
- 13 Enhanced streetscape
- 14 Area to be studied for development potential
- 15 Brock Business Park Secondary Plan Special Policy Area

Introduction

The Brock District Plan sets a framework for the planning, design and development of a vibrant complete university community set within a UNESCO Biosphere Reserve. The vision focuses on higher education as a catalyst for economic prosperity. Brock University is the fulcrum around which areas for new mixed use, higher density housing and employment are stitched together with a network of tree lined streets, urban open spaces and natural features, demonstrating sustainable design and a walkable positive experience. The District Plan demonstrates how to monetize the research at Brock University, build on the intellectual capital of the area and leverage the assets of Niagara Region to have a global impact in terms of opportunities to attract new students, new residents, new businesses, and new employees to the Brock District.

The District Plan is a planning and development strategy for a defined area. District Plan Areas are recognized within the Regional Official Plan as unique land use centres that form part of Niagara's urban structure. They are primary development nodes and represent pathways to ongoing Regional prosperity.

With the overlapping jurisdictions of the City of St. Catharines, City of Thorold, Brock University, Niagara Escarpment and the Province's Greenbelt, implementation will require ongoing communication, commitment to coordination and collaboration under the Region's guidance.

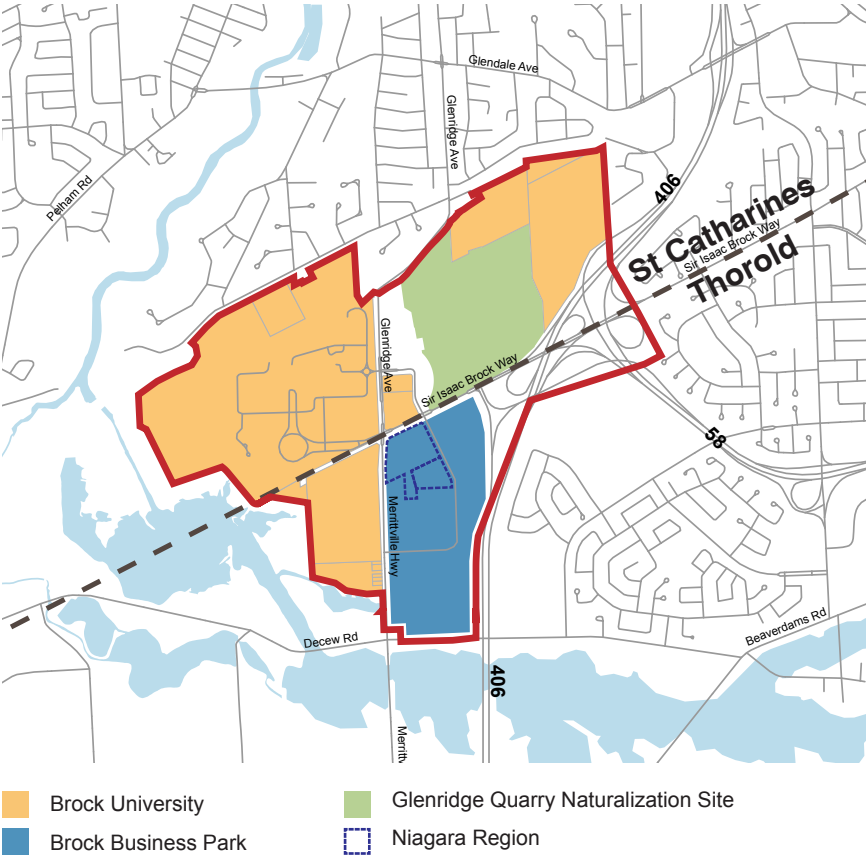
The District Plan will be implemented through an amendment to the Region's Official Plan where the vision, principles and key directions will set the overarching framework for implementation to the policy, zoning and special studies required through the City of St. Catharines and the City of Thorold.

It is recommended that a Brock District Technical Advisory Committee be established to meet regularly to coordinate projects, review planning and design concepts, review detailed design, to establish detailed design standards and to ensure coordinated policies. The Brock District Technical Advisory Committee should include representatives from the Region, the City of St. Catharines, the City of Thorold, Brock University, the Niagara Escarpment Commission and the Ministry of Transportation.

The Brock District Plan builds on the solid foundation laid by the Region's prosperity agenda, *Official Plan*, *Complete Streets* (2012), *Sustainable Niagara* (2012), *Transportation Strategy Update* (completed 2012), *Transportation Master Plan Study* (underway), *Water*, *Waste Water Master Servicing Plan* (underway), as well as the *Niagara Escarpment Plan*, the Official Plans of the City of Thorold and City of St. Catharines, the *Brock Business Park Secondary Plan*, and provincial policies.

"In 2060 Niagara will be a leader in planning, developing and revitalizing our neighbourhoods and communities to ensure residents can thrive and maintain a high quality of life".

(Sustainable Niagara)



The Brock District is approximately 335 hectares, of which about half of the lands (172 hectares) are owned by Brock University (including their peripheral development lands).

The Brock District is a unique urban centre - a defined area that straddles the City of St. Catharines and the City of Thorold with about half of the area comprised by Brock University. The District includes the four quadrants of Sir Isaac Brock Way and Merrittville Highway/Glenridge Avenue and extends from Highway 406 west to Lake Moodie and from Lake Gibson north to the wooded slope of the Niagara Escarpment. The area is influenced by provincial policies of the Greenbelt Plan and the Niagara Escarpment Plan.



St Paul St W

Pelham Rd

Twelve Mile Creek

Glendale Ave

Glendale Ave

The Pen Centre

Hwy 406

Sir Isaac Brock Way

Glenridge Quarry Naturalization Site

Glendale Ave

Sir Isaac Brock Way

Brock University

BROCK DISTRICT

Hwy 58

Lake Moodie

Merriville Hwy

Decew Rd

Lake Gibson

Hwy 406

Beaverdams Rd

Welland Canal

Short Hills Provincial Park

The Study Area's Context

The Brock District has all of the raw ingredients of a university innovation centre. It has:

- a university;
- a major regional employment centre (Region of Niagara and City of Thorold);
- employment uses;
- healthcare institutions (Hotel Dieu Shaver hospital and Niagara Children's Centre, and Niagara Prosthetics & Orthotics);
- a hotel (Four Points Sheraton);
- retail uses;
- athletic and recreation facilities (Eleanor Misener Aquatic Centre, Bob Davis Gymnasium and various outdoor athletics fields on the Brock University campus);
- cultural facilities (Sean O'Sullivan Theatre, Rodman Hall Art Centre, David S. Howes Theatre);
- significant open space (Glenridge Quarry Naturalization and the Niagara Escarpment lands);
- student housing; and,
- excellent accessibility (Highway 406, transit hub focused on Brock University).

There are already about 5,000 people working and 3,500 students living in the Brock District.

However, the uses and activity areas within the District are currently isolated from each other in part by inhospitable roads, vast open spaces, parking lots and buildings that have been developed as singular projects. The Brock District Plan illustrates the opportunities of stitching together the existing uses and accommodating intensification to transform the area into a mixed use centre. Key to the success of the District will be the incorporation of a broader mix of housing types over time.



The Brock District Plan builds on the direction provided by the planning frameworks of the component jurisdictions.

The lands north of Sir Isaac Brock Way are included in the **Niagara Escarpment Plan** and are identified as Urban Area and Escarpment Natural Area. The Plan's development objectives provide direction for an urban design approach compatible with the visual and natural environment of the Escarpment, by for example, incorporating setbacks and screening. Development in the Urban Area is to enhance public access to the Escarpment, incorporate attractive streetscapes and protect ecological areas, habitat, streams and water supplies.

The City of Thorold has completed the **Brock Business Park Secondary Plan** for the lands south of Sir Isaac Brock Way and east of Merrittville Highway. The Plan's intent is to revitalize the Business Park in a manner that supports and enhances employment uses within the context of new uses that integrate surrounding areas, encourage mixed use with enhanced urban design.

The **City of St. Catharines Official Plan** identifies the area north of Sir Isaac Brock Way in an area covered by the South District Plan. Land use designations in the Brock District Plan include general employment (Brock University and uses north of John MacDonell Street), mixed use in the north east corner of Sir Isaac Brock and Glenridge Ave and medium density residential west of the Glenridge Quarry Naturalization site. The Official Plan includes urban design principles providing support for high quality built form and a requirement for urban design concept plans that demonstrate the application of the City's Urban Design Guidelines.

Brock University's updated Campus Master Plan re-examines the framework and directions (from the 2003 Campus Plan) for physical changes that support the university's academic goals while enhancing the campus experience. The Campus Plan has the following key directions:

- expand and renew the Core;
- improve and integrate the East Campus;
- renew facilities;
- renew the campus setting;
- improve movement and connections;
- integrate with the surrounding city; and,
- create partnership opportunities.

The Campus Plan identifies areas for new development as well as redevelopment and intensification, enhancements to roads, transit, pedestrian and cycling routes, enhanced open space and upgraded services and utilities. A number of specific projects related to new buildings, roads and entrances, and landscape features including the edge to the Niagara Escarpment, the West and East Common and gateways are identified.

The campus vision is depicted in a demonstration plan illustrating a future Brock University in both the short term and long term (excluding the "peripheral development lands"). The Brock District Plan builds on the key directions of the Campus Plan that include a connected open space network, intensification of mixed use buildings, new street edge buildings to define the edge of beautiful tree lined streets through the District, and enhanced mobility for pedestrians, cyclists, transit users, as well as motorists.

Niagara Region Official Plan

The Region's Official Plan sets out Niagara's aspiration to build sustainable, complete communities to serve the needs of the population, without compromising the potential needs of future generations. The Region's Official Plan provides clear direction for building **sustainable, complete communities** by:

- » Encouraging mixed and integrated land uses;
- » Making efficient use of land, resources and infrastructure;
- » Promoting compact, transit supportive development friendly to active transportation;
- » Supporting intensification;
- » Building better greenfield neighbourhoods;
- » Fostering development that conserves natural resources and maintains or enhances natural systems;
- » Integrating cultural programs and facilities in our Urban Areas; and,
- » Making prudent fiscal decisions.

The Brock District Plan is prepared to meet the Region's **Urban Growth** objectives (Section 4.G of the Official Plan):

Objective 1

Build compact, vibrant, sustainable, integrated and complete communities.

Objective 2

Plan and manage growth to support a strong, competitive and diverse economy.

Objective 3

Protect, conserve, enhance and wisely use the valuable natural resources of land, air, energy and water for current and future generations.

Objective 4

Maximize the use of existing and planned infrastructure to support growth in a compact and efficient manner.

Objective 5

Provide flexibility to manage growth in Niagara in a manner that recognizes the diversity of communities across the Region within the framework set out in the Regional Official Plan.

Objective 6

Promote continued collaboration and cooperation among governments, institutions, businesses, residents, and not-for-profit organizations to achieve our Vision and the objectives of these policies

Section 3.A.3.1 of the Official Plan contains policies for the Niagara Economic Gateway, of which the Brock District is a part. Policy 3.A.3.4 is concerned specifically with the Brock Business Park. It reads:

"The concept for the Brock Business Park Revitalization is to capitalize on market opportunities for research and development and the close proximity to Brock University and Highway 406 by transforming the area into an integrated, mixed use, campus-style setting which caters to incubators, innovator, limited office uses, and related uses.

"In order to address the challenges, capitalize on opportunities and transform the concept into reality, the following tools will be utilized:

- a) *Preparation of a joint secondary plan to coordinate development and refine the concept;*
- b) *Preparation of a public realm improvement program to re-energize the area and attract new investment;*
- c) *Preparation of supporting plans for servicing and transportation (including active transportation and transit);*
- d) *Preparation of urban design guidelines; and,*
- e) *Updating relevant local plans, policies, and zoning by-laws."*

Niagara Region Council Priorities

The Brock District Plan meets three of the Council's priorities for 2015-2018.

1 Fostering Innovation, Investment and Entrepreneurship

The Brock District Plan provides coordinated direction to multiple stakeholders to provide the “necessary infrastructure to foster growth and be a catalyst to attract investment”. It will help to create “an attractive environment for both current and prospective businesses and investors to innovate, invest and embark on new and exciting entrepreneurial ventures”. The Brock District Plan will help to create an environment “to foster creativity, celebrate innovation successes, support research and development and encourage new and expanded business opportunities in Niagara”

2 Building a Labour-ready Workforce

The Brock District has all of the raw ingredients for a successful urban district – a university, existing business, head offices, health services

3 Positioning Niagara Globally

The Brock District is set within the Niagara Escarpment a UNESCO Biosphere Reserve. The District Plan can provide the coordination among stakeholders to position Niagara globally to better “market Niagara to attract skilled immigrants, foreign investors and international students”.





Precedents Mixed Use Development next to Universities

Niagara Region is not alone in exploring opportunities for complete university communities. Universities across the continent are becoming the catalyst for economic prosperity in urban districts. In Canada alone, there are 26 research and technology parks near universities that contribute \$4 billion in GDP and provide 65,000 jobs. UniverCity at Simon Fraser University, UTown at University of British Columbia, Kendall Square at MIT in Boston and Mission Bay at University of California's San Francisco campus are precedents of mixed use development on and near university campuses. They demonstrate a way of integrating uses and sharing resources such as public space, art, cultural and recreation resources and parking. They demonstrate the value of working in partnership to attract the key elements of a knowledge economy hub with regional reach: innovative businesses and communities, and support for incubators, startups, research synergies and the commercialization of research.



UniverCity at Simon Fraser University

UniverCity is a recently developed urban centre neighbouring Simon Fraser University (SFU) in British Columbia. UniverCity is designed to be a compact, mixed use and transit oriented centre, founded on the principles of sustainability. Its development is intended to create a model sustainable community and to support an endowment fund for SFU. It will accommodate more than 10,000 people when built out. It is widely recognized as a model sustainable community with protection of more than 320 hectares of habitat, a stormwater management system that returns almost 100% of rainfall to the ground and a requirement for new buildings to be at least 40% more efficient than traditional development. It is a complete community with schools, childcare, shops, services, open space, and parks. It offers a full range of mobility options and has a diversity of housing to appeal to a broad range of households and income levels.







UTown at University of British Columbia

UTown @ UBC is a residential community adjacent to the University of British Columbia (UBC). The vision for UTown@UBC began over a century ago when it was envisioned as “a small city... capable of being made one of the most interesting and beautiful in the world.” UTown has transformed UBC from a commuter campus to a complete, sustainable campus community. UTown@UBC is home to 20,000 people in eight neighbourhoods each with a distinct character, housing options, public transportation, shops, services and access to cultural and recreational amenities. UTown's housing includes 3,200 family housing units with 50% of the residents working or studying at UBC.



Mission Bay at UCSF

The University of California San Francisco at Mission Bay is a vibrant biotechnology hub and major campus for UCSF's research and education programs being built as part of a massive 123 hectare mixed use redevelopment of a former railway yard.

Initiated with donations of land from the major Mission Bay developer and the City of San Francisco, the 23 hectare campus is now home to 13 research facilities, 3 clinical facilities, a 1.3 hectare campus green and the first new medical centre in San Francisco in 3 decades.

Key to the success of the Mission Bay campus are the partnerships between academia and industry that help drive top-notch research, innovation, education and patient care. The campus is home to more than 100 companies and is immediately surrounded by a growing and collaborative ecosystem of more than 50 bioscience startups, nine established pharmaceutical and biotech companies, 10 venture capital firms, and several related institutes affiliated with UCSF.

The transformation of UCSF Mission Bay into a thriving biotechnology center has been an economic boon for San Francisco. With \$1.4 billion worth of investment to date, the campus has been a significant catalyst to the San Francisco Bay Area biotechnology industry.





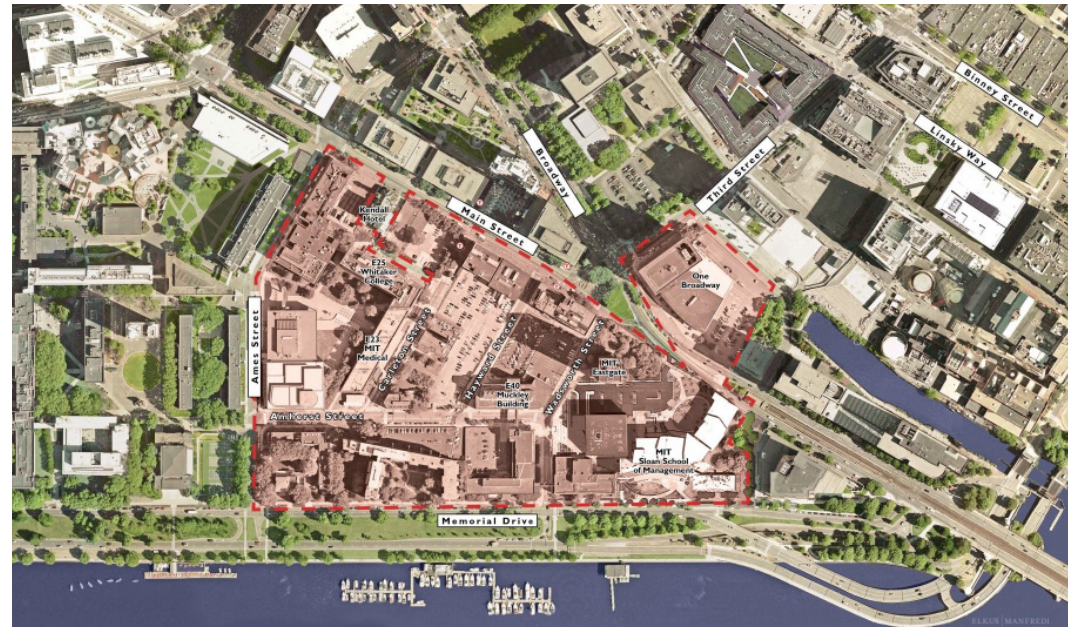
Kendall Square Initiative at MIT

MIT is revitalizing its east campus gateway area around Kendall Square through a collaborative and inclusive planning process that has engaged with neighbours, faculty, students, and staff.

The Kendall Square Initiative aims to create a vibrant mixed-use district featuring six new buildings on what are now MIT-owned parking lots, including three buildings for research and development, two for housing, and one for retail and office space. The plan will produce approximately 250 net new housing units for graduate students and approximately 290 new housing units for market use, more than 100,000 square feet of new and repositioned ground-floor retail, and nearly three acres of new and repurposed open spaces

Open space will be defining element of the Initiative. 1.2 hectares of the existing parking lots have been recaptured to create a welcoming and connected series of open spaces, while streetscape improvements will provide better and more comfortable connectivity.

The Initiative will support Kendall Square's growing innovation district by providing research and development space, and by maintaining innovation space in the district equal to 10% of the project's new commercial development space for early innovators and innovative academic initiatives and commercial enterprises.



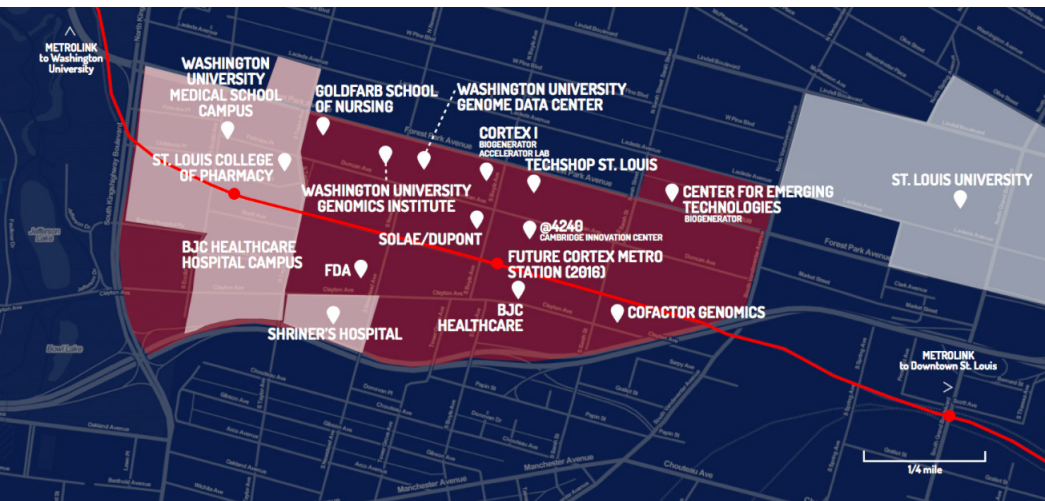
Cortex Innovation Community St. Louis

The Innovation Community is a 81 hectare innovation hub and technology district integrated into St. Louis' historic Central West End and surrounding communities. Cortex is a tax exempt nonprofit organization formed in 2002 by Washington University in St. Louis, BJC Healthcare, University of Missouri – St. Louis, St. Louis University, and the Missouri Botanical Garden to capture the commercial benefits of university and regional corporate research for St. Louis.

Founded with a \$29 million investment, Cortex has now completed or has under construction 1 million square feet of new and rehabilitated space totaling \$350 million of investment and generating 2,500 technology-related jobs. When fully implemented, the Cortex master plan projects \$2.1 billion of construction, over 4.5 million square feet of mixed-use development (research, office, clinical, residential, hotel, and retail), and 13,000 permanent technology-related jobs.

The district offers a broad range of spaces at a variety of price points, including office/R&D space, customizable lab spaces, co-working options and large, corporate offices suitable for entire companies or departments.

In addition, a new Interstate interchange, streetscape improvements, a 1.4 hectare park in the centre of the district and a new MetroLink light-rail station will all contribute to the creation of a complete, connected and vibrant community.





Brock University Plaza Building

7 Frameworks

The Brock District Plan is comprised of 7 frameworks that position the District within its regional context and provide a path forward towards a vibrant complete university community.

The description of each framework is followed by specific strategies and in some cases, specific projects and guidelines demonstrate the potential of the District.

- 1 Positioning the Brock District Globally within a UNESCO Biosphere Reserve
- 2 Setting the Brock District in the Niagara Escarpment
- 3 Gateways to the Brock District
- 4 Sustainable Urban Brock District
- 5 Balanced Circulation in the Brock District
- 6 A Green Brock District
- 7 The Brock District is a Complete Community

1



Positioning the Brock District Globally within a UNESCO Biosphere Reserve



The Bruce Trail is **900km** long following the Escarpment from **Queenston** to **Tobermory**

The Niagara Escarpment is a **UNESCO Biosphere Reserve**



-  The Niagara Escarpment Plan Area
-  Brock District

Map of the Brock District within the Niagara Escarpment UNESCO Biosphere Reserve



As the only institute of higher education in Canada set within a UNESCO Biosphere Reserve, Brock University has the unique opportunity to take a leading role in fulfilling this mandate, with the added advantage of being located in one of the Region's Gateway Economic Zones which includes the adjacent Brock Business Park providing the potential for strong research and development relationships.

Niagara Escarpment's combination of geological and ecological features results in a landscape that is unequalled in Canada. Collectively the Biosphere Reserves form a network of the world's main ecological systems.

The Niagara Escarpment is the most significant landform in the southern Great Lakes, stretching from Rochester in New York through the Niagara Peninsula to Hamilton, up through

the Bruce Peninsula to Manitoulin Island, then south through the Door Peninsula along the west coast of Lake Michigan into Wisconsin west of Milwaukee. The unique geologic origins of the Escarpment have created a rich natural heritage of diverse habitats and unique plant and animal species.

The Niagara Escarpment UNESCO Biosphere Reserve is one of 16 in Canada. Rather than simply protecting a landscape, species or habitat in its natural state, a Biosphere Reserve is meant to promote solutions reconciling the conservation of biodiversity with its sustainable use, a place for testing interdisciplinary approaches to understanding and managing changes and interactions between social and ecological systems, including the management of biodiversity.

Strategies

1a

Leverage setting within a UNESCO Biosphere Reserve to promote innovative education, research and business synergies and healthy lifestyles.



Decew Falls on the Niagara Escarpment

Map of the Brock District within the Niagara Escarpment and Greenbelt Areas



Strategies

- 1b** Continue to protect the Escarpment Natural Area and Escarpment Protection Areas as they run through the Brock District, and meet and exceed the requirements for development within the Escarpment Urban Areas

RELATIONSHIPS

Escarpment

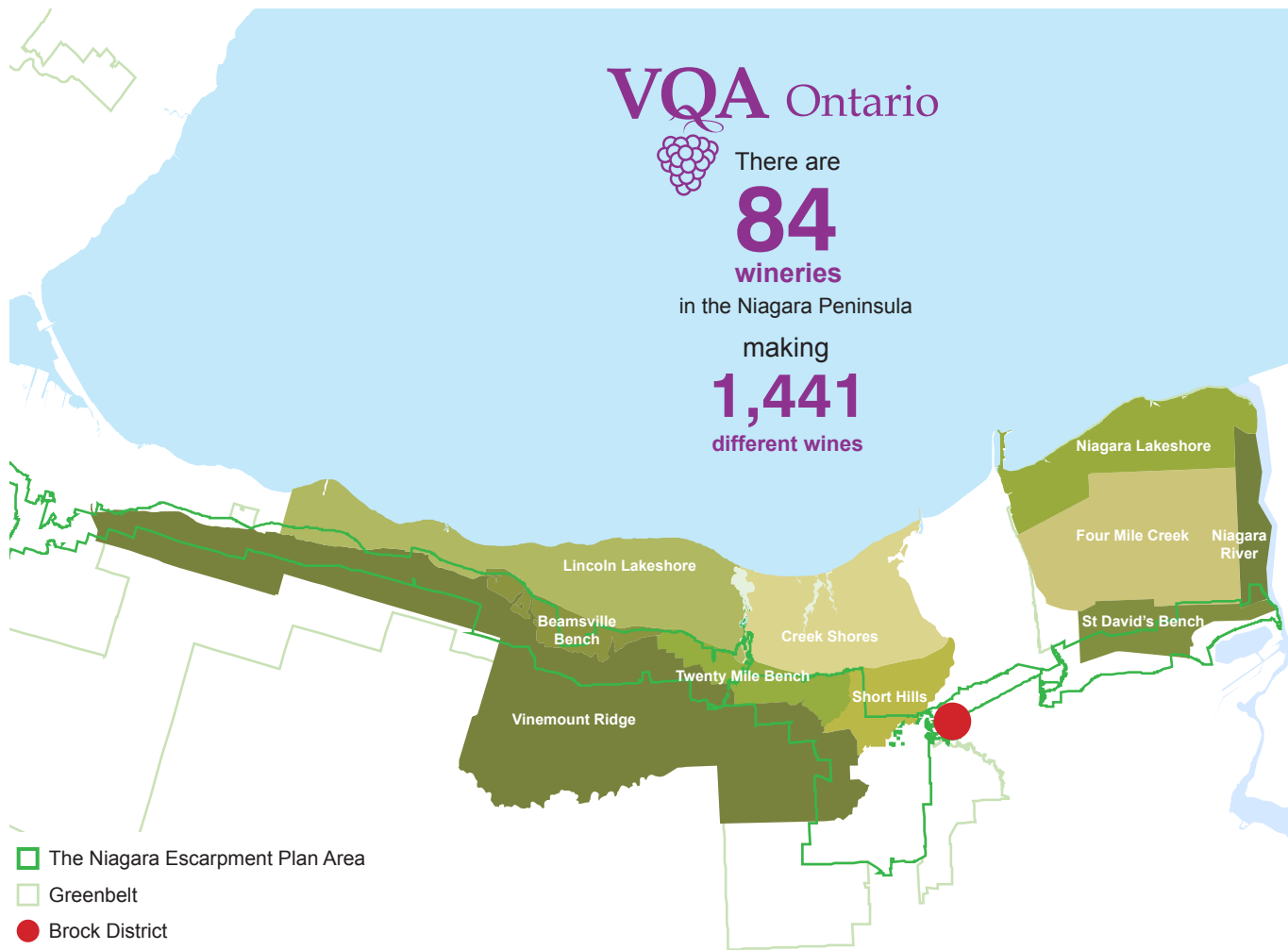
In Canada, the Niagara Escarpment Commission administers the Niagara Escarpment Plan, Canada's first large-scale environmental land use plan, which provides protections for the natural heritage, landscape and land use for all areas within the Plan Area.

All of the Brock District north of Sir Isaac Brock Way (and the extension of that line west through Brock University's campus) falls under the Niagara Escarpment Plan Area. Most of the District (apart from the natural areas associated with the slope of the Escarpment and areas around Lake Moodie) falls under the Urban Area designation which intends to minimize impacts and further encroachment of urban growth on the Escarpment environment. The Plan provides development objectives and criteria, permitted uses and other controls for new development within the Urban Area designation.

Development Control Areas are regulated by the Niagara Escarpment Commission under a different Act (the Niagara Escarpment Planning and Development Act) and while most of these areas correspond to Niagara Escarpment Plan Areas, there are some variations. In the case of the Brock District, the Brock University-owned parcels northwest of the Sir Isaac Brock Way and Glenridge Ave intersection are excluded from Development Control.



Vineyards at Hidden Bench, Niagara



Map of the Niagara Peninsula Sub-Appellations

Strategies

- 1c** Leverage location within the Niagara Peninsula Appellation to promote viticultural education, research and business synergies.

RELATIONSHIPS Viticulture

The Niagara Peninsula is the largest viticultural area in Canada and represents one of Ontario's 3 official Appellations of Origin. The Niagara Peninsula appellation includes 2 regional appellations and 10 varied sub-appellations.

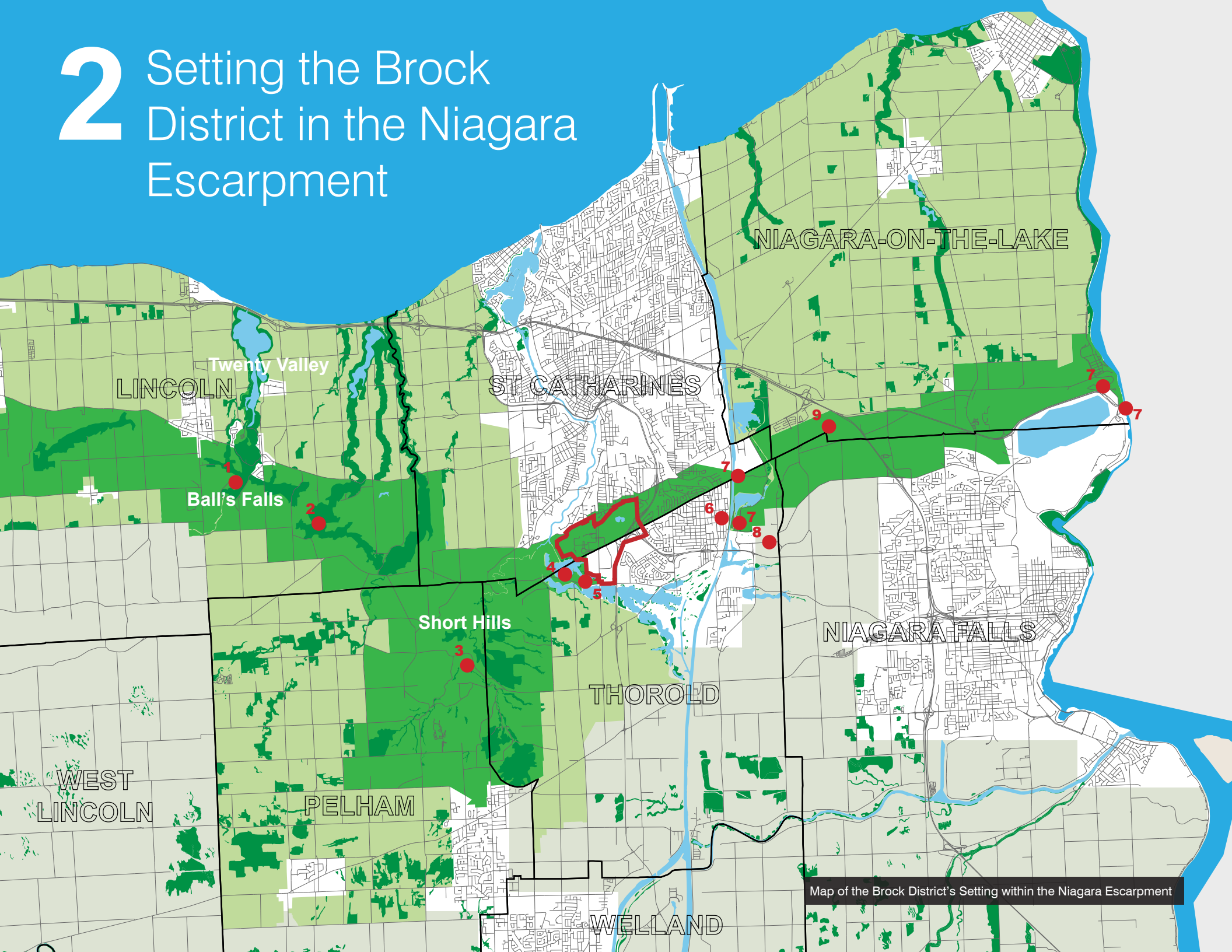
In 2011 the Ontario wine industry contributed \$2.3 billion to the economy in business revenues, with a total economic impact of \$3.34 billion including collected taxes and wages. The Niagara Peninsula wine industry is responsible for over 80% of this economic impact¹.

The Cool Climate Oenology and Viticulture Institute (CCOVI) at Brock University is an internationally recognized research institute on cool climate viticulture, oenology, wine business and wine culture, dedicated to the advancement of the Canadian grape and wine industry. The institute provides research, laboratory and analytical services from two state-of-the-art research facilities as well as supporting an Oenology and Viticulture Program at Brock University offering a co-op Honours BSc. Additional partnerships with Niagara College's unique Teaching Winery and Canadian Food and Wine Institute should also be pursued.

The proximity of the Brock Business Park to the CCOVI and its connections to the wine industry creates an ideal opportunity to promote further research and business synergies with the potential to create a world class cluster for viticultural research in support of the wine industry.

¹ The Economic Impact of the Wine and Grape Industry in Canada 2011, Canadian Vintners Association

2 Setting the Brock District in the Niagara Escarpment





Ball's Falls on the Niagara Escarpment

Brock District

Points of Interest within the Niagara Escarpment

- 1 Ball's Falls
- 2 Louth Falls
- 3 Short Hills Provincial Park
- 4 Morningstar Mill
- 5 Decew House
- 6 Downtown Thorold
- 7 Welland Canal Locks
- 8 Battle of Beaver Dams
- 9 Niagara College
- 10 Queenston Heights
- 11 Lewiston-Queenston Bridge

 Core Natural Heritage: Environmental Protection Areas

 Niagara Escarpment Plan Area

 Greenbelt Plan Area

 Rural Areas

At a macro scale, the Brock District is nestled within the natural environment despite its proximity to both the urban centres of St Catharines and Thorold.

Nestled against the Niagara Escarpment, the District also has strong connections through the water system of Lakes Gibson and Moodie to the Welland Canal and down the Escarpment to Twelve Mile Creek and on to Port Dalhousie and Lake Ontario.

The Brock District is also set within the Greater Golden Horseshoe Greenbelt, the world's largest permanent greenbelt. The Greenbelt includes the rural lands south of the District as well as the Tender Fruit areas to the west of St Catharines.

Short Hills Provincial Park to the southwest of the District is the largest park or conservation area in Niagara Region.

The Bruce Trail and its connections to subsidiary trail systems joins all of these natural elements together.

Strategies

2a Continue to leverage the local natural heritage system as a hands-on resource for education and research in Tourism and Environment, Geography, Sustainability Science, Earth Sciences

2b Leverage the setting in the Niagara Escarpment in marketing development opportunities for employment, housing and education



View over Brock University Looking Southwest (2009)

Relationship to a Varied Landscape

The Brock District lies within a rich and varied landscape to which it is connected by a network of paths that include the 900 km Bruce Trail along the Niagara Escarpment.

Apart from the core natural heritage of the Escarpment itself, Lake Moodie is surrounded by provincially significant wetlands and environmental protection areas. While no boating or swimming is allowed in Lakes Gibson and Moodie due to their role as reservoirs for the Decew Falls power generating stations (for which they were created by flooding the Beaverdams Creek valley), the lakes are home to a thriving ecosystem, with picturesque landscape features on their own.

Reaching southwest from the north tip of Lake Moodie, the Bruce Trail runs alongside an Area of Natural and Scientific Interest, beyond which starts the Short Hills Provincial Park, the largest park in Niagara Region. To the south and east are protected rural areas forming part of the Greenbelt. To the north of Lake Moodie, trail connections lead to the Twelve Trail along Twelve Mile Creek.

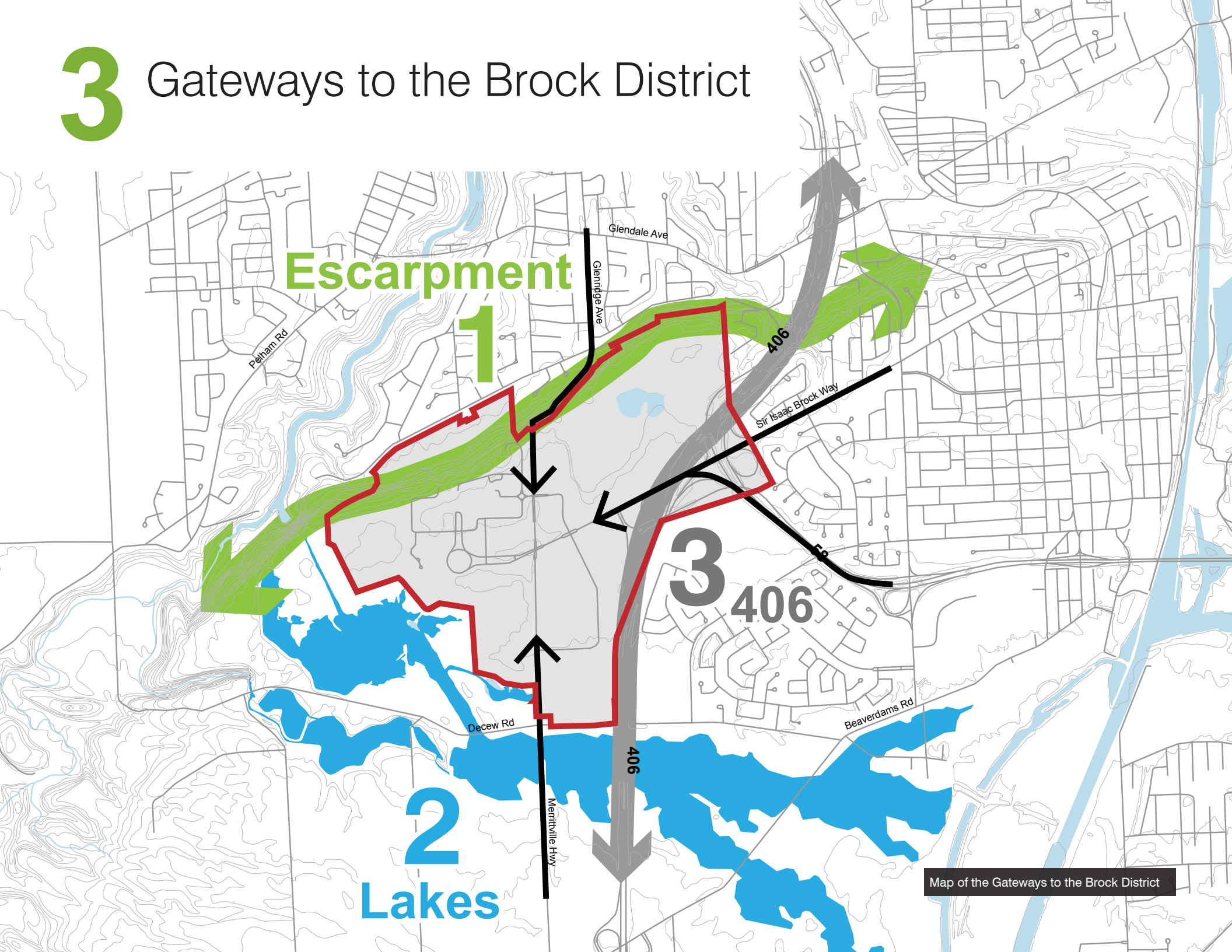


- Core Natural Heritage: Environmental Conservation Areas
- Core Natural Heritage: Environmental Protection Areas
- Provincially Significant Wetlands (MNR)
- Areas of Natural and Scientific Interest (MNR)
- Greenbelt Plan Area
- Niagara Escarpment Plan Area

Strategies

- 2c** Protect and enhance existing natural features and biosystems, including groundwater, wetlands, and habitat in new and existing development

3 Gateways to the Brock District



Escarpment

1

3 406

2
Lakes

Map of the Gateways to the Brock District

3 Defining Boundaries

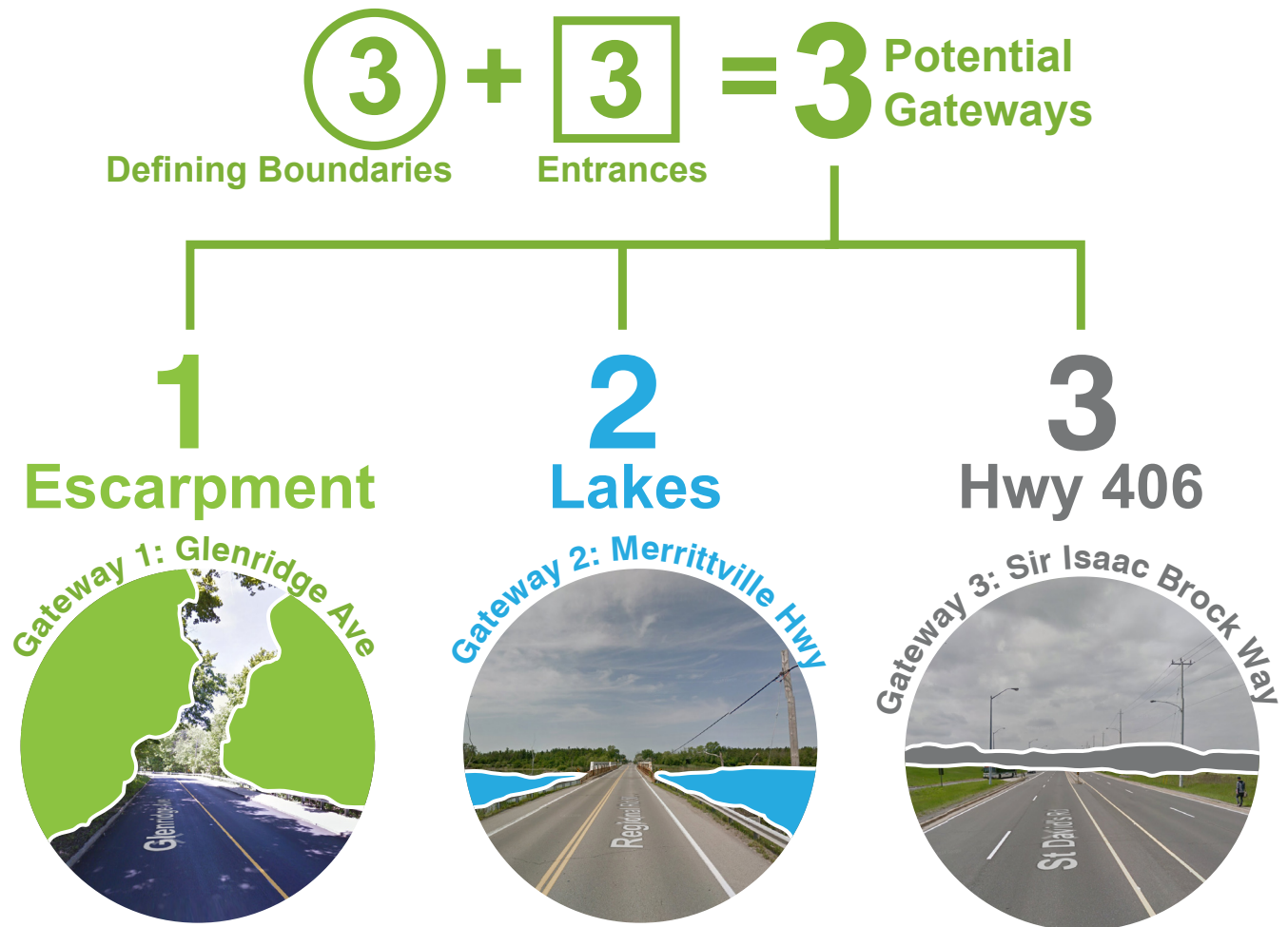
The Brock District is defined by three very clear boundaries that also act as transitions to the District. Boundaries clearly define this area enhancing its unique character and special attributes. There are no blurry edges as in other urban areas, where one disappears into the next. In the Brock District, entry from the north is defined by the wooded steep slope of the Niagara Escarpment. To the south and west entry crosses over Lakes Gibson and Moody, the wetlands and forested edges. Entrance from the east is from Highway 406, a controlled-access expressway.

3 Entrances

These three boundaries are more or less impenetrable except for the three major roads that enter the District. These entrances are Glenridge Avenue as it climbs the Escarpment, Merrittville Highway as it comes north from Lake Gibson, and Sir Isaac Brock Way as it passes west over Highway 406 and under the Highway 58 ramps.

3 Potential Gateways

Given the strong characters of these three entrances to the District, each acts as an informal landscape-scale gateway (the Escarpment, the Lakes and Highway 406). The Escarpment and the Lakes are natural features already forming clear and appealing gateways, although the sense of passage and arrival could be strengthened through further landscape interventions that integrate with their characters. The landscape of Highway 406 on the other hand currently forms a bleak gateway. The character of this gateway, and of Brock District, would benefit from large scale planting and landscape interventions with the aim of creating the sense of a third natural gateway.



"Regina Gateway" by Paul Raff, Regina SK

Strategies

- 3a** Emphasize gateways to further define a distinct District nestled in the natural environment
- 3b** Plant naturalized areas and other large-scale landscape interventions along Hwy 406, and its ramps providing a gateway to the District

4 Sustainable Urban Brock District

Clean, Green, Accessible, Sustainable

With its rich and unique context of natural heritage, the Brock District has the potential to be a leader in sustainability, anchored by the progressive example of Brock University.

Protecting the Local Hydrology

Low Impact Development is a stormwater management planning approach that aims for zero net runoff from changes to the landscape to ensure the protection and health of potentially affected streams, rivers, lakes, and aquatic and terrestrial habitats. Mitigation techniques range from conventional stormwater ponds to permeable surfaces, bioswales, rain gardens, green roofs, and other means of water treatment, retention and entrapment.

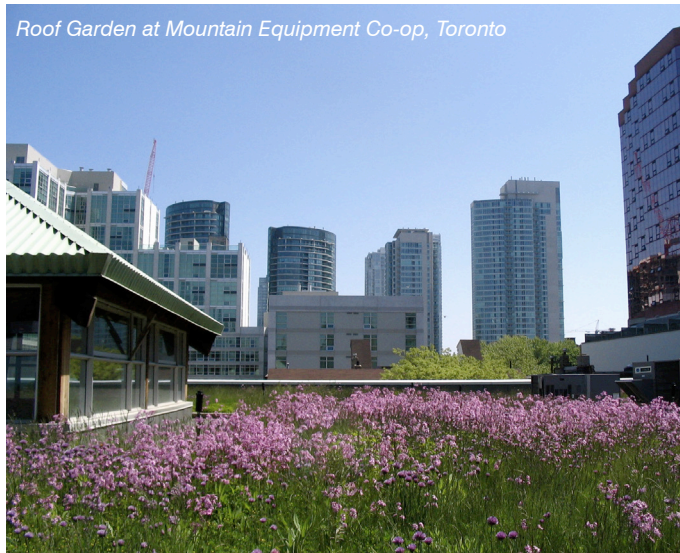
Strategies

- 4a** Manage stormwater by adhering to the zero net runoff practices of Low Impact Development

Parking at Morton Arboretum, Lisle IL



Roof Garden at Mountain Equipment Co-op, Toronto



Green Roofs

There are many benefits to green roofs, including reducing stormwater runoff, reducing energy consumption (due to the moderation of indoor temperatures by insulating from extremes of cold and absorbing heat in summer), reducing the urban heat island effect, support for pollinating insects and biodiversity, and creating additional natural green space.



Evolving Solutions

Supporting newer technologies such as by providing charging stations or priority parking for electric/hybrid vehicles, introducing solar and wind energy production, and being flexible as possibilities arise can have an immediate effect on multiple sustainability goals.

Transit

The St Catharines-Niagara CMA is **highly automobile dependent**, with only **small fractions** using transit, walking or cycling. **Brock students** on the other hand are **heavy transit users**.

Working toward a more integrated transportation network by increasing transit use, car-sharing and active transportation can lead to healthier people, cleaner air and reduce dependence on fossil fuels.

Walkability

The entire **built-up area** of the Brock District is **accessible** within a **10 minute walk** (800 m)

Walkability is an important component of a variety of urban design and liveability measures which contribute to a sustainable district, but is a key requirement for significantly reducing a district's automobile dependence, saving energy and reducing carbon footprint (see Framework 5).

Strategies

- 4b** Use Transportation Demand Management to increase modal share for active transportation and transit usage



St Catharines-Niagara CMA



75%

Brock University Students



Transit Connections



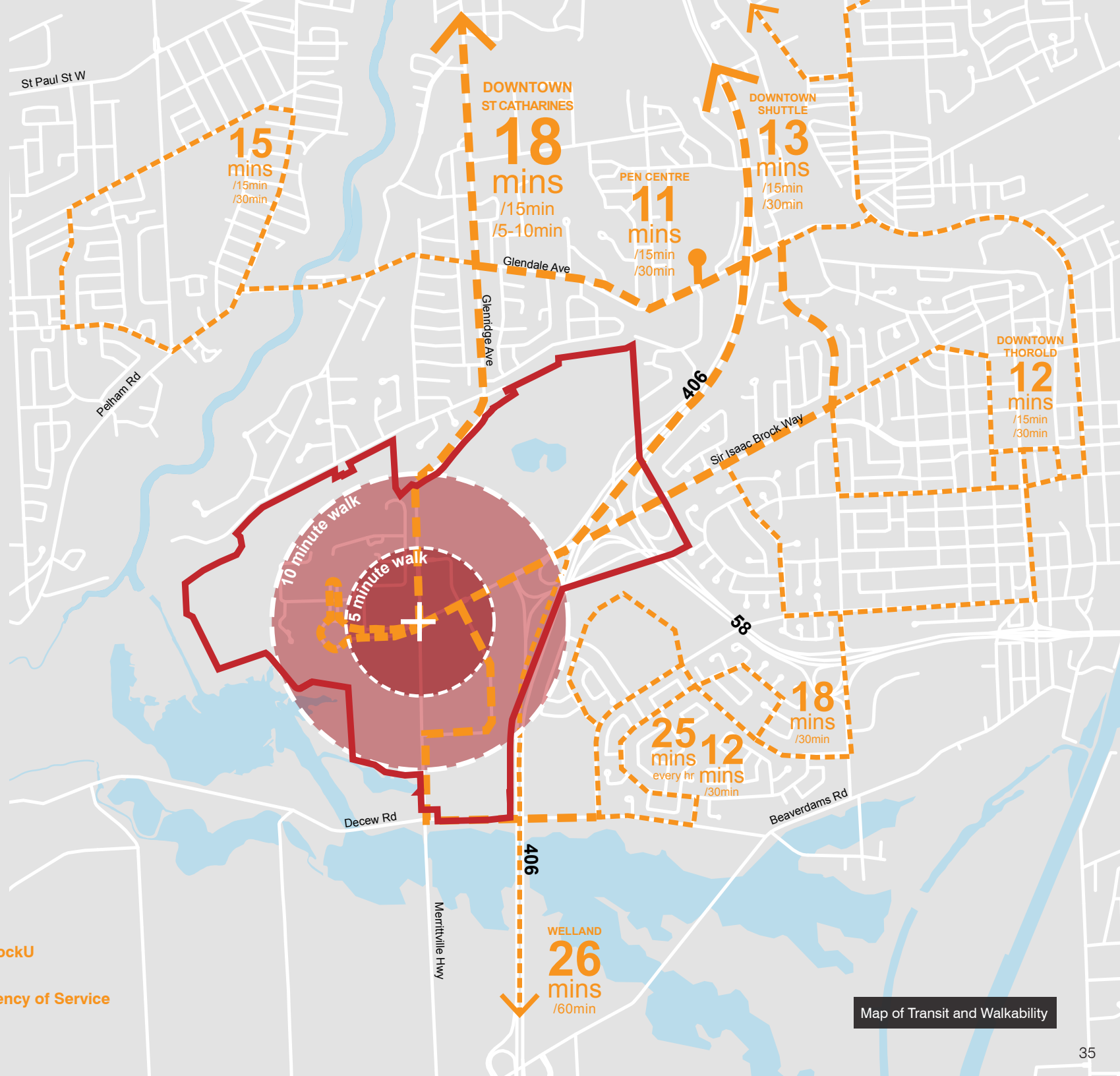
10 mins

Time from BrockU

/15min
/30min

peak
off-peak

Frequency of Service



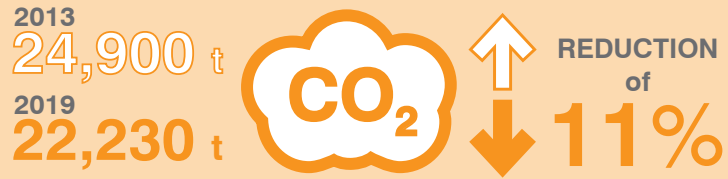
Map of Transit and Walkability

The Region provides clear direction to encourage municipalities to support the principles of sustainability including:

- Reducing energy demands;
- Designing development to optimize passive solar energy gains;
- Providing for on site renewable energy generation and cogeneration and district energy systems;
- Maximizing water conservation including water efficient landscaping and collection and reuse of clean water;
- Providing stormwater infiltration at source;
- Integrating green roofs and energy and water conservation strategies;
- Providing for collection and storage of recyclable waters on site;
- Integrating active transportation and transit into development plans; and,
- Maintaining and enhancing natural heritage and hydrological features and functions.



BrockU's GHG Emissions Targets



Minimizing **Greenhouse Gas (GHG) emissions** for gasses such as Carbon Dioxide (CO_2), Methane (CH_4) and Nitrous oxide (N_2O) helps **reduce** the effects of **climate change**

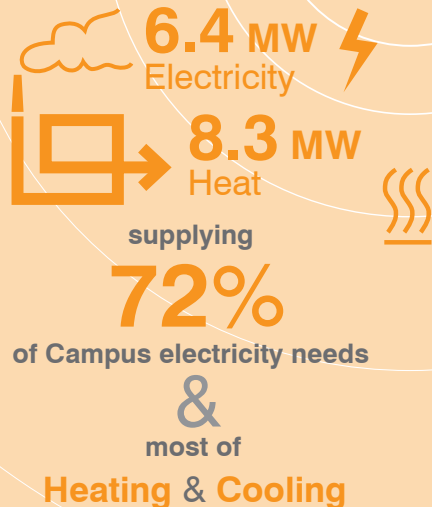
Strategies

4c Aspire to a carbon neutral (net zero carbon footprint) district by reducing GHG Emissions from electricity, heating and cooling, and transportation, and offsetting remaining emissions

4d Explore using co-generation to provide power, heating and cooling to new buildings

Use of Co-generation plants (also known as combined heat and power) helps to reduce a district's overall carbon footprint through significant efficiencies in energy production and heating and cooling. Less reliance on the grid for electricity is beneficial from a cost, carbon emissions and self-sufficiency perspective.

BrockU's Co-generation Plant produces



Combined Heat & Power Plant at BedZED, London UK



Brock's Cairns Family Health and Bioscience Research Complex



LEED (Leadership in Energy and Environmental Design) is the most recognized standard for measuring building sustainability

There are **3 LEED certified** buildings on the BrockU campus

Strategies

4e New buildings should be certified as minimum LEED Gold



5 Balanced Circulation in the Brock District

Walkable, Connected, Convenient

The Brock District will balance all transportation modes with an emphasis on creating a walkable, connected and convenient network.

Active Transportation

A key theme in the Region's Transportation Strategy, currently being updated through the *Regional Transportation Master Plan*, is to provide active transportation links and to support sustainable transportation and land use development. Draft initiatives include building on existing cycling and pedestrian links to improve active transportation. The Complete Streets for Niagara (2012) demonstrates the Region's commitment to healthy and prosperous communities with a balance of transportation options. Niagara defines a Complete Street as

"a public right-of-way where the transportation facilities and adjacent land uses are planned, designed and constructed to accommodate users of all ages and abilities including pedestrians, bicyclists, transit vehicles, automobiles and freight traffic"

The built up area of the Brock District is within a 10 minute walk. Students, residents and employees can easily walk from housing, to shops, to school, to businesses. Active transportation is a fundamental pillar of this sustainable, complete community and must be accommodated.



Pedestrian Crossing at Penn State University



Creating a safe, beautiful and comfortable pedestrian network is an essential part of placemaking. Pedestrians bring vitality and animation to the urban environment, making for safer streets, supporting street-oriented retail, and promoting a more public culture, while providing both health and environmental benefits.

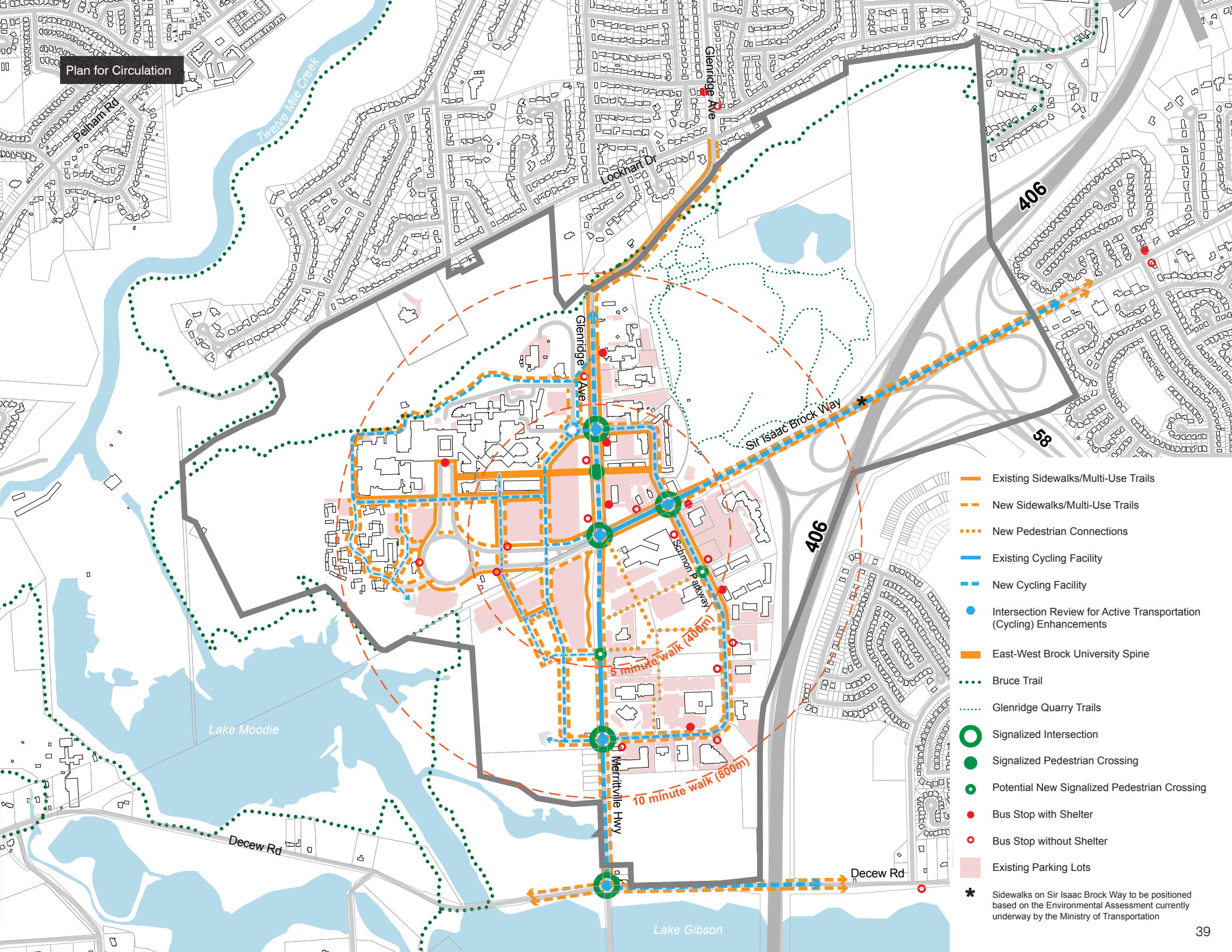
Despite the built-up area of the Brock District being entirely within a 10 minute (800 m) walk, many areas lack sidewalks on both sides of the street and some have no sidewalks at all. Lack of connectivity poses significant challenges and the pedestrian environment needs to be prioritized to both enhance pedestrian comfort levels and encourage walking.

The sidewalk system should be extended south on Merrittville Highway, east on Sir Isaac Brock Way over Hwy 406, and completed on Schmon Parkway and John Macdonell Street. The pedestrian network should be integrated with multi-use trails where they exist or are proposed. Benches, bus stops, waste bins, lighting and other pedestrian-oriented street furniture should be provided.

Strategies

- 5a** Improve comfort and connectivity for pedestrians by ensuring there is a sidewalk on both sides of streets, pedestrian crossings are safe, well marked and frequent, pathways and sidewalks are well lit, and signage is clear and informative

Plan for Circulation



- Existing Sidewalks/Multi-Use Trails
- New Sidewalks/Multi-Use Trails
- New Pedestrian Connections
- Existing Cycling Facility
- New Cycling Facility
- Intersection Review for Active Transportation (Cycling) Enhancements
- East-West Brock University Spine
- Bruce Trail
- Glenridge Quarry Trails
- Signalized Intersection
- Signalized Pedestrian Crossing
- Potential New Signalized Pedestrian Crossing
- Bus Stop with Shelter
- Bus Stop without Shelter
- Existing Parking Lots
- * Sidewalks on Sir Isaac Brock Way to be positioned based on the Environmental Assessment currently underway by the Ministry of Transportation

Cycling

Cycling is increasingly popular as both a recreational pursuit and a practical transportation option. In suburban environments, cycling routes have traditionally been located off-road, but increasingly they are being integrated into new road designs and becoming a fundamental component of transportation planning and an important part of the urban fabric. Safety is always the top priority for cyclists.

The size of the Brock District is ideal for cycling, and the introduction of new bike lanes on Merrittville Hwy, Glenridge Ave and Sir Isaac Brock Way, as well as a planned cycling facility across Highway 406, will encourage longer trips to and from the District from nearby neighbourhoods. However, the width, speed of traffic and configuration of the streets may still not be comfortable enough or safe enough for many cyclists.

Intersections are by far the most critical part of a safe cycling infrastructure, and attention should be focussed on improving safety at intersections for cyclists, with painted pavement, clear signage and a re-evaluation of the current infrastructure.

Bike lanes or sharrows should be introduced on Schmon Parkway/John Macdonell Street, with a connection to Brock University's Green Spine, allowing direct access to the Brock Campus from local residences, while largely avoiding the major roads.

Strategies

5b Complete the cycling network and improve the safety of the cycling infrastructure, particularly at intersections



Bike Lanes on Laurier St, Ottawa



Transit

In an urban centre, every sector, whether institutional, mixed use, residential or employment, is reliant upon transit. With the concentration of uses and density that makes a true centre, transit becomes crucial in mitigating the impossible equation of parking and congested traffic that would otherwise result, while at its best providing a comfortable and relaxing alternative to driving.

The presence of Brock University means that Brock District is very well connected to the local and regional bus networks, with frequent service to a variety of key locations like the Pen Centre, downtown St Catharines and downtown Thorold. However, summer service is significantly reduced due to the university schedule making travel less reliable for employment and other trips at these times.

Many bus stops in Brock District lack even the most basic of amenities. Small, inscrutable signs indicate stops on poles near the curb. Sometimes there is no sidewalk, no connection from the sidewalk to the stop, and no paved surface to stand on apart from the road.

Bus stops will be clearly signed, include a sheltering structure, have direct access from the sidewalk and to the road, and be well-lit.

Strategies

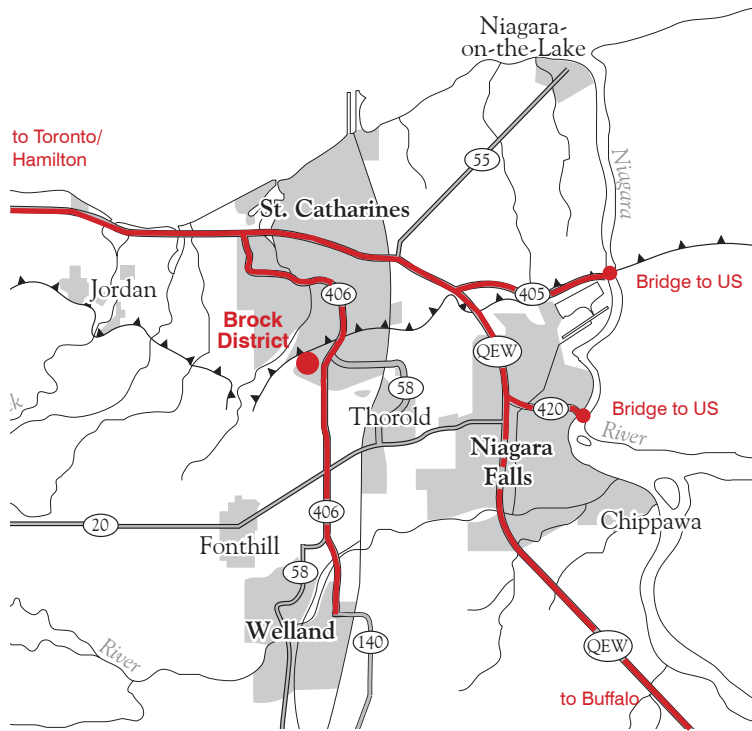
5c

Improve the convenience and comfort of using transit to better serve Brock University and future increases in residential and employment populations



Bus shelter, Toronto

The Brock District's Regional Connections



Vehicular

For employment uses, regional connections are critically important. In suburban locations, these connections are primarily made by car, and easy access to a higher-order highway system is a significant advantage. At the same time, within the destination, the needs of circulation and parking must be balanced with other modes and with urban design, public realm and placemaking objectives.

In the Brock District, the convenience of access to Highway 406 provides excellent regional connections, supporting the institutional and employment uses.

As the District further urbanizes and density increases, parking supply will diminish, while with the prioritization of pedestrians, cyclists and transit, road space will become more limited. Carsharing, ridesharing, shared parking and other methods to reduce parking requirements will help to deal with some of these changes, while depending on the form of development, parking structures may play an increasingly important role.

The safety of pedestrians and cyclists needs to be made a priority at key points of interaction such as intersections and driveways.

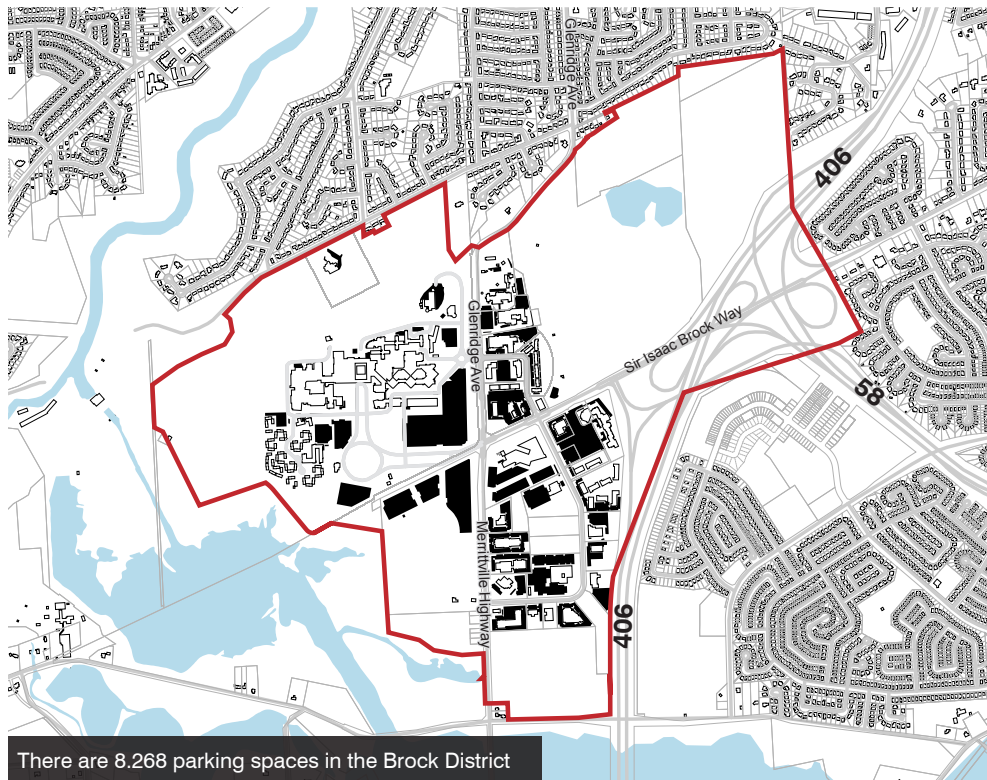
Strategies

- 5d** Balance the convenience of vehicular movement and parking with the need to prioritize other modes and urban design objectives



A Parking Area in Hamilton

Over time, in association with intensification and infill development, surface parking will be replaced with structure parking. Development scenarios included in Framework 7 demonstrate how structure parking can be incorporated into new mixed use development in ways that do not sterilize the street edge with non-active uses. Ideally, parking will be shared between private owners and the public through various mechanisms and agreements. With an emphasis on modes of transportation other than single occupant vehicles, demand for parking may decrease. In addition, changes in policy may provide alternate standards for provision of parking in new developments. Such initiatives will help to eliminate some of the surface parking in the Brock District, enabling transformation to a mixed use, pedestrian focused complete community.



John's Pass, Pinella County, FL



Santa Monica, CA

6 A Green Brock District

Public,
Inviting,
Useable,
Connected



The Brock District will be a **Green District**, one that protects and augments the existing natural and cultural green resources, with the addition of a connective fabric of characterful streets and a system of public and publicly accessible private open spaces.

The Brock District contains a unique collection of ecologies, and represents among the most biodiverse landscapes in the country, due to its interface with the Carolinian climactic zone. The District offers an opportunity to integrate and showcase these diverse associated natural environments; whether it is highlighting what is already present, or finding new opportunities with new developments to showcase these unique ecosystems with an ecologically contextual approach.

Strategies

- 6a** Create beautiful and sustainable streetscapes along Sir Isaac Brock Way, Glenridge Avenue/ Merrittville Highway and Schmon Parkway
- 6b** Provide a network of publicly accessible open spaces, both on public land and as part of private development
- 6c** Beautify and enhance parking
- 6d** Use bioswales and other surface water treatment and entrapment techniques to manage runoff including capturing roof runoff for watering trees and other landscape features

Glenridge Quarry Naturalization Site

A former municipal landfill and quarry was transformed into a wildlife habitat and environmental education and recreation area with a Children's Science and Nature Area, a bird and butterfly meadow, a boardwalk at the clay borrow pit pond, and interpretive walks and trails, including a link to the Bruce Trail. As a part of the Brock District, Glenridge Quarry makes an exceptional contribution to the diversity of the natural heritage system, complementing the Niagara Escarpment and lakes Moodie and Gibson.

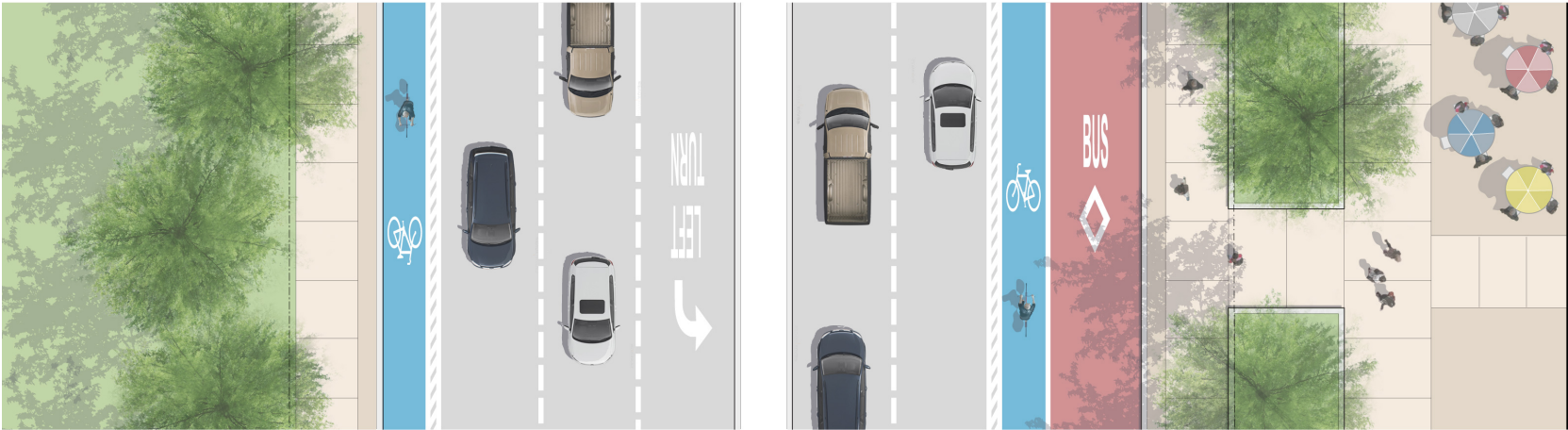
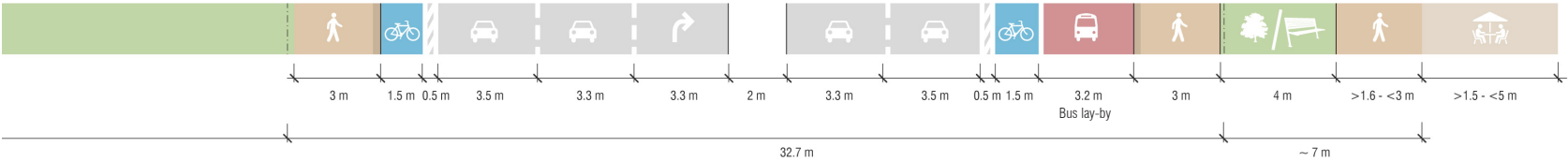
- Existing Open Space
- Campus Green Space
- Proposed Park
- Athletic Fields
- * Playgrounds
- Future Open Space Associated with Redevelopment
- Proposed Linear Park
- Active Transportation Link
- Sir Isaac Brock Way Streetscape
- Glenridge Ave Streetscape
- Schmon Parkway/Macdonell St Streetscape
- Gateway/Threshold
- Glenridge Quarry Naturalization Site
- Core Natural Heritage: Environmental Conservation Areas
- Core Natural Heritage: Environmental Protection Areas
- Provincially Significant Wetlands (MNR)
- Areas of Natural and Scientific Interest (MNR)



Pond Boardwalk at Glenridge Quarry

Sir Isaac Brock Way: A Grand Avenue to Brock University

Section and Plan of Concept for Sir Isaac Brock Way between Glenridge Ave and Schmon Parkway



A Grand Avenue to Brock University

The streetscape of Sir Isaac Brock Way will be transformed by the planting a double row of large canopy trees on both sides of the street, creating a powerful Grand Avenue leading to Brock University and a spine for the Brock District.

The width of the Sir Isaac Brock Way Right-of-Way widens to 32.7 m as it enters Brock District, but this still means that trees must be planted on adjacent properties. The provision of the streetscape and tree planting within the setback should be made a condition of development.



Rendering of Concept for Sir Isaac Brock Way

Sir Isaac Brock Way

In the more urban streetscapes adjacent to future street-oriented retail uses on Sir Isaac Brock Way, the double row of trees will be planted at alternating intervals in a 4.0 m wide planter, with sufficient soil volume for a minimum of 15 m³ of useable and uncompacted soil per tree (or 30 m³ for a single tree planted alone). A low curb will surround the planter, and it will be planted with a mix of a groundcovers and low shrubs.

The planter will be set back at a minimum of 3.0 m from the street curb, allowing a metre for an edge zone and a minimum of a 2.0 m sidewalk.

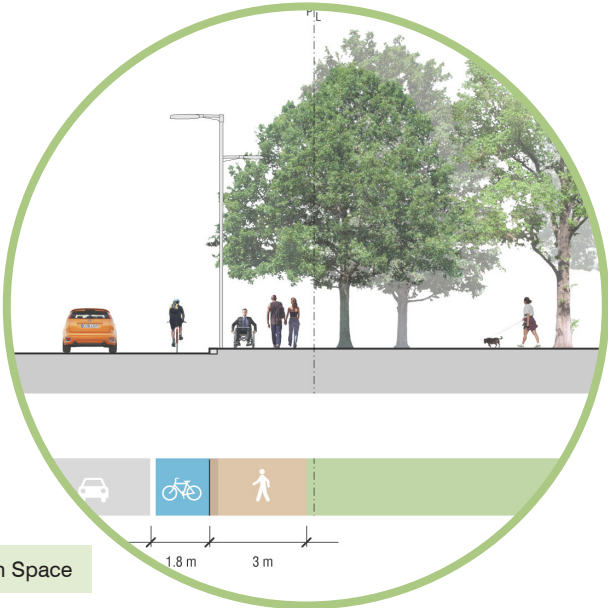
The spacing of tree planting maintains visibility to retail signs, while providing a enhanced pedestrian environment.

A second sidewalk on private property will be located in front of the retail and street-oriented uses, allowing a minimum 1.8 m pedestrian clearway. Beyond this, a frontage zone will allow for potential patio and retail spillout uses or a small buffer separating residential, office or other more passive uses from the sidewalk.

The two sidewalks will be connected by a path interrupting the planter no more than every 25 m and no less than every 10 m.

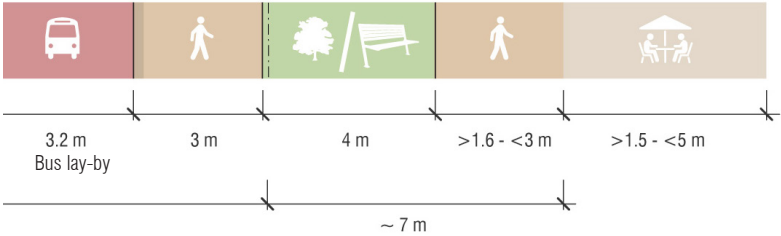
Adjacent to open space or larger landscape setbacks, the double row of trees will be planted within 4m of the sidewalk, with no second sidewalk.

Additional pedestrian-scaled lighting should be provided where a second sidewalk is required.



Alternate Section for Areas Adjacent to Green Space

Section and Plan Detail of Pedestrian Realm and Tree Planting

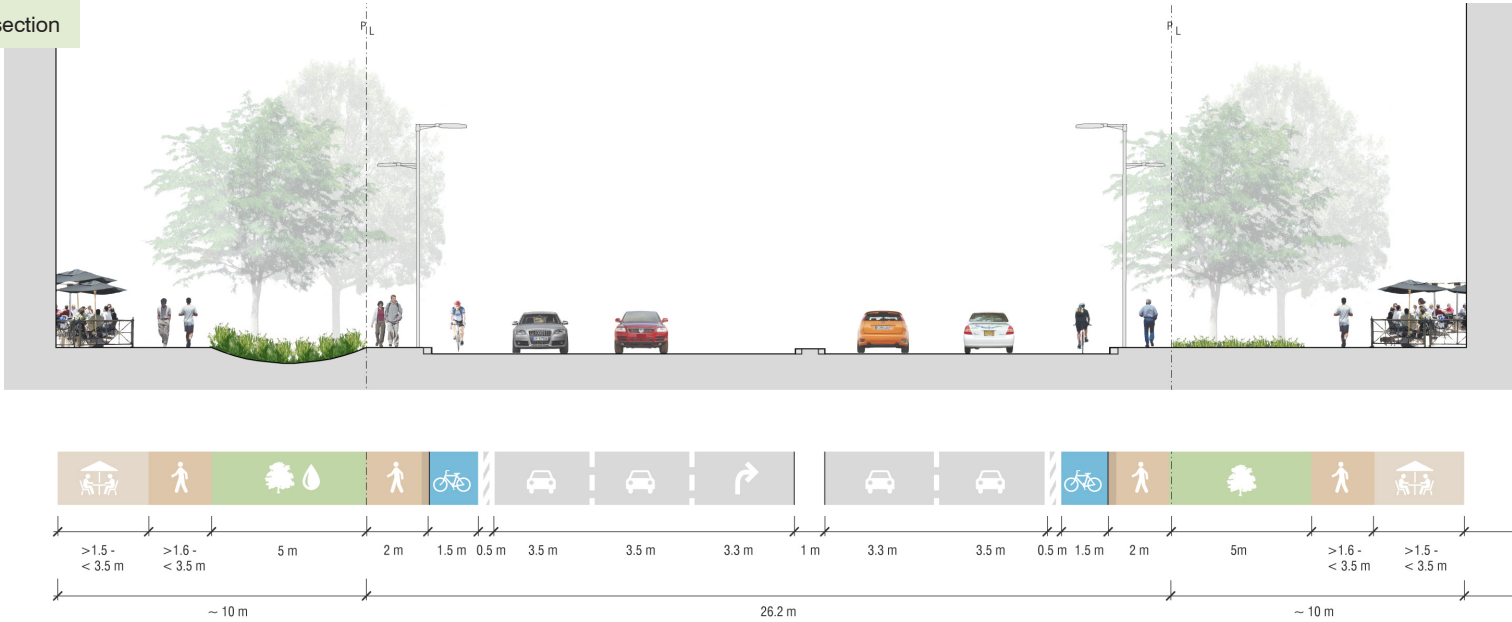




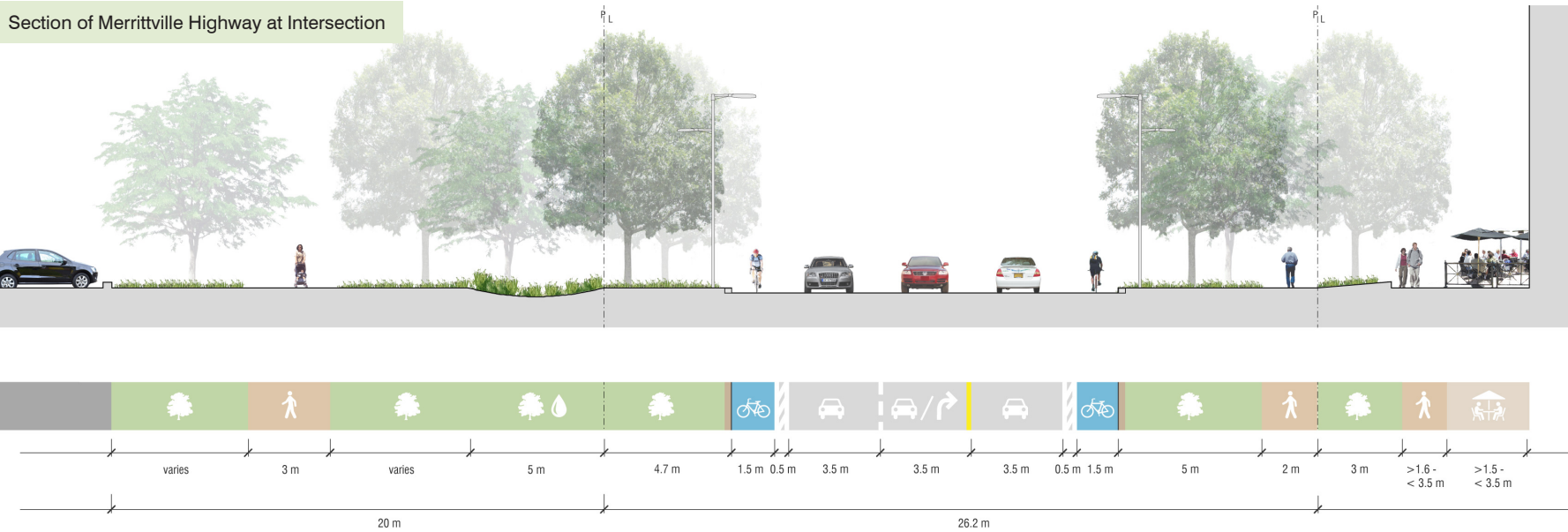
Sidewalk and Planting in Frankenmuth, MI

Brock District's Complete Streets

Section of Glenridge Ave at Intersection



Section of Merrittville Highway at Intersection



Glenridge Avenue and Merrittville Highway form a main spine through the District. Connecting the Niagara Escarpment to the Lake Moodie and Gibson Lake natural heritage features, these roads are an important green connecting link.

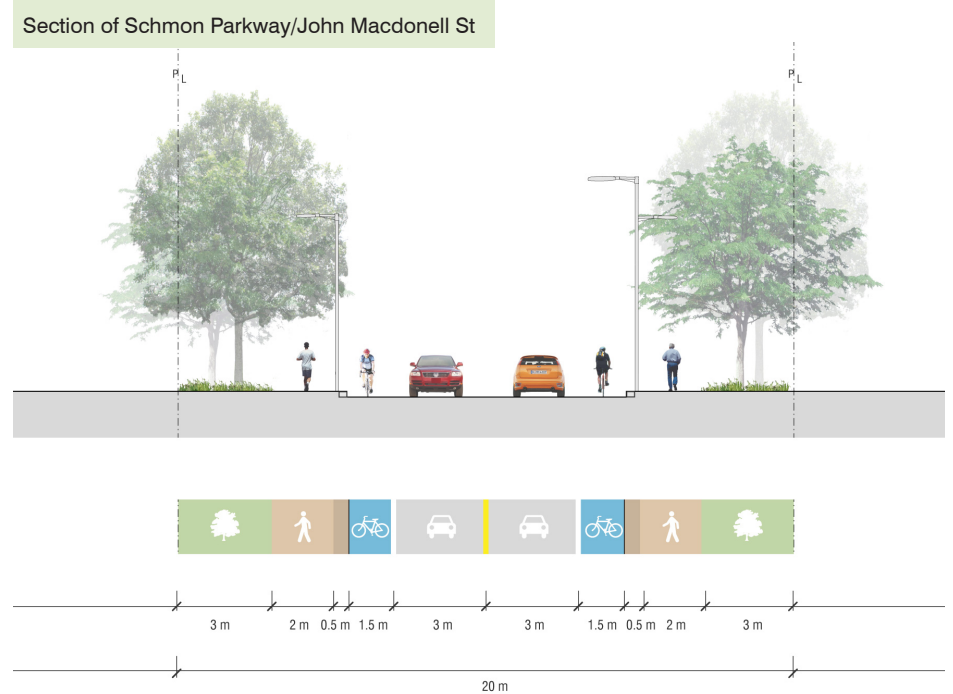
Glenridge Avenue passes the core of Brock University where in the long term the campus is envisioned to have new buildings forming continuous street edge activating the pedestrian environment with new uses. The east side of Glenridge Avenue will be developed as an urban mixed use retail node, forming a focus for the District.

Merrittville Highway passes Brock University where a long term vision sees infill development framing key street connections to the campus and long term redevelopment in the Brock Business Park with street related buildings that create a pedestrian friendly environment. A multi-use trail will run along the east side of Merrittville Highway from the Region's Headquarters south to Decew Road and east on Decew Road to Richmond St.

Both Glenridge Avenue and Merrittville Highway will embody the Region's **"complete streets"** philosophy where they are designed to complement the adjacent uses with cycling connections, well lit tree-lined sidewalks, transit shelters and amenities, and trees that create a green frame for adjacent development. On the west side of the street, trees are planted adjacent to bioswales to capture runoff and to help keep trees well watered. On the east side of the street, trees are planted in 5 m wide planting beds. In order to achieve the streetscape vision, partnership is required with adjacent land owners and local area municipalities.

In the long term, an investigation should be carried out into the potential for Glenridge Avenue and Merrittville Highway to be reduced to a single travel lane in each direction (with central turn lane where required). If supported by the required studies and analysis, such a configuration could be implemented when the roads were next rehabilitated.

Schmon Parkway and **John Macdonell Street** are planned to have continuous sidewalks on both sides of the street, with on-street cycling lanes and trees planted at the edge of the right-of-way in a 3 m wide planting zone. With the location of significant student housing in the Brock Business Park, safe pedestrian and cycling routes are essential.



A Civic Park in front of Niagara Region Headquarters

The wide setback of the Niagara Region Headquarters building along Sir Isaac Brock Way creates a significant opportunity for the Region of Niagara to take a catalytic leading role in the transformation of Brock District's public realm to support a future as a dynamic mixed use urban centre. Development in the Brock District should "lead with landscape" creating beautiful public spaces, demonstrating the public sector's commitment to the District and setting the stage and expectations of the private sector.

The park creates a positive relationship to the surroundings, presenting a visible and tangible new presence for the Region from the important urban arteries that it faces on two sides.

Redesigning this largely empty 4 acres site as a fully accessible and programmed urban park will create a destination public space at the Region like the spaces in front of many city halls across the country. The park would provide a venue for year-round gatherings, festivals, events and

performances, social interaction and informal play for employees, residents and visitors to the District. Exercise stations, fitness areas and "grown up" play areas are some elements that could be incorporated creating an outdoor fitness centre. The Region, Brock University and the City of Thorold could collaborate on events and programming.

A potential theme for the park is "International Plaza"



The new park is envisioned as a four season landscape that is a showpiece for the Niagara. It will provide open spaces for a variety of activities focussed on adults who are employed in the area and students. Over time as the demographic of the District evolves, children's programming and play features could be added. Programmed park activities could include movies in the park, farmers markets, Canada day celebrations, music etc. Rows of canopy trees will create a visual frame around play fields and fitness courts. In future a public square, with a skating area and pavilion could be added

to animate the park in all four seasons. The vegetation in the park will showcase native Carolinian species that are unique to the Niagara region, including Tulip Trees, Black Gum and others.

Public access into the Headquarters building should be explored from the existing courtyard entrance to provide shared use of washrooms and food services.

Maintenance of the park would be contracted out by the Region of Niagara.



Plan for Proposed Civic Park



Current Condition



Rendering of First Phase of Concept for Proposed Civic Park



Rendering of Second Phase of Concept for Proposed Civic Park

7 The Brock District is a Complete Community

Dense, Compact, Mixed Use, Infill

With all the raw ingredients for an innovation centre, the Brock District will become a complete community by integrating current and new uses and spaces, with a revitalized public realm and dense, compact mixed use development supporting a lively blend of residential, retail, institutional, recreational and employment activities.

Niagara Region's Official Plan provides clear direction to build sustainable complete communities by encouraging mixed and integrated land uses, making efficient use of land, resources and infrastructure, promoting compact development that is transit supportive, encouraging active transportation, supporting intensification and fostering development that conserves and enhances natural systems.

The Brock District provides a framework for implementing Niagara's vision for sustainable complete communities. The District is planned to include a range of uses, with housing for students and others, opportunities to share the University's athletic and cultural facilities, existing and new green space and shared use of amenities of the Region's Headquarters.

The policies of Brock University's recently completed Master Plan, the Brock Business Park Secondary Plan, and the other applicable policies have been combined to create an Integrated Plan of Future Land Uses (opposite).

Institutional uses reflect the university related uses of the Brock University Campus Plan and the existing health care and community services on the east side of Glenridge Ave.

Employment uses include office, research and development, laboratories and other knowledge-based businesses as set out in the Brock Business Park Secondary Plan.

A **mix of uses** is identified for buildings fronting Glenridge Avenue and Merritville Highway on Brock University lands, and in nodes north and south of Sir Isaac Brock Way. Retail and commercial uses are encouraged for the ground floor with office and or residential on upper floors. A retail focus is planned for the north east corner of Glenridge Avenue and Sir Isaac Brock Way in buildings that will front and feature the tree lined street and the new civic green beyond.

Brock District has a significant supply of **student housing** including student residences on the Brock University campus and new purpose built student housing north of Sir Isaac Brock Way adjacent to Glenridge Quarry and in the Brock Business Park. New student housing is contemplated in the Business Park. It will be important to diversify housing type in the District to attract a broader demographic in addition to residents. Ground contact housing and low rise apartment is permitted on the Residential 2 lands as per the Brock Business Park Secondary Plan.

The Brock University Campus Plan includes a Special Use Area that supports future flexibility by accommodating various types of development based on the future needs of the university and a Peripheral Development Lands designation that recognizes the physical constraints and isolation of these lands..

The Brock Business Park Secondary Plan identifies a Special Policy Area designation that requires additional studies to justify the conversion of employment lands to non-employment uses, including residential.

Strategies

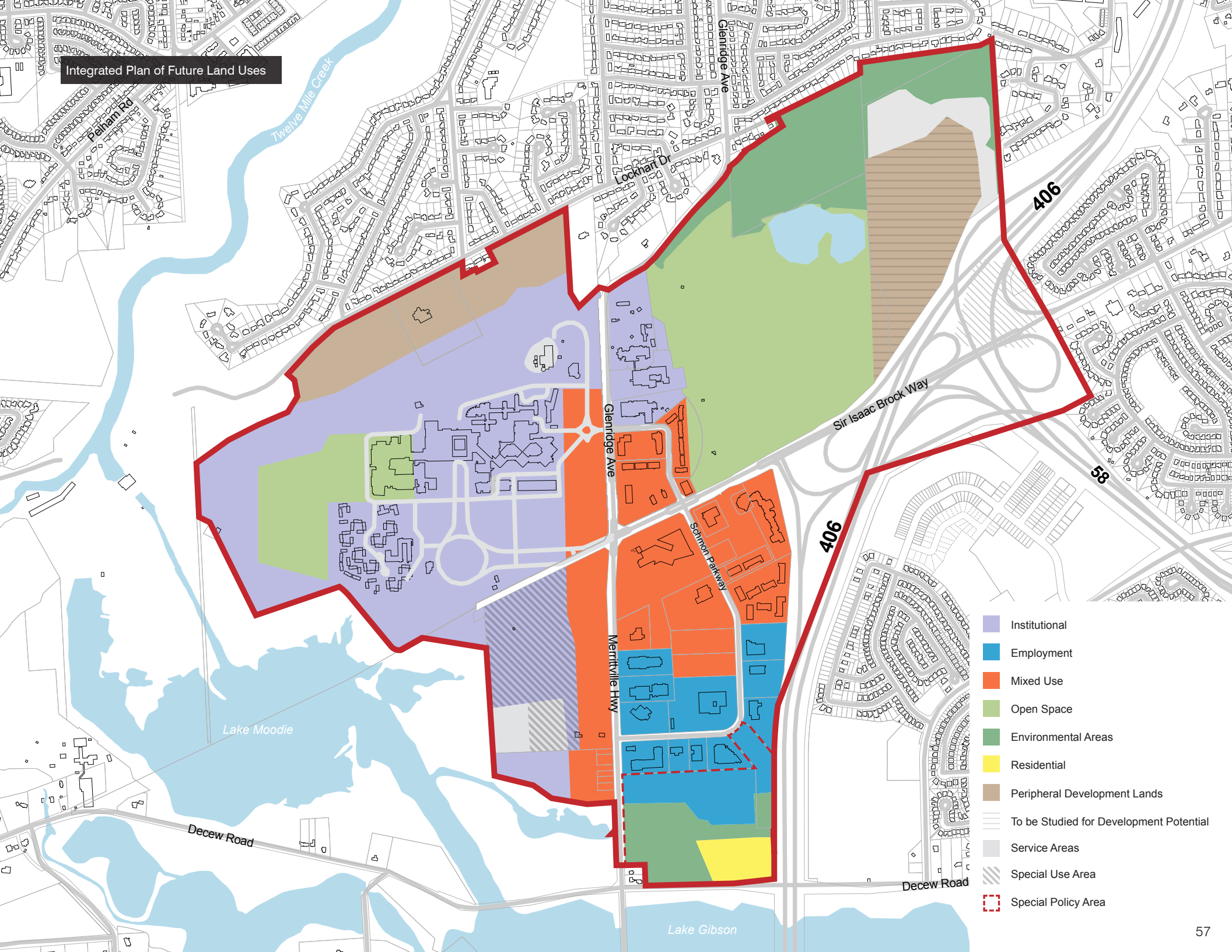
7a Promote mixed uses while maintaining employment uses

7b Promote a mix of housing types and tenures, including privately owned housing

7c Create opportunities for placemaking: parks, streetscapes and gateways

7d Explore structured parking to allow higher densities

Integrated Plan of Future Land Uses



Demonstration Plan



- 1 Brock University Campus Plan long range demonstration plan
- 2 Long term intensification
- 3 Mixed use retail centre
- 4 New civic park
- 5 Niagara Region Headquarters
- 6 Mixed use development
- 7 Intensification of Brock Business Park
- 8 New linear park
- 9 Active transportation connections
- 10 Glenridge Avenue Gateway
- 11 Merriville Highway Gateway
- 12 Enhanced landscape and gateway from 406
- 13 Enhanced streetscape
- 14 Area to be studied for development potential
- 15 Brock Business Park Secondary Plan Special Policy Area

The demonstration plan illustrates the vision for the Brock District that reflects the Brock University Campus Plan (long term vision), the intent of the Brock Business Park Master Plan and Secondary Plan and is consistent with the policy direction of the Region, St. Catharines, the Niagara Escarpment Plan and provincial planning.

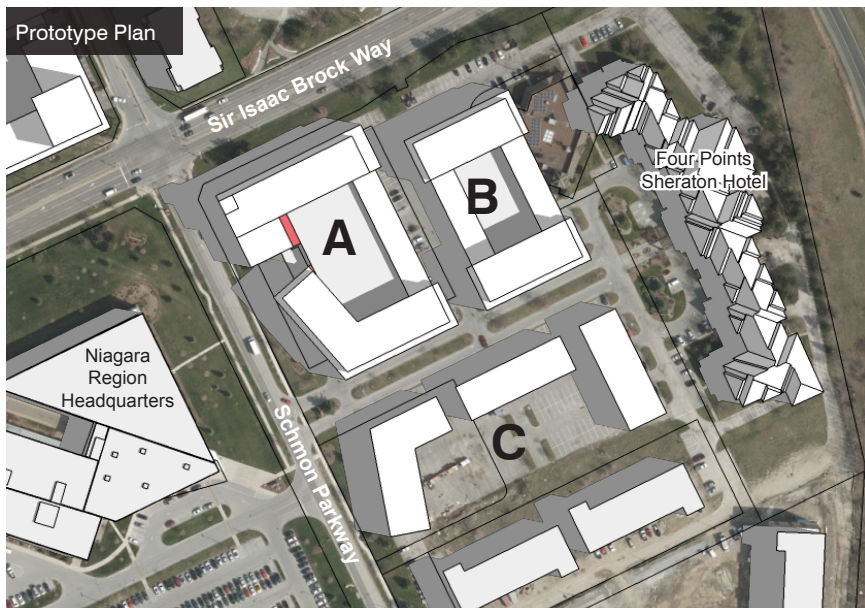
The demonstration plan illustrates the new sustainable complete community for Brock District. Development is framed by a green space network comprised of beautiful tree lined streets, parks and open space, urban squares, athletic facilities that connects to the spectacular Niagara Escarpment. A new public space in front of the Region's Headquarters along Sir Isaac Brock Way is a new green jewel and central focus for the District. This new public space will provide programmed space and informal green space. Enhanced pedestrian and cycling connections will provide safe alternatives to travel in cars and clear connections to all areas in the District. A sense of place is enhanced by encouraging street edge mixed use intensification to animate streets and public spaces. Sustainable strategies, including onsite storm water management and green building design are encouraged.

Approximately 40% of the area is green space of the Escarpment, Glenridge Quarry Naturalization, sports fields of Brock University and wetlands north of Lake Gibson.

The design guidelines provide general direction applicable to all development parcels and address building massing and design, facade design and articulation, loading and servicing, parking and green technology, public space and streetscape treatment.

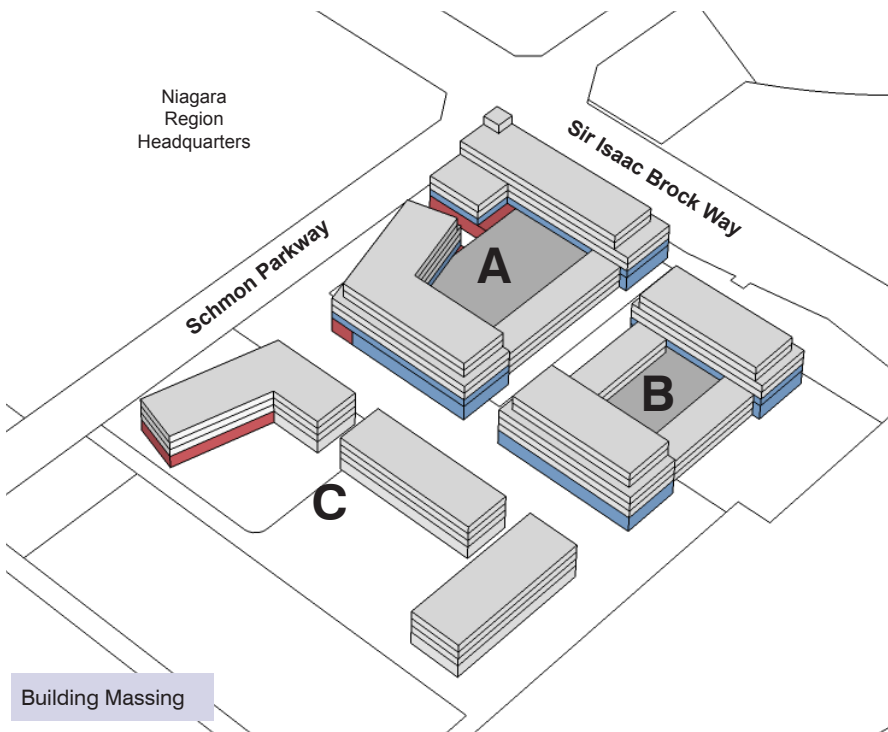






A prototypical mixed use development is illustrated for the site in the south east corner of Schmon Parkway and Sir Isaac Brock Way. This prototype illustrates mixed use development in buildings of heights varying from 4 to 6 storeys. Parking is provided in structure in the interior of the block, wrapped by buildings. Second floor uses could be residential or office, with primarily retail and office uses on the ground floor.

The proposed massing and population density of the buildings shown are general concepts. Servicing capacity for the existing municipal services were not evaluated in detail during this process. The density of future developments may be restricted by capacity or cost benefit to upgrade the existing servicing systems and this will have to be evaluated in detail at the future stage.



Upper Mid-Rise Component

Residential GFA: 9,400 m²

Mid-Rise Component

Residential GFA: 27,100 m²

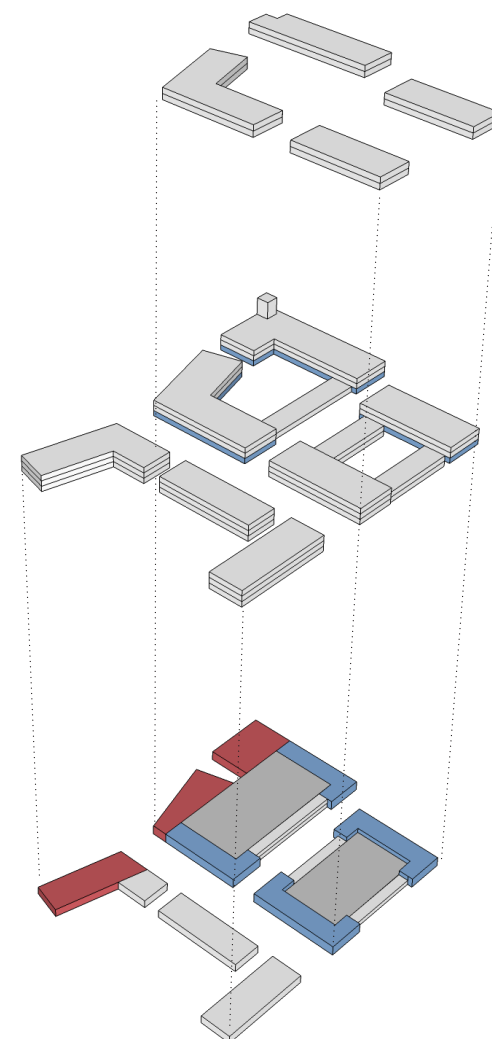
Office GFA: 5,200 m²

Ground Level

Residential GFA: 3,200 m²

Retail GFA: 2,900 m²

Office GFA: 8,300 m²



Block A		Floors	Area	GFA	SF
Upper Mid	Res	2	1,613	3,226	34,724
	Res	2	1,270	2,540	27,340
Mid-Rise	Res	2	2,050	4,100	44,132
	Office	1	2,050	2,050	22,066
	Res	2	1,997	3,994	42,991
	Office	1	1,997	1,997	21,496
	Res	1	199	199	2,142
Ground	Res	1	727	727	7,825
	Retail	1	969	969	10,430
	Retail	1	859	859	9,246
	Office	1	701	701	7,546
	Office	1	678	678	7,298
	Res	2	199	398	4,284
	Parking	2	3,225	6,450	69,427
Totals					
	Res			15,184	163,439
	Office			5,426	58,405
	Retail			1,828	19,676
	Parking			6,450	69,427
			Total GFA Parcel A	28,888	310,948
			Total GFA no parking	22,438	241,521

Block B		Floors	Area	GFA	SF
Upper Mid	Res	2	919	1,838	19,784
	Res	2	919	1,838	19,784
Mid-Rise	Res	2	1,196	2,392	25,747
	Office	1	1,196	1,196	12,874
	Res	3	1,196	3,588	38,621
	Res	2	533	1,066	11,474
	Res	2	531	1,062	11,431
Ground	Office	1	851	851	9,160
	Office	1	846	846	9,106
	Res	1	266	266	2,863
	Res	1	267	267	2,874
	Parking	1	2,301	2,301	24,768
Totals					
	Res			12,317	132,579
	Office			2,893	31,140
	Parking			2,301	24,768
			Total GFA Parcel B	17,511	188,487
			Total GFA no parking	15,210	163,719

Block C		Floors	Area	GFA	SF
Mid-Rise	Res	3	1,324	3,972	42,754
	Res	3	952	2,856	30,742
	Res	3	1,033	3,099	33,357
Ground	Res	1	301	301	3,240
	Retail	1	1,024	1,024	11,022
	Res	1	952	952	10,247
	Res	1	1,033	1,033	11,119
Totals					
	Res			12,213	131,460
	Retail			1,024	11,022
			Total GFA Parcel C	13,237	142,482





Guidelines

The guidelines provide design guidance for development by both the public and private sector in the Brock District. They are informed by and reinforce the 7 Frameworks described in the preceding chapters. They are intended to provide clarity with respect to the expectation of development of buildings, streets, parks, publicly accessible private green spaces, streets and parking - the component parts that together will shape the design, form and aesthetic of the Brock District.

Building Massing/Design

Building heights should generally be limited to a maximum of 6 storeys (or 20 m) and a minimum of 3 storeys (or 11 m) in mixed use areas and a minimum of 2 storeys (or 8 m) in the employment areas.

Buildings should have a step back of at least 3 m no higher than the 4th floor (or 15 m) on public frontages to break up the building's mass. Under some circumstances, articulation of the facade to reduce the bulk of the building may be considered instead of a step back.

Use corner sites (buildings with two frontages) as an urban design opportunity to frame the intersection, create landmark buildings, and create wider sidewalks and small urban spaces.

Ground level floor heights should be a minimum of 4.5 m to allow flexibility for a diversity of future uses.

Buildings should create a comfortable, animated pedestrian environment on all public frontages. A primary entrance should face the street with clear and direct pedestrian access from the public right-of-way.

Program ground floor uses of a building to be active and front onto the street, with a high degree of transparency. Active uses include lobbies, retail, offices and grade-related residential.

Roof mechanical elements should be incorporated into the building design or screened from the ground.



Facade Design & Articulation

The building facade is the main interaction between a building and the surrounding public realm, both visually and functionally.

Articulate building facades in a way that divides up the flat surface into smaller parts and creates an interesting wall to the public space of the street. Articulation can make use of differences of transparency, quality and type of materials, fenestration, vertical elements, canopies, balconies, doorways and changes in wall plane to break down the scale of the building.



Loading & Servicing

Careful consideration is required in the placement and design of loading and servicing, including service elements such as meters, transformers and waste storage and collection.

Ensure that loading, servicing, parking access and service elements to not detract from the use, safety or attractiveness of the pedestrian realm. Locate utility rooms, garbage, loading areas and vehicle access at the back or side of the building.

Incorporate loading and servicing elements into the building envelope to minimize impacts on pedestrian areas. Screen outdoor service elements from view with high quality materials, components and/or landscape elements that integrate with and complement the design and materials of the building and/or the landscape concept.



Parking

Do not locate parking along the public frontage in front of buildings in mixed use areas. In employment areas, at most 1 parking aisle can be located in front of buildings. In those cases, the pedestrian access to the building must be direct and clear and take priority as it crosses the parking areas.

Distribute at-grade parking in smaller groupings around the site instead of in one large parking area. Consider parking as an integrated part of the landscape.

In larger contiguous parking lots, use trees and planted islands to break up the lot into smaller areas.

Use bioswales, permeable surfaces and other surface water treatment, retention and entrapment techniques to manage runoff from parking areas.

Create clear pedestrian pathways through parking lots to building entrances, using changes in paving, painted markings, signage and lighting to increase pedestrian comfort and safety.

Where driveways and other vehicular accesses cross sidewalks and pedestrian routes, the sidewalk takes priority, with paving and signage indicating the pedestrian right-of-way. Parking structures should be sleeved with buildings and active uses, with design integrated with the buildings.

Green Infrastructure and Building Energy

Explore the opportunity for District Energy in the Brock District.

Encourage passive solar orientation to permit enhanced energy efficiencies by creating optimum conditions for the use of passive and active solar strategies.

Encourage solar roofs to improve energy conservation, and consider constructing buildings to be Solar Ready (built with all the necessary piping and equipment that would be needed to install a rooftop solar power system).

Consider use of reflective or light-colored roofs for higher density residential, employment, office, and public or institutional buildings, to reduce solar heat absorption and energy demand.

Mitigate heat island impacts through the use of paving material with high solar reflectance, strategic use of deciduous trees or preserve existing trees as part of a free cooling strategy to help with evapotranspiration and shading of sidewalks and hard surface areas in summer and solar access in winter.

Water Use & Management

Promote water efficiency by requiring all buildings to use Low Impact Development strategies to deal with on-site run-off and heat island effects

Encourage the implementation of Low Impact Design strategies that emphasize the use of bio-swales, innovative stormwater practices, constructed wetlands, at-source infiltration, greywater re-use system, and alternative filtration systems such as treatment trains.

Implement a comprehensive rainwater and water recharge strategy in conjunction with required stormwater management facilities. Implement policies for stormwater retention and run-off such as:

- Retain stormwater on-site through rainwater harvesting, on-site infiltration, and evapotranspiration;
- Consider the inclusion of third pipe greywater systems and rain water harvesting for watering lawns, gardening, to reduce demand on potable water use;
- Direct flow to landscaped areas and minimize the use of hard surfaces in order to reduce the volume of run-off into the storm drainage system;
- Store snow piles away from drainage courses, storm drain inlets, and planted areas; and,
- Use infiltration trenches, dry swales and naturalized bioswales adjacent to parking areas to improve on-site infiltration.



Introduce green infrastructure, such as bioswales, within the public right-of-way to enhance ground water infiltration and improve water quality as part of a comprehensive water management plan.

Encourage the use of porous or permeable pavement instead of standard asphalt and concrete for surfacing sidewalks, driveways, parking areas, and many types of road surfaces as a stormwater run-off management strategy.

Implement a rainwater harvesting program to provide the passive irrigation of public and/or private greenspace, including absorbent landscaping, cisterns, rain barrels, underground storage tanks, infiltration trenches, etc.

Implement curb cuts along sidewalks and driveways to allow water to flow onto planted zones or infiltration basins.

Consider the installation of subsurface basins below parking lots to enable stormwater to be stored and absorbed slowly into surrounding soils.

Green Building

Encourage green roofs to reduce urban heat island effect and improve energy conservation and thermal performance. Planted roofs can establish habitat for native insects and songbirds with a diversity of species that avoid monocultures of sedums, with no more than 10% of one species, and 25% of one genus. Green roofs, designed with substrates to detain and retain stormwater, can help to minimize run off.

Promote innovative programs to encourage the design and construction of energy efficient green buildings and sites.



Publicly Accessible Privately Owned Open Spaces

New development on sites of at least 1,000 m² will provide 7.5% of the site for public open space or provide publicly accessible open space on private property within the development site.

These open spaces should be contiguous, with a minimum size of 750 m².

They should open directly onto a public right-of-way, with a minimum opening to the public street of 20 m.

They must be ungated and open to the public at all times, with multiple pedestrian accesses and connections.

The built form should frame the open spaces, fronting them with active uses and building entrances. The built form should respond to the open space architecturally, with emphasis in height, form, detail etc. at corners and view termini.

These publicly accessible open spaces will remain private property and will be maintained by the landowner.



The High Line, New York City

Linear Park

As indicated in the Brock Business Park Secondary Plan, a minimum 10 m wide Linear Park will connect the middle of Schmon Parkway to the intersection of Glenridge Ave and Sir Isaac Brock Way, allowing improved pedestrian connections to the Brock University Campus and within the large block enclosed by Schmon Parkway.

This Linear Park should also be extended west to Merrittville Highway, splitting the block in half and allowing greater pedestrian connectivity to uses along Merrittville Highway and connection to a potential future pedestrian and/or vehicular signalized intersection on Merrittville Highway.

From the Linear Park, a recreation trail will connect southward to Schmon Parkway, allowing pedestrian movement through the block in every direction.

Adjacent developments should provide pedestrian connections to the Linear Park from parking areas, open spaces and sidewalks.

Buildings should front and face onto the Linear Park with entrances, windows etc. and not loading, garbage and other service areas.

Safety is extremely important for these off-street pathways which may be used at all times. The principles of crime prevention through environmental design (CPTED) should be followed, with good sightlines, low plantings, and lighting that meets a very high standard of brightness. Emergency posts or phones should be considered if possible.



Urban open space in mixed use development, Oakville

Sustainable Planting

Typical planting methods used for trees in urban environments provide poor and insufficient soil volumes for trees to achieve a valuable mature size.

Trees require a minimum 15 m³ soil per tree in a shared soil volume. Single trees require a minimum 30 m³ soil volume with a minimum 1.2 m planting soil depth, with measures to mitigate soil compaction and to ensure healthy soils for the trees.

Structural soil cells (a system of structural plastic units) can be used where soil volumes are needed under paved areas. Structural soils and structural sands can be used to bridge between adjacent soil volumes.

Streets should be lined with a diverse selection of resilient canopy tree species. Trees as well as shrubs, perennials and grasses should be planted for complete, diverse and durable landscapes.

The location and requirements for access of underground and overhead utilities must be taken into account in the selection of tree species and planting sites to ensure the long-term health and success of street trees.



Canopy Street Trees

Black Gum - *Nyssa sylvatica*
Kentucky Coffeetree - *Gymnocladus dioica*
Turkish Filbert - *Corylus colurna*
Tuliptree - *Liriodendron tulipifera*
Swamp White Oak - *Quercus bicolor*
Golden Raintree - *Koelreuteria paniculata*
Hybrid Soft Maple - *Acer saccharinum x rubrum*
Katsura Tree - *Cercidiphyllum japonicum*
Common Hackberry - *Celtis occidentalis*
Redmond Basswood - *Tilia americana* 'Redmond'

Canopy Park Trees

American Sycamore - *Platanus occidentalis*
Eastern White Pine - *Pinus strobus*
Dawn Redwood - *Metasequoia glyptostroboides*
Sweetgum - *Liquidambar styraciflua*

Ornamental Small Trees

Tatarian Maple - *Acer tataricum*
Eastern Redbud - *Cercis canadensis*
Fringetree - *Chionanthus virginicus*
Cornelian Cherry - *Cornus mas*
Hop Hornbeam - *Ostrya virginiana*
Hedge Maple - *Acer campestre*
Yellowwood - *Cladastris kentukea*
Amur Maple - *Acer ginnala*
Ivory Silk Lilac - *Syringa reticulata* 'Ivory Silk'

Multistemmed Flowering Shrubs

Downy Serviceberry - *Amelanchier arborea*
Doublefile Viburnums - *Viburnum plicatum f. tomentosum*
Carolina Allspice - *Calycanthus floridus*
Vernal Hazel - *Hamamelis vernalis*





Platinum Business Park, Warsaw

Implementation

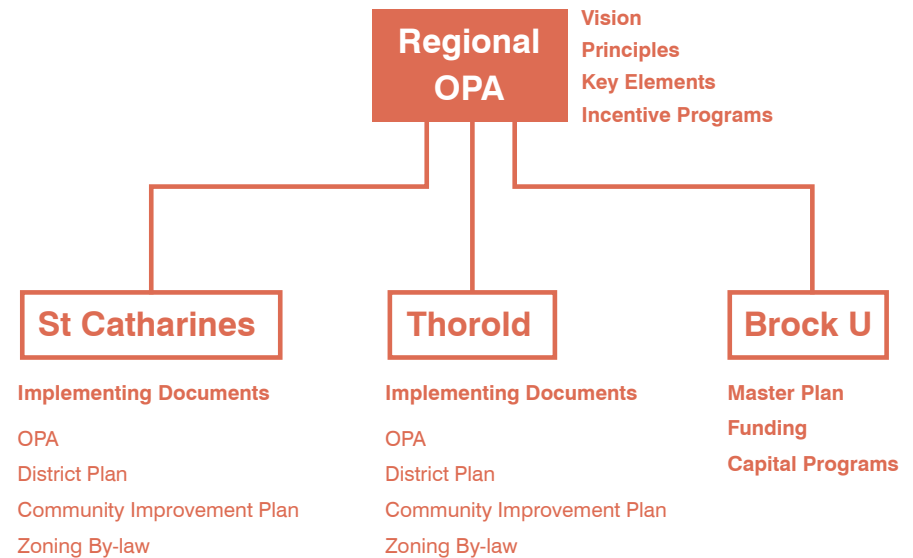
The Brock District Plan requires the Region, the two municipalities, Brock University and private sector partners to work together. The policy regime among the Region and municipal partners must align and then implementation must ensure that choices and decisions achieve the intent of the vision.

The District Plan will be implemented through an amendment to the Region's Official Plan where the vision, principles and key directions will set the overarching framework for implementation to the policy, zoning and special studies required through the City of St. Catharines and the City of Thorold.

Implementation of the Brock District Plan will require ongoing communication, coordination and collaboration among all of the partners. A sustainable, complete community recognized for its prototypical development of green buildings, sustainable streets and parks and green infrastructure will only be realized through coordinated development in each of the jurisdictions. Success through coordination and collaboration is not new to Niagara Region: Team Niagara Economic Development Action Plan, Sustainable Niagara, Complete Streets are a few of the recent initiatives that resulted from collaboration among multiple partners.

It is recommended that a Brock District Technical Advisory Committee be established to meet regularly to coordinate projects, review planning and design concepts, review detailed design, to establish detailed design standards and to ensure coordinated policies. The Brock District Technical Advisory Committee should include representatives from:

- Niagara Region's Planning and Development Services, Economic Development and Public Works;
- City of St. Catharines;
- City of Thorold;
- Brock University;
- Niagara Escarpment Commission; and,
- Ministry of Transportation.



The Brock District Plan should be used as a guiding document in the development of any new plan, guideline or strategy developed for the area. For work being completed at a Regional scale, the Brock District Plan should provide a special focus area where additional requirements for streetscaping and urban design may be warranted.

Policy Directions for the Brock District Plan:

- The Brock District Plan should be reviewed and updated every 10 years;
- The Brock District Plan should act as a guiding document and vision for new plans, guidelines or strategies;
- The Brock District Plan should be used in the review of any new development application within the subject area; and,
- Any new Official Plan Amendments or Zoning By-law amendments within the Brock District Plan Area shall be consistent with and support the overall vision of the area.

The following sets out actions, priorities and responsibilities for each of the 25 strategies identified in the 7 frameworks.

1 Positioning the Brock District Globally within a UNESCO Biosphere Reserve

Strategies	Recommendation & Mechanism
1a Leverage the setting within a UNESCO Biosphere Reserve to promote innovative education, research, business synergies and healthy lifestyles	Work with all of the Brock District partners and stakeholder group to ensure development sets a precedent for a sustainable complete community by creating prototypical green infrastructure and buildings, active transportation, landscape treatment, sustainable streetscape etc. Opportunities for incentives, policies and design guidelines should be explored to help achieve this. Build awareness of the Brock District Plan, its unparalleled location and the opportunities for development by using it as a basis in future plans, guidelines and strategies. Forward a copy to local area municipalities, Brock and Regional departments
1b Continue to protect the Escarpment Natural Area and Escarpment Protection Areas as they run through the Brock District and meet and exceed the requirements for development within the Escarpment Urban Areas	
1c Leverage location within Niagara Peninsula Appellation to promote viticultural education, research and business synergies	

2 Setting the Brock District in the Niagara Escarpment

Strategies	Recommendation & Mechanism
2a Continue to leverage the local natural heritage system as a hands on resource for education and research in Tourism and Environment, Geography, Sustainability Science and Earth Sciences	Continue to support the protection of the UNESCO World Biosphere and the opportunities it provides for education.
2b Leverage the setting in the Niagara Escarpment in marketing development opportunities for employment, housing and education	Economic Development to incorporate Into the Economic Development Work plan and Strategy
2c Protect and enhance existing natural features and biosystems, including groundwater, wetlands and habitat in new and existing development	Continue to protect natural features through planning policy and development review.

3 Gateways to the Brock District

Strategies	Recommendation & Mechanism
3a Emphasize gateways as crossings of a natural threshold to further define a distinct District nestled in the natural environment	<p>Employ best practices of urban design and placemaking to create a distinct and cohesive look for Brock District, in particular creating a unified and seamless approach to the public realm and ensuring that private development complements and enhances the public realm</p> <p>Prepare a detailed Brock District Placemaking Manual that includes standards with respect to gateways, parks (public and private), wayfinding, identity, innovation and streetscape: materials, furnishings, transit shelters and amenities, plant species, lighting, sustainable planting, maintenance requirements, etc.</p> <p>Create a Master Plan for the Region's lands. The master plan should address a range of improvements including pedestrian, parking, locations for new buildings, and improvements to the Region's headquarters</p>
3b Plant naturalized areas and other large scale landscape interventions along Hwy 406 and its ramps to provide a gateway to the District	Meet with MTO to discuss opportunities for landscape treatment and Brock District signage at the interchange and work with Region and local area municipalities

4 Sustainable Urban Brock District

Strategies	Recommendation & Mechanism
4a Manage stormwater by adhering to the zero net runoff practices of Low Impact Development	Prepare detailed Brock District Green Infrastructure standards to address alternate standards for sewer, waste, water, stormwater and lighting
4b Use Transportation Demand Management to increase modal share for active transportation and transit use	Continue to support the Transportation Master Plan work that is currently ongoing and subsequently develop policies that support Transportation Demand Management.
4c Aspire to a carbon neutral (net zero carbon footprint) district by reducing GHG Emissions from electricity, heating and cooling, and transportation, and offsetting remaining emissions	Prepare detailed Brock District Green Building standards for design and construction of energy efficient green buildings and sites
4d Explore using co-generation to provide power, heating and cooling to new buildings	Stakeholder group to administer a study related to opportunities for district energy in the Brock District
4e New buildings should be certified as minimum LEED Gold	Niagara Region should consider potential incentives such as tax breaks or grants for the Brock District to encourage green building practices

5 Balanced Circulation in the Brock District

Strategies	Recommendation & Mechanism
5a Improve comfort and connectivity for pedestrians by ensuring there is a sidewalk on both sides of streets, pedestrian crossings are safe, well marked and frequent, pathways and sidewalks are well lit and signage is clear and informative	<p>Niagara Region should continue work on the Transportation Master Plan.</p> <p>City of St. Catharines and City of Thorold should work with Niagara Region to identify capital program opportunities and budget to fast track implementation of capital projects for roads and identify opportunities to implement missing sidewalks, enhanced crossings, enhanced lighting and signage and barrier-free design. Niagara Region should allocate money in the capital budget for pedestrian improvements within the Brock District.</p>
5b Complete the cycling network and improve the safety of the cycling infrastructure, particularly at intersections	<p>Niagara Region should continue work on the Transportation Master Plan.</p> <p>City of St. Catharines and City of Thorold should work with Niagara Region to identify capital program opportunities and budget to fast track implementation of capital projects for roads and identify opportunities to implement missing cycling connections, enhanced crossings, enhanced lighting and signage</p> <p>Niagara Region could encourage/develop partnerships to implement bike lanes or multi-use pathways along local roadways within the District.</p> <p>Niagara Region should allocate money in capital budgets for cycling improvements within the Brock District.</p>
5c Improve the convenience and comfort of using transit to better serve Brock University and future increases in residential and employment populations	<p>Provision of a high quality bus shelter experience to be addressed in Brock District Placemaking manual</p> <p>Work with the St. Catharines Transit Commission and Niagara Region transit to review schedules, routes and projected ridership patterns to improve service delivery where possible</p> <p>Utilize the stakeholder group to identify partnership opportunities for major transit hub and terminal facilities to accommodate transit vehicle bays, kiss and ride and pick-up/drop-off for ride sharing vehicles.</p>
5d Balance the convenience of vehicular movement and parking with the need to prioritize other modes and urban design objectives	<p>Implement Complete Streets policy by implementing the Placemaking Manual and adopting streetscape improvements</p> <p>Parking should be reviewed as part of a Regional Master Plan.</p>

6 A Green Brock District

Strategies	Recommendation & Mechanism
6a Create beautiful and sustainable streetscapes along Sir Isaac Brock Way, Glenridge Avenue/Merritville Highway and Schmon Parkway	<p>Prepare a detailed Brock District Placemaking Manual</p> <p>Prepare detailed streetscape design</p> <p>Prepare a Master Plan for Regional Lands</p> <p>Develop business cases to allocate money in capital budget for construction related to streetscaping.</p>
6b Provide a network of publicly accessible open spaces, both on public land and as part of private development	<p>Encourage the City of St. Catharines and City of Thorold to review existing policies and update where necessary to ensure policy reflects current thinking that promotes all pedestrian realm elements and enables all possibilities and mechanisms including parkland dedication to achieve public and or private parks</p> <p>Implement the Linear Park according to the Brock Business Park Secondary Plan through partnerships between the City of Thorold, Niagara Region and private developer(s).</p> <p>Prepare a Master Plan for Regional Lands that demonstrates integration of the pedestrian network and areas for publicly accessible open spaces and parks</p> <p>Develop business case to allocate money in capital budget for construction related to new public open spaces.</p>
6c Beautify and enhance parking	<p>Prepare a detailed Brock District Placemaking manual</p> <p>Review parking through a Master Plan for Regional Lands</p>
6d Use bioswales and other surface water treatment and entrapment techniques to manage runoff including capturing roof runoff for watering trees and other landscape features	<p>Prepare detailed Brock District Green Infrastructure standards to ensure coordination among all jurisdictions</p>

7 The Brock District is a Complete Community

Strategies	Recommendation & Mechanism
7a Promote mixed uses while maintaining employment uses	<p>Review current policy framework to evaluate the strategies for promoting and requiring a mix of uses in the District.</p> <p>Update policies to reflect future changes in the Growth Plan that permit a broader mix of uses that support employment within employment areas.</p>
7b Promote a mix of housing types and tenures, including privately owned housing	<p>Prepare a detailed Brock District Placemaking Manual</p> <p>Review current policy framework to evaluate the strategies for promoting and requiring a full range and mix of housing through the District</p> <p>Economic Development to incorporate Into the Economic Development Work plan and Strategy</p>
7c Create opportunities for placemaking: parks, streetscape and gateways	<p>Prepare a detailed Brock District Placemaking Manual</p> <p>Prepare a Master Plan for Regional Lands</p>
7d Explore structured parking to allow higher densities	<p>Review current policy framework to ensure full spectrum of shared, structural and integrated parking is possible</p> <p>Utilize stakeholder group to develop partnerships where possible for shared parking between new developments or improvements to existing developments.</p> <p>Create a parking structure template that would provide parking for mixed uses, including the potential for adaptability to meet future needs</p>

Brock District Plan