Newmarket Mulock Drive Multi-Use Path Feasibility Study

Newmarket

Newmarket Mulock Drive Multi-Use Path Feasibility Study
Final Report
Prepared by:

Table of Contents

Appendices

APPENDIX A: DETAILED COSING SUMMARY

APPENDIX B: DETAILED ROLL PLAN & TYPICAL SECTIONS

APPENDIX C: ARBORIST REVIEW & TREE PLANTING REPORT

APPENDIX D: VIRTUAL PIC PRESENTATION

1 PROJECT SUMMARY

This report documents a design feasibility study and recommends a preferred solution for the proposed alignment and preliminary design for a multi-use pathway (MUP) along Mulock Drive, in the Town of Newmarket. Stretching just over 6km, from Bathurst St to Harry Walker Parkway South, the proposed MUP represents a significant expansion of the Town's active transportation and recreational trails network and will serve as a key spine route for the Town-wide active transportation and trails network. Mulock Drive is under the jurisdiction of the Region of York and is a key arterial road and mobility corridor within the Town. The corridor provides important connections for residents to key destinations and existing active transportation routes and trails, including the Tom Taylor Trail, Newmarket Town Hall, Magna Centre and proposed Newmarket Town Park. The goal of this project was to assess which side of Mulock Drive should be considered for a MUP and then develop a design alignment and high-level cost estimate to inform the Town, should they wish to advance the project to detailed design and implementation.

The process of designing a multi-use pathway along the Mulock Dr corridor began by collaborating with Town staff to identify a vision and series of route selection criteria to align the project with local objectives. Once developed, a series of investigative activities were completed within the corridor to thoroughly understand all relevant existing conditions, including constraints and opportunities. This included a topographic and engineering survey, desktop review, arborist (tree condition and potential impact) review, field investigations and input from discussions with Town and Regional staff, as well as the project team for the new Town Park. Notable aspects of the corridor recorded included: boulevard widths, tree cover, utilities and other infrastructure, elevation changes, intersecting driveways and, existing signalized intersections and active transportation facilities (i.e. sidewalks, MUPs and connecting trails). Using this information, three route alignments were identified and mapped out, exploring different alternatives of how the facility might be best implemented in the Mulock Dr corridor to provide key connections to destinations and to minimize the impact to existing trees and other infrastructure. The preferred route alignment was then determined through the application of a set of evaluative criteria adapted from planning and design guidance and best practices for MUPs, assessment of existing infrastructure along the corridor, consideration of existing and planned key destinations (e.g. new Town Park), input from Town staff and consideration of the project's overall goals and objectives.

The study team presented the study process, evaluation criteria and draft preferred alignment and other results from the technical analysis to the Town of Newmarket's Committee of the Whole on Tuesday May 25th, 2021, where it was very positively received. The next step in confirming the draft preferred alignment and to ensure the project process considered local ideas, comments and concerns, consisted of a virtual public information center, which was held on June 10th, 2021. In addition to a PowerPoint presentation, the event featured an interactive online commenting board which allowed participants to comment directly on segments of the draft MUP design concept along the entire corridor. Those who participated were very supportive of the proposed new MUP. A few key items raised included the need to consider safety of intersection crossings, high-volume intersecting driveways and a preference to have a connection from the new MUP to Newmarket High School.

The design concept was then refined and finalized incorporating feedback received from the Committee of the Whole, the Public (through a virtual PIC) and from comments from Town staff. The design concept was informed by a series of industry leading references and guides including the Ontario Traffic Manual's (OTM) Book 18: Cycling Facilities, and applicable York Regional and Newmarket standards.

The estimated cost to design and implement the proposed multi-use pathway was developed based on current industry unit prices within Southern Ontario. The total cost to implement the facility was estimated at **$2.87M**. This figure assumes a contingency rate of 30%, a 10% rate for detailed design work and an additional **$165k** for optional design features, with a more detailed breakdown provided in ***Appendix A***. This estimate however, is not a substitute for additional costing that should be completed as part of a future detailed design phase, should the Town select to proceed with this project.

It is recommended that:

1. The Town of Newmarket proceed with developing a detailed design for the following facility, based on the preferred alignment and preliminary design recommended in this study.
2. Although not part of Mulock MUP design assignment, based on input from the Public and Town staff, it is recommended the Town consider designing a new MUP connection from the Mulock MUP directly to Newmarket High School. The extension is proposed to include replacing the sidewalk on east side of College Manor north of Mulock Dr with an asphalt MUP, as well as continuing the MUP along south side of Pickering Crescent to connect directly to the school entrance.

2 MULOCK DRIVE PROJECT OVERVIEW

2.1 PROJECT CONTEXT

In January 2021, WSP was retained by the Town of Newmarket to assess the feasibility of implementing a multi-use path within the existing public-right-of-way along Mulock Drive. This 4-5 lane roadway is under the jurisdiction of the Region of York and extends from Bathurst Street in the west to Harry Walker Parkway South in the east, totalling 6.3km in length. Mulock Drive also intersects with several other major north/south regional roads including Yonge Street, Bayview Avenue, and Leslie Street.

Key destinations directly accessible from this corridor include the proposed Newmarket Town Park, Yonge Street Transitway, Newmarket Town Hall, Magna Centre, Newmarket High School, and Newmarket Islamic Centre. Seven additional primary and secondary schools are also located within 300 metres of Mulock Drive, as well as numerous commercial and institutional plazas. A multi-use pathway (MUP) along the Mulock Drive corridor would significantly improve connectivity for people of all ages and abilities between the Town's various parks, trails and the numerous key destinations on Mulock Dr. Notable facilities include Jim Bond Park, Dennis Park, Bailey Ecological Park, and Wesley Brooks Conservation Area. The latter two areas are part of a larger network of green space that continues south into the Town of Aurora, complete with a ravine system and the Tom Taylor walking/cycling trail network. Fairy Lake is also accessible through the Wesley Brooks Conservation Area.

The proposed MUP along Mulock Drive offers an excellent opportunity to provide an all ages and abilities recreational and active transportation facility. It supports making Mulock Dr a more complete street that better accommodates all travel modes and will serve as a key east/west spine across Newmarket that will link to the Town's existing and planned active transportation network. The many destinations and potential connections found along the corridor (see ***Figure 1***) underline the benefits of proceeding with the Mulock Dr MUP.

Figure 1: A map depicting the location of the proposed Mulock Dr MUP and nearby destinations and facility connections

2.2 GOALS & OBJECTIVES

To guide the feasibility study in accordance with local objectives and technical precedence, a series of project goals and objectives were identified. These are listed below in ***Table 1*** and reflect a broad range of considerations developed through discussions with Town staff and informed by best practices. Input provided over the course of the study from Town staff, Members of Council and the Public also informed the development these goals and objectives.

Table 1:Provides an overview of the project goals and objectives which informed the following feasibility study.

Connect to Key Destinations		
	*Magna Centre, a community centre located on Mulock Drive.* *Source: Google Maps*	Improving connectivity to destinations and amenities along the Mulock corridor remains a key project priority. Notable examples include Newmarket High School, Magna Centre, and the various shopping plazas which incent residents to travel more by active modes.
Navigate constrained segments, grades and utilities		
	*Mulock' s existing right of way remains constrained by various elements* *Source: Google Maps*	The proposed MUP would improve the travel conditions for cyclists and pedestrians by providing an operating environment free from vehicular traffic. While accommodable within the road right-of-way, the chosen alignment will need to navigate around the existing grades, trees and utilities infrastructure that share this space.
Minimize potential conflicts between users (i.e.: at driveways)		
	*Photo of a high frequency driveway treatment along an MUP facility within York Region* *Source: WSP*	Driveways from adjacent lots pose a potential collision risk between MUP users and intersecting motorist traffic. The installation of proactive and highly visual design treatments at these conflict points can reinforce predictable traffic operations that enhance safety for all road users.
Minimize Utility, Tree and Other Infrastructure Impacts		
	*Section of existing sidewalk along Mulock Drive* *Source: WSP*	Minimize the need to relocate light poles, trees and other infrastructure where feasible to minimize costs. This can be partly achieved by replacing a sidewalk on one side of the street with a wider asphalt multi-use pathway in the same location.

Account for future development along the corridor		
	*Image depicting the secondary plan study area for the proposed Mulock GO Station* *Source: Town of Newmarket*	In addition to current travel destinations, the proposed MUP should align with planned developments along the corridor to support projected travel patterns. This includes the new GO station planned near Newmarket Town Hall and the Newmarket Town Park planned just west of Yonge St.
Accommodate intersection treatments		
	*Photo of a combined crossride treatment, across a signalized intersection within York Region* *Source: WSP*	To ensure a safe travel experience across all parts of the network, it is vital that the appropriate treatments and amenities be applied where intersecting vehicular roadways. Bicycle traffic signals and crossrides are commonly applied solutions used to minimize potential conflict points and improve safety for all road users.

2.3 PROJECT SCHEDULE

Work to develop a preliminary design for the Mulock multi-use pathway began in January 2021 and was completed in September of 2021. Within this period, a series of technical and consultative exercises were undertaken to first, select a preferred alignment and then, to develop the design concept. ***Figure 2*** below provides an overview of this timeline, with all key study events and stages of work identified:

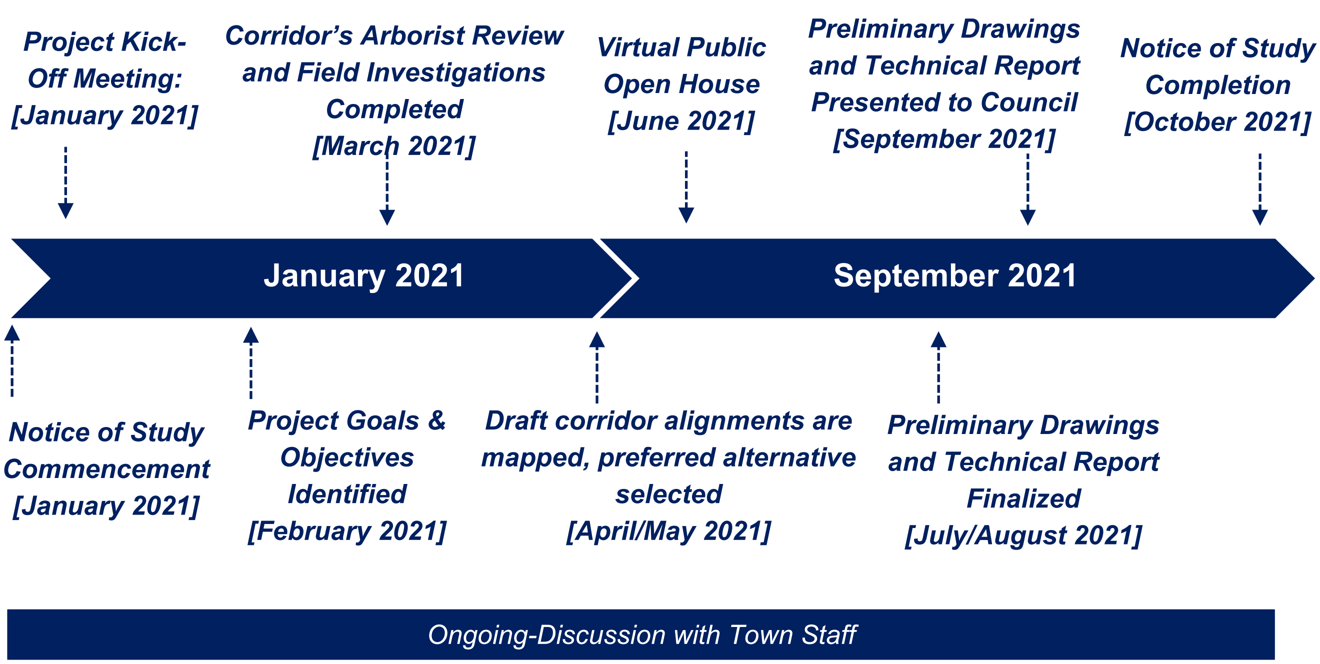

Figure 2: Figure illustrating key deliverables and stages of work within the timeline of the following study

3 CORRIDOR ROUTE EVALUATION

3.1 DESIGN CONSIDERATIONS

To ensure the proposed Mulock MUP facility met its various underlying goals and objectives, several elements and aspects were considered in the determination of an optimal design and alignment. The complete list of items detailed within ***Table 2***, relied on a combination of high-level planning guidance provided within OTM Book 18, as well as discussions and engagement held with the Town and public throughout the project process. This comprehensive exercise was undertaken across all segments and intersections through a series of desktop analyses and field visits along the corridor. Examples include, at the locations of Mulock Drive and Sawmill Valley Drive(***Figure 3***) and Mulock Drive and Rourke Place (***Figure 4***), as shown within the annotated photos provided below.

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Table 2: List of design considerations and how they were applied in designing and mapping alignments for the proposed multi-use pathway facility

Consideration	Design Application
Access to key destinations	Alignment prioritized access to key destinations and trip generators, such as populated residential neighbourhoods, major parks, commercial districts and other well visited sites
Reutilize existing infrastructure	Chosen facility alignment sought to utilize existing trails and sidewalk infrastructure to minimize costs and disruptions to the existing active transportation network
Minimize tree relocates and removals	Based off the outcomes of the arborist study, the need for tree relocates/removals was minimized to maintain the existing canopy
Work within existing right-of-way	As a fully separated facility, it was essential that the facility maximize space availability within the roadway's current public right-of-way width
Safe intersection treatments	To minimize hazards at intersections, the facility was designed to utilize existing signal infrastructure and place crossrides at direct crossing alignments
Avoid crossing busy driveways	To avoid potential conflicts with turning vehicles, the chosen facility alignment sought to avoid driveways with high and/or heavy vehicular traffic
Minimize the need for utility relocates	Chosen facility alignment was routed to avoid existing utilities infrastructure to avoid the need for costly relocations and or removals
Geometric feasibility and affordability	To minimize costs, the chosen alignment sought to avoid the need for costly regrading and/or road reconstruction work to accommodate the facility

3.2 CORRIDOR ROLL PLAN

To determine the optimal corridor alignment for the proposed MUP facility, three different alternatives were identified and evaluated. Alternative alignments were distinguished by the sides of the street on which they where placed and where they cross at signalized intersections. These decisions strived to maximize the facility's access to key destinations, avoid geometric constraints, and make best use of existing infrastructure. Some segments of the three options are similar and/or overlap and are noted below.

BATHURST STREET - COLUMBUS WAY [*Figure 5*]

Alignment 1

Travels along the south side of Mulock Dr between Bathurst St and Columbus Dr, crossing Sawmill Valley Dr and Columbus Way with combined crossrides. Repurposes an existing sidewalk and maintains connections to several localized trail systems servicing neighbourhoods south of Mulock Dr. Crosses onto the north side of Mulock Dr along the eastern side of the signalized intersection at Mulock Dr and Columbus Way.

Alignment 2

Directly overlaps Alignment 1 and Alignment 3. Travels along the south side of Mulock Dr between Bathurst St and Columbus Dr, crossing Sawmill Valley Dr and Columbus Way with combined crossrides. Repurposes an existing sidewalk and maintains connections to several localized trail systems servicing neighbourhoods south of Mulock Dr. Crosses onto the north side of Mulock Dr along the eastern side of the signalized intersection at Mulock Dr and Columbus Way.

Alignment 3

Directly overlaps Alignment 1 and Alignment 2. Travels along the south side of Mulock Dr between Bathurst St and Columbus Dr, crossing Sawmill Valley Dr and Columbus Way with combined crossrides. Repurposes an existing sidewalk and maintains connections to several localized trail systems servicing neighbourhoods south of Mulock Dr. Crosses onto the north side of Mulock Dr along the eastern side of the signalized intersection at Mulock Dr and Columbus Way.

Figure 5: Roll plan illustrating the alignment of three considered alternatives, along Mulock Drive between Bathurst Street and Columbus Way.

COLUMBUS WAY -SANDFORD STREET [*Figure 6*]

Alignment 1

Continues along the north side of Mulock Dr parallel to the roadway, crossing over Yonge St as a combined crossride. East of Yonge St, the facility maintains a similar alignment, with commercial driveway treatments applied along the vehicular entranceways to nearby commercial plazas. This segment repurposes an existing sidewalk.

Alignment 2

Continues along the north side of Mulock Dr, parallel to the roadway until Osler Crescent, where the facility turns upwards and continues through Jim Bond Park and the planned Newmarket Town Park (within the existing Mulock Farms parcel). Returns to the northern boulevard of Mulock Dr at Yonge St and then crosses as a combined crossride. East of Yonge St, the facility carries along the northern boulevard of Mulock, with commercial driveway treatments applied along the vehicular entranceways to the nearby commercial plazas. This segment repurposes an existing sidewalk.

Alignment 3

Continues along the north side of Mulock Dr, parallel to the roadway until Osler Crescent, where the facility then turns upwards and continues through Jim Bond Park and the planned Newmarket Town park (within the existing Mulock Farms parcel). Returns to the northern boulevard of Mulock Dr at Yonge St and then crosses south then east as a combined crossride. East of Yonge St, the facility carries along the southern boulevard of Mulock, with commercial driveway treatments applied along the vehicular entranceways to the nearby commercial plazas. This segment repurposes an existing sidewalk.

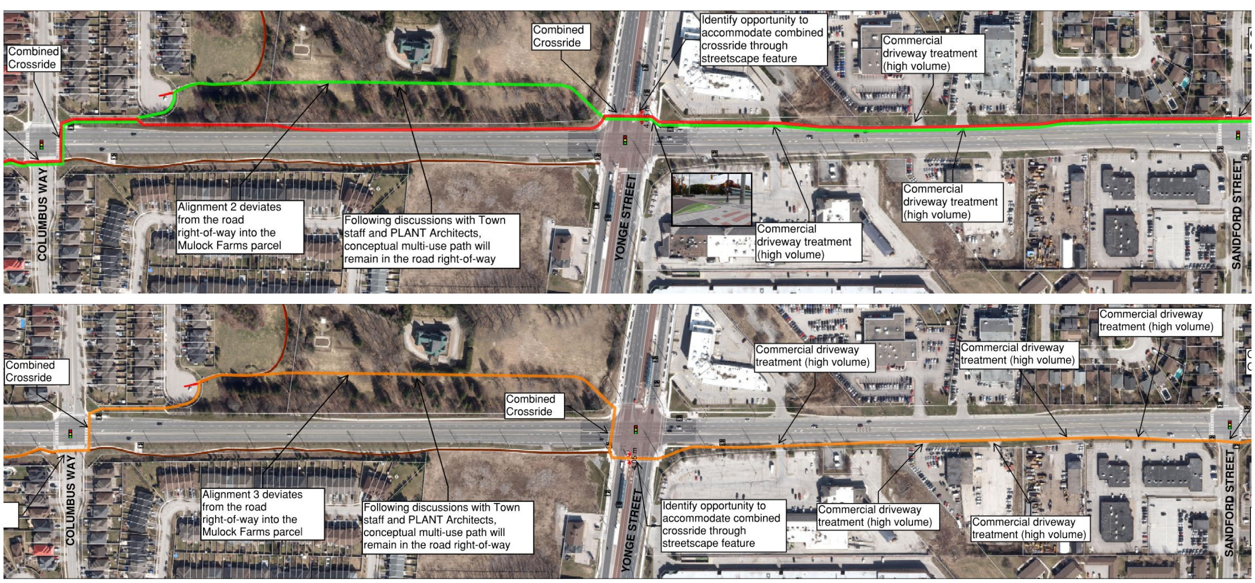


Figure 6: Roll plan illustrating the alignment of three considered alternatives, along Mulock Drive between Columbus Way and Sandford Street.

SANDFORD STREET – METROLINX RAIL CORRIDOR [*Figure 7*]

Alignment 1

Continues along the northern boulevard of Mulock Drive, crossing the intersections of Sandford St and Cane Parkway as combined crossrides. Further east, the alignment provides a connection to the Tom Taylor Trail and then narrows over the water course bridge due to geometric constraints. The alignment then crosses over at a grade rail crossing just past Newmarket Town Hall.

Alignment 2

Directly overlaps Alignment 1. Continues along the northern boulevard of Mulock Drive, crossing the intersections of Sandford St and Cane Parkway as combined crossrides. Further east, the alignment provides a connection to the Tom Taylor Trail and then narrows over the water course bridge due to geometric constraints. The alignment then crosses over an at grade rail crossing just past Newmarket Town Hall.

Alignment 3

Continues along the southern boulevard of Mulock Drive, with commercial driveway treatments applied along the vehicular entranceways to the various commercial plazas. Further east, the alignment provides a connection to the Tom Taylor Trail and then narrows over the water course bridge due to geometric constraints. The alignment then crosses over an at grade rail crossing just past Newmarket Town Hall.

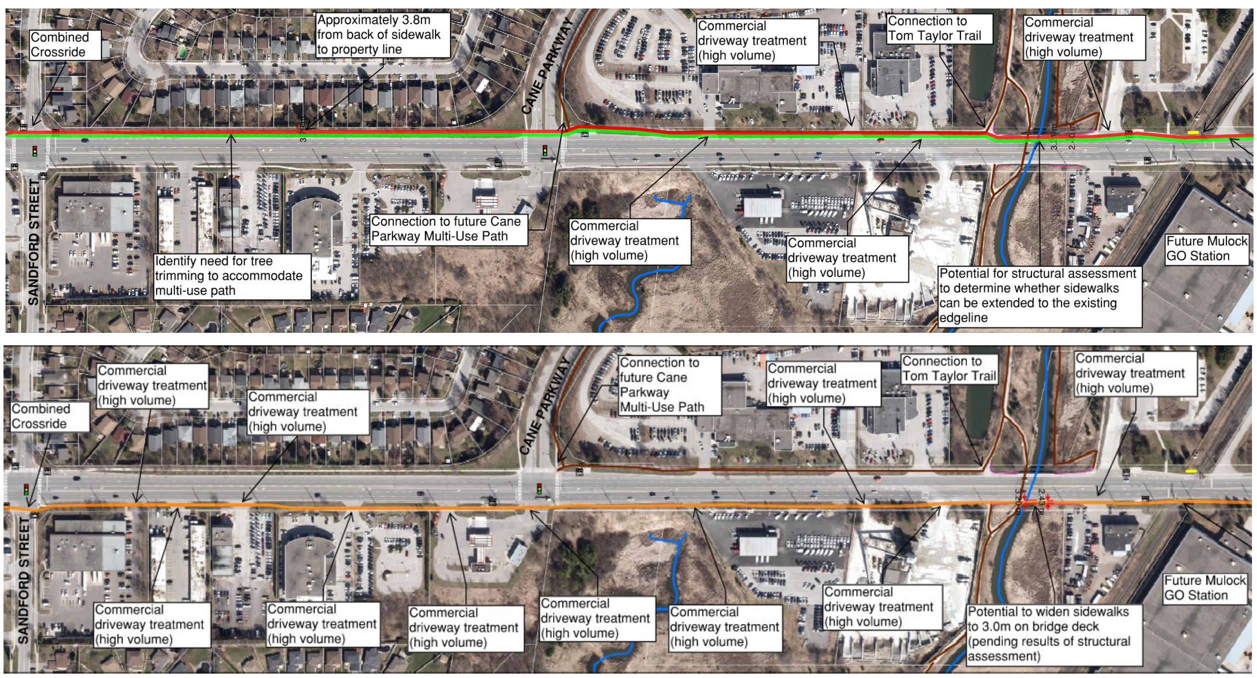


Figure 7: Roll plan illustrating the alignment of three considered alternatives, along Mulock Drive between Sandford Street and Newmarket Town Hall.

METROLINX RAIL CORRIDOR – COLLEGE MANOR DRIVE [*Figure 8*]

Alignment 1

Continues along the northern boulevard of Mulock Dr crossing the intersections of Steven Court, Bayview Avenue and College Manor Dr as combined crossrides. Commercial driveway treatments are also applied along the vehicular entranceways to the various commercial plazas. While almost entirely parallel to the roadway, the alignment briefly bends further north just east of Bayview Avenue, to utilize an existing sidewalk and connect to a local trail system.

Alignment 2

Directly overlaps Alignment 1. Continues along the northern boulevard of Mulock Dr crossing the intersections of Steven Court, Bayview Avenue and College Manor Dr as combined crossrides. Commercial driveway treatments are also applied along the vehicular entranceways to the various commercial plazas. While almost entirely parallel to the roadway, the alignment briefly bends further north between Bayview Avenue and College Manor Drive, to utilize an existing sidewalk and connect to a local trail system.

Alignment 3

Continues along the southern boulevard of Mulock Dr, crossing the intersections of Steven Court, Bayview Avenue and College Manor Dr as combined crossrides. Commercial driveway treatments are also applied along the vehicular entranceways to the various commercial plazas. While almost entirely parallel to the roadway, the alignment bends further north between Bayview Avenue and College Manor Drive, to utilize an existing sidewalk.

Figure 8: Roll plan illustrating the alignment of three considered alternatives, along Mulock Drive between Newmarket Town Hall and College Manor Drive.

COLLEGE MANOR DRIVE – NEWMARKET HIGH SCHOOL CROSSING [*Figure 9*]

Alignment 1

Continues along the northern boulevard of Mulock Dr, crossing south then east at the intersection of College Manor Dr, as a combined crossride. The alignment then continues east along the southern boulevard, following an existing meandering path built within the fields of the nearby Magna Center. This alignment also connects to an existing local trail system which services neighbourhoods south of Mulock Dr.

Alignment 2

Continues along the northern boulevard of Mulock Dr, crossing the intersection of College Manor Dr as a combined crossride. Eastward, the facility follows the existing sidewalk, with commercial driveway treatments applied along the vehicular entranceways to the various commercial plazas

Alignment 3

Continues along the southern boulevard of Mulock Dr, crossing College Manor Dr as a combined crossride. Commercial driveway treatments are applied along the vehicular entranceways to the various commercial plazas. The alignment then continues east along the southern boulevard, following an existing meandering path built within the fields of the nearby Magna Center, also connecting to an existing localized trail which services neighbourhoods south of Mulock Dr. The facility then crosses onto the northern side of Mulock Dr as a combined crossride, using the midblock crossing directly adjacent to Newmarket High School.

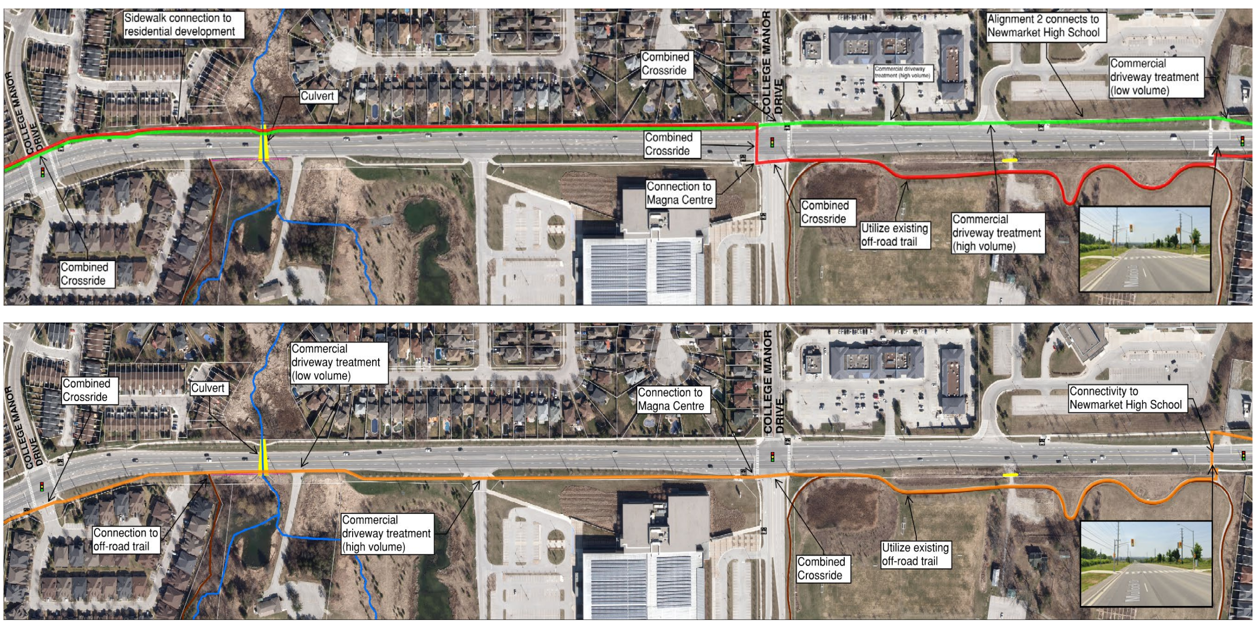


Figure 9: Roll plan illustrating the alignment of three considered alternatives, along Mulock Drive between College Manor Drive and the Magna Centre.

NEWMARKET HIGH SCHOOL CROSSING – HARRY WALKER PARKWAY SOUTH [*Figure 10*]

Alignment 1

Continues along the southern boulevard of Mulock Dr, crossing north then east at the intersection of Leslie St as a combined crossride. The facility then continues along the northern boulevard of Mulock Dr until the corridor's terminus Harry Walker Parkway.

Alignment 2

Continues along the northern boulevard of Mulock Dr, crossing the intersection of Leslie St as a combined crossride. The facility then continues along the northern boulevard of Mulock Dr until the corridor's terminus Harry Walker Parkway.

Alignment 3

Continues along the northern boulevard of Mulock Dr, crossing south then east at the intersection of Leslie St as a combined crossride. The facility then continues along the southern boulevard of Mulock Dr until crossing back north at the intersection of Harry Walker Parkway, as a combined crossride.

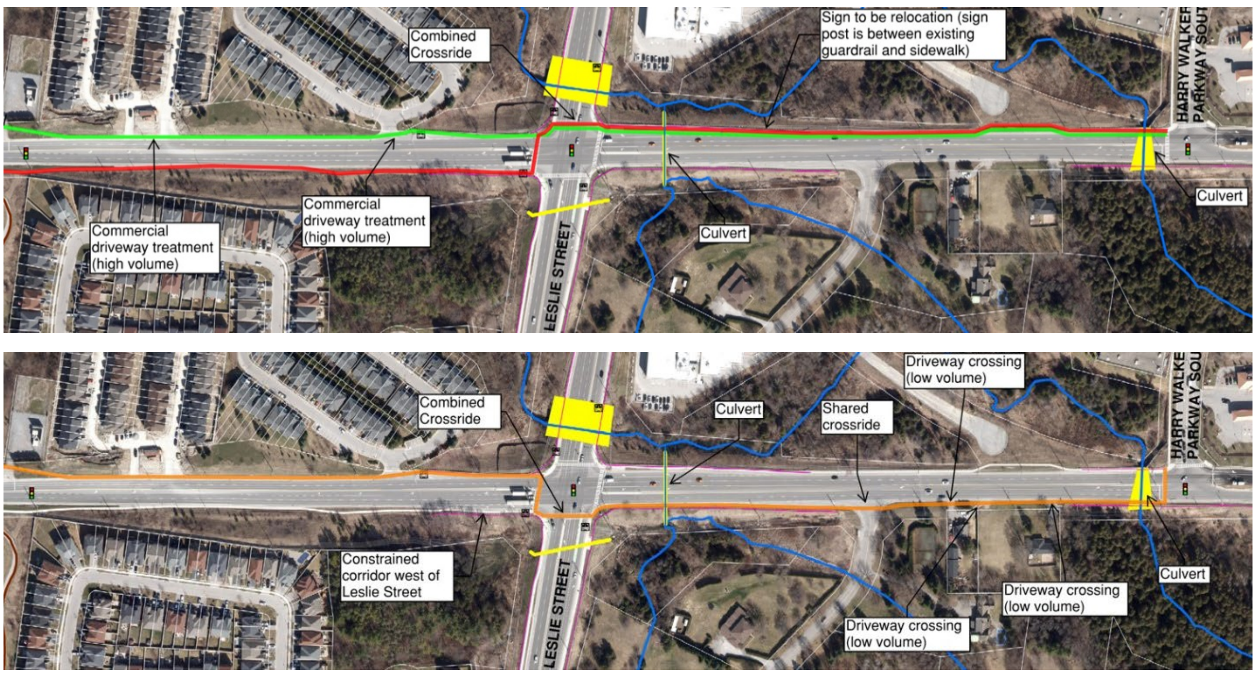


Figure 10: Roll plan illustrating the alignment of three considered alternatives, along Mulock Drive between the Magna Centre and Harry Walker Parkway South.

3.3 CORRIDOR EVALUATION CRITERIA

To inform the selection of an optional alignment among the three considered alternatives, a range of evaluative criteria were identified. The items listed below were chosen based on guidance from leading planning and design references, including OTM Book 18, York Region's Pedestrian and Cycling Design Guidelines as well as consideration of the project's underlying goals and objectives. To carry out this evaluation a three-point scale ranking system was used for each criterion:

Conflict Mitigation:

Conflict mitigation between motorists, cyclists and pedestrian due to a wider buffer from adjacent motor vehicle traffic. Rankings were assigned based off the number of potential safety hazards to facility users.

Constructability & Cost:

Feasibility of implementing a multi-use path facility based off construction costs assumed from required relocates of utility poles, guide rails, and fire hydrants along the corridor. Rankings were assigned based off the presence of existing facilities, even grading, minimal utilities needing relocating and other factors which define feasibility.

Residential Access/Proximity:

Access and proximity to residential neighborhoods located along the Mulock Dr corridor. Rankings were assigned based off the degree of connectivity to localized facilities and populated residential areas

Transit Impacts:

Impacts to transit stops, including concrete bus pads, transit shelters, and other amenities found at transit stops. Rankings were assigned based off the need for transit amenities needing relocating.

Tree Impacts:

Impacts to trees and potential removal / relocation of existing trees along the corridor to accommodate the multi-use path (as identified from the tree impact study). Rankings were assigned based off the need for trees needing relocating.

Connectivity:

Potential to connect to existing and proposed AT network identified in the Active Transportation Implementation Plan. Rankings were assigned based off the degree of connectivity to the existing active transportation network.

Destination Access:

Quantity of destinations and attractions accessible from the multi-use path, particularly for youth and seniors. Rankings were assigned based off the quantity of connections to facilities frequented by vulnerable traffic users (i.e. schools, community centers, parks, retirement homes)

Driveway Frequency:

Frequency and size of driveways that intersect the multi-use path. Rankings were assigned based off the quantity of intersecting driveways and their traffic volumes.

Intersection Frequency:

Frequency of intersections that intersect the multi-use path. Rankings were assigned based off the quantity of required intersection crossings required by facility users.

3.4 CORRIDOR EVALUATION RESULTS

Based off the framework of the previously listed criteria, all three corridors were thoroughly evaluated. For each criterion, a score of “3” reflected the highest suitability while a score of “1” reflected the lowest suitability. The alignment which received the highest overall score was then deemed to be the preferred option. Importantly, while foundational to the selection of a preferred alternative, this process did not circumvent the final confirmation of both town staff, members of the public, and technical experts. The results of this scoring are depicted below within ***Table 3***.

Table 3: Results of the corridor-wide evaluation completed for all three route alignments

CORRIDOR WIDE EVALUATION			
Criteria	**Alignment Option 1**	**Alignment Option 2**	**Alignment Option 3**
Conflict Mitigation	**3**	**2**	**2**
Constructability & Cost	**3**	**3**	**2**
Residential Proximity & Access	**3**	**3**	**3**
Transit Impacts	**3**	**3**	**3**
Tree Impacts	**2**	**1**	**2**
Connectivity	**3**	**3**	**3**
Destination Access	**3**	**3**	**3**
Driveway Frequency	**3**	**3**	**2**
Intersection Frequency	**3**	**3**	**3**
Total Score	**26**	**24**	**23**
Final Rank	**1**	**2**	**3**

Based on the evaluation of the three alternatives, Alignment 1 was ultimately selected, having received the highest total score of 26 points. Among all evaluative criteria, Alignment 1 received the highest score of 3 points, except for “Tree Impacts”, for which it received a score of two points (still the highest value score received among all three alternatives). The evaluation approach and results were reviewed with Town staff and confirmed prior to initiating the design concept phase for the draft preferred alternative. A complete roll plan of these suggested alignment with typical section details, is included within ***Appendix B***.

3.5 PROJECT RENDERINGS

To better illustrate the proposed MUP facility along Mulock Dr, a series of project renderings were developed. While beyond the scope of a conventional preliminary design exercise, renderings help to build public enthusiasm for the proposed facility and serve as a vital reference for later detailed design work. Overall, four separate renderings were developed (***Figure 11***), to showcase how the facility could look across the various conditions featured along its alignment. While conceptual, aspects of the shown facility were designed to reflect applicable standards from OTM Book 18 as well as elements of the draft alignment.

Rendering #1:
Dr just East of Bathurst (Municipal Boundary)

Rendering #2:
Mulock Dr just west of Yonge St (proposed Newmarket Town Park)

Rendering #3:
Mulock Dr just south of Yonge St

Rendering #4:
Mulock Dr between Bayview Avenue College Manor Dr

Figure 11: Illustrative rendering showing what the proposed multi-use pathway along Mulock Drive could look like at key locations

3.6 ARBORIST REVIEW

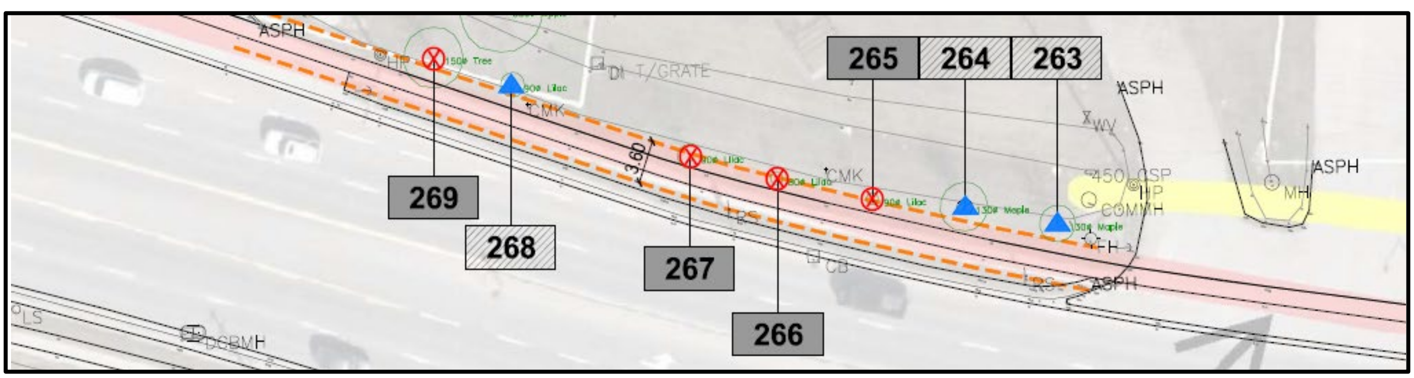
An important consideration that informed the alternatives evaluation and ultimate selection of a preferred MUP alignment was minimizing the impact to trees, including those that may need to be relocated or removed. This approach was also consistent with the goal of making the best use of existing infrastructure and trees and minimizing MUP implementation costs and environmental impacts. Ultimately, the intention of the exercise is to maintain, if not increase, the number of trees in the final design (i.e. relocate or plant new trees). The range of tree types identified as part of this assessment include the following:

- Trees within the City right of way (ROW) along Mulock Dr;
- Larger trees >20cm diameter at breast height (DBH)DBH within 7m of the sidewalk;
- Smaller trees <20cm DBH within 3m of the sidewalk; and
- And any trees within the ROW with canopy overhanging the sidewalk.

To properly assess the associated criterion identified within the corridor-wide evaluation, a thorough arborist review was completed to understand tree impacts of each alignment option (***Table 4***). In addition to mapping the location of all trees found within the corridor (***Figure 12***), the review labelled both the type and diameter of each tree. This review was completed assuming that each MUP alignment would feature a 3.6m facility width and remain within the existing public boulevard. While each alignment was generally designed to align where the existing sidewalk is located or existing multi-use pathways, slight adjustments were considered to reduce the need for some tree relocates. A copy of the report which culminated this arborist review, is attached within ***Appendix C***.

Table 4: Results of the arborist review for each of the three MUP alignment alternatives evaluated

Alignment	Trees identified for removal	Trees identified for potential impacts
Option 1 (Preferred)	89	123
Option 2	95	153
Option 3	67	89



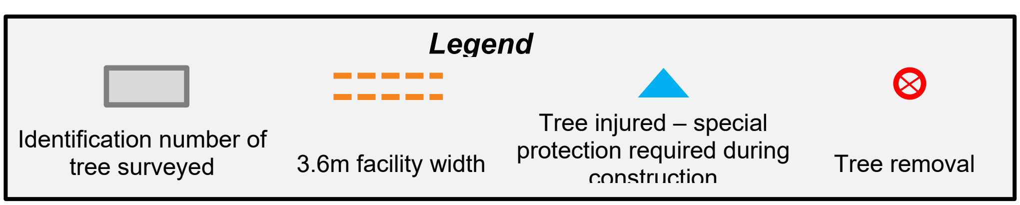


Figure 12: Sample section of the Tree Preservation Plan, used to map findings of the arborist review conducted along the corridor

3.7 PUBLIC CONSULTATION

As part of the following feasibility study, a virtual public-information center (PIC) was held during the evening of June 10th, 2021. The event was scheduled to share the outcomes of the project's corridor evaluation and confirm the selected alignment with members of the public. In addition to PowerPoint presentation, the event featured an interactive mapping exercise, available both during the event and for one week afterwards, to solicit targeted feedback. Using the online Miro Board tool, participants were invited to add their comments to a map of the study area with the three alignment options overlaid on top (***Figure 13***). A copy of the PIC Presentation is provided with ***Appendix D***, with the complete list of Miro board comments accessible through the following link: https://miro.com/app/board/o9J_IBL-5GU=/.

Concerns for cyclist safety were noted on all three alignment options, with several comments raised over the safety of intersection crossings along Mulock Drive. Having the proposed trail shift from the south side of Mulock to the north side was another commonly raised concern, with many comments mentioning that crossing the drive at its busy intersections already poses a danger to cyclists.

Another commonly raised concern related to the lack of connectivity among existing active transportation facilities that intersect the corridor. Many comments noted how current cyclists take Mulock to connect to the existing trail network as well as north-south routes along the major arterials. It was noted that many of the current cyclists along this corridor are commuters, rather than recreational riders and as such, require a comfortable connection to destinations on or around Mulock Drive. Notable examples include nearby shopping plazas, Newmarket High School, and the proposed Newmarket Town Park. This feedback emphasized the need for a facility design which features safer transitions near access points of nearby arterial roads and key destinations.

Overall, feedback received from the virtual PIC largely confirmed the range of considerations factored into choosing a preferred route alignment and the resultant selection of Alignment #1. While supported, many respondents remain opposed to the Alignment's lack of a direct connection to Newmarket High School. Although identified as a major trip generator, safety concerns were raised over routing the facility closer by, along the nearby northern boulevard of Mulock Drive. Specifically, the corridor segment's sharp elevation change combined with multiple high-volume driveway crossings, imposed a serious collision risk between fast moving cyclists and turning vehicular traffic. As a safer solution, the project team suggested that a potential spur line connection along College Manor Drive be considered as part of a future feasibility assignment. Additional details on this recommendation are provided within Section 5.2 of this report.

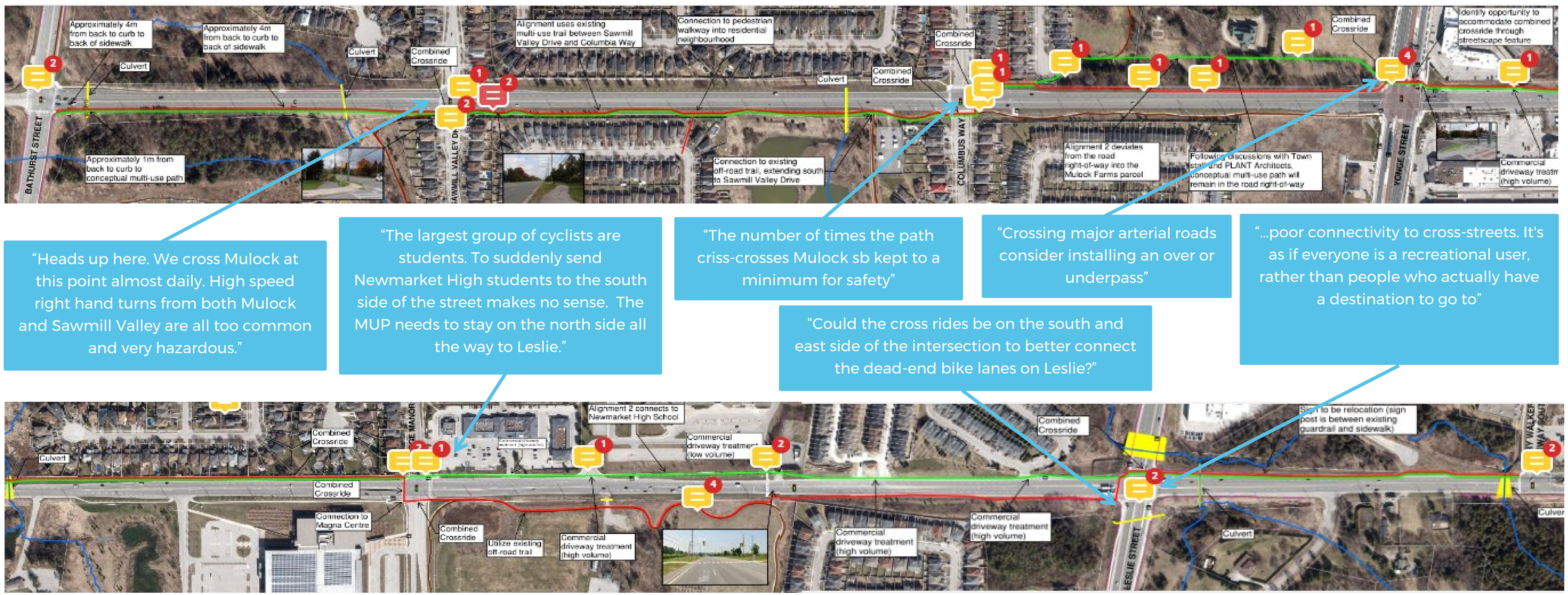


Figure 13: Screenshots taken of the online Miro boards, posted to gather feedback on the three different facility route alignments considered. Featured speech bubbles denote sample direct comments received from the engagement exercise

4 DESIGNING THE FACILITY

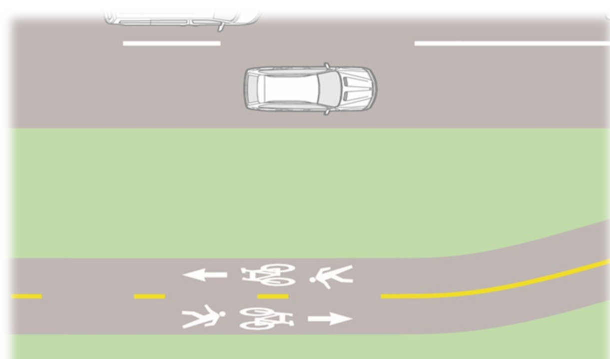
4.1 FACILITY DESIGN GUIDANCE

To ensure a facility design that reflects the most up-to-date and innovative guidance, industry leading references and guides were thoroughly examined and applied. Key among which is the Ontario Traffic Manual's (OTM) Book 18: Cycling Facilities, which is currently being updated to incorporate emerging best practices. This includes information specific to multi-use pathways (*Table 5*), the facility type selected as part of the following design assignment. Although OTM Book 18 served as a primary reference, it did not supersede the application of York Region's own existing standards and guidelines pertaining to the design of cycling facilities and the overall cycling network.

Table 5: OTM Book 18 Design Guidance: Multi-Use Pathways (Section 4.3.4.

	Multi-Use Pathways
Facility Description	A two-way path that is horizontally and vertically separated from the travelled portion of the roadway by a curb and buffer. Multi-use paths are shared by cyclists and pedestrians
OTM Book 18 Reference	*Section 4.3.4*
Application	This facility provides two-way travel shared by bikes and pedestrians and is suitable for roadways with moderate to high traffic volumes and speeds
Geometry	**Desired Width**: 3.5 metres **Suggested Minimum:** 3.0 metres Paths may be reduced to 2.4 m over very short distances, in constrained areas or in complex circumstances, such as to avoid utility poles or other infrastructure that may be costly to relocate, or in cases where a very low volume of users is anticipated
Signs & Pavement Markings	Refer to applicable existing York Region guidelines (see Section 3.3 – 3.5 of report)

Photo of the Newmarket East-West Bikeway along Eagle St, an existing multi-use pathway facility [Source: HDR]



Conceptual plan drawing of a multi-use pathway facility [Source: OTM Book 18]

4.2 DRIVEWAY TREATMENTS

Despite an objective to minimize driveway intersections, with so many found within the Mulock corridor, avoiding them entirely remained unfeasible. Instead, it was important that appropriate design treatments and amenities be applied across all intersecting driveways to ensure the safety and comfort of all MUP users. While too expensive to achieve this through grade separation or signalization, there remained several cost-efficient alternatives available. These include targeted signage and additional pavement markings, which visually reinforce safe and efficient traffic operations. To inform the appropriate application of these treatments, ***Section 6.2 Driveways*** of the York Region Pedestrian and Cycling Planning Guidelines were carefully reviewed and followed. The design recommendations are consistent with York Region guidelines based on facility type and the kind of intersecting driveway (as defined by traffic volumes and surrounding context) and proposed treatments related to "Multi-Family Residential" (***Figure 14***) and "Commercial/Industrial or Volume > 100 VPH" (***Figure 15***), at the locations shown in ***Figure 16***.

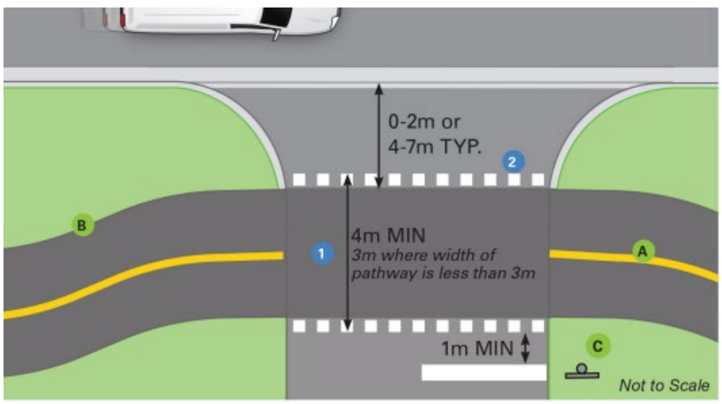


Figure 14: Design guidelines related to Multi-Family Residential Driveways (Source: Exhibit 6-14 York Region Pedestrian and Cycling Planning Design Guidelines)

Multi-Family Residential

1 & 2: Treatment of "Elephant's Feet" ***must be*** applied across the entire driveway

A & B: Yellow median ***may be*** extended through the driveway and MUP ***may*** approach at a slight bend to enhance safety

C: ***Optional*** advisory "Pedestrian and Bicycle Crossing Ahead Sign '

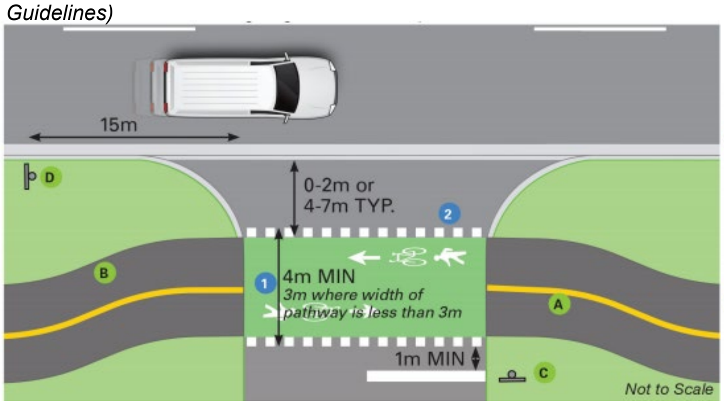


Figure 15: Design guidelines related to Commercial/Industrial Driveways (Source: Exhibit 6-15 York Region Pedestrian and Cycling Planning Design Guidelines)

Commercial/Industrial (or volumes > 100 VPH)

1 & 2: Combined Crosside ***must be*** applied across entire driveway

A & B: Yellow median ***may be*** extended through the driveway and MUP ***may*** approach at a slight bend to enhance safety

C & D: ***Optional*** advisory "Pedestrian and Bicycle Crossing Ahead" and Bicycle Trail Crossing Side Street" signage

Optional green paint treatment

Figure 16: Map depicting the location were the following two driveway treatments are recommended along the Mulock Drive corridor

4.3 INTERSECTION TREATMENTS (CROSSRIDES)

To ensure a safe and seamless travel experience across all parts of the corridor, the appropriate treatments and amenities are recommended to be applied across all intersecting vehicular roadways. Despite the presence of existing signals and crosswalks, features that enable cyclists to cross without dismounting and walking their bike do not currently exist. This can be resolved through the implementation of "crossrides" at each intersection, which permit cyclists to continue riding through the crossing consistent with Ontario Traffic Manual Book 18: Cycling Facilities and the Highway Traffic Act (HTA). Crossrides consist of series of pavement markings which delineate the movement of cyclists from adjacent pedestrian traffic. Of the three different types commonly applied, both ***Combined*** (***Figure 17***) and ***Mixed (Figure 18)*** crossrides are recommended by York Region:

Combined Crossride

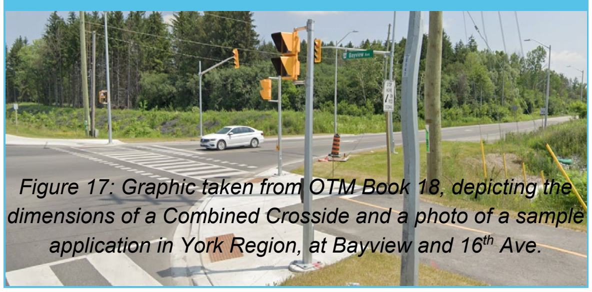
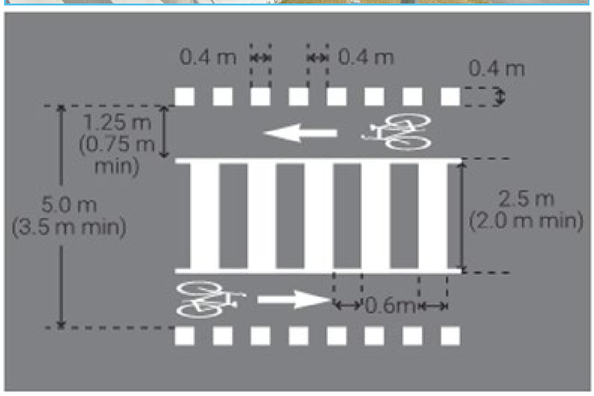


Figure 17: Graphic taken from OTM Book 18, depicting the dimensions of a Combined Crosside and a photo of a sample application in York Region, at Bayview and 16th Ave.



Crossings are provided on both sides of a pedestrian crosswalk and are typically used in conditions where pedestrians and cyclists approach the crossing on a shared facility. When pedestrians are expected to cross in the centre on the crosswalk markings, Tactile Walking Surface Indicators (TWSI) should be implemented across the full width of the combined crossing where the pedestrian and cyclist space is mixed at the approaches. Combined crossrides may be used at signalized or unsignalized crossings.

Mixed Crossride

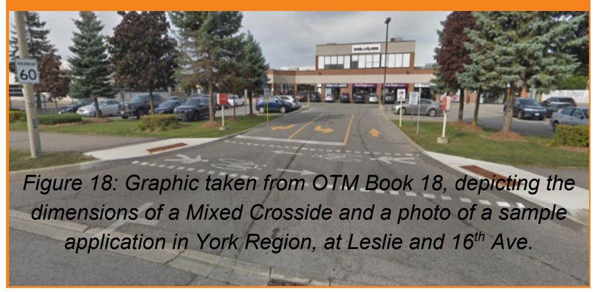
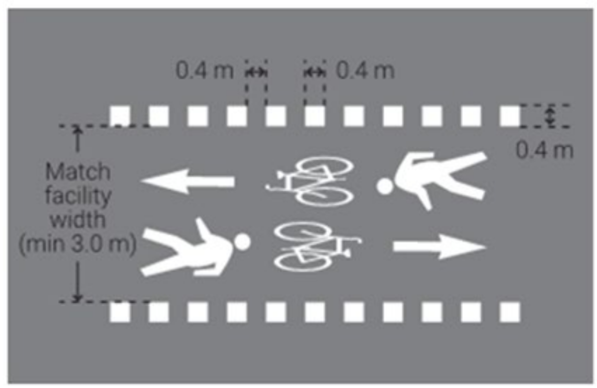


Figure 18: Graphic taken from OTM Book 18, depicting the dimensions of a Mixed Crosside and a photo of a sample application in York Region, at Leslie and 16th Ave.

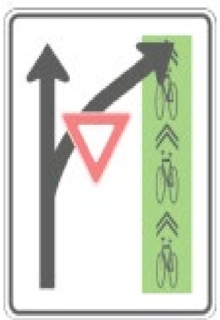


Intended for use at low volume unsignalized crossings and driveways, where pedestrians and cyclists are approaching the crossing on a shared facility, such as a MUP. These treatments allow cyclists and pedestrians to operate in a shared space. They are more space efficient and should only be implemented in locations where cyclists and pedestrian volumes are low or where cyclist volumes are high while pedestrian volumes are low. The HTA does not currently allow mixed crossrides to be implemented at signalized intersections.

4.4 SIGNAGE GUIDELINES

Signage is an effective and necessary feature of any multi-use pathway to assist user navigation and instruct proper traffic etiquette and operations. For the proposed Mulock MUP facility, these requirements were based off the guidance of various technical references, including ***Section 7.1 Signage*** of York Region's Pedestrian & Cycling Design Guidelines. Although the York Region Guidelines addresses common signage types, signage requirements were equally informed upon guidance listed within relevant Regional Traffic Policies, OTM Book 18: Cycling Facilities and OTM Book 12: Traffic Signals. While not exhaustive, the list provided below show images and planning guidelines associated with key signage types which should be included as part of the Mulock's MUP design:

TURNING VEHICLES YIELD TO BICYCLE SIGN



Applications: Intersections (signalized and unsignalized), facility transitions and driveways

Usage: Reminds motorists to yield to cyclists through conflict zones (ahead of merging zones).

YIELD TO PEDESTRIANS SIGN

Applications: Intersections (signalized and unsignalized), facility transitions and driveways

Usage: Reminds cyclists to yield to through cyclist traffic.

SHARED PATHWAY SIGN

Applications: Intersections (signalized and unsignalized), midblock crossings

Usage: Reminds pedestrians and cyclists that they are using a shared facility. Placed at the start of facilities or across intersections

RAILWAY CROSSING AHEAD

Applications: Railway crossings

Usage: Reminds pedestrians and cyclists of an upcoming at grade railway crossing.

Wayfinding Signage Design Principles

Conspicuity: *signs attract visual attention and are easily discerned by users*

Simplicity: *sings are legible and comprehensible and not overcrowded with information*

Predictability: *signs offer information in a consistent manner*

Progressive Disclosure: *signs present information in a manageable amount for users*

Progression: *signs are placed in a position that allow users (cyclists) to maintain their movement*

Connectivity: *signs should allow users to see the extent they can travel by walking or cycling*

5 IMPLEMENTATION AND NEXT STEPS

5.1 PROJECT COSTING

To set reasonable financial expectations related to the future design and implementation of the proposed multi-use pathway facility, a high-level project cost was developed. This figure was reliant on the precedence of similar projects recently built across Southern Ontario as well as a thorough understanding of the Mulock corridor. Overall, the proposed facility is estimated at an overall cost of **$2.87M**. Provided below is a list of the key factors and considerations that informed this figure, with a complete breakdown provided within Appendix A:

- **$461k** in costs towards general construction works (i.e. small tree removals, traffic closures);
- **$2.14M** in costs towards road and boulevard works (i.e. removal of existing sidewalk, facility installation, pavement markings, signage features);
    - **$90K** in additional costs for optional guiderail works near Leslie St, recommended to ensure a consistent 3.0m MUP facility width closer to Leslie Street;
    - **$75K** in additional costs for optional toe wall work east of Bayview Avenue, which may be identified as required following later detailed design work;
- 30% contingency rate included, typical for the preliminary design of a multi-use pathway preliminary where utilities and detailed design impacts remain undetermined; and
- 10% rate included for future detailed design engineering work.

Excluded from this figure are estimated costs related to potential traffic work, including the reprogramming of existing traffic signal controllers and relocation of current median cutbacks, which would be assumed by the Region. The following preliminary design features crossings at 6 signalized intersections where existing traffic signals and median island may be impacted. Assuming a unit cost of $100,000-$150,000 per intersection, this work would be estimated to add $600K to $900K onto the existing project cost. Also excluded from the following estimate are costs related to the design and construction of a separate spur line connection to Newmarket High School. Like the facility design, this costing figure would also depend on the outcome of a separate associated preliminary and eventual detail design process. Costs were also not calculated for segments of the proposed Mulock facility where a multi-use pathway has already been implemented. This includes the section between Plantation and Columbus (600m) and another section 450 meters east of Fernback Rd (within the Magna Centre fields).

5.2 FUTURE MUP CONNECTION TO NEWMARKET HIGH SCHOOL

An underlying objective in designing the Mulock MUP was to maximize connectivity to key destinations located along the corridor. This included local schools, such as Newmarket Highschool, located just east of the intersection of Mulock Dr and College Manor Dr. Providing access to Newmarket Highschool not only aligns with anticipated travel patterns but promotes active transportation as a more convenient and safer travel alternative for youth in the community. This is particularly important to provide access for people of all ages and promote physical activity as part of a healthier lifestyle.

Two options for this future connection were assessed. The first involved extending the Mulock MUP west to the driveway entrance to Newmarket High School. However, this would require the MUP to cross a busy plaza entrance which was flagged by both the study team and Town staff as an undesirable option from a risk and safety perspective.

The second alternative that was assessed and is recommended involves constructing a MUP in place of the sidewalk on east side of College Manor (Plaza side) north of Mulock Dr as then continuing the MUP along the back of the plaza on Pickering Crescent to connect directly to the school (***Figure 19***). It is recommended that the Town undertake a design study in the future should the Mulock Dr MUP project b approved. This could be combined with the detailed design of the Mulock Dr MUP.

Figure 19: Figure depicting the suggested alignment of a spur line connection from the proposed Mulock MUP, to connect to Newmarket High School

5.3 CONCLUSION

The proposed multi-use pathway along Mulock Drive represents a significant expansion to the Town of Newmarket's active transportation network. Extending over 6 km long across the entire width of the Town of Newmarket, the Mulock Dr MUP will provide vital connections to key travel destinations and existing active transportation facilities, helping to promote multi-modal travel along the corridor and across the Town. The preferred alignment and design were developed through a series of technical exercises, informed by the guidance of industry leading references and practices. This includes a complete arborist study of the corridor to identify and mitigate impacts to potential tree cover and a thorough and measurable evaluation of three different alignment alternatives. The recommended alignment also reflects a strong understanding of local needs and priorities as informed through Council and Public consultations conducted during the study. During all key stages of project work, town staff were routinely consulted, with a draft study update presented to Committee of the Whole in May of 2021. This was then followed by an interactive public information center hosted in June 2021, to engage input from members of the public.

The estimated cost to design and construct the Mulock Dr Multi-Use Pathway is $2.87M, assuming a contingency rate of 30% and rate of 10% for future detailed design work

If approved by Town Council, it is recommended that staff proceed with the detailed design phase. It is also recommended that Town staff explore potential external funding sources to offset the cost to the Town to construct this facility. For example, the Federal Government in the summer of 2021 announced a $400 million active transportation infrastructure fund to support a new National Active Transportation Strategy. Details on this program and the application process can be found on Infrastructure Canada Website https://www.infrastructure.gc.ca/trans/active-actif-eng.html.

In addition to advancing to the detailed design phase for the Mulock Dr MUP, it is recommended that the Town, design and implement a separate spur line to provide a direct connection to Newmarket High School. Suggestively, this would involve a MUP in place of the sidewalk on east side of College Manor (Plaza side) north of Mulock Dr, which would then continue along the back of the plaza on the south side of Pickering Crescent and connect directly to the school's main entrance.

The proposed Mulock Dr MUP represents a significant expansion and a new east/west spine to the Town's active transportation and highly valued recreational trails network, will accommodate users of all ages and abilities and support the Town's goals and policies, including improving public health and quality of life of all Newmarket residents.

Appendix A: Detailed Costing Summary

Town of Newmarket - Active Transportation Facilities 211-00396-00

Mulock Drive - Bathurst Street to Harry Walker Parkway South
Preliminary Construction Cost Estimate (September 2021) - Setback 0.6m from Roadway, 3.0m MUP

	Item	Description	Unit	Quantity	Unit Cost	Total	Comments
		Part A - General					
General	1.01	Construction Layout	L.S.	1	$ 65,000.00	**$ 65,000.00**	
	1.02	Small Tree Removals	ea	154	$ 100.00	**$ 15,400.00**	From preservation plans
	1.03	Maintenance of Traffic	L.S.	1	$ 110,000.00	**$ 110,000.00**	Assumes 5% of Section B
	1.04	Supply and Install Field Office for City Staff	L.S.	1	$ 40,000.00	**$ 40,000.00**	
	1.05	Supply, Install and Maintain Silt Fence for Erosion and Sediment Control	m	4000	$ 25.00	**$ 100,000.00**	Assumes one side at a time completed
	1.06	Supply, Install and Maintain Tree Protection Fence	m	1200	$ 20.00	**$ 24,000.00**	From preservation plans at 4m per injured tree
		Subtotal (Part A - General excluding contingency)				**$ 354,400.00**	
		30% contingency (Part A)				**$ 106,320.00**	
		SubTotal (Part A - General)				**$ 460,720.00**	
Road and Boulevard Works		**Part B - Road and Boulevard Works**					
	2.01	Remove and Dispose of Existing Concrete Curb and Gutter (All Types)	m	300	$ 18.00	**$ 5,400.00**	For intersection works
	2.02	Remove and Dispose of Existing Concrete Sidewalk	m2	14500	$ 18.00	**$ 261,000.00**	
	2.03	Clearing and Grubbing	m2	8700	$ 5.00	**$ 43,500.00**	Assumes approximately 0.9m grass boulevard width removed per metre of sidewalk removed
	2.04	Remove and Dispose of Existing Steel Beam Guide Rail Including End Treatment	m	390.0	$ 18.00	**$ 7,020.00**	**As an option to provide a more consistent and desirable MUP facility**
	2.05	Pavement Marking Obliterating - Stop Lines and Zebra Marking Lines	m	950	$ 20.00	**$ 19,000.00**	
	2.06	Relocate sign and post	ea	5	$ 100.00	**$ 500.00**	Added for 60% design
	2.07	HL-8 (50mm) Binder Course Asphalt (PG 58-28) - for Cycle Facility or MUP	m2	16700	$ 12.00	**$ 200,400.00**	Pavement structure matches recent Clark project. Geotechnical report to confirm recommendations
	2.08	HL-3 (40mm) Surface Course Asphalt (PG 64-28) - for Cycle Facility or MUP	m2	16700	$ 10.00	**$ 167,000.00**	Pavement structure matches recent Clark project. Geotechnical report to confirm recommendations
	2.09	Supply, Place and Compact 150mm Granular A for MUP base	t	6250	$ 28.00	**$ 175,000.00**	Assumes 150mm depth
	2.10	Construct 150 mm Thick Concrete Sidewalk	m2	700	$ 100.00	**$ 70,000.00**	Intersection works only
	2.11	Construct 125mm Thick Coloured Concrete Buffer	m2	1000	$ 105.00	**$ 105,000.00**	Pavement structure matches recent Vaughan project.
	2.12	Supply and Install Tactile Warning Surface Indicators	ea	350	$ 300.00	**$ 105,000.00**	Intersection works only
	2.13	Toe Wall (including all removals and installation works)	m	50.0	$ 1,500.00	**$ 75,000.00**	East of Bayview
	2.14	Guiderail (including end treatments and extra 0.6m MUP width)	m	450.0	$ 200.00	**$ 90,000.00**	**As an option to provide a more consistent and desirable MUP facility.** Includes widening MUP from 2.4m to 3.0m
	2.15	Permanent Durable Pavement Markings-10cm white line	m	170	$ 6.00	**$ 1,020.00**	
	2.16	Permanent Durable Pavement Markings - 60cm Stop Lines and for Zebra crossing	m	700	$ 35.00	**$ 24,500.00**	
	2.17	Permanent Durable Pavement Markings - Elephant's feet (40cm x 40 cm)	m	450	$ 24.00	**$ 10,800.00**	
	2.18	Pavement markings - Green Thermoplastic cycle crossing	m	390	$ 200.00	**$ 78,000.00**	
	2.19	Pavement markings - Bicycle Symbol and Arrow	ea	18	$ 110.00	**$ 1,980.00**	
	2.20	Pavement markings - Pedestrian Symbol	ea	18	$ 85.00	**$ 1,530.00**	
	2.21	Permanent Roadway Signage	ea	200	$ 265.00	**$ 53,000.00**	Assumes 20 signs per/km per direction.
	2.22	Streetlight Pole Relocation Complete with Luminaire and Bracket. Install Handhole and Re-Route Existing Underground Duct Wiring into Handhole. Splice Cables and Connect	ea	9	$ 10,000.00	**$ 90,000.00**	
	2.23	Supply and install Chain Link Fence	m	336	$ 150.00	**$ 50,400.00**	
	2.24	Remve and Install Fire Hydrant	ea	1	$ 15,000.00	**$ 15,000.00**	
		SubTotal (Part B - Road and Boulevard Works excluding contingency)				**$ 1,650,050.00**	
		30% contingency (Part B)				**$ 495,015.00**	
		SubTotal (Part B - Road and Boulevard Works)				**$ 2,145,065.00**	
		Signalized Intersection Median and Signal works	ea	6.0	$ 0.00	**$ 0.00**	**To be completed by York Region**
		Rail Crossing Implementation	ea	1.0	TBD	**TBD**	**To be assessed in Detailed Design in coordination with Metrolinx and Region**
		Bridge ATF Component Widening	ea	1.0	TBD	**TBD**	**To be assessed by Structrual Engineers for whether widening the ATF along the bridge can be completed**
		10% Design (Engineering)				**$ 265,000.00**	
		Total (Mulock Drive)				**$ 2,870,785.00**	

Geotechnical borehole program to confirm proposed MUP pavement structure

Appendix B: Detailed Roll Plan & Typical Sections

LEGEND

- PROPOSED MULTI-USE TRAIL
- EXISTING MULTI-USE TRAIL
- PROPOSED CONCRETE SIDEWALK
- PROPOSED CONCRETE COLORED BUFFER RANGE 0.6m TO 1.0m
- PROPOSED TACTILE PLATE
- PROPOSED DRIVEWAY MIXED CROSSING
- PROPOSED COMBINED CROSSRIDE
- POTENTIAL TOE WALL REQUIRED

MULOCK DRIVE

CONCEPTUAL DESIGN
SCALE 1:500

(SHEET 1 OF 3)

LEGEND

- PROPOSED MULTI-USE TRAIL
- EXISTING MULTI-USE TRAIL
- PROPOSED CONCRETE SIDEWALK
- PROPOSED CONCRETE COLORED BUFFER RANGE 0.6m TO 1.0m
- PROPOSED TACTILE PLATE
- PROPOSED DRIVEWAY MIXED CROSSING
- PROPOSED COMBINED CROSSRIDE
- POTENTIAL TOE WALL REQUIRED

MULOCK DRIVE

CONCEPTUAL DESIGN

SCALE 1:500

(SHEET 2 OF 3)

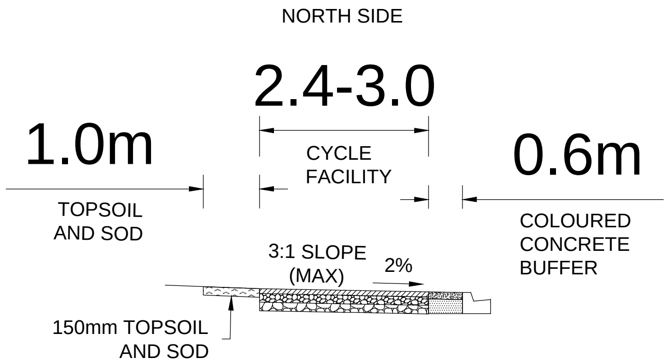
LEGEND

- PROPOSED MULTI-USE TRAIL
- EXISTING MULTI-USE TRAIL
- PROPOSED CONCRETE SIDEWALK
- PROPOSED CONCRETE COLORED BUFFER RANGE 0.6m TO 1.0m
- PROPOSED TACTILE PLATE
- PROPOSED DRIVEWAY MIXED CROSSING
- PROPOSED COMBINED CROSSRIDE
- POTENTIAL TOE WALL REQUIRED

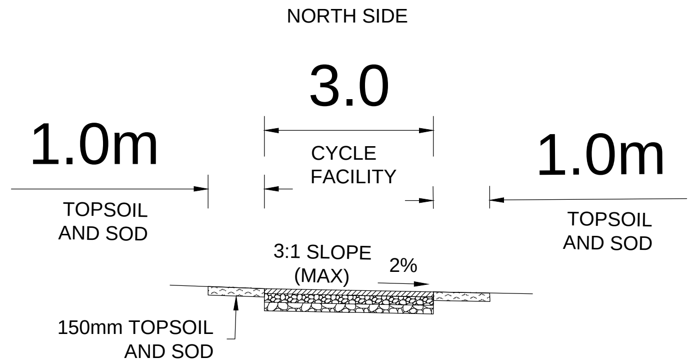
MULOCK DRIVE
CONCEPTUAL DESIGN
SCALE 1:500

(SHEET 3 OF 3)

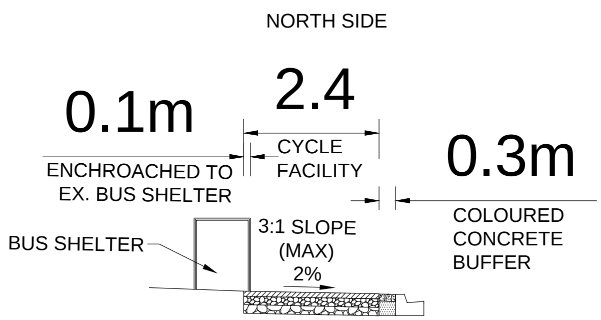
MULOCK DRIVE MUP CROSS SECTIONS



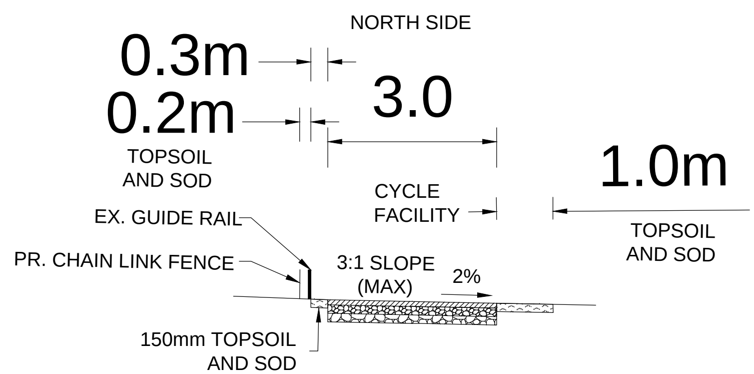
SECTION A - A



SECTION B - B



SECTION C - C



SECTION D - D

Appendix C: Arborist Review & Tree Planting Report

TOWN OF NEWMARKET

MULOCK DRIVE MULTI-USE TRAIL FEASIBILITY STUDY

TREE INVENTORY & ASSESSEMENT REPORT

MULOCK DRIVE MULTI-USE TRAIL FEASIBILITY STUDY

TREE INVENTORY & ASSESSMENT REPORT

TOWN OF NEWMARKET

PROJECT NO.: 211-00396-00
DATE: APRIL 08, 2021

WSP

WSP.COM

REVISION HISTORY

FIRST ISSUE

April 8, 2021	Preliminary Design Submission			
Prepared by	Reviewed by	Approved By		
Peter McNamara	Peter McNamara	Sham Nankoosingh		
REVISION 1				
<Date>	<Remarks>			
Prepared by	Reviewed by	Approved By		
<preparer, title>	<reviewer, title>	<approver, title>		
REVISION 2				
<Date>	<Remarks>			
Prepared by	Reviewed by	Approved By		
<preparer, title>	<reviewer, title>	<approver, title>		

SIGNATURES

PREPARED BY

April 8, 2021

Tiffany Waters, B.Sc.
Ecologist, ISA Certified Arborist ON-2590A

Date

REVIEWED BY

Peter McNamara

April 8, 2021

Peter McNamara, B.A.
Senior Landscape Technician / Certified Arborist ON-1140A

Date

APPROVED[1] BY *(must be reviewed for technical accuracy prior to approval)*

Peter McNamara

April 8, 2021

Peter McNamara, B.A.
Senior Landscape Technician / Certified Arborist ON-1140A

Date

WSP Canada Inc. prepared this report solely for the use of the intended recipient, Town of Newmarket, in accordance with the professional services agreement. The intended recipient is solely responsible for the disclosure of any information contained in this report. The content and opinions contained in the present report are based on the observations and/or information available to WSP Canada Inc. at the time of preparation. If a third party makes use of, relies on, or makes decisions in accordance with this report, said third party is solely responsible for such use, reliance or decisions. WSP Canada Inc. does not accept responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken by said third party based on this report. This limitations statement is considered an integral part of this report.

[1] Approval of this document is an administrative function indicating readiness for release and does not impart legal liability on to the Approver for any technical content contained herein. Technical accuracy and fit-for-purpose of this content is obtained through the review process. The Approver shall ensure the applicable review process has occurred prior to signing the document.

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

1 INTRODUCTION

WSP Canada Inc. (WSP) has been retained to undertake a tree inventory and prepare a technical memo to identify the existing vegetation around the proposed multi-use trail along Mulock Drive between Bathurst Street and Harry Walker Parkway, approximately 6km in length. The purpose of this technical memo is to discuss the findings of the tree inventory, identify areas where the proposed multi-use trail may impact existing trees and provide recommendations for future work.

1.1 STUDY LIMITS

- A tree inventory was conducted along the following areas:
  - North and South sides of Mulock Drive between Bathurst Street to Harry Walker Parkway
  - Trees adjacent to existing multi-use trails have been omitted

1.2 TREE INVENTORY METHODOLOGY

A tree inventory and assessment were conducted by two (2) WSP Certified Arborists on March 18, 19, 22 and 23, 2021 to identify species, size, and quantity and evaluate the health of vegetation along the proposed multi-use trail. The assessment focused on:

- Trees within the City ROW along Mulock Drive;
- Larger trees >20cm DBH within 7 m of the sidewalk;
- Smaller trees <20cm DBH within 3 m of the sidewalk;
- And any trees within the ROW with a canopy overhanging the sidewalk

Vegetation has been inventoried for species, size and condition and separated into 617 individual trees (trees #01 and 02 to 617) and one (1) tree grouping of eleven (11) Eastern White Cedars (Thuja occidentalis) (tree #03).

This report is to be read in conjunction with:

- Appendix A: Tree Inventory Tables
- Tree Preservation Plans (TP-1 to TP-10)

2 TREE INVENTORY AND ASSESSMENT

Vegetation was observed predominantly along the existing sidewalk along Mulock Drive. Most trees and vegetation are planted along the existing sidewalk and are a mixture of native and introduced naturally occurring deciduous and coniferous trees. Within the study area, 35 tree species or varieties were inventoried (Table 2.1).

2.1 VEGETATION

The most common species identified was Japanese Tree Lilac (Syringa reticulata ssp. Reticulata), followed by Norway Maple (Acer negundo) and Cherry species (Prunus sp.). Trees were young to mature with a DBH range of 3 to 90 cm, with a majority between 3 to 25 cm DBH. Refer to Table 2.1 that outlines the species and quantities of each species.

Table 2.1 – Species and Quantity

COMMON NAME	SCIENTIFIC NAME	NUMBER OF TREES
Hedge Maple	*Acer campestre*	17
Amur Maple	*Acer ginnala*	23
Manitoba Maple	*Acer negundo*	8
Norway Maple	*Acer platanoides*	89
Red Maple	*Acer rubrum*	5
Silver Maple	*Acer saccharinum*	7
Sugar Maple	*Acer saccharum*	29
Ohio Buckeye	*Aesculus glabra*	4
Serviceberry Species	*Amelanchier sp.*	2
Northern Catalpa	*Catalpa speciosa*	1
Common Hackberry	*Celtis occidentalis*	17
Hawthorn Species	*Crataegus sp.*	2
Russian Olive	*Eleagnus angustifolia*	2
Green Ash	*Fraxinus pennsylvanica*	1
Honey-locust	*Gleditsia triacanthos*	16
Kentucky Coffee-tree	*Gymnocladus dioicus*	2
Black Walnut	*Juglans nigra*	11
Apple Species	*Malus sp.*	36
White Spruce	*Picea glauca*	27

Blue Spruce	*Picea pungens*	9
Black Pine	*Pinus nigra*	5
Scots Pine	*Pinus sylvestris*	1
Cherry Species	*Prunus sp.*	70
Pear Species	*Pyrus sp.*	15
Bur Oak	*Quercus macrocarpa*	17
English Oak	*Quercus robur*	2
Northern Red Oak	*Quercus rubra*	8
Oak Species	*Quercus sp.*	2
Black Locust	*Robinia pseudoacacia*	4
Japanese Tree Lilac	*Syringa reticulata ssp. reticulata*	152
Eastern White Cedar	*Thuja occidentalis*	11 (1 group)
American Elm	*Ulmus americana*	5
Elm Species	*Ulmus sp.*	8
Accolade Elm	*Ulmus x Morton*	2
Little-leaf Linden	*Tilia cordata*	17
Total		**627**

Table 2.2 – Tree Location

LOCATION / BY-LAW	TREE ID	TOTAL
North Side of Mulock Drive	1, 2, 6, 10, 11, 15 to 143, 194 to 223, 263 to 270, 272 to 300, 308 to 356, 358 to 393, 480 to 613	420
South Side of Mulock Drive	3 (11 trees), 4, 5, 7, 8, 9, 12, 13, 14, 144 to 193, 224 to 262, 271, 301 to 307, 357, 394 to 479, 614 to 617	207
Total		**627**

2.2 CONDITION

Overall tree health ranges between good and poor; a majority observed to be in good condition. Signs of decline and defects were observed on a small number of trees including:

- Lean;
- Weakly formed unions;
- Poor form;
- Overall lack of vigour;
- Broken branches and stems;
- Dead branches;
- Peeling bark;
- Soil mounded around trunks;
- Pruning or topping;
- Multiple stems;
- Trunk wounds;
- Exposed roots with mower damage;
- Gridling roots;
- Poor compartmentalization; and,
- Epicormic shoots.
- Symptoms of decline in one (1) Ash (*Fraxinus* sp.) tree observed due to the presence of EAB. Symptoms included:
    - 'D' shaped exit holes in bark;
    - Suckering at the base;
    - Water sprouting up trunk;
    - Woodpecker damage from woodpeckers eating the larvae;
    - Deadwood in crown; and,
    - Treatment for EAB observed on some Ash trees (e.g. green spray-painted dots and tree tags).

3 DEFINITIONS

The following are the definitions of the assessment categories utilized in our tree assessment:

Table 3.1 – Definitions

ACRONYM / DEFINITION	DESCRIPTION
Tree Number	This number refers to the number on the on the tree tag or alpha-numeric, alphabetical or tree grouping label listed in Appendix A: Tree Inventory and Preservation Charts and labelled on the Tree Preservation Plans (e.g. PK01, P01 or TG-01).
Tree Grouping	A tree grouping is more than one (1) tree located within proximity of other trees with no separation between the canopies.
DBH	This refers to diameter (in centimetres) at breast height and is measured at 1.4 m above the ground for each tree.
Tree Protection Zone	This to the area around a tree that is to be protected through tree protection measures e.g. hoarding. No construction activities are to be undertaken within this zone.
Suppressed	Refers to trees that have their crowns completely overtopped by adjacent trees and received limited to very limited sunlight.
Co-dominant Stem	Stems equal in size and relative importance that make up the overall crown of the tree.
Union	Junction point where two or more stems meet. A ‘U’ shaped junction indicates a well-formed union. A ‘V’ shaped junction indicates a weakly formed union, whereas stems grow and increase in girth, weak bark called ‘included bark’ forms within the junction and stems start to push apart causing vertical cracks and loss of structure.
Compartmentalization	This is a naturally occurring process by which chemical and physical barriers are synthesized to prevent the spread of decay and disease in trees.
Irregular Tree Form	Refers to branches and stems that have formed irregularly often resulting in contorted growth, weak attachments, weakly formed unions and codominant stems. The irregular growth of scaffold (lateral) branches typically leads to damage to other scaffold branches.
Imminently Hazardous Tree	Refers to a destabilized or structurally compromised tree that is in imminent danger of causing damage or injury to life or property.
Injure and Injury	Described as any act that will harm a tree's health, including failure to protect in accordance with standards set by the Cities tree protection / preservation policy.
Root Zone	Refers to the subterranean area around the tree measured from the trunk to up to 2-3m beyond the dripline.
Critical Root Zone	The minimum area of the root system necessary to maintain vitality or stability of the tree. Typically, this area extends to the drip line of the tree. The severing of one root can cause approximately 5-20% loss of the root system. A reduction of this area by greater than 30% can pose stability concerns for the tree.

Table 3.2 – Tree Assessment Criteria

DEFINITION	DESCRIPTION
Trunk Integrity (T.I.)	This is an assessment of the trunk for any defects or weaknesses. It is measured on a scale of poor, fair, good.
Canopy Structure (C.S.)	This is an assessment of the scaffold branches, unions and the canopy of the tree. This is measured on a scale of poor, fair, good.
Canopy Vigour (C.V.)	This is an assessment of the health of the tree and assesses the amount of deadwood and live growth in the crown as compared to a 100% healthy tree. The size, colour and amount of foliage are also considered in this category. This is measured on a scale of poor, fair, good.
Good	Tree displays less than 15% deficiency/defect within the given tree assessment criteria (TI, CS, CV).
Fair	Tree displays 15%-40% deficiency/defect within the given tree assessment criteria (TI, CS, CV).
Poor	Tree displays greater than 40% deficiency/defect within the given tree assessment criteria (TI, CS, CV).

4 DISCUSSION

This section is a discussion of the retention potential, preservation and / or impacts to trees within the proposed limits of the Multi-Use trial.

Proposed works, vegetation recommendations, impacts and preservation are detailed in the following sections.

4.1 PROPOSED TRAIL

- Limits of construction are anticipated to be 3.6m

4.2 TREE RECOMMENDATIONS / ASSUMPTIONS

Assessments of tree injury, removal and preservation were based on the following criteria.

4.2.1 TREE REMOVAL

- Removal is based on the degree of excavation / disturbance within dripline and critical root zone. The following assumption has been used to determine whether a tree requires removal which is based on the amount of disturbance within the critical root zone that could result in the decline or mortality of the tree;
  - Diameter of the tree x 5 = encroachment zone
    - (e.g. 50cm x 5 = 2.5m encroachment zone)
- Any encroachment from construction activities into this zone would result in the recommendation that the tree be removed.

4.2.2 TREE INJURY

- Where construction, excavation, grading or use of equipment and vehicles will occur within the dripline and root zone of existing trees the potential exists for injury to trees through broken branches, pruning, damage to and compaction of roots;
- Any encroachment into the dripline will be considered an injury;
- Tree injury is recommended to be mitigated by measures enacted during construction and measures enacted post construction.

4.2.3 TREE PRESERVATION

- Preservation of trees is considered where there is no encroachment, excavation or disturbance within the dripline or encroachment zone.

4.2.4 TREE TRANSPLANTING

- Potential exists for the transplanting of young trees, generally under <10cm DBH.
- Transplanting depends on trees that are in good condition and the availability of a temporary transplanting site.

4.3 TREE REMOVALS

Impacts to trees will occur where trees are located within the limits of the proposed trail and 3.6m construction / excavation limits. Tree removal will be considered where:

- Trees are within the excavation limit;
- Trees where the encroachment exceeds 5 times the trunk diameter.

The following table details the tree numbers and quantity of trees that may require removal on the north and south sides of Mulock Drive

Table 4.1 – Tree Removal Table

Location	Tree #	Total
North Side of Mulock Drive	1, 2, 23, 24, 34, 57, 58, 59, 77, 103, 104, 105, 110, 115, 139, 141, 142, 143, 195, 196, 198, 199, 200, 201, 202, 204, 207, 2089, 210, 211, 220, 265, 266, 267, 269, 273, 274, 276, 280, 285, 287, 290, 291, 293, 296, 300, 314, 318, 322, 328, 331, 334, 336, 337, 338, 340, 344, 346, 347, 348, 349, 352, 353, 354, 355, 356, 359, 360, 363, 366, 371, 384, 480, 500, 509, 512, 513, 518, 520, 523, 524, 540, 547, 548, 551, 560, 562, 567, 568, 579, 587, 589, 604	94
South Side of Mulock Drive	144 to 161, 162 to 167, 243, 247, 249, 251, 252, 253, 254, 258, 261, 262, 301, 302, 303, 304, 357, 396, 397, 398, 399, 400, 401, 402, 404, 405, 416, 423, 441, 446, 450, 451, 468, 614, 615, 616, 617	60
Totals		**154**

- Based on the table above approximately 20% of the trees on the north side and 30% of the trees on the south side of Mulock Drive would require removal.

4.4 TREE INJURY

- Tree injury consists of any impact to the above and below ground components of the tree e.g. roots and branches. For this assignment, injury is assumed where the proposed construction / excavation limits will occur within the dripline;
- The minimization of tree injury can be achieved through mitigative measures that are utilized during construction and post construction. These measures are discussed in Section 5.
- Refer to the following Table details the tree #'s and quantity of trees that may be injured.

Table 4.2 – Tree Injury Location Table

Location	Tree #	Total
North Side of Mulock Drive	6, 10, 11, 15, 19, 20, 21, 22, 25, 28, 30, 31, 32, 33, 35 to 42, 45 to 53, 56, 68 to 71, 74, 100, 106, 107, 108, 120 122, 123, 126 to 131, 133, 134, 144, 203, 205, 206, 212, 215, 263, 264, 268, 270, 272, 275, 277, 278, 281, 283, 283, 284, 286, 289, 292, 297, 310, 319, 320, 321, 323, 324, 326, 330, 332, 339, 341, 342, 350, 351, 358, 361, 362, 364, 365, 370, 372, 378, 383, 385, 387, 388, 393, 481, 482, 483, 483, 487, 489, 490, 494, 495, 498, 499 to 505, 507, 508, 511, 514, 515, 517, 5189, 521, 522, 526, 527, 529, 630, 532, 534, 535, 538, 543, 555, 556, 557, 566, 572, 573, 574, 578, 582, 584, 594, 595, 596, 601, 606, 607, 610, 611, 612, 613	155
South Side of Mulock Drive	4, 9, 168 to 172, 174, 189, 190, 191, 193, 242, 245, 248, 250, 256, 259, 260, 402, 424, 426, 439, 452, 456, 457, 459, 460, 461, 464, 465, 466, 469, 470, 471, 472, 473, 474, 475	41
Totals		**196**

- Based on the table above approximately 48% on the north side and 25% of the trees on the south side of Mulock Drive would be injured (excluding tree removals).

4.5 TREE PRESERVATION

Trees can be preserved where there will be no encroachment into the dripline. Refer to the following Table details the tree #'s and quantity of trees that may be injured.

Table 4.3 – Tree Injury Location Table

Location	Tree #	Total
North Side of Mulock Drive	16, 17, 18, 26, 27, 29, 39, 43, 44, 54, 55, 60, 61, 62, 63, 64, 65, 66, 67, 72, 73, 75, 76, 78, 79, 80, 81, 82, 83 to 99, 101, 102, 109, 111, 112, 113, 114, 116, 117, 118, 119, 121, 124, 125, 132, 135, 136, 137, 138, 140, 197, 209, 213, 214, 216, 217, 218, 219, 221, 222, 223, 278, 288, 294, 295, 298, 299, 308, 309, 311, 312, 313, 315, 316, 325, 327, 329, 333, 335, 342, 345, 367, 368, 369, 373, 374, 375, 376, 377, 379, 380 381, 382, 386, 389, 390, 391, 392, 485, 486, 488, 491, 492, 493, 497, 506, 516, 525, 528, 531, 533, 536, 537, 539, 541, 542, 544, 545, 546, 549, 550, 552, 554, 558, 559, 561, 563, 564, 565, 569, 570, 571, 575, 576, 577, 580, 581, 582, 585, 586, 588, 590, 591, 592, 593, 597, 598, 599, 600, 602, 603, 605, 608, 609	171
South Side of Mulock Drive	3, 5, 7, 8, 12, 13, 13, 173, 175, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 192, 224 to 241, 255, 257, 271, 305, 306, 307, 394, 395, 406 to 415, 417, 418, 419, 420, 421, 422, 425, 427, 440, 442, 443, 444, 445, 447, 448, 449, 453, 455, 458, 462, 463, 467, 476, 477, 478, 479	106
Totals		**277**

- Based on the table above approximately 52% on the north side and 72% of the trees on the south side of Mulock Drive could be preserved (excludes tree removals and includes tree injury).

5 MITIGATION MEASURES

The survival rates for trees, which are in proximity to construction, are dependent on the resultant changes to a variety of environmental and anthropogenic factors. These construction activities bring about changes to a variety of environmental features such as the existing microclimate that includes winds, air temperature, soil moisture, amount of available sunlight, soil quality, and the level of the water table. Increased human activities may also damage the structure and/or physiological activities of the trees. The full effects of any damage that occurs may not appear until several years after its occurrence. Thus, it is essential that both vegetative clearing and preservation methods follow the guidelines below and those generally accepted as keeping with good horticultural and construction practices. The guidelines are subject to adjustments deemed reasonable and appropriate considering the proximity and number of trees involved and the site-specific servicing requirements.

5.1 GENERAL MITIGATION MEASURES

- To minimize damage to roots it is recommended that excavators scrape soil within the same direction of the roots and not across. Any roots exposed are too be pruned neatly and cleanly.
- Any roots exposed during grading are to be pruned using good arboricultural practices and per the guidelines in this report.
- Areas where excavation, grading and construction have compacted soil within a reduced TPZ, at the completion of construction, scarify soil to a depth of 100mm. Restore disturbed areas as per Landscape Plans and /or the following methods below:
  - Water trees periodically during construction; and,
  - After construction it is recommended that a 75mm depth layer of mulch be placed in a 2m radius around the trunks of these trees.
- Trees shall not have any rigging cables or hardware of any sort attached or wrapped around them, nor shall any contaminants be dumped within the protective areas. Further, no contaminants shall be dumped or flushed where they may come into contact with the feeder roots of the trees.
- If it is necessary to remove additional limbs or portions of trees after construction has commenced, to accommodate the construction, the consulting arborist is to be informed and under their direction the removal is to be executed carefully and in full accordance with arboricultural techniques, by a certified arborist.

5.2 AIR SPADE / HYDRO VACUUM EXCAVATION

Where excavation, grading or construction may encroach into the dripline Air-spade / hydro-vacuum excavation is recommended to minimize the damage to roots from construction activities.

Where this measure may be applied, the following steps are recommended:

- At the limit of the excavation /construction, air-spade / hydro-vacuum excavate to a depth of 300mm and at a width of 0.5m to expose roots;
- Ensure that the pressure used from the air spade / hydro-vacuum is such that it will not damage roots during excavation;
- Prune any roots in this area using good arboricultural practices per the guidelines in this report or under the supervision of a Certified Arborist;
- Backfill with excavated material, or better, immediately after completion of air spade excavation to prevent roots from drying out;

- Upon completion reinstate tree protection fencing to original location;
- Water trees periodically during construction; and,
- Apply a layer of 50mm depth mulch in a 2m radius around the trees.

5.3 HORIZONTAL ROOT PROTECTION

To be utilized where encroachments into the dripline and or encroachment zone may occur and where air-spade is not feasible. The intent of this measure is to reduce compaction.

Where this measure is applied, the following steps are recommended:

- Application to be reviewed and approved by the contract administrator prior to installation;
- Place layer of non-woven geo-textile material on top of sod;
- Place 30cm depth wood chip mulch on top of geo-textile. Where required place 4x4 timbers to hold mulch in place;
- Place 4'x8' plywood boards (minimum ¾" thick) length wise within the TPZ between the trunk and limit of excavation on top of mulch;
- Field fit if necessary. Board width and length may vary depending on available space
- Upon completion, remove boards, timbers, fabric and spread mulch in a 1m diameter around the trunk to a depth of 5cm and reinstate tree protection fencing to original location; and,
- Scarify soil to 2" depth and re-seed or re-sod.

5.4 ROOT PRUNING PRACTICES

- All approved root pruning is to take place by or under the supervision of an arborist and in accordance with the Toronto Tree Protection Specifications.
- Pruned root ends shall be neatly and squarely trimmed, and the area shall be backfilled with clean native fill as soon as possible to prevent desiccation and promote root growth.
- The exposed roots shall not be allowed to dry out and an appropriate watering schedule shall be undertaken (e.g. water bi-weekly to field capacity between **June 1st and September 15th**) so that the roots maintain optimum soil moisture during construction and backfilling operations.
- Backfilling shall occur immediately and shall be with clean uncontaminated topsoil from an approved source. It is recommended that texture of backfill be coarser than existing soils, and that backfill comes into clean contact with existing soils (remove air pockets, sod, etc.).

5.5 BRANCH PRUNING PRACTICES

- All limbs damaged or broken during construction should be pruned cleanly, utilizing by-pass secateurs in accordance with approved horticultural practices. Should there be a potential risk of transfer of disease from infected to non-infected trees, tools must be disinfected after pruning each tree by dipping in methyl hydrate. This practice is particularly important during periods of tree stress and when pruning many members of the same genera, within which a disease could be spread quickly (i.e., Verticillium Wilt on Maples or Fireblight on genera of the Rosaceae family).
- All pruning cuts should be made to a growing point such as a bud, twig or branch, cut just outside the branch collar (the swollen area at the base of the branch that sometimes has a bark ridge), and perpendicular to the

branch being pruned rather than as close to the trunk as possible. This minimizes the site of the wound. No stubs should be left. Poor cut location, poor cut angle and torn cuts are not acceptable.

- Extensive pruning is best completed before plants break dormancy. Pruning should be limited to the removal of no more than 25% of the total bud and leaf bearing branches. Pruning should include the careful removal of:
    - Deadwood;
    - Branches that are weak, damaged, diseased and those which will interfere with construction activity;
    - Secondary leaders of conifers;
    - Trunk and root suckers;
    - Trunk waterspouts; and,
    - Tight V-shaped or weak crotches (included unions).
- Any branches that overhang the work area and require pruning are to be pruned using good arboricultural practices utilizing by-pass secateurs in accordance with approved horticultural practices and/or American National Standard (ANSI) A300 (Part 1) – 2008 Pruning.
- The Contractor must report immediately any damage to trees such as broken limbs, damage to roots, or wounds to the main trunk or stem systems so that the damage can be assessed immediately.

6 SPECIES AT RISK

As part of the street tree inventory along Mulock Drive (March 18-23, 2021), one potential Butternut tree was observed on an adjacent property that could be impacted by the creation of a multi-use trail. Butternut is an Endangered tree species and Butternut trees and their habitat are protected by the Endangered Species Act (ESA). The tree is located in the backyard of 568 Mulock Court which backs onto the existing sidewalk along Mulock Drive.

Butternut

- Butternut is listed as Endangered and receives species and habitat protection under the ESA (2007), O.Reg 242/08.
- Under the ESA, Butternut trees within or adjacent to development and potentially impacted must undergo an health assessment by a certified Butternut Health Assessor in order to determine if the trees are protected under the ESA and to identify the subsequent steps that must be taken to ensure ESA compliance.

Conclusion / Recommendation

- Based on a visual assessment of the tree and its surroundings, we believe the tree is a hybrid Butternut which would be exempt from the ESA, based on the following characteristics:
  - The bark is typical of a hybrid;
  - Twigs and buds could not be assessed as they were high up on the tree;
  - Since there were no leaves on the tree, tree leaf characteristics could not be assessed;
  - No fruit was seen;
  - There was a wound on the upper part of the trunk, but no indication of canker was seen from the ground;
  - Tree appears to have been planted in the centre of the rear property line. The backyard has been landscaped consisting of gardens and lawn.

If works are planned along the existing sidewalk or its vicinity (i.e. close to this tree), the tree should be assessed during the growing season by a provincially-designated Butternut Health Assessor, and a Butternut Health Assessment submitted to the Ministry of the Environment, Conservation, and Parks (MECP) for their review. This process documents the tree's status (pure vs hybrid) based on visual characteristics and ensures compliance with the ESA. The City may already have a BHA report on file if the tree has previously been assessed.

7 TREE REMOVALS / INJURY / COMPENSATION

This section summarizes the potential removals and injury to trees as a result of the proposed trail.

7.1 COMPENSATION NOTES

- The table below details the quantities of removals and injury and preservation of trees that may be one item used to determine the feasibility of the multi-use trail.

Table 7.1 – Removal, Injury and Compensation Table

Location	Removals	Injury	Preservation	Total
North side	94			94
		155		155
			171	171
South Side	60			60
		41		41
			106	106
Total	**154**	**196**	**277**	**627**

8 CONCLUSION

Much of the vegetation found ranges from young to mature and is characterized by a mixture of planted native and non-native urban tolerant species and cultivars.

Impacts to existing trees is greater on the north side than the south side of Mulock Drive. Part of this is due to the greater number of trees located on the north side and the proximity of existing trees to the sidewalk that is proposed to be widened. There will be no impacts to trees where existing multi-use trails on the north and south sides of Mulock Drive.

Tree impacts to be assessed should the project proceed to detailed design. Tree Preservation Plans and an Arborist Report will be required to determine impacts and provide recommendations on protection of trees, mitigation measures and compensation. The plans and report would be required to meet Town of Newmarket's Tree Preservation, Protection, Replacement and Enhancement Policy (2005) and the Region's of York's Street Tree and Forest Preservation Guidelines (2016).

9 LIMITATIONS OF ASSESSMENT

- It is our policy to attach the following clause regarding limitations. We do this to ensure that the client is aware of what is technically and professionally realistic in retaining trees.
- The assessment of the trees presented in this report has been made using accepted arboricultural techniques. These include a visual examination of all the above ground parts of the tree for structural defects, scars, external indications of decay such as fungal fruiting bodies, evidence of attack by insects, discoloured foliage, the condition of any visible root structures, the degree and direction of lean (if any), the general condition of the trees and the surrounding site, and the proximity of property and people. Except where specifically noted, the trees were not cored, probed or climbed and there was no detailed inspection of the root crowns involving excavations.
- Notwithstanding the recommendations and conclusions made in this report, it must be recognized that trees are living organisms, and their health and vigour constantly change over time. They are not immune to changes in site conditions or seasonal variations in the weather conditions.
- While reasonable efforts have been made to ensure that the subject trees are healthy, no guarantees are offered, or implied, that these trees or any of their parts will remain standing. It is both professionally and practically impossible to predict with absolute certainty the behaviour of any single tree or its component parts under all circumstances. Inevitably, a standing tree will always pose some level of risk. Most trees have the potential for failure under adverse weather conditions, and the risk can only be eliminated if the tree is removed.

APPENDIX

A

TREE INVENTORY TABLES

Appendix A: Tree Inventory Tables

Project: Mulock Drive, Newmarket - Trail Feasibility Study **Field Work Completed By:** L. Wallis (ISA#ON-2484A), C. Perkin (ISA# ON-2306A), J. Mentlik

Date of Field Work: March 18, 19, 22, 23, 2021 **Weather:** March 18 and 19 (cool, 5 degrees), March 22 and 23 (Warm, 15 degrees)

Tree Condition Assessment Criteria:
TI - Trunk Integrity: assessment of the trunk for any defects or weaknesses.
CS - Canopy Structure: assessment of scaffold branches, unions and canopy
CV - Canopy vigour: assessment of the health of the tree, based on the % of deadwood, disease, pests & live crown

Tree Condition:
Good (G): tree displays less than 15% deficiency/defect within the given tree assessment criteria (TI,CS,CV)
Fair (F): tree displays 15-40% deficiency/defect within the given tree assessment criteria (TI,CS,CV)
Poor (P): tree displays greater than 40% deficiency/defect within the given tree assessment criteria (TI,CS,CV)

Legend:
Trees to be Preserved
Trees to be Removed
Trees to be Injured / Mitigation / Post Construction Monitoring

Tree #	Code	Botanical Name	Common Name	Qty.	DBH (cm)	Effective DBH	TI	CS	CV	Dripline Radius (m)	Height (m)	Tree Location / Applicable By-law	City of Toronto Category	Tree Protection Zone (m)	Recommendation	Comments - Health	Comments - Removal/Preservation
1		*Acer ginnala*	*Amur Maple*	1	15	15	G	G	G	5	7	ROW		1.8	Remove	Trunk cracked sealed, exposed roots with wounds, epicormic shoots, under hydro, photo 2886	
2		*Acer ginnala*	*Amur Maple*	1	12	12	G	G	G	4	7	ROW		1.8	Remove	Trunk crack sealed, epicormic shoots, under hydro	
3	THUJOCC	*Thuja occidentalis*	*Eastern White Cedar*	11	11	11	G	G	G	1	8	ROW		1.8	Preserve	Row of cedars	
4	CRAT_SP	*Crataegus sp.*	*Hawthorn sp.*	1	8,8,8,8	16	G	G	G	2	8	ROW		1.8	Injure-Preserve	Multistem	
5	ACERPLA	*Acer platanoides*	*Norway Maple*	1	27	27	G	G	G	8	20	ROW		1.8	Preserve		
6	ROBIPSE	*Robinia pseudoacacia*	*Black Locust*	1	34	34	F	F	G	6	14	ROW		2.4	Injure-Preserve	Major stem removed, broken branches, trunk wounds, canopy extends over sidewalk	
7	ROBIPSE	*Robinia pseudoacacia*	*Black Locust*	1	11, 11, 11	19	G	G	G	4	12	ROW		1.8	Preserve	Photo 2892	
8	ROBIPSE	*Robinia pseudoacacia*	*Black Locust*	1	11	11	G	G	G	3	8	ROW		1.8	Preserve	Photo 2892	
9	ROBIPSE	*Robinia pseudoacacia*	*Black Locust*	1	8, 11, 12, 12	22	G	G	G	6	12	ROW		1.8	Injure-Preserve	Photo 2892	
10		*Eleagnus angustifolia*	*Russian Olive*	1	7,8,10	15	G	G	G	6	8	ROW		1.8	Injure-Preserve	Canopy extends over sidewalk	
11		*Eleagnus angustifolia*	*Russian Olive*	1	24,16	29	G	G	G	6	12	ROW		1.8	Injure-Preserve	Canopy extends over sidewalk	
12	ACERNEG	*Acer negundo*	*Manitoba Maple*	1	13,13,10	21	G	G	G	6	12	ROW		1.8	Preserve	Major trunk removed, epicormic shoots	
13	ACERNEG	*Acer negundo*	*Manitoba Maple*	1	13,10,8,8,8	22	G	G	G	6	12	ROW		1.8	Preserve		
14	ACERNEG	*Acer negundo*	*Manitoba Maple*	1	10,7	12	G	G	G	6	12	ROW		1.8	Preserve		
15	ACERNEG	*Acer negundo*	*Manitoba Maple*	1	14,12,9	21	F	F	F	3	12	ROW		1.8	Injure-Preserve	Tag 1779, removed trunks, epicormic shoots, exposed roots, twisted stems	
16	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	4	4	G	G	G	1	4	ROW		1.2	Preserve	Minor trunk wound	
17	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	4	4	G	G	G	1	4	ROW		1.2	Preserve		
18	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	4	4	G	G	G	1	4	ROW		1.2	Preserve		
19	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	4	4	G	G	G	1	4	ROW		1.2	Injure-Preserve		
20	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	4	4	G	G	G	1	4	ROW		1.2	Injure-Preserve		
21	CELTOCC	*Celtis occidentalis*	*Common Hackberry*	1	12	12	G	G	G	2	12	ROW		1.8	Injure-Preserve		
22	CELTOCC	*Celtis occidentalis*	*Common Hackberry*	1	12	12	G	G	G	2	12	ROW		1.8	Injure-Preserve		
23	CELTOCC	*Celtis occidentalis*	*Common Hackberry*	1	15	15	G	G	G	2	15	ROW		1.8	Remove		
24	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	4	4	G	G	G	1	4	ROW		1.2	Remove		
25	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	4	4	G	G	G	1	4	ROW		1.2	Injure-Preserve		
26	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	4	4	G	G	G	1	4	ROW		1.2	Preserve		
27	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	4	4	G	G	G	1	4	ROW		1.2	Preserve		
28	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	4	4	G	G	G	1	4	ROW		1.2	Injure-Preserve		
29	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	4	4	G	G	G	1	4	ROW		1.2	Preserve		
30	ACERPLA	*Acer platanoides*	*Norway Maple*	1	27	27	G	G	G	3	16	ROW		1.8	Injure-Preserve	Trunk wound, photo 2906	
31	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	7	7	G	G	G	1	5	ROW		1.2	Injure-Preserve	Shuberts Chokecherry	
32	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	10	10	G	G	G	2	5	ROW		1.8	Injure-Preserve	Shuberts Chokecherry, trunk wound	

Appendix A: Tree Inventory Tables

Project: Mulock Drive, Newmarket - Trail Feasibility Study | **Field Work Completed By:** L. Wallis (ISA#ON-2484A), C. Perkin (ISA# ON-2306A), J. Mentlik

Date of Field Work: March 18, 19, 22, 23, 2021 | **Weather:** March 18 and 19 (cool, 5 degrees), March 22 and 23 (Warm, 15 degrees)

Tree Condition Assessment Criteria:
TI - Trunk Integrity: assessment of the trunk for any defects or weaknesses.
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Legend:
Trees to be Preserved
Trees to be Removed
Trees to be Injured / Mitigation / Post Construction Monitoring

Tree #	Code	Botanical Name	Common Name	Qty.	DBH (cm)	Effective DBH	TI	CS	CV	Dripline Radius (m)	Height (m)	Tree Location / Applicable By-law	City of Toronto Category	Tree Protection Zone (m)	Recommendation	Comments - Health	Comments - Removal/Preservation
33	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	11	11	G	G	G	2	5	ROW		1.8	Injure-Preserve	Shuberts Chokecherry	
34	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	12	12	F	F	G	3	6	ROW		1.8	Remove	Major stem removed, epicormic shoots, water sprouts	
35	MALU_SP	*Malus sp.*	*Apple sp.*	1	14	14	F	F	G	3	6	ROW		1.8	Injure-Preserve	Wound at base of trunk, pruned branches	
36	CELTOCC	*Celtis occidentalis*	*Common Hackberry*	1	16	16	G	G	G	2	12	ROW		1.8	Injure-Preserve	Pruned branches	
37	ACERPLA	*Acer platanoides*	*Norway Maple*	1	22	22	G	F	F	2	12	ROW		1.8	Injure-Preserve		
38	CELTOCC	*Celtis occidentalis*	*Common Hackberry*	1	16	16	G	G	G	4	12	ROW		1.8	Injure-Preserve		
39	AMEL_SP	*Amelanchier sp.*	*Serviceberry sp.*	1	11	11	P	F	G	1	12	ROW		1.8	Preserve	Major trunk wound with rot	
40	CELTOCC	*Celtis occidentalis*	*Common Hackberry*	1	14	14	G	G	G	2	12	ROW		1.8	Injure-Preserve		
41	ACERPLA	*Acer platanoides*	*Norway Maple*	1	24	24	G	F	F	2	12	ROW		1.8	Injure-Preserve		
42	CELTOCC	*Celtis occidentalis*	*Common Hackberry*	1	16	16	G	G	G	3	12	ROW		1.8	Injure-Preserve	Major limb pruned off	
43	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	8	8	G	G	G	1	6	ROW		1.2	Preserve		
44	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	4	4	G	G	G	1	6	ROW		1.2	Preserve		
45	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	14	14	G	G	G	2	8	ROW		1.8	Injure-Preserve	Shuberts Chokecherry, trunk crack, water sprouts, epicormic shoots	
46	CELTOCC	*Celtis occidentalis*	*Common Hackberry*	1	18	18	G	G	G	3	12	ROW		1.8	Injure-Preserve		
47	ACERPLA	*Acer platanoides*	*Norway Maple*	1	17	17	G	G	G	4	6	ROW		1.8	Injure-Preserve		
48	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	9	9	G	G	G	1	6	ROW		1.2	Injure-Preserve		
49	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	11	11	G	G	G	1	8	ROW		1.8	Injure-Preserve	Water sprouts	
50	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	10	10	G	G	G	1	6	ROW		1.8	Injure-Preserve	Water sprouts, epicormic shoots	
51	CELTOCC	*Celtis occidentalis*	*Common Hackberry*	1	17	17	G	G	G	3	12	ROW		1.8	Injure-Preserve		
52	CELTOCC	*Celtis occidentalis*	*Common Hackberry*	1	20	20	G	G	G	3	12	ROW		1.8	Injure-Preserve		
53	CELTOCC	*Celtis occidentalis*	*Common Hackberry*	1	19	19	G	F	G	3	12	ROW		1.8	Injure-Preserve	Poor form	
54	PICEPUN	*Picea pungens*	*Blue Spruce*	1	23	23	G	G	G	3	16	ROW		1.8	Preserve		
55	MALU_SP	*Malus sp.*	*Apple sp.*	1	21	21	G	G	G	3	12	ROW		1.8	Preserve		
56	PICEPUN	*Picea pungens*	*Blue Spruce*	1	22	22	G	G	G	3	12	ROW		1.8	Injure-Preserve		
57	ACERPLA	*Acer platanoides*	*Norway Maple*	1	20	20	G	G	G	1	12	ROW		1.8	Remove		
58	MALU_SP	*Malus sp.*	*Apple sp.*	1	13	13	F	F	G	3	5	ROW		1.8	Remove	Wound at trunk base, lean	
59	ACERPLA	*Acer platanoides*	*Norway Maple*	1	20	20	F	G	G	1	12	ROW		1.8	Remove	Trunk wound	
60	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	7	7	G	G	G	1	6	ROW		1.2	Preserve		
61	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	8	8	G	G	G	1	6	ROW		1.2	Preserve		
62	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	12	12	G	G	G	2	8	ROW		1.8	Preserve		
63	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	12	12	G	G	G	2	8	ROW		1.8	Preserve	Shuberts Chokecherry	
64		*Acer ginnala*	*Amur Maple*	1	10	10	G	G	G	2	8	ROW		1.8	Preserve		
65	MALU_SP	*Malus sp.*	*Apple sp.*	1	12	12	G	G	G	2	6	ROW		1.8	Preserve		

Appendix A: Tree Inventory Tables

Project: Mulock Drive, Newmarket - Trail Feasibility Study
Field Work Completed By: L. Wallis (ISA#ON-2484A), C. Perkin (ISA# ON-2306A), J. Mentlik
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Tree Condition Assessment Criteria:
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Legend:
Trees to be Preserved
Trees to be Removed
Trees to be Injured / Mitigation / Post Construction Monitoring

Tree #	Code	Botanical Name	Common Name	Qty.	DBH (cm)	Effective DBH	TI	CS	CV	Dripline Radius (m)	Height (m)	Tree Location / Applicable By-law	City of Toronto Category	Tree Protection Zone (m)	Recommendation	Comments - Health	Comments - Removal/Preservation
66	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	8	8	G	G	G	1	6	ROW		1.2	Preserve		
67	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	7	7	G	G	G	1	6	ROW		1.2	Preserve		
68	MALU_SP	*Malus sp.*	*Apple sp.*	1	14	14	F	G	G	3	6	ROW		1.8	Injure-Preserve	Trunk wounds	
69	CELTOCC	*Celtis occidentalis*	*Common Hackberry*	1	14	14	G	G	G	2	8	ROW		1.8	Injure-Preserve		
70	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	12	12	F	G	G	3	6	ROW		1.8	Injure-Preserve	Trunk wounds	
71	MALU_SP	*Malus sp.*	*Apple sp.*	1	10	10	G	G	G	3	6	ROW		1.8	Injure-Preserve		
72	MALU_SP	*Malus sp.*	*Apple sp.*	1	4	4	G	G	G	1	4	ROW		1.2	Preserve	Gator bag	
73	MALU_SP	*Malus sp.*	*Apple sp.*	1	4	4	G	G	G	1	4	ROW		1.2	Preserve	Gator bag	
74	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	11	11	G	G	G	3	8	ROW		1.8	Injure-Preserve	water sprouts	
75	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	6	6	G	G	G	1	6	ROW		1.2	Preserve	Schubert Chokecherry	
76	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	7	7	P	G	G	1	6	ROW		1.2	Preserve	Lots of trunk wounds	
77	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	8	8	P	F	G	1	8	ROW		1.2	Remove		
78	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	6	6	G	G	G	1	8	ROW		1.2	Preserve		
79	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	6	6	G	G	G	1	8	ROW		1.2	Preserve	Sealed trunk wound	
80	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	5	5	G	G	G	1	8	ROW		1.2	Preserve		
81	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	8	8	F	G	G	2	8	ROW		1.2	Preserve	Trunk wounds	
82	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	8	8	G	G	G	2	8	ROW		1.2	Preserve		
83	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	5	5	G	G	G	1	6	ROW		1.2	Preserve		
84	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	5	5	G	G	G	1	6	ROW		1.2	Preserve		
85	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	5	5	G	G	G	1	6	ROW		1.2	Preserve		
86	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	8	8	F	G	G	2	8	ROW		1.2	Preserve	Trunk base wound	
87	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	8	8	G	G	G	2	10	ROW		1.2	Preserve		
88	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	8	8	F	G	G	2	8	ROW		1.2	Preserve	Trunk base wound	
89	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	6	6	G	G	G	1	6	ROW		1.2	Preserve		
90	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	5	5	G	G	G	1	6	ROW		1.2	Preserve		
91	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	5	5	G	G	G	1	6	ROW		1.2	Preserve		
92	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	5	5	G	G	G	1	8	ROW		1.2	Preserve		
93	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	5	5	F	G	G	1	8	ROW		1.2	Preserve	Minor trunk wounds	
94	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	5	5	F	G	G	1	6	ROW		1.2	Preserve	Minor trunk wounds	
95	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	6	6	F	G	G	1	6	ROW		1.2	Preserve	Minor trunk wounds	
96	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	6	6	G	G	G	1	6	ROW		1.2	Preserve		
97	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	6	6	G	G	G	1	6	ROW		1.2	Preserve		
98	ACERPLA	*Acer platanoides*	*Norway Maple*	1	21	21	G	G	G	2	16	ROW		1.8	Preserve		

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Trees to be Preserved
Trees to be Removed
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Tree #	Code	Botanical Name	Common Name	Qty.	DBH (cm)	Effective DBH	TI	CS	CV	Dripline Radius (m)	Height (m)	Tree Location / Applicable By-law	City of Toronto Category	Tree Protection Zone (m)	Recommendation	Comments - Health	Comments - Removal/Preservation
99	MALU_SP	*Malus sp.*	*Apple sp.*	1	13	13	F	G	G	3	7	ROW		1.8	Preserve	Minor trunk wounds	
100	ACERPLA	*Acer platanoides*	*Norway Maple*	1	26	26	F	F	G	5	16	ROW		1.8	Injure-Preserve	Exposed roots, major branches pruned off	
101	ACERPLA	*Acer platanoides*	*Norway Maple*	1	17	17	P	F	F	3	12	ROW		1.8	Preserve	Major wounds and rot on stem, many branches already removed	
102	MALU_SP	*Malus sp.*	*Apple sp.*	1	10	10	G	G	G	3	6	ROW		1.8	Preserve		
103	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	10	10	G	G	G	3	10	ROW		1.8	Remove		
104	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	10	10	G	G	G	2	8	ROW		1.8	Remove		
105	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	8	8	G	G	G	2	8	ROW		1.2	Remove		
106	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	6	6	G	G	G	2	8	ROW		1.2	Injure-Preserve		
107	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	8	8	G	G	G	2	8	ROW		1.2	Injure-Preserve		
108	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	9	9	G	G	G	2	10	ROW		1.2	Injure-Preserve		
109	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	8	8	G	G	G	1	6	ROW		1.2	Preserve		
110	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	10	10	G	G	G	1	6	ROW		1.8	Remove		
111	ACERCAM	*Acer campestre*	*Hedge Maple*	1	5	5	G	G	G	1	4	ROW		1.2	Preserve	Gator bag	
112	ACERCAM	*Acer campestre*	*Hedge Maple*	1	4	4	G	G	G	1	4	ROW		1.2	Preserve	Gator bag	
113	MALU_SP	*Malus sp.*	*Apple sp.*	1	12	12	G	G	G	2	6	ROW		1.8	Preserve		
114	ACERCAM	*Acer campestre*	*Hedge Maple*	1	4	4	G	G	G	1	4	ROW		1.2	Preserve		
115	ULMUAME	*Ulmus americana*	*American Elm*	1	29	29	G	G	G	3	20	ROW		1.8	Remove		
116	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	4	4	G	G	G	1	4	ROW		1.2	Preserve	Gator bag	
117	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	8	8	G	G	G	1	5	ROW		1.2	Preserve	Epicormic sprouts	
118	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	3	3	G	G	G	1	3	ROW		1.2	Preserve	Gator bag	
119	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	3	3	G	G	G	1	3	ROW		1.2	Preserve		
120	ACERPLA	*Acer platanoides*	*Norway Maple*	1	26	26	G	G	G	3	20	ROW		1.8	Injure-Preserve		
121	ACERPLA	*Acer platanoides*	*Norway Maple*	1	12, 10	16	G	G	G	4	14	ROW		1.8	Preserve		
122	ACERPLA	*Acer platanoides*	*Norway Maple*	1	26	26	G	G	G	6	16	ROW		1.8	Injure-Preserve		
123	ACERPLA	*Acer platanoides*	*Norway Maple*	1	25	25	G	F	G	6	16	ROW		1.8	Injure-Preserve	Pruned branches	
124	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	3	3	G	G	G	1	3	ROW		1.2	Preserve	Gator bag	
125	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	3	3	G	G	G	1	3	ROW		1.2	Preserve	Gator bag	
126	MALU_SP	*Malus sp.*	*Apple sp.*	1	11	11	F	G	G	2	6	ROW		1.8	Injure-Preserve	Minor trunk wounds	
127	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	10	10	G	G	G	1	8	ROW		1.8	Injure-Preserve	Minor trunk wounds	
128	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	9	9	G	G	G	1	8	ROW		1.2	Injure-Preserve		
129	PINUNIG	*Pinus nigra*	*Black Pine*	1	23	23	G	G	G	3	6	ROW		1.8	Injure-Preserve		

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Trees to be Preserved
Trees to be Removed
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Tree #	Code	Botanical Name	Common Name	Qty.	DBH (cm)	Effective DBH	TI	CS	CV	Dripline Radius (m)	Height (m)	Tree Location / Applicable By-law	City of Toronto Category	Tree Protection Zone (m)	Recommendation	Comments - Health	Comments - Removal/Preservation
130	PINUNIG	*Pinus nigra*	*Black Pine*	1	25	25	G	G	G	3	10	ROW		1.8	Injure-Preserve		
131	PINUNIG	*Pinus nigra*	*Black Pine*	1	23	23	G	G	G	3	6	ROW		1.8	Injure-Preserve		
132	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	12	12	G	G	G	2	8	ROW		1.8	Preserve		
133	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	12	12	G	G	G	2	10	ROW		1.8	Injure-Preserve		
134	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	13	13	G	G	G	2	10	ROW		1.8	Injure-Preserve		
135	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	12	12	G	G	G	2	8	ROW		1.8	Preserve		
136	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	12	12	G	G	G	2	8	ROW		1.8	Preserve		
137	PINUNIG	*Pinus nigra*	*Black Pine*	1	32	32	G	G	G	5	16	ROW		2.4	Preserve		
138	ACERNEG	*Acer negundo*	*Manitoba Maple*	1	33, 25	41	F	F	F	8	18	ROW		3	Preserve	Growing on slope, branch wounds with rot, water sprouts	
139	PICEPUN	*Picea pungens*	*Blue Spruce*	1	30	30	G	G	G	3	18	ROW		2.4	Remove		
140	PICEPUN	*Picea pungens*	*Blue Spruce*	1	30	30	G	G	G	3	18	ROW		2.4	Preserve		
141	PICEPUN	*Picea pungens*	*Blue Spruce*	1	30	30	G	G	G	3	18	ROW		2.4	Remove		
142	PICEPUN	*Picea pungens*	*Blue Spruce*	1	28	28	G	G	G	3	16	ROW		1.8	Remove		
143	PICEPUN	*Picea pungens*	*Blue Spruce*	1	23	23	G	G	G	3	16	ROW		1.8	Remove		
144	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	11	11	G	G	G	2	8	ROW		1.8	Remove		
145	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	12	12	G	G	G	2	8	ROW		1.8	Remove	Sealed trunk wound	
146	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	8	8	G	G	G	1	6	ROW		1.2	Remove		
147	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	11	11	G	G	G	2	8	ROW		1.8	Remove		
148	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	12	12	G	G	G	2	8	ROW		1.8	Remove	Water sprouts, sealed trunk wound	
149	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	12	12	G	G	G	2	8	ROW		1.8	Remove	Water sprouts, sealed trunk wound	
150	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	10	10	G	G	G	2	8	ROW		1.8	Remove		
151	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	10	10	G	G	G	2	8	ROW		1.8	Remove	Branch wound	
152	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	12	12	G	F	G	2	8	ROW		1.8	Remove	Heavy pruning, water sprouts	
153	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	11	11	G	G	G	2	8	ROW		1.8	Remove		
154	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	11	11	G	G	G	2	8	ROW		1.8	Remove		
155	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	12	12	G	F	G	3	10	ROW		1.8	Remove	Poor pruning	
156	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	12	12	G	F	G	2	8	ROW		1.8	Remove	Poor pruning	
157	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	12	12	F	G	G	2	8	ROW		1.8	Remove	Trunk wound partially sealed	
158	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	8	8	P	G	G	2	8	ROW		1.2	Remove	Bad trunk wound	
159	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	8	8	P	G	G	2	8	ROW		1.2	Remove	Bad trunk wound	
160	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	8	8	P	G	G	2	8	ROW		1.2	Remove	Bad trunk wound	
161	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	9	9	P	G	G	2	8	ROW		1.2	Remove	Bad trunk wound	
162	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	8	8	G	G	G	1	5	ROW		1.2	Remove		

Appendix A: Tree Inventory Tables

Project: Mulock Drive, Newmarket - Trail Feasibility Study **Field Work Completed By:** L. Wallis (ISA#ON-2484A), C. Perkin (ISA# ON-2306A), J. Mentlik

Date of Field Work: March 18, 19, 22, 23, 2021 **Weather:** March 18 and 19 (cool, 5 degrees), March 22 and 23 (Warm, 15 degrees)

Tree Condition Assessment Criteria:
TI - Trunk Integrity: assessment of the trunk for any defects or weaknesses.
CS - Canopy Structure: assessment of scaffold branches, unions and canopy
CV - Canopy vigour: assessment of the health of the tree, based on the % of deadwood, disease, pests & live crown

Tree Condition:
Good (G): tree displays less than 15% deficiency/defect within the given tree assessment criteria (TI,CS,CV)
Fair (F): tree displays 15-40% deficiency/defect within the given tree assessment criteria (TI,CS,CV)
Poor (P): tree displays greater than 40% deficiency/defect within the given tree assessment criteria (TI,CS,CV)

Legend:
Trees to be Preserved
Trees to be Removed
Trees to be Injured / Mitigation / Post Construction Monitoring

Tree #	Code	Botanical Name	Common Name	Qty.	DBH (cm)	Effective DBH	TI	CS	CV	Dripline Radius (m)	Height (m)	Tree Location / Applicable By-law	City of Toronto Category	Tree Protection Zone (m)	Recommendation	Comments - Health	Comments - Removal/Preservation
163	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	7	7	G	G	G	1	5	ROW		1.2	Remove	Trunk wound partially sealed	
164	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	7	7	G	G	G	1	5	ROW		1.2	Remove		
165	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	7	7	G	G	G	1	5	ROW		1.2	Remove		
166	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	7	7	G	G	G	1	5	ROW		1.2	Remove		
167	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	7	7	G	G	G	1	5	ROW		1.2	Remove		
168	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	5	5	G	G	G	1	5	ROW		1.2	Injure-Preserve		
169	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	6	6	G	G	G	1	5	ROW		1.2	Injure-Preserve		
170	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	6	6	P	G	G	1	5	ROW		1.2	Injure-Preserve		
171	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	6	6	G	G	G	1	5	ROW		1.2	Injure-Preserve		
172	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	7	7	P	G	G	1	5	ROW		1.2	Injure-Preserve	Wound at trunk base	
173	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	7	7	G	G	G	1	6	ROW		1.2	Preserve	Tag 117	
174	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	14	14	G	F	G	2	10	ROW		1.8	Injure-Preserve	Tag 118	
175	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	7	7	G	G	G	1	8	ROW		1.2	Preserve	Tag 119	
176	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	8	8	G	G	G	2	10	ROW		1.2	Injure-Preserve	Tag 120	
177	ACERCAM	*Acer campestre*	*Hedge Maple*	1	15	15	G	G	G	2	10	ROW		1.8	Preserve	Tag 121	
178	ACERCAM	*Acer campestre*	*Hedge Maple*	1	14	14	G	G	G	2	10	ROW		1.8	Preserve	Tag 122	
179	ACERCAM	*Acer campestre*	*Hedge Maple*	1	14	14	G	G	G	2	10	ROW		1.8	Preserve	Tag 123	
180		*Acer ginnala*	*Amur Maple*	1	8	8	G	G	G	2	5	ROW		1.2	Preserve	Tag 124	
181	ACERCAM	*Acer campestre*	*Hedge Maple*	1	16	16	G	G	G	2	12	ROW		1.8	Preserve	No tag	
182	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	12	12	G	G	G	1	8	ROW		1.8	Preserve	Tag 126	
183	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	9	9	G	G	G	1	8	ROW		1.2	Preserve	Tag 127	
184	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	9	9	G	G	G	1	6	ROW		1.2	Preserve	Tag 128	
185	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	10	10	P	G	G	1	6	ROW		1.8	Preserve	Tag 129, trunk wounds	
186	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	8	8	P	G	G	1	6	ROW		1.2	Preserve	Tag 130, trunk wounds	
187	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	8	8	G	G	G	1	6	ROW		1.2	Preserve	Tag 131	
188	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	8	8	G	G	G	1	8	ROW		1.2	Preserve	Tag 132	
189	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	8	8	G	G	G	1	8	ROW		1.2	Injure-Preserve	Tag 133	
190	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	8	8	P	G	G	1	6	ROW		1.2	Injure-Preserve	Tag 134, trunk wound at base	
191	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	9	9	G	G	G	1	8	ROW		1.2	Injure-Preserve	Tag 135	
192	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	8	8	G	G	G	1	8	ROW		1.2	Preserve	Tag 136	
193	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	8	8	G	G	G	1	8	ROW		1.2	Injure-Preserve	Tag 137	
194	QUERROB	*Quercus robur*	*English Oak*	1	15	15	F	G	G	1	12	ROW		1.8	Injure-Preserve	Trunk wound at base	
195	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	8	8	G	G	G	2	4	ROW		1.2	Preserve		

Appendix A: Tree Inventory Tables

Project: Mulock Drive, Newmarket - Trail Feasibility Study — Field Work Completed By: L. Wallis (ISA#ON-2484A), C. Perkin (ISA# ON-2306A), J. Mentlik

Date of Field Work: March 18, 19, 22, 23, 2021 — Weather: March 18 and 19 (cool, 5 degrees), March 22 and 23 (Warm, 15 degrees)

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Legend:
Trees to be Preserved
Trees to be Removed
Trees to be Injured / Mitigation / Post Construction Monitoring

Tree #	Code	Botanical Name	Common Name	Qty.	DBH (cm)	Effective DBH	TI	CS	CV	Dripline Radius (m)	Height (m)	Tree Location / Applicable By-law	City of Toronto Category	Tree Protection Zone (m)	Recommendation	Comments - Health	Comments - Removal/Preservation
196	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	10	10	P	G	G	1	4	ROW		1.8	Remove	Trunk wound at base	
197	QUERROB	*Quercus robur*	*English Oak*	1	8	8	G	G	G	2	9	ROW		1.2	Preserve	Major branch removed	
198	MALU_SP	*Malus sp.*	*Apple sp.*	1	18	18	G	G	G	3	6	ROW		1.8	Remove		
199	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	10	10	G	G	G	1	4	ROW		1.8	Remove		
200	PINUNIG	*Pinus nigra*	*Black Pine*	1	22	22	G	G	G	3	6	ROW		1.8	Remove		
201	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	7	7	G	G	G	1	6	ROW		1.2	Remove	Trunk wound almost sealed	
202	ACERPLA	*Acer platanoides*	*Norway Maple*	1	16	16	F	G	G	3	10	ROW		1.8	Remove	Trunk wound at base	
203	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	10	10	G	G	G	1	6	ROW		1.8	Injure-Preserve		
204	ACERPLA	*Acer platanoides*	*Norway Maple*	1	24	24	G	G	G	4	12	ROW		1.8	Remove		
205	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	8	8	G	G	G	1	6	ROW		1.2	Injure-Preserve		
206	PICEGLA	*Picea glauca*	*White Spruce*	1	9	9	G	G	G	2	8	ROW		1.2	Injure-Preserve		
207	PINUSYL	*Pinus sylvestris*	*Scots Pine*	1	22	22	G	G	G	5	16	ROW		1.8	Remove		
208	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	9	9	G	G	G	1	8	ROW		1.2	Remove		
209	ACERPLA	*Acer platanoides*	*Norway Maple*	1	21	21	G	G	G	1	16	ROW		1.8	Preserve		
210	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	10	10	G	G	G	1	6	ROW		1.8	Remove		
211	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	8	8	F	G	G	1	6	ROW		1.2	Remove	Trunk wound at base	
212	AMEL_SP	*Amelanchier sp.*	*Serviceberry sp.*	1	14	14	P	F	G	3	6	ROW		1.8	Injure-Preserve	bad trunk wounds, poor form	
213	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	4	4	G	G	G	1	4	ROW		1.2	Preserve	Gator bag	
214	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	4	4	G	G	G	1	4	ROW		1.2	Preserve	Gator bag	
215	ACERPLA	*Acer platanoides*	*Norway Maple*	1	19	19	G	G	G	5	6	ROW		1.8	Injure-Preserve		
216	ACERSAC	*Acer saccharinum*	*Silver Maple*	1	5	5	G	G	G	1	4	ROW		1.2	Preserve	Gator bag	
217	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	5	5	G	G	G	1	4	ROW		1.2	Preserve	Gator bag	
218	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	6	6	G	G	G	1	4	ROW		1.2	Preserve	Gator bag	
219	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	5	5	G	G	G	1	4	ROW		1.2	Preserve	Gator bag	
220	MALU_SP	*Malus sp.*	*Apple sp.*	1	13	13	F	G	G	3	4	ROW		1.8	Remove	Trunk wounds	
221	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	11	11	G	G	G	1	6	ROW		1.8	Preserve		
222	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	6	6	F	G	G	1	4	ROW		1.2	Preserve	Trunk wounds	
223	ACERSAC	*Acer saccharinum*	*Silver Maple*	1	7	7	G	G	G	1	8	ROW		1.2	Preserve		
224	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	7	7	G	G	G	1	6	ROW		1.2	Preserve		
225	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	7	7	G	G	G	1	6	ROW		1.2	Preserve		
226	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	8	8	G	G	G	1	6	ROW		1.2	Preserve		
227	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	9	9	G	G	G	1	6	ROW		1.2	Preserve		
228	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	10	10	G	G	G	1	6	ROW		1.8	Preserve		

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Project: Mulock Drive, Newmarket - Trail Feasibility Study | Field Work Completed By: L. Wallis (ISA#ON-2484A), C. Perkin (ISA# ON-2306A), J. Mentlik

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Legend:
Trees to be Preserved
Trees to be Injured / Mitigation / Post Construction Monitoring
Thuja occidentalis

Tree #	Code	Botanical Name	Common Name	Qty.	DBH (cm)	Effective DBH	TI	CS	CV	Dripline Radius (m)	Height (m)	Tree Location / Applicable By-law	City of Toronto Category	Tree Protection Zone (m)	Recommendation	Comments - Health	Comments - Removal/Preservation
229	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	11	11	G	G	G	1	6	ROW		1.8	Preserve		
230		*Acer ginnala*	*Amur Maple*	1	11	11	G	G	G	2	6	ROW		1.8	Preserve		
231	ACERCAM	*Acer campestre*	*Hedge Maple*	1	12	12	G	G	G	2	6	ROW		1.8	Preserve		
232	ACERCAM	*Acer campestre*	*Hedge Maple*	1	11	11	G	G	G	3	6	ROW		1.8	Preserve		
233		*Acer ginnala*	*Amur Maple*	1	9	9	P	G	G	3	6	ROW		1.2	Preserve	bad crack on trunk	
234	ACERCAM	*Acer campestre*	*Hedge Maple*	1	11	11	G	G	G	3	6	ROW		1.8	Preserve		
235	ACERCAM	*Acer campestre*	*Hedge Maple*	1	13	13	G	G	G	3	6	ROW		1.8	Preserve		
236	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	13	13	G	G	G	1	8	ROW		1.8	Preserve		
237	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	10	10	G	G	G	1	8	ROW		1.8	Preserve		
238	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	9	9	G	G	G	1	8	ROW		1.2	Preserve		
239	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	9	9	G	G	G	1	8	ROW		1.2	Preserve		
240	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	7	7	G	G	G	1	8	ROW		1.2	Preserve		
241	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	10	10	G	G	G	1	8	ROW		1.8	Preserve	Minor trunk wound	
242	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	6,6,7	11	G	G	G	1	6	ROW		1.8	Injure-Preserve		
243	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	10	10	G	G	G	1	8	ROW		1.8	Remove		
244	MALU_SP	*Malus sp.*	*Apple sp.*	1	20	20	G	G	G	3	8	ROW		1.8	Remove	minor trunk wounds at base	
245	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	10	10	G	G	G	1	8	ROW		1.8	Injure-Preserve	Trunk wound at base	
246	CELTOCC	*Celtis occidentalis*	*Common Hackberry*	1	16	16	G	G	G	3	12	ROW		1.8	Injure-Preserve		
247	CELTOCC	*Celtis occidentalis*	*Common Hackberry*	1	20	20	G	G	G	3	12	ROW		1.8	Remove		
248	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	10	10	G	G	G	1	8	ROW		1.8	Injure-Preserve		
249	CELTOCC	*Celtis occidentalis*	*Common Hackberry*	1	16	16	G	G	G	3	12	ROW		1.8	Remove		
250	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	10	10	G	G	G	1	8	ROW		1.8	Injure-Preserve		
251	MALU_SP	*Malus sp.*	*Apple sp.*	1	20	20	P	P	G	3	8	ROW		1.8	Remove	Trunk wounds, pruned major limb (removed), poor form, epicormic shoots	
252	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	14	14	P	P	G	3	8	ROW		1.8	Remove	Marked for removal,black knot abundant, many limbs pruned off, poor form, epicormic shoots	
253	CELTOCC	*Celtis occidentalis*	*Common Hackberry*	1	4	4	G	G	G	1	5	ROW		1.2	Remove	Gator bag	
254	MALU_SP	*Malus sp.*	*Apple sp.*	1	16	16	P	P	G	3	8	ROW		1.8	Remove	Lean, epicormic shoots, trunk wounds at base	
255	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	8	8	G	G	G	1	6	ROW		1.2	Preserve		
256	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	10	10	G	G	G	1	8	ROW		1.8	Injure-Preserve		
257	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	3	3	G	G	G	1	4	ROW		1.2	Preserve	Gator bag	
258	MALU_SP	*Malus sp.*	*Apple sp.*	1	16	16	P	P	G	3	8	ROW		1.8	Remove	Trunk wounds, pruned major limb (removed), poor form, epicormic shoots, water sprouts	
259	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	3	3	G	G	G	1	4	ROW		1.2	Injure-Preserve	Gator bag	
260	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	3	3	G	G	G	1	4	ROW		1.2	Injure-Preserve	Gator bag	

Appendix A: Tree Inventory Tables

Project: Mulock Drive, Newmarket - Trail Feasibility Study | **Field Work Completed By:** L. Wallis (ISA#ON-2484A), C. Perkin (ISA# ON-2306A), J. Mentlik

Date of Field Work: March 18, 19, 22, 23, 2021 | **Weather:** March 18 and 19 (cool, 5 degrees), March 22 and 23 (Warm, 15 degrees)

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Legend:
Trees to be Preserved
Trees to be Removed
Trees to be Injured / Mitigation / Post Construction Monitoring

Tree #	Code	Botanical Name	Common Name	Qty.	DBH (cm)	Effective DBH	TI	CS	CV	Dripline Radius (m)	Height (m)	Tree Location / Applicable By-law	City of Toronto Category	Tree Protection Zone (m)	Recommendation	Comments - Health	Comments - Removal/Preservation
261	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	11	11	P	P	G	1	8	ROW		1.8	Remove	Trunk wounds, pruned major limb (removed), poor form, epicormic shoots, water sprouts	
262	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	4	4	G	G	G	1	4	ROW		1.2	Remove	Gator bag	
263	ACERCAM	*Acer campestre*	*Hedge Maple*	1	14	14	G	G	G	3	10	ROW		1.8	Injure-Preserve		
264	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	13	13	G	G	G	2	10	ROW		1.8	Injure-Preserve		
265	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	8	8	G	G	G	1	6	ROW		1.2	Remove		
266	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	7	7	G	G	G	1	5	ROW		1.2	Remove	Lean	
267	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	8	8	G	G	G	1	6	ROW		1.2	Remove		
268	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	8	8	G	G	G	1	8	ROW		1.2	Injure-Preserve		
269	CELTOCC	*Celtis occidentalis*	*Common Hackberry*	1	16	16	G	G	G	3	10	ROW		1.8	Remove		
270	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	19	19	P	G	G	3	8	ROW		1.8	Injure-Preserve	Trunk wounds, pruned limbs, epicormic sprouts, water sprouts	
271	PICEPUN	*Picea pungens*	*Blue Spruce*	1	20	20	G	G	G	3	14	ROW		1.8	Preserve		
272	MALU_SP	*Malus sp.*	*Apple sp.*	1	16	16	G	G	G	3	7	ROW		1.8	Injure-Preserve		
273	ACERPLA	*Acer platanoides*	*Norway Maple*	1	31, 26	40	P	P	G	6	18	ROW		2.4	Remove	Wounds at base, two trunks from the base, pruned limbs, marked with orange spray paint - possibly slated for removal.	
274	ACERCAM	*Acer campestre*	*Hedge Maple*	1	11	11	G	G	G	3	7	ROW		1.8	Remove		
275	MALU_SP	*Malus sp.*	*Apple sp.*	1	16	16	G	G	G	3	5	ROW		1.8	Injure-Preserve		
276	ACERPLA	*Acer platanoides*	*Norway Maple*	1	35	35	P	G	G	6	18	ROW		2.4	Remove	Bad trunk wound,branch wounds, exposed roots, girdling roots	
277	MALU_SP	*Malus sp.*	*Apple sp.*	1	12	12	G	G	G	3	5	ROW		1.8	Injure-Preserve		
278	ULMU_SP	*Ulmus sp.*	*Elm sp.*	1	7	7	G	G	G	2	8	ROW		1.2	Preserve	Possibly Accolade Elm Ulmus x Morton	
279	PYRU_SP	*Pyrus sp.*	*Pear sp.*	1	4	4	G	G	G	1	4	ROW		1.2	Injure-Preserve	Chanticleer pear, gator bag	
280	PYRU_SP	*Pyrus sp.*	*Pear sp.*	1	4	4	G	G	G	1	4	ROW		1.2	Remove	Chanticleer pear, gator bag	
281	GLEDTRI	*Gleditsia triacanthos*	*Honey-locust*	1	18	18	G	G	G	7	22	ROW		1.8	Injure-Preserve		
282	MALU_SP	*Malus sp.*	*Apple sp.*	1	20,14,16, 15	33	G	G	G	7	12	ROW		2.4	Injure-Preserve		
283	PYRU_SP	*Pyrus sp.*	*Pear sp.*	1	4	4	G	G	G	1	4	ROW		1.2	Injure-Preserve	Chanticleer pear, gator bag	
284	PYRU_SP	*Pyrus sp.*	*Pear sp.*	1	4	4	G	G	G	1	4	ROW		1.2	Injure-Preserve	Chanticleer pear, gator bag	
285	ACERPLA	*Acer platanoides*	*Norway Maple*	1	35	35	G	G	G	7	18	ROW		2.4	Remove		
286	PYRU_SP	*Pyrus sp.*	*Pear sp.*	1	4	4	G	G	G	1	4	ROW		1.2	Injure-Preserve	Chanticleer pear, gator bag	
287	PYRU_SP	*Pyrus sp.*	*Pear sp.*	1	4	4	G	G	G	1	4	ROW		1.2	Remove	Chanticleer pear, gator bag	
288	GLEDTRI	*Gleditsia triacanthos*	*Honey-locust*	1	5	5	G	G	G	2	6	ROW		1.2	Preserve		
289	PYRU_SP	*Pyrus sp.*	*Pear sp.*	1	4	4	G	G	G	1	4	ROW		1.2	Injure-Preserve	Chanticleer pear, gator bag	
290	PYRU_SP	*Pyrus sp.*	*Pear sp.*	1	3	3	G	G	G	1	4	ROW		1.2	Remove	Chanticleer pear, gator bag	
291	ACERPLA	*Acer platanoides*	*Norway Maple*	1	35	35	G	G	G	7	18	ROW		2.4	Remove		
292	PYRU_SP	*Pyrus sp.*	*Pear sp.*	1	4	4	G	G	G	1	4	ROW		1.2	Injure-Preserve	Chanticleer pear, gator bag	

Appendix A: Tree Inventory Tables

Project: Mulock Drive, Newmarket - Trail Feasibility Study
Field Work Completed By: L. Wallis (ISA#ON-2484A), C. Perkin (ISA# ON-2306A), J. Mentlik
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Trees to be Removed
Trees to be Injured / Mitigation / Post Construction Monitoring

Tree #	Code	Botanical Name	Common Name	Qty.	DBH (cm)	Effective DBH	TI	CS	CV	Dripline Radius (m)	Height (m)	Tree Location / Applicable By-law	City of Toronto Category	Tree Protection Zone (m)	Recommendation	Comments - Health	Comments - Removal/Preservation
293	PYRU_SP	*Pyrus sp.*	*Pear sp.*	1	4	4	G	G	G	1	4	ROW		1.2	Remove	Chanticleer pear, gator bag	
294	ACERPLA	*Acer platanoides*	*Norway Maple*	1	10	10	F	G	G	1	10	ROW		1.8	Preserve	Trunk wound	
295	ACERPLA	*Acer platanoides*	*Norway Maple*	1	10	10	G	G	G	1	10	ROW		1.8	Preserve		
296	PYRU_SP	*Pyrus sp.*	*Pear sp.*	1	4	4	G	G	G	1	4	ROW		1.2	Remove	Chanticleer pear, gator bag	
297	PYRU_SP	*Pyrus sp.*	*Pear sp.*	1	4	4	G	G	G	1	4	ROW		1.2	Injure-Preserve	Chanticleer pear, gator bag	
298	PYRU_SP	*Pyrus sp.*	*Pear sp.*	1	3	3	P	G	G	1	4	ROW		1.2	Preserve	Chanticleer pear, gator bag, bad crack on stem	
299	ACERPLA	*Acer platanoides*	*Norway Maple*	1	8	8	G	G	G	1	8	ROW		1.2	Preserve		
300	PYRU_SP	*Pyrus sp.*	*Pear sp.*	1	4	4	G	G	G	1	4	ROW		1.2	Remove	Chanticleer pear, gator bag	
301	ACERPLA	*Acer platanoides*	*Norway Maple*	1	22	22	G	G	G	4	12	ROW		1.8	Remove		
302	ACERPLA	*Acer platanoides*	*Norway Maple*	1	22	22	G	G	G	4	12	ROW		1.8	Remove		
303	ACERPLA	*Acer platanoides*	*Norway Maple*	1	16	16	G	G	G	4	10	ROW		1.8	Remove		
304	ACERPLA	*Acer platanoides*	*Norway Maple*	1	22	22	G	G	G	4	12	ROW		1.8	Remove		
305	ACERRUB	*Acer rubrum*	*Red Maple*	1	5	5	P	G	G	1	5	ROW		1.2	Preserve	Bad trunk wounds	
306	CRAT_SP	*Crataegus sp.*	*Hawthorn sp.*	1	6,6,4,4	10	G	G	G	1	5	ROW		1.8	Preserve		
307	GLEDTRI	*Gleditsia triacanthos*	*Honey-locust*	1	7	7	G	G	G	1	5	ROW		1.2	Preserve		
308	ACERPLA	*Acer platanoides*	*Norway Maple*	1	10	10	G	G	G	1	10	ROW		1.8	Preserve		
309	PYRU_SP	*Pyrus sp.*	*Pear sp.*	1	4	4	G	G	G	1	4	ROW		1.2	Preserve	Chanticleer pear, gator bag	
310		*Acer ginnala*	*Amur Maple*	1	4	4	G	G	G	1	4	ROW		1.2	Injure-Preserve	gator bag	
311	ACERPLA	*Acer platanoides*	*Norway Maple*	1	10	10	G	G	G	1	10	ROW		1.8	Preserve		
312		*Acer ginnala*	*Amur Maple*	1	4	4	G	G	G	1	4	ROW		1.2	Preserve	gator bag	
313	ACERPLA	*Acer platanoides*	*Norway Maple*	1	10	10	G	G	G	1	10	ROW		1.8	Preserve	Lower branch broken	
314		*Acer ginnala*	*Amur Maple*	1	4	4	G	G	G	1	4	ROW		1.2	Remove	gator bag	
315		*Acer ginnala*	*Amur Maple*	1	4	4	G	G	G	1	4	ROW		1.2	Preserve	gator bag	
316	ACERPLA	*Acer platanoides*	*Norway Maple*	1	10	10	G	G	G	1	10	ROW		1.8	Preserve		
317		*Acer ginnala*	*Amur Maple*	1	4	4	G	G	G	1	4	ROW		1.2	Remove	gator bag	
318		*Acer ginnala*	*Amur Maple*	1	4	4	G	G	G	1	4	ROW		1.2	Remove	gator bag	
319	ACERPLA	*Acer platanoides*	*Norway Maple*	1	10	10	G	G	G	1	10	ROW		1.8	Injure-Preserve		
320		*Acer ginnala*	*Amur Maple*	1	4	4	G	G	G	1	4	ROW		1.2	Injure-Preserve	gator bag	
321		*Acer ginnala*	*Amur Maple*	1	4	4	G	G	G	1	4	ROW		1.2	Injure-Preserve	gator bag	
322	ACERPLA	*Acer platanoides*	*Norway Maple*	1	30	30	G	G	G	5	16	ROW		2.4	Remove		
323	MALU_SP	*Malus sp.*	*Apple sp.*	1	14	14	G	G	G	2	7	ROW		1.8	Injure-Preserve	Minor trunk wound, minor lean	
324		*Acer ginnala*	*Amur Maple*	1	4	4	G	G	G	1	4	ROW		1.2	Injure-Preserve	gator bag	
325	ACERPLA	*Acer platanoides*	*Norway Maple*	1	7	7	G	G	G	1	10	ROW		1.2	Preserve		

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326		*Acer ginnala*	*Amur Maple*	1	4	4	G	G	G	1	6	ROW		1.2	Injure-Preserve	gator bag	
327		*Acer ginnala*	*Amur Maple*	1	4	4	G	G	G	1	6	ROW		1.2	Preserve	gator bag	
328	ACERPLA	*Acer platanoides*	*Norway Maple*	1	30	30	G	G	G	5	16	ROW		2.4	Remove	Exposed roots with wounds	
329		*Acer ginnala*	*Amur Maple*	1	4	4	G	G	G	1	6	ROW		1.2	Preserve	gator bag	
330		*Acer ginnala*	*Amur Maple*	1	4	4	G	G	G	1	6	ROW		1.2	Injure-Preserve	gator bag	
331	ACERNEG	*Acer negundo*	*Manitoba Maple*	1	26, 18	32	F	F	G	4	20	ROW		2.4	Remove	Branch pruning wounds, epicormic shoots, unbalanced crown, relatively straight trunks for this species	
332	ACERNEG	*Acer negundo*	*Manitoba Maple*	1	24	24	F	F	G	4	20	ROW		1.8	Injure-Preserve	Unbalanced crown, minor lean	
333	ACERNEG	*Acer negundo*	*Manitoba Maple*	1	14	14	F	F	G	5	14	ROW		1.8	Preserve	Unbalanced crown, minor lean	
334	ACERPLA	*Acer platanoides*	*Norway Maple*	1	30	30	G	G	G	5	16	ROW		2.4	Remove	Minor wound at base of trunk from mower, broken branch	
335		*Acer ginnala*	*Amur Maple*	1	4	4	G	G	G	1	6	ROW		1.2	Preserve	gator bag	
336		*Acer ginnala*	*Amur Maple*	1	4	4	G	G	G	1	6	ROW		1.2	Remove	gator bag	
337	ACERCAM	*Acer campestre*	*Hedge Maple*	1	6	6	G	G	G	1	5	ROW		1.2	Remove		
338	ACERPLA	*Acer platanoides*	*Norway Maple*	1	24	24	G	G	G	5	20	ROW		1.8	Remove	Also a Multistem (4) apple at this location in fair health, not mapped, dripline 5m, height 16m	
339	MALU_SP	*Malus sp.*	*Apple sp.*	1	19	19	G	G	G	3	8	ROW		1.8	Injure-Preserve	Minor mower damage at base, marked with green dot on trunk	
340	ACERPLA	*Acer platanoides*	*Norway Maple*	1	25	25	G	G	G	5	20	ROW		1.8	Remove		
341	ACERPLA	*Acer platanoides*	*Norway Maple*	1	19	19	G	G	G	3	8	ROW		1.8	Injure-Preserve		
342	ACERCAM	*Acer campestre*	*Hedge Maple*	1	6	6	G	G	G	1	4	ROW		1.2	Preserve		
343	ACERPLA	*Acer platanoides*	*Norway Maple*	1	15	15	G	G	G	3	18	ROW		1.8	Injure-Preserve		
344	MALU_SP	*Malus sp.*	*Apple sp.*	1	14	14	F	G	G	3	8	ROW		1.8	Remove	Minor trunk wound from mower damage	
345	ACERPLA	*Acer platanoides*	*Norway Maple*	1	15	15	F	F	G	3	18	ROW		1.8	Preserve	Unbalanced crown, minor lean, water sprouts	
346		*Acer ginnala*	*Amur Maple*	1	4	4	G	G	G	1	6	ROW		1.2	Remove	gator bag	
347	ACERPLA	*Acer platanoides*	*Norway Maple*	1	36	36	G	G	G	5	20	ROW		2.4	Remove	Pruning wounds, dead branch	
348		*Acer ginnala*	*Amur Maple*	1	4	4	G	G	G	1	6	ROW		1.2	Remove	gator bag	
349	MALU_SP	*Malus sp.*	*Apple sp.*	1	14	14	F	G	G	3	8	ROW		1.8	Remove	Minor trunk wound from mower damage, broken branch	
350	ACERCAM	*Acer campestre*	*Hedge Maple*	1	9	9	F	G	G	1	5	ROW		1.2	Injure-Preserve	Trunk wounds	
351	CATASPE	*Catalpa speciosa*	*Northern Catalpa*	1	19	19	G	G	G	3	14	ROW		1.8	Injure-Preserve		
352	ACERPLA	*Acer platanoides*	*Norway Maple*	1	32	32	F	F	G	5	20	ROW		2.4	Remove	Pruned for hydro resulting in unbalanced crown, trunk wound from mower	
353	ACERPLA	*Acer platanoides*	*Norway Maple*	1	14	14	P	F	G	3	6	ROW		1.8	Remove	1m long trunk wound with rot, pruning has resulted in unbalanced crown	
354	MALU_SP	*Malus sp.*	*Apple sp.*	1	11	11	F	F	G	2	6	ROW		1.8	Remove	Minor trunk wound from mower damage, broken branches	
355	MALU_SP	*Malus sp.*	*Apple sp.*	1	11	11	G	G	G	3	8	ROW		1.8	Remove		
356	ACERPLA	*Acer platanoides*	*Norway Maple*	1	26	26	G	G	G	5	18	ROW		1.8	Remove	Minor trunk wounds, exposed roots with mower damage	
357	GLEDTRI	*Gleditsia triacanthos*	*Honey-locust*	1	26	26	G	G	G	5	18	ROW		1.8	Remove		

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358	ACERCAM	*Acer campestre*	*Hedge Maple*	1	9	9	G	G	G	2	8	ROW		1.2	Injure-Preserve		
359	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	4	4	G	G	G	1	5	ROW		1.2	Remove	Schubert Chokecherry, epicormic shoots	
360	ACERPLA	*Acer platanoides*	*Norway Maple*	1	29	29	G	F	F	5	18	ROW		1.8	Remove	Branch wounds on major limbs, unbalanced crown as pruned for hydro	
361	MALU_SP	*Malus sp.*	*Apple sp.*	1	11	11	G	G	G	3	8	ROW		1.8	Injure-Preserve	Epicormic shoots, unbalanced crown	
362	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	4	4	G	G	G	1	5	ROW		1.2	Injure-Preserve		
363	MALU_SP	*Malus sp.*	*Apple sp.*	1	20, 25, 18, 18	41	G	F	G	3	10	ROW		3	Remove	Multi stem, pruned limbs, major additional stems removed at base	
364	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	4	4	G	G	G	1	5	ROW		1.2	Injure-Preserve	Schubert Chokecherry, epicormic shoots	
365	MALU_SP	*Malus sp.*	*Apple sp.*	1	14	14	G	G	G	3	8	ROW		1.8	Injure-Preserve	Minor trunk wound from mower damage	
366	ACERPLA	*Acer platanoides*	*Norway Maple*	1	26	26	F	F	F	6	18	ROW		1.8	Remove	Branch wounds on major limbs, unbalanced crown as pruned for hydro, trunk wound at base, exposed roots with mower damage	
367	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	4	4	G	G	G	1	4	ROW		1.2	Preserve	Gator bag	
368	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	4	4	G	G	G	1	4	ROW		1.2	Preserve	Gator bag	
369	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	4	4	G	G	G	1	4	ROW		1.2	Preserve	Gator bag	
370	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	6	6	G	G	G	1	6	ROW		1.2	Injure-Preserve	Schubert Chokecherry, epicormic shoots	
371	ACERPLA	*Acer platanoides*	*Norway Maple*	1	26	26	F	F	F	6	18	ROW		1.8	Remove	Branch wounds on major limbs, major branch removed, water sprouts	
372	MALU_SP	*Malus sp.*	*Apple sp.*	1	14	14	G	G	G	3	8	ROW		1.8	Injure-Preserve	Epicormic sprout, trunk wound, lean	
373	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	4	4	G	G	G	1	4	ROW		1.2	Preserve	Gator bag	
374	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	4	4	G	G	G	1	4	ROW		1.2	Preserve	Gator bag	
375	ACERPLA	*Acer platanoides*	*Norway Maple*	1	19	19	G	G	G	4	18	ROW		1.8	Preserve		
376	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	6	6	G	G	G	1	6	ROW		1.2	Preserve	Schubert Chokecherry, epicormic shoots	
377	MALU_SP	*Malus sp.*	*Apple sp.*	1	10	10	G	G	G	2	6	ROW		1.8	Preserve		
378	ACERPLA	*Acer platanoides*	*Norway Maple*	1	30	30	G	F	G	6	22	ROW		2.4	Injure-Preserve	Branch wounds from pruning, pruned for hydro	
379	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	4	4	G	G	G	1	4	ROW		1.2	Preserve	Gator bag	
380	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	4	4	G	G	G	1	4	ROW		1.2	Preserve	Gator bag	
381	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	4	4	G	G	G	1	4	ROW		1.2	Preserve	Gator bag	
382	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	4	4	G	G	G	1	4	ROW		1.2	Preserve	Gator bag	
383	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	4	4	G	G	G	1	4	ROW		1.2	Injure-Preserve	Gator bag	
384	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	4	4	G	G	G	1	4	ROW		1.2	Remove	Gator bag	
385	MALU_SP	*Malus sp.*	*Apple sp.*	1	15, 15	21	P	F	G	3	10	ROW		1.8	Injure-Preserve	One stem has strong lean and bad rot at base	
386	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	4	4	G	G	G	1	6	ROW		1.2	Preserve	Schubert Chokecherry, epicormic shoots	
387	ACERPLA	*Acer platanoides*	*Norway Maple*	1	28	28	G	G	G	6	22	ROW		1.8	Injure-Preserve	Branch wounds from pruning, minor wound at base of trunk, exposed roots with mower damage, girdling roots	
388	MALU_SP	*Malus sp.*	*Apple sp.*	1	24, 22, 25	41	F	F	G	6	12	ROW		3	Injure-Preserve	Major limbs have been removed, broken branch, unbalanced crown	

Appendix A: Tree Inventory Tables

Project: Mulock Drive, Newmarket - Trail Feasibility Study
Field Work Completed By: L. Wallis (ISA#ON-2484A), C. Perkin (ISA# ON-2306A), J. Mentlik
Date of Field Work: March 18, 19, 22, 23, 2021
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Tree Condition Assessment Criteria:
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Legend:
Trees to be Preserved
Trees to be Removed
Trees to be Injured / Mitigation / Post Construction Monitoring

Tree #	Code	Botanical Name	Common Name	Qty.	DBH (cm)	Effective DBH	TI	CS	CV	Dripline Radius (m)	Height (m)	Tree Location / Applicable By-law	City of Toronto Category	Tree Protection Zone (m)	Recommendation	Comments - Health	Comments - Removal/Preservation
389	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	4	4	G	G	G	1	5	ROW		1.2	Preserve	Schubert Chokecherry	
390	ACERPLA	*Acer platanoides*	*Norway Maple*	1	22, 15	27	F	F	G	4	18	ROW		1.8	Preserve	Included bark, unbalanced crown	
391	MALU_SP	*Malus sp.*	*Apple sp.*	1	26	26	F	F	G	6	12	ROW		1.8	Preserve	Major limbs have been removed, unbalanced crown	
392	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	4	4	G	G	G	1	6	ROW		1.2	Preserve	Schubert Chokecherry, epicormic shoots	
393	ACERPLA	*Acer platanoides*	*Norway Maple*	1	28	28	G	G	G	8	22	ROW		1.8	Injure-Preserve	Branch wounds from pruning, minor wound at base of trunk	
394	FRAXPEN	*Fraxinus pennsylvanica*	*Green Ash*	1	28	28	P	P	P	8	22	ROW		1.8	Preserve	Hazard tree, Emerald Ash Borer larvae exit holes, water sprouts, lots of dead branches. Main branches lacking buds, epicormic sprouts with buds.	
395	TILICOR	*Tilia cordata*	*Little-leaf Linden*	1	28	28	F	F	G	5	22	ROW		1.8	Preserve	Pruned for hydro, unbalanced crown, crack on trunk, epicormic sprouts	
396	JUGLNIG	*Juglans nigra*	*Black Walnut*	1	7	7	G	G	G	1	5	ROW		1.2	Remove		
397	ACERPLA	*Acer platanoides*	*Norway Maple*	1	15	15	G	G	G	2	4	ROW		1.8	Remove	Existing tag 745	
398	ACERPLA	*Acer platanoides*	*Norway Maple*	1	15	15	G	G	G	2	4	ROW		1.8	Remove	Existing tag 746	
399	ACERPLA	*Acer platanoides*	*Norway Maple*	1	15	15	G	F	G	2	4	ROW		1.8	Remove	Existing tag 747, west side half of canopy has been pruned off	
400	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	12	12	G	G	G	1	8	ROW		1.8	Remove		
401	ACERPLA	*Acer platanoides*	*Norway Maple*	1	16	16	F	F	F	3	8	ROW		1.8	Remove	Existing tag 750, leader has been topped at 2.25m for hydro	
402	ACERPLA	*Acer platanoides*	*Norway Maple*	1	15	15	G	F	G	2	8	ROW		1.8	Injure-Preserve	Existing tag 751, pruned major limb, unbalanced crown	
403	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	14	14	G	G	G	1	8	ROW		1.8	Preserve		
404	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	13	13	G	G	G	1	8	ROW		1.8	Remove		
405	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	4	4	G	G	G	1	6	ROW		1.2	Remove	Schubert Chokecherry, epicormic shoots	
406	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	4	4	G	G	G	1	6	ROW		1.2	Preserve	Schubert Chokecherry	
407	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	4	4	G	G	G	1	6	ROW		1.2	Preserve	Schubert Chokecherry	
408	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	4	4	G	G	G	1	6	ROW		1.2	Preserve	Schubert Chokecherry	
409	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	4	4	G	G	G	1	6	ROW		1.2	Preserve	Schubert Chokecherry, epicormic shoots	
410	ACERSAC	*Acer saccharinum*	*Silver Maple*	1	6	6	G	G	G	1	8	ROW		1.2	Preserve		
411	ULMU_SP	*Ulmus sp.*	*Elm sp.*	1	8	8	G	G	G	1	8	ROW		1.2	Preserve	Possibly Accolade Elm Ulmus x Morton	
412	ACERPLA	*Acer platanoides*	*Norway Maple*	1	17	17	P	P	F	1	8	ROW		1.8	Preserve	Existing tag 753, bad trunk wound with rot, water sprouts, major limb has been removed, unbalanced crown, wounds at base of trunk	
413	ULMU_SP	*Ulmus sp.*	*Elm sp.*	1	8	8	G	G	G	1	8	ROW		1.2	Preserve	Possibly Accolade Elm Ulmus x Morton	
414	ACERPLA	*Acer platanoides*	*Norway Maple*	1	19	19	P	G	G	2	8	ROW		1.8	Preserve	Bad trunk wound at base with rot, hazard tree	
415	ULMUAME	*Ulmus americana*	*American Elm*	1	8	8	G	G	G	1	8	ROW		1.2	Preserve		
416	TILICOR	*Tilia cordata*	*Little-leaf Linden*	1	21	21	G	G	G	4	15	ROW		1.8	Remove		
417	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	7	7	G	G	G	1	7	ROW		1.2	Preserve	Schubert Chokecherry, broken branch with water sprouts	
418	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	6	6	G	G	G	1	6	ROW		1.2	Preserve		
419	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	6	6	G	G	G	1	6	ROW		1.2	Preserve		

Appendix A: Tree Inventory Tables

Project: Mulock Drive, Newmarket - Trail Feasibility Study	Field Work Completed By: L. Wallis (ISA#ON-2484A), C. Perkin (ISA# ON-2306A), J. Mentlik
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Trees to be Removed
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Tree #	Code	Botanical Name	Common Name	Qty.	DBH (cm)	Effective DBH	TI	CS	CV	Dripline Radius (m)	Height (m)	Tree Location / Applicable By-law	City of Toronto Category	Tree Protection Zone (m)	Recommendation	Comments - Health	Comments - Removal/Preservation
420	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	6	6	G	G	G	1	6	ROW		1.2	Preserve		
421	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	6	6	G	G	G	1	6	ROW		1.2	Preserve		
422	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	6	6	G	G	G	1	6	ROW		1.2	Preserve		
423	TILICOR	*Tilia cordata*	*Little-leaf Linden*	1	21	21	G	G	G	4	15	ROW		1.8	Remove		
424	TILICOR	*Tilia cordata*	*Little-leaf Linden*	1	21	21	G	G	G	4	15	ROW		1.8	Injure-Preserve		
425	TILICOR	*Tilia cordata*	*Little-leaf Linden*	1	21	21	G	G	G	4	15	ROW		1.8	Preserve		
426	TILICOR	*Tilia cordata*	*Little-leaf Linden*	1	21	21	G	G	G	4	15	ROW		1.8	Injure-Preserve	Water sprouts	
427	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	6	6	G	G	G	1	7	ROW		1.2	Preserve	Schubert Chokecherry	
428	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	8	8	G	G	G	1	7	ROW		1.2	Preserve	Schubert Chokecherry	
429	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	6	6	G	G	G	1	7	ROW		1.2	Preserve	Schubert Chokecherry	
430	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	6	6	F	G	G	1	7	ROW		1.2	Preserve	Schubert Chokecherry, epicormic shoots, trunk wound	
431	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	6	6	G	G	G	1	7	ROW		1.2	Preserve	Schubert Chokecherry, epicormic shoots	
432	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	6	6	G	G	G	1	7	ROW		1.2	Preserve	Schubert Chokecherry, epicormic shoots	
433	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	6	6	G	G	G	1	7	ROW		1.2	Preserve	Schubert Chokecherry, epicormic shoots	
434	AESCGLG	*Aesculus glabra*	*Ohio Buckeye*	1	8	8	G	G	G	1	5	ROW		1.2	Preserve		
435	AESCGLG	*Aesculus glabra*	*Ohio Buckeye*	1	8	8	G	G	G	1	5	ROW		1.2	Preserve		
436	ACERPLA	*Acer platanoides*	*Norway Maple*	1	22	22	G	F	G	4	16	ROW		1.8	Preserve	Poor form	
437	ACERRUB	*Acer rubrum*	*Red Maple*	1	9	9	G	G	G	2	10	ROW		1.2	Preserve		
438	ACERRUB	*Acer rubrum*	*Red Maple*	1	9	9	G	G	G	2	10	ROW		1.2	Preserve		
439	ACERPLA	*Acer platanoides*	*Norway Maple*	1	23	23	G	G	G	5	14	ROW		1.8	Injure-Preserve	Exposed root with mower damage, dirt mounded around stem	
440	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	6	6	G	G	G	1	6	ROW		1.2	Preserve		
441	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	6	6	G	G	G	1	6	ROW		1.2	Remove		
442	ACERPLA	*Acer platanoides*	*Norway Maple*	1	20	20	P	F	F	3	14	ROW		1.8	Preserve	Bad trunk wound (possibly canker) with rot, pruned major limbs, exposed roots with mower damage, soil mounding around trunk, shaded by adjacent conifer to south	
443	ACERPLA	*Acer platanoides*	*Norway Maple*	1	24	24	G	G	G	5	14	ROW		1.8	Preserve	pruned major limbs, exposed roots with mower damage, soil mounding around trunk	
444	GYMNDIO	*Gymnocladus dioicus*	*Kentucky Coffee-tree*	1	5	5	G	G	G	1	4	ROW		1.2	Preserve		
445	ACERPLA	*Acer platanoides*	*Norway Maple*	1	20	20	P	G	G	3	14	ROW		1.8	Preserve	Bad trunk wound with rot, exposed roots with mower damage, soil mounding around trunk	
446	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	6	6	G	G	G	1	6	ROW		1.2	Remove		
447	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	6	6	G	G	G	1	6	ROW		1.2	Preserve		
448	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	6	6	G	G	G	1	7	ROW		1.2	Preserve	Schubert Chokecherry, epicormic shoots	
449	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	8	8	G	G	G	1	7	ROW		1.2	Preserve	Schubert Chokecherry, epicormic shoots	

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Trees to be Removed
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450	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	6	6	G	G	G	1	7	ROW		1.2	Remove	Schubert Chokecherry, epicormic shoots	
451	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	6	6	F	G	G	1	7	ROW		1.2	Remove	Schubert Chokecherry, epicormic shoots	
452	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	6	6	G	G	G	1	7	ROW		1.2	Injure-Preserve	Schubert Chokecherry, epicormic shoots	
453	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	6	6	G	G	G	1	7	ROW		1.2	Preserve	Schubert Chokecherry, epicormic shoots	
454	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	6	6	G	G	G	1	7	ROW		1.2	Preserve	Schubert Chokecherry, epicormic shoots	
455	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	6	6	G	G	G	1	7	ROW		1.2	Preserve	Schubert Chokecherry, epicormic shoots	
456	ACERPLA	*Acer platanoides*	*Norway Maple*	1	20	20	G	G	G	3	14	ROW		1.8	Injure-Preserve	exposed roots with mower damage, soil mounding around trunk	
457	ACERPLA	*Acer platanoides*	*Norway Maple*	1	20	20	G	G	G	3	14	ROW		1.8	Injure-Preserve	exposed roots with mower damage, soil mounding around trunk	
458	ULMU_SP	*Ulmus sp.*	*Elm sp.*	1	6	6	G	G	G	1	7	ROW		1.2	Preserve	Possibly Accolade Elm Ulmus x Morton	
459	ACERPLA	*Acer platanoides*	*Norway Maple*	1	20	20	G	G	G	3	14	ROW		1.8	Injure-Preserve	exposed roots with mower damage, soil mounding around trunk	
460	ACERPLA	*Acer platanoides*	*Norway Maple*	1	20	20	G	G	G	4	14	ROW		1.8	Injure-Preserve	exposed roots with mower damage, soil mounding around trunk	
461	ACERPLA	*Acer platanoides*	*Norway Maple*	1	21	21	G	G	G	4	14	ROW		1.8	Injure-Preserve	exposed roots with mower damage, soil mounding around trunk	
462	TILICOR	*Tilia cordata*	*Little-leaf Linden*	1	21	21	G	G	G	4	13	ROW		1.8	Preserve	Water sprouts	
463	TILICOR	*Tilia cordata*	*Little-leaf Linden*	1	20	20	G	G	G	3	15	ROW		1.8	Preserve		
464	ACERPLA	*Acer platanoides*	*Norway Maple*	1	21	21	G	G	G	4	14	ROW		1.8	Injure-Preserve	exposed roots with mower damage, soil mounding around trunk	
465	TILICOR	*Tilia cordata*	*Little-leaf Linden*	1	18	18	G	G	G	3	15	ROW		1.8	Injure-Preserve	Epicormic shoots	
466	TILICOR	*Tilia cordata*	*Little-leaf Linden*	1	8	8	G	G	G	1	8	ROW		1.2	Injure-Preserve		
467	TILICOR	*Tilia cordata*	*Little-leaf Linden*	1	8	8	G	G	G	1	8	ROW		1.2	Preserve	Epicormic shoots, soil mounding at base of trunk	
468	TILICOR	*Tilia cordata*	*Little-leaf Linden*	1	22	22	G	G	G	3	20	ROW		1.8	Remove	Water sprouts	
469	ULMU_SP	*Ulmus sp.*	*Elm sp.*	1	10	10	G	G	G	1	8	ROW		1.8	Injure-Preserve	Possibly Accolade Elm Ulmus x Morton	
470	ULMU_SP	*Ulmus sp.*	*Elm sp.*	1	9	9	G	G	G	1	8	ROW		1.2	Injure-Preserve	Possibly Accolade Elm Ulmus x Morton	
471	ULMU_SP	*Ulmus sp.*	*Elm sp.*	1	10	10	G	G	G	1	8	ROW		1.8	Injure-Preserve	Possibly Accolade Elm Ulmus x Morton	
472	ACERRUB	*Acer rubrum*	*Red Maple*	1	9	9	G	G	G	1	10	ROW		1.2	Injure-Preserve		
473	ACERPLA	*Acer platanoides*	*Norway Maple*	1	17	17	G	G	G	3	10	ROW		1.8	Injure-Preserve		
474	TILICOR	*Tilia cordata*	*Little-leaf Linden*	1	18	18	G	G	G	3	10	ROW		1.8	Injure-Preserve	Water sprouts	
475	TILICOR	*Tilia cordata*	*Little-leaf Linden*	1	18	18	G	G	G	3	10	ROW		1.8	Injure-Preserve	Epicormic sprouts, exposed roots with mower damage	
476	ACERPLA	*Acer platanoides*	*Norway Maple*	1	9	9	G	G	G	1	10	ROW		1.2	Preserve		
477	ACERPLA	*Acer platanoides*	*Norway Maple*	1	9	9	G	G	G	1	10	ROW		1.2	Preserve		
478	ACERPLA	*Acer platanoides*	*Norway Maple*	1	9	9	G	G	G	1	10	ROW		1.2	Preserve		
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480	ACERSAS	*Acer saccharum*	*Sugar Maple*	1	90	90	F	F	F	10	30	ROW		5.4	Remove	Diameter estimated, existing tag 1873, approximately 75 honey bees / wasps buzzing around and crawling into/out of a crack in the trunk on west side and 3m above ground, basic visual assessment only - bees suggest possible cavity which could affect trunk integrity, minor trunk mowing wounds, dead smaller branches.	
481	ACERSAS	*Acer saccharum*	*Sugar Maple*	1	15	15	G	G	G	3	10	ROW		1.8	Injure-Preserve		
482	ACERSAS	*Acer saccharum*	*Sugar Maple*	1	15	15	G	G	G	3	10	ROW		1.8	Injure-Preserve		
483	PICEGLA	*Picea glauca*	*White Spruce*	1	32	32	G	G	G	3	30	ROW		2.4	Injure-Preserve	Very tall, lower limbs pruned off	
484	ACERSAS	*Acer saccharum*	*Sugar Maple*	1	15	15	G	G	G	3	8	ROW		1.8	Injure-Preserve		
485	ACERSAS	*Acer saccharum*	*Sugar Maple*	1	4	4	G	G	G	1	4	ROW		1.2	Preserve	Gator bag	
486	ACERSAS	*Acer saccharum*	*Sugar Maple*	1	10	10	G	G	G	2	9	ROW		1.8	Preserve		
487	ACERSAS	*Acer saccharum*	*Sugar Maple*	1	70	70	G	F	F	10	30	ROW		4.2	Injure-Preserve	Diameter estimated, existing tag 0109, pruned off rotted major limb in canopy, minor trunk wound at base, dripline over sidewalk	
488	ACERSAS	*Acer saccharum*	*Sugar Maple*	1	17	17	G	G	G	4	16	ROW		1.8	Preserve		
489	ACERSAS	*Acer saccharum*	*Sugar Maple*	1	80	80	G	F	F	10	30	ROW		4.8	Injure-Preserve	Diameter estimated, existing tag 1875, major limb in canopy dead and has been removed	
490	GLEDTRI	*Gleditsia triacanthos*	*Honey-locust*	1	7	7	G	G	G	4	7	ROW		1.2	Injure-Preserve		
491	PICEGLA	*Picea glauca*	*White Spruce*	1	24	24	G	G	G	3	25	ROW		1.8	Preserve		
492	PICEGLA	*Picea glauca*	*White Spruce*	1	24	24	G	G	G	3	25	ROW		1.8	Preserve		
493	PICEGLA	*Picea glauca*	*White Spruce*	1	24	24	G	G	G	3	25	ROW		1.8	Preserve		
494	ACERSAS	*Acer saccharum*	*Sugar Maple*	1	90	90	F	F	F	10	30	ROW		5.4	Injure-Preserve	Diameter estimated, existing tags 1876 and 0441, a few major limbs have been pruned off- suggesting tree is in decline	
495	ACERSAS	*Acer saccharum*	*Sugar Maple*	1	80	80	G	G	G	10	30	ROW		4.8	Injure-Preserve	Diameter estimated, existing tag 1877, minor trunk wound at base	
496	ACERPLA	*Acer platanoides*	*Norway Maple*	1	8	8	G	G	G	3	8	ROW		1.2	Injure-Preserve		
497	ACERSAS	*Acer saccharum*	*Sugar Maple*	1	13	13	G	G	G	3	8	ROW		1.8	Preserve		
498	ACERSAS	*Acer saccharum*	*Sugar Maple*	1	80	80	P	F	F	12	30	ROW		4.8	Injure-Preserve	Diameter estimated, existing tags 1878 and 0093, trunk rotten for about 4m on east side	
499	QUER_SP	*Quercus sp.*	*Oak sp.*	1	9	9	F	G	G	2	10	ROW		1.2	Injure-Preserve	Trunk wound, appears to be some twig dieback but hard to determine in leaf off condition, White or Bur Oak	
500	QUERMAC	*Quercus macrocarpa*	*Bur Oak*	1	24	24	G	G	G	5	15	ROW		1.8	Remove		
501	GLEDTRI	*Gleditsia triacanthos*	*Honey-locust*	1	11	11	G	G	G	3	10	ROW		1.8	Injure-Preserve	Poor form	
502	ACERRUB	*Acer rubrum*	*Red Maple*	1	14	14	G	G	G	3	14	ROW		1.8	Injure-Preserve	Exposed root with mower damage	
503	GLEDTRI	*Gleditsia triacanthos*	*Honey-locust*	1	11	11	G	G	G	3	10	ROW		1.8	Injure-Preserve	Poor form	
504	ACERSAS	*Acer saccharum*	*Sugar Maple*	1	18	18	G	G	G	5	16	ROW		1.8	Injure-Preserve		

Appendix A: Tree Inventory Tables

Project: Mulock Drive, Newmarket - Trail Feasibility Study | Field Work Completed By: L. Wallis (ISA#ON-2484A), C. Perkin (ISA# ON-2306A), J. Mentlik

Date of Field Work: March 18, 19, 22, 23, 2021 | Weather: March 18 and 19 (cool, 5 degrees), March 22 and 23 (Warm, 15 degrees)

Tree Condition Assessment Criteria:
TI - Trunk Integrity: assessment of the trunk for any defects or weaknesses.
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Tree Condition:
Good (G): tree displays less than 15% deficiency/defect within the given tree assessment criteria (TI,CS,CV)
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Legend:
Trees to be Preserved
Trees to be Injured / Mitigation / Post Construction Monitoring
Trees to be Removed

Tree #	Code	Botanical Name	Common Name	Qty.	DBH (cm)	Effective DBH	TI	CS	CV	Dripline Radius (m)	Height (m)	Tree Location / Applicable By-law	City of Toronto Category	Tree Protection Zone (m)	Recommendation	Comments - Health	Comments - Removal/Preservation
505	ACERSAS	*Acer saccharum*	*Sugar Maple*	1	80	80	P	G	G	10	30	ROW		4.8	Injure-Preserve	Diameter estimated, existing tag 1879, minor trunk wound at base, major trunk crevice with rot on west side at 3m above ground to 4m above ground	
506	ACERSAS	*Acer saccharum*	*Sugar Maple*	1	11	11	F	G	G	3	8	ROW		1.8	Preserve	Trunk wound, exposed root with mower damage	
507	QUERMAC	*Quercus macrocarpa*	*Bur Oak*	1	24	24	G	G	G	5	15	ROW		1.8	Injure-Preserve		
508	ACERSAS	*Acer saccharum*	*Sugar Maple*	1	14	14	G	G	G	4	12	ROW		1.8	Injure-Preserve	Mower wound at base of trunk	
509	QUERMAC	*Quercus macrocarpa*	*Bur Oak*	1	24	24	G	G	G	5	15	ROW		1.8	Remove	Water sprouts where small limbs have been pruned	
510	ACERSAS	*Acer saccharum*	*Sugar Maple*	1	21	21	F	G	G	5	15	ROW		1.8	Preserve	Trunk wounds	
511	ACERSAS	*Acer saccharum*	*Sugar Maple*	1	21	21	G	G	G	5	15	ROW		1.8	Injure-Preserve		
512	ACERSAS	*Acer saccharum*	*Sugar Maple*	1	24	24	F	G	G	6	15	ROW		1.8	Remove	Trunk wounds	
513	QUERMAC	*Quercus macrocarpa*	*Bur Oak*	1	24	24	G	G	G	6	18	ROW		1.8	Remove	Water sprouts where small limbs have been pruned	
514	ACERSAC	*Acer saccharinum*	*Silver Maple*	1	21	21	G	G	G	5	18	ROW		1.8	Injure-Preserve	Water sprouts	
515	ACERSAC	*Acer saccharinum*	*Silver Maple*	1	21	21	G	G	G	6	18	ROW		1.8	Injure-Preserve	Epicormic sprouts, poor form	
516	ACERSAC	*Acer saccharinum*	*Silver Maple*	1	18	18	G	G	G	6	18	ROW		1.8	Preserve	Water sprouts	
517	QUERMAC	*Quercus macrocarpa*	*Bur Oak*	1	22	22	G	G	G	5	18	ROW		1.8	Injure-Preserve		
518	JUGLNIG	*Juglans nigra*	*Black Walnut*	1	20	20	G	G	G	5	18	ROW		1.8	Remove		
519	QUERRUB	*Quercus rubra*	*Northern Red Oak*	1	25	25	G	G	G	6	18	ROW		1.8	Injure-Preserve		
520	QUERMAC	*Quercus macrocarpa*	*Bur Oak*	1	26	26	G	G	G	6	18	ROW		1.8	Remove	minor injury at trunk base	
521	ACERSAC	*Acer saccharinum*	*Silver Maple*	1	20	20	G	G	G	5	18	ROW		1.8	Injure-Preserve		
522	ACERPLA	*Acer platanoides*	*Norway Maple*	1	25	25	G	G	G	6	18	ROW		1.8	Injure-Preserve		
523	GYMNDIO	*Gymnocladus dioicus*	*Kentucky Coffee-tree*	1	24	24	G	G	G	6	18	ROW		1.8	Remove		
524	QUERRUB	*Quercus rubra*	*Northern Red Oak*	1	24	24	G	G	G	6	18	ROW		1.8	Remove	Exposed roots with mower damage	
525	ACERPLA	*Acer platanoides*	*Norway Maple*	1	27	27	G	G	G	6	18	ROW		1.8	Preserve		
526	QUERMAC	*Quercus macrocarpa*	*Bur Oak*	1	24	24	G	G	G	6	18	ROW		1.8	Injure-Preserve		
527	GLEDTRI	*Gleditsia triacanthos*	*Honey-locust*	1	22	22	G	G	G	4	18	ROW		1.8	Injure-Preserve	Mower wounds at base of trunk	
528	PRUN_SP	*Prunus sp.*	*Cherry sp.*	1	4,8,7,5,10	16	F	F	F	2	7	ROW		1.8	Preserve	Multistem cherry shrub, trunk wounds	
529	QUER_SP	*Quercus sp.*	*Oak sp.*	1	6	6	G	G	G	1	4	ROW		1.2	Injure-Preserve	Similar to bur oak but leaves and twig not typical, minor trunk wound	
530	GLEDTRI	*Gleditsia triacanthos*	*Honey-locust*	1	12	12	F	F	G	3	10	ROW		1.8	Injure-Preserve	Lean, poor form, water sprouts, sealed mower wound	
531	JUGLNIG	*Juglans nigra*	*Black Walnut*	1	45	45	G	G	G	7	24	ROW		3	Preserve		
532	ACERSAS	*Acer saccharum*	*Sugar Maple*	1	90	90	F	F	F	8	30	ROW		5.4	Injure-Preserve	Diameter estimated, existing tags 1880 and 0746, mower wounds at base of trunk, included bark, major limb pruned off, cherry shrub growing in branch crotch, major limb mostly dead	
533	AESCGLG	*Aesculus glabra*	*Ohio Buckeye*	1	5	5	G	G	G	1	5	ROW		1.2	Preserve		
534	JUGLNIG	*Juglans nigra*	*Black Walnut*	1	45	45	G	G	G	7	24	ROW		3	Injure-Preserve	One large limb pruned and has water sprouts	

Appendix A: Tree Inventory Tables

Project: Mulock Drive, Newmarket - Trail Feasibility Study | Field Work Completed By: L. Wallis (ISA#ON-2484A), C. Perkin (ISA# ON-2306A), J. Mentlik

Date of Field Work: March 18, 19, 22, 23, 2021 | Weather: March 18 and 19 (cool, 5 degrees), March 22 and 23 (Warm, 15 degrees)

Tree Condition Assessment Criteria:
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Legend:
Trees to be Preserved
Trees to be Removed
Trees to be Injured / Mitigation / Post Construction Monitoring

Tree #	Code	Botanical Name	Common Name	Qty.	DBH (cm)	Effective DBH	TI	CS	CV	Dripline Radius (m)	Height (m)	Tree Location / Applicable By-law	City of Toronto Category	Tree Protection Zone (m)	Recommendation	Comments - Health	Comments - Removal/Preservation
535	QUERRUB	*Quercus rubra*	*Northern Red Oak*	1	13	13	G	G	G	3	12	ROW		1.8	Injure-Preserve	Mower wounds at base of trunk	
536	ULMUAME	*Ulmus americana*	*American Elm*	1	26	26	F	F	G	6	18	ROW		1.8	Preserve	Tree seems to be the result of an epicormic shoot - there is a well-rotted large 60 cm stump at the base. Many newer epicormic sprouts, form slightly unbalanced.	
537	JUGLNIG	*Juglans nigra*	*Black Walnut*	1	50	50	G	G	G	7	24	ROW		3	Preserve	Existing tag 1881	
538	ACERSAS	*Acer saccharum*	*Sugar Maple*	1	90	90	G	G	G	12	30	ROW		5.4	Injure-Preserve	Diameter estimated, full crown, well balanced, great form. Excellent health	
539	AESCGLG	*Aesculus glabra*	*Ohio Buckeye*	1	5	5	G	G	G	1	5	ROW		1.2	Preserve		
540	QUERRUB	*Quercus rubra*	*Northern Red Oak*	1	21	21	G	G	G	5	16	ROW		1.8	Remove		
541	PICEGLA	*Picea glauca*	*White Spruce*	1	28	28	G	G	G	6	30	ROW		1.8	Preserve	Honeysuckle shrub growing at base	
542	PICEGLA	*Picea glauca*	*White Spruce*	1	28	28	G	G	F	4	30	ROW		1.8	Preserve	Reduced vigour possibly from shading from other conifers	
543	ACERPLA	*Acer platanoides*	*Norway Maple*	1	25	25	G	G	G	6	16	ROW		1.8	Injure-Preserve	Lean, exposed roots with mower damage, girdling roots	
544	PICEGLA	*Picea glauca*	*White Spruce*	1	24	24	G	G	F	4	25	ROW		1.8	Preserve	Reduced vigour possibly from shading from other conifers	
545	PICEGLA	*Picea glauca*	*White Spruce*	1	26	26	G	G	G	4	30	ROW		1.8	Preserve	Honeysuckle shrub growing at base	
546	ACERPLA	*Acer platanoides*	*Norway Maple*	1	25	25	G	G	G	6	16	ROW		1.8	Preserve	exposed roots with mower damage, girdling roots	
547	GLEDTRI	*Gleditsia triacanthos*	*Honey-locust*	1	18	18	G	F	G	6	16	ROW		1.8	Remove	Poor form, pruning has caused water sprouts	
548	ACERPLA	*Acer platanoides*	*Norway Maple*	1	22	22	F	F	G	6	18	ROW		1.8	Remove	Exposed roots with a few severed from mechanical damage, sealed trunk wounds, lean, poor form, pruning has caused water sprouts	
549	GLEDTRI	*Gleditsia triacanthos*	*Honey-locust*	1	5	5	G	G	G	1	7	ROW		1.2	Preserve		
550	ACERSAS	*Acer saccharum*	*Sugar Maple*	1	23	23	G	G	G	6	18	ROW		1.8	Preserve		
551	ACERPLA	*Acer platanoides*	*Norway Maple*	1	22	22	G	G	G	4	14	ROW		1.8	Remove	Exposed roots with mower damage	
552	ACERPLA	*Acer platanoides*	*Norway Maple*	1	14	14	P	P	P	2	7	ROW		1.8	Preserve	Major wound on trunk extends along whole length from base up to top of tree, exposed inner bark and crack, recommended for removal	
553	QUERMAC	*Quercus macrocarpa*	*Bur Oak*	1	7	7	G	G	G	1	6	ROW		1.2	Preserve		
554	QUERMAC	*Quercus macrocarpa*	*Bur Oak*	1	4	4	G	G	G	1	4	ROW		1.2	Preserve		
555	JUGLNIG	*Juglans nigra*	*Black Walnut*	1	40	40	G	G	G	10	26	ROW		2.4	Injure-Preserve		
556	JUGLNIG	*Juglans nigra*	*Black Walnut*	1	28	28	G	G	G	12	24	ROW		1.8	Injure-Preserve	Trunk wound	
557	ACERPLA	*Acer platanoides*	*Norway Maple*	1	16	16	G	G	G	3	12	ROW		1.8	Injure-Preserve	Exposed roots with mower damage, girdling roots, trunk wound at base, severed root from mechanical damage	
558	PICEGLA	*Picea glauca*	*White Spruce*	1	26	26	G	G	G	4	26	ROW		1.8	Preserve	Trunk wound at base	
559	PICEGLA	*Picea glauca*	*White Spruce*	1	27	27	G	G	G	6	30	ROW		1.8	Preserve		
560	QUERRUB	*Quercus rubra*	*Northern Red Oak*	1	26	26	G	G	G	7	18	ROW		1.8	Remove	Mower damage at base of trunk and on exposed roots, girdling root	
561	QUERMAC	*Quercus macrocarpa*	*Bur Oak*	1	16	16	G	G	G	3	14	ROW		1.8	Preserve		
562	QUERMAC	*Quercus macrocarpa*	*Bur Oak*	1	20	20	G	G	G	5	18	ROW		1.8	Remove		

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Trees to be Preserved
Trees to be Removed
Trees to be Injured / Mitigation / Post Construction Monitoring

Tree #	Code	Botanical Name	Common Name	Qty.	DBH (cm)	Effective DBH	TI	CS	CV	Dripline Radius (m)	Height (m)	Tree Location / Applicable By-law	City of Toronto Category	Tree Protection Zone (m)	Recommendation	Comments - Health	Comments - Removal/Preservation
563	PICEGLA	*Picea glauca*	*White Spruce*	1	20	20	G	G	G	4	26	ROW		1.8	Preserve	Mower wounds at base of trunk	
564	PICEGLA	*Picea glauca*	*White Spruce*	1	25	25	G	G	G	5	28	ROW		1.8	Preserve		
565	ACERSAS	*Acer saccharum*	*Sugar Maple*	1	24	24	G	G	G	5	18	ROW		1.8	Preserve	Exposed roots and severed roots from mechanical damage	
566	JUGLNIG	*Juglans nigra*	*Black Walnut*	1	12	12	G	G	G	4	12	ROW		1.8	Injure-Preserve		
567	QUERRUB	*Quercus rubra*	*Northern Red Oak*	1	26	26	G	G	G	6	22	ROW		1.8	Remove		
568	QUERRUB	*Quercus rubra*	*Northern Red Oak*	1	24	24	G	G	G	6	22	ROW		1.8	Remove		
569	PICEGLA	*Picea glauca*	*White Spruce*	1	24	24	G	G	G	6	24	ROW		1.8	Preserve	Exposed roots with mower damage	
570	PICEGLA	*Picea glauca*	*White Spruce*	1	26	26	G	G	G	6	24	ROW		1.8	Preserve		
571	PICEGLA	*Picea glauca*	*White Spruce*	1	24	24	G	G	G	5	24	ROW		1.8	Preserve		
572	GLEDTRI	*Gleditsia triacanthos*	*Honey-locust*	1	4	4	G	G	G	2	5	ROW		1.2	Injure-Preserve	Minor trunk wound, shaded by conifers and trying to grow branches towards the north so slightly unbalanced crown	
573	ACERSAS	*Acer saccharum*	*Sugar Maple*	1	80	80	G	G	G	10	30	ROW		4.8	Injure-Preserve	Diameter estimated, existing tree tag 1883, trunk wounds at base from mower damage	
574	GLEDTRI	*Gleditsia triacanthos*	*Honey-locust*	1	6	6	G	G	G	3	7	ROW		1.2	Injure-Preserve		
575	PICEGLA	*Picea glauca*	*White Spruce*	1	26	26	G	G	G	6	24	ROW		1.8	Preserve	Cherry shrub growing at base, exposed roots with mower damage	
576	PICEGLA	*Picea glauca*	*White Spruce*	1	24	24	G	G	G	5	24	ROW		1.8	Preserve	Cherry shrub growing at base, exposed roots with mower damage	
577	QUERMAC	*Quercus macrocarpa*	*Bur Oak*	1	14	14	G	G	G	3	12	ROW		1.8	Preserve		
578	GLEDTRI	*Gleditsia triacanthos*	*Honey-locust*	1	6	6	G	G	G	4	12	ROW		1.2	Injure-Preserve		
579	PICEPUN	*Picea pungens*	*Blue Spruce*	1	17	17	G	G	G	4	18	ROW		1.8	Remove	Exposed roots with mechanical damage, severed roots	
580	ACERSAS	*Acer saccharum*	*Sugar Maple*	1	25	25	G	G	G	6	18	ROW		1.8	Preserve	Exposed roots with mower damage, girdling roots	
581	QUERMAC	*Quercus macrocarpa*	*Bur Oak*	1	3	3	G	G	G	1	4	ROW		1.2	Preserve		
582	ACERSAS	*Acer saccharum*	*Sugar Maple*	1	70	70	G	G	G	10	30	ROW		4.2	Injure-Preserve	Diameter estimated, existing tag 1884	
583	ACERPLA	*Acer platanoides*	*Norway Maple*	1	11	11	G	G	G	4	8	ROW		1.8	Preserve	Trunk wound at base from mower, poor form due to shading, tree is growing branches towards the north causing an unbalanced crown	
584	ACERSAS	*Acer saccharum*	*Sugar Maple*	1	80	80	F	F	F	10	30	ROW		4.8	Injure-Preserve	Diameter estimated, some dead and broken branches, cherry shrub at base, small hole in one major limb	
585	GLEDTRI	*Gleditsia triacanthos*	*Honey-locust*	1	4	4	G	G	G	2	8	ROW		1.2	Preserve		
586	PICEGLA	*Picea glauca*	*White Spruce*	1	22	22	G	G	G	4	16	ROW		1.8	Preserve		
587	ACERPLA	*Acer platanoides*	*Norway Maple*	1	20	20	G	G	G	5	22	ROW		1.8	Remove	Trunk wound at base from mower	
588	ULMUAME	*Ulmus americana*	*American Elm*	1	22, 21,20,24,25	44	G	G	G	5	25	ROW		3	Preserve	Exposed roots with mower damage	
589	QUERRUB	*Quercus rubra*	*Northern Red Oak*	1	23	23	G	G	G	5	22	ROW		1.8	Remove	Exposed roots with mower damage, girdling roots	
590	PICEGLA	*Picea glauca*	*White Spruce*	1	24	24	G	G	G	4	24	ROW		1.8	Preserve	Exposed roots with mower damage	
591	PICEGLA	*Picea glauca*	*White Spruce*	1	26	26	G	G	G	4	24	ROW		1.8	Preserve	Trunk wound at base	
592	PICEGLA	*Picea glauca*	*White Spruce*	1	24	24	G	G	G	4	24	ROW		1.8	Preserve	Trunk wound at base	

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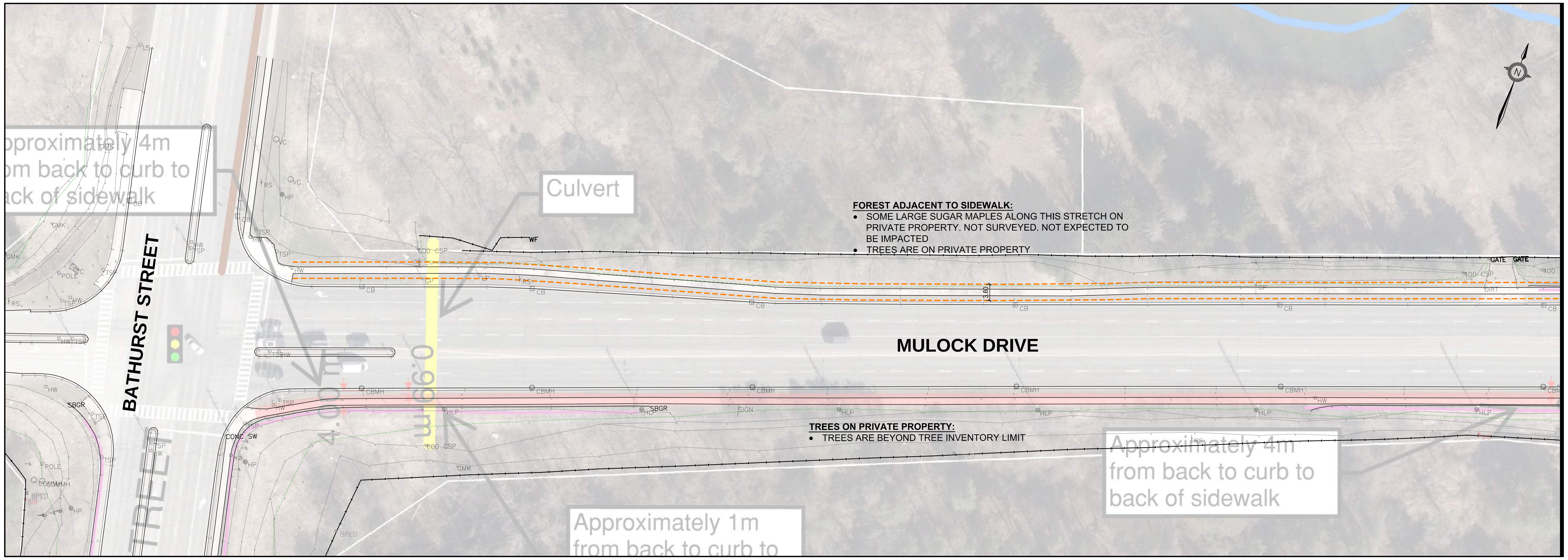
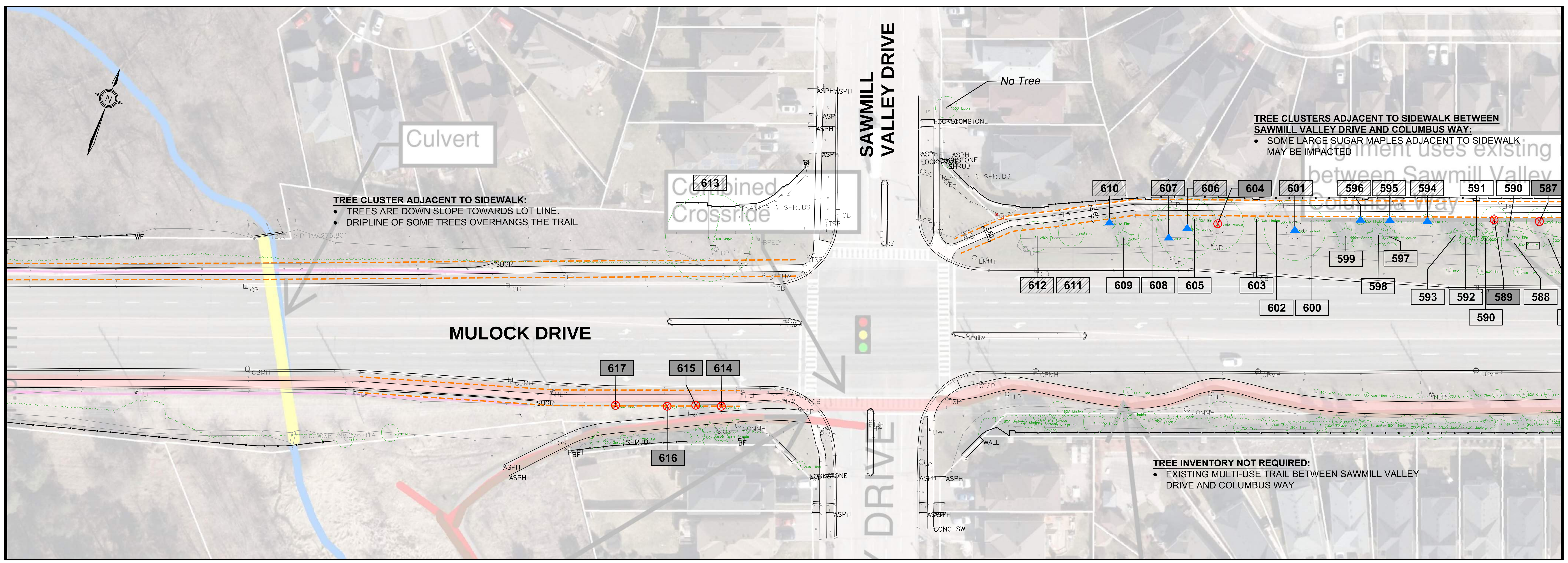
594	QUERMAC	*Quercus macrocarpa*	*Bur Oak*	1	16	16	G	G	G	4	12	ROW		1.8	Injure-Preserve		
595	TILICOR	*Tilia cordata*	*Little-leaf Linden*	1	12	12	G	G	G	2	12	ROW		1.8	Injure-Preserve		
596	TILICOR	*Tilia cordata*	*Little-leaf Linden*	1	12	12	G	G	G	2	12	ROW		1.8	Injure-Preserve		
597	PICEGLA	*Picea glauca*	*White Spruce*	1	25	25	G	G	G	4	24	ROW		1.8	Preserve		
598	PICEGLA	*Picea glauca*	*White Spruce*	1	26	26	G	G	G	5	26	ROW		1.8	Preserve		
599	PICEGLA	*Picea glauca*	*White Spruce*	1	28	28	G	G	G	5	30	ROW		1.8	Preserve		
600	QUERMAC	*Quercus macrocarpa*	*Bur Oak*	1	4	4	G	G	G	1	4	ROW		1.2	Preserve		
601	JUGLNIG	*Juglans nigra*	*Black Walnut*	1	40	40	G	G	G	8	28	ROW		2.4	Injure-Preserve		
602	GLEDTRI	*Gleditsia triacanthos*	*Honey-locust*	1	4	4	G	G	G	2	6	ROW		1.2	Preserve		
603	TILICOR	*Tilia cordata*	*Little-leaf Linden*	1	4	4	F	G	G	1	4	ROW		1.2	Preserve	Trunk wound	
604	JUGLNIG	*Juglans nigra*	*Black Walnut*	1	45	45	G	G	G	10	28	ROW		3	Remove	Existing tree tag 1885	
605		*Ulmus x Morton*	*Accolade Elm*	1	4	4	P	G	G	1	8	ROW		1.2	Preserve	Tag says Accolade Elm Ulmus x Morton, bad wound on trunk 1.5m long	
606	JUGLNIG	*Juglans nigra*	*Black Walnut*	1	40	40	G	G	G	8	28	ROW		2.4	Injure-Preserve		
607	ULMUAME	*Ulmus americana*	*American Elm*	1	23,26,28,26,27,20	61	G	G	G	10	28	ROW		4.2	Injure-Preserve	Some pruned limbs with water sprouts, exposed roots with mower damage	
608		*Ulmus x Morton*	*Accolade Elm*	1	4	4	G	G	G	1	8	ROW		1.2	Preserve	Tag says Accolade Elm Ulmus x morton, no visible buds - may be dead. Could be reassessed during leaf on season. No visible damage.	
609	PICEGLA	*Picea glauca*	*White Spruce*	1	26	26	G	G	G	4	26	ROW		1.8	Preserve		
610	ULMU_SP	*Ulmus sp.*	*Elm sp.*	1	15	15	G	G	G	4	14	ROW		1.8	Injure-Preserve	Possibly Accolade Elm Ulmus x Morton	
611	QUERMAC	*Quercus macrocarpa*	*Bur Oak*	1	20	20	G	G	G	4	18	ROW		1.8	Injure-Preserve	Bark is peeling off some branches, tree health could be assessed during leaf on season	
612	QUERMAC	*Quercus macrocarpa*	*Bur Oak*	1	22	22	G	G	G	4	18	ROW		1.8	Injure-Preserve	Bark is peeling off some branches, tree health could be assessed during leaf on season, exposed root with mower damage	
613	ACERSAS	*Acer saccharum*	*Sugar Maple*	1	75	75	G	G	G	10	30	ROW		4.8	Injure-Preserve	Diameter estimated, existing tag 1886, area immediately to west of tree from 1m from trunk to the extent of the dripline has been cleared of brush and is being used as access to a residence for construction of a pool and pool house. No Tree Protection Fencing in place. Verify if a permit was issued and if requirements are being met.	
614	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	8	8	G	G	G	1	5	ROW		1.2	Remove	Epicormic shoots	
615	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	7	7	G	G	G	1	5	ROW		1.2	Remove	Epicormic shoots	
616	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	5	5	G	G	G	1	5	ROW		1.2	Remove	Epicormic shoots	
617	SYRIRET	*Syringa reticulata ssp. reticulata*	*Japanese Tree Lilac*	1	5	5	G	G	G	1	5	ROW		1.2	Remove	Epicormic shoots	



MATCHLINE - REFER TO SHEET TP-1B

TP-1A



MATCHLINE - REFER TO SHEET TP-1A

MATCHLINE - REFER TO SHEET TP-2

TP-1B

KEY MAP

LEGEND:

	PROPERTY LINE
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T-?	IDENTIFICATION NUMBER FOR EXISTING TREE TO BE REMOVED DUE TO CONSTRUCTION
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	APPOXIMATE LIMIT OF CONSTRUCTION - 3.6m
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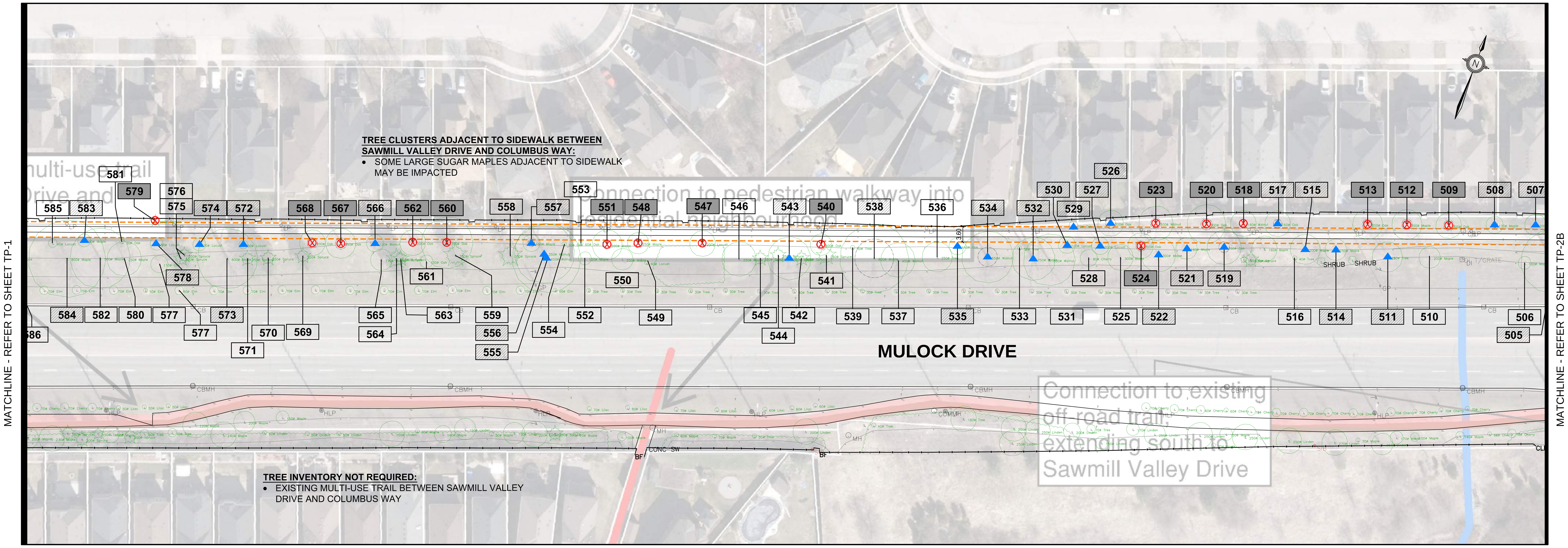
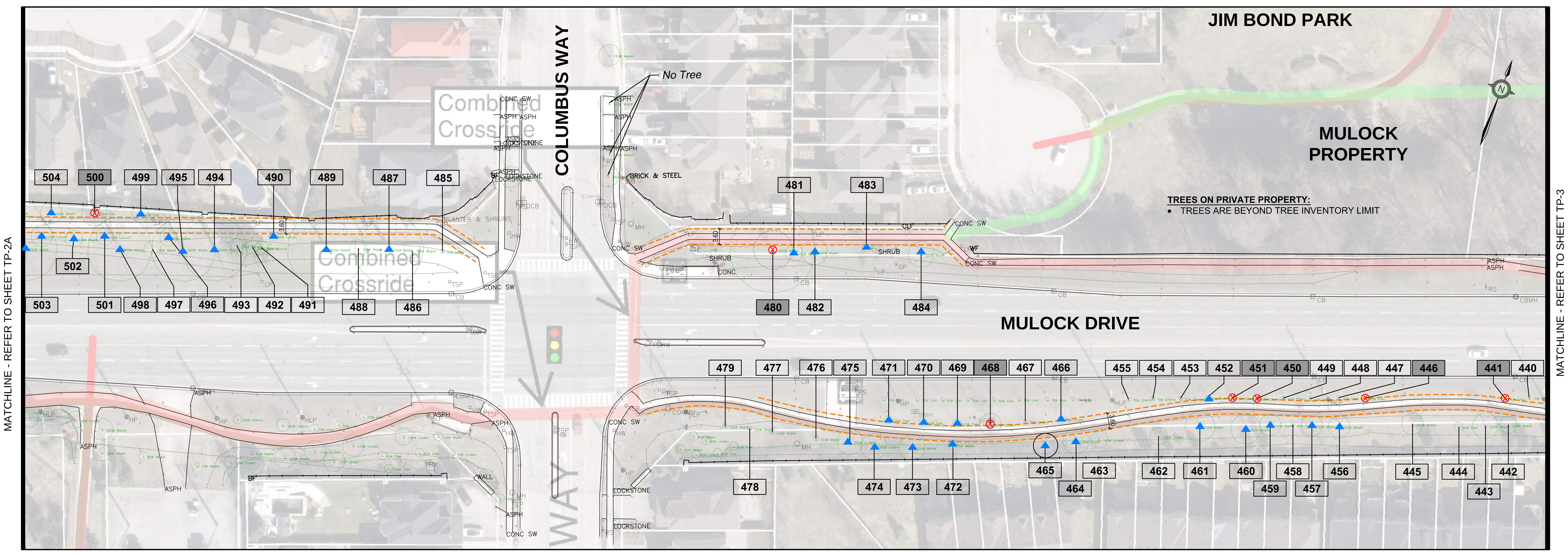
SCALE	DATE
1 : 500	MARCH 2021

DRAWING NUMBER	SHEET NUMBER
211-00396-00-LA	TP-1

FILENAME: C:\Users\mcnamarap\OneDrive - WSP O365\Documents\Newmarket - Mulock Drive - Feasability Study\Drawings\Tree Preservation Plans.dwg
PLOTDATE: Apr 08, 2021 - 2:19pm



TP-2A



TP-2B

KEY MAP

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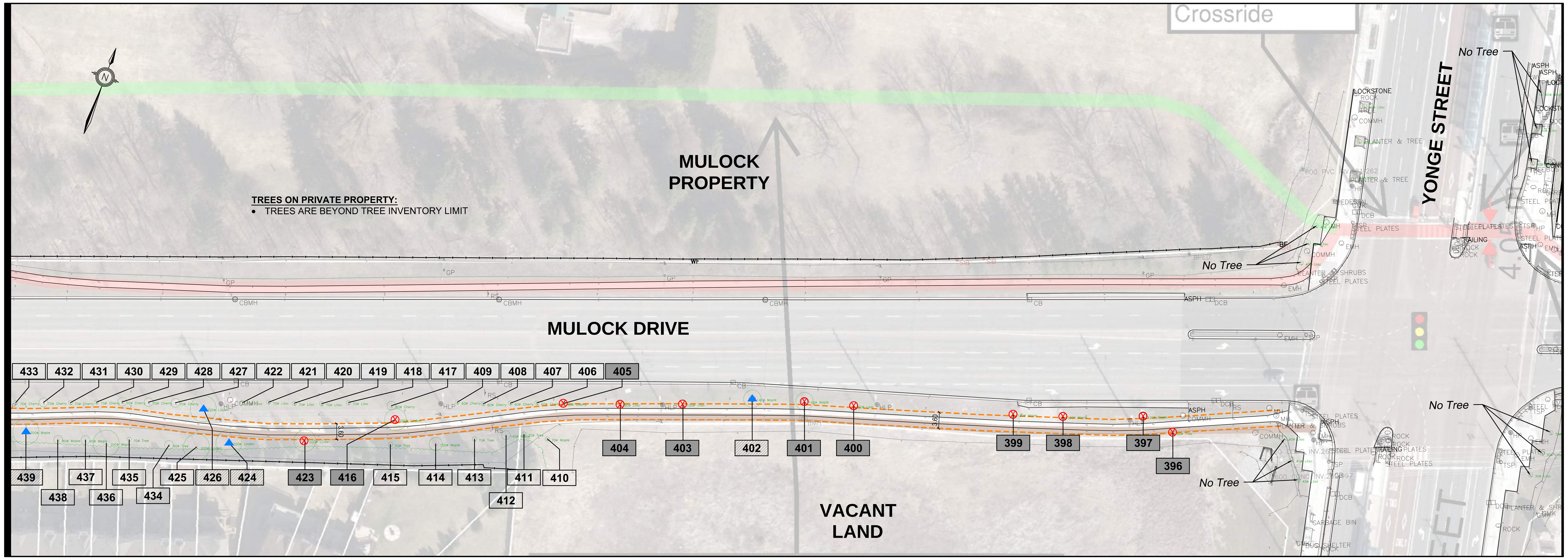
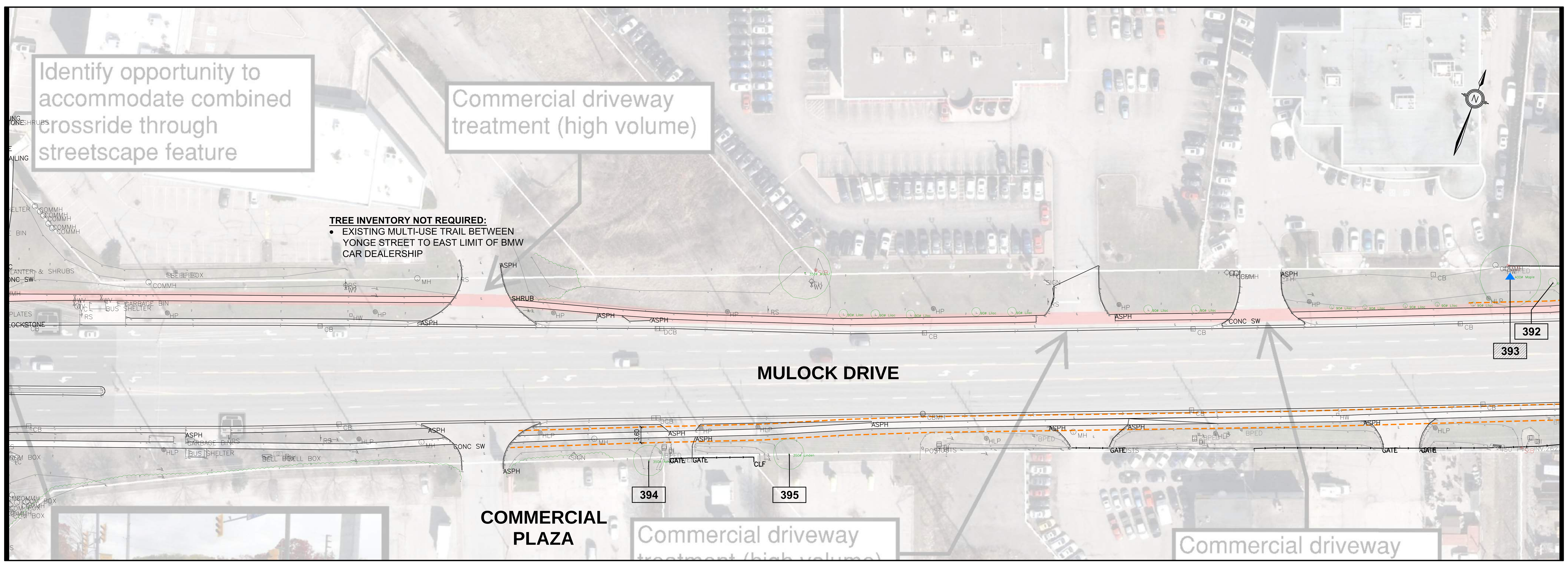


MATCHLINE - REFER TO SHEET TP-3B

TP-3A

MATCHLINE - REFER TO SHEET TP-3A



MATCHLINE - REFER TO SHEET TP-4

TP-3B

KEY MAP

LEGEND:

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211-00396-00-LA	TP-3

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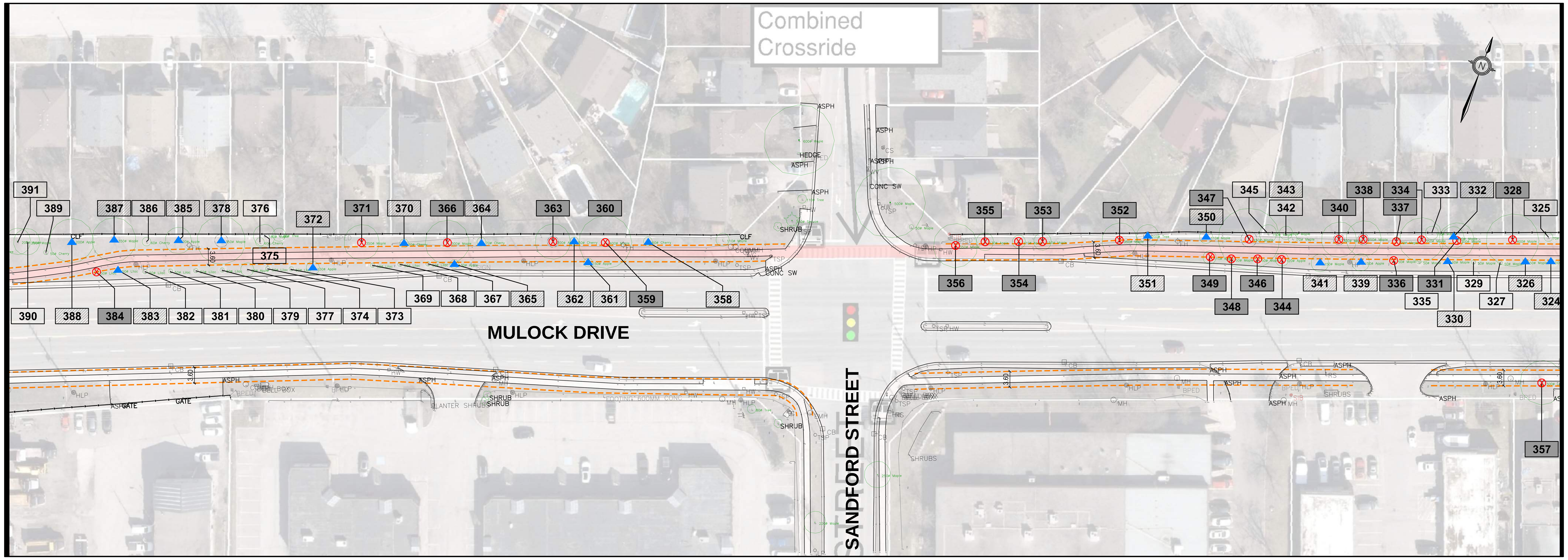
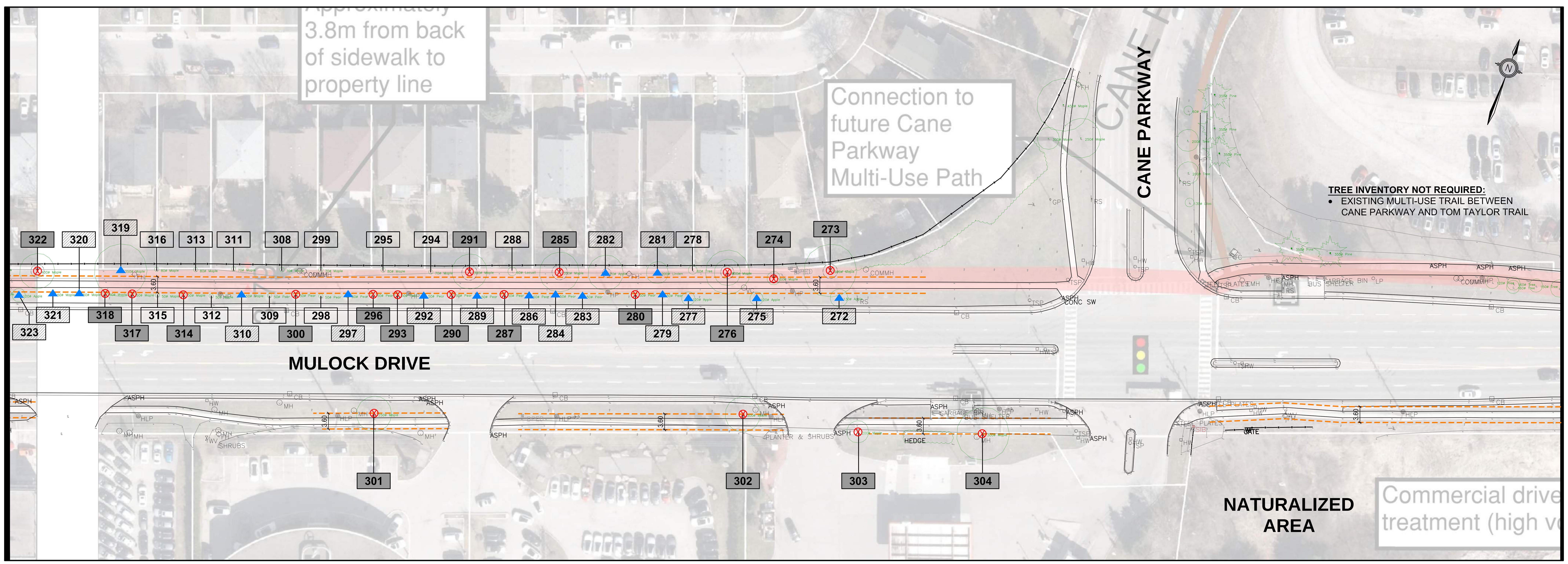


MATCHLINE - REFER TO SHEET TP-4B

TP-4A

MATCHLINE - REFER TO SHEET TP-4A



MATCHLINE - REFER TO SHEET TP-5

TP-4B

KEY MAP

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  • Diameter of trunk x 5 = Encroachment Zone (50cm diameter x 5 = 2.5m Zone)

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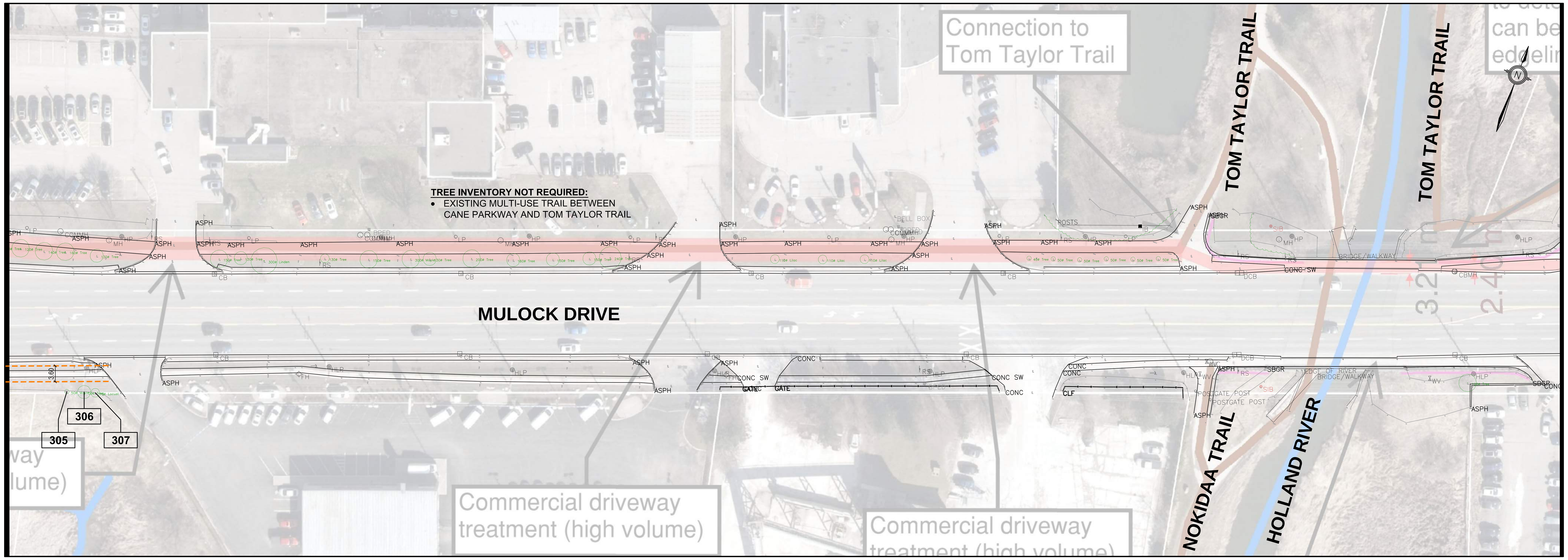
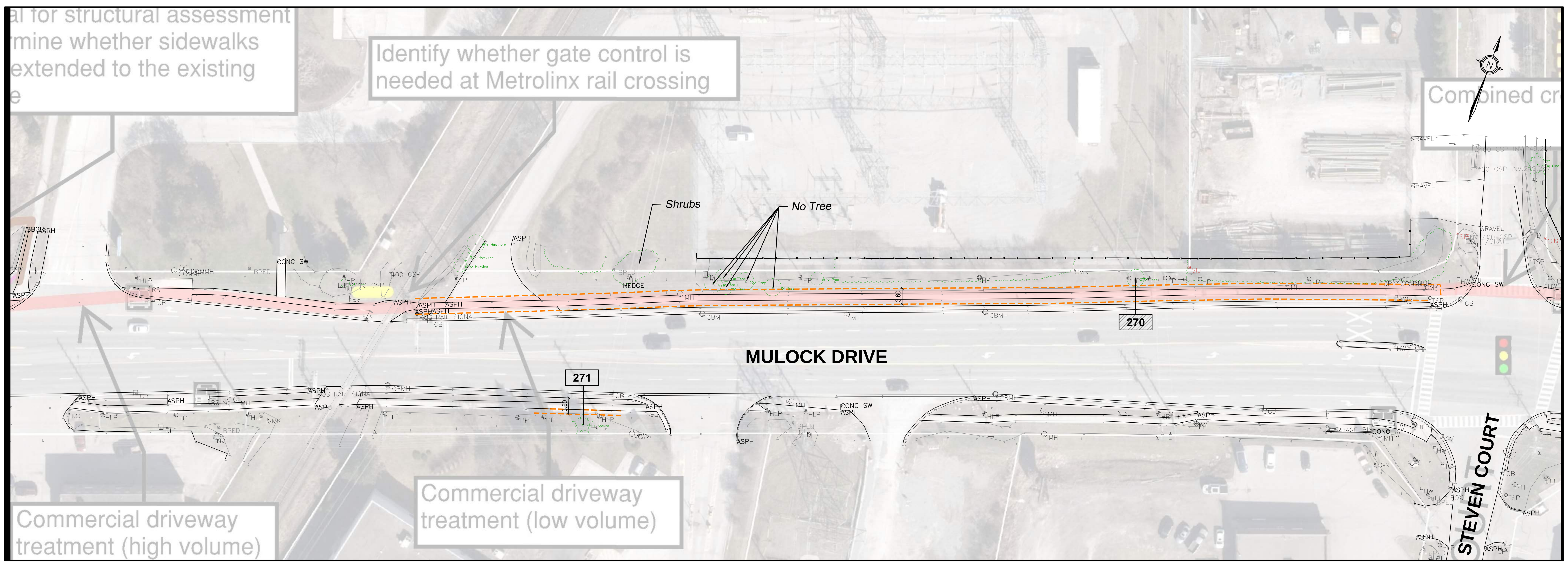


TP-5A



TP-5B

KEY MAP

LEGEND:

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APPOXIMATE LIMIT OF CONSTRUCTION - 3.6m

LIMIT OF ENCROACHMENT
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DRAWING NUMBER	SHEET NUMBER
211-00396-00-LA	TP-5

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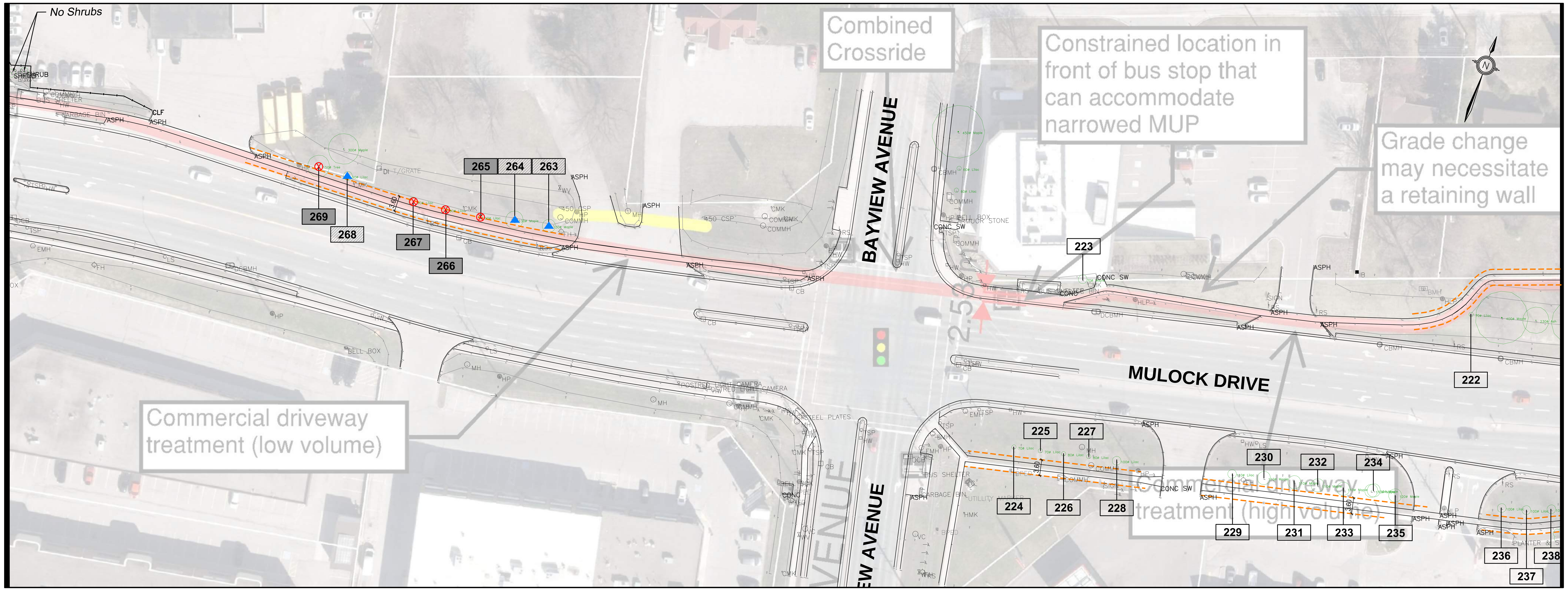
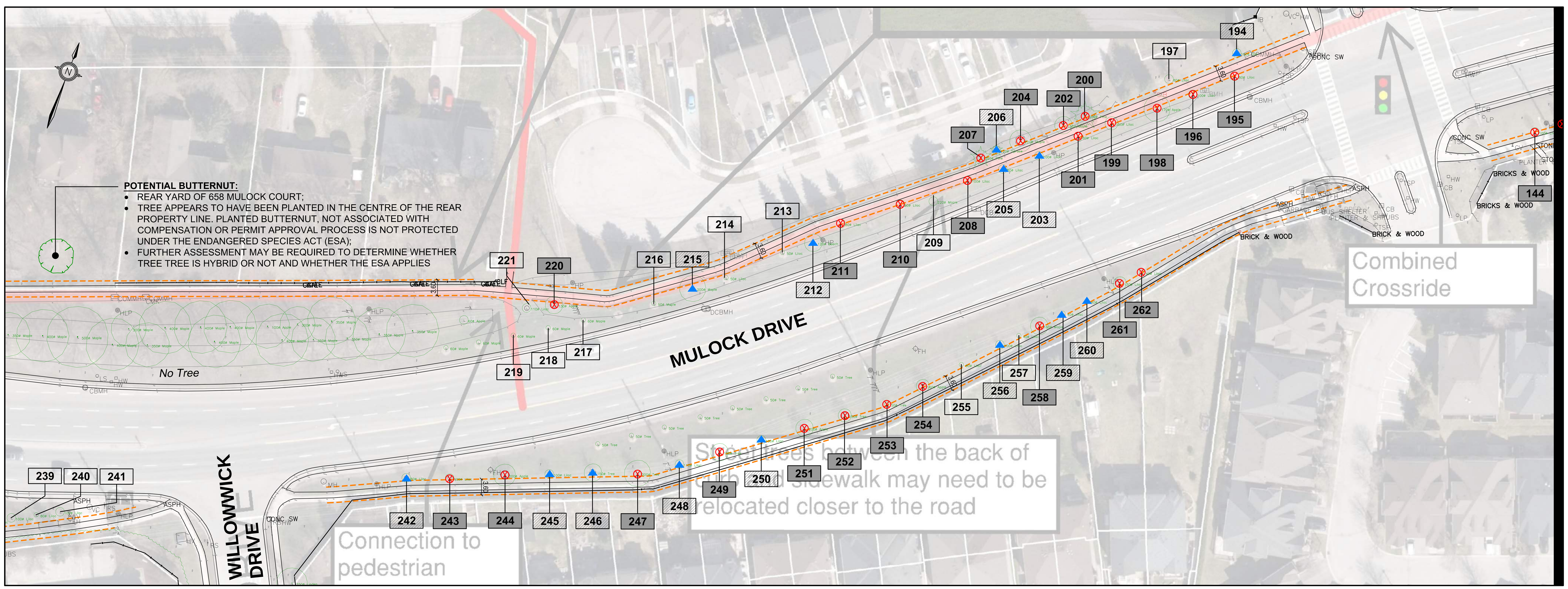


TP-6A



TP-6B

KEY MAP

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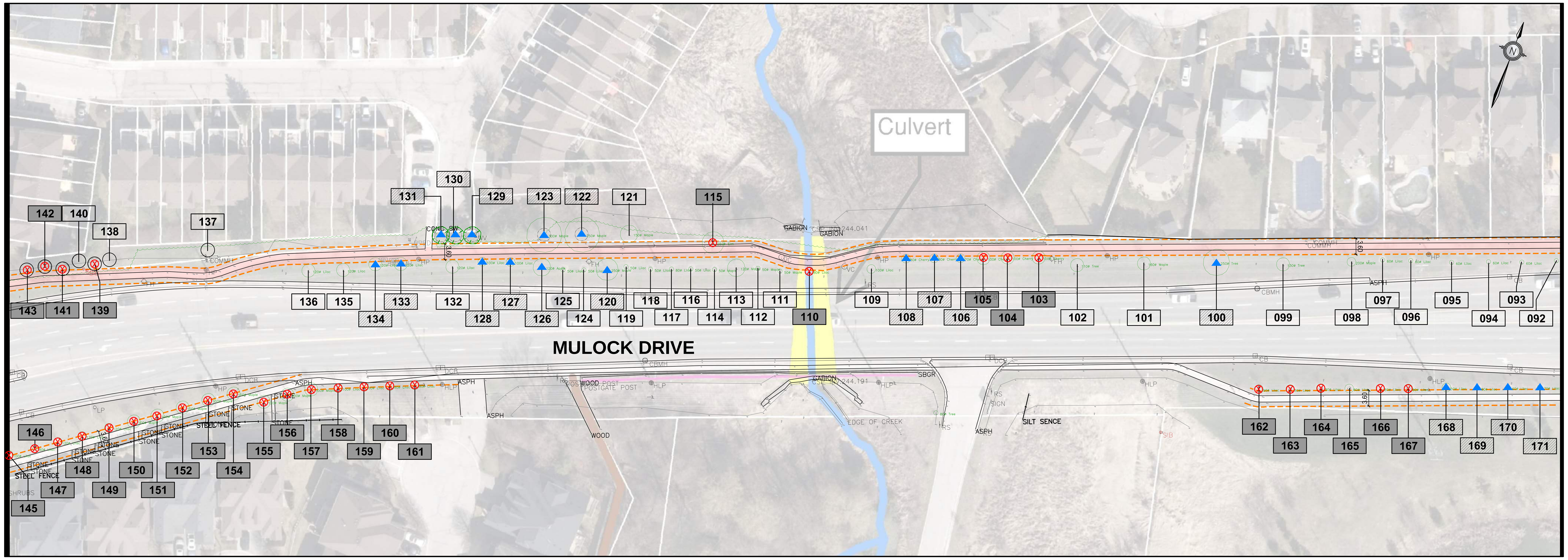
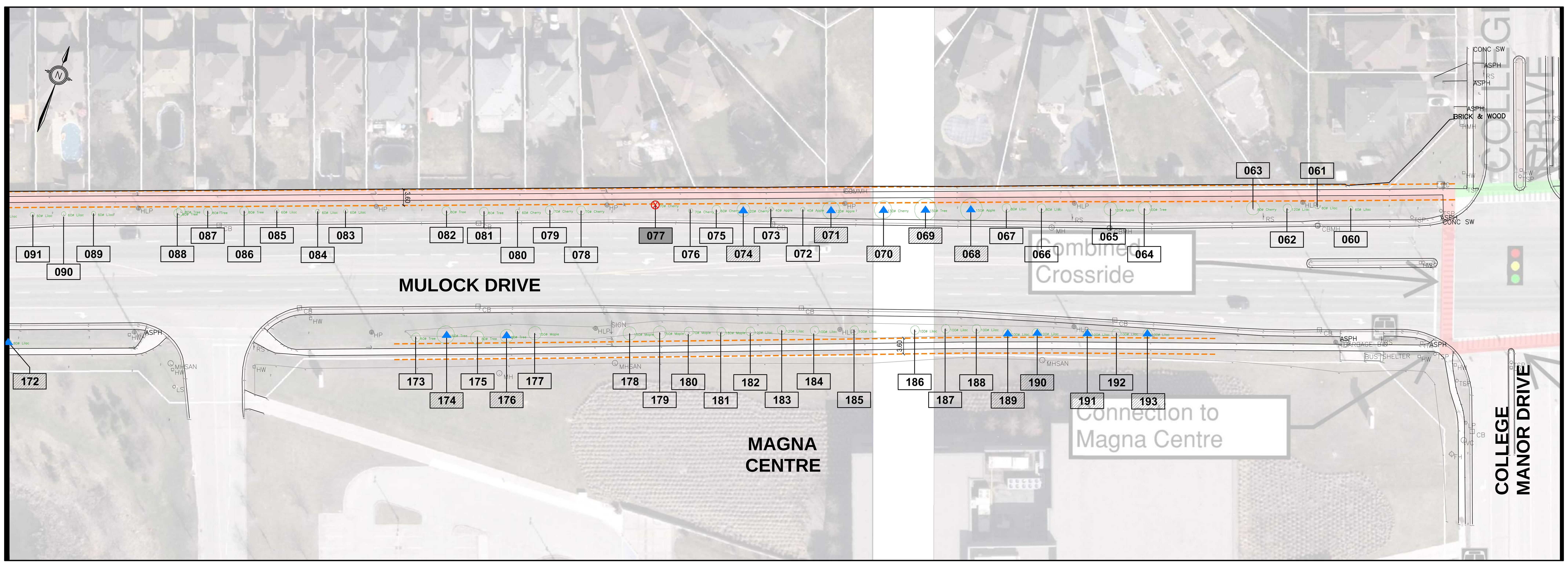


MATCHLINE - REFER TO SHEET TP-7B

TP-7A

MATCHLINE - REFER TO SHEET TP-7A



MATCHLINE - REFER TO SHEET TP-8

TP-7B

KEY MAP

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DRAWING NUMBER	SHEET NUMBER
211-00396-00-LA	TP-7

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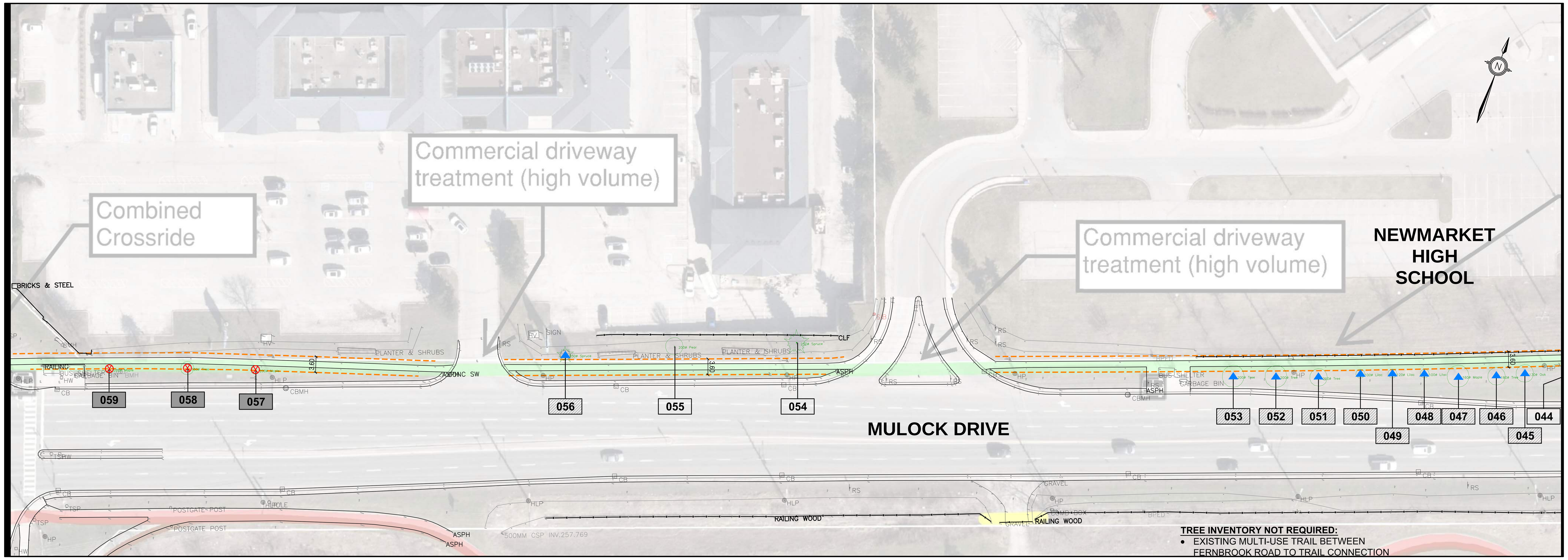
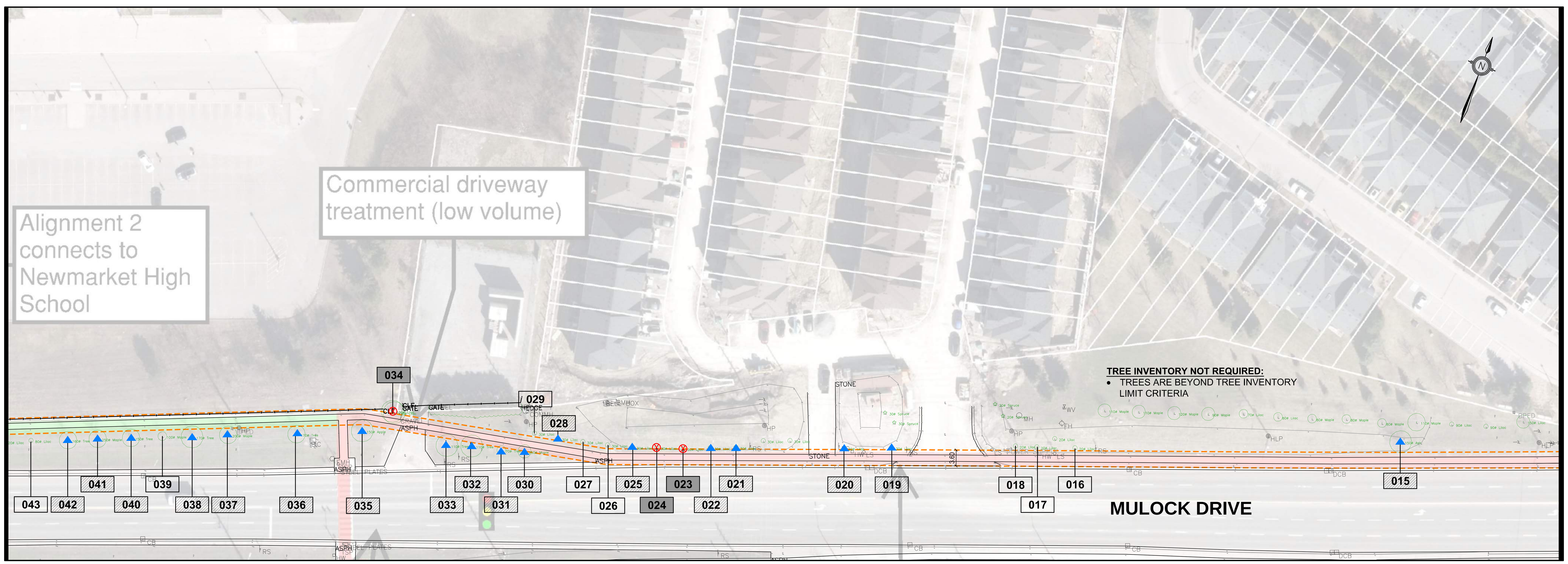


TP-8A



TP-8B

KEY MAP

LEGEND:

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T-? IDENTIFICATION NUMBER FOR EXISTING TREE TO BE REMOVED DUE TO CONSTRUCTION

TREE REMOVAL SYMBOL. TREE TO BE REMOVED

TREE INJURY SYMBOL. MITIGATION RECOMMENDED DURING CONSTRUCTION AND MONITORING POST CONSTRUCTION. REFER TO NOTES ON SHEET TP-10

APPOXIMATE LIMIT OF CONSTRUCTION - 3.6m

LIMIT OF ENCROACHMENT
REMOVAL OF TREES IS RECOMMENDED WHERE THE LIMIT OF CONSTRUCTION ENCROACHES INTO THIS ZONE:
- Diameter of trunk x 5 = Encroachment Zone (50cm diameter x 5 = 2.5m Zone)

No.	REVISIONS	BY	DATE	APPR.
1	FEASABILITY STUDY SUBMISSION	PM	2021.03.31	–

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT
TOWN OF NEWMARKET

MUNICIPALITY
NEWMARKET

PROJECT TITLE
MULOCK DRIVE MULTI-USE TRAIL FEASABILITY STUDY

SHEET TITLE
TREE PRESERVATION PLAN

wsp
100 Commerce Valley Dr. West
Thornhill, Ont. L3T 0A1
Tel (905) 882-1100
Fax (905) 882-0055
www.mmm.ca

Peter McNamara
PETER McNAMARA, BA
ISA Certified Arborist ON-1140A

DESIGNED	DRAWN	CHECKED
AK	PM	LSN

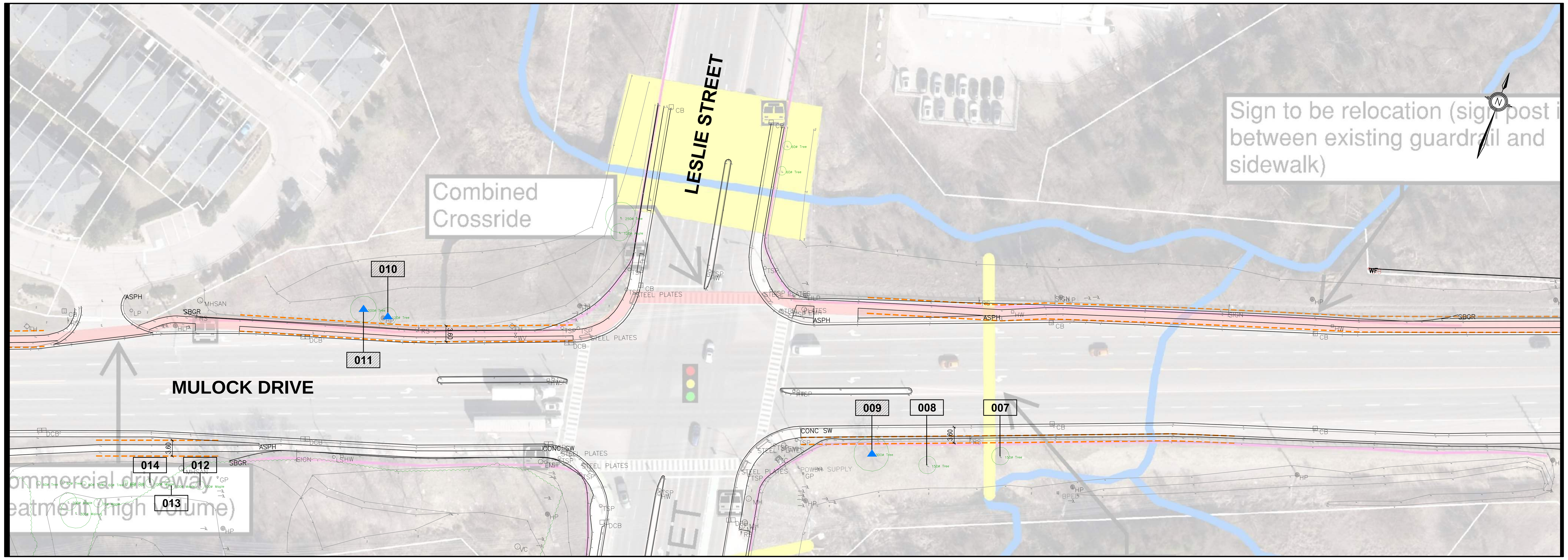
SCALE 1 : 500

DATE MARCH 2021

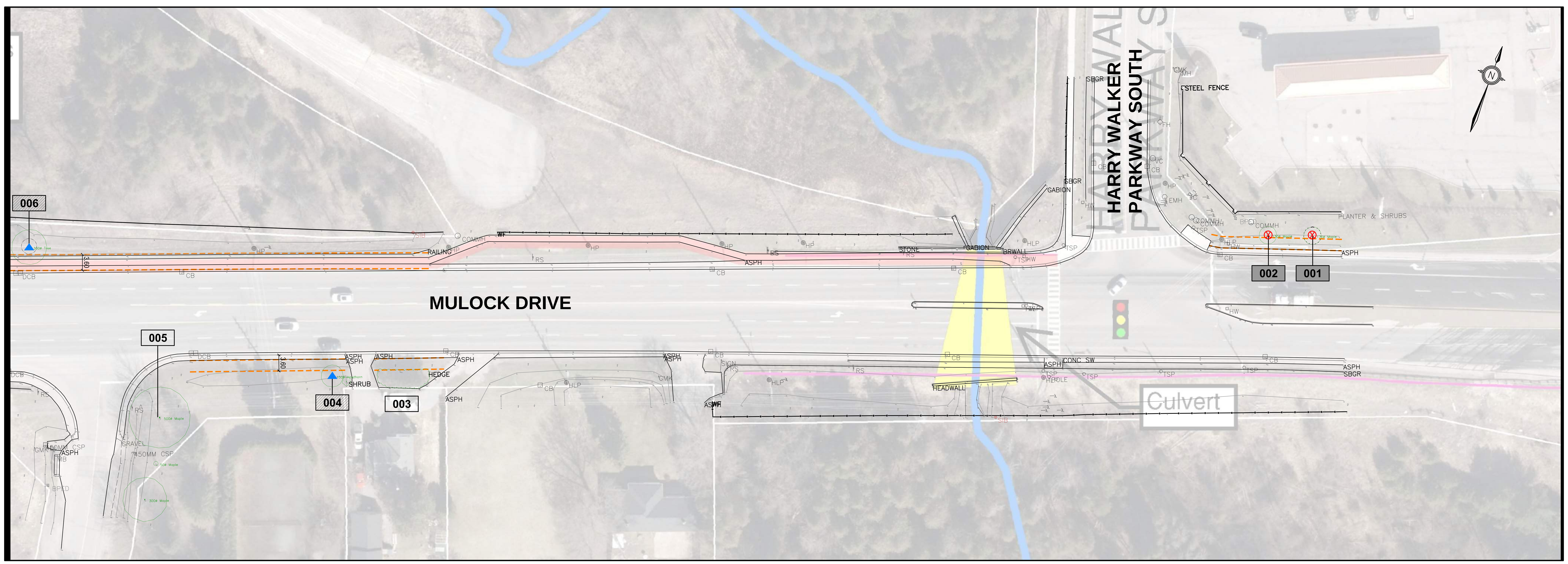
DRAWING NUMBER 211-00396-00-LA

SHEET NUMBER TP-8

KEY MAP



TP-9A



TP-9B

LEGEND:

- PROPERTY LINE
- EXISTING INDIVIDUAL TREE (SURVEYED)
- EXISTING INDIVIDUAL TREE (NOT SURVEYED) LOCATIONS ARE APPROXIMATE.
- EXISTING TREE GROUPING
- T-? IDENTIFICATION NUMBER FOR EXISTING TREE TO BE PRESERVED
- T-? IDENTIFICATION NUMBER FOR TREE THAT WILL BE INJURED. MITIGATION RECOMMENDED DURING CONSTRUCTION AND MONITORING POST CONSTRUCTION. REFER TO NOTES ON SHEET TP-10
- T-? IDENTIFICATION NUMBER FOR EXISTING TREE TO BE REMOVED DUE TO CONSTRUCTION
- TREE REMOVAL SYMBOL. TREE TO BE REMOVED
- TREE INJURY SYMBOL. MITIGATION RECOMMENDED DURING CONSTRUCTION AND MONITORING POST CONSTRUCTION. REFER TO NOTES ON SHEET TP-10
- APPOXIMATE LIMIT OF CONSTRUCTION - 3.6m
- LIMIT OF ENCROACHMENT
  REMOVAL OF TREES IS RECOMMENDED WHERE THE LIMIT OF CONSTRUCTION ENCROACHES INTO THIS ZONE:
  • Diameter of trunk x 5 = Encroachment Zone (50cm diameter x 5 = 2.5m Zone)

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1 : 500	MARCH 2021

DRAWING NUMBER	SHEET NUMBER
211-00396-00-LA	TP-9

GENERAL TREE PRESERVATION NOTES AND GUIDELINES

TREE PRESERVATION AND PROTECTION RECOMMENDATIONS:

THE SURVIVAL RATES FOR TREES, WHICH ARE IN PROXIMITY TO CONSTRUCTION SITES ARE DEPENDENT ON THE RESULTANT CHANGES TO A VARIETY OF ENVIRONMENTAL AND ANTHROPOGENIC FACTORS. THESE CONSTRUCTION ACTIVITIES BRING ABOUT CHANGES TO A VARIETY OF ENVIRONMENTAL FEATURES INCLUDING THE EXISTING MICROCLIMATE INCLUDING WINDS, TEMPERATURE, SOIL MOISTURE, AMOUNT OF AVAILABLE SUNLIGHT, SOIL QUALITY, AND THE LEVEL OF THE WATER TABLE. INCREASED HUMAN ACTIVITIES MAY ALSO DAMAGE THE STRUCTURE AND / OR PHYSIOLOGICAL ACTIVITIES OF THE TREES. THE FULL EFFECTS OF THE DAMAGE MAY NOT APPEAR UNTIL SEVERAL YEARS AFTER ITS OCCURRENCE. THUS, IT IS ESSENTIAL THAT BOTH VEGETATIVE CLEARING AND PRESERVATION METHODS FOLLOW THE GUIDELINES BELOW AND THOSE GENERALLY ACCEPTED AS KEEPING WITH GOOD HORTICULTURAL AND CONSTRUCTION PRACTICES. THE GUIDELINES ARE SUBJECT TO ADJUSTMENTS DEEMED REASONABLE AND APPROPRIATE CONSIDERING THE PROXIMITY AND NUMBER OF TREES INVOLVED AND THE SITE-SPECIFIC SERVICING REQUIREMENT.

GENERAL RECOMMENDATIONS:

- ALL TREES WITHIN THE TREE PRESERVATION ZONE MUST BE LEFT STANDING. THE TREE REMOVALS MUST BE COORDINATED TO BE COMPLETED OUTSIDE OF THE BIRD NESTING SEASON, **APPROXIMATELY FROM THE END OF MARCH TO THE END OF AUGUST**.
- ALL REMOVALS MUST BE FELLED INTO THE WORK AREA TO ENSURE THAT DAMAGE DOES NOT OCCUR TO THE TREES WITHIN THE TREE PRESERVATION ZONE.
- UPON COMPLETING OF THE TREE REMOVALS, ALL FELLED TREES ARE TO BE CHIPPED , UNLESS OTHERWISE ADVISED BY THE CONSULTING CERTIFIED ARBORIST. THIS WORK MUST BE COMPLETED OUTSIDE OF THE BIRD NESTING SEASON, **APPROXIMATELY FROM THE END OF MARCH TO THE END OF AUGUST.**
- TREE PROTECTION FENCING / SILT FENCE MUST BE INSTALLED AS PER THE CITY OF VAUGHAN AND REGION OF YORK DETAILS AS SHOWN ON THE TREE PRESERVATION PLAN. UPON INSTALLATION OF THE FENCING, THE CONTRACTOR WILL CONTACT THE CONSULTING ARBORIST TO REVIEW AND APPROVE THE FENCING AND ITS LOCATION PRIOR TO COMMENCEMENT OF ANY GRADING WORK.
- AREAS WITHIN THE TREE PRESERVATION ZONE ARE NOT TO BE USED FOR ANY TYPE OF STORAGE (E.G. STORAGE OF DEBRIS, CONSTRUCTION MATERIAL, SURPLUS SOILS, AND CONSTRUCTION EQUIPMENT). NO TRENCHING OR TUNNELLING FOR UNDERGROUND SERVICES SHALL BE LOCATED WITHIN THE TREE PROTECTION ZONE OR DRIPLINE OF TREES DESIGNATED FOR PRESERVATION WITHIN OR ADJACENT TO THE CONSTRUCTION ZONE.

TREE INJURY:

TYPICALLY TREE ROOTS EXTEND 1.5 TO 3 TIMES BEYOND THE DRIPLINE OF THE TREE AND ARE WITHIN THE TOP 150mm OF THE SOIL. TYPES OF DAMAGE FROM CONSTRUCTION INCLUDE:

- PHYSICAL INJURY
- SOIL COMPACTION
- SEVERING OF ROOTS
- SMOTHERING OF ROOTS
- SPLIT OR BROKEN BRANCHES
- EXCESSIVE PRUNING

SOIL COMPACTION REDUCES PORE SPACE, OXYGEN AVAILABLE TO ROOTS INCREASES CARBON DIOXIDE ACCUMULATION, RESTRICTS ROOT GROWTH AND THE ABILITY TO ABSORB WATER AND NUTRIENTS, AS WELL AS IMPAIRS DRAINAGE.
SMOTHERING OF ROOTS: 90% OF FINE ABSORBING ROOTS ARE WITHIN THE UPPER 150-300mm OF THE SOIL. SMOTHERING WITH THE ADDITION OF SOIL CAN KILL THE ROOTS AND STRESS THE TREE.
PHYSICAL INJURY, SPLIT OR BROKEN BRANCHES HINDER THE TREES ABILITY TO COMPARTMENTALIZE (CLOSE) WOUNDS PROPERLY.

ROOT PRUNING PRACTICES:

- DURING EXCAVATION OPERATIONS IN WHICH THE ROOT AREA IS AFFECTED, THE CONTRACTOR IS TO PRUNE ALL EXPOSED ROOTS CLEANLY. PRUNED ROOT ENDS ARE TO BE NEATLY AND SQUARELY TRIMMED AND THE AREA IS TO BE BACKFILLED WITH CLEAN NATIVE FILL AS SOON AS POSSIBLE TO PREVENT DESICCATION AND PROMOTE ROOT GROWTH. THE EXPOSED ROOTS SHOULD NOT BE ALLOWED TO DRY OUT, AND THE CONTRACTOR SHALL DISCUSS WATERING OF THE ROOTS WITH THE CONSULTING ARBORIST SO THAT THE ROOTS SHALL MAINTAIN OPTIMUM SOIL MOISTURE DURING CONSTRUCTION AND BACKFILLING OPERATIONS, YET SO NOT TO INTERFERE WITH CONSTRUCTION OPERATIONS. BACKFILLING MUST BE WITH CLEAN UNCONTAMINATED TOPSOIL FROM AN APPROVED SOURCE. TEXTURE MUST BE COARSER THAN EXISTING SOILS, AND TO COME INTO CLEAN CONTACT WITH EXISTING SOILS (REMOVE AIR POCKETS, SOD, ETC.)
- TREE ROOTS SHOULD NOT BE EXCAVATED WITHIN THE CRITICAL STRUCTURAL ROOTING AREA. THIS IS THE MINIMUM AREA OF THE ROOT SYSTEM NECESSARY TO MAINTAIN VITALITY OR STABILITY OF THE TREE. TYPICALLY THIS AREA EXTENDS TO THE DRIPLINE OF THE TREE. THE SEVERING OF ONE ROOT CAN CAUSE APPROXIMATELY 5-20% LOSS OF THE ROOT SYSTEM. A REDUCTION OF THIS AREA BY GREATER THAN 30% CAN POSE STABILITY CONCERNS FOR THE TREE.
- A SLOW RELEASE FERTILIZER EG: BONE MEAL OR APPROVED EQUAL TO BE APPLIED TO TREES WHERE ROOT PRUNING OR ROOT DAMAGE HAS OCCURRED. APPLY PER MANUFACTURER'S RECOMMENDATIONS
- ROOTS OVER 2.5cm DIAMETER THAT ARE TO BE CUT SHOULD BE PRUNED RATHER THAN LEFT TORN OR CRUSHED
- AT THE COMMENCEMENT OF CONSTRUCTION PRUNE ROOTS CLEANLY USING ACCEPTABLE ARBORICULTURAL PRACTICES AND IMMEDIATELY BACKFILL WITH APPROPRIATE MATERIAL. THE FOLLOWING ARE GENERAL METHODS OF ROOT PRUNING TO TO UTILIZED WHEN GRADING / CONSTRUCTION WILL OCCUR WITHIN THE DRIPLINE OF TREES:
    1. SOIL EXCAVATION USING SUPERSONIC AIR TOOLS, PRESSURIZED WATER OR HAND TOOLS, FOLLOWED BY SELECTIVE ROOT CUTTING
    2. CUTTING THROUGH THE SOIL ALONG A PREDETERMINED LINE ON THE SURFACE USING TOOL SPECIFICALLY DESIGNED TO CUT ROOTS
    3. MECHANICALLY EXCAVATING (e.g. BACKHOE) THE SOIL AND PRUNING WHAT IS LEFT OF THE EXPOSED ROOTS.
    4. CUTS TO BE MADE WITH HAND PRUNING SHEARS, BY-PASS BLADE, PRUNING SAW. DO NOT USE ANVIL TYPE PRUNERS.

BRANCH PRUNING PRACTICES:

- ALL LIMBS DAMAGED OR BROKEN DURING THE COURSE OF CONSTRUCTION SHOULD BE PRUNED CLEANLY, UTILIZING BY-PASS SECATEURS IN ACCORDANCE WITH APPROVED HORTICULTURAL PRACTICES. SHOULD THERE BE A POTENTIAL RISK OF TRANSFER OF DISEASE FROM INFECTED TO NON-INFECTED TREES; TOOLS MUST BE DISINFECTED AFTER PRUNING EACH TREE BY DIPPING IN METHYL HYDRATE. THIS PRACTICE IS PARTICULARLY IMPORTANT DURING PERIODS OF TREE STRESS AND WHEN PRUNING MANY MEMBERS OF THE SAME GENERA, WITHIN WHICH A DISEASE COULD BE SPREAD QUICKLY (I.E., VERTICILLIUM WILT ON MAPLES OR FIRE BLIGHT ON GENERA OF THE ROSACEA FAMILY).
- ALL PRUNING CUTS SHOULD BE MADE TO A GROWING POINT SUCH AS A BUD, TWIG OR BRANCH, CUT JUST OUTSIDE THE BRANCH COLLAR (THE SWOLLEN AREA AT THE BASE OF THE BRANCH THAT SOMETIMES HAS A BARK RIDGE), AND PERPENDICULAR TO THE BRANCH BEING PRUNED RATHER THAN AS CLOSE TO THE TRUNK AS POSSIBLE. THIS MINIMIZES THE SITE OF THE WOUND. NO STUBS SHOULD BE LEFT. POOR CUT LOCATION, POOR CUT ANGLE AND TORN CUTS ARE NOT ACCEPTABLE.
- EXTENSIVE PRUNING IS BEST COMPLETED BEFORE PLANTS BREAK DORMANCY. PRUNING SHOULD BE LIMITED TO THE REMOVAL OF NO MORE THAN ONE THIRD (1/3) OF THE TOTAL BUD AND LEAF BEARING BRANCHES. PRUNING SHOULD INCLUDE THE CAREFUL REMOVAL OF
  DEADWOOD,
  BRANCHES THAT ARE WEAK, DAMAGED, DISEASED AND THOSE WHICH WILL INTERFERE WITH CONSTRUCTION ACTIVITY,
  SECONDARY LEADERS OF CONIFERS,
  TRUNK AND ROOT SUCKERS,
  TRUNK WATERSPOUTS, AND
  TIGHT V-SHAPED OR WEAK CROTCHES (INCLUDED UNIONS).
- THE CONTRACTOR MUST IMMEDIATELY REPORT ANY DAMAGE TO TREES SUCH AS BROKEN LIMBS, DAMAGE TO ROOTS, OR WOUNDS TO THE MAIN TRUNK OR STEM SYSTEMS SO THAT THE DAMAGE CAN BE ASSESSED IMMEDIATELY.
- THE TREE PROTECTION FENCING WILL BE MAINTAINED UNTIL ALL CONSTRUCTION IS COMPLETED, SOILS ARE STABILIZED AND ALL OF THE EQUIPMENT HAS BEEN REMOVED FROM THE SITE.
- ANY BRANCHES THAT OVERHANG THE WORK AREA AND REQUIRE PRUNING ARE TO BE PRUNED USING GOOD ARBORICULTURAL PRACTICES UTILIZING BY-PASS SECATEURS IN ACCORDANCE WITH APPROVED HORTICULTURAL PRACTICES AND/OR AMERICAN NATIONAL STANDARD (ANSI) A300 (PART 1) - 2008 PRUNING

UNDERGROUND SERVICING AND UTILITIES:

- PRIOR TO ANY EXCAVATION, TREE REMOVAL, OR TREE PLANTING, CONTRACTOR SHALL PROVIDE UTILITY STAKE-OUT. ANY DAMAGE TO UTILITIES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR FOR ALL REPAIRS AND ASSOCIATED COSTS.
- CONTRACTOR TO MAKE GOOD ALL DISTURBED AREAS.

TREE IMPACT / REMOVAL / PRESERVATION ASSUMPTIONS

ASSUMPTIONS:

ASSESSMENTS OF TREE INJURY, REMOVAL AND PRESERVATION WERE BASED ON SEVERAL CRITERIA.

TREE INJURY
- WHERE CONSTRUCTION, EXCAVATION, GRADING OR USE OF EQUIPMENT AND VEHICLES WILL OCCUR WITHIN THE DRIPLINE AND ROOT ZONE OF EXISTING TREES THE POTENTIAL EXISTS FOR INJURY TO TREES THROUGH BROKEN BRANCHES, PRUNING, DAMAGE TO AND COMPACTION OF ROOTS
- ANY ENCROACHMENT INTO THE DRIPLINE WILL BE CONSIDERED AN INJURY.
- TREE INJURY IS RECOMMENDED TO BE MITIGATED BY MEASURES ENACTED DURING CONSTRUCTION AND MEASURES ENACTED POST CONSTRUCTION. REFER TO NOTES ON THIS SHEET

REMOVAL
- REMOVAL IS BASED ON THE DEGREE OF EXCAVATION / DISTURBANCE WITHIN DRIPLINE AND CRITICAL ROOT ZONE. THE FOLLOWING ASSUMPTION HAS BEEN USED TO DETERMINE WHETHER A TREE REQUIRES REMOVAL WHICH IS BASED ON THE AMOUNT OF DISTURBANCE WITHIN THE CRITICAL ROOT ZONE THAT COULD RESULT IN THE DECLINE OR MORTALITY OF THE TREE
- DIAMETER OF THE TREE X 5 = ENCROACHMENT ZONE
    - (E.G. 50cm x 5 = 2.5m ENCROACHMENT ZONE)
- ANY ENCROACHMENT FROM CONSTRUCTION ACTIVITIES INTO THIS ZONE WOULD RESULT IN THE RECOMMENDATION THAT THE TREE BE REMOVED.

PRESERVATION
- TREE PRESERVATION IS CONSIDERED WHERE THERE IS NO ENCROACHMENT INTO THE DRIPLINE OR ENCROACHMENT ZONE

LIMIT OF CONSTRUCTION
- LIMIT OF CONSTRUCTION IS ANTICIPATED TO BE 3.6m WIDTH

TREE INJURY MITIGATION AND POST CONSTRUCTION MONITORING

TREE INJURY:

- WHERE CONSTRUCTION, EXCAVATION, GRADING OR USE OF EQUIPMENT AND VEHICLES WILL OCCUR WITHIN THE DRIPLINE AND ROOT ZONE OF EXISTING TREES THE POTENTIAL EXISTS FOR INJURY TO TREES THROUGH BROKEN BRANCHES, PRUNING, DAMAGE TO AND COMPACTION OF ROOTS.
- THE FOLLOWING MITIGATION MEASURES ARE RECOMMENDED TO BE IMPLEMENTED DURING CONSTRUCTION. MITIGATION MEASURES ARE NOT LIMITED TO THE MEASURES NOTED ON THIS SHEET. ADDITONAL MEASURES MAY BE REQUIRED SHOULD THE PROJECT PROCEED TO DETAILED DESIGN.

HORIZONTAL ROOT PROTECTION

TO BE UTILIZED IN AREAS WHERE ENCROACHMENTS INTO THE DRIPLINE AND OR ENCROACHMENT ZONE WILL OCCUR. THE FOLLOWING ARE GENERAL RECOMMENDATIONS ON THE IMPLEMENTATION OF THIS MEASURE:
- PLACE LAYER OF NON-WOVEN GEO-TEXTILE MATERIAL ON TOP OF SOD;
- PLACE 30CM DEPTH WOOD CHIP MULCH ON TOP OF GEO-TEXTILE. WHERE REQUIRED PLACE 4X4 TIMBERS TO HOLD MULCH IN PLACE;
- PLACE 4'X8' PLYWOOD BOARDS (MINIMUM ¾" THICK) LENGTH WISE WITHIN THE TPZ BETWEEN THE TRUNK AND LIMIT OF EXCAVATION ON TOP OF MULCH;
- FIELD FIT IF NECESSARY. BOARD WIDTH AND LENGTH MAY VARY DEPENDING ON AVAILABLE SPACE;
- INSTALL TREE PROTECTION HOARDING AROUND ROOT PROTECTION AREA;
- UPON COMPLETION, REMOVE BOARDS AND SPREAD MULCH IN A 1M DIAMETER AROUND THE TRUNK TO A DEPTH OF 5CM AND REINSTATE TREE PROTECTION FENCING TO ORIGINAL LOCATION;
- APPLICATION TO BE REVIEWED AND APPROVED BY THE CONTRACT ADMINISTRATOR PRIOR TO INSTALLATION;
- RESTORE DISTURBED AREAS.

AIR-SPADE / HYDRO-VACUUMM EXCAVATION

WHERE CONSTRUCTION WILL OCCUR WITHIN THE DRIPLINE AND / OR ENCROACHMENT ZONE THIS MEASURE IS RECOMMENDED. THE FOLLOWING ARE GENERAL RECOMMENDATIONS ON THE IMPLEMENTATION OF THIS MEASURE:
- APPLY THIS MEASURE TO EXPOSE ROOTS SO THAT THEY CAN BE PRUNED. THE PRUNING OF ROOTS PRIOR TO CONSTRUCTION WILL ALLOW ROOTS TO SPROUT NEW ROOTS FROM CUT ROOT ENDS ONCE SOIL HAS BEEN BACKFILLED;
- AIR-SPADE / HYDRO-VACUUM EXCAVATE ON THE OUTSIDE OF THE TPZ AND ALONG THE LIMIT OF EXCAVATION ON THE WEST SIDE OF THE TREE (AS SHOWN ON PLAN). APPLY AT A WIDTH OF 0.5m AND EXCAVATE TO A DEPTH OF 0.3m ALONG THE LENGTH OF THE TREE PROTECTION ZONE;
- ENSURE THAT THE PRESSURE USED FROM THE AIR-SPADE / HYDRO-VACUUM IS SUCH THAT IT WILL NOT DAMAGE ROOTS DURING EXCAVATION;
- PRUNE ROOTS IN ACCORDANCE WITH NOTES ON SHEET TP-14 OR UNDER THE SUPERVISION OF A CERTIFIED ARBORIST.
- BACKFILL WITH EXCAVATED MATERIAL OR BETTER, IMMEDIATELY AFTER COMPLETION OF EXCAVATION AND ROOT PRUNING, TO PROTECT ROOTS FROM DRYING OUT;
- WATER TREES PERIODICALLY DURING CONSTRUCTION;
- AT THE COMPLETION OF CONSTRUCTION, RESTORE DISTURBED AREAS WITH A LAYER OF 75mm SHREDDED BARK MULCH IN A 2m RADIUS AROUND THE AFFECTED TREES (MAY VARY DEPENDING ON TREE LOCATION).

MITIGATION MEASURES WITHIN THE DRIPLINE

THE FOLLOWING STEPS ARE RECOMMENDED WHERE CONSTRUCTION ACTIVITY WILL OCCUR WITHIN THE DRIPLINE:

1. APPLY 150-300mm MULCH OR 150mm MULCH + ROAD MASTS ON ALL AREAS OF POTENTIAL COMPACTION (FOOT/VEHICLE TRAFFIC). SEE NOTES FOR 'WORK WITHIN A TREE PROTECTION ZONE' BELOW FOR ADDITIONAL GUIDELINES FOR WORKING WITHIN THE DRIPLINE.
2. PRUNE ALL DAMAGED ROOTS WITHIN EXCAVATION ZONE NEATLY AND SQUARELY WITH SHARP DISINFECTED BLADES. SEE 'ROOT PRUNING PRACTICES' ON THIS SHEET.
3. PRUNE DAMAGED LIMBS WITH SHARP DISINFECTED BLADES. SEE 'BRANCH PRUNING PRACTICES' ON THIS SHEET.
4. WATER AFFECTED TREES TO FIELD CAPACITY WITHIN THE ENTIRE DRIPLINE BI-WEEKLY FROM JUNE 1ST TO SEPTEMBER 15TH.
5. NEVER STORE EQUIPMENT / MATERIALS WITHIN A TREE PROTECTION ZONE. SEE 'TREE PROTECTION ZONE' SECTION ON THIS SHEET.
6. CONTRACTOR TO ADHERE TO THE GUIDELINES ON THIS SHEET

POST-CONSTRUCTION MONITORING

- DUE TO CONSTRUCTION ACTIVITIES WITHIN CLOSE PROXIMITY OF THE TRUNKS OF SOME TREES, POST CONSTRUCTION MONITORING WILL BE REQUIRED TO ASSESS TREE HEALTH AND SIGNS OF DECLINE. TREE MAINTENANCE REPORTS WILL BE PREPARED BY A CERTIFIED ARBORIST AND SUBMITTED TO THE CONTRACT ADMINISTRATOR.
- THESE REPORTS WILL COINCIDE WITH THE COMPLETION OF CONSTRUCTION. REPORTS WILL INCLUDE:
    - AN ASSESSMENT OF ALL TREES DAMAGED DURING GRADING AND CONSTRUCTION;
    - PROVIDE REMEDIAL RECOMMENDATIONS FOR ANY DAMAGED TREES THAT ARE TO BE RETAINED USING CURRENT AND ACCEPTED ARBORICULTURAL PRACTICES;
    - TIMING OF REMEDIAL MEASURES; AND,
    - RECOMMENDATION OF FURTHER TREES TO BE REMOVED OR TRANSPLANTED OR REPLACEMENT.

INSPECTION SCHEDULE

- DURING EARTH WORKS: SPRING/EARLY SUMMER (TREES SHOWING SIGNS OF STRONG BUDDING/LEAF-OUT), MID-SUMMER, FALL (WHILE TREES ARE IN LEAF);
- AFTER COMPLETION OF CONSTRUCTION; AND,
- TWO SITE VISITS DURING THE FOLLOWING GROWING SEASON (AFTER TREE LEAF-OUT HAS OCCURRED).

TREE ASSESSMENT REPORT

- FOR A DETAILED DESCRIPTION OF TREE SPECIES, SIZE, CONDITION AND RECOMMENDATIONS REFER TO APPENDIX A: TREE INVENTORY TABLES IN THE TREE ASSESSMENT REPORT PREPARED BY WSP CANADA INC., DATED: APRIL 8, 2021.
- REFER TO THE ARBORIST REPORT FOR SPECIFIC RECOMMENDATIONS, PROTECTIVE AND MITIGATION MEASURES.

KEY MAP

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FILENAME: C:\Users\mcnamarap\OneDrive - WSP O365\Documents\Newmarket - Mulock Drive - Feasability Study\Drawings\Tree Preservation Plans.dwg
PLOTDATE: Apr 08, 2021 - 2:50pm

Appendix D: Virtual PIC Presentation

MULOCK DRIVE MULTI-USE PATH FEASIBILITY STUDY

The Corporation of the Town of Newmarket

VIRTUAL PUBLIC INFORMATION CENTRE

JUNE 10TH, 2021 | 7:00 – 8:00 P.M.

Newmarket

wsp

MULOCK DRIVE MUP CORRIDOR PROJECT

- WSP retained by Town in Winter 2021 to assess the feasibility of a multi-use path along one side of Mulock Drive
- Bathurst Street to Harry Walker Parkway South
- 6.3km in length
- Significant number of commercial driveways (Yonge-Bayview)

GOALS & OBJECTIVES

Connect to key destinations

Navigate constrained segments, grades and utilities

Minimize potential conflicts between users (i.e.: at driveways)

Re-use existing infrastructure

Account for future development along the corridor

Accommodate intersection treatments

Mulock Drive east of Sawmill Valley Drive (WSP)

DESIGN CONSIDERATIONS

Connectivity to Mulock Farms site

Connectivity to existing trails

Grade changes


Mulock Drive at Sawmill Valley Drive (WSP)

Constructability & Cost

Guardrails

Existing utility poles

Add crossride intersection treatments

DESIGN CONSIDERATIONS

Bus stops & bus shelters

Frequency of commercial driveways

Boulevard width

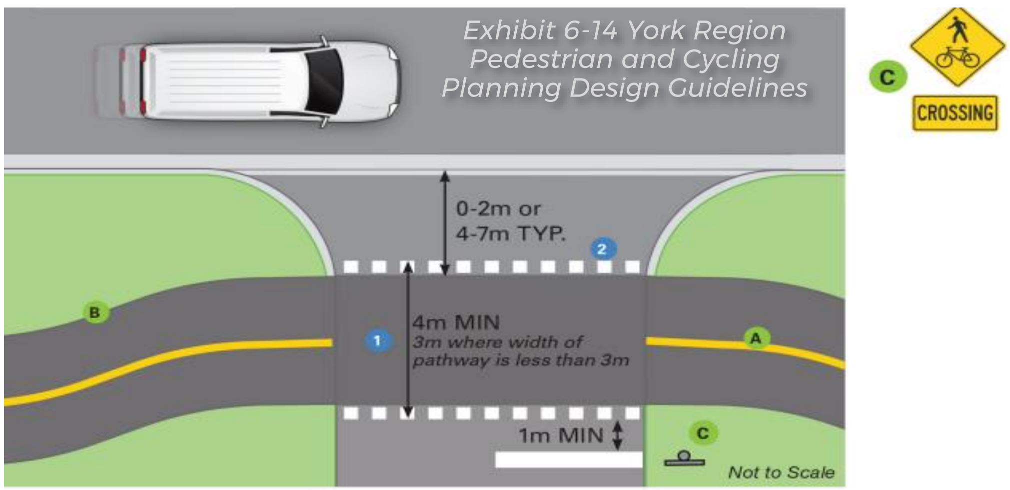
Mulock Drive adjacent to Rourke Place (WSP)

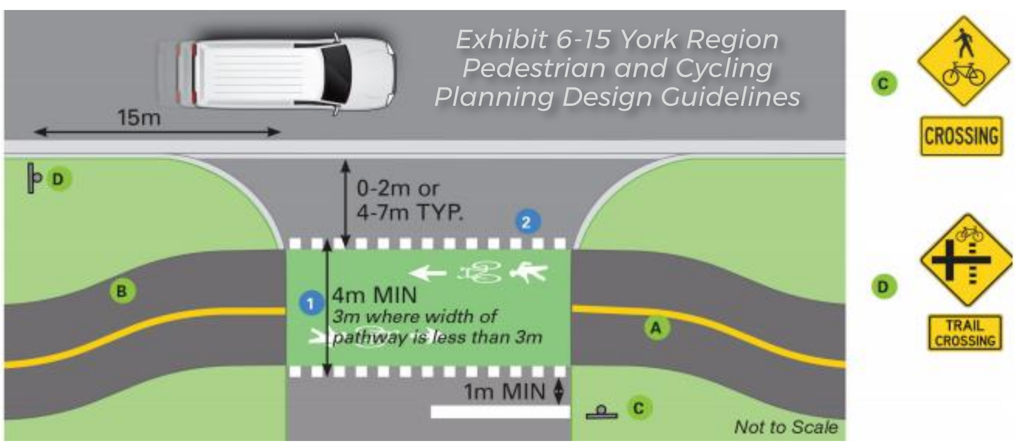
Using existing trails (where feasible)

Proximity to residential populations

Minimizing impacts to mature trees

PROPOSED DRIVEWAY TREATMENTS: MULTI-USE PATHS





Multi-Family Residential

1 & 2: Treatment of "Elephant's Feet" ***must be*** applied across the entire driveway

A & B: Yellow median ***may be*** extended through the driveway and MUP ***may*** approach at a slight bend to enhance safety

C: ***Optional*** advisory "Pedestrian and Bicycle Crossing Ahead Sign'

Commercial/Industrial (or volumes > 100 VPH)

1 & 2: Combined Crosside ***must be*** applied across entire driveway

A & B: Yellow median ***may be*** extended through the driveway and MUP ***may*** approach at a slight bend to enhance safety

C & D: ***Optional*** advisory "Pedestrian and Bicycle Crossing Ahead" and Bicycle Trail Crossing Side Street" signage

- ***Optional*** green paint treatment

EXAMPLE OF CROSSRIDE TREATMENTS: INTERSECTIONS AND DRIVEWAYS

Combined Crossride

Bayview and 19th, Richmond Hill

Combined crossrides are typically used at signalized intersections where pedestrians and cyclists approach the crossing on a shared facility.

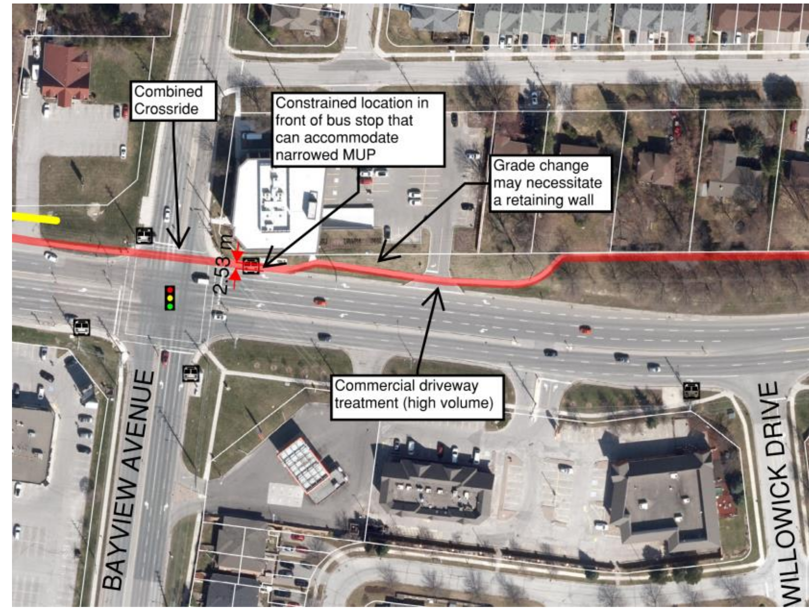
Mixed Crossride

Leslie and 16th, Richmond Hill

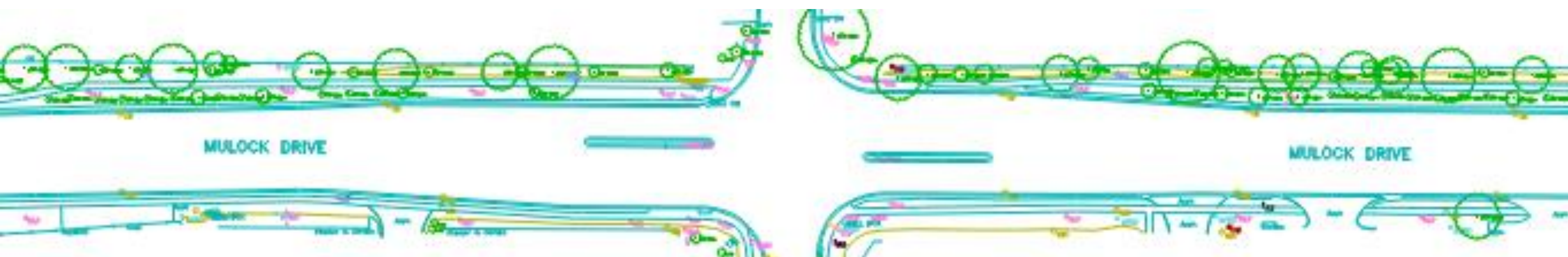
Mixed crossrides are typically used at unsignalized crossings and driveways, where pedestrians and cyclists approach crossing on a shared facility.

WHAT HAS BEEN DONE TO DATE?

- Completed survey of the corridor
- Identified and assessed 3 conceptual alignment options
- Reviewed alignment options with Town and Regional staff
- Inventoried and classified driveways
- Arborist report completed and submitted
- Primary field investigation completed
- Presented to Town Council on May 25th



Snippet from conceptual alignment mark-up drawing (WSP)



Snippet from completed survey of Mulock Drive (WSP)

CORRIDOR WALK-THROUGH

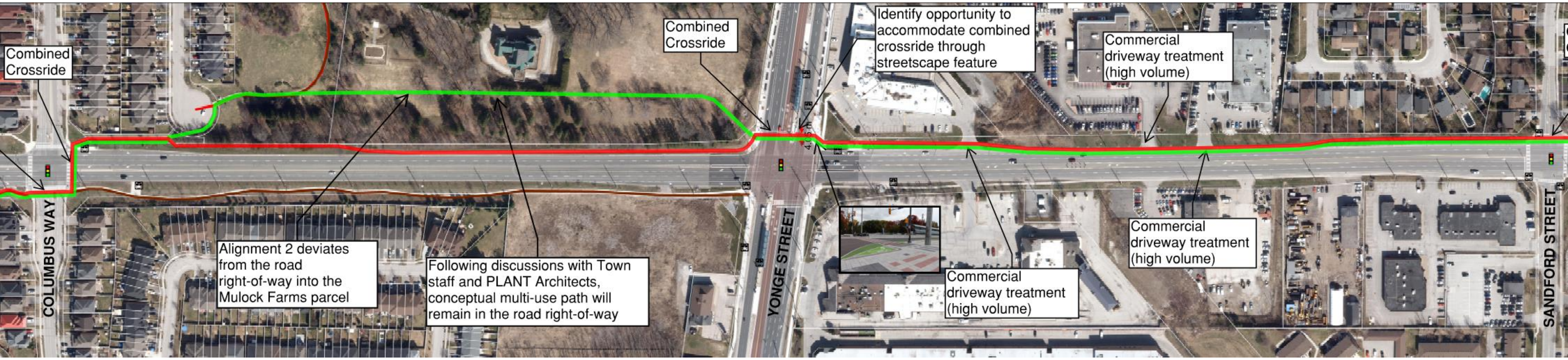
BATHURST STREET - COLUMBUS WAY

Above: Alignment 1 illustrated in red; Alignment 2 illustrated in green

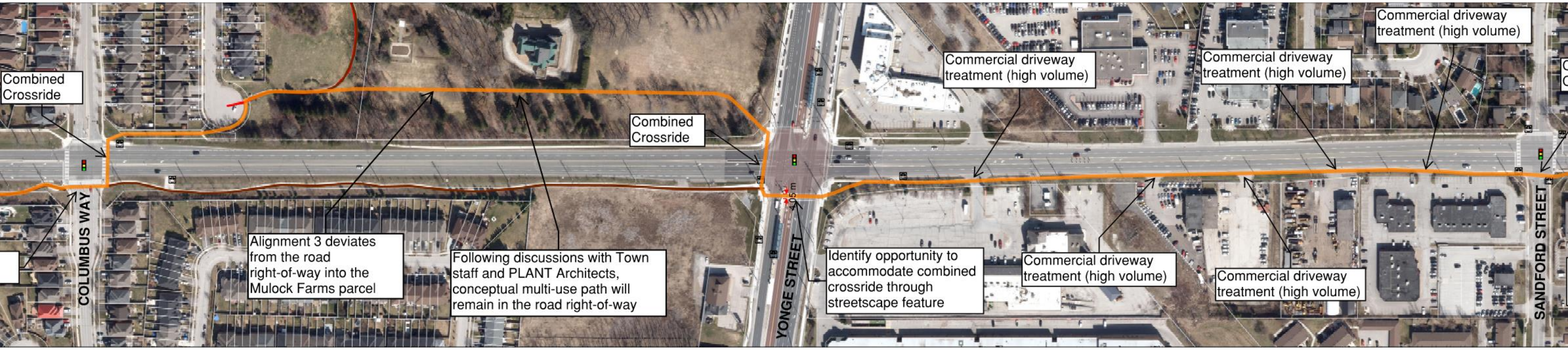
Above: Alignment 3 illustrated in orange

CORRIDOR WALK-THROUGH

COLUMBUS WAY – SANDFORD STREET



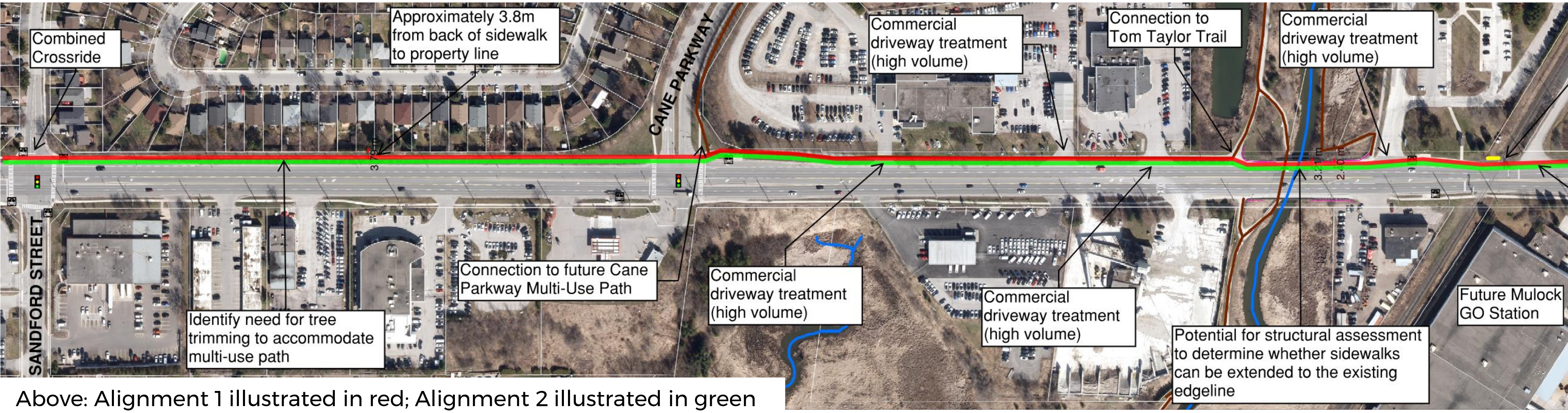
Above: Alignment 1 illustrated in red; Alignment 2 illustrated in green



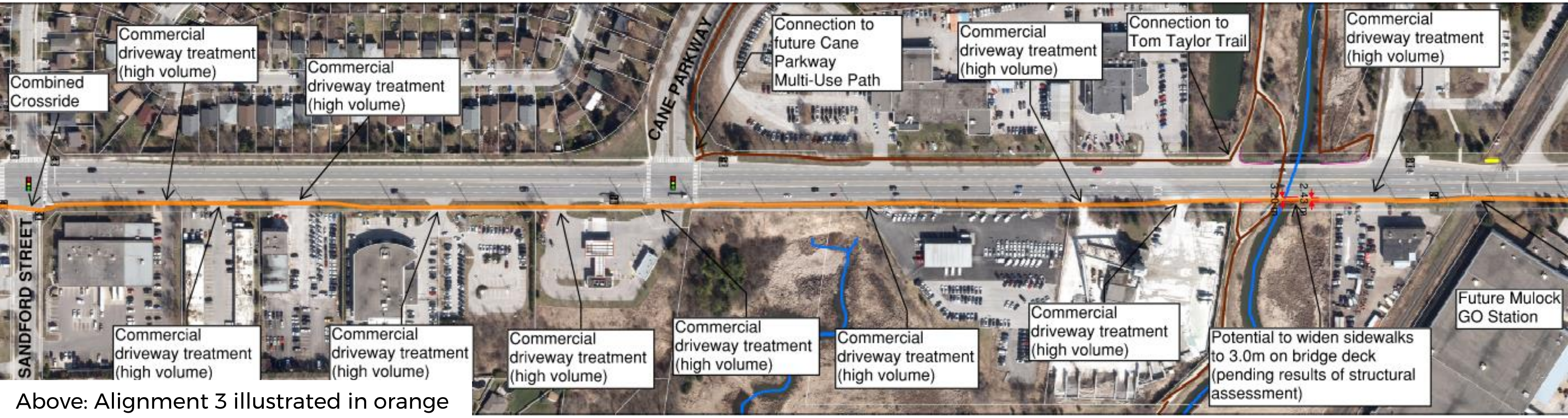
Above: Alignment 3 illustrated in orange

CORRIDOR WALK-THROUGH

SANDFORD STREET – METROLINX RAIL CORRIDOR



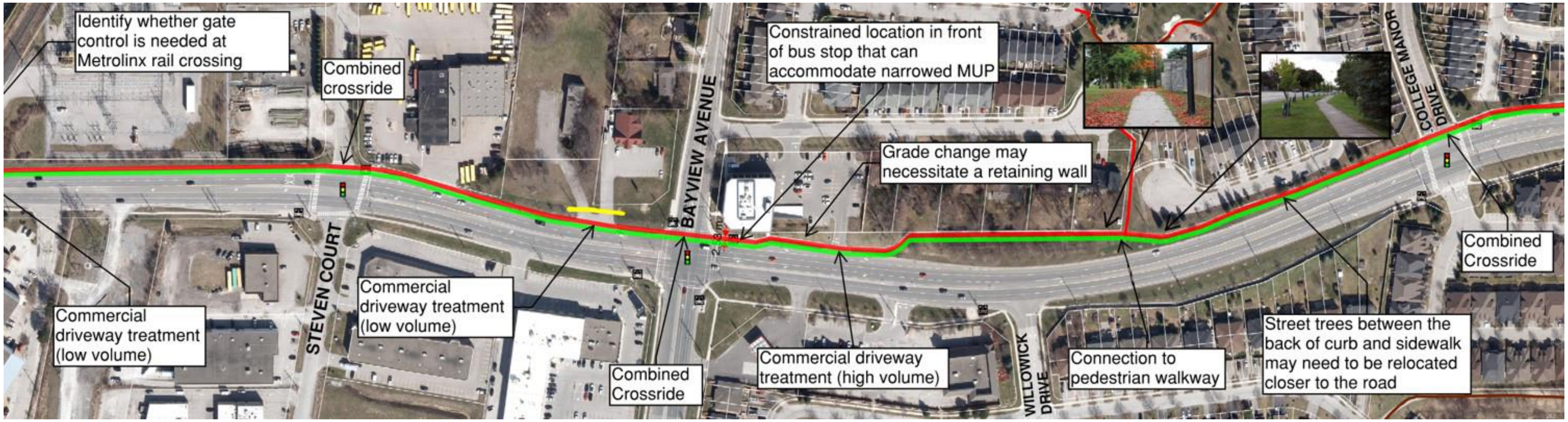
Above: Alignment 1 illustrated in red; Alignment 2 illustrated in green



Above: Alignment 3 illustrated in orange

CORRIDOR WALK-THROUGH

METROLINX RAIL CORRIDOR – COLLEGE MANOR DRIVE

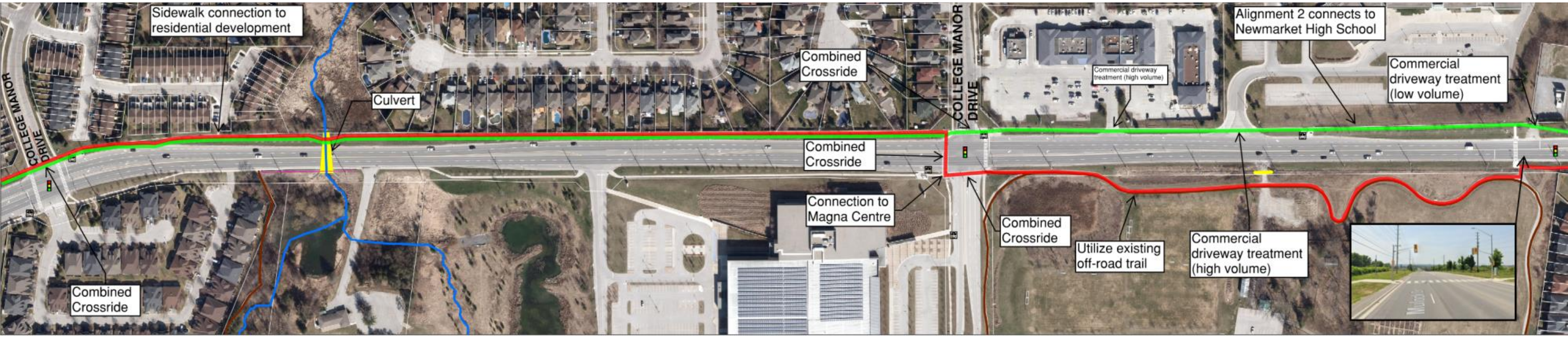


Above: Alignment 1 illustrated in red; Alignment 2 illustrated in green

Above: Alignment 3 illustrated in orange

CORRIDOR WALK-THROUGH

COLLEGE MANOR DRIVE – NEWMARKET HIGH SCHOOL CROSSING

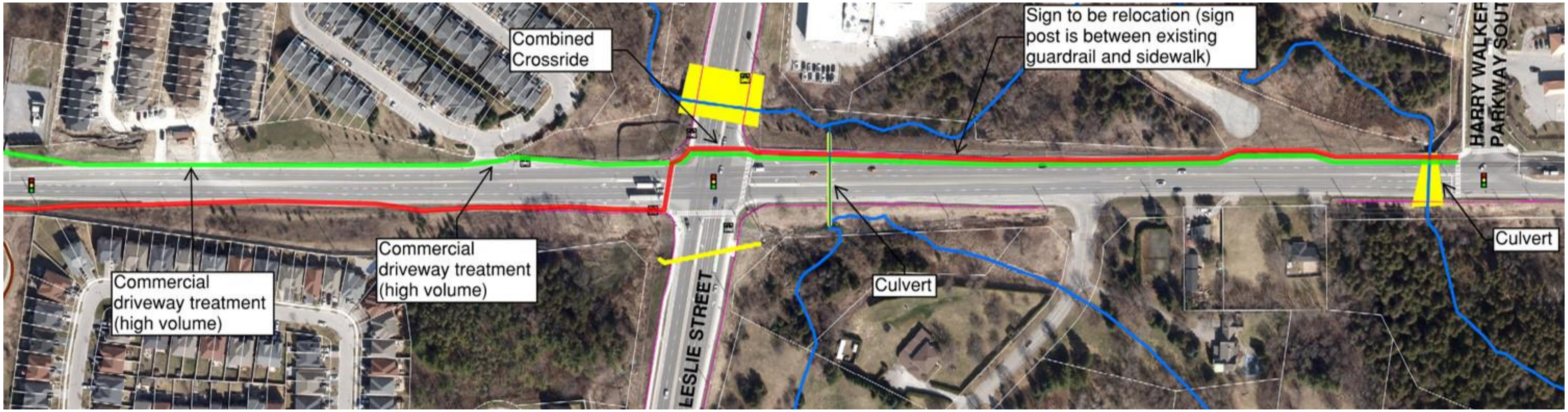


Above: Alignment 1 illustrated in red; Alignment 2 illustrated in green

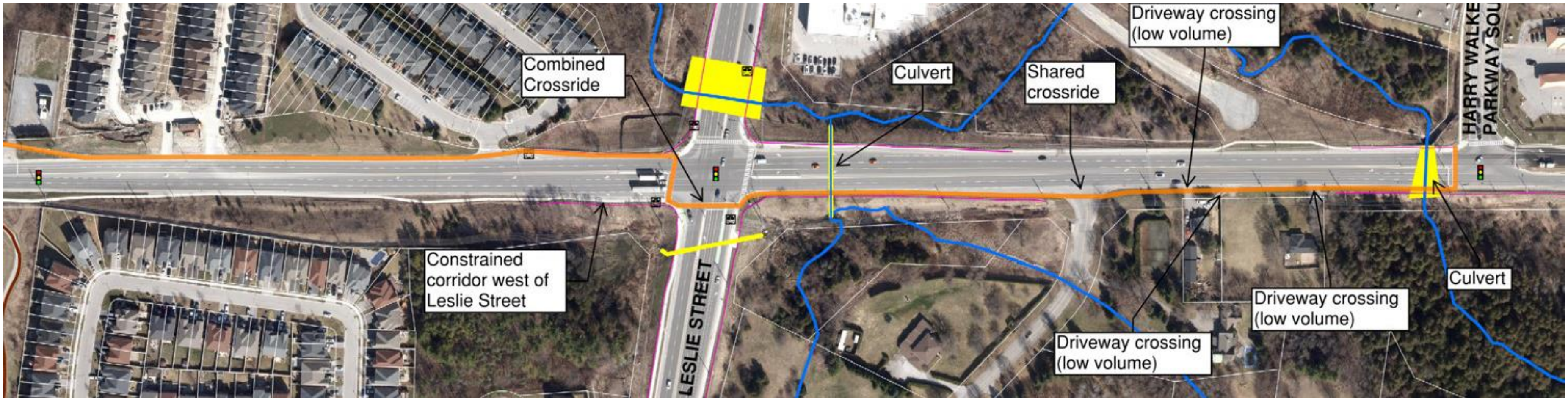
Above: Alignment 3 illustrated in orange

CORRIDOR WALK-THROUGH

NEWMARKET HIGH SCHOOL CROSSING – HARRY WALKER PARKWAY SOUTH



Above: Alignment 1 illustrated in red; Alignment 2 illustrated in green



Above: Alignment 3 illustrated in orange

CORRIDOR EVALUATION CRITERIA

- **Conflict Mitigation** – Conflict mitigation between motorists, cyclists and pedestrians.
- **Constructability & Cost** – Corridor suitability and the level of effort to implement a multi-use path. Assumed cost to construct a multi-use path including impacts to utility poles, guide rails, and fire hydrants along the corridor.
- **Residential Access/Proximity** - Residential neighbourhood access and proximity to the multi-use path along Mulock Drive.
- **Transit Impacts** - Impacts to transit stops, including concrete bus pads, transit shelters, and other amenities found at transit stops.
- **Tree Impacts** - Impacts to trees and potential removal / relocation of existing trees along the corridor to accommodate the multi-use path.
- **Connectivity** - Potential to connect to existing and proposed AT network identified in the Active Transportation Implementation Plan.
- **Destination Access** - Number of destinations and attractions to be accessed by the multi-use path, particularly for youth and seniors.
- **Driveway Frequency** - Frequency and size of driveways that intersect multi-use path.
- **Intersection Frequency** - Frequency of intersections that intersect multi-use path.

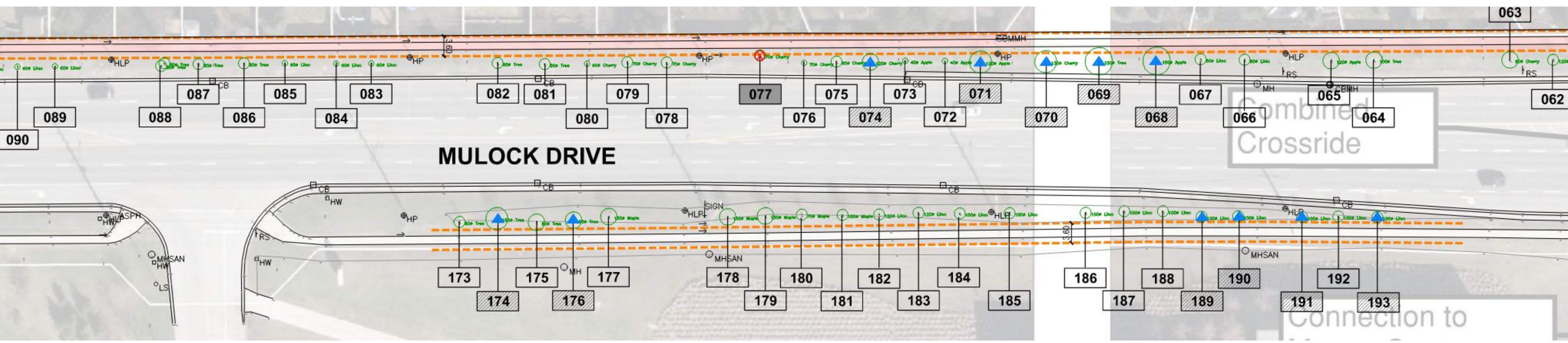
DRAFT CORRIDOR EVALUATION RESULTS

- Alignment option 1 ranked as having the highest score
  - Highest score for conflict mitigation and constructability & cost metrics
- Alignment option 3 ranked as having the lowest score
  - Lowest overall score in the constructability & cost and driveway frequency metrics

CORRIDOR-WIDE	Conflict Mitigation	Constructability & Cost	Residential Access/Proximity	Transit Impacts	Tree Impacts	Connectivity	Destination Access	Driveway Frequency	Intersection Frequency	Total Score	Rank
Alignment Option 1	3	3	3	3	2	3	3	3	3	26	1
Alignment Option 2	2	3	3	3	1	3	3	3	3	24	2
Alignment Option 3	2	2	3	3	2	3	3	2	3	23	3

ARBORIST REVIEW

- Tree impacts associated with the 3 alignment options have been evaluated
- Tree types have been identified and impacts have been classified
- 3.6m clearance zone from the centerline of the sidewalk was used to assess tree impacts
- **The intention is to maintain if not exceed the number of trees in the final design (i.e. relocate or plant new trees)**

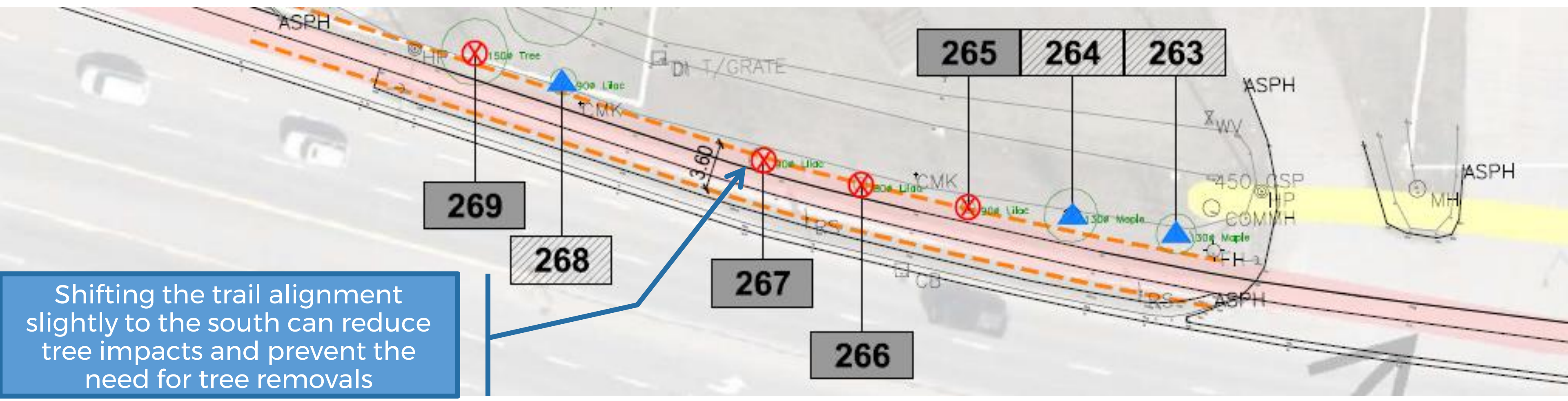


Snippet from Tree Preservation Plan (WSP)

ARBORIST REVIEW

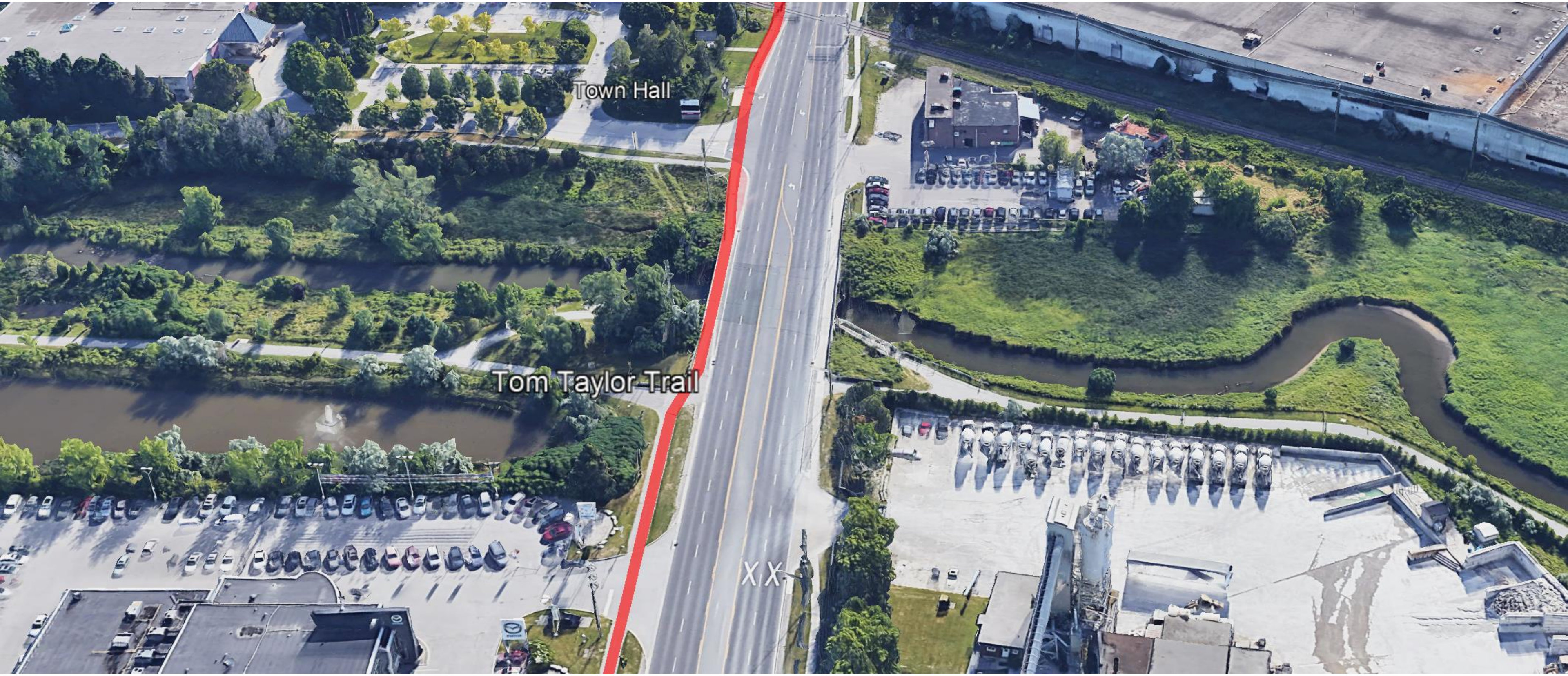
Alignment	Trees identified for removal	Trees identified for potential impacts
Option 1 (Preferred)	89	123
Option 2	95	153
Option 3	67	89

*There is an opportunity to reduce the number of trees that will be impacted by realigning the MUP where feasible



CORRIDOR FLY-THROUGH

Click here to view a video of the corridor fly-through.



WE WANT TO HEAR FROM YOU!

Go to: https://miro.com/app/board/o9J_lBL-5GU=/

The design team identified and assessed 3 alignments (red, green and orange lines). Our draft preferred alignment is Option 1 (red line).

Our ask to you:

Please review the alignments and provide us with your comments on all 3 options and whether you think the preferred alignment is the best choice for Newmarket.

NEXT STEPS & CONTACT INFO

- Review public input from the virtual public open house
- Refine and confirm preferred alignment based on public and Town staff input
- Complete functional design and prepare high-level cost-estimate of preferred alignment
- Present final design report and findings to Town Council

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