



Downtown Streetscaping Class Environmental Assessment

ENVIRONMENTAL STUDY REPORT

City of Brantford

58 DALHOUSIE STREET, BRANTFORD, ONTARIO N3T 2J2 | 2023

Table of Contents

| | |
|--|------|
| Executive Summary..... | i |
| Downtown Brantford Today..... | ii |
| Environmental Assessment Focus | iii |
| Problem / Opportunity | iii |
| Evaluation Criteria..... | iv |
| Background Studies..... | v |
| Alternative Solutions | viii |
| Alternative Design Concepts..... | xi |
| Preferred Alternative | xiv |
| Public and Stakeholder Engagement..... | xvi |
| Construction Staging and Cost Estimation | xvii |
| Summary and Recommendations | xx |
| 1.0 Introduction..... | 1 |
| 2.0 Background | 3 |
| 3.0 Class Environmental Assessment..... | 5 |
| 4.0 Downtown Brantford Today..... | 6 |
| 4.1 Existing Conditions..... | 6 |
| 4.2 Planning Context..... | 7 |
| 4.3 Current Land Uses and Activities..... | 8 |
| 4.4 Land Use Planning Objectives..... | 9 |
| 4.5 Current Streetscape Conditions..... | 10 |
| 4.6 Sidewalks..... | 11 |
| 4.7 Water Supply..... | 11 |
| 4.8 Sanitary Sewers | 12 |
| 4.9 Storm Water Management..... | 12 |
| 4.10 Natural Gas | 13 |
| 4.11 Hydro | 13 |
| 4.12 Bell Communications..... | 14 |
| 4.13 Other Communications Network..... | 14 |
| 4.14 Public Transit | 14 |
| 4.15 Source Water Protection | 15 |
| 5.0 Study Purpose – “Come Around to a New Downtown”..... | 16 |
| 5.1 Introduction | 16 |

| | | |
|-------|---|----|
| 5.2 | Guiding Documents | 16 |
| 5.3 | Environmental Assessment Focus..... | 17 |
| 5.4 | Problem / Opportunity..... | 18 |
| 5.5 | Evaluation Criteria | 18 |
| 6.0 | Background Studies..... | 20 |
| 6.1 | Archaeological Resources | 20 |
| 6.2 | Cultural Heritage | 21 |
| 6.3 | Natural Environment..... | 22 |
| 6.4 | Geotechnical Investigation and Environmental Site Assessment..... | 24 |
| 6.5 | Parking..... | 24 |
| 6.6 | Wayfinding Strategy Study | 28 |
| 6.7 | Transportation and Traffic Analysis | 28 |
| 6.8 | Roundabout Screening..... | 35 |
| 6.9 | Air Quality Impact Assessment..... | 36 |
| 7.0 | Alternative Solutions | 37 |
| 7.1 | Introduction | 37 |
| 7.2 | Public Input | 50 |
| 8.0 | Alternative Design Concepts..... | 57 |
| 8.1 | Design Concept Development..... | 57 |
| 8.2 | Public Input | 66 |
| 8.3 | Why is Alternative #3 Preferred? | 68 |
| 9.0 | Recommended Design Concept | 71 |
| 9.1 | Street Design | 71 |
| 9.2 | Design Features..... | 73 |
| 9.2.4 | Lighting | 75 |
| 9.3 | Underground Utilities and Infrastructure | 76 |
| 9.4 | Waste Management | 76 |
| 9.5 | Operations and Maintenance..... | 77 |
| 9.6 | Estimated Capital Costs | 77 |
| 10.0 | Public Consultation | 79 |
| 10.1 | Public Consultation as Part of Class EA | 79 |
| 10.2 | Notice of Study Commencement..... | 79 |
| 10.3 | Workshops | 80 |
| 10.4 | Public Information Centre #1 | 80 |

| | | |
|------|--|----|
| 10.5 | Public Information Centre #2 | 81 |
| 10.6 | Public Information Centre #3 | 81 |
| 10.7 | Public & Stakeholder Communication..... | 82 |
| 10.8 | Indigenous Correspondence..... | 82 |
| 10.8 | Council Approval | 83 |
| 10.9 | Notice of Study Completion | 83 |
| 11.0 | Impacts and Mitigation Measures..... | 84 |
| 11.1 | Key Impacts and Mitigation..... | 84 |
| 11.2 | Climate Change..... | 86 |
| 12.0 | Operations Considerations..... | 88 |
| 13.0 | Permits, Approvals and Next Steps..... | 90 |
| 13.1 | Approvals | 90 |
| 13.2 | Future Phases | 90 |
| 13.3 | Construction Staging | 90 |
| 13.4 | Noise and Vibration | 92 |
| 13.5 | Preliminary (30%) Design..... | 92 |
| 13.6 | Transitioning to the Detailed Design Phase | 93 |
| 14.0 | Summary and Recommendations | 93 |

List of Figures

| | |
|--|-------|
| Figure 1 Preferred Alternative Municipal Downtown Parking Inventory | vii |
| Figure 2 Evaluation Summary of Alternative Design Concepts | xiv |
| Figure 3 Cross-section of Preferred Alternative for Colborne and Dalhousie Streets | xv |
| Figure 4 Phase 1 Proposed Construction Plan (Years 1-5)..... | xviii |
| Figure 5 Phase 2 Proposed Construction Plan (Years 5-10)..... | xviii |
| Figure 6 Study Area Map..... | 1 |
| Figure 7 Class EA Process..... | 5 |
| Figure 8 Colborne Street (West End) – Facing West | 6 |
| Figure 9 Dalhousie Street (West End) – Facing West..... | 7 |
| Figure 10 Sanderson Centre | 9 |
| Figure 11 Brantford Transit Map..... | 15 |
| Figure 12 Brantford Downtown Source Water Protection Area Mapping..... | 15 |
| Figure 13 Walking Distances from Municipal Parking Lots..... | 26 |
| Figure 14 Parking Inventory for Preferred Alternative | 27 |
| Figure 15 Proposed Wayfinding and Parking Guidance Signs..... | 28 |
| Figure 16 Current Traffic Operation (AM and PM Peak Hour)..... | 33 |
| Figure 17 Collision Summary Data | 33 |
| Figure 18 Collision Summary Data | 34 |
| Figure 19 Evaluation Summary..... | 39 |
| Figure 20 Alternative #1: Do Nothing | 40 |
| Figure 21 Evaluation of Alternative #1 | 41 |
| Figure 22 Cross-Section of Alternative #2 | 42 |
| Figure 23 Plan View of Alternative #2..... | 42 |
| Figure 24 Evaluation of Alternative #2 | 43 |
| Figure 25 Cross-Section of Alternative #3 | 44 |
| Figure 26 Plan View of Alternative #3..... | 44 |
| Figure 27 Evaluation of Alternative #3 | 45 |
| Figure 28 Cross-Section of Alternative #4 | 46 |
| Figure 29 Plan View of Alternative #4..... | 46 |
| Figure 30 Evaluation of Alternative #4 | 47 |
| Figure 31 Cross-Section of Alternative #5 | 48 |
| Figure 32 Plan View of Alternative #5..... | 48 |
| Figure 33 Evaluation of Alternative #5 | 49 |
| Figure 34 AM Peak Hour Traffic Volumes..... | 52 |
| Figure 35 2051 Capacity Comparison – Two-Way (Dalhousie)..... | 53 |
| Figure 36 2051 Capacity Comparison – Two-Way (Colborne)..... | 54 |
| Figure 37 2051 One-Way Peak Hour..... | 55 |
| Figure 38 2051 Two-Way Peak Hour..... | 55 |
| Figure 39 Evaluation of the Preferred Alternative | 58 |
| Figure 40 Cross-Section of Alternative #1: Do Nothing..... | 59 |
| Figure 41 Illustration of Alternative #1..... | 59 |
| Figure 42 Cross-Section of Alternative #2 | 60 |
| Figure 43 Illustration of Alternative #2..... | 61 |
| Figure 44 Cross-Section of Alternative #3 | 62 |
| Figure 45 Illustration of Alternative #3..... | 62 |

| | |
|---|----|
| Figure 46 Cross-Section of Alternative #4 | 63 |
| Figure 47 Illustration of Alternative #4..... | 64 |
| Figure 48 Cross-Section of Alternative #5 | 65 |
| Figure 49 Illustration of Alternative #5..... | 66 |
| Figure 50 Cross-Section of Preferred Alternative..... | 71 |
| Figure 51 Illustration of Preferred Alternative..... | 72 |
| Figure 52 Implementation of Soil Cells | 74 |
| Figure 53 Image of Potential Style of Bench..... | 74 |
| Figure 54 Image of Curbside Garbage..... | 77 |
| Figure 55 Phase 1 of Construction (Years 1-5)..... | 91 |
| Figure 56 Phase 2 of Construction (Years 5-10)..... | 92 |



Executive Summary

The Downtown Brantford Streetscape Environmental Assessment was initiated by the City of Brantford (City) as the aging underground infrastructure within the Downtown core is at the end of its serviceable life and in need of replacement. Underground infrastructure includes services such as watermain, sanitary sewers, storm sewers, Hydro, Enbridge, Bell, Rogers, and other telecommunications providers.

This project presents the opportunity to holistically upgrade the right-of-way following the underground improvements with a streetscape that will revitalize the Downtown by promoting walkability, greater accessibility, aesthetics, and greenery. The goal of this Study is to present options to make Downtown Brantford a destination place.

MTE Consultants (MTE) was retained by the City to assist with undertaking a Schedule C Municipal Class Environmental Assessment (Class EA) to reconstruct and streetscape of Downtown Brantford.

The limits for this Class EA include:

- Colborne Street from Brant Avenue / Icomm Drive to Dalhousie Street / Colborne Street east junction
- Dalhousie Street from Brant Avenue to Colborne Street East / Dalhousie Street junction
- Brant Avenue, King Street, Queen Street, Market Street, Charlotte Street, Clarence Street from Dalhousie Street to Colborne Street

This Class EA is intended to build upon the previous studies conducted on the Downtown core that considered streetscaping elements and the conversion of one-way traffic to two-way traffic. During the Class EA process, previous studies provided background information and were used as a foundation for the current Study, including:

- 2008 Master Plan for Downtown Brantford
- 2010 Waterfront Master Plan
- 2010 Conversion of Colborne Street and Dalhousie Street to Two-Way Traffic Operations
- 2011 Downtown Streetscape Design Plan

These studies provided excellent background information about the operation of Downtown, including traffic flow. The studies listed below were completed in parallel with this Class EA. Collaboration between the various teams and City staff has been ongoing throughout the process of this Study, with the intent of having consistency in the findings and recommendations.

- 2021 Urban Design Manual
- 2021 Transportation Master Plan
- 2021 Master Servicing Plan
- 2021 Official Plan

In Ontario, municipal infrastructure projects are obligated to meet the requirements put forth in the Ontario Environmental Assessment Act. The Municipal Class EA process



(October 2000, as amended in 2007, 2011, and 2015), applies to a group or “class” of municipal infrastructure projects which occur frequently and have relatively minor predictable impacts. These projects are pre-approved under the Ontario Environmental Assessment Act, given they are planned, designed and constructed according to the requirements of the Class EA process. The specific requirements of the Class EA process that each project must follow depend on the type of project, the complexity and the potential impact on the environment. The document identifies four categories or “schedules” of projects: A, A+, B, and C.

This Study was undertaken as a Schedule C project. Schedule C projects must follow the complete Class EA process, namely:

- **Phase 1 – Data Collection:** Identify Problem / Opportunity
- **Phase 2 – Develop Alternative Solutions:** Create Functional Designs Based on Stakeholder Input
- **Phase 3 – Alternative Designs:** Refine Solutions Based on Stakeholder Feedback
- **Phase 4 – Environmental Study Report:** Compile Results of Background Studies and Submit Report to the Ministry of the Environment, Conservation and Parks (MECP)

Downtown Brantford Today

Colborne Street is a one-way street providing traffic flow in the easterly direction through Downtown. This roadway forms the southerly section of the designated arterial road through the Downtown core and has a two-lane cross-section within the Study Area with turning lanes provided at strategic locations. The roadway has a posted maximum speed limit of 50 kilometres per hour (km/h). Parking is permitted on both sides of the roadway throughout various segments of the corridor, largely contained to on-street parking bays.

Dalhousie Street is a one-way street providing traffic flow in the westerly direction through Downtown. This roadway forms the northerly section of the designated arterial road through the Downtown core and has a three-lane cross-section within the Study Area with turning lanes provided at strategic locations. The roadway has a posted speed limit of 50 km/h. Parking is permitted on both sides of the roadway through various segments of the corridor, largely contained to on-street parking bays.

Within the Study Area, the following collector and local roads intersect Colborne Street and Dalhousie Street and form the basis for the transportation network analysis:

Brant Avenue is a north-south, four-lane, minor arterial roadway with an urban cross-section. The posted maximum speed limit is 50 km/h. South of Colborne Street West, Brant Avenue operates south with a four-lane, undivided cross-section, with two travel lanes per direction. Parking is not permitted on either side of the roadway between Colborne Street and Dalhousie Street.



King Street is a north-south, minor arterial roadway that operates with a two-lane cross-section. The posted maximum speed limit is 50 km/h. Parking is permitted on both sides of the roadway within the Study Area.

Queen Street is a north-south, minor arterial that operates with a two-lane cross-section. The posted maximum speed limit is 50 km/h. On-street parking is not permitted on Queen Street within the Study Area.

Market Street in the Study Area is a right-of-way that provides access for parking, deliveries, and emergency vehicles between Colborne Street and Dalhousie Street.

Charlotte Street is a north-south, local roadway that operates with a two-lane cross-section. The posted maximum speed limit is 50 km/h. Parking is permitted on both sides of the roadway in the Study Area.

Clarence Street is a major arterial that operates with a four-lane cross-section. The posted maximum speed limit is 50 km/h. Parking is prohibited on both sides of the roadway in the Study Area.

Environmental Assessment Focus

This Study is focused on identifying the necessary infrastructure improvements that the City should apply to the Downtown core to allow for growth, while also evaluating the needs for all modes of transportation, improving walkability, and making Downtown a destination within the City. The recommendations of this Study outline the Design Concepts that will be applied throughout Downtown and provide information for the future detailed design phase. Many of the streetscaping elements selected for Downtown may vary from the current materials as well as the City's Design Standards. Items such as lighting, bollards, and paving material are key to creating a unique space and making Downtown a place-making destination. Guiding principles to the implementation of this streetscaping Class EA are outlined in this report.

Problem / Opportunity

Phase 1 of the Class EA process involves developing a Problem / Opportunity Statement to guide the Study. The following Problem / Opportunity Statement was developed for this Study, and was presented at the first Public Information Centre (PIC):

Revitalize Brantford's core by improving infrastructure, accessibility, safety, and rebuilding an aesthetically beautiful and adaptable Downtown.

In conjunction with the Problem / Opportunity Statement, a Vision was developed as follows:

Create a Downtown Brantford that is attractive, vibrant, and safe for all users while providing the infrastructure needed to handle growth in the City's core.

- Make Downtown a destination place
- Enhance infrastructure for all transportation modes including pedestrians, cyclists, and transit users
- Improve accessibility and safety in the core



Evaluation Criteria

Prior to developing the Alternative Design Concepts, evaluation criteria were established to assist in generating and evaluating the Alternative Solutions. The evaluation criteria are described as follows:

| Criteria | User Benefits | Other Benefits |
|--------------------|--|---|
| Vision | <ul style="list-style-type: none"> • Improves walkability throughout Downtown • Increases pedestrian capacity • Animates streets, is a “People Place” | <ul style="list-style-type: none"> • Improves necessary infrastructure – all modes • Is attractive, vibrant, and unique |
| Social Environment | <ul style="list-style-type: none"> • Addresses curbside management issues • Addresses accessibility for all users • Improves pedestrian and cycle lanes • Accommodates public transit • Consideration for parking | <ul style="list-style-type: none"> • Minimal cultural heritage and archaeological impacts • Improves natural environment • Contributes to improved quality of life and public health • Addresses climate change |
| Safety | <ul style="list-style-type: none"> • Promotes feelings of comfort and safety • Encourages street-level activity • Roads and sidewalks are safe and accessible for all users | <ul style="list-style-type: none"> • Reduces vehicular accidents overall • Encourages safe use of sidewalks and roads under all conditions • Safer pedestrian crossings – shorter crossing distances and dedicated crossings |
| Traffic Operations | <ul style="list-style-type: none"> • Sufficient level of service for traffic • Minimizes traffic disruption from loading / unloading | <ul style="list-style-type: none"> • Integrates transportation network • Minimizes need for widening • Encourages decrease in single-occupant vehicle travel |
| Costs | <ul style="list-style-type: none"> • Minimizes property impacts • Minimizes disruption costs to businesses | <ul style="list-style-type: none"> • Capital construction costs • Consideration for long-term maintenance costs • Constructability – disruption during construction |



Background Studies

Stage 1 Archaeological Investigation

A Stage 1 Archaeological Assessment was undertaken by Archaeological Research Associates Limited (ARA) to collect information about the history of the project area, identify land conditions and geography, as well as determine if there has been any previous archaeological fieldwork within the area. The investigation encompassed the entirety of the Study Area, including the subject thoroughfares as well as the intervening properties.

The Stage 1 Archaeological Assessment determined that the Study Area comprises a mixture of areas of archaeological potential and areas of no archaeological potential. The Archaeological Assessment recommends that areas identified within the report be subject to a Stage 2 property assessment.

Cultural Heritage

A Cultural Heritage Resource Assessment was conducted to identify and evaluate cultural heritage resources and create an inventory of built heritage and cultural landscape resources within the Study Area and assess how the project will impact each of the identified resources. A total of 201 Built Heritage Resources and six Cultural Heritage Landscapes were identified within the heritage assessed area. As the combined Study Area and heritage assessed area is quite large, it was broken down into 14 blocks from the west end of the Study Area to the east end. Within each block, Built Heritage Resources and Cultural Heritage Landscapes were identified and addressed. The identified Built Heritage Resources could be directly or indirectly impacted by streetscape improvements. The Built Heritage Resources include a bridge constructed in 1924 which might be directly impacted by streetscape improvements. To mitigate the impact to cultural heritage features, designs should attempt to avoid directly impacting identified features and a Heritage Impact Assessment should be completed during the detailed design phase.

Natural Environment

A Natural Environment Assessment was undertaken by Groundwater Environmental Management Services Inc. (GEMS) to identify existing natural heritage features along with wildlife habitat within the Study Area. This information is used to help build the natural environment constraints for the design.

The Assessment identifies no significant impacts to the ecology of the adjacent natural features. The Study Area has received past disturbance and does not interfere with any natural heritage features or their functions. The proposed streetscaping will provide an overall improved habitat for some species due to the increased tree cover and green space.

Additionally, Low Impact Development and Green Infrastructure measures will reduce any increased impervious surface cover and allow for a more natural infiltration rate during precipitation events. Since the Study Area is so close to the Grand River any



increased impervious surfaces may have a more immediate effect on the river, which could also contribute to higher erosion rates in the watercourse.

Geotechnical and Phase 1 Environmental Site Assessment

As part of the Class EA process, a geotechnical investigation was conducted. The Geotechnical Investigation Report identifies requirements and suitable materials for the reconstruction of the road base and surface.

Prior to completing the geotechnical investigation, MTE completed a Screening Level Phase I Environmental Site Assessment (ESA) for the corridors. The purpose of the Screening Level Phase I ESA was to identify potential environmental concerns along, or near, the corridors that may affect soil or groundwater quality.

The findings of the Screening Level Phase I ESA were used to: determine potential locations for the environmental assessment in conjunction with the geotechnical boreholes to adequately assess areas of potential environmental concern, to develop the preliminary soil and groundwater sampling and analysis work plan for the proposed drilling activities, and to determine the general environmental quality of the on-site soil for preliminary soil management discussion purposes ahead of the planned construction activities.

The recommendations found in the report can be used as a reference as the detailed design of the roadway is undertaken. Additional soil sampling is recommended between and beyond the boreholes previously completed to better define the spatial extent of the impacts.

Parking

A Parking Study was completed for Downtown Brantford to evaluate the existing capacity of both the on-street, and off-street parking in and around Downtown. The study found that overall there is no deficiency of parking within Downtown, and that there is capacity within the surface lots and Market Centre Parkade. The study also found that on-street parking spots were more heavily utilized than off-street parking lots.

The impact to parking was assessed for each of the Alternatives, and it was found that with the Preferred Alternative, it is expected that there will be no loss of on-street parking. Through detailed design, the current amount of on street parking will be maintained wherever feasible.

Figure 1 provides a preliminary review of the parking spaces that could be available as part of the streetscaping, showing block-by-block where the on-street spots could be accommodated. The parking counts are adjusted to reflect changes to the layout of parking spaces. Rather than having painted lines for each parking stall, the recommendation of the Parking Study is that the parking stalls not be marked, other than with a start and end point. This allows for an approximately 15% increase in parking within the same block of on-street parking. This increase in on-street parking capacity is expected to be offset by the minor losses in parking for bump outs for pedestrian crossing, curbside management, loading and unloading etc.

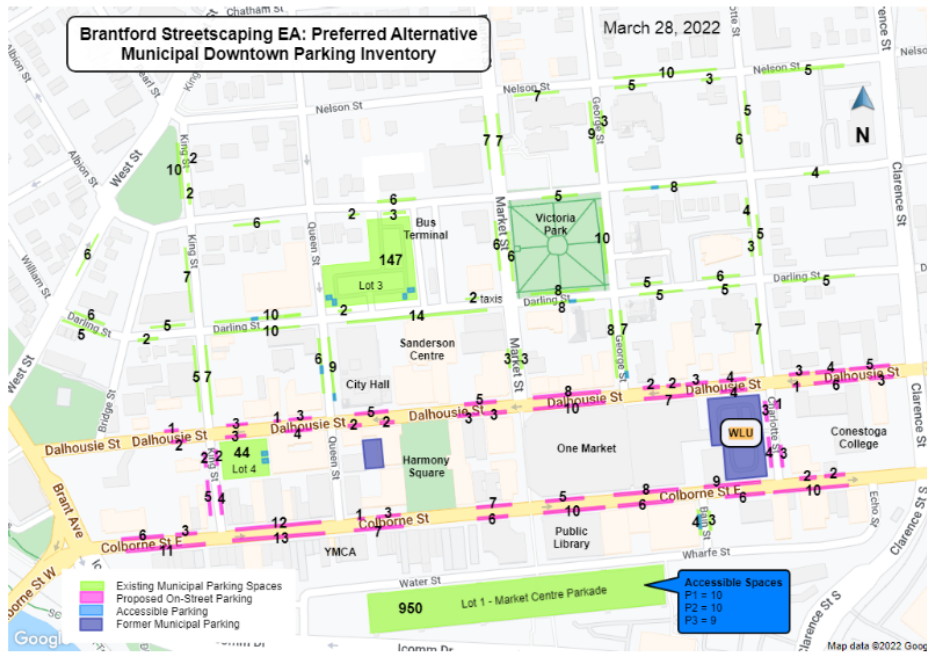


Figure 1 Preferred Alternative Municipal Downtown Parking Inventory

Wayfinding

The Wayfinding Study identifies the need for signage and providing direction to visitors within the Downtown core. Within the study, walkability is evaluated, showing walking distances to various locations, and identifying that all of the Downtown core can be accessed within a four-minute walk of one of the City parking lots. The wayfinding strategy gives examples of types of signage and possible locations for signage to provide clear direction to Downtown visitors.

Transportation

A Transportation and Traffic Analysis was conducted on the traffic patterns within the Downtown based on the 2051 horizon, consistent with the Master Servicing Plan, Transportation Master Plan, and Official Plan. The study reviewed both the one-way and two-way Alternatives and their impact on the overall traffic patterns during peak conditions. The study found that two-way traffic introduced a number of constraints, including significant impacts to traffic flow at Clarence Street and Brant Avenue.

Through the Transportation and Traffic Analysis, it was determined that two-way vehicular lanes would result in significant disturbance of traffic flow with stopping vehicles (emergency vehicles, deliveries, waste collection, or collisions) occupying the lane. Due to the right-of-way in the Downtown being narrow, only one lane of traffic in each direction could be accommodated in a two-way traffic scenario and this would impede traffic to such an extent that it is unfeasible given the demands for both roads in the City's transportation network. The recommendation of the Transportation and Traffic Analysis is that one-way traffic be maintained.



Street Lighting

The Street Lighting Study evaluated the Study Area of this Class EA, as well as the surrounding Downtown area. A photometric analysis was completed to determine what the appropriate lighting levels should be for the Downtown. This will allow the design team to make decisions about specific lighting during the detailed design phase.

Roundabout Screening

In 2020, the City implemented a new roundabout screening policy which provides direction to City staff to review the feasibility of roundabouts within the City. The intent is that when a signalized intersection is to be replaced, a roundabout screening should be completed to confirm the most appropriate type of configuration for that intersection. MTE was asked to conduct roundabout screenings for all signalized intersections within the Study Area.

Looking at each of the signalized intersections within the corridor, all but one was screened out based on several factors:

- Property impacts, many of which would include full buyouts of buildings adjacent to right-of-way
- Implementation cost
- Functionality of roundabout with one-way traffic

The roundabout screening found that one intersection met the screening criteria, which was explored further through functional design. The intersection of Colborne Street and Dalhousie Street, at the east limit of the Study Area, is a feasible candidate for a roundabout. It is recommended that a roundabout be further explored at this intersection.

Alternative Solutions

Phase 2 of the Class EA process involves developing and evaluating several Alternative Solutions. The intention of this phase was to determine the features that the City would like to improve, and the elements that could or should be included in the new streetscape. This phase included an evaluation of the different types of cross-sections that could be applied to the Downtown core, including discussion of maintaining one-way traffic versus conversion to two-way traffic. Given the constraints within the City's right-of-way, and the need and desire for cycle lanes and parking spaces, the width of the travelled portion of the roadway was of paramount importance. The main considerations for the solutions were:

- One-way or two-way traffic
- Number of vehicular lanes
- Cycle lanes
- On-street parking provision
- Provision of furnishing zones and pedestrian walkways

The table below presents the Alternative Solutions that were considered prior to the final evaluation, as well as the Preferred Solution that was presented at the second PIC and proceeded to the next stage of evaluation. These solutions are derived from cross-



sections that were developed by participants in the workshop sessions at the beginning of the project.

| Alternatives | Evaluation |
|--|---|
| Do Nothing | <ul style="list-style-type: none"> • Vision: Doing nothing does not meet the City’s vision for creating a Downtown that people want to visit, nor does it make Downtown more walkable. Underground infrastructure will need to accommodate needs of planned growth. • Social Environment: No improvement to aesthetics, walkability, no cycle lane. • Traffic Operations: Under current conditions, traffic will not be impacted, and capacity does not appear to be an issue. • Safety: Speed of traffic through Downtown not addressed. • Cost: The lowest cost option is to do nothing. Will still require some cost to improve so that accessibility is addressed. |
| Two-Way Traffic with Separated Bi-Directional Cycle Facility | <ul style="list-style-type: none"> • Vision: This Alternative is in-line with the overall vision. Provides dedicated cycle lane addressing active transportation, maintains parking on one side of the street, narrows the travel lanes to reduce speeds, and allows street furniture. Pedestrian space is not any wider than the existing, meaning no additional space for patios is available. • Social Environment: Provides space for street trees and improves the natural environment, maintains parking on one side. Two-way traffic operations are affected by the need for curbside management (i.e. garbage pick-up, loading, unloading). • Traffic Operations: Overall the two-way traffic does not perform as well as the one-way option, and is also more greatly impacted by curbside management, loading, emergency vehicles, etc. • Safety: High level of cyclist safety as cycle lanes are fully protected. Parking is also separated. • Cost: Slightly higher cost of maintaining cycle lanes, as plows might need to pass twice to clear snow. |
| Two-Way Traffic with Separated Cycle Lanes | <ul style="list-style-type: none"> • Vision: This Alternative is in-line with the City’s vision. Provides dedicated cycle lane addressing active transportation, maintains parking on one side of the street, narrows the travel lanes to reduce speeds, and allows street furniture. Pedestrian space is no wider than the existing, meaning no additional space for patios is available. • Social Environment: Provides space for street trees and improves the natural environment, maintains parking on one side. Two-way traffic operations are affected by the need for curbside management (i.e. garbage pickup, loading, unloading). |



| Alternatives | Evaluation |
|--|--|
| | <ul style="list-style-type: none"> • Traffic Operations: Overall the two-way traffic does not perform as well as the one-way option, and is also more greatly impacted by curbside management, loading, emergency vehicles, etc. • Safety: High level of cyclist safety as cycle lanes are fully protected. Parking is also separated. • Cost: Slightly higher cost of maintaining cycle lanes, standard sidewalk plow can clear in one pass, but plowing on both sides is required. |
| One-Way Traffic with Separated Bi-Directional Cycle Facility | <ul style="list-style-type: none"> • Vision: This Alternative is in-line with the City’s vision. Provides dedicated cycle lane addressing active transportation, maintains parking on one side of the street, narrows the travel lanes to reduce speeds, and allows street furniture. With this cross-section, the pedestrian space is no wider than the existing, meaning no additional space for patios is available. • Social Environment: Provides space for street trees and improves the natural environment, maintains parking on one side. Two lanes of traffic allow for curbside management (i.e. garbage pick-up, loading, unloading). • Traffic Operations: One-way streets move traffic more efficiently. • Safety: High level of cyclist safety as cycle lanes are fully protected. Parking is also separated. • Cost: Slightly higher cost of maintaining cycle lanes as plows might need to pass twice to clear snow. |
| One-Way Traffic with Separated Single Lane (Preferred) | <ul style="list-style-type: none"> • Vision: This Alternative is in-line with the City’s vision. Provides dedicated cycle lane addressing active transportation, maintains parking on one side of the street, narrows the travel lanes to reduce speeds, and allows street furniture. In this option, 1.5 m of space is gained from only having one cycle lane, which can be used for additional patio or pedestrian space. • Social Environment: Provides space for street trees and improves the natural environment, maintains parking on one side. Two lanes of traffic allow for curbside management (i.e. garbage pick-up, loading, unloading). • Traffic Operations: One-way streets move traffic more efficiently. Slight reduction in capacity based on 2041 projections. • Safety: High level of cyclist safety as cycle lanes are fully protected. Parking is also separated. • Cost: Slightly reduced cost of maintaining cycle lanes, standard sidewalk plow can clear in one pass. |



Alternative Design Concepts

Based on the feedback received at PIC #1 and PIC #2, a review of the evaluation factors, Project Team input and other input, a number of issues and concerns were raised and evaluated to develop the Alternative Design Concepts.

Based on stakeholder feedback received following PIC #2, the Project Team only presented Alternative Design Concepts that featured one-way traffic. Additionally, the Alternatives include low-profile rollover curbs, reducing the transition from the roadway to the parking areas and cycle lanes. Rollover curbs create a more level surface, which is better for accessibility and allows for greater flexibility within the right-of-way. Ahead of PIC #3, the stakeholders were steadfast in their desire for on-street parking to be maintained, and this was considered in developing the Alternative Design Concepts. The table below outlines the Alternative Design Concepts that were presented.

| Alternatives | Evaluation |
|---|---|
| Do Nothing – Reinstatement with Reduced Lane Widths | <ul style="list-style-type: none"> • Vision: Does not contribute to enhancing the streetscape and does not meet the City’s vision for creating a Downtown destination. • Social Environment: Does not contribute to enhancing the streetscape and does not meet the City’s vision for creating a Downtown destination. • Traffic Operations: Reinstating existing conditions will have no impact to current traffic operation. With current traffic configuration, capacity and traffic operation are not a significant concern given future traffic. • Safety: Will include reduced lane widths, which will act as natural traffic calming through Downtown. No improvements to pedestrian or cyclist safety. • Cost: Will be the lowest cost Alternative, as no streetscaping features will be included. Cost breakdown shows that approximately 86% of overall construction-related costs will be associated with the replacement of underground infrastructure. |
| Parking on One Side, Cycle Lane | <ul style="list-style-type: none"> • Vision: This Alternative is in-line with the City’s vision. Provides dedicated cycle lane and addresses active transportation improvements. Outdoor space for businesses is increased from the current conditions, improving the walkability of Downtown. Provides a flexible streetscape that can adapt with shifting demands. • Social Environment: Greater amount of space for street trees and improves the natural environment, maintains parking on one side. Parking is limited to one side of the road. Stakeholder engagement reflected importance of on-street parking and desire to maintain parking on both sides. • Traffic Operations: Two lanes of one-way traffic will have capacity under current traffic forecasting. Curbside management, loading, and emergency vehicles can use one lane as required, allowing traffic to flow around. |



| Alternatives | Evaluation |
|---|---|
| | <ul style="list-style-type: none"> • Safety: High level of cyclist safety as cycle lanes are fully protected. Parking is also separated. Bump outs for pedestrian crossing will be included. Narrow traffic lanes act as natural traffic calming and reduce speeds through Downtown. • Cost: Includes cost of underground infrastructure as well as streetscaping alternatives. The streetscaping will require additional maintenance effort from City staff. Underground infrastructure cost makes up most of the overall project cost. |
| Parking Both Sides, Cycle Lanes (Preferred) | <ul style="list-style-type: none"> • Vision: This Alternative is in-line with the City’s vision. Provides dedicated cycle lane addressing active transportation needs. Outdoor space for businesses is not increased from current conditions. Provides a flexible streetscape that can adapt with shifting demands. • Social Environment: Allows for space for street furnishing and street trees and improves the natural environment. Maintains parking on both sides of the road. Stakeholder engagement reflected importance of on-street parking and desire to maintain parking on both sides. • Traffic Operations: Two lanes of one-way traffic will have capacity under current traffic forecasting. Curbside management, loading, and emergency vehicles can use one lane as required, allowing traffic to flow around. • Safety: High level of cyclist safety as cycle lanes are fully protected. Parking is also separated. Bump outs for pedestrian crossing will be included. Narrow traffic lanes act as natural traffic calming and reduce speeds through Downtown. • Cost: Includes cost of underground infrastructure as well as streetscaping alternatives. The streetscaping will require additional maintenance effort from City staff. Underground infrastructure cost makes up most of the overall project. |
| One Traffic Lane, Parking Both Sides | <ul style="list-style-type: none"> • Vision: Does not adequately address the City’s vision. Provides dedicated cycle lane addressing active transportation needs. Outdoor space for businesses is increased from current conditions. Provides a flexible streetscape that can adapt with shifting demands. Does not address the needs of all forms of transportation. • Social Environment: Allows for space for street furnishing and street trees, improving natural environment. Maintains parking on both sides of the road. Stakeholder engagement reflected importance of on-street parking, and desire to maintain parking on both sides. • Traffic Operations: One lane of traffic will greatly reduce the capacity of the roadway. Any disturbance from garbage collection, loading, and emergency vehicles will be detrimental to traffic flow. |



| Alternatives | Evaluation |
|--|--|
| | <ul style="list-style-type: none"> • Safety: Lower level of safety for cyclists as they will be on road in a dedicated lane, as opposed to a separated facility. Bump outs for pedestrian crossing will be included. Wider lane may not result in reduced speed. • Cost: Includes cost of underground infrastructure as well as streetscaping alternatives. The streetscaping will require additional maintenance effort from City staff. Underground infrastructure cost makes up most of the overall project cost. |
| <p>Parking Both Sides, On-Road Cycle Lanes</p> | <p>Vision: Does not adequately address the City’s vision. Cycle lanes are provided, addressing active transportation needs. Outdoor space for businesses is not increased from current conditions. Provides a flexible streetscape that can adapt with shifting demands. Does not address the needs of all forms of transportation.</p> <ul style="list-style-type: none"> • Social Environment: Allows space for street furnishing and street trees and improves the natural environment. Maintains parking on both sides of the road. Stakeholder engagement reflected importance of on-street parking, and desire to maintain parking on both sides. • Traffic Operations: Two lanes of one-way traffic will have capacity under current traffic forecasting. Curbside management, loading, and emergency vehicles can use one lane as required, allowing traffic to flow around. • Safety: Lower level of safety for cyclists as they will be on road, as opposed to a separated facility. Bump outs for pedestrian crossing will be included. Wider lane may not result in reduced speeds. • Cost: Includes cost of underground infrastructure as well as streetscaping alternatives. The streetscaping will require additional maintenance effort from City staff. Underground infrastructure cost makes up most of the overall project cost. |

A detailed evaluation summary is provided in Figure 2 where all Alternatives included in the table above were examined.



Preferred Alternative

Following the evaluation of the Alternative Design Concepts it was determined that Alternative 3 was the most preferred. The key features of the Preferred Alternative are as follows:

- One-way traffic on Colborne and Dalhousie Streets
- Parking laybys on both sides of Colborne and Dalhousie Streets
- Single direction cycle lane on Colborne and Dalhousie Streets in the same direction as vehicular traffic
- Inclusion of furnishing zones and pedestrian walkways clearly delineated from the roadway

The Preferred Alternative includes a low-profile curb combined with level surface for pedestrian, cycling, and parking. The level surface allows for greater street flexibility in future should demands change. This Alternative also features narrower vehicular lane widths than what is currently present which will result in natural traffic calming. Additionally, the cross-section allows for the introduction of street trees within the site furnishing zone, as well as benches and other features.

| Evaluation Criteria | Alternative 1: Do Nothing; Reinstate with Reduced Lane Widths | Alternative 2: Parking on One Side, Bike Lane | Preferred | | Alternative 4: One Traffic Lane, Parking Both Sides, Bike Lane | Alternative 5: Parking Both Sides, On-Road Bike Lane |
|---------------------|---|---|--|--|---|---|
| | | | Alternative 3: Parking on Both Sides, Bike Lanes | | | |
| Vision | | | | | | |
| Social Environment | | | | | | |
| Traffic Operations | | | | | | |
| Safety | | | | | | |
| Cost | | | | | | |
| Preferred | | | | | | |

Figure 2 Evaluation Summary of Alternative Design Concepts

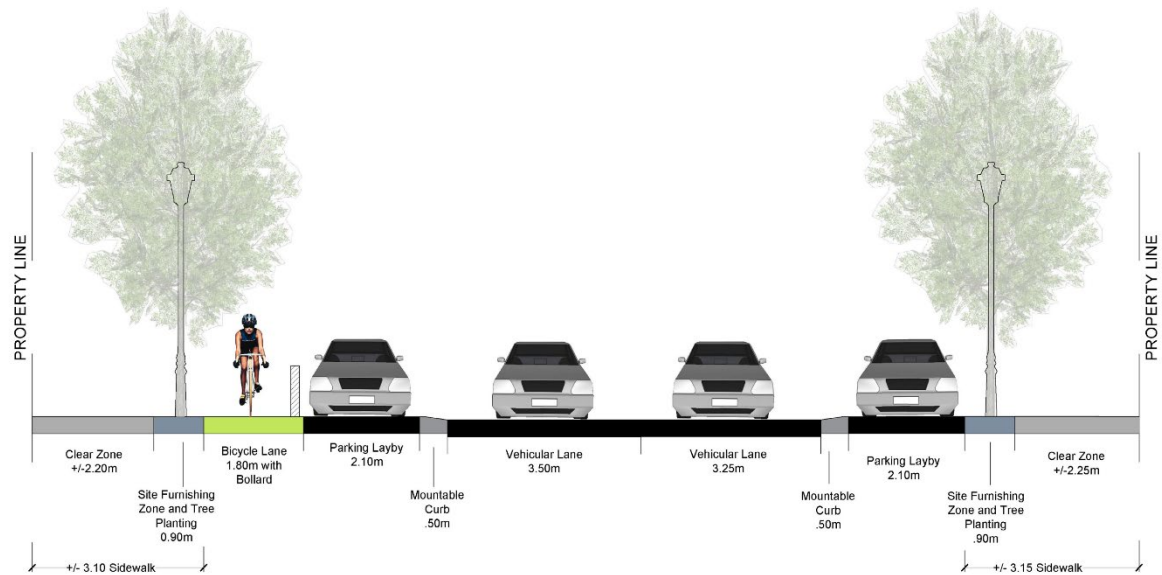


Figure 3 Cross-section of Preferred Alternative for Colborne and Dalhousie Streets

When weighed against the evaluation criteria, it was found that the Preferred Alternative closely meets the vision of the project, improves the social environment by accommodating all modes of transportation and use of the space, does not negatively impact traffic operations, and maximizes the safety of all users by delineating the roadway from cyclist or pedestrian infrastructure. As most of the cost associated with this project is related to the underground infrastructure and reinstatement of the roadway, the evaluation of cost for the Alternative Design Concepts was not as relevant to the decision making.

Market Street

Market Street has been designed as a pedestrian priority style street, also known as a Woonerf Street. This type of street puts pedestrians first and vehicular access second. Woonerf style streets have low traffic speeds, curb-less profiles (little to no grade change), and provide pedestrian amenities (seating, shade, tree plantings and pedestrian scale lighting). Two-way access to the back of buildings has been noted off Colborne Street.

Queen Street

Queen Street has been designed as a one-way street to allow for two-way cycle lanes that provide a north-south connection between Dalhousie and Colborne Streets. This street has been noted to be designed as a pedestrian priority style street. This allows for a pedestrian friendly connection from the Icomm Parkade to City Hall. With this proposal there is no loss of on-street parking as there is no parking on Queen Street currently.



Public and Stakeholder Engagement

Various stakeholders were identified and approached to provide comment throughout the project. Stakeholders were invited to participate in workshops where the opportunities and constraints of the Downtown streetscape were presented, and stakeholders were asked to develop potential cross-sections for Downtown. Workshops were held over multiple days in August 2020. COVID-19 restrictions at the time limited gatherings to a maximum of eight people, so the presentations and workshops were held with smaller groups.

The workshops included City staff and external stakeholders such as Wilfrid Laurier University, Downtown Brantford Business Improvement Area, Conestoga College, Grand River Council on Aging, Brantford Public Library, Brantford Police, and others. The cross-sections that were created by participants in the workshops were collated and used to form the Alternative Solutions that were presented to the public at PIC #2.

Prior to each PIC, the Project Team met with stakeholder groups individually to receive their feedback. The groups consulted prior to each PIC were:

- Technical Advisory Committee (TAC) consisting of City staff, regulatory agencies, utility providers
- Stakeholders including Wilfrid Laurier University, Conestoga College, Brant Historical Society, Brantford Public Library, Grand River Council on Aging, and others
- Six Nations of the Grand River Consultation Team
- Downtown Brantford Business Improvement Area

Notice of Study Commencement

A Notice of Study Commencement was mailed out on July 16, 2020, to all property owners and residents identified as being adjacent or in the Study Area, agencies, stakeholders and business owners. In addition, the Notice of Study Commencement was advertised in Civic News, Turtle Island News, and Two Row Times.

Public Information Centre #1

Notice of Virtual PIC #1 was mailed out on November 19, 2020, to all property owners, residents, business owners and others who indicated interest in the Class EA. All information related to PIC #1 was also posted on www.brantford.ca/NewDowntown. In addition, the Notice of Virtual PIC #1 was advertised in Civic News, Turtle Island News, and Two Row Times.

Due to the COVID-19 pandemic, the City hosted PIC #1 virtually. The virtual PIC included a video that was posted on November 30, 2020, providing information about the Class EA, findings from the stakeholder workshops, potential cross-sections for feedback, and evaluation criteria. The question and comment period for PIC #1 closed on December 14, 2020, and a Frequently Asked Questions document was posted to the City's webpage on December 21, 2020.



Public Information Centre #2

Notice of PIC #2 was mailed out on April 29, 2021, to all property owners, residents, business owners and others who indicated interest in the Class EA. All information related to PIC #2 was also posted on www.brantford.ca/NewDowntown. In addition, the Notice of PIC #2 was advertised in Civic News, Turtle Island News, and Two Row Times.

Due to the COVID-19 pandemic, the City hosted PIC #2 virtually through a live YouTube meeting on May 12, 2021, where community members could register to ask questions.

The purpose of PIC #2 was to present the Preferred Alternative as it related to one-way versus two-way traffic operations. The Transportation and Traffic Analysis indicating one-way as the ideal Alternative and the Parking Study were the two main components of PIC #2. The key takeaway from PIC #2 was that the preference was for one-way traffic, and that all Alternatives presented going forward would be one-way only.

The question and comment period for PIC #2 closed on May 25, 2021, and a Frequently Asked Questions document was posted to the City's webpage on June 2, 2021.

Public Information Centre #3

Notice of PIC #3 was mailed out on March 24, 2022, to all property owners, residents, business owners and others who indicated interest in the Class EA. All information related to PIC #3 was also posted on www.brantford.ca/NewDowntown. In addition, the Notice of PIC #3 was advertised in Civic News, Turtle Island News, and Two Row Times.

At PIC #3 the Project Team presented the Preferred Alternative cross-section, as well as the concept plan for Downtown. The construction staging plan was also presented, showing that the construction would take place over a five-year period for the phases west of Clarence Street, and over a 5-to-10-year planning horizon for the remainder of the corridor. The key takeaway from PIC #3 was that through stakeholder engagement, the importance of parking on both sides of the road was made clear, and parking on both sides was part of the Preferred Alternative.

At the time of PIC #3, the COVID-19 protocols had been relaxed and PIC #3 was held in-person at Brantford City Hall at 58 Dalhousie Street in Council Chambers on April 7, 2022. To allow participation from those who could not attend in person, the PIC #3 boards were posted to the City's website on April 4, 2022, and members of the public could participate virtually. Following PIC #3, the question and comment period was open until April 21, 2022, and a Frequently Asked Question document was posted to the City's webpage on April 28, 2022.

Construction Staging and Cost Estimation

The Study Area for this Class EA extends beyond the Downtown core, east of Clarence Street. The reason the Study Area extends east to the junction is because the underground infrastructure and traffic patterns are all interconnected. If the capacity of the roadways were to change in the Downtown core it would need to extend to the east



limit of the Study Area. As this project moves from the Class EA phase to the detailed design phase, the most effective way to complete the detailed design will be by designing both phases as one assignment. While the detailed designs should be completed at the same time, the construction is too substantial to be completed all at once. Therefore, the construction for this project will need to be staged for the infrastructure to be built in an efficient and cost-effective way, ensuring that there is not significant overlap and re-work.

Construction Staging

A proposed construction staging plan was prepared and presented at PIC #3. The construction plan is based on looking at areas that make sense to build together from a constructability perspective. The limits of the areas are defined by sanitary and stormwater drainage areas, as well as the ability to minimize traffic disruptions.

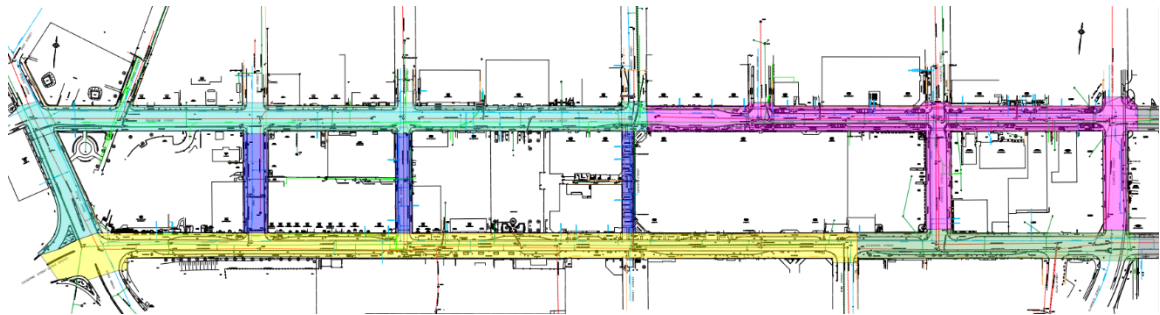


Figure 4 Phase 1 Proposed Construction Plan (Years 1-5)

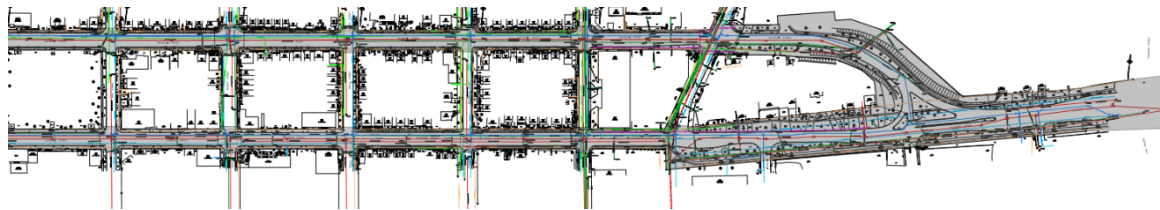


Figure 5 Phase 2 Proposed Construction Plan (Years 5-10)

The focus of the construction staging for this Class EA has been on the areas between Brant Avenue and Clarence Street. It is anticipated that the Downtown area between Brant Avenue and Clarence Street could be constructed in five construction seasons. This could be reduced by doing multiple phases per year or extending areas by directing contractors to use multiple crews. The remainder of the Study Area would be constructed over years 5-10. This staging plan is based on the preliminary design, and all construction details will need to be determined during the detailed design phase.

Construction Cost Estimates

The construction cost estimate that has been completed for this Study focuses on the Downtown area between Brant Avenue and Clarence Street. The total construction cost is estimated to be between \$29 and \$32 million, assuming that the project was

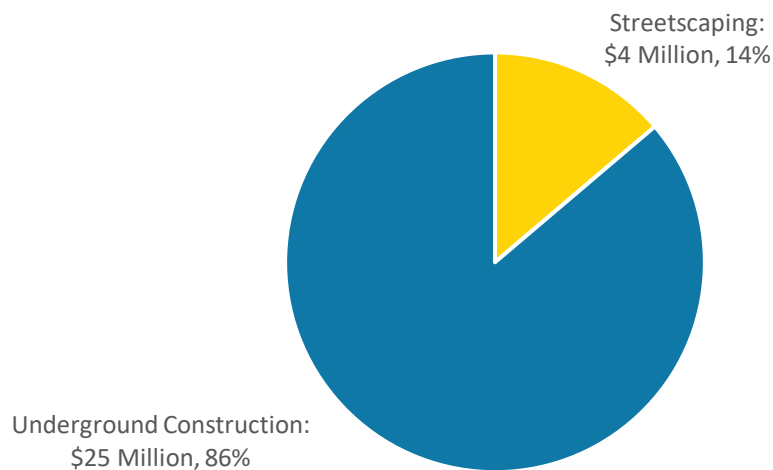


completed in 2022 dollars. This estimate does not consider the rising construction costs and inflation.

The cost of the infrastructure replacement and streetscaping specific costs have been separated to demonstrate the scale of the underground work that is required in relation to the whole project and are shown in the figure below.

Construction Cost Breakdown

■ Streetscaping ■ Underground Construction



The underground construction represents the replacement of the underground utilities (water main, sanitary sewer, storm sewer, gas, hydro, telecommunications), but also includes the restoration of the roadway once the infrastructure is completed. This is due to the disturbance that will be caused as a result of the infrastructure replacement. The reinstatement of the roadway will include:

- New curb and gutter
- Complete excavation and reconstruction of the road
- Replacement of the asphalt
- New sidewalk

The streetscaping elements consist of features such as:

- Tree wells
- Items in the furnishing zone (benches, bike racks, etc.)
- Premiums on finishings (cycle lanes, decorative concrete, etc.)

Preliminary (30%) Design

Along with the Environmental Study Report, MTE will prepare a preliminary (30%) design. The 30% preliminary design includes stormwater drainage, sanitary sewer sizing, water main sizing, including alignments for all infrastructure. The 30% preliminary design will also consider the relocation of various utility providers. Prior to completing the



30% preliminary design, MTE will collaborate with utility providers to ensure that adequate space is maintained for their planned infrastructure relocations or improvements. Adequate space will also be maintained for features such as Molok garbage collection systems which require dedicated underground space.

Prior to completing the 30% preliminary design, City staff will have an opportunity to review and comment. Coordination with all relevant departments is crucial to developing a 30% preliminary design that meets all the City's needs. The decisions that were made during the preliminary design phase will influence and direct the detailed design phase.

Transitioning to Detailed Design

Once the preliminary design is complete, City staff will begin preparing the terms of reference for selecting a consulting firm to assist with detailed design. The 30% preliminary design package will be used as a base for future design, and designs will rely on the data and assumptions made at this time. The detailed design is expected to be out to consultant selection in early 2023, with detailed design taking place in 2023 and 2024.

Summary and Recommendations

As part of the Class EA process, several Alternative Design Concepts for the Downtown Brantford Streetscape were evaluated. A small number of Alternatives were selected to be modified and further evaluated. Upon completion of the evaluation following the Schedule C Municipal Class EA process, a Preferred Alternative was selected. The Preferred Alternative is a one-way traffic design with a two vehicular lane cross-section, dedicated cycle lane on one side, and parking on both sides of Colborne Street and Dalhousie Streets using parking laybys. This cross-section meets the overall vision of the project, as the features will make Downtown more walkable and suitable for all forms of transportation. Some key features from this report:

Natural Environment: The downtown consists of an already disturbed area, has few trees within the study area, and there were no Species at Risk found within the study area. The addition of street trees, soil cells, and Low Impact Development features will overall improve the natural environment in the downtown.

One-Way Traffic: Maintaining one-way traffic is preferable as it is more effective at conveying the projected traffic flows Downtown. Two-way traffic with one lane in each direction would be greatly affected by garbage collection as well as loading and emergency services.

Parking: There is no shortage of parking within Downtown. The Preferred Alternative does not lead to a reduction in on-street parking and will require confirmation during the detailed design phase.

Construction: Construction of the Downtown core (Brant Avenue to Clarence Street) will occur over approximately a five-year period, with the remainder of the corridor being built in years five to 10. Detailed design will take place in 2023 and 2024, with expected construction start in 2025.



Cost: Estimated construction costs are between \$29 million and \$32 million, assuming the construction takes place in 2022. This is subject to change given the rising costs of construction. A more precise estimate of total costs for reconstruction will be available following the detailed design phase.



1.0 Introduction

The City of Brantford (City) initiated this Study to determine a common shared vision and design of the Downtown streetscape to create a Downtown Brantford that is attractive, vibrant and safe for all users while providing the infrastructure needed to handle growth in the City's core.

One of the City's main objectives for the Downtown streetscape is to capitalize on the walkability and pedestrian capacity of the area, elevating the Downtown core to a place-making destination, while enhancing infrastructure for all modes of transportation including pedestrians, cyclists, drivers and transit users.

This Study followed a Schedule C Municipal Class Environmental Assessment (Class EA) process, which included extensive public consultation to gather and incorporate public input into the development of the Downtown streetscape vision and design of the streets.

The Study Area within Downtown Brantford comprises:

- Colborne Street from Brant Avenue / Icomm Drive to Dalhousie Street / Colborne Street East Junction
- Dalhousie Street from Brant Avenue to Colborne Street East / Dalhousie Street junction
- Brant Avenue from Dalhousie Street to Icomm Drive
- Clarence Street from Dalhousie Street to Colborne Street
- King Street, Queen Street and Charlotte Street all from Dalhousie Street to Colborne Street
- Market Street / Square from Dalhousie Street to Colborne Street
- Brant Avenue / Icomm Drive / Colborne Street East / Colborne Street West Intersection



Figure 6 Study Area Map

The main driver of this project is the need for the City to replace its underground infrastructure in the Downtown core. The underground infrastructure, including watermain, sanitary sewer, storm sewer, telecommunications, gas, etc., are all nearing or have exceeded their serviceable life, and need to be replaced and in some locations upsized to meet the current servicing needs of Downtown.



Following the completion of this Study, the City will advance to the detailed design and construction phases of the project. Subject to City Council approval and funding, reconstruction of the infrastructure is expected to begin in 2025 and will be phased over several years. The phasing of construction will be determined during the detailed design phase.



2.0 Background

The City initiated this Study in response to the aging underground infrastructure in the Downtown core. The intent was to review the condition of the underground infrastructure, including watermain, sanitary sewer, storm sewer, telecommunications, gas, etc. The majority of the infrastructure is beyond its serviceable life and in need of full replacement, which will result in complete reconstruction of the Downtown streets. City staff and City Council saw the restoration portion of this project as an opportunity to improve the streetscape and implement a new vision for Downtown Brantford.

Improvements to the streetscape have the potential to improve walkability and pedestrian capacity within the Downtown core. The physical layout and composition of the roadways, such as one-way and two-way traffic operations, on-street parking, sidewalk width, street lighting, street furniture, plantings and trees, and public art were explored through the Class EA process.

In November 2019, the City retained MTE Consultants (MTE) as the Prime Consultant to lead the Class EA. GSP Group (GSP) provided support for the streetscaping portion of the Study. The Study followed the Schedule C Municipal Class EA process.

Several groups were formed to provide input into the project and process. These included:

Project Team: The Project Team included staff from the City, MTE and GSP. The Project Team met on several occasions to review the objectives and provide direction for the Study.

Working Group: A Working Group comprising City staff from various departments conducted a workshop at the beginning of the Study to discuss opportunities and develop Alternative Solutions. The purpose of this workshop was to ensure that the Alternative Solutions addressed as many of the concerns and issues of the various departments as possible.

Stakeholders Group: This project has many stakeholders in Downtown Brantford, including business owners, Wilfrid Laurier University, Conestoga College, Grand River Community Health Centre, as well as residents. As part of the Notice of Study Commencement, stakeholders were invited to join a Stakeholders Group. The Project Team held meetings with this group separate from the Public Information Centres (PICs) to gather feedback on Alternative Solutions and Alternative Design Concepts.

Technical Advisory Committee: The Technical Advisory Committee (TAC) included utility providers, City staff and their consultants working on the underground infrastructure improvement projects, as well Public Works staff. This TAC met on several occasions to review the impacts of the Alternative Solutions and Alternative Design Concepts on their existing and proposed plant. In addition, the utility providers were encouraged to upgrade their plant now, prior to or as part of construction to minimize the need to dig up the newly constructed road and streetscaping.

Indigenous Nations: The Project Team provided notification to the Mississaugas of the Credit First Nation and the Six Nations of the Grand River (SNGR). At multiple stages



throughout the process, the Project Team met with the SNGR Consultation Team to obtain feedback on the process and address any concerns with the proposed works.

This Study is intended to build upon the previous studies conducted on the Downtown core that considered streetscaping elements and the conversion of one-way traffic to two-way traffic. During the Class EA process, the findings of the previous studies provided background information and were used as a foundation for the current Study, including:

- 2008 Master Plan for Downtown Brantford
- 2010 Waterfront Master Plan
- 2010 Conversion of Colborne Street and Dalhousie Street to Two-Way Traffic Operations
- 2011 Downtown Streetscape Design Plan

These studies provided excellent background information about the operation of Downtown, including traffic flow. The studies listed below were completed in parallel with this Class EA. Collaboration between the various teams and City staff has been ongoing throughout the process of this Study, with the intent of having consistency in the findings and recommendations.

- 2021 Urban Design Manual
- 2021 Transportation Master Plan
- 2021 Master Servicing Plan
- 2021 Official Plan



3.0 Class Environmental Assessment

In Ontario, municipal infrastructure projects are obligated to meet the requirements put forth in the Ontario Environmental Assessment Act. The Municipal Class EA process (October 2000, as amended in 2007, 2011, and 2015), applies to a group or “class” of municipal infrastructure projects which occur frequently and have relatively minor predictable impacts. These projects are pre-approved under the Ontario Environmental Assessment Act, given they are planned, designed and constructed according to the requirements of the Class EA process. The specific requirements of the Class EA that each project must follow depend on the type of project, the complexity and the potential impact on the environment. The document identifies four categories or “schedules” of projects: A, A+, B, and C. This Study was undertaken as a Schedule C Class EA and followed the Class EA process, namely:

- **Phase 1 – Data Collection:** Identify Problem / Opportunity
- **Phase 2 – Develop Alternative Solutions:** Create Functional Designs Based on Stakeholder Input
- **Phase 3 – Alternative Designs:** Refine Solutions Based on Stakeholder Feedback
- **Phase 4 – Environmental Study Report:** Compile Results of Background Studies and Submit Report to the Ministry of the Environment, Conservation and Parks (MECP)

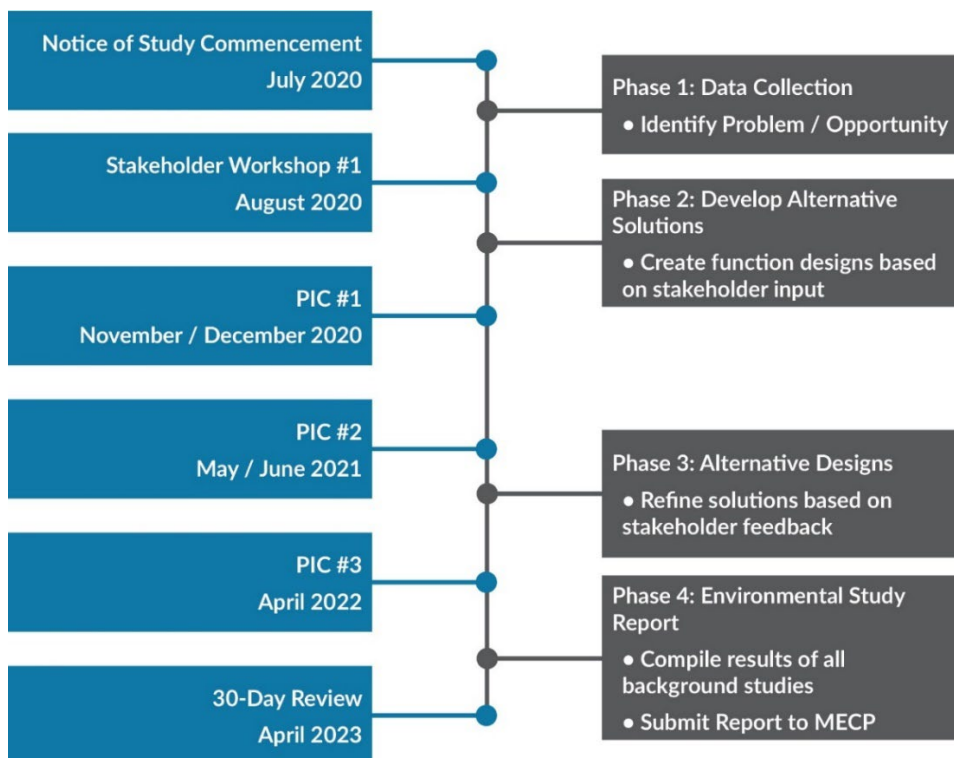


Figure 7 Class EA Process



4.0 Downtown Brantford Today

4.1 Existing Conditions

The Study Area comprises part of the historical Downtown core of Brantford. Colborne Street and Dalhousie Street run east and west through Downtown. They are both one-way streets, which run parallel to each other, separated by approximately 100 m throughout the corridor. There are a number of two-way streets that interconnect Dalhousie Street and Colborne Street, allowing drivers to maneuver around Downtown. These two streets act as main arterials within the City and are used by motorists looking to get across the City and up to Highway 403.

Colborne Street is a one-way street providing traffic flow in the easterly direction through Downtown. This roadway forms the southerly section of the designated arterial road through the Downtown core and has a two-lane cross-section within the Study Area with turning lanes provided at strategic locations. The roadway has a posted maximum speed limit of 50 km/h. Parking is permitted on both sides of the roadway throughout various segments of the corridor, largely contained to on-street parking bays.



Figure 8 Colborne Street (West End) – Facing West

Dalhousie Street is a one-way street providing traffic flow in the westerly direction through Downtown. This roadway forms the northerly section of the designated arterial road through the Downtown core and has a three-lane cross-section within the Study Area with turning lanes provided at strategic locations. The roadway has a posted maximum speed limit of 50 km/h. Parking is permitted on both sides of the roadway through various segments of the corridor, largely contained to on-street parking bays.

Within the Study Area, the following collector and local roads intersect Colborne Street and Dalhousie Street and form the basis for the transportation network analysis:



Figure 9 Dalhousie Street (West End) – Facing West

Brant Avenue is a north-south, four-lane, minor arterial roadway with an urban cross-section. The posted maximum speed limit is 50 km/h. South of Colborne Street West, Brant Avenue operates south with a four-lane, undivided cross-section, with two travel lanes per direction. Parking is not permitted on either side of the roadway.

King Street is a north-south, minor arterial roadway that operates with a two-lane cross-section. The posted maximum speed limit is 50 km/h. Parking is permitted on both sides of the roadway between Colborne Street and Darling Street.

Queen Street is a north-south, minor arterial roadway that operates with a two-lane cross-section. The posted maximum speed limit is 50 km/h. Parking is permitted on both sides of the roadway between Dalhousie Street and Darling Street.

Market Street is a north-south, major collector roadway that operates with a two-lane cross-section. The posted maximum speed limit is 50 km/h. Parking is permitted on both sides of the roadway north of the Study Area. Between Colborne and Dalhousie, Market Street remains an active right-of-way, but is mostly used as a pedestrian corridor.

Charlotte Street is a north-south, local roadway that operates with a two-lane cross-section. The posted maximum speed limit is 50 km/h. Parking is permitted on both sides of the road between Colborne Street and Dalhousie Street and limited to the west side north of Dalhousie Street.

Clarence Street is a major arterial roadway that operates with a four-lane cross-section. The posted maximum speed limit is 50 km/h. Parking is prohibited on both sides of the roadway.

4.2 Planning Context

The City completed its Official Plan in 2021 with a planning horizon of 2051. The purpose of the Official Plan is to evaluate strategic choices and shape Brantford's collective future. In the Official Plan, the Study Area lies within the Historic Mainstreets



Precinct. The Project Team for this Class EA worked closely with the City staff involved in preparing the Official Plan to ensure that findings of this Study were in line with the planning horizon and context of the Official Plan. The Official Plan indicates that the projected population of Brantford will be 165,000 by the year 2051 (current population is 101,700), in accordance with the population and employment forecasts set out in Schedule 3 of the Province of Ontario's A Place to Grow: Growth Plan for the Greater Golden Horseshoe plan. The Downtown core lies within the City's Delineated Built-Up Area, as well as a Strategic Growth Area. The Official Plan indicates that 45% of all new residential development within Brantford shall occur within the Delineated Built-Up Area until 2031, at which time that percentage increases to 50%. The City's primary intention is to accommodate intensification opportunities within the Strategic Growth Areas, including the Downtown Urban Growth Area. The Downtown Urban Growth Centre is expected to see a minimum density of 150 residents and jobs combined per hectare by 2031.

In 2021, the City also adopted the Transportation Master Plan Addendum with a planning horizon of 2051 to be in line with the Official Plan. The purpose of the Transportation Master Plan is to assess the strategic transportation trip generation, distribution of trips, and to identify additional service or infrastructure needed to address the 2051 constraints. The Transportation Master Plan indicates that one of the two main population growth areas in Brantford lies just south of the Study Area, implying that there is potential for significant population growth just a short distance from the Study Area. The Transportation Master Plan indicates that Colborne Street and Dalhousie Street are part of the proposed Cycling and Trails Network and are to be bicycle-priority streets.

4.3 Current Land Uses and Activities

The Study Area comprises a variety of roadway platforms, sidewalks, parking lots, driveways and laneways, grassed and treed areas, and parts of several residential, public and commercial properties. The Study Area includes a wide range of uses and activities that one would expect in a typical Downtown area. Many of the older two-storey "main-street" type buildings operate with a wide range of retail, service and restaurant uses. Many civic and community uses are also found within the core, including Brantford's new City Hall (Queen Street and Dalhousie Street), various churches, YMCA of Hamilton Burlington Brantford, and the Brantford Public Library. A main feature of Downtown is the old Brantford Mall, which extends from Colborne Street to Dalhousie Street, and from Market Street to Charlotte Street. In recent years, the Mall housed numerous municipal departments, before being purchased by Wilfrid Laurier University.

Wilfrid Laurier University's Brantford campus is spread throughout Downtown Brantford, housing 2,700 undergraduate and graduate students. The University has purchased numerous buildings across the City, and the campus has become interwoven with the Downtown. With plans to expand the number of students at the campus, the demand for housing and transit in and around Downtown continues to grow.



Figure 10 Sanderson Centre

The iconic Sanderson Centre is a destination for performing arts events and has been a staple of Downtown Brantford since 1919. The Sanderson Centre regularly hosts events and when an event is taking place, it creates a buzz in the Downtown core.

Across from the Sanderson Centre is Harmony Square, which is a popular outdoor gathering place located in the heart of the City. Harmony Square features a splash pad which converts to a skating rink in the winter and is the location for countless outdoor events.

Market Street is a unique pedestrian space that connects Colborne Street and Dalhousie Street. While it is considered an active City right-of-way, it is nearly entirely used by pedestrians and cyclists. There are several restaurants and cafes on the street, with patios and outdoor dining.

On-street parking is found nearly everywhere Downtown, with very few blocks without on-street parking. The Market Centre parking garage located one block south of Colborne Street has 950 parking spots, with pedestrian walkways directly connecting the parkade to Colborne Street at Queen Street and Market Street. Between the on-street parking, off-street parking, and parking garage, there is an estimated 1,682 parking spots within the Downtown area.

Almost all public transit services connect to the Brantford Transit terminal, operating along the streets within the Downtown area. The primary streets used are Colborne Street, Dalhousie Street, Market Street, Clarence Street, Darling Street, Wellington Street, and Brant Avenue. Buses typically operate every 30 minutes on weekdays, with daytime service every 30 minutes on Saturday, and every 60 minutes on evening and Sunday periods.

4.4 Land Use Planning Objectives

This streetscaping Class EA takes into account the planning objectives put forth by the Province of Ontario as part of the Provincial Policy Statement released in 2020. One of the objectives that is considered, and underlying the entire Class EA, is building a sustainable community for people of all ages, a clean healthy environment, and provides an environment that supports a strong and competitive economic landscape.

The City's growth development plans provide indicate that substantial development is expected in and around the downtown in coming years. The re-envisioned Downtown is designed to support the development and growth around the downtown, through improved infrastructure, a safer right-of-way, and an environment that encourages active



transportation. Underground infrastructure (watermain, storm, sanitary sewer, utilities) is to be sized to accommodate the projected population of Brantford. Brantford is expected to grow to 165,000 by 2051, from its current population of 104,688 (2021). While the underground infrastructure will be sized for the projected growth Downtown, the streetscaping must consider that the Downtown is meant for everyone in the City to utilize. As the resources Downtown are improved, so will the programming, and subsequently the amount of visitors Downtown.

The City of Brantford is completing this Class EA concurrently with the following studies:

- 2021 Transportation Master Plan
- 2021 Master Servicing Plan
- 2021 Official Plan

The Project Team met with City staff to coordinate the findings of this Class EA with the other ongoing studies.

4.5 Current Streetscape Conditions

Colborne Street and Dalhousie Street have been the topic of streetscaping discussions for a number of years. Today, the streetscape of both streets is showing signs of aging, no longer adheres to Accessibility for Ontarians with Disabilities Act (AODA) standards and is in need of replacement. In general, the characteristics of both streets are similar and the description that follows generally applies to both streets.

Colborne Street and Dalhousie Street have the characteristics of many central small town Ontario streets. The narrow 20.1 m right-of-way is the traditional length of a surveyor's chain. Many Downtowns across Ontario have streets of similar width, lined with two- and three-storey buildings, and a comfortable pedestrian realm.

Each street is one-way, running parallel to the other in opposite directions. Each has two travel lanes with parking lanes on both sides of the road. Within the right-of-way, there are very few other features other than the roadway, parking lanes, and sidewalk, and the width of the sidewalk varies and is generally around 2.5 m in width to the curb. Generally, the sidewalks are concrete; however, there are a number of interlocking brick sections that present accessibility and maintenance issues. Over time, the City has replaced parts of interlocking brick with concrete.

The main Downtown area between Brant Avenue and Clarence Street is approximately 800 m. The type and style of street lighting varies across this area, and the corridor generally lacks any theme or consistency. All of the utilities are entirely underground, including hydro, Bell, Rogers, and Enbridge.

The character of Downtown has been maintained and is showing its age. The Downtown lacks modern amenities and has a restricted pedestrian space. Improvements to create a more functional public realm that accommodates the projected population and employment growth, and to meet the City's active transportation objectives and increased public transit use, are warranted.



4.6 Sidewalks

Sidewalks exist on both sides of Colborne Street and Dalhousie Street throughout the Study Area. The widths of the sidewalks vary with the built form of the building frontages. The sidewalks range in width from 2.1 m to 2.7 m in some areas. The sidewalks are a mix of concrete and interlocking brick. The areas that are interlocking brick have created accessibility issues, as the material has shifted and heaved, creating uneven surfaces. In areas where utility repairs have occurred, evidence of the repairs is present as the material does not match or is uneven. Problematic areas have been replaced with traditional concrete sidewalk, and the City plans to continue to replace interlocking brick as further issues arise.

4.7 Water Supply

Watermain throughout the Downtown core is approaching or exceeding its serviceable life and is in need of replacement. The City is in the process of conducting modelling to determine the adequacy of the existing watermain sizing. The expectation is that the watermain will be upsized when replaced. As part of the watermain replacement works, each of the buildings in the Study Area will receive new water service as required. During the detailed design phase, coordination with property owners will be required to enter the buildings and verify locations and make new connections. Building owners may wish to provide input on whether they would like to increase the size of their water service for current or future needs.

Throughout the corridor, there are connections to each of the side street. During the detailed design phase, each connection should be considered more closely regarding size and extent of replacement.

Colborne Street (Brant Avenue to Clarence Street):

- There is a 250 / 300 mm diameter Ductile Iron watermain
- Watermain runs along the north side of the street

Colborne Street (Clarence Street to Murray Street):

- Just east of Clarence Street, the watermain reduces in size to a 150 mm diameter Cast Iron watermain
- Watermain runs along the south side of the street

Colborne Street (Murray Street to East Limit):

- A 200 mm diameter Asbestos Cement watermain runs along the centre of the street to the east limit
- A 100 mm diameter Cast Iron watermain runs along the south side of the street between Murray Street and Brock Street
- At Stanley Street, a 350 mm diameter Asbestos Cement watermain also runs along the south side of the right-of-way to the east limit

Dalhousie Street (Brant Avenue to Market Street):

- There is a 150 mm diameter Cast Iron watermain on the north side of the street



Dalhousie Street (Market Street to George Street):

- There is a 200 mm diameter Ductile Iron watermain

Dalhousie Street (George Street to Alfred Street):

- There is a 200 mm diameter PVC watermain. During the detailed design phase, condition of this section and whether it needs to be replaced will need to be determined

Dalhousie Street (Alfred Street to Stanley Street):

- There is a 100 / 150 mm diameter Cast Iron watermain. Watermain size changes between 100 mm and 150 mm diameter through this section

4.8 Sanitary Sewers

The sanitary sewers within the Study Area are approaching or have exceeded their useful life and will need to be replaced. Sanitary drainage area plans have been prepared for the Study Area which identify all the contribution areas, network pipe sizes and outlet locations. The sanitary sewers along Colborne Street and Dalhousie Street collect sanitary flows from extensive drainage areas and convey them through Downtown. As a result, the sanitary sewers through the corridor vary greatly in depth. The majority of the sanitary sewer is approximately 4 m deep, however, there are isolated areas where the sanitary sewer extends to up to 7 m deep.

The depth of the sanitary sewer in the Downtown area will require careful planning to reduce construction challenges. The excavation of the existing sewer will be quite disruptive and will limit the City's ability to maintain any traffic within the right-of-way during construction. Trench boxes may be useful to help limit the width of the excavations but given the number of services and other infrastructure within the confined right-of-way the use of them may be limited.

Additionally, special consideration will need to be given to the location and replacement of sanitary services. Active services should be confirmed with dye testing, as the City has indicated that there are likely a number of abandoned services throughout the Downtown core.

Through the detailed design phase, the sanitary sewer locations should be realigned within the corridor for consistency, and any redundant or temporary sewers that have been installed in the past should be consolidated.

4.9 Storm Water Management

The storm sewers within the Study Area are approaching or have exceeded their useful life and will need to be replaced. Storm sewer drainage area plans have been prepared for the Study Area, which identify all the contribution areas, network pipe sizes and outlet locations. The storm sewers along Colborne Street and Dalhousie Street collect runoff from extensive drainage areas and convey them through the Downtown core. Through the detailed design phase, the storm sewer locations should be realigned within the



corridor for consistency, and any redundant or temporary sewers that have been installed in the past should be consolidated.

There are three main trunk storm sewer outlets that collect flows within and around the Study Area.

- **Bain Street:** Collects storm flows from east of Bain Street, and discharges to the south
- **Alley One:** A 2,100 mm diameter trunk sewer east of Clarence Street that conveys flow north to south through the Study Area
- **Stanley Street:** A 1,500 mm diameter trunk sewer that conveys flows north to south through the Study Area

The Study Area lies just north of the Grand River Conservation Authority (GRCA) regulated limit, with all the storm sewers conveying flows through the Study Area and into the regulated limit. As such, the GRCA should be considered a key stakeholder in the detailed design phase of the project.

Local storm sewers are fairly consistent at 2.5 m to 3 m depth through the corridor. Similar to the sanitary system, it is expected that there will be a number of abandoned services along the storm sewer system. Through the detailed design phase services should be verified.

4.10 Natural Gas

There are existing Enbridge gas mains on the north and south side of Colborne Street and Dalhousie Street. The gas mains are 100 mm and 200 mm diameter steel. The presence of gas mains on either side indicates that there will be very few gas services that run across the streets. The gas mains are located outside the roadway, generally beneath the sidewalk at a depth of approximately 0.9 m to 1 m. Enbridge was included as a stakeholder as part of the TAC and provided the location of their infrastructure for the preparation of base plans. They did not provide any indication as to whether their infrastructure was in need of replacement or upsizing. Coordination with Enbridge will be required early in the detailed design phase.

4.11 Hydro

Brantford Power Incorporated (BPI), now GrandBridge Energy Inc., was included as a stakeholder at the TAC meetings. The details of the location of their infrastructure was provided and is included in the detailed base plan drawings. BPI indicated that they have no plans for improving their infrastructure before 2026. They did indicate that they have plans beyond 2026 that should be coordinated with the detailed design phase, as construction within the Study Area will extend beyond 2026. Their plans include replacing existing duct banks and building capacity to facilitate future growth in the Downtown core.

BPI also indicated that all high-voltage infrastructure should be considered “untouchable,” as it requires extensive planning, effort and cost to relocate. In addition, some infrastructure will need to remain active as new infrastructure is placed. In recent years (2019-2021), BPI has replaced a portion of their infrastructure. Coordination with



BPI will be imperative during the detailed design phase as they will need more detailed plans to be able to coordinate improvements.

4.12 Bell Communications

Bell Communications (Bell) has a network of existing duct banks and underground maintenance holes within the Study Area. Bell indicated that there is a major structure that carries Bell's copper and fibre cables between Bridge Street and Stanley Street (on both Colborne Street and Dalhousie Street). Bell indicated that most of their infrastructure is considered "untouchable," implying that during the detailed design phase it should not be considered as infrastructure that can be relocated.

During the detailed design phase, Bell will need to be engaged further to determine what types of protection needs to be provided to the sensitive transmission lines.

4.13 Other Communications Network

Several other communication networks such as Rogers, Zayo, etc. within the Study Area were contacted regarding this Study. Details regarding the locations, size, etc., of their infrastructure were provided and are included in the detailed base plans for the Study Area. During the detailed design, phase potential relocations and upgrades to their networks must be finalized.

4.14 Public Transit

The City has a well-developed public transit service that is operated by Brantford Transit. This service provides conventional public transit services throughout the urban area of Brantford. The central focus of the City's transit services is the off-street "transit hub" on the north side of Darling Street and west of Market Street. This terminal provides a Downtown route terminus for the various bus routes, with an off-street stop for each route and sheltered passenger waiting areas. Almost all of the public transit services connect to the Downtown transit terminal, operating along the streets within the Downtown area. The primary streets used are Colborne Street, Dalhousie Street, Market Street, Clarence Street, Darling Street, Wellington Street, and Brant Avenue. Buses typically operate every 30 minutes on weekdays, with service every 30 minutes during the day on Saturdays and every 60 minutes during evening and Sunday periods.



Figure 11 Brantford Transit Map

4.15 Source Water Protection

The western limit of the Study Area is adjacent to the Grand River and given the overall proximity of the area to the river, it is imperative that source water be protected and considered as part of the Class EA. A review of the source water protection mapping indicates that along the Grand River there is a band of source water protection zone. During detailed design, consideration will need to be given to how Low Impact Development and stormwater runoff are treated in and adjacent to the source water protection areas. The majority of the Study Area is not within the source water protection area. Preliminary design will assess measures that provide treatment of runoff within the Study Area and assess the impact of infiltration.

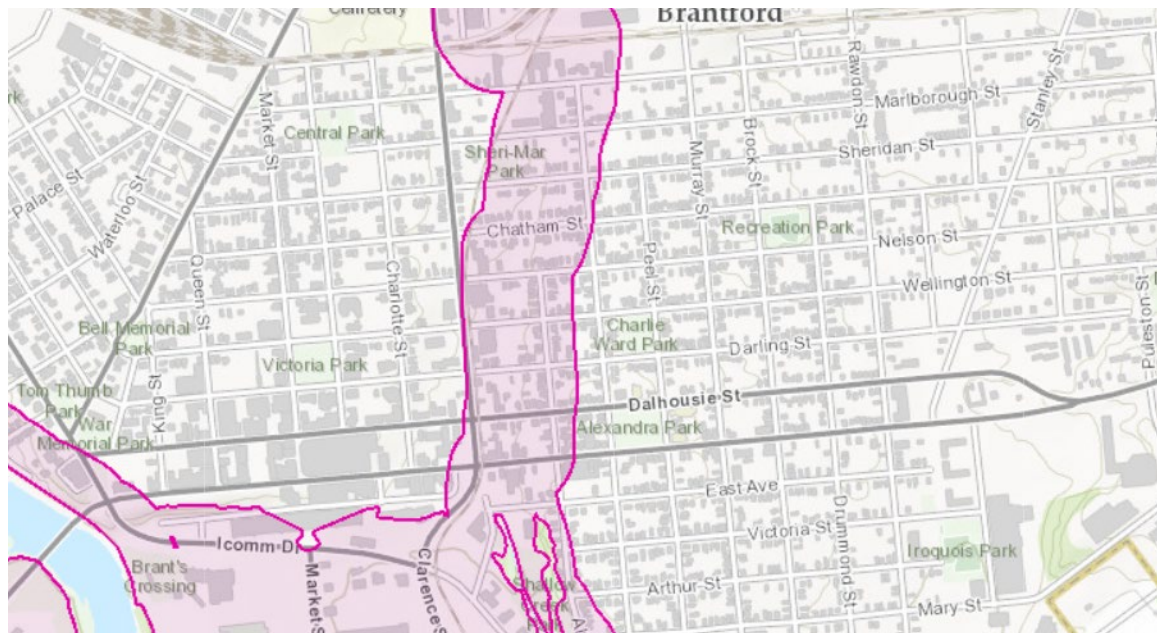


Figure 12 Brantford Downtown Source Water Protection Area Mapping



5.0 Study Purpose – “Come Around to a New Downtown”

5.1 Introduction

Through the Class EA process, the City pursued strategic direction of improving walkability and accessibility, enhancing the infrastructure for all modes of transportation, increasing pedestrian capacity, and improving underground infrastructure to allow for development. The aim of the streetscaping improvements is to create a Downtown that is attractive, vibrant and safe for all users and that provides the infrastructure needed to accommodate expected growth. An upgraded streetscape can restore the confidence of business owners and investors that there are significant revitalization efforts happening in Downtown Brantford.

A significant component of the overall scope of the project is the replacement of the aging underground infrastructure throughout the Downtown core. The City’s requirement for replacing the watermain, storm sewer and deep sanitary sewer is an opportunity to undertake the desired streetscaping improvements as part of the roadway restoration, and to minimize the overall disturbance to residents and businesses Downtown. This Study builds upon the previous studies that the City has undertaken and was prepared in parallel with other planning studies.

5.2 Guiding Documents

There have been a number of past and concurrent studies and reports undertaken by the City regarding the streetscape of Downtown Brantford. These include:

Past Studies:

- 2008 Master Plan for Downtown Brantford
- 2010 Waterfront Master Plan
- 2010 Conversion of Colborne Street and Dalhousie Street to Two-Way Traffic Operations
- 2011 Downtown Streetscape Design Plan

Concurrent Studies:

- 2021 Urban Design Manual
- 2021 Transportation Master Plan
- 2021 Master Servicing Plan
- 2021 Official Plan

Several studies were completed as part of this Class EA and inform the opportunities and constraints of the overall project. The studies included in this Class EA are:

- Natural Environment Assessment Report
- Stage 1 Archaeological Assessment
- Cultural Heritage Assessment Report
- Transportation and Traffic Analysis
- Parking Study



- Stormwater Management Study
- Phase 1 Environmental Site Assessment Report
- Geotechnical Report
- Wayfinding Study
- Contaminated Soil / Groundwater Assessment
- Lighting Study

5.3 Environmental Assessment Focus

This Study is focused on identifying the necessary infrastructure improvements that the City should apply to the Downtown core to allow for growth, while also evaluating the needs for all modes of transportation, improving walkability, and making Downtown a destination within the City. The recommendations of this Study outline the Design Concepts that will be applied throughout Downtown and provide information that will be used for the future detailed design phase. Many of the streetscaping elements selected for Downtown may vary from the current materials as well as the City's Design Standards. Items such as lighting, bollards, and paving material are key to creating a unique space and making Downtown a place-making destination. Guiding principles to the implementation of this streetscaping Class EA are outlined in this report.

When the proposed work is complete, Downtown Brantford will have a refurbished identity, as well as the necessary infrastructure in place to support planned development and growth. The images used in this report are intended to illustrate the concepts and cannot exactly capture what Downtown will look like when the project is finished. There are streetscaping elements such as the type and spacing of bollards, lighting, paving material, public art, location and spacing of trees and public seating which will be confirmed during the detailed design phase.

While the streetscaping will draw most of the public focus, the driving force behind this Study is the necessary underground infrastructure improvements. The Class EA includes discussion about how adjacent infrastructure will be affected. Coordination has occurred with all utility providers, including watermain, storm sewer, sanitary sewers, hydro, gas, and telecommunications among others. While some of the underground infrastructure may still be in relatively good condition with serviceable life remaining, it may require replacement to accommodate changes to the streetscape. A key component of this Study, and more specifically the future detailed design phase, will be gaining an understanding of the existing infrastructure and how they will be influenced by the proposed works.

This Study involved extensive engagement with various stakeholders throughout the Class EA process. Stakeholders provided feedback on a range of topics from functionality of the street to the types of events that should be held, types of businesses, and even specific design features. The feedback guided the Class EA process and decisions where applicable. Feedback was also documented for review and consideration during the future detailed design and operations phase.



5.4 Problem / Opportunity

Phase 1 of the Class EA process involves developing a Problem / Opportunity Statement to guide the Study. The following Problem / Opportunity Statement was developed for this Study, and was presented at PIC #1:

Revitalize Brantford’s core by improving infrastructure, accessibility, safety, and rebuilding an aesthetically beautiful and adaptable Downtown.

In conjunction with the Problem / Opportunity Statement, a Vision was developed as follows:

Create a Downtown Brantford that is attractive, vibrant, and safe for all users while providing the infrastructure needed to handle growth in the City’s core.

- Make Downtown a destination place
- Enhance infrastructure for all transportation modes including pedestrians, cyclists, and transit users
- Improve accessibility and safety in the core

5.5 Evaluation Criteria

Prior to developing the Alternative Design Concepts, evaluation criteria were established to assist in generating and evaluating the Alternative Solutions. The evaluation criteria are described as follows:

| Criteria | User Benefits | Other Benefits |
|--------------------|--|---|
| Vision | <ul style="list-style-type: none"> • Improves walkability throughout Downtown • Increases pedestrian capacity • Animates streets, is a “People Place” | <ul style="list-style-type: none"> • Improves necessary infrastructure – all modes • Is attractive, vibrant and unique |
| Social Environment | <ul style="list-style-type: none"> • Addresses curbside management issues • Addresses accessibility for all users • Improves pedestrian and cycle lanes • Accommodates public transit • Consideration for parking | <ul style="list-style-type: none"> • Minimal cultural heritage and archaeological impacts • Improves natural environment • Contributes to improved quality of life and public health • Addresses climate change |
| Safety | <ul style="list-style-type: none"> • Promotes feelings of comfort and safety • Encourages street-level activity • Roads and sidewalks are safe and accessible for all users | <ul style="list-style-type: none"> • Reduces vehicular accidents overall • Encourages safe use of sidewalks and roads under all conditions • Safer pedestrian crossings – shorter crossing distances and dedicated crossings |
| Traffic Operations | <ul style="list-style-type: none"> • Sufficient level of service for traffic | <ul style="list-style-type: none"> • Integrates transportation network |



| Criteria | User Benefits | Other Benefits |
|----------|--|--|
| | <ul style="list-style-type: none"> Minimizes traffic disruption from loading / unloading | <ul style="list-style-type: none"> Minimizes need for widening Encourages decrease in single-occupant vehicle travel |
| Costs | <ul style="list-style-type: none"> Minimizes property impacts Minimizes disruption costs to businesses | <ul style="list-style-type: none"> Capital construction costs Consideration for long-term maintenance costs Constructability – disruption during construction |

Additional Criteria

As part of the development of evaluation criteria, there were a number of factors that were given consideration but were not included in the evaluation matrix. The intention of the evaluation matrix was to present a clean and easy-to-follow set of decision-making criteria for the public so that elements that provided no differentiation between alternatives were not included. Some of these factors are discussed below:

Air Quality:

The impact to air quality for each of the alternatives was determined to be the same for all. Each alternative included the addition of street trees and soil cells for improved canopy growth. The net positive effect of air quality would be the same in each alternative. An evaluation of one-way versus two-way traffic was conducted, and similarly, the direction of traffic did not have an impact on air quality. While there could be some impact to air quality during construction, the long-term benefits of having street trees outweigh the short-term impact to air quality.

Noise:

Each alternative resulted in a similar level of underground construction taking place, producing similar noise impacts. In order to reconstruct the underground infrastructure, noise will be unavoidable. Comparing one-way versus two-way traffic also had no impact on the overall noise generated. Noise was determined to be a non-determining factor in the evaluation and was therefore left out of the summary table.



6.0 Background Studies

6.1 Archaeological Resources

A Stage 1 Archaeological Assessment was undertaken by Archaeological Research Associates Ltd. (ARA) in August 2020 to collect information about the history of the Study Area, identify land conditions and geography, as well as to determine if there has been any previous archaeological fieldwork within the area (Appendix A). The investigation encompassed the entirety of the Study Area, including the subject thoroughfares as well as the intervening properties. At the time of assessment, the Study Area comprised a mixture of roadway platforms, sidewalks, parking lots, driveways and laneways, grassed and treed areas, and parts of a wide variety of residential, public and commercial properties.

The Stage 1 Archaeological Assessment determined that the Study Area comprised a mix of areas of archaeological potential and areas of no archaeological potential.

The Ontario Archaeological Sites Database and the Ontario Public Register of Archaeological Reports were consulted to determine whether any registered or known archaeological resources occur within a 1 km radius of the Study Area. Five registered archaeological sites were located within at least 1 km radius. Laurier Brantford YMCA is located within 50 m of the western portion of the Study Area along the south side of Colborne Street. None of the other sites are located within or immediately adjacent to the project lands; accordingly, they have no potential to impact the assessed area.

A review of available archaeological management plans and/or other archaeological potential mapping was undertaken to inform the assessment process. Specifically, the City's Official Plan was examined for information that could influence the choice of fieldwork techniques or recommendations. The associated mapping indicates that the western part of the Study Area has potential for Indigenous and Euro-Canadian archaeological materials. The remainder of the Study Area, from Alfred Street to the eastern limit, are listed as having no archaeological potential.

It is recommended that all identified areas of archaeological potential that could be impacted by the project be subject to a Stage 2 property assessment in accordance with Section 2.1 of the 2011 Standards and Guidelines for Consultant Archaeologists. Given that the areas of archaeological potential consist of both upper layers and lower layers, it is recommended that both test pit survey and deeply buried survey methods be utilized to complete the assessment.

All areas of deeply buried archaeological potential associated with possible sealed pockets relating to Laurier Brantford YMCA must be subject to archaeological monitoring in accordance with Section 2.1.7 Standard 4 of the 2011 Standards and Guidelines for Consultant Archaeologists. The identified areas of no archaeological potential do not require additional assessment.



6.2 Cultural Heritage

A Cultural Heritage Resource Assessment (CHRA) was conducted to identify and evaluate cultural heritage resources and create an inventory of built heritage and cultural landscape resources within the Study Area and assess how the project will impact each of the identified resources. A CHRA was conducted within the Study Area by ARA (Appendix B).

The Study Area consists of a rectangular corridor with a total area of 27.75 hectares. This parcel extends for approximately 2.2 km along Dalhousie Street between Brant Avenue and just east of the Dalhousie Street / Colborne Street East junction, 2.2 km along Colborne Street to just east of the Dalhousie Street / Colborne Street East junction, 175 m along Brant Avenue to Icomm Drive and approximately 122 m along King Street, Queen Street, Market Street / Square, Charlotte Street and Clarence Street between Dalhousie Street and Colborne Street and is generally bounded by a mix of residential, public and commercial properties to the north and south. In legal terms, the Study Area falls on part of Lot C, Concession 4 in the Geographic Township of Brantford, former Brant County.

A total of 201 Built Heritage Resources (BHRs) and six Cultural Heritage Landscapes (CHLs) were identified within the heritage assessed area. As the combined Study Area and heritage assessed area is quite large, it was broken down into 14 blocks, numbered 1–14 from the west end of the Study Area to the east end. Within each block, BHRs and CHLs were identified and addressed.

A full list and more detailed description of the Listed and Designated properties in Blocks are found in ARA's CHRA report.

The identified BHRs could be directly or indirectly impacted by streetscape improvements. The BHRs include a bridge constructed in 1924 which might be directly impacted by streetscape improvements. The heritage value and associated attributes of CHL1–CHL5, may be directly and indirectly impacted by streetscape improvements. Streetscape improvements in the form of public realm enhancements have the potential to not be sympathetic to BHRs and CHLs. There are potential impacts to potential, and known, archaeological sites.

As a result of this CHAR, the following mitigation strategies are recommended:

- That during the planning and detailed design phases, cultural heritage resources be avoided where possible and any construction staging areas be located on lands located well away from any of the BHRs and CHLs
- That once a Preferred Alternative has been selected and design work has begun, a Heritage Impact Assessment report should be undertaken to evaluate the impact of the proposed design, as well as outline avoidance and mitigation measures to minimize the impact
- That if there is a direct impact to Lorne Bridge (BHR 1) a Cultural Heritage Evaluation Report (CHER) maybe be required as outlined in the MCEA process
- That the design Alternatives and planned intersection improvements should consider the heritage attributes of the identified CHLs



- That any streetscape improvements should be designed to be sympathetic to the adjacent cultural heritage resources, and consideration should be given to enhancements that highlight the area's cultural heritage resources and/or history through using imagery or commemorating history
- That should intersection and road improvements create seating areas and/or transit stops, this may provide an opportunity to interpret some of the identified cultural heritage resources (i.e., with plaques, public art)
- That a Stage 1 Archaeological Assessment is undertaken to address the identified archaeological potential associated with the Study Area. (A Stage 1 Archaeological Assessment was also included in this Class EA and has been completed)
- That should the intersection improvement activities or the project location expand beyond the scope examined in this report, a qualified Heritage Consultant should be retained to identify cultural heritage resources within the expanded Study Area as well as determine the potential impacts and suggest mitigation measures
- That public consultation may result in additional potential cultural heritage resources being identified. These potential cultural heritage resources should be reviewed by a qualified Heritage Consultant to determine their cultural heritage value or interest, evaluate potential project impacts, and suggest strategies for future conservation of any identified cultural heritage resources
- That this CHAR should be provided to City staff

6.3 Natural Environment

A Natural Environment Assessment was undertaken by Groundwater Environmental Management Services Inc. (GEMS) to identify existing natural heritage features along with wildlife habitat within the Study Area. This information is used to help build the natural environment constraints for the design. The Natural Environment Study can be found in Appendix C.

The Study Area is located within the broad physiographic region known as the Norfolk Sand Plain (Chapman and Putman, 2007). The surficial geology within the general Study Area is noted as comprised of both older and modern alluvial deposits and fine-textured glaciolacustrine deposits with pockets of coarse-textured glaciolacustrine deposits. Bedrock geology within the Study Area is noted as comprised of limestone, dolostone, shale, sandstone, gypsum and salt of the Salina Formation. The elevations of the area immediately within the Study Area are undulating, ranging between 213 and 202 metres above sea level.

The Study Area is located within the Grand River watershed. The Grand River is approximately 100 m west of the proposed streetscaping improvements. There is also a tributary leading into Mohawk Lake daylighting approximately 100 m south of Colborne Street East. Groundwater flow direction within the Grand River watershed aquifer is generally in a southerly direction eventually discharging to Lake Erie.

The Ministry of Natural Resources and Forestry (MNRF) Natural Heritage Information Centre "Make-a-Map: Natural Heritage Areas" online mapping application was reviewed for information pertaining to tracked species (rare or at-risk) with records of occurrence



within the vicinity of the Site. GEMS conducted a search of the 1 km² areas that contain the Study Area. Records for the following species were identified:

- *Moxostoma duquesnei** (Black redhorse)
- *Ammocrypta pellucida** (Eastern sand darter)
- *Notropis photogenis** (Silver shiner)
- *Lampsilis fasciola** (Wavy-rayed lampmussel)
- *Asterocampa clyton* (Tawny emperor)
- *Contopus virens* (Eastern wood-pewee)
- *Ranunculus hispidus* (Bristly buttercup)

The species marked with an asterisk (*) represent those found in the 1 km grid associated with the Grand River. Since these species are aquatic species, it is unlikely that they will be found within the Study Area. The remainder of the species may be encountered, therefore proper precautionary and mitigation measures will be put into place prior to and during construction activities to ensure potential impacts are reduced.

During a site investigation on June 25, 2020, GEMS did observe some active wildlife including squirrels (*Sciuridae sp.*), sparrows (*Passeridae sp.*), American crow (*Corvus brachyrhynchos*), American robin (*Turdus migratorius*) and blue jays (*Cyanocitta cristata*). It is anticipated that additional species common to urban settings would be present.

Based on the above information it is GEMS' opinion that there will not be significant impacts to the ecology of the adjacent natural features. The Study Area has received past disturbance and does not interfere with any natural heritage features or their functions. The proposed streetscaping will provide an overall improved habitat for some species due to the increased tree cover and green space.

Including proper Erosion and Sediment Control (ESC) measures into the project works prior to the start of any construction and maintaining these measures until the project is complete will severely reduce any impacts to the Grand River and the species within it. Properly installed and periodically inspected ESC will also contribute to less runoff from construction activities. Measures such as sediment control fencing and fibre rolls in certain areas to contain any sediment that would potentially runoff into the Grand River are recommended. Catch basin inserts to collect sediment flowing into the local sewers are also recommended. Active maintenance must be done on all ESC measures to ensure proper function.

Additionally, Low Impact Development and Green Infrastructure measures will reduce any increased impervious surface cover and allow for a more natural infiltration rate during precipitation events. Since the Study Area is close to the Grand River, any increased impervious surfaces may have a more immediate effect on the river, which could also contribute to higher erosion rates in the watercourse.

The Natural Environment Study found no Species at Risk within the Study Area.



6.4 Geotechnical Investigation and Environmental Site Assessment

As part of the Class EA process, a geotechnical investigation was conducted. The Geotechnical Investigation Report identifies requirements and suitable materials for the reconstruction of the road base and surface (Appendix D).

Prior to completing the geotechnical investigation, MTE completed a Screening Level Phase I Environmental Site Assessment (ESA) for the corridors. The purpose of the Screening Level Phase I ESA was to identify potential environmental concerns along, or near, the corridors that may affect soil or groundwater quality.

The findings of this Screening Level Phase I ESA were used to: determine potential locations for the environmental assessment in conjunction with the geotechnical boreholes to adequately assess areas of potential environmental concern; develop the preliminary soil and groundwater sampling and analysis work plan for the proposed drilling activities, and determine the general environmental quality of the on-site soil for preliminary soil management discussion purposes ahead of the planned construction activities.

The recommendations found in the report can be used as a reference as the detailed design of the roadway is undertaken. Below are some of the findings and recommendations from the geotechnical investigation.

| Findings | Recommendations |
|--|---|
| General Soil Conditions | Pavement structure and / or fill overlying native granular, silt, and glacial till deposits. |
| Groundwater Conditions | Saturated soil conditions and groundwater were encountered at various depths within the native granular, silt, and glacial till soils in a number of the boreholes that were drilled. Dewatering will likely be required for installation of the deeper infrastructure. |
| Environmental Lab Testing Results (Soil) | Soil material samples were taken throughout the corridor. The geotechnical report outlines several locations that have contaminated material. In some locations, wood fragments found, and hydrocarbon odour was detected. |

6.5 Parking

A consistent feature in Downtown Brantford is the on-street parking that lines both sides of Colborne Street and Dalhousie Street. An important element of this Class EA was to establish the usage of the existing parking and identify areas for improvement. Allowing for on-street parking is a significant element within the cross-section of any road. As part of this Study, a Parking Study was conducted, which evaluates the existing parking within and surrounding the Study Area. The Parking Study can be found in Appendix E.

6.5.1 Existing Conditions

The Parking Study includes counts of all on-street and off-street public parking within and adjacent to the Study Area. The overall amount of parking was sub-categorized as



on-street and off-street. Currently, all the on-street parking is free, with the majority having a two-hour time limit. Below is a summary of the on-street parking spaces identified west of Clarence Street.

| Area | Number of Spaces |
|----------------------------------|------------------|
| Colborne Street | 94 |
| Dalhousie Street | 98 |
| Immediate Side Streets | 33 |
| Sub-Total | 225 |
| Spaces North of Dalhousie Street | 317 |
| Total On-Street Spaces | 542 |

Also included in the overall evaluation is the Market Centre Parkade, which is located just south of the Study Area and contributes a substantial amount of parking for the Downtown core. The off-road at-grade parking lots were also included in the parking counts. Below is a summary of the off-street parking spaces identified west of Clarence Street.

| Area | Number of Spaces |
|--|------------------|
| Lot 1 (Market Centre Parkade) | 950 |
| Lot 2 (Darling Street and Queen Street) | 147 |
| Lot 3 (Dalhousie Street and King Street) | 44 |
| Total Off-Street Spaces | 1,141 |

Overall, a grand total of 1,683 public parking spaces were identified between Brant Avenue and Clarence Street, including the adjacent on street parking spaces and parking garage.

In addition to the public parking available, there are an additional 1,679 spaces on private property within the Downtown area.

6.5.2 Parking Demand

In order to identify the parking needs within Downtown, an evaluation of the existing parking demand was conducted based on historical data collected by the City. The Parking Study revealed that the on-street parking spots throughout the corridor are at or exceeding their capacity, while the parking lots are only being utilized at a 40-60% rate. The Parking Study also indicated that the turnover within the on-street parking spaces was low compared to other local municipalities. Essentially, those parking on the street are occupying spots for the maximum or beyond the maximum amount of time.

Overall, there is no deficiency in parking within the Downtown core, however, the on-street spots are over utilized while the parking lots are underutilized.

6.5.3 Impacts of Changes to Cross-Section

When evaluating the Alternatives, it was important that a review of the impacts of the proposed cross-sections on parking was completed. The Parking Study determined that any cross-section that only includes parking on one side of the road would result in a



loss of approximately 84 parking spaces within the Downtown area. While this is not a significant loss to the overall parking Downtown, it is a substantial loss of on-street parking which is in the highest demand Downtown.

6.5.4 Walking Distances

A key component to ensuring that there is adequate parking within the Downtown core is ensuring that the parking spots are located within a short walking distance of key destinations. If the distance between parking and the destination is too great, people will refrain from using those spots. As the Parking Study identified that the off-street lots are underutilized, it was imperative to look at the distance from the parking lots to destinations within Downtown. Figure 12 below illustrates that the entirety of Downtown is less than a four-minute walk from at least one parking lot within the Downtown area. This is considered acceptable, and shows that all lots, including the parkade are well situated for supporting parking Downtown.



Figure 13 Walking Distances from Municipal Parking Lots

6.5.5 The Preferred Alternative

Public consultation indicated that on-street parking is highly valued and should be considered very important when developing the proposed cross-sections. In the table below, it can be seen that the on-street parking is similar to the existing conditions.

| Area | Number of Spaces |
|----------------------------------|------------------|
| Colborne Street | 125 |
| Dalhousie Street | 99 |
| Immediate Side Streets | 24 |
| Sub-Total | 248 |
| Spaces North of Dalhousie Street | 317 |
| Total On-Street Spaces | 565 |



Combined with the 1,141 off-street parking spots, which remains unchanged, there will be an expected 1,706 public parking spaces Downtown. It is expected that the proposed parking spaces will continue to adequately service the parking needs of Downtown Brantford.

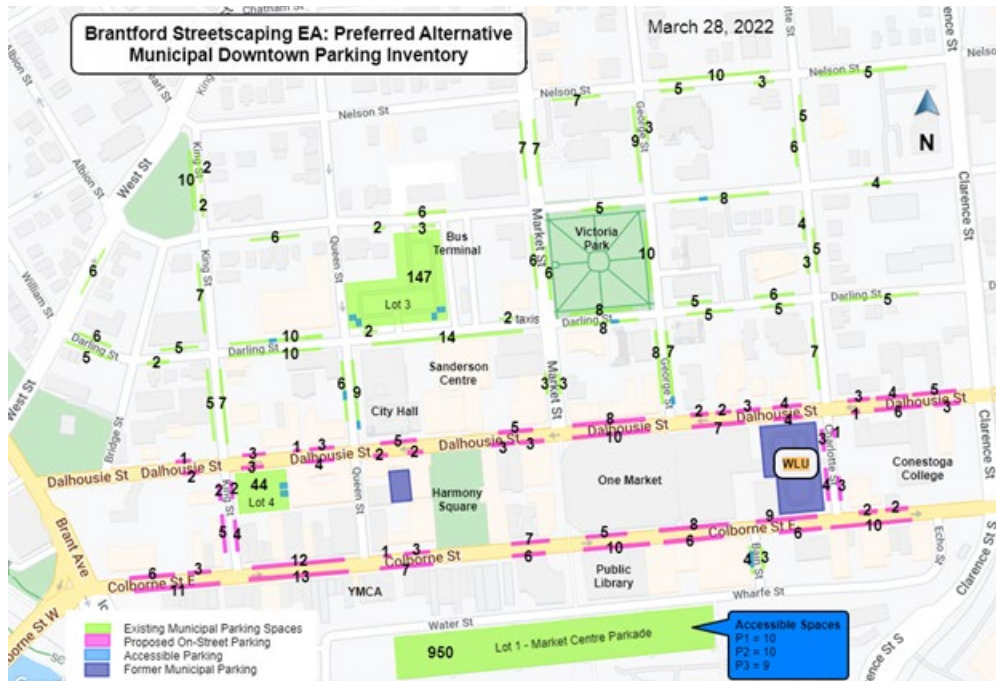


Figure 14 Parking Inventory for Preferred Alternative

Figure 14 provides a preliminary review of the parking spaces that could be available as part of the streetscaping, showing block-by-block where the on-street spots could be accommodated. The parking counts are adjusted to reflect changes to the layout of parking spaces. Rather than having painted lines for each parking stall, the recommendation of the Parking Study is that the parking stalls not be marked, other than a start and end point. This allows for approximately a 15% increase in parking within the same block of on-street parking. This increase in on-street parking capacity is expected to be offset by the minor losses in parking for bump outs for pedestrian crossing, curbside management, loading and unloading, etc.

6.5.6 Paid Versus Free Parking

Best practices in parking recognizes that on-street parking spaces are premium spaces due to close proximity to local businesses and services, while off-street parking spaces are more suited for long-term parking, such as employee parking, and should be priced lower than the premium spaces. Free parking often results in business owners, employees and residents who live or work nearby, parking in on-street spaces near their stores, offices and homes, using up the limited spaces that should be used by customers and visitors.

Paid parking, at the right price, is a tool to manage parking demand and achieve high parking space turnover (which increases the total parking supply without having to build



new parking lots and garages). When parking occupancy and turnover is low (i.e., many empty spaces) free parking is acceptable. However, when parking occupancy and turnover are high (i.e., very few empty spaces), then paid parking is recommended. With the City’s current on-street free parking program, people are avoiding paid lots and parking in the on-street spaces that are required by customers.

Part of an on-street paid parking program involves “pricing parking right,” which means the lowest price that will leave one or two vacant spaces on each blockface (average of two spaces of every eight spaces vacant). The objective should be to keep 85% of parking spaces occupied all the time.

Parking can be controlled by Pay By Licence Plate or Pay & Display machines (approximately one machine for every 8-10 spaces per blockface), Pay by Mobile Phone app and ongoing enforcement. The City has Pay & Display machines in storage that may be re-deployed with some upgraded technology and/or conversion to Pay By Licence Plate machines. Further details regarding payment strategies and deployment of paid parking can be found in the Parking Study found in Appendix E.

6.6 Wayfinding Strategy Study

The Wayfinding Strategy Study has important implications to the better utilization of parking within the Downtown, and for providing direction for how visitors can navigate Downtown. The Wayfinding Strategy Study provides indication for style and location of enhanced signage. Figure 15 provides some examples of proposed signage that will assist visitors with navigating Downtown. Digital signs allow the City to provide real time information to the public about parking levels at various lots, reducing the time it takes to find parking and eliminating the frustration associated with driving around looking for parking. The complete Wayfinding Strategy Study can be found in Appendix E, which provides further details on parking guidance systems, and implementation of the wayfinding strategy.



Figure 15 Proposed Wayfinding and Parking Guidance Signs

6.7 Transportation and Traffic Analysis

Colborne Street and Dalhousie Street are both one-way streets running parallel to each other. They are both main arterials in the City and have a posted maximum speed limit



of 50 km/h. As part of this Study, a Transportation and Traffic Analysis was completed, and included analysis of the transportation network for the 2051 planning horizon. The Transportation and Traffic Analysis examines the existing and proposed streetscape alternatives from a multi-modal, safety, and traffic operations perspective, and can be found in Appendix F. The multi-modal approach included:

- An examination of the existing road network, traffic, land use and travel characteristics along Colborne Street and Dalhousie Street to illustrate the transportation context for the corridors
- A road safety performance assessment and recommended mitigation measures based on collision history, field investigation and predictive safety techniques
- Forecast 2025, 2030 and 2051 traffic patterns and operational analyses to identify deficiencies in the existing road network
- Traffic operations assessments for the improvement alternatives to determine the merits
- Evaluation of the candidate solutions in terms of their ability to maintain satisfactory traffic operations while capitalizing on the walkability, pedestrian capacity and active transportation within the Downtown area

Colborne Street and Dalhousie Street have frequently been discussed as potential streets to convert from one-way to two-way. Decisions regarding one-way versus two-way streets need to be context sensitive and value-based, having regard for the shared community vision, planned road functions, and competing interests for the valued and often constrained right-of-way of any given street.

6.7.1 Operations

The 2051 forecast traffic conditions under the one-way and two-way scenarios indicate that the peak period level of service conditions at the Downtown street intersections are generally satisfactory. This is particularly the case within the Downtown area, where most intersections operate at a level of service A or B. The intersections projected to experience some congestion are generally at the centre of the Downtown core (i.e., Clarence Street) under both the one-way and two-way scenarios.

A widening of Clarence Street would result in significant property impacts and would be constrained by the railway spur line on the east side (limiting widening options to the west side). The Veterans Memorial Parkway partial extension (to Murray Street) provides an opportunity for an alternative route out of Downtown via Murray Street. A partial extension of the Veterans Memorial Parkway could be considered beyond 2051 to address potential long-term issues and should be protected as an alternative to Clarence Street. In addition, the two-way scenario is also expected to create some additional capacity constraints at the intersection of Colborne Street and Brant Avenue given modifications to the east leg are required to achieve a straight alignment through the intersection. In summary, the one-way scenario offers the least amount of delay and travel time as a result of limited conflicts for turning vehicles at intersections as there is no traffic travelling in the opposite direction to delay either a left turn or right turn movement.



6.7.2 Preferred Arrangement

The foregoing assessment indicates there are valid arguments for both maintaining an existing one-way street network in Downtown Brantford, and conversely, converting one-way operation to two-way operation. In Downtown Brantford's case, the primary one-way street network is considered somewhat unique given the connectivity the subject streets provide to critical elements of the transportation infrastructure and bridge crossings of rivers. It is also worth noting that the Downtown streets with the most mixed and street-oriented land use and high and sustained pedestrian activity are two-way streets. More importantly, the narrow right-of-way reality of Downtown Brantford's streets creates added pressure on the roads to operate as efficiently as possible for all modes. Since the vision for the Downtown is to pursue avenues that can provide wider sidewalks and on-street cycle lanes, as well as basic functionality for vehicles and buses, this tends to balance the scales towards one-way operation, provided the narrow right-of-way can be re-arranged accordingly.

6.7.3 Preferred Alternative

One-way operation is seen as the beneficial arrangement in meeting the overall goals and intent of the streetscaping alternative. Additionally, to improve the potential safety hazards within the sub-Study Area, the implementation of a blanket 40 km/h posted maximum speed limit along Colborne Street and Dalhousie Street could be implemented as a means of improving overall safety. Furthermore, improved sidewalks (i.e., wider with limited to no obstructions) and cycle lanes will need to be incorporated. Ultimately, the preferred design and streetscape design should support these recommendations.

Other improvements that may need to be considered in the final design could include bike signals, pedestrian only phases (reserved for intersections with high pedestrian volumes) and pedestrian leading green time to provide pedestrians with an advance opportunity to cross before vehicles are allowed to proceed right. Additionally, the measures identified are further recommended for consideration:

The intersection of Dalhousie Street and Bridge Street be modified to only one-way traffic in the northbound direction to reduce the number of potential conflicts with westbound through traffic

To mitigate the number of active transportation collisions along Colborne Street between the Market Street Intersection Pedestrian Signal (IPS) and Clarence Street, an additional controlled crossing should be considered.

6.7.4 Cycling

There are no existing dedicated cycle lanes along Colborne Street and Dalhousie Street. The City's Transportation Master Plan identifies these corridors as possible candidates for on-road or in-boulevard facilities. The City's traffic counts and/or Synchro network did not provide cycling data for the intersections within the sub-Study Area. Given limited data, estimates of cycling demand were developed based on the Transportation Tomorrow Survey (TTS). The TTS survey randomly selects households in the Greater



Golden Horseshoe and is an important data source for transportation planning and is supported by the City.

Unlike other data sources, such as regular traffic counts, which measure the change in magnitude of travel demand, the TTS provides information on the characteristics of these changes. As a transportation time series database, the TTS enables analysis on how factors such as flexible work hour programs, relocation of manufacturing employment, and aging population influence how people travel, how often, and the purpose of their trips. TTS data from year 2016 (most recent survey) was available for Brantford. This data comprises modes of transportation originating in Brantford to destinations within and external to Brantford.

Daily cycling trips were reviewed for the entire City to produce a reasonable estimate of cycling demand. The TTS data is provided in the table below.

| City of Brantford – Mode Split (All Trips) 2016 | |
|--|------------|
| Mode | % |
| Dalhousie Street | 99 |
| Immediate Side Streets | 24 |
| Sub-Total | 248 |
| Spaces North of Dalhousie Street | 317 |
| Total On-Street Spaces | 565 |

| Roadway | Start of Segment | End of Segment | 2020 AADT Estimate | 2020 Daily Cyclist Estimate |
|------------------|------------------|------------------|--------------------|-----------------------------|
| Dalhousie Street | Brant Avenue | King Street | 7,500 | 45 |
| | King Street | Queen Street | 6,190 | 37 |
| | Queen Street | Market Street | 6,460 | 39 |
| | Market Street | Charlotte Street | 6,000 | 36 |
| | Charlotte Street | Clarence Street | 5,750 | 35 |
| | Clarence Street | Colborne Street | 10,000 | 60 |
| Colborne Street | Brant Avenue | King Street | 5,350 | 32 |
| | King Street | Queen Street | 5,700 | 34 |
| | Queen Street | Market Street | 6,180 | 37 |
| | Market Street | Charlotte Street | 6,180 | 37 |
| | Charlotte Street | Clarence Street | 6,670 | 40 |
| | Clarence Street | Colborne Street | 10,000 | 60 |

Utilizing the TTS data, an estimate of the number of cyclists that could occur along the Study Area roadways can be developed based on the annual average daily traffic (AADT) volumes.

Based on the data, Colborne Street and Dalhousie Street could see on average 40 cyclists per day.



6.7.5 Traffic Operations

The quality of intersection operations at signalized and unsignalized intersections is evaluated in terms of level of service (LOS) and volume to capacity as defined by the Highway Capacity Manual. LOS is evaluated based on the average control delay per vehicle and includes deceleration delay, queue move-up delay, stopped delay and final acceleration delay.

For signalized intersections, LOS ranges from LOS A (<10 seconds of average delay) to LOS F (>80 seconds of average delay).

For unsignalized intersections, the LOS ranges from LOS A (<10 seconds of average delay) to LOS F (>50 seconds of average delay).

It should be noted that for Downtown areas, delays are common and generally acceptable. Therefore, a LOS D is typically acceptable, and many cases a LOS of E can be tolerated.

Figure 15 illustrates the base year or current peak hour LOS at each intersection in the Downtown core. The lowest level of service is at the Colborne Street and Clarence Street intersection in the PM Peak.

6.7.6 Collisions

Figures 17 and 18 below provide summaries of the collision data that was provided by the City. Data was collected between January 1, 2017, and December 31, 2019.



| LOS (Delay s) | DESCRIPTION | LOS (Delay s) | DESCRIPTION |
|---------------|------------------------|---------------|-------------------------------|
| A (<10) | Little to no delay | D (35 – 55) | Frequent queuing and delay |
| B (10-20) | Minimal delay | E (55 – 80) | Increased queuing and delay |
| C (20-35) | Some queuing and delay | F (>80) | Significant queuing and delay |

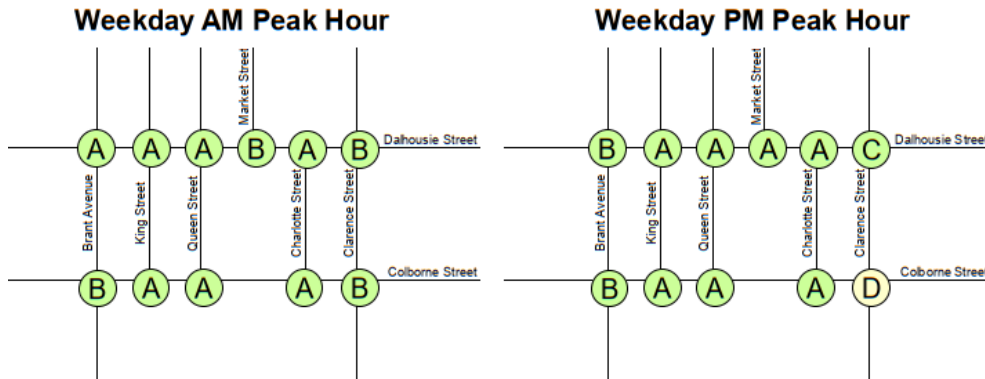


Figure 16 Current Traffic Operation (AM and PM Peak Hour)

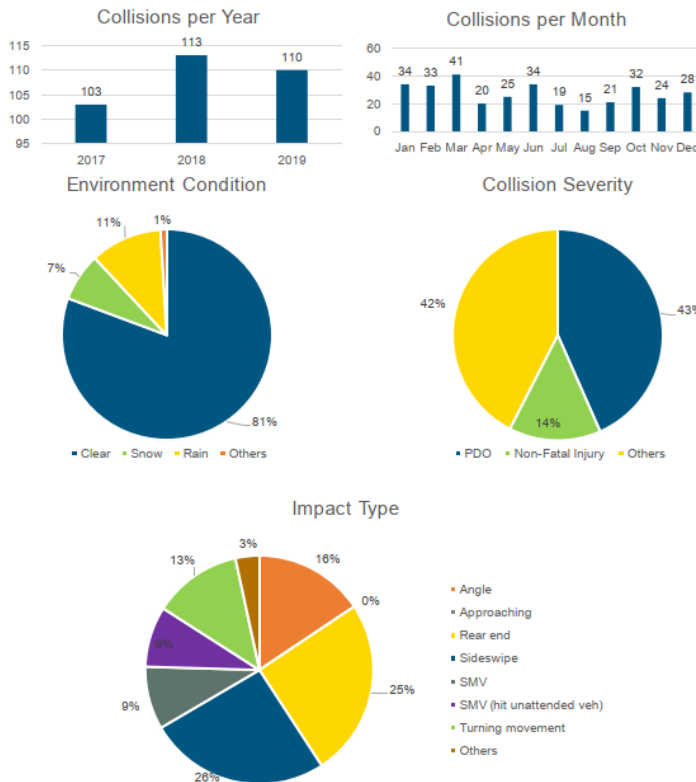


Figure 17 Collision Summary Data

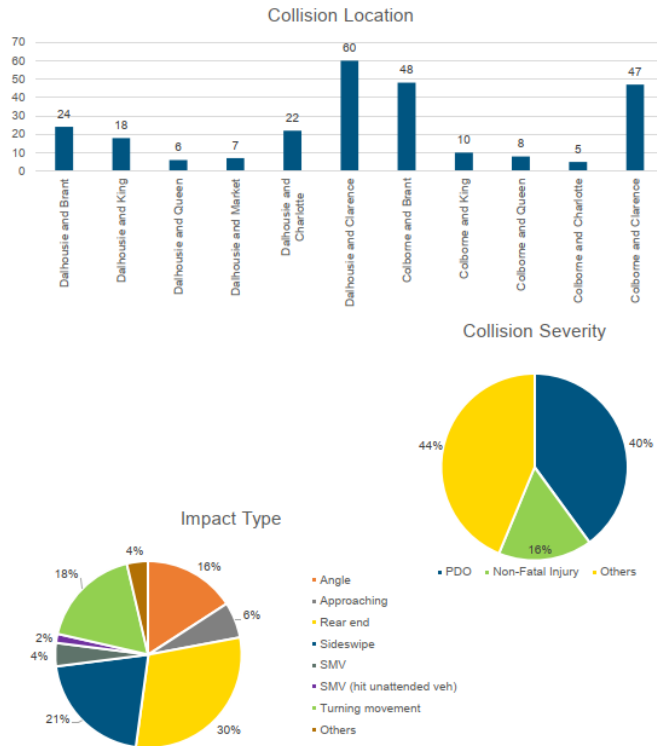


Figure 18 Collision Summary Data



6.8 Roundabout Screening

In 2020, the City implemented a new roundabout screening policy, which provides direction to City staff to review the feasibility of roundabouts within the City. The intent is that when a signalized intersection is to be replaced, a roundabout screening is completed to confirm the most appropriate type of configuration for that intersection. The screening compares the capital cost associated with each type of intersection, as well as a 20-year net present value cost that includes maintenance and operational costs.

MTE was asked to conduct roundabout screenings for all the signalized intersections within the Study Area.

Only one of the intersections analyzed met the screening criteria and was evaluated further. Each of the signalized intersections were screened out for various reasons, as summarized in the table below:

| Street | Cross Street | Screening Result | Screened Out |
|------------------|------------------|---|--------------|
| Colborne Street | Brant Avenue | Direct and significant impact to Royal Bank of Canada building. | Yes |
| Colborne Street | Queen Street | Limitations on geometry at the bridge. | Yes |
| Colborne Street | Clarence Street | Significant impact to buildings, resulting in property acquisition and higher costs than signalization. | Yes |
| Colborne Street | Alfred Street | Significant property acquisition, including impact to active rail line on the east side of the intersection. | Yes |
| Colborne Street | Murray Street | Significant impact to buildings, resulting in property acquisition and higher costs than signalization. | Yes |
| Colborne Street | Rawdon Street | Significant impact to buildings, resulting in property acquisition and higher costs than signalization. | Yes |
| Colborne Street | Dalhousie Street | Lower impact to buildings and property acquisition and higher costs than signalization. | No |
| Dalhousie Street | Brant Avenue | Life cycle costing, traffic benefits, and minimal property acquisition resulting in recommendation ahead of signalized. | Yes |
| Dalhousie Street | King Street | Direct and significant impact to buildings. | Yes |
| Dalhousie Street | Queen Street | Property impact to War Memorial and Prominence Point. | Yes |



| Street | Cross Street | Screening Result | Screened Out |
|------------------|-----------------|---|--------------|
| Dalhousie Street | Market Street | Significant impact to property, requiring acquisition and higher costs than signalization. | Yes |
| Dalhousie Street | Clarence Street | Significant impact to buildings, resulting in property acquisition and higher costs than signalization. | Yes |
| Dalhousie Street | Murray Street | Significant impact to buildings, resulting in property acquisition and higher costs than signalization. | Yes |
| Dalhousie Street | Rawdon Street | Significant property acquisition, including impact to active rail line on east side of intersection. | Yes |
| Dalhousie Street | Stanley Street | Significant impact to buildings, resulting in property acquisition and higher costs than signalization. | Yes |

The roundabout screening found that one intersection met the screening criteria, which was explored further through functional design. The intersection of Colborne Street and Dalhousie Street, at the east limit of the Study Area, is a feasible candidate for a roundabout. It is recommended that a roundabout be further explored at this intersection. The roundabout screening report, along with the cost benefit analysis of each intersection, is in Appendix G.

6.9 Air Quality Impact Assessment

The Study Area is comprised of an urban centre cross-section with commercial and residential buildings lining the City’s right-of-way. Colborne Street and Dalhousie Street are major arterial roads running east and west, connecting commuters across the City. The use of these roads is not intended to change as part of this Class EA. The Project Team will include design elements to improve the overall air quality within the Downtown, such as improved pedestrian and cycling facilities to encourage active transportation, as well as soil cells to allow for street trees to grow with larger canopies.

Given that the Study Area is a fully developed urban centre, the Project Team determined that an Air Quality Impact Assessment was not necessary.



respondents indicated that they drive. Once in Downtown, 49% of respondents said they walk to their destination.

Currently there are no cycle lanes within Downtown, and cycle lanes around the core are limited. Through the workshop with the Working Group and conversations with the Stakeholders Group, it was made clear that dedicated cycle lanes are highly desired. This is reinforced by the City's Transportation Master Plan, which indicates that both Colborne Street and Dalhousie Street are part of the cycling network.

Transit is an oft-overlooked component of transportation in Downtown. Brantford Transit has routes that run along Colborne Street and Dalhousie Street which provide connectivity throughout the City. This Study partly focused on highlighting Brantford Transit bus stop locations, ensuring that they have adequate space, and featuring bus stops within the streetscape.

For Downtown to become a destination, it needs to be walkable. Once people make their way to Downtown, they need to have a reason and the ability to walk around and experience the streetscape. The Alternative Solutions explore ways that key areas, such as Harmony Square and Market Street, can be better connected. The Alternative Solutions also look at ways to enhance those spaces themselves, by making them more pedestrian-friendly.

Accessibility and Safety

The corridor cannot be made to be more walkable without consideration for accessibility. The AODA has been instrumental in creating standards for features such as walkways, sidewalks, pedestrian crossings, etc. Alternative Solutions and Alternative Design Concepts must comply with the current AODA standards, which factor into the selection of materials, spacing of barriers, grading, amongst other elements. As an example, features such as interlocking brick, which is prevalent throughout Downtown, shift and heave over time, making rough surfaces that create challenges for those with mobility issues.

Based on the workshops and the feedback obtained from stakeholders, improvement to safety was another main concern. There are a number of social concerns within the Downtown core that contribute to the perception of safety, and while those are not directly addressed within this Study, they cannot be ignored either. The City has indicated that there are several concurrent and ongoing programs addressing some of the social and economic conditions that exist Downtown, and this Study attempts to support those programs. The Project Team factored these conditions into the evaluation process for design elements. The streetscape will need to have open and clear lines of visibility, excellent lighting, among other features that will provide a higher level of safety Downtown. Of all the design features that can be implemented into the Downtown streetscape to improve safety, none will be more effective than increasing the number of people within the Downtown area. There is an inherent feeling of safety in numbers and increasing the number of people Downtown will improve the perception of safety.

Safety does not just apply to pedestrians, it applies to all those who are Downtown, including cyclists, drivers, and transit users. The Alternative Solutions must improve the



safety of drivers on the roadway, cyclists who use the roadway and cycle lanes, pedestrians on the sidewalks, as well as safety for all those in the areas where these modes of transportation mix.

The Alternative Solution phase addresses the significant physical design and transportation elements that impact the transformation of Colborne Street and Dalhousie Street into a destination. The aim is to create both a physical space and a temporal concept that makes Downtown safer, more walkable and accessible for all users.

Various Alternative Solutions were developed, with Alternative #5 (one-way traffic, with a uni-directional cycle lane) selected as the Preferred Solution. The evaluation summary can be found in Figure 19 below.

7.1.1 Alternative #1: Do Nothing

The Do Nothing Alternative means that there are no improvements made, and the conditions will remain exactly as they are. The evaluation of the Do Nothing Alternative is a requirement of the Class EA process, intended to ensure that there is validity in continuing with the project.

| Evaluation Criteria | Alternative 1: Do Nothing | Alternative 2: Two Way (Bi-Directional bike) | Alternative 3: Two Way (Separated Bike) | Alternative 4: One Way (Bi-Directional Bike) | Alternative 5: One Way (Single Bike) |
|---------------------|------------------------------|--|---|--|--|
| Vision | | | | | |
| Social Environment | | | | | |
| Traffic Operations | | | | | |
| Safety | | | | | |
| Cost | | | | | |
| Preferred | | | | | |

Figure 19 Evaluation Summary



The existing cross-section consists of four lanes with on-street parking. The width of the sidewalk varies; however, it is roughly 2.95 m from the back of curb to property line or building face.

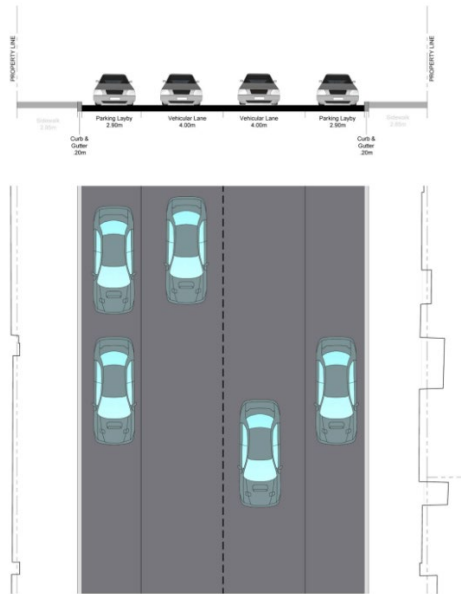


Figure 20 Alternative #1: Do Nothing

Vision: Doing nothing does not meet the City’s vision for creating a Downtown that people want to visit, nor does it make Downtown more walkable. Planned development in the Downtown core is dependent upon upgrades to the infrastructure. To accommodate any growth or intensification, all the underground infrastructure needs to be replaced.

Social Environment: There would be no improvement to aesthetics, walkability, and no cycle lane included.

Traffic Operations: If the Do Nothing Alternative is pursued, traffic will not be impacted, and traffic reporting does not show significant constraints with regards to traffic under current conditions.

Safety: Speed of traffic through Downtown would not be addressed by this option. Pedestrian crossings are considered dangerous under current conditions due to the speed of traffic and the crossing distances.

Cost: Doing nothing is the lowest-cost Alternative, however, significant portions of the overall cost will be related to underground infrastructure improvements, which will likely need to be replaced in the near future. Some cost will be necessary to improve accessibility, even if the Do Nothing Alternative is selected.



| | |
|--------------------|--|
| Vision | |
| Social Environment | |
| Traffic Operations | |
| Safety | |
| Cost | |

Figure 21 Evaluation of Alternative #1

7.1.2 Alternative #2: Two-Way Traffic with Separated Bi-Directional Cycle Lane

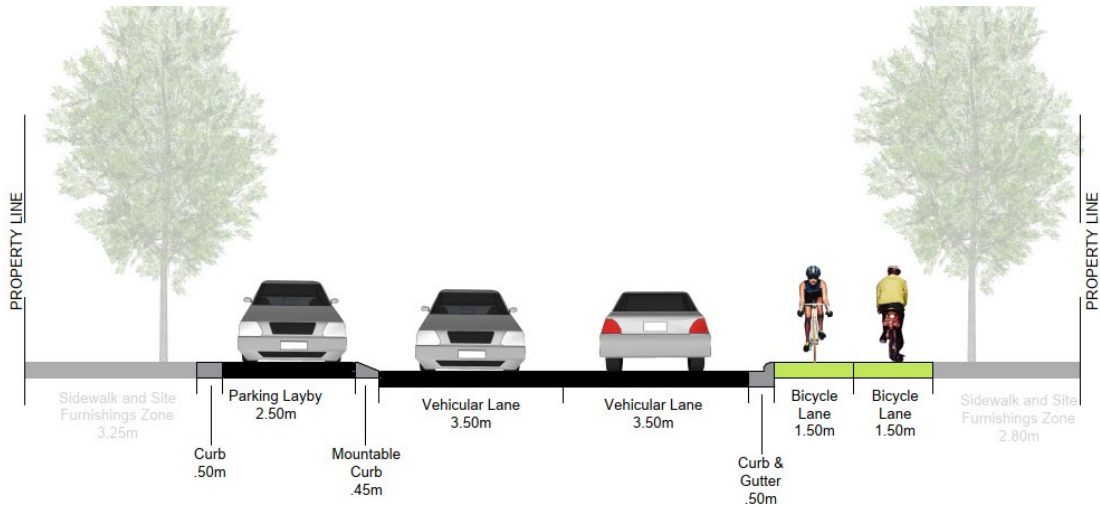


Figure 22 Cross-Section of Alternative #2

Alternative #2 is a two-way traffic option, with parking on one side, and separated cycle lanes in each direction.

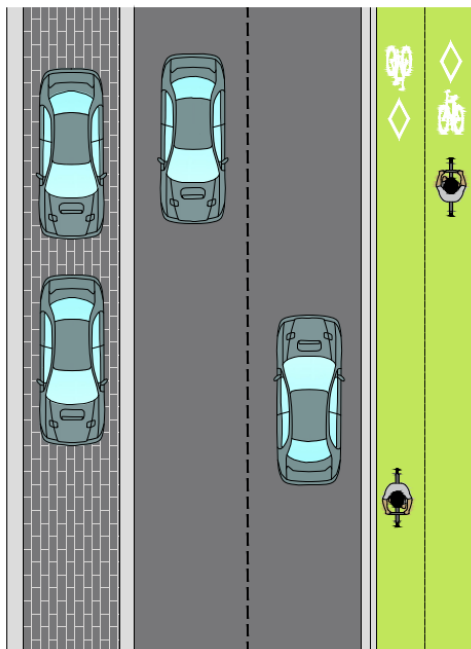


Figure 23 Plan View of Alternative #2

Vision: This Alternative is in line with the overall vision in a number of ways. It provides dedicated separated cycle lanes addressing active participation, maintains parking on one side of the street, narrows the travel lanes to reduce speeds, and provides space for street furniture and furnishings. What we see in this cross-section is that the pedestrian



space is no wider than the existing pedestrian space, meaning no additional space for patios is available.

Social Environment: Alternative #2 provides space for trees, improves the natural environment, and maintains parking on one side. Two-way traffic will be disturbed by any delays in traffic movement (i.e., garbage pick-up, loading, unloading).

Traffic Operations: With one lane in each direction, the overall traffic movement is affected more greatly at the intersections when turning movements are introduced. Overall, the one-way Alternatives provide less disruption to traffic flow. Two-way traffic is more affected by curbside management, loading, emergency vehicles etc.

Safety: This Alternative presents a high level of cyclist safety as the cycle lanes are fully protected. Parking is also separated.

Cost: Cost is slightly higher for maintaining cycle lanes on the side of the road.

| | |
|--------------------|--|
| Vision | |
| Social Environment | |
| Traffic Operations | |
| Safety | |
| Cost | |

Figure 24 Evaluation of Alternative #2

7.1.3 Alternative #3: Two-Way Traffic with Separated Bi-Directional Cycle Lanes

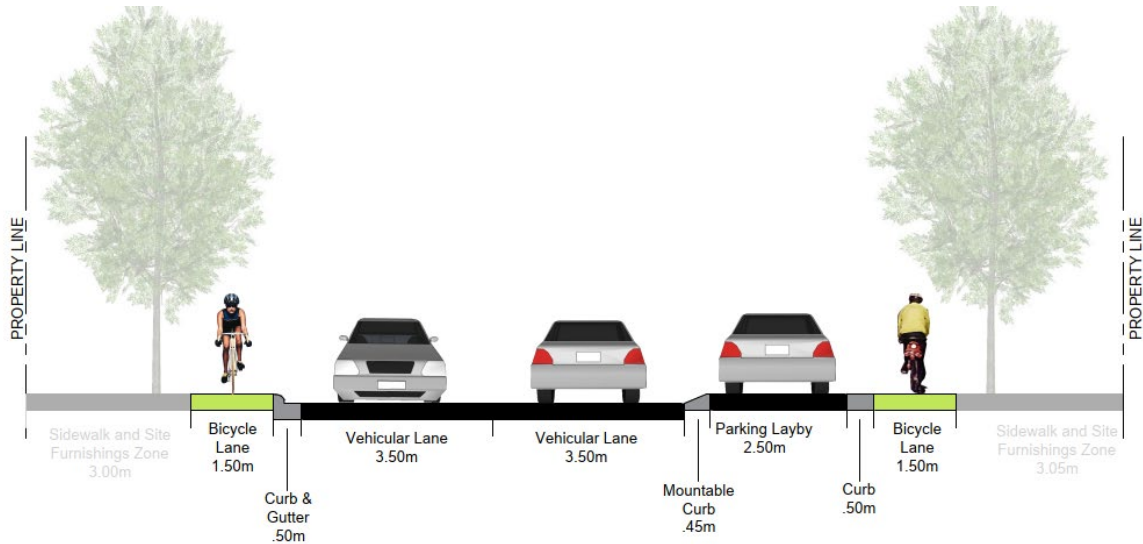


Figure 25 Cross-Section of Alternative #3

Alternative #3 includes two-way traffic, with separated cycle lanes.

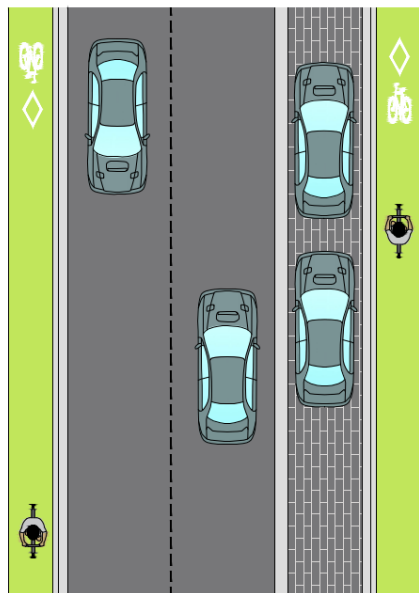


Figure 26 Plan View of Alternative #3



Vision: This Alternative is in line with the overall vision. It provides dedicated separated cycle lanes addressing active transportation, maintains parking on one side of the street, narrows the travel lanes to reduce speeds, and provides space for street furniture and furnishings. What we see in this cross-section is that the pedestrian space is no wider than the existing pedestrian space, meaning no additional space for patios is available.

Social Environment: This Alternative provides space for street trees, improves the natural environment, and maintains parking on one side. Two lanes of traffic allow for curbside management (i.e., garbage pick-up, loading, unloading). There is a slight reduction in traffic operations capacity based on 2051 projections.

Safety: Alternative #3 provides a high level of cyclist safety as the cycle lanes are fully protected. Parking is also separated.

Cost: This Alternative would result in slightly higher cost due to higher maintenance cost due to the cycle lanes.

| | |
|--------------------|--|
| Vision | |
| Social Environment | |
| Traffic Operations | |
| Safety | |
| Cost | |

Figure 27 Evaluation of Alternative #3



7.1.4 Alternative #4: One-Way Traffic with Separated Bi-Directional Cycle Lane

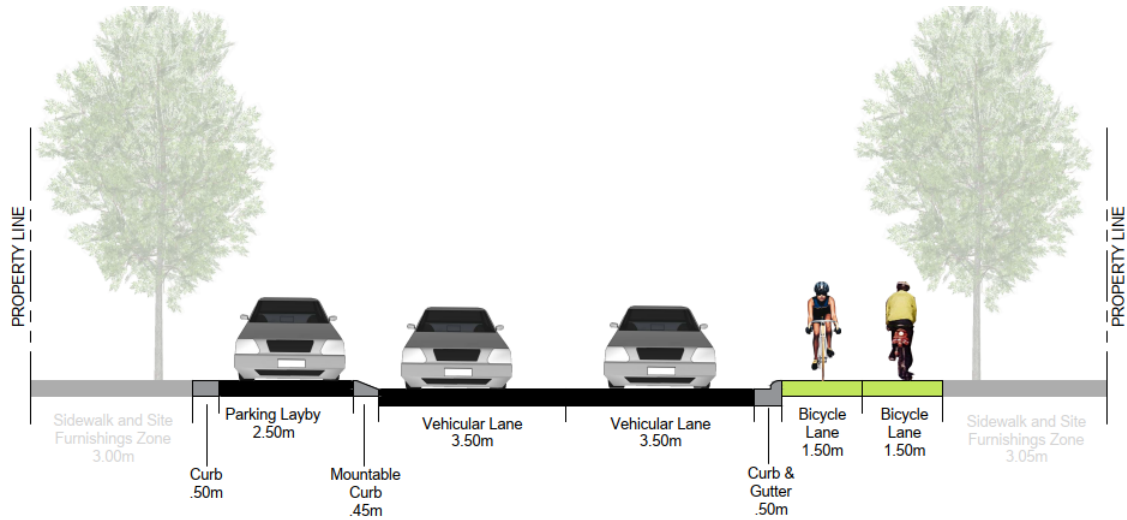


Figure 28 Cross-Section of Alternative #4

Alternative #4 includes one-way traffic, with separated bi-directional cycle lanes on one side of the streets.

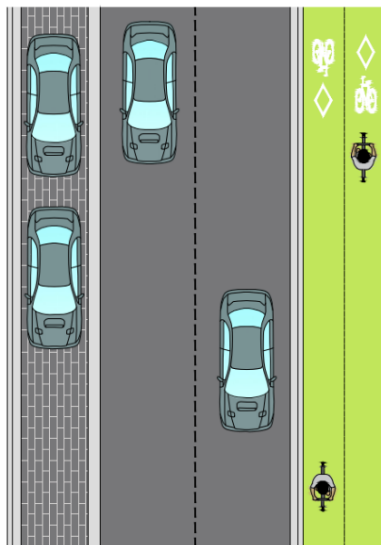


Figure 29 Plan View of Alternative #4

Vision: This Alternative is in line with the overall vision. It provides dedicated separated cycle lanes addressing active transportation, maintains parking on one side of the street, narrows the travel lanes to reduce speeds, and provides space for street furniture and furnishings. With this cross-section, the pedestrian space is no wider than it is currently; meaning no additional space for patios is available.



Social Environment: Alternative #4 provides space for street trees, improves natural environment, and maintains parking on one side. Two lanes of traffic allow for curbside management (i.e., garbage pick-up, loading, unloading).

Traffic Operations: Traffic operation will remain essentially the same, with slight reductions in capacity based on 2051 projections.

Safety: This Alternative has a high level of cyclist safety as the cycle lanes are fully protected. Parking is also separated.

Cost: There is slightly reduced cost of maintaining the cycle lanes.






| | |
|--------------------|---|
| Vision |  |
| Social Environment |  |
| Traffic Operations |  |
| Safety |  |
| Cost |  |

Figure 30 Evaluation of Alternative #4



7.1.5 Alternative #5: One-Way Traffic with Separated Single Cycle Lane (Preferred)

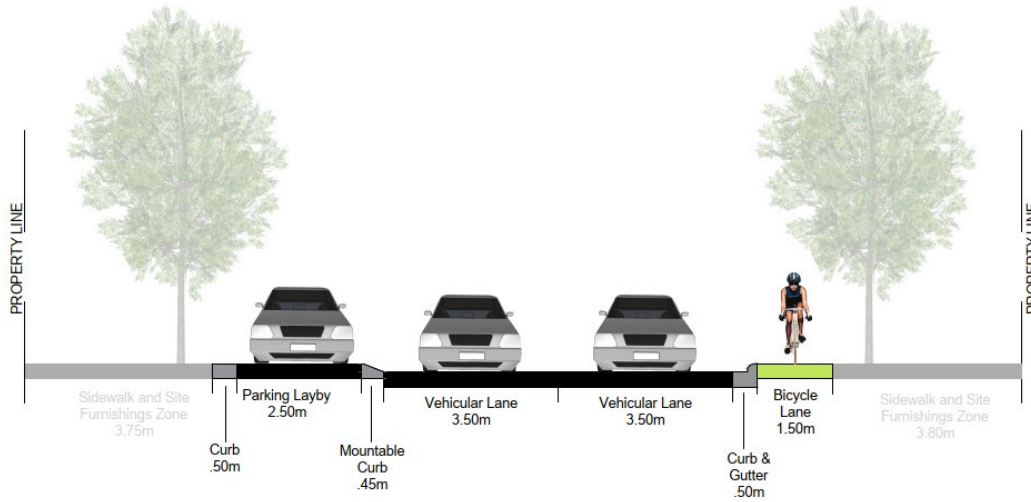


Figure 31 Cross-Section of Alternative #5

Alternative #5 maintains one-way traffic, includes parking on one side, as well as a separated uni-directional cycle lane.

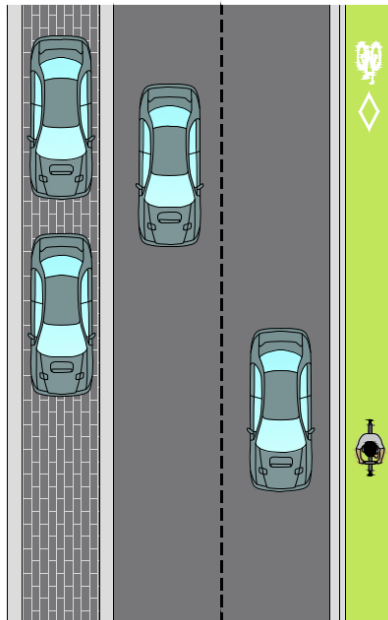


Figure 32 Plan View of Alternative #5



Vision: This Alternative is in line with the overall vision. It provides a dedicated separated cycle lane addressing active transportation, maintains parking on one side of the street, narrows the travel lanes to reduce speeds, and provides space for street furniture and furnishings. In this option, an additional 1.5 m is gained from having a single cycle lane. This additional space can be used for extra patio or pedestrian space.

Social Environment: This Alternative provides space for street trees, improving natural environment, and maintaining parking on one side. Two lanes of traffic allow for curbside management (i.e., garbage pick-up, loading, unloading).

Traffic Operations: There will be slight reductions in traffic Operations in capacity based on 2051 projections.

Safety: There is a high level of cyclist safety as cycle lanes are fully protected. Parking is also separated.

Cost: There is slightly reduced cost of maintaining cycle lanes, standard sidewalk plow can clear in one pass.

The Project Team presented Alternative #5 (one-way traffic with parking on one side with a separated uni-directional cycle lane) as the Technically Preferred Alternative at PIC #2.

| | |
|--------------------|--|
| Vision | |
| Social Environment | |
| Traffic Operations | |
| Safety | |
| Cost | |

Figure 33 Evaluation of Alternative #5



7.2 Public Input

7.2.1 Public Information Centre #1

As part of PIC #1, the public and stakeholders were asked to identify their concerns and priorities for what they envisioned for Downtown. Details regarding PIC #1 are documented separately in this report, and all the correspondence can be found in Appendix H.

Public feedback from the first PIC yielded a significant amount of information about the struggles, constraints and opportunities within the Downtown core. Following PIC #1, a Town Hall meeting was held, where the comments from the PIC were amalgamated and the main concerns discussed. The main topics are discussed below:

One-Way Versus Two-Way

Preference amongst stakeholders for one-way traffic and two-way traffic was evenly distributed. Some stakeholders expressed that one-way traffic hurts businesses as it makes it difficult for drivers to stop at a business or turn around and return to a business. Similar arguments were made for two-way traffic. At the conclusion of PIC #1, the Transportation and Traffic Analysis was not yet completed. The Transportation and Traffic Analysis provides details on how Colborne Street and Dalhousie Street will function in the 2051 scenario under one-way and two-way conditions.

Curbside Management

Curbside management is a concern in most Downtown environments, and not unique to Downtown Brantford. The current streetscape does not have dedicated areas where central garbage bins can be stored, and there are very few alleys or areas along the corridor for garbage to be stored. As a result, the City has implemented a daily garbage collection program. The streetscaping for Downtown will include space for centralized garbage bins, whether they be above or below ground. It is likely that there is more and better space for underground storage within the right-of-way. Improvements to the infrastructure for businesses to store garbage will keep garbage off the streets, and proper storage areas may help reduce the frequency at which garbage collection is required.

Accessibility

One of the key objectives of this Study was to design a streetscape for Downtown Brantford that is accessible for people of all ages. There are some challenges in regard to connecting to the existing built form, which will be evaluated in the future detailed design phase. As an example, there are buildings that currently have a step up or down to the front door, and so the detailed design will have to accommodate and find ways to minimize the impact of these accessibility features.

The streetscape must also follow all current AODA standards and be a barrier-free design. Accessibility concerns can be addressed through a new design.



On-Street Parking

At the time of PIC #1, the Parking Study had not yet been completed. The two main questions regarding parking were: Will convenient on-street parking be maintained? Will there be an opportunity to increase the amount of parking? On-street parking is a significant component of the streetscape, and each Alternative addresses parking to varying degrees. The Parking Study provides some direction as to the amount and location of parking.

Active Transportation

The inclusion of active transportation in the Downtown core is important to the City, and through this Class EA, ways to integrate the existing cycling networks into Downtown were evaluated. For cyclists, it is important that there is connectivity with the trails and bicycle paths that surround Downtown. The Grand River is close to Downtown, and convenient connections to the trail system should be present. Active transportation also includes pedestrians, and so ensuring improved walkability is essential. Widening sidewalks can improve the overall pedestrian experience and increasing the level of pedestrian safety.

Businesses

Downtown businesses are incredibly important to the success of Downtown Brantford. That is why the Downtown Brantford Business Improvement Area (BIA), and Brantford-Brant Chamber of Commerce are significant stakeholders in this project. The Project Team was in contact with these groups regularly and their feedback was critical to ensuring that the plans for Downtown meet the needs of the business community on the whole. Their support of the plans for Downtown are paramount to the successful implementation of a new streetscaping design.

Downtown Programming

In the early stages of the Class EA process, the Project Team identified the type of events and activities that the public and the City would like to see occur Downtown. Through the Class EA and streetscape design, the intention is to include features that will allow Downtown to be flexible so that a wide variety of events can be hosted in the core, including street festivals, concerts, and any other type of event that may arise in the future. Some examples of streetscaping elements that support programming include removable bollards to close sections of the streets, power sources at streetlights, and WiFi internet to name a few. Downtown should be reconstructed with the infrastructure in place so that it is as flexible as possible to support a wide variety of future programming.

7.2.2 Public Information Centre #2

As part of PIC #2, the Alternative Solutions were presented to the public. Based on the feedback received from stakeholders and the public at PIC #1, Alternative #5 (one-way traffic with single cycle lane and parking on one side) was selected by the Project Team as the Technically Preferred Alternative.



At the time of PIC #2, the Transportation and Traffic Analysis and Parking Study were complete, and the Alternative Solutions were informed by the constraints presented in those reports. The main focus of PIC #2 was to directly address the one-way versus two-way discussion. Without resolution on this issue, the remainder of the streetscaping Alternatives could not adequately be evaluated. The Project Team received a number of questions and comments regarding PIC #2. Below is a discussion of the common questions and concerns.

One-Way Versus Two-Way

The findings of the Transportation and Traffic Analysis indicated that based on 2051 projections, Downtown would operate with a higher level of service if it were to remain one-way. The Transportation and Traffic Analysis suggested greater congestions at Brant Avenue and Clarence Avenue under a two-way traffic scenario. Based on projected traffic levels, multiple lanes would need to be added to accommodate necessary turning movements associated with two-way traffic.

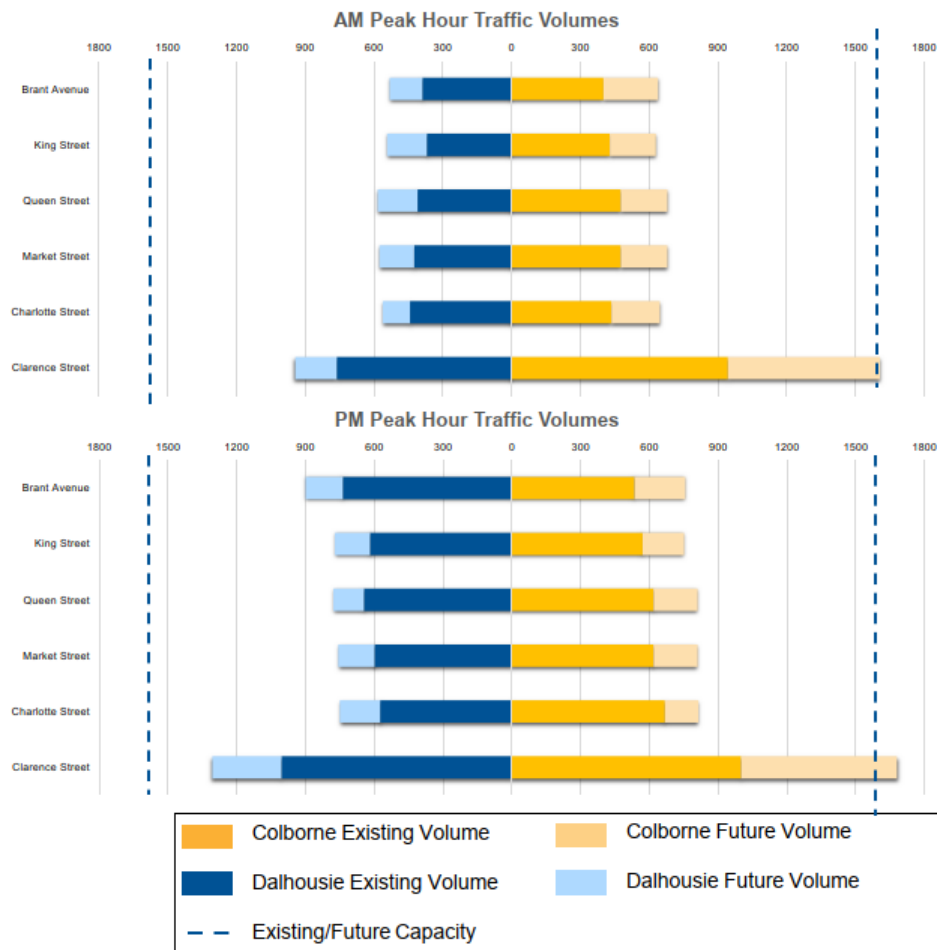


Figure 34 AM Peak Hour Traffic Volumes



Another concern with two-way traffic is the impact that garbage collection, emergency vehicles, transit, and delivery vehicles would have on traffic flow. In the two-way scenarios, a vehicle pulled over for loading and unloading or collecting garbage would block traffic, forcing traffic to travel around the parked vehicle. In the Downtown, where regular deliveries occur to businesses, and garbage collection occurs daily, these disruptions would be far more significant than in other areas.

Figure 34 indicates that under the two-way scenario, the level of service at many of the intersections is lower for both the AM and PM peak. Most significantly, the LOS at Clarence Street and Brant Avenue is lower under the two-way scenario.

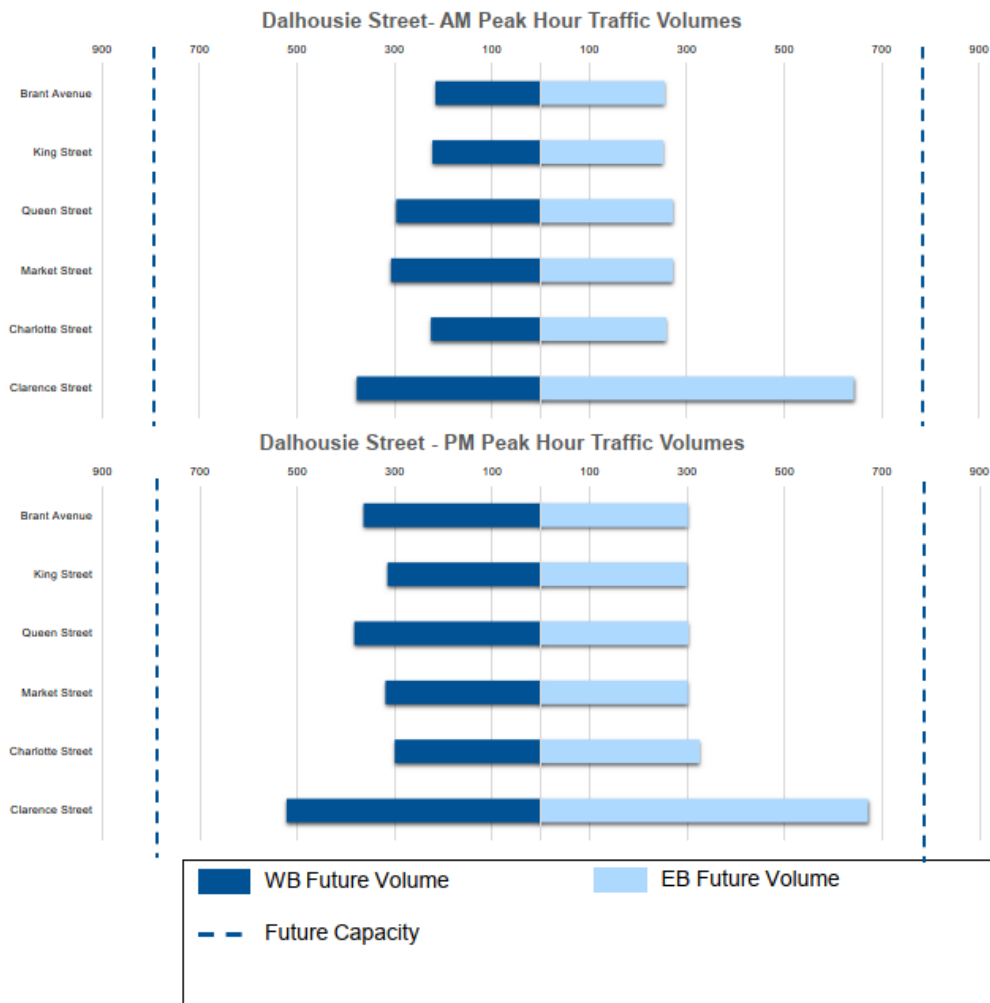


Figure 35 2051 Capacity Comparison – Two-Way (Dalhousie)

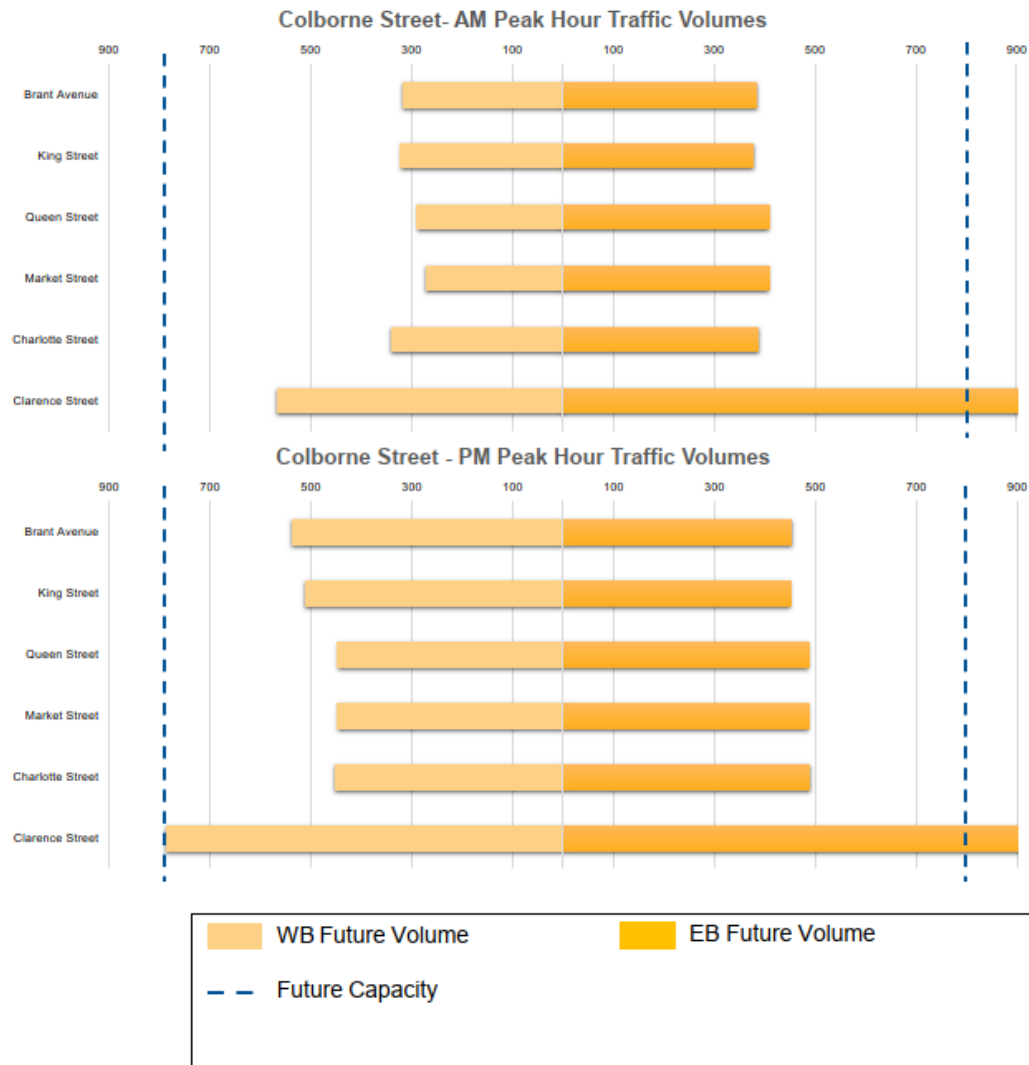


Figure 36 2051 Capacity Comparison – Two-Way (Colborne)



| LOS (Delay s) | DESCRIPTION | LOS (Delay s) | DESCRIPTION |
|---------------|------------------------|---------------|-------------------------------|
| A (<10) | Little to no delay | D (35 – 55) | Frequent queuing and delay |
| B (10-20) | Minimal delay | E (55 – 80) | Increased queuing and delay |
| C (20-35) | Some queuing and delay | F (>80) | Significant queuing and delay |

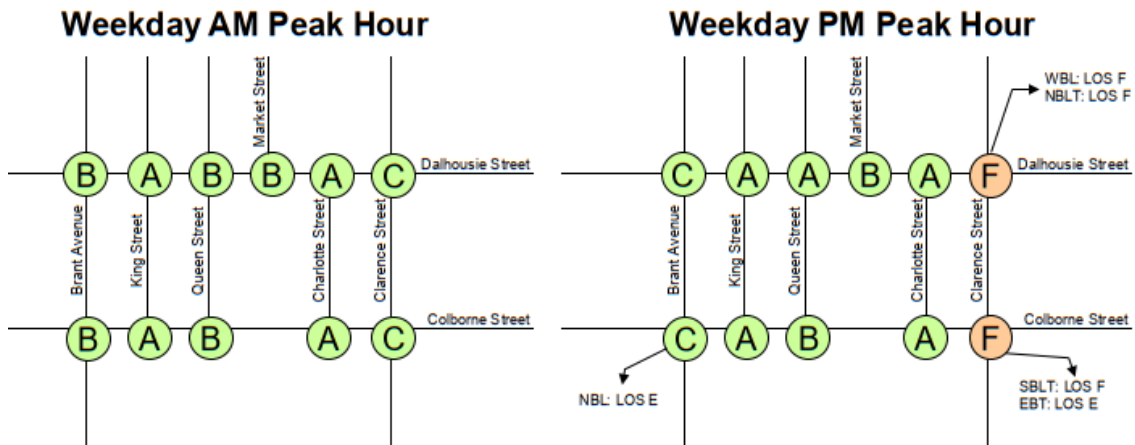


Figure 37 2051 One-Way Peak Hour

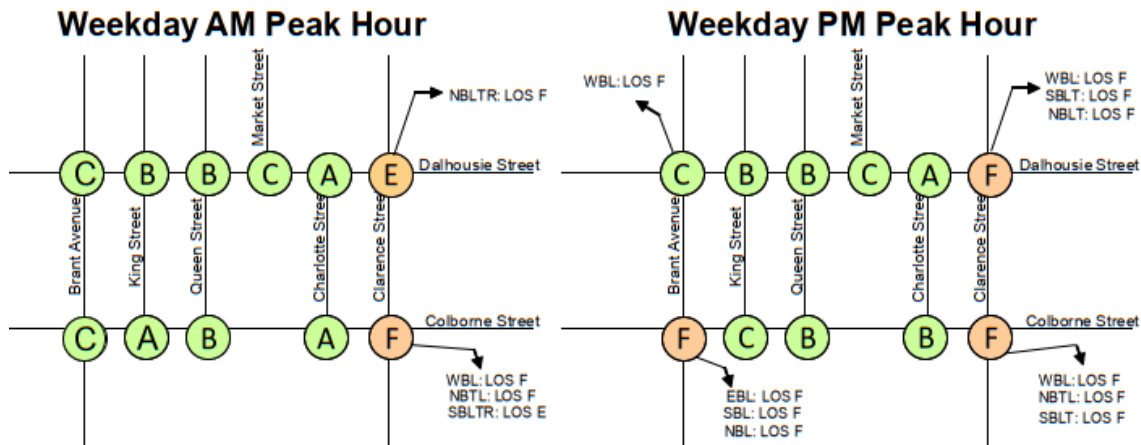


Figure 38 2051 Two-Way Peak Hour

Safety

There are a few ways that the outcomes of this Study can improve the perception of safety. This includes consideration of open sight lines and reducing the potential for “hiding spaces” with the placement of streetscape elements and lighting (also known as Crime Prevention Through Environmental Design or CPTED) and attracting more residents and visitors to Downtown to increase the presence of others.

The evaluation of safety in Downtown was similar under each Alternative Solution as the key issues of safety were addressed in each Alternative. The Project Team did not put



forward any Alternative that did not meet the safety improvement requirements. Narrower lanes, improved pedestrian crossing (shorter crossing distances), and improved pedestrian and cycle lanes are the keys to addressing safety, and each Alternative meets these needs.

Parking

Although there is a general movement towards the accommodation of active transportation over the reliance on single-vehicle traffic, parking still plays an important role in a successful Downtown core. Convenient, short-term parking for deliveries or pick-ups, or for accessibility reasons, should still be provided.

The Preferred Alternative for the right-of-way would reduce the overall on-street parking provision for Downtown, requiring further utilization of off-street parking. The messaging from the public following PIC #2 was that on-street parking was of paramount importance and losing any parking would not be acceptable.

Cycle Lanes

The implementation of cycle lanes fits within the City's Transportation Master Plan, as well as the vision that was developed for Downtown. The objection to cycle lanes from the public came from those who viewed cycle lanes as the root cause for the loss of parking on one side of the street. The City was asked to identify and evaluate alternative cycling routes around Downtown. In the Preferred Alternative, a single cycle lane was selected because it reduces the space requirements for cycle lanes within the restricted corridor.

All the comments received were reviewed by the City's Project Manager, the City's Consultant Engineer, or were submitted through the City's "Let's Talk Brantford" platform. A number of comments were not addressed or included in the development of the Alternative Solutions. There were requests to remove all on-street parking, close either Colborne Street or Dalhousie Street, and many others that were outside the scope of this Study or would result in detrimental impacts to local business owners.



8.0 Alternative Design Concepts

8.1 Design Concept Development

Based on the feedback received at PIC #1 and PIC #2, a review of the evaluation factors, and Project Team input and other input, several issues and concerns were raised and evaluated to develop Alternative Design Concepts.

Ahead of PIC #3, five additional Alternative Design Concepts were developed by the Project Team. Based on stakeholder feedback received following PIC #2, the Project Team only presented Alternative Design Concepts that featured one-way traffic. Additionally, the Alternatives include low profile rollover curb, reducing the transition from the roadway to the parking area and cycle lane. The rollover curb creates a more level surface, which is better for accessibility and allows for greater flexibility within the right-of-way. Ahead of PIC #3, the stakeholders were steadfast in their desire for on-street parking to be maintained, and this was considered in developing the Alternative Design Concepts.

This section of the report represents Phase 3 of the Class EA process. The right-of-way for Colborne Street and Dalhousie Street is approximately 20 m wide, which is considered narrow for a Downtown corridor. In many areas the property line is the building face, and this constraint leads to necessary trade-offs when developing a new cross-section. There are trade-offs between the need for parking, cycle lanes, furnishing zones, and wider pedestrian areas. All the Alternatives presented at this stage explore the trade-offs associated with the constrained corridor.



| Evaluation Criteria | Alternative 1: Do Nothing; Reinstate with Reduced Lane Widths | Alternative 2: Parking on One Side, Bike Lane | Preferred | | Alternative 4: One Traffic Lane, Parking Both Sides, Bike Lane | Alternative 5: Parking Both Sides, On-Road Bike Lane |
|---------------------|---|---|--|--|---|---|
| | | | Alternative 3: Parking on Both Sides, Bike Lanes | | | |
| Vision | | | | | | |
| Social Environment | | | | | | |
| Traffic Operations | | | | | | |
| Safety | | | | | | |
| Cost | | | | | | |
| Preferred | | | | | | |

Figure 39 Evaluation of the Preferred Alternative

8.1.1 Alternative #1: Do Nothing – Reinstate with Reduced Lane Widths

Based on all the stakeholder feedback, the Project Team felt it prudent to present a Modified Do Nothing Alternative at PIC #3. The Modified Do Nothing Alternative included all the necessary underground infrastructure improvements but left out the streetscaping elements. Essentially, the underground infrastructure and roadway would be replaced, with reinstatement in the current configuration.

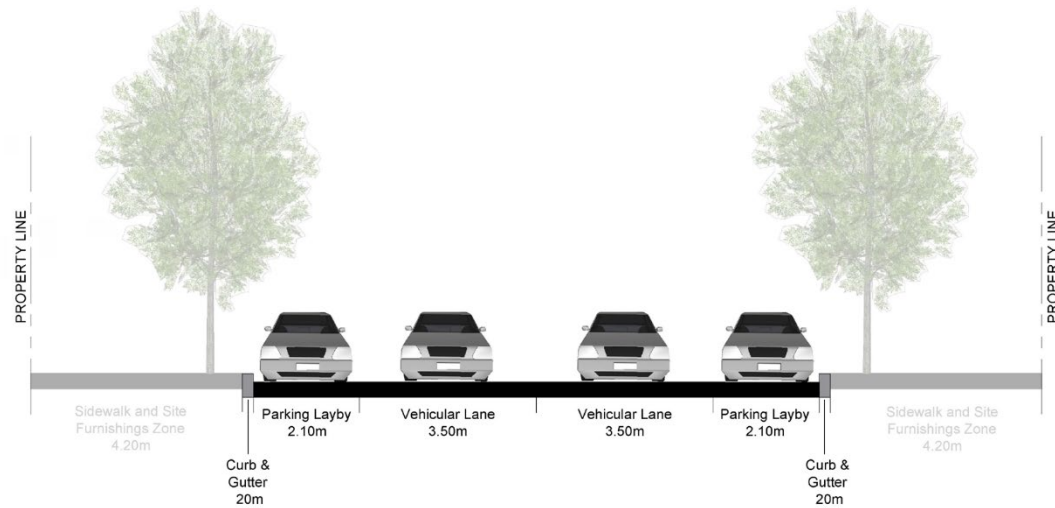


Figure 40 Cross-Section of Alternative #1: Do Nothing

Vision: This Alternative does not contribute to enhancing the streetscape and does not meet the City’s vision for creating a Downtown destination.

Social Environment: This Alternative does not make any improvement to the streetscape, does not add any street trees, make space for patios, enhance walkability or contribute to Downtown becoming a destination.



Figure 41 Illustration of Alternative #1



Traffic Operations: Reinstating the existing conditions will have no impact to current traffic operation. With current traffic configuration, the Transportation and Traffic Analysis indicates that capacity and traffic operation are not a significant concern given future traffic.

Safety: The Modified Do Nothing Alternative includes reduced lane widths, which will provide some natural traffic calming through the corridor. No improvements to pedestrian or cycle lanes are included, and so safety is not adequately improved.

Cost: This is the lowest cost Alternative, as no streetscaping features are included. Evaluation of construction cost estimates indicates that approximately 86% of overall construction-related costs will be associated with the replacement of underground infrastructure. Most of the project costs will still apply even in the Modified Do Nothing Alternative.

8.1.2 Alternative #2: Parking on One Side, Separated Cycle Lane

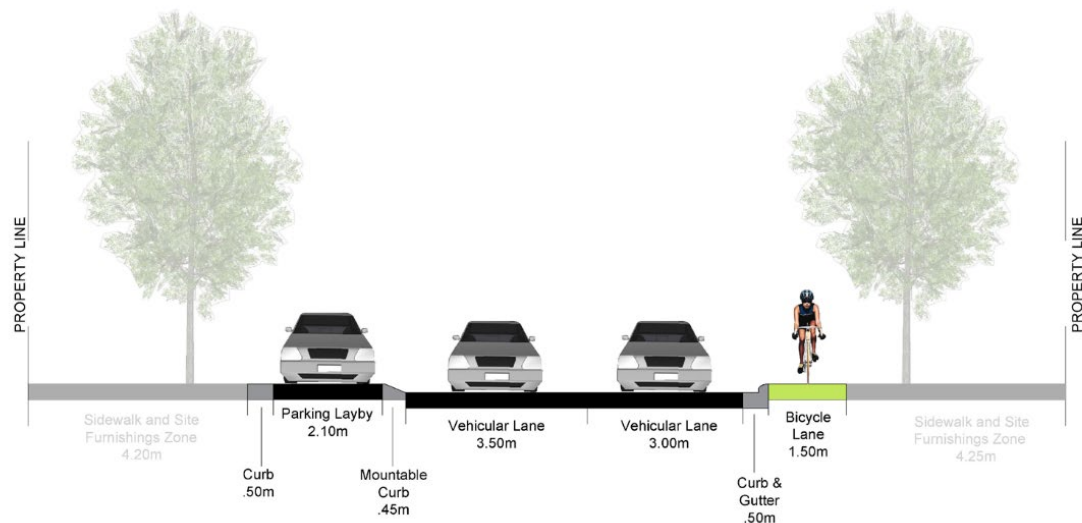


Figure 42 Cross-Section of Alternative #2

This Alternative maintains one-way traffic, and has parking on one side of the road, with a separated cycle lane on the other side.

Vision: This Alternative is in-line with the overall vision. It provides a dedicated cycle lane and addresses active transportation improvements. Outdoor space for businesses and pedestrians is increased from the existing conditions, improving the walkability of Downtown. This is in line with the flexible street concept that allows the streetscape to adapt with shifting demands over time.

Social Environment: This Alternative provides a greater amount of space for street trees, improving the natural environment. Parking is limited to one side of the road. Stakeholder engagement reflected the importance of on-street parking, and desire to maintain parking on both sides.



Figure 43 Illustration of Alternative #2

Traffic Operations: Two lanes of one-way traffic will have capacity under future traffic conditions based on 2051 forecasting. Traffic disruptions will be reduced by two lanes of traffic as curb-side management, loading, and emergency vehicles can use one lane as required, allowing traffic to flow around stopped vehicles.

Safety: Overall safety is increased as cycle lanes are fully protected. Parking is also separated. Bump outs for pedestrian crossing will be included. Narrow traffic lanes act as natural traffic calming and reduced speed through Downtown.

Cost: This Alternative includes the cost of underground infrastructure as well as streetscaping alternatives. The streetscaping will require additional maintenance effort from City staff. Underground infrastructure cost makes up most of the overall project cost and is similar in all the Alternatives that include streetscaping. Cycle lane, furnishing zone, and pedestrian areas will be similar materials.

8.1.3 Alternative #3 (Preferred): Parking on Both Sides, Separated Cycle Lane

This Alternative maintains one-way traffic, and has parking on both sides of the road, with a separated cycle lane on one side.

Vision: This Alternative is in line with the overall vision. It provides a dedicated separated cycle lane and addresses active transportation improvements. Outdoor space for businesses and pedestrians is not increased from the existing conditions. This Alternative is in line with the flexible street concept that allows the streetscape to adapt with shifting demands over time.

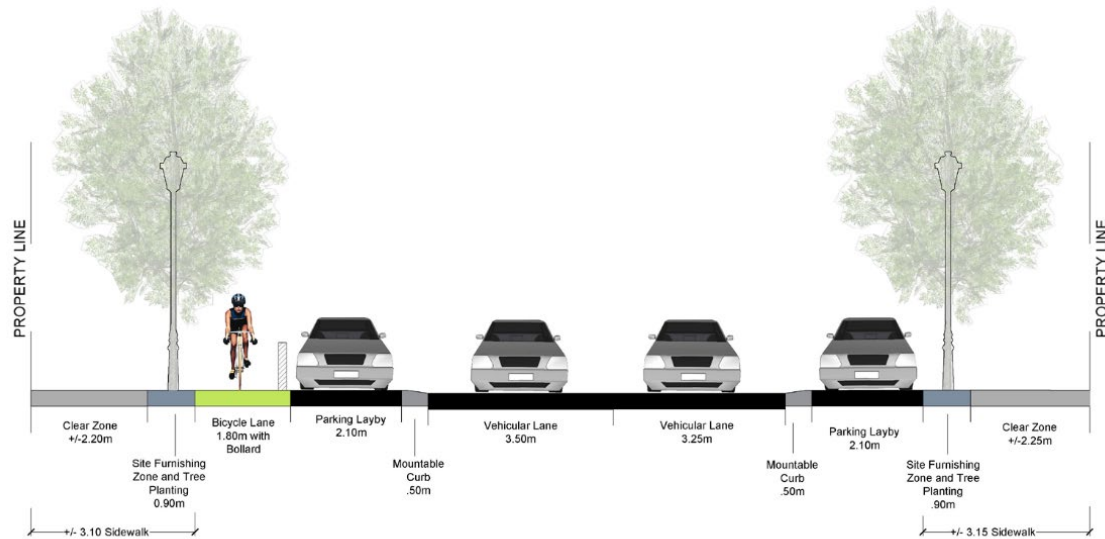


Figure 44 Cross-Section of Alternative #3

Social Environment: This cross-section maintains space for street trees, improving the natural environment. In this Alternative, pedestrian space and street furnishing zones are minimized to allow for parking to be maintained on both sides of the road. Stakeholder engagement reflected importance of on-street parking, and desire to maintain parking on both sides.



Figure 45 Illustration of Alternative #3



Traffic Operations: Two lanes of one-way traffic will have capacity under future traffic conditions based on 2051 forecasting. Traffic disruptions will be reduced by two lanes of traffic as curb-side management, loading, and emergency vehicles can use one lane as required, allowing traffic to flow around stopped vehicles.

Safety: Overall safety is increased as cycle lanes are fully protected. Parking is also separated. Bump outs for pedestrian crossing will be included. Narrow traffic lanes act as natural traffic calming and reduced speed through Downtown.

Cost: This Alternative includes the cost of underground infrastructure as well as streetscaping alternatives. The streetscaping will require additional maintenance effort from City staff. Underground infrastructure cost makes up most of the overall project cost and is similar in all the Alternatives that include streetscaping. Cycle lane, furnishing zone, and pedestrian areas will be similar materials.

8.1.4 Alternative #4: One Lane of Traffic, Parking on Both Sides, On-Road Cycle Lane

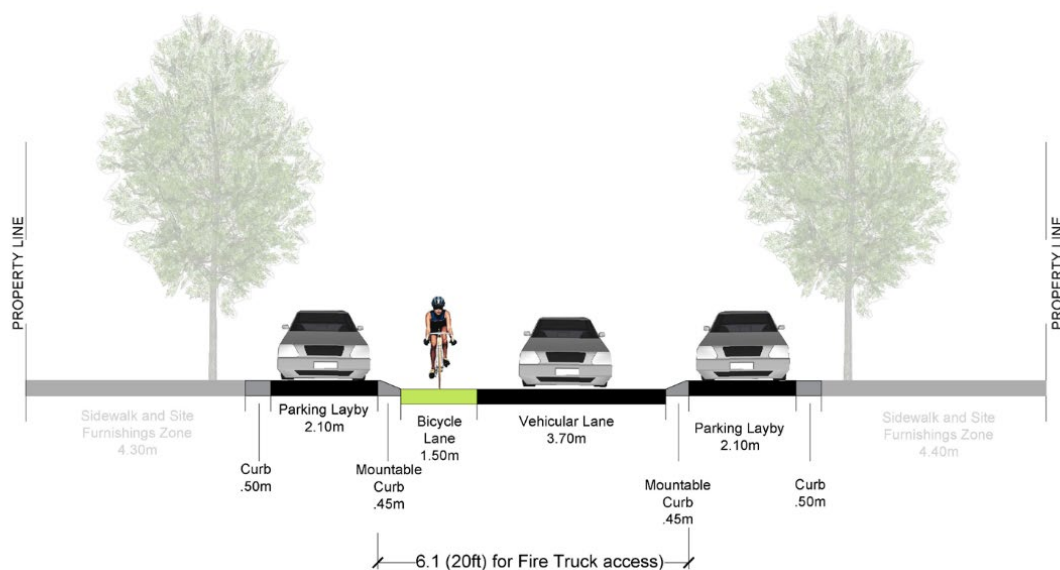


Figure 46 Cross-Section of Alternative #4

This Alternative maintains one-way traffic and has parking on both sides of the road. In this Alternative, the cycle lane is on-road (not fully protected), and there is only one lane of traffic. The cycle lane is on-road so that the minimum 6 m cross-section can be maintained for emergency vehicles.

Vision: While the overall outdoor space for businesses and pedestrians is increased, it does not meet the overall vision, as it does not address the needs of all forms of transportation. This Alternative does provide a flexible streetscape that can adapt with shifting demands.

Social Environment: This Alternative provides for space for street furnishing and street trees, improving the natural environment. It maintains parking on both sides of the road.

Stakeholder engagement reflected importance of on-street parking, and desire to maintain parking on both sides.



Figure 47 Illustration of Alternative #4

Traffic Operations: This Alternative faces all the challenges of the two-way Alternatives. Any disturbance from garbage collection, loading, emergency vehicles will be detrimental to traffic flow.

Safety: This Alternative provides a lower level of safety for cyclists as they will be on-road in a dedicated lane, as opposed to a separated cycle lane. Drivers will have to cross the cycle lane to access parking. Crossing distances for pedestrians are reduced in this Alternative; however, the wider lane may not result in reduced speeds.

Cost: This Alternative includes cost of underground infrastructure as well as streetscaping alternatives. The streetscaping will require additional maintenance effort from City staff. Underground infrastructure cost makes up most of the overall project cost and is similar in all the Alternatives that include streetscaping. Cycle lane, furnishing zone, and pedestrian areas will be similar materials.

8.1.5 Alternative #5: Parking on Both Sides, On-Road Cycle Lane

This Alternative maintains one-way traffic and has parking on both sides of the road. In this Alternative, the cycle lane is on-road (not fully protected). The cycle lane is on-road so that the interaction between pedestrians and cyclists is reduced.

Vision: This Alternative does not adequately address the overall vision of the corridor. There is no increased space for pedestrians and businesses, and this Alternative does not address the needs of all forms of transportation. This Alternative does provide a



flexible streetscape that can adapt with shifting demands.

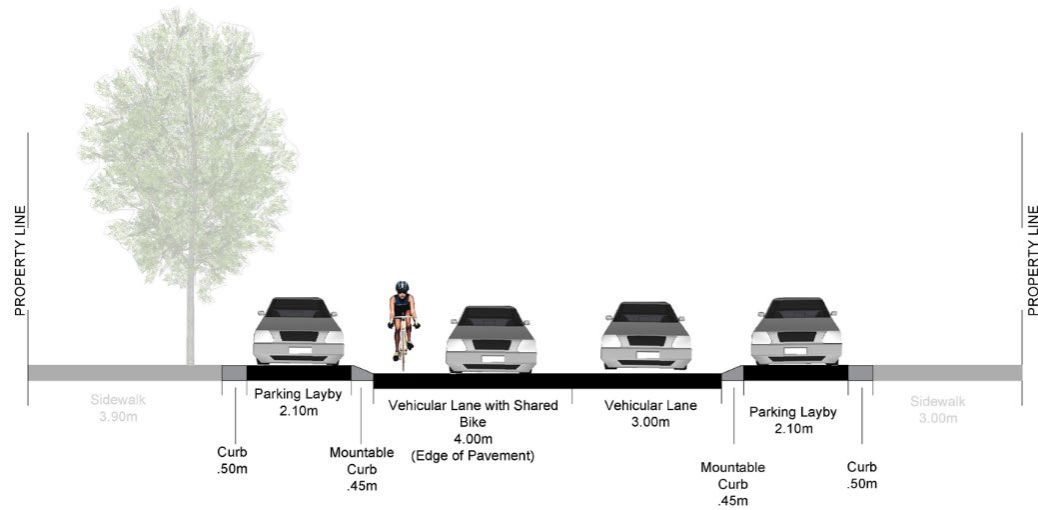


Figure 48 Cross-Section of Alternative #5

Social Environment: This Alternative allows for space for street furnishing and street trees, improving the natural environment. It maintains parking on both sides of the road. Stakeholder engagement reflected importance of on-street parking, and desire to maintain parking on both sides.

Traffic Operations: Two lanes of one-way traffic will have capacity under future traffic conditions based on 2051 forecasting. Traffic disruptions will be reduced by two lanes of traffic as curb-side management, loading, and emergency vehicles can use one lane as required, allowing traffic to flow around stopped vehicles.



Figure 49 Illustration of Alternative #5

Safety: This Alternative provides a lower level of safety for cyclists as they will be on-road in a dedicated lane, as opposed to a separated cycle lane. Drivers will have to cross the cycle lane to access parking. Crossing distances for pedestrians are reduced in this Alternative; however, drivers having the additional width of the cycle lane may not result in reduced speeds.

Cost: This Alternative includes cost of underground infrastructure as well as streetscaping alternatives. The streetscaping will require additional maintenance effort from City staff. Underground infrastructure cost makes up most of the overall project cost and is similar in all the Alternatives that include streetscaping. Cycle lane, furnishing zone, and pedestrian areas will be similar materials.

8.2 Public Input

8.2.1 Public Information Centre #3

As part of PIC #3, stakeholders and attendees were presented with the Preferred Alternative, which included a standard cross-section, and overall concept plan for the Study Area. Complete details, including the boards that were made available to the public, can be found in Appendix J.

Some of the key questions and concerns that were brought to the Project Team's attention in relation to the Preferred Alternative and PIC #3 in general are discussed below:



Cycle Lanes

In order for cycle lanes in the Downtown core to be considered a success, a broader perspective from the City on cycling in and around Downtown is required. If there is no connectivity with other cycle facilities, or the trail systems along the Grand River, then cycle lanes in the Downtown area will be underutilized. This Class EA was completed in conjunction with the City's Transportation Master Plan, which is investigating the ways to connect the proposed cycle lane with surrounding trail networks.

Public Transit

The Study reviewed the need for improvements to public transit in the Downtown core. Unfortunately, due to the timing of this Study, it was difficult to make accurate recommendations for improvements when ridership was well below average due to the COVID-19 pandemic. The City will continue to evaluate the need for improvements to public transit as ridership increases. Evaluation of servicing areas outside of Downtown Brantford was beyond the scope of this Study.

Infrastructure

The infrastructure within the Downtown core has reached the end of its serviceable life and is in need of replacement. Some of the infrastructure is over 100 years old. The underground infrastructure is the impetus for this Study, as the underground improvements are necessary for the City to continue to provide services (water, sanitary, etc.) to residents and businesses. As failures in the infrastructure occur, which they have over recent years, the City incurs significant repair costs which also cause

Parking

While previous iterations of the streetscape and functional design showed a potential loss of 84 spots, the Preferred Alternative that was presented at PIC #3 showed no loss of on-street parking. The Preferred Alternative shows that parking will be maintained on both sides of Colborne Street and Dalhousie Street and the Parking Study determined that this Alternative would not result in a loss of on-street parking spaces.

The weighting of the importance of parking versus other elements of the streetscape is a challenge. The Project Team received feedback from a significant number of stakeholders for this project, and it was clear that maintaining on-street parking was highly desired. However, what is presented in the cross-section creates a level surface from the back of the curb to the building face and allows the City the greatest amount of flexibility in the future. As priorities shift in the future, parking could be substituted for extended patios, additional cycle lanes, or a variety of other uses that may evolve in time as needs change.

Garbage Collection

Part of the curbside management component of this Study is aimed at ensuring infrastructure is in place to better accommodate garbage collection. The preliminary design will evaluate what space requirements will be necessary to accommodate



underground storage, while the detailed design will determine the types of garbage storage systems that can be introduced to the streetscape.

The scope of this Study is to focus on the infrastructure and provide recommendations for the Downtown streetscape. While the Study focused on the provision of infrastructure, the City’s Public Works Commission manages the waste disposal systems and any changes to the collection in the Downtown core will be a City initiative outside of this Study.

8.3 Why is Alternative #3 Preferred?

Following the evaluation criteria utilized throughout the Class EA process, Alternative #3 was selected as the Technically Preferred Alternative by the Project Team. Alternative #3, which includes parking on both sides and a separated cycle lane, was selected because it is the Alternative that meets all the objectives of the vision statement and adequately addresses the Problem / Opportunity Statement. The Preferred Design Concept(s) address several issues that were identified as part of the Class EA process:

| Feature | Compromise |
|---|---|
| Meets the Problem / Opportunity Statement | “Revitalize Brantford’s core by improving infrastructure, accessibility, safety, and rebuilding an aesthetically beautiful and adaptable Downtown” |
| Infrastructure Needs | The Preferred Design Concept includes all necessary underground infrastructure improvements. These are included in each Alternative presented. Utility providers have been engaged and are aware of the planned improvements so they can begin capital forecasting accordingly. |
| Accessibility | The Preferred Design Concept will meet all the current AODA standards. Signalized intersections will be replaced with adequate signalization, and the crossing will be accommodating as per AODA. |
| Safety | <p>The Preferred Design Concept has considered the safety of all stakeholders, and all forms of transportation</p> <ul style="list-style-type: none"> • Vehicles: Lane widths have been reduced, which will provide natural traffic calming, reducing speeds through the Downtown. • Cyclists: A dedicated off-road cycle lane for cyclists is included. Cyclists are separated from the traffic, and additionally, are set back from parking. Bollards prevent vehicles from tracking into cycle lane. • Pedestrians: Pedestrians are separated from cyclists by a furnishing zone. Bump outs will be placed at all crossings, including intersections, so that crossing distances are reduced. Better visibility of pedestrians for drivers. • Residents and Visitors: Each element of the design has taken into consideration to potential unintended consequences associated with each element. |



| Feature | Compromise |
|---------------------------|--|
| | Streetscape will have improved and open site lines and will minimize any areas with blind spots. |
| Flexible Design | The Preferred Design Concept features a low profile rollover curb, and a level platform from the back of curb to building face. The parking lane, cycle lane, street furnishing zone and pedestrian clearway will all be at the same grade, with only material types and colours defining the separate zones. This allows for greatest amount of future flexibility. If parking needs change, the layby parking can be repurposed for cycle lanes, patio space, etc. |
| One-way vs Two-way | The Transportation and Traffic Analysis indicated that traffic would operate better, (when 2051 projections are considered) if one-way traffic is maintained. With two-way traffic (one lane in each direction), any disturbance from garbage collection, loading/unloading, emergency vehicles, etc., will greatly slow traffic through Downtown. Additionally, at Clarence Street and Brant Avenue, widening to accommodate additional turn lanes would be required. |
| Traffic | The Preferred Design Concept has very little impact to traffic in the surrounding to Downtown as the traffic patterns are not changing in any substantial manner. There is an opportunity for improvement at Clarence Street should turn lanes be introduced, which will need to be determined during the future detailed design phase. |
| Animating Streets | Animating the streets is a function of having more people Downtown. Improvements to infrastructure will allow for in-fill development to occur, bringing more residents to Downtown. Focus on active transportation will encourage more people to use Downtown. Improvements to safety will encourage people to come Downtown who may have otherwise stayed away. By creating an environment that people want to experience, and engaging with that environment, it will lead to further animation of the streets. |
| Safe Cycling / Cycle Lane | Separated cycle lanes provide a more comfortable experience for the average cyclist, and with the presence of the cycle lanes, more cyclists will travel to Downtown by cycle. Creating inviting connections to the trail system along the river is important, as connectivity to adjacent trail systems will be key to successful utilization of the cycle lanes. |
| Climate Change | The Preferred Design Concept includes features that address climate change. The addition of street trees is key, specifically because there are very few trees Downtown currently. To improve the success of the trees, soil cells will be included to encourage canopy |



| Feature | Compromise |
|---|---|
| | growth. The soil cells will also act as infiltration galleries, allowing stormwater runoff to be absorbed by tree roots. This also reduces watering needs for the trees. |
| Parking Needs | Parking is being included on both sides of the road in the Preferred Design Concept. Throughout the Class EA process, stakeholders were vocal about the importance and need for on-street parking. The Preferred Design Concept attempts to maximize the parking and match the amount that currently exists. |
| Curbside Management | The Preferred Design Concept includes space within the corridor for centralized underground garbage collection. The exact locations of the underground storage bins will be determined during detailed design but will have enough storage to accommodate reduced frequency of garbage collection. |
| Natural Environment – Street Trees | Any introduction of street trees is an improvement to the natural environment, as there are currently very few trees. The Preferred Design Concept is an overall improvement to the natural environment. |
| Air Quality | The introduction of tree canopy to a streetscape that currently has very few street trees will be beneficial to the overall air quality. The improvements to pedestrian facilities and inclusion of cycling facilities will encourage more active modes of transportation. This may not have a significant impact on through traffic, but those who have Downtown as their destination will hopefully choose to leave their cars at home. |
| Transit | The Preferred Design Concept is flexible enough to accommodate additional bus stops through the corridor if needed in the future. Appropriate bus stop infrastructure will be included. |
| Accessibility | All the newly reconstructed streetscape will meet AODA, which will address all the current accessibility concerns. Improvements will also be made to connecting to the existing built form. |
| Maintenance | The Preferred Design Concept will require increased maintenance than other areas around Downtown. Cycle lanes will require plowing through winter, and snow removal will likely need to be included as well. These are expectations that the City understands and are typical in other similar Downtown environments. |
| Connection to Public Spaces (Harmony Square, Market Street) | The Preferred Design Concept gives consideration to the importance of pedestrian connections between key public spaces within the Downtown core. |



9.0 Recommended Design Concept

9.1 Street Design

The preferred street design for Downtown Brantford is illustrated in Figures 50 and 51 below. The recommended design concept includes maintaining two lanes one-way traffic, mountable curb, layby parking on both sides of the road, furnishing zones, a single separated cycle lane and a pedestrian clear zone. The concept plan for the entire Study Area can be found in Appendix K.

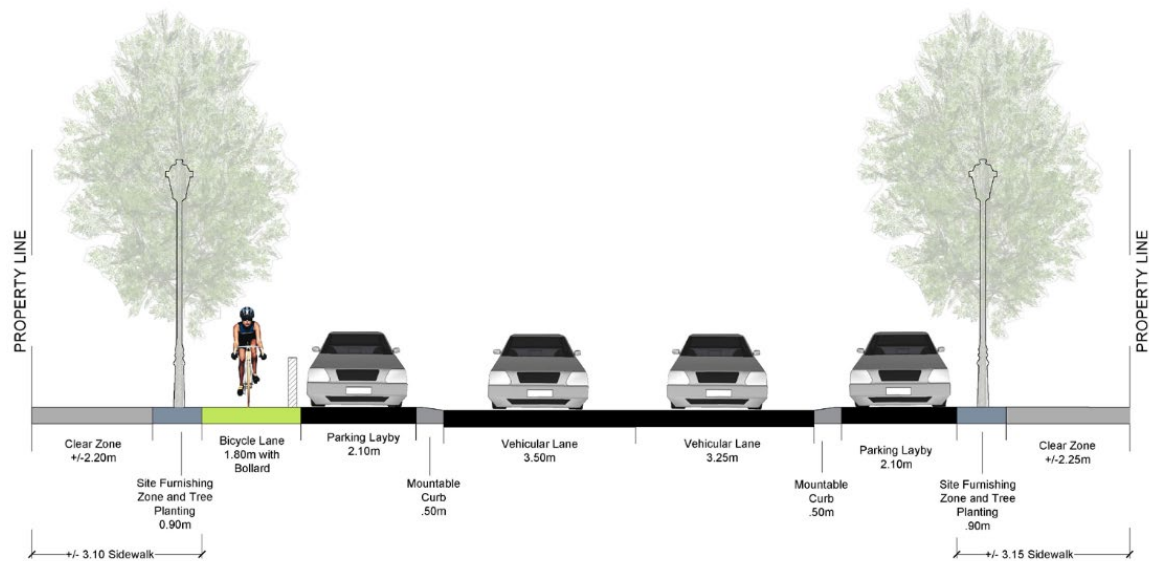


Figure 50 Cross-Section of Preferred Alternative

Pedestrian Clear Zone

The pedestrian clear zone is a pedestrian pathway that is to be unencumbered by any site furnishings, or have any impediments put in place by business owners or residents. The pedestrian clear zone that is being recommended is approximately the same width as the current sidewalk. The clear zone will vary throughout the corridor; in some areas it will be limited by the existing built form of building faces, but it may be wider in other areas.

Site Furnishing Zone

The site furnishing zone and pedestrian clear zone will be two interconnected design features. The site furnishing zone is a dedicated space that can house benches, trees, street lighting, garbage cans etc. but these elements will not be placed along the entire corridor. This means in spaces where there are no site furnishings present, there will be additional space for pedestrians to use. Pedestrians will be able to trek in and out of this space, making the sidewalk space wider.

Cycle Lane

There will be a 1.8 m cycle lane adjacent to the site furnishing zone. The site furnishing zone creates additional buffer between the pedestrians and the cyclists, minimizing the points of conflict between the two user groups. The 1.8 m cycle lane includes the space that will be taken up by the bollards, which provide a buffer between the cyclists and the parking lane. Locating the cycle lane behind the parking lane provides another level of separation between the cyclists and active traffic and eliminates the need for drivers to cross through a cycle lane to get in or out of parking spots.



Figure 51 Illustration of Preferred Alternative

Parking Lane

Parking spaces will be separated from the roadway by a low-profile mountable curb. The mountable curb will be the only change in grade within the cross-section. The intent is to minimize the potential tripping hazards and accessibility concerns within the Study Area. The parking area being at grade with the cycle lane provides flexibility in future if parking needs are ever reduced. The cycle lane could be transitioned out to the parking area, widening the sidewalk. The parking lanes will be kept to a minimum of 2.1 m, which is narrow, but allows for parking to be maintained on both sides of the road.

Driving Lanes

Two lanes of traffic are to be maintained, one 3.5 m lane and one 3.25 m lane. The 3.5 m wide lane is required to accommodate trucks, buses, garbage trucks, and other large vehicles. The right lane is wider to accommodate larger, slower traffic, and will be where loading and unloading will occur. The benefit of having two lanes of one-way traffic is



that when vehicles are pulled over in one lane, drivers can use the second lane to pass and maneuver around the stopped vehicle.

9.2 Design Features

This section of the report provides an overview of the various elements of the proposed streetscape design. These elements and design features will be further refined in the next phase of the project.

9.2.1 Pavement Treatments

Paving treatments will be an important consideration Downtown given the amount of space covered by pavement. A consistent approach and a richness of materials are important given the pedestrian orientation of these Downtown streets. While the treatments will be selected during the detailed design stage, some suggestions for the materials can be made:

Simple and durable materials: The intent is for Downtown to be aesthetically beautiful today, but also in the future. Consideration should be given to materials that will hold up to the elements and will still look good in the future.

Ease of repair: Inevitably there will be a need to replace services or install new utilities in the future. Materials should be such that repairs can be made easily without significant disturbance, and reasonably reinstated to original conditions.

Materials such as broom finish concretes are durable and can be replaced with relative ease. They can be completed with a variety of patterns, colours, and saw cut options to enhance the character and the quality of the finished product.

9.2.2 Street Trees

The addition of new trees to Downtown will have a significant impact on enhancing the environment. The trees will be provided along the street generally as illustrated in the concept plans. At the detailed design phase, specific placement will be achieved through coordination with underground infrastructure and integration with garbage storage and other adjacent facilities. The type of underground soil cell structure used for this purpose will be specified in the detailed design stage. Specific tree species will also be determined with a preference for native species and those that are tolerant of urban conditions such as those found Downtown. Several species may be used to provide diversity and to match local conditions.



Figure 52 Implementation of Soil Cells

The soil cells will be strategically placed throughout the Downtown to enhance tree growth and integrate street trees into the streetscape. While the soil cells are modular, and can be removed or replaced as needed, plans and procedures for how repairs will be made should be considered during the detailed design phase. The need for irrigation will also be reviewed and addressed at the detailed design phase.

9.2.3 Furniture and Seating

Providing furniture and seating for people to rest or wait while shopping or participating in events Downtown is a very important component of the streetscape development. Currently there is a lack of available seating along these streets, partly due to the narrowness of the pedestrian space in many instances.

A furnishings package will be prepared in the detailed design phase and will include seating, both permanent benches and movable chairs, waste and recycling receptacles and bicycle racks. This furniture palette will be chosen for its durability, comfort and aesthetics, but also to meet current accessibility standards. Benches such as the one shown below have the middle arm which meets AODA standards.



Figure 53 Image of Potential Style of Bench



9.2.4 Lighting

Lighting is an important streetscape consideration that not only provides a safe environment for motorists and pedestrians, but also forms part of the place-making strategy that will allow Downtown to have a unique feel from the rest of the City.

The Lighting Study (Appendix Q) evaluated the existing lighting conditions and provided a photometric analysis that can be used in the detailed design phase to determine what types of luminaires will be used in Downtown. The selection and placement of light standards and luminaires will be completed during the detailed design phase, and in conjunction of the recommendations made in the Urban Design Manual.

There are also opportunities to provide some custom lighting pieces in strategic locations such as Market Street and Harmony Square.

9.2.5 Gateways and Public Art

It is important to celebrate the sense of arrival to Downtown and to signify to both motorists and pedestrians that they are entering a special place. Public art is important to establish a sense of place for Downtown. The City should investigate public art opportunities during the detailed design phase and commission the local artistic community to participate with new pieces. This is also an opportunity to engage local Indigenous groups for ideas and feedback, with the mindset that this is an opportunity for sculptural, visual or lighting related art that will enhance the Downtown experience.

9.2.6 Bollards

Bollards will be a key feature to providing separation between the layby parking and cycle lane. The style and details of the bollards will be determined during the detailed design phase. Consideration may want to be given to the implementation of removable bollards. Removable bollards can be relocated or removed completely should there be street closures for events. They can also be removed in the future should the needs of Downtown change.

Location of bollards will need consideration as it relates to the location of street furnishings, maintenance requirements, and interaction between parked vehicles opening doors and cyclists.

9.2.7 Loading and Unloading Areas

Loading and unloading is an ongoing challenge Downtown due to the narrow right-of-way and parking on both sides of the road. Generally, areas that are designated for loading and unloading do not allow parking, but in Downtown Brantford, on-street parking is present. Designating areas for loading and unloading will come at the cost of on-street parking but will need to be done to accommodate safe and convenient loading and unloading for Downtown businesses.

The size and location of the loading zones will need to be determined during the detailed design phase.



The selection of one-way traffic is helpful for accommodating loading and unloading as any delivery vehicle that is stopped in the active lane does not completely disrupt traffic. The design team must consider how the demands for delivery have changed in recent years. Many businesses rely on take-out and delivery, so having a loading zone may be more critical to that business than a parking spot. Placement of short duration parking (five- or 10-minute parking) in front of hydrants may be ways to include additional loading and unloading space. It is recommended that City staff work closely with the BIA to ensure the needs for business are addressed to the fullest extent possible.

9.3 Underground Utilities and Infrastructure

As part of this Class EA process, a preliminary typical street cross-section has been developed to illustrate underground utility locations. This will serve as a starting point for the detailed design phase and will illustrate the extent of the utilities which must be accommodated. Each block will be unique and likely require individual strategies to accommodate all the underground requirements.

A general overview of servicing is as follows:

- **Sanitary Sewer:** To be replaced by the City.
- **Watermain:** To be replaced by the City.
- **Storm Sewer:** To be replaced as evaluated by the City. Catchbasin leads will be replaced in new curb location. Aging and undersized storm sewer will be replaced where required.
- **Gas Main:** Only minor service upgrades are expected. Enbridge did not provide any indication as to whether significant upgrades were planned or required.
- **Hydro:** There were no immediate plans for improvements to the hydro that exists along Colborne Street and Dalhousie Street, however, it was indicated that they have plans for improving infrastructure beyond 2026. Given the expected construction timing, coordination with hydro for improvements should occur during detailed design.
- **Bell Duct Banks:** Will remain in the existing location, as main feeder fibre optic lines pass through Study Area. Bell has no plans to improve main infrastructure but will likely need to replace minor services.

9.4 Waste Management

During the detailed design phase, a thorough waste management strategy will be developed for the Study Area, and the plan must be developed along with direction from City staff. Current waste collection occurs daily and there are no centralized garbage storage bins, leaving garbage to be left out on the streets nightly. Bags are regularly picked through and often strewn across the sidewalk.

The streetscape concept includes dedicated areas where underground garbage bins could be placed. The Molok style bins will need to be placed strategically in collaboration with the design of the other underground infrastructure. The bins should allow for greater storage capacity and allow the City the flexibility to adjust their collection schedule.



Figure 54 Image of Curbside Garbage

9.5 Operations and Maintenance

As the project progresses into the detailed design phase, it is imperative that special consideration be given to how operations groups will maintain the Downtown. Within the Study Area, there will be elements of the streetscape that are unique to Downtown and will require different maintenance practices than what exists throughout the rest of the City. It is recommended that City Operational Services Staff be included in the detailed design phase of the streetscape, and that their input be considered regarding maintenance. Proper maintenance of the streetscaping elements will be key to the long-term success of Downtown and the new vision. If City Operations Staff are unable to maintain certain elements, they will become worn, and quickly lose their luster.

There must be plans put in place for replacement of various elements. It is recommended that the City purchase an additional quantity of each element of the street design, which can be kept in stock for quick replacement. The more customized a design feature is, the greater the likelihood that it may be difficult to source replacement parts in the future. Therefore, it is best to have a sufficient number of replacement features and parts on hand. Determining in advance how City Operational Services Staff will resurface the roadway or sidewalk when underground works are required will assist in the overall ease with which maintenance is approached.

9.6 Estimated Capital Costs

The preliminary capital cost estimates for the concept plan are contained in the table below. The estimated cost at this stage is \$29,000,000 for Phase 1 and \$32,000,000 for Phase 2, which includes allowance for contingencies, design fees and applicable taxes. These project costs will be updated during the detailed design phase.



| Description | Phase 1 Cost | Phase 2 Cost |
|------------------------------------|---------------------|---------------------|
| Site Preparation and Removals | \$5,800,000 | \$3,200,000 |
| Road Works | \$2,800,000 | \$5,200,000 |
| Storm Sewer | \$3,000,000 | \$6,000,000 |
| Sanitary Sewer | \$2,000,000 | \$2,600,000 |
| Streetlighting and Traffic Signals | \$2,000,000 | \$2,000,000 |
| Utility Relocations | \$1,500,000 | \$1,500,000 |
| Excess Soils Management | \$1,500,000 | \$1,500,000 |
| Miscellaneous Items | \$5,400,000 | \$5,000,000 |
| Contingency | \$5,000,000 | \$5,000,000 |
| Total | \$29,000,000 | \$32,000,000 |



10.0 Public Consultation

10.1 Public Consultation as Part of Class EA

Public consultation early on and throughout the Class EA process was a key feature of this Study. Consultation is a two-way process between the proponent (City) and the affected or interested stakeholders that provides opportunities to exchange information and provide input into the process.

It is important to identify the various stakeholders for a Class EA. For this Study, they included:

Municipal Council: It was important to keep City Council aware of the Study status.

The Public: This included individual members of the public who may be affected by the project, including property owners, residents, and special interest groups (i.e., accessibility groups, etc.)

Stakeholders Group: The Stakeholders Group represented the Downtown Brantford BIA members as well as people who wished to be part of the Group. As part of the Notice of Study Commencement, stakeholders were invited to join the Stakeholders Group. Those wishing to be part of the Stakeholders Group were documented and advised of any stakeholder meetings held by the Project Team. Minutes from each stakeholder meeting can be found in Appendix L.

Review Agencies: Government Agencies that represent the policy positions of their respective departments, ministries or authorities.

Indigenous Nations: Six Nations of the Grand River and Mississaugas of the Credit First Nation were contacted regarding the Study, notified of milestones, and invited to provide comments.

City Staff: Multiple departments were engaged in the process, including Operational Services, Engineering Services, Parking Services, Transit Services, Traffic Services, and the senior leadership team.

10.2 Notice of Study Commencement

A Notice of Study Commencement was mailed out on July 16, 2020, to all property owners and residents identified as being adjacent or in the Study Area, as well as agencies, stakeholders and BIA members. In addition, the Notice of Study Commencement was also advertised in the Brantford Expositor on July 16, 2020. Details regarding the Notice Letter and Notice of Study Commencement can be found in Appendix M.

A total of 32 responses were received as part of the Notice of Study Commencement. A copy of these responses and how they are addressed can be found in Appendix M.



10.3 Workshops

Several workshops were held between August 18 to August 27, 2020, with City staff from various departments as well as other stakeholders within the Downtown core to generate ideas and gather input on various issues and desired outcomes for Downtown Brantford and this Study. Appendix N contains copies of meeting notes from these workshops, and the presentation to the group that introduced the project and the various issues involved.

Due to the COVID-19 pandemic, workshop sessions were divided into groups of maximum eight individuals, with two presenters in each room. Workshop participants were provided with streetscape puzzle pieces to create two right-of-way cross-sections.

The result of these brainstorming sessions can be found in Appendix N, including the various cross-sections that were developed by each group. In general, the stakeholders favoured:

- **Sidewalks:** Increased sidewalk width wider for greater walkability, as well as additional space for business owners and patios.
- **Cycle Lanes:** Nearly every group indicated that having cycle lanes in the Downtown core was important.
- **One-Way Versus Two-Way Traffic:** Stakeholders were generally divided on maintaining one-way traffic and converting to two-way traffic.
- **Parking:** The importance of maintaining on-street parking was expressed.

Each participant was also asked to complete a questionnaire individually, asking them to identify their top three priorities for Downtown and their reasoning. Each of the responses, as well as a summary report, is included in Appendix N.

10.4 Public Information Centre #1

Notice of PIC #1 was mailed out in November 2020 to all property owners, residents, BIA members and others who indicated interest in the Study. A copy of the Notice and the cover letter is included in Appendix H. All information relation to the Notice and Public Information Centre was also posted on www.brantford.ca/NewDowntown.

Due to the COVID-19 pandemic, the City hosted PIC #1 virtually. The virtual PIC included a video providing information about the Class EA, findings from the stakeholder workshops, potential cross-sections for feedback, and evaluation criteria.

On November 30, 2020, the PIC boards were posted on the project website with a walkthrough video. A period of two-weeks was allotted for questions and comments. The first question and comment period ended December 14, 2020. A Question and Answer Town Hall video was posted on the project website on December 21, 2020, followed by a second question and comment period for a duration of four weeks, ending January 15, 2021. A consolidated list of questions and answers was posted on the project website on January 25, 2021.

A total of 20 comments and questions were received.



PIC #1 presented the Problem / Opportunity Statement, outlined the various studies and background documents undertaken or were ongoing at the time, and illustrated the Alternative Solutions being considered. Examples of how the streetscaping could alter the image of Downtown were presented along with examples of other Downtown urban areas that have been transformed through similar streetscaping efforts. The evaluation criteria for the Alternative Solutions were presented, along with addressing the constraints of the project.

Emails were sent to 134 stakeholders, while mail outs were sent to 2,067 residents and 17 stakeholders. The virtual presentation was viewed 176 times.

All the materials presented in PIC #1 can be found in Appendix H.

10.5 Public Information Centre #2

Notice of PIC #1 was mailed out in April 2021 to all property owners, residents, BIA members and others who indicated interest in the Study. All information relation to the Notice and Public Information Centre was also posted on www.brantford.ca/NewDowntown.

Due to the COVID-19 pandemic, the City hosted PIC #2 virtually. The virtual PIC included a video providing information about the Class EA, findings from the stakeholder workshops, potential cross-sections for feedback, and evaluation criteria.

On May 5, 2021, the PIC boards were posted on the project website. A live presentation of the PIC material was conducted on May 12, 2021, and two weeks was allowed for the first question and comment period, which ended May 25, 2021. A consolidated list of questions and answers was posted on the project website on June 2, 2021.

A total of 29 comments and questions were received

The purpose of PIC #2 was to present the Preferred Alternative as it related to one-way versus two-way traffic. The Transportation Study indicating one-way as the ideal alternative and the parking strategy were the two main components of the PIC.

Emails were sent to 134 stakeholders, while mail outs were sent to 2,040 residents and 17 stakeholders. The virtual presentation was viewed 293 times.

The key takeaway from PIC #2 was that the preference was for one-way traffic, and that all the Alternatives presented going forward would be one-way only.

All the materials presented in PIC #2 can be found in Appendix I.

10.6 Public Information Centre #3

PIC #3 was held on April 7, 2022. At the time of the PIC, the COVID-19 protocols had been relaxed, and an in-person PIC was held at Brantford City Hall in the City Council chambers. At PIC #3, the Project Team presented the Preferred Alternative cross-section, as well as the concept plan for Downtown. The construction planning and staging was also presented, demonstrating that construction would take place over a



five-year period of the phases west of Clarence Street, and over a five- to 10-year planning horizon for the remainder of the corridor.

Emails were sent to 134 stakeholders, while mail outs were sent to 2,014 residents and 17 stakeholders. The process for PIC #3 was as follows:

April 4, 2022: PIC #3 slides posted on the project website

April 28, 2022: Question and answer document posted on the project website

A total of 25 comments and questions were received.

The key takeaway from PIC #3 was that through stakeholder engagement, the importance of parking on both sides of the street was made clear, and thus parking on both sides of the street was part of the Preferred Alternative.

All the materials presented in PIC #3 can be found in Appendix J.

10.7 Public & Stakeholder Communication

A record of the public and stakeholder communication received throughout the Class EA process is included in Appendix R.

10.8 Indigenous Correspondence

One of the stakeholders for this Class EA were the Indigenous partners involved in the Brantford community. The Project Team contacted the Indigenous groups directly and were met with them as a key stakeholder to provide feedback ahead of each point of contact with the public. The meeting minutes were recorded and can be found in Appendix L. A brief summary of some of their questions and responses can be found below.

Six Nations of the Grand River (SNGR) Meeting – November 5, 2020

| Question | Response |
|--|--|
| Is an Archaeological Assessment being completed? | As part of the EA, an Archaeological and Cultural Heritage Study is being completed. Both are being completed by ARA. A Natural Environment Study has also already been completed in draft form. |
| Is homelessness being addressed in this Study? | Homelessness is beyond the scope of this Study. We are considering the impact of the improvements to the homeless population, but we will not be discussing the issue of homelessness directly. |
| Will the Class EA consider an Indigenous presence in the Downtown? | Through the Class EA, the City is open to ideas of ways that Indigenous culture can be incorporated into the streetscape. A turtle garden was suggested as an example. GSP will work with City and Indigenous groups to incorporate culture into the streetscape elements. |
| Is there any specific landscape consideration for plants? | The City is definitely open to utilizing local green houses and species for streetscaping provided they meet certain criteria with respect to tolerance, canopy, etc. |



| Question | Response |
|---|---|
| Would the City consider a welcome belt? | The City is open to suggestions from the Indigenous community. The suggestion was made for a welcome belt to be incorporated into sidewalk panels, or for other sidewalk stamping, gardens etc. |
| Statement from Six Nations of the Grand River | The Six Nations of the Grand would like to reiterate that they feel it is important that an Indigenous presence is felt in the Downtown |

Six Nations of the Grand River Meeting – March 22, 2022

| Question | Response |
|---|--|
| Can the Cultural Heritage Report be reviewed? | SNGR would like to review the report when it is completed. They would like to see that the lands are being considered, and not just the buildings and businesses. Once it is made public, it will be circulated for review. City needs to review first |
| Was a Stage 2 Archaeological Investigation recommended in the report? | Yes |
| Where do promises that were not kept get brought up? Can they be brought up internally? | Yes, anything that should be discussed, can be presented to the City for discussion. |
| Statement from Six Nations of the Grand River | SNGR would like to have participation in the Stage 2 Archaeological Investigation |

10.8 Council Approval

On June 28, 2022, a recommendation was put forth to Council that they approve recommended alternative identified through the Class EA process. The report dated June 28, 2022, re: recommendation Report and Budget Amendment – Downtown Brantford Streetscaping can be found in Appendix O. The report was accepted by Council and by extension the Preferred Alternative approved.

10.9 Notice of Study Completion

The Notice of Study Completion was published on March 30, 2023. The Environmental Study Report was also available for digital download on the City’s website. The Notice of Study Completion can be found in Appendix P.



11.0 Impacts and Mitigation Measures

11.1 Key Impacts and Mitigation

The following table is a summary of the key impacts and mitigation measures that must be considered as part of the detailed design phase and throughout construction.

| Engineering and/or Environmental Feature | Potential Benefits and Cumulative Impact | Avoidance and Mitigation |
|--|---|--|
| Pedestrian Safety | <p>While the sidewalk will remain approximately the same width as it is currently, there will be a furnishing zone that will contribute to the walkable area adjacent to the pedestrian clear zone. There will also be the buffer of the cycle lane, and the parking lane between pedestrians and active lanes of traffic.</p> <p>Bump outs at each intersection and each crossing will shorten pedestrian crossing distances</p> | <p>Materials that delineate pedestrian and furnishing zones will be determined in detailed design. Zones will be seamless to reduce any risk of tripping hazards. Low profile rollover curb will also reduce tripping risk.</p> <p>Detailed design will need to verify location of pedestrian crossings.</p> |
| Accessibility - AODA Requirements | <p>Streetscape design will meet all AODA standards. New traffic signals will be included with accessible signalization. Surfaces will be more walkable and more durable so that accessibility does not degrade over time.</p> | <p>All signals, tactile plates, and bollards will be finalized during the detailed design phase and must meet AODA standards at time of design.</p> |
| Utility Relocations | <p>Utility upgrades are expected throughout the corridor, specifically in the Downtown core.</p> | <p>Utility providers have been engaged in the preliminary design and have begun capital planning. They will need to be re-engaged in the detailed design phase and play a more active role in planning improvements and relocations.</p> |
| City Underground Infrastructure | <p>Watermain, storm sewer, and sanitary sewer will all be replaced. They are preliminarily sized to accommodate the expected growth within the catchment areas. Individual services will be replaced to property line.</p> | <p>The City is undergoing modelling to confirm size of watermain required to service growth. Sanitary and storm sewer sizing will be confirmed during the detailed design phase.</p> |



| Engineering and/or Environmental Feature | Potential Benefits and Cumulative Impact | Avoidance and Mitigation |
|---|---|--|
| Excess Soils | Excess soil regulations may change by the time the detailed design phase is complete. Presence of contaminated or unsuitable fill could result in significant increase in construction costs. Presence of groundwater in the corridor may require dewatering. | Geotechnical investigation and assessment of potential environment concerns is complete. Geotechnical information is available to the design team during the detailed design phase. |
| Groundwater | Geotechnical report indicated the presence of groundwater within the Study Area. Installation of deep infrastructure may encounter groundwater. | Detailed dewatering plans will need to be prepared to identify the limits and extent of groundwater. |
| Construction Staging and Traffic Management | Construction will be broken into multiple phases, spread out over several years. Construction will be staged so that pedestrian access to businesses will remain open. Given nature of deep infrastructure, keeping lanes open to traffic may not be possible. Rerouting traffic or temporarily altering the functionality of Colborne Street or Dalhousie Street may be considered. Construction will be limited to small pieces at a time to minimize overall impact to Downtown. | Construction fencing and other physical barriers should be used to protect pedestrians during construction. Staging of construction will be an important element of the detailed design, ensuring access while also minimizing impact to traffic. |
| Impacts on Transit Operations | During construction, transit routes will need to be diverted. | Transit routes should be able to follow traffic flow determined through construction staging and traffic management. |
| On-Street Parking | The preliminary design and concept plan indicate that a cross-section can be implemented while maintaining on-street parking. | The location of on-street parking will need to be determined during the detailed design phase. Bump outs for pedestrian crossing, underground garbage bins, and streetscaping features will factor in to where parking will be maintained. |



| Engineering and/or Environmental Feature | Potential Benefits and Cumulative Impact | Avoidance and Mitigation |
|--|---|--|
| Access Impacts on Businesses | Pedestrian access will be maintained during construction wherever possible. Traffic will be detoured to adjacent streets through signed detour. | Detailed traffic management plans will be developed during the detailed design phase. |
| Cultural Heritage Resources | Potential for construction to have negative impact on heritage resources. | Development of preferred designs should avoid impacts to identified cultural heritage resources. |
| Archaeological Assessment | The Study Area has been subject to deep soil disturbance and is unlikely to retain archaeological potential. | A Stage II Archaeological Investigation is recommended as part of the detailed design phase. |
| Natural Environment | <p>Introduction of soil cells will allow for introduction of trees and will support healthy canopy growth. Trees will support the presence of wildlife in the Downtown area.</p> <p>Oil Grit Separators (OGS) and Low Impact Development strategies will be implemented to reduce the impact of stormwater runoff on receiving waterbodies.</p> | <p>The number of soil cells that can be implemented in conjunction with the design of underground infrastructure will need to be determined during the detailed design phase.</p> <p>Sizing and location of Low Impact Development features and OGSs will also be determined in the detailed design phase.</p> |

11.2 Climate Change

A key focus of this Study has been the impact of climate change and consideration of how the Alternative Solutions and Design Concepts are influenced by – and can influence – climate change. The City has recently adopted the Community Climate Change Action Plan 2022 (CCAP), which identifies ways for emission reduction within the community. In 2019, the City of Brantford along with cities from around the world, declared a Climate Emergency, setting a target of net-zero emissions by 2050. The City’s objective is to lower its emissions, while also increasing its means of absorbing the emissions that still exist, creating a net-zero environment.

The City’s approach to addressing climate change is two-fold: reduce the amount of emissions and enhance its ability to absorb and offset emissions. As part of reducing emissions, the City will be implementing ways to increase transit ridership, increase active transportation and promote electric vehicles. With regards to offsetting emissions, the objective of the City according to the CCAP is to increase tree canopy.



Through the Class EA, Design Concepts have been developed to support the City's plans for addressing climate change. Improvements to the streetscape and making Downtown more walkable will hopefully encourage people to come Downtown, park and walk around rather than driving from place to place. Ideally, people will choose to make their way Downtown by walking or cycling. The Preferred Alternative includes dedicated cycle lanes, which will provide a safe environment for cyclists to make their way Downtown, as well as improved pedestrian facilities. Improvements are being made to the locations and infrastructure at transit stops, making them safer and more user-friendly, encouraging increased ridership. The Parking Study provides recommendations for how and where to implement electric vehicle charging stations within the Downtown core to support the growing usage of electric vehicles.

Simultaneously, this Study provides recommendations for how the City can introduce some tree planting into the confined Downtown corridor. Soil cells can be installed below grade to allow tree roots to extend beyond confined concrete boxes, allowing the trees to grow larger with fuller canopies. These have been implemented with success in other similar Downtown areas and are intended to be implemented strategically and wherever possible in Downtown Brantford.

Soil cells have the added benefit of creating a space in the hardscape of a Downtown for infiltration and storage of rainwater runoff during storm events. These structures, along with OGS units, will be used to store and treat runoff, reducing the loading on receiving water bodies.

Air Quality

Industry best practice will be employed during construction and construction documents will use the City's Environmental Sustainability Strategy as a baseline to ensure they are minimized. Some examples of this are:

- Ensuring all motorized equipment is in good condition, properly and regularly maintained, and compliant with applicable federal and provincial regulations.
- Ensuring all equipment is well maintained and operated in accordance with the manufacturer's specification.
- Locating stationary equipment as far away from sensitive receptors as practical.
- Adhering to the Region's idling policy and minimizing idling time.
- Implementing a Dust Management Plan for the full duration of construction activities – with the use of non-chloride dust suppressants.



12.0 Operations Considerations

Throughout this Study, it has been recognized that the physical transformation of Downtown Brantford is a key element to the success of this project. With this in mind, the operation of the space must be separate and unique from the operation of the rest of the City. A robust event programming and management strategy is as important as the operation and maintenance of the streetscaping elements, which will make up the Downtown core. The standard Class EA process is focused on documenting the process leading to the selection of the Preferred Design Concept. This project differs in that it must consider how Downtown will operate once the physical elements of the project are complete. Further coordination and feedback from the public, City Operations Staff, and business owners is required to ensure that Downtown has a distinct operations plan.

It is recommended that Downtown Brantford be managed as a “place” and not as a typical City street. There is a great number of specifics with regards to operations that must yet be determined, but these specifics should be compiled and reviewed as part of a separate study following the completion of this Study. There are various departments within the City that will be responsible for the maintenance and development of the Downtown area, and these departments should work together to develop a single plan for continuity going forward. Regardless of management structures, the following items should be considered as part of the future operations plan:

- The higher-than-normal standard of maintenance and care that must be applied in the Downtown core.
 - As elements are disturbed, they cannot be replaced by standard City practices, and must be replaced using a higher standard.
- The additional snow clearing effort that will be required for the separated cycle lanes and layby parking areas. A separate snow clearing and removal program will need to be implemented for Downtown.
- Yearly operations budget that addresses operations and maintenance, as well as programming and efforts required for opening and closing the street for various events.
- A review of City services, including waste management, to determine the level of service desired. Some services like garbage and recycling collection may require modifications from what takes place currently.
- Development of an “Activation Plan,” collecting input from key stakeholders, specifically the public and operations groups, that defines how the space will be activated, including:
 - Goals and objectives for the Downtown space.
 - Logistics for how the space will be used for various types of events. (i.e., plans for how patios, festivals, etc. will be implemented).
 - When and where events are likely to occur, and what amenities are required to facilitate each type of event.
- The success of this project will not just be measured upon completion of construction, but in the years to come as the space becomes fully activated; when Downtown becomes a draw for people to visit and stay, as opposed to a place that people pass through. This will require a steady flow of activities and events



throughout the year, which also requires amenities to support the activities. There will be a great deal of coordination needed among various groups, and it is recommended that this coordination occur prior to the completion of the detailed design phase to increase the chances of Downtown being used to its full potential following construction.



13.0 Permits, Approvals and Next Steps

13.1 Approvals

During the detailed design phase of the project, there will be a number of submissions that will need to be made regarding various elements of the project:

| Feature | Approval Details | Timing |
|---|---|-----------------------------|
| Storm Sewers | Storm sewer design, including OGS units and any Low Impact Development features will require Environmental Compliance Approval (ECA) submission to the MECP. | 90% Detailed Design |
| Sanitary Sewers | Sanitary sewer design will require ECA submission to the MECP. | 90% Detailed Design |
| Watermain | Watermain design will require a Form 1 submission to the MECP. | 100% Detailed Design |
| Grand River Conservation Authority (GRCA) | The Study Area lies just outside the GRCA's regulation limit, floodplain, and floodplain special policy area. Given the proximity to the regulation limit and floodplain, the GRCA should be circulated on all design submissions, and treated as a key stakeholder in the detailed design phase. | 60% and 90% Detailed Design |

13.2 Future Phases

A 30-day public and agency review period will follow the submission of this report. At the conclusion of this period, the detailed design phase of the project may continue. The design of streetscaping elements must be coordinated with the detailed design that is ongoing for the replacement of the watermain and sanitary sewer, conducted by the City. Design elements highlighted in this report will be incorporated and combined with outside design elements to into the detailed design.

The drawings and documents must incorporate all the environmental and mitigation measures identified in this report to avoid and mitigate adverse impacts. These mitigation measures will be expanded upon where necessary during detailed design. The City should maintain ongoing coordination with stakeholders, the public, utilities and emergency services throughout the design and construction phases.

13.3 Construction Staging

As the project transitions from the Class EA phase to the detailed design phase, there will be much more focus on the construction staging and timing of construction. Currently, it is anticipated that the detailed design phase will take place in 2023 and 2024, with an expected construction start of 2025. During the detailed design phase, the Project Team and the City will need to determine the areas of greatest need, as well as the most appropriate approach to staging the multi-year construction project. To complete the proposed infrastructure improvements as well as streetscaping that is proposed for the Study Area, numerous years of construction are expected.



It is expected that the City will focus on the Downtown core first (Colborne Street and Dalhousie Street from Brant Avenue to Clarence Street, including all the connecting streets). Figure 54 below provides a preliminary breakdown of potential construction staging based on location of existing infrastructure, and location of storm and sanitary outlets. At PIC# 3, this was presented as Phase 1 of construction, which will consist of five construction stages. Each of these stages could be constructed in one construction season with a typical sized construction crew. Multiple crews could be assigned to speed up the process, but these details will need to be confirmed through the detailed design phase, and very clearly stated at the time of tender.

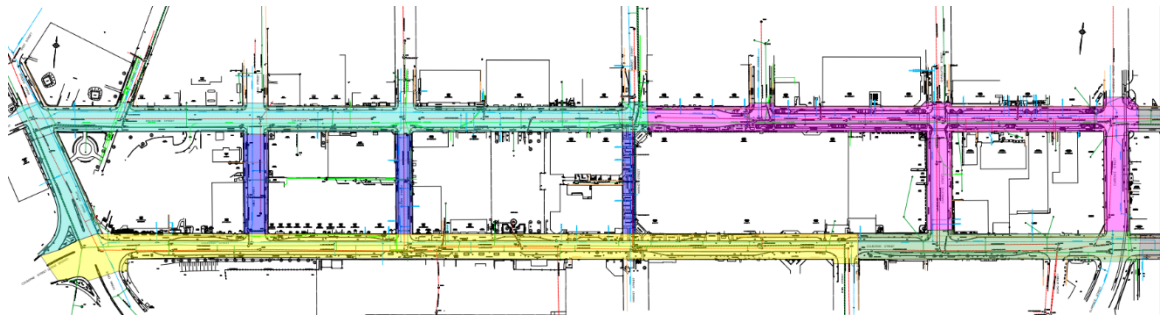


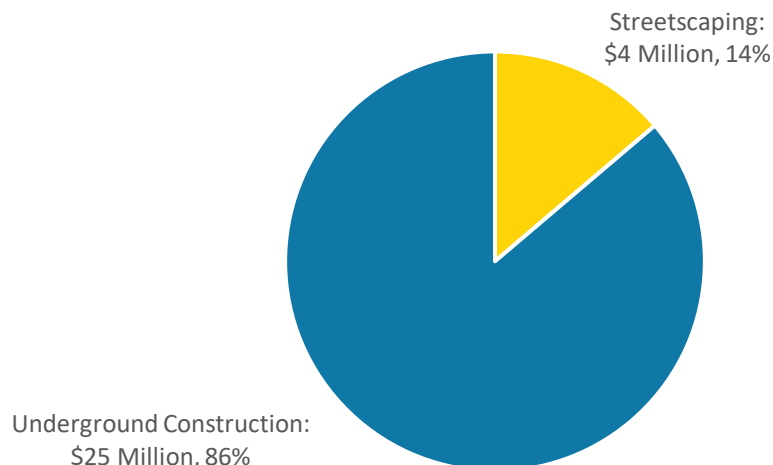
Figure 55 Phase 1 of Construction (Years 1-5)

The preliminary construction cost estimate for budget purposes for Phase 1 is \$29 million. This cost estimate is prepared based on construction costs in spring of 2022. This estimate will require revisions once the detailed design elements are introduced and will need to take into consideration the current material and construction costs.

The majority of the construction costs for Phase 1 are comprised of the underground infrastructure work. Approximately 86% of the total cost of construction will be associated with non-streetscaping elements.

Construction Cost Breakdown

■ Streetscaping ■ Underground Construction





The remainder of the Study Area is considered Phase 2 of the reconstruction. The boundaries and limits of each stage may change as the detailed design is completed. Staging will be determined by the final stormwater and sanitary outlets, and traffic management expectations amongst other factors. Phase 2 will likely take place over a four-to-five-year period, similar to Phase 1.

Each stage of construction could be combined to speed up the overall construction period or spread out over longer periods to accommodate need and funding. Currently, Phase 2 of construction is outside the planning horizon for the Downtown construction, so budgetary cost estimates will need to be put into place during the detailed design phase. Many of the streetscaping elements will not be applied to Phase 2 of the Study Area, which will reduce some of the costs associated with the streetscaping elements.

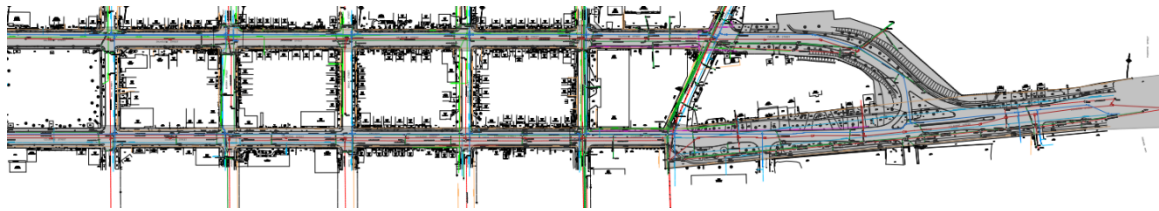


Figure 56 Phase 2 of Construction (Years 5-10)

During the detailed design phase, a complete constructability review will be completed. Erosion and sediment control elements will be included in the design. The design should look to minimize disruption to Downtown business, and where unavoidable, make provisions to maintain access to businesses. Dust control will be a main factor during construction, and through design, ways to minimize that dust impacts building frontages should be considered. The application of non-chloride dust suppressants is preferred during construction.

13.4 Noise and Vibration

Noise will also be a factor during construction. As previously stated, it is likely that the active work zones will be completely shut down to through traffic, which will reduce the overall construction duration in each phase. Construction activities will be limited to between 7 a.m. to 7 p.m., Monday to Friday, to minimize disturbance to residents and allow businesses to continue to operate without active construction on weekends. Continued discussion with City staff, stakeholders, and the BIA will be important to determine the optimal timing windows for construction.

Included in the construction contracts will be vibration monitoring. It will be expected that the Contractor have active vibration monitoring occurring in all active construction zones. Given the proximity of the buildings and the depth of the existing infrastructure, it is expected that settlement and vibration monitoring be conducted during construction.

13.5 Preliminary (30%) Design

In addition to this Environmental Study Report, the consultant will prepare a preliminary (30%) design. MTE will prepare a preliminary design that includes preliminary design of



the stormwater drainage, sanitary sewer sizing, watermain sizing, including alignments for all infrastructure. The preliminary design will also consider the relocation of various utility providers. Prior to completing the preliminary design, MTE will collaborate with utility providers to ensure that adequate space is being maintained for their planned infrastructure relocations or improvements. Adequate space will be maintained for features such as Molok garbage collection systems which require dedicated underground space.

Prior to completing the preliminary design, City staff will have an opportunity to review and provide comments. Coordination with all relevant departments will be crucial to developing a preliminary design that meets all the City's needs. The decisions that are made during the preliminary design phase will influence and direct the detailed design phase. The Preliminary Design Report and Environmental Study Report, including drawings, are intended to be complete in the first quarter of 2023.

13.6 Transitioning to the Detailed Design Phase

Once the preliminary design is complete, City staff will begin preparing the terms of reference for selecting a consulting firm to assist with the detailed design phase. The preliminary design package will be used as a base for future design, and designs will rely on the data and assumptions made at this time. The detailed design phase is expected to be out to consultant selection in early 2023, with detailed design taking place in 2023 and 2024.

14.0 Summary and Recommendations

As part of the Class EA process, a number of Alternative Designs for the Downtown Brantford's streetscape were evaluated. A small number of Alternatives were selected to be modified and further evaluated. Following a Schedule C Class EA process, a Preferred Alternative was selected. The Preferred Alternative is a one-way traffic alternative with a two vehicular lane cross-section, dedicated cycle lane on one side, with parking on both sides of Colborne Street and Dalhousie Streets in the form of parking laybys. This cross-section meets the overall vision of the project, as the features will make Downtown more walkable and suitable for all forms of transportation. Key features include:

Natural Environment: The Downtown consists of an already disturbed area, has few trees within the Study Area, with no Species at Risk found within the Study Area. The addition of street trees, soil cells, and Low Impact Development features will overall improve the natural environment in the Downtown core.

One-Way Traffic: Maintaining one-way traffic is preferable as it is more effective at conveying the projected traffic flows Downtown. Two-way traffic with one lane in each direction would be greatly affected by garbage collection as well as loading and emergency services.

Parking: There is no shortage of parking within Downtown. The Preferred Alternative does not lead to a reduction in on-street parking and will require confirmation during the detailed design phase.



Construction: Construction of the Downtown core (Brant Avenue to Clarence Street) will occur over approximately a five-year period, with the remainder of the corridor being built in years five to 10. The detailed design phase will take place in 2023 and 2024, with expected construction start in 2025.

Cost: Estimated construction costs are between \$29 million and \$32 million, assuming the construction takes place in 2022. This is subject to change given the rising costs of construction. A more precise estimate of total costs for reconstruction will be available following the detailed design phase.