Background Report:

Street (One- to Two-Way) Conversions

Hamilton

CITY OF HAMILTON
TRANSPORTATION MASTER PLAN
REVIEW AND UPDATE

Street (One-Way to Two-Way) Conversion Policy Paper

1.0 Introduction

The issue of street conversions (converting from one-way to two-way traffic operations) has been an on-going community conversation piece in Hamilton since the mass adoption of one-way streets in 1956. Over the past two decades, requests and plans have been developed to change streets back to two-way operation. Some street conversions were recommended in the approved 2001 Downtown Transportation Master Plan (DTMP) and its 2006 review and update. Many of these conversions have now been implemented. In some cases, conversions have been delayed to take advantage of or align with reconstruction projects and other capital works. In other cases, conversions have been made without policy direction or decision-making process.

This policy paper identifies the approach to address street conversion requests, where no Council approved sub-area (neighbourhood) plan has been approved. This approach is a subset of the Complete-Livable-Better (CLB) Streets Policy and Framework identified as part of the TMP review and update.

The CLB Streets approach and associated policy directions and inputs such as the Pedestrian Mobility Plan and Healthy-by-Design can take several forms and does not necessarily reflect a “one-design-fits-all” outcome. The CLB Street approach advocates that streets be designed and operated to balance the competing needs of all road users regardless of age, ability and income. It also suggests that streets can be either one-way or two-way as long as the desired outcomes improve livability within the community.

The outcome is intended to result in a safer, more active environment and provide for a more livable local community. For example, increasing safety and walkability for transit users in particular has been highlighted as an important part of increasing transit ridership. As a whole, the CLB streets policies are aimed at raising the profile of other modes relative to the automobile and attaining health, social, economic, and environmental benefits through a more balanced approach to mobility.

In 2012, the City hosted a Complete Streets Transportation Summit. As a result of the summit, a number of community organizations are carrying on with their own community engagement efforts, review and analysis of possible improvements to roads within their communities, including intersection and mid-block crossing facilities and one-way to two-way street traffic conversion concepts. The desire to support vibrant and livable local communities and maximize benefits for retail/commercial areas were highlighted as key considerations in regard to street conversions, traffic calming and enhanced walkability. These issues have been carried forward for consideration as part of this policy paper.

2.0 Overview/Background

The history of one-way and two-way streets in Hamilton can generally be broken down into six major time periods:

- **1924**: Birth of one-way streets along north-south sections between Main Street and King Street and between King Street and King William Street.
- **1940s to early 1950s**: Post-war boom and increase in automobile use and associate traffic concerns leading to road expansion, parking restrictions and introduction of Walnut Street one-way street between King Street and King William Street, as well as identification of the need to plan for automobile growth.
- **1956 to 1957**: With increase traffic concerns, the City retained Wilbur Smith and Associates to develop a *Traffic and Transportation Plan for Hamilton, Ontario*[1]. The conversion of arterials in the central business district to one-way operation gained the most attention and changed the transportation landscape for the next 50+ years. The original plan is illustrated in Figure 1.
- **Late 1950s and the 1960s**: Once the expanded one-way system was implemented, the on-going community debate between improved traffic flow and impacts on businesses, pedestrians and parking ensued. Despite opposition, expansion of the system continued.
- **1990s to 2000s**: A paradigm shift in transportation planning and role and function of downtowns occurred during this period. During the late 1990's the Downtown Secondary Plan entitled *Putting People First: The New Land Use Plan for Downtown Hamilton* and the Downtown Transportation Master Plan was launched. Included in this plan was the conversion of several streets back to their original two-way form, the first of which were James Street and John Street. In addition, a number of other sub-area (neighbourhood) traffic management plans also identified the conversion of one-way streets back to two-way streets in their respective neighbourhoods. An example of this was the Hess Street and Caroline conversions recommended as part of the Durand Neighbourhood Traffic Management Plan.
- **Present Day**: Despite progress in the implementation of street conversions, there have been recent requests to accelerate the implementation of remaining conversions within Council approved plans, plus some additional conversions not within approved plans. Overlaid on these requests is the movement to advance Complete-Livable-Better streets.

Over the years, there have been various surveys and opinion polls on the topic of street conversions by media outlets and community groups. More recently, a 2012 opinion telephone survey[2] of 400 residents conducted by the Canadian Automobile Association of South Central Ontario indicated that approximately 54% of respondents were supportive of the conversion of north-south streets, while 57% were not supportive of the conversion of east-west streets such as Main Street. The majority of reasons cited by respondents of this survey for not supporting changes were emotional as opposed to safety or financially based.

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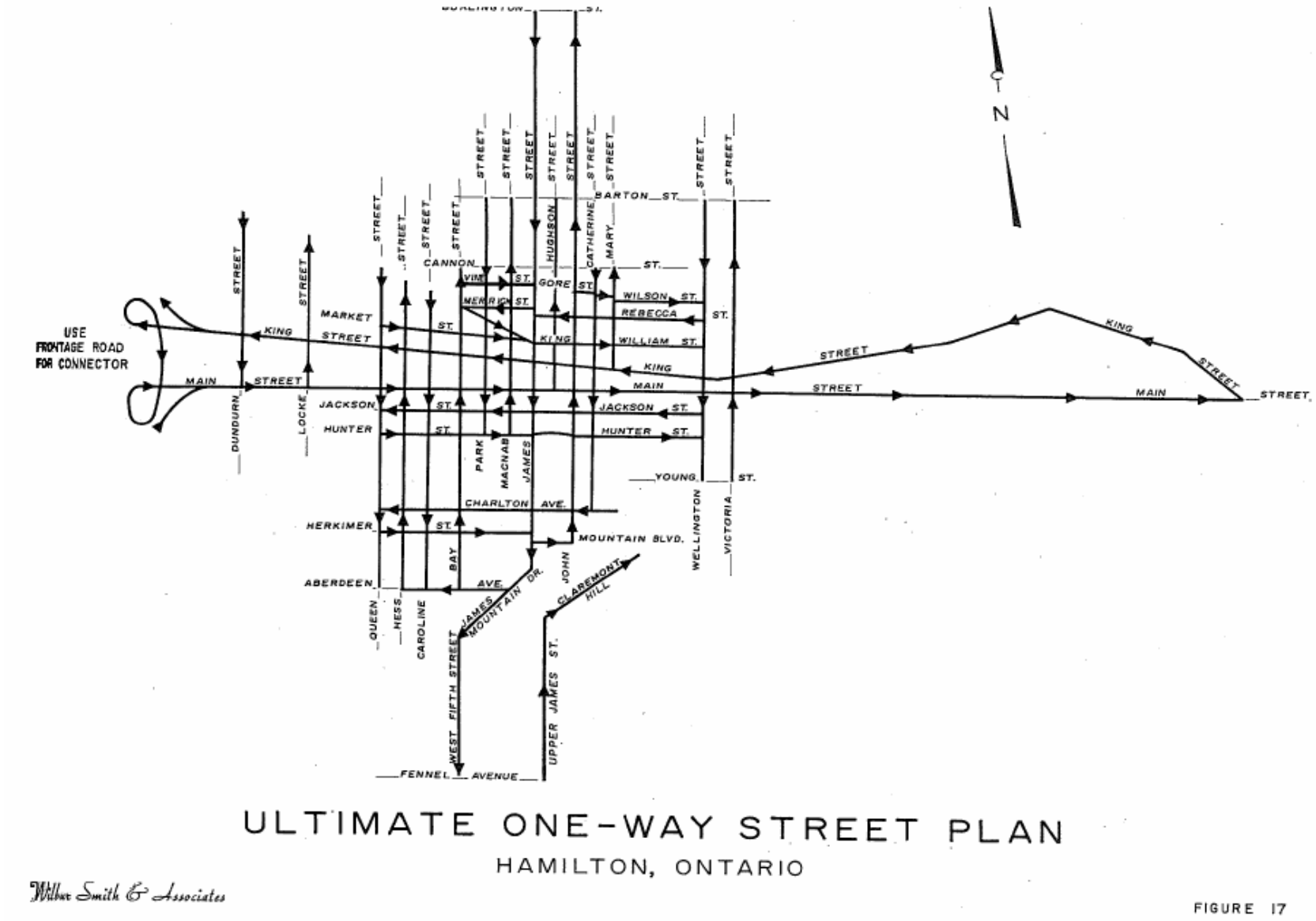
[1] Wilbur Smith and Associates (1956) "Traffic and Transportation Plan for Hamilton, Ontario" can be accessed at the City of Hamilton's Central Library, Local and History Archives Collection. One-way streets are discussed in Part III – Operational Improvements

[2] Note: The margin of error for 400 interviews is +/- 5 percent

Figure 1: Original One-way Street Network in *Traffic and Transportation Plan for Hamilton, Ontario* (1956)



The two streets that remain the most discussed in the City are Main and King Streets. The alignment of the B-line Light Rail Transit (LRT) along King Street will significantly change King Street with a majority of the corridor being converted back to two-way. As part of the TMP review and update, a high level review of Main Street was undertaken.

2.1 Sensitivity Modelling

As part of the assessment of alternatives for the future transportation system undertaken through the TMP review and update for the 2031 planning horizon, additional sensitivity scenarios were developed and examined at a high level. These scenarios primarily focussed on the impact of different options for a Main Street conversion, but also included the impacts if Hunter, Cannon, Hess and Queen Streets were also converted, as well as Sherman, Birch, and Sanford Avenues.

This high-level review based on the City's Travel Demand Model (EMME model) for the AM peak hour only was executed according to three scenario subsets specific to the impacts associated with Main Street, including the conversion of the following segments:

a. Paradise Road North to the Delta[3]
b. Queen Street North to the Delta
c. Wellington Street to the Delta

It is important to note that the configuration of the Highway 403 interchange ramps at King Street and at Main Street and the detailed impact analysis relating to the up- and downstream operations along the mainline and associated costs rely on consultation and coordination with MTO. Modelling results for scenarios a, and b indicate that from a traffic operations perspective, there would be segments of Main Street that would exceed capacity with potential implications for the operation of the ramps. Therefore, the feasibility of scenarios a, and b are not realistic for the foreseeable future. However, scenario c does identify potential opportunities to examine in more detail that could have transportation system benefits.

Further analysis should be inclusive of both the AM and PM peak periods to determine the full impacts of peak directional traffic operations. With the construction management planning association with the B-Line LRT project there is an opportunity to examine pre- and post-construction alternatives. The analysis should also include the proposed screening process identified in the following section to understanding the full impacts of the potential conversion.

3.0 Evaluation Process

Development of criteria and establishing a screening process will help provide decision-making transparency that aligns with the three desired outcomes of the TMP review and update: Sustainable and Balanced; Healthy and Safe Communities; and Economic Prosperity and Growth.

The decision-making process for converting one-way streets to two-way streets in Hamilton should be informed by a holistic evaluation that addresses not only

[3] The Delta is the location described as the intersection of Main Street East and King Street East at the easterly edge of Gage Park within the Delta Neighbourhood.

transportation considerations, but also matters such as: community liveability, street-oriented land use, and the quality and functionality of the pedestrian, cycling and transit environments.

This will enable street-specific, value-based evaluation, similar to the type of evaluation that would be carried out for Environmental Assessment (EA) road projects. It is important to note that criteria identified herein includes only those "distinguishing criteria", meaning criteria where there is likely to be a difference in rating between a one-way street and a two-way street. For example, the quality of sidewalk surfaces or streetscaping is not included, since those street design considerations are not dependent of the directional arrangement of the street.

As part of the TMP review and update public consultation process a survey was administered, which included a question regarding how people prioritize considerations for street conversions. Approximately 425 responses were received and indicated that considerations such as improved pedestrian experience, vehicle routing options, and road safety were valued higher than other elements such as improved transit routing, an improved cycling experience and business visibility. During the public information centres, there was an expressed desire by the public to know more about the impact of conversions and traffic calming on the overall network and whether additional road improvements would also be needed as a result of any conversions.

Decisions regarding one-way versus two-way streets need to be context sensitive and value-based, having regard for the shared community vision, planned road functions, and competing interests for the valued and often constrained right-of-way (ROW) of any given street.

3.1 Advantages and Disadvantages of One- and Two-Way Streets

Many municipalities with a one-way traffic operation network are reviewing this type of system to determine whether consideration should be given to conversions. For example, the City of Ottawa's Downtown Moves: Transforming Ottawa Streets[4] conducted an assessment relating to their downtown one-way street network. In addition, the Association of Commuter Transportation of Canada developed a discussion paper with a detailed assessment of advantages/disadvantages of one-way and two-way street networks relating to Ottawa's Downtown Moves study.[5] The opportunities and constraints highlighted in the Ottawa study are similar to points made in past and on-going discussions on the merits of one-way vs. two-way streets in Hamilton and are summarized below for the purpose of establishing policy direction.

[4] Downtown Moves: Transforming Ottawa Streets, City of Ottawa, 2013. https://documents.ottawa.ca/sites/default/files/documents/dm_draft_report_en_0.pdf

[5] One-way Street Conversion Discussion Paper, Association of Commuter Transportation, 2013. https://www.actcanada.com/docs/default-source/act-canada-summit-2013/one-way-street-conversion-discussion-paper.pdf?sfvrsn=2

From a transportation perspective, the advantages of two-way streets include:

- Decreased vehicle distances travelled: By eliminating indirect routes, the distances that vehicles are required to travel to reach a destination may be slightly lower (i.e., eliminate driving around the block).
    - Counterpoint: Similar behaviour can occur as drivers search for on-street parking spaces immediately adjacent to their destination; major parking facilities often provide multiple access/egress points efficiently serving a one-way street network.
- Slower travel speeds: With the additional friction resulting from two-way traffic operation, mid-block speeds are typically lower on two-way streets.
    - Counterpoint: Intersections are the critical points within the corridor, and any resulting congestion at intersections could adversely impact transit service reliability and the ability of emergency vehicles to respond to calls.
- Improved pedestrian (and cyclist) safety: With the foregoing lower travel speeds, pedestrians on the sidewalk (and cyclists within the travelled asphalt) may be considered safer.
    - Counterpoint: Appropriately designed sidewalks and on-road cycling facilities on one-way streets can help to enhance the pedestrian and cycling environment.

From a transportation planning perspective, the advantages of one-way streets are:

- Narrow street cross-section: A street can accommodate relatively high traffic volumes with only two travel lanes, given that turning movements can happen from one lane or the other. By comparison, a two-way street will need a wider, three (3) lane cross-section to accommodate a turning lane (otherwise traffic would come to standstill waiting for a single vehicle to turn). This wider cross-section would occur at intersections where pedestrian crosswalks would therefore be lengthened in the two-way scenario.
- Improved signal coordination: Coordination of traffic signals is more easily attained within an area such as downtown Ottawa where signals by necessity are closely spaced (i.e., short blocks). This results in improved traffic and bus transit flow with fewer stops, less idling, and lower emissions. Note that signal timing parameters (i.e., offsets) can be used to regulate travel speeds.
    - Counterpoint: Higher travel speeds for vehicles are the result of coordinated traffic signals, which is not considered conducive to a welcoming pedestrian environment and safe cycling.
- Increased capacity: The capacity of one-way streets can be approximately 10% to 20% greater than that of two-way streets. Increased capacity can translate into fewer lanes and fewer through streets within a one-way grid system, or alternatively, the option to reprogram any surplus capacity/

space for other purposes (i.e., dedicated parking lanes, bicycle lanes, wider sidewalks).
    - Counterpoint: None.

- Reduced congestion and delay: Congestion and delay is reduced for all modes, including pedestrians, vehicles and transit. Delay is often reduced as the cycle length can be much shorter with one-way streets. The extra phases to accommodate left-turn movements are unnecessary with one-way streets.
    - Counterpoint: The one-way system forces drivers to follow out of direction routes, and this recirculation results in an increase in traffic volume on a given segment or intersection within a one-way system.

- Improved pedestrian safety at intersections: The pedestrian has fewer directions to be concerned about at intersections involving one-way streets, and drivers have fewer potential conflicts to process (and can give more attention to pedestrian safety). Safety studies conducted from the 1930's to the 1970's of before and after conditions (as cities switched from two-way to one-way) consistently found that one-way streets had 10% to 20% lower accident rates than when previously two-way, and pedestrian accidents dropped by 30% to 60%.
    - Counterpoint: At intersections of two-streets that are each two-way, pedestrians have an expectation of potential vehicular conflicts with their path as they cross the intersection. These expectations can be different at the intersection of one-way streets, which may create a less safe pedestrian environment.

From an urban planning perspective, the advantages of two-way streets are:

- Creating Calmer Communities: By increasing the direction of vehicle access and range of vehicle turning movements to and from adjacent uses, and ultimately slowing vehicle travel speed, the impacts of vehicles on adjacent land uses is less. This is particularly important for residential neighbourhood streets in inner-city areas.

- Supporting Street-Oriented Land Uses: A two-way street supports street-oriented land uses by providing opportunities for on-street parking and passenger pick-ups (buses, taxis and service vehicles). It also supports the passenger side of vehicles along the street, and by "doubling" the visual exposure to signs serving businesses and institutions. This is particularly important to "main streets" and streets where street oriented retail and service businesses are encouraged.

3.2 Screening Procedure

In order to facilitate the technical review of future conversions of the remaining one-way streets in Hamilton, criteria were developed for inclusion in the TMP review and update to guide staff and Council in the decision-making process. It is preferred that street conversions be evaluated within the context of sub-area (neighbourhood) plans.

However, when directed by Council to evaluate specific streets, the following technical review should be undertaken:

Part 1: Develop design alternatives (based on street context and characteristics)
Part 2: Evaluate alternatives for all road users based on:

- Step 1: Transportation Operations
  - Routing (access) / Connectivity (for all modes of travel)
  - Travel time
  - Emergency response
- Step 2: Complete-Livable-Better streets / TMP review and update framework
  - Sustainable and balanced criteria
  - Healthy and safe communities criteria
  - Economic prosperity and growth criteria
- Step 3: Cost
  - Capital impacts
  - Operational impacts

3.3 Establishing Priorities

Once these outputs are attained, parameters for determining the priority that conversions (reversions) are implemented should be undertaken. Priorities should be aligned with the City's strategic plan vision and objectives, as well as the TMP review and update vision and goals. Priorities and the process in general should be integrated with continued public engagement and education of residents.

3.4 Preliminary Findings

Based on the evaluation process introduced above, a high-level review of the decision-making process was undertaken for one-way collector and arterial roadways, with the exception of Main and King Streets. Street conversions already approved by Council were also excluded. As discussed previously, potential King and Main conversions were evaluated under a different process given the City-wide implications. Local one-way streets were excluded from this preliminary evaluation since they have less of an impact on overall transportation system performance.

As more detail is inputted into the process, a refinement of the process should be undertaken. The process should be viewed as iterative and adapt as new information is identified. For example, major development proposals could influence needs and priorities. The preliminary list of street conversion priorities is provided below:

Rank	Street Name	From	To
1	Wilson Street	Victoria Street	Sherman Avenue
2	Birch Avenue	Burlington Street	Wilson Street
3	Catharine Street	Barton Street	Main Street
4	Queen Street	York Boulevard	Barton Street
5	Sanford Avenue	Delaware Avenue	Barton Street
6	Sherman Avenue	Burlington Street	Wilson Street

Rank	Street Name	From	To
7	Queen Street	Aberdeen Avenue	Main Street
8	Wellington Street	Main Street	Burlington Street
9	Victoria Street	Main Street	Barton Street

4.0 Supporting Policies and Actions

The Street (One- to Two-Way) Conversions policy theme developed as part of the TMP review and update includes policies and supporting actions. The policies are summarized below along with the associated supporting actions.

Policy:

Prioritize conversions based on Council approved planning and investment decisions, liveable community policy and design standards, and transportation needs of the community and the City-wide transportation system.

Supporting actions*:*

- Continue to monitor and refine the one- to two-way street conversion framework and develop a more detailed assessment tool to help inform decisions.
- Apply the decision-making framework and detailed assessment tool to implement street conversions based on prioritization.
- Identify neighbourhoods, planned developments or strategic investments that would benefit most from a conversion.
- Identify cost-recovery mechanisms from development to facilitate advancement of a street conversion (e.g., financial strategy in Secondary Plans).
- Perform before and after (post-construction and beyond) studies to identify impacts associated with change.
- Facilitate the implementation of street conversions previously approved by Council.
- Maintain an annual schedule of projects to be implemented and submit budgeting as part of capital planning process.
- Collaborate with various City departments to integrate existing plans and operational impacts associated with the conversion.
- Further refine and implement methodology to identify additional conversion candidates for council approval.

Policy:

Consider street conversions as a potential alternative within the context of Complete-Livable-Better streets evaluation.

Supporting actions*:*

- Include street conversions as a potential alternative in consideration of Complete-Livable-Better streets and the vision of individual streets.

List of Appendices

Appendix A: Street Conversion Criteria

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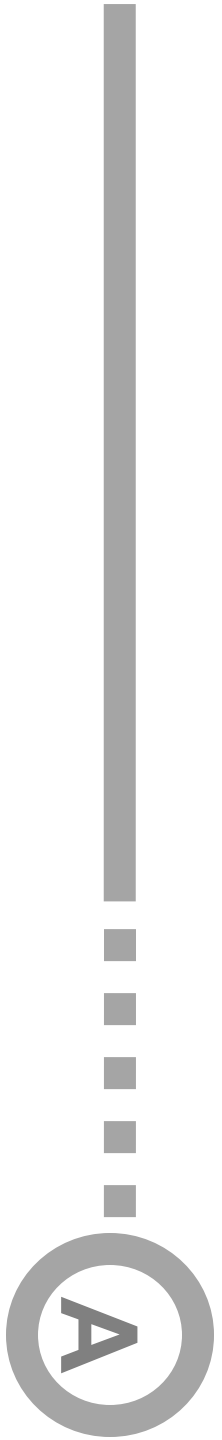

Appendix A

Street Conversion Criteria

Street name:			
Identify the conversion limits		From:	
		To:	
		Data Input	**Y/N**
Step 1: Information/Data Inputs	Traffic count information:	Intersection counts	
		Mid-block counts	
		Average daily traffic (ADT)	
	Identify street classification	Arterial	
		Collector	
		Local	
	Speed limit	Posted	
		85 percentile	
	Collisions	Intersection	
		Mid-block	
	Land use	Predominant use	
		Secondary use (if appropriate)	
	Transit service	Existing	
		Planned	
		Access to Higher-order transit	
	Sidewalks	Availability	
		Connectivity	
	Cycling	Existing/future bicycle route in CMP	
		Would be included in conversion	
		Availability	
		Connectivity	
		Type of facility proposed	
	Truck Route	Designated truck route in TRS	
	Traffic signals	Number of traffic signals/PXO/IPS	
	Pedestrian crossing locations		

Note:
CMP – Cycling Master Plan
IPS – Intersection Pedestrian Signal
PXO – Pedestrian Crossover
TRS – Truck Route Study

Street name:			
Identify the conversion limits		From:	
		To:	
		Data Input	**Y/N**
Step 2: Complete-Livable-Better Street Framework	**Sustainable and Balanced**	Road users comfort level	
		Directness of routing	
		Impact on potential for cut-through	
		Impact on travel time/delay	
		Impact on traffic signal progression	
		Impact on parking operations	
		i. Residential	
		ii. Business	
		Impact on adjacent streets	
		i. One-way couplet	
		ii. Cross streets	
		Impact on turning traffic	
		Impact on road maintenance operations	
		Impact on waste collection	
		Impact on winter control activities	
	Healthy and Safe Communities	Results in a healthier outcome/livability	
		Creates a calmer community	
		Impacts on pedestrian experience	
		Impacts on cycling experience	
		Impacts to emergency response	
		Improves access to area	
		Reduces noise/vibration	
		Improves air quality	
		Reduces risk of collisions	
		Reduces risk of injury	
	Economic Prosperity and Growth	Improved ease of access to land use and businesses	
		Increases business exposure	
		Improved goods movement	
		Improved loading/unloading	
		Improved development opportunities/viability	

Street name:			
Identify the conversion limits		From:	
		To:	
		Criteria	**Y/N**
Step 3: Cost	Capital cost		
	Operating cost		

Street name:			
Identify the conversion limits		From:	
		To:	
		Criteria	**Y/N**
Implementation Priority	Strategic Plan	Community Engagement	
		Economic Prosperity & Growth	
		Healthy & Safe Community	
		Clean & Green	
		Build Environment & Infrastructure	
		Culture & Diversity	
		People & Performance	
	City-wide TMP	Reduce reliance of single occupancy vehicles	
		Promotes accessibility	
		Improves options for active transportation	
		Improves efficiency of goods movement	
	Hamilton Road Safety Program	Improves environment for vulnerable road user	
		Reduces Distracted driver	
	Complete/Livable/Better Street (CLB)	Conversion represents CLB outcome	
		Improves street-oriented development	
	Provides to Transportation network	Conversion improves net benefit to network	
	Conversion approval	Previously approved by Council	
	Road reconstruction	Road scheduled for reconstruction	