Village on Main

Public Infrastructure Plan

Final Report

Presented to: *Graziella Grbac, Executive Director of*
Main Street Business Improvement District,
and to: *Professor John Zuck, Dalhousie School of Planning,*
for partial completion of PLAN6500 Integrative Team Project

May 2016 **Coast to Coast Consulting**

Image: Main Street, photograph by Sara Jellicoe, January 2016

Executive Summary

Introduction

Main Street Dartmouth is a commercial hub adjacent to the Circumferential Highway that connects suburban communities to Downtown Dartmouth. The site's four major roads are Main Street, Lakecrest Drive, Hartlen Street, and Tacoma Drive. Streets and businesses currently cater to cars, with wide vehicle lanes and spacious parking lots.

In 2008, Halifax Regional Municipality approved the Main Street Dartmouth Planning Vision and Streetscape Concept Plan (Ekistics Planning and Design, 2007). In the years since, the BID was created and a special Main Street Designation added to Dartmouth planning documents. Several public infrastructure improvements have also been made, such as a new pocket park and added street trees. Ekistics, HRM, and Coast to Coast Consulting have consulted the Main Street community and they proposed a more walkable, safe, and comfortable community with more public amenities (e.g., seating, trash cans, lighting) and more public spaces like parks, green spaces, and plazas.

In response to a request for proposals from the BID, Coast to Coast Consulting (a team of Masters of Planning students from the Dalhousie University School of Planning) developed a public infrastructure plan. The project represents the coursework of PLAN 6500: Integrative Team Project. The project goal is to create a public infrastructure plan that advances the BID's vision of becoming an urban village: the Village on Main. Our project reconsiders the direction of the Ekistics plan in light of current conditions and reviews policies and studies to present updated public infrastructure recommendations for the Village.

Vision & Branding:

We developed design principles based on key public infrastructure concepts from the BID vision, branding pillars, and branding values to guide our design and ensure our designs contribute to the Village on Main vision (see Table E1).

Site Issues:

Heavy traffic, poor pedestrian connectivity, poor cycling connectivity, inadequate public transit amenities, limited public space, and unappealing streetscapes prevent the Village on Main vision from being achieved. The root of these problems is car-oriented designs of streets in the area.

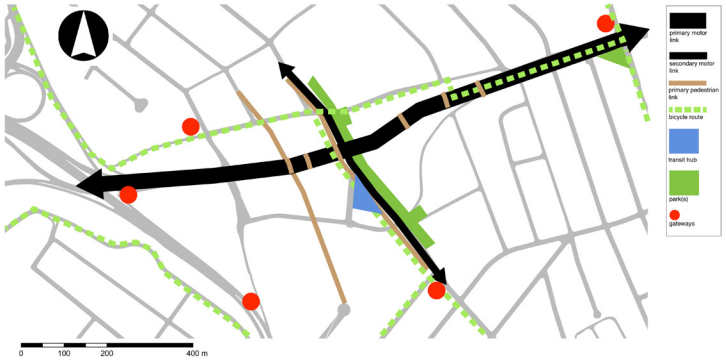
Principles	BID's Definition
Public Infrastructure Quality	
Walkable	Pedestrian-friendly.
Accessible	Accommodates those with physical and visual limitations.
Engaging	Provides interesting features that engage the community.
Convenient	Provides a convenient mix of uses and services and convenient travel access.
Interaction	Enables social interaction.
Community	Establishes distinct community identity.
Responsible Development	Environmentally sustainable development.
Public Infrastructure Component	
Green Space	Improves existing or increases amount or green spaces.
Cyclist-friendly	Accommodates cyclists.
Public Transport	Enables access to public transit.

Table E1: Principles based on Key Concepts from Village on Main Vision and Branding

Design Goals:

Based on the vision principles and site problems, we developed seven Design Goals:

- Goal 1: People can travel by foot throughout the site safely and comfortably.
- Goal 2: People can access public transit on the site safely, comfortably and conveniently.
- Goal 3: People can travel on bicycle through the site safely and comfortably.
- Goal 4: People can travel by motor vehicle through the site conveniently.
- Goal 5: People identify the Village on Main as a destination.
- Goal 6: People can interact in outdoor public spaces safely and comfortably.
- Goal 7: All public infrastructure designs support sustainable, responsible development.



Conceptual Vision, Coast to Coast Consulting
Data Source: adapted from HRM Corporate Dataset (HRM, 2012)

Design Recommendations

Design Concept:

"The Village Centre" creates a linear village centre along Hartlen Street and keeps most car traffic on Main Street (Figure E1). This concept aligns Hartlen Street with Valleyfield Road to the south and extends Hartlen to Lakecrest Drive to the north.

Site-wide Recommendations:

1. Adjust motor vehicle space.
   - Narrow all motor-vehicle lane widths to 3m, or 3.4m for bus route lanes;
   - Maintain two-way motor vehicle traffic flow on each street.

2. Improve pedestrian space.
   - Increase clear sidewalk through-way widths to 2m;
   - Create distinct furnishing zone between roads and sidewalks that provides more pedestrian amenities;
   - Install pedestrian-scale, village-style lighting;
   - Maintain at-grade crossings on Main Street, rather than adding pedways;
   - Install distinct paving for all crosswalks for safety and establishment of village identity.

3. Make strategic use of natural elements.
   - Apply stormwater management strategies, like rain gardens, in furnishing zones, medians, and parks;
   - Add street trees to furnishing zones of sidewalks and medians.

4. Define cyclist space.
   - Lane widths of at least 1.5m but 1.8m if possible;
   - Protected bike lanes on Main Street
   - Intersection treatments of bike boxes and painted crossing lanes for routes intersecting with Main Street.

Site-specific Recommendations:

1. Improve Lakecrest Drive streetscape and expand cycling network.
   - Add separated cycling lane to Lakecrest to connect existing cycling lanes outside site;
   - Add sidewalk on south side of Lakecrest;
   - Remove on-street parking on Lakecrest;

- Convert Lakecrest east of Mountain Road to a laneway and remove access to Helene Avenue.

2. Improve Main Street streetscape.
   - Reduce number of driveways turning off Main Street;
   - Add midblock pedestrian crosswalks on Main Street;
   - Provide buffered cycling lane east of Tacoma.

3. Establish Village Center on Hartlen Street (Figure E2).
   - Build road extension of Hartlen and create large public open space to east of new road;
   - Upgrade Hartlen transit stop to transit hub with public amenities, including bicycle racks and Park-and-Ride along with more park land and a multi-use trail;
   - Provide bike lanes to connect Lakecrest cycling route to transit hub;
   - Paint bike boxes and crossing marks at Hartlen-Main intersection.

4. Improve Tacoma Drive.
   - Construct new signalized intersection and convert Tacoma east of Stevens Road to a park;
   - Convert Stevens Road to a cul-de-sac;
   - Paint bike boxes and crossing marks at new Tacoma-Main intersection;
   - Convert intersection into a roundabout and remove shortcut lane on off-ramp;
   - Formalize parking on Tacoma using parklets.

5. Improve Major Street and Gordon Avenue intersection and streetscapes.

6. Expand pedestrian path network.
   - Establish pedestrian right of ways connecting Lakecrest to Main, Main to Tacoma, Gordon to the transit hub, and Tacoma east of Hartlen to the transit hub.

7. Improve parks and open spaces.
   - Make purposeful use of slopes in BID and add features of interest;
   - Create more public open space wherever possible to meet HRM open space guidelines.

8. Create gateways to the site.
   - Define ‘Gateways’ with signage, landscaping, public art, and traffic-calming measures.

Schematic Design
Data source: adapted from HRM Corporate Dataset (HRM, 2012)

Implementation Plan

Policy Recommendations:

Policy and by-law amendments are needed for mid-block parking, gateways, and commercial frontage on Hartlen Extension.

Phasing Strategy:

Three implementation phases prioritize high impact, high opportunity, and low cost design components (see Table E2).

Partnership and Funding Possibilities:

The BID can explore funding opportunities at the municipal, provincial, and federal levels along with the list of potential partners, such as Halifax Transit, HRM Transportation and the Nova Scotia Department of Transportation and Infrastructure Renewal.

BID-led Project Opportunities:

The following are projects the BID could lead, with little reliance on outside partners, that will forward the Public Infrastructure Plan:

- promotion to the community,
- pilot projects,
- planning studies, and
- a facade improvement program.

Phase	Public Infrastructure Component to be Implemented
Short Term: Establish Village Identity	Hartlen Extension; Hartlen-Main intersection; improvements to current bus stops on Hartlen; gateways; streetscape improvements on Main (west of Tacoma); add midblock crossings on Main.
Medium Term: Improve Active Transportation Accessibility	New Intersection at Main-Tacoma; cycling route on Lakecrest; streetscape on Main (east of Tacoma) and Lakecrest; pedestrian paths.
Long Term: Improve Functionality and Connectivity	Realign Hartlen Street to connect with Valleyfield Road; expand transit hub; streetscape improvements on Tacoma and Gordon and Major; Gordon-Main intersection; improve existing parks; Gordon-Tacoma intersection improvements.

Table E2: Three Phases of Implementation Strategy

Conclusion

The Main Street Dartmouth Business Improvement District (BID) envisions the transformation of the BID into an urban centre: the Village on Main. The site currently faces urban issues of high traffic volumes, lack of pedestrian connectivity, poor cycling connectivity, inadequate public transit amenities, limited public space, and often unappealing streetscapes.

Recommendations support the following Design Principles created from the Village on Main vision, branding pillars, and branding values: walkable, accessible, engaging, convenient, interaction, community, responsible development, public infrastructure component, green space, cyclist-friendly, and public transport. We recommend narrowing roadways, and widening AT and pedestrian infrastructure, to make the BID more pedestrian and cyclist friendly without compromising vehicle capacity on Main Street. Improving existing public space and creating additional public space will enhance public interaction, sense of community, and the natural environment. Realigning Hartlen Street with Valleyfield Road will improve connectivity, efficiency, and safety for all modes of travel across the BID. Our recommendations provide a strategy to establish a Village Centre and install gateways to enhance the identity of the Village on Main as a distinct destination.

Through strategic use of street right-of-ways and public open spaces, the BID has the opportunity to achieve its vision of becoming the Village on Main.

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Figures and Tables

Acknowledgments

Our team would like to thank everyone who contributed to the creation of this public infrastructure plan for the Village on Main. Firstly thank you to Graziella Grbac for submitting a Request for Proposals to the Dalhousie School of Planning and then for her consistent support and enthusiasm throughout the project. Thank you also to Greg Fong for his insights and for hosting our community consultations at his restaurant in the Business Improvement District. We also want to thank Marcus Garnet for several meetings with us and sharing his knowledge throughout the process. Thank you to Dave McCusker, too, for answering our questions. Thank you also to Karen Brake for the work she contributed that supported our project. And above all, thank you to every community member who came out to the community meetings or shared our project on social media; their contribution is invaluable. This was truly a team effort that would not have been possible without these people.

We also want to thank our course instructor, John Zuck, for offering continuous guidance, feedback, and expertise throughout the process. Thank you also to our classmates for your feedback and encouragement.

The project has been an enjoyable and important learning experience for our whole team. We are thrilled to have been part of the story of the Village on Main.

The Coast to Coast Consulting Team

Tim Davidson (Internal Liaison):

Tim brings a background in Geography (BA) and a Post-Graduate Certificate in Urban Design from Simon Fraser University.

Mia Feng (Team Secretary):

Mia graduated from the University of Toronto with a HBS in Chemistry and Mathematics. She has quantitative analysis, design, and software skills.

Sara Jellicoe (External Liaison):

Sara brings to the team design and software skills from her Architecture degree and research skills from her honours Psychology degree.

Dylan Smith:

Dylan graduated from the University of Victoria with a BA in Geography and Urban Development Studies. His background is in transportation research and pedestrian network analysis.

Kaitlyn Walker:

Kaitlyn graduated from the University of Waterloo with a Bachelor of Environmental Studies in Planning. Her extensive planning education allows her to approach projects from a range of different perspectives.

Christina Wheeler (Team Coordinator):

Christina graduated from Saint Mary's University with a BA in International Development Studies (honours thesis) and Anthropology. School and work have given her leadership and teamwork experience.

Introduction

Imagine an urban village on Main Street in Dartmouth. Halifax Regional Municipality (HRM), the Main Street Dartmouth Business Improvement District (BID), and Coast to Coast Consulting recognize the great potential of this area. In response to a request for proposals from the BID, Coast to Coast Consulting, a team of Master of Planning students from Dalhousie University, developed this public infrastructure plan for the BID between January and April 2016. The project represents the coursework of PLAN 6500: Integrative Team Project, a core course in the Masters of Planning program at Dalhousie University.

HRM has taken steps to improve the central commercial area of Main Street. In 2007, the HRM commissioned Ekistics Planning and Design to research and propose a vision for the area: the Main Street Dartmouth Planning Vision and Streetscape Concept. HRM also initiated a Transportation Study of the BID area (GENIVAR, 2011). The BID (Figure 1), created in 2009, rebranded the area in 2015 as the Village on Main.

In 2013, HRM gave the area special designations in several planning documents. The Dartmouth Land Use By-law (LUB) and Dartmouth Municipal Planning Strategy (MPS) identify the BID as a secondary planning area, while the Halifax Regional Municipal Planning Strategy identifies the area as an Urban Local Growth Centre. These policies direct future development in the area, setting the stage to achieve the village vision.

Some physical improvements have taken place on the site since the Ekistics (2007) vision. For example, HRM improved some streetscapes by adding street trees; however, there continues to be discrepancy between the current site conditions and the Village vision. Over the past nine years, various studies, visions, policies, and groups, including the BID, have expressed similar ideas to improve the area. Now is a good time to reconsider the directions and visions laid in the above documents in light of the changes that have been implemented and the BID's new Village vision. This project integrates policies, studies, and recommendations with the current site context to present an updated public infrastructure plan for the Village on Main.

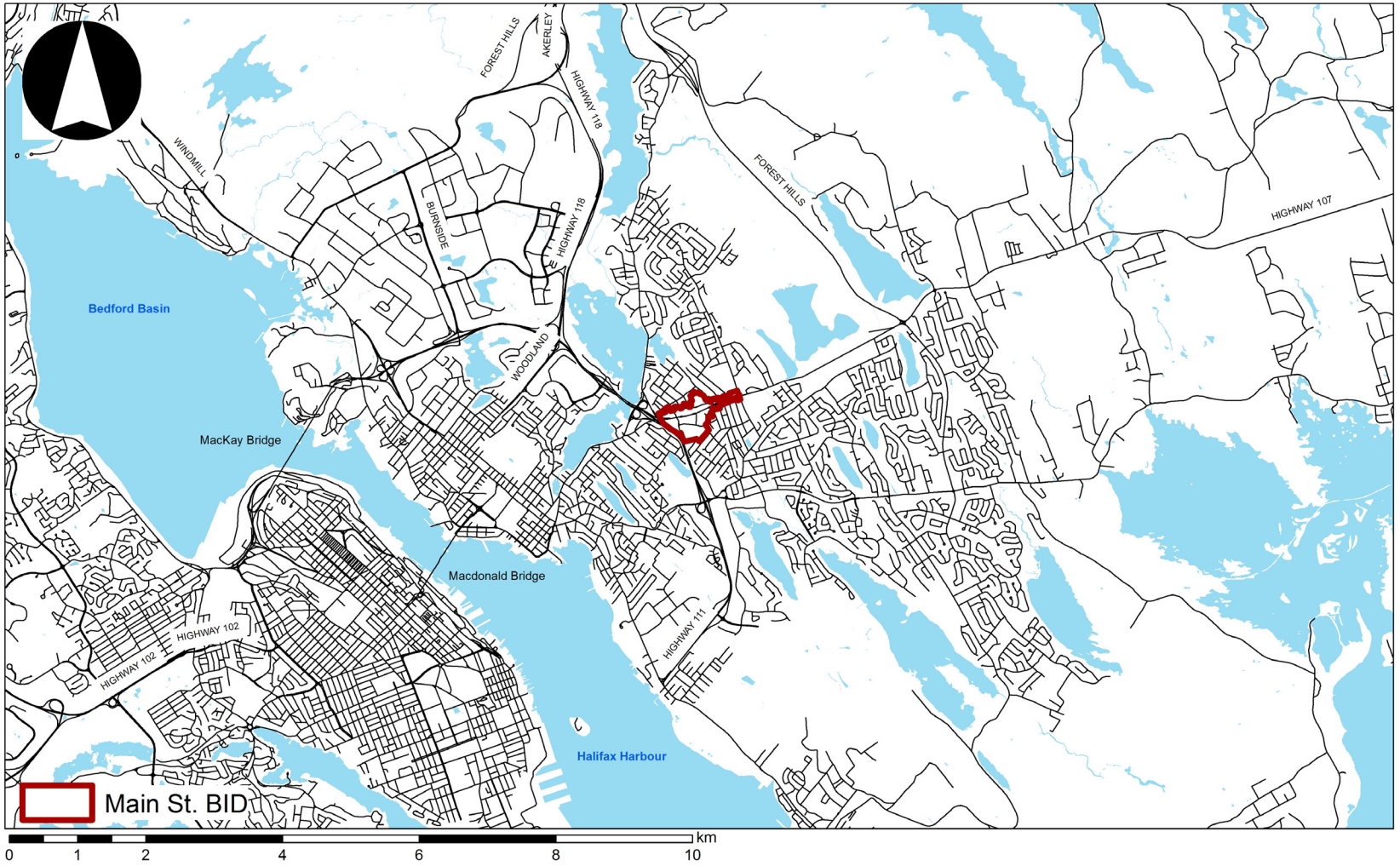


Figure 1: Main Street Business Improvement District location in the community of Dartmouth, Halifax Regional Municipality, Nova Scotia
Image Source: map by Tim Davidson, data from HRM Corporate Dataset, 2015.

Report Structure

This report begins by introducing the Main Street Dartmouth BID, including its vision, branding values, and branding pillars. We identify design principles based on the BID's vision. It then presents the core problems to be addressed on the site, followed by the project goals, objectives, and methods.

Site Background

The first major section of the plan presents background information about the site, such as demographics, transportation services, site amenities, and current street designs. We then review key policy documents relevant to planning public infrastructure in the Main Street area, including a review of the key recommendations from the Ekistics (2007) plan and transportation study (GENIVAR, 2011) and present a summary of community consultation feedback. The background section concludes with our Design Goals based on the BID's vision principles and the findings about the current context.

Concept Design

We present our plan for the site in the last three sections of the report. First, we present the larger concept design options, an evaluation of these options, and then the chosen concept.

Schematic Design

Next, we present the more detailed schematic design. The schematic design is presented as site-wide and then site-specific recommendations.

Implementation

Finally, we present an implementation plan to help the BID see the Village on Main vision become reality.

Business Improvement District History

Figure 2 outlines important planning events in the BID's recent history, including the development of the Ekistics (2007) vision, its approval by council in 2008, and the 2011 Transportation Study. One of the recommendations from Ekistics (2007) was to create a Business Improvement District for the commercial stretch of Main Street.

HRM created the Main Street Dartmouth BID in 2009. Main Street is a commercial centre of diverse shops and services in Dartmouth; the BID represents the interests of over 150 businesses. The formation of the BID has been instrumental to many recent positive changes because of its continued leadership for transformation in the community.

BIDs operate on service agreements with the HRM that are renewed every 2 years. BIDs function through a levy on the local businesses managed by the HRM and through supplemental municipal grant programs. A volunteer board made of business owners from the district lead the BID. The BID's role involves advocating for and promoting the area.

In 2010, the HRM implemented several recommendations from the Ekistics (2007) vision: rezoning, additional sidewalks and trees, LED lights, and a pocket park on the southern corner of the Main Street and Woodlawn Road intersection. HRM added Main Street branded pole wrap signs and banners in 2011. The Dartmouth MPS and LUB were updated in 2013 with a new Main Street Designation that includes new policies and zoning. In 2015, a BID summer student created a full build-out vision based on the amended policies and the BID was rebranded as the Village on Main (Figure 3).

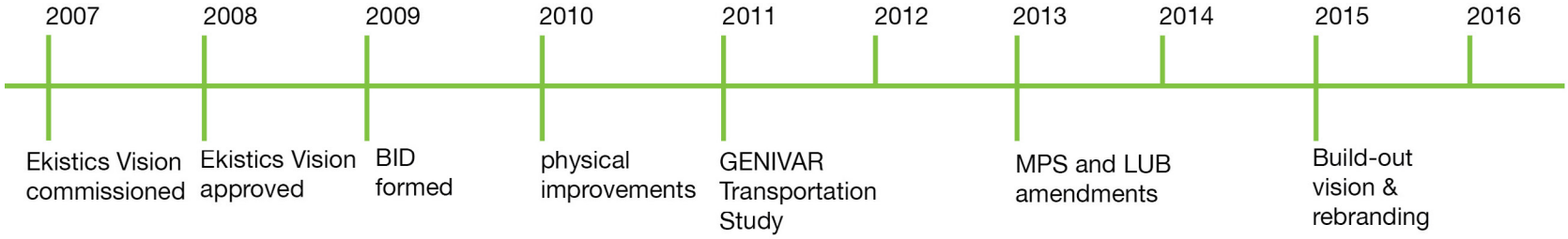


Figure 2: Important Recent Planning Events for Main Street, Dartmouth Area
Image Source: Sara Jellicoe

Vision and Branding

The following vision, branding pillars, and branding values are drawn directly from the request for proposals presented to our team. They form the foundation on which our public infrastructure plan is built:

Vision:

Infrastructure will be based on a philosophy of putting people first.

- Infrastructure: A walkable town centre with affordable, quality residential living offering a variety of shops and services, green spaces and accessible infrastructure for active and public transportation.
- Value base of our vision: The Village on Main will instill a sense of fulfillment, because it provides an engaging, village-like community that puts people first, while offering day-to-day conveniences within a one kilometer radius.

Branding pillars:

- convenience,
- interaction,
- community,
- responsible development.

Branding values:

Developing a welcoming community for all ages and abilities, based on soft values (rather than profit driven hard values), that attracts social enterprise.

The Village on Main

Figure 3: New branding for the Main Street Dartmouth BID

Design Principles

We address challenges on the site through design principles based on terms drawn directly from the BID's vision, branding values, and branding pillars. Table 1 describes the design principles. The principles are divided into public infrastructure qualities and components. The principles are presented in order that they are mentioned by the BID.

The principles allow us to continuously link our designs to the BID vision because we used them to generate and evaluate our designs throughout the design process. In the upcoming Policy section, we assess whether or not the principles are supported by each document by using a checklist. The design principles and our site background inform our creation of Design Goals and Objectives. We assess design concepts and schematic design options with the principles to help select the designs presented in this report; these assessments are found in Appendix B.

Principles	BID's Definition
Public Infrastructure Quality	
Walkable	Pedestrian-friendly.
Accessible	Accommodates those with physical and visual limitations.
Engaging	Provides interesting features that engage the community.
Convenient	Provides a convenient mix of uses and services and convenient travel access.
Interaction	Enables social interaction.
Community	Establishes distinct community identity.
Responsible Development	Environmentally sustainable development.
Public Infrastructure Component	
Green Space	Improves existing or increases amount or green spaces.
Cyclist-friendly	Accommodates cyclists.
Public Transport	Enables access to public transit.

Table 1: Design Principles and Definitions

Site Challenges

The following public infrastructure problems prevent the BID from realizing the vision, branding pillars, and branding values. We explore the site challenges in further detail in the background section.

- **Heavy traffic:**
  Traffic is fast due to wide roads with few pedestrian crosswalks. Roads are physically designed for higher speeds than the posted limit of 50 kilometres per hour.

- **Poor pedestrian connectivity:**
  Aside from poor pedestrian access due to wide roads, the pedestrian experience is unpleasant due to a lack of public amenities like street furniture, shelter, or open space.

- **Poor cycling connectivity:**
  The site abuts a bike lane to the Eastern shore and another towards Waverly but has no comfortable cycling connection between the two through the BID site itself.

- **Insufficient public transit amenities:**
  Amenities for public transit users on the site are few and the Tacoma Centre bus stop does not meet its full potential as a designated transit centre.

- **Limited public space:**
  The site has few open public spaces. The few existing spaces are pocket parks are inaccessible and unappealing due to the lack of crosswalks and proximity to busy roads.

- **Unappealing streetscape:**
  The site lacks public amenities like benches, trees, and green spaces which make it not only aesthetically unappealing but also unpleasant for workers and visitors.

Problem Statement

Our team has synthesized the above problems into a central problem statement:

The central barrier to achieving the Village on Main vision for public infrastructure is the current design of the streets in the BID.

The current street designs prioritize moving private motor-vehicles more than other modes of transport. The site is used more as a route to move through rather than a destination. The design makes the area feel unsafe, inaccessible, and unpleasant for pedestrians and cyclists, discouraging people from spending time in the area and ultimately impeding the vision of having a Village on Main.

Since Main Street's design makes it difficult for pedestrians to cross, few pedestrians frequent services on the site, leading services to cater to the more prominent car-driving customers in business design rather than to pedestrian customers. How can a car-oriented, strip-mall-lined highway be turned into the accessible village-like vision desired by the BID? The background section of this report provides further understanding of the problems outlined here to inform our design recommendations.

HRM government has direct control over public infrastructure. Public infrastructure includes street right of ways and public open space (e.g., parks, plazas, promenades). The HRM can regulate but not control land use and development form on private land through Land Use Bylaws (LUBs). Though the city cannot directly dictate what happens on private land, good public infrastructure can influence the quality of private developments.

Project Goals and Objectives

The project goal is to create a **public infrastructure plan** that advances the Main Street Dartmouth Business Improvement District's vision, branding pillars, and branding values.

The project objectives are deliverables found in this report:

- Site analysis and inventory
- Policy analysis
- Concept design
- Schematic design
- Implementation plan

Methods

Figure 4 shows our design process. The design process was iterative, which means each part of the process (e.g., concept design) informed other parts of the process in a continuous feedback loop. Consequently, our process did not strictly follow the order in which we describe the following stages. The methods used are listed with each stage.

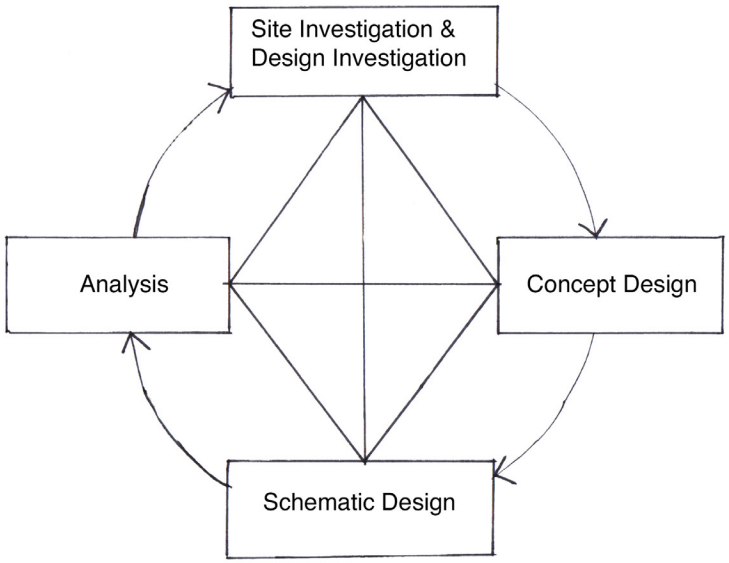


Figure 4: Iterative Design Process
Image Source: Christina Wheeler, March 2016

Site Investigation and Design Investigation:

We gathered background information, identified problems, and developed design objectives.

- Site Investigation
  - Visited site
  - Inventoried existing public infrastructure
  - Collected demographic data
  - Communicated with client and client contacts
  - Gathered feedback from Main Street community members who attended our first presentation to the BID
- Design Investigation
  - Reviewed urban design theory
  - Reviewed case studies and good practices
  - Reviewed relevant policy documents, with special focus on the Ekistics (2007) vision and the transportation study (GENIVAR, 2011)
  - Analyzed BID vision and branding to develop design principles (Figure 5 on following page)
  - Developed design goals and objectives based on design principles and other findings from investigations

Figure 5 shows several key components of the public infrastructure plan developed during the site and design investigation phase as we moved towards the concept design phase.

Concept Design:

We explored several broad concept design ideas for the site.

- Developed concept designs that explore movement (i.e., car, bicycle, pedestrian) and open space options.
- Evaluated designs based on design principles to choose the concept that will most effectively achieve the BID vision.

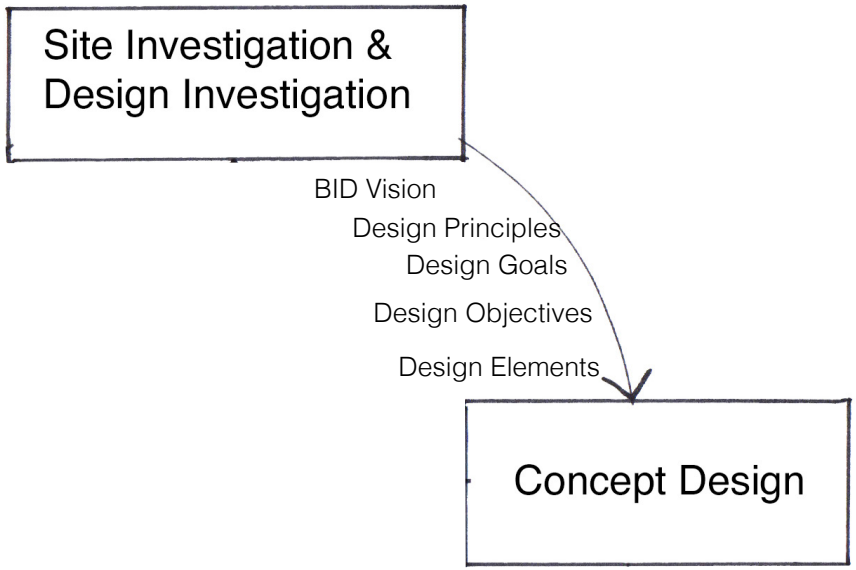


Figure 5: Public Infrastructure Plan components (e.g., design goals) developed during the site/design investigation that informed the concept design.
Image Source: Christina Wheeler, March 2016

Schematic Design:

We further developed the chosen concept design.

- Created to-scale drawings (sections and plans) to test concept ideas.
- Evaluated designs with design principles and from feedback from second community consultation meeting.

Analysis:

We explored how the BID could implement the designs.

- Made policy amendment recommendations
- Explored logical phasing options
- Analyzed available policy tools
- Identified potential funding sources and partnership options

Site Background

Location

Main Street BID is a high-density hub in the HRM adjacent to the Circumferential Highway (see Figure 1 in the Introduction). The district's land area is approximately 380,000 square metres. Figure 6 identifies key roads in and around the site. Significant vehicle travel through-ways bookend the site, with the Circumferential Highway to the southwest and Caledonia Road/ Woodlawn Road to the northeast. Main Street, running through the centre of the site, connects suburban communities such as Forest Hills, Preston, and Cherry Brook to Downtown Dartmouth. Other key streets are Lakecrest Drive, Tacoma Drive, and Hartlen Street.

The commercial centre on Main Street was originally developed in the late 1960s (Ekistics, 2007). With its prime central location, Main Street serves communities across Dartmouth. It is only a 20 minute drive from the Halifax Inter national Airport, a 10 minute drive from Downtown Dartmouth, and a 15 minute drive from Downtown Halifax (Main Street Dartmouth Business Improvement District, n.d., b). The site could become a distinctive and easy-to-access destination for Haligonians if the improvements envisioned for the Village on Main are realized.

Main Street serves 93,000 people within a 10 minute driving radius and thousands within 15 minute walking radius (Ekistics, 2007), giving it one of the densest service areas in Eastern Canada (Main Street Dartmouth Business Improvement District, n.d., a).

Population

The 2015 population in the BID is 618 (Main Street Dartmouth Business Improvement District, n.d., e.). With the recent amendments to the Dartmouth land use by-law, the population should increase. The conservative population projected for 2035 given the recent by-law amendments is 4,451 people, which would happen if the site only developed to half of the capacity that is now permitted. The population would be 8,285 if the site built out to the full permitted extent.

Figure 6: Main Street BID and Major Streets
Image Source: Map by Sara Jellicoe; adapted from HRM Corporate Dataset (HRM, 2012)

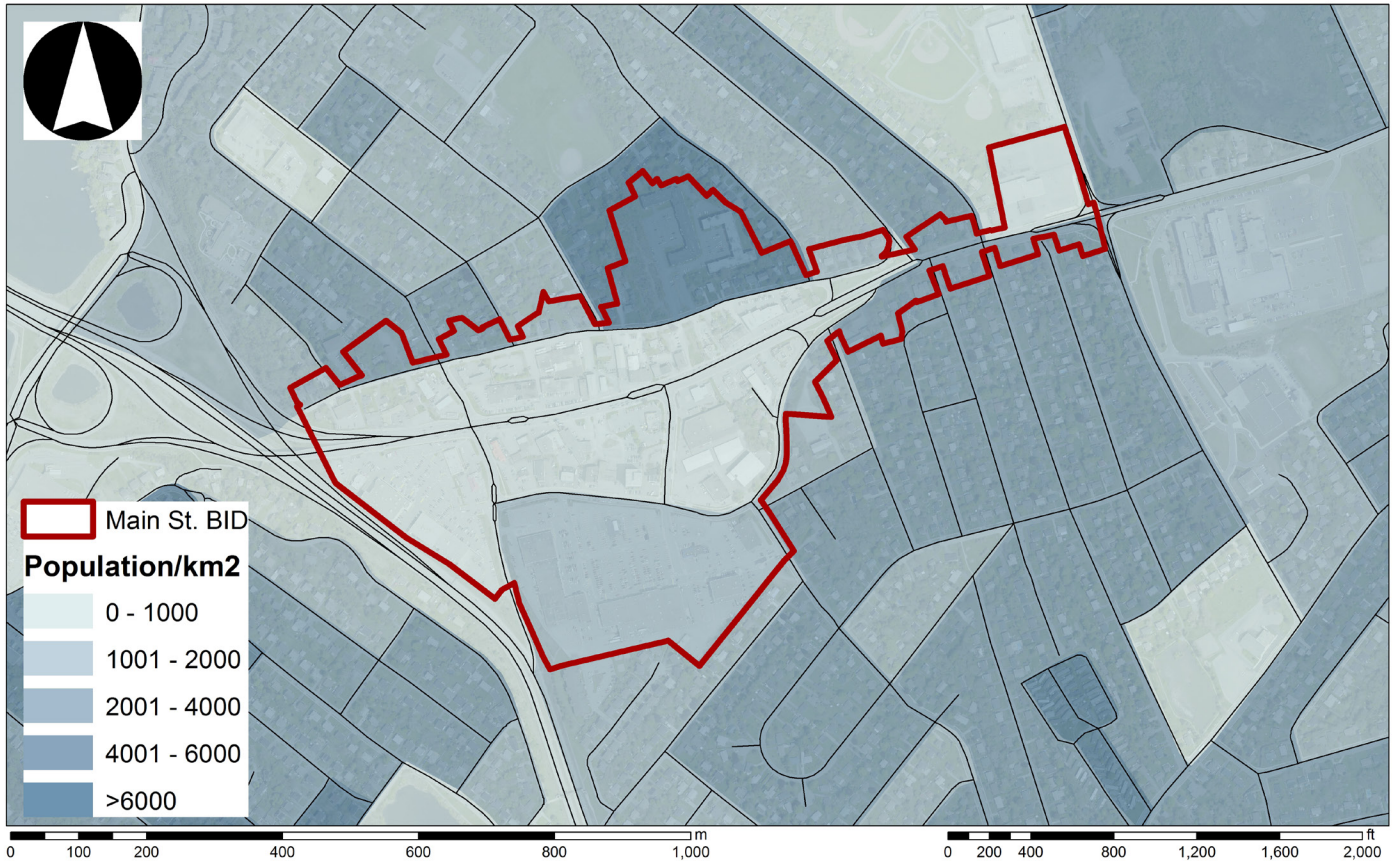


Figure 7: Residential population density by dissemination area in Main Street Dartmouth BID area
Image Source: mapping by Kaitlyn Walker and Tim Davidson, data from Statistics Canada, 2012 and HRM OpenData, 2016

Figure 7 shows residential population density. Low densities within the BID are due to presence of more commercial than residential uses. This population is relatively elderly; of all Canadian provinces, Nova Scotia has the highest proportion of persons 65 and older, comprising 17.2% of the population compared to the 14.9% Canadian average (Statistics Canada, 2012). Though accessibility is important everywhere, the high number of seniors in Nova Scotia makes it especially important here.

Property Values and Development

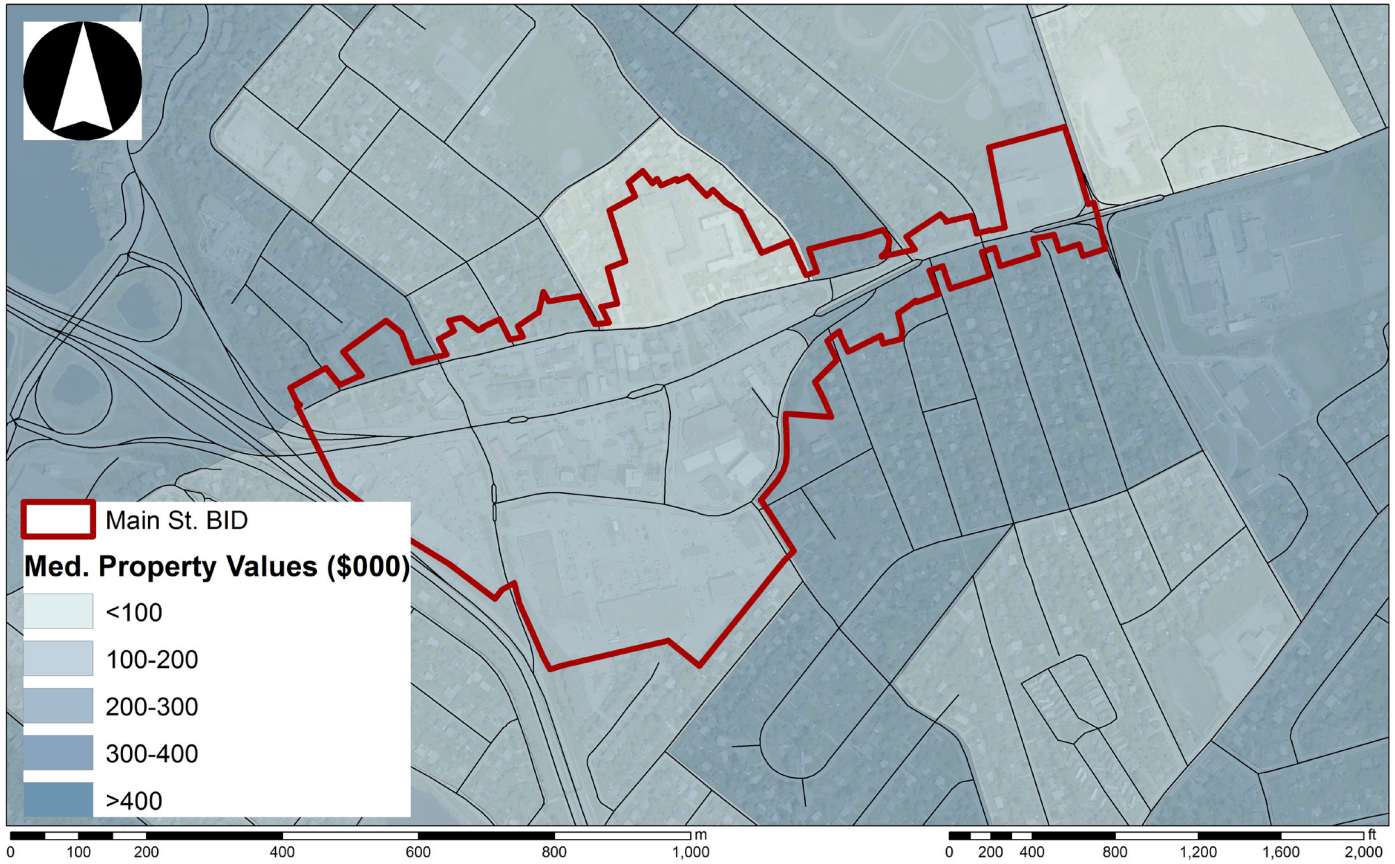


Figure 8: Property values by dissemination area in the Main Street Dartmouth BID
Image Source: mapping by Kaitlyn Walker and Tim Davidson, data from Statistics Canada 2012 and HRM OpenData, 2016

The average property values around Main Street are lower than most of Dartmouth, the Halifax Peninsula, Bayer's Lake, and Dartmouth Crossing, adding appeal for developers (see Figure 8) (Main Street Dartmouth Business Improvement District, n.d., d). With low property values, the central location, and significant planning attention from the HRM, it is likely that this area will see an increase in future development. Public infrastructure improvements are especially important to set the tone for what the Main Street area will become.

Introduction
Site Background
Concept Design
Schematic Design
Implementation

Introduction

Site Background

Several new developments are already in progress. These developments are consistent with recent amendments to the MPS and LUB that should be helping move the area towards the Village on Main vision. The developments in progress include

- 139 Main Street - “The Horizon”;
- 174 Main Street - “Garden View Village” (Figure 10);
- 77 Lakecrest Drive; and
- 46 Lakecrest Drive (Main Street Dartmouth Business Improvement District, n.d., a).

The BID identified additional properties with high redevelopment potential, all of which are shown in Figure 9 and an example shown in Figure 10 (Main Street Dartmouth Business Improvement District, n.d., a). These opportunities include

- 32 Lakecrest Drive;
- 101 Main Street;
- 145 Main Street;
- 109 Tacoma Drive; and
- 67 Tacoma Drive.

Concept Design

Schematic Design

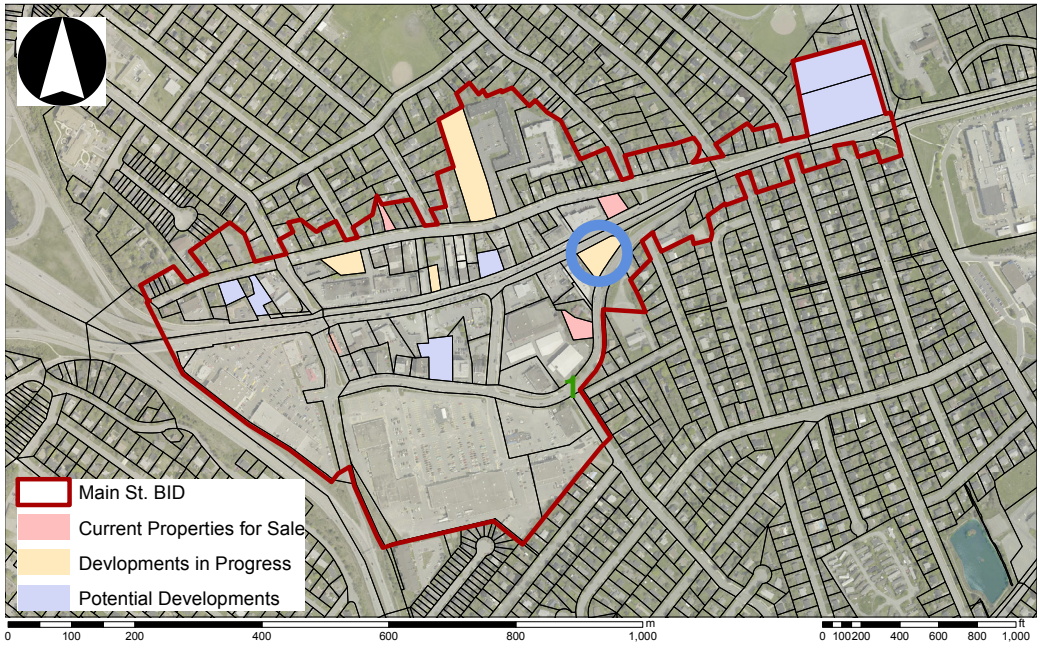


Figure 10: Example of Development Opportunity at current Garden View Location
Image Source: TEAL Architects, 2016

Implementation

Figure 9: Development opportunity properties in Main Street Dartmouth BID
Image Source: Map by Tim Davidson; Aerial Photography from HRM Corporate Dataset, 2014 (HRM, 2014b); (Main Street Dartmouth Business Improvement District, n.d., b)

Services and Key Destinations

Main Street Dartmouth offers a wide range of services. Notably, the BID area alone has 45 health and wellness centres, making Main Street a health and wellness hub in Dartmouth (Main Street Dartmouth Business Improvement District, n.d., a). Such services often serve individuals with physical mobility difficulties, making it all the more important that public infrastructure within the BID be accessible. Key destinations in and around the site are schools, daycares, recreation facilities, a residential care facility, and small options (3-4 bedroom home for those with disabilities) (Figure 11). Many people are employed by establishments in the BID, largely in retail, food service, and health-related jobs. An interactive map of shops and services in the BID is available on the BID's website at http://www.villageonmain.ca/?page_id=94 (The Village on Main, n. d.).

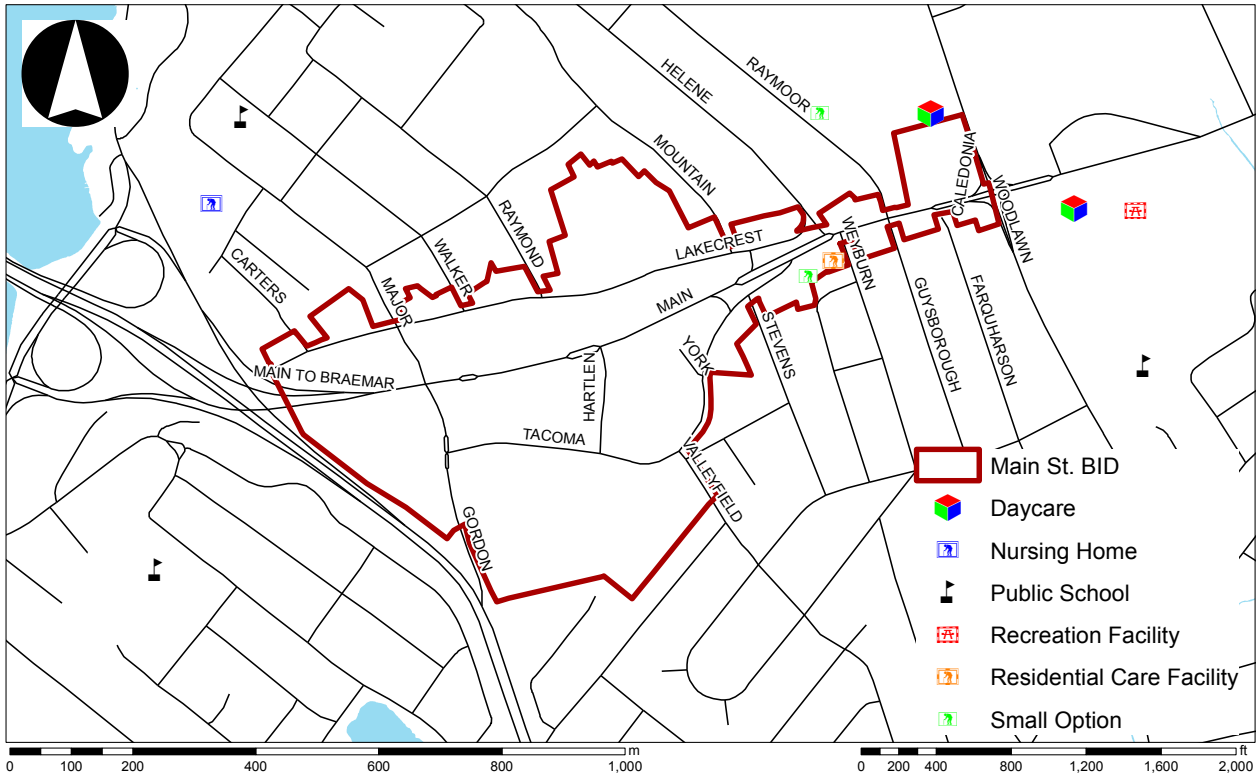


Figure 11: Key destinations around the Main Street Dartmouth BID
Image Source: Map by Tim Davidson; Data via HRM OpenData 2016.

Transportation

Motor-Vehicle Traffic

Transportation infrastructure is a key challenges on the site. Main Street is a major automobile thoroughfare with minimal infrastructure supporting alternative transport modes (Ekistics Planning & Design, 2007). Almost all businesses cater to cars with many parking options and driveways, so parking lots and pavement separate pedestrians from businesses (Ekistics Planning & Design, 2007). Main Street provides high visibility to cars for businesses, but accessing them is challenging. The BID provides much on-street parking, which makes driving lanes appear wider and encourages fast speeds even along local streets like Lakecrest Drive. The superblock between Lakecrest and Main also does little to discourage speeding on Lakecrest.

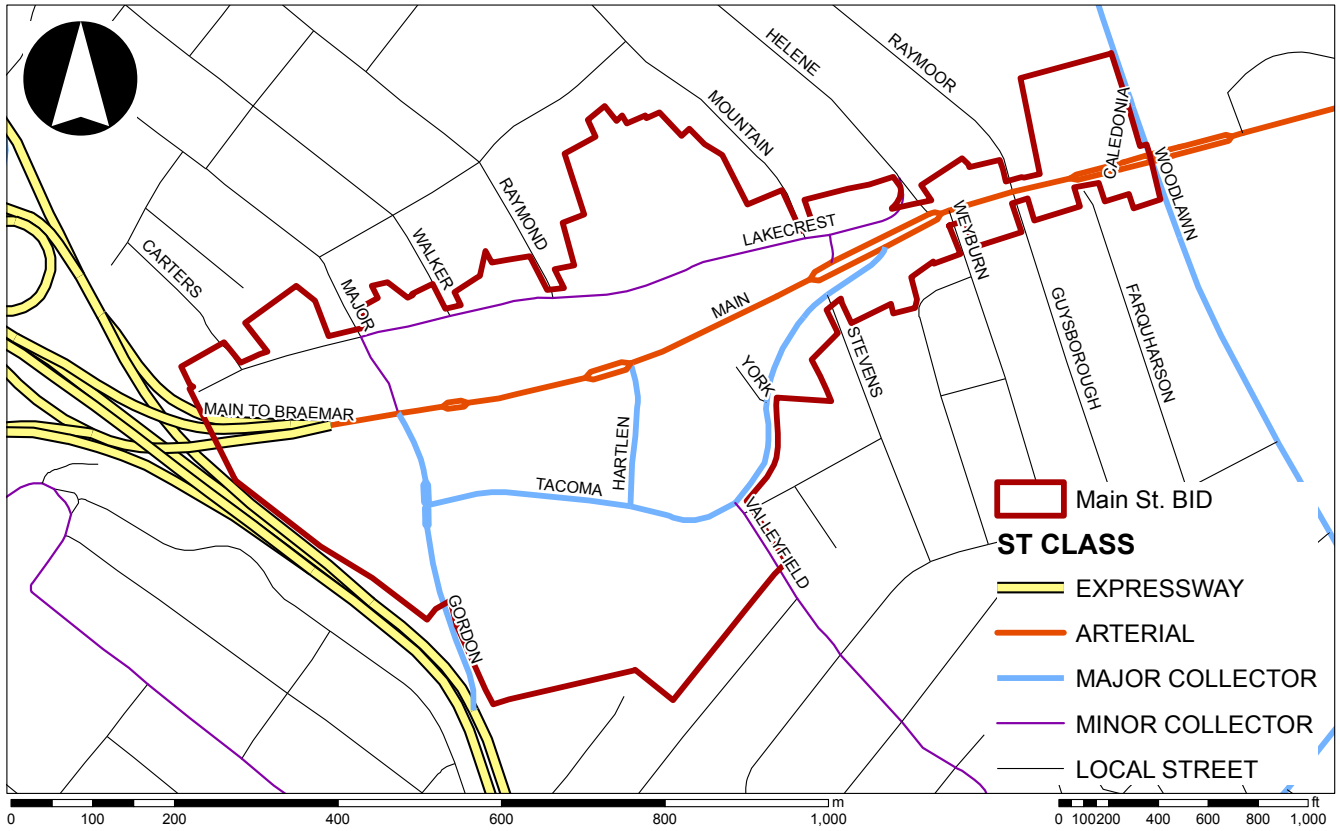


Figure 12: Main Street Dartmouth BID's functional street classes
Image Source: Map by Tim Davidson; Data via HRM OpenData 2016.

Prior to the 1996 amalgamation, municipalities had approved road classifications that designated Main Street as a major collector. New consolidated classifications, which would reclassify Main Street as an arterial, were initially proposed for the Dartmouth MPS, but were not included in the final plan. Halifax has no municipally-approved street classifications (personal communication, Dave McCusker, February 2016). Functionally, however, Main Street is an arterial. Figure 12 shows the functional (but not legal) street classes of BID roads based on the HRM's open geographic information systems data. Figure 13 describes the characteristics of the street classifications along with which streets inside the BID generally fit the descriptions.

The province owns Main Street west of Gordon Avenue, on the ramps to the Circumferential Highway. This means the design of Main Street west of Gordon Avenue must be coordinated with the Province. East of this intersection, Main Street is municipally-owned (HRM, 2012).

The arterial-like design of the BID's portion of Main Street makes it indistinguishable from the provincially-owned Circumferential Highway to the west and the higher speed stretch of Main Street outside the BID to the east. This design includes a wide right-of-way and highway features like tall street lights. Main Street acts as a barrier to pedestrians who may wish to walk across the street. HRM currently owns all of Main Street within the BID to the east of the Main and Major/ Gordon intersection. We intend to maintain the volume of an arterial on Main Street but ensure that the street design encourages drivers to travel closer to the 50 km/hour speed.

Characteristics of Street Classes

Characteristic	Arterial St.	Major Collector St.	Minor Collector St.	Local St.
Street	Main Street	Tacoma Drive Hartlen Street Gordon Avenue	Lakecrest Drive Valleyfield Road	Stevens Road
1. Traffic service function	First consideration	First consideration	Equal to Land Access	Second Consideration
2. Land access function	Limited access with no parking	Second Consideration	Equal to Traffic Movement, Parking Permitted	First consideration, Parking Permitted
3. Range of design traffic average daily volume	More than 20,000	More than 12,000	Up to 12,000	Less than 3,000
4. Characteristics of traffic flow	Uninterrupted flow except at signals; with pedestrian overpasses	Uninterrupted flow except at signals and crosswalks	Interrupted flow	Interrupted flow
5. Average running speed in off-peak conditions	50-70 km/h	40-60 km/h	30-50 km/h	15-30 km/h
6. Vehicle types	All types	All types but trucks may be limited	All types with truck limitation	Passenger vehicles and service vehicles; large vehicles restricted
7. Connects to	Expressways, arterials, major collectors, minor collectors	Expressways, arterials, major collectors, minor collectors, some locals	Arterials, major collectors, minor collectors, locals	Some major collectors, minor collectors, locals

Adapted From Municipal Design Guidelines: Part A (2013)

Figure 13: Street classification characteristics based on HRM Design Standards Part A (HRM, 2013c)

Public Transit Services

Several Halifax Transit bus routes run through the area, with only Route 370 travelling the full length of Main Street (Figure 14). Halifax Transit's (2015) recent draft transit plan proposes some changes to routes. Our design is based on the current primary transit route through the site that runs along the western end of Main Street, south-west on Hartlen Street, and then out of the site via Valleyfield Road. Considering changes to the bus network falls outside the scope of our project because our plan focuses on site-specific infrastructure. We recommend improvements to service within the BID, mostly concerned with physical infrastructure.

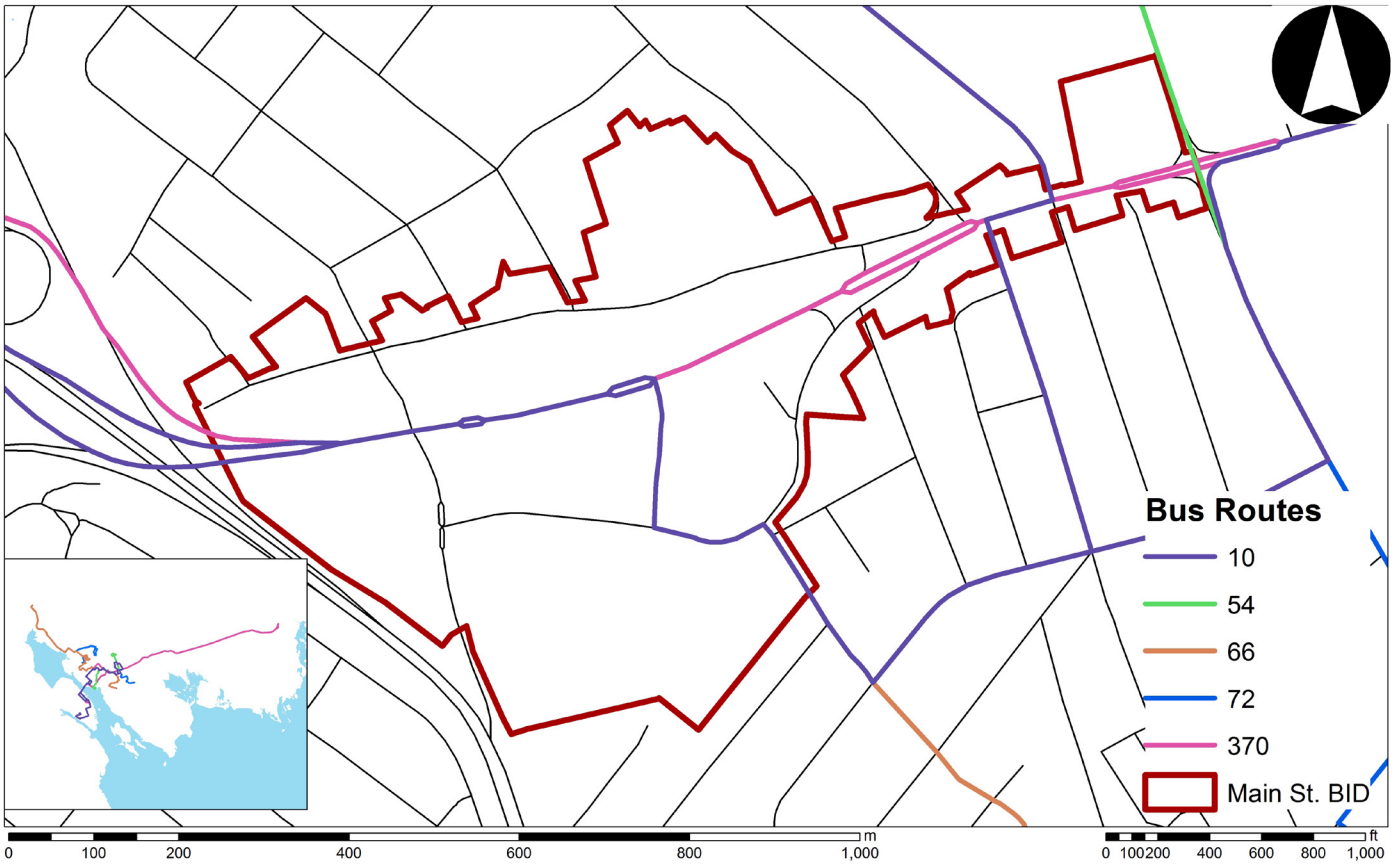


Figure 14: Halifax Transit Bus Routes in the Main Street Dartmouth BID
Image Source: Map by Tim Davidson; Data via HRM OpenData 2016.

Our site visits and site inventory showed the BID's infrastructure could serve public transit users better. Becoming more walkable would help improve the site for transit users. More specific to transit, there were three bus shelters on the site as of our January 2016 site visit (see Figure 19 with the site inventory). The bus shelter on Hartlen Street, a major transit stop on the site, is broken. Improving amenities at bus stops is key to encouraging increased transit usage, which reduces private-automobile reliance and is more environmentally responsible, a key principle from the Village on Main vision.

Halifax Transit's (2015) Moving Forward Together: Draft Plan (public transit plan) identifies "Tacoma Centre" (the bus stop on Hartlen Street) as a Level 4 Transit Centre for passenger amenity classifications, as it sees over 500 boardings per day. It may be eligible for park and ride facilities, an electronic message board, bike rack, and pay phone, plus more amenities like expanded shelters as appropriate, seating, lighting, route maps, schedule information, and garbage cans. Level 5 Transit Centres are major stations with interior passenger space (Halifax Transit, 2015). Both levels 4 and 5 can be considered terminals, but level 4 is outdoor while level 5 has indoor shelter. Halifax transit is investigating the possibility of heated shelters at Level 4 stops (Halifax Transit, 2015). There are no minimum standards for number of parking stalls for park and ride facilities in Halifax; however, other locations in Halifax offer between 30 and 515 parking spots at level 4 and 5 Transit Centres (HRM, 2015d). Twelve of the fourteen park and ride locations in HRM provide free parking while Alderney Ferry Terminal and Bridge Terminal charge a monthly parking fee of $30 and $35, respectively (HRM, 2015d).

Improvements to transit infrastructure will become more important as the BID population grows. Whether or not the experience of using transit is enjoyable will impact whether new residents choose transit over private cars, which affects the environmental sustainability of development. The current transit centre may need to expand to a level 5 terminal with interior space passenger when the population grows.

Cycling Infrastructure

The BID has no bike lanes. Bike lanes or paved shoulders are found just outside the BID heading northwest and northeast (see Figure 15). The cycling infrastructure ends at Caledonia Road and Main Street intersection on the east side of the BID and at the partial cloverleaf entrance from Waverly Road to the west. Bike lanes do not continue through the site. Future active transportation (AT) priorities for the BID include connecting existing bike lanes with new bike lanes through the site to create a functioning AT network (Main Street Dartmouth Business Improvement District, n.d., c).

Figure 15: Existing Bike Lanes in Main Street Dartmouth Area
Image Source: Map by Tim Davidson; Data via HRM OpenData 2016.

Pedestrian Infrastructure

The site has many sidewalks, which is a good step towards becoming more walkable; however, it currently only has four marked pedestrian crossings on Main Street, including stop lights and lighted crosswalks (Figure 16). Portions of Lakecrest Drive and Major Street found in the site have sidewalks on only one side of the street, potentially limiting ease of use for pedestrians. Some crosswalks on Main Street are separated by over 400 metres.

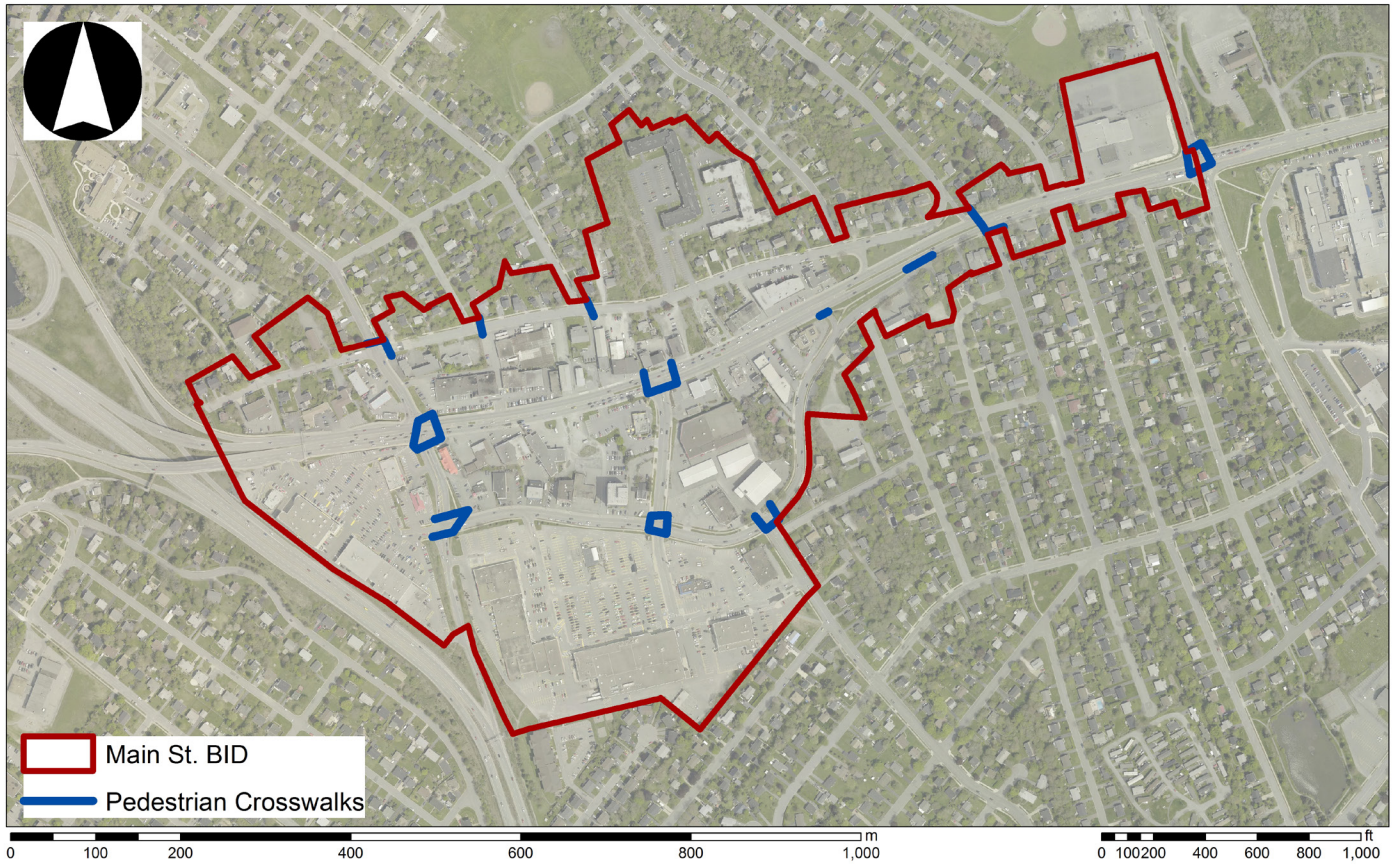


Figure 16: Existing Pedestrian Crosswalks
Image Source: Map by Tim Davidson; Data via HRM OpenData 2016; Aerial photography from HRM Corporate Dataset (HRM, 2014b).

As seen in Figure 17, the BID has numerous possible conflict points between pedestrians and vehicles. Conflict points are located at all street intersections, crosswalks, and locations that may encourage jaywalking such as bus-stops in the middle of a block.

Figure 17: Potential Pedestrian-Vehicle Conflict Areas
Image Source: Map by Tim Davidson; Aerial Photography from HRM Corporate Dataset, 2014 (HRM, 2014b); Conflict zones based on site observations)

Public Amenities

Our team prepared an inventory of public amenities on the site, some from secondary sources and some from our own site visit. Public amenities are features like public benches, garbage cans, lighting, and other similar conveniences that are available to the public. Figure 18 shows the locations of public amenities on the site. Bus stops are spaced fairly regularly throughout the site, but there are few bus shelters. The bus shelter on Hartlen Street is severely damaged. Garbage cans are regularly spaced along Main Street but not along Tacoma Drive. The only formal seating on the site are two picnic benches in the pocket park at the Main Street and Woodland Road/Caledonia Road intersection. The only two bike racks on the site are near the Tacoma Drive and Main Street intersection.

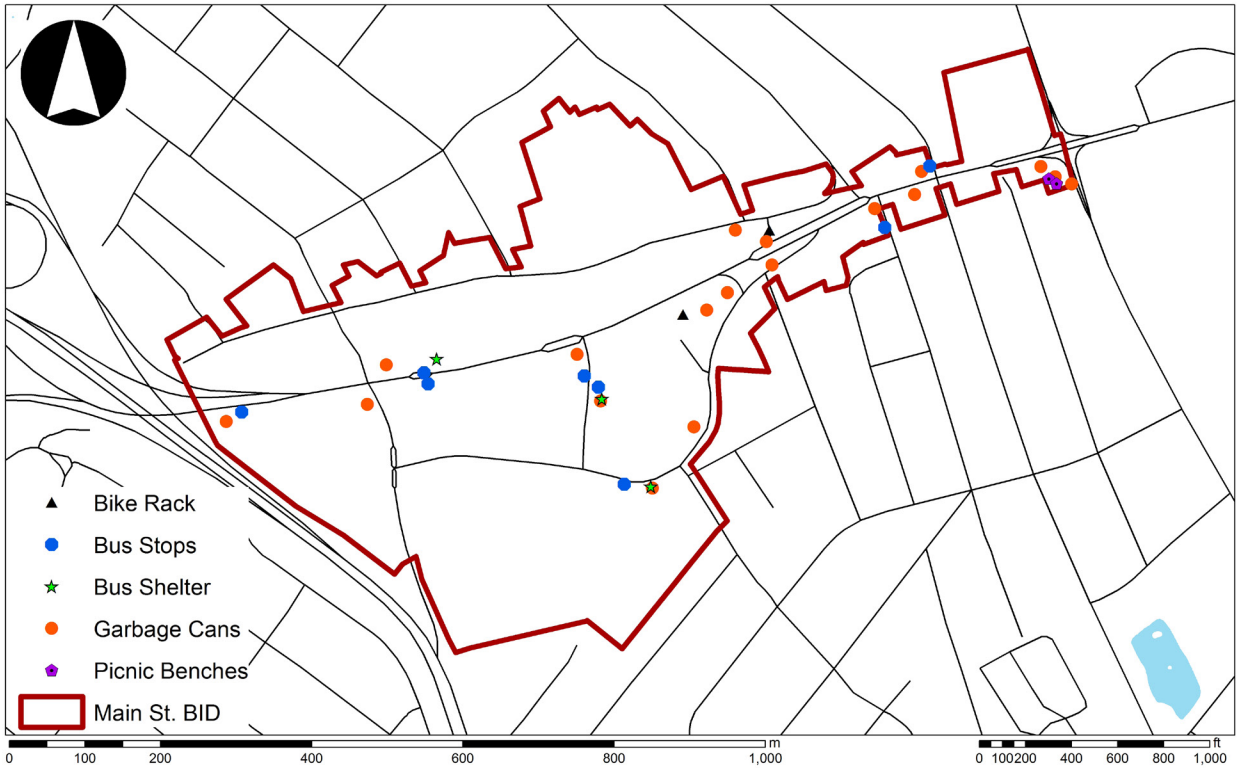


Figure 18: Public amenities in the Main Street Dartmouth BID
Image Source: Map by Tim Davidson; Data via HRM OpenData 2016.

Figure 19 shows the location of railings and major driveways on the site. Numerous driveways on Main Street make pedestrian sidewalk movement particularly hazardous. The eight railings along Main Street are a result of major grade changes. The topography (shown in the next subsection of this report) is such that the land drops off just north of the road. Railings are required for safety of pedestrians on sidewalks due to height differences between sidewalks and front parking lots. If buildings were built adjacent to the sidewalks, with no setbacks, railings would not be necessary.

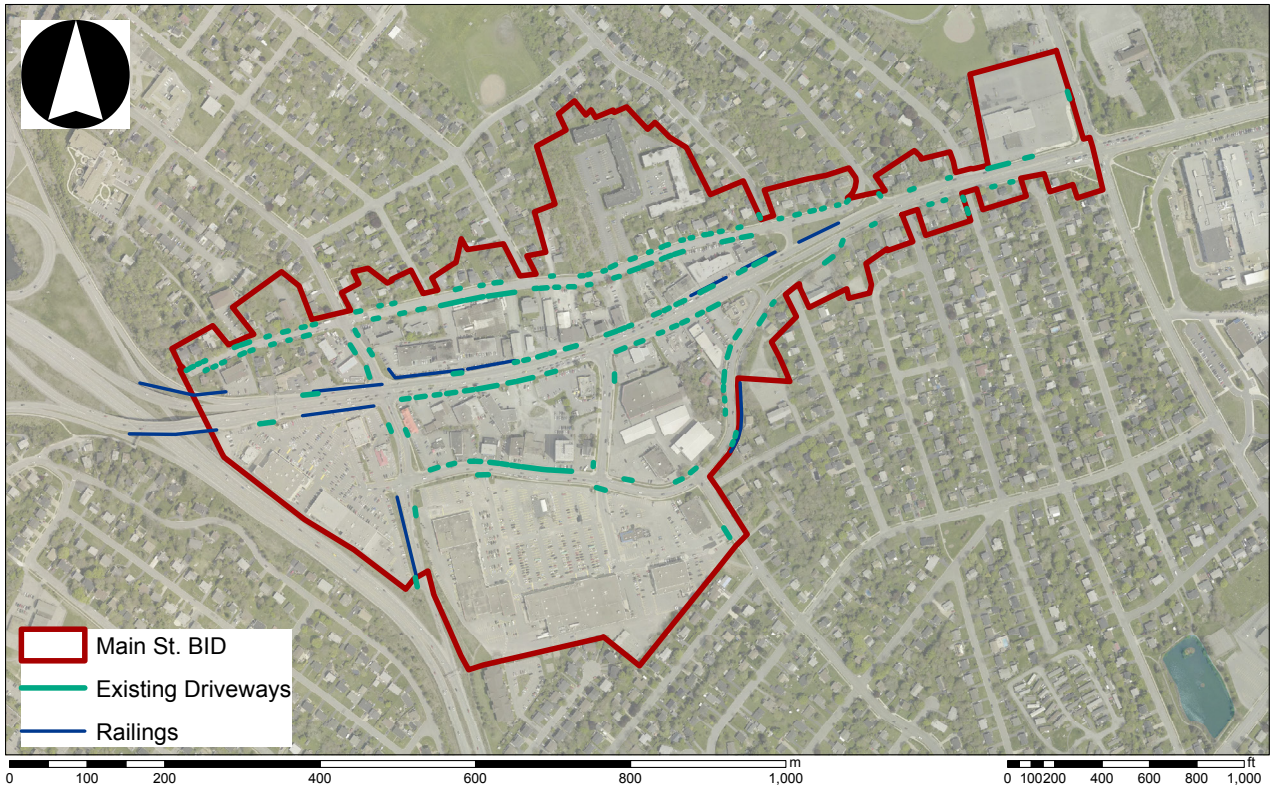


Figure 19: Site Inventory of Railings & Driveways
Image Source: Map by Tim Davidson; Data collected by team; Aerial Photography from HRM Corporate Dataset, 2014 (HRM, 2014b).

Figure 20 shows the trees on or very close to the public right of way, based on our site audit on January 28, 2016. These trees contribute to the walkability, experience, and identity of the streetscapes. The BID is in polling district 6: Harbourview-Burnside-Dartmouth East, which had the lowest tree-stocking level in all of HRM when the Urban Forest Master Plan was completed in 2013 (HRM, 2013b, p. 15). Many of the trees inventoried were only planted in 2015 (personal communication Grbac, G., January, 2016) and are still very young, which means their contribution to tree canopy at this time is negligible. The area is of mid-range priority for urban forest challenges and immediate priority for opportunities (HRM, 2013b).

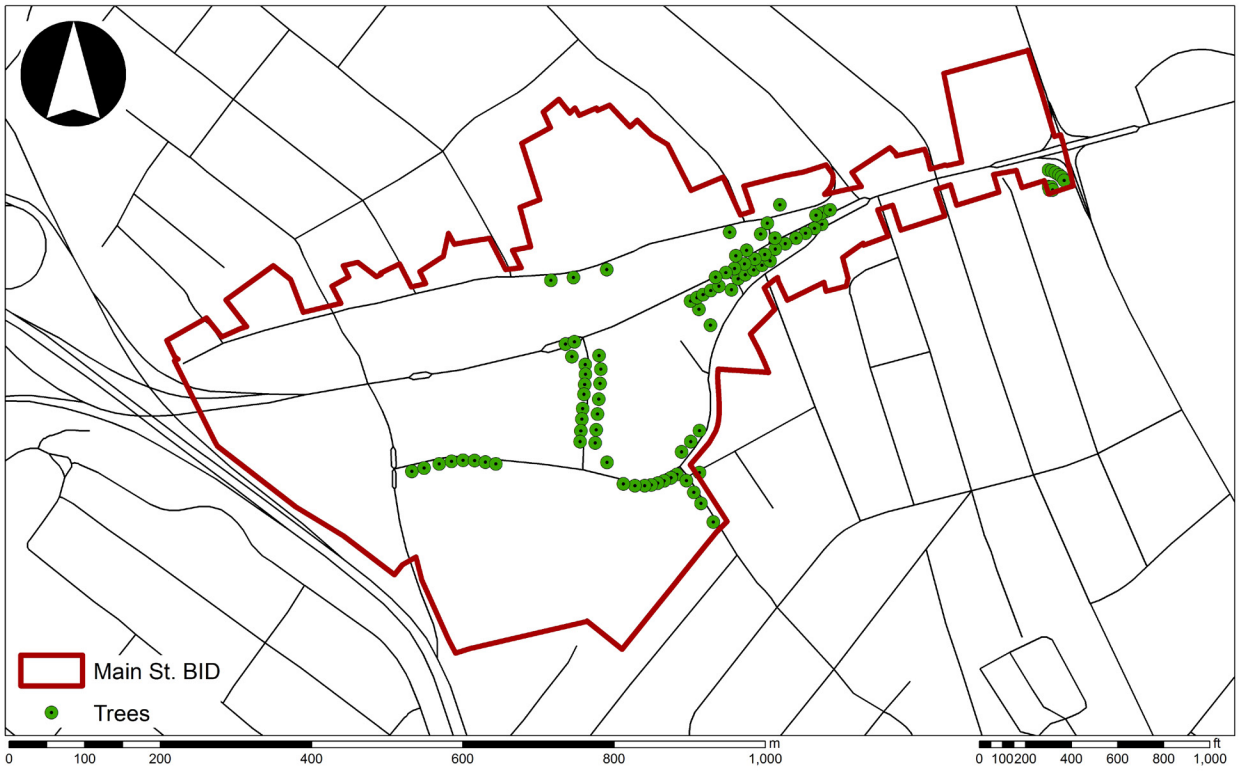


Figure 20: Current street trees from team site inventory in Main Street Dartmouth BID
Image Source: Map by Tim Davidson; Data via HRM OpenData 2016 and team's site inventory.

Topography

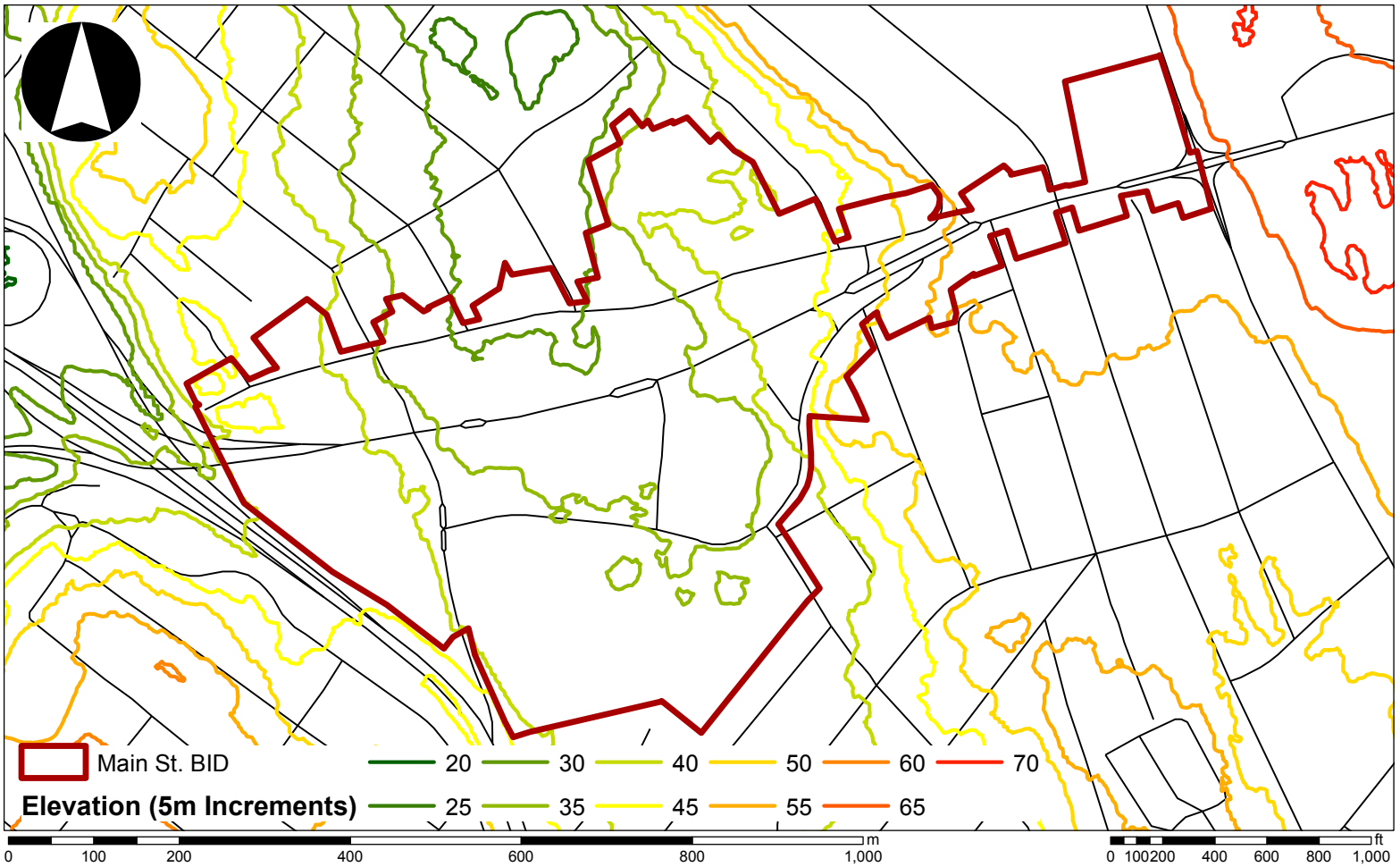


Figure 21: Main Street Dartmouth BID topography
Image Source: Map by Tim Davidson; Data via HRM OpenData 2016

Figure 21 shows the topography of our study area in metres above sea level. The site centre is a valley while the eastern and western sides of the site are at higher elevations. The steepest slopes are on the eastern side of the site.

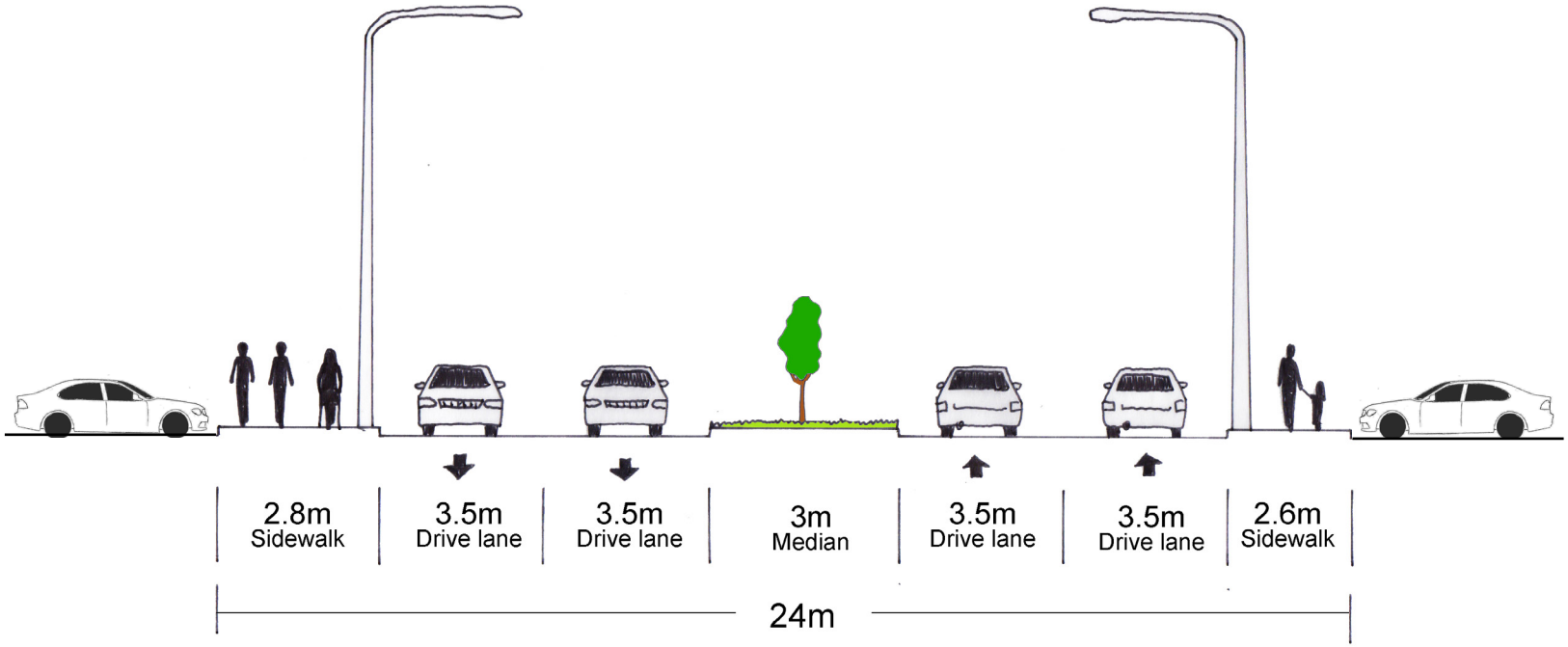
Current Street Design

Figure 22: Main Street BID and Major Streets
Image Source: Map by Sara Jellicoe; Data adapted from HRM OpenData 2016.

Figure 22 identifies major roads in the BID that our team considers important areas to redesign in this plan. Here we provide an overview of the existing street design using section drawings.

The current sections of the major streets in the BID are visualized in Figures 23 through 27. The cross-section drawings represent the generalized approximate dimensions for the entire right of way, including sidewalks, furnishing zones, street vegetation, parking, and vehicle lanes.

Main Street, which functions as an arterial in a 24m right of way, carries four lanes of through traffic with two in each direction. All lanes are at least 3.5m in width. A median alternates with a shared turn lane. Tall light standards line the street. Sidewalks of between 2 and 3 m line the road. Most commercial properties along the road are set back and fronted by deep parking lots.

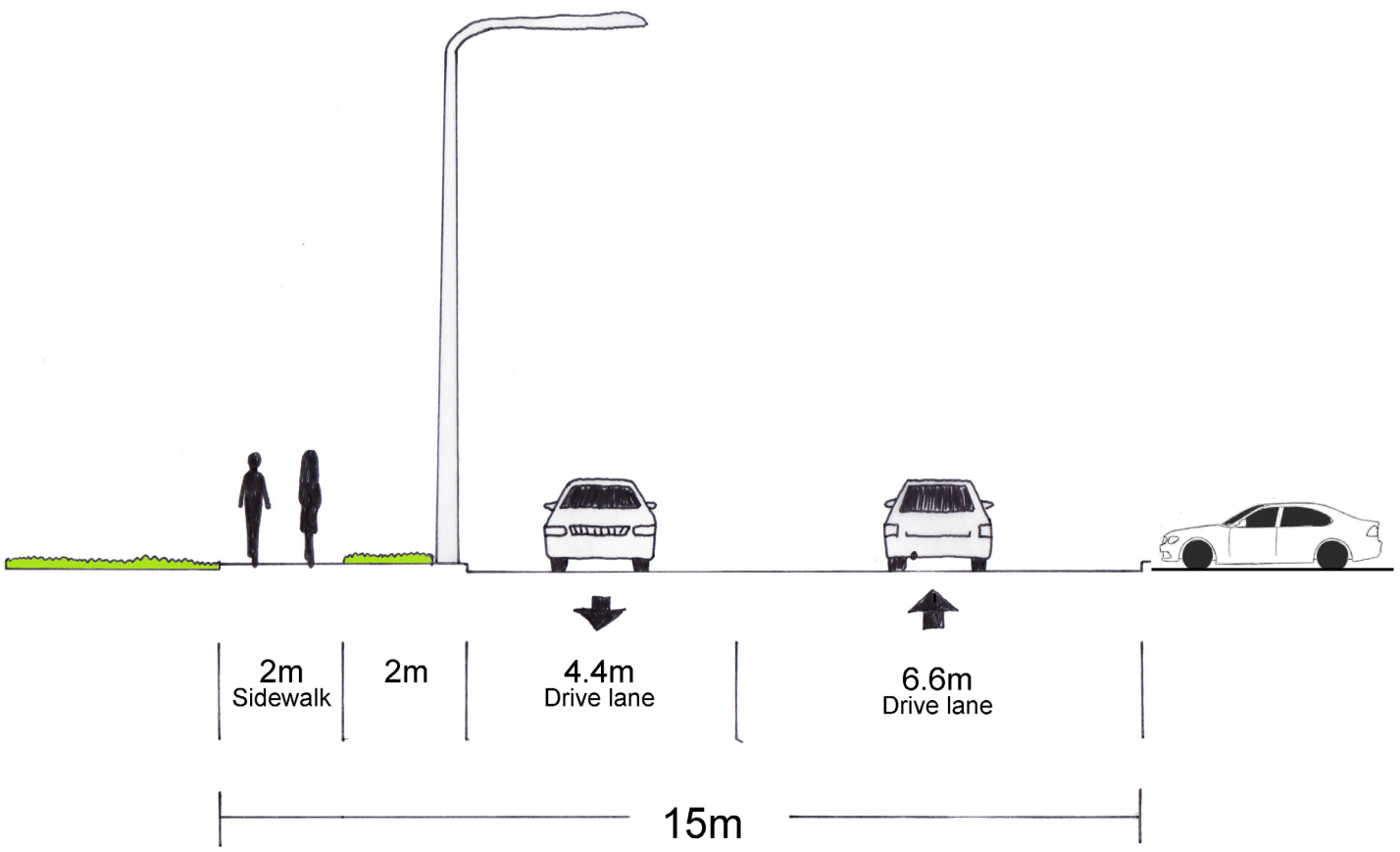


① Main Street

Figure 23: Section of current Main Street
Image Source: Created by Christina Wheeler, based on www.streetmix.net

Lakecrest Drive, which functions as a minor collector on the north side of Main Street, has a right-of-way that varies between 15m and 18m. There are 2 vehicle lanes, one of approximately 4.4m and one of approximately 6.6m. Parking is permitted along most of the length of Lakecrest in the wider 6.6 lane but it is underutilized.

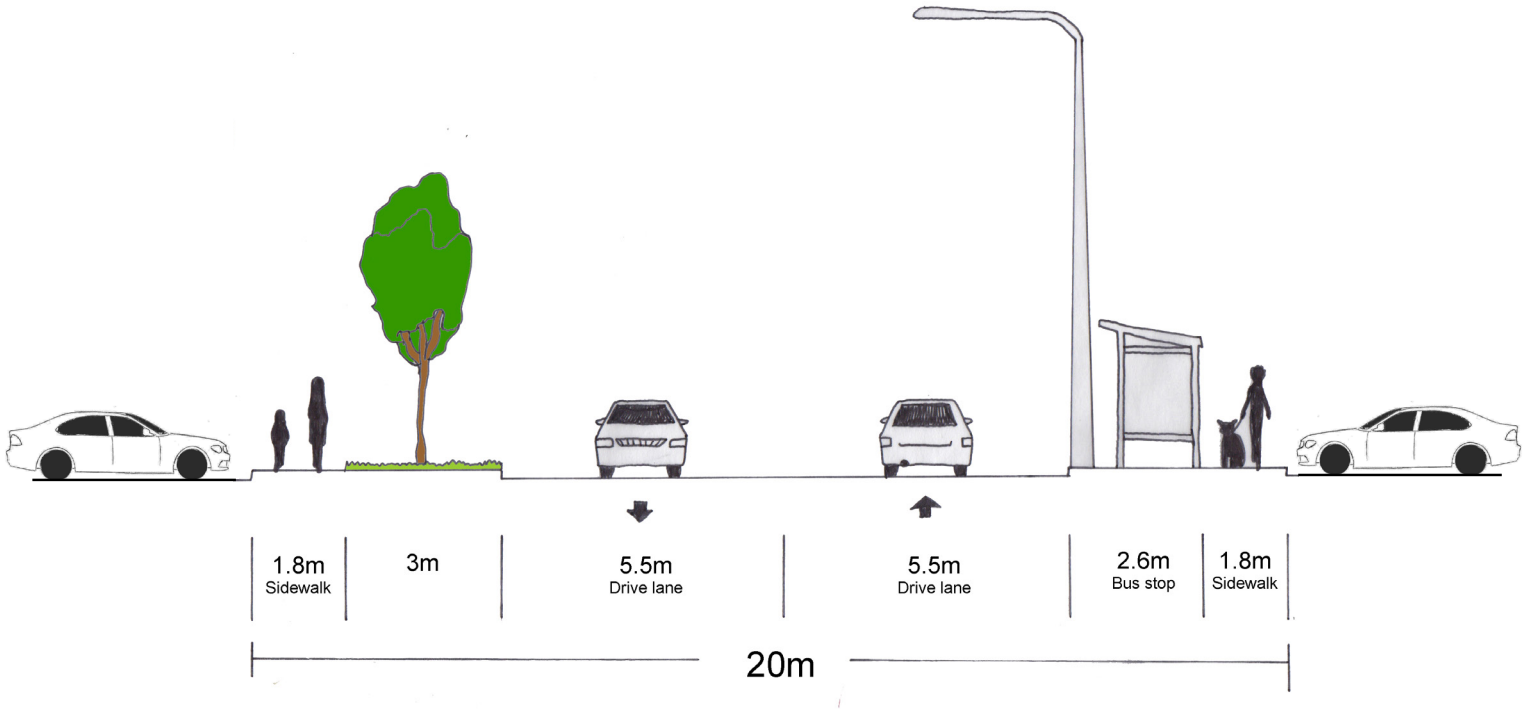
Sidewalks are located only along the north side of Lakecrest Drive. The north side is primarily residential while the south is largely commercial with parking lots adjacent to the road. The street is sometimes used as a shortcut alternative to Main Street to travel through the area.



② Lakecrest Drive

Figure 24: Section of current Lakecrest Drive
Image Source: Created by Christina Wheeler, based on www.streetmix.net

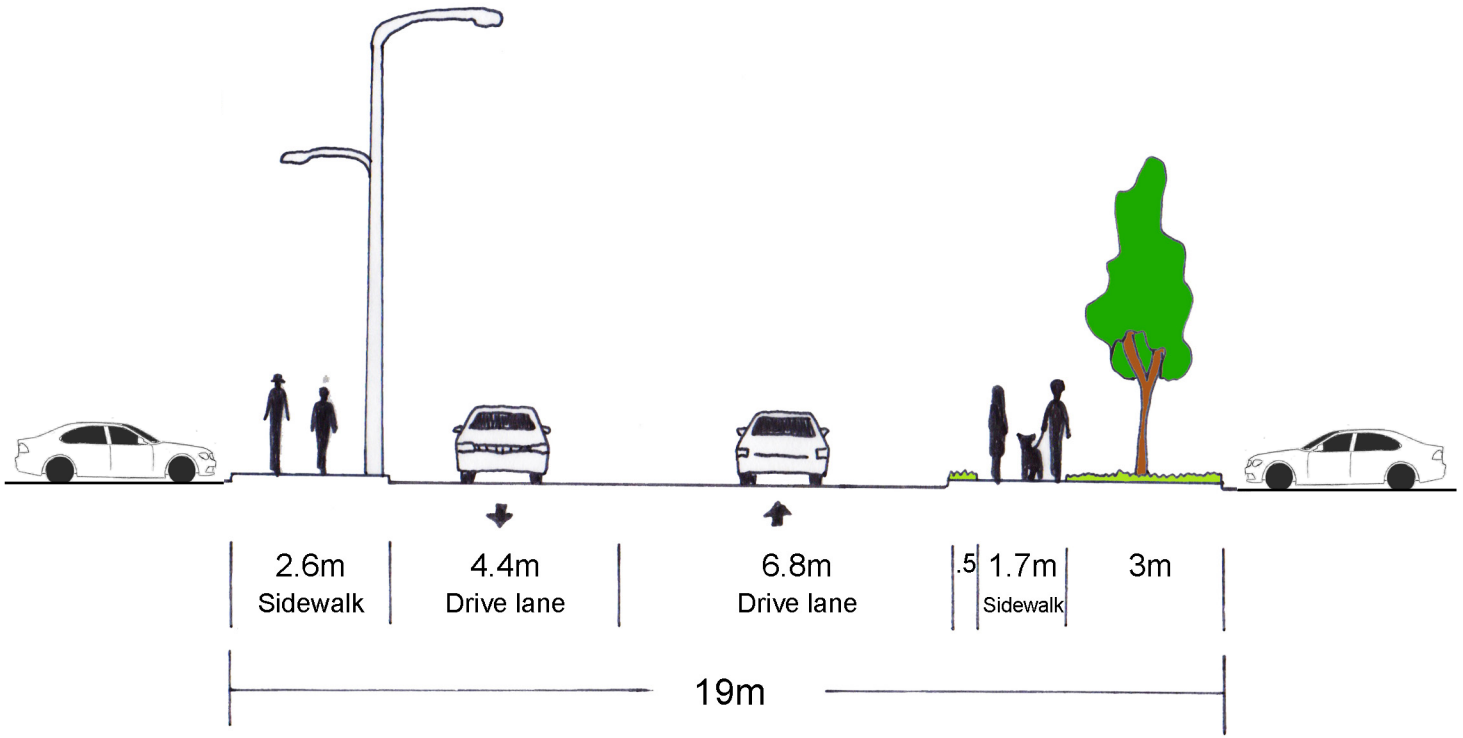
Hartlen Street functions as a major collector linking Tacoma Drive and Main Street and has approximately a 20m right of way. It has a level 4 bus stop, the second highest importance as assessed by Halifax Transit (see page 26 for more detail on levels of bus stops). As on Main Street and Tacoma Drive, commercial properties along Hartlen are set back from the road, with parking lots in front. Sidewalks are narrow on both sides, between 1.6 and 1.8m, with planted buffers of 2m to 3m between vehicular traffic and pedestrians. Two car lanes, one in each direction, are approximately 5.5m wide.



③ Hartlen Street

Figure 25: Section of current Hartlen Street
Image Source: Created by Christina Wheeler, based on www.streetmix.net

Tacoma Drive, an approximately 19m wide major collector, services large parking lots in the south part of the BID. It provides access to Valleyfield Road, a minor collector leading into the residential neighbourhood south of the BID. Tacoma has a different character on either side of its intersection with Hartlen Street. West of Hartlen, the character is more commercial; east it is more residential. Parking is allowed along the south side of Tacoma west of Hartlen but is unmarked, which makes the road feel like 2 very large lanes rather than a road with on-street parking (Figure 26). Landscaping lines the south side of Tacoma. The south sidewalk is narrower than the north sidewalk. Lights are on the north side of the street only. Commercial properties along the road are set back and fronted by some of the largest parking lots in the BID, causing the buildings to be even further away from the road than on Main Street.



4 Tacoma Drive

Figure 26: Section of current Tacoma Drive (West)
Image Source: Created by Christina Wheeler, based on www.streetmix.net

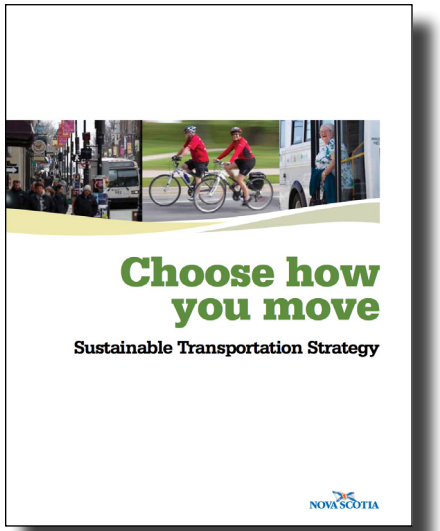
Policy Context

The BID's vision for Main Street aligns well with provincial, regional, and community policy documents. A detailed analysis comparing the BID's vision with visions for Main Street found in the Regional MPS, Dartmouth MPS, and Ekistics Plan is found in Appendix C and D. The key finding from this analysis is that the three planning documents strongly support most Design Principles from the Village on Main vision, both of which were presented in the Introduction. This means the BID may point to these planning documents to promote the directions of our public infrastructure plan to the HRM. We use the Design Principles to assess compatibility between policy documents and the BID's vision through this Policy section (see Figures 27 through 30, Figures 33, 35, 36). We begin the policy review from the Provincial, to the Regional, and then the community level. We assess the community policy documents with the Main Street Designation specific to our site in the most detail.

Provincial

Sustainable Transportation Strategy

The BID's goals for walking, cycling and public transport align with the Nova Scotia's Choose How You Move Sustainable Transportation Strategy of 2013 (Province of Nova Scotia, 2013), which recommends driving less distance and providing more choices for movement modes. The Choose How You Move plan's goals support the BID's vision of sustainable responsible development, convenience and accessibility. The strategy also recommends increasing access to employment and essential services.



Design Principle Alignment

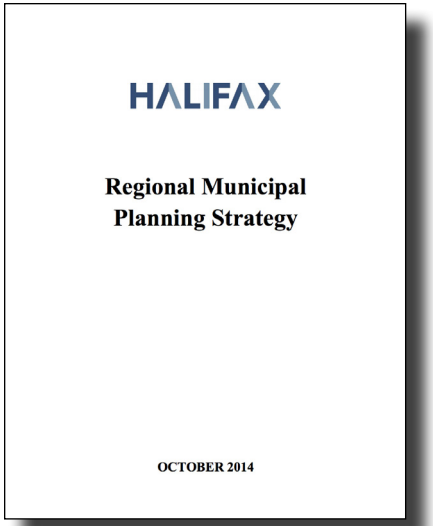
- √ Walkable
- √ Accessible
- Engaging
- √ Convenient
- Interaction
- Community
- √ Responsible Development
- Green Space
- √ Cyclist-friendly
- √ Public Transport

Figure 27: Sustainable Transportation Strategy
Image Source: HRM 2013

Regional

Regional Municipal Planning Strategy

The Halifax Regional Municipality MPS defines Main Street as an “Urban Local Growth Centre” (2015a). These centres are meant to connect transit to other centres, enhance pedestrian linkages and design streetscapes and facades for pedestrians. The MPS also supports sustainable transportation and livable communities (Halifax, 2015a).



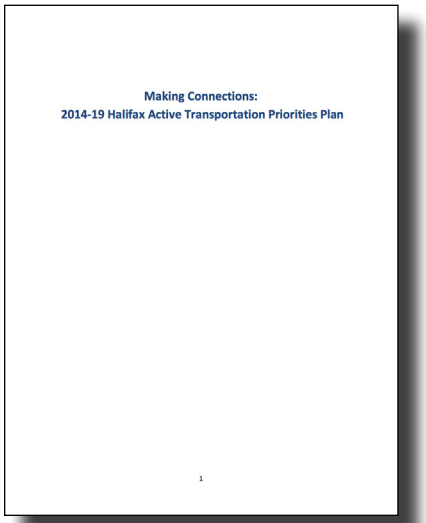
Design Principle Alignment

- √ Walkable
- √ Accessible
- √ Engaging
- √ Convenient
- √ Interaction
- √ Community
- √ Responsible Development
- √ Green Space
- √ Cyclist-friendly
- √ Public Transport

Figure 28: Halifax Regional Municipality Planning Strategy
Image Source: Halifax, 2014

Halifax Active Transportation Priorities Plan

As recommended in the 2007 Ekistics plan, the Municipal AT Plan specifically budgets to create a bicycle route design that will go through the Main Street area and connect to the two existing bike lanes (Halifax, 2014a).



- √ Walkable
- Accessible
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- Convenient
- Interaction
- Community
- √ Responsible Development
- Green Space
- √ Cyclist-friendly
- Public Transport

Figure 29: Halifax Active Transportation Priorities Plan
Image Source:

Local

Main Street Planning Vision and Streetscape Concept

The 2007 vision for Main Street Area is (Ekistics, 2007, p. 23):

> ***The Main Street area will become [a] dense, mixed use village core with great pedestrian spaces, goods and services, and facilities that invite residents to walk or bicycle to obtain daily needs and in so doing informally interact with their neighbours.***

The plan includes recommendations for use of both public and private land. Figure 26 presents the key public infrastructure recommendations from this plan.

The plan presents a phased implementation plan. The plan's first stage (years 1-9) includes Main Street streetscape and Woodlawn Corner Park improvements. In the second stage (years 10-30), Lakecrest is to become the AT route through the area. Lakecrest Drive, Tacoma Drive, and Gordon Avenue are to become a circular road around Main Street making a "Village Ring" street, improving both pedestrian and auto circulation in the area. The plan proposes an improved intersection at Tacoma Drive and Main Street. Gordon and Tacoma becomes a traditional village centre. The plan recommends underground or rear parking, a transit station in the centre of the site,

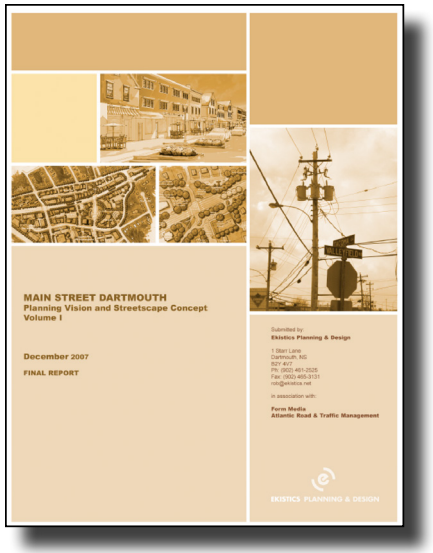


Figure 30: Main Street Planning Vision and Streetscape Concept
Image Source: Ekistics, 2007

Design Principle Alignment

- √ Walkable
- √ Accessible
- √ Engaging
- √ Convenient
- √ Interaction
- √ Community
- √ Responsible Development
- √ Green Space
- √ Cyclist-friendly
- √ Public Transport

improvements to a park on the northeast of the site between Lakecrest Drive and Main Street, and major gateways on either end of Main Street to signal to drivers that they are entering the Village on Main community. More detailed information on the Ekistics Plan is available in Appendix A.

The vision was approved by the community and adopted by Council. Overall, the Ekistics vision for the area is still supported by the city (personal communication, Garnet, M., February 2016). Despite continued municipal support, not all of the recommendations from the Ekistics vision have been incorporated into municipal document amendments. The Dartmouth LUB amendments do not require building heights as low as Ekistics recommended. Amendments also did not incorporate the mixed use developments proposed for the west

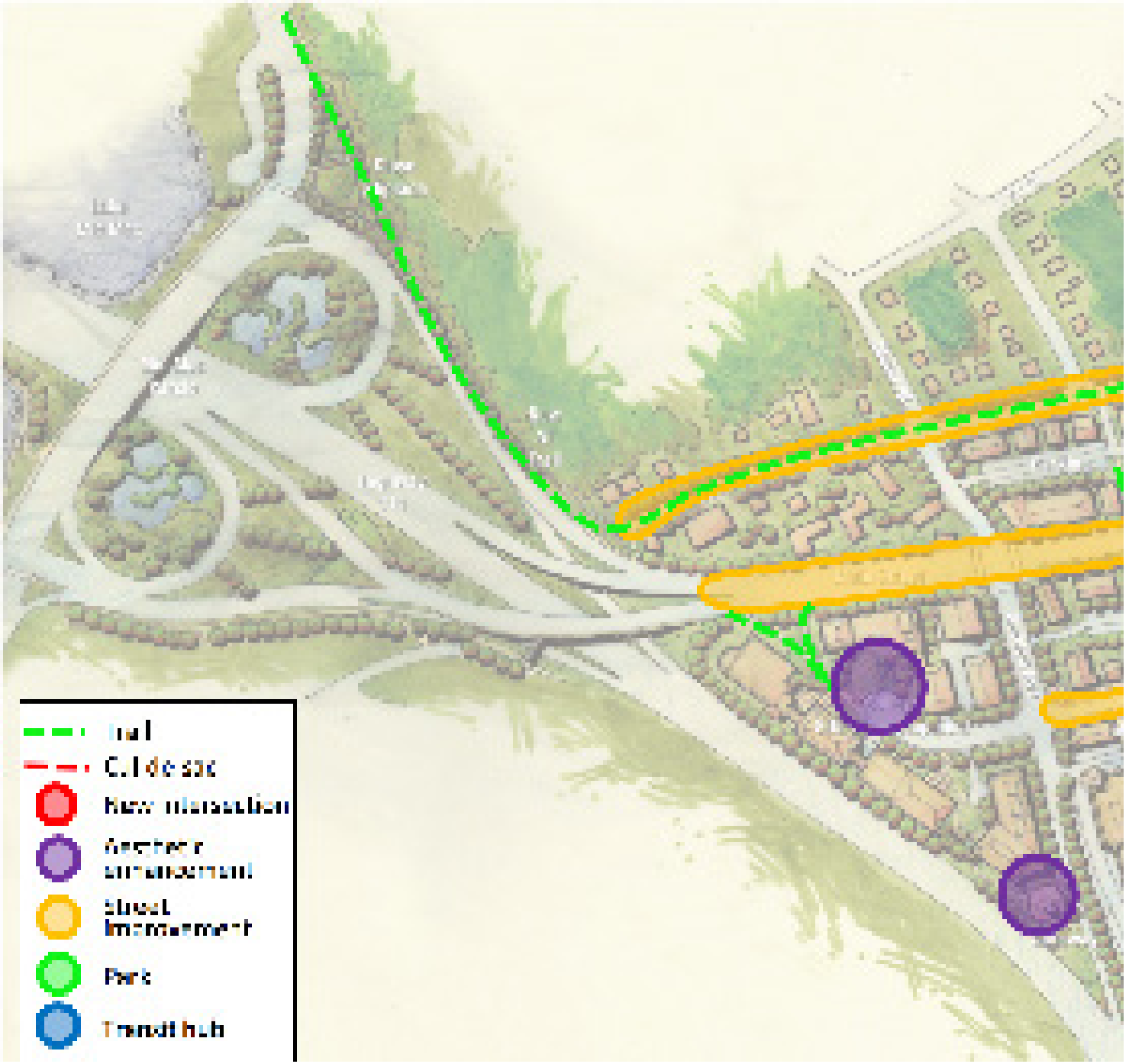
end of Lakecrest, which remain a residential zone.

A more in-depth analysis of Ekistic's vision in Appendix A shows which key concepts from the Village on Main vision (See Figure 32) are prioritized and further elaborates on the phasing. We conducted an in-depth analysis of this document because it is the only existing Main Street site-specific design document. Table 1.2 is an analysis of the Ekistics plan based on our Design Principles (see Table 2).

Figure 31: Lakecrest Rendering (from Ekistics, 2007, p. 37)

Design Principle	Ekistics 2007 Plan Alignment
Walkable	The Village Ring has only one proposed new safe location to cross Main Street, at the intersection of Tacoma and Main, which limits the community walkability. The concept proposes a series of pedestrian paths cutting through the large blocks, particularly to access the transit hub, and through the large private properties south of Tacoma Drive.
Accessible	Accessibility by visually and physical impaired persons is not explicitly addressed in the Ekistics vision.
Engaging	Engaging public spaces are not emphasized in the vision, but the pocket park and transit hub could function this way.
Interaction	Locations that allow for interaction are not emphasized, but the pocket park and transit hub could function this way.
Community	Locations to create a sense of identity and community are not emphasized, but the pocket park and transit hub could function this way.
Responsible Development	More linkages for pedestrians and cyclists, and an increase in trees support more sustainable, responsible development.
Green Space	The proposed pocket park and tree-lined streets increase green space in the Main Street area.
Cyclist-friendly	No dedicated cycling lanes are proposed. A rendering from the Ekistics plan pictures athletic, young, male cyclists using the proposed Lakecrest Drive route, a cycling environment which is physically unchanged from the existing street (See Figure 28).
Public Transport	A new public transit hub is proposed at the centre of the plan, along Hartlen Street, surrounded by landscaping, and linked with pedestrian paths.

Table 2: Alignment of Ekistics Plan with Design Principles



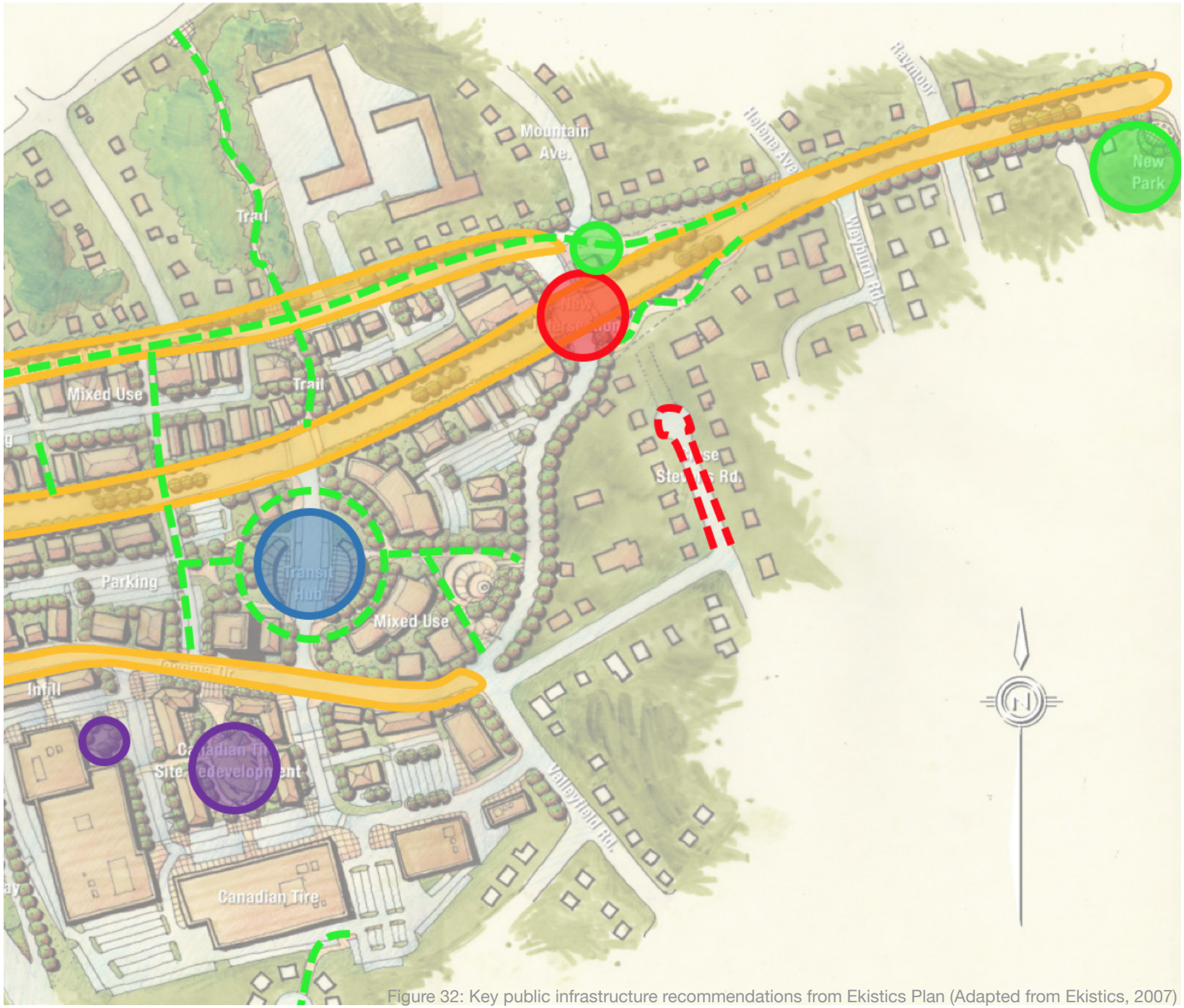


Figure 32: Key public infrastructure recommendations from Ekistics Plan (Adapted from Ekistics, 2007)

Introduction

Site Background

Concept Design

Schematic Design

Implementation

Main Street Transportation Study

GENIVAR (now WSP Global) conducted a transportation study of Main Street area to understand transportation and pedestrian access concerns in the BID. The primary objectives of the transportation study were to measure current conditions for vehicle traffic and evaluate proposed changes to the local transportation network, including:

1. Complete ring with intersection:

Consolidation of the Lakecrest Drive / Main Street / Mountain Avenue / Tacoma Drive intersection to complete a 'Village Ring' comprising Lakecrest Drive, Major Street, Gordon Avenue, and Tacoma Drive, including defined cycling infrastructure

2. Hartlen extension:

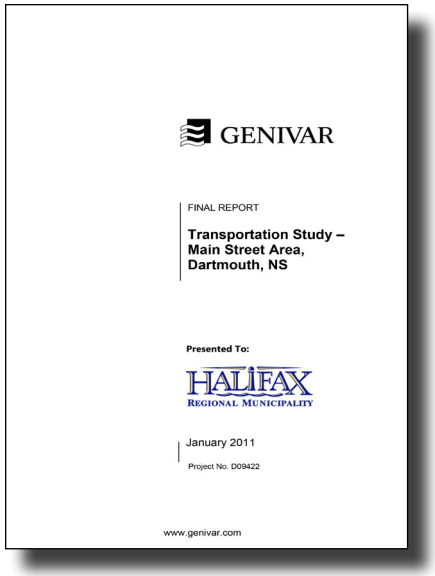
Creation of a smaller 'Village Ring' by adding a multi-use trail, and possibly a street, by extending Hartlen Street through the block from Main Street to Lakecrest Drive

3. Move transit:

Relocation of the transit services from Sobeys' parking lot to a location near the Tacoma Drive / Hartlen Street intersection

4. Shared parking:

Creation of shared parking facilities at various entry points to the Main Street Business Improvement District to reduce internal traffic and encourage higher density developments



Design Principle Alignment

- √ Walkable
- √ Accessible
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- Interaction
- Community
- Responsible Development
- Green Space
- √ Cyclist-friendly
- √ Public Transport

Figure 33: Main Street Transportation Study
Image Source: GENIVAR 2011

5. Optimized driveways:

Rationalization and optimization of driveway access points to enhance safety and improve the pedestrian experience, likely by reducing the number of driveways by consolidating them.

6. Rationalized turns:

Evaluation of the potential to add a curbed median in the Center of Main Street to rationalize left turns at commercial driveways and improve the appearance of Main Street.

Site-specific recommendations are summarized in Figure 34. The Main Street Transportation Study highlights long-term vehicle traffic trends, with Main Street and connecting Highway 107 experiencing 1.9% and 2.0% increases in traffic volumes annually between 1980 and 2009, respectively (GENIVAR, 2011). Annual average weekday traffic numbers (AAWT) show Main Street sees more than 34,000 vehicles pass through each

Figure 34: Key recommendations from Transportation Study (Adapted from GENIVAR, 2011)

day as of 2009, with between 2,450 and 2,680 vehicles per hour, during peak AM and PM hours (GENIVAR, 2011). The study simulated the proposed transportation infrastructure changes, which led to five recommended alterations to the Main Street Dartmouth BID transportation infrastructure (GENIVAR, 2011).

Dartmouth Municipal Planning Strategy and Dartmouth Land Use Bylaw

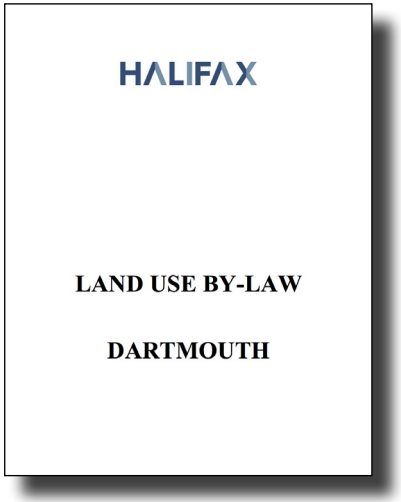
In 2013, the Dartmouth MPS and LUB were amended to establish a Main Street Designation (which functionally constitutes a “secondary planning strategy”, as recommended in the Ekistics plan), in order to foster incremental development of a mixed use town centre, increase density, attract developers, focus housing close to shops, services, employment and transit, reduce car-oriented designs and encourage walkable, accessible, appealing streetscapes.

The Dartmouth MPS:

- created 3 sub-designations: Town Centre, Town Residential and Neighbourhood Edge;

The Dartmouth LUB:

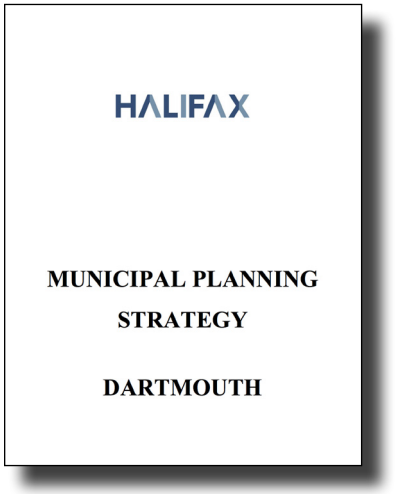
- allowed as-of-right development for mixed-used and multi-unit residential (HRM, 2015e, p. 53);
- required additional architectural design controls on appearance of buildings, maximum building heights, streetwall setbacks, maximum streetwall heights, buildings and front yard setbacks - a form-based code (HRM, 2015e, section 32H, p. 40).;
  - New height allowances: commercial use buildings are allowed to have larger building height and streetwall height (see Figure 32).



Design Principle Alignment

- √ Walkable
- √ Accessible
- √ Engaging
- √ Convenient
- √ Interaction
- √ Community
- √ Responsible Development
- √ Green Space
- √ Cyclist-friendly
- √ Public Transport

Figure 35: Dartmouth Land Use By-Law
Image Source: HRMe, 2015



- √ Walkable
- √ Accessible
- √ Engaging
- √ Convenient
- √ Interaction
- √ Community
- √ Responsible Development
- √ Green Space
- √ Cyclist-friendly
- √ Public Transport

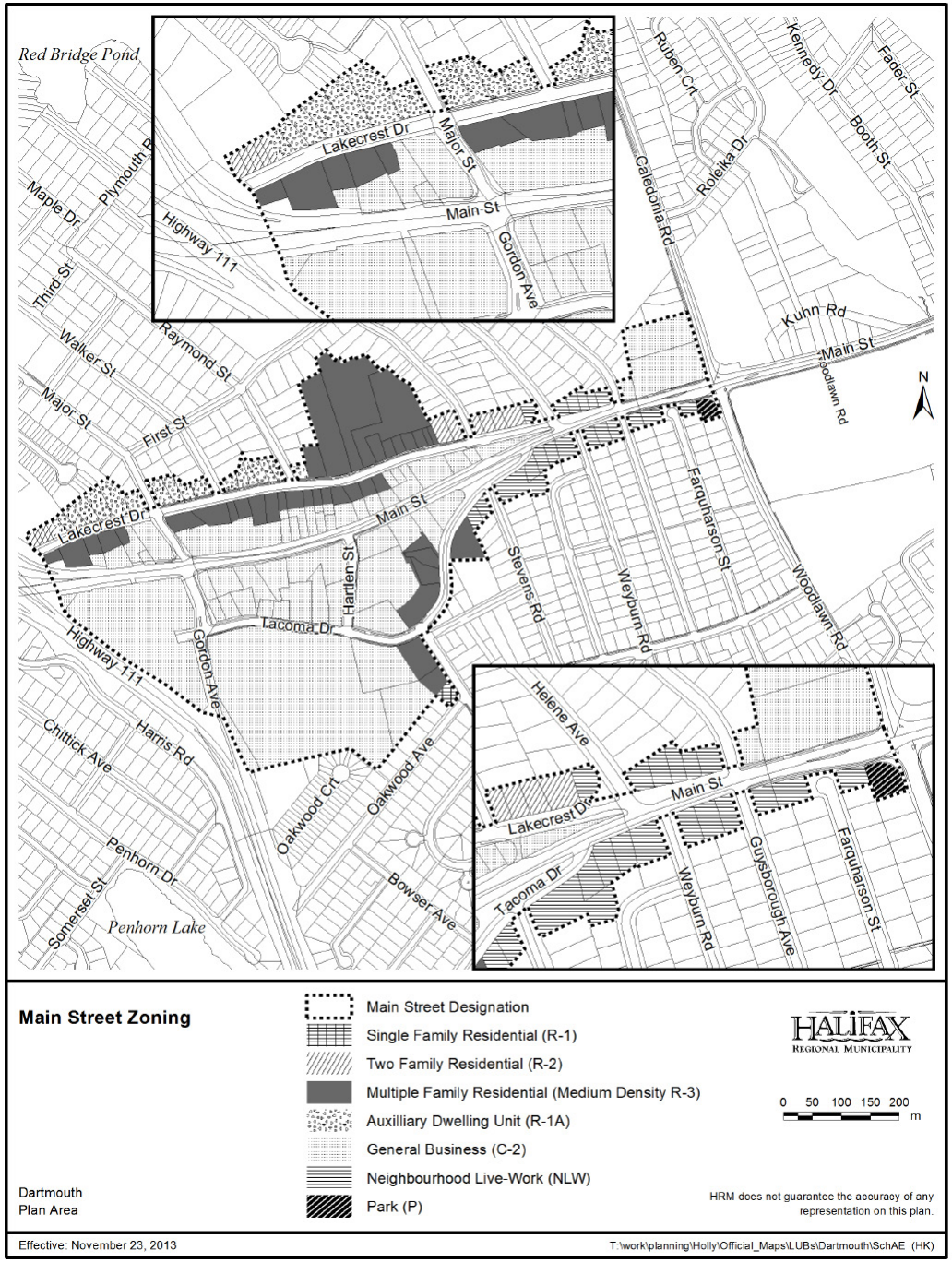
Figure 36: Dartmouth Municipal Planning Strategy
Image Source: HRMc, 2015

- Front yard setbacks:
  1. Gordon, Major and Hartlen: 1-6.1m
  2. Main, Tacoma and Caledonia: 2-9.1m
  3. Lakecrest and Valleyfield: minimum 6.1m
- reduced parking requirements and limited locations to behind or underneath buildings;
- created new zoning, mostly commercial C-2, with residential zones on the edges and a unique Neighbourhood Live-Work zone (see Figure 37 & Table 3);

Table 3 summarizes key characterstics of zones within the BID. The BID is the only area in Dartmouth where a development agreement is not required for multi-unit residential developments. Development agreements are contracts between the city and the property owner that set the standards and conditions that govern the development of a property. By contrast, as-of-right development gives developers more flexibility and development opportunities (HRM, 2015e, section 34(7), p. 53; HRM, 2015e, section 18B, p. 19).

Zone	Key Characteristics
Town Centre General Commercial (C-2) Zone	• For a walkable mix of uses and buildings: - Sidewalk-oriented commercial on ground floor - General Offices: max. 3 floors to avoid competing with downtown - Residences above, as-of-right - No industrial, storage or “adult” uses - Rear or subgrade parking
Town Residential Medium Density Residential (R-3) Zone	• Lakecrest/Valleyfield: - Multiple unit facades must resemble townhouses - Low (2-storey) street wall • Other Locations: 4 storey streetwall • All locations: 12.2 m separation from R-1, R-1A or R-2 zone
Neighbourhood Edge Neighbourhood Live-Work (NLW) Zone	• For low-impact live/work: - Craftshop/spa/studio/office - Accessory retail only - Other uses and rules comparable to R-1A - Limited signage - Townhouse-style dwellings (internal driveways only)
Neighbourhood Edge Auxiliary Dwelling Unit (R-1A Zone)	• To add more residents near shopping, while retaining a small scale: - As in R-1, plus one auxiliary unit up to 40% of gross floor area - Must retain the appearance of a single house

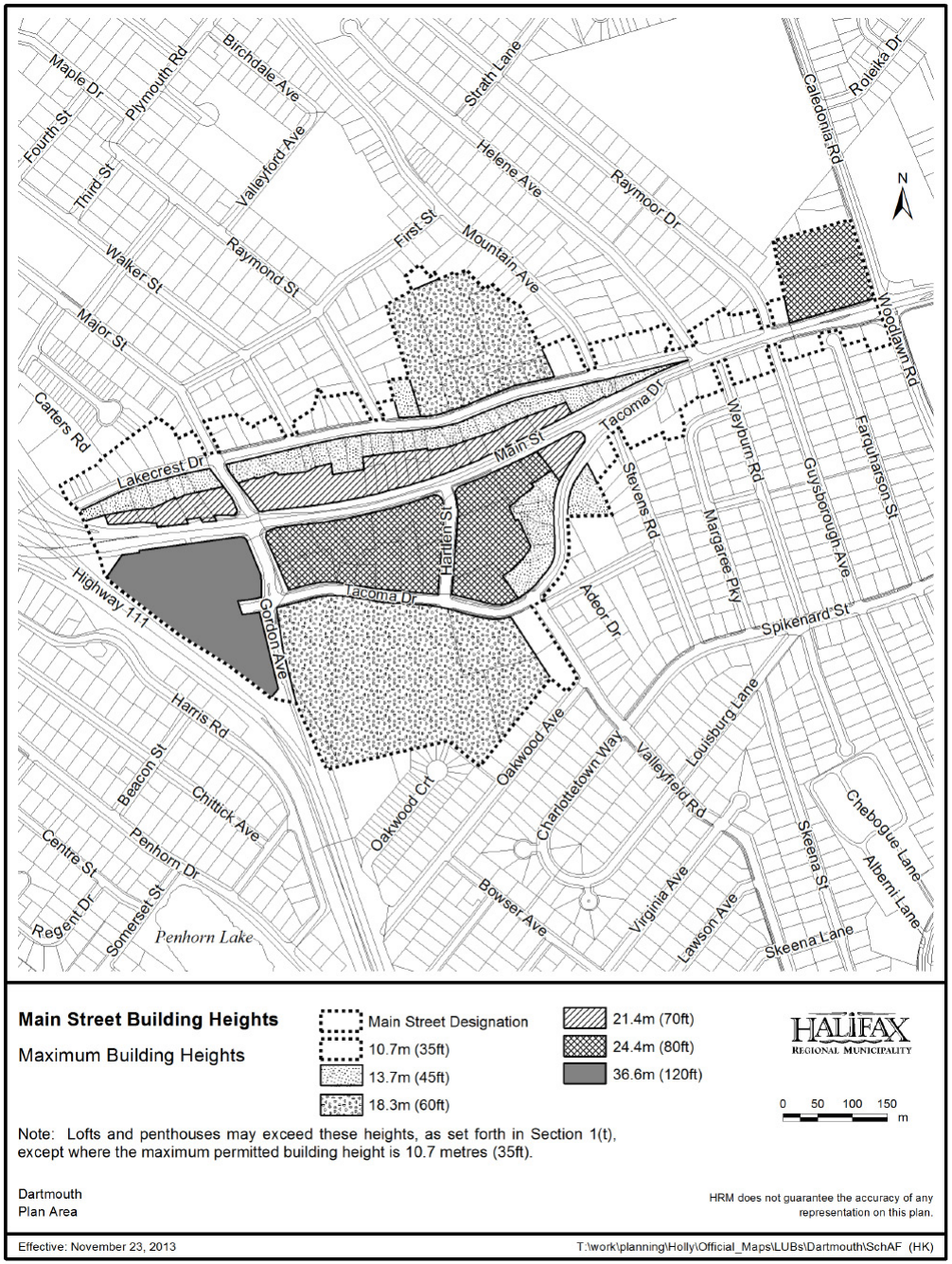
Table 3: Key characteristics of zones in the study area (HRM, 2015e, section 3: zones, pp. 43-93).



The vision created by Ekistics (2007) suggested mixed use with retail along all three major streets: Lakecrest Drive, Main Street, and Tacoma Driwve. Despite the recommendations in the Ekistics plan, the bylaw amendments made the Lakecrest zoning into a dense residential zone: R-3, specifically zoning for townhouses along the southern side of Lakecrest. Allowable height in the R-3 zone is also somewhat higher than the low-rise village envisioned by Ekistics (2007), also allowing for greater density.

The 2013 amendments help to achieve many of the aspects of the Ekistics 2007 plan which are oriented towards private property. Some of the amendments are also relevant to public infrastructure design. The location of retail uses (commercial zones) helps inform where to locate public amenities such as a transit hub, central park or village centre, because these (as opposed to private residential properties) are places where the public can gather.

Figure 37: LUB Zoning Map
Image Source: Halifax Regional Municipality, 2015e



Policy Conclusion

Despite discrepancies in emphasis among the documents, the BID's vision for the Village on Main is generally well-aligned with provincial, regional, and local policy documents. The 2013 amendments to the Dartmouth MPS and LUB set regulations for private land use; they do not address changes to public streetscapes. Policy documents have built on each other to support improving the area. Moving forward, the BID can look to these documents to support their public infrastructure vision.

Figure 38: LUB Building Height Restrictions Map
Image Source: Halifax Regional Municipality, 2015e

Public Consultations

The community in the Main Street area was consulted numerous times since 2007 when Ekistics developed the Main Street Dartmouth Planning Vision and Streetscape Concept, and also during the Dartmouth MPS and LUB amendment processes. The results of these consultations relevant to public infrastructure are summarized in this section.

Ekistics Public Consultation

To inform the Main Street Dartmouth Planning Vision and Streetscape Concept, Ekistics (2007) hosted several different forms of public consultation. These included a walk-about inventory with City staff and Councillor Andrew Younger, a visioning workshop, design workshop, and online survey.

Overall, people felt the current conditions in the area were unsatisfactory (Ekistics, 2007). People generally felt the site lacked pedestrian amenities, green space, landscaping, and safe and convenient travel options for non-vehicular traffic. High traffic volumes along Main Street were seen as positive for business. People also felt that there was a good number of green spaces within walking distance of Main Street. The public identified the following three key issues in the Main Street area.

1. Automobile-oriented Design

Consultations identified that automobiles were prioritized over pedestrians in the design and function of the site (Ekistics, 2007). Main Street functioned as a throughway for all transportation modes and was not a destination. A lack of connections between the surrounding residential area and Main Street resulted in pedestrians cutting through private property to access Main Street. The many driveways located along Main Street and Tacoma Drive, along with the speed of automobiles, were identified as safety concerns for cars, cyclists, and pedestrians.

2. Lack of Transportation Options

Participants felt there were missed opportunities to connect the site with regional multi-use trails and outdoor community spaces (Ekistics, 2007). Increased pedestrian crosswalks, improved active transportation infrastructure and connections, and improved connections from Tacoma Drive and Lakecrest Drive to Main Street were identified as important components for future development. Many participants felt that the area should have a bus terminal and more bus shelters.

3. Minimal Pedestrian Design and Amenities

The streets in the community were viewed as untidy and lacking amenities like trash cans, street trees, public benches, pedestrian scale lighting, and seating. Participants identified additional green space and improved amenities as a key priorities for the future (Ekistics, 2007).

In response to the issues identified through consultation Ekistics developed five big ideas. They presented the following ideas to the public for feedback (Ekistics, 2007).

- Create a loop road connecting Tacoma Drive with Lakecrest Drive.
- Develop Lakecrest Drive as an AT corridor that links the area to existing AT trails.
- Create a new intersection at Main Street and Mountain Avenue.
- Develop concepts for additional and improved green space.
- Add street connecting Hartlen Street to Lakecrest Drive.

The first four ideas were met with positive responses (Ekistics, 2007). There was no solution found for the final concept as most people felt expropriation of property should be avoided. It was also suggested the size of the pedestrian loop be reduced by providing further pedestrian connections.

Halifax Public Consultation

Halifax conducted several public consultation sessions prior to the Dartmouth MPS and LUB amendments that addressed future development in Main Street area (HRM, 2009a & HRM, 2009b). The consultation sessions focused on how private land should be developed on the site in the future, along with the future physical form of the community. The meetings resulted in some comments related to the public right of ways which are relevant to our project.

Control Speeds on Lakecrest Drive

The community was concerned that Lakecrest Drive was frequently used to bypass stop lights on Main Street and drivers tended to travel at high traffic speeds on this residential road (HRM, 2009a & HRM, 2009b). Several solutions were proposed for this issue, including narrowing the street, replacing parking lanes with a bike lane on the north side, and a sidewalk on the south side. The community wanted to remove on-street parking from the east and west ends of Lakecrest and instead accommodate parking in a parking garage on HRM land or property at the east end of the south side of the street.

Control Turns from Main Street

Driveway safety was identified as a key concern on Main Streeet. It was also recommended that underground parking be located in the slope west of Tim Hortons on the north side of Main Street, and that the intersections of Hartlen Street and Main Street, and Gordon Avenue and Main Street, have an advanced and delayed left arrow (HRM, 2009a & HRM, 2009b).

BID/Team Public Consultation

Our team had the opportunity to present to and consult with the BID community three times during the course of this project. Our first session was on Thursday, February 11, 2016 at the Garden View Restaurant on Main Street in Dartmouth. The purpose of the meeting was to introduce of team and the project to the community, confirm that we had understood the key public infrastructure problems on the site, and gather community ideas for the future of the area. The meeting was open to the public and included community residents, BID board members, and employees in the BID area. Eleven people attended, including the Executive Director of the BID and the President of the BID. We gave a short presentation with an overview of our project and understanding of the site problems. We gathered feedback through both large group discussion and smaller break out groups (Figure 39), which we then analyzed and compiled.

During the feedback stage of the first meeting, we asked if our understanding of site problems aligned with community views of the neighbourhood. This part of the meeting took the form of a question and answer session. A main point of contention was the heavy traffic on Main Street: some participants were concerned about designs that might reduce traffic volumes and negatively affect their businesses. Everyone in attendance agreed, however, that a better balance of automobile-oriented and pedestrian-oriented infrastructure and design was needed.

The goal of the second stage of the meeting was to understand how the public imagined their future community. In small groups, they were asked to draw where they envisioned several different elements on a map of the study area. These elements were a transit terminal, town centre, road changes, community gateways, green space, bike lanes, and crosswalks. They were invited to include any other elements they wished to see. The different options proposed by the community were considered when developing concepts for the Village on Main. Consultation comments from the meeting can be found in Appendix G.

On March 3rd, our team, in coordination with the BID, hosted a second public meeting at the Garden View Restaurant. Nineteen people attended, including the Executive Director of the BID, the President of the BID and three HRM staff members. The goal of this meeting was to gather feedback from the public on our preliminary design concepts. We presented design options for cycling routes, Main Street, Lakecrest Drive, Tacoma Drive, a future transit hub, the extension of Hartlen Street, a new intersection at Lakecrest-Main-Tacoma, and gateways. We conducted a question and answer session where we asked the public for feedback on the design options. The following summarizes the main discussion points:

Cycling routes

The community was concerned about the option of having the bike lane connecting Lakecrest Drive with the Waverly bike lane on Maple Drive as it is extremely steep. There was also interest in developing a pedway/cycling way across the Circumferential Highway to access Mic Mall.

Hartlen Extension

The idea of extending Hartlen Street through to Lakecrest was met with a lot of enthusiasm. The participants overwhelmingly agreed that the public space should be consolidated to the east side of Main Street and include both green park space and a pedestrian plaza. It was recommended that there be no driveways off the Hartlen extension as they would conflict with pedestrian activities, which the community felt should be the priority in this new space. One person suggested dedicated bike lanes may not be needed. It was agreed that the Hartlen extension could be closed off for community events.

Village Centre

The community agreed that a village centre should consist of several sites that all have a similar character, creating a central corridor made of connected nodes. Some felt it was important to have centres on both sides of Main Street so the community could access the centre without crossing Main Street.

Figure 39: Public Consultation Meeting
Image Source: Graziella Grbac, February, 2016.

Transit Hub

Some community members recommended the transit hub be located between Tacoma Drive and Main Street. Safe access to the terminal was also a priority.

Main Street

The concept for the Main Street streetscape was well accepted. An HRM staff member recommended further study of tree spacing. Some who attended the meeting also felt mid-block crossings were needed along Main Street. When we asked about the importance of the centre left turn lanes on the eastern end of Main Street, the community said they are well used.

Lakecrest Drive

Some participants expressed concern about the removal of street parking along Lakecrest Drive. They were concerned the new condominium buildings would have inadequate visitor parking and inadequate public parking within close proximity.

Gordon Avenue & Tacoma Drive

The existing parking lot was identified as a problem and many felt it was too large and should be used in a more effective way.

Consultation Conclusions

Both recent and previous public consultation data reveal that community members are unsatisfied with the current condition of public infrastructure in the Main Street area. The community wants a more walkable community with a range of community amenities. They want to see more public community spaces and destinations such as parks and public plazas. An increase in aesthetic appeal through more green space and landscaping was another key theme. There is also a demand for more seating, trash cans, and lighting. Safety is a major concern, with particular concern that pedestrian safety is at risk due to a large number of driveways and high traffic speeds. Public consultation shows that community values largely align with the values in the BID's vision. We recommend the BID continue to work closely with the public in the future to maintain this strong shared vision.

The community feedback strongly supported our design principles and helped us revise our site-specific recommendations in the following ways:

- align Hartlen Extension road to west side of parcels and park to east side,
- remove bike lane buffers on Hartlen Extension,
- remove driveway access on Hartlen Extension,
- target Hartlen bus stop for future upgrade to terminal,
- improve pedestrian connection on existing pedway over Circumferential Highway, and
- select off-ramp cycling connection to Braemar instead of Maple Drive.

Concept Design

Design Goals and Objectives

The Project Goals presented in the Introduction outline deliverables for the Public Infrastructure Plan; the Design Goals presented here describe the design directions we propose in the Plan. The Design Goals address site problems and align with the Design Principles (see Table 1). We present the goals in an order that reflects the priorities in the Village on Main vision (i.e., people first).

Goal 1: People can travel by foot throughout the site safely and comfortably.

- Objective 1.1: Streets have appropriate motor vehicle lane widths for design speeds of 50 km/hr.
- Objective 1.2: Improve sidewalks by creating a complete and connected network.
- Objective 1.3: Crosswalks are safe and comfortable.
- Objective 1.4: A transit hub is connected to the sidewalk network and conveniently accessible by foot
- Objective 1.5: Pedestrian amenities (e.g., street trees, benches, lighting) are provided.

√ Walkable
√ Accessible
√ Engaging
√ Convenient
√ Interaction
√ Community
√ Responsible Development
Green Space
Cyclist-friendly
Public Transport

Goal 2: People can access public transit on the site safely, comfortably and conveniently.

- Objective 2.1: Lane widths remain appropriate to accommodate buses along transit routes.
- Objective 2.2: A transit hub is established in a convenient central location.
- Objective 2.3: The transit hub provides passenger amenities (ie. shelter, seating).
- Objective 2.4: The transit hub is conveniently accessible by people traveling by foot, bicycle and motor vehicle

√ Walkable
√ Accessible
√ Engaging
√ Convenient
Interaction
Community
√ Responsible Development
Green Space
Cyclist-friendly
√ Public Transport

Goal 3: People can travel on bicycle through the site safely and comfortably.

- Objective 3.1: There is at least one uninterrupted dedicated route for people to travel east/west through the site by bicycle to connect existing bike lanes outside of the BID
- Objective 3.2: There is an uninterrupted dedicated route for people traveling by bicycle north/south past a transit hub.

Walkable
Accessible
Engaging
√ Convenient
Interaction
Community
√ Responsible Development
Green Space
√ Cyclist-friendly
√ Public Transport

Goal 4: People can travel by motor vehicle through the site conveniently.

- Objective 4.1: Roads maintain motor vehicle volumes of no less than 20,000 and no more than 30,000 vehicles per day, to support business viability
- Objective 4.2: Routes for people traveling by motor vehicles are legible and convenient
- Objective 4.3: Park and ride spaces are provided adjacent to the transit hub
- Objective 4.4: On-street parking is limited to strategic locations and is formalized; off-street parking is provided on private property underground or in rear lots

Walkable
Accessible
Engaging
√ Convenient
Interaction
Community
Responsible Development
Green Space
Cyclist-friendly
√ Public Transport

Goal 5: People come to and identify the Village on Main as a destination.

- Objective 5.1: There is a discernible “village centre”, fostering a BID community identity
- Objective 5.2: There are discernible edges (“gateways”), fostering a BID community identity
- Objective 5.3: There is a discernible community identity that aligns with the BID’s vision

√ Walkable
√ Accessible
√ Engaging
Convenient
√ Interaction
√ Community
Responsible Development
√ Green Space
Cyclist-friendly
Public Transport

Goal 6: People can interact in outdoor public spaces safely and comfortably.

- Objective 6.1: Public spaces are provided in an adequate amount to support the projected residential density and accessible to neighborhoods on both sides of Main Street
- Objective 6.2: Public spaces are connected to the pedestrian network
- Objective 6.3: Public spaces are uniquely designed and reflect the BID’s identity
- Objective 6.4: Small green spaces surrounding road right-of-ways are used strategically and effectively as “pocket parks”

Walkable
Accessible
√ Engaging
Convenient
√ Interaction
√ Community
Responsible Development
Green Space
Cyclist-friendly
Public Transport

Goal 7: All public infrastructure designs support sustainable, responsible development.

- Objective 7.1: Stormwater management techniques are applied strategically in medians, furnishing zones and parks
- Objective 7.2: Increase tree canopy coverage in medians and furnishing zone of sidewalks to help stormwater management and reduce heat island effect
- Objective 7.3: Include native plantings to increase bio-diversity and resilience

√ Walkable
Accessible
√ Engaging
Convenient
Interaction
√ Community
√ Responsible Development
√ Green Space
Cyclist-friendly
Public Transport

Design Elements

To meet our design goals and objectives we identified the following design elements to be included in our public infrastructure plan. These elements are based on site background research, the design principles derived from the BID's vision (see Table 1), policy research, and consultation. Each design element addresses multiple design principles, as shown in Table 4.

1. Pedestrian Infrastructure

Infrastructure to make it safe and comfortable for people to travel by foot in the BID is top priority of the vision. This infrastructure includes sidewalks, crosswalks and paths.

2. Transit Hub

With the current high transit usage and projected residential growth in the BID, a transit hub is an important feature for the Main Street BID. At its most successful, a transit hub is linked to all modes of transport and is integrated with parks and open space networks, and can even become part of a village centre.

3. Cycling Infrastructure

Infrastructure specifically dedicated to bicyclists is necessary to attract cyclists that would not be comfortable cycling mixed with motor vehicle traffic, such as seniors, children and inexperienced cyclists.

4. Motor Vehicle Infrastructure

Motor vehicle infrastructure is an important part of a successful business district, and should be designed to promote safety, and to consider other modes of transport.

5. Village Centre

We recommend identifying and developing a village centre. This centre may be integrated with the transit hub, and should create a place where people to feel welcome to stay, rather than merely pass through. Village centres help to establish an identity for neighbourhoods. They should be well defined: "One should be able to tell when one has arrived in the neighbourhood and when one has reached its heart" (Farr, 2008, p. 127). Village centres should include an outdoor public space for pedestrians and often a square or plaza. Village centres can be as simple as "a special "four corners" intersection of important streets" (Farr, 2008, p. 128).

6. Gateways

According to the HRM (2014c), "clearly defined gateways enhance orientation, define a sense of place and contribute to civic pride" (p. 43). Gateways are one of eight key components of the public realm identified in the Municipal Planning Strategy for Downtown Halifax, which may be the most design-based plan in HRM (2014c). Gateways establish the distinct character of districts. Key elements that establish gateways are signage, traffic calming measures, parks and landscaping.

7. Parks and Open Space

Open, green, public space allows for interaction between people in the BID, and contributes to environmental sustainability by increasing the amount of permeable surface in an area.

8. Natural Elements

Creative stormwater management solutions and street trees can help reduce stormwater runoff while also enhancing the beauty and livability of the BID.

Design elements can be configured in different ways to create different design concepts. We considered different configurations of pedestrian, vehicle, park space, gateways and village centre in our concept design. The location of cycling infrastructure, transit hub and natural elements remain consistent through each concept.

Principle	Pedestrian Space	Transit Hub	Motor Vehicle Space	Bicycle Space	Village Centre	Gate-ways	Parks	Natural Elements
Walkable	√	√			√	√	√	√
Accessible	√	√	√		√		√	
Engaging	√				√		√	√
Convenient	√	√	√	√				
Interaction	√				√		√	
Community	√				√	√	√	√
Responsible Development	√	√		√			√	√
Green Space					√		√	√
Cyclist-friendly		√		√				
Public Transport		√						

Table 4: Alignment of Design Elements with Design Principles

Design Concepts

This section shows three concepts our group considered for the BID: the Village Ring, the Village Grid and the Village Centre (Figures 40-42).

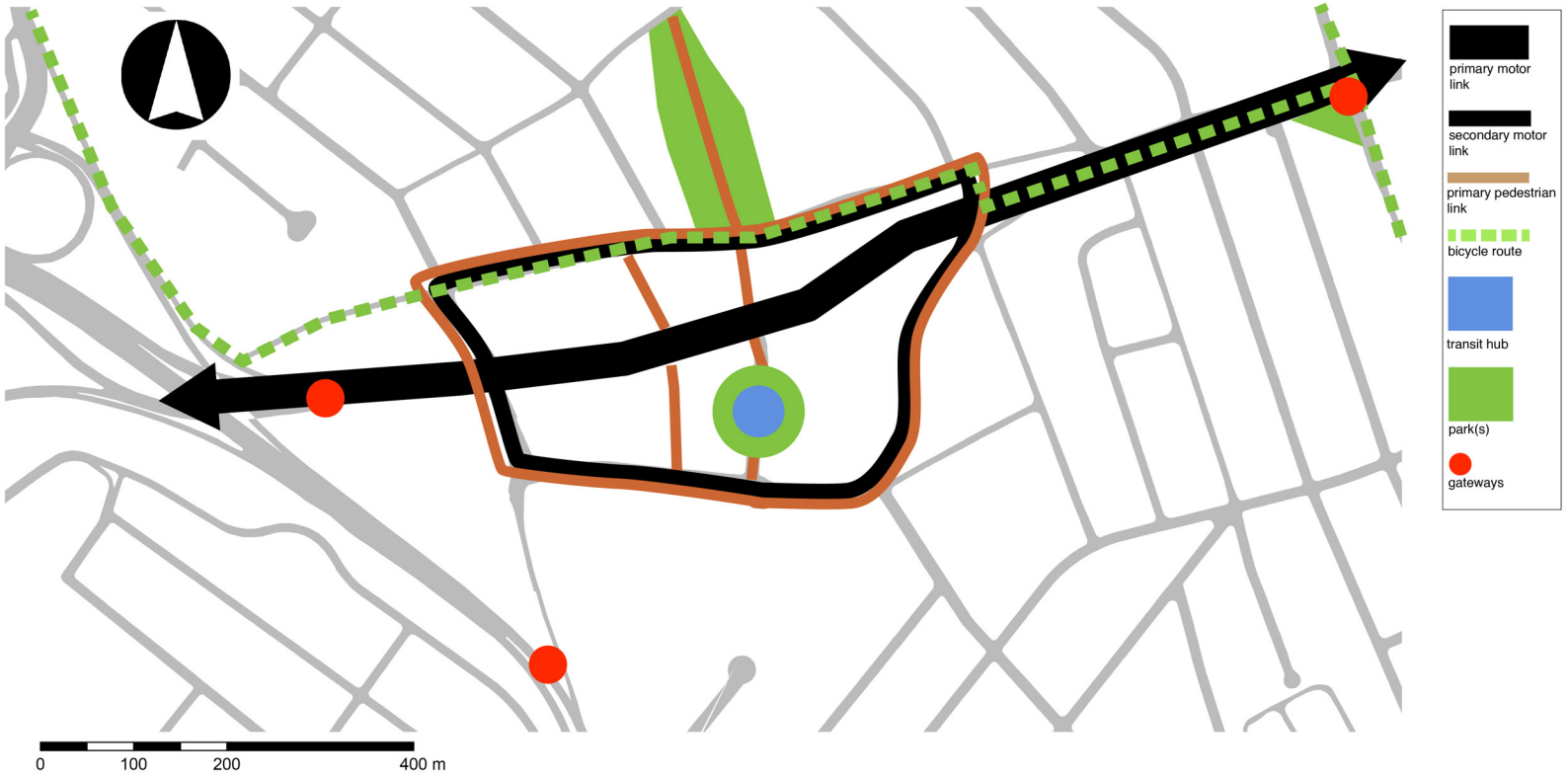


Figure 40: Village Ring Design Concept
Data source: adapted from HRM Corporate Dataset (HRM, 2012)

The Village Ring

The Village Ring concept was proposed by Ekistics in 2007 and adopted by HRM Council in 2008. The central concept maintains high traffic volumes on Main Street and directs other kinds of activity to Lakecrest Drive and Tacoma Drive instead.

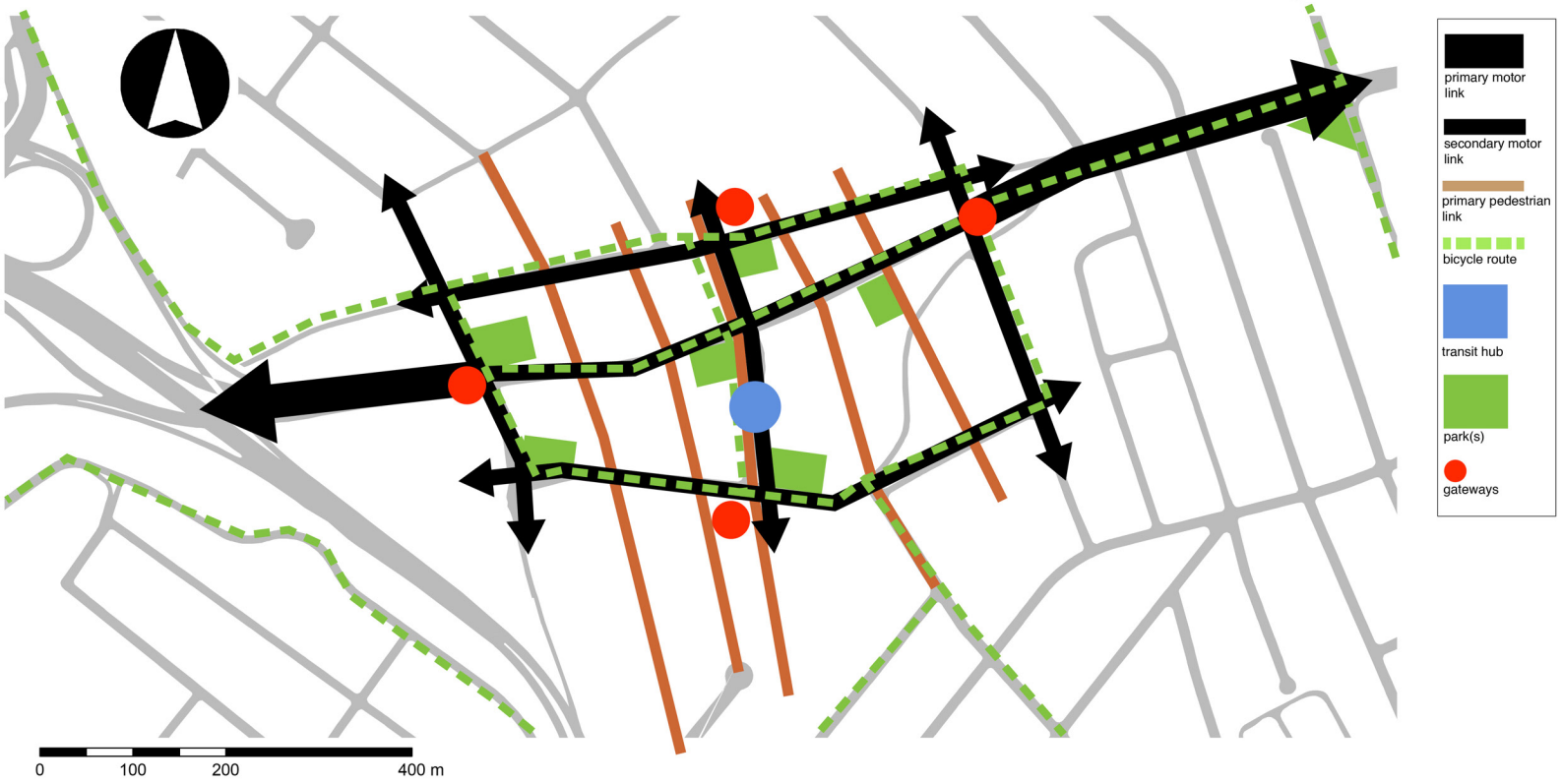


Figure 41: Village Grid Design Concept
Data source: adapted from HRM Corporate Dataset (HRM, 2012)

The Village Grid

This concept, explored by our team, disperses traffic more evenly through the BID and would increase connectivity by emphasizing a legible grid. Like traffic, park space is intentionally and equally dispersed throughout the BID. Pedestrian connections are frequent.

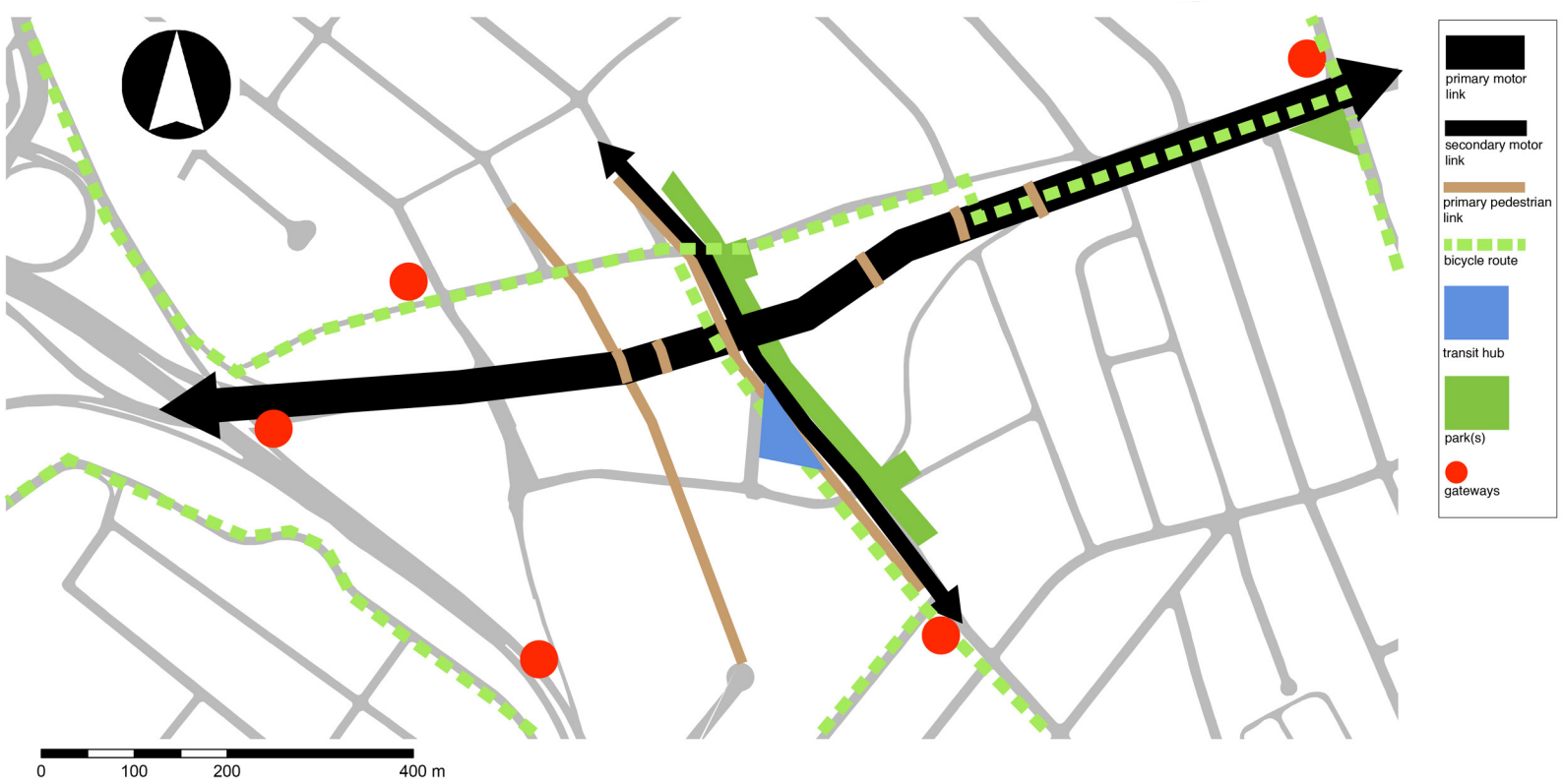


Figure 42: Village Centre Design Concept, Coast to Coast Consulting
Data Source: adapted from HRM Corporate Dataset (HRM, 2012)

The Village Centre

The central concept is to maintain high traffic volumes on Main Street but create a main North/South pedestrian corridor with linear park space alongside Hartlen Street (See figure 42). Hartlen Street is realigned with Valleyfield Road, connecting the two neighbourhoods on either side of Main Street. Pedestrian connections across Main Street are improved.

Principles Analysis

We score each of the design concepts based on the Design Principles (see Table 1). Each concept addresses the principles in different ways. Table 5 summarizes the relative emphasis of the principles by each concept.

Walkable

The Ring concept keeps pedestrians mainly along the ring, instead of the central area of the BID. In comparison, the Grid and Centre concepts have more pedestrian links through the central area. Although traffic volumes are high on Main Street in the Centre concept, there are midblock crossings to improve pedestrian connectivity and safety. It is safer for pedestrians to walk on other streets in the Centre concept, since there is less dispersed traffic than in the Grid concept.

Accessible

Improving walkability also improves accessibility for persons who cannot drive, so similar scores to walkability are given to each of the concepts.

Engaging

The Centre concept consolidates green space into one large, linear and central place, where the transit hub and public plazas are located on either side, an exciting place for future events to take place. It provides interesting features that have more potential to engage the community than the other concepts.

Convenient

The Ring concept excluded pedestrians from the central area of the BID. The Centre concept improves pedestrian access to mixed areas. Compared to the Ring and Centre concept, the Grid concept is more convenient for both drivers and pedestrians, since traffic is dispersed equally through out the BID, and there are many pedestrian paths.

Interaction

There is more opportunity for engagement in the Centre and Grid concepts. In the Grid concept, people can start conversations when they come across each other at every street corner in the BID. In the Centre concept, large events can take place in the central green space, which can create more interactions among people.

Community

With a central linear park, the Centre concept creates a very strong sense of place at the heart of the Village on Main. The sense of place is more dispersed in the Grid concept that we propose. The Ring concept maintains Main Street as a barrier through the middle of the BID, cutting the Main Street community in half.

Responsible Development

This principle is defined by the BID as sustainable development (see Table 1). Sustainability is a holistic principle: the other design principles all contribute to sustainability. The Centre and Grid will be more successful than the Ring at achieving responsible development because of their higher scores in these other principles.

Green Space

All three concepts include a pocket park on the corner of Main and Woodlawn. The Centre and Grid concepts have more green space in central locations. The Centre concept consolidates green space into one large, linear central space, which may serve more functions; the Grid disperses green space, which may be more accessible to surrounding neighborhoods.

Principle	Centre	Ring	Grid
Public Infrastructure Quality			
Walkable	√ √ √	√	√ √
Accessible	√ √ √	√	√ √
Engaging	√ √	√	√
Convenient	√ √	√	√ √ √
Interaction	√ √	√	√ √
Community	√ √ √	√	√
Responsible Development	√ √	√	√ √
Public Infrastructure Component			
Green Space	√ √	√	√ √
Cyclist-friendly	√ √	√	√ √
Public Transport	√ √	√ √	√ √ √
Total	**23**	**11**	**20**

Table 5: Evaluation checklist for Centre, Ring, and Grid Concepts

Cyclist-Friendly

The Ring concept did not include dedicated bicycle lanes, only a roadway wide enough for cars to be able to move out of the way of bicycles, except for the section of Main Street between Lakecrest Drive and Caledonia Road. The Grid and Centre concepts include dedicated cycling routes along primary motor links through the BID giving them higher scores.

Public Transport

The location of the transit hub is consistent in all three concepts, but pedestrian connections are more frequent in the Grid concept. The Ring and the Centre concepts are scored the same, and the Grid concept gets higher scores.

Recommended Concept

The Village Centre Concept scores the highest; it will be the most successful in achieving the BID vision. In the next section we develop this concept further in Schematic Design.

Schematic Design

Schematic Design

Figure 43: Schematic Design
Image: Sara Jellicoe 2016
Data source: adapted from HRM Corporate Dataset (HRM, 2012)

Site-Wide Recommendations

Motor Vehicle Space

Space allocation for people traveling by motor vehicle is an important requirement for the BID. Businesses benefit from their visibility to passing vehicles (Ekistics, 2007). Access to businesses for vehicles is also important.

Lane Widths

To meet the design principles of walkability and cyclist friendly design, we recommend maximum motor vehicle lane widths throughout the site of 3m for typical motor vehicle lanes and 3.4 metre lanes for public transit routes. Narrow traffic lanes improve street safety while maintaining traffic flow and vehicle capacity (NACTO, n.d.), reduce vehicle speeds and encourage motorists to abide by posted speed limits (FHA, 2014). 3-3.4m traffic lanes are supported by many transit organization including, NACTO, the United States Department of Transportation Federal Highway Administration, the Institute of Transportation Engineers and the National Collaborating Centre for Healthy Public Policy (FHA, 2014; NACTO n.d.; ITE, 2010; the National Collaborating Centre for Healthy Public Policy, 2013).

Traffic Flow

To meet the design principles of walkability, accessibility and convenience, we recommend that two-way streets are maintained throughout the BID. One-way streets increase vehicle speeds (Act Canada, 2012; Jaffe, 2015), reduce business visibility (Act Canada, 2012; Walker, Kulash & McHugh, 2000), and increase the likelihood and severity of collisions (Act Canada, 2012; Jaffe, 2015). One-way streets increase the total number of vehicle turning movements, which typically increases the number of potential pedestrian-vehicle conflicts by between 30% and 40% (Walker, Kulash & McHugh, 2000). One-way streets would also increase travel distances to destinations within the BID. Notably for Main Street's context, reduced business visibility from one-way streets is "particularly important to "mainstreets" and streets where street-oriented retail and service businesses are encouraged" (Act Canada, 2012, p. 3).

Pedestrian Space

Sidewalks

To meet the design principles of walkability, accessibility, convenience, community identity, and interaction, we recommend upgrades to sidewalks throughout the BID. Sidewalks are a substantial component of pedestrian networks in the urban landscape. For the purposes of this report, we have defined two sidewalk zones: the pedestrian throughway, and the furnishing zone. The throughway functions as sidewalk space free of objects and obstructions to allow for pedestrian movement (See Figure 44). We recommend a 2m pedestrian throughway for all sidewalks across the Main Street Site to allow for improved accessibility for people using mobility aids or strollers (Canadian Standards Association, 2012). The furnishing zone, is located between the pedestrian throughway and the street. The furnishing zone holds amenities that enhance the streetscape.

Our inventory of public amenities (see Figure 18) revealed a lack of necessary pedestrian amenities. We recommend a wide range of amenities be located in the furnishing zone, including: trees, planters, bicycle parking, public seating, and gardens. We recommend that the pedestrian throughway and furnishing zone are defined through surface materials with different colours and textures to distinguish their areas. Combining differing surface materials improve sidewalk aesthetics and make the space more accessible for people with visual impairments who rely on tactile cues to navigate (Koutsoklenis & Papadopoulos, 2014). The furnishing zone should be used to promote the community's identity. The amenities located in the furnishing zone should be characteristic of the area.

Seating

Jan Gehl's (2010) book, Cities for People, discusses the importance of creating seating that allow people to interact to create "talkscapes" (p. 55). Such seating could include benches that face each other, movable chairs, or curved seating. Gehl (2010) also discusses primary versus secondary seating. Primary seating refers to intended seating, such as benches and chairs with backs and perhaps arm rests. Secondary seating is found in places that are not designed specifically as seats but people can still sit there, such as bollards, walls,

Figure 44: Defining the Pedestrian Throughway & Furnishing Zone, Barrington Street, Halifax
Image Source: photography by Kaitlyn Walker, 2015

stairs, and rock features. Gehl says seniors prefer primary seating. We recommend that the design of future seating incorporates these principles.

Pedestrian Lighting

To meet the design principles of walkability, accessibility, engagement, interaction, and community identity, we recommend upgrades to lighting. Effective street and pedestrian lighting is essential for perceived and real levels of safety and security (City & County of San Francisco, 2015). Pedestrian-scale lighting reinforces the importance of pedestrians in the area, adding to the village character (Project for Public Spaces, n.d.a). We recommend:

- pedestrian-scale lighting throughout the entire site (See Figure 45), and
- design of street light fixtures that aligns with the BID's vision for creating a village-like atmosphere.

Pedestrian Crossings

To meet the design principles of walkability, accessibility, engagement, convenience, and community identity, we recommend upgrades to pedestrian crossings throughout the entire site. High-visibility pedestrian crossings have a positive effect on pedestrian and driver behaviour (City & County of San Francisco, 2015). We recommend continental crosswalk markings (most visible for drivers, see the white lines in Figure 38), and a distinct paving type to further define the presence of pedestrian crossings. Enhanced pedestrian crossings will help define the Village on Main as a pedestrian-focused space and make drivers more aware of other users on the street.

We recommend that all pedestrian crossing be provided at grade. Pedestrian under/overpasses remove people from the street and create a further disconnect and segregation between people and cars. Under/overpasses tend to present a barrier

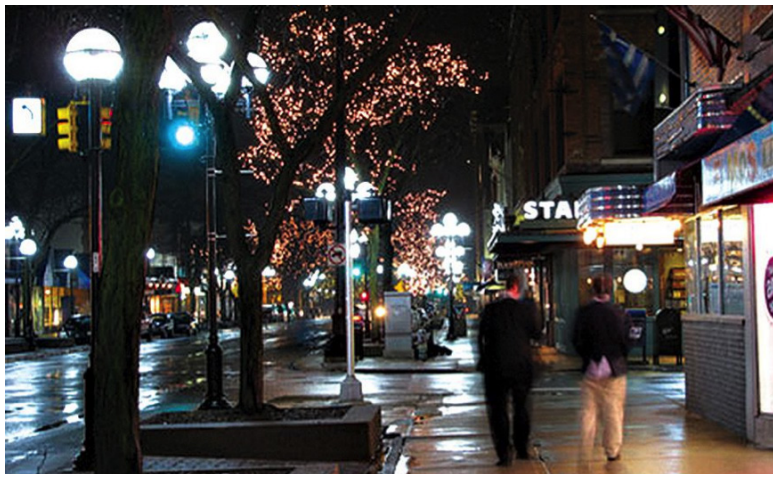


Figure 45: Pedestrian Scale Lighting
Image Source: http://nacto.org/publication/urban-street-design-guide/intersection-design-elements/visibility-sight-distance/

Figure 46: Enhanced Pedestrian Crossing with Continental Style Markings
Image Source: http://hubss.com/wp-content/uploads/2015/09/enhanced-crosswalks.jpg

to people using mobility aids or using anything with wheels (Gehl, 2010). Pedestrian overpasses should only be used if pedestrians need to cross a major highway (Gehl, 2010) such as the Circumferential Highway.

Natural Elements

Stormwater Management Strategies

To meet the design principles of community identity, engagement, responsible environmentally sustainable development and green space, we recommend stormwater management strategies be integrated into the design of streetscapes and parks throughout the BID.

Under natural conditions, rain is either intercepted by vegetation, absorbed by ground, or runs slowly overground to water bodies like rivers, lakes and streams. Impermeable surfaces (e.g., pavement) disrupt natural systems. In urban and suburban places, large sections of land are covered by impermeable surfaces and vegetation is often minimal. These impermeable surfaces result in more rainwater reaching the ground (minimal vegetation interception) and it is unable to soak into the ground (Town of Richmond Hill, n.d). These conditions lead to large amounts of water moving above ground, which is referred to as stormwater runoff. Stormwater runoff leads to a range of issues such as flooding, property damage, erosion, water pollution and destruction of habitat.

Stormwater management strategies can mitigate runoff. Vegetation, such as street trees, intercept rainwater before it reaches the ground. Permeable surfaces absorb rainwater. In an urban landscape like the Village on Main there are opportunities to incorporate stormwater management strategies and features into the landscaping of furnishing zone, curb extensions and central medians. Below are some examples of different stormwater management strategies that could be applied to the Village on Main community.

Figure 47: Incorporating Bioretention Cells/Rain Gardens into the Urban Streetscape
Source:http://chesapeakestormwater.net/2012/04/financing-stormwater-retrofits-in-philadelphia-and-beyond/

Bioretention Cells/Rain Gardens & Stormwater Planters

A rain garden/bioretention cell is a planted area that is depressed and porous, allowing rain runoff to be absorbed (United States Environmental Protection Agency, 2015). Rain gardens and bioretention cells can be located in urban spaces including parks, furnishing areas, curb extensions or central medians. Figure 48 is an example of how rain garden/ bioretention cells can be incorporated into urban infrastructure.

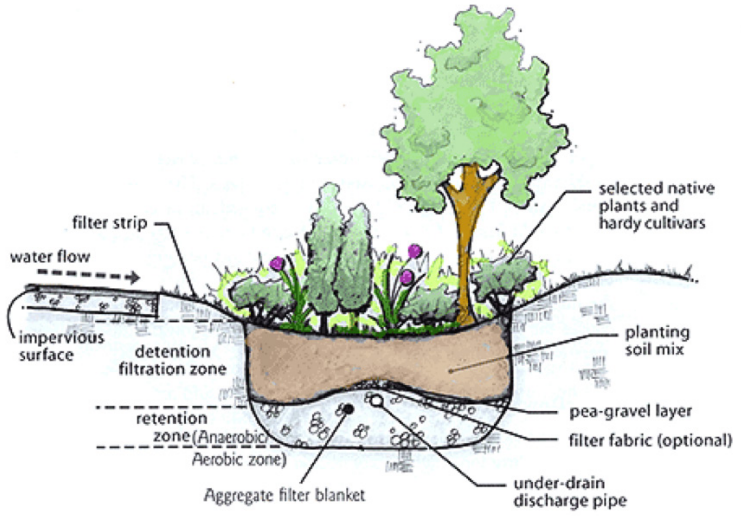


Figure 48: Bioretention Cells/Rain Gardens Diagram
Source: http://jkdirtworks.com/html/rain_gardens.html

Stormwater planters function in a similar way to rain gardens but are smaller in scale (United States Environmental Protection Agency, 2015). The purpose of stormwater planters is to filter stormwater into the ground (see for example Figure 49).

Figure 49: Stormwater Planter
Source: http://www.southsidegreen.com/green-infrastructure-primer/

Gutter and Curb Elimination

One of the functions of gutters and curbs is to direct stormwater runoff to stormwater drains. Eliminating gutters and curbs in strategic locations can direct runoff into permeable areas, allowing the surface water to be absorbed (United States Environmental Protection Agency, 2015). Figures 50 and 51 are examples of gutter and curb eliminations for stormwater management.

Figure 50: Diagram of Curb Cutout
Source: https://www.wbdg.org/resources/lidtech.php

Figure 51: Curb Elimination in Parking Lot
Source: https://www.pinterest.com/pin/510454938987467328/

Stormwater management is of particular importance to the BID's "Village on Main" community as most of the site is impermeable surfaces (parking lots, streets etc).The site is also located in a valley. We recommend that future furnishing zones (particularly in wider sections), central medians (eg. Main Street), and park areas incorporate stormwater management strategies such as rain gardens. We also recommend that design and location of green spaces reflect the natural topography and flow direction in the BID. These interventions will help increase vegetation in the community and have positive environmental and economic benefits.

Street Trees

To meet the BID vision elements of responsible development, walkability, identity, and green space, we recommend street trees be planted in all sidewalk furnishing zones and medians if possible. Street trees make a site more pleasant for pedestrians by acting as a buffer between traffic and pedestrian spaces, providing shade, and making an area more aesthetically pleasing. They can also be used in conjunction with stormwater management interventions (for example, Figures 50 and 51). For other advantages see the HRM Urban Forest Master Plan (HRM, 2013b).

Parks and Open Space

To meet the BID's vision of becoming walkable, engaging, convenient, interactive, and sustainable, along with the desire to have a strong identity and green space, we recommend enhancing existing pocket parks and adding more open space where possible. Open spaces can include parks and paved public spaces, such as pedestrian plazas.

The Dartmouth MPS (HRM, 2015c, Section 3 of Open Space and Recreation section) provides guidelines for appropriate amounts of open space relative to population; the guidelines present a range of suggestions rather than one strict quantity to recognize differing needs of neighborhoods. Table 6 presents the suggested area of open space for the 2015 population, along with the conservative (at 50% of full build out) and maximum density population projections. Table 6 shows both the minimum open space area recommended for a neighborhood, along with the average recommended amount.

The current total amount of open space within our study area is approximately 7,230 square metres, which meets the minimum guideline for open space for the current population (see Table 6); however, it does meet the minimum quantity for even the conservative projected population permitted by the land use bylaw amendments. In the interest of planning for a larger future population, the BID needs more open space.

BID Scenario	BID Population	Minimum Area for Neighbourhood (9,307.8 sq m / 1000 people)*(m^2)*	Average Area for Neighbourhood (16,996.8 sq m / 1000 people)*(m^2)*
Actual 2015	618	5,752.2	10,504.0
Projected 2035 Conservative (50% development)	4,451	41,429.0	75,652.8
Projected 2035 Maximum Density	8,285	77,115.1	140,818.5

Table 6: Open Space requirements based on population projections, calculated based on Requirements from Halifax Regional Municipality, 2014, Dartmouth MPS, Section 3 of Open Space and Recreation section; Population projections from Main Street Dartmouth BID, n.d., e, slide 17)

Adding open spaces at each gateway location, perhaps as pocket parks and gardens, and creating a substantial open space along Hartlen Extension and the Transit Hub, provides the recommended minimum amount of open space for the conservative projected population (see Figure 52). Nearby open spaces supplement this amount, effectively meeting the BID's vision of enhancing green spaces.

Creative park designs can help make the Village on Main a destination, drawing in people with village novelty. Functional and aesthetically pleasing designs can make the small spaces more useful and comfortable for residents, business owners, and customers, which may encourage more people to visit the site on foot.

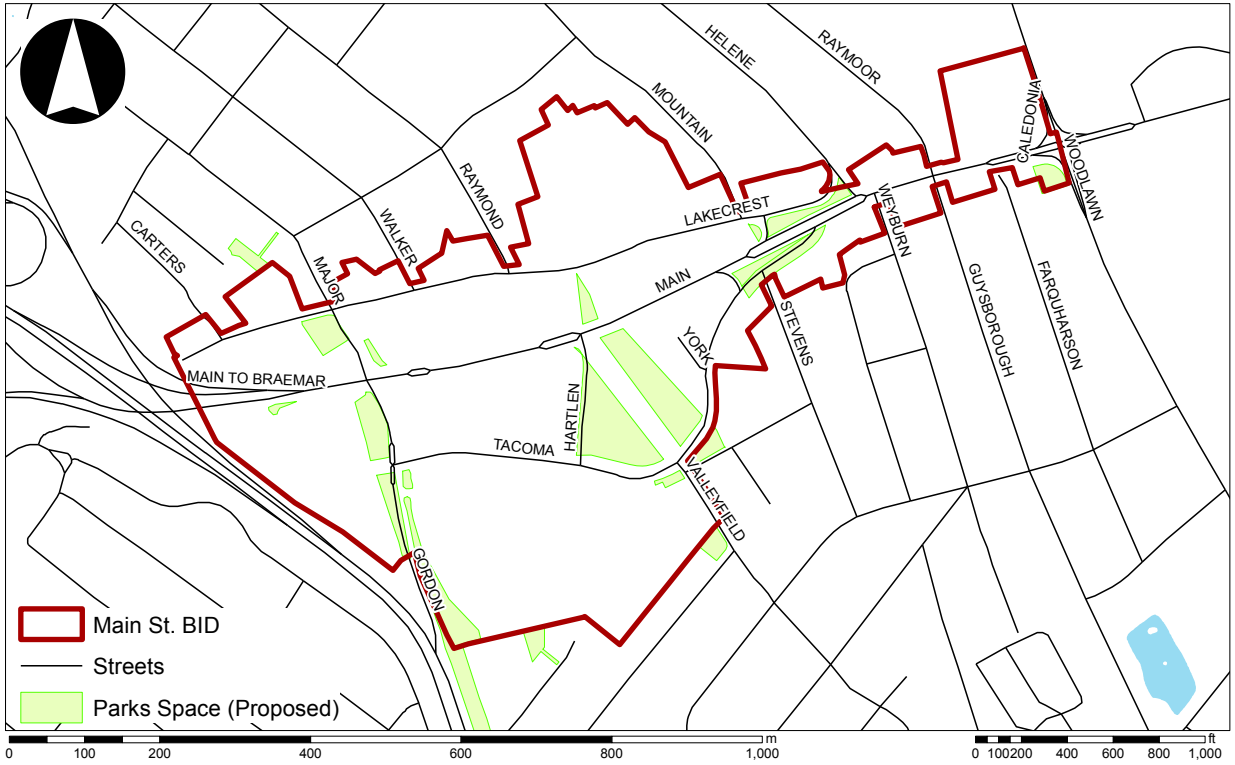


Figure 52: Proposed park spaces to meet open space requirement for conservative population estimates

Introduction

Site Background

The BID's steep terrain and varying slopes across the entire site. Slopes create accessibility and construction challenges, provide opportunities to make creative, unique spaces that are interesting enough to attract visitors. We recommend that park designs of the BID take advantage of the steep slopes. The existing pocket park between the top of Lakecrest Drive and Main Street is an example of a park space with a steep slope that we envision putting to use (see Figure 53).

Figure 53: Pocket park between Lakecrest Drive and Main Street with a steep slope.

Image Source: Photography by Sara Jellicoe

Concept Design

The slopes could be used to make a space playable by adding features like a slide (Figure 54). Play areas encourage families with children to spend time in public spaces, increasing community interaction. Later in this report, we propose converting the top end of Lakecrest into a lane way with no access to Helene, which would make the pocket parks in Figure 53 a safer place for children to play.

Figure 54: Simple Playground Slide Made Using Natural Hill and Surrounded by Local Plants

Source: http://img.weixinyidu.com/150720/79f07f5c.jpg

Schematic Design

Slopes can also be used to create interesting seating options (Figure 55). This example is still a form of primary seating, preferred by seniors (Gehl, 2010), but is also more interesting than traditional bench designs.

Implementation

The steep slopes could be used to make interesting and attractive stair or step paths. Figure 56 shows how this could be done along with some natural gardens and landscaping.

Figure 55: Stone bench built into hill-side with landscaping surrounding it.

Source: http://www.wickistone.com/rock-water_landscape_profile.html

Figure 56: Landscape stone staircase built into natural hillside

Source: http://www.homeest.com/photo/2014/07/18/meEST_1405623319_1031.jpg

Figure 57: Stone steps and stone retaining wall built into hillside
Image Source: http://stoneandturf.com/build-a-bench-or-stairs-out-of-stones-and-rocks/

Figure 79 shows a smaller version of a similar intervention. These features incorporating the natural space could also be an example of what the BID could do to create some variety with the many retaining walls found throughout the site: a dry-stacked stone wall with a small step looks attractive, and provides pedestrians with a slightly more accessible route than a typical retaining wall.

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Implementation

On flatter, gentler slopes, we recommend adding public art pieces (See Figure 58). We recommend these pieces be made of durable material that will survive the wide range of local weather. Art pieces can serve multiple purposes, for example, the art piece shown in Figure 60 is not only visually appealing but also useful as shelter and bike parking.

Public art pieces that use landscaping and gardening as their medium, like mazes, can create a community activity (See Figure 59). Areas that provide shelter, like gazebos, are also helpful in our local climate. Shelters can be simple yet attractive.

Figure 58: Durable, simple public art piece that could fit in long flat sections of pocket parks
Source: https://commons.wikimedia.org/wiki/File:At_The_End_Of_The_Tunnel.jpg

Figure 59: Garden Mazes
Source:http://www.stravaiging.com/photos/albums/buildings/houses/Pollok%20House,%20Lanarkshire/IMG_9018.jpg

Figure 60: Bike Parking, Shelter, and Public Art Piece
Source:http://www10.aeccafe.com/blogs/arch-showcase/2012/04/12/pasadena-bike-transit-center-in-los-angeles-california-by-peter-tolkin-architecture/

Cyclist Infrastructure

To meet the BID vision elements of accessibility, convenience, responsible environmentally sustainable development, and cyclist friendly design, we recommend bike lanes along the cycling routes through the BID, and intersection treatments that enhance cyclist safety at streets with high volumes of traffic.

Lane Width

Dedicated bike lanes will improve the level of mobility throughout the community and help form connections throughout the site and with surrounding areas. HRM Municipal Design Guidelines (2013a) require marked bicycle lanes to be a minimum of 1.5m in width, with optimal bicycle lane infrastructure set at 1.8m in width. We recommend that where possible, a 1.8m bike lane be installed.

Painted Lanes

Two types of dedicated bike lanes have been recommended. The first is an unprotected bike lane, meaning cyclist have their own painted lane on the street but there is no physical barrier between them and automobile traffic. Unprotected bike lanes are appropriate for streets with moderate traffic volumes and speeds. The National Association of City Transportation Officials (NACTO) recommends the use of unprotected bike lanes on streets that have traffic speeds between approximately 40km/hour and 55km/hour (2014).

Protected Lanes

The second type of bike lane used is a protected bike lane, which has a physical barrier between cyclists and automobiles. Protected lanes are more desirable than unprotected bike lanes on high traffic streets (NACTO, 2014). When locating bike lanes on streets with traffic speeds greater than 55km/hour, NACTO recommends considering protected bake lanes be installed (2014).

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Implementation

Bike Boxes

We recommend bike boxes for routes at intersections with Main Street. Bike boxes reserve a space in front of the left-most vehicle lane and allow cyclists to move through intersections first. According to the NACTO, intersections with bike boxes require the following infrastructure:

1. differentiated box that is at least 3 metres deep (deeper boxes prevent cars from stopping on the bike boxes),
2. “No Turn on Red” signage,
3. stop lines for vehicles at least 2.4 metres from bike box, and
4. cyclist symbol inside bike box (2014). Bike boxes are appropriate at intersections with high volumes of bike and/or automobiles (NACTO, 2014).

Cycling Crossing Marks

Another priority cycling measure for intersections on Main is intersection cycling crossing marks (see Figure 61). These lanes help inform drivers of the presence and rights of cyclists at intersections. NACTO (2014) identifies a dashed outline for such interventions as the minimum requirement, with a painted line of at least 6 inches wide between cyclists and vehicular traffic on the left. To increase the visibility of these crossing marks, the BID could use colored pavement, chevrons, giant dashes, or a combination of the cyclist symbol with any of these suggestions (NACTO, 2014).

Figure 61: Bike Boxes & Cycling Lanes in Intersection
Image Source: http://nacto.org/publication/urban-bikeway-design-guide/intersection-treatments/bike-boxes/

Table 7 summarizes how these Site-Wide design recommendations align with the Design Principles.

Principle	Sidewalk Width	Pedestrian-Scale Lighting	Pedestrian Crossings	Cycling Lanes & Intersection Treatments	Stormwater Management Strategies	Traffic Flow	Vehicle Lane Widths
Public Infrastructure Quality							
Walkable	√	√	√			√	√
Accessible	√	√	√	√		√	
Engaging		√	√		√		
Convenient	√		√	√		√	
Interaction	√	√					
Community	√	√	√		√		
Responsible Development				√	√		
Public Infrastructure Component							
Green Space					√		
Cyclist-friendly				√			
Public Transport							√

Table 7: Schematic Design checklist evaluation

Site Specific Recommendations

In this section we recommend interventions for specific locations in the Main Street BID. Streetscape drawings detail the public right of way and also portray the maximum possible height and step-backs of buildings on the private land fronting the streets based on the Land Use Bylaw (HRM, 2015e).

Cycling Network

Figure 62 shows our recommended bike routes based on the Green Network Map (HRM 2015b), Main Street Transportation Study (GENIVAR, 2011), Ekistics's Main Street Dartmouth Plan (2007), public consultation data and site visits. Project locations are numbered in Figure 45 corresponding to the following descriptions. Instead of forming a cycling loop around the village centre like the Ekistics plan, we recommend cyclists bike through the study area using Hartlen Street. We recommend that the primary bike routes for the study area include Lakecrest Drive, Hartlen Street (realigned), Main Street and Valleyfield. These bike routes should connect to existing bike lanes on Braemar Drive and Grahams Grove, and Main Street east of Woodlawn Road.

1. Bike route on Lakecrest

We recommend that the major function of Main Street continues to be the movement of automobile. HRM has identified Lakecrest Drive as a location for a cycling connection between Main Street east of Caledonia and Waverley Road. $20,000 was allocated for design of the bikeway in the 2014-2019 Making Connections Active Transportation Plan for HRM (HRM, 2014a). Based on previous studies and public consultations (Ekistics Planning & Design, 2007; Genivar, 2011), we recommend that Lakecrest Drive should be the key active transportation link in the study area (also see Figure 63).

2. Bike route from the west end of Lakecrest to Lake Mic Mac

Previous studies have suggested creating a connection from the end of Lakecrest Drive to Braemar Drive to improve cycling connectivity in the study area (Ekistics Planning & Design, 2007; Genivar, 2011). The construction would require two steps (Ekistics Planning & Design, 2007). First, a bike route alongside the slope which runs adjacent to Carters Road needs to be built. This can be done without property acquisitions, but will require some retaining walls and coordination with the Provincial NSTIR. Second, the slip lane to Braemar Drive needs to be removed (needs approval from the Province) and a right turn lane should be built at the existing lights at Grahams Grove. Traffic coming off the Highway 111 entering onto Braemar Drive is often traveling in excess of 100km/hr and a bike route in this location would be extremely dangerous. This allows the bike route to cross at an existing crosswalk at a lit intersection (Ekistics Panning & Design, 2007).

Figure 62: Proposed Bike Network
Image Source: adapted from Google Maps, 2016, by Mia Feng and Kaitlyn Walker

Appendix F shows an alternative connection between Lakecrest Drive and Braemar Drive. Bike routes are suggested on Raymond Street and Maple Street. Residents from the public consultation session reflected that the topography at the intersection of Raymond Street and Maple Street is not convenient for cycling. Although this option is less costly and complex, we recommend the bike routes shown in Figure 62.

3. Bike route from the east end of Lakecrest to Main Street east of Woodlawn Road

We propose a new intersection at the east end of Lakecrest Drive. The intersection requires visibility improvements and infrastructure upgrades to support pedestrian and bicycle traffic. The bike route on Lakecrest Drive will continue on Main Street east of Woodlawn Road and connect with the existing bike route (See Figure 62 above and Figure 63).

4. Bike route past transit hub

We recommend future bike routes on Hartlen Street (realigned with Valleyfield Street) and Valleyfield Road, which will connect with the proposed bike routes in the neighbourhoods to the south of the study area (See Figure 63). This allows cyclists from within or near the site more accessible routes to the “Village Centre” and transit hub (See Figure 42 above).

5. Bike route linking study area to the Grahams Grove area and the Trans Canada Trail

Linking neighbourhoods to the west of the study area to the site is challenging due to the existing Circumferential Highway. There are two existing pedestrian overpasses to the west and southwest end of the study area (one with stairs and the other with no stairs) (See Figure 62). According to the public consultation data, cyclists currently use the pedestrian overpass to the west of the study area to get to Prince Albert Road. The Main Street Transportation Study suggests creation of a multi-use trail that facilitates two-way pedestrian and bicycle traffic utilizing the pedestrian overpass to the west of the study area (Genivar, 2011). Based on our research, only by expanding the west end of Main Street or reducing the number of traffic lanes could the suggestion be implemented, although future review of the possibility is recommended. We instead recommend a bike route on the pedestrian overpass to the southwest of the study area connecting two local streets: Oakwood Avenue and Harris Road (See Figure 63).

Figure 63: HRM Future Greenway Network
(Figure adapted from Halifax Future Greenway Network Map, HRM, n.d.)

Lakecrest Drive Streetscape

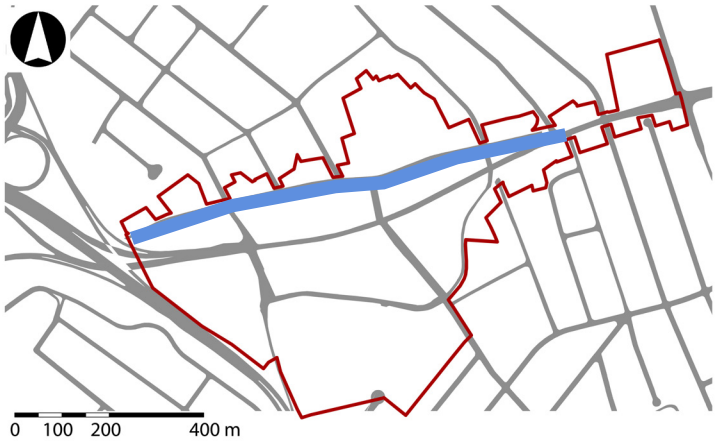

Figure 64: Lakecrest Drive Location
Image Source: adapted from HRM Corporate Dataset (HRM, 2012)

Based on previous studies and public consultations (Ekistics Planning & Design, 2007; Genivar, 2011), we recommend that the major function of Lakecrest Drive be a key cycling linkage in the study area, where cyclists are the first priority.

The current zoning along Lakecrest Drive is mostly residential (see Figure 37), with a few commercial uses on the south side of the street. Amendments to local zoning in 2013 allow for dense residential development (especially R-3), and encourage more commercial development through development permits; these changes will bring more residents and more businesses to the area. Lakecrest Drive will be more populated, and traffic volumes will increase. The existing width of Lakecrest Drive is about 18m to the west end, and becomes gradually smaller towards the east end, where it is about 15m, and is where more commercial activities occur. Thus, we developed two street cross sections along Lakecrest Drive (See Figures 65 and 66). The only difference is the width of the furnishing zone.

We recommend preferred 1.8m bike lanes on Lakecrest, drive lanes and sidewalks as recommended in the Site-wide Recommendations section, and a furnishing zone for the remaining available width of the street.

Lakecrest Drive is wide enough to accommodate bikes along both sides of the street. In order to ensure the priority and safety of cyclists, we recommend dedicated bike lanes. As a collector, Lakecrest Drive's traffic volumes are lower than Main Street, and narrowing car lanes to 3m helps to reduce traffic speeds

(see Site Wide Recommendations). Since traffic volumes and speeds are lower than Main Street, we suggest no bike lane buffers on Lakecrest Drive. On the wider end of Lakecrest Drive where there is a wider furnishing zone, we recommend incorporating more landscaping features and street furniture such as bike racks and benches. On-street parking can conflict with bike lanes and increase hazards for cyclists (Institute of Transportation Engineers, 2010) and the 2011 Transportation Study found that on-street parking in the Main Street Area is vastly under-utlized (GENIVAR, 2011) , so no on-street parking is proposed for Lakecrest Drive.

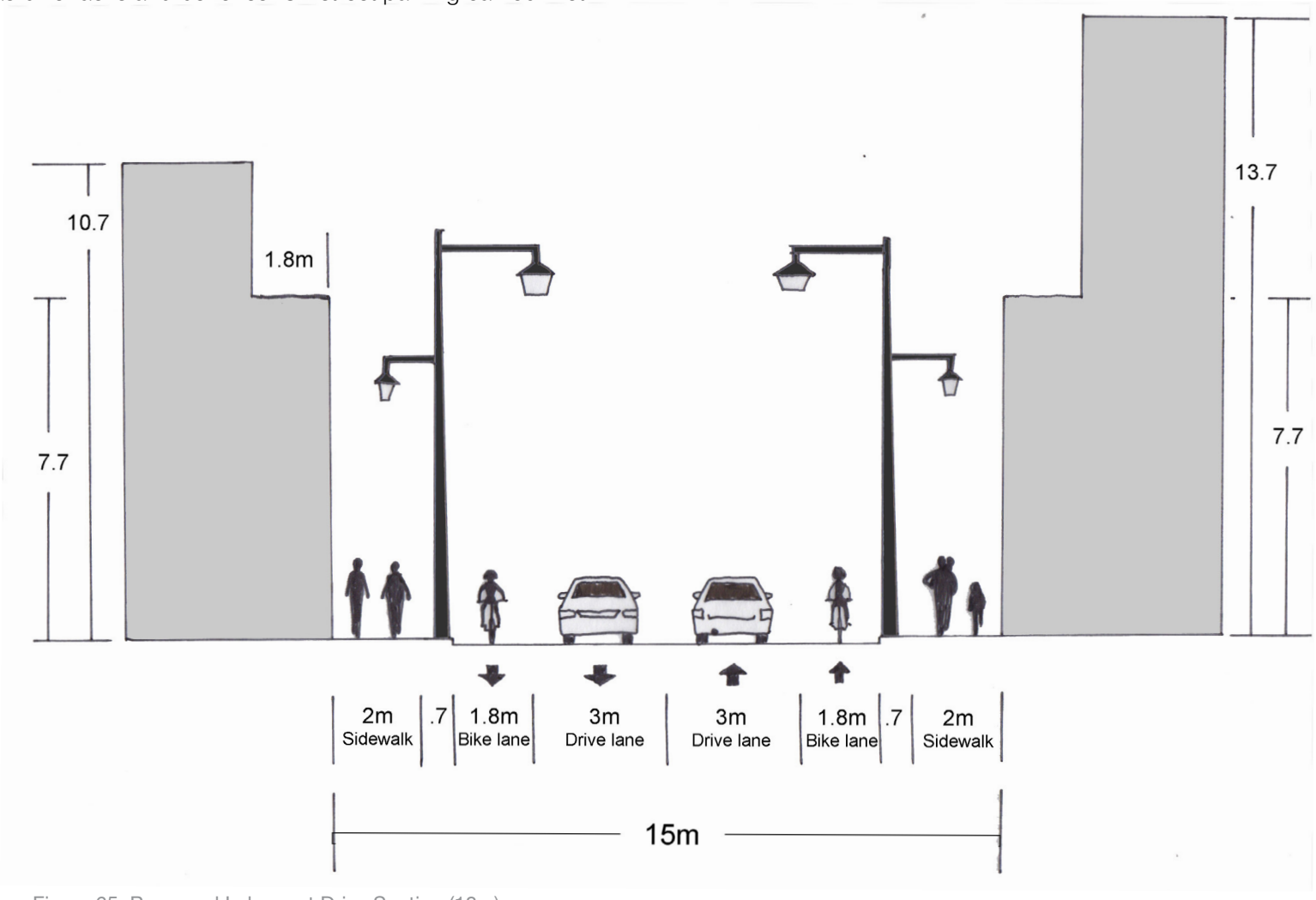

Figure 65: Proposed Lakecrest Drive Section (18m)

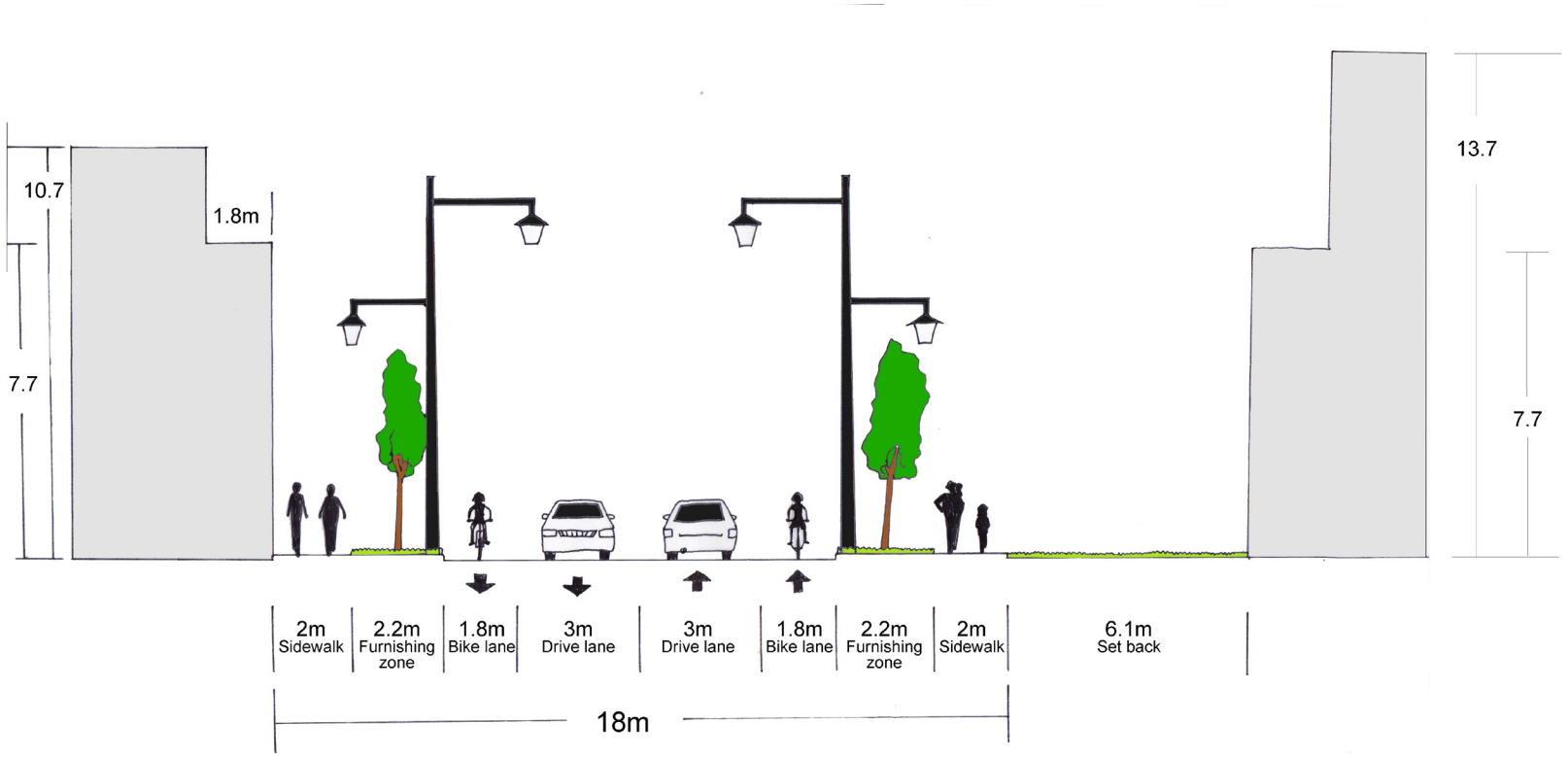

Figure 66: Proposed Lakecrest Drive Section (15m)

Main Street Streetscape

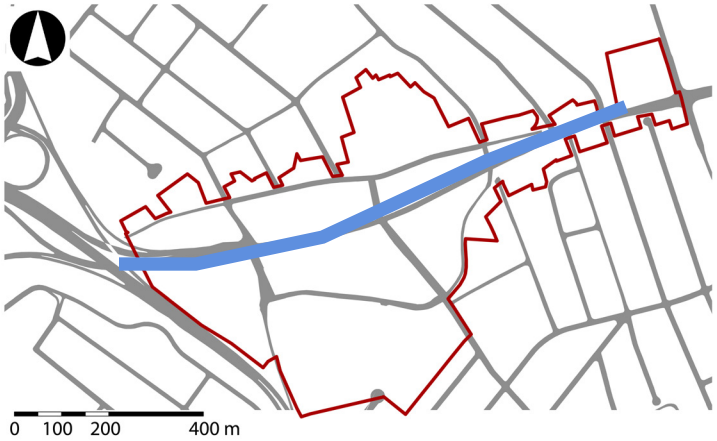

Figure 67: Main Street Location
Image Source: adapted from HRM Corporate Dataset (HRM, 2012)

As currently designed, Main Street is the primary vehicle thoroughfare in the BID. Its high vehicles per day provides customers to business and acts as an important vehicle link to the surrounding area. We therefore recommend that the major function of Main Street continues to be the movement of automobile. Our overall goal for Main Street is to obtain a better balance of pedestrian and automobile space and infrastructure, while maintaining current automobile flows. Typically arterial roads have high traffic volumes, between 20,000 and 40,000 vehicles per day (e.g. City of Toronto, 2016). At volumes above 30,000 vehicles per day people are less likely to stop their vehicles and visit businesses (Ekistics, 2007). This means that Main Street's current volumes of about 34,000 (GENIVAR, 2011) are close to ideal, but are beginning to be so high as to create expressway-like conditions where people driving are less likely to stop and shop. Main Street's traffic volumes should not be encouraged to increase any further, and ideally should be reduced very slightly to closer to 30,000 vehicles per day.

As one of the current concerns on Main Street is pedestrian safety, we recommend clearly defining the Village on Main as a pedestrian-friendly space. Prominent gateways on each end of Main Street will help to inform drivers that they are now leaving a highway space and entering a 'Village'. The recommended lane widths of 3 and 3.4 metres will further reinfroce the contrast between Main Street and the highway. We also propose the expansion of the central median. Medians can take the form of pavement markings or raised curbs with landscaping. Raised medians have the ability to calm traffic and provide aesthetic benefits (City & County of San Francisco, 2015). Medians can also hold stormwater management infrastructure (See Stormwater Management Section above for more information) when they are wider than 0.9m (3ft) (City & County of San Francisco, 2015).

Driveways and Midblock Crossings

Currently, most of Main Street has a central turning lane so the many driveways along Main Street can be easily accessed by drivers travelling in either direction. We propose that future development reduce the number driveways present along Main Street so both pedestrians and vehicles are able to move more efficiently. Spacing out and locating driveways away from intersections minimizes effects on traffic operations, the

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potential for crashes, and pedestrian vehicle conflicts (Institute of Transportation Engineers, 2010). Consolidating driveways allows us to expand the central median (See Figure 68). The approximate intersection spacings on Main Street are seen in Figure 68.

Site Background

Recommended driveway spacing is 50m on roadways with 50kmph speed limit and Annual average Daily Traffic (AADT) of 2000 (South Carolina Department of Transportation, 2008). Halifax By-law S300 (Halifax Regional Municipality, 2012) does not permit driveways within 30m of a street intersection controlled by traffic signals.

Concept Design

The 2011 Transportation study (GENIVAR) recommended removing or consolidating as many driveways as possible in order to improve traffic flow through the Main Street Site.

Schematic Design

Implementation

Main Street (West of Hartlen)

Main Street (East of Hartlen)

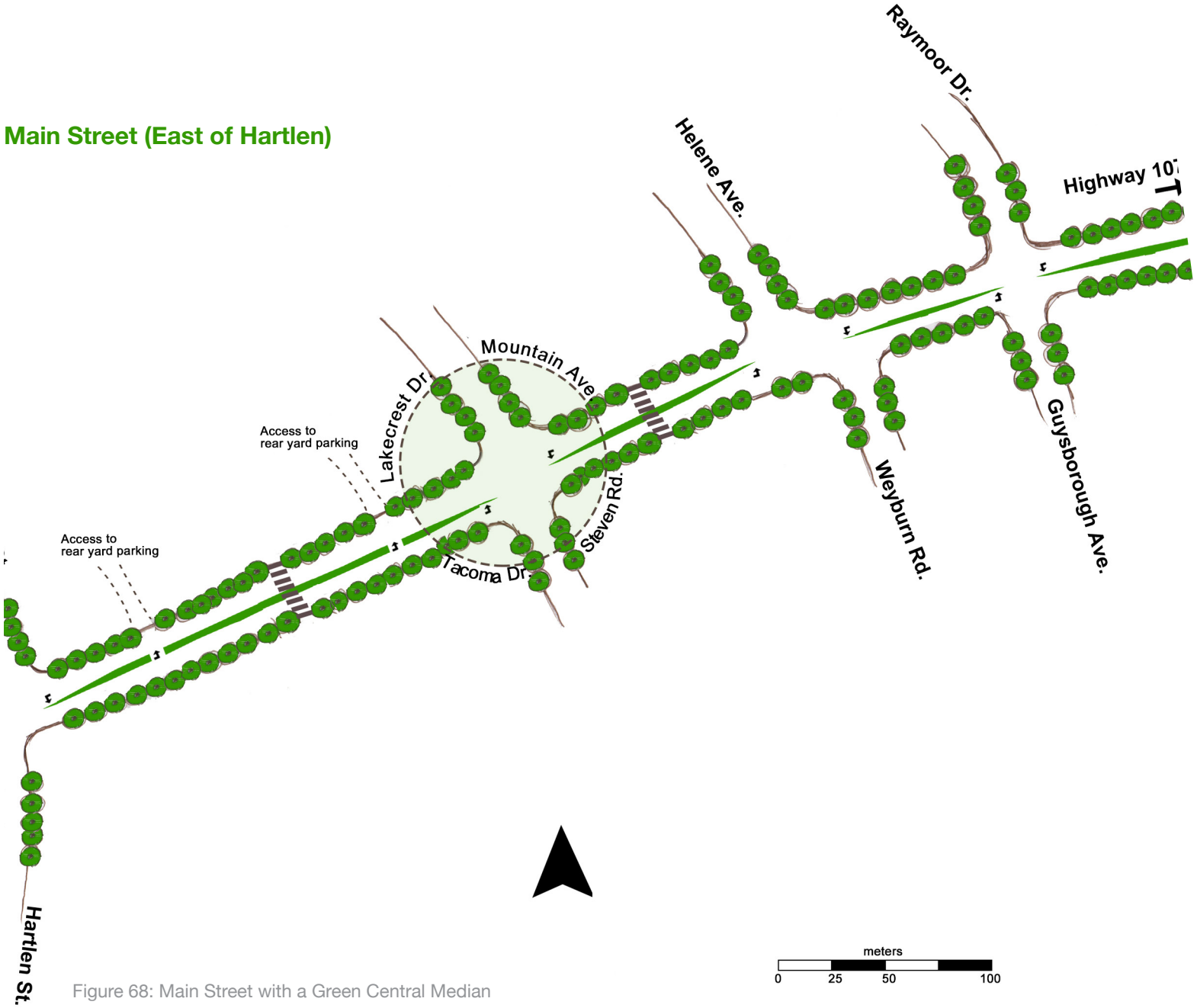


Figure 68: Main Street with a Green Central Median

220m

127m

120

Introduction

Site Background

Concept Design

Schematic Design

Implementation

Using recommended driveway spacing, the following shows the maximum number of driveways (spaced 50m from each other) which can be located between intersections (Figure 68):

- From Gordon to Hartlen: four
- From Hartlen to Tacoma: three
- From Steven to Helene, from Raymoor to Caledonia, from Gordon to Main Street west end: two
- Other intersection spacings: no driveways

The location of driveways is also influenced by the location of midblock crosswalks. Midblock crossings are usually not necessary due to short block lengths but may be considered where blocks are unusually long (greater than 122m) and there is a demonstrated demand to cross (Institute of Transportation Engineers, 2010). Based on the public consultation data and existing intersection spacing, midblock crosswalks between Gordon and Helene are recommended. Midblock crosswalks should be located at least 30m from the nearest side street or driveway so that drivers turning onto the major street have a chance to notice pedestrians and properly yield to pedestrians

Figure 69: Midblock crosswalk concept for Main Street BID (Institute of Transportation Engineers, 2010)

who are crossing the street (Institute of Transportation Engineers, 2010). We recommend that midblock crosswalks are located no greater than 60m to 90m apart (Institute of Transportation Engineers, 2010; NACTO, 2013).

Figure 68 shows the proposed location of driveways and midblock crosswalks on Main Street, as well as the driveway access to rear yard parking in the future. Ideal intersection spacing is 90-200m (Farr, 2008); however, the spacing between Gordon and Hartlen is about 260m. We recommend the driveway aligning with Walker Street be extended to Tacoma Drive and Lakecrest Drive in the future.

Figure 70: Crosswalks with alternate paving materials (Institute of Transportation Engineers, 2010)

As noted in Site-Wide Recommendations, on Main Street we recommend 2m sidewalks, a furnishing zone for trees, benches, planters, and other pedestrian amenities and special paving at pedestrian crossings along Main Street (See Figure 69). Properly designed and visible midblock crosswalks, signals and warning signs warn drivers of potential pedestrians, protect crossing pedestrians and encourage walking in high-activity areas (Institute of Transportation Engineers, 2010). Figure 69 and 70 show some examples of protected midblock crosswalks. High quality pedestrian space will attract more foot traffic to the area creating an economically vibrant community (NACTO, 2013).

Main Street West of Hartlen

We have identified two distinct parts along Main Street. The first part stretches from Highway 111 to Tacoma Drive (See Figures 70 and 71). This part has approximately a 24m right of way. We recommend a 2m pedestrian throughway, a 2.1m furnishing zone, a 3m central median with breaks for left hand turns when needed, a 3m inside drive lane, and a 3.4m outside drive lane, to accommodate buses.

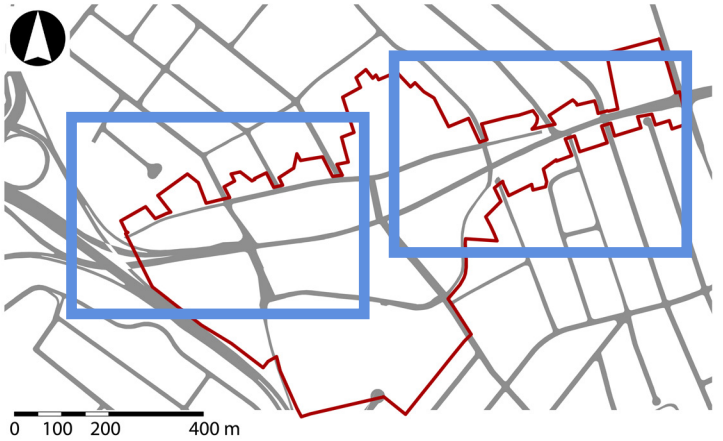


Figure 72: Main Street distinct parts.
Image source: adapted from HRM Corporate Dataset (HRM, 2012)

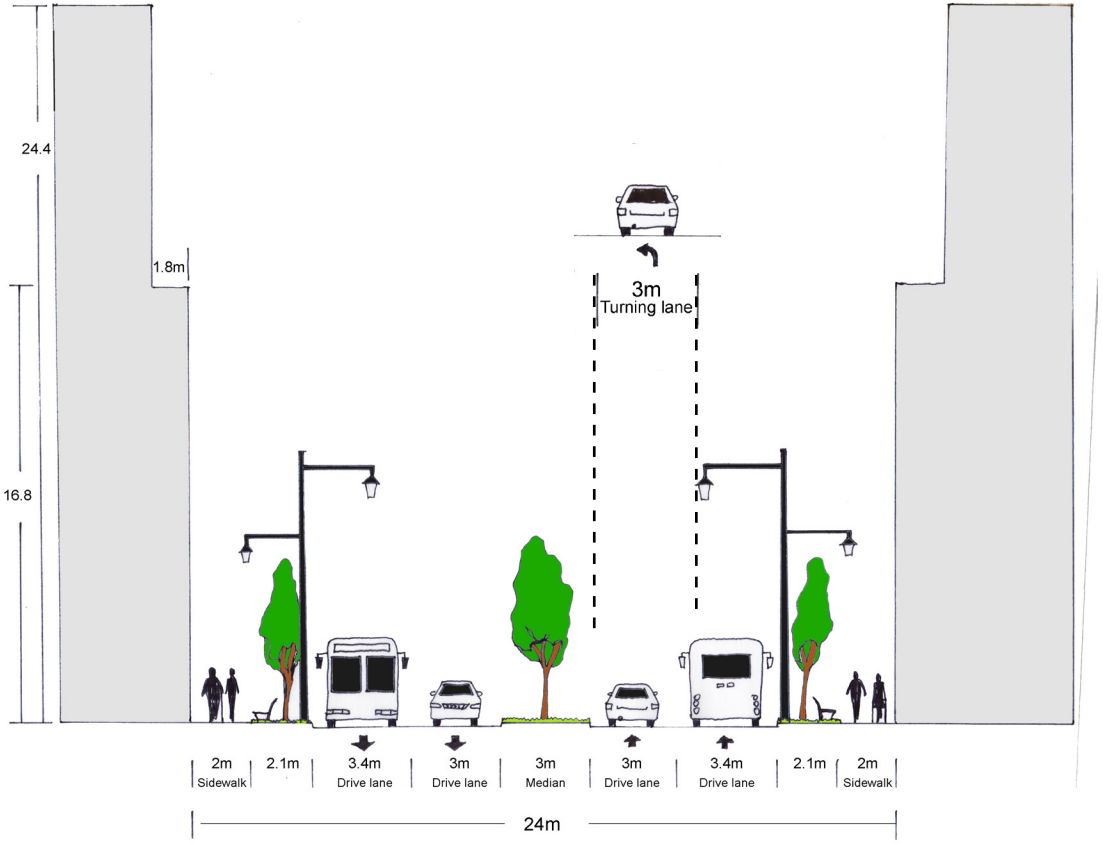


Figure 71: Main Street Section with Median (from Highway 111 to Tacoma Drive)

Main Street East of Hartlen

The second section of Main Street is Tacoma Drive to Woodlawn Road. This section of Main Street will have a dedicated bike lane that connects the existing bike lane on Main Street to a recommended bike lane on Lakecrest Drive (See Figure 65).

We may need to acquire approximately 1m of additional Right-of-way to achieve this design. We recommend a 2m pedestrian throughway, a 0.6m furnishing zone, 1.5m bike lanes, a 0.6m bike lane buffer, a 3m central median, with stormwater management features that stop to allow for a left turn lane at intersections, 3m inside lanes and 3.4m outside lanes.

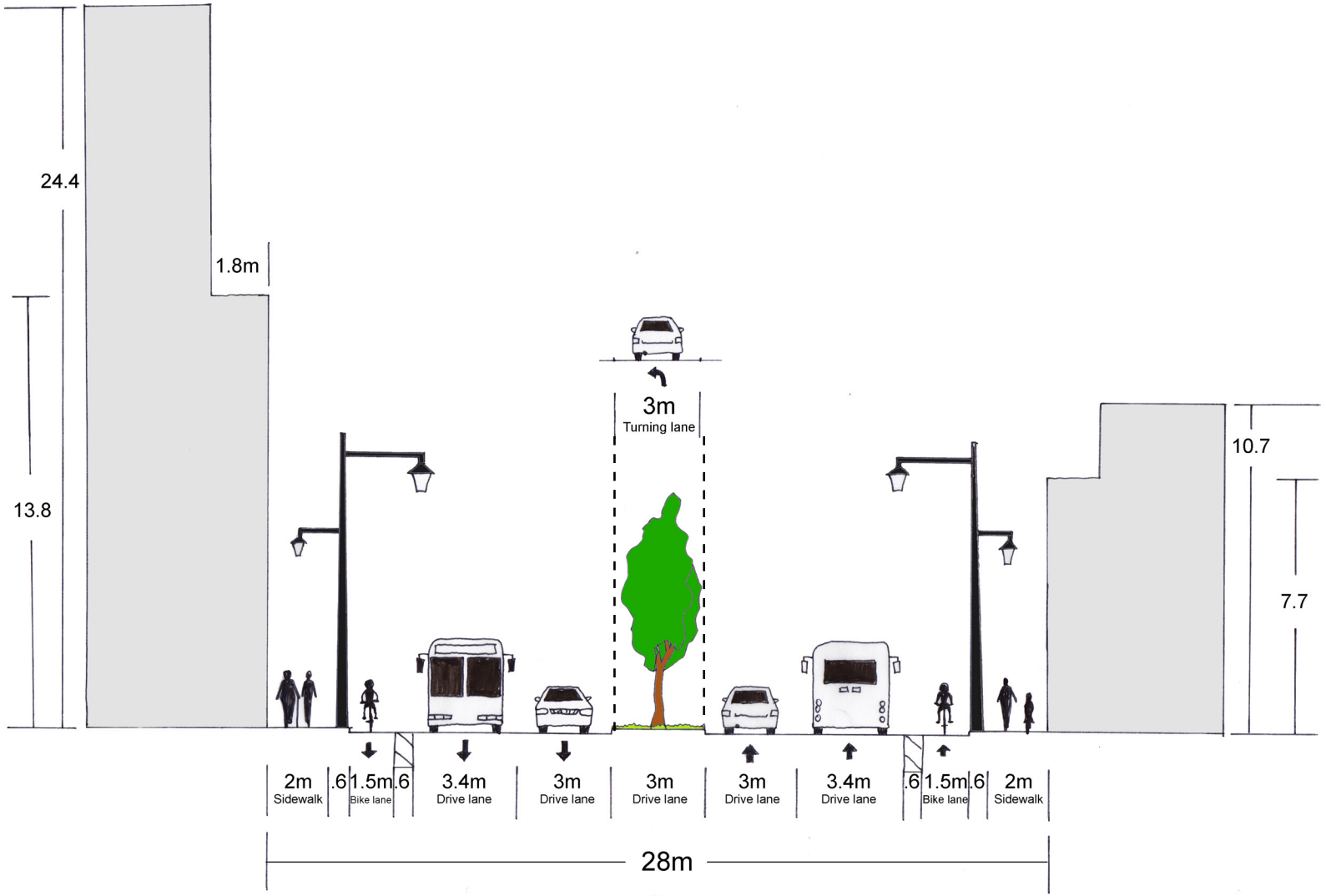


Figure 73: Main Street Section with Turning Lane (from Tacoma Drive to Woodlawn Road)

Main/Tacoma Intersection

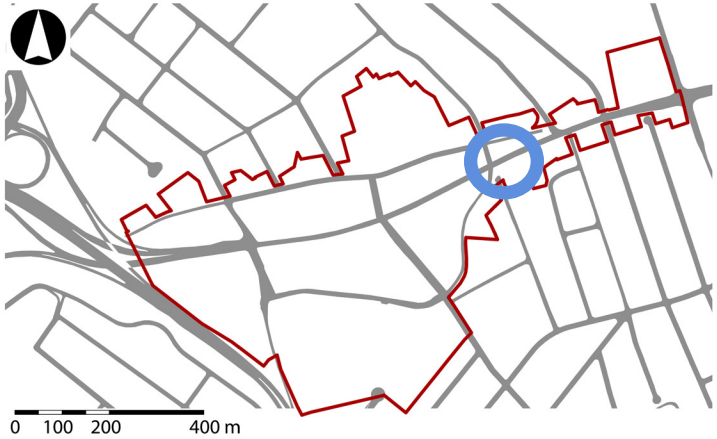


Figure 74: Location of Tacoma/Main Intersection
Image Source: adapted from HRM Corporate Dataset (HRM, 2012)

HRM is now pursuing a detailed traffic study of the intersection of Tacoma Drive and Main Street (Garnet, M., personal communication, February 3, 2016). Currently, the intersection is confusing for walkers, cyclists, and motorists. The Transportation Study (GENIVAR, 2011) and Ekistics (2007) made slightly different suggestions to improve the intersection; we considered their ideas in developing this suggestion how to address this location in the BID.

Our design expands on that proposed by Ekistics (2007) and involves removing Tacoma Drive's extended on ramp onto Main Street and replacing it with park land.

Detailed recommendations on intersection alignment, turn lane allocation, crosswalks, sidewalk bulb-outs, and wayfinding signage can be seen in Figure 75. Turn lane allocations are proposed as recommended in the Transportation Study of 2011 (Genivar).

Since Main Street has high traffic volumes, protection for cyclists is especially important. Crossing large intersections is particularly risky for cyclists, so two options are proposed to ensure their safety. One is solid painted lanes, with a two-stage turn queue bicycle box, which encourages cyclists to cross the intersection in a similar manner as pedestrians do, in two stages. The other is a bike box for a turn in one stage, as seen in Figure 76.

We recommend forming a cul-de-sac at the end of Stevens Road where it currently connects with Tacoma Drive in order to reduce traffic conflicts, as also recommended by the Ekistics 2007 plan. We recommend the end of Stevens Road be designed so that pedestrians and cyclists have through-access and provide the potential for longer term through access for vehicles based on future projected traffic volumes. In our plan Lakecrest east of Mountain Avenue is narrowed into a laneway for access by residents and fire trucks only, with no through traffic to Helene Avenue (a neighbourhood street to the east of Mountain Avenue). This prevents motorists from taking Helene, then Lakecrest as a shortcut to bypass Main Street.

Figure 75: Lakecrest Drive Extension Intersection

Along the extension of Lakecrest Drive, the street retains characteristics similar to the rest of Lakecrest Drive, with a total width of 18 metres, 3m motor vehicle lanes, generous sidewalks including a 1m furnishing zone, and designated bicycle lanes (see Figure 75). Unlike on Main Street, bicycle lanes are not buffered, as traffic volumes are lower.

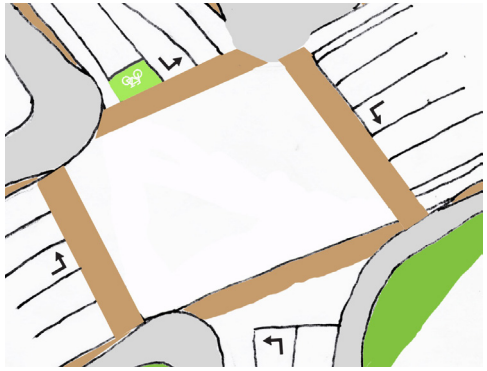


Figure 76: Alternate Bicycle Intersection Treatment

Hartlen Street Streetscape

Hartlen Street Extension

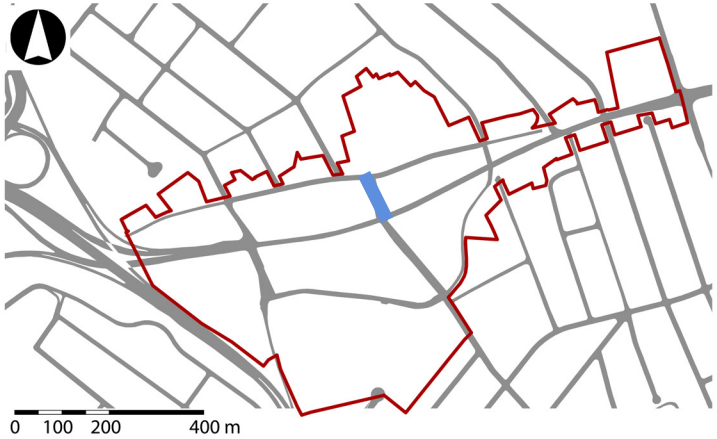


Figure 77: Location of Hartlen Extension
Image Source: adapted from HRM Corporate Dataset (HRM, 2012)

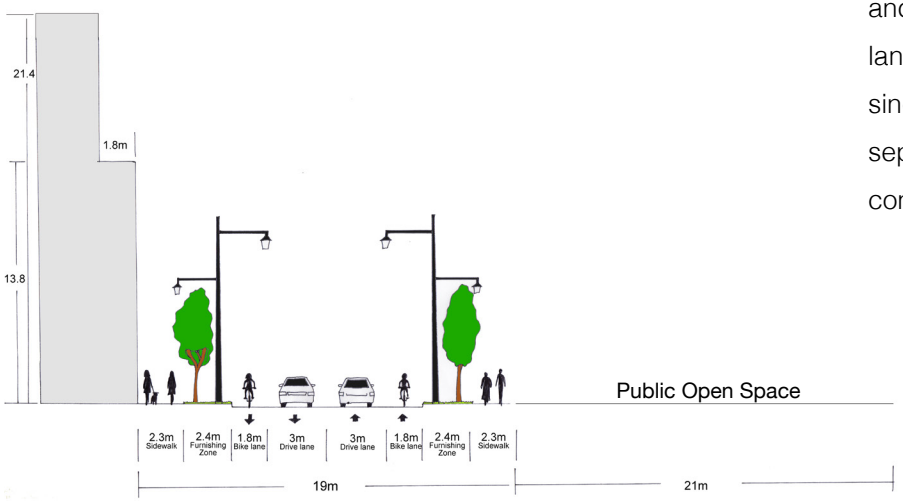


Figure 78: Section of Hartlen Street Extension's New Street Design
Image Source: Christina Wheeler, using www.streetmix.net

The HRM is working on purchasing two land parcels opposite Hartlen Drive on Main Street. The site is a significant opportunity to address the community's desire to improve connectivity by providing public access through the center of what is currently a "superblock" between Lakecrest Drive and Main Street. Part of the vision of an Urban Local Growth Centre as identified by the Regional MPS (2015) is to have "short interconnected blocks for ease of walkability" (P. 47). This policy direction supports the BID's vision of becoming more walkable and convenient (see Appendix D with Vision Content Analysis).

It will also provide an important cycling connection between the proposed AT route along Lakecrest Drive and our proposed Town Centre/Transit Hub location (see bike lanes in Figures 62 and 63). The new stretch of Hartlen will have dedicated bike lanes. Buffered bike lanes along this stretch are unnecessary since the anticipated traffic volume should be low; however, separated bike lanes will emphasize that this is a key cycling connection across the site.

Extending Hartlen Street creates two new intersections: one with Main and one with Lakecrest (see Figure 55). In our plan, each intersection includes pedestrian crosswalks differentiated by paving material and cycling

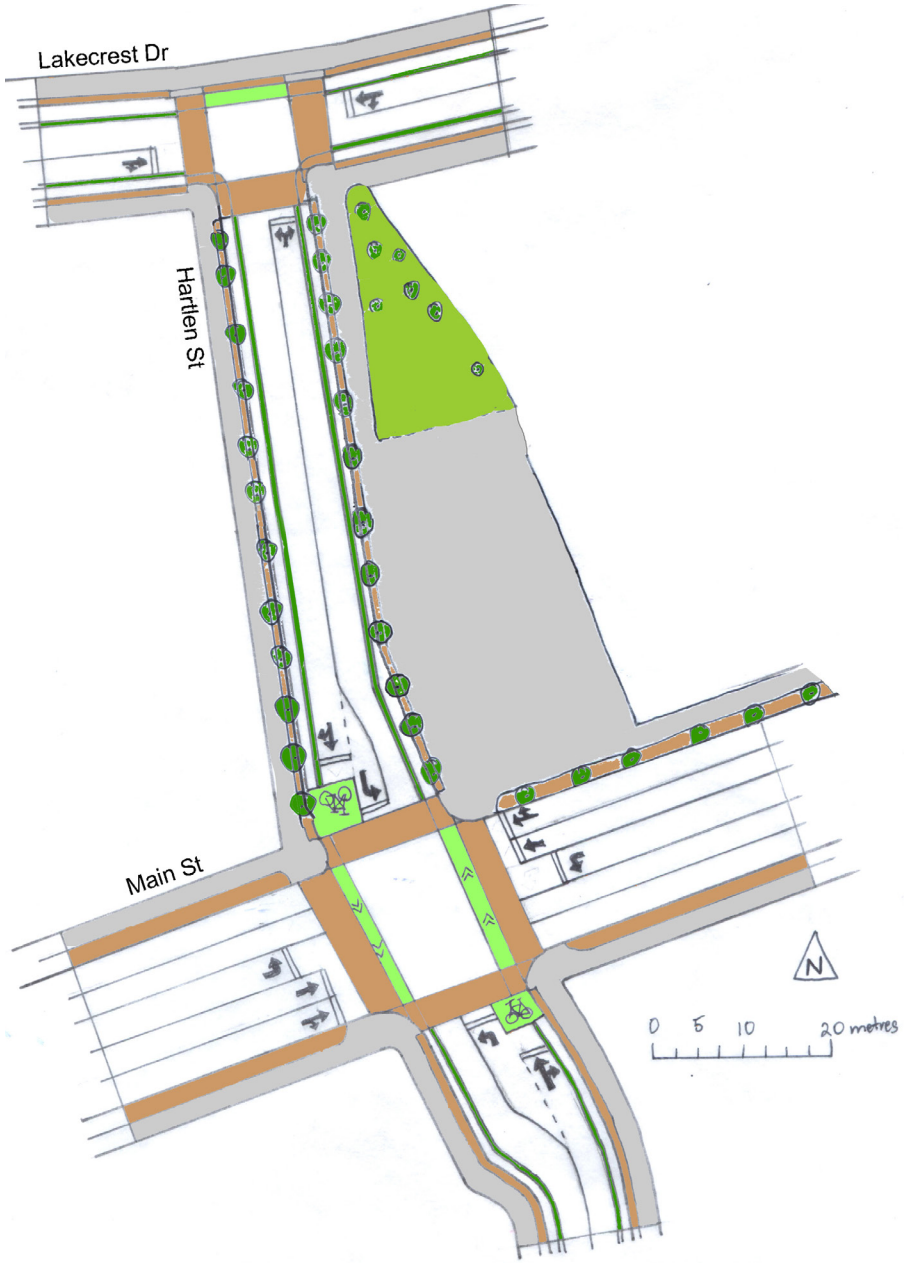


Figure 79: Plan of Hartlen St. Extension's New Intersections & New Street
Image Source: created by Christina Wheeler

crossings marked by paint. All vehicular lanes are reduced to the minimum possible width. The Main Street/Hartlen Street intersection will remain signalized. It will add bike boxes and painted cycling crossings to the intersection to give cyclists priority and an added feeling of safety when crossing this busy street. The existing intersection would be adjusted slightly toward the west to align with the new Hartlen road extension. The Lakecrest Drive/Hartlen Street intersection will become a three-way stop, which helps slow traffic on Lakecrest by adding a required stopping point.

Hartlen Extension Public Space

The land parcels being acquired for the Hartlen Extension offer a large amount of space: 40 metres at the widest point and 19 metres at the narrowest (Figure 79). We propose a consolidated open space on the east side of the parcels, with no driveway access along this portion of the street, as supported by our consultation sessions. Alternate proposals are found in Appendix E.

We recommend further consultation with the community to guide the design of the consolidated public space in the Hartlen extension. Here we provide public park and pedestrian plaza design ideas that could be considered for this future design.

Public Park Design Ideas for Hartlen Extension

The Hartlen Street Extension could incorporate open park space. Possible park components are shown in Figure 80 based on pocket park ideas presented in the Parks and Open Space section in the earlier General Design Recommendations part of the report. The lower part of the park in Figure 80 contains two major examples of features: a maze and a seating area made of a cluster of trees and inward-facing benches. A maze is a feature of interest that could draw in visitors while inward-facing benches encourage community interaction.

The upper part of the park in Figure 80 has a multi-use path lined with benches on one side and with tables and chairs on the other. There is an opportunity for businesses beside the park to have their stores front onto the space, perhaps as cafes with seating on open space. A playground may be a good option here to attract families with children to the community. It is also well-located for storm-water management techniques like rain gardens because the Hartlen Extension is located at the lowest area of the BID.

Figure 80: Park space design ideas for Hartlen extension
Image Source: created by Christina Wheeler

Plaza Design Ideas for Hartlen Extension

The available open space could also be used as a pedestrian plaza (we show an example of how this may fit in the space in Figure 79). New York City has many pedestrian plazas, one example of which is shown in Figure 81. Pedestrian plazas can be used for multiple purposes. They can be used as performance spaces for informal busking and can even enable more formal performances by providing a stage structure. Movable furniture, seen in Figure 81, helps space encourage interaction because people can change the position of seating which allows them to choose how they interact. Another advantage of mobile furniture is it can be moved aside when programs require open space, such as concerts or exercise classes.

Bollards are an important part of pedestrian plazas. They provide a protective edge to a space. People are naturally drawn to the edges of spaces because they provide an anchor point where they feel they can stay, watch what is going on, and not be in the way of others (Gehl, 2010). They can help pedestrians feel like they belong in a space. Bollards can also act as secondary seating (Figure 83), which refers to features designed to serve other purposes but that can act as seats, and help establish a community identity, as shown in the examples in Figures 82 and 83.

Figure 81: Gansevoort Pedestrian Plaza, NYC
Source: http://images.huffingtonpost.com/2014-10-19-2.jpg

Figure 82: Bollards in Bermondsey Square, London give the space a distinct identity.
Source:https://davisla.wordpress.com/2014/01/20/bermondsey-square-london-public-square/

Figure 83: Rough stone bollards in Duke of York Square, London can be secondary seating
Source:https://davisla5.files.wordpress.com/2014/01/duke-of-york-square-london-stone-block-bollard-seats-some-with-lighting.jpg

Transit Hub

We propose a transit hub for the BID on Hartlen Street, near the current location of a major bus stop (see Figure 85). (An alternative design we explored is in Appendix H.) For the near future, buses should maintain their current routing along Hartlen, with improvements made to all supporting infrastructure. The transit hub will be accessible by all forms of transportation, linking directly to the Hartlen extension through wide pathways and bike lanes. The transit hub would provide bus shelters, expanded public green space, and bicycle racks. The transit hub is close proximity to an excess of parking spaces (Sobeys and surrounding businesses parking lots). This location provides an opportunity to include park and ride in the excess parking as a viable option for commuters.

We recommend eventually realigning Hartlen Street to connect directly with Valleyfield Road. After realignment, the hub would move to this newly aligned street, keeping Hartlen Street as the main Transit corridor for the Main Street BID. The newly aligned street (See Figure 85) allows for additional green space and street trees, bicycle parking, wide pedestrian walkways and bike lanes protected from street traffic, bus lay-by lanes to allow for vehicle traffic to move past while buses unload/load, and additional space for potential expansion to a bus terminal in the future, if necessary.

Figure 84: Location of Transit Hub
Image Source: adapted from HRM Corporate Dataset (HRM, 2012)

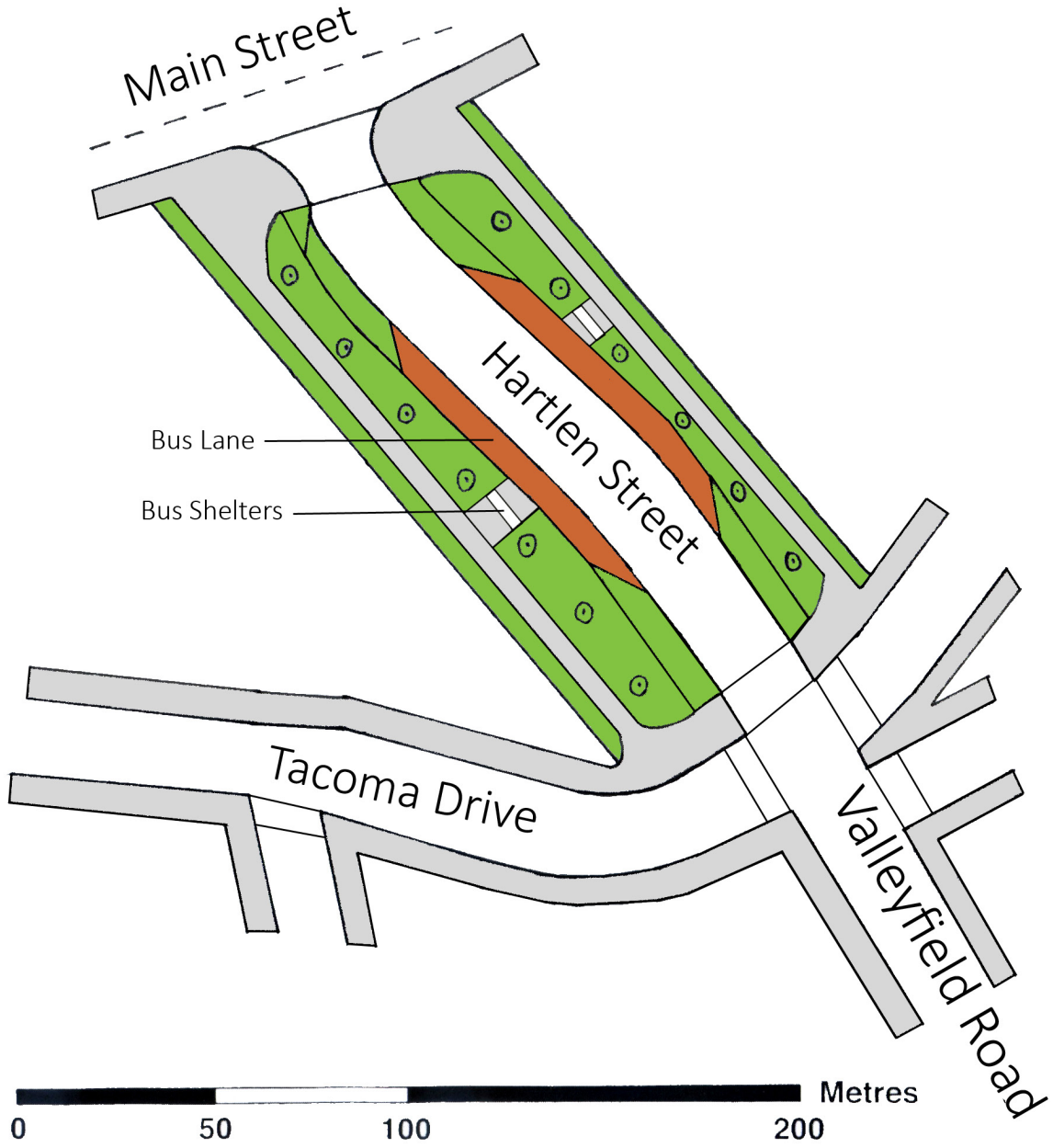


Figure 85: Hartlen Street Transit hub, multi-use path
Image by Dylan Smith 2016

Tacoma Drive Streetscape

An overview of Tacoma Drive is shown in Figure 86. In this concept a combination of formalized parking and parklets are installed on the south side of the street. Site-wide recommendations should be applied to all of Tacoma Drive including, sidewalks with a 2m pedestrian throughway and a furnishing zone, pedestrians lighting, stormwater management infrustructure, and street trees.

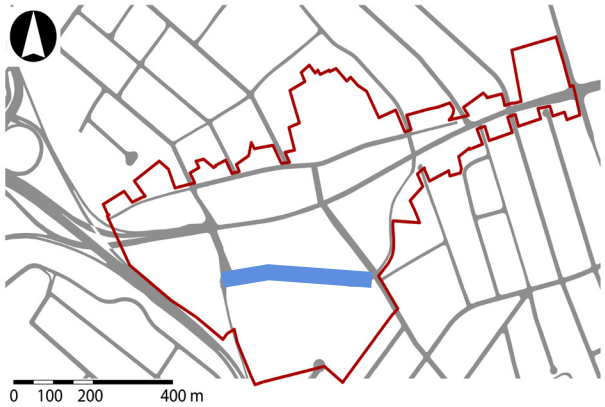


Figure 87: Location of Tacoma Drive
Image Source: adapted from HRM Corporate Dataset (HRM, 2012)

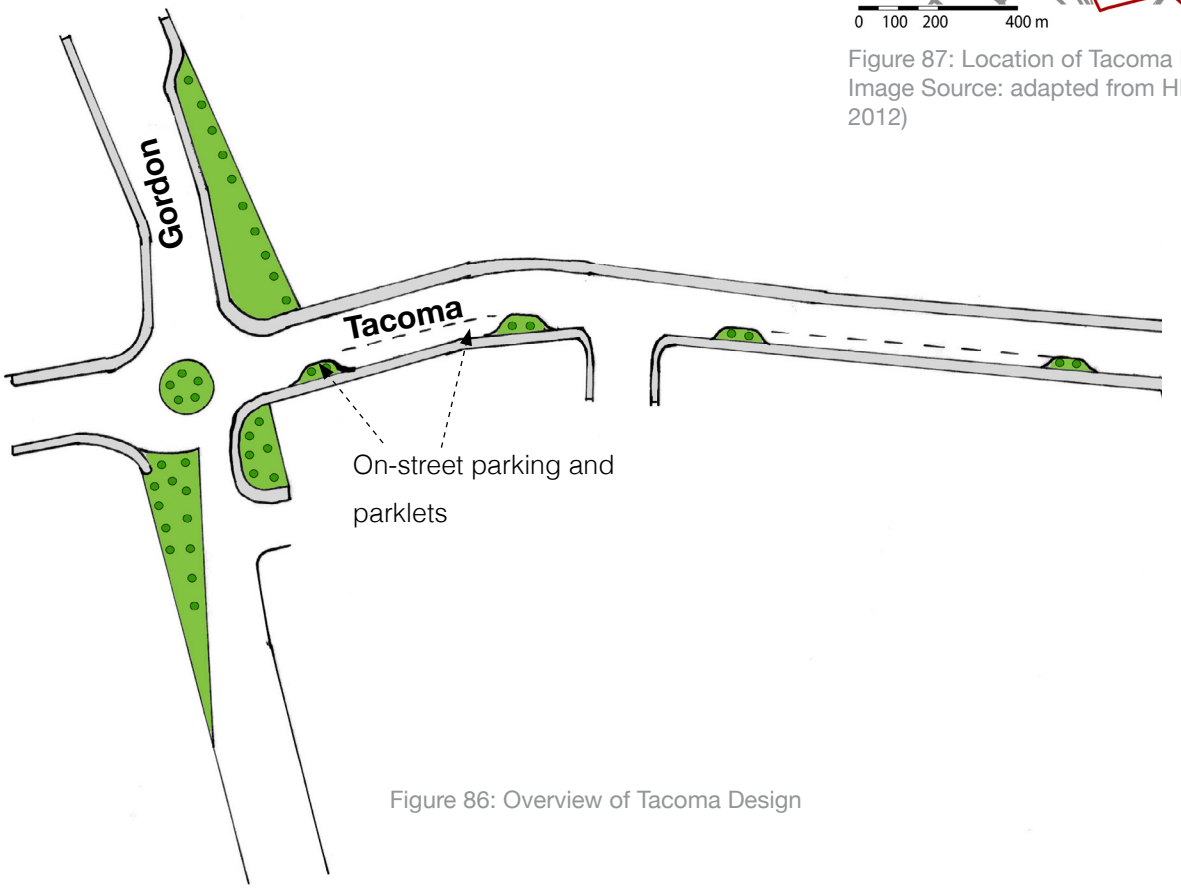


Figure 86: Overview of Tacoma Design

Streetscape design for Tacoma Drive is shown in Figure 87 and 88. A large sidewalk and generous furnishing zones are provided and all Site-wide Recommendations apply.

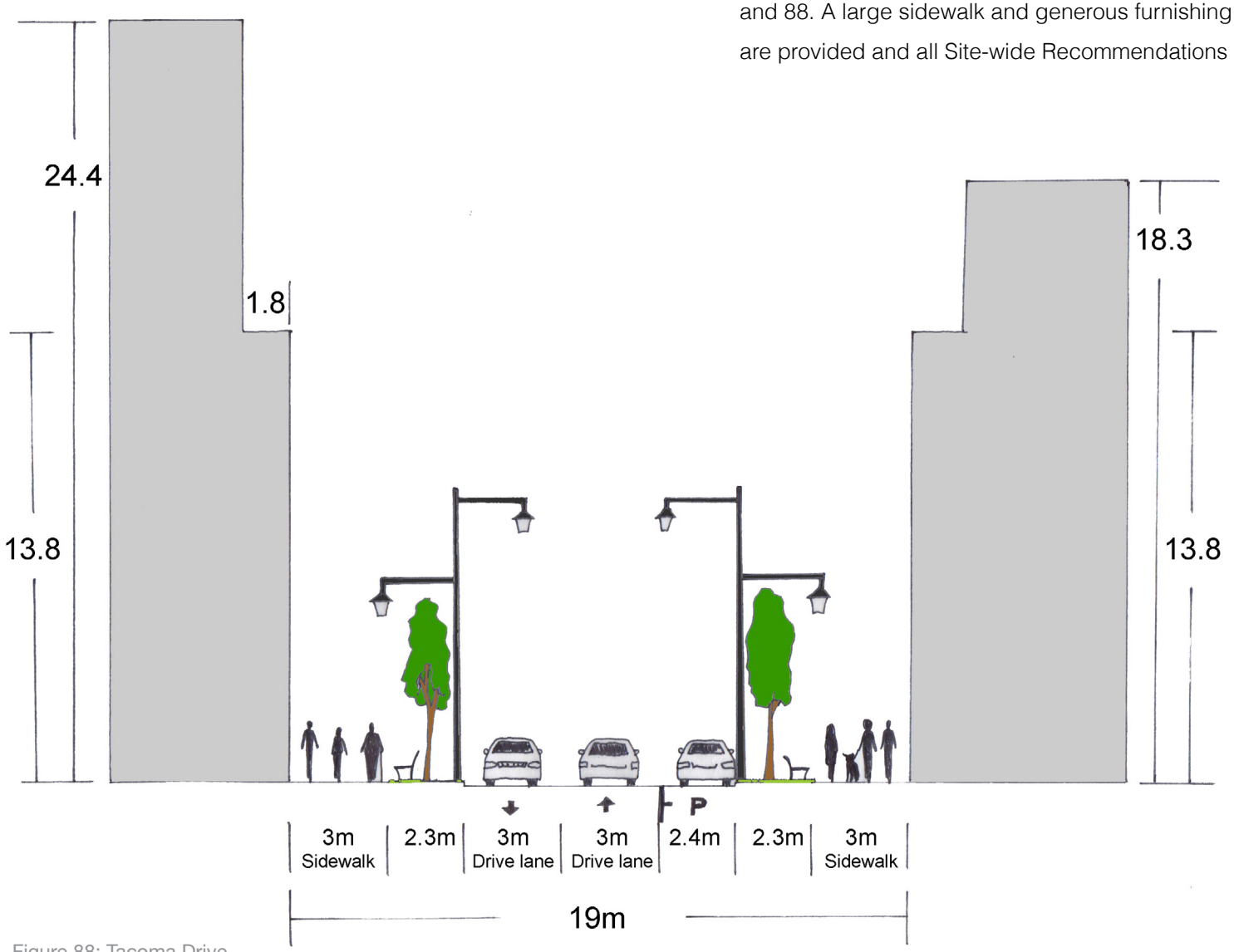


Figure 88: Tacoma Drive

Tacoma Drive / Gordon Avenue Intersection

The corner of Tacoma Drive and Gordon Avenue is an ideal location for a traffic circle, as identified in 2011 traffic study by GENIVAR. Rather than maintaining the current method of a four way stop, engineers predict a traffic circle will simplify the intersection, increase pedestrian safety, and improve traffic flow (GENIVAR, 2011). Under this method, the opportunity to use Gordon Avenue to enter the Sobey's parking lot will be removed, as no entry to Gordon Avenue south of Tacoma Drive will be allowed (See Figure 90). This will simplify the intersection and reduce the potential for additional pedestrian vehicles conflicts by eliminating traffic that cuts through both intersections. This design will also reduce traffic on Main Street and Tacoma Drive. An alternative 4-way stop option for the intersection is located in Appendix I. Sidewalks are added to the west side of Gordon Avenue (see Figure 89).

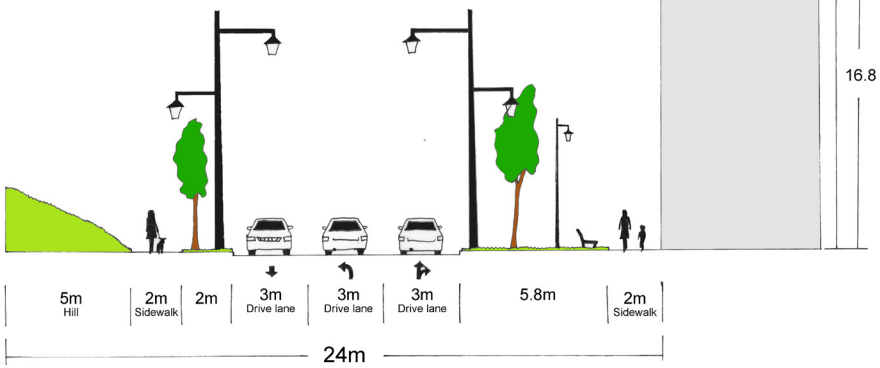


Figure 89: Gordon Avenue street section

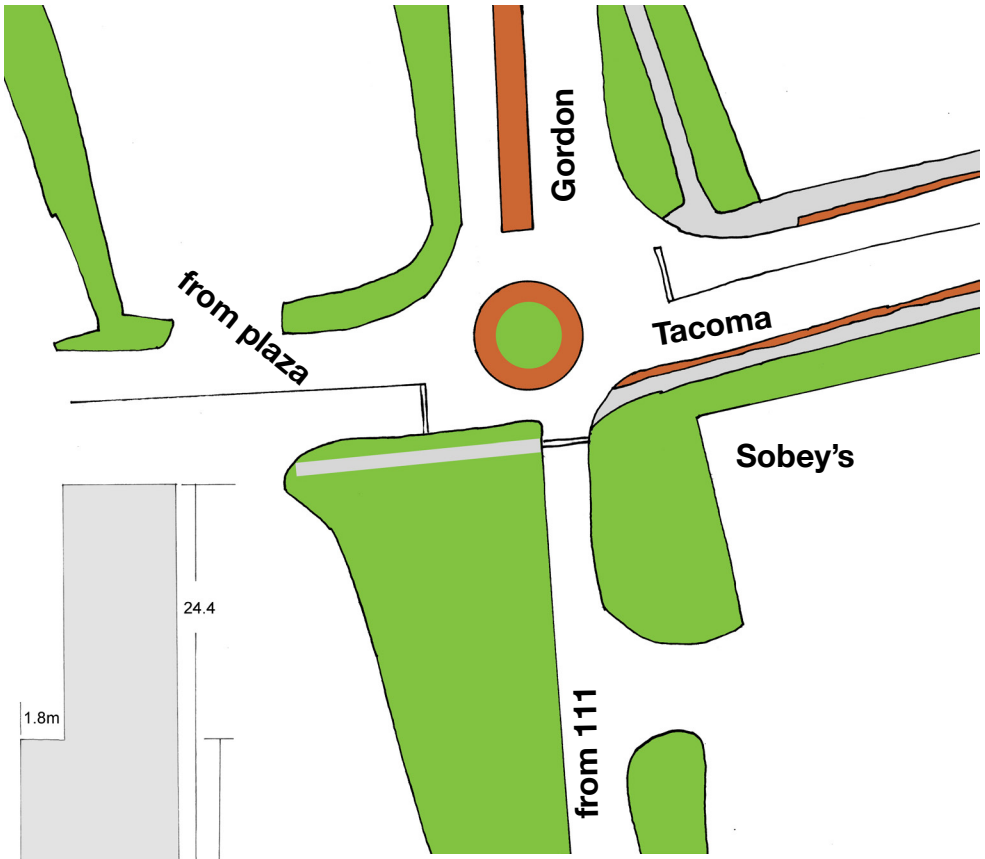


Figure 90: Gordon Avenue/Tacoma Drive Roundabout Intersection Concept

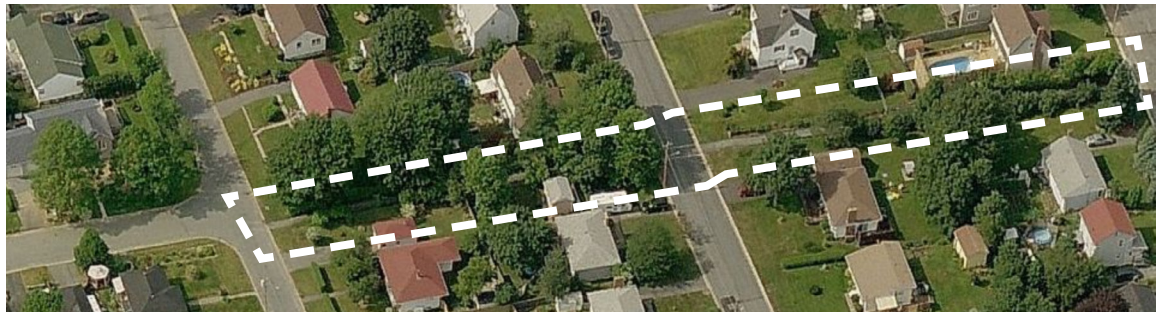
Pedestrian Paths

Figure 91: Neighbourhoods South of BID
Image Source: adapted from HRM Corporate Dataset (HRM, 2012)

Existing Paths

There is a pre-existing pattern of pedestrian paths in the Woodlawn neighbourhood south of the BID (see Figure 92 for examples).

A



B

Figure 92: Pedestrian Paths near the BID, adapted from image source: Bing Maps, 2016

Proposed Paths

We recommend additional pedestrian paths to divide large block sizes, with proposed locations of pathways shown in Figure 93. These new paths will connect the neighbourhoods north and south of the BID, and connect directly to the transit hub on Harlten Street (see Figure 85; also see transit section of report). New connections between Lakecrest and Main Street as well as between Tacoma and Main would meet the requests of community members expressed in consultations. They also contribute to the design principles of becoming more walkable, encouraging interaction, and establishing a community identity. Proposed paths integrate with existing neighbourhood paths.

Figure 93: Proposed New Pedestrian Paths
Data Source: adapted from HRM Corporate Dataset (HRM, 2012)

Existing Pocket Parks

Figure 94: Desire Lines Through Pocket Park between Main Street and Lakecrest Drive (view from corner of Helene Avenue and Main Street)

Existing pocket parks, highlighted below (Figure 95), could use any of the treatments described in the previous site-wide Park and Open Space section, particularly designs that take advantage of the steep slopes. Interventions could be implemented on existing parks now and/or in the new pocket parks when the new Main-Tacoma intersection is constructed. The parks could act as a secondary gateway location between the more residential and mixed-use business areas.

People create desire lines when they consistently walk in places other than designated paths, showing their “desired” path. Figure 94 shows an example of desire lines in the snow on the green space currently located between the top of Lakecrest and Main. Desire lines can create interesting, organic path designs while also meeting the needs of site users (Gehl, 2010). Future designs for this park could include formalized paths that follow such desire lines.

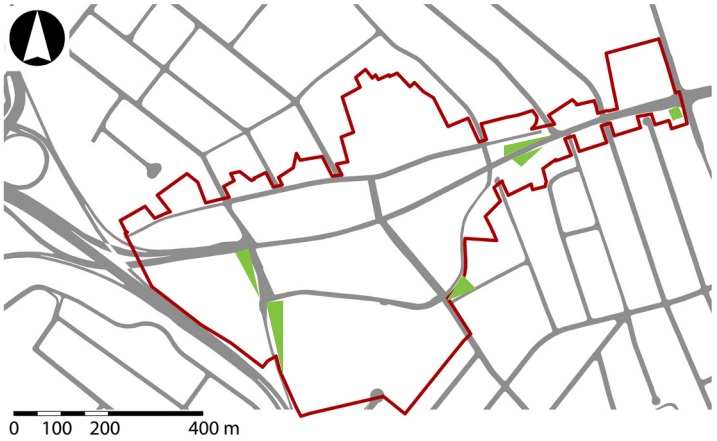


Figure 95: Desire Lines in the BID
Image Source: adapted from HRM Corporate Dataset (HRM, 2012)

Village Identity

To make the Village on Main a destination, instead of merely a route which people use to pass through, a distinct Village identity is key. The design of public infrastructure should emphasize the Village identity, establishing the Village on Main as a place distinct from the surrounding area. We recommend using a consistent type of specialty paving in the furnishing zone of sidewalks, crosswalks, and other pedestrian spaces throughout the site to make the distinct identity clear. Other simple additions like a consistent style of pedestrian scale lighting and a distinct bench type (see Site-wide Recommendations) will further distinguish the area. The Village Centre and Gateways help establish the identity of the area.

Centre

We propose Hartlen Street become the heart of the Village on Main: the Village Centre (Figures 96 and 97). A promenade or linear design element can provide a community with “a Centre for its public life: a place where you can go to see people, and to be seen” (Alexander, Ishikawa & Silverstein, 1977, p. 169). Promenades are a place where people can gather (Alexander, Ishikawa, and Silverstein, 1977). Hartlen will become an activity-filled public promenade. The street will be a combination of movement corridors (e.g., wide sidewalks, road, bike lanes, multi-use paths) and larger open public spaces (e.g. Hartlen Extension park/plaza). Alexander et al. (1977) emphasize the need for places to eat and shop along promenades to give people a reason to come to the space. Cafes are particularly key to making good urban spaces for staying, rather than just for moving through (Gehl, 2010). Building design should encourage small restaurants, cafes, and stores to front onto

Figure 96: Village Centre location

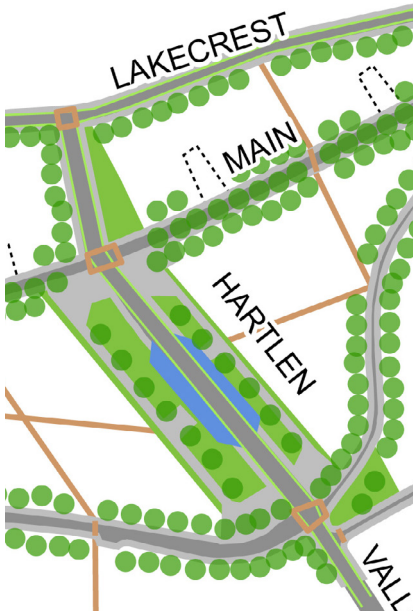


Figure 97: Village Centre

sidewalks and open spaces to encourage interaction with people and the space. The three public open spaces along Hartlen will act as activity nodes (e.g., eating lunch at the park, traveling from the transit hub, events at the plaza). Hartlen Village Centre will help establish the Village on Main identity, encourage social interaction, and engage the community, all key pieces of the Village vision.

Gateways

We have identified two major and four minor gateways to the BID (see Figure 98). Gateways were recommended to help define the Main Street area in the 2007 Ekistics plan, and in subsequent consultation sessions with the community. The side-wide recommendations that we have made also help to distinguish the Main Street BID from the surrounding area by making it distinct.

Figure 98: Location of proposed gateways in BID

Parks and Landscaping

Parks and landscaping can help establish transitions points which inform users that they are entering or leaving a particular place. The new public park, added at the corner of Main Street and Caledonia Road, has been a positive step in identifying a transition point into the Village on Main. Refer to our section on parks for ideas of features to create points of interest. Parks could have information kiosks, and amenities such as benches for those who need to rest in the center of the site. Parks, particularly plants, can help slow traffic as well (Lewis and Schwindeller, n.d.)

Public Art

A large concrete retaining wall dominates the western major gateway from the circumferential highway (see Figure 99). This space provides a great opportunity for implementation of public art installation to help define a gateway at this location, perhaps through the creation of a mural. At Caledonia Road, statue art elements could form a “conversation piece”, reinforcing the BID branding and identity (see Figure 102).

Figure 99: Existing Retaining Wall Highway 111 Exit
Source: Google Maps Street View, 2015.

Signage

Signs are a useful tool to welcome people to an area, provide information and directions, and highlight local amenities, shops and services. An example of a sign concept for the western major gateway, using the Village on Main speech bubble branding, can be seen in Figure 100. This concept takes advantage of existing road sign infrastructure, which would reduce capital costs. The major gateway from NSCC currently has a gateway sign with the BID's old branding (highlighted in Figure 102). This sign, however, is low-profile, non-informative, and outdated. Figure 102 shows another major gateway signage option that uses the new Main Street BID branding to create a sort of public art piece. Figure 101 shows smaller scale signage possible for secondary gateways.

Figure 101: Minor gateway signage concept, Tim Davidson, 2016. Modified from Google Street View 2015.

Figure 100: Main Street Gateway at Highway 111 Exit (Concept 1) Source: Modified from Google Maps by Sara Jellicoe

Figure 102: Main Street Gateway at Woodlawn Road (Concept 1) Source: Modified from Google Maps by Sara Jellicoe

Traffic Calming Measures

Traffic calming measures can help establish a gateway to a new neighbourhood. These measures are particularly important at the two major gateways as these are transition points between highways and the Village on Main. The eastern and western entrances to the BID require significant signals to indicate the transition from highway to village.

As previously presented, we recommend traffic lane widths be reduced and protected bike lanes be added along this upper, eastern stretch of Main Street. Narrowing traffic lanes and installing sidewalks and bicycle lanes are recommended traffic calming techniques (Project for Public Spaces, n.d.b, Street Films, 2011).

We also recommend adding and enhancing crosswalks where Helene/Weyburn and Raymoor/Gyusborough cross Main Street (see Figure 103). Adding crosswalks to this upper stretch of Main Street will help achieve the Village vision of becoming more walkable, will slow traffic by requiring vehicles to stop more frequently, and will reinforce the eastern gateway. Additional pedestrian crosswalks distinguish Main Street from the highways on either end and will help notify drivers of the village-like area, reduce speeds and improve safety.

Figure 103: Proposed Main Street Crosswalks East of Tacoma
Image Source: modified from bing maps 2015

Introduction

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Implementation

When entering the Village from the Circumferential, (the western major gateway) the road design between the posted 50km/hr speed limit sign, located on the overpass, and the first intersection does little to notify drivers that they are entering a village street (see Figure 104). Its location on an overpass makes many interventions, like street parks or medians, expensive. As a result, curb or sidewalk extensions may be more appropriate traffic calming techniques. Curb extensions improve pedestrian safety; this is especially important at this location where there are unprotected, narrow sidewalks beside fast, high volume traffic. Curb extensions can visually narrow the road, naturally slowing traffic, while providing more space for amenities (Lewis & Schwindeller, n.d.).

Figure 104 shows how curb and sidewalk extensions could be added to this gateway. The road would go from three to two vehicle lanes, which is more consistent with our designs for the rest of Main Street. Traffic merging onto Main from the south on-ramp would yield to Main Street traffic and the vehicle lane would be converted into a larger pedestrian path starting at the west pedway, including a buffer between the traffic and people. Wayfinding signage could be placed at the pedway entrance and a bus-only lane could established at the existing bus stop. This redesign should help notify drivers that they have entered a new place even before they see the large “Welcome to the Village on Main” sign while also reinforcing the priority of pedestrian safety and comfort.

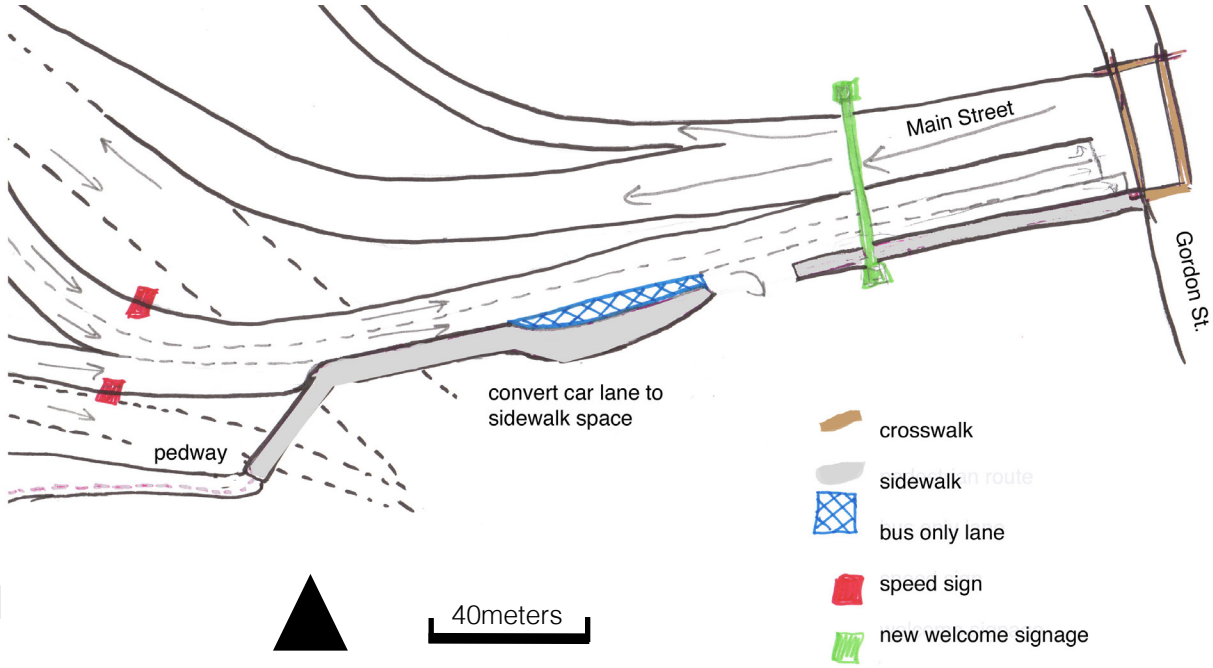

Figure 104: Proposed West Gateway modifications
Image Source: Christina Wheeler 2016

Design Recommendations Summary

Site-wide Recommendations:

1. Adjust motor vehicle space.
- Narrow all motor-vehicle lane widths to 3m or 3.4m for bus route lanes;
- Maintain two-way motor vehicle traffic flow on each street.

2. Improve pedestrian space.
- Increase minimum clear sidewalk through-way widths to 2m;
- Create distinct furnishing zone between roads and sidewalks which provides increased pedestrian amenities;
- Install pedestrian-scale, village-style lighting;
- Maintain at-grade crossings on Main Street, rather than adding pedways;
- Install distinct paving for all crosswalks for safety and establishment of village identity.

3. Make strategic use of natural elements.
- Apply stormwater management strategies, like rain gardens, in furnishing zones, central medians and parks;
- Add street trees to furnishing zones of sidewalks wherever possible.

4. Define cyclist space.
- Minimum 1.5m lane widths;
- Painted lanes on low volume streets;
- Protected lanes on higher traffic volume streets;
- Intersection treatments which define cyclist space through the intersection.

Site-specific Recommendations:

1. Improve Lakecrest Dr. streetscape and expand cycling network.
- Add separated cycling lane to Lakecrest to connect existing cycling lanes outside site;
- Add sidewalk on south side of Lakecrest;
- Remove on-street parking on Lakecrest.

2. Improve Main St. streetscape.
- Reduce number of driveways turning off Main Street to recommended number;
- Add midblock pedestrian crosswalks on Main Street;
- Provide buffered cycling lane along Main east of Tacoma.

3. Establish Village Center on Hartlen St.
- Build road extension of Hartlen and create large public open space to east of new road;
- Upgrade Hartlen transit stop to transit hub with public amenities, including bicycle racks and Park-and-Ride along with more park land and an AT trail;
- Provide bike lanes to connect Lakecrest cycling route to transit hub;
- Paint bike boxes and crossing marks at Hartlen-Main.

4. Improve Tacoma Drive.
- Construct new signalized intersection and convert Tacoma east of Stevens Road to park;
- Convert Stevens Road to a cul-de-sac;
- Paint bike boxes and crossing marks at Tacoma-Main intersections;
- Convert Lakecrest east of Mountain Rd. to a laneway and remove access to Helene Ave;
- Convert intersection of Tacoma and Gordon Ave. into a roundabout and remove shortcut lane on off-ramp;
- Formalize parking on Tacoma using parklets.

5. Improve Major Street and Gordon Avenue intersection and streetscapes.
- Create sidewalk space on the western side of the road;
- Remove southbound lane on highway 111 offramp.

6. Expand pedestrian path network.
- Establish pedestrian right of ways connecting Lakecrest to Main, Main to Tacoma, Gordon to the transit hub, and Tacoma east of Hartlen to the transit hub.

7. Improve parks and open spaces.
- Make purposeful use of slopes in BID and add features of interest;
- Create more public open space wherever possible to meet HRM open space guidelines.

8. Create gateways to the site.
- Define ‘Gateways’ with signage, landscaping, public art, and traffic-calming measures.

Implementation

Introduction

Site Background

Concept Design

Schematic Design

Implementation

Policy Recommendations

1. Mid-Block Parking

Recent land use bylaw amendments do not permit front or side yard parking (unless along a driveway), intending to eliminate streetscapes dominated by parking lots; however, certain land parcels (see example locations in Figure 106) have frontage on two streets. This allows some parking lots to remain in the streetscape. We suggest altering the by-law to only allow parking in the middle of the lot for parcels that have frontages on both Main and Lakecrest or on both Main and Tacoma, encouraging a courtyard form.

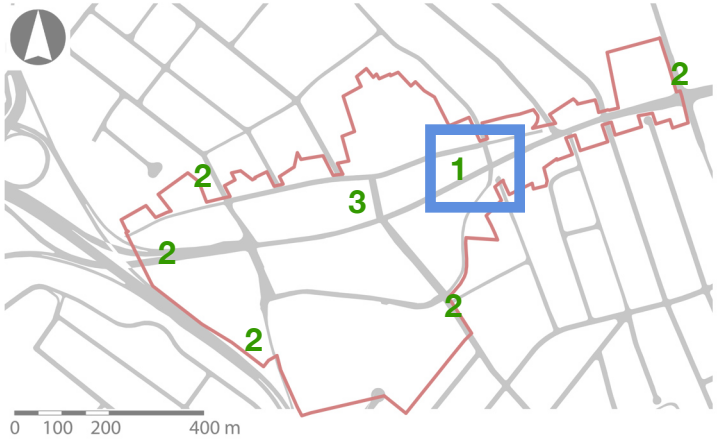

Figure 105: Key locations for Policy recommendations

2. Gateways

The HRM could consider creating a gateway policy for the Main Street Designation in the Dartmouth MPS to give this aspect of public infrastructure more priority. The policy could be modeled on the gateways policy from the Downtown Halifax MPS, Section 6.2 (HRM, 2014). (Gateways are labelled 2 in Figure 105)

3. Commercial Frontage on Hartlen Extension

The Hartlen Extension (see label 3 in Figure 105) will become the new Village Centre. The southern half closest to Main Street is already zoned C-2, but the half fronting on Lakecrest is currently residential (R-3). We recommend rezoning the areas around the Hartlen Street extension that are currently residential to a mixed use zoning (perhaps C-2) to allow businesses to locate on the new street. This amendment will allow business owners to take advantage of the new public space and amenities to be provided in this area. Allowing businesses

Figure 106: Example parcels with double street frontages

to front onto the whole extension also helps activate the new public space because it gives people a reason to come to the space. Businesses that locate along the new street will still be subject to the form based code of the area (e.g., large windows, lighting, etc).

Phasing

We propose short, medium, and long term phases to implement our recommendations

Tables 8 to 10 outline the evaluations of Opportunities, Costs, and Impacts for each of the proposed projects. Project locations are identified in Figure 107. Opportunity indicates the presence of current momentum in the community or municipality. Projects with high opportunity and impact are generally phased earlier while those with low opportunity and high cost are phased later.

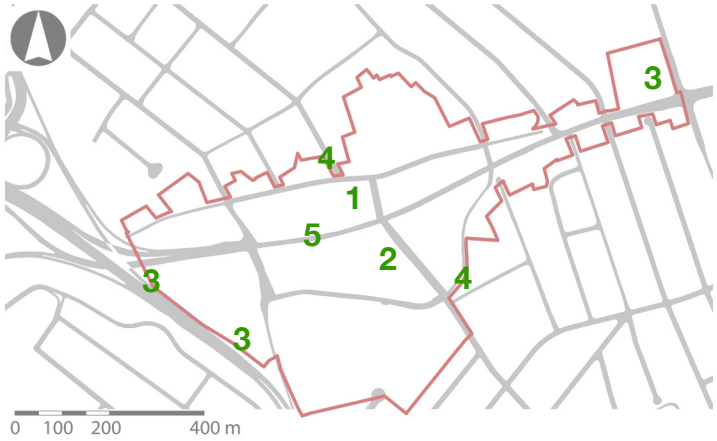

Figure 107: Short Term Implementation Projects

Short Term: Establish Village Identity

In the short term we propose high impact projects to begin to establish a village centre and gateways. The extension of Hartlen Street and the improvement of the bus stop on Harlten Street should serve as first steps to establishing Hartlen as the centre. Improvements to Main Street will help facilitate access to the centre.

Project	Opportunity	Cost	Impact
1. Construct Hartlen Extension, including the central park, and improve Hartlen/Main Intersection including distinctive pedestrian crosswalks and bicycle boxes, to create a “Village Centre”.	√ √ √ √	√ √ √ √	√ √ √ √
2. Improve existing Level 4 bus stop	√	√ √	√ √
3. Install landscaping, signage, and art to form “gateways”.	√	√ √	√ √
4. Implement street improvements on Main west of Tacoma, including tree planting, sidewalk widening, pedestrian-scale lighting, stormwater management and median extensions.	√	√ √ √	√ √ √

Table 8: Opportunity, Cost, and Impact evaluations for short term project proposals

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Site Background
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Medium Term: Improve Active Transportation Accessibility

In the medium term we propose projects that focus on improving pedestrian and cyclist connections. High impact projects make crossing Main Street safer and provide connected routes through the site east/west and north/south. Lower impact interventions improve convenience and access. Project locations are identified in Figure 108.

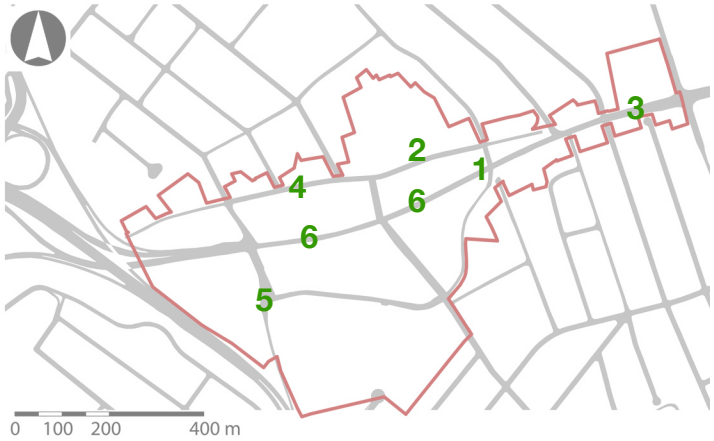

Figure 108: Medium Term Implementation Projects

Project	Opportunity	Cost	Impact
1. Construct new intersection at Main and Tacoma, including distinctive pedestrian crosswalks and bicycle boxes.	√	√ √ √ √	√ √ √ √
2. Construct cycling route on Lakecrest Drive.	√ √ √	√ √	√ √ √
3. Implement street improvements on Main Street east of new intersection, including tree planting, bicycle lane, pedestrian-scale lighting, and storm water management.			
4. Construct new sidewalk along south side of Lakecrest Drive and improve sidewalk on north side.	√ √ √	√ √	√ √ √
5. Improve Gordon-Tacoma intersection, including traffic circle.	√ √	√ √ √	√
6. Construct 3 mid-block pedestrian crosswalks on Main Street between Gordon and Hartlen, Hartlen and Tacoma, and Tacoma and Caledonia.	√	√ √	√ √ √ √
7. Create pedestrian path connections between Lakecrest Drive, Main Street, and Tacoma Drive, and to the transit hub on Hartlen.	√	√ √	√ √ √

Table 9: Opportunity, Cost, and Impact evaluations for medium term project proposals

Long Term: Improve Functionality and Connectivity

In the long term, we propose projects to improve overall functionality and connectivity of the Village on Main for travel by all transportation modes, realigning Hartlen south of Main Street, and expanding the transit station on Hartlen Street. The area becomes more functional to the south of Main Street with improvements to Tacoma Drive and Gordon Avenue and increased green spaces. Project locations are identified in Figure 109.

Figure 109: Long Term Implementation Projects

Project	Opportunity	Cost	Impact
1. Realign Hartlen Street to connect with Valleyfield Road and implement linear park with multi-use trail, tree planting, sidewalk improvements, pedestrian-scale lighting, and stormwater management to strengthen the "Village Centre".	√	√ √ √ √	√ √ √ √
2. Expand transit hub on Hartlen Street into transit terminal.	√ √	√ √ √	√ √ √
3. Implement street improvements on Tacoma Drive, including tree planting, sidewalk widening, lane narrowing, parking formalization, parklets, pedestrian-scale lighting, and stormwater management.	√	√ √	√ √
4. Implement street improvements at Gordon/Main intersection and on Gordon Avenue, including distinctive pedestrian crosswalks, tree planting, sidewalk widening, lane narrowing, pedestrian-scale lighting, and stormwater management.	√	√ √	√ √
5. Improve existing park spaces and create "pocket parks".	√ √	√ √ √	√ √ √

Table 10: Opportunity, Cost, and Impact evaluations for long term project proposals

Potential Partners

Affirmative Ventures Association

This non-profit provides economic services to people with mental and physical disabilities in Nova Scotia (website: http://affirmativeventures.ca).

Canada Green Building Council

This organization promotes environmentally sustainable construction projects throughout Canada (website: http://www.cagbc.org/cagbc).

Centre for Entrepreneurship Education and Development

The Centre helps entrepreneurs in Nova Scotia by providing a variety of services, including finances, business growth, and youth engagement (website: http://ceed.ca).

Destination Halifax

This is HRM's tourism marketing organization (website: http://www.destinationhalifax.com)

Ecology Action Centre

This group promotes environmental and economic sustainability in Nova Scotian communities (website: https://www.ecologyaction.ca).

Engage Nova Scotia

Engage Nova Scotia is a network of individuals and groups working on various socio-economic issues (website: http://www.engagenovascotia.ca).

Fusion Halifax

This non-profit organization organizes events meant to help young professionals connect with organizations and businesses to make an impact on Halifax as a vibrant city (website: http://fusionhalifax.ca).

Greater Halifax Partnership

A partnership supports business development by providing important information about business growth (website: http://www.halifaxpartnership.com/en/home/default.aspx).

Halifax Cycling Coalition

The Halifax Cycling Coalition is a citizen organization that promotes cycling infrastructure improvements and awareness of cycling issues in the HRM (website: http://cyclehalifax.ca).

Halifax Transit

Halifax's public transit authority. (website: http://halifax.ca/transit).

Housing Nova Scotia

Housing Nova Scotia is another group that is working to address the Nova Scotia affordable housing issue (website: http://housing.novascotia.ca).

Housing Trust of Nova Scotia

This new non-profit organization addresses the major issue of housing affordability in our province (website: http://www.housingtrust.ca).

HRM Active Transportation Advisory Committee

This committee advises on Active Transportation for HRM. (website: http://www.halifax.ca/boardscom/ActiveTransportationAdvisoryCommittee.php).

Nova Scotia Department of Transportation and Infrastructure Renewal

This department is responsible for transportation projects in the Province (website: http://novascotia.ca/tran/).

Our HRM Alliance

Rural, suburban, and urban groups form this alliance that strives for more sustainable, complete community growth, with a particular focus on the Halifax Greenbelt (website: http://www.ourhrmalliance.ca).

Potential Funding Sources

Municipal

HRM BID Funding

HRM provides funds ($170,000/yr) to 6 BIDs for capital improvement projects. The money is only available to incorporated non-profit BIDs (HRM, 2014d).

Density Bonusing

Density bonusing is a planning tool which gives the municipality the option to grant a development extra density or height allowances in exchange for public benefits, such as streetscape improvements and green space (HRM, 2014d). Density bonusing does not allow for building heights that are exceed those outlined in the land use by-law, but sets out conditions that must be met by the developer if they wish to build to the by-laws full height allowance (HRM, 2014d). The goal of density bonusing is to ensure buildings which full height allowance also contribute to the community in a positive way (HRM, 2014d).

Using density bonusing as a development tool in the Main Street BID could help to help fund public infrastructure improvements. Currently, the Halifax Regional Municipality Charter only allows for density bonusing within the Regional Centre (Teal Architects et al, 2015); the Village on Main falls just outside of this boundary. Halifax will need to make a request for the Province to amend the Halifax Regional Municipality Charter to include areas like the Main Street BID for density bonusing to become an available planning tool (HRM, 2014d).

Development Charges

Consider the use of “development charges” to have developers fund capital costs of public infrastructure construction off-site (as described in HRM, 2014d).

Parkland Dedication

As development continues to take place in the Main Street BID, it is likely that there will be applications for subdivision submitted to HRM. Lot subdivision means that a single lot is separated into two or more lots, or two or more lots are consolidated into one (HRM, 2007). One of the requirements of lot subdivision is that the subdivider provides the Municipality with a park dedication which is at least 10% of the total area of all newly created lots (HRM, 2011). The subdivider has the option of providing the Municipality with usable land or the equivalent value, which could take the form of, cash, facilities, services or other values related to parks (Province of Nova Scotia, 2016).

In future when subdivision applications are made in the Main Street community, the BID should request that Council allocate that parkland dedication within the BID’s boundaries. This request should also be accompanied with several park investment options that the Municipality could consider for the

BID. Encouraging the Municipality to directly allocate parkland dedication into the Main Street BID area will help to achieve the BID's vision of increased public green space.

Provincial

Community Economic Development Investment Funds (CEDIF)

The funds are available for persons who want to operate or invest in local business within a defined community. The local business cannot be charitable, non-taxable, or non-for-profit, and must have at least six directors elected from the defined community (Province of Nova Scotia, n.d.,a.).

Regional Development Program

This program supports communities and urban growth centre areas with activities including sport and recreation opportunities, capacity building, volunteer development and activities responding to underserved populations (Province of Nova Scotia, n.d.,b).

Provincial Capital Assistance Program

This program is designed to reduce the cost burden of high priority municipal infrastructure projects such as sewage disposal and solid waste projects (Province of Nova Scotia, 2015a).

Federal

Ecoaction 2000 Community Funding Program

This program provides financial support for community groups for projects that have measurable, positive impacts on the natural environment. Funding ranges from $500 to $100,000. Average funding is $25,000 (Service Canada, 2015).

Federal Gas Tax Fund

This funding helps to build and revitalize local public infrastructure in order to support local economic growth and build strong communities (Province of Nova Scotia, 2015b).

National Recreational Trails Program

This program provides $10 million to expand and improve multi-purpose trails throughout Canada. There is also an additional $25 million received by the Trans Canada Trail Foundation to connect all sections of the Trans Canada Trail system by 2017 (Infrastructure Canada, 2014).

BID Project Opportunities

Many of the recommendations of this plan require partnership between the BID and the municipality. This section describes actions that the BID can take to lead in implementation of the Public Infrastructure Plan.

Promotion to the Community:

- Consider applying for an event at 100 in 1 day, 2016 and 2017, to promote the Public Infrastructure Plan (halifax.100in1day.ca);
- Create comprehensive package for current land owners in the Village, to demonstrate the opportunities for redevelopment of properties with enhanced public space.

Pilot Projects:

- Once constructed, consider closing the Hartlen Extension to vehicle traffic periodically to illustrate the opportunity for pedestrian focused design in the area;
- Consider parklets as pilot projects on Tacoma Drive, with possibility to partner with the Dalhousie School of Architecture for their design and construction;
- Consider other creative pilot projects along streets. The Innovative Transportation Act allows for pilot projects with aspects that would otherwise be prohibited under the Motor Vehicle Act (MVA) (Nova Scotia Legislature 2013). Thus, this Act could be referenced by the BID in proposals as a precedent . Making permanent changes to the MVA is time consuming and expensive, so these pilot projects could help to test whether amendments particular would be worthwhile. Halifax's Active Transportation Plan: Making Connections (2014) recommends using the Innovative Transportation Act to explore implementing recommendations from the Transportation Association of Canada's Guidelines for Bikeways (Recommendation #29, p. 46, HRM 2014).

Planning Studies:

- Create detailed redevelopment studies for large C2 parcels south of Tacoma Drive; exploring the potential of these properties could help encourage redevelopment consistent with the Tacoma Drive streetscape.

Facade improvement Program

- A facade improvement program can provide grants to landowners who make improvements to their public building facades, which would improve the streetscapes in the BID. It is typically funded by a levy on business owners, which is already available through the BID.

Conclusion

The Main Street Dartmouth Business Improvement District (BID) envisions the transformation of the BID into an urban centre: the Village on Main. The site currently faces urban issues of high traffic volumes, lack of pedestrian connectivity, poor cycling connectivity, inadequate public transit amenities, limited public space, and often unappealing streetscapes. Most issues stem from the current design of streetscapes.

Our team used an iterative design process that included site investigation, design investigation, concept design, schematic design, and analysis to provide direction to improve public spaces based on the BID's progressive and innovative vision. The site-wide and site-specific recommendations provide a roadmap to achieving the Village on Main.

Recommendations support the following Design Principles created from the Village on Main vision, branding pillars, and branding values: walkable, accessible, engaging, convenient, interaction, community, responsible development, public infrastructure component, green space, cyclist-friendly, and public transport.

We recommend narrowing roadways and widening AT and pedestrian infrastructure to make the BID more pedestrian and cyclist friendly without compromising vehicle capacity on Main Street. Improving existing public space and creating additional public space will enhance public interaction, sense of community, and the natural environment. Realigning Hartlen Street with Valleyfield Road will improve connectivity, efficiency, and safety for all modes of travel across the BID. Our recommendations provide a strategy to establish a Village Centre and install gateways to enhance the identity of the Village on Main as a distinct destination.

Future implementation strategies include policy and by-law amendments for mid-block parking, gateways, and commercial frontage on Hartlen Extension; three implementation phases prioritizing high impact, high opportunity, and low cost design components; funding opportunities from municipal, provincial, and federal governments; a list of potential partners; and BID-led project opportunities such as promotion to the community, pilot projects, planning studies, and a facade improvement programs.

Future studies to achieve the Village on Main vision should include detailed design development for the Village Centre along Hartlen Street, additional traffic studies for Main Street and Hartlen Street, and feasibility studies about redeveloping properties dominated by parking lots.

Through strategic use of street right-of-ways and public open spaces, the BID has the opportunity to achieve its vision of becoming the Village on Main.

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Appendices

Appendix A: Ekistics Vision Analysis

The Ekistics (2007) vision plan informed many parts of our design. This Appendix summarizes the key public infrastructure changes presented in the 2007 plan.

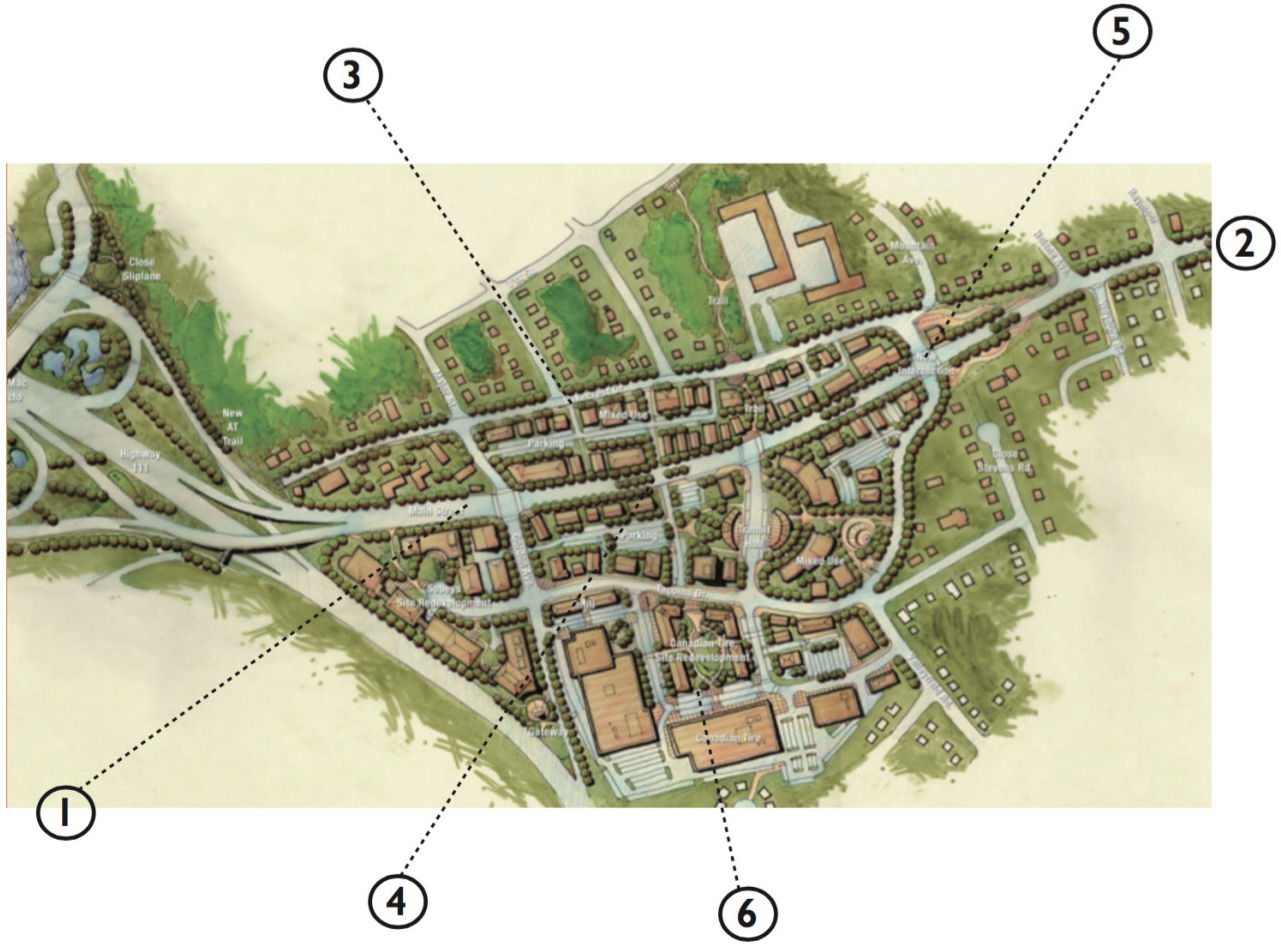


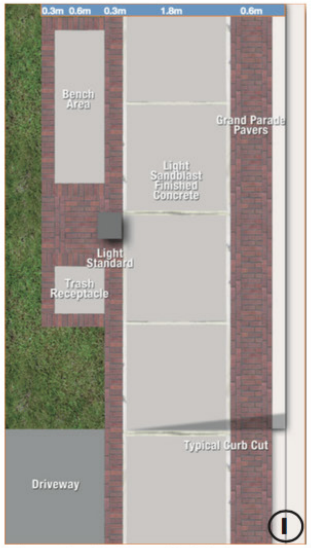
Figure A1: Ekistics Vision Analysis Part 1

Main Street Primary Study Area Streetscape Improvements (Years 1-5)

Woodlawn Corner Park Improvements

Main Street Secondary Study Area Streetscape Improvements (Years 6-9)

Phase 3 Improvements (Years 10-30)



Main St. Sidewalk Enhancements

Also applicable to Tacoma Drive on both sides of the street (from Gordon Avenue to Hartlen Street), from Hartlen Street to the new intersection (near Stevens Road) on the north side of Tacoma.

Boulevard trees should be spaced an appropriate distance apart:	
Large Trees	13-16 metres apart
Medium Trees	10-13 metres apart
Small Trees	7-10 metres apart
Appropriate distance boulevard trees should be separated from above ground structures:	
Street intersections	6 metres
Light Standards	3 metres
Private Approaches	3 metres
Fire Hydrants	3 metres
Hydro Poles	3 metres
Manholes	3 metres

Main Street Tree Requirements

Woodlawn Corner Park Improvements

The streetscape improvements recommended for the Main Street core are not recommended in this area.

Lakecrest Streetscape Improvements

- Provide easy access to Lakecrest;
- Develop a new street cross section: South side- pedestrian-scale lighting, parallel parking, 1.5m wide sidewalk; bike facilities on both sides;
- Encourage redevelopment on Lakecrest and along Main Street;
- Derelict properties enforcement.

New Intersection (Tacoma & Lakecrest)

- Expansion of the Stevens Road United Baptist Church;
- Stevens Road becomes neighbourhood cul-de-sac;
- Tacoma Drive is linked directly to Lakecrest;
- A possible commercial property at the intersection.

Hartlen Street

- Village Centre transit node - "on-street terminal";
- Minimum 2.4m wide sidewalk on the west side.

AT Corridor from Lakecrest to Main

- A fenced neighbourhood playground;
- AT Route from the west end of Lakecrest to Lake Mic Mac: multi-use trail alongside the slope which runs adjacent to Carters Road & remove the slip lane to Braemar Drive & build a new right turn lane at Grahams Grove
- AT route on Lakecrest Drive;
- Multi-use trail at the east end of Lakecrest.

Tacoma Centre

- Part of Canadian Tire to be mixed use development;
- Rear lot parking between Main Street and Tacoma Drive;
- Parallel parking on the south side of Tacoma Drive from Gordon Avenue to Hartlen Street;
- Pedestrian-scale lighting on the south side of Tacoma Drive;
- Infill development.

Wayfindings

Figure A2: Ekistics Vision Analysis Part 2

Appendix B: Assessing Design Concepts with Principles

This set of principles for assessing design concepts was created based on key public infrastructure concepts from the Village on Main Vision, Pillars, and Values. The completed scor tables below show the evaluation process that we undertook throughout the design development process.

Hartlen Extension

Option 1: Park (green) on one side = 25
Option 2: Pedestrian Plaza on one side = 23
Option 3: Pedestrian Boulevard = 25

Criterion	No Improvement (1)	Better (2)	Best (3)
Public Infrastructure Quality			
Walkable			1,2,3
accessible		1,2	3
engaging		3	1,2
convenient (mixed use)		1,2	3
interaction			1,2,3
community (identity)		3	1,2
responsible development (environmentally sustainable)		2,3	1
Public Infrastructure Component			
green space		2, 3	1
Cyclist-friendly			1,2,3
public transport	N/A		

Figure B1: Hartlen Extension Evaluation

New Intersection

Option A: Keep Main St Alignment and make Stephens a cul-de-sac = 25
Option B: Shift Main St. South and make Stephens a cul-de-sac = 27

Criterion	**No Improvement (1)**	**Better (2)**	**Best (3)**
Public Infrastructure Quality			
Walkable			A, B
accessible			A, B
engaging		A	B
convenient (mixed use)		B	A
interaction		A	B
community (identity)		A	B
responsible development (environmentally sustainable)		B	A
Public Infrastructure Component			
green space		A	B
Cyclist-friendly			A,B
public transport		A,B	

Figure B2: New Intersection Evaluation

Tacoma at Gordon

(A) Simplified= 27 (B) Traffic Circle = 22

Criterion	No Improvement (1)	Better (2)	Best (3)
Public Infrastructure Quality			
Walkable		B	A
Accessible		B	A
Engaging		A	B
Convenient (mixed use)		B	A
Interaction		B	A
Community (identity)		B	A
Responsible Development (environmentally sustainable)		A and B	
Public Infrastructure Component			
Green Space		A	B
Cyclist-friendly		B	A
Public Transport		B	A

Figure B3: Tacoma / Gordon Evaluation

Tacoma Centre (A) Hartlen = 25

(B) Shoppers = 24

Criterion	No Improvement (1)	Better (2)	Best (3)
Public Infrastructure Quality			
Walkable		B	A
Accessible		A	B
Engaging		A&B	
Convenient (mixed use)		A	B
Interaction		A	B
Community (identity)		A	B
Responsible Development (environmentally sustainable)		B	A
Public Infrastructure Component			
Green Space		B	A
Cyclist-friendly		B	A
Public Transport		B	A

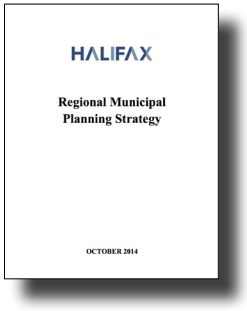
Figure B4: Transit Hub Evaluation

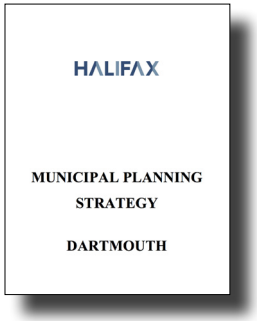
Appendix C: Vision Comparison

Table 9 compares the key concepts from the Village on Main vision with visions found in the 2007 Ekistics plan, the RMPS, and the Dartmouth MPS. Key concepts from the current BID vision are all explicitly or implicitly included in visions for Main Street from the other documents, so the upcoming table compares them based on differences in emphasis. The content analysis of each vision that supports the findings follow the table. They all strongly emphasize the first key concepts from the BID with the notable exception of accessible, which has weak support from two visions and moderate support from another. They also have differences in focus for “convenient” and “responsible development”, though all strongly support both concepts. Most notably, the Dartmouth MPS focuses on automobile access and economic sustainability while the other two focus on active transport connectivity and environmental sustainability. Visions differ most in their emphasis of green space, active transport, and public transport.

The lesson to be drawn from the analysis is that the various planning documents are generally supportive of one another and the BID may refer to the other planning documents to show municipal support for many parts of the plan we propose.

MAIN STREET DARTMOUTH BUSINESS IMPROVEMENT DISTRICT





Emphasis	BID	Vision (Ekistics)	Regional MPS (Urban Local Growth Centre)	Dartmouth MPS
Strong	• Walkable • Accessible • Engaging • Convenient • Interaction • Community • Responsible Development • Green Space • Active Transport • Public Transport	• Walkable • Engaging • Convenient: mixed use & connectivity • Interaction • Community • Responsible development: environmental • Green Space • Active Transport	• Walkable • Engaging • Convenient: mixed use & connectivity • Interaction • Community • Responsible development: environmental & cultural • Green Space • Public Transit	• Walkable • Engaging • Convenient: mixed use & automobile access • Interaction • Community • Responsible development: economic & logistics
Moderate			• Active Transport	• Accessible • Active Transport • Public Transit
Weak		• Accessible • Public Transport	• Accessible	• Green Space

Table C1: Vision Comparison, Christina Wheeler, 2016.

Appendix D

Content Analysis of Visions for Main Street Dartmouth Area

The following tables show a content analysis conducted by the Coast to Coast Consulting team in order to compare the visions for the Main Street Dartmouth area found in separate key planning documents. The analysis includes the Vision and Streetscape Plan (Ekistics, 2007), the Regional Municipal Planning Strategy (HRM, 2014), and the Dartmouth Municipal Planning Strategy (HRM, 2014). The design principles drawn from the BID Village on Main vision are in the right column and the visions from key documents are in the left column. Colors show which text from the visions support which key concepts.

Dartmouth MPS	BID Vision Concepts
The Main Street Designation in the Dartmouth MPS presents the first more general statement from the Ekistics Vision and adds the following specific directions: **"This plan is intended to implement the above vision in relation to development regulations, by fostering a town centre as a focal point for residential and commercial investment in pedestrian oriented buildings and spaces close to public transit, while recognizing the need for automobile access. Development is to be guided by criteria which are easily interpreted by both residents and investors. The aim is to attract re-investment, minimize uncertainties and financial risk, and address land use compatibility and design issues.** **There are three key objectives to this Designation:** • **Foster incremental development of a mixed-use town centre;** • **Focus housing close to shops, services, employment and transit; and** • **Encourage walkable streetscapes.** **[…]** **Important considerations include human scale, pedestrian access, aesthetics and the potential for buildings to shape public spaces such as streets, plazas and parks. Automobile access and parking is accommodated in such a way as to minimize risks and inconveniences to pedestrians, cyclists and transit users while ensuring that the buildings and their inter-relationships are the dominant elements of the streetscape." (p. 90).**	**walkable** **accessible** **active transport**

Table D1: Vision Content Analysis DMPS1

Dartmouth MPS	BID Vision Concepts
The Main Street Designation in the Dartmouth MPS presents the first more general statement from the Ekistics Vision and adds the following specific directions (p. 90): **"This plan is intended to implement the above vision in relation to development regulations, by fostering a town centre as a focal point for residential and commercial investment in pedestrian oriented buildings and spaces close to public transit, while recognizing the need for automobile access. Development is to be guided by criteria which are easily interpreted by both residents and investors. The aim is to attract re-investment, minimize uncertainties and financial risk, and address land use compatibility and design issues.** **There are three key objectives to this Designation:** • **Foster incremental development of a mixed-use town centre;** • **Focus housing close to shops, services, employment and transit; and** • **Encourage walkable streetscapes.** **[…]** **Important considerations include human scale, pedestrian access, aesthetics and the potential for buildings to shape public spaces such as streets, plazas and parks. Automobile access and parking is accommodated in such a way as to minimize risks and inconveniences to pedestrians, cyclists and transit users while ensuring that the buildings and their inter-relationships are the dominant elements of the streetscape." (p. 90).**	**engaging** **interaction** **community (village identity)**

Table D2: Vision Content Analysis DMPS2

Dartmouth MPS	BID Vision Concepts
The Main Street Designation in the Dartmouth MPS presents the first more general statement from the Ekistics Vision and adds the following specific directions (p. 90): **"This plan is intended to implement the above vision in relation to development regulations, by fostering a town centre as a focal point for residential and commercial investment in pedestrian oriented buildings and spaces close to public transit, while recognizing the need for automobile access. Development is to be guided by criteria which are easily interpreted by both residents and investors. The aim is to attract reinvestment, minimize uncertainties and financial risk, and address land use compatibility and design issues.** **There are three key objectives to this Designation:** • **Foster incremental development of a mixed-use town centre;** • **Focus housing close to shops, services, employment and transit; and** • **Encourage walkable streetscapes.** **[…]** **Important considerations include human scale, pedestrian access, aesthetics and the potential for buildings to shape public spaces such as streets, plazas and parks. Automobile access and parking is accommodated in such a way as to minimize risks and inconveniences to pedestrians, cyclists and transit users while ensuring that the buildings and their inter-relationships are the dominant elements of the streetscape." (p. 90).**	**green space** **responsible development** **convenient (mixed use)** **public transport**

Table D3: Vision Content Analysis DMPS3

2007 Vision (Ekistics)	BID Vision Concepts
"The Main Street area will become dense, mixed use village core with great pedestrian spaces, goods and services, and facilities that invite residents to walk or bicycle to obtain daily needs and in so doing informally interact with their neighbours" (Ekistics, 2007, p. 1).	**walkable accessible active transport**
Four Big Ideas in Vision (pp.1-2): **1. "Main Street becomes a tree lined arterial with improved pedestrian amenities and with entry parks, or gateways, at each end of the area."** **2. "Lakecrest Drive becomes the AT route through the area."** **3. Lakecrest Drive, Tacoma Drive, and Gordon Avenue become a circular road around Main Street making a "Village Ring" street, which will improve both pedestrian and auto circulation in the area."** **4. "The three shopping centres (Tacoma Centre, Sobeys, & Smitty's) become a traditional village centre."**	

2007 Vision (Ekistics)	BID Vision Concepts
"The Main Street area will become dense, mixed use village core with great pedestrian spaces, goods and services, and facilities that invite residents to walk or bicycle to obtain daily needs and in so doing informally interact with their neighbours" (Ekistics, 2007, p. 1).	engaging interaction community (village identity)
Four Big Ideas in Vision (pp.1-2): 1. "Main Street becomes a tree lined arterial with improved pedestrian amenities and with entry parks, or gateways, at each end of the area." 2. "Lakecrest Drive becomes the AT route through the area." 3. Lakecrest Drive, Tacoma Drive, and Gordon Avenue become a circular road around Main Street making a "Village Ring" street, which will improve both pedestrian and auto circulation in the area." 4. "The three shopping centres (Tacoma Centre, Sobeys, & Smitty's) become a traditional village centre."	

Table D5: Vision Content Analysis Ekistics 2

2007 Vision (Ekistics)	BID Vision Concepts
"The Main Street area will become dense, mixed use village core with great pedestrian spaces, goods and services, and facilities that invite residents to walk or bicycle to obtain daily needs and in so doing informally interact with their neighbours" (Ekistics, 2007, p. 1).	green space responsible development convenient (mixed use) public transport
Four Big Ideas in Vision (pp.1-2): 1. "Main Street becomes a tree lined arterial with improved pedestrian amenities and with entry parks, or gateways, at each end of the area." 2. "Lakecrest Drive becomes the AT route through the area." 3. Lakecrest Drive, Tacoma Drive, and Gordon Avenue become a circular road around Main Street making a "Village Ring" street, which will improve both pedestrian and auto circulation in the area." 4. "The three shopping centres (Tacoma Centre, Sobeys, & Smitty's) become a traditional village centre."	

Table D6: Vision Content Analysis Ekistics 3

RMPS: Urban Local Growth Centre	BID Vision Concepts
• Mix of low, medium and high density residential, small office, small institutional and convenience commercial uses • In established residential neighbourhoods, low to medium density residential uses • Encourage infill or redevelopment of large parking lots into traditional blocks with streetwalls and step-backs • Pedestrian oriented facades • Transit to connect to other centres and Regional Centre • Pedestrian oriented transit stops • Enhanced pedestrian linkages • Street, or rear yard parking wherever possible • Access to AT routes • Short interconnected blocks for ease of walkability • Streetscaping featuring landscaped pocket parks and tree-lined streets • Interconnected private and public open space • Improved quality and quantity of parkland • Focus on waterfront parks and trails • Private and public realm urban forest canopy cover to be maintained and improved • Provisions for food security • Built and natural heritage to be maintained and improved • Heritage features integrated with new development • Public art integrated with new development • Scenic public views preserved • Cultural heritage corridors (*RMPS* - HRM, 2014, p. 47)	walkable accessible active transport

Table D7: Vision Content Analysis RMPS 1

RMPS: Urban Local Growth Centre	BID Vision Concepts
• Mix of low, medium and high density residential, small office, small institutional and convenience commercial uses • In established residential neighbourhoods, low to medium density residential uses • Encourage infill or redevelopment of large parking lots into traditional blocks with streetwalls and step-backs • Pedestrian oriented facades • Transit to connect to other centres and Regional Centre • Pedestrian oriented transit stops • Enhanced pedestrian linkages • Street, or rear yard parking wherever possible • Access to AT routes • Short interconnected blocks for ease of walkability • Streetscaping featuring landscaped pocket parks and tree-lined streets • Interconnected private and public open space • Improved quality and quantity of parkland • Focus on waterfront parks and trails • Private and public realm urban forest canopy cover to be maintained and improved • Provisions for food security • Built and natural heritage to be maintained and improved • Heritage features integrated with new development • Public art integrated with new development • Scenic public views preserved • Cultural heritage corridors (*RMPS* - HRM, 2014, p. 47)	engaging interaction community (village identity)

Table D8: Vision Content Analysis RMPS 2

RMPS: Urban Local Growth Centre	BID Vision Concepts
• Mix of low, medium and high density residential, small office, small institutional and convenience commercial uses • In established residential neighbourhoods, low to medium density residential uses • Encourage infill or redevelopment of large parking lots into traditional blocks with streetwalls and step-backs • Pedestrian oriented facades • Transit to connect to other centres and Regional Centre • Pedestrian oriented transit stops • Enhanced pedestrian linkages • Street, or rear yard parking wherever possible • Access to AT routes • Short interconnected blocks for ease of walkability • Streetscaping featuring landscaped pocket parks and tree-lined streets • Interconnected private and public open space • Improved quality and quantity of parkland • Focus on waterfront parks and trails • Private and public realm urban forest canopy cover to be maintained and improved • Provisions for food security • Built and natural heritage to be maintained and improved • Heritage features integrated with new development • Public art integrated with new development • Scenic public views preserved • Cultural heritage corridors (*RMPS* - HRM, 2014, p. 47)	green space responsible development convenient (mixed use) public transport

Table D9: Vision Content Analysis RMPS 3

Appendix E: Hartlen Extension Option

This is a third option we proposed for the Hartlen Extension design called the Pedestrian Boulevard. The option aligns the new Hartlen Street extension more in the centre of the land parcels which splits public open space more evenly on either side of the extension. Wider planting strips and large seating areas are located on either side of the road, with wide pedestrian through ways.

We set the option aside because the Main Street community members and planning professionals who attended the second engagement session preferred aligning the road fully to one side of the available land parcels because it gives the maximum amount of consolidated public space. Consolidated open space creates more opportunity to develop the Hartlen Extension as the Village Centre.

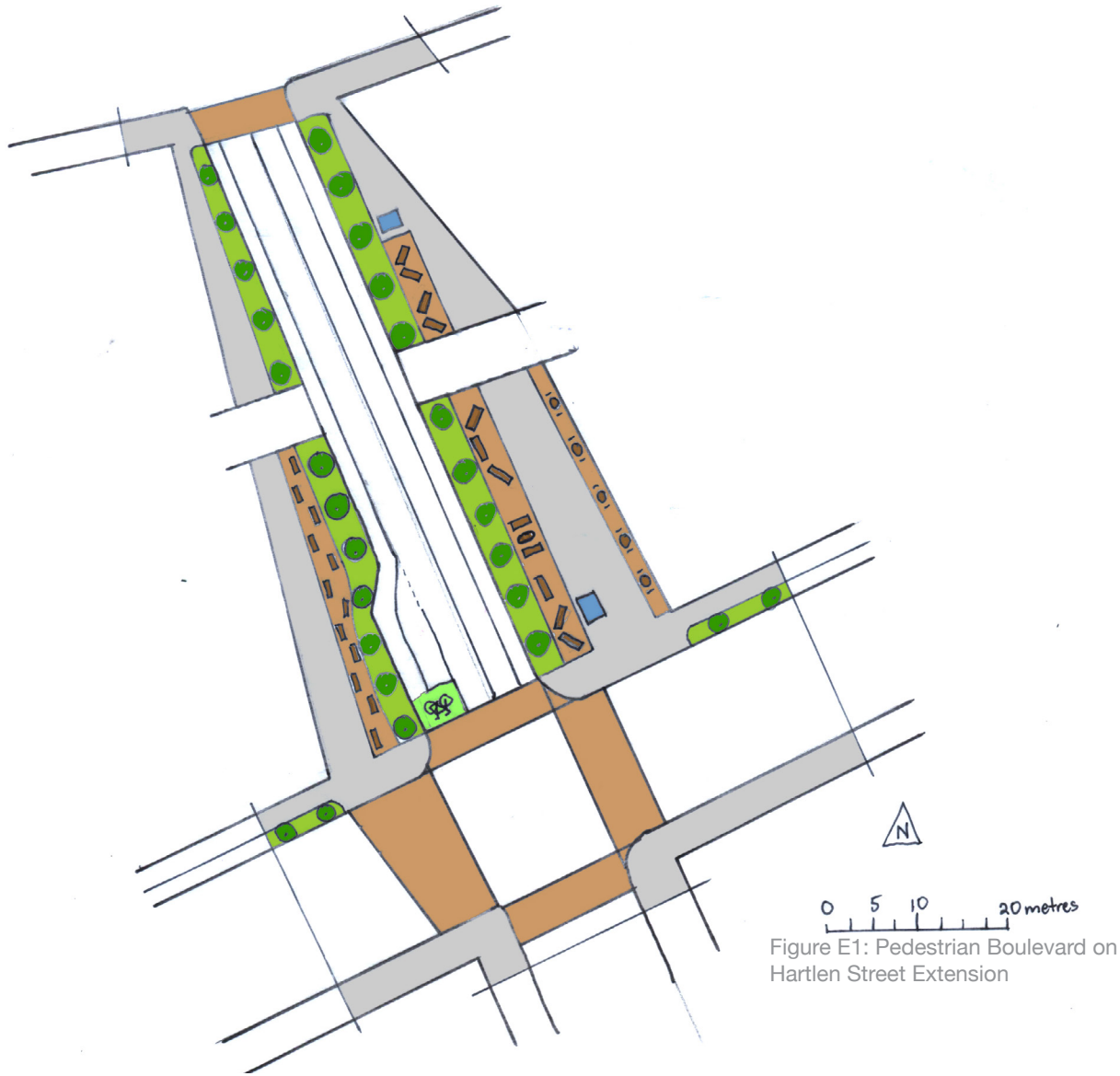


Figure E1: Pedestrian Boulevard on Hartlen Street Extension

Appendix F: Alternative Proposed Bike Route

This shows an alternative route that could connect the proposed lakecrest bike route with the existing bike lane on Braemer drive. Instead of making the connection along the ramp between the western-most end of lakecrest, the cycling route would go down Raymond Street and Maple Drive. Although there are currently no standards for bike trail slopes in HRM, we ruled out this option when the public expressed concerns about the steep slopes on Maple and the challenge this poses to cyclists.

Figure F1: Alternative Proposed Bike Route

Appendix G: February 11 Consultation Comments

In this appendix we compile the ideas expressed at our February 11 consultation with the community in the BID and relate them to our design elements.

Table G1: Consultation Comments

Design Elements	Ideas
Transit Hub	• land to the west of MacDonald's and east of Manhattan Pizza • transit ring around the site - possibly a trolley • Old Ford Dealership
Village Centre	• Manhattan Pizza (based on having a transit terminal there) • Hartlen and Main intersection (Based on the extension of Hartlen to Lakecrest) • Sobey's Parking Lot (Based on transit stop between MacDonald's and Manhattan Pizza • Parking Lot at Tacoma and Hartlen, across from KFC • Block of Main, Gordon, Tacoma & Hartlen - one option is shifted to the east side of the block - one option shifted to the west side of the block - one option recommends and indoor and affordable hub

Table G2: Consultation Comments

Design Elements	Ideas
Motor Vehicle and Pedestrian Infrastructure	• Extend Hartlen to Lakecrest (very popular option) • traffic circle at Gordon & Tacoma, and Hartlen & Tacoma • Extend Stevens Rd. to Lakecrest to create a 4 way intersection & close the connection from Helene to Main • Parking lot beside Hartlen extension • Lakecrest & Major become a pedestrian shopping street with bike traffic • People use the Lawton's Parking lot, and the Sobey's parking lot as short cuts which make walking in the area unsafe. • Main street - Not drive-through - Welcoming - Not a highway - Maintain traffic volume and speed on Main Street: Balance of car and pedestrian space • Traffic calm – don't divert traffic • Visual cues of speed (sense of enclosure) • bottle at 4 way stop at Gordon and Tacoma • Sobey's parking lot is wasted since Canadian Tire left • Driveways are a key hazard • Stevens Rd extension creates a new crosswalk across Main St.
Gateways	• From Hwy 7 (east & west) • from Hwy 111 • from Raymond St • from Valleyfield Rd.
Bicycle Infrastructure	• Along Lakecrest Dr. and to the north following the Hwy. • Following Hwy 111 to Prince Albert Rd. West (Cyclists currently use the bridge here but it is too narrow) • Lakecrest & Major become a pedestrian shopping street with bike traffic

Table G3: Consultation Comments

Design Elements	Ideas
Other comments	General Design should be or include: • Senior friendly • Pedestrian friendly: Pedestrians need places and reasons to stop and interact with one another and the space • All daily amenities are available • Intergenerational Buildings • Pedestrian mall, like Grandville streets and/or Hydrostone, with green and retail space, local food, beverage vendors • Explore option of pedways on Main • Materials of public infrastructure, wide sidewalks • Address Tacoma and Lakecrest and how they fit in with Main • More living and working spaces • Active transportation infrastructure • Wayfinding (eg. Distance signs) Amenities • Local food (market) • Playground (green space beside apartments on Lakecrest where knew condo is going in) • Community space - Clubs to meet - Hub spots for entrepreneurs • Food truck vendors • Parks

Appendix H: Transit Hub Options

Multiple options were explored throughout the design process, for the location of a transit hub in the BID. These options create viable alternatives to the recommended tranist hub solution. Figure H1 is an iteration of an alternative transit hub located on Hartlen Street. Through our design process the transit hub evolved to become a more integrated part of the Village Centre, which led to the recommendations found in figure 85. Figure H1 is an additional transit hub option that we explored, to accomodate for greater bus parking than alternative options.

Transit Hub on Hartlen Street: Alternative Option 1

This option (See figure H1) represents cost effective opportunity to increase transit ridership while increasing the safety and convenience for all forms of users. To maintain the highest levels of cyclist safety, cycle lanes are placed behind a newly separated 2.7m bus loading zone (See Figure H1). This area includes new bus shelters and provides many of the same features found in furnishing zones for sidewalks of the recommended transit hub. The sidewalk width is increased to a 2m size and trees are installed in within the bus loading zone.

This option was not selected as the recomended transit hub as it does not provide space bus parking or bus cut-out lanes.

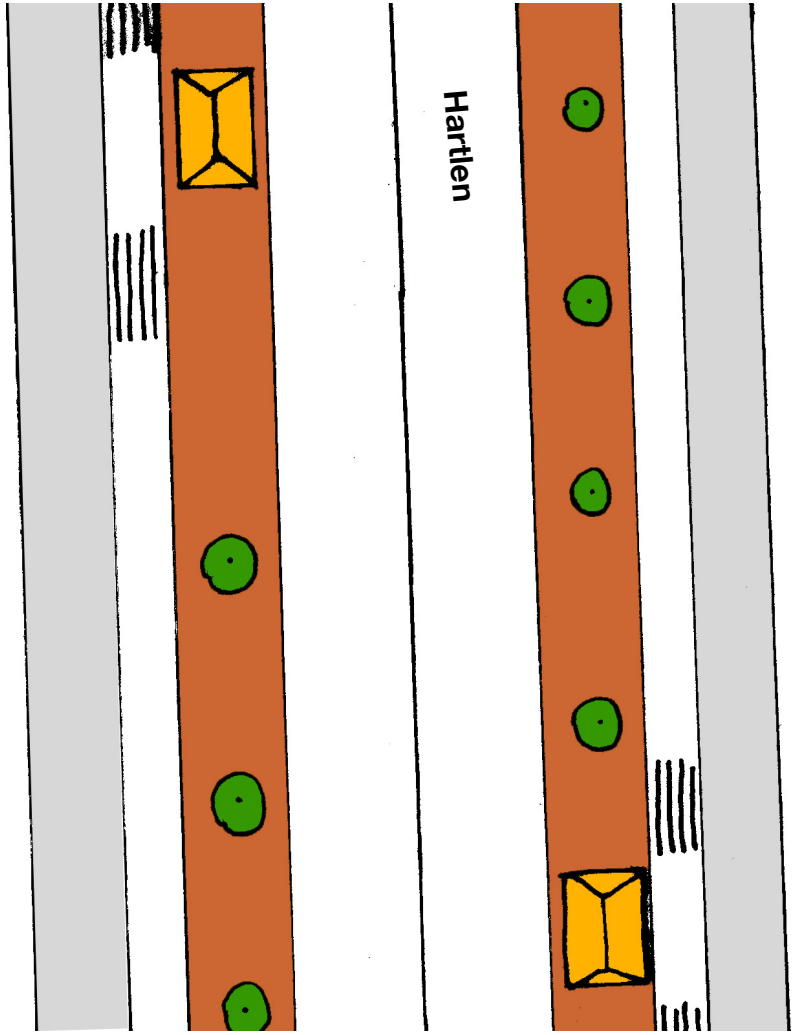


Figure H1: Transit Hub within Shopper's Drug Mart Parking Lot

Transit Hub on Hartlen Street: Alternative Option 2

Rather than using Hartlen Street, this option moves transit stops to within the parking lot area at the corner of Tacoma Drive and Hartlen Street. The transit hub includes a large covered area with seating for passengers and minor amenities, including trash receptacles. This design allows for a greater variety of transit options. By making the area 20m long, this transit centre allows for four buses (or two articulated buses) to arrive and unload simultaneously. The wide areas create ample opportunity for buses parking, park and ride spaces, bicycle parking, bike lanes, and public green space. Buses can enter the parking lot through Hartlen, or through a newly created entry-way to the east on Tacoma Drive. In this option, Hartlen has its bus stops removed, and reconfigures the road space to include a painted bike lane in either direction, but maintains its use as a bus thoroughfare. (See Figure H2). This method was discarded due to its incompatibility with the adjusted Hartlen design.

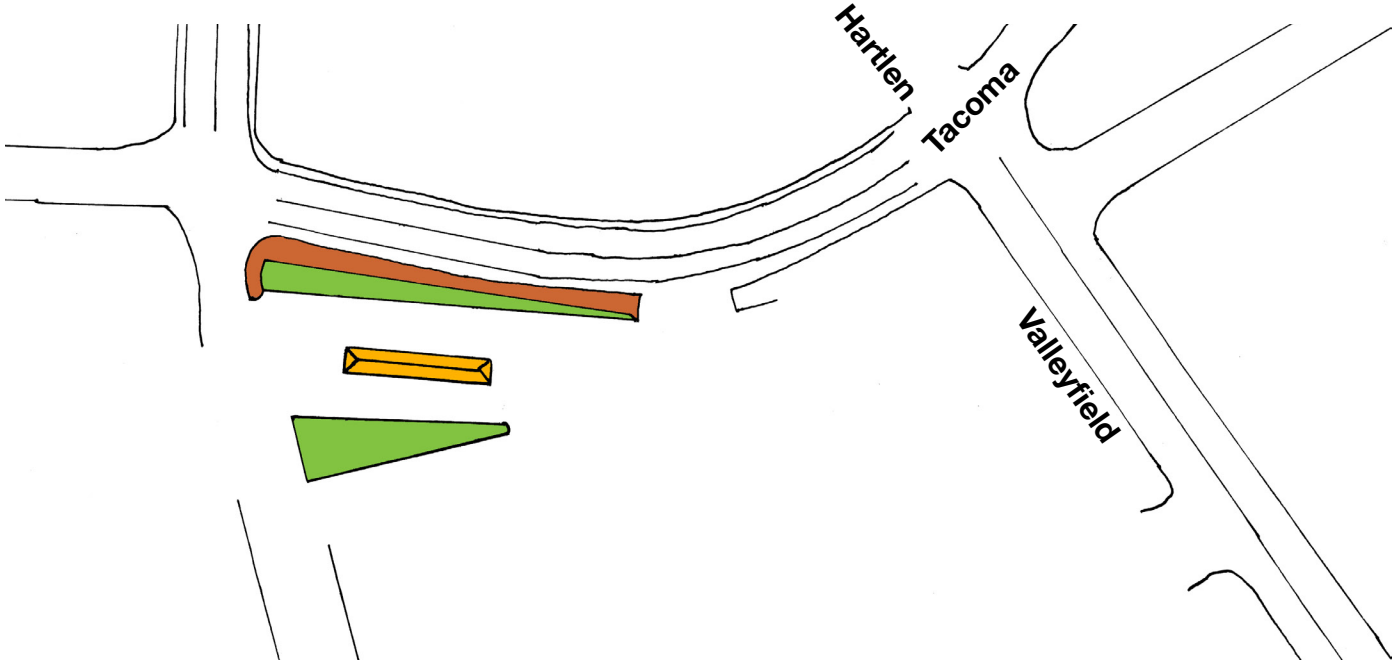


Figure H2: Alternate Bus Terminal on Tacoma Drive

Appendix I: Gordon Tacoma Option

Tacoma Drive / Gordon Avenue Alternative Option: Four Way Stop

This is an alternative upgrade to the Tacoma Drive / Gordon Avenue intersection. This design still removes the option to travel south on the 111 exit but did not score as highly as the roundabout which we ultimately recommended (see Figure 90).

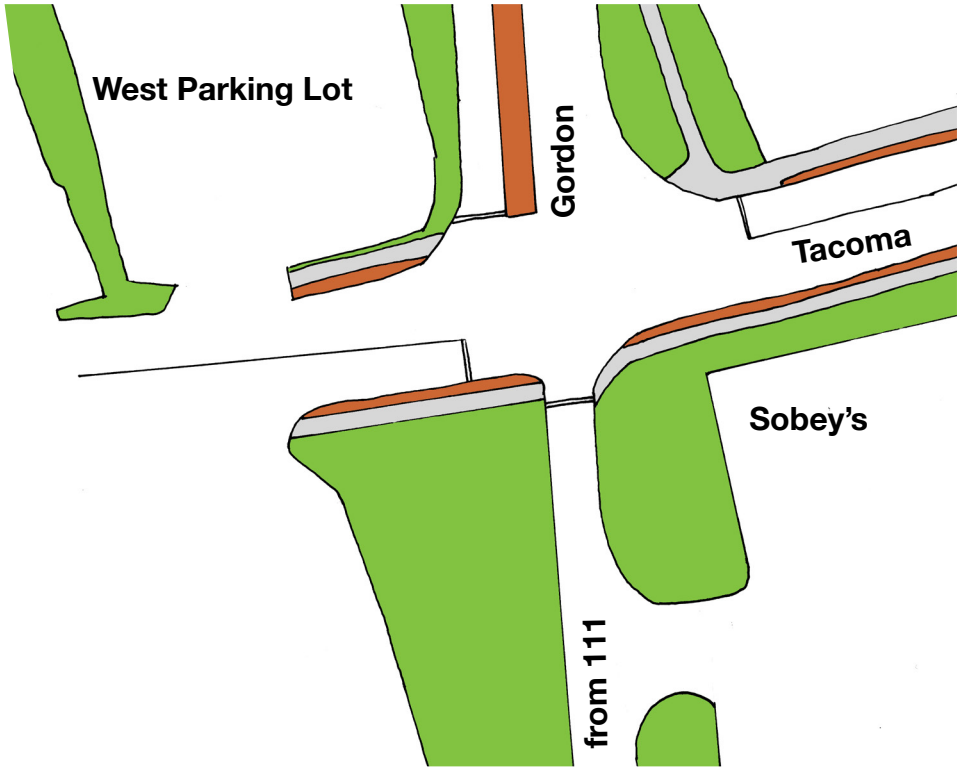


Figure I1: Gordon Avenue/ Tacoma Drive Four-way Intersection Concept