City of Hamilton

Mohawk Road Class Environmental Assessment

Lime Kiln Road/McNiven Road to Highway 403

Environmental Study Report

December 2019

B000941

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1. Introduction and Study Background

1.1. Introduction

Mohawk Road is a major arterial road in the City of Hamilton connecting to both the Lincoln M. Alexander Parkway (LINC) and the provincial Highway 403 in the east. It has a two-lane cross section and a posted speed limit of 50 km/h. West of the study area, Mohawk Road becomes Rousseaux Street providing access to downtown Ancaster.

The City of Hamilton is undertaking a Schedule C Municipal Class Environmental Assessment (EA) Study to review the transportation needs of Mohawk Road between Lime Kiln Road/ McNiven Road and Filman Road. Phases 1 and 2 of the Class EA were completed during the development and approval of the Ancaster Transportation Master Plan (TMP) (2011). The Ancaster TMP recommended that Mohawk Road (and a number of other arterial roads within Ancaster) have a three-lane section including two-way centre left-turn lane where feasible, plus sidewalks and bike lanes.

The purpose of the wider road section is to accommodate increasing traffic volumes, facilitate safer driveway access for residential properties along Mohawk Road, improve conditions for service trucks, and address the need for active transportation facilities.

1.2. Study Area

The study area, as illustrated in Exhibit 1-1, includes Mohawk Road between Lime Kiln Road/ McNiven Road and Highway 403/Filman Road, including intersections and approaches. The right-of-way varies throughout the corridor from 20 metres to 35 metres, with 23 metres being the typical right-of-way.

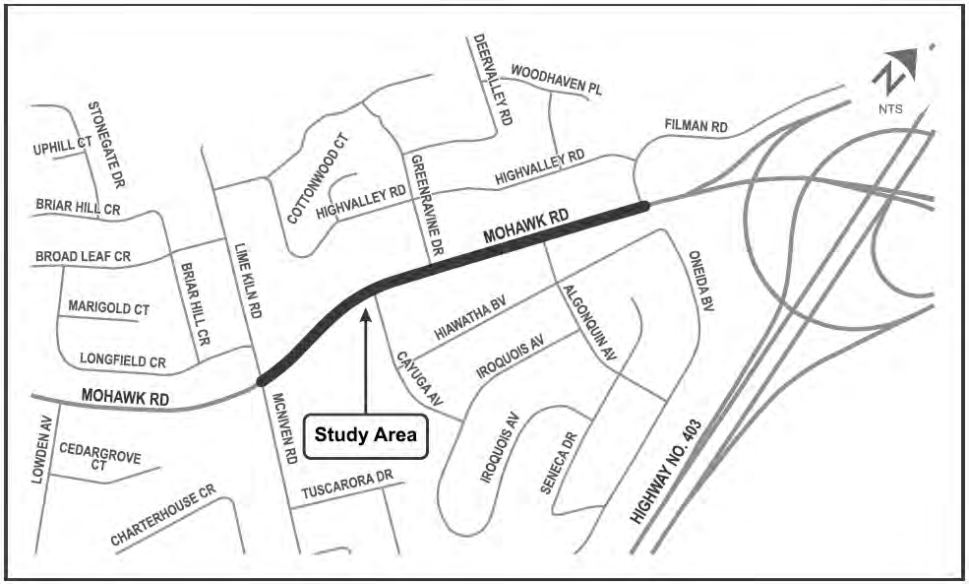

Exhibit 1-1: Study Area

Within the study limits Mohawk Road has a predominately two-lane rural cross-section with narrow gravel shoulders. Exceptions are along the north side, east of Lime Kiln Road, and at the east end of the study area near Filman Road. A sidewalk is provided on the south side from McNiven Road to approximately 40 metres west of Cayuga Avenue. There are no additional pedestrian and bicycle facilities within the study limits.

1.3. Municipal Class Environmental Assessment Process

This study follows the Municipal Engineers Association (MEA) Municipal Class Environmental Assessment process for a Schedule C project (October 2000, as amended in 2007, 2011 and 2015).

The Ontario Environmental Assessment Act (2010) guides the process for reviewing the environmental impact of proposed activities. The Act applies to government agencies, conservation authorities, and municipalities. The City of Hamilton is the proponent in this study and the Municipal Class Environmental Assessment for the Mohawk Road has been completed in accordance with the Ontario Environmental Assessment Act (2010).

Municipal projects that affect the purpose, capacity or function of a roadway, or propose new roadways are subject to the Municipal Engineers Association Municipal Class Environmental Assessment (October 2000, as amended in 2007, 2011 and 2015). The Municipal Class Environmental Assessment (Class EA) is a planning and design process for transportation/ transit and water/wastewater infrastructure projects which have a predictable range of impacts that can be mitigated. The Municipal Class EA process is approved by the Ministry of Environment, Conservation and Parks to meet the requirements of the Environmental Assessment Act (2010).

Based on their potential range of impacts, projects are classified under the Municipal Class EA by Schedules:

Schedule A Activities have minimal environmental effects. Projects are pre-approved.

Schedule A+ Activities have minimal environmental effects. Projects are pre-approved so long as the public is advised prior to implementation.

Schedule B Activities have some adverse environmental effects. Projects typically involve improvements and minor expansions to existing facilities. These projects proceed through a screening process (Phases 1 and 2 of the Class EA), including consultation with the potentially-affected public.

Schedule C Activities have some adverse environmental effects. Projects typically involve the construction of new facilities and major expansions to existing facilities. These projects proceed through the full Class EA planning and design process (Phases 1 through 5).

In particular, road widening or extensions with an estimated construction cost of $2.4M or more are classified as a Schedule C project under the Municipal Class EA. As noted above, Schedule C projects must follow Phases 1 through 5 of the Class EA process:

Phase 1 Identify the problem or opportunity.

Phase 2 Identify alternative solutions to address the problem or opportunity.

This Phase will identify and assess the positive and negative effects of alternative planning solutions for the identified problem and/or opportunity, taking into account the natural, social, cultural, and economic environment and input from all agencies and the public.

Phase 3 Examine alternative methods of implementing the preferred solution.

Phase 3 will identify and assess the positive and negative effects of alternative design concepts for the preferred solution, taking into account the natural, social, cultural, and economic environment and input from all agencies and the public.

Phase 4 Document the rationale for the preferred solution and design concept, and the planning, design and consultation process in an Environmental Study Report for public and agency review.

The Environmental Study Report is placed on the public record for at least 30 calendar days. If any outstanding issues raised by the public or agencies cannot be resolved during this review period, the public and agencies have the right to request the Minister of the Environment, Conservation and Parks to order an Individual Environmental Assessment as per Part II of the Ontario Environmental Assessment Act. If no requests for a Part II order are received during the review period, the project will proceed to Phase 5 for implementation.

Phase 5 Complete contract drawings and documents, and proceed to construction, operation and environmental monitoring.

1.3.1. Part II Order

The Municipal Class EA process includes an appeal provision to change the status of a project from being subject to the Municipal Class EA process to being subject to an Individual Environmental Assessment as per Part II of the Ontario EA Act. The latter requires the submission of an EA document to the Minister of the Environment, Conservation and Parks (MECP) for government review and approval.

1.4. Study Approach and Organization

Exhibit 1-2 illustrates the process for a Schedule C project under the Municipal Class EA. This study approach began with a thorough understanding of the problem being addressed, followed by assessing the alternative solutions. Phases 1 and 2 of this study were completed during the Ancaster Transportation Master Plan (2011).

This report documents the review and confirmation of Phases 1 and 2 followed by the completion of Phases 3 and 4 of the Class EA. The approach is organized around study phases, including Public Information Centres (PICs) and stakeholder engagement at study milestones. This study began in September 2018, with completion scheduled for late 2019.

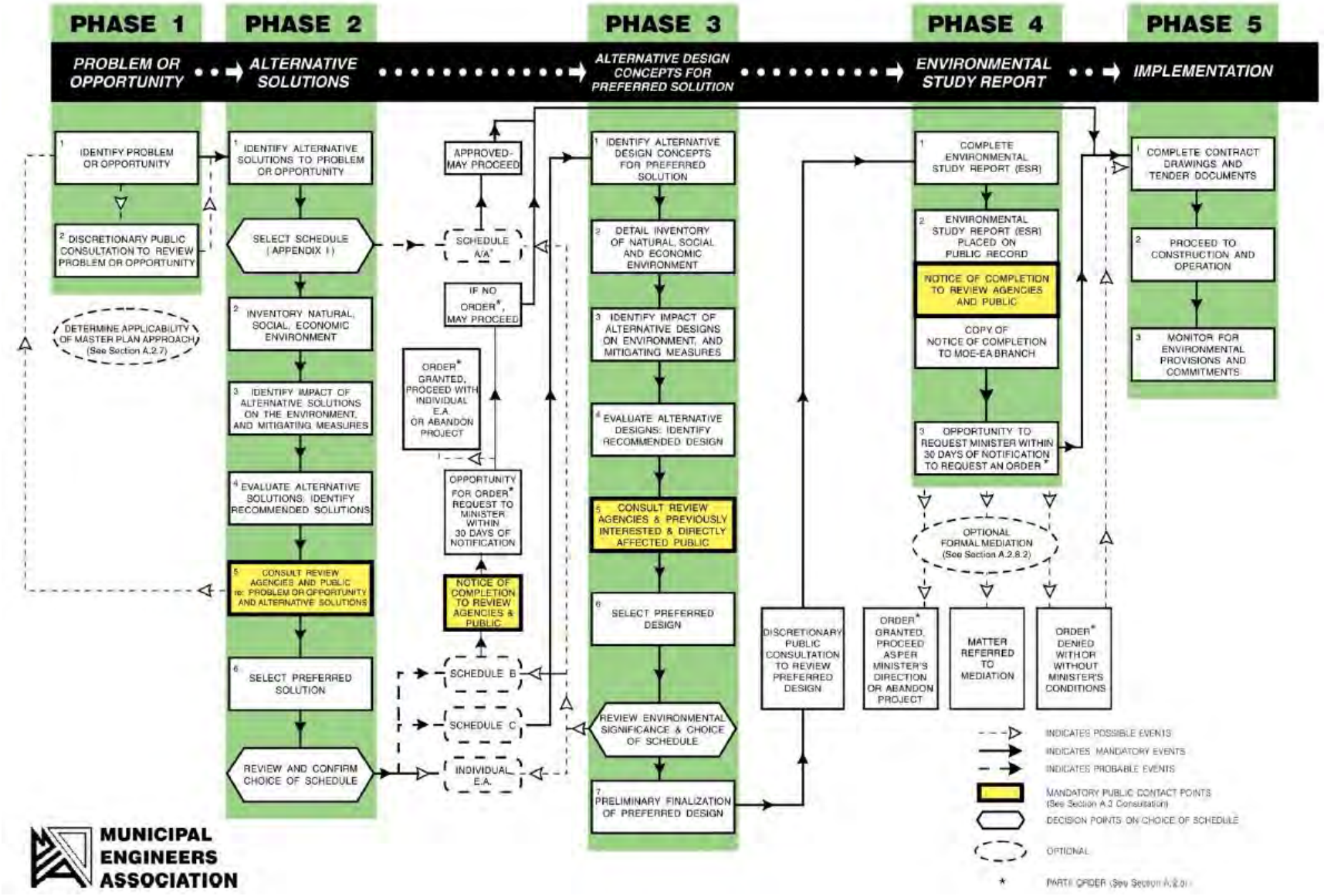

Exhibit 1-2 : Municipal Class EA Flow Chart

2. Review of Phases 1 and 2

Phases 1 and 2 of the Municipal Class EA were documented as part of the Ancaster Transportation Master Plan (TMP) (2011). The Ancaster TMP identified the preferred solution for Mohawk Road as a road widening with a two-way centre left-turn lane. The Class Environmental Assessment Master Plan Report approved the planning solution for this road section as a Schedule C project. Phases 1 and 2 of the EA study were reviewed and confirmed prior to commencing with Phases 3 and 4.

2.1. Planning and Policy Context

2.1.1. Ancaster Transportation Master Plan

The Ancaster TMP (2011) identified the future requirements to address short, medium and long-term transportation demands, and outline a plan providing the facilities in a phased manner consistent with the Hamilton Transportation Master Plan (HTMP), land use plans and policies as identified in provincial plans, official plans and secondary plans.

The Ancaster TMP also included a review of the development impacts on the road network within the Ancaster Urban Area, particularly the intersection of Wilson Street and Rousseaux Street.

As part of the long range plan to address transportation issues in Ancaster, the TMP identified the opportunity to widen Mohawk Road to three auto lanes with a two-way centre left-turn lane. Community members recommended sidewalks be included along both sides of the roadway and pedestrian crossings be considered. The recommended cross-section from the Ancaster TMP is illustrated in Exhibit 2-1. The Mohawk Road corridor was identified as a critical access point for mobility within Ancaster and continued monitoring for potential traffic operations issues were recommended.

The City of Hamilton Cycling Master Plan Review and Update (2018), recommended bike lanes on Mohawk Road within the study area. The preferred solution for Mohawk Road was therefore determined to be a three auto lane cross-section with a centre-two way left-turn lane and active transportation facilities, whether they be sidewalks, bike lanes or a combination that caters to both pedestrians and cyclists.

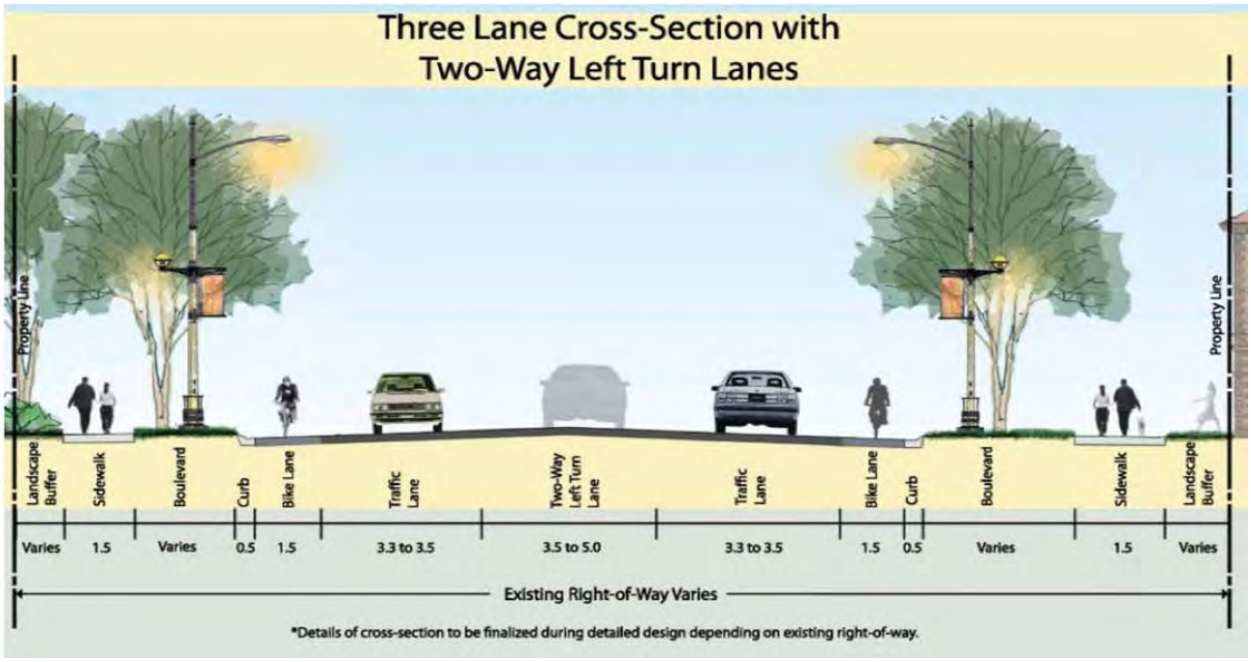

Exhibit 2-1: Ancaster TMP Cross-Section

2.2. Transportation and Traffic Assessment

A Transportation and Traffic Assessment was conducted to review background data provided in the Ancaster TMP and incorporate updated information (i.e. population, employment, trip generation projections, link volumes) provided by the City. This information, in conjunction with turning movement counts (TMC), was used to forecast intersection volumes for the 2031 horizon year. A copy of the Transportation and Traffic Assessment is provided in Appendix A.

2.2.1. Existing Geometry

Within the study area, there are two existing signalized intersections and three intersections with stop control on the minor approaches only. The land use surrounding the study area, and along Mohawk Road, is predominantly low-density residential.

Mohawk Road is classified as a major arterial road within the study area. The posted speed limit is 50 km/h and there is a single travel lane in both the eastbound and westbound directions. At the signalized McNiven Road/Lime Kiln Road intersection, auxiliary left-turn lanes are provided for all directions and an auxiliary right-turn lane is provided for the eastbound right-turn movement. At the signalized Filman Road intersection, auxiliary turn lanes are provided for the eastbound left-turn and southbound right-turn movements. The unsignalized intersections in the study area are ‘T’ intersections with Mohawk Road and consist of a single-lane approach, with the exception of the Algonquin Avenue intersection where an auxiliary westbound left-turn lane is provided.

2.2.2. Existing Traffic Volumes

Recent vehicle turning movement count (TMC) data was provided by the City for each study area intersection. The dates when TMC data was collected is summarized in Exhibit 2-2 and the weekday peak hour volumes for each intersection are illustrated on Exhibit 2-3. Detailed TMC data is provided as Appendix A.

Exhibit 2-2: TMC Data Collection Dates and Peak Hours

Intersection	Count Date	AM Peak Hour	PM Peak Hour
Mohawk Road & McNiven Road/Lime Kiln Road	Thursday, April 26, 2018	8:45 – 9:45	17:00 – 18:00
Mohawk Road & Green Ravine Drive	Thursday, June 21, 2018	7:45 – 9:45	16:45 – 17:45
Mohawk Road & Algonquin Avenue	Monday, June 4, 2018	8:00 – 9:00	16:00 – 17:00
Mohawk Road & Filman Road	Monday, April 25, 2018	8:00 – 9:00	16:45 – 17:45

As shown in Exhibit 2-2, AM and PM peak hours vary for different intersections within the study area. For analysis and volume balancing purposes, data that was collected between 8:00 and 9:00, and between 16:45 to 17:45 was selected to represent AM and PM peak hours, respectively. It should be noted that CIMA+ completed AM and PM peak hour counts at the intersection of Mohawk Road and Cayuga Avenue on Thursday, July 19, 2018, to confirm the assumed peak hours.

Exhibit 2-3 depicts the existing observed peak hour intersection volumes.

Despite using a common peak hour when extracting TMC data, notable imbalances were revealed between study area intersections. Traffic volumes were conservatively balanced by proportionally increasing approach volumes at select study area intersections, such that total network volumes are consistent with higher observed volumes.

Exhibit 2-4 depicts the resultant balanced existing intersection volumes used for analysis purposes.

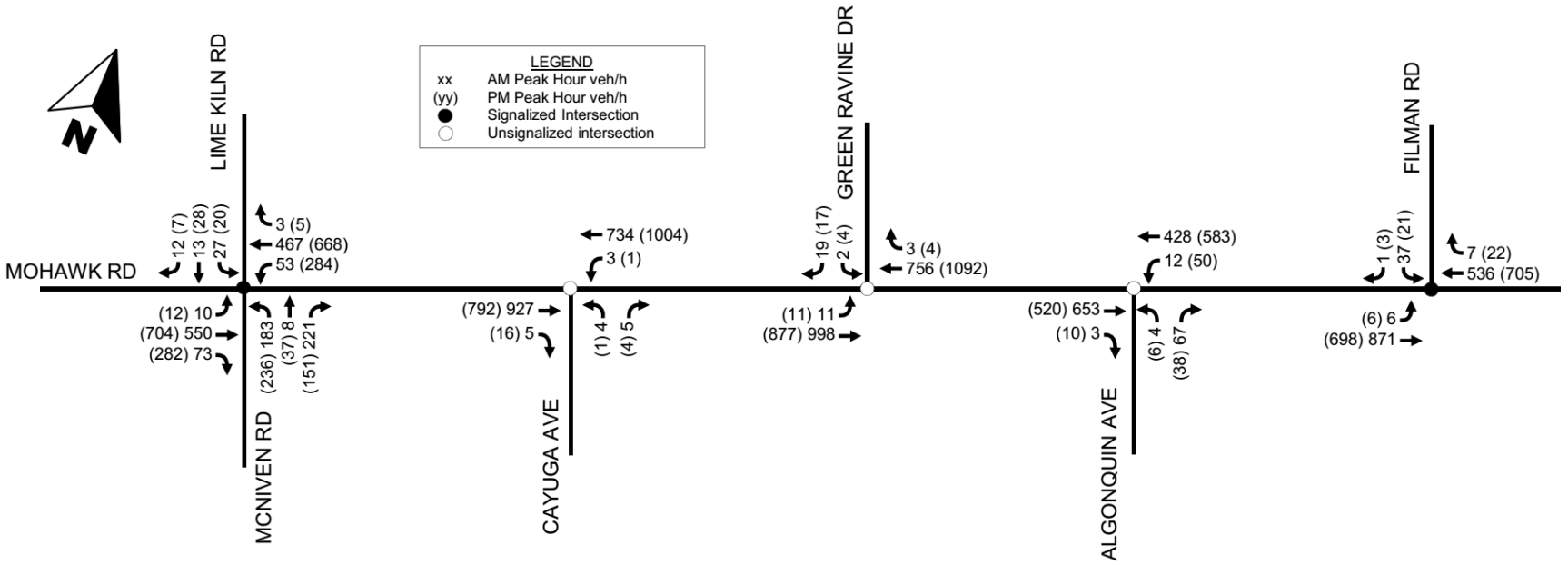

Exhibit 2-3: Existing Intersection Volumes – Observed TMC Data

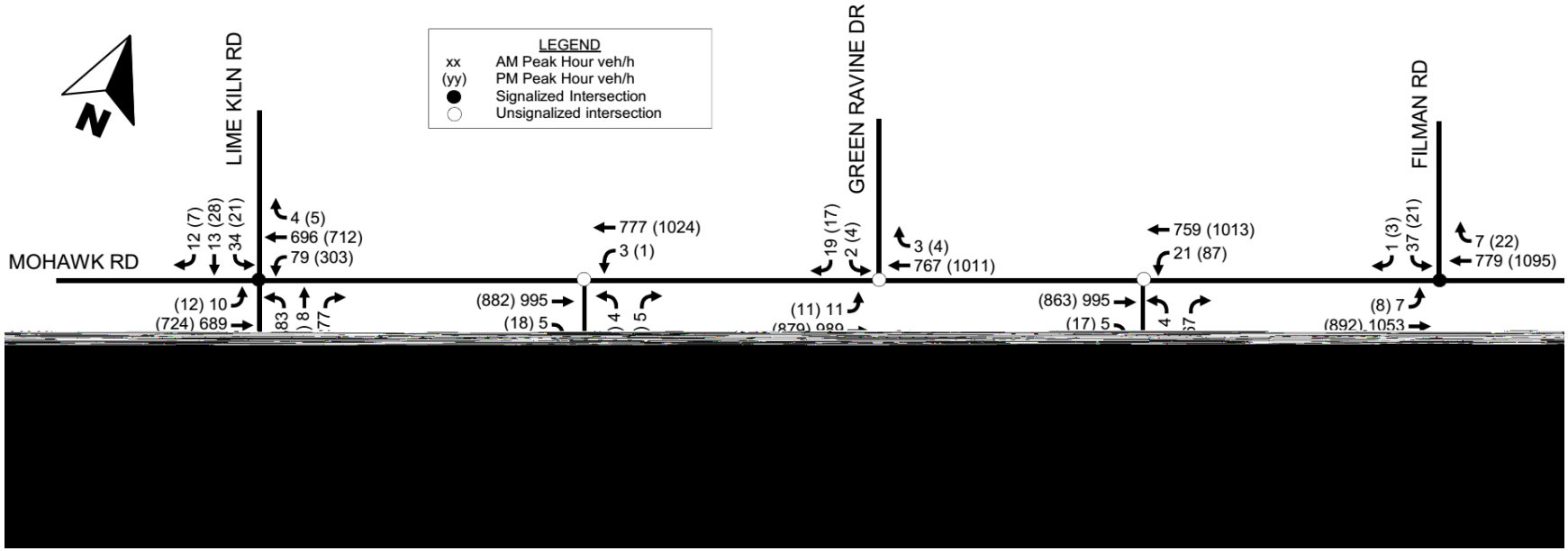

Exhibit 2-4: Existing Intersection Volumes – Balanced

2.6.3. Existing Major Drainage System

Mohawk Road has poorly defined major drainage systems. Fundamentally, these systems convey flows to three (3) different outlets.

Catchment 1.0: The western portion of the study area, labelled Outlet 1, has an overland flow path which is conveyed by Lime Kiln Road north to Longfield Crescent and then west along Longfield Crescent to Ancaster Creek. The overland flow route has no defined flow route between homes from Longfield Crescent to Ancaster Creek, the receiving watercourse. This lack of a defined overland flow path poses potential flooding risks.

Catchment 101 & 102 (External): The external areas drainage has the same overland flow route as catchment 1.0, as described above.

Catchment 2.0: The central portion of the study area between Cayuga Avenue and Filman Road, labelled Outlet 2, has no clear overland flow route to Tiffany Creek, the receiving watercourse. This lack of a defined overland flow path poses potential flooding risks.

Catchment 201, 202 & 203 (External): The external areas drainage has the same overland flow route as catchment 2.0, as described above.

Catchment 3.0: The eastern portion of the study area, labelled Outlet 3, has an overland flow path that will convey water in a north easterly direction along Filman Road, spilling to Tiffany Creek at Highvalley Road.

Catchment 301 (External): The external areas drainage has the same overland flow route as catchment 3.0, as described above.

2.6.4. Existing Stormwater Infrastructure

There is no existing stormwater quantity or quality infrastructure (SWM Ponds, OGS, etc.) on Mohawk Road, however, the existing storm ditches provide a measure of quality and quantity control. The Falling Brook Estates storm drainage area plan identifies an oil grit separator (OGS) prior to outletting to the Banting's Pond, at Tiffany Creek. No record information was available to confirm the level of quality and quantity controls provided.

2.7. Utilities

Hydro poles are located on the south side of Mohawk Road from Filman Road to Cayuga Avenue. The poles are set back approximately 3.5 metres from the curb and illumination is provided on the poles. Hydro poles are also intermittently located on the north side of Mohawk Road within this section. West of Cayuga Avenue, the hydro poles are located on the north side of Mohawk Road.

2.8. Phase 1 and 2 Consultation

2.8.1. Notice of Study Commencement and Public Information Centre #1

A combined Notice of Study Commencement and Notice of Public Information Centre (PIC) No. 1 was prepared to inform the public and agencies of the study and to invite recipients to attend

the PIC to review the project information on display and provide input. The Notice was advertised in the Ancaster News on September 14 and 21, 2018. The Notice was emailed or mailed to 40 agency representatives (including City staff) and 76 property owners within the study limits on September 10, 2018. A copy of the Notice is included in Appendix E.

The Notice of Study Commencement and PIC No. 1 outlined the purpose of the study and identified the time, date, and location for the PIC. The Notice invited public comments on the study by either attending the PIC or contacting the project team.

2.8.2. Public Information Centre #1

The PIC was held on September 24, 2018 at Ancaster Town Hall, at 310 Wilson Street East from 6:00 p.m. to 8:00 p.m. The PIC was held in an open-house format where the public was invited to review display boards, ask questions, and discuss comments and concerns with the project team. The display boards described the following:

- Purpose of Public Information Centre #1
- Study Area Overview
- Municipal Class EA Process
- Ancaster Transportation Master Plan (Ancaster TMP)
- Roadway Section from the Ancaster TMP
- Photos of Existing Conditions
- Natural Heritage Features
- Motor Vehicle Transportation – Existing and Future Conditions
- Active Transportation – Existing
- Cross Section Alternatives
    - On-Road Bike Lanes and Sidewalks (Both Sides)
    - Boulevard Cycle Tracks and Sidewalks (Both Sides)
    - Boulevard Multi-use trail (One Side Only)
- Active Transportation – Proposed
- Next Steps

A sign-in sheet and comment sheets were provided to record attendance and obtain written comments. A copy of the PIC material is included in Appendix E. Twenty-two (22) people signed into the PIC and nine (9) comments were received in response to the PIC.

The following general comments were submitted and noted by the project team during the PIC:

Vehicle Traffic and Infrastructure

- Concerns regarding safety and high traffic speeds in the study area
- Suggestion for a traffic signal at Mohawk Road & Green Ravine Drive to reduce vehicle speeds
- General support for a 3-lane cross-section
- Concern that the centre left-turn lane may become dangerous if some drivers use it as fast/passing lane to bypass traffic
- Suggestion to add curbs to turning areas to keep speeding/passing in turning areas
- Request for traffic calming

- Suggestion for raised medians mid-block for pedestrian refuge
- Suggestion to narrow the westbound approach at Filman Road to a single lane to eliminate vehicles attempting to pass on the right side

Active Transportation

- Suggestion for a controlled crossing at Mohawk Road & Green Ravine Drive for pedestrians and cyclists
- Support for a sidewalk on one side only and note that this is not an area with high pedestrian traffic
- Support for sidewalks on both sides or a multi-use trail on one side and sidewalk on the other
- General preference for separation of cyclists from cars (i.e. boulevard cycle tracks or multi-use trail)
- Concern regarding safety of cyclists with on-road bicycle lanes without a physical barrier
- Suggestion that bicycle lanes are redundant as Hiawatha Boulevard provides a safe option with access to cross Mohawk Road and Filman Road

Social Impacts

- Comments that residents feel isolated due to the lack of pedestrian facilities and high vehicle speeds along Mohawk Road making it difficult for residents to leave their properties without a vehicle
- Concern regarding property impacts (reduction in driveway length and impacts to mature trees)
- Suggestions to reduce boulevard widths to minimize property impacts

Other

- Suggestion for a gateway feature at Mohawk Road & Filman Road to calm aggressive/high speed drivers

2.9. Confirmation of Preferred Solution

Based on the feedback received from the public and stakeholders, the preferred solution was reconfirmed to be the widening of Mohawk Road to three lanes with a two-way centre left turn lane and introduction of active transportation facilities. This solution serves to reduce the queuing along Mohawk Road for drivers making turning movements, and better accommodate pedestrians and cyclists along the corridor.

3. Alternative Design Concepts

3.1. Development of Alternative Design Concepts

In this phase of the EA process, alternative design concepts for the preferred solution were developed, analyzed and evaluated. Nine (9) alternative design concepts were examined as part of this Class EA study (Appendix F).

Given that the three-lane cross-section with a two-way centre left-turn lane was identified as part of the preferred solution, the differences amongst alternative design concepts was the type of active transportation facilities provided. The alternative design concepts include:

Do Nothing – Mohawk Road remain in a “as-is” state

Option 0 – Three-lane section with two-way left-turn lane only

Option 1 – Three-lane section with bicycle lanes and sidewalks both sides

Option 2 – Three-lane section with cycle tracks and sidewalks both sides

Option 3A – Three-lane section with boulevard multi-use path on south side only

Option 3B – Three-lane section with boulevard multi-use path on south side and sidewalk on north side

Option 4A – Three-lane section with boulevard multi-use path on north side only

Option 4B – Three-lane section with boulevard multi-use path on north side and sidewalk on south side

Option 5 – Three-lane section with sidewalks both sides

The ‘Do Nothing’ alternative was included in the set of alternatives as a baseline measure of the effects of the other alternatives on the environment.

Options 1 though 5 are illustrated in Exhibit 3-1 through Exhibit 3-14.

Exhibit 3-1: Option 1, Three-Lane Section Plus Bicycle Lanes and Sidewalks Both Sides, Rendering

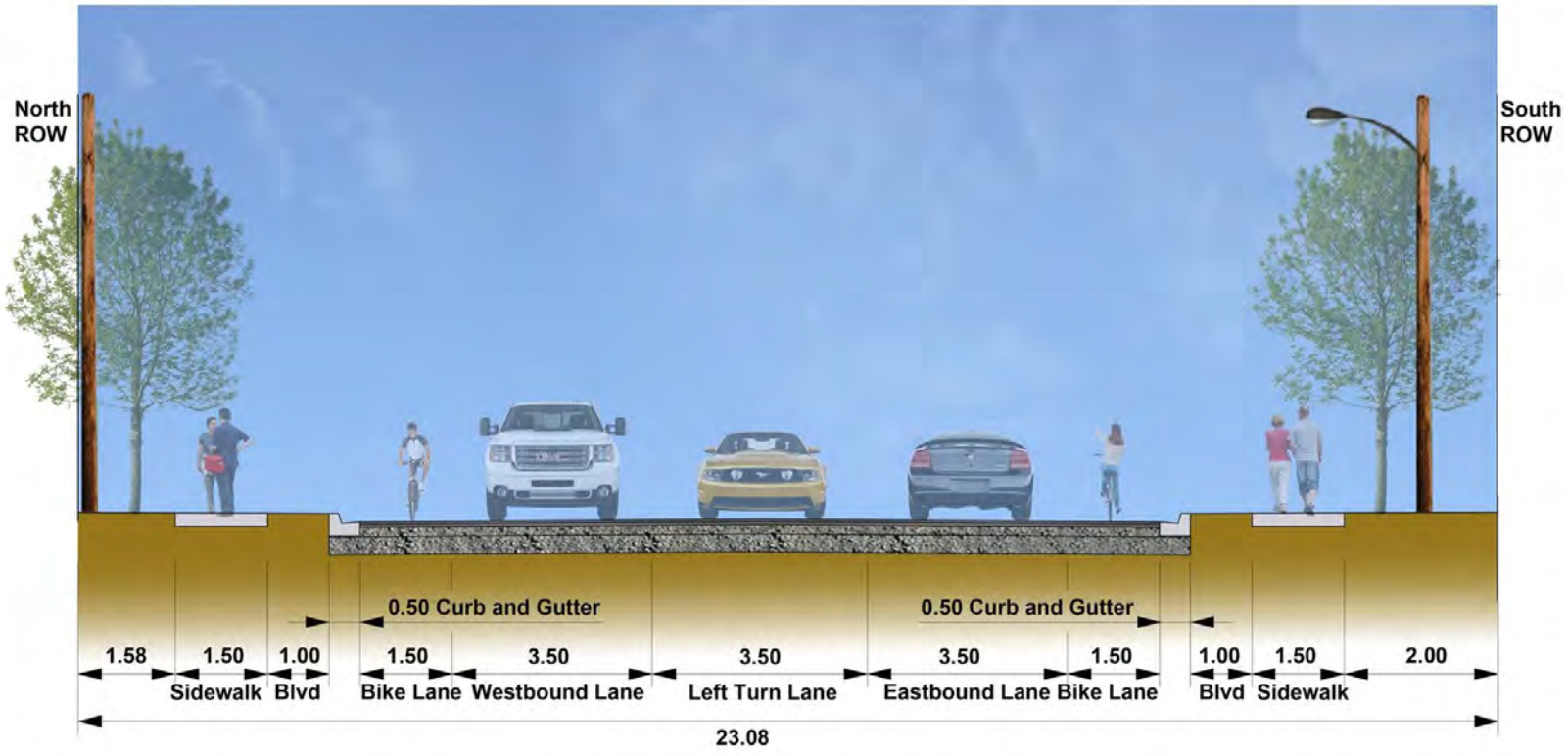

Exhibit 3-2: Option 1, Three-Lane Section Plus Bicycle Lanes and Sidewalks Both Sides, Cross-Section

Exhibit 3-3: Option 2, Three-Lane Section with Cycle Tracks and Sidewalks Both Sides, Rendering

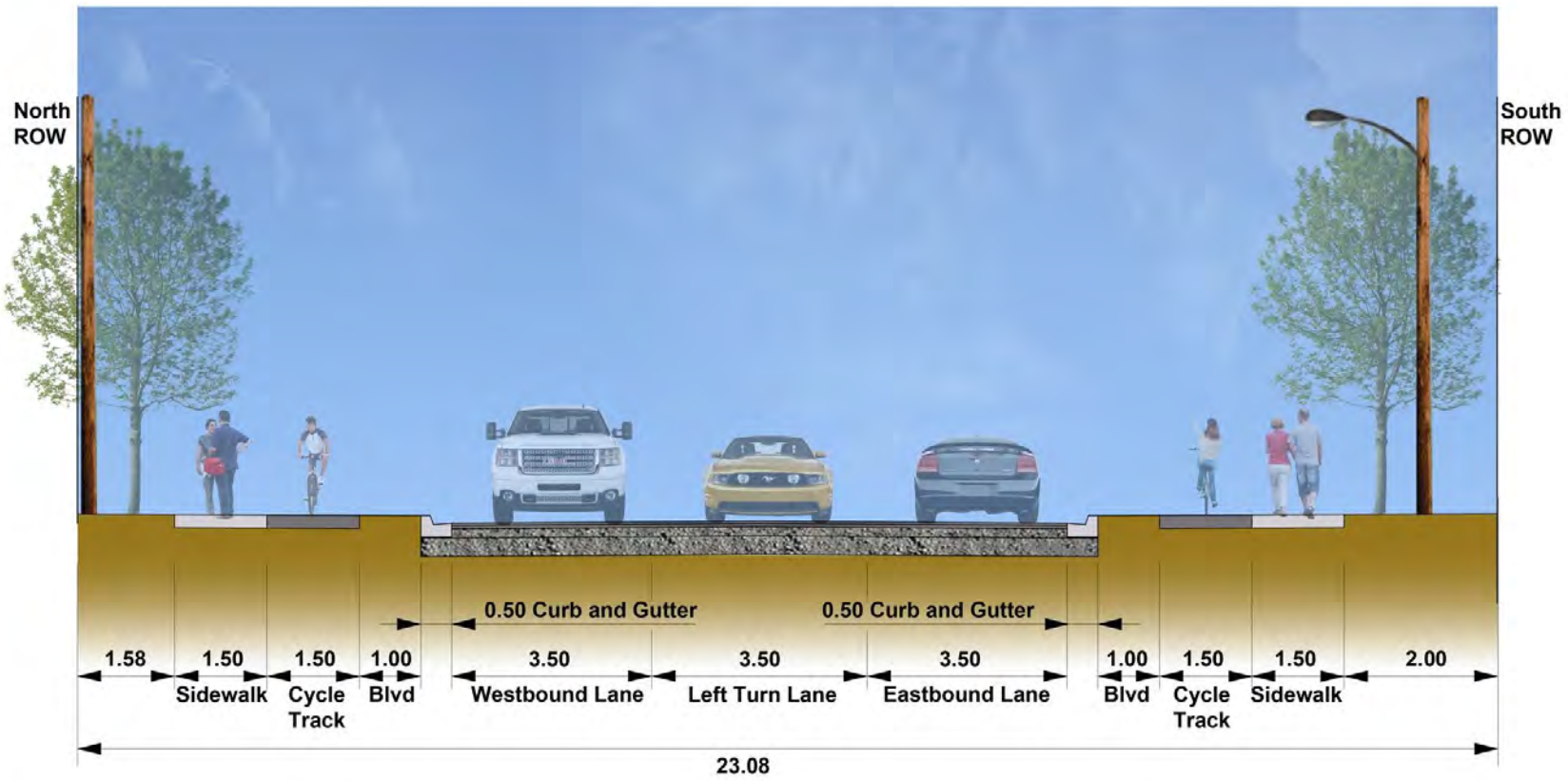

Exhibit 3-4: Option 2, Three-Lane Section with Cycle Tracks and Sidewalks Both Sides, Cross-Section

Exhibit 3-5: Option 3A, Three-Lane Section with Multi-use Path on South Side Only, Rendering

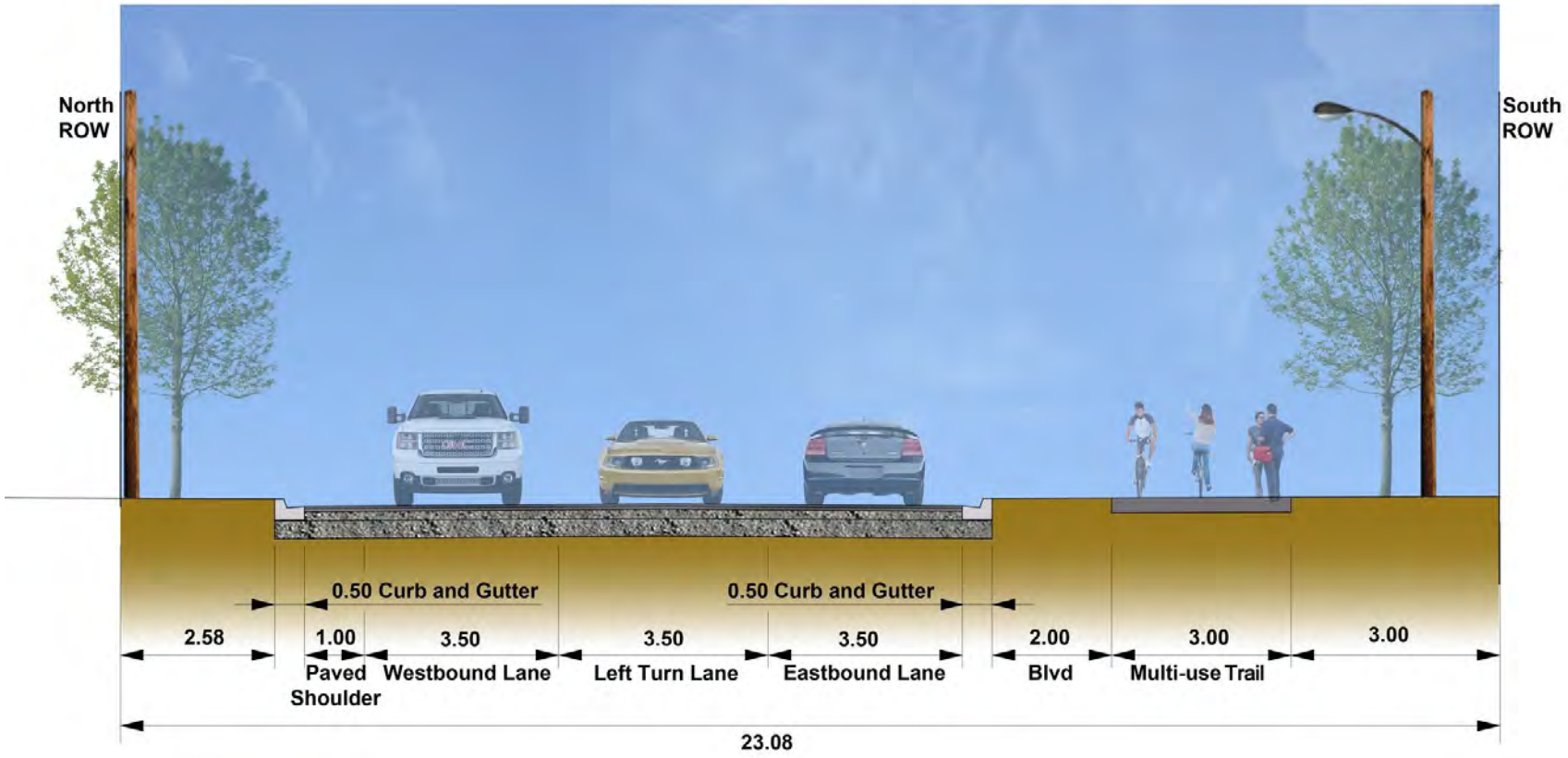

Exhibit 3-6: Option 3A, Three-Lane Section with Multi-use Path on South Side Only, Cross-Section

Exhibit 3-7: Option 3B, Three-Lane Section with Multi-use Path on South Side and Sidewalk on North Side, Rendering

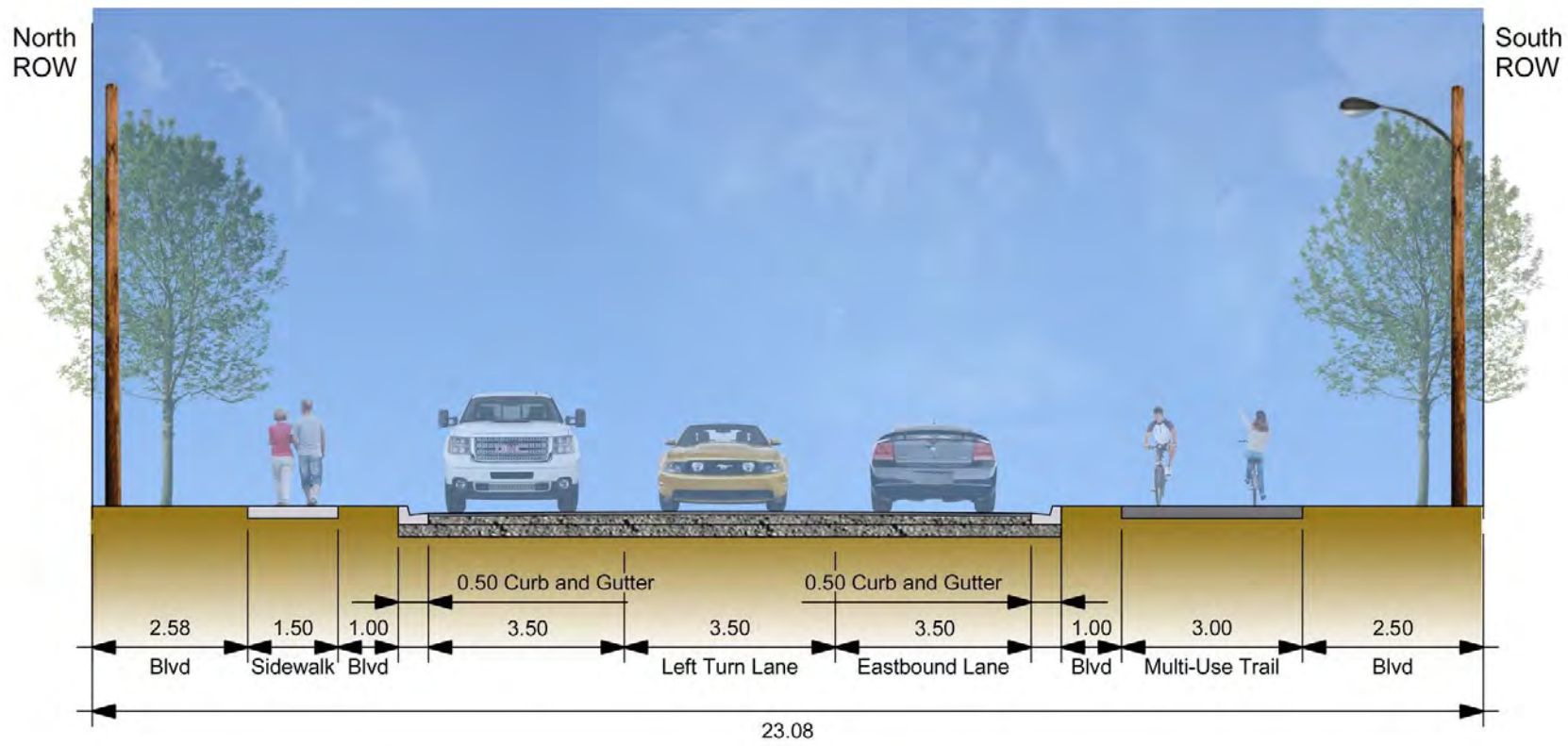

Exhibit 3-8: Option 3B, Three-Lane Section with Multi-use Path on South Side and Sidewalk on North Side, Cross-Section

Exhibit 3-9: Option 4A, Three-Lane Section with Multi-use Path on North Side Only, Rendering

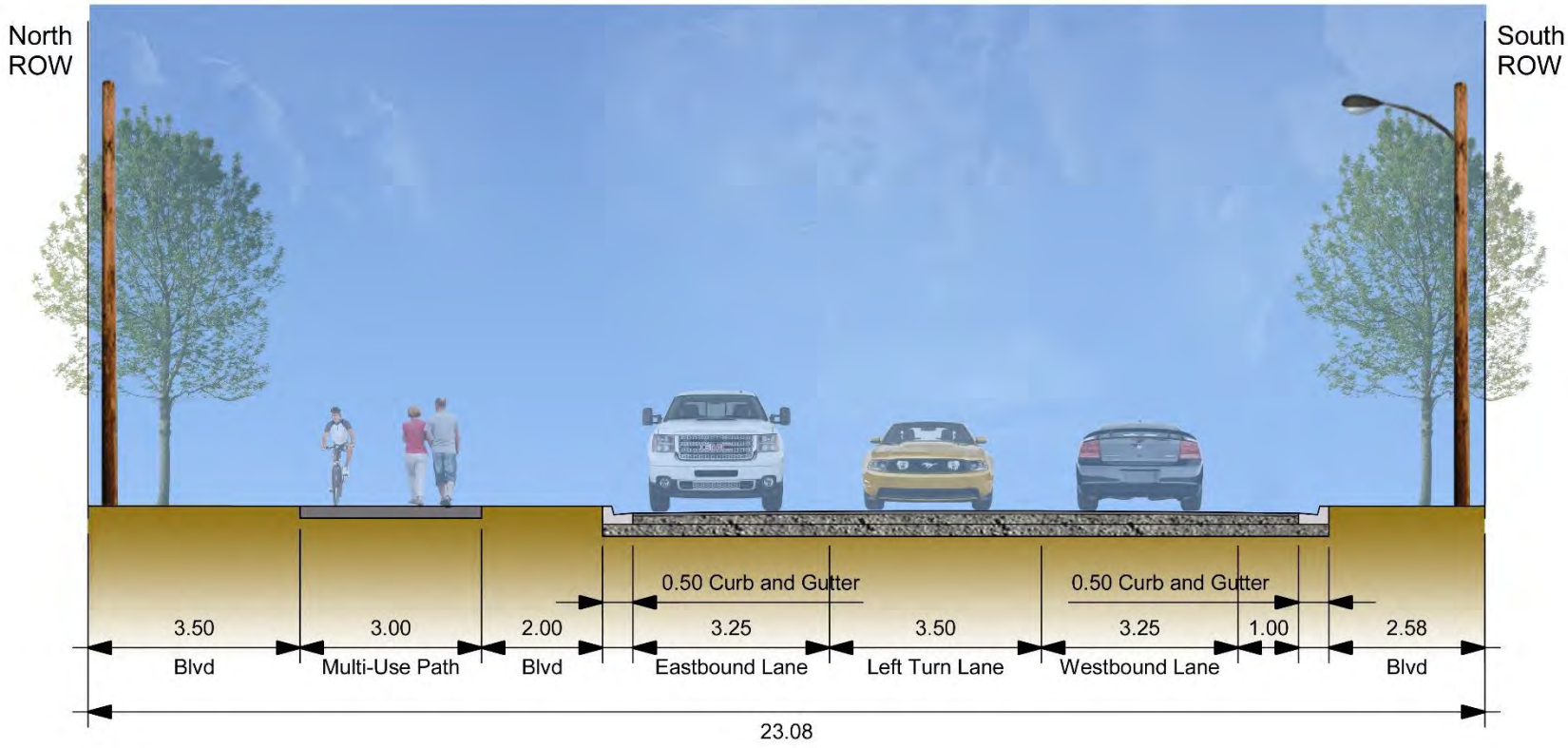

Exhibit 3-10: Option 4A, Three-Lane Section with Multi-use Path on North Side Only, Cross-Section

Exhibit 3-11: Option 4B, Three-Lane Section with Multi-use Path on North Side and Sidewalk on South Side, Rendering

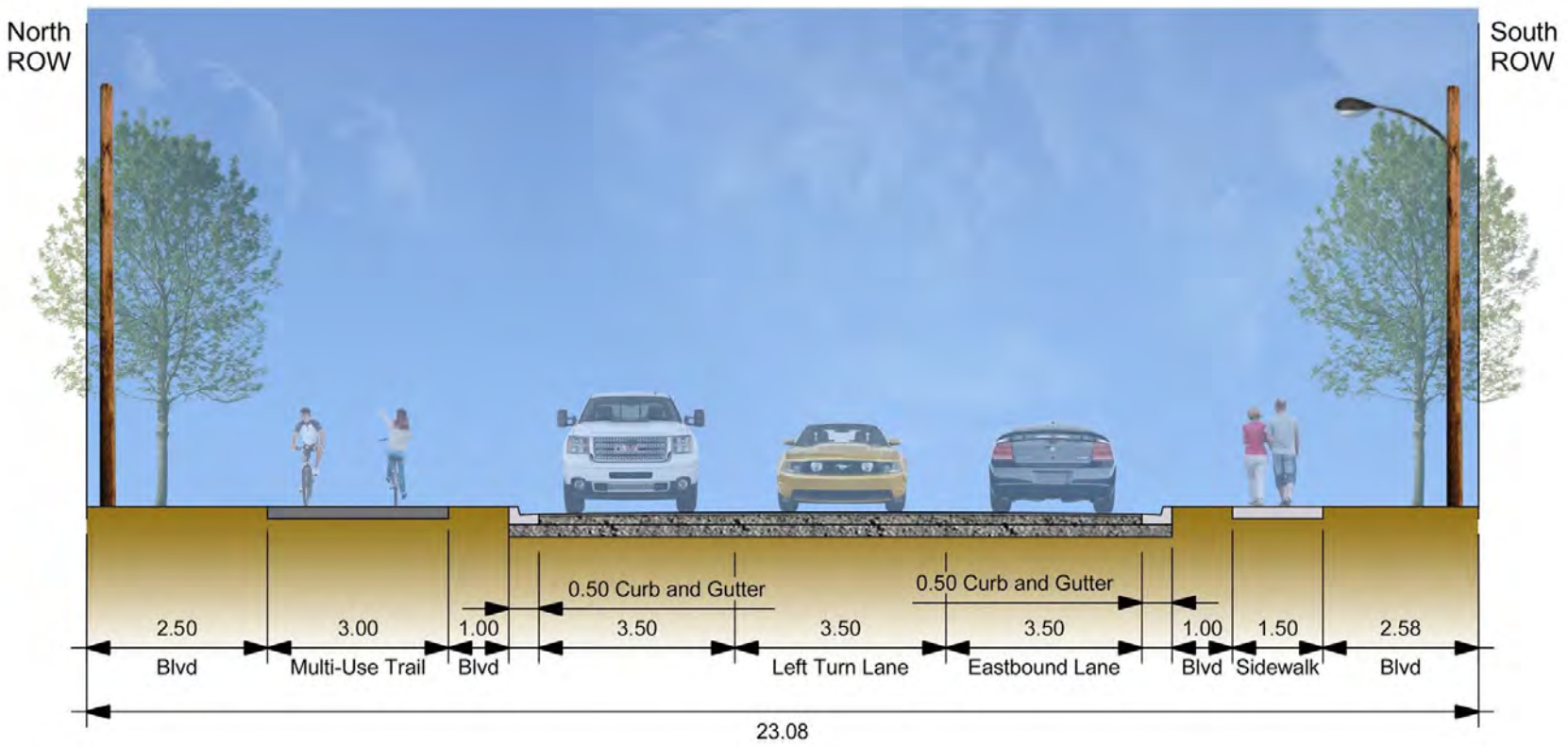

Exhibit 3-12: Option 4B, Three-Lane Section with Multi-use Path on North Side and Sidewalk on South Side, Cross-Section

Exhibit 3-13: Option 5, Three-Lane Section with Sidewalks on Both Sides, Rendering

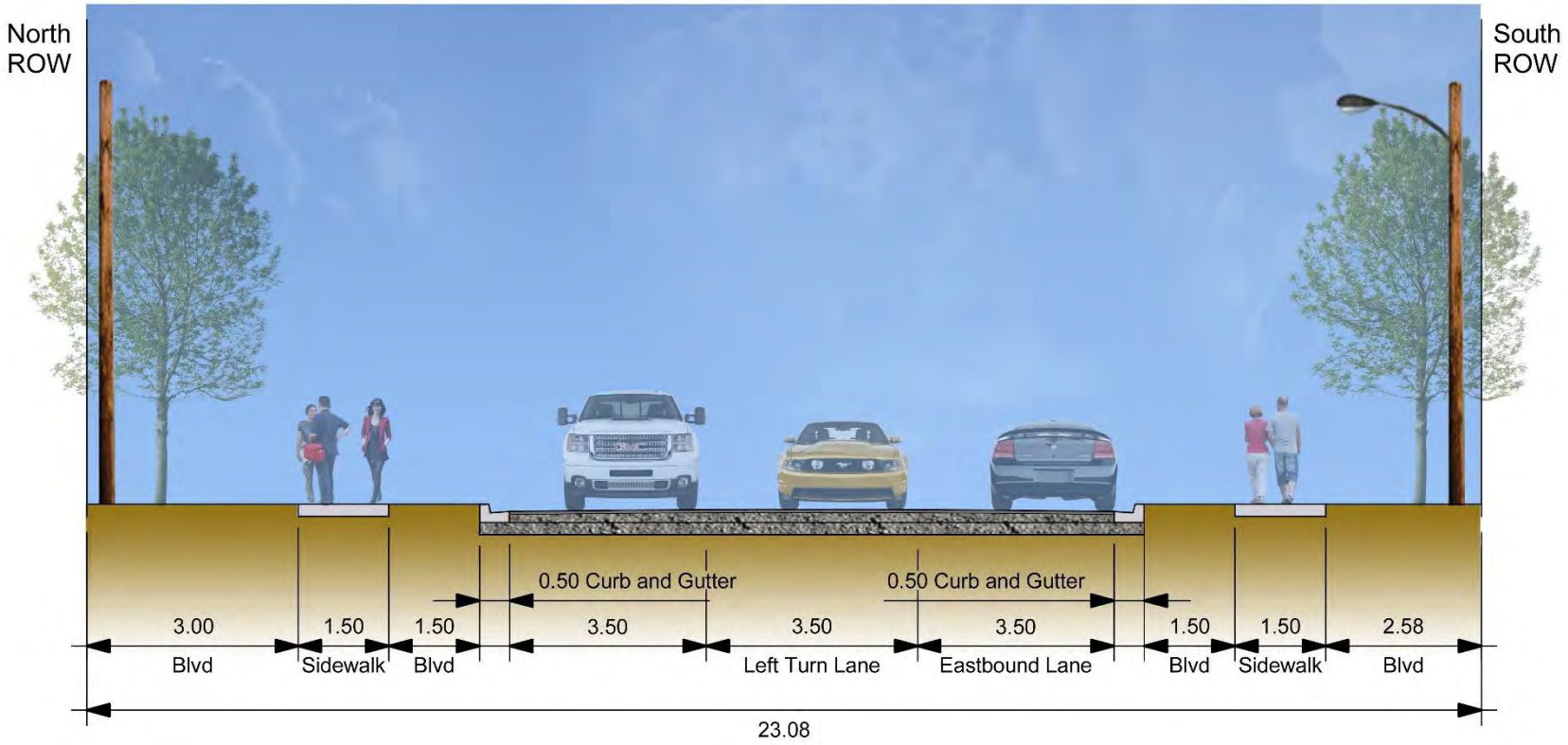

Exhibit 3-14: Option 5, Three-Lane Section with Sidewalks on Both Sides, Cross-Section

3.2. Analysis and Evaluation of Alternative Design Concepts

The alternative design concepts were assessed and evaluated based on the following factors:

- **Traffic Operations and Safety**
  - Future Traffic Operations
  - Motorist Safety
  - Pedestrian Safety
  - Cyclist Safety
  - Pedestrian and Cyclist Comfort
  - Potential Conflict for Cyclists at Driveways
- **Transportation Planning**
  - Compliance with Planning Policy
- **Natural Environment**
  - Stormwater Management
  - Tree Impacts
- **Socio-Economic**
  - Property Impacts
  - Cultural Heritage Impacts
  - Accessibility
  - Active Transportation Network Connectivity
- **Implementation**
  - Utility Relocations
  - Operations and Maintenance
  - Construction Staging and Constructability

As shown in the analysis and evaluation table, each alternative was analyzed against the various criteria listed above (i.e. future traffic operations, compliance with planning policies, etc.). The alternatives were then evaluated against one another and assigned a score based on the scoring system in Exhibit 3-15 and their respective benefits to the surrounding environments.

Exhibit 3-15: Evaluation Scale

Highest Benefit	**Fairly High Benefit**	**Moderate Benefit**	**Fairly Low Benefit**	**Least Benefit**

A summary score is provided for each criteria category (i.e. Transportation, Natural Environment, etc.). The summary score for each category was established by averaging the scores across the sub-categories. In situations where the average score was between two of the scoring levels, a greater weight was placed on the more critical sub-categories.

The overall recommendation from the table was determined using the same methodology. The average of the summary scores was taken to determine the overall score for each alternative. In this situation, the Transportation and Natural Environment categories were assigned a greater weight as the safety of road users and potential impacts to trees were identified as critical factors by the project team and the public.

The analysis and evaluation of alternative design concepts is provided in Exhibit 3-16.

Exhibit 3-16: Analysis and Evaluation of Alternative Design Concepts

3.3. Technically Preferred Alternative Design

Based on the analysis and evaluation of alternative design concepts, Option 4A, Three-Lane Section with Boulevard Multi-use path North Side Only, was selected as the preliminary preferred alternative design subject to agency and public review. Primary reasons this option was selected as preferred:

- All options have a centre two-way left-turn lane which will improve traffic operations yet not result in excessive vehicle speeds and passing like a four-lane section
- All options will feature centre medians to calm traffic and create pedestrian crossing areas
- All options except Options 1 and 5 provide a dedicated space for pedestrians and cyclists physically separated from motor vehicles
- Options 3A and 4A don't have pedestrian and cyclist facilities on both sides of Mohawk Road but will impact fewer trees than Options 2, 3B and 4B
- Option 4A will not require (expensive) relocation of an overhead utility line

3.4. Phase 3 Consultation

3.4.1. Notice of Public Information Centre #2

A Notice of Public Information Centre (PIC) No. 2 was prepared to invite recipients to attend the PIC to review the project information on display and provide comments on the preliminary recommended plan. The Notice was advertised in the Ancaster News on March 28 and April 4, 2019. The Notice was emailed or mailed to 39 agency representatives (including City staff) and 76 property owners within the study limits on March 18, 2019. A copy of the Notice is included in Appendix G.

The Notice of PIC No. 2 outlined the purpose of the meeting and identified the time, date, and location for the PIC. The Notice invited public comments on the study by either attending the PIC or contacting the project team.

3.4.2. Public Information Centre #2

The PIC was held on April 11th, 2019 at Ancaster Town Hall, at 310 Wilson Street East from 6:00 p.m. to 8:00 p.m. The PIC was held in an open-house format where the public was invited to review display boards, ask questions, and discuss comments with the project team. The display boards described the following:

- Purpose of Public Information Centre #2
- Study Area Overview
- Municipal Class EA Process and Schedule
- Summary of PIC No. 1
- Natural Heritage Features
- Stormwater Management

- Cross Section Alternatives
- Analysis and Evaluation of Alternative Design Concepts
- Preliminary Preferred Alternative Design
- Tree Protection and Mitigation
- Next Steps

A sign-in sheet and comment sheets were provided to record attendance and obtain written comments. A copy of the PIC material is included in Appendix G. Eighteen (18) people signed into the PIC and eight (8) comments were received in response to the PIC.

The following general comments were submitted and noted by the project team during the PIC:

Vehicle Traffic and Infrastructure

- Concerns regarding safety and high traffic speeds in the study area
- Suggestion for a traffic signal at Mohawk Road & Green Ravine Drive to reduce vehicle speeds
- General support for a 3-lane cross-section
- Concern that the centre left-turn lane may become dangerous for drivers if some drivers use it as fast/passing lane to bypass traffic
- Suggestion to add curbs to turning areas to keep speeding/passing in turning areas
- Request for traffic calming
- Suggestion to narrow traffic lanes to reduce speeds
- Support for raised medians mid-block for pedestrian refuge
- Concerns regarding noise due to high traffic volumes and high speeds
- Suggestions to add flashing crosswalk lights

Active Transportation

- Suggestion for a controlled crossing at Mohawk Road & Green Ravine Drive for pedestrians and cyclists
- Support for a sidewalk on one side only and note that this is not an area with high pedestrian traffic
- Support for sidewalks on both sides or a multi-use trail on one side and sidewalk on the other
- General preference for separation of cyclists from cars (i.e. boulevard cycle tracks or multi-use trail)
- Concern regarding safety of cyclists with on-road bicycle lanes without a physical barrier
- Suggestion that bicycle lanes are redundant as Hiawatha Boulevard provides a safe option with access to cross Mohawk Road and Filman Road
- Support for mixed-use cycle track design

Social Impacts

- Comments that residents feel isolated due to the lack of pedestrian facilities and high vehicle speeds along Mohawk Road making it difficult for residents to leave their properties without a vehicle

- Concern regarding property impacts (reduction in driveway length and impacts to mature trees)
- Suggestions to reduce boulevard widths to minimize property impacts
- Concerns regarding local businesses that will be impacted by the construction and access to the main road and property taken away from the business location

Other

- Suggestion for a gateway feature at Mohawk Road & Filman Road to calm aggressive/high speed drivers

3.5. Preferred Design Concept

Based on feedback received from the public and stakeholders, Option 4A, Three-Lane Section with Boulevard Multi-use path North Side Only was selected as the preferred design concept.

Several comments were received in response to PIC #2 requesting pedestrian facilities on the south side of Mohawk Road. In response to these comments, a sidewalk along the south side of Mohawk Road has been added between Lime Kiln Road/McNiven Road and Algonquin Avenue to improve pedestrian safety along the corridor. The sidewalk can be implemented along this section without significant impact to trees or impact to the hydro poles on the south side of the corridor. A sidewalk was not provided between Algonquin Avenue and Filman Road, as this would result in significant impact to trees.

It is expected that pedestrians travelling from the north side of Mohawk Road can cross at the controlled crossings at Lime Kiln Road/McNiven Road or Filman Road to continue to the south or vice-versa.

The justification for providing two pedestrian crossings (PXOs) on Mohawk Road was reviewed (Section 4.1.4). Based on the low volumes of pedestrians crossing Mohawk Road within the study limits, a controlled pedestrian crossing is not warranted.

However, the implementation of raised median islands as a traffic calming measure, with no accompanying formal pedestrian crossing treatments, is recommended. Raised median islands will aid in reducing vehicle speeds, provide informal pedestrian refuge mid-block, and deter drivers from using the centre left-turn lane as a through lane. The medians will aid in addressing concerns of high vehicle speeds and passing noted by the public at PIC #2. Given the length of this section of Mohawk Road, two raised median islands are recommended: one approximately 22 metres west of Cayuga Avenue, and one approximately 8 metres west of Algonquin Avenue.

Elements of the Preferred Alternative include:

- Two 3.5 metre travel lanes (one in each direction)
- A 3.5 metre two-way centre left-turn lane
- A 3.0 metre multi-use path on the north side along the full length of the corridor
- A sidewalk on the south side from Lime Kiln Road/McNiven Road to Algonquin Avenue
    - The sidewalk is typically 1.8 to 2.0 metres wide when adjacent to curbs and 1.5 metres wide otherwise.

  - The sidewalk width adjacent to curbs has been reduced to 1.5 metres in constrained locations (i.e. adjacent to trees identified as being high value in order to mitigate impacts)
- Raised median islands approximately 22 metres west of Cayuga Avenue, and approximately 8 metres west of Algonquin Avenue. The roadway width adjacent to the islands is 4.5 metres to facilitate winter maintenance activities.

4. Description of the Recommended Plan

The main features of the recommended plan for the Mohawk Road improvements are discussed in Section 4. While refinements to the recommended plan may occur during detailed design, any modifications should not alter the function of the recommended undertaking.

Preliminary design plates for the preferred design concept are provided in Exhibit 4-2 through Exhibit 4-7.

4.1. Roadway Geometry

4.1.1. Design Criteria

The design criteria for the recommended plan is provided in Exhibit 4-1.

Exhibit 4-1: Design Criteria

Parameter			Unit	Target Values	Actual Values
Classification			-	UAU 60	UAU 60
Design Speed			km/h	60	60
Number of Through Lanes			-	2	2
Design Vehicle			-	WB-17	WB-17
Stopping Sight Distance			m	85	85
Horizontal Alignment	Min. Radius/ Min. Reverse Crown Radius		m	130/185	250
	Min. Radius with Normal Crown		m	1290	1290
	Min. Spiral Parameter A		m	N/A	N/A
Vertical Alignment	Grade	Maximum	%	6	3.77
		Minimum	%	0.5	0.505
	K Value	Crest Curve	-	11	11
		Sag Curve	-	9	9
Cross Section	Max. Superelevation		m/m	0.04	0.04
	Lane Width	Through Lane	m	3.5	3.5
		TWLTL	m	3.5	3.5
		Bicycle Lane	m	N/A	N/A
	Min. Curb Face to Curb Face Width (at Pedestrian Refuge Islands)		m	4.5	4.5
	Min. Pedestrian Refuge Island Width		m	2.0	2.5
	Min. Median Width		m	1.5	1.5

Parameter		Unit	Target Values	Actual Values
	Sidewalk Width	m	1.5 (where provided)	1.5-1.8 (South side)
	Multi-use path (MUP)	m	3	3 (North side)
	Boulevard Width	m	2 (can vary)	2 (varies)
	Crossfall	%	2	2
Min. Pole Offset from Curb Face		m	1.2	1.2
Intersection Daylight Triangle		m	15	Existing
Right of Way	With Median	m	Existing	Existing

4.1.2. Profile and Alignment

The horizontal alignment matches the existing alignment of Mohawk Road, and the proposed profile generally matches the existing profile. The proposed plan and profile are shown in Exhibit 4-2 through Exhibit 4-7.

Exhibit 4-2: Preliminary Design Plates – Plan Station 0+140 to 0+540

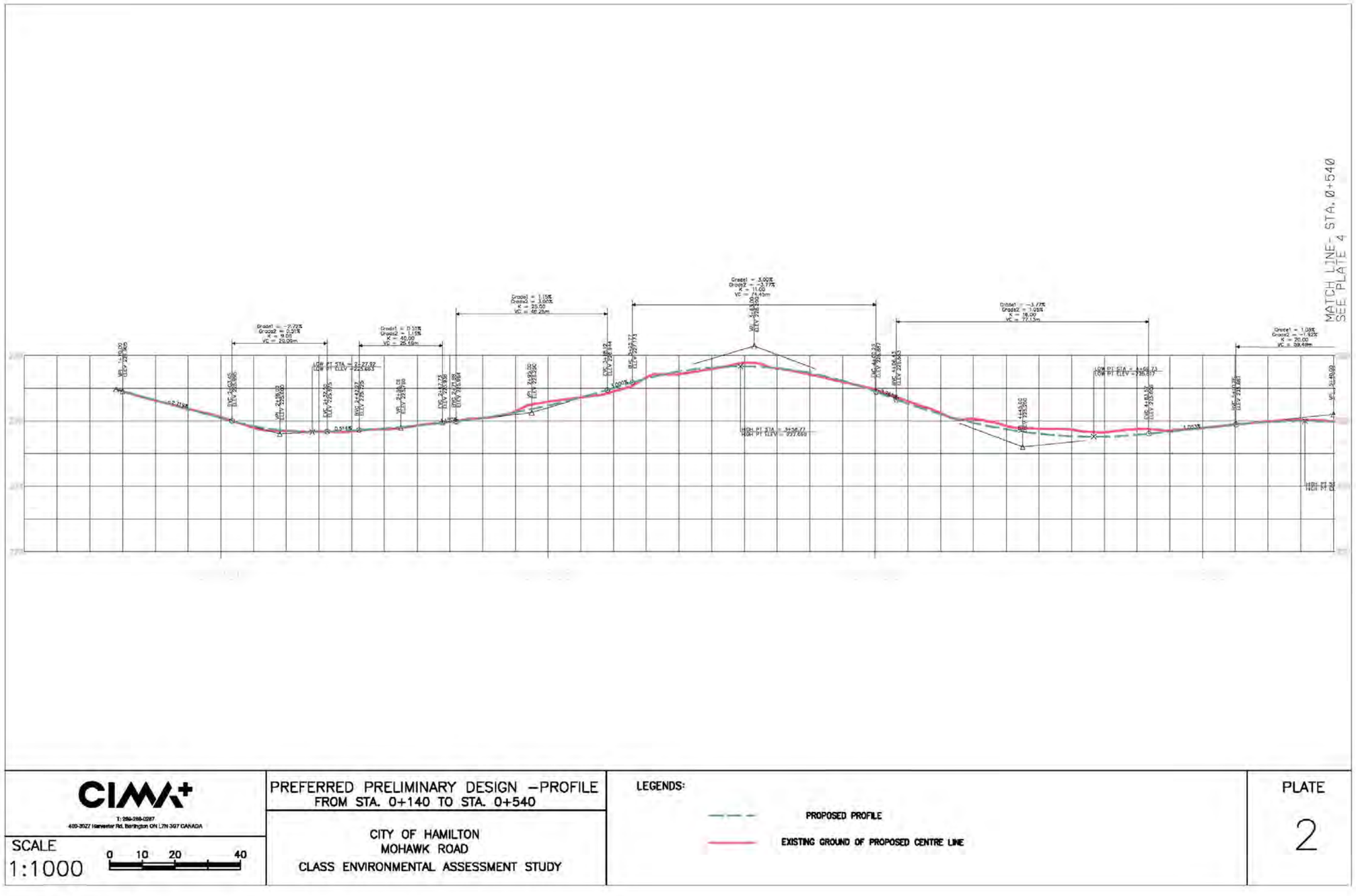

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Exhibit 4-3: Preliminary Design Plates – Profile Station 0+140 to 0+540

Exhibit 4-4: Preliminary Design Plates - Plan Station 0+540 to 0+920

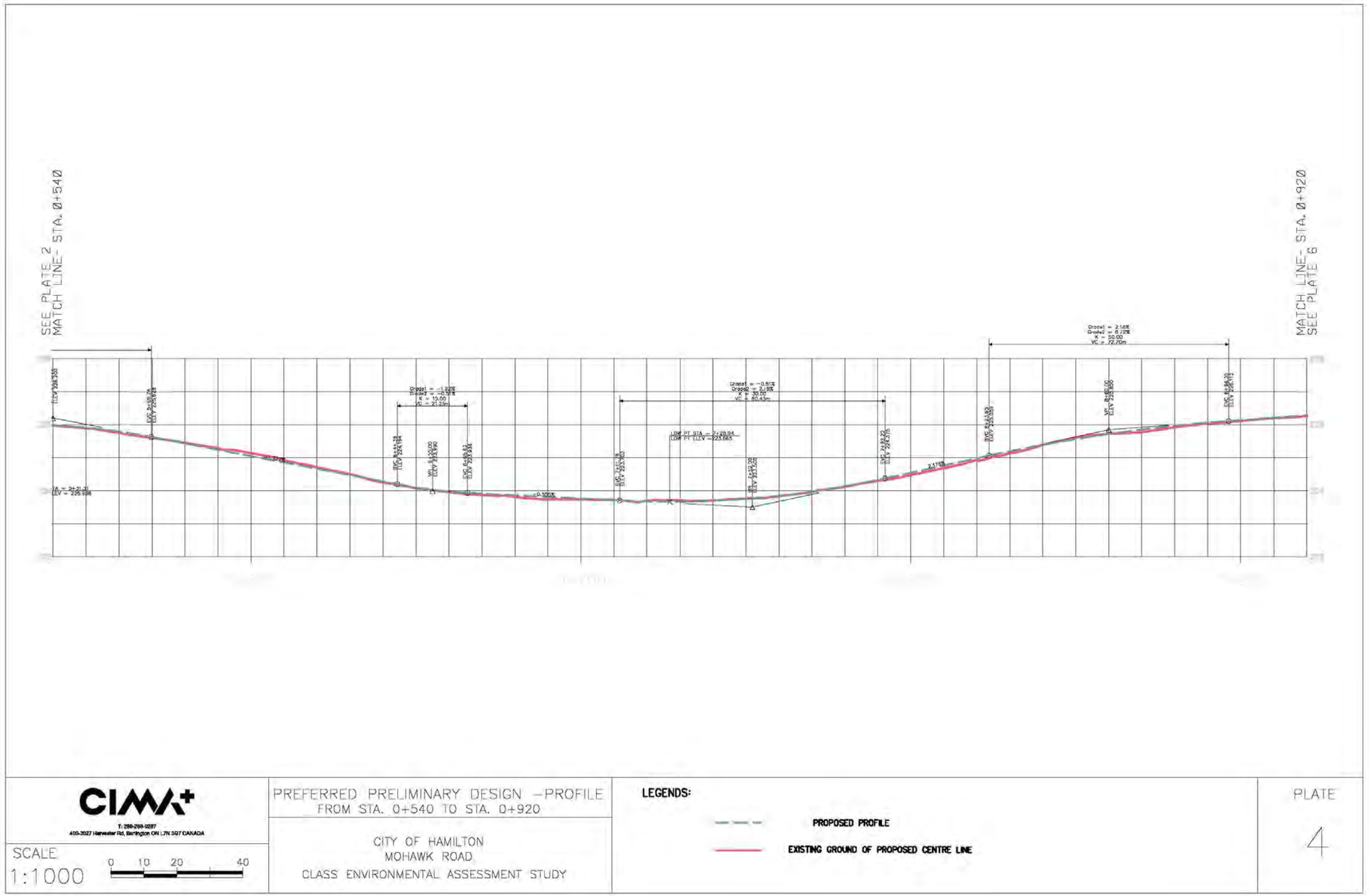

Exhibit 4-5: Preliminary Design Plates - Profile Station 0+540 to 0+920

Exhibit 4-6: Preliminary Design Plates Plan – Station 0+920 to 1+000

Exhibit 4-7: Preliminary Design Plates Profile – Station 0+920 to 1+000

4.1.3. Typical Cross Sections

The recommended typical cross section for Mohawk Road varies along the corridor as different constraints are present within different segments of the corridor. The Mohawk Road corridor has been divided into three sections based on the varying cross-sections:

- Section 1 – Mohawk Road between Lime Kiln Road/McNiven Road and Cayuga Avenue
- Section 2 – Mohawk Road between Cayuga Avenue and Algonquin Avenue
- Section 3 – Mohawk Road between Algonquin Avenue and Filman Road

The typical cross sections have been amended to reduce the boulevard widths and where possible to avoid impact to private property, trees and utilities.

The typical cross section between Lime Kiln Road/McNiven Road and Cayuga Avenue is illustrated in Exhibit 4-8. This section includes a 3.0 metre multi-use path on north side and a 1.5 metre sidewalk on south side adjacent to the property line. The sidewalk between Lime Kiln Road/McNiven Road and Cayuga Avenue is present under existing conditions and a relocation of the sidewalk is not proposed. A new segment of sidewalk approximately 35 metres in length is recommended to connect the existing sidewalk to the Mohawk Road and Cayuga Avenue intersection.

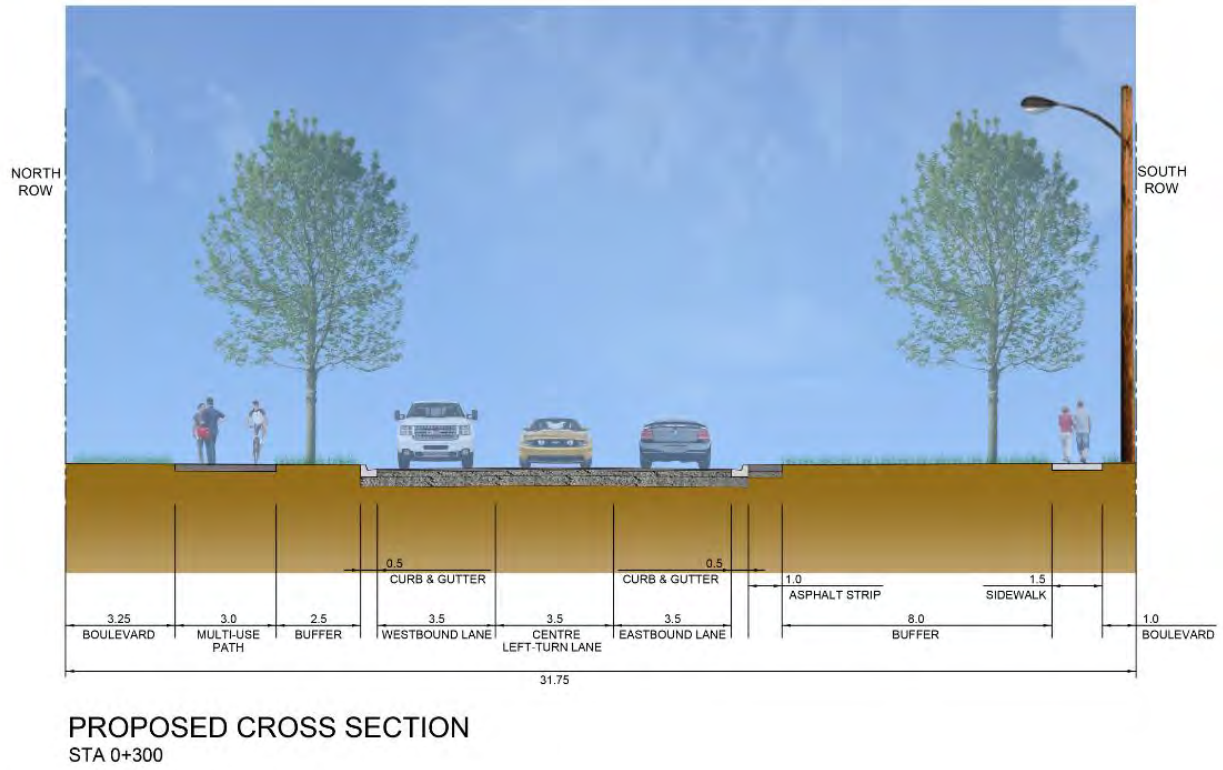

Exhibit 4-8: Typical Cross Section Between Lime Kiln Road/McNiven Road and Cayuga Avenue with Multi-use Path on North Side and Sidewalk on South Side Adjacent to Property Line

The typical cross section between Cayuga Avenue and Algonquin Avenue is illustrated in Exhibit 4-9. This section includes a 3.0 metre multi-use path on the north side and a 1.8 metre sidewalk on south side adjacent to the curb. The sidewalk has been provided adjacent to the curb in order to avoid impact to high value trees located along this section. To the west of the intersection of Mohawk Road and Algonquin Avenue, the sidewalk "jogs" in alignment in order to avoid further impact to trees.

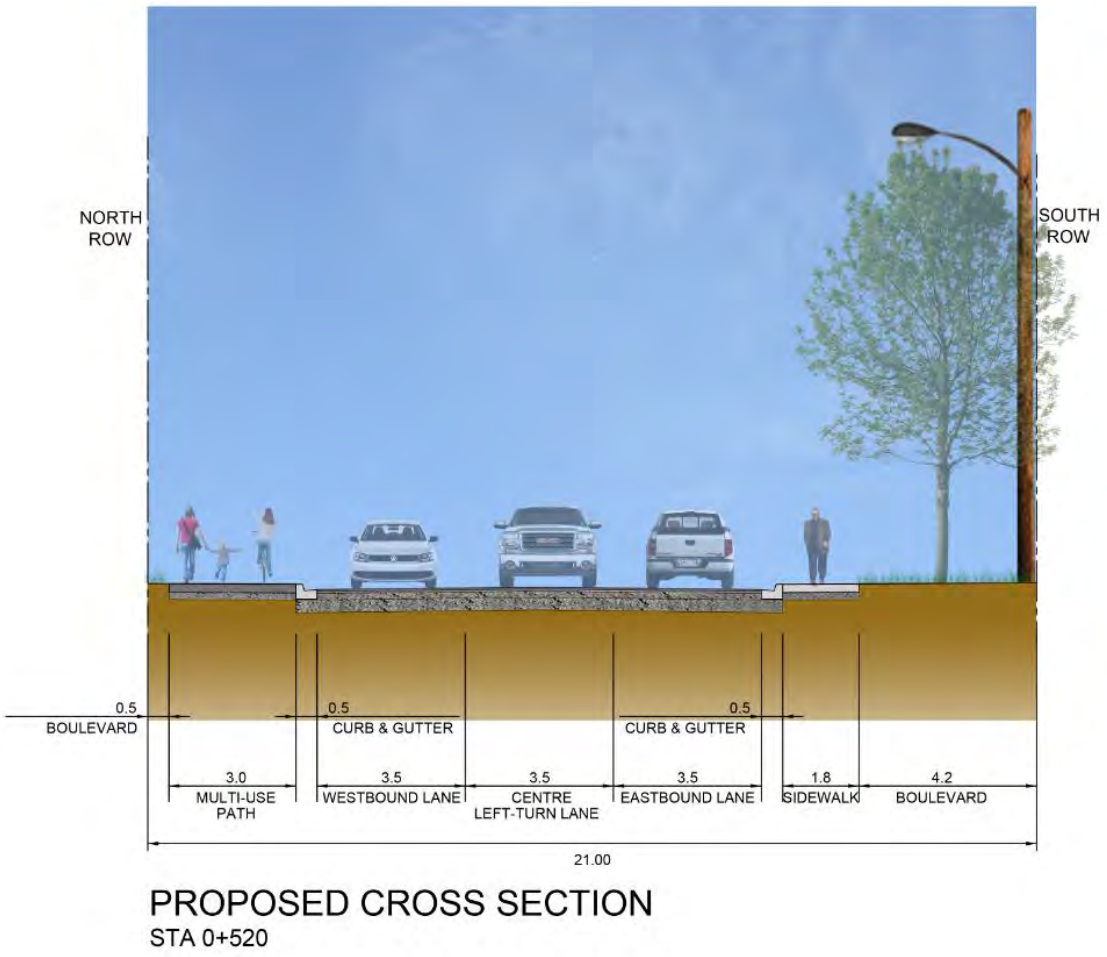

Exhibit 4-9: Typical Cross Section Between Cayuga Avenue and Algonquin Avenue with Multi-use Path on North Side and Sidewalk on South Side Adjacent to Curb

The typical cross section between Algonquin Avenue and Filman Road is illustrated in Exhibit 4-10. This section includes a 3.0 metre multi-use path on the north side. A sidewalk on the south side is not provided within this section because of the location of high value trees and utility poles. If a sidewalk were to be provided in this section it would require removal of trees, the relocation of utility poles and additional property. A 1.0 metre asphalt strip is provided adjacent to the curb on the south side.

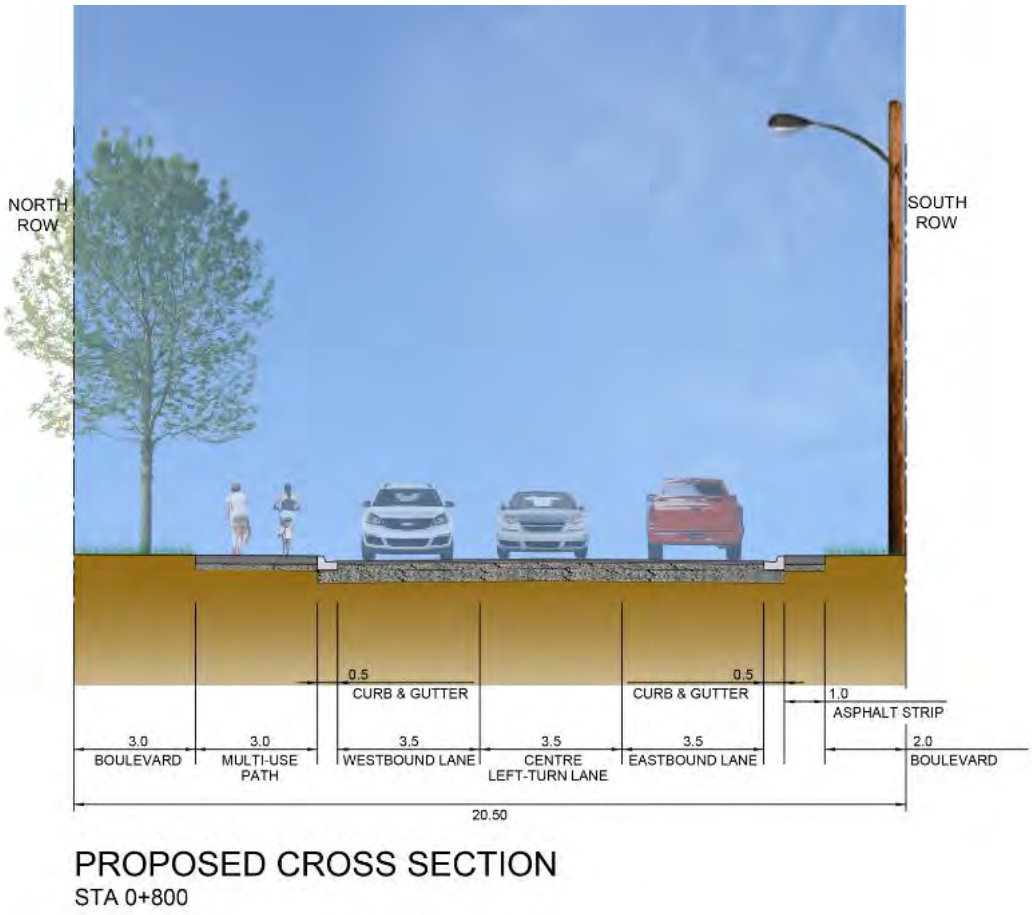

Exhibit 4-10: Typical Cross Section Between Algonquin Avenue and Filman Road with Multi-use Path North Side Only (No Sidewalk)

4.1.4. Active Transportation

As discussed in Section 4.1.3, the recommended plan includes a 3.0 metre multi-use path on the north side and a 1.8 metre sidewalk on the south side of Mohawk Road between Lime Kiln Road/McNiven Road and Algonquin Avenue. The multi-use path provides dedicated pedestrian and cycling facilities along the full length of the corridor. The sidewalk reduces to 1.5 metres in constrained locations to avoid impact to private property, high value trees and utilities. A sidewalk is not provided between Algonquin Avenue and Filman Road due to the location of high value trees and utilities poles.

The feasibility of implementing pedestrian crossing treatments within the study area were reviewed. The assessment can be found in Appendix H. Based on the guidance provided in Ontario Traffic Manual (OTM) Book 15, a pedestrian crossing is not warranted within the study limits due to the low pedestrian volumes crossing Mohawk Road. Given that Mohawk Road is a major arterial road, an uncontrolled crossing is also unsuitable.

However, the implementation of raised median islands as a traffic calming measure, with no accompanying formal pedestrian crossing treatments, is recommended. Raised median islands

will aid in reducing vehicle speeds, provide informal pedestrian refuge mid-block, and deter drivers from using the centre left-turn lane as a through lane.

Given the length of this section of Mohawk Road, two raised median islands are recommended: one approximately 22 metres west of Cayuga Avenue, and one approximately 8 metres west of Algonquin Avenue. These locations separate the Mohawk Road corridor into three roughly equal-length segments, and do not impact residential driveway access or left-turn movements from Cayuga Avenue and Algonquin Avenue using a WB-17 design vehicle.

4.1.5. Intersections

With the implementation of the centre two-way left-turn lane, additional left-turn storage at the intersections of Mohawk Road and Lime Kiln Road/McNiven Road and Filman Road intersections will be provided. Motorists will also be able to use the centre two-way left-turn lane to complete westbound left-turn movements at Cayuga Avenue and Algonquin Avenue, and eastbound left-turn movements at Green Ravine Drive, and it will allow motorists on the minor roads to compete left turns onto Mohawk Road in two stages

4.2. Drainage and Stormwater Management

As discussed in Section 2.6, a Drainage and Stormwater Management Assessment was conducted for the study area. A copy of the Drainage and Stormwater Management Report is available in Appendix D.

An evaluation of alternative stormwater solutions including source controls, conveyance controls and end of pipe solutions was completed. The following best management practices were evaluated considering relative cost, construction feasibility and stormwater objectives:

- Permeable Pavement
- Curb Extension Bioretention
- Traditional SWM Facilities
- Oil Grit Separators
- Bioretention Swale or Planters
- Underground Storage

It was concluded that the combination of Oil Grit Separators (OGS) and underground storage would be the most feasible and effective SWM practice that could be applied to provide the required levels of retention, quality and quantity controls for the roadway widening. The following is a summary of the recommended SWM plan for each outlet.

Catchment 1.0: The western portion of Mohawk Road is proposed to enter the existing storm sewers at Lime Kiln Road and Mohawk Road. Underground storage will be implemented to provide flow storage to reduce the runoff from the proposed roadway back to existing conditions. An Oil-Grit Separator (OGS) unit will be implemented before the entrance of the storage system to provide level 1 enhanced quality control for the roadway runoff.

Catchment 2.0: The central portion of Mohawk Road is proposed to enter the existing storm sewers as they cross Mohawk Road approximately 120 m to the east of green Ravine Drive. Underground storage will be implemented to provide flow storage to reduce the runoff from the

proposed roadway back to existing conditions. An OGS unit will be implemented before the entrance of the storage system to provide level 1 enhanced quality control for the roadway runoff.

Catchment 3.0: No SWM is required as no increase to the amount of impervious area within catchment 3.0 are proposed.

The proposed layout for the proposed SWM facilities is illustrated in Exhibit 4-11.

4.2.1. Proposed Stormwater Management System

The following section provides preliminary sizing details for the proposed stormwater management system.

Catchment 1.0: Roadway runoff will need to outlet into a Hydroworks HydroStorm 8 or equivalent in order to provide level 1 enhanced quality control for the proposed roadway expansion as per ETV certification. The OGS will outlet into underground storage with a volume of 43 m^3 to control the 100-year flow back to pre widening levels. The storage unit will then outlet into the existing storm sewer.

Catchment 2.0: Roadway runoff will need to outlet into a Hydroworks HydroStorm 10 or equivalent in order to provide level 1 enhanced quality control for the proposed roadway expansion as per ETV certification. The OGS will outlet into underground storage with a volume of 113 m^3 to control the 100-year flow back to existing conditions. The storage unit will then outlet into the existing storm sewer.

Catchment 3.0: No SWM is required as no increase to the amount of impervious area of catchment 3.0 are proposed.

As the soils in the study area are well draining, it is recommended that the underground storage units be open bottomed to provide a treatment train approach to quality control, as well as providing water retention. The increase in impervious area between existing and proposed conditions is 0.44 ha. Aiming for an infiltration amount of 5 mm, a total volume of 22 will need to m^3be retained within the underground storage to infiltrate into the ground.

4.2.2. Proposed Minor Drainage System

The study area will be urbanized with curb & gutters and stormwater will be captured with the implementation of storm sewers and catch basin infrastructure for the minor drainage system.

4.2.3. Proposed Major Drainage System

The proposed urban roadway will act as a major drainage path and will maintain the existing major drainage patterns as part of the proposed roadway widening to existing sag locations. The roadway was analyzed using the minimum road grade of 0.50% and maximum 100-year flow of 400 L/s. The roadway has capacity for 480 L/s of flow, and at the maximum flow the depth of flow shall be 0.11 m.

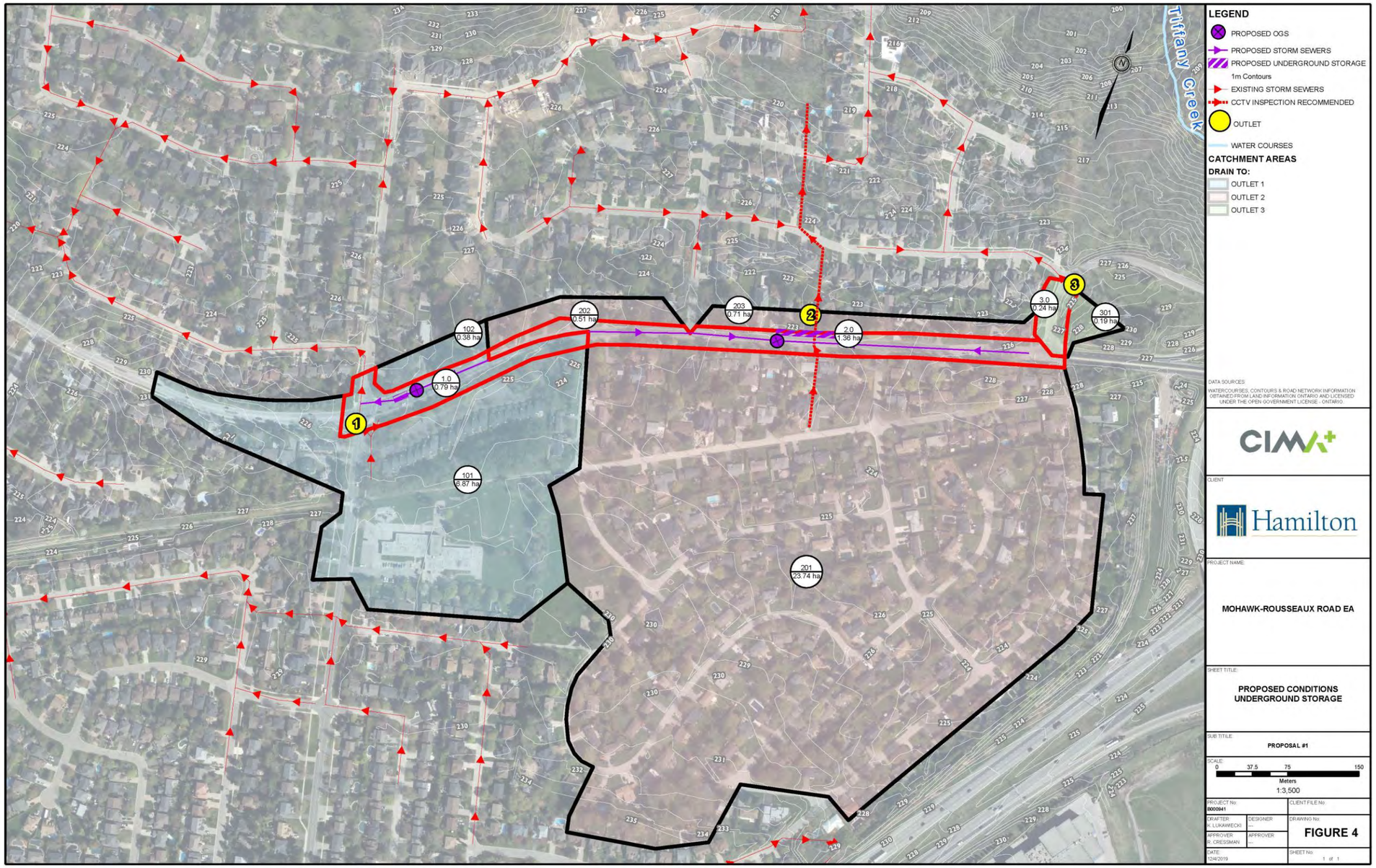

Exhibit 4-11: Proposed Stormwater Management Conditions

4.3. Tree Management

A total of 58 trees are expected to be injured as a result of the proposed hardscape and/or grading though the Tree Protections Zones (TPZs) as required for the road reconstruction. A total of 25 trees are expected to require removal due to conflict with construction zones along the roadway. The details regarding the trees expected to be injured and/or removed during construction are provided in Appendix C.

As discussed in Section 2.4, the most typical construction damage to trees is root damage from compaction and severance. Some of the trees inventoried will be close to the construction zone and may be at risk of contact with, and damage from, heavy equipment. A tree protection plan will be developed prior to construction to indicate the City's Tree Protection Zone and locations for Preservation Fencing. Compensation in the form of re-planting on site and/or planting trees elsewhere is required for the loss of 25 individual public trees. This compensation requirement shall be completed during the project detailed design and construction phases. Additional mitigation measures to protect trees to the extent possible are disused in Section 5.

4.4. Utilities

No impacts to the existing utilities along the corridor are anticipated as a result of implementing the recommended plan for Mohawk Road. This will also be confirmed during detailed design.

4.5. Property Requirements

The property requirements associated with the recommended plan for Mohawk Road are provided in Exhibit 4-12. Property requirements are shown for encroachment outside of the existing right-of-way to the edge of the proposed shoulder as well as property requirements for grading. Only a temporary easement is required during construction for some properties. Property and easements requirements will be confirmed during detailed design.

The Urban Hamilton Official Plan provides requirements for future right-of-way dedications. Under the Official Plan, Mohawk Road has a 30.480 metre right-of-way dedication requirement. Although the preferred design identified through this project has a right-of-way that is less than this amount, the requirements in the Official Plan should be maintained to accommodate for future growth or road changes. Development along Mohawk Road will remain subject to the requirements set out in the Official Plan.

Exhibit 4-12: Property Requirements

Property ID	Areas from Shoulder Line (m2)	Areas from Grading Line (m2)	Temporary Easement Area (m2)
743 Hiawatha Blvd		17	
583 Mohawk Rd		5	
617 Mohawk Rd	8	26	

Property ID	Areas from Shoulder Line (m2)	Areas from Grading Line (m2)	Temporary Easement Area (m2)
621 Mohawk Rd	23	30	
627 Mohawk Rd	7	11	
657 Mohawk Rd		45	
675 Mohawk Rd		35	
678 Mohawk Rd			10
687 Mohawk Rd	3	15	
694 Mohawk Rd			170
717 Mohawk Rd	72	121	

4.6. Construction Staging

The construction work for widening Mohawk Road is planned to be completed in four stages. The proposed construction staging cross-sections Mohawk Road are illustrated in Exhibit 4-13 and Exhibit 4-14. Two lanes of traffic (one per direction) will be maintained during construction in all stages.

Prior to stage 1, the existing north shoulder of Mohawk Road will be paved to increase the work zone in stage 1 and provide an adequate road surface for the temporary westbound lane. Then traffic is shifted to the north side of Mohawk Road allowing for the south section to be constructed. Temporary eastbound and westbound lanes are provided on the north side of Mohawk Road. In stage 2, the temporary eastbound lane is shifted to the newly-constructed south section of Mohawk Road in order to facilitate the construction of the centre section. In stage 3, both lanes are shifted to the south in order to construct the north section. In stage 4, the medians are constructed and top course paving is completed.

The construction staging plan will be reviewed during detailed design and a detailed staging plan will be developed at that time.

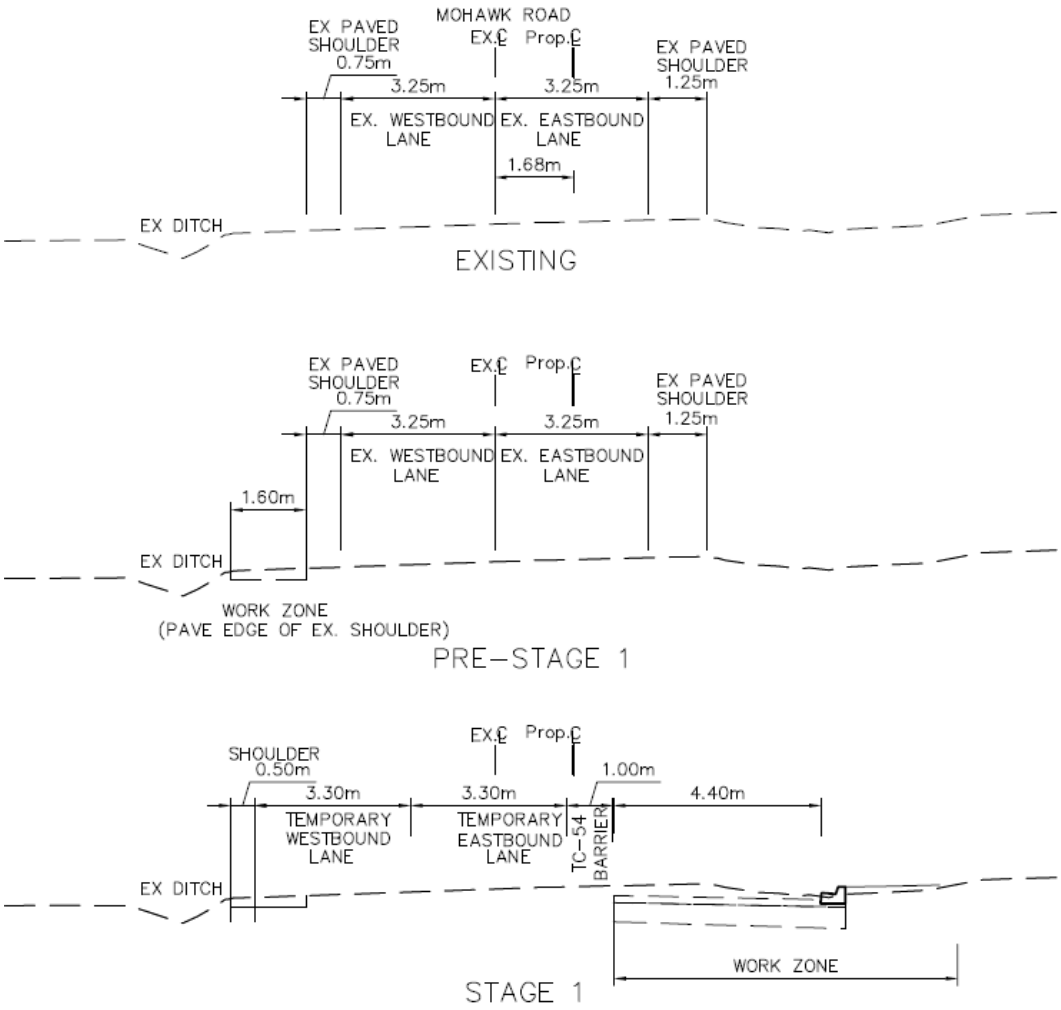

Exhibit 4-13: Construction Staging – Existing, Pre-Stage 1 and Stage 1 (Not to Scale)

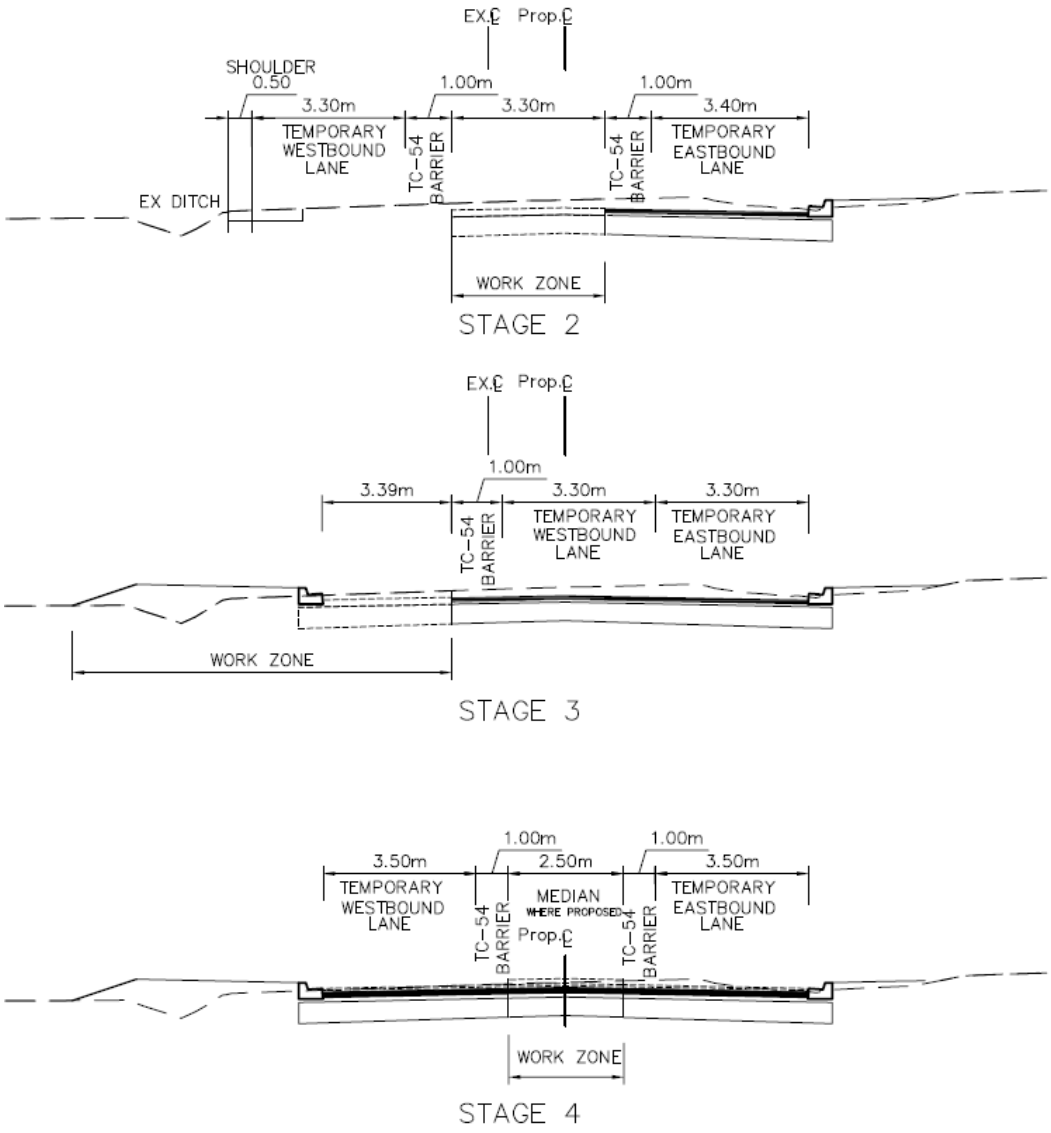

Exhibit 4-14: Construction Staging – Stage 2, Stage 3 and Stage 4 (Not to Scale)

4.7. Preliminary Cost Estimate

The preliminary cost estimate for the preferred design is provided in Exhibit 4-15. The cost estimate for the widening of Mohawk Road to three lanes, and implementation of a multi-use path on the north side and sidewalk on the south side, is $4.3 million. This estimate is exclusive of property costs.

Exhibit 4-15: Construction Cost Estimate

Item No.	Description	Unit	Estimated Quantity	Unit Cost	Total Cost
1	Clearing and Grubbing	m^2	8900	$10	$89,000
2	Stripping (100mm)	m^3	890	$20	$17,800
3	Tree Removal	each	62	$1,000	$62,000
4	Earth Borrow	m^3	600	$25.00	$15,000
5	Earth Excavation	m^3	400	$20.00	$8,000
6	Tree Replacement	each	62	$1,000	$62,000
7	Full Depth Pavement Removal	m^2	7750	$25.00	$193,750
8	Curb Removal	m	450	$24.00	$10,800
9	Sidewalk Removal	m^2	250	$20.00	$5,000
10	Surface Course Hot Mix (40 mm)	t	911.4	$120.00	$109,368
11	Base Course Hot Mix (120 mm)	t	2734.2	$100.00	$273,420
12	Granular A (150 mm)	t	3600	$25.00	$90,000
13	Granular B (450 mm)	t	9900	$22.00	$217,800
14	Asphalt Multi-Trail	m	740	$300.00	$222,000
15	Concrete Sidewalk	m^2	660	$165.00	$108,900
15	Concrete Island	m^2	150	$165.00	$24,750
16	Asphalt Splash Pad	m^2	880	$100.00	$88,000
17	Concrete Curb & Gutter	m	1600	$75.00	$120,000
18	Subdrain	m	1600	$25.00	$40,000
19	Catch Basin	each	38	$4,500.00	$171,000
20	Storm Manhole	each	9	$8,000.00	$72,000
21	Storm Sewer	m	750	$700.00	$525,000
22	Lateral Pipe	m	456	$500.00	$228,000
23	Pavement Marking-Lines	m	3000	$5.00	$15,000

Item No.	Description	Unit	Estimated Quantity	Unit Cost	Total Cost
24	Pavement Marking-Crosswalks	m	140	$30.00	$4,200
25	Pavement Marking-Stop Bars	m	75	$25.00	$1,875
26	Pavement Marking-Symbols	each	20	$150.00	$3,000
27	Top Soil, sod, and seed	m^2	3600	$11.50	$41,400
28	Entrances Modifications	m^2	570	$65.00	$37,050
29	Hydro Relocation (Pole)	each	7	$7,000.00	$49,000
30	Traffic Signs (New & Relocations)	each	40	$175.00	$7,000
31	Traffic Signal Modifications	each	2	$100,000	$200,000
32	Traffic Control	LS	1	$100,000	$100,000
33	Other Utility Relocation	LS	1	$100,000	$100,000
Sub-Total Construction Cost					**$3,312,113**
Minor Items (20% of Construction Cost)					$662,422.60
Estimated Engineering - Civil, Geo, etc. (10%)					$331,211.30
Total Construction Cost (Rounded)					**$4,300,000**

5. Mitigation and Commitments to Further Work

The preferred design for Mohawk Road has mitigated negative impacts to the environment where possible. Where impacts cannot be entirely avoided, mitigation measures and commitments for detailed design and construction have been developed to minimize impacts (Exhibit 5-1).

Exhibit 5-1: Mitigation and Commitments to Further Work

Category	Interested Agency	Mitigation/Commitment to Further Work
Stormwater Management	Hamilton Region Conservation Authority	Undertake a broader stormwater study to investigate opportunities to improve the existing storm sewer, stormwater and drainage infrastructure downstream of Outlet 2.
		A hydraulic capacity and grade line investigation of the existing storm sewers should be performed during detailed design to ensure adequate capacity of existing storm sewers.
		A CCTV inspection of existing storm sewers running through private property from Hiawatha Boulevard through to the parkland north of Deervalley Road should be undertaken during detailed design to verify the condition of the existing storm sewers.
Natural Heritage/ Tree Management	Ministry of Natural Resources and Forestry, Ministry of Environment, Conservation and Parks, Hamilton Region Conservation Authority	The Red-headed Woodpecker potential habitat has been identified within the study area. As this species and its residence are protected under the federal Species at Risk Act, additional bird surveys are recommended prior to construction to confirm the absence of this species from the work area.
		Compensation in the form of re-planting on site and/or planting trees elsewhere is required for the loss of 25 individual public trees. This compensation requirement shall be completed during the project detailed design and construction phases.
		To protect trees, grade changes and construction activities that could cause soil compaction shall be kept away from trees as much as possible.

Category	Interested Agency	Mitigation/Commitment to Further Work
		If roots will be damaged by excavation equipment, it is better to cut roots cleanly with sharp pruning tools rather than allow them to be torn by large equipment. Clean cuts will help to minimize decay and entry points for disease.
		If branches are likely to hang in the way of passing equipment, the branches should be pruned by a qualified arborist to avoid tearing and undue injury to the tree.
		Equipment and materials shall not be stored near trees, and equipment should not be left idling where exhaust could burn foliage.
		Tree protection fencing shall be erected following the City's Tree Protection Zone Detail around trees at risk of injury. The project design drawings must show the City's Tree Protection Zone Detail as well as the Tree Preservation Fencing Detail and the Tree Preservation Techniques notes as per the City's Tree Preservation & Protective Measures for Trees Affected by Construction Policy (attached in Appendix C).
		Tree clearing should avoid spring and summer periods when local and migrating wildlife are most active, and sensitive to disturbance or loss of habitat.
		Tree removals should occur between September 1 and March 31 to protect the breeding bird period.
		Limit removal of trees to the minimum; i.e. preferred pruning of individual branch and root when less than 30% of the crown or root system is impacted.
		Vegetation clearing should avoid spring and summer periods when local wildlife are most active and sensitive to disturbance and loss of habitat.

Category	Interested Agency	Mitigation/Commitment to Further Work
		Construction should be conducted during allowable periods according to the City's noise by-law.
		Machinery should be maintained in good condition with appropriate exhaust controls.
		Machinery should be kept clean of excessive dirt and debris.
		An erosion and sediment control plan (ESCP) should be developed to avoid runoff from entering the ditches.
		Stockpiles of erodible material are to be stabilized during inclement weather events.
		Remove all construction materials from the site upon project completion.
		Trees #29,31,32,33,35 all identified as Fraxinus sp. shall be removed by forestry through the City of Hamilton Emerald Ash Borer program prior to construction commencement.
Air Quality	Ministry of Environment, Conservation and Park	Environment Canada "Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities" practices shall be followed during construction of the roadway to reduce any air quality impacts that may occur.
Construction Monitoring	City of Hamilton	Mitigation measures shall be implemented and maintained through on-site inspections by the City of Hamilton staff who will ensure that the natural, social and economic environments are not impacted by the construction activities and/or that impacts are minimized. The inspection staff will also ensure that items such as sedimentation controls and appropriate signage are maintained throughout construction.
		Appropriate signage shall be implemented to identify detour routes at the time of temporary roadway/sidewalk closure.

Category	Interested Agency	Mitigation/Commitment to Further Work
Road Design	City of Hamilton	The median locations will be reviewed at detailed design to ensure driveway access is unobstructed for all residences along Mohawk Road.
		The lane widths for the recommended design will be reviewed at detailed design to investigate if the lane widths can be reduced.
		During detailed design, include a design consideration to minimize conflict between turning motor traffic and cyclists at driveways/ intersections with pavement markings and/ or suitable setback (1 car length) of the multi-use path behind the curb.
		During detail design, consider opportunities to provide a buffer between the curb and the multi-use path.
Utilities	City of Hamilton	Potential impacts to the existing utilities along the corridor will be reviewed during detailed design.
Property Requirements	City of Hamilton	Property and easements requirements will be confirmed during detailed design.
		The Urban Hamilton Official Plan provides requirements for future right-of-way dedications. Under the Official Plan, Mohawk Road has a 30.480 metre right-of-way dedication requirement. Although the preferred design identified through this project has a right-of-way that is less than this amount, the requirements in the Official Plan should be maintained to accommodate for future growth or road changes. Development along Mohawk Road will remain subject to the requirements set out in the Official Plan.

A

Appendix A

B

Appendix B

C

Appendix C

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