Memo

To: Bryan Purins, C.E.T. – City of Hamilton

From: Ravi Bhim, Wood
Joseph Gowrie, Wood

Date: June 3, 2019

Project Ref: TPB186044

cc:

Re: **Ainslie Wood Neighbourhood Traffic Management Review – Identification of Alternatives Memo**

1. INTRODUCTION

The City of Hamilton is undertaking a Traffic Management Study for the Ainslie Wood neighbourhood area to identify and recommend potential transportation-related improvements that will benefit all road-users. The study will be completed as a Master Plan addressing Phases 1 and 2 of the Municipal Class Environmental Assessment (MCEA) process as shown in **Figure 1.** This study will follow Approach No. 2 of the Master Planning Process where the level of investigation, consultation and documentation are sufficient to fulfil the requirements of Schedule 'B' projects.

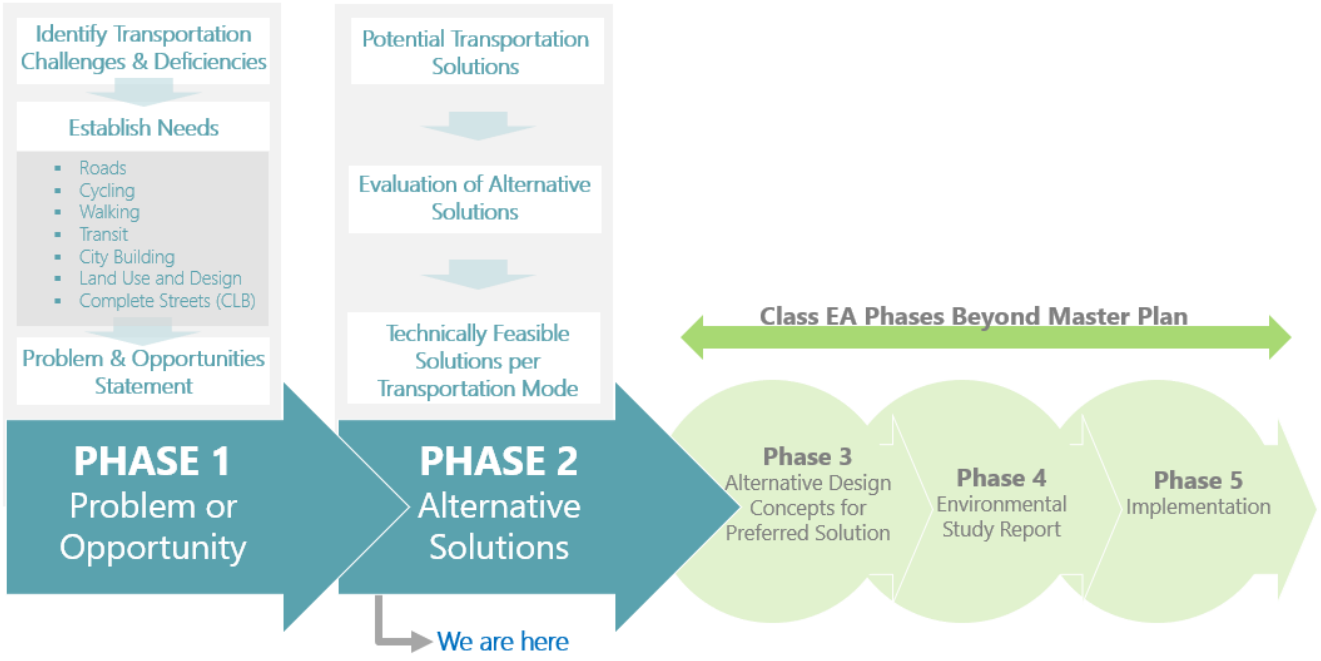


Figure 1: Municipal Class Environmental Assessment Process

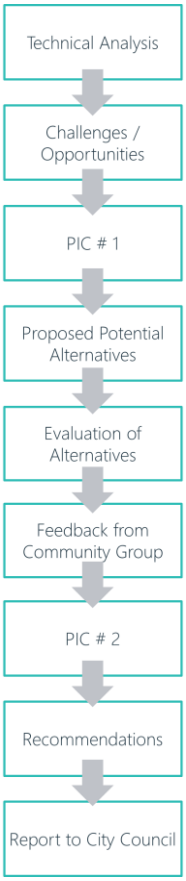
The purpose of this memorandum is to document the potential alternative solutions that were developed to address traffic challenges and opportunities identified in or from:

- *Existing Conditions Final Report*;
- *Future Conditions Report* (provided in **Appendix A**);
- Site observations; and,
- Input obtained from local residents.

The project team carried out an evaluation process to assess the feasibility of these alternatives including their potential advantages and disadvantages in supporting the study's transportation goals and objectives. Evaluation of alternatives criteria and methodology will be discussed and confirmed in consultation with City staff to ensure the process has captured the required quantifiable and qualitative criteria and recommendations are justified.

2. METHODOLOGY

The key steps in the study process is shown on the right. Transportation related challenges and opportunities were identified and documented in the Existing Condition Report (available under separate cover). Localized concerns were identified and reviewed based on technical analysis, field investigation and comments provided by local residents at the public information centre (PIC). The project team then synthesized all information for developing feasible potential alternatives for the Ainslie Wood neighbourhood.



The development of potential alternatives incorporates a multi-modal approach to ensure designs are context-sensitive and balance the needs of all mode user types. As a result, the following City guidelines and transportation demand management (TDM) strategies/policies were considered in developing potential improvements:

- Traffic Calming/Management Policy
- Complete Streets Design Guidelines
- Pedestrian Mobility Plan
- Strategic Road Safety Program with emphasis on intersections and vulnerable road users
- Neighbourhood Action Plans
- Vision Zero concept
- City Wide Transportation Master Plan
- Cycling Master Plan

A description of these guidelines and their relevance to the study area are discussed in the Planning Context Report.

3. IDENTIFIED CONCERNS AND POTENTIAL SOLUTIONS

During the first phase of this study, several residents and key stakeholders attended a Public Information Centre (PIC #1) on June 19, 2018 to identify their transportation challenges and opportunities for Ainslie Woods. In addition, several residents identified potential alternative solutions to address the community's transportation challenges. **Figure 2** is a location plan showing all the locations within the Ainslie Wood neighbourhood where either a problem or opportunity was identified through the project. These locations are referenced in the same manner in **Table 1**, that documents the proposed alternative solutions by location. As part of the City-wide traffic calming and management policy, the development of alternative solutions will reflect the principles and concepts of the *Complete Liveable Streets* design approach.

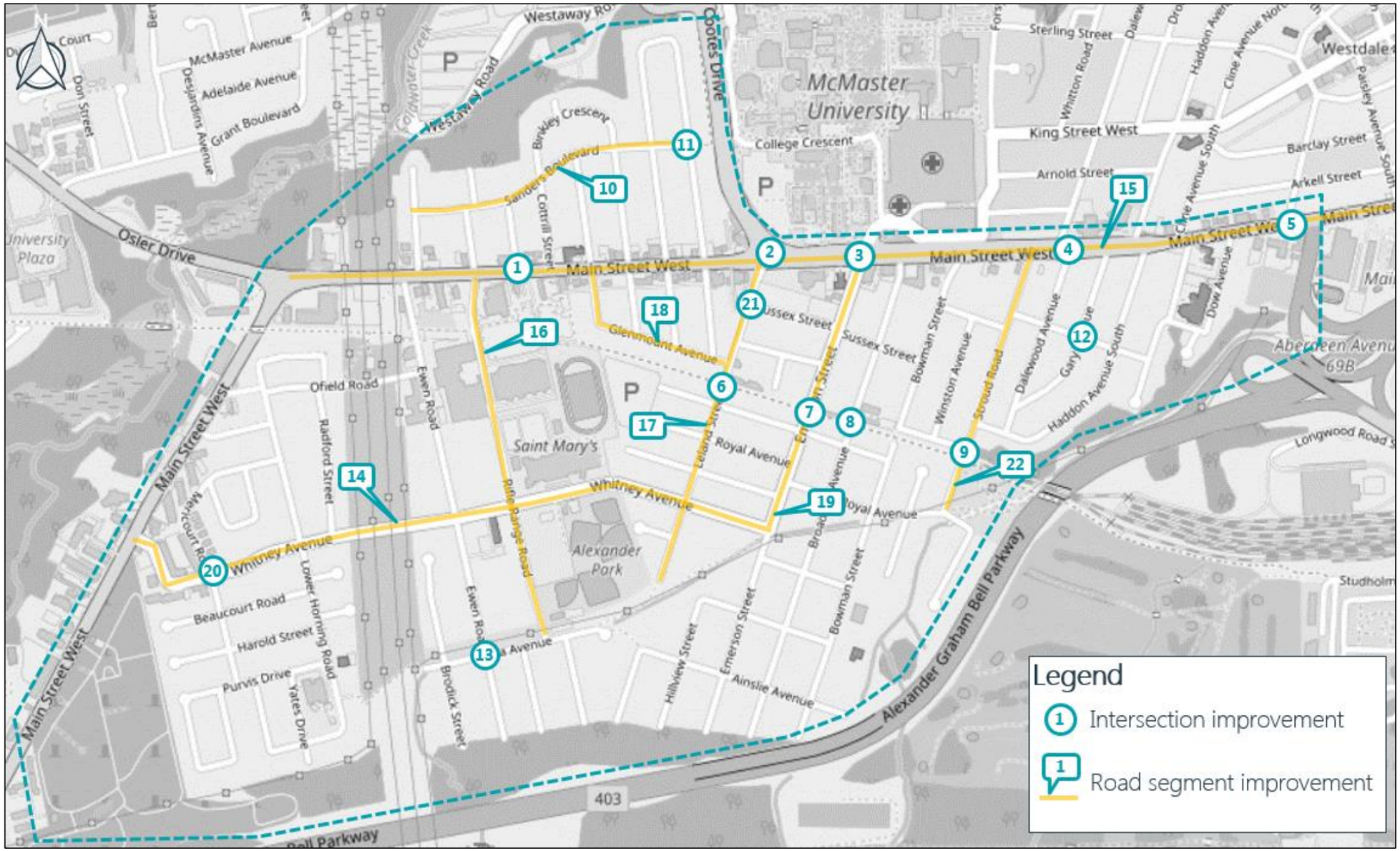


Figure 2: Locations of Identified Problems or Opportunities

Table 1 provides a description for each problem or opportunity that was identified within the neighbourhood and lists their potential alternative solutions.

Table 1: Issues and Potential Alternative Solutions

Reference No.	Location	Issue	Potential Alternative Solutions
General	Ainslie Wood	• Consider flashing all traffic lights in the neighbourhood at midnight. Many residents are unaware of what a flashing amber means. • Many people are not stopping or slowing down when the sign is flashing. • Consider implementing rumble strips on Ofield Road and Ewen Road. • Many cyclists that ride on the sidewalk do not stop at traffic signals. • Bus shelters in the neighbourhood have large advertising signs that block drivers view from someone waiting in the shelter.	--
1	Main Street & Binkley Road	• Fifty percent of collisions (or 4 out of 8) involved pedestrians; however, 2 out of 4 (50%) pedestrian-related collisions are associated with pedestrian crossing without right-of-way (note that this is a jogged intersection with no pedestrian crossing treatment on the west approach	• Monitoring of pedestrian crossing behaviour is required to determine if any mitigation measures are needed (i.e. increase in pedestrian related collisions).
2	Main Street & Cootes Drive	• Predominate impact types are rear-end (11 out of 27) and left-turns (8 out of 27). • WB right turn is channelized with a large radius resulting in high speed vehicles. Two uncontrolled pedestrian crossings exist (pedestrians must "wait for gap"). • PM Peak NBL operates at LOS F. Signal timing plan does not have a protected phase. Consider implementing one.	• Alter lane designation (convert EB Through-Left lane to just EB Left). • Higher order pedestrian crossing treatment.

Reference No.	Location	Issue	Potential Alternative Solutions
3	Main Street & Emerson Street	• Predominate impact types are rear-end (14 out of 26) followed by pedestrian (5 out of 26). • Potential illumination issues at Main Street and Emerson Street since all the pedestrian/vehicle collisions were recorded under dark conditions. • Unclear whether pedestrians or vehicles have ROW for channelized westbound right movement on Main Street West.	• Implement pedestrian signage. • Add crosswalk markings. • Improve street lighting.
4	Main Street & Dalewood Avenue	• Pedestrians walk down wide center median on Main Street to adjacent signal to the west. • Pedestrian crossing is unstriped at the north/west corner of the intersection. • Pavement marking and signage do not match. • During PM Peak, SB Left and SB Through movements operate with LOS F.	• Correct signage at location. • Add pavement markings. • Pedestrian barriers.
5	Main Street & Newton Avenue	• Predominant impact type is rear-end (8 of 19) followed by left-turn collisions (6 of 19). • Left turn collisions were caused by drivers making improper turns or lane changes along Main Street. Improper lane change could be attributed to vehicles using the centre-left-turn-lane for turning onto Newton Avenue.	• Implement turning restriction.
6	Leland Street @ Rail Trail	• Crosswalk marking requested along the Rail Trail to ensure cyclists and pedestrian safety at intersections.	• Implement pedestrian signage. • Add crosswalk markings.
7	Emerson Street @ Rail Trail	• Crosswalk marking requested along the Rail Trail to ensure cyclists and pedestrian safety at intersections.	• Implement pedestrian signage. • Add crosswalk markings.
8	Broadway Avenue @ Rail	• Crosswalk marking requested along the Rail Trail to ensure cyclists and pedestrian safety at intersections.	• Implement pedestrian signage. • Add crosswalk markings.
9	Stroud Road @ Rail Trail	• Crosswalk marking requested along the Rail Trail to ensure cyclists and pedestrian safety at intersections.	• Implement pedestrian signage. • Add crosswalk markings.

Reference No.	Location	Issue	Potential Alternative Solutions
10	Sanders Boulevard	• Speeding concern.	• Implement flexible bollards along centerline. • Implement flexible bollards between travel lane and bicycle lane. • Install speed monitoring system with real-time speed reporting. • Add East-West crosswalk markings.
11	Sanders Boulevard & Norfolk Street	• All-way stop request noted in Terms of Reference for project under "currently identified issues".	• Conduct all-way stop warrant.
12	Westwood Avenue & Gary Avenue	• All-way stop request noted in Terms of Reference for project under "currently identified issues".	• Conduct all-way stop warrant.
13	Iona Avenue & Ewen Road	• All-way stop request noted in Terms of Reference for project under "currently identified issues".	• Conduct all-way stop warrant.
14	Whitney Avenue	• Speeding concern.	• Implement flexible bollards along centerline. • Install speed monitoring system. • Implement geometric chicanes. • Implement speed humps. • Improve roadside lighting.
15	Main Street	• Speeding concern.	• Reduce speed limit.
16	Rifle Range Road	• Speeding concern. • Exhibits high N/S traffic demand due to connection with Main Street and high trip generators. An increase in traffic volumes in the morning has been noted by residents. Is an important connection between Main Street West and Whitney Avenue resulting in increased traffic in the morning?	• Implement flexible bollards along centerline. • Introduce speed monitoring system: Consider camera enforcement. • Implement speed humps.

Reference No.	Location	Issue	Potential Alternative Solutions
17	Leland Street	• Speeding concern.	• Implement flexible bollards along centerline. • Speed monitoring system. • Implement speed humps (installed 2018).
18	Glenmount Avenue	• Speeding concern.	• Implement flexible bollards along centerline. • Implement speed humps.
19	Emerson Street	• 63% of vehicles travelling faster than the speed limit in the school zone. Traffic calming measures may need to be considered. • Lack of visibility of Rail Trail from Emerson Street. • Trail from Emerson Street to Iona Avenue now floods every spring. It was previously heavily used and is now avoided. • Poor road condition, in need of repair.	• Introduce speed monitoring system: Install dynamic speed signs to raise awareness about motor vehicle speeds and consider camera enforcement.
20	Whitney Avenue & Mericourt Road	• All-way stop request noted in Terms of Reference for project under "currently identified issues". Also noted "to be installed in 2018".	• Conduct all-way stop warrant.
21	Sussex Street & Leland Street	• All-way stop request noted in Terms of Reference for project under "currently identified issues".	• Installed in 2018.
22	Stroud Street	• Speeding concern. Identified in the Terms of Reference for project under "currently identified issues".	• Implement flexible bollards along centerline. • Implement speed humps.

The alternatives identified in **Table 1** were evaluated using the evaluation criteria in **Table 2** in **Table 3**.

4. SCREENING CRITERIA

As part of a rigorous assessment to evaluate the potential solutions, the project team developed several criteria to gauge key differences and impacts amongst the alternatives.

In consultation with the City, a set of evaluation criteria and indicators that are reflective of local conditions and applicable to the study area are presented in **Table 2**.

Table 2: Evaluation Criteria and Indicators

Category	Criteria	Measures/Indicators
Technical	Change in Level of Transportation Service	• Improvements to Level of Service (LOS) and capacity (i.e. delay and volume/capacity ratios)
	Supportive of Sustainable Modes of Travel	• Supportive of other transportation modes (e.g. walking, cycling, carpooling, transit etc.) • Consistent with Pedestrian Mobility Plan (PMP), Cycling Master Plan (CMP), HSR Operations Plans, and Health-by-Design (Public Health)
	Efficiency of Using Existing Infrastructure	• Accommodating all modes of transportation within the confines of the existing transportation system (i.e. creation of complete streets within the limits of existing road right-of-ways)
	Safety	• Reflective of Hamilton Road Safety Program (i.e. safety, behaviors, enforcement levels, etc.) • Consistent with Vision Zero
Conformity with City's Direction / Policies	Compatibility with City Plans	• Consistency with City policy objectives included in the Transportation Master Plan (TMP) • Consistent with Complete, Liveable, Better (CLB) Streets concepts and elements
	Feasibility of Implementation	• General assessment of feasibility of implementation by the City • Constructability of features • Impact of features on other operations (e.g. winter control, emergency service response) • Compatibility with proposed LRT
Estimated Costs	Estimated Costs	• Estimated capital costs (discriminating implementation and maintenance costs) • Consideration of timing with other City projects/priorities to ensure efficiency in expenditures • Compatibility with budget planning process

5. EVALUATION OF ALTERNATIVES AND RECOMMENDATIONS

A data-driven approach was used to evaluate the proposed alternatives against the criteria established in **Section 4.** **Table 3** provides a summary of the evaluation for each recommended solution. Both the carried forward and screened-out alternatives were documented with clear justification and explanation as to the recommendation.

As there are many combinations of requested and/or potential improvements to address the deficiencies, an implementation plan was developed to identify the timing and phasing of implementing these improvement (short, medium and long-term solutions). The timeframe for implementation was established based on a number of factors including; capital budget, complexity of solutions, coordination efforts and neighbourhood consultation.

Additionally, transportation alternatives were proposed along Main Street based on existing conditions analysis findings and comments received from the local residents. Considering the future implementation of the Hamilton LRT; however, any medium to long-term recommendations along Main Street will likely be reviewed and revisited by the City when further studies on the LRT are being conducted.

For ease of review and the nature of traffic calming improvements, the like-type improvements are grouped and evaluated together in the table. This method allows a pragmatic implementation approach as it is more time-efficient and cost-effective to implement like-type improvements within the community simultaneously (e.g. road rehabilitation, signage installation, etc.). In addition, a single location may have been identified with multiple issues/opportunities and, as such, may appear in more than one location.

Table 3 - Ainslie Wood Neighbourhood Traffic Management Study Evaluation of Alternatives and Recommended Improvements

Type of Improvements	Locations	Location ID	Details	Evaluation Criteria: Change in Traffic Level of Service	Supportiveness of Other Transportation Modes	Efficiency of Use of Existing Infrastructure	Safety	Compatibility with City Plans	Implementation Feasibility	Estimated Costs	Recommendations	Implementation / Phasing Strategy
Legend	**All**			Significant Positive Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	Significantly improves the ability to use sustainable modes of transportation	Enhance the use of facility with no modification to existing infrastructure	Improves safety for all road users	Compatible	Very easy to implement (requires minimal resources/very short duration)	No Cost		
				Moderate Positive Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	Improves the ability to use sustainable modes of transportation	Enhance the use of facility with minor modification to existing infrastructure	Improves safety for some road users	--	Easy to implement (requires some technical resources/short duration)	Low Cost		
				No Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	No Change	No change to existing infrastructure	No Change	--	--	Medium Cost		
				Moderate Negative Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	More difficult to use sustainable modes of transportation	Requires minor modification to existing infrastructure with no direct enhancement of facility.	Increases the safety risks for some road users	--	Difficult to implement (requires some technical resources/long duration)	High Cost		
				Significant Negative Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	Significantly more difficult to use sustainable modes of transportation	Requires significant modification to existing infrastructurewith no direct enhancement of facility.	Increases the safety risks for all road users	Not Compatible	Very difficult to implement (requires significant technical resources/long duration)	Prohibitive Cost		
Implement Signage	Leland Street @ Rail Trail crossing	6	Add signage indicating trail crossing	No impact to Traffic Operations	Supports trail users (pedestrians and cyclists)	Enhance the use of trail crossing facility with minor modification to existing infrastructure. Requires purchasing and installing new signage. No new construction.	Improve safety of pedestrians, cyclists and motorists (i.e. motorists are aware of AT traffic using Rail Trail)	Compatible with Hamilton Recreational Trail Master Plan, Section 2.8.1 Minor and Major Roads ("consideration of signage along roadways in advance of crossing points to alert motoists of trail crossings")	Very Easy to implement. Add signs with "new" tab.	Low Cost	Carried Forward	Short Term (1-3 years)
				0.50	**0.75**	**0.75**	**1.00**	**1.00**	**1.00**	**0.75**	**0.82**	
	Emerson Street @ Rail Trail Crossing	7	Add signage indicating trail crossing	No impact to Traffic Operations	Supports trail users (pedestrians and cyclists)	Enhance the use of trail crossing facility with minor modification to existing infrastructure. Requires purchasing and installing new signage. No new construction.	Enhance the use of facility with minor modification to existing infrastructure. Requires purchasing and installing new signage. No new construction.	Compatible with Hamilton Recreational Trail Master Plan, Section 2.8.1 Minor and Major Roads ("consideration of signage along roadways in advance of crossing points to alert motoists of trail crossings")	Very Easy to implement. Add signs with "new" tab.	Low Cost	Carried Forward	Short Term (1-3 years)
				0.50	**0.75**	**0.75**	**1.00**	**1.00**	**1.00**	**0.75**	**0.82**	
	Broadway Avenue @ Rail Trail Crossing	8	Add signage indicating trail crossing	No impact to Traffic Operations	Supports trail users (pedestrians and cyclists)	Enhance the use of trail crossing facility with minor modification to existing infrastructure. Requires purchasing and installing new signage. No new construction.	Improve safety of pedestrians, cyclists and motorists (i.e. motorists are aware of AT traffic using Rail Trail)	Compatible with Hamilton Recreational Trail Master Plan, Section 2.8.1 Minor and Major Roads ("consideration of signage along roadways in advance of crossing points to alert motoists of trail crossinas")	Very Easy to implement. Add signs with "new" tab.	Low Cost	Carried Forward	Short Term (1-3 years)
				0.50	**0.75**	**0.75**	**1.00**	**1.00**	**1.00**	**0.75**	**0.82**	
	Stroud Road @ Rail Trail Crossing	9	Add signage indicating trail crossing	No impact to Traffic Operations	Supports trail users (pedestrians and cyclists)	Enhance the use of trail crossing facility with minor modification to existing infrastructure. Requires purchasing and installing new signage. No new construction.	Improve safety of pedestrians, cyclists and motorists (i.e. motorists are aware of AT traffic using Rail Trail)	Compatible with Hamilton Recreational Trail Master Plan, Section 2.8.1 Minor and Major Roads ("consideration of signage along roadways in advance of crossing points to alert motoists of trail crossings")	Very Easy to implement. Add signs with "new" tab.	Low Cost	Carried Forward	Short Term (1-3 years)
				0.50	**0.75**	**0.75**	**1.00**	**1.00**	**1.00**	**0.75**	**0.82**	

Table 3 - Ainslie Wood Neighbourhood Traffic Management Study Evaluation of Alternatives and Recommended Improvements

				Evaluation Criteria								
Type of Improvements	**Locations**	**Location ID**	**Details**	**Change in Traffic Level of Service**	**Supportiveness of Other Transportation Modes**	**Efficiency of Use of Existing Infrastructure**	**Safety**	**Compatibility with City Plans**	**Implementation Feasibility**	**Estimated Costs**	**Recommendations**	**Implementation / Phasing Strategy**
Legend	**All**			Significant Positive Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	Significantly improves the ability to use sustainable modes of transportation	Enhance the use of facility with no modification to existing infrastructure	Improves safety for all road users	Compatible	Very easy to implement (requires minimal resources/very short duration)	No Cost		
				Moderate Positive Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	Improves the ability to use sustainable modes of transportation	Enhance the use of facility with minor modification to existing infrastructure	Improves safety for some road users	--	Easy to implement (requires some technical resources/short duration)	Low Cost		
				No Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	No Change	No change to existing infrastructure	No Change	--	--	Medium Cost		
				Moderate Negative Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	More difficult to use sustainable modes of transportation	Requires minor modification to existing infrastructure with no direct enhancement of facility.	Increases the safety risks for some road users	--	Difficult to implement (requires some technical resources/long duration)	High Cost		
				Significant Negative Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	Significantly more difficult to use sustainable modes of transportation	Requires significant modification to existing infrastructurewith no direct enhancement of facility.	Increases the safety risks for all road users	Not Compatible	Very difficult to implement (requires significant technical resources/long duration)	Prohibitive Cost		
Add Crosswalk Markings	Leland Street @ Rail Trail crossing	6	Add crosswalk markings at Rail Trail crossing to improve visibility	No impact to Traffic Operations 	Supports trail users (pedestrians and cyclists) 	Enhance the use of trail crossing facility with minor modification to existing infrastructure (painted crosswalk marking) 	Potential to improve safety of trail users by making them more visible while crossing. May add confusion regarding who has ROW (trail users have stop signs while vehicles are not required to stop). 	Not compatible with Hamilton Recreational Trail Master Plan Section 2.8.1 Minor and Major Roads ("pavement markings, to delineate crossings. Should not be considered at uncontrolled trail road intersections as users are required to wait for traffic gaps before crossing these locations to avoid a false sense of security") 	Very Easy to implement. 	Low Cost 	Carried Forward	Short Term (1-3 years) Funding can be allocated from "Minor Rehab" in City's Budget for 2019-2027
				0.50	**0.75**	**0.75**	**0.50**	**0.00**	**1.00**	**0.75**	**0.61**	
	Emerson Street @ Rail Trail Crossing	7	Add crosswalk markings at Rail Trail crossing to improve visibility	No impact to Traffic Operations 	Supports trail users (pedestrians and cyclists) 	Enhance the use of trail crossing facility with minor modification to existing infrastructure (painted crosswalk marking) 	Potential to improve safety of trail users by making them more visible while crossing. May add confusion regarding who has ROW (trail users have stop signs while vehicles are not required to stop). 	Not compatible with Hamilton Recreational Trail Master Plan Section 2.8.1 Minor and Major Roads ("pavement markings, to delineate crossings. Should not be considered at uncontrolled trail road intersections as users are required to wait for traffic gaps before crossing these locations to avoid a false sense of security") 	Very Easy to implement. 	Low Cost 	Carried Forward	Short Term (1-3 years) Funding can be allocated from "Minor Rehab" in City's Budget for 2019-2027
				0.50	**0.75**	**0.75**	**0.50**	**0.00**	**1.00**	**0.75**	**0.61**	
	Broadway Avenue @ Rail Trail Crossing	8	Add crosswalk markings at Rail Trail crossing to improve visibility	No impact to Traffic Operations 	Supports trail users (pedestrians and cyclists) 	Enhance the use of trail crossing facility with minor modification to existing infrastructure (painted crosswalk marking) 	Potential to improve safety of trail users by making them more visible while crossing. May add confusion regarding who has ROW (trail users have stop signs while vehicles are not required to stop). 	Not compatible with Hamilton Recreational Trail Master Plan Section 2.8.1 Minor and Major Roads ("pavement markings, to delineate crossings. Should not be considered at uncontrolled trail road intersections as users are required to wait for traffic gaps before crossing these locations to avoid a false sense of security") 	Very Easy to implement. 	Low Cost 	Carried Forward	Short Term (1-3 years) Funding can be allocated from "Minor Rehab" in City's Budget for 2019-2027
				0.50	**0.75**	**0.75**	**0.50**	**0.00**	**1.00**	**0.75**	**0.61**	

Table 3 - Ainslie Wood Neighbourhood Traffic Management Study Evaluation of Alternatives and Recommended Improvements

Type of Improvements	Locations	Location ID	Details	Evaluation Criteria: Change in Traffic Level of Service	Supportiveness of Other Transportation Modes	Efficiency of Use of Existing Infrastructure	Safety	Compatibility with City Plans	Implementation Feasibility	Estimated Costs	Recommendations	Implementation / Phasing Strategy
Legend	**All**			Significant Positive Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	Significantly improves the ability to use sustainable modes of transportation	Enhance the use of facility with no modification to existing infrastructure	Improves safety for all road users	Compatible	Very easy to implement (requires minimal resources/very short duration)	No Cost		
				Moderate Positive Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	Improves the ability to use sustainable modes of transportation	Enhance the use of facility with minor modification to existing infrastructure	Improves safety for some road users	--	Easy to implement (requires some technical resources/short duration)	Low Cost		
				No Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	No Change	No change to existing infrastructure	No Change	--	--	Medium Cost		
				Moderate Negative Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	More difficult to use sustainable modes of transportation	Requires minor modification to existing infrastructure with no direct enhancement of facility.	Increases the safety risks for some road users	--	Difficult to implement (requires some technical resources/long duration)	High Cost		
				Significant Negative Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	Significantly more difficult to use sustainable modes of transportation	Requires significant modification to existing infrastructurewith no direct enhancement of facility.	Increases the safety risks for all road users	Not Compatible	Very difficult to implement (requires significant technical resources/long duration)	Prohibitive Cost		
Add Crosswalk Markings	Stroud Road @ Rail Trail Crossing	9	Add crosswalk markings at Rail Trail crossing to improve visibility	No impact to Traffic Operations 	Supports trail users (pedestrians and cyclists) 	Enhance the use of trail crossing facility with minor modification to existing infrastructure (painted crosswalk marking) 	Potential to improve safety of trail users by making them more visible while crossing. May add confusion regarding who has ROW (trail users have stop signs while vehicles are not required to stop). 	Not compatible with Hamilton Recreational Trail Master Plan Section 2.8.1 Minor and Major Roads ("pavement markings, to delineate crossings. Should not be considered at uncontrolled trail road intersections as users are required to wait for traffic gaps before crossing these locations to avoid a false sense of security") 	Very Easy to implement. 	Low Cost 	Carried Forward	Short Term (1-3 years) Funding can be allocated from "Minor Rehab" in City's Budget for 2019-2027
				0.50	**0.75**	**0.75**	**0.50**	**0.00**	**1.00**	**1.00**	**0.64**	
	Sanders Boulevard	10	Add EB/WB crosswalk markings	No impact to Traffic Operations 	Supports pedestrians - all vehicles required to stop therefore pedestrians free to walk 	Enhance the use of facility with minor modification to existing infrastructure (painted crosswalk marking) 	Improve safety for pedestrians by making them / the crossing more visible to motorists (more likely their ROW will be respected/noticed). 	Protects for pedestrian safety by increasing vibility of crosswalk, promotes healthy and safe communities as described in the 2018 TMP Update. 	Very Easy to implement. 	Low Cost 	Carried Forward	Short Term (1-3 years) Funding can be allocated from "Minor Rehab" in City's Budget for 2019-2027
				0.50	**1.00**	**0.75**	**0.75**	**1.00**	**1.00**	**0.75**	**0.82**	
All-Way Stop Control	Sanders Boulevard & Norfolk Street	11	AWSC Request in ToR - not warranted according to Hamilton Policy	Moderate Negative Impact. Currently TWSC (3 leg intersection). No change in LOS (A to A) and decrease in delay from 7.7 s to 7.0 s during the AM peak. No change in LOS (A to A) and increase in delay from 7.4 s to 8.5 s during the PM 	Supports pedestrians - all vehicles required to stop therefore pedestrians free to walk 	Minimal change to existing infrastructure. Requires purchasing and installing new signage. No new construction. 	Improves safety for pedestrians by giving them opportunity for ROW. Potential reduction of 43% in vehicle/pedestrian collisions and 75% in angled vehicular crashes. 	Protects for pedestrian safety by providing for extra opportunity for pedestrian right of way at crosswalk. Promotes healthy and safe communities as described in the 2018 TMP Update. 	Very easy to Implement. Will require signs with "new" tab to alert drivers to new all-way stop. 	Low Cost, requires two new stop signs and signage indicating "new" all-way stop controlled 	Screened Out	
				0.25	**1.00**	**0.50**	**0.75**	**1.00**	**1.00**	**0.75**	**0.75**	
	Westwood Avenue & Gary Avenue	12	AWSC Request in ToR - not warranted according to Hamilton Policy	Moderate Negative Impact. Currently TWSC. No change in LOS (A to A) and decrease in delay from 8.2 s to 7.2 s in the AM peak. No change in LOS (A to A) and decrease in delay from 8.4 s to 7.2 s in the AM peak. 	Supports pedestrians - all vehicles required to stop therefore pedestrians free to walk 	Minimal change to existing infrastructure. Requires purchasing and installing new signage. No new construction. 	Improves safety for pedestrians by giving them opportunity for ROW. Potential reduction of 43% in vehicle/pedestrian collisions and 75% in angled vehicular crashes. 	Protects for pedestrian safety by providing for extra opportunity for pedestrian right of way at crosswalk. Promotes healthy and safe communities as described in the 2018 TMP Update. 	Very easy to Implement. Will require signs with "new" tab to alert drivers to new all-way stop. 	Low Cost, requires two new stop signs and signage indicating "new" all-way stop controlled 	Screened Out	
				0.25	**1.00**	**0.50**	**0.75**	**1.00**	**1.00**	**0.75**	**0.75**	

Table 3 - Ainslie Wood Neighbourhood Traffic Management Study Evaluation of Alternatives and Recommended Improvements

Type of Improvements	Locations	Location ID	Details	Evaluation Criteria: Change in Traffic Level of Service	Supportiveness of Other Transportation Modes	Efficiency of Use of Existing Infrastructure	Safety	Compatibility with City Plans	Implementation Feasibility	Estimated Costs	Recommendations	Implementation / Phasing Strategy
Legend	**All**			Significant Positive Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	Significantly improves the ability to use sustainable modes of transportation	Enhance the use of facility with no modification to existing infrastructure	Improves safety for all road users	Compatible	Very easy to implement (requires minimal resources/very short duration)	No Cost		
				Moderate Positive Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	Improves the ability to use sustainable modes of transportation	Enhance the use of facility with minor modification to existing infrastructure	Improves safety for some road users	--	Easy to implement (requires some technical resources/short duration)	Low Cost		
				No Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	No Change	No change to existing infrastructure	No Change	--	--	Medium Cost		
				Moderate Negative Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	More difficult to use sustainable modes of transportation	Requires minor modification to existing infrastructure with no direct enhancement of facility.	Increases the safety risks for some road users	--	Difficult to implement (requires some technical resources/long duration)	High Cost		
				Significant Negative Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	Significantly more difficult to use sustainable modes of transportation	Requires significant modification to existing infrastructurewith no direct enhancement of facility.	Increases the safety risks for all road users	Not Compatible	Very difficult to implement (requires significant technical resources/long duration)	Prohibitive Cost		
All-Way Stop Control	Ewen Road & Iona Avenue	13	AWSC Request in ToR - not warranted according to Hamilton Policy	Moderate Negative Impact. Currently TWSC. No change in LOS (A to A) and increase in Delay from 5.5 s to 7 s in the AM peak. No change in LOS (A to A) and increase in delay from 5.8 s to 7.0 s in the PM peak. 	Supports pedestrians - all vehicles required to stop therefore pedestrians free to walk. 10 pedestrians use this intersection during the AM peak while 7 pedestrians use it during the PM peak. 	Minimal change to existing infrastructure. Requires purchasing and installing new signage. No new construction. 	Improves safety for pedestrians by giving them opportunity for ROW. Potential reduction of 43% in vehicle/pedestrian collisions and 75% in angled vehicular crashes. 	Protects for pedestrian safety by providing for extra opportunity for pedestrian right of way at crosswalk. Promotes healthy and safe communities as described in the 2018 TMP Update. 	Very easy to Implement. Will require signs with "new" tab to alert drivers to new all-way stop. 	Low Cost, requires two new stop signs and signage indicating "new" all-way stop controlled 	Screened Out	
				0.25	**1.00**	**0.50**	**0.75**	**1.00**	**1.00**	**0.75**	**0.75**	
	Whitney Avenue & Mericourt Road	20	AWSC Request in ToR - planned to be implemented in 2018	Moderate Negative Impact. Currently TWSC. No change in LOS (A to A) and increase in delay from 1 s to 9 s in the AM peak. No change in LOS (A to A) and decrease in delay from 1.9 s to 8.5 s in the PM peak. 	Supports pedestrians - all vehicles required to stop therefore pedestrians free to walk. 47 pedestrians use this intersection during the AM peak while 27 pedestrians use it during the PM peak. 	Minimal change to existing infrastructure. Requires purchasing and installing new signage. No new construction. 	Improves safety for pedestrians by giving them opportunity for ROW. Potential reduction of 43% in vehicle/pedestrian collisions and 75% in angled vehicular crashes. 2 collisions recorded in the last 5 years. 	Protects for pedestrian safety by providing for extra opportunity for pedestrian right of way at crosswalk. Promotes healthy and safe communities as described in the 2018 TMP Update. 	Very easy to Implement. Will require signs with "new" tab to alert drivers to new all-way stop. 	Medium Cost, requires four new stop signs (two each for NB and SB) and signage indicating "new" all-way stop controlled 	Carried Forward	Short Term (1-3 years)
				0.25	**1.00**	**0.50**	**0.75**	**1.00**	**1.00**	**0.50**	**0.71**	
Introduce Speed Monitoring System	Emerson Street	19	Speed indication display (and consider camera enforcement)	Moderate Negative Impact. Potential minor decrease in capacity due to decrease in speed 	Potential to create a safer environment for pedestrians and cyclists (reduced speeds) 	Minimal change to existing infrastructure. Requires purchasing and installing new signage. No new construction. 	Prompt driver to become aware of excessive speed. Improves safety for active transportation users by discouraging high speeds. Latest speed survey indicates 37% of compliance. 	Aligns with 2018 TMP Update (Ch 5) in reaching City's vision and in creating healthy and safe communities. Road Safety is identified as a priority which includes implementation of traffic calming and management measures. Demonstrates consistency with Vision Zero initiative. Could be implemented through Portable Radar Message Board Program (Road Safety Program). 	Easy to implement. Equipment set up is required. Could be portable speed radar speed sign or mounted on existing poles. 	Low Cost 	Carried Forward	Short Term (1-3 years)
				0.25	**0.75**	**0.50**	**0.75**	**1.00**	**0.75**	**0.75**	**0.68**	

Table 3 - Ainslie Wood Neighbourhood Traffic Management Study Evaluation of Alternatives and Recommended Improvements

Type of Improvements	Locations	Location ID	Details	Evaluation Criteria: Change in Traffic Level of Service	Supportiveness of Other Transportation Modes	Efficiency of Use of Existing Infrastructure	Safety	Compatibility with City Plans	Implementation Feasibility	Estimated Costs	Recommendations	Implementation / Phasing Strategy
Legend	**All**			Significant Positive Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	Significantly improves the ability to use sustainable modes of transportation	Enhance the use of facility with no modification to existing infrastructure	Improves safety for all road users	Compatible	Very easy to implement (requires minimal resources/very short duration)	No Cost		
				Moderate Positive Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	Improves the ability to use sustainable modes of transportation	Enhance the use of facility with minor modification to existing infrastructure	Improves safety for some road users	--	Easy to implement (requires some technical resources/short duration)	Low Cost		
				No Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	No Change	No change to existing infrastructure	No Change	--	--	Medium Cost		
				Moderate Negative Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	More difficult to use sustainable modes of transportation	Requires minor modification to existing infrastructure with no direct enhancement of facility.	Increases the safety risks for some road users	--	Difficult to implement (requires some technical resources/long duration)	High Cost		
				Significant Negative Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	Significantly more difficult to use sustainable modes of transportation	Requires significant modification to existing infrastructurewith no direct enhancement of facility.	Increases the safety risks for all road users	Not Compatible	Very difficult to implement (requires significant technical resources/long duration)	Prohibitive Cost		
Introduce Speed Monitoring System	Rifle Range Road	16	Consider camera enforcement	Moderate Negative Impact. Potential minor decrease in capacity due to decrease in speed 	Potential to create a safer environment for pedestrians and cyclists (reduced speeds) 	Minimal change to existing infrastructure. Requires equipment installation within existing ROW. No new construction. 	Prompt driver to become aware of excessive speed. Improves safety for active transportation users by discouraging high speeds. 	Aligns with 2018 TMP Update (Ch 5) in reaching City's vision and in creating healthy and safe communities. Road Safety is identified as a priority which includes implementation of traffic calming and management measures. Demonstrates consistency with Vision Zero. 	Equipment set up required. 	Medium cost 	Carried Forward	Medium-term (3-5 Years)
				0.25	0.75	0.50	0.75	1.00	0.75	0.50	0.64	
Roadside Lighting	Main Street West & Emerson Street	3	Add on median in vicinity of intersection to improve illumination	No impact to Traffic Operations 	Supports all modes (improved visibility) 	Enhance the use of facility with minor modification (installation of new luminaires) to existing infrastructure with improved illumination. 	Improves safety for active transportation users by making them more visible to motorists 	Consistent with City's Complete-Livable-Better Streets Policy for comfortable and safe opportunities for active transportation. Adding lighting will add comfort and provide a safer experience for AT users. 	Difficult implementation. Require electrical connection and equipment set up to erect and install light poles. 	Medium to High Cost 	Carried Forward	Medium-term (3-5 Years)
				0.50	1.00	0.75	0.75	1.00	0.25	0.25	0.64	
	Whitney Avenue	14	Improve roadway lighting	No impact to Traffic Operations 	Supports all modes (improved visibility) 	Enhance the use of facility with minor modification (installation of new luminaires) to existing infrastructure with improved illumination. 	Improves safety for active transportation users by making them more visible to motorists 	Consistent with City's Complete-Livable-Better Streets Policy for comfortable and safe opportunities for active transportation. Adding lighting will add comfort and provide a safer experience for AT users. 	Difficult implementation. Require electrical connection and equipment set up to erect and install light poles. 	Medium to High Cost 	Carried Forward	Medium-term (3-5 Years)
				0.50	1.00	0.75	0.75	1.00	0.25	0.25	0.64	
Curb Bump-outs	Sanders Boulevard & Cottrill Street / Binkley Crescent	10	North West and South East Quadrant. Traffic calming measure.	Moderate Negative Impact. Potential for small decrease in capacity and small increase in delays (slower speeds) 	Supports pedestrians and cyclists 	Enhance the use of facility with minor modification to existing infrastructure. 	Intended to reduce overall vehicle speeds, thereby improving safety of all road users. Also reduces crossing distances for pedestrians. 	Consistent with City policy objectives (i.e. Traffic calming suggested in Vision Zero section of Road Safety Background report) 	Easy to implement. Requires simple design task and minor construction. 	Medium Cost. 	Carried Forward	Medium-term (3-5 Years)
				0.25	0.75	0.75	0.75	1.00	0.75	0.50	0.68	
	Sanders Boulevard & Hollywood Street North / Binkley Crescent	10	North West and South East Quadrant. Traffic calming measure.	Moderate Negative Impact. Potential for minor decrease in capacity and minor increase in delays (slower speeds) 	Supports pedestrians and cyclists 	Minor modification to existing infrastructure (reduced useable space for auto drivers). 	Intended to reduce overall vehicle speeds, thereby improving safety of all road users. Also reduces crossing distances for pedestrians. 	Consistent with City policy objectives (i.e. Traffic calming suggested in Vision Zero section of Road Safety Background report) 	Easy to implement. Requires simple design task and minor construction. 	Medium Cost 	Carried Forward	Medium-term (3-5 Years)
				0.25	0.75	0.25	0.75	1.00	0.25	0.50	0.54	

Table 3 - Ainslie Wood Neighbourhood Traffic Management Study Evaluation of Alternatives and Recommended Improvements

Type of Improvements	Locations	Location ID	Details	Evaluation Criteria: Change in Traffic Level of Service	Supportiveness of Other Transportation Modes	Efficiency of Use of Existing Infrastructure	Safety	Compatibility with City Plans	Implementation Feasibility	Estimated Costs	Recommendations	Implementation / Phasing Strategy
Legend	**All**			Significant Positive Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	Significantly improves the ability to use sustainable modes of transportation	Enhance the use of facility with no modification to existing infrastructure	Improves safety for all road users	Compatible	Very easy to implement (requires minimal resources/very short duration)	No Cost		
				Moderate Positive Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	Improves the ability to use sustainable modes of transportation	Enhance the use of facility with minor modification to existing infrastructure	Improves safety for some road users	--	Easy to implement (requires some technical resources/short duration)	Low Cost		
				No Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	No Change	No change to existing infrastructure	No Change	--	--	Medium Cost		
				Moderate Negative Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	More difficult to use sustainable modes of transportation	Requires minor modification to existing infrastructure with no direct enhancement of facility.	Increases the safety risks for some road users	--	Difficult to implement (requires some technical resources/long duration)	High Cost		
				Significant Negative Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	Significantly more difficult to use sustainable modes of transportation	Requires significant modification to existing infrastructurewith no direct enhancement of facility.	Increases the safety risks for all road users	Not Compatible	Very difficult to implement (requires significant technical resources/long duration)	Prohibitive Cost		
Chicanes	Whitney Avenue	14	Traffic calming measure	Moderate Negative Impact. Potential for minor decrease in capacity and minor increase in delays (slower speeds) 	Supports pedestrians and cyclists 	Minor modification to existing infrastructure (reduced road width for auto drivers). Requires curbs in some locations to be extended/rebuilt 	Improves safety of pedestrians and reduce overall collision severity due to lower travel speeds. May reduce the level of comfort for cyclists at curb bump-outs. 	Consistent with City policy objectives (i.e. Traffic calming technique suggested in the Vision Zero section of Road Safety Background report) 	Can present issues with respect to winter control and emergency response 	Medium Cost 	Carried Forward	Short-term (1-3 Years)
				0.25	**0.75**	**0.25**	**0.75**	**1.00**	**0.25**	**0.50**	**0.54**	
	Sanders Boulevard	10	Traffic calming measure	Moderate Negative Impact. Potential for minor decrease in capacity and minor increase in delays (slower speeds) 	Supports pedestrians and cyclists 	Minor modification to existing infrastructure (reduced road width for auto drivers). Requires curbs in some locations to be extended/rebuilt 	Improves safety of pedestrians and reduce overall collision severity due to lower travel speeds. May reduce the level of comfort for cyclists at curb bump-outs. 	Consistent with City policy objectives (i.e. Traffic calming technique suggested in the Vision Zero section of Road Safety Background report) 	Can present issues with respect to winter control and emergency response 	Medium Cost 	Carried Forward	Short-term (1-3 Years)
				0.25	**0.75**	**0.25**	**0.75**	**1.00**	**0.25**	**0.50**	**0.54**	
Speed Humps	Whitney Avenue	14	Traffic calming measure	Moderate Negative Impact. Potential for minor decrease in capacity and minor increase in delays (slower speeds) 	Supports pedestrians and cyclists 	Minor modification to existing infrastructure (road surface) with no direct enhancement of facility. 	Improves safety of active transportation users and reduce overall collision severity due to lower travel speeds. Potential reduction in all collision types by 40-50%. 	Consistent with City policy objectives (i.e. Traffic calming technique suggested in Vision Zero section of Road Safety Background report) 	Easy to implement. Potential winter maintenance issue. 	Medium Cost 	Carried Forward	Short-term (1-3 Years)
				0.25	**0.75**	**0.25**	**1.00**	**1.00**	**0.75**	**0.75**	**0.68**	
	Rifle Range Road	16	Traffic calming measure	Moderate Negative Impact. Potential for minor decrease in capacity and minor increase in delays (slower speeds) 	Supports pedestrians and cyclists 	Minor modification to existing infrastructure (road surface) with no direct enhancement of facility. 	Improves safety of active transportation users and reduce overall collision severity due to lower travel speeds. Potential reduction in all collision types by 40-50%. 	Consistent with City policy objectives (i.e. Traffic calming technique suggested in Vision Zero section of Road Safety Background report) 	Easy to implement. Potential winter maintenance issue. 	Medium Cost 	Carried Forward	Short-term (1-3 Years)
				0.25	**0.75**	**0.25**	**1.00**	**1.00**	**0.75**	**0.50**	**0.64**	
	Leland Street	17	Speed hump installed in 2018	Speed hump already installed.							Screened Out	
	Glenmount Avenue	18	Traffic calming measure	Moderate Negative Impact. Potential for minor decrease in capacity and minor increase in delays (slower speeds) 	Supports pedestrians and cyclists 	Minor modification to existing infrastructure (road surface) with no direct enhancement of facility. 	Improves safety of active transportation users and reduce overall collision severity due to lower travel speeds. Potential reduction in all collision types by 40-50%. 	Consistent with City policy objectives (i.e. Traffic calming technique suggested in Vision Zero section of Road Safety Background report) 	Easy to implement. Potential winter maintenance issue. 	Medium Cost 	Carried Forward	Short-term (1-3 Years)
				0.25	**0.75**	**0.25**	**1.00**	**1.00**	**0.75**	**0.50**	**0.64**	

Table 3 - Ainslie Wood Neighbourhood Traffic Management Study Evaluation of Alternatives and Recommended Improvements

				Evaluation Criteria								
Type of Improvements	**Locations**	**Location ID**	**Details**	**Change in Traffic Level of Service**	**Supportiveness of Other Transportation Modes**	**Efficiency of Use of Existing Infrastructure**	**Safety**	**Compatibility with City Plans**	**Implementation Feasibility**	**Estimated Costs**	**Recommendations**	**Implementation / Phasing Strategy**
Legend	**All**			Significant Positive Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	Significantly improves the ability to use sustainable modes of transportation	Enhance the use of facility with no modification to existing infrastructure	Improves safety for all road users	Compatible	Very easy to implement (requires minimal resources/very short duration)	No Cost		
				Moderate Positive Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	Improves the ability to use sustainable modes of transportation	Enhance the use of facility with minor modification to existing infrastructure	Improves safety for some road users	--	Easy to implement (requires some technical resources/short duration)	Low Cost		
				No Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	No Change	No change to existing infrastructure	No Change	--	--	Medium Cost		
				Moderate Negative Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	More difficult to use sustainable modes of transportation	Requires minor modification to existing infrastructure with no direct enhancement of facility.	Increases the safety risks for some road users	--	Difficult to implement (requires some technical resources/long duration)	High Cost		
				Significant Negative Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	Significantly more difficult to use sustainable modes of transportation	Requires significant modification to existing infrastructurewith no direct enhancement of facility.	Increases the safety risks for all road users	Not Compatible	Very difficult to implement (requires significant technical resources/long duration)	Prohibitive Cost		
Flexible Bollards	Sanders Boulevard	10	Implement along centerline and between travel lane and bicycle lane (traffic calming measure)	Moderate Negative Impact. Potential for minor decrease in capacity and minor increase in delays (slower speeds) 	Supports pedestrians and cyclists 	Enhance the use of existing cycling facility with minor modification to existing infrastructure. 	Improves safety of active transportation users and reduce overall collision severity due to lower travel speeds. 	Consistent with long-term recommendations as outlined in the Ainslie Wood / Westdale Transportation Master Plan (2003) for considering traffic calming measures on neighbourhood streets. Also aligns with Ainslie Wood Westdale Walkability Report for investing in traffic calming initiative. 	Easy to implement. Potential winter maintenance issue. 	Medium Cost (depends on barrier style) 	Carried Forward	Short-term (1-3 Years)
				0.25	**0.75**	**0.75**	**1.00**	**1.00**	**0.75**	**0.50**	**0.71**	
	Whitney Avenue	14	Along centerline (traffic calming measure)	Moderate Negative Impact. Potential for minor decrease in capacity and minor increase in delays (slower speeds) 	Supports pedestrians and cyclists 	Requires minor changes to existing infrastructure with the installation of bollards. Reduce usable space for auto drivers. 	Improves safety of active transportation users and reduce overall collision severity due to lower travel speeds. 	Consistent with long-term recommendations as outlined in the Ainslie Wood / Westdale Transportation Master Plan (2003) for considering traffic calming measures on neighbourhood streets. Also aligns with Ainslie Wood Westdale Walkability Report for investing in traffic calming initiative. 	Easy to implement. Potential winter maintenance issue. 	Low Cost 	Carried Forward	Short-term (1-3 Years)
				0.25	**0.75**	**0.25**	**1.00**	**1.00**	**0.75**	**0.75**	**0.68**	
	Rifle Range Road	16	Along centerline (traffic calming measure)	Moderate Negative Impact. Potential for minor decrease in capacity and minor increase in delays (slower speeds) 	Supports pedestrians and cyclists 	Requires minor changes to existing infrastructure with the installation of bollards. Reduce usable space for auto drivers. 	Improves safety of active transportation users and reduce overall collision severity due to lower travel speeds. 	Consistent with long-term recommendations as outlined in the Ainslie Wood / Westdale Transportation Master Plan (2003) for considering traffic calming measures on neighbourhood streets. Also aligns with Ainslie Wood Westdale Walkability Report for investing in traffic calming initiative. 	Easy to implement. Potential winter maintenance issue. 	Low Cost 	Carried Forward	Short-term (1-3 Years)
				0.25	**0.75**	**0.25**	**1.00**	**1.00**	**0.75**	**0.75**	**0.68**	

Table 3 - Ainslie Wood Neighbourhood Traffic Management Study Evaluation of Alternatives and Recommended Improvements

Type of Improvements	Locations	Location ID	Details	Evaluation Criteria: Change in Traffic Level of Service	Supportiveness of Other Transportation Modes	Efficiency of Use of Existing Infrastructure	Safety	Compatibility with City Plans	Implementation Feasibility	Estimated Costs	Recommendations	Implementation / Phasing Strategy
Legend	**All**			Significant Positive Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	Significantly improves the ability to use sustainable modes of transportation	Enhance the use of facility with no modification to existing infrastructure	Improves safety for all road users	Compatible	Very easy to implement (requires minimal resources/very short duration)	No Cost		
				Moderate Positive Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	Improves the ability to use sustainable modes of transportation	Enhance the use of facility with minor modification to existing infrastructure	Improves safety for some road users	--	Easy to implement (requires some technical resources/short duration)	Low Cost		
				No Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	No Change	No change to existing infrastructure	No Change	--	--	Medium Cost		
				Moderate Negative Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	More difficult to use sustainable modes of transportation	Requires minor modification to existing infrastructure with no direct enhancement of facility.	Increases the safety risks for some road users	--	Difficult to implement (requires some technical resources/long duration)	High Cost		
				Significant Negative Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	Significantly more difficult to use sustainable modes of transportation	Requires significant modification to existing infrastructurewith no direct enhancement of facility.	Increases the safety risks for all road users	Not Compatible	Very difficult to implement (requires significant technical resources/long duration)	Prohibitive Cost		
Flexible Bollards	Leland Street	17	Along centerline (traffic calming measure)	Moderate Negative Impact. Potential for minor decrease in capacity and minor increase in delays (slower speeds)	Supports pedestrians and cyclists	Requires minor changes to existing infrastructure with the installation of bollards. Reduce usable space for auto drivers.	Improves safety of active transportation users and reduce overall collision severity due to lower travel speeds.	Consistent with long-term recommendations as outlined in the Ainslie Wood / Westdale Transportation Master Plan (2003) for considering traffic calming measures on neighbourhood streets. Also aligns with Ainslie Wood Westdale Walkability Report for investing in traffic calming initiative.	Easy to implement. Potential winter maintenance issue.	Low Cost	Carried Forward	Short-term (1-3 Years)
				0.25	**0.75**	**0.25**	**1.00**	**1.00**	**0.75**	**0.75**	**0.68**	
	Glenmount Avenue	18	Along centerline (traffic calming measure)	Moderate Negative Impact. Potential for minor decrease in capacity and minor increase in delays (slower speeds)	Supports pedestrians and cyclists	Requires minor changes to existing infrastructure with the installation of bollards. Reduce usable space for auto drivers.	Improves safety of active transportation users and reduce overall collision severity due to lower travel speeds.	Consistent with long-term recommendations as outlined in the Ainslie Wood / Westdale Transportation Master Plan (2003) for considering traffic calming measures on neighbourhood streets. Also aligns with Ainslie Wood Westdale Walkability Report for investing in traffic calming initiative.	Easy to implement. Potential winter maintenance issue.	Low Cost	Carried Forward	Short-term (1-3 Years)
				0.25	**0.75**	**0.25**	**1.00**	**1.00**	**0.75**	**0.75**	**0.68**	
Signal Timing Modification	Main Street West & Cootes Drive	2	Modify signal timings to improve traffic	Signals are already optimized along Main St. Not feasible to improve timing if LRT will change all timings in the near future.							Screened Out	
	Main Street West & Emerson Drive	3	Modify signal timings to improve traffic	Signals are already optimized along Main St. Not feasible to improve timing if LRT will change all timings in the near future.							Screened Out	
	Main Street West & Dalewood Avenue	4	Modify signal timings to improve traffic	Signals are already optimized along Main St. Not feasible to improve timing if LRT will change all timings in the near future.							Screened Out	
Implement Signage	Main Street West & Emerson Drive	3	Add signage for pedestrians to wait for a gap to cross the channelized westbound right turn lane	No impact to Traffic Operations	Supports pedestrian safety as approximately 532 pedestrians use this intersection during the AM peak, while 551 pedestrians use it during the PM peak.	Minimal change to existing infrastructure. Requires equipment installation within existing ROW. No new construction.	Improve safety of pedestrians and motorists (i.e. both parties are aware of who has ROW)	Protects for pedestrian safety and promotes healthy and safe communities as described in the 2018 TMP Update.	Very easy to implement. Add signs with "new" tab.	Low Cost	Carried Forward	Subject to LRT
				0.50	**1.00**	**0.50**	**0.75**	**1.00**	**1.00**	**0.75**	**0.79**	

Table 3 - Ainslie Wood Neighbourhood Traffic Management Study Evaluation of Alternatives and Recommended Improvements

Type of Improvements	Locations	Location ID	Details	Evaluation Criteria: Change in Traffic Level of Service	Supportiveness of Other Transportation Modes	Efficiency of Use of Existing Infrastructure	Safety	Compatibility with City Plans	Implementation Feasibility	Estimated Costs	Recommendations	Implementation / Phasing Strategy
Legend	**All**			Significant Positive Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	Significantly improves the ability to use sustainable modes of transportation	Enhance the use of facility with no modification to existing infrastructure	Improves safety for all road users	Compatible	Very easy to implement (requires minimal resources/very short duration)	No Cost		
				Moderate Positive Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	Improves the ability to use sustainable modes of transportation	Enhance the use of facility with minor modification to existing infrastructure	Improves safety for some road users	--	Easy to implement (requires some technical resources/short duration)	Low Cost		
				No Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	No Change	No change to existing infrastructure	No Change	--	--	Medium Cost		
				Moderate Negative Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	More difficult to use sustainable modes of transportation	Requires minor modification to existing infrastructure with no direct enhancement of facility.	Increases the safety risks for some road users	--	Difficult to implement (requires some technical resources/long duration)	High Cost		
				Significant Negative Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	Significantly more difficult to use sustainable modes of transportation	Requires significant modification to existing infrastructurewith no direct enhancement of facility.	Increases the safety risks for all road users	Not Compatible	Very difficult to implement (requires significant technical resources/long duration)	Prohibitive Cost		
Implement Signage	Main Street West & Dalewood Avenue	4	Match signage with pavement markings (lane movements do not match)	No impact to Traffic Operations 	No significant impact on other transportation modes 	Minimal change to existing infrastructure. Requires equipment installation within existing ROW. No new construction. 	Potential to improve safety for all users by providing clarification in way finding, right of way, etc. 	Improvement in road safety (elimination of confusion between signage and pavement markings) is consistent with City's vision in creating healthy and safe communities (2018 TMP update), as well as Vision Zero. 	Easy to implement. Add signs with "new" tab. 	Low Cost 	Carried Forward	Subject to LRT
				0.50	**1.00**	**0.50**	**1.00**	**1.00**	**1.00**	**0.75**	**0.82**	
Add Pavement Markings	Main Street West & Dalewood Avenue	4	Match pavement markings with signage for which lanes are for which movements	No impact to Traffic Operations 	Potential to support all modes depending on specific markings 	Minimal change to existing infrastructure. Requires equipment installation within existing ROW. No new construction. 	Potential to improve safety for all users by providing clarification in way finding, right of way, etc. 	Improvement in road safety (elimination of confusion between signage and pavement markings) is consistent with City's vision in creating healthy and safe communities (2018 TMP update), as well as Vision Zero. 	Very easy to implement. Note that pavement markings along Main Street have potential to be altered by LRT. 	Low Cost 	Carried Forward	Subject to LRT
				0.50	**1.00**	**0.50**	**1.00**	**1.00**	**1.00**	**0.75**	**0.82**	
Add Crosswalk Markings	Main Street West & Emerson Street	3	Increase visibility of crossing (i.e. zebra striping)	No impact to Traffic Operations 	Supports pedestrian safety as approximately 532 pedestrians use this intersection during the AM peak, while 551 pedestrians use it during the PM peak. 	Enhance the use of existing pedestrian crossing facility with painted crosswalk marking. 	Improve safety for pedestrians by making them / the crossing more visible (more likely their ROW will be respected/noticed). Potential reduction of 40% in vehicle-pedestrian collisions. 5 vehicle-pedestrian collisions in the last 5 years 	Protects for pedestrian safety by increasing vibility of crosswalk, promotes healthy and safe communities as described in the 2018 TMP Update. 	Very easy implementation 	Low Cost 	Carried Forward	Subject to LRT
				0.50	**1.00**	**0.75**	**1.00**	**1.00**	**1.00**	**0.75**	**0.86**	
Reduce Speed Limit	Main Street West	15	Decrease posted speed limit from 60 km/h to 50 km/h	Moderate Negative Impact. Decreases capacity. Synchro analysis shows average increase in delay at intersections is 2.25s during 2031 PM peak 	Creates a safer environment for pedestrians and cyclists. 	No change to existing infrastructure. 	Potential to improve safety for all road users. Severity of collisions reduce significantly as speeds are reduced. Pontential reduction in all collisions of 12%. 	Consistent with speed limit reduction initiatives outlined in the Hamilton Strategic Road Safety Program as well as the Road Safety Background Report included in the 2018 TMP Update. 	Easy to implement - include "new" tab on speed limit signs. Enforcement might be required initially to raise awareness. 	Low Cost 	Carried Forward	Subject to LRT
				0.25	**1.00**	**0.50**	**1.00**	**1.00**	**0.75**	**0.75**	**0.75**	

Table 3 - Ainslie Wood Neighbourhood Traffic Management Study Evaluation of Alternatives and Recommended Improvements

Type of Improvements	Locations	Location ID	Details	Evaluation Criteria: Change in Traffic Level of Service	Supportiveness of Other Transportation Modes	Efficiency of Use of Existing Infrastructure	Safety	Compatibility with City Plans	Implementation Feasibility	Estimated Costs	Recommendations	Implementation / Phasing Strategy
Legend	**All**			Significant Positive Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	Significantly improves the ability to use sustainable modes of transportation	Enhance the use of facility with no modification to existing infrastructure	Improves safety for all road users	Compatible	Very easy to implement (requires minimal resources/very short duration)	No Cost		
				Moderate Positive Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	Improves the ability to use sustainable modes of transportation	Enhance the use of facility with minor modification to existing infrastructure	Improves safety for some road users	--	Easy to implement (requires some technical resources/short duration)	Low Cost		
				No Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	No Change	No change to existing infrastructure	No Change	--	--	Medium Cost		
				Moderate Negative Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	More difficult to use sustainable modes of transportation	Requires minor modification to existing infrastructure with no direct enhancement of facility.	Increases the safety risks for some road users	--	Difficult to implement (requires some technical resources/long duration)	High Cost		
				Significant Negative Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	Significantly more difficult to use sustainable modes of transportation	Requires significant modification to existing infrastructurewith no direct enhancement of facility.	Increases the safety risks for all road users	Not Compatible	Very difficult to implement (requires significant technical resources/long duration)	Prohibitive Cost		
Install higer order pedestrian treatment (Level 2 Type B)	Main Street West & Cootes Drive	2	WBR crossing, combine two pedestrian crossing areas and implement signalization	Moderate Negative Impact. Potential minor increase in delay if treatment alots more time for ped crossing 	Supports pedestrians 	Requires minor changes to existing infrastructure. Connect two existing crossing locations (remove one section of pavement, add a new section to join) 	Improves safety for pedestrians. 1 vehicle-pedestrian collision recorded in the past 5 years. 	Consistent with City policy objectives (i.e. Traffic calming suggested in Vision Zero section of Road Safety Background report) 	Difficult to implement. Installation of warning (Wc-27R) and advance (Ra-5R) signage and pavement markings which include painted crosswalk and Yield to Pedestrian Line. Wiring is required for push button and flashing beacon mounted above signs. Minimal impact to traffic during installation. 	Medium Cost 	Carried Forward	Subject to LRT
				0.25	**0.75**	**0.25**	**1.00**	**1.00**	**0.25**	**0.50**	**0.57**	
Implement Signalized Pedestrian Crossing	Main Street West & Cootes Drive	2	WBR crossing, combine two pedestrian crossing areas and implement signalization	Moderate Negative Impact. Increases delays when vehicles required to stop at crossing 	Supports pedestrians 	Requires minor changes to existing infrastructure. Connect two existing crossing locations (remove one section of pavement, add a new section to join) 	Improves safety for pedestrians (increased comfort and visibility). May cause queue spillback and increase in rear end collisions. 	Consistent with City policy objectives (i.e. Traffic calming suggested in Vision Zero section of Road Safety Background report) 	Difficult to implement. Signal design required. Electrical connection and equipment set up required. Minimal impact to traffic during installation. 	Medium Cost 	Carried Forward	Subject to LRT
				0.25	**0.75**	**0.25**	**1.00**	**1.00**	**0.25**	**0.50**	**0.57**	
Pedestrian Barriers	Main Street West & Dalewood Avenue	5	To dissaude pedetrians from walking on the centre median	No impact to Traffic Operations 	Supports / impedes pedestrian movement. Improved interaction between pedestrians and vehicles. 	Minimal change to existing infrastructure. 	Improves safety for pedestrians. Dissuades pedestrians from jaywalking. Provides barrier between pedestrians and motorists. 	Consistent with City's Complete-Livable-Better Streets Policy for comfortable and safe opportunities for active transportation. Would eliminate / reduce unsafe pedestrian actions 	Very easy to implement. 	Low Cost - Median Cost (depending on barrier type) 	Carried Forward	Subject to LRT
				0.50	**0.75**	**0.50**	**0.75**	**1.00**	**1.00**	**0.75**	**0.75**	
Roadside Lighting	Main Street West & Emerson Street	3	Add on median in vicinity of intersection to improve illumination	No impact to Traffic Operations 	Supports all modes (improved visibility). Supports pedestrian safety as approximately 532 pedestrians use this intersection during the AM peak, while 551 pedestrians use it during the PM peak. 	Minimal change to existing infrastructure. (installation of new luminaires on existing median) 	Improves safety for active transportation users and reduce overall collision severity by making them more visible to motorists 	Consistent with City's Complete-Livable-Better Streets Policy for comfortable and safe opportunities for active transportation. Adding lighting will add comfort and provide a safer experience for AT users. 	Difficult implementation. Require electrical connection and equipment set up to erect and install light poles. 	Medium to High Cost 	Carried Forward	Subject to LRT
				0.50	**1.00**	**0.50**	**1.00**	**1.00**	**0.25**	**0.25**	**0.64**	

Table 3 - Ainslie Wood Neighbourhood Traffic Management Study Evaluation of Alternatives and Recommended Improvements

				Evaluation Criteria								
Type of Improvements	**Locations**	**Location ID**	**Details**	**Change in Traffic Level of Service**	**Supportiveness of Other Transportation Modes**	**Efficiency of Use of Existing Infrastructure**	**Safety**	**Compatibility with City Plans**	**Implementation Feasibility**	**Estimated Costs**	**Recommendations**	**Implementation / Phasing Strategy**
Legend	**All**			Significant Positive Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	Significantly improves the ability to use sustainable modes of transportation	Enhance the use of facility with no modification to existing infrastructure	Improves safety for all road users	Compatible	Very easy to implement (requires minimal resources/very short duration)	No Cost		
				Moderate Positive Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	Improves the ability to use sustainable modes of transportation	Enhance the use of facility with minor modification to existing infrastructure	Improves safety for some road users	--	Easy to implement (requires some technical resources/short duration)	Low Cost		
				No Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	No Change	No change to existing infrastructure	No Change	--	--	Medium Cost		
				Moderate Negative Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	More difficult to use sustainable modes of transportation	Requires minor modification to existing infrastructure with no direct enhancement of facility.	Increases the safety risks for some road users	--	Difficult to implement (requires some technical resources/long duration)	High Cost		
				Significant Negative Impact to Traffic Operations (e.g. Delay, Capacity, LOS)	Significantly more difficult to use sustainable modes of transportation	Requires significant modification to existing infrastructurewith no direct enhancement of facility.	Increases the safety risks for all road users	Not Compatible	Very difficult to implement (requires significant technical resources/long duration)	Prohibitive Cost		
Monitoring	Main Street West & Binkley Road	1	Monitoring of pedestrian crossing behaviour	No impact to Traffic Operations 	No Change (monitoring only) 	No change to existing infrastructure 	No change. 	Provide emphasis on pedestrian-related collisions which aligns with the principles of City's Vision Zero concept. 	Very easy to implement (requires data collection and analysis) 	Low Cost 	Carried Forward	
				0.50	**0.50**	**0.50**	**1.00**	**1.00**	**1.00**	**0.75**	**0.75**	
Turn Prohibition	Main Street West & Newton Avenue	5	Prohibit vehicles from making left turns.	Moderate Negative Impact. Minor increase in delay for through movement. 	Fewer conflict points for pedestrians 	Minimal change to existing infrastructure. 	Increased vehicular safety by relocating movement to safer location and pedestrian safety by reducing the number of conflicts. 	Improvement in road safety (reudction of rear end collisions) is consistent with City's vision in creating healthy and safe communities (2018 TMP update), as well as Vision Zero. 	Very easy to implement. Requires signage 	Low Cost 	Carried Forward	Subject to LRT
				0.25	**0.75**	**0.50**	**0.75**	**1.00**	**1.00**	**0.75**	**0.71**	