Niagara 🗐 🎢 Region

PW 24-2021 Appendix 1



20M-00847-00 | May 19th, 2021 Niagara Region Complete Streets Design Manual (CSDM) Background Review Discussion Paper

Table of Contents

1.0	Intro	oduction	3
2.0	Rev	view of Policies	5
2.1	ι	Inderstanding Policy	5
2	.1.1	Policy Best Practices	7
2.2	F	Policy Review & Results	8
2	.2.1	Policy Review Approach	8
2	.2.2	Existing Policies	9
2	.2.3	Other Policy Supports & Documentation1	2
2.3	F	Policy Review: Key Outcomes1	4
3.0	Rev	view of Guidelines & Standards1	7
3.1	ι	Inderstanding Standards & Guidelines1	7
3.2	Ģ	Guideline & Standards Review1	8
3	.2.1	Guideline & Standard Review Approach1	8
3	.2.2	Design1	9
3	.2.3	Implementation & Process	26
3	.2.4	Maintenance & Monitoring2	28
4.0	Exis	sting Conditions	0
4.1	Ir	nventory of Conditions	61
4.2	C	Observations	2
4.3	E	xisting Complete Streets Typologies4	.5
4	.3.1	Existing Typologies4	-5
4	.3.2	Examples of Application4	.7
5.0	Орр	portunities & Constraints5	i1
Poli	icies .		i1
Des	sign G	Guidelines & Standards5	52
6.0	Key	7 Takeaways & Next Steps5	6
6.1	ĸ	ey Outcomes5	6
6.2	F	uture Considerations5	6
6.3	Ν	lext Steps5	57

1.0 Introduction

In June 2020, Niagara Region retained WSP to assist in developing a Complete Streets Design Manual (CSDM). The purpose of this exercise is to move forward with one of the key recommendations outlined in the Region's Transportation Master Plan and to provide Regional staff with a transformative document that will assist practitioners in all aspects of Complete Streets projects, including planning, design, implementation, and maintenance. The concept of Complete Streets has been adopted by municipalities across Canada and the United States. Niagara Region has recognized the potential for achieving Complete Streets on its Regional Roadway Network for nearly a decade and is taking steps to support the delivery of Complete Streets projects to improve its communities. While definitions vary by jurisdiction, Complete Streets are typically defined as roadways that are designed to reflect the needs of surrounding land-use and provide appropriate facilities for all road users.

Complete Streets support operation and interaction between multiple transportation modes (walking, cycling, transit, driving, goods movement), as well as supporting local heritage and urban design objectives. The design of Complete Streets and public spaces, particularly those with accessible and comfortable active transportation, can encourage community members to make more trips using active or "Soft Mobility" modes or e-mobility devices (e-scooters), improving public health. Active transportation – any form of human-powered transportation such as walking, cycling, or using a wheelchair – and transit are also key components of equitable transportation networks. Furthermore, Complete Streets may act as locations for communities to meet, interact, live, and play. As many municipalities across North America shift away from the car-centric environment toward the implementation of accessible active transportation and transit-oriented road networks, Complete Streets stand as an approach to balance the mobility needs of all road users, all ages, abilities, and support the delivery of multi-modal network objectives.

The *Complete Streets for Niagara* project was initiated by Niagara Region in 2012. The project began in response to discussions about Complete Streets during a 2011 Active Transportation Summit with an attendee list that included local and regional transportation practitioners, elected officials, community stakeholders, and members of the public. Since 2012, the Region has researched best practices and integrated Complete Streets into policy and several high-level planning documents, including the Regional Official Plan and Transportation Master Plan.

At the provincial level, there are a number of design guidelines and standards that have recently been updated to reflect a more Complete Streets approach and / or provide guidance on the design and implementation of Complete Streets elements including but not limited to transit, goods movement, walking, cycling, crossings. More recently, throughout Niagara Region, there have been examples of Complete Streets projects recently implemented as a result of this policy and design shift. The understanding that a complete street is not only achieved between the curbs (both at surface and underground) but beyond to the abutting public realm and pedestrian space has led to a multi-modal, equitable, and inviting style of planning and design for residents and visitors of all ages and abilities.

This document is the first of five Complete Streets Design Manual project deliverables which represents the culmination of technical tasks completed for Phase 2 of the project. This Background Review Discussion Paper has been developed as a tool which will contribute to the development of the Niagara CSDM. It summarizes the applicable regional policies and design guidelines that will influence and affect the recommendations and content of the manual itself, discusses the Region's progress-to-date regarding the design and implementation of Complete Streets, identifies the opportunities and constraints associated with the future design of Complete Streets, and outlines the role of the upcoming CSDM in transforming Niagara's transportation landscape.

Phase 2 of the Complete Streets Design Manual work plan includes the review and assessment of existing policies, guidelines, and Complete Streets conditions. The tasks included in Phase 2 of the proposal that have led to the development of the discussion paper include the following:

- Task 2.1 Review Current Standards & Policies. A review and summary of existing policies, designs standards or guidelines, and plans published by the Region of Niagara, the Ontario Ministry of Transportation, and the Transportation Association of Canada.
- Task 2.2 Complete Field Investigations & Desktop Assessment. An assessment of implemented Regional Road design in Niagara Region using field and desktop investigations.
- Task 2.3 Prepare Existing Conditions Database. A catalogue of design features and Complete Streets elements of Regional Roads based on data collected in Task 2.2.
- Task 2.4 Prepare Opportunities and Constraints Analysis. An analysis of potential treatments, materials, and fixtures for each of the Region's existing Complete Streets Typologies. The analysis will consider pedestrian, cycling, and transit amenities as well as streetscaping and curbside management strategies.

The purpose of the background review was 'to better understand the current opportunities and challenges with Complete Streets implementation' in Niagara Region. The outcomes of this phase are critical to establishing a foundational knowledge of existing processes, policy, and design that impact the implementation of Complete Streets in Niagara Region. The content of this document forms the Background Review Discussion Paper, which is a culmination of the project team's research and analysis. The discussion paper includes the following sections:

- Section 2.0 Review of Policies. A review and summary of Complete Streets policies in the Region and a discussion of how the frame and impact the development of the CSDM.
- Section 3.0 Review of Guidelines and Standards. An analysis of existing guidelines and standards at the provincial and national levels that pertain to elements of Complete Streets.
- Section 4.0 Summary of Field Investigation & Existing Conditions. An overview and analysis
 of existing infrastructure based on field investigations and desktop review.
- Section 5.0 Opportunities & Constraints. An identification of potential impacts to future project phase based on the materials reviewed during the background review.
- Section 6.0 Next Steps. An identification of takeaways and considerations for Phase 3.

2.0 Review of Policies

An effective Complete Streets program requires policies that provides Regional staff and practitioners the tools and support necessary to implement Complete Streets. While manuals and guidelines can outline processes, designs, and best practices for implementing Complete Streets, policies are what dictate when and how these guidelines are applied. Complete Streets policies may be incorporated into high-level planning documents to help reinforce the importance of advancing the Complete Streets program in support of other planning objectives. When developing a CSDM, it is important to understand how it must comply with existing policy and identify gaps that must be filled by the CSDM itself or new policy. Section 2.0 provides an overview of the applicable policies that currently influence the planning, design and implementation of Complete Streets and more importantly how the CSDM will form part of the Region's policy structure and hierarchy.

2.1 Understanding Policy

Policy is an essential component of an effective Complete Streets program. Policy is a planning tool which provides statutory and regulatory direction on where and how community elements are guided and implemented. Policies serve as mechanisms to enact planning direction approved by governing bodies that are to be implemented by municipal staff. All municipalities are required to plan, adopt, and uphold policies ranging from topic-specific standards and guidelines to higher-order long-term visions and master plans.

In the Province of Ontario, upper- and lower-tier municipalities may share overlapping boundaries but serve unique functions with different policy structures based on jurisdiction. The Region of Niagara is an upper-tier governing body that supports twelve lower-tier municipalities. Its policies and guidelines apply to assets and functions that fall under the Region's jurisdiction or purview of responsibility and, occasionally, its lower-tier municipalities. Roadways are an excellent example of how jurisdiction has a significant influence on the way in which municipal services and assets are designed and implemented. Within the current road classification or structure, there are provincial, regional and local municipal roadways. While they intersect and connect, the decisions that are being made about those roads are being done at all three levels of government and at times through different policy, which can cause some issues of consistency and continuity – which will be discussed later in this paper.

A policy structure refers to the hierarchy of policies that are in place or adopted by a government agency that provides the necessary guidance to pursue land-use and infrastructure planning and implementation. In addition, not all policies are equal. There can be a hierarchy in application of policy, and one may supersede the other. Depending on where a policy "falls" within the hierarchy directly affects the type of influence and impact it has. An overview of the Ontario based policy hierarchy is provided in Table 1.

This is provided with the purpose of demonstrating the rationale for, placement and influence of a set of design guidelines such as the Complete Streets Design Manual that is being created for Niagara Region.

Provincial Statutes	Provincial legislative documents that must be enacted and upheld without deviation or interpretation.	
Provincial Policies	Provincial statutory documents that outline implementable processes and actions that may be interpreted differently depending on context.	
Regional & Local Official Plans	A long-range policy document that shapes the physical, economic, and social development of the Niagara Region or its Local Area Municipalities (LAMs). They outline how the Region and LAMs will manage growth and development over the next several decades. Official Plans are statutory documents required under the Ontario Planning Act, and must conform to applicable Provincial Policy.	
Regional Functional Plans	Topic specific long-term plans of action for key municipal servicing issues, such as the Niagara Region Transportation Master Plan. Regional Functional Plans have no statutory impact on a community unless there is further policy provided in the Official Plan.	
District Plans	Region-led development strategies that outline the land-use vision for specific areas within a municipality, especially those that currently are, or have the potential to become, iconic in nature. They are typically implemented through the subsequent creation of a Secondary Plan for the project area. Examples include the Brock District Plan and Glendale Niagara District Plan.	
Secondary Plans	Site specific documents that provide detailed policies for land use permissions within a specific area of a municipality, as well as guidance on the use of public spaces, parks, and urban design. Secondary plans are typically implemented through amendments to local Official Plans.	
Land-use Controls	The means by which the Official Plan policies are implemented, monitored and enforced with a requirement to be consistent with both Local and Regional Official Plans e.g. zoning by-law, traffic impact studies, access management policies and guidelines	

Table 1. A typical policy hierarchy for Regional municipalities and the role of a CSDM

A design manual is not considered a policy document. Design guidelines or manuals are associated with the development of Secondary Plans. A design manual serves as a policy implementation tool through a set of guidelines and standards related to the planning, design, implementation and maintenance of Complete Streets. A design manual is a direct result of existing policies that are in place; therefore, it is imperative that other planning documents and policies refer to or support the CSDM to necessitate its use in future roadway construction and reconstruction projects.

Within the Niagara context, Complete Streets and related policies have been gradually integrated into Niagara Region's planning documents over the past ten years starting in 2012 with the commencement of the Complete Streets for Niagara project. Since 2012, the Region has developed dedicated policy to aid in achieving key Complete Streets objectives.

The Regional Official Plan (2014) provides policy and the Transportation Master Plan (2017) provides policy direction and design guidance to define Complete Streets in the Niagara context and identify key Regional documents that should be developed to implement them. Both of these high-level planning documents indicate that Regional Complete Streets Design Guidelines (or Manual) need to be developed to support the design and implementation of Complete Streets. As noted above, while the guidelines will serve as a tool, they themselves are not policy. The guidelines remain flexible in this way, permitting practitioners to implement best practices in Complete Streets design, implementation, and maintenance but deviating where special constraints present themselves.

2.1.1 Policy Best Practices

While a CSDM provides guidance on the design, implementation, and maintenance of Complete Streets, policy outlines the process and tools required for Regional staff to implement Complete Streets design on Regional Roads. Furthermore, policy may identify the process and timeframe in which Complete Streets will be implemented. High-level government documents, such as Official Plans and Transportation Master Plans, should include Complete Streets policy to support their implementation and reinforce their importance within the regional transportation planning paradigm.

Within each of these policies, there can be variations on where and how a topic such as Complete Streets is addressed. Not all policy references have the same intent and outcomes and a critical look at the relationship between the intent and the outcomes should always be assessed. To help guide meaningful Complete Streets policy, reference should be made to the National Complete Streets Coalition (NCSC) 10 policy components:

- 1 **Vision & Intent.** A clear vision on how the community wants to complete its streets, specifying at least four modes that include walking and cycling.
- 2 **Diverse Users.** Benefits and equitably supports transportation by road users of all abilities and modes, particularly vulnerable road users.
- 3 **Commitment in All Projects and Phases.** Applicable to the design, implementation, and maintenance of new construction and reconstruction/retrofit projects.

7

Niagara Complete Streets Design Manual | Background Review Discussion Paper

- 4 **Clear, Accountable Expectations.** Holds decision-makers accountable to applying Complete Streets guidance and requires both public notice and a clear approval process before exceptions are made on Complete Streets projects.
- 5 **Jurisdiction.** Requires coordination and collaboration between governmental departments and partner agencies on Complete Streets projects.
- 6 **Design.** Directs the applications of current best practices in design guidelines and establishes a timeframe for implementation.
- 7 Land-use & Context Sensitive Approach. Considers the existing and planned community context surrounding any Complete Street.
- 8 **Performance Measures.** Establishes measurable performance metrics that are specific, equitable, and available to the public.
- 9 **Project Selection Criteria.** Establishes project selection criteria that encourage funding for implementing and maintaining Complete Streets design.
- 10 Implementation Steps. Identifies next steps to implementing Complete Streets policy and design.

2.2 Policy Review & Results

A review of existing Regional Complete Streets policy is an important step in understanding how the Region envisions Complete Streets and how the CSDM will be used to bring that vision into reality. The following section describes the project team's approach to and results from reviewing existing Regional Road design policies, as well as those identified as action items within the Regional Official Plan and Transportation Master Plan.

2.2.1 Policy Review Approach

To complete the policy review, the project team performed a key terms search in the Regional Official Plan and Transportation Master Plan (TMP) for Complete Streets. Additional existing policies listed in the TMP's Operating Policy Discussion Paper were also included in this search. Policies were then reviewed based on their relevance to the CSDM, noting potential implications to the design, implementation, and maintenance of Complete Streets on Regional Roads.





Niagara Complete Streets Design Manual | Background Review Discussion Paper

Some questions that need to be answered by policy include the following:

- Which roadways within the Region do Complete Streets policy address?
- What type of projects are eligible for Complete Streets design?
- Who will own and maintain Complete Streets?
- Who will pay for the cost to design, implement, and maintain Complete Streets projects?
- How will Regional Complete Streets be designed to connect with local roads?
- What groups must be consulted prior to implementing a Complete Streets project?
- What type of roadway modifications are permitted when implementing Complete Streets design into road rehabilitation or reconstruction projects?
- Who within the Region staff structure has the necessary knowledge and capacity to ensure that a Complete Streets approach is implemented at EAs and through Detailed Design?

2.2.2 Existing Policies

The Region has identified Complete Streets in multiple Regional policies. These policies identify many of the NCSC components of a model Complete Streets policy and even go so far as to identify the appropriate applications of a CSDM within capital works projects in Niagara. Complete Streets policies are described within the Regional Official Plan and Transportation Master Plan, making them readily available to the general public. Furthermore, embedding Complete Streets policies into these high-level Regional documents directs the Region to applying a Complete Streets approach to Regional Road design moving forward. The following table describes Regional Complete Streets policies and their relevance to the development and implementation of the CSDM.

Policy/Action	Description	Relevance to CSDM			
Official Plan (2014	Official Plan (2014)				
Policy 9.E.1	Niagara Region's Complete Streets Design Guidelines shall be used in the design, refurbishment, or reconstruction of the Niagara Region's transportation system to ensure the needs and safety of all road users are considered and appropriately accommodated.	Defines Regional capital works project types where the CSDM is applicable.			
Policy 9.E.2	Niagara Region shall ensure that the Niagara Region's Complete Streets Design Guidelines are included as a reference document within the Request for Proposal (RFP) process for Municipal Class Environmental Assessments.	Requires Regional staff to identify the CSDM as a reference in future RFPs.			

Table 2. Overview of Existing Policy and Relevance.

Policy/Action	Description	Relevance to CSDM
Policy 9.E.3	LAMs shall include policies within Official Plans that ensure that a Complete Streets approach is used in the design, refurbishment, or reconstruction of their planned or existing street network.	Requires LAMs to include Complete Streets design and implementation policies in updates to local Official Plans.
Policy 9.E.4	In the absence of local Complete Streets Guidelines, local municipalities shall refer to the Niagara Region's Complete Streets Design Guidelines for the design, refurbishment or reconstruction of their existing and planned local street network.	Requires LAMs to create local Complete Streets Guidelines or apply the Region's CSDM.
Policy 9.E.5	Complete Streets elements within local jurisdiction shall be maintained by the LAM.	Identifies the maintenance of a Complete Streets infrastructure owned by a LAM as the responsibility of the LAM, not the Region.
Policy 9.E.5	The Niagara Region will have regard to it's Model Urban Design Guidelines, Complete Streets Design Guidelines, and Wayfinding Signage for Cyclists Guidelines when providing comments on development applications located along Regional Roads.	Requires Regional staff to review the CSDM and other complimentary documents as part of the development application review process.

Niagara Region Transportation Master Plan (2017)

1

4

Niagara Complete Streets Design Manual | Background Review Discussion Paper

Policy/Action	Description	Relevance to CSDM
Action Plan 1	Adopt and implement the Niagara Region Complete Streets Policy document which provides decision-making tools to reflect an integrated consideration of land use and transportation issues.	Recommends the inclusion of decision-making tools for Complete Streets implementation as part of Regional Policy. This should b consistent with the implementation process and guidance included in the CSDM.
Action Plan 2	Implement Complete Streets Design Guidelines and standards as part of road rehabilitation and reconstruction projects.	Recommends the development of a CSDM as a short-term transportation priority.
Additional Region	al Policy	
PW3.P01.1	<u>Acquiring Property & Easement (2002):</u> outlines the process to acquire property and easements for the Region.	May be necessary when roadway reconstruction requires property acquisition o easement due wider planned ROWs.
PW5.R01.3	Road Cross Section (2005): Describes requirements for Regional Road cross- section elements between the curbs and in the boulevard, such as provisions for active transportation and drainage features. [this policy is described in greater detail in Section 3 of this discussion paper]	Identifies key elements of Regional Roads and minimum cross-sectional dimensions. Designs included in the CSDM must comply with this policy or be identified as exceptions. If necessary, the Region may choose to amend the policy to match the CSDM.
PW3.C01	Request from LAMs for Joint Funding to Advance Construction of Future Regional Sewage and Water Supply Projects (1993): Outlines a procedure for joint funding between the Region and LAMs or landowners to advance Regional sewer and water supply construction projects.	May be used as an example for cost-sharing options to suppor the implementation of Complete Streets design projects.

Policy/Action	Description	Relevance to CSDM
PW3.C05	Incorporating Local Works into Regional Niagara Contracts (1998): Outlines a process for considering requests by LAMs to incorporate local capital works improvements into Regional contracts.	May be used as an example for cost-sharing options to support the implementation of Complete Streets design projects.
PW5.T01.1	<u>Tree Planting Along Regional Roads (1993):</u> Acknowledges that removal of decaying trees along Regional ROWs is the responsibility of the Region and that removed tree trunks may be repurposed into sculptures. The policy identifies the conditions that decaying trees must meet to be repurposed into sculptures.	Identifies the Region as the caretaker of trees along Regional Roads.

2.2.3 Other Policy Supports & Documentation

Since 2012, the Region has published several documents as part of the Complete Streets design project that have assisted in framing how Complete Streets can benefit its communities and identifying the necessary steps that must be completed before Complete Streets may be implemented. These documents have included discussion papers and a section in the recent Regional TMP. They are not policies and the Region is not required to enact their recommendations, apart from the TMP. Regardless of their applicability to the Region's transportation planning policy structure, the documents have been reviewed to understand how the Region envisions Complete Streets as a key component of its future transportation network. Discussions presented and debated in these documents provide some direction in developing the final CSDM.

Regional Document	Description		
Complete Streets for Niagara Discussion Paper (2012)	 Defines how Complete Streets may function in Niagara Region once implemented. Raises questions about the feasibility of implementing and maintaining Complete Streets in Niagara Region. Identifies the potential benefits of Complete Streets to the various communities in Niagara Region based on best practices from other jurisdictions. 		

 Table 3. Complete Streets documents in Regional documents and plans.

	Description
Complete Streets for Niagara Model Policy Handbook (2012)	 Discusses Complete Streets in the Niagara context a how barriers to Complete Streets implementation an success may be addressed through new Regional ar Local policies. Describes Complete Streets policy examples from of jurisdictions. Proposes model policies that could be implemented the Region and its LAMs to support Complete Street Development.
Niagara Region Transportation Master Plan (2017)	 Establishes a vision for the next 25 years of transportation policy development and capital works projects for Niagara Region. Helps inform the development of transportation polic in the Regional Official Plan – including Complete Streets policy recommendations. Identifies the integration of transportation infrastruct with surrounding land-use, enhancement of multi-mode and improving the efficiency of goods movements as some goals. Presents six new Complete Streets typologies for Regional Roads. Describes a Complete Streets Approach that balanc the needs of all road users and is context sensitive, considering both the transportation needs and

Regional Document	Description			
	 Describes the six new Complete Streets typologies for Regional Roads that are presented in the TMP: Main Street 			
	2 Urban General (Narrow)			
Niagara Region TMP	3 Urban General (Wide)			
Streets Design Guidelines	4 Transitioning			
(2017)	5 Hamlet			
	6 Rural			
	 Provides high-level overview of the different component of Complete Streets, such as sidewalks, cycle tracks, and other elements in the roadway or boulevard. 			
Niagara Region TMP Technical Paper: Operating Policies Review (2017)	 Identifies existing transportation operating policies and their relevance to Complete Streets in Niagara Region. Describes a new policy titled Moving Towards Complete Streets that informs the decision-making process for future Regional Road investment projects at any scale - applicable to all Regional Roads and Local Downtown of BIA Main Street. 			
Vision Zero Road Safety Program (2019)	 Road design improvements that include geometric modifications to the road and integration of safety improvements have been identified as a desired action of the Vision Zero Road Safety program. Recommends that Regional Staff proactively address high-risk mid-block crossing safety. Additional actions include an education and engagemen plan and increased enforcement measures. 			

2.3 Policy Review: Key Outcomes

Niagara Region's policies, high-level transportation planning documents, and discussion papers describe how Complete Streets should be introduced into Niagara Region's transportation landscape but do not provide clear design guidance. The Region's policies and documents identify the need for a clear design, implementation, and maintenance process for Complete Streets. As noted in the TMP,

Complete Streets guidance must be flexible yet clear to support the implementation of the Region's vision for Complete Streets in it's large Regional Roadway Network. Rationale for the CSDM project is embedded throughout the documents and policies reviewed, however, it is important to understand how the CSDM will complement and support the Region's existing policy and guidelines.

Below are answers to the Complete Streets policy questions asked at the beginning of Section 2.2. The answers clearly outline how and when the CSDM will be applied in Niagara Region.

- Which roadways within the Region do Complete Streets policy address?

All Regional Roads are designated as arterial roads. The Region's Complete Streets policy and future CSDM apply to all Regional Roads and Local Downtown Main Streets. Based on the Complete Streets typologies outlined in the TMP discussion paper, all Regional Roads could be and should be considered a complete street. It is about the design elements and application based on the conditions and context that need to be addressed.

– What type of projects are eligible for Complete Streets design?

The Region will consider the Complete Streets typologies and elements during the planning and design of any planned capital projects for the Regional Roadway Network. The Region may wish to explore stand-alone Complete Streets projects on a case-by-case basis as pilot projects if deemed appropriate.

– Who will own and maintain Complete Streets?

The Region is responsible for maintaining all travelled portions of the road between the curb while the LAMs own and maintain all boulevard elements, including sidewalks. LAMs and/or business improvement areas must enter a Maintenance Agreement prior to the installation of plantings, enhanced or expanded sidewalks, street furniture, hydro outlets, and lighting improvements to ensure that they understand and accept the responsibility to maintain these features. Demonstration cross-sections in the Niagara CSDM will consider the optimal location of utilities to assist the Region in standardizing the location of these features in the future.

– Who will pay for the cost to design and implement Complete Streets projects?

The Region will pay for the initial capital costs to design and implement all elements of a Complete Streets project on its Regional Roadway Network, including roadway and boulevard elements. The Region may consider cost-sharing strategies for the burying of utilities on a case-by-case basis.

– What groups must be consulted prior to implementing a Complete Streets

project?

All Complete Streets projects should commence with a planning workshop that includes the LAM, BIAs, utility agencies, and other relevant community stakeholders in attendance. The workshop should include discussion regarding the potential Complete Streets typology or typologies appropriate for the roadway and Complete Streets elements that could be considered in the design.

- What type of roadway modifications are permitted when implementing

Complete Streets design into road rehabilitation or reconstruction projects?

Physical changes to roadways that include a vertical traffic calming measures are not permitted as part of Complete Streets projects. Vertical traffic calming measures may include speed humps, bumps, or raised crosswalks. These elements impact the Region's existing maintenance practices. Traffic calming measures that are permitted in Complete Streets projects include those without vertical elements such as narrowing of lane width within prescribed limits without changing the physical curb-to-curb width of the road. Narrowing lanes must consider impacts to emergency services, solid waste collection, and goods movement or transit vehicles where applicable. The design of the Complete Streets must also conform to the accepted roadway design standards described by Regional Policy *PW5.R01.3 Road Cross Section*. Beyond traffic calming, reconstruction and rehabilitation projects may include roadway modifications such as the removal of channelized right turns, the introduction of dedicated or separated cycling facilities, and sidewalk widening to name a few.

As important as it is to understand the Region's current Complete Streets policies and how the CSDM fits within the policy hierarchy, it is also important to identify a direction for creating the CSDM. While this document is not policy, it will serve as the design directive for Complete Streets on the Regional Roadway Network and will serve as a valuable tool for Regional staff and practitioners. In this regard, the CSDM is an important publication that must strive to answer key questions that practitioners may face as they design, implement, and maintain these future roadways. Guidance must be provided to address the questions of Regional staff and practitioners that are not answered in existing policies. Topics that are not covered by existing Complete Streets policy that must be addressed in the CSDM include the following:

- The appropriate Complete Streets design elements for each Complete Streets typology
- The appropriate process to follow during the planning, design, and implementation phases of a Complete Streets project
- The recommended (yet flexible) dimensions, widths, products, including the description and lifetime of furniture, and maintenance for the different Complete Streets typology
- The best practices that may be applied to maintain the elements of a Complete Streets using Niagara Region's existing and planned maintenance equipment
- The metrics for monitoring the success of a Complete Streets project

3.0 Review of Guidelines & Standards

Niagara Region is responsible for implementing and maintaining roadway designs that meet its Regional policy and design standards, as well as provincial and national roadway guidance. As such, the final CSDM must consider existing guidelines and standards at the regional, provincial, and national levels. Niagara Region has already developed some guidance related to Complete Streets design in its TMP and the associated Complete Streets background report, however, the Region's project team has indicated that this guidance will need to be refined for the final CSDM. Section 3.0 of this report reviews existing guidance on Complete Streets designs at the provincial and national levels and analyzes how this guidance may be used to support the development of the CSDM.

3.1 Understanding Standards & Guidelines

Municipalities in Ontario benefit from a plethora of design guidelines and standards when it comes to roadway planning, design, implementation, and management. The Transportation Association of Canada (TAC), the Ontario Traffic Council (OTC), and the Ontario Ministry of Transportation (MTO) have published standards and guidelines (or manuals) to assist municipalities and roadway practitioners on all phases of roadway projects. Many municipalities have their own road and other infrastructure design guidelines and standards, including the Region of Niagara.

Their documents are reviewed periodically, compared with research, and tested in the field to ensure that their guidance is appropriate for a range of contexts in Ontario. In more recent publications, the topic of Complete Streets is addressed directly. It is important to understand, however, that standards and guidelines vary in how they are used and can be described in the following manner:

- Standards are documents with clear directions and requirements that must be upheld by all governments and agencies under the purview of that governing body. In other words, Ontario roadway standards must be upheld by all municipalities within the province.
- Guidelines are documents that outline industry best practices but are not prescriptive. The guidance included in these documents may be considered flexible and open to interpretation depending on context.

It is possible that some of the provincially accepted design guidelines and standards may already provide sufficient guidance to address design questions and concerns. It is the intent of this review to better understand the role of the various guidelines, the content that it provides and how it can be addressed, applied or utilized in the Niagara context.

3.2 Guideline & Standards Review

Seven design guidelines (or manuals) and standards from the Province of Ontario and the Transportation Association of Canada (TAC) were reviewed as part of the background review. The documents were selected based on their applicability to the key elements of Complete Streets, such as transit and active transportation. The guidance in these documents should be reflected in the final CSDM as Niagara Region may be required to uphold them in future Regional Road design and management, particularly standards. It is important to note that all of the documents reviewed were published or updated within the last five years, which suggests that they reflect industry best practices in the Province of Ontario.

3.2.1 Guideline & Standard Review Approach

The documents reviewed as part of the guidelines and standards review are robust; they provide guidance for a range of roadway contexts, land-use types, and municipal capital budgets. Summarizing all of the available guidance included would create redundancy and provide limited value to the context of Niagara's Regional Roads. To effectively review these documents, the project team refined their review to focus on topics and issues related specifically to implementing Complete Streets in the context of Niagara. This was accomplished by establishing key questions to ask when reviewing each document. The questions reflect and were grouped into three key components (or topic areas) of all Complete Streets projects:

Applicable Provincial and National Guidelines and Standards

- OTM Book 12A: Bicycle Traffic Signals
- OTM Book 15: Pedestrian Crossing Facilities
- OTM Book 18: Cycling Facilities
- MTO Freight-Supportive Guidelines
- MTO Transit-Supportive Guidelines
- Ontario Regulation 239/02: Minimum Maintenance Standards for Municipal Highways
- TAC Geometric Design Guide for Canadian Roads

- 1 Design
- 2 Implementation and Process

3 Maintenance and Monitoring

The following section describes the questions asked when reviewing each document as well as corresponding **answers**. The project team has documented these answers into tables, the corresponding document section for each answers, and the applicability of each document to the questions. These tables have been submitted as separate excel files and serve as useful tools that may be referenced again in future phases of the project. A write-up discussing the best answers to each question has been documented in the following pages.

3.2.2 Design

What is the appropriate cycling facility for typical arterial and / or collector roadways in urban and rural contexts?

Selecting an appropriate cycling facility requires consideration of the surrounding land-use, motor vehicle operating speeds, and traffic volume. Cycling facilities cannot be assigned to roadways using functional road classifications alone. OTM Book 18 offers a three-step facility selection process for cycling facility on any given roadway that includes: pre-selecting facility type options, evaluating options by reviewing contextual attributes of the corridor, and documenting the rationale for selecting a preferred option. Therefore, cycling facilities cannot be assigned with absolute certainty to any given road classification and the three-step facility selection process should be applied at the preliminary design phase for every Complete Streets project. Generally, however, arterial roadways with speeds greater than 50 km/h typically include designated or physically separated cycling facilities in urban areas (i.e. bike lanes, buffered bike lanes, separated bike lanes, cycle tracks, or in-boulevard multi-use paths). In rural area, arterial roadways with speeds greater than 50 km/h typically include paved shoulders or in-boulevard multi-use paths. Increasing levels of spatial or physical separation between motor vehicles and people cycling are generally dependent on the number of through lanes, traffic volume, operating speed, and adjacent land-use. The MTO Freight-Supportive Guidelines recommends that cycling traffic be separated by buffer or physical separation from general traffic on roadways identified for goods movement.

What multi-use or single-use crossing treatments should be applied in multi-modal corridors and what process should be applied to decide which is appropriate in different contexts?



Figure 1. Shared crossride pavement markings and a green surface treatment at a multi-use path crossing in Richmond Hill (OTM Book 18, 2020).

Crossride pavement markings are recommended for multi-use crossings intended for people walking, cycling, and using other active mode, as noted in OTM Book 18. Typical boulevard or midblock facilities that would warrant these treatments include multi-use paths and trails. Crossrides should be applied at intersections where people walking and cycling share boulevard queuing space and have the right-of-way when crossing. OTM Book 12a notes that bicycle traffic signals should be provided at any signalized roadway crossings for designated or separated cycling facilities, including multi-use crossings. At these locations, pedestrian traffic signals and bicycle traffic signals should both be installed. Bicycle traffic signals are not required at unsignalized intersections or at roadway crossings where people cycling must travel in mixed traffic.

OTM Book 15 provides a warrant process for implementing pedestrian crossing treatments based on motor vehicle traffic speeds and volumes, motorist-pedestrian sightlines, crossing distance, and proximity to other parallel crossings. The warrant process includes selecting appropriate signalized or unsignalized treatments that include signage and pavement marking elements, such as ladder crossings treatments and rapid rectangular flashing beacons (RRFBs). Signalized pedestrian crossing treatments are generally recommended where motor vehicle speeds and volumes are high or where visibility is low, such as turn channels or hills.

What methods exist to design and implement designated cycling facilities on narrow roadways?

There is limited national and provincial guidance that pertains specifically to narrow roadways. OTM Book 18 notes some strategies that may be applied to add certain cycling facilities between the curb of existing roadways. One strategy includes roadway space reallocation and road diets whereby the number of general through lanes are reduced and a two-way left turn lane is placed in the centre of the roadway. This strategy ensures that through traffic and turning movements are accommodated while opening existing ROW space to accommodate designated or physically separated cycling facilities. Traffic modeling may be necessary to assess potential impacts to traffic operation and flow. Another strategy includes the implementation of Advisory Bike Lanes whereby two-way motor vehicle traffic is accommodated in a single through lane and motorists temporarily enter bikes lanes when passing other motor vehicles. The Three-Step Facility Selection process should be used to understand the suitability of this facility type on any given roadway. The MTO Freight-Supportive Guidelines generally recommend that active transportation facilities be placed on parallel roadways when a narrow roadway is identified for goods movement and active transportation facilities cannot be physically separated.

How should roadways be selected and designed for goods movement from a Complete Streets lens?

Consideration for lane widths and turning radii at intersections should be made for roadways designated as goods movement corridors. Generally, the MTO Freight-Supportive Guidelines recommend that cycling traffic be spatially or physically separated from general traffic on goods movement corridors. Additional design recommendations include the provision of dedicated curbside loading spaces on corridors where deliveries cannot be accommodated on the adjacent property or in parallel roadways/alleyways. Loading spaces are typically the length of two on-street parking spaces. Where daytime on-street parking demand is high, parking spaces may be bylawed for off-peak loading and delivery to accommodate both curbside activities.

The MTO Freight Supportive Guidelines recognize that larger transport trucks require greater roadway distance to accelerate or decelerate and large corner raddii for turning movements – something worth noting on high-volume corridors where through movement of goods is prioritized over curbside loading. At intersections on through truck routes, signal phasing should be adjusted to accommodate slower-than-normal acceleration and deceleration (e.g. extended amber phase). The turning radius of curves and intersection corners should consider the off-tracking and swept path of longer vehicles.

How is accessibility integrated and highlighted in the context of different facility types?

Accessibility may be incorporated into Complete Streets design in multiple ways. General requirements for accessibility are documented in the Built Environment Standards of the Accessibility for Ontarian with Disabilities Act (AODA). Accessible design should seek to provide ease-of-access for all road users and alert pedestrians with visual impairments to potential roadway hazards and wayfinding queues. Some key accessible design elements that should be considered when designing Complete Streets include:

 Tactile Walking Surface Indicators (TWSIs) should be implemented at all pedestrian crossing locations. (OTM Book 15)



Figure 2. Tactical Walking Surface Indicators (TWSIs) at a pedestrian crossing in Ottawa (OTM Book 18, 2020).

- Curb cuts should be provided at all pedestrian and multi-use crossing locations (OTM Book 15)
- Audible Pedestrian Signals (APS) and pushbuttons should be installed when replacing or constructing new pedestrian crossing devices at signalized intersections, as required by the Ontario Accessibility Standards for the Built Environment Standard (OTM Book 15)
- Visually-contrasting and cane-detectable unit pavers should be installed between cycling facilities and pedestrian facilities that are level. (OTM Book 18)
- Yield to Pedestrian' signage and pavement markings should be installed on cycle tracks and bike lanes in advance of conflict areas between people walking and cycling, such as transit stops. (OTM Book 18)



Figure 3. Ontario Standard Bicycle Symbol Traffic Signal (OTM Book 12A, 2018).

- Pedestrian refuge islands should be considered at signalized intersections crossings on wide roadways where pedestrians may need two signal phases to cross the full length of the road. They may also be appropriate at unsignalized intersection or midblock crossings where pedestrians must wait for gaps in traffic to cross multiple lanes of vehicular traffic. (OTM Book 15)
- Bicycle traffic signals that are not timed with general traffic signals should be actuated automatically using sensors embedded in pavement or traffic signal poles. Manual signal actuation, such as pushbuttons, may also be implemented so long as they are placed in proximity to the cycling facility without requiring a cyclist to dismount. (OTM Book 12a)

How are transit stops addressed in the context of designing and implementing different Complete Streets treatments?

In general, the MTO Transit-Supportive Guidelines recommend that all transit stops provide queuing space that is accessible year-round for users of all ages and abilities. Transit amenities such as transit shelters and benches should be provided to improve users comfort and reduce perceived wait times. Short- and long-term bike parking facilities, such as bike racks or lockers, should be provided in proximity to transit stops to encourage first- and last-mile transportation using active modes. The length and width of transit boarding islands should accommodate the turning requirements of mobility devices and deployable bus ramps. OTM Book 18 describes four (4) transit stop designs that support designated or physically separated cycling facilities located at the curb. They include the following:

- 1 **Transit Boarding Island Stop.** The cycling facility temporarily travels between the bus stop and the sidewalk.
- 2 **Shared Cycle Track Transit Stop.** Transit users cross the cycle track to reach the transit vehicle while people cycling yield to pedestrians.
- 3 Lay-by Transit Stop. Transit vehicles cross the cycling facility to board/alight passengers from a dedicated transit lay-by.

Niagara Complete Streets Design Manual | Background Review Discussion Paper

4 **Curbside Transit Stop.** Transit vehicles temporarily pull into and block the cycling facility to board/alight passengers at the curb.

On constrained corridors identified for both transit and goods movement, the MTO Freight-Supportive Guidelines recommend transit stops be located on the far side of intersections to limit impacts to travel times and right-turning movements. In many cases, the ROW widths may cause challenges in implementing the transit stops indicated.

At all transit stops, regardless of the presence of cycling facilities in the roadway or boulevard, designers should strive to provide 1.8m sidewalks (2.4m in high traffic area) on both sides of the roadway. Sidewalks should be provided within 400m of local transit stops or 800m of express transit stops (BRT). Ideally, a furniture zone should be placed between the sidewalk and the curb for transit stop queuing and amenities. Trees, pedestrian-scale lighting, and other pedestrian amenities should be considered in these locations to improve comfort and safety near stops. In rural areas where sidewalks may not be feasible, consideration should be made toward paving shoulders that connecting stops to nearby land-use.

Bus stop designs should be inviting as they are a visible image of the local transit system. Consideration should be made toward the design of transit amenities (ex. branding) at stops, such as benches, bike racks, and shelters for high-volume stops. All stops, regardless of ridership, should be designed for universal access and meet the requirements of the AODA's Built Environment Standards.



Figure 4. Transit Boarding Island Stop (OTM Book 18, 2020).



Figure 5. Shared Cycle Track Transit Stop (OTM Book 18, 2020).



Figure 6. Lay-by Transit Stop (OTM Book 18, 2020).



Figure 7. Curbside Transit Stop (OTM Book 18, 2020).

What guidance is provided regarding the provision of on-street parking?

The MTO Transit-Supportive Guidelines note that low-cost parking on or adjacent to commercial corridors, or mixed-use corridors, incentivizes motor vehicle trips by visitors and residents alike. The visibility of low-cost parking adjacent to pedestrian facilities has even demonstrated a reduction in transit ridership in some corridors. Municipalities are encouraged to remove parking minimums for new developments and explore strategies to encourage parking turnover on commercial corridors. Strategies to encourage parking turnover and incentivize the use of other modes, particularly transit, include the following:

- Implement or increase the rates of paid on-street parking zones on commercial main streets and mixed-use environments.
- Implement green infrastructure (e.g. trees, bioswales, solar panels) around surface parking lots adjacent to pedestrian facilities.
- Reduce the width of on-street parking spaces toward acceptable minimum acceptable dimensions and delineate parking spaces with pavement markings.
- Establish 'Shared Parking' zones where loading, delivery, and parking are permitted in same space but restricted depending on peak demand.

On-street parking has a direct effect on cycling infrastructure because they are both (typically) located at the curb. OTM Book 18 notes that where on-street parking and cycling facilities are located on the same side of the roadway, a spatial or physical buffer (typically 1.0m, minimum 0.6 m) should be placed between the two facilities to protect from dooring. Separated cycling facilities are typically designed at the curb while parking is located floating between the general through lane and the cycling facility. Using this design, on-street parking can provide added physical protection for people cycling. It is important to remember that parking should be restricted, however, on the approach to intersections to maintain unobstructed sightlines between people cycling and turning motorists.



Figure 8. One-way cycle track with on-street parking (OTM Book 18, 2020).

3.2.3 Implementation & Process

What phase(s) of the Class EA process need to be complete before designing or constructing a Complete Street?

In general, Complete Streets projects may not require an environmental assessment for active transportation and pedestrian improvement projects. Active transportation projects that involve repurposing existing road right-of-way space and do not require significant reconstruction are considered pre-approved under the 2015 amendments to the Municipal Class Environmental Assessment (MCEA). There will likely be a number of Complete Streets projects where the existing cross-section width and the level of service of that roadway would not be impacted by the proposed improvements. In this case, the work completed as part of the TMP i.e. Phases 1 and 2 of the MCEA process would be deemed sufficient and the Region would be able to move forward with detailed design and tender. That said, there are some Complete Streets projects where the improvements recommended may result in either a dollar value and/or more complex roadway modifications that require a Schedule B or C environmental assessment. In this case, a more detailed class environmental assessment would need to be undertaken to complete Phases 3 through 5 of the MCEA requirements. Similar to other capital projects, the schedule of the project would need to be determined based on preliminary recommendations which will be derived from the application of the Complete Streets typology to the existing Regional Roadway Network.

What features or materials may be used to provide physical separation for cycling facilities while achieving urban design and streetscaping objectives?

Physical separation may be achieved in a number of ways. OTM Book 18 notes that there are three types of cycling facilities that provide physical separation between people cycling and general traffic: separated bike lanes, cycle tracks, and in-boulevard multi-use paths. The former describes a buffered bike lane in the roadway with a form of physical separation in the buffer zone. For the latter two, the cycling facility is located above the curb in the boulevard or at an intermediate elevation between the roadway and the sidewalk. Physical separation for separated bike lanes may be achieved using a combination of separation products depending on the context of the corridor. The TAC Geometric Design Guidelines for Canadian Roads identifies several examples of separation that may be installed on the roadway to create physical separation:



Figure 10. Bollards and planters separating a bike lane in Toronto (OTM Book 18, 2020).



Figure 10. Painted concrete barrier in Toronto (OTM Book 18, 2020).

- Raised Medians. Poured concrete and vegetated separation that may be between 0.3 and 2.0 m wide.
- On-street Parking. Floating parking lanes placed between the cycling facility and general through lane. OTM Book 18 recommended placing a physical barrier, such as bollards or pre-cast concrete curbs, between the parking lane and the cycling facility to reduce encroachment and dooring.
- Flexible Bollards. Flexible poles placed 2 to 5 m apart in row to help delineate the buffer zone.
 May be mounted to pre-cast concrete barriers to improve degree of separation and encroachment deterrence.
- Planter Boxes. Pre-fabricated planter barriers of varying size and material that may be deployed seasonally. May support local streetscaping depending on planted vegetation and can be combined with other forms of separation.
- Concrete Barriers. Jersey barriers or low pre-cast concrete curbs that are appropriate on corridors where increased levels of separation are desired.

How should Complete Streets projects be coordinated with other capital projects to reduce implementation cost?

OTM Book 18 and the MTO Transit-Supportive Guidelines recommend that the implementation of active transportation and transit projects be coordinated with planned capitals works – particularly major reconstruction projects where permanent separation is easier to install. Coordination between projects is a long-term cost-effective strategy for implementing multi-modal designs. OTM Book 18 notes, however, that where precedence or public pressure warrants the implementation of cycling facilities in advance of scheduled capital works, municipalities may choose to implement low-cost roadway reallocation designs for the interim that may be upgraded in the future.

What mechanisms are in place to inform decision-making when an existing facility/design treatment is no longer appropriate for the given context?

There is limited guidance within the documents reviewed pertaining to decision-making for replacing existing design treatments that do not meet new design standards. It has been WSP's experience that new design standards and guidelines are typically applied when roadway infrastructure improvements are budgeted and scheduled.

3.2.4 Maintenance & Monitoring

What is the recommended winter maintenance practice for active transportation facilities in the roadway?

The Ontario Minimum Maintenance Standards for Municipal Highways (MMS) are non-prescriptive maintenance practices for roadways across Ontario. They were amended in 2018 to include pedestrian and cycling infrastructure. While it is recommended that municipalities maintain active transportation facilities throughout winter, municipalities have the discretion to decide through their policy whether some or all cycling routes are maintained or not during winter months. It should be noted that MMS recommendations for cycling facilities do not apply to in-boulevard multi-use paths, which are shared with pedestrians. For multi-use facilities, the winter maintenance standards and practices for sidewalks apply. The following summarizes recommendations from the MMS for winter maintenance on active transportation facilities in public ROWs.

When maintaining cycling facilities between curbs, municipalities are to strive toward achieving bare pavement conditions, noting that people cycling may be able to functionally cycle in up to 2.5 cm of snow. The appropriate time to deploy snow clearing equipment for cycling infrastructure is context specific. The MMS specifies level of service standards and snow clearing deployment timelines for snowfall events based on the posted speed limit and average daily traffic volume of motor vehicles. Ice removal standards for roadways apply to cycling infrastructure located within the curb. Municipalities have the discretion to declare significant weather events, when their ability to winter maintain cycling is impractical due to conditions and may monitor weather until it is deemed reasonable to begin winter maintenance practices.

When designing cycling infrastructure, OTM Book 18 recommends creating sufficient buffer between the roadway and cycling facilities to store snow. Consideration should also be made to designing cycling facilities to accommodate for existing or future maintenance vehicles and methods. Where feasible, it is recommended that priority (high-volume) cycling routes be maintained year-round. Efforts should be made to keep bicycle loop detectors and pushbuttons clear of snow to ensure that pedestrian and bicycle traffic signals are not actuated by accident, as noted by OTM Book 12a. Some examples of snow removal techniques listed in OTM Book 18 that may be applied to cycling facilities include:

- **Pro-active anti-icing** applied to facilities 24 hours in advance of a storm event.
- **Salt** applied to facilities where snowfall is light to moderate.
- **Sand** applied to facilities if the temperature is -12 C or lower.
- Sweeping machinery applied where snow accumulation is 2 cm or less.

Who is responsible for undertaking maintenance of facilities between the curb?

As stated in the MMS, it is the responsibility for municipalities to maintain all roadways under their jurisdictions. Therefore, the winter maintenance of transportation assets is the responsibility of the owner unless otherwise stated in a regional or local bylaw. The Region of Niagara is responsible for maintaining roadway elements between the curb on roadways owned by the Region.

What is the recommended winter maintenance practice for active transportation facilities in the boulevard?

As stated in the MMS, in-boulevard cycling facilities should be monitored and maintained in the winter to the same standard as cycling facilities located in the roadway between the curb. When maintaining inboulevard multi-use paths or sidewalk, municipalities should preserve a minimum sidewalk width of 1.0 m with a snow depth of 8.0 cm within 48 hours of snow accumulation ending. During significant weather events, municipalities may apply the same discretion to monitoring and clearing multi-use/pedestrian facilities as they would for cycling facilities.

Who is responsible for undertaking maintenance of boulevard facilities?

As stated in the MMS, it is the responsibility for municipalities to maintain roadway assets under their jurisdictions. Therefore, the winter maintenance of transportation assets is the responsibility of the owner unless otherwise stated in regional or local bylaw. The Region of Niagara is only responsible for boulevard features that are within their jurisdiction.

What (if any) indicators are used to monitor the success of newly implemented Complete Streets projects?

It is generally recommended by the documents reviewed that monitoring the success of Complete Projects is an important part of the post-implementation process. Monitoring allows practitioners to compare pre-implementation data with post-implementation data to evaluate changes in operation, safety, and modal split along Complete Streets corridors. There is a range of metrics and data collection strategies that may be used to gather information on how Complete Streets are performing for users and operators of different modes of transportation, as well as the impact to the larger transportation system and local businesses. Data collection and analysis should be quantitative (e.g. traffic counts by mode, collision data, transit ridership, business transaction reports) and qualitative (e.g. intersect surveys, online newsletter surveys, interviews with local businesses) to create a holistic understanding of impacts from newly implemented Complete Streets. In general, a monitoring program should include the following elements:

- Performance Metrics. Clear transportation objectives that are measurable through qualitative or quantitative data collection methods.
- Methodology for Collecting Data. Well-document and repeatable methods for collecting transportation data.
- Consideration for Multiple Modes. Performance metrics and data should be provided for all modes, operations, and functions of a Complete Streets corridor – unless specific modes, operations, or functions are omitted from the design.

4.0 Existing Conditions

Existing conditions refers to the Complete Streets design elements and applications that are found on or along Regional Roads throughout Niagara as defined and implemented by the Region as a result of existing design guidelines, standards, policies and processes.

Historically, Niagara Region's existing road design has lacked dedicated Complete Streets design guidance. In 2017, the Regional TMP presented six new Complete Streets typologies that establish a vision for how Regional Roads will become multi-modal and sensitive to the needs of adjacent land-use. Detailed guidance on designing, implementing, and maintaining this infrastructure will be included in the final CSDM for this project.

As demonstrated in section 3.0, the existing design of roadways and thus the conditions found throughout the Region Niagara is defined and directed by Regional Policy PW5.R01.3 (Road Cross Section). While these standards provide general direction and ROW widths on key roadway elements between the curb and in the boulevard, it focuses on roadway design for motor vehicles almost exclusively. For topics that are not covered by the policy, designers and practitioners are directed to consult TAC manuals (as described in section 3.0). Although it includes design recommendations on a range of multi-modal transportation topics, the TAC Geometric Design Guidelines for Canadian Roads provides general guidance for municipalities of various scales across the country and is not specifically created for the Niagara context.

This section of the discussion paper explores the Region's existing roadway design, the previously proposed Complete Streets typologies and where and how current conditions could be considered to reflect or address those typologies. The content of this section is meant to provide a comprehensive understanding of the existing Complete Streets elements and applications in order to inform the review, confirmation and modelling of the typologies and sub-typologies in phase 5 and 6 of the work plan.

More specifically, section 4.0 includes detailed discussions on the following elements of the background review process:

- Inventory of Conditions from field investigations and desktop assessments of existing Regional Road infrastructure
- Discussion of observations from field investigations with a particular focus on streetscaping, urban design, and placemaking
- Summary of Regional Policy PW5.R01.3: Road Cross Section and the Region's existing roadway design requirements
- Comparison of the Region's six Complete Streets Typologies presented in the 2017 Regional TMP

4.1 Inventory of Conditions

A field review was completed on Thursday August 27, 2020 and Tuesday September 1, 2020 by members of the WSP team. The purpose of the review was to collect quantitative and qualitative data regarding right-of-way geometry, amenities, utilities/infrastructure, and general character of each Regional Roads found throughout Niagara Region. The field investigation was completed using a two-part approach including a preliminary field investigation followed by a supplementary desktop review.

Prior to investigation, a selection of Regional Roads were identified for field review. The Regional Roads were selected in order to establish a sampling from each of the 12 LAMs, a mix of urban centres, and potential Complete Streets typologies in application throughout the Region. The scope of the field inventory included:

- Select Regional Roads within local municipal urban cores (downtown settings)
- Select Regional Roads within local municipal urban and suburban areas
- Select Regional Roads within rural settings

Considering the comprehensive nature of the data collection exercise, a survey was created and used to document observations. The survey was hosted on Google forms and included yes / no and dropdown questions to ensure consistency. The following is an overview of the information which was gathered:

- Adjacent land-use
- Boulevard features (streetscape, utility, landscape, pedestrian, and transit amenities)
- Active transportation infrastructure (pedestrian, cycling, and multi-use facilities)
- General roadway design and observed operations (relative freight, vehicle, and parking volumes)

The intent of this survey was to establish a foundation from which the inventory database and Complete Streets asset management tool will be created. All of the information gathered was downloaded and formatted into a database of information. This database, which can be found in **Appendix A**, will be used as the basis for developing one of the key project outcomes – the Complete Streets inventory and implementation tool.

In addition, as part of the field review, the project team took photos to support the information documented in the inventory of conditions. In field photos have been geotagged and uploaded to a KMZ file submitted as part of the background discussion paper. The Region is encouraged to use the photo geotagged photo catalog as a reference for understanding existing roadway conditions to supplement the inventory database.

Following the field investigation, all remaining Regional Roads were investigated using a supplementary desktop assessment. The information gathered was used to populate additional information in the inventory database and "site photos" were taken from GoogleEarth to supplement the KMZ file. WSP can confirm that all Regional Roads have been comprehensively reviewed through this process and that our team has a strong understanding of the current conditions both Complete Streets and non-Complete Streets related throughout each of the LAMs. The following sections provide an overview of key themes that emerged through this investigation process.

4.2 Observations

This section discusses observations from field investigations that are supported by photos provided in the photo catalog and KMZ file. To summarize field investigations, the project divided its observations into four key themes. These themes emerged through preliminary consultation with internal stakeholders i.e. Regional staff and were further confirmed and observed through the field investigation and desktop review. The themes as well a high-level summary of observations is presented below.

Key Observation #1. Rural Areas vs. Urban Areas

Streets within Large Urban Centres

Streets within larger urban centres exhibit a broader application of street furnishing, bike lanes, and pedestrian facilities. The quality and consistency of street furnishing is less evident in the larger urban centres, with the application being more functional than decorative. Street cross sections are more organized with a higher consistency to standardized approaches than smaller communities.

Public transit amenities are prominent with furnishing nodes and shelters. Bike facilities are provided on new or reconstructed roadways, however, they often start/end abruptly with minimal connectivity to outlying community destinations. In-boulevard multi-use pathways along roadways were observed in Port Colborne and provide connectivity to the canal feature. Sidewalks and controlled crossings are provided on most roadways promoting good pedestrian activity. Planted medians and roadside medians feature healthy street trees and decorative plantings. Sidewalks are frequently buffered from the roadway with a lawn/planted boulevard, a feature that is lacking in the smaller communities.

Streets are predominantly designed for motor vehicles outside of urban core and 'Mainstreet' typologies. Pedestrian and cycling level amenities and infrastructure are less apparent in transitional zones.

Overall, the larger urban centres show more consistency and infrastructure for amenities related to transit and crossings. These areas fall short on pedestrian-level comfort provisions and connectivity.

Streets within Small Urban Centres & Hamlets

There are common characteristics within the smaller communities, largely consisting of street typologies that would be classified as Main Street, Transitioning, and Hamlet. These smaller communities include Grimsby, Beamsville, Vineland, Jordan Station, Pelham, Smithville, Wellandport, and Wainfleet. Each features a Regional Roads functioning as an established downtown core or a defined main thoroughfare through the community.

Many newer urban roads within these communities tend to have sidewalks on both sides of the road and little to no on-street parking. Downtown areas tend to have narrow pedestrian zones, no cycling facilities, and on-street parking – striving for the desired main street characteristic with varied success. Newer rural roads have provisions for people cycling with fully or partially shoulders for active transportation.

'Main Street' and other community spines exhibit healthy street trees, decorative annual baskets/planters, and feature planting beds at key nodes. Planting beds with retaining walls have been used in several locations to address significant grade changes from street to building elevations.

The local architecture reflects a heritage feel of a Victorian, Georgian, and Craftsman styles. The approach to landscape treatments of 'Main Streets' has been to mimic these characteristics within furnishings and fixtures. It is recommended that the Region and its LAMs consider a more modern approach that aims to acknowledge that character, while giving these spaces a more fresh and modern flair. New installations in downtown Smithville show examples of a modern/heritage blend, including decorative signal poles that have been standardized in the Region for ease of replacement.

Most notably, there is vast inconsistency with cross sections geometry, amenity, and facilities as a roadway transitions through a community. Often these changes appear to be associated with differing land-uses or geographical boundaries of previous road improvement projects, which occur in frequent intervals along roadways with multiple



Example of heritage features with a modern twist, signal poles, downtown Smithville.



Example of community sensitivity to the character of development, Grimsby.

small urban centres. Bike lanes, sidewalks, and paved shoulders start and stop abruptly - presenting a barrier to active transportation. Establishing consistent 'Transitioning' typology characteristics that address the needs of smaller communities would be beneficial. Regional staff have noted that this is due to project limits established by the capital budget.

Overall, streets are heavily vehicular focused with minimal provisions for cycling. Sidewalks are often placed adjacent to the curb or separated by a narrow boulevard buffer zone that prevents landscaping and additional amenity programing. Inconsistencies with approach to drainage were noted in the field and present both opportunities and challenges with reimagining boulevard space. Evidence of pooling water and heaving hardscape were observed in 'Transitioning' areas, which should be addressed inline with developing consistency in overall design approach.

There was a high sensitivity to staff presence completing field work in the smaller communities, with notes of concern and questions regarding purpose. Several signs noted (see photo - Grimsby) regarding preserving the main street over development (heritage not condos) may be an indication of potential pushback from the public on roadway redesign.

Roads within Rural Areas

Roads within rural areas generally have ample granular shoulders with a narrow (200-300mm) asphalt shoulder. Newer rural roads showed wider paved shoulders, varying in size. A recent installation south of Smithville, Regional Road 14 (Smithville Road), illustrated a rural road cross section with signs and pavement markings indicating dedicated cycling lanes extending from the urban centre into the rural area. The rural areas within the Region are typically agricultural, however, its on-site retail nature and scenic landscapes make the rural setting prime for active transportation and nodal destination infrastructure.

There are significant challenges to 'Rural' roadways and 'Transitioning' roadways which are located within areas of significant elevation changes, largely associated with the escarpment landscape. Regional Road 81 between Grimsby and St. Catharines is an example of this constrained roadway cross section. Between urban centres and hamlets, this road exhibits minimal shoulders and is often flanked by sharp slopes and/or dense woodlots. The scenic nature and connectivity of this roadway makes it very popular for all modes of travel - active and vehicular, which lends to the opportunity for expanding the infrastructure to accommodate a multi-model usage - particularly active transportation facilities, vehicular pull-off for sight-seeing, public transit opportunities and more robust wayfinding infrastructure to support uses.

Regional staff have noted that ROW restrictions in some rural areas come as a result of policy limitations from other agencies, such as the Niagara Escarpment Commission, that limit the capacity for roadway widening.



Example of typical rural road, (Regional Road 26, near Jordan Station).



Example of rural road with paved shoulder, (Regional Road 20 near 24).



Example of typical constrained rural road, (Regional Road 81, near 24/Vineland).

Key Observation #2. Application of Amenities

When referring to the application of amenities reference is being made to the design and implementation of specifically Boulevard amenities including street furnishings, pedestrian facilities, and supporting other infrastructure. Throughout each of the municipalities unique design treatments were observed which have been documented through graphics on the following pages. The purpose of this information is to help inform the future development of furnishing and street typology standards.

Grimsby



Gateway Feature, wide pedestrian zone.



Waste bin, on-street waste pickup for businesses and apartments. Garbage blowing into street and obstructing sidewalk and curbside access.



Mixed tree pit treatment. Note lower image depicts piloted tree pit design intended to promote tree growth / longevity.





Temporary expansion of pedestrian/restaurant space into existing on-street parking.



Mixed-use area treatment between road and retail parking lot.



Paved unprogrammed area – no parking and not assigned to AT modes (Regional Road 81 east of downtown).



Wide boulevards with bike lanes (Livingstone Ave).



Narrow street cross section on busy roadway (along Escarpment vista).

Smithville



Bench, waste bin, decorative paved furnishing zone.



Tree pits and waste can, large furnishing zone.



Raised planters.



Signal posts – heritage with a modern twist.



Planting and seating node at intersection.



Light standard and bike parking.

Beamsville







Grade issues mitigated with planting and decorative fencing, accessibility limitations (downtown).





Bench and bike parking.



Tree guard and grate.

Vehicular-oriented downtown



Decorated wine barrel community initiative throughout communities along Regional Road 81.

St. Catharines



Opportunities to connect users to rear parking, also noted in Grimsby.



Road crossing, light standards.



Transit stop - shelter and benches with advertising.

Niagara Falls



Transit stop with no shelter.



Transit stop with shelter and furnishings.



Raised planted median and light Planted median, light standards, standards. Note complimentary styles of median and boulevard lighting with buried hydro cables along the corridor.



benches.



Street tree, coloured concrete in furnishing zone.



Unit paver in furnishing zone, waste bin and bench.

Niagara-on-the-Lake



Lawn boulevard with street trees and sidewalk.



Benches, raised planters, street trees, waste bins (Non-Regional Road).



Planted median, light standard, street trees (Non-Regional Road).

40

Welland



Planter and light standard.



Floral basket.



Bike lane and sidewalk



Light standard and wayfinding signage.



Decorative paving, waste bin, bike parking and bollards.



Street cross section.



Street cross section



Planters, bollards, gateway feature, planters.

Niagara Complete Streets Design Manual | Background Review Discussion Paper

Port Colborne / Olde Humberstone



Raised planter, coloured/stamped concrete, use of natural stones.



Benches, bike parking, floral baskets, raised planters.



Signal pole/light standard, raised planter and natural stone.





Light standard





Fixed vehicle bollards.





Signal poles – heritage with modern twist, commemorative paving inlay.



Key Observation #3. Crossings & Intersection Treatment

The design of pedestrian crossings at signalized and un-signalized intersections, mid-block, and driveways proves to be quire inconsistent based on observations. Crossings within the Region's LAMs show significant variation, largely due to differences in historical approach with lifestyle upgrades, however, there are still differences in newer design treatments from location to location. More specifically, within smaller communities and hamlets, there is a significant lack of pedestrian crossing opportunities, with long distances between signalized or controlled intersections. Within 'Main Street' typologies and throughout larger municipalities, there appears to be more adequate crossing opportunities and better consistency in design approach. Regional staff have indicated that regional policy currently dictates that pedestrian crossings are only provided at controlled intersections. Midblock pedestrian crossings are only implemented if a study warrants their implementation. The following are some graphic examples of various crossing types and applications demonstrated throughout Niagara Region.



New intersection upgrade, Grimsby.



Decorative paving (sampled concrete), Smithville



New intersection upgrade, Smithville



Lined crossing, Grimsby



Coloured/stamped concrete, Port Colborne



Lined crossing with fading pavement markings, Niagaraon-the-Lake



Ladder crossing, St. Catharines



Mid-block crossing and bikelanes, Vineland.



Livingston Ave, Grimsby. Residential area and main connection to community amenities. Vehicular focus, long sections with no pedestrian crossings.

Key Observation #4. Consistency of Design

Design consistency in both approach and materials differs between communities and roadways and associated infrastructure throughout each of the area municipal communities. Smaller communities have a more consistent furnishing treatment in the downtown retail cores and show a greater sensitivity to theme/design of the overall streetscape. Larger urban areas have greater consistency in the provision of amenities throughout the overall road network. Where there are applications of design elements, the amenities and infrastructure are intermittent, starting and terminating abruptly which could be a result of the interest to align with limits of historical road upgrades. The "theme" of design inconsistency is not one that is uncommon when reviewing and investigating roadway design at an upper tier level. The roadway design and application when taking into consideration multiple jurisdictions of planning, design, engineering and implementation can naturally will reflect different interpretations of design standards, iterations of design manuals, community design preferences, historic values and principles and priorities. All of these will need to be considered and addressed through the identification of the street typologies, sub-typologies and design / amenity features.

44

4.3 Existing Complete Streets Typologies

The Region of Niagara has invested time in establishing a vision for Complete Streets on Regional Roads. As discussed in this paper, the Region has incorporated Complete Streets in several high-level planning documents and policies. The Region has even drafted Complete Streets typologies that have been implemented in varying degrees across the Region in some permanent and temporary roadway design projects. These designs were implemented without the assistance of a Regional CSDM and demonstrate inconsistency in approach. Nonetheless, they clearly show an interest in exploring and implementing Complete Streets typologies, identifies some sample roadways that reflect the typologies, and some additional discussion on Regional Road design requirements that may need to be adapted in order to fully realize the Region's vision for Complete Streets.

4.3.1 Existing Typologies

The Region's existing Complete Streets design guidance is captured within the Regional TMP's Complete Streets Design Guidelines background report. This document defines Complete Streets as roadways that link land-use planning, transportation planning, and urban design. It recognizes that the public ROW should respond to the needs of adjacent land use and it should be designed to equitably and efficiently support users of all modes and abilities. The document outlines best practices for Complete Streets elements in the boulevard and roadway and describes six (6) Complete Streets Typologies for Niagara Region. The typologies reflect aspirational visions for Regional Roads and recognizes that flexibility will be necessary for broad implementation. It is noted that while these typologies have distinct contextual application, all Regional Roads are considered arterials. The six Complete Streets Typologies are outlined on the following table.

Summary of Complete Streets Typologies as Described in Niagara Region's Transportation Master Plan (2017)

	Main Street	Urban General (Narrow)	Urban General (Wide)	Transitioning	Hamlet	Rural
Context	Urban/Hamlet	Urban/Mixed-Use	Urban/Mixed-Use	Semi-Urban/Mixed Use	Small Rural Communities	Agricultural/Natural Areas
Special Considerations	Heritage character	High-volumes, all modes	High-volumes, all modes	Cross-regional travel	Serve local residents & through traffic	Cross-regional travel & recreational cycling
Righ-of-way (ROW)	20-26m	20-26m	26-36m	26-36m+	20-26m	20-36m+
Pedestrian	Wide sidewalks Signalized intersection x-ings Unsignalized midblock x-ings	Wide sidewalks Signalized intersection x-ings	Wide sidewalks Signalized intersection x-ings	Wide sidewalks or multi-use paths Signalized intersection x-ings	Sidewalks Signalized	Sidewalks where passing through Hamlet or Village Signalized intersection x-ings
Cycling	Dedicated facility	Dedicated facility	Physically separated facilities	Physically separated facilities or multi-use paths	Type unspecified	Wide, paved shoulders
Public Transit	Priority lane or in mixed traffic	Priority lane, dedicated lane, or in mixed traffic	Priority lane, dedicated lane, or in mixed traffic	Priority lane, dedicated lane, or in mixed traffic	Unspecified	In mixed traffic
General Traffic (Motor Vehicles)	Narrow travel lanes	Narrow or reduced number of travel lanes	Four or more lanes May include medians & left turn lanes at intersections	Four or more lanes	Supports through movement	Wide lane widths
Goods Movement	Unspecified	Goods movement limited to certain times & locations	Goods movement limited to certain times & locations	Supportive of goods movement	Limited goods movement	Primary goods movement corridors
Parking	On-street	On-street	On- or off-street parking	Permit off-peak parking	May include on-street parking	No on-street parking unless in Hamlet or Village
Boulevard Features	Pedestrian-scale lighting Pedestrian & transit amenities Street trees	Pedestrian & transit amenities Street trees & Shrubs Planters Less emphasis on streetscaping compared to Main Streets	Pedestrian & transit amenities Street trees & Shrubs Planters Less emphasis on streetscaping compared to Main Streets	Pedestrian & transit amenities Street trees & Shrubs Raised planters Buffer planting	Pedestrian amenities Pedestrian-scale lighting Benches Street trees & shrubs	Buffer planting Naturalized drainage swales Street trees only in Hamlet or Village
Other	Passive traffic calming			Transitioning from large format retail to medium/high density residential mixed-use	Slow traffic through smaller setlements, compared to Rural	Access control no necessary
Relative Priority	High Priority	Medium Priority	Low Priority	Not included		

While these six typologies reflect aspirational designs for key corridors, the Region has set roadway cross-sectional requirements in policy PW5.R01.3. As set out in this "Road Cross Section" policy, the design of Regional Roads is to conform with the following standards:

- Boulevards widths should be 3.0 m or greater (desired) and 1.5 m at the minimum
- Boulevards widths less than 1.5 m should be considered for hard surface treatments and a 600 mm boulevard width should be considered in constrained locations
- Sidewalk widths should be 1.5 m as generally dictated by LAMs
- Sidewalk widths should be 1.8 m when ramping at intersections as generally dictated by LAMs
- Urban curb-to-curb widths at least 10 m wide.
- Through lane widths at least 3.5 m with lane widths increasing depending on design speed and AADT.
- Rural cross-sections consisting of two 3.5 m through lanes and 0.5 m partially paved shoulders.
- Shoulders must either be fully (2.0 m) or partially paved (minimum 0.5 m).
- Side slopes may have a maximum front slope of 3:1 for vehicle recovery.
- Below grade utility should be uniformly installed parallel to the adjacent roadway.
- Sewer covers and watermain valves should not be located in the wheel track path.
- Design years for flexible pavement reconstruction and rigid pavement reconstruction projects shall be 20 and 40 years respectively.
- Practitioners are to consult the TAC Geometric Design Guidelines for Canadian Road for any design challenge or topic that is no addressed within the Region's policies or standards.

It is worth noting that this policy was last amended in 2005, prior to the release of the updated TAC Manual, as well as the publication of the Ontario Traffic Manual and MTO Guidelines reviewed in previous sections. The cross-sectional standards identified in this policy may not reflect the dimensions and lifecycles recommended by recent provincial and national design guidance.

4.3.2 Examples of Application

Niagara Region has designed and implemented some Complete Streets consistent with the typologies provided in the TMP already and should celebrate and learn from those successes through this process. While these roadways may not exhibit every design characteristic described in the Complete Streets typologies, they reflect designs considerate of the local context, placemaking, and multiple modes. During the field investigation, WSP's interest was not only catalogue existing conditions and treatments but further consideration of the Complete Streets typologies and their application. The Complete Streets typologies will be reviewed and confirmed and sub-typologies identified within phase 5 and 6 of the work plan; however, WSP has utilized the existing conditions inventory and information to provide preliminary suggested typology applications for select streets throughout Niagara Region. The following are some examples of where the typologies have been "found" in Niagara Region.

Main Street

Main Street W (Downtown Grimsby)



E Main Street and Division Street

(Welland)

Griffin Street N (Smithville)









- Jersey barrier in place to expand pedestrian realm and outdoor dining space in wake of COVID-19
- Raised planters to separate vehicular traffic from pedestrian realm
- Themed colour and material palette throughout entire streetscape
- Elimination of on street parking and introduction of new parking lots
- E Main Street and Division Street are one-way streets running parallel to oneanother.
- Paver boulevards and crosswalks
- Raised planters to resolve grade difference in sidewalk and road
- Decorative light poles embrace local heritage with modern edge

Niagara Complete Streets Design Manual | Background Review Discussion Paper

Urban General (Narrow)



Constraint

median Bike lanes

Wide sidewalks

Utility poles within right-ofway between sidewalk and road

Wide right-of-way with 4 lanes of traffic with centre

Bus stop with amenities



Vineland

(Lincoln)



Transitioning

E Main Street (Welland)

Canborough Street

(Smithville)





- Transition mixed use to downtown streetscape
- Bike lane with on street parking
- Dedicated bike lanes
- On street parking
- Sidewalks
- **Decorative lighting**
- Pedestrian crosswalks

Urban General (Wide)

Niagara Complete Streets Design Manual | Background Review Discussion Paper

Hamlet



Stevensville Road

(Stevensville)

- On street parking for travelers to stop and visit shops
- Opportunity to formalize on street parking and bike lanes

	Rural	
HWY 20 W @ Victoria Ave (Pelham)		 Recently reconstructed road Wide paved should Wide gravel shoulder
Helena Street (Fort Erie)		 Example of a constrained rural road Little room for paved should High speed traffic

Niagara Complete Streets Design Manual | Background Review Discussion Paper

5.0 Opportunities & Constraints

As demonstrated in section 2.0 through 4.0, there are a number of influencing factors that need to be considered, integrated and addressed when designing Complete Streets. The intent of this design manual is not to reinvent the wheel but to build upon the significant efforts at the local, regional and provincial level of support Complete Streets and to provide a context specific approach to design and implementation. Through our assessment of policies, guidelines and existing conditions, there are clearly both opportunities that can be leveraged as well as constraints that may policy, program or design solutions to overcome. The following is a summary of the opportunities and constraints that have been identified for Niagara Region as it relates to Complete Streets.

Policies

Opportunities

- Clearly defined role for the CSDM.
 Existing regional policies indicate that the CSDM is to be applied by staff and practitioners during all capital work projects involving road construction or rehabilitation. The Region is directed to uphold the final CSDM, as it will be tailored to address the Regional context.
- Consultation. Complete Streets has been introduced in previous consultation efforts during the TMP, which will allow for greater focused discussion during consultation for the CSDM.

Constraints

- Maintenance. Limitations in regional and local maintenance capacities for roadways, separated cycling facilities, and boulevard features may affect the feasibility of some design concepts.
- Application. The nature of the planning and design policy hierarchy means that the interpretation, if not clear, will vary by municipality.
- Consistency. Not all policies are updated

 amended at the same time or have the same standards in different LAMs. There may be a possibility for some policies to lack the necessary support because of their schedule of review. E.g. Heritage guidelines, PW5.R01.3 Road Cross Section.

Design Guidelines & Standards

Opportunities

- Updated National and Provincial Guidelines. Multiple recently revised national and provincial guidelines and standards that reflect industry standards are available to support the development of CSDM recommendations and guidance.
- Performance Metrics and Monitoring. An absence of clearly defined regional, national, or provincial performance metrics for Complete Streets will allow the project team to explore and develop unique monitoring recommendations in the CSDM.

Constraints

- Trade-offs to priority and access for different modes depending on context may require the CSDM to deviate from some provincial/national guidance.
- Much of the newly published design guidance has not been adopted in Niagara. The CSDM must therefore address road user adherence to safe operations of new designs.
- New provincial guidance requires greater spatial and physical separation on highspeed / high-volume roadways for cycling infrastructure, which impacts ROW space.

Existing Conditions / Infrastructure

Opportunities

- Scenic landscapes and tourism trip generators, such as wineries, may draw 'cyclotourism' to Regional roads in rural and urban environments. Infrastructure upgrades with supportive facilities and amenities will be utilized.
- New project works area exhibiting aesthetic and functional features that are positively contributing to the Region's Complete Streets goals. These can be built on and standardized to ensure continued implementation.
- Smaller communities exhibiting more unified furniture zone approaches that could be refined and standardized for all Regional Roads.

Constraints

- Narrow road cross sections along escarpment terrain limits the ability and increases costs for active transportation upgrades on roadways where there is a greater demand for these facilities.
- Grade issues within narrow historic downtown areas are limiting accessibly and contain liability risks.
- Small/no buffer between sidewalk and road curb limits programing and planting abilities, reduces human comfort.
- Lack of road crossings and rest areas are barriers to pedestrian use.
- Inconsistent intersection treatments create confusion for vehicular and pedestrian users.
- Mixed approaches to storm water management have led to unusable spaces and ineffective applications of treatments.

 Narrow ROWs along Regional Roads where buildings are built on the property lines, limiting what could be implemented

Examples of Existing Infrastructure Constraints documented in Field Investigations

Narrow with poor sight-lines, cyclist route and location of trail crossing (ex. King St near Jordan, Lincoln)





Limited buffers between active transportation and vehicular users (ex. Victoria Ave near Vineland, Lincoln)





Sidewalk adjacent to road – no buffer, road appears to be in progress of line work for cycling lanes (ex. Smithville).



Unclear pedestrian and cyclist zones, signed cycling route, pedestrian tourist area (ex. Jordan Station)





Niagara Complete Streets Design Manual | Background Review Discussion Paper

Poor delineation of street parking and use of boulevard space (ex. Stevensville Rd, Fort Erie)



Poorly defined intended use of boulevard, no parking or sidewalks (ex. Grimsby)



Mixed approaches to storm water management lead to unusable spaces and ineffective applications of treatments.





6.0 Key Takeaways & Next Steps

This Background Review Discussion Paper is a resource that may be used by the project team throughout the development of the Niagara Region Complete Streets Design Manual. It identifies and describes the Region's Complete Streets policies that outline a purpose and commitment to the CSDM. It has also summarized regional, provincial, and national roadway design guidelines and standards that should be reflected in the guidance of the Region's CSDM. The tabulated breakdown of design, implementation, and maintenance guidance at the provincial and national levels, as well as the table description of the Region's Complete Streets typologies, may serve as tools for the project team's consideration in future phases. This section describes a few key highlights from these detailed reviews and the next phase of the Niagara CSDM project.

6.1 Key Outcomes

The Background Review process has highlighted the Region of Niagara's progress-to-date in framing Complete Streets on its Regional Roads. While Complete Streets have yet to be implemented, the Region has published high-level planning documents and policies that identify a need for Complete Streets and means to implement them moving forward. The need for a proper Complete Streets Design Manual that is catered to the context of Niagara has been recognized as paramount to the success of designing, implementing, and maintaining the Region's proposed Complete Streets typologies. The Niagara CSDM project reflects the Region's commitment to developing the tools and guidance necessary to enact its Complete Streets vision.

6.2 Future Considerations

The contents of this discussion paper will be valuable to revisit and reference throughout the CSDM project. It is important, however, to understand key takeaways that should be considered by the project team as they develop draft material and prepare for consultation events. Key takeaways and future considerations that have come out of the background review process include the following:

- The CSDM must be developed with the understanding that its intended purposes are for new construction or reconstruction projects on Regional Roads and Main Streets under the jurisdiction of the Region.
- The boulevard cross-section and Complete Streets design recommendations of the CSDM must accommodate the maintenance capabilities of Local Area Municipalities who will maintain these features.
- There may be a need to amend Policy PW5.R01.3 pending the final recommended cross-sectional widths that are adopted through consideration of national and provincial guidance, research on

best practices, and consultation with Regional stakeholders. Table 9.1 of the Regional OP should also be reviewed and revisited during the development of draft cross-sections. Both the policy and the table may need updating to match the final CSDM's cross-sections or the CSDM cross-sections may need to be developed to meet these ROW limitations.

- The Complete Streets typologies proposed in the Niagara TMP must be revisited and refined as needed to meet recent national and provincial roadway design guidelines and standards.
- Depending on traffic volume, speed, and number of lanes, greater physical separation for cycling facilities may need to be provided on urban Complete Streets typologies to comply provincial and national guidance.
- By-law and operational strategies should be considered and recommended in addition to design strategies to manage curbside in commercial area with demand for transit, goods movement (delivery/loading), and on-street parking.
- An absence of national and provincial guidance on post-implementation monitoring metrics for Complete Streets may require increased research on the topic during the best practices review phase.

6.3 Next Steps

The next phase of the project is the Best Practices Review. In this phase, the project team will perform an independent review of Best Practices in comparable jurisdictions and hold a Stakeholder Workshop to discuss some materials from the Background and Best Practices reviews. To support the Best Practices review, the project team will be creating and distributing a Complete Streets Best Practices survey to municipal contacts in comparable jurisdictions across Canada and the American Midwest to understand how other municipalities use CSDMs to support the delivery of their Complete Streets programs. A Best Practices Discussion Paper will be drafted and submitted to the Region in early 2021 to reflect the findings of the project team's research, survey, and consultation.