City of Hamilton Complete, Livable, Better Streets Design Manual

Background Review & Jurisdictional Scan

October 8th, 2020

Contents

1 Introduction & Overview

Complete Streets policies are increasingly being adopted by municipalities across Canada and the United States. Complete, Livable, Better Streets are the City of Hamilton's version of Complete Streets. The CLB Streets approach represents a shift from the traditional "centreline out" approach to road design, which is primarily focused on motor vehicle throughput. By contrast, CLB Streets takes an "outside in" approach that equitably considers the needs of all road users, and that recognizes the importance of streets not only as conduits to move from one place to another, but also as public spaces and an integral component of the public realm.

In 2020, the City of Hamilton retained WSP to assist in developing a Complete, Livable, Better Streets Design Manual (CLBSDM). This fulfills one of the actions of the 2018 Transportation Master Plan Review and Update, which provides explicit direction to create a CLBSDM. The manual will provide City staff with a transformative document that will assist practitioners in all aspects of CLB Streets projects, including design, implementation and maintenance. This Background Review and Jurisdictional Scan is among the first deliverables for this assignment. It summarizes the current state of CLB Streets within the City of Hamilton's policies, identifies the role of the upcoming CLBSDM, and provides an overview of the key principles that have been applied in design manuals developed by other jurisdictions.

2 Policy Review & Understanding

An effective CLB Streets program requires policies that hold municipal staff and practitioners accountable to investing and implementing these streets. While manuals and guidelines may outline processes, designs, and best practices for implementation, policies are what dictate when and how guidelines are applied. Policies related to CLB Streets may be incorporated into high-level planning documents to help reinforce the importance of advancing the CLB Streets program in support of other planning objectives. When developing a design manual, it is important to understand how it must comply with existing policy and identify gaps that must be filled by the design manual itself or by new policy.

2.1 Understanding Policy

Policy is an essential component of an effective CLB 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 and hold municipal staff accountable to regulatory promises established by their governing body. All municipalities are required to plan, adopt, and uphold policies ranging from topic-specific standards and guidelines to higher-order long-term visions.

A street design manual does not typically serve as a policy document but as a set of guidelines and best practices related to design, implementation and maintenance. It is therefore imperative that other planning documents and policies reference the CLB Streets Design Manual to necessitate its use in future roadway construction and reconstruction projects.

2.1.1 The Policy Hierarchy

CLB Streets or Complete Streets policies have been referenced in the City of Hamilton's Urban (2009) and Rural (2006) Official Plans (OPs), and in its 2018 Transportation Master Plan (TMP) Review and Update. The policies in the urban and rural OPs support the development of guidelines as implementation tools to meet the City's objectives. The TMP identifies the need for the development of a CLB Streets Design Manual (or guidelines) and recommends policy changes (for example, an OP amendment) to support the implementation of CLB Streets. **Table 1** illustrates the planning policy hierarchy and the role of the CLB Streets Design Manual within the policy structure.

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 interpreted differently depending on context.
Official Plans	Municipal statutory documents that are required by the Provincial Planning Act and Policy Statement that outline how the City will use land, how it will allocate resources to its departments and services, and how it is planning for future growth.
Transportation Master Plan	Municipal statutory document that reflects the objectives of the Official Plan and outlines actions to implement the City's vision for transportation infrastructure and services.
Complete, Livable, Better Streets Design Manual	A municipal document that reflects the City's street design, implementation, and maintenance objectives for Complete, Livable, Better Streets. The guidance included within this document will be flexible and may be interpreted differently depending on context.

Table 1 - *Transportation planning policy hierarchy.*

2.1.2 Policy Best Practices

While a street design manual provides guidance on the design, implementation, and maintenance of CLB Streets, policy holds decision-makers and municipal staff accountable to applying the design manual when designing municipal roads. Furthermore, policy may identify the process and timeframe in which CLB Streets will be implemented. Higher-level documents, such as Official Plans and Transportation Master Plans, should include CLB Streets policy to support their implementation and reinforce their importance within the transportation planning paradigm. The National Complete Streets Coalition (NCSC) identifies 10 components of the model Complete Streets policy, which include:

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.
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 implement Complete Streets policy and design.

2.2 Policy Review & Results

2.2.1 Policy Review Approach

To complete the policy review, the consultant project team performed a key terms search in the City's Urban and Rural Official Plans and Transportation Master Plan (TMP). Additional policies and background papers referenced by the TMP and provided by City staff were also reviewed. Policies were reviewed based on their relevance to the CLB Streets policy, noting potential implications and relevance to the design, implementation, and maintenance of streets.

2.2.2 Existing Policies

The City of Hamilton has identified CLB Streets or Complete Streets in several policies. ***Table 2*** describes the City's CLB Streets policies and their relevance to the development and implementation on the CLB Streets Design Manual.

Policy/Action	Description	Relevance to CLB Streets Design Manual
Urban Hamilton Official Plan (Adopted 2009)		
Policy A.1.6	The OP relies on guidelines as implementation tools to meet City directions and provincial requirements. Both the City and Province have adopted subject-based guidelines to provide a greater level of explanation for the implementation of a policy or the completion of a further study.	Defines a relationship between the OP and guideline documents.
Policy C.4.2.8	New secondary plans and designs for major transit generators shall incorporate Complete Streets design directions.	Requires complete streets design directions to be incorporated in secondary plans and certain designs.
Policy C.4.5.6.5	The City may waive or accept less lands to be dedicated than the maximum right-of-way dedication and/or daylighting triangle requirements where the City's objectives for sustainable infrastructure, complete streets and mobility can be achieved.	Identifies complete streets objectives as a consideration in determining whether to accept a reduced right-of-way.

Policy/Action	Description	Relevance to CLB Streets Design Manual
Rural Hamilton Official Plan (Adopted 2006)		
Policy A.1.5	The OP relies on guidelines as implementation tools to meet City directions and provincial requirements. Both the City and Province have adopted subject-based guidelines to provide a greater level of explanation for the implementation of a policy or the completion of a further study.	Defines a relationship between the OP and guideline documents.
Policy C.4.5.6.5	The City may waive or accept less lands to be dedicated than the maximum right-of-way dedication and/or daylighting triangle requirements where the City's objectives for sustainable infrastructure, complete streets and mobility can be achieved.	Identifies complete streets objectives as a consideration in determining whether to accept a reduced right-of-way.
Transportation Master Plan Review and Update (2018)		
Action #35	Adopt a CLB streets policy for road design, operation and maintenance. The CLB streets approach emphasizes routine accommodation in order to ensure designs consider the needs of users of all ages and abilities.	Provides direction to adopt a CLB streets policy.
Action #36	Develop a CLB streets design manual for each typology, harmonizing existing applicable guidelines. A Vision Zero lens will be applied to the design of streets in new neighbourhoods and redesign of streets in existing neighborhoods.	Provides explicit direction to develop the CLB Streets Design Manual.
Action #37	Harmonize the road classification and descriptions in the Official Plan with the CLB streets approach and undertake an Official Plan Amendment.	Provides direction to incorporate the CLB streets typology in the OP.

Policy/Action	Description	Relevance to CLB Streets Design Manual
Action #38	Use the multi-modal level of service (MMLOS) approach to evaluate road designs and facilitate the implementation of CLB streets. The MMLOS approach will also be integrated into Transportation Impact Study Guidelines as part of a major update to these guidelines (see Action 57).	Provides direction to consider all modes when evaluating roadway level of service.
Action #39	Integrate stormwater management Low Impact Development (LID) opportunities as part of CLB Streets designs where feasible.	Provides direction to consider Low Impact Development in CLB Streets design.
Action #40	Provide paved shoulders on rural roads where cycling is prevalent and/or where paved shoulders could benefit farm vehicles.	Provides direction to consider cycling and farm vehicle uses on rural roads.
Action #41	Evaluate options for providing sidewalks or multi-use trails in rural areas where the road leads to a school or community facility.	Provides direction to consider pedestrian/cycling facilities in rural areas.
Action #42	Operationalize the one-way to two-way decision-making framework identified in this TMP. Consider street conversions as a potential alternative within CLB streets evaluation.	Provides direction to consider one-way to two-way conversions within the CLB Streets evaluation.
Action #51	Integrate the goals and principles of Vision Zero into the CLB streets design manual and Engineering Guidelines.	Provides direction to integrate Vision Zero principles in the CLBSDM.
Action #54	Apply speed reduction techniques through the implementation of CLB streets as well as through other opportunities such as the introduction of protected cycling facilities.	Provides direction to consider speed reduction techniques.
Action #58	Update Road Right-of-Way policies within the Official Plan to ensure that future development protects for future multi-modal capacity needs, municipal services and utilities, while adhering	Provides direction to update right-of-way policies.

Policy/Action	Description	Relevance to CLB Streets Design Manual
	to the principles of CLB streets and Vision Zero.	
Action #62	Adopt off-street and on-street parking policies and designs that ensure an adequate parking supply to support growth and economic development, contribute to the achievement of the mode share targets of the TMP, and implement the CLB streets and Vision Zero objectives of the TMP.	Provides direction to develop off-street and on-street parking policies.

Table 2 – *Existing City of Hamilton Policies & Relevance to CLB Streets Design Manual*

2.2.3 Other Policy Supports & Documentation

As part of the 2018 TMP Review and Update, several background reports were prepared that include information related to CLB Streets. Although these background reports do not constitute policy, they provide an understanding of how the City envisions CLB Streets as a key component of its future transportation network.

Apart from the TMP background reports, the City also has several guidelines and standards that may support the planning, design and implementation of CLB Streets. **Table 3** identifies the various supporting documents that have been reviewed. Following the development of the CLBSDM, City guidelines and standards (such as those shown in this table) may need to be updated for consistency with the CLBSDM in order to support the implementation of the CLB Streets vision.

Of particular importance to CLB Streets, the Comprehensive Development Guidelines and Financial Policies manual provides design standards for municipal roads. These include minimum standards for parameters such as pavement width and corner radii. **Table 4** provides an excerpt of the Geometric Road Design Table (Table C.1) of this document, which illustrates some of the standards related to street design in the City of Hamilton.

Document	Description
TMP Background Reports	
Complete-Livable-Better (CLB) Streets Background Report	— Introduces the concept of a CLB Street — Identifies a CLB Street Typology — Proposes CLB Streets policies — Includes a decision-making framework for CLB Streets
Cycling Master Plan Review and Update	— Provides potential cycling accommodations (e.g. cycle tracks, bike lanes, paved shoulders) for each of the CLB Street Typologies
Goods Movement Review Background Report	— Provides recommendations related to goods movement, curbside use and other operational considerations within the context of Complete Streets — Provides comparisons to other jurisdictions that have incorporated goods movement considerations in complete streets guidelines
Road Safety Background Report	— Recommends integrating Vision Zero goals and principles in the CLBSDM — Recommends applying speed reduction techniques through the implementation of CLB Streets
Role of Health Background Report	— Discusses the health benefits of active and sustainable travel — Identifies CLB Streets as supportive of a balanced transportation system that facilitates healthy choices
Street Conversions (One-to Two-way) Background Report	— Includes CLB principles in the evaluation criteria for screening street conversion requests — Recommends that street conversions be considered as a potential alternative within the CLB streets evaluation
Sustainable Mobility Background Report	— Identifies a relationship between CLB Streets and sustainable mobility

Other Supporting Documents	
Comprehensive Development Guidelines and Financial Policies Manual (2019)	— Provides geometric design standards (e.g. pavement width, corner radius) for municipal roads
Construction and Material Specifications (revised 2020)	— Contains standard engineering drawings for the construction of roads in the City of Hamilton
Site Plan Guidelines	— Provides guidance and technical standards to development projects — Includes standards related to emergency vehicle access and parking
Road Classification and Right-of-Way Width Project (2009)	— Provides background material related to the existing functional road classification defined in the Urban and Rural OPs

Table 3 – *Description of TMP Background & Supporting Documents*

Geometric Detail	Local Road Urban Residential	Minor Collector Urban Residential	Major Collector Urban Residential	Local Road Rural Residential, Crescents and Cul-de-sacs	Minor Collector Rural Residential Straight-through Roads	Major Collector Rural Residential	Local Road Industrial/ Commercial Crescents and Cul-de-sacs	Minor Collector Industrial/ Commercial	Major Collector Industrial/ Commercial
Min. ROW (m)	20	20	20	20	20	26	26	26	26
Design speed (km/h)	50	50	60	50	60 to 80	80 to 100	60	60	60
Posted speed (km/h)	50	50	60	50	50 to 70	60 to 80	50	50	60
Min. curb radius at intersection (m)	9	9	12	9	12	15	-	-	-
Pavement asphalt width (m)	8.0	8.0	11.0	6.7 plus shoulders	6.7 plus shoulders	9.0 plus shoulders	9.25	11.0	14.0

Table 4 – *Excerpt from Table C.1 – Geometric Road Design Table from the City of Hamilton Comprehensive Development Guidelines and Financial Policies Manual*

2.3 Design Guidelines & Standards

A number of provincial, national, and international design guidelines inform the development of complete streets and multi-modal transportation design. As part of this background review, the project team reviewed several documents that focus on different user groups. **Table 5** below identifies the various design guidelines and standards that inform the development and implementation of complete streets and complete streets policy, along with their relevance to different key user groups. The design guidelines identified in Table 4 will be referenced throughout the development of the Hamilton CLB Streets Design Manual.

Design Guideline	Pedestrian Relevance	Cyclist Relevance	Transit Relevance	Vehicle Relevance	Intersection Relevance
OTM Book 12A	Low	Medium	Low	Low	High
OTM Book 15	High	Low	Low	Low	High
OTM Book 18	Medium	High	Low	Medium	High
MTO Freight-Supportive Guidelines	Low	Low	Low	High	Medium
MTO Transit-Supportive Guidelines	Medium	Low	High	Low	Low
Ontario Minimum Maintenance Standards	Low	Low	Low	High	Low
TAC Geometric Design Guide	Low	Medium	Medium	High	High
NACTO Urban Bikeway Design Guide	Low	High	Low	Low	Medium
NACTO Urban Street Design Guide	High	Medium	Medium	Medium	High
NACTO Transit Street Design Guide	Medium	Medium	High	Low	Low
NACTO Global Street Design Guide	High	High	High	High	High
NACTO Urban Street Stormwater Guide	Low	Low	Low	Low	Low

Table 5 – *Relevance of Design Guidelines and Standards*

3 Review & Application of Best Practice Guidelines

As part of the background review for phase 1 of the Hamilton CLB Streets Design Manual assignment, the project team undertook a jurisdictional scan of five municipalities with existing complete streets design guideline/manual documents.

Jurisdictional Scan

- London Complete Streets Design Manual
- Toronto Complete Streets Guidelines
- Kitchener Complete Streets Design Guidelines
- Edmonton Complete Streets Design Standards
- Boston Complete Streets Guidelines

The intention of performing the jurisdictional scan is to identify common themes and best practices that can be integrated into the Hamilton CLB Streets Design Manual. The jurisdictional scan focused on identifying the particular design principles that inform the typology-specific design interventions presented in the various design guideline documents. These principles apply to every street typology presented with the particular design manual. The focus on design principles in intended to provide the City of Hamilton with an understanding of the guiding principles that have been identified for different user groups, principles that are not specific to any one municipality.

3.1 Guideline Summary

Table 6 on the following page identifies the existing Functional Road Classifications, along with the complete streets typologies presented in each of the five jurisdictional scan documents. This table makes it possible to identify common themes between the complete streets typologies identified in the various design guidelines and manuals reviewed, with typologies addressing common built forms found in each of these five municipalities.

Table 7 identifies principles across the five complete streets guidelines based on different user groups. This table illustrates design principles that apply to the different user groups identified in these complete streets documents, spanning all complete streets typologies. The design principles identified in this table convey the significance of considerations when designing for different user groups. For instance, the City of Boston's design considerations for intersections include references to "reduce clutter", "smart tags", and "sensors", among others. These considerations speak to the need to thoughtfully lay out utilities, traffic signals, fire hydrants etc., to ensure that the intersection is organized in a simple and straightforward manner, with publicly accessible Wi-Fi incorporated into next generation intersection infrastructure, and an overall emphasis on incorporating technology to provide the City with real-time data collection and monitoring.

Jurisdictional Document	Functional Road Classifications	Complete Streets Typologies
London Complete Streets Design Manual	— Arterial — Primary/Secondary Collector — Local — Rural Roads	— Rapid Transit Boulevard — Main Street — Urban Thoroughfare — Civic Boulevard — Neighbourhood Connector — Neighbourhood Street — Rural Thoroughfare — Rural Connector
Toronto Complete Streets Guidelines	— City Expressway — Major Arterial — Minor Arterial — Collector — Local — Other — Laneway — Busway — Access Road — Park Road	— Civic Street — Downtown & Centres Main Street — Downtown & Centres Residential Street — Apartment Neighbourhood Residential Street — Neighbourhood Residential Street — Mixed Used Use Connector Street — Residential Connector Street — Scenic Street — Park Street — Employment Street — Mixed Use Access Street — Shared Street — Residential Shared Street — Mixed Use Lane — Residential Lane
Kitchener Complete Streets Design Guidelines	— Arterial — Major Collector — Minor Collector — Local	— Local — Woonerf — Green Streets — Minor Collector Streets — Major Collector — Arterial (Main Streets) — Arterial (Thoroughfares) — Arterial (Industrial Streets) — Pedestrian-Only Streets
Edmonton Complete Streets Design Standards	— Freeway — Arterial — Collector — Local — Alley — Shared Street — Pedestrian Only Street	— Freeway — Arterial — Collector — Local — Alley — Shared Street — Pedestrian Only Street
Boston Complete Streets Guidelines	— Arterial — Collector — Local	— Downtown Commercial — Downtown Mixed-Use — Neighborhood Main Street — Neighborhood Connector — Neighborhood Residential — Industrial — Shared Streets — Parkways — Boulevards

Table 6 – *Functional Road Classifications and Complete Streets Typologies*

Jurisdiction Design Guideline	Pedestrian Design Principles	Cyclist Design Principles	Transit Design Principles	Vehicle Design Principles	Intersection Design Principles
London Complete Streets Design Manual	— Prioritize safety — Design for accessibility — Create a comfortable environment — Provide connectivity	— Make context-sensitive design decisions — Provide continuity and guidance — Prioritize vulnerable users — Provide convenient cycling-supportive facilities	— Minimize delay / give transit priority — Mitigate conflicts with vulnerable users — Plan for multi-modal travel — Provide a comfortable user experience	— Select an appropriate design speed — Select and appropriate design vehicle — Consider induced demand when determining capacity	— The London Complete Streets Design Manual provides specific design interventions for pedestrian, cyclist, transit, and motor vehicle facilities.
Toronto Complete Streets Guidelines	— Accessibility and mobility — Provide a network of continuous sidewalks — Design for safe crossings — Placemaking — Design for comfort — Greening infrastructure and stormwater management — Design for efficient maintenance — Coordination with utilities	— Apply context-appropriate designs — Design for both present and future users — Prioritize the most vulnerable road users — Visible, intuitive cycling facilities — Intersection safety and mixing zones — Supply adequate bicycle parking and Bike Share access — Design and maintain bike-friendly curbside conditions — Surface conditions	— Enhance transit users' experience — Make connections safe, convenient, and seamless — Visible, safe and convenient transit stops — Universally accessible transit stops and facilities — Curbside design to support transit efficiency — Traffic signals control strategies — Transit streets are safe for walking and cycling — Transit streets and linear public spaces — Design for growth	— Multi-modal transportation — Safety — Context-sensitive target speed and reliable travel — Placemaking — Greening and stormwater management	— Safety first — Predictability — Visibility — Multi-modal — Accessibility — Compact design and shorter crossings — Active transportation — Transit — Placemaking — Maintenance and operations — Manage stormwater
Kitchener Complete Streets Design Guidelines	— Prioritize safety — Design for accessibility — Ensure direct, continuous and connected routes — Provide sidewalks on both sides of the street — Create beautiful and enjoyable places — Make it comfortable	— Prioritize safety — Design for all ages and abilities — Ensure direct and connected routes — Provide guidance — Make it maintainable — Provide a comfortable experience	— Provide safe and convenient active transportation access — Facilitate multimodal connections — Include adequate space for transit amenities — Facilitate transit efficiency — Design for all users — Create vibrant places	— Design for safe speeds — Set context-sensitive speed limits — Accommodate the needs of large vehicles — Consider induced demand when determining capacity — Optimize use of street space	— Prioritize vulnerable users — Balance comfort and convenience of all travel modes — Maximize visibility — Reduce turn speeds — Maintain consistency and foster predictable movements — Accommodate large vehicles appropriately
Edmonton Complete Streets Design Standards	User-specific design principles are not identified within the Edmonton Complete Streets Design Standards				— Make approaching, entering, and using an intersection easy for people walking and wheeling of all ages and abilities; — Provide streets and intersections that are both convenient and safe for all users, particularly those with mobility issues;

				— Emphasize dignity and independence, providing those features that will allow all people to function in their day-to-day activities; — Consider accessibility in all seasons and conditions; and — Be successfully integrated with an intersection's function and form.
Boston Complete Streets Guidelines	— Accessible to all — All-weather access — Vibrant walking environment — Ease of maintenance — Intelligent systems — Stormwater management — Efficient technologies	— Road diets, lane diets, and the consideration or removal of on-street parking should be considered in order to provide adequate space for bicycle facilities — The potential hazard of opening car doors should be considered when developing appropriate designs for bicycle facilities — Coloured pavement should be considered to increase awareness of bicycle facilities at curbside locations, beginning of block segments, and through intersections — Roadways should be designed to provide the most direct and appropriate bicycle route, and minimize convoluted or out-of-way routing — Where possible, the installation of bicycle facilities should be coupled with an evaluation of pavement conditions and improvements to ensure smooth riding surfaces	— Multimodal — Smart — Green	— Accessible for all — Ease of maintenance — Reclaiming space — Minimum signal cycle lengths — Traffic controls — Reduce clutter — Balancing users' needs — Emissions reductions — Smart tags — All-weather access — Stormwater management — Obeying the law — Sensors

Table 7: *Complete Streets Principles by User Group*

3.2 Comparison & Highlights

The five jurisdictional documents reviewed identified a number of common themes and design principles. The following section summarizes three key principles related to each user group. This is intended to provide a high-level summary of design principles that should be considered moving forward with the development of the CLB Streets Design Manual.

Pedestrian Design Principles

Three key pedestrian design principles were identified:

1. Prioritize the safety of pedestrians;
2. Ensure that pedestrian facilities are accessible to all; and
3. Create vibrant and comfortable pedestrian environments.

The plans displayed an overwhelming focus on ensuring that the safety of pedestrian is prioritized above all design principles. This is due to pedestrians being the most vulnerable road users, particularly pedestrians with disabilities. Ensuring that all pedestrian facilities — regardless of the location or street typological context — prioritize safety and ensures access to all is paramount. The creation of vibrant and comfortable environments reinforces pedestrian safety and access, and welcomes users to these spaces.

Cyclist Design Principles

Three key cycling design principles were identified:

1. Apply context-sensitive facilities on streets;
2. Ensure cycling facilities are direct, intuitive, and comfortable; and
3. Provide continuity in the network and sufficient user guidance.

The key design principles relevant to cyclists focused on developing cycling networks that are well thought out, with context-sensitive cycling facilities that connect with one another to form an integrated network. Continuity was identified as a recurring key design principle as municipalities seek to fill gaps in their respective cycling networks.

Transit Design Principles

Three key transit design principles were identified:

1. Provide safe and comfortable access to transit facilities;
2. Accommodate multi-modal travel (e.g. bike parking at transit stops); and
3. Facilitate transit efficiency by providing transit vehicles with priority access.

The key design principles that relate to transit touch on those related to pedestrian and cycling design. The transit user design principles focus on ensuring that transit stops are safe to travel to and from, as

well as comfortable and inviting while waiting for the transit vehicle to arrive. Transit stops should focus on enabling multi-modal trips, such as through the provision of bicycle parking at transit stop locations or ensuring that connecting routes are located in a manner that accommodates convenient and intuitive transfers. Where feasible, physical interventions should be explored, such as adding bus queue jump lanes at intersections or dedicated priority lanes along busy corridors.

Motor Vehicle Design Principles

Three key motor vehicle design principles were identified:

1. Select appropriate design speeds when designing a roadway;
2. Consider induced demand when determining vehicular capacity; and
3. Implement context-sensitive speed limits that reflect the surrounding built form and land uses.

A key takeaway from the review of motor vehicle design principles is that practitioners should carefully select an appropriate design speed prior to design and construction of a roadway. This in turn, will influence the posted speed limit. For existing roadways not undergoing reconstruction, design practitioners should set speed limits that are context-sensitive, reflecting the surrounding land uses and user groups that are using that roadway. Induced demand was identified as a key consideration, as decisions around adding vehicular capacity to a corridor have direct implications on inducing vehicular demand and potentially detracting from shifting demand to other modes of travel.

Intersection Design Principles

Three key principles related to intersection design were identified:

1. Ensuring that pedestrian facilities are accessible to all;
2. Prioritizing the safety of pedestrians; and
3. Creating vibrant and comfortable pedestrian environments.

The final design principles focused on those relating to intersections and intersection design. The recurring themes and key design principles identified as part of the jurisdictional scan highlighted a significant amount of overlap with the design principles identified for the other user groups, namely pedestrians and cyclists. Intersections represent a potential point of conflict for all road users, particularly vulnerable road users such as pedestrians and cyclists. As such, intersection design must prioritize the safety of pedestrians and cyclists, ensuring that intersections are accessible to all. The use of technology at intersections was also identified as a key design principle, with intersections giving municipalities the opportunity to enhance other modes of travel such as transit, through the use of transit signal priority technology. Another example is the use of cameras to count and monitor intersections in real time, allowing for real-time information to be provided to departments overseeing the broader transportation network.

4 Conclusions and Next Steps

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

4.1 Key Outcomes

The Background Review & Jurisdictional Scan has highlighted the City's progress-to-date in framing CLB Streets on its roadways. While CLB Streets have yet to be implemented, the City has published high-level planning documents and background reports that identify a need for CLB Streets and a means to implement them moving forward. The need for a CLB Streets Design Manual that is catered to the Hamilton transportation context has been recognized as paramount to the success of designing, implementing, and maintaining the City's proposed CLB Streets typologies. The Hamilton CLB Streets Design Manual project reflects the City's commitment to developing the tools and guidance necessary to enact its Complete Streets vision.

4.2 Next Steps

With a number of City policies and plans having been reviewed, as well as a jurisdictional scan of sample complete streets guidelines, a foundation has been established to guide in the development of the CLB Streets Design Manual. However, a number of questions will need to be answered moving forward, including:

- What roadways does the CLB Streets Design Manual apply to?
- What type of projects are eligible for CLB Streets design?
- What are barriers to implementing CLB Streets in Hamilton?
- What groups must be consulted prior to implementing a CLB Streets project?
- What type of roadway modifications are permitted when implementing CLB Streets design into road rehabilitation or reconstruction projects?

Answering these questions in Phase 1 is critical to understanding how best to proceed with the development of the CLB Streets Design Manual, ensuring that all recommendations can be implemented in a context-sensitive manner and in keeping with the broader Hamilton policy landscape.