



Environmental Study Report (DRAFT)

*Municipal Class Environmental Assessment
for Road Improvements near Derry Road East and Alstep Drive*

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May 5, 2022

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Executive Summary

ES-1. Project Description

Bombardier Inc. (Bombardier) has partnered with the Region of Peel (Region) and the City of Mississauga (City) to undertake a Municipal Class Environmental Assessment (Class EA) study to assess existing and future road conditions on Derry Road East and Alstep Drive near Menkes Drive and Bramalea Road. The study will include Derry Road East (a Regional Road) as well as Bramalea Road, Menkes Drive, Telford Way, Alstep Drive and Menway Court (all City roads).

The need for the Class EA is due to current and projected road infrastructure demands that exceed the system's current capacity, driven in part by Bombardier's planned industrial development (referred to as Bombardier Aerospace {or BA} Pearson) at 1890 Alstep Drive, Mississauga, Ontario as well as other planned and proposed developments in the vicinity. To accommodate the increase in traffic demands, improvements to the infrastructures will be required. As such, the Region, the City and Bombardier are co-proponents on this Schedule C Municipal Class Environmental Assessment (Class EA) to upgrade the local existing road network. The Class EA is being undertaken as per the Municipal Engineers Association (MEA) Class EA Manual (October 2000, as amended in 2007, 2011 & 2015).

In consultation with the City, Region and Ministry of Environment, Conservation and Parks (MECP), it was determined that this project was to be completed as a Schedule C Class EA.

ES-2. Class EA Study Area

The study area for this Class EA is primarily along Derry Road East (185 metres (m) west of Menkes Drive and 450 m east of Bramalea Road) and Bramalea Road (485 m south of Derry Road East and 410 m north of Derry Road East). It also includes three local roads: Menkes Drive, Alstep Drive, and Telford Way. The study area is depicted in Error! Reference source not found..

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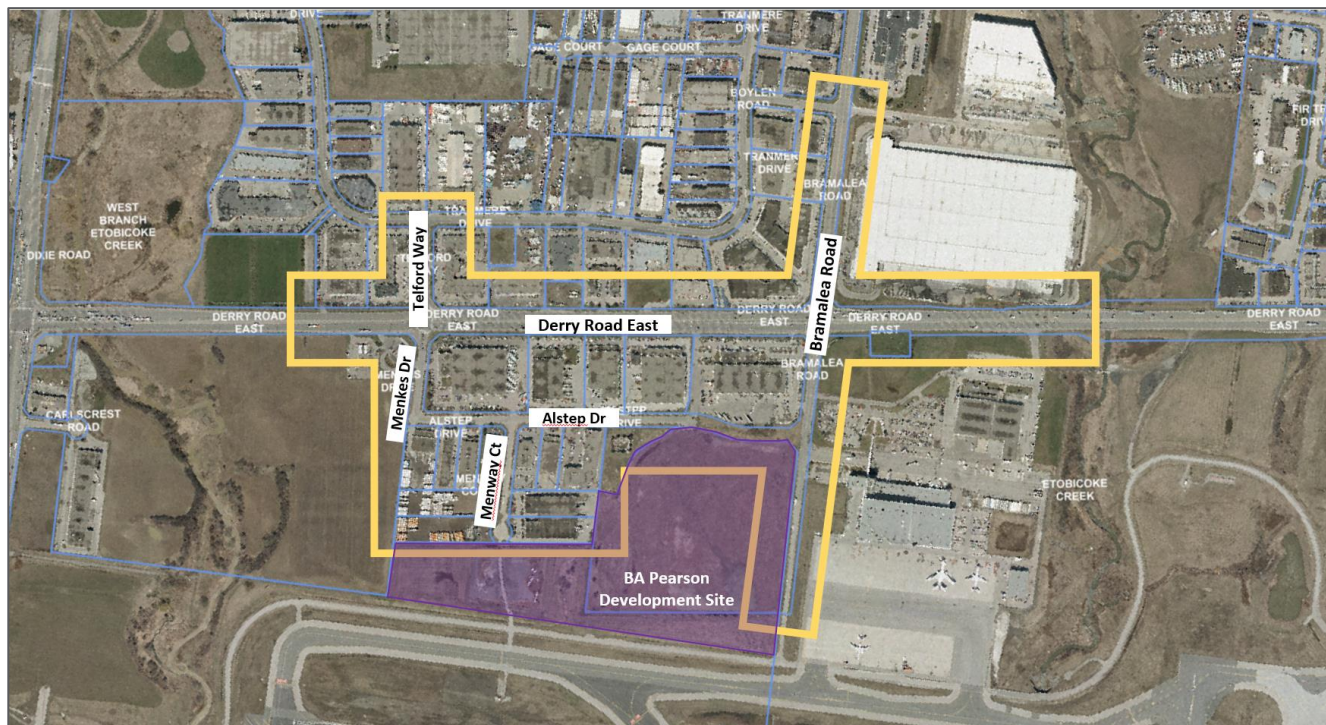


Figure ES-1: Class EA Project Study Area

ES-3. Project Proponents

The co-proponents of this Schedule C Class EA include:

- Bombardier (primary proponent);
- Region (co-proponent); and
- City (co-proponent).

Bombardier retained EXP Services Inc. as its consultant for the Class EA. A summary of the roles and responsibilities of each proponent is provided in Error! Reference source not found..

Table ES-1: Proponent Roles and Responsibilities

Bombardier Aerospace Lead Proponent	Region of Peel Co-Proponent	City of Mississauga Co-Proponent
Responsible for all the planning, design, and construction of the road improvements	EA process review Document review Access to relevant Region data Hosting of project website	EA process review Document review Access to relevant City data

ES-4. Stakeholder Consultation

Stakeholder consultation was a key component of this Class EA. The key consultation tasks included in this project were:

- Development of a Stakeholder list;
- Preparation and issuing of Project Notices, including:
 - Combined Notice of Commencement and Invitation for Public Comment (Phase 2);
 - Invitation for Public Comment (Phase 3); and
 - Notice of Completion;
- Two Technical Advisory Committee (TAC) meetings (one each in Phases 2 and 3);
- Two virtual Public Information Centres (PICs); and
- Project website.

The Class EA project began in 2019, prior to the onset of the COVID-19 pandemic. The pandemic and the associated provincial declarations of emergency required a modification to the typical approach to Class EA consultation and communications, including the following:

- The first wave of the pandemic occurred during Phase 1 and into Phase 2 of this Class EA. During this time, both the City and the Region halted the publication of municipal notices other than those related to public health. As a result, publication of the Notice of Commencement, which normally occurs during Phase 1 of the Class EA process, was delayed. Instead, a Combined Notice of Commencement and Invitation for Public Comment notice was published in Phase 2.
- TAC meetings were held via videoconference instead of in-person.
- PIC #1 was held virtually by posting a narrated presentation and supporting documents on the project website, in lieu of in-person PIC.
- Similarly, PIC #2 was also held virtually, but its format included a live presentation. Presentation materials were then posted on the project webpage for public review.

ES-5. Transportation Assessment

A Transportation Assessment was conducted for this Class EA study and included a traffic analysis and a safety review within the study area.

The traffic analysis was conducted to evaluate the existing and future traffic conditions within the study area, to assess the need for improvements to accommodate traffic in a safe and efficient manner, to provide a traffic analysis of alternative improvements, and to provide recommendations for future geometric improvements to existing and future intersections. The analysis was completed for both build-out (2022) and future (2031) conditions during the weekday morning (AM) and afternoon (PM) peak hours to characterize operating conditions and identify locations requiring improvements.

The safety analysis was conducted to review safety within the study area and to identify and recommend countermeasures for safety improvements.

The assessment included an analysis of existing and future traffic operations. The analysis indicated that the intersections in the study area are generally operating satisfactorily under the existing conditions, but problems are beginning to emerge over time. For instance:

- The intersections along Derry Road, at Bramalea Road and at Menkes Drive, will start showing high levels of congestion with some movements failing during the study peak periods, in the year 2022 future traffic analysis. The unsignalized intersection at Alstep Drive and Bramalea Road is also becoming highly congested with a Level of Service (LOS) F.
- In the year 2031, future traffic analysis shows the signalized intersections on Derry Road at Menkes and Bramalea continue to fail with a LOS F.
- The proposed unsignalized intersection of Alstep Drive and Bramalea Road operates with a failed LOS and over capacity.

At the Bramalea Road intersection, the poor future traffic operations at the intersections can be attributed to lack of adequate capacity and the split phasing of the signal operations. At the Menkes Drive intersection, poor traffic operations may be attributable to inadequate capacity. These traffic issues can be mitigated through provision of additional turn lanes and improved phasing and timing for the signals.

At the Alstep Drive and Bramalea Road intersection, poor operation may be attributable to inadequate traffic control and the existing alignment of the intersection. A mitigative measure may be installation of traffic signal at the intersection.

The safety analysis included an analysis of collisions within the study area. The assessment identified the following trends and patterns:

- Higher than expected numbers of collision are occurring at the study intersections. Hence long-term efforts to improve road safety should be focused on improving intersection safety in general.
- The intersection of Derry Road and Menkes Drive/Telford Way appears to have a higher proportion of turning collisions involving Eastbound (EB) and Westbound (WB) vehicles and rear end collisions involving EB or WB vehicles. None of the collisions seems to may have been attributable to poor environmental and lighting conditions.
- The intersection of Derry Road and Bramalea Road appears to have a higher proportion of turning collisions involving EB and WB vehicles and rear end collisions involving EB, WB, or Soutbound (SB) vehicles. None of the collisions seems to may have been attributable to poor environmental and lighting conditions.
- The intersection of Bramalea Road and Boylen Road/Logistics Drive appears to have a higher proportion of angle and turning collisions involving EB and Nortbound (NB)/SB vehicles and NB and SB vehicles. None of the collisions seems to have been attributable to poor environmental and lighting conditions. The intersection appears to have been signalized after the 5-year period reviewed, potentially mitigating the collisions observed during our review.
- The road segment of Derry Road between Menkes Drive/Telford Way and Bramalea Road appears to have a higher proportion of rear-end collisions involving EB or WB vehicles and sideswipe collisions involving EB or WB vehicles.
- The road segment of Derry Road between Bramalea Road and the eastern study area limit appears to have a higher proportion of rear-end collisions involving WB vehicles and single motor vehicle (SMV) collisions involving EB or WB vehicles.

Following the identification of the safety issues listed above, the assessment identified potential countermeasures that could be considered to improve the overall safety within the study area, including the prevention in the occurrence and severity of collisions. The countermeasures include but are not limited to the improvements and addition of pedestrian facilities, left turn lanes, pavement resurfacing, and signal operations review. These were considered during the preparation of alternative designs.

ES-6. Problem and Opportunity Statement

Based on a review of existing and future conditions, as well as consultation with the Approving Agencies, it was determined that improvements are required along Derry Road East and Bramalea Road to accommodate the existing and future traffic demands generated by the Alstep Drive site.

Based on the analysis completed during the Class EA, the following problems and opportunities are identified:

- Existing congestion during the AM and PM peak hours is expected to increase by the horizon year of 2031 if no improvements are implemented.
- Opportunity to support efficient movements of passenger vehicles, trucks, and transit, at the intersections and segments in the study area for active transportation and transit.
- Opportunity to support increasing use of public transit (Light Rail Transit (LRT) & MiWay) and reduce the number of motor vehicles containing a single motorist.
- Opportunity to improve safety within the study area.
- Opportunity to support employment.
- Opportunity to support economic growth (employment / movement of goods).
- Opportunity to support functionality to Pearson Airport.
- Opportunity to support development plans (land development/ Transportation Master Plan (TMP) / transit plan).
- Opportunity to support preservation of existing natural system.

Based on these findings, the following is the Problem/Opportunity Statement for this Class EA:

As a result of the proposed development at 1890 Alstep Drive, Mississauga, the road network along Derry Road East in the vicinity of its intersections with Bramalea Road and Menkes Drive will not be able to accommodate the traffic demand anticipated by 2031. Improvements to this road network will be necessary to mitigate possible impacts to traffic operations.

An opportunity exists to make improvements to this road network that will improve the efficiency of traffic and reduce or avoid traffic delays outside of the project study area that either currently exist or are expected to exist by 2031, regardless of whether the development proceeds.

ES-7. Alternative Solutions

Identification of Alternative Solutions

The identification of alternative solutions was completed during Phase 2 of the Class EA study. Various solutions to the problem/opportunity statement were explored and evaluated according to a set of evaluation criteria. The nine alternative solutions identified are presented in **Error! Reference source not found.**

Table ES-2: Identification and Description of Alternative Solutions

Alternative Solutions	Descriptions
Do Nothing	<ul style="list-style-type: none"> ● No change to the existing infrastructure. ● All road characteristics and road geometry remain the same, including no new roads are added to the project study area.

Alternative Solutions	Descriptions
Limit Growth	<ul style="list-style-type: none"> Limit population and employment levels in the Pearson Airport area
Transportation Demand Management (TDM) Measures	<ul style="list-style-type: none"> Shifting arrival and departure time of staff to avoid baseline peak hours. Provide preferred parking spaces for carpool vehicles. Provide bicycle racks at the development site to promote active transportation. Improve sidewalks.
Improve Transit	<ul style="list-style-type: none"> Improve the quality of transit service to encourage more people to commute using public transit. Encouragement can be in the form of adding new bus stops, adding new routes, and/or extending service hours.
Improve Local Intersection Operations	<ul style="list-style-type: none"> Install auxiliary lanes. Optimize and improve signal timing, according to the changes made to improve intersection operations. Installation of traffic signals.
Widen Existing Regional Roads	<ul style="list-style-type: none"> Widen existing regional road (i.e., Derry Road East) to accommodate additional through lane.
Widen Existing Municipal Roads	<ul style="list-style-type: none"> Widen existing municipal roads (e.g., Menkes Drive, Alstep Drive, etc.) to accommodate additional through lane. <i>Note: This does not include tapered widenings to accommodate added turning lanes.</i>
Diversion of Traffic to Other Existing Roadways	<ul style="list-style-type: none"> Relieve capacity deficiency by diverting traffic to other existing roadways to bypass areas of heavy traffic.
Extend Alstep Drive	<ul style="list-style-type: none"> Improve the road network by adding an east extension of Alstep Drive connecting to Bramalea Road. The road allowance for the Alstep Drive Extension has been in place since the late 1990's (exact date unknown).

Screening and Evaluation of Alternative Solutions

The evaluation of alternative solutions included a preliminary screening of the potential alternative solutions for further evaluation. Each alternative solution was compared against the problem/opportunity statement to determine whether it would be able to address it. Alternative solutions that were able to adequately address the problem/opportunity statement were carried forward, while those that could not were screened out and set aside.

The potential alternative solutions that were screened out included:

- Limit Growth:** Limiting growth within the study area and in the broader area as a whole is impractical as a long-term strategy and is not consistent with City or Region growth strategies.
- Improve Transit:** Improving public transit service may contribute to addressing capacity deficiencies. However, this improvement alone will not be enough to address future demands. This option will be carried forward with the TDM Measures solution to supplement preferred alternatives.

- **Diversion of Traffic to Other Existing Roadways:** The ability to divert traffic to other existing roadways is limited, as the only alternative east/west route to bypass Derry Road is Drew Road. While it may relieve some stress in high traffic areas, it is unlikely to adequately address future demands. Further, Drew Road would not have the available capacity to receive additional significant volumes.

The potential alternative solutions that were carried forward for further evaluation included:

- **Do Nothing:** All evaluation of potential alternative solutions will be compared based on the “Do Nothing” option.
- **TDM Measures:** Managing transportation demand may contribute to addressing capacity deficiencies. Hence, this option should be considered because it may be a significant factor in addressing capacity deficiencies.
- **Improve Local Intersection Operations:** Improving operation at local intersections will contribute to addressing capacity deficiencies. Improving signal timing and adding additional auxiliary lanes may efficiently accommodate the growing future travel demands.
- **Widen Existing Regional Roads:** Widening existing roads may accommodate the growing future travel demands.
- **Widen Existing Municipal Roads:** Widening existing roads may accommodate the growing future travel demands.
- **Extend Alstep Drive:** Extending Alstep Drive to enhance the grid may contribute to addressing capacity deficiencies. This improvement alone may not address future demands in the study area.

A broad range of criteria were used to evaluate the alternative solutions. The criteria were organized into the following categories:

- Planning and Transportation;
- Socio-Economic Environment;
- Healthy Community;
- Natural Environment;
- Cultural Environment;
- Technical; and
- Cost.




































Table ES-3 provides a summary of the evaluation of alternative solutions.





















The results of the evaluation and consultation with the Region, City and stakeholders indicate that a combination of the following alternative solutions is the recommended solution for this Class EA:

- **Improve Local Intersection Operations** - The improvement of operations at the intersections of Derry Road East with Menkes Drive and Bramalea Road, including geometric and operational improvements.
- **TDM Measures** - Application of Transportation Demand Management (TDM) measures to help the redistribution of demand and reduce the overall traffic capacity peaks. Implementation of TDM in the Phase 3 Alternative Designs will include any available future transit infrastructure plans for the area, as well as improving active transportation facilities (such as adding or improving sidewalks and multi-use pathways (MUP's)).
- **The extension of Alstep Drive** - The extension of Alstep Drive eastward to Bramalea Road. This will provide an additional route option for commuters to fulfill the City's original intent for the area, as depicted by the existing road allowance.

Alternative designs for the local intersection improvements and the Alstep Drive extension were undertaken in Phase 3.

Table ES-3: Alternative Solutions Evaluation Summary

Evaluation Criteria	Alternative 1: Do Nothing	Alternative 2: TDM Measures	Alternative 3: Improve Local Intersection Operations	Alternative 4: Widen Existing Regional Roads	Alternative 5: Widen Existing Municipal Roads	Alternative 6: Extend Alstep Drive
 Planning and Transportation Summary	 Not Preferred Alternative 1 is not preferred because it is inconsistent with planning objectives and would negatively impact traffic operations and safety.	 Preferred Alternative 2 is preferred because it is consistent with planning objectives and provides some improvements to safety and traffic/transit operations	 Preferred Alternative 3 is preferred because it has positive effect on all planning and transportation criteria.	 Neutral Alternative 4 is neutral because while it may improve traffic safety and traffic operations, it may negatively impact active transportation facilities.	 Neutral Alternative 5 is neutral because it does not have significant benefits within the planning and transportation criteria.	 Preferred Alternative 6 is preferred because it has either a positive or neutral effect on all planning and transportation criteria.
 Socio-Economic Environment Summary	 Neutral Alternative considered neutral due to lack of any significant socio-economic benefits or impacts.	 Neutral Alternative considered neutral due to lack of any significant socio-economic benefits or impacts.	 Neutral Alternative considered neutral due to lack of any significant socio-economic benefits or impacts.	 Not Preferred Alternative 4 is not preferred due to potential property requirements along the regional road.	 Not Preferred Alternative 5 is not preferred due to property requirements where widening is required.	 Neutral Alternative considered neutral due to lack of any significant socio-economic benefits or impacts.
 Healthy Community Summary	 Not Preferred Alternative 1 is not preferred because it is not compatible with the healthy community criteria.	 Preferred Alternative 2 is preferred because it encourages active transportation, provides options for accessibility, and improves air quality compared to “do nothing”.	 Preferred Alternative 3 is preferred because it provides an opportunity to incorporate improvements that will aid active transportation and accessibility and improves air quality compared to “do nothing”.	 Not Preferred Alternative 4 is not preferred because of negative impacts on active transportation and accessibility.	 Neutral Alternative 5 is considered neutral because of limited opportunity to incorporate improvements that will aid active transportation and accessibility.	 Neutral Alternative 6 is considered neutral because, while the design of the extension could accommodate accessibility, it will likely encourage use of active transportation.
 Natural Environment Summary	 Neutral The alternative will have no or minimal impacts on the natural environment, although will have higher Greenhouse Gas (GHG) emissions compared to alternatives 2, 3 and 4.	 Preferred Alternative is preferred, given that it has no or minimal impacts on the natural environment and reduces GHG emissions compared to the “do nothing” alternative.	 Preferred Alternative is preferred, given that it has no or minimal impacts on the natural environment and reduces GHG emissions compared to the “do nothing” alternative.	 Preferred Alternative is preferred, given that it has no or minimal impacts on the natural environment and reduces GHG emissions compared to the “do nothing” alternative.	 Neutral The alternative will have minimal impacts on the natural environment, but with no reduction to GHG emissions compared to the “do nothing” alternative.	 Neutral The alternative will have minimal impacts on the natural environment, but with no reduction to GHG emissions compared to the “do nothing” alternative.
 Cultural Environment Summary	 Preferred Alternative is preferred because of lack of impacts on archaeological, built heritage, and cultural heritage resources.	 Preferred Alternative is preferred because of lack of impacts on archaeological, built heritage, and cultural heritage resources.	 Preferred Alternative is preferred because of lack of impacts on archaeological, built heritage, and cultural heritage resources.	 Not Preferred Alternative is not preferred because of potential impacts to Moore’s Cemetery.	 Preferred Alternative is preferred because of lack of impacts on archaeological, built heritage, and cultural heritage resources.	 Preferred Alternative is preferred because of lack of impacts on archaeological, built heritage, and cultural heritage resources.

Evaluation Criteria	Alternative 1: Do Nothing	Alternative 2: TDM Measures	Alternative 3: Improve Local Intersection Operations	Alternative 4: Widen Existing Regional Roads	Alternative 5: Widen Existing Municipal Roads	Alternative 6: Extend Alstep Drive
 Technical Summary	 Preferred <i>Alternative is preferred due to avoidance of construction.</i>	 Preferred <i>Alternative is preferred due to avoidance of construction</i>	 Neutral <i>Alternative is considered neutral because construction is feasible with minimal changes required to stormwater and utilities.</i>	 Not Preferred <i>Alternative is not preferred given the complexity of the widening and changes required to the stormwater system and utilities.</i>	 Not Preferred <i>Alternative is not preferred because construction of somewhat complex feasibility and impacts to stormwater and utilities.</i>	 Neutral <i>Alternative is considered preferred because construction is feasible with the opportunity to incorporate new utilities into the design.</i>
 Cost Summary	 Preferred <i>Alternative is preferred due to low costs and no property acquisition.</i>	 Preferred <i>Alternative is preferred due to low costs and minimal property acquisition.</i>	 Neutral <i>Alternative is neutral due to moderate capital and maintenance costs.</i>	 Not Preferred <i>Alternative is not preferred due to high capital and maintenance costs and required property acquisition.</i>	 Not Preferred <i>Alternative is not preferred due to high capital costs and required property acquisition.</i>	 Neutral <i>Alternative is neutral due to high capital costs, but no property acquisition required.</i>
Overall Summary	 Not Preferred <i>Alternative 1 is not preferred due to its inconsistency with planning objectives and negative air quality impacts.</i>	 Preferred <i>Alternative 2 is preferred due to its consistency with planning objectives, promotion of active transportation and avoidance of construction.</i>	 Preferred <i>Alternative 3 is preferred because it has generally positive results for the evaluation criteria.</i>	 Not Preferred <i>Alternative 4 is not preferred due to its inconsistency with planning objectives, property impacts and anticipated costs.</i>	 Not Preferred <i>Alternative 5 is not preferred due to its lack of project benefits and anticipated costs.</i>	 Neutral <i>Alternative 6 is considered preferred as construction will not have any significant impacts, provides required vehicular capacity and active transportation infrastructure.</i>

ES-8. Alternative Designs

Following the selection of the Preferred Solution in Phase 2 of the Derry Road and Alstep Drive Class EA Study, Alternative Design Concepts for implementing the improvements along Derry Road and creating a new connection to Alstep Drive at Bramalea Road were generated, assessed, and evaluated. The Preferred Solution includes the installation of cycling and pedestrian facilities along with intersection improvements.

In developing the design concept within the study area as a multi-modal corridor, the following components were required based on Transportation Association of Canada (TAC), the Region of Peel, and the City of Mississauga's design standards:

- Accommodation for Active Transportation via dedicated 1.8m wide sidewalk;
- Provision of adequate width for traffic lanes at intersections, where appropriate; and
- Minimum pedestrian island size to accommodate pedestrian storage.

In addition, minimizing the impacts to adjacent properties and natural environment and minimizing cost while maximizing traffic operations and safety were considered. Lastly, to support the Region of Peel and City of Mississauga's Vision Zero Road Safety Strategic Plan, relevant emphasis areas were also considered during the design process: creating safer intersections; protecting pedestrians; and protecting cyclists.

Design Alternatives for Alstep Drive and Intersection with Bramalea Road

As part of the design for Alstep Drive at Bramalea Road, various alternatives were assessed for the intersection improvements. Three alternative designs were considered for the easterly extension of Alstep Drive to Bramalea Road, including:

- Alternative 1: Extend Alstep Drive to Bramalea Road, with 2-lane unsignalized intersection at Bramalea Road.
- Alternative 2: Extend Alstep Drive to Bramalea Road, with 2-lane signalized intersection at Bramalea Road.
- Alternative 3: Extend Alstep Drive to Bramalea Road, with 3-lane signalized intersection at Bramalea Road.

For each alternative design concept, other improvements were included to supplement the intersection operational improvements. Active transportation design elements including crosswalks and sidewalks along the north and south sides of Alstep Drive were included in the three Alternatives. **Design Alternative for Derry Road E & Menkes Drive/Telford Way**

As part of the design for Menkes Drive at Derry Road various alternatives were assessed for the intersection improvements. There are three alternative designs that were considered for this intersection.

- Alternative 1: Extend paved surface of Menkes Drive/Telford Way to the east.
- Alternative 2: Extend paved surface of Menkes Drive/Telford Way on both sides.
- Alternative 3: Extend paved surface of Menkes Drive/Telford Way to the west.

For each Alternatives design concept, other improvements are planned to supplement the intersection operational improvements. Two northbound left-turn lanes are proposed with storage length along the entire length of Menkes. The existing channelized islands will be retrofitted into smart channels for added safety for all road users. Active transportation design elements with MUP on the south side of Derry Road East and sidewalk with boulevard on the east side of Telford Way and on the northside of Derry Road East, west of Telford Way.

Design Alternative for Derry Road East & Bramalea Road

As part of the design for Bramalea Road at Derry Road East several alternatives were assessed for the intersection improvements. There are four alternative designs under consideration for this intersection:

- **Alternative 1:** Extend Paved Surface of Bramalea Road to the East and on Derry Road to the North.
- **Alternative 2:** Extend Paved Surface of Bramalea Road to the West and on Derry Road to the North
- **Alternative 3:** Extend Paved Surface of Bramalea Road on Both Sides and on Derry Road to the North
- **Alternative 4:** Modify Intersection using a Hybrid Approach. The paved surface of Bramalea Road north of Derry Road is extended to the east, while south of Derry Road pavement is extended to both the east and west.

For each Alternatives design concepts, other improvements are planned to supplement the intersection operational improvements. The paved surface along Derry Road, would be extended approximately 3 m northward from Bramalea Road to the eastern limit of the project. Existing channelized islands will be retrofitted into smart channels for added safety for all road users. Active transportation design elements that have been added in all four alternatives include:

- Upgrading the multi-use path on the south side of Derry Road west of Bramalea Road.
- Adding a new multi-use path on the north side of Derry Road east of Bramalea Road.
- Adding a new multi-use path east side of Bramalea Road north of Derry Road.
- Addition of cross-rides or crosswalks at signalized intersections.
- Adding a new sidewalk on the north side of Derry Road west of Bramalea Road.
- Adding sidewalks on both sides of Bramalea Road south of Derry Road.
- Adding a westbound bus-stop queue jump lane along Derry Road to improve merging of transit vehicles into traffic, from the bus-stop located on the north side of Derry Road east of Bramalea Road¹.

Active Transportation within Study Area

As part of the alternative designs described, active transportation is proposed for inclusion throughout the study area. Including active transportation into the design concepts is based on the City and the Region's 2031 planning for increased sustainable transportation accommodations. Given the Preferred Solution and the 2031 Planning, all Alternatives will provide adequate and appropriate facilities to accommodate all users and provide the highest level of safety. Within the study area, this will include:

- Inclusion of sidewalks to help achieve the Region and the City's active transportation goals.
- Inclusion of crosswalks and cross-rides
- Inclusion of an upgraded MUP along Derry Road and a new MUP along Bramalea Road, which may include inclusion of a boulevard, where feasible. The portion of the MUP extending out of the study area eastward would connect to a potential future Region of Peel MUP installation.
- The Region of Peel currently does not have a defined criteria for measuring Pedestrian Level of Service (PLOS) or Bicyclist Level of Service (BLOS). A PLOS and BLOS has been considered based on the availability of facilities as identified in the Region's Pedestrian and Bicycle Facilities guidelines.

¹ Configuration of the queue jump lane is to be confirmed in consultation with Mi-Way.

- The pedestrian crossing distances for the intersections of Menkes Drive / Telford Way & Derry Road and at Bramalea Road & Derry Road may be impacted depending on the alternatives. The existing crossing distance has been compared to the proposed distances as a result of the modifications of each alternative to the roadway.

Identification of Evaluation Criteria

To determine the best Alternative design concept for each intersection, a list of Evaluation Criteria was compiled using the City and the Region's design criteria. The Evaluation Criteria will use the same evaluation framework for this process. That will include criteria that addresses the transportation needs and the broader social, health, economic, and environmental contributions to ensure the designs are compatible to support existing and planned land uses. Each criterion was used to compare alternatives and measure its ability to minimize impacts and meet the study goals. The criteria were organized into the following categories:

- Planning and Transportation;
- Healthy Communities;
- Natural Environment;
- Socio-Economic Environment;
- Cultural Environment;
- Technical; and
- Cost.




The evaluation of the alternative design concepts was based on an assessment of potential impacts and a review of input received from the public and regulatory agencies during Phase 2 of the study process. For each evaluation, a description was provided for how each alternative design concept (option) compares to the other for each major criterion. The options that received the most favorable overall rating (taking in account all criteria) were put forward by the study team as the preliminary preferred design concepts.

Design meetings were held virtually over several days with representatives from the City, the Region, Bombardier, and EXP. The general consensus was to promote safety for all by separating cyclist and pedestrians from vehicular traffic and reducing lane widths to encourage reduced vehicular speed.

Tables ES-4 to ES-6 summarize the results of the evaluation.

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Table ES-4: Evaluation Summary of Alternative Design Concepts for Alstep Drive & Bramalea Road

Alternative 1: Extend Alstep Drive to Bramalea Road, with 2-lane unsignalized intersection at Bramalea Road	Alternative 2: Extend Alstep Drive to Bramalea Road, with 2-lane signalized intersection at Bramalea Road	Alternative 3: Extend Alstep Drive to Bramalea Road, with 3-lane signalized intersection at Bramalea Road
 Least Preferred	 Neutral / Moderately Preferred	 Most Preferred
<p>Alternative 1 is least preferred because it provides the least improvements of traffic operations and traffic safety compared to Alternatives 2 and 3.</p> <p>While Alternative 1 does have the least construction complexity and lower capital and maintenance costs compared to Alternatives 2 and 3, they are not to the extent that they outweigh optimized traffic operations and safety.</p>	<p>Alternative 2 is neutral or moderately preferred because it provides greatest improvements to traffic operations and traffic safety compared to Alternative 1, but less than Alternative 3.</p> <p>While Alternative 2 does have some increased construction complexity and capital and maintenance costs compared to Alternative 1, these are not to the extent that they outweigh the improvements to traffic operations and safety.</p> <p>Alternative 2 has similar construction complexity and capital and maintenance costs compared to Alternative 3, but it does not improve traffic operations and traffic safety to the same extent.</p>	<p>Alternative 3 is most preferred because it will provide the greatest improvements to traffic operations and traffic safety compared to Alternatives 1 and 2.</p> <p>While Alternative 3 does have some increased construction complexity and capital and maintenance costs compared to Alternative 1, these are not to the extent that they outweigh the improvements to traffic operations and safety.</p>

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Table ES-5: Evaluation Summary of Alternative Design Concepts for Derry Road East & Menkes Drive/ Telford Way








Alternative 1: Extend paved surface of Menkes Drive to the east	Alternative 2: Extend paved surface of Menkes Drive on both sides	Alternative 3: Extend paved surface of Menkes Drive to the west
 Neutral / Moderately Preferred	 Most Preferred	 Least Preferred
<p>Alternative 1 is less preferred to Alternative 2 because it lacks the design flexibility of Alternative 2. While Alternative 1 likely has a lower capital and property cost than Alternative 2, this amount is likely not substantial and does not offset the advantages of Alternative 2.</p>	<p>While Alternative 2 may have slightly more capital and property costs than Alternative 1, it is most preferred because extending the pavement on both sides on Menkes Drive provides increased flexibility in the redesign of the street. This flexibility provides the opportunity to minimize potential impacts along Menkes Drive to sidewalk separation from the roadway, boulevard trees along the street, and utilities. It also provides flexibility with respect to streetscaping opportunities.</p>	<p>Alternative 3 is least preferred due to its potential impacts on major utilities and associated costs.</p>

Table ES-6: Evaluation Summary of Alternative Design Concepts for Derry Road East & Bramalea Road

Alternative 1: Extend paved surface of Bramalea Road to the east and on Derry Road to the north	Alternative 2: Extend paved surface of Bramalea Road to the west and on Derry Road to the north	Alternative 3: Extend paved surface of Bramalea Road on both sides and on Derry Road to the north	Alternative 4: Modify intersection using a hybrid approach
 Neutral / Moderately Preferred	 Least Preferred	 Least Preferred	 Most Preferred
<p>Alternative 1 is less preferred because, while it provides some improvements to traffic safety, it has less cost and fewer impacts on existing utilities than Alternatives 2 and 3 but more than 4. The impacts to healthy communities, the natural environment, and the cultural environment are not significantly different among the four alternatives.</p>	<p>Alternatives 2 and 3 are not preferred because they provide less optimization of traffic safety and have higher cost and greater impacts on existing utilities than Alternative 4. They also have slightly greater encroachment into private property for the installation of the sidewalk on the west side of Bramalea Road, south of Derry Road. The impacts to healthy communities, the natural environment, and the cultural environment are not significantly different among the four alternatives.</p>	<p>Alternatives 2 and 3 are not preferred because they provide less optimization of traffic safety than Alternative 4 but have higher cost and greater impacts on existing utilities. They also have slightly greater encroachment into private property for the installation of the sidewalk on the west side of Bramalea Road, south of Derry Road. The impacts to healthy communities, the natural environment, and the cultural environment are not significantly different among the four alternatives.</p>	<p>Alternative 4 is preferred because it optimizes traffic safety compared to the other alternatives while minimizing cost and impacts on existing utilities. The impacts to healthy communities, the natural environment, and the cultural environment are not significantly different among the four alternatives.</p>

ES-9. Recommended Alternative Design Concepts

Based on the results of the evaluation, the recommended alternative design concepts for the study area are discussed below and presented in **Figures ES-2 to ES-7**. The recommended designs incorporate feedback from stakeholders provided to the project team through the TAC Meeting #2 and the PIC #2.

Alstep Drive & Bramalea Road

The recommended alternative design concept for Alstep Drive and its intersection with Bramalea Road is *Alternative 3: Extend Alstep Drive to Bramalea Road, with 3-lane signalized intersection at Bramalea Road*. The Alstep Drive extension will be constructed within the existing municipal road right-of-way (ROW) and consist of one westbound lane, one eastbound left turn lane, and one eastbound right turn lane, for three lanes in total. The intersection with Bramalea Road will be signalized. The sidewalk that is considered for the west side of Bramalea Road and positioned north of the Alstep Drive extension would continue directly southward below the intersection and then further southward along Bramalea Road. The design features in

this alternative optimize safety and are consistent with the emphasis areas from Region of Peel and City of Mississauga's Vision Zero strategy of creating safer intersections and protecting pedestrians.

This alternative was selected because it will provide the greatest optimization of traffic operations and traffic safety compared to the other alternatives.

During implementation of the Alstep Drive Extension, realignment of the FedEx entrance to opposite Alstep Drive is also recommended.

Derry Road East & Menkes Drive/Telford Way

The recommended alternative design concept for the intersection of Derry Road East and Menkes Drive/Telford Way is *Alternative 2: Extend paved surface of Menkes Drive/Telford Way on both sides*. The paved surface of Menkes Drive extends to the east and to the west but still within the municipal road ROW.

Physical adjustments made to the intersection under this design alternative include:

- Concrete median Southbound on the north approach of the intersection.
- Curb on southeastern corner of intersection is shifted eastward, with realignment of the sidewalk.
- Curb on northwestern corner of intersection is shifted westward to allow for an improved turning radius, with a corresponding realignment of the sidewalk;
- Median curbs shifted further back to improve truck-turning ability;
- Slight reduction to the pedestrian islands in the southwestern and northeastern corners of the intersection. Pedestrian island size continues to meet the standard.

Active transportation design elements in this design include:

- Sidewalks with boulevard on the east side of Telford Way and on the northside of Derry Road East, west of Telford Way.
- Relocation of the westbound nearside bus stop on the northwest corner of Derry Road and Telford Way to behind the sidewalk.
- Upgraded multi-use path on the south side of Derry Road East.

The design elements in this alternative of separating of the left-turn lane at Telford Way, adding dual left-turn lanes at Menkes Drive, and retrofitting existing traffic islands to smart channels are consistent with the emphasis area of creating safer intersections from the Region of Peel and City of Mississauga's Vision Zero strategy. The addition of sidewalks with boulevards and the upgraded multi-use path on the south side of Derry Road East are consistent with the emphasis areas of protecting pedestrians and protecting cyclists.

This key advantage to this alternative is that extending the pavement on both sides on Menkes Drive provides increased redesign flexibility, which minimize impacts to sidewalk separation from the roadway, boulevard trees along the street, and utilities. It also provides flexibility with respect to streetscaping opportunities.

Derry Road East & Bramalea Road

The recommended alternative design concept for the intersection of Derry Road East and Bramalea Road is *Alternative 4: Modify intersection using a hybrid approach*. The paved surface of Bramalea Road north of Derry Road is extended to the east, while south of Derry Road the pavement is extended to both the east and west. The eastward expansion south of Derry Road

would occur on the east side of the Bramalea / Alstep intersection and continue northward for about 100 m. The expansion westward would occur along Bramalea from Derry Road to about 100 m southward.

North of Derry Road, the eastward extension of Bramalea Road would make room for the separate southbound through and the two left turn lanes, in addition to the existing right turn lane. The extension around the centreline to the south of Derry Road is to make room for the separate northbound through and right turn lanes, in addition to the existing left turn lane and shadow lane, as well as the sidewalk on the west side. The hybrid approach allows the northbound and southbound lanes on Bramalea Road to align.

The paved surface along Derry Road would be extended approximately 3 m northward from Bramalea Road to the eastern limit of the project.

Active transportation design elements in this design are:

- Upgrading the multi-use path on the south side of Derry Road west of Bramalea Road;
- Adding a new multi-use path on the north side of Derry Road east of Bramalea Road;
- Adding a new multi-use path on the east side of Bramalea Road north of Derry Road;
- Addition of cross-rides or crosswalks with signals;
- Adding a new sidewalk on the north side of Derry Road west of Bramalea Road;
- Adding sidewalks on both sides of Bramalea Road south of Derry Road; and
- Adding a westbound bus-stop queue jump lane along Derry Road to improve merging of transit vehicles into traffic, from the bus-stop located on the north side of Derry Road east of Bramalea Road².

In this alternative, safety improvements such as the addition of dedicated dual left-turn lanes, the separation of through lanes from the auxiliary lanes on Bramalea Road, retrofitting existing traffic islands to smart channels, and the optimal alignment of the lanes on Bramalea Road are consistent with the emphasis area of creating safer intersections from the Region of Peel and City of Mississauga's Vision Zero strategy. The addition of sidewalks with boulevards, the addition of a cross-ride with signals, and the new/upgraded multi-use paths on Derry Road East are consistent with the emphasis areas of protecting pedestrians and protecting cyclists.

The key advantage of this alternative is that it optimizes traffic safety compared to the other alternatives while minimizing cost and impacts on existing utilities.

Other Active Transportation Improvements

Other active transportation improvements included in the project study area include:

- Sidewalks in the following locations:
 - North side of Derry Road from Bramalea Road to the western limits of the study area, which would connect with future Region of Peel sidewalk improvements (or existing sidewalks, where applicable) beyond the study area to the west;
 - North and south sides of the existing Alstep Drive; and
 - West side of Menway Court.

² Configuration of the queue jump lane is to be confirmed in consultation with Mi-Way.

- Upgrading the MUP along the south side of Derry Road, west of Bramalea Road.
- Adding an MUP along the north side of Derry Road, east of Bramalea Road.

Inclusion of the sidewalks and upgrading of the MUP will help to achieve the Region and the City's active transportation goals. The proposed active transportation improvements noted above are illustrated in **Figures ES-2 to ES-7** (see also Appendix Q for full size drawings).

Some portions of the proposed sidewalk may require a retaining wall due to the difference in elevation between the sidewalk and private property. This requirement will be confirmed during detailed design.

During the Class EA, Region of Peel staff identified necessary repair or replacement of a Ditch Catch Basin Inlet (DCIB) along Derry Road by 6975 Tranmere Drive. It is recommended that this be completed during the installation of the sidewalk along the north side of Derry Road. The works may require some permanent or temporary easements or other property requirements, which will be confirmed by the Region during detailed design of the DCIB works.

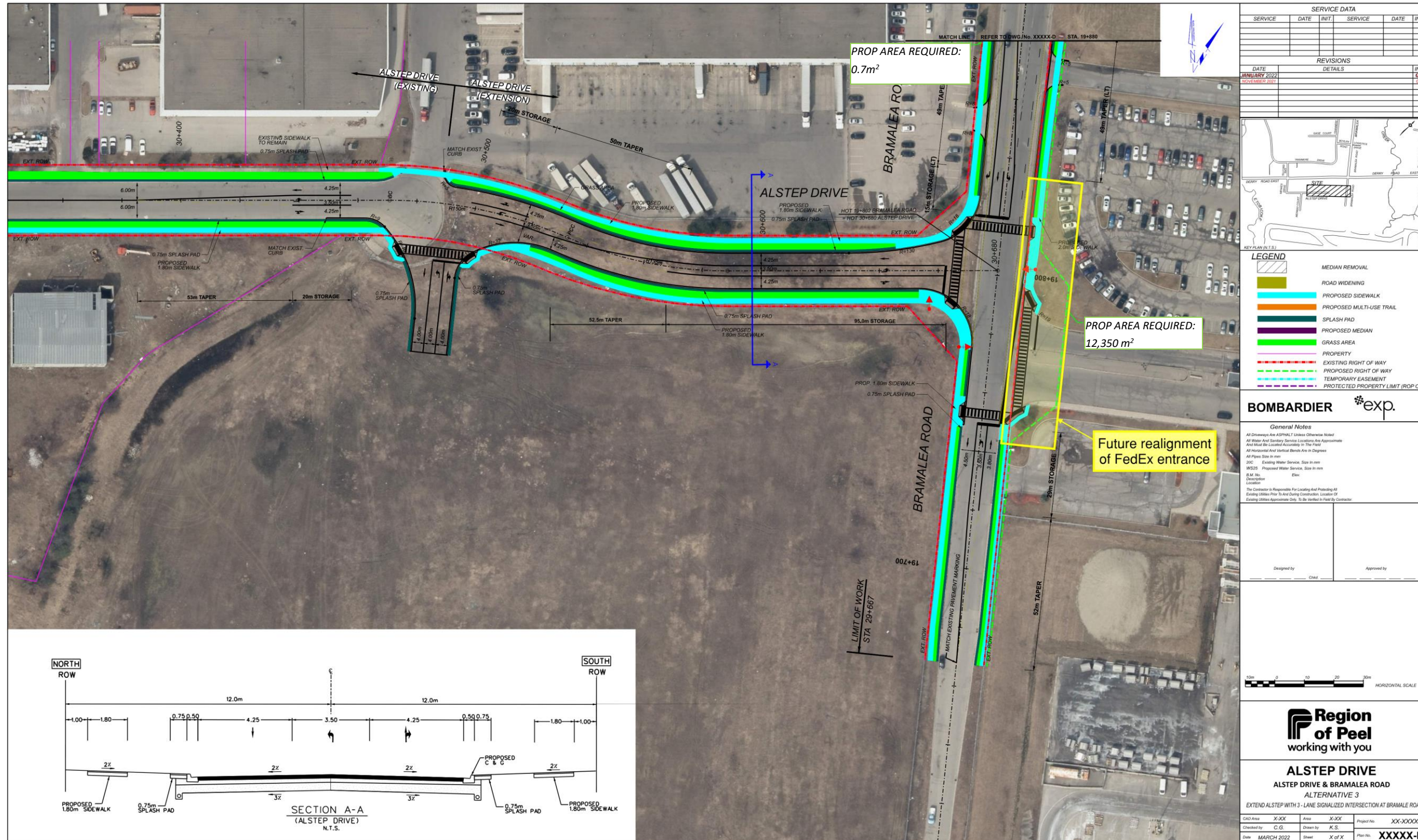


Figure ES-2: Alstep Drive & Bramalea Road Preferred Alternative Design Concept

DRAFT



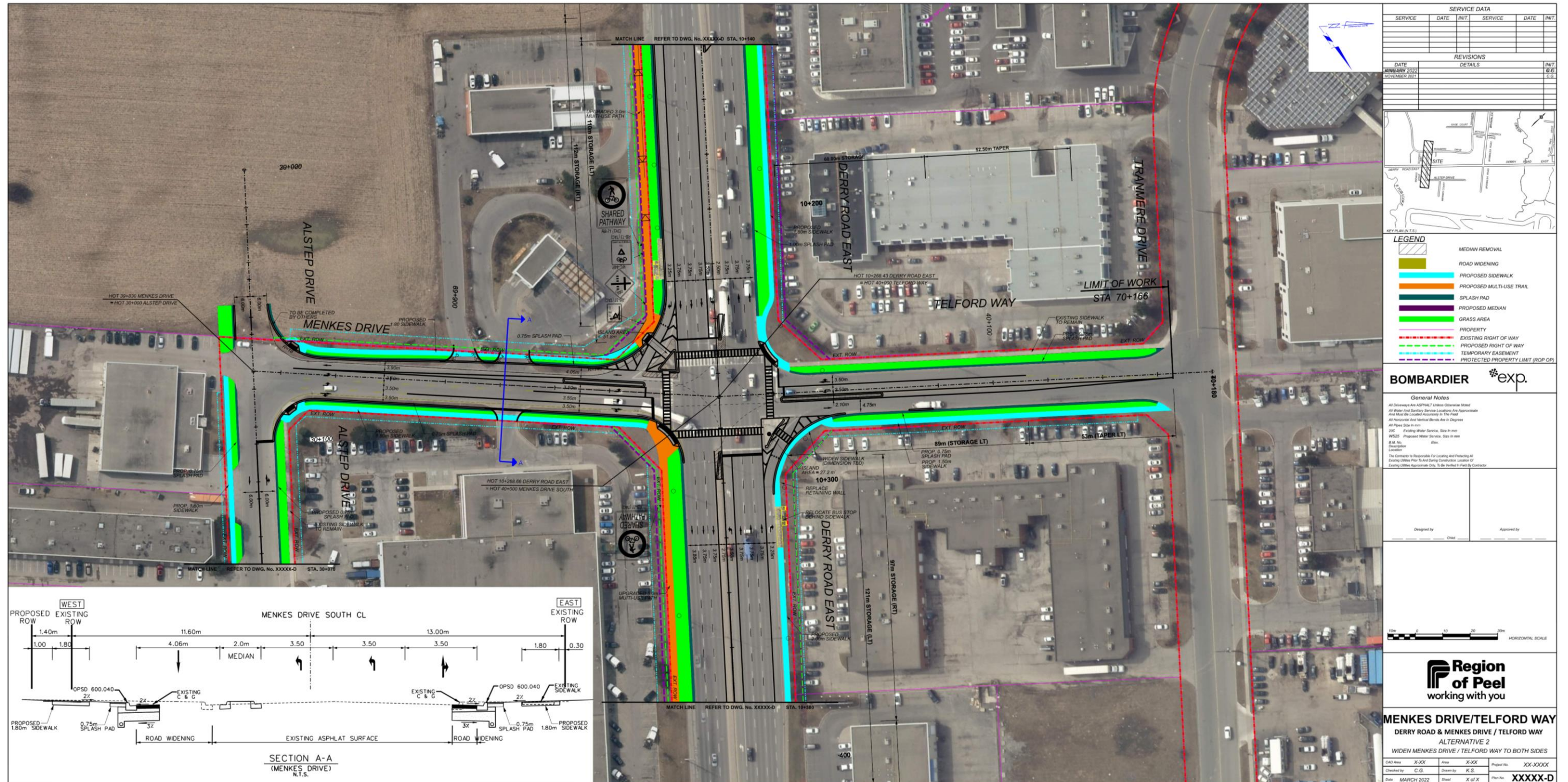


Figure ES-3: Derry Road East & Menkes Drive/Telford Way Preferred Alternative Design Concept

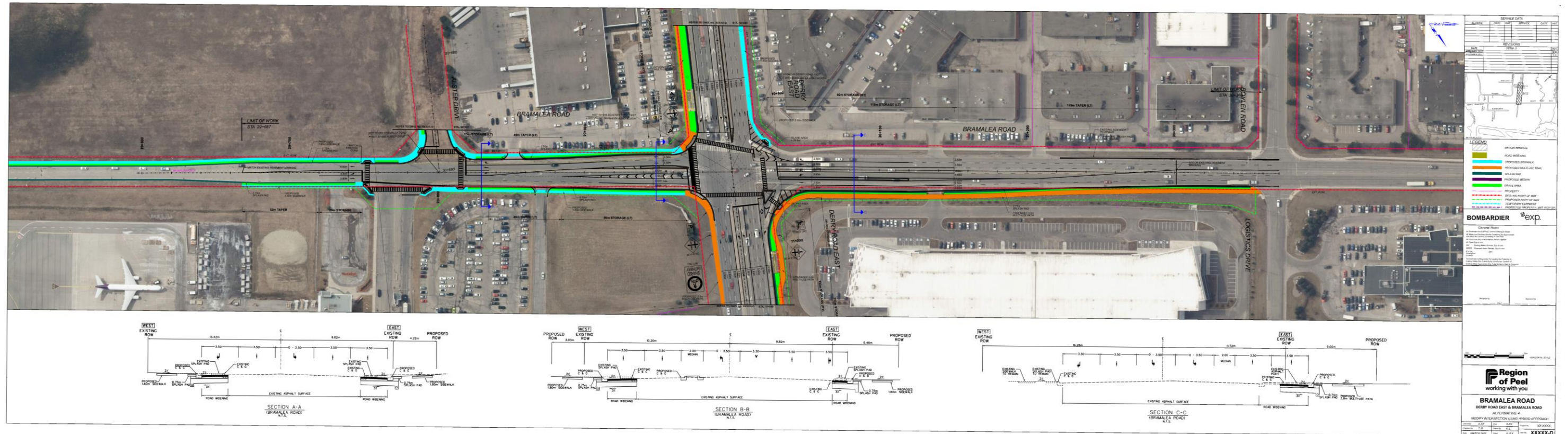


Figure ES-4: Derry Road East & Bramalea Road Preferred Alternative Design Concept (Bramalea)

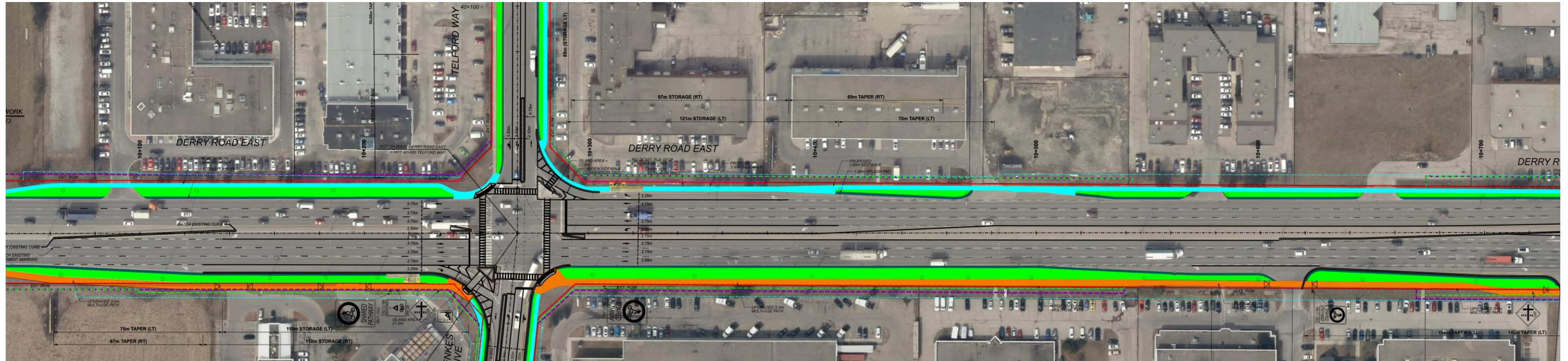


Figure ES-5: Active Transportation Improvements on Derry Road East (West)

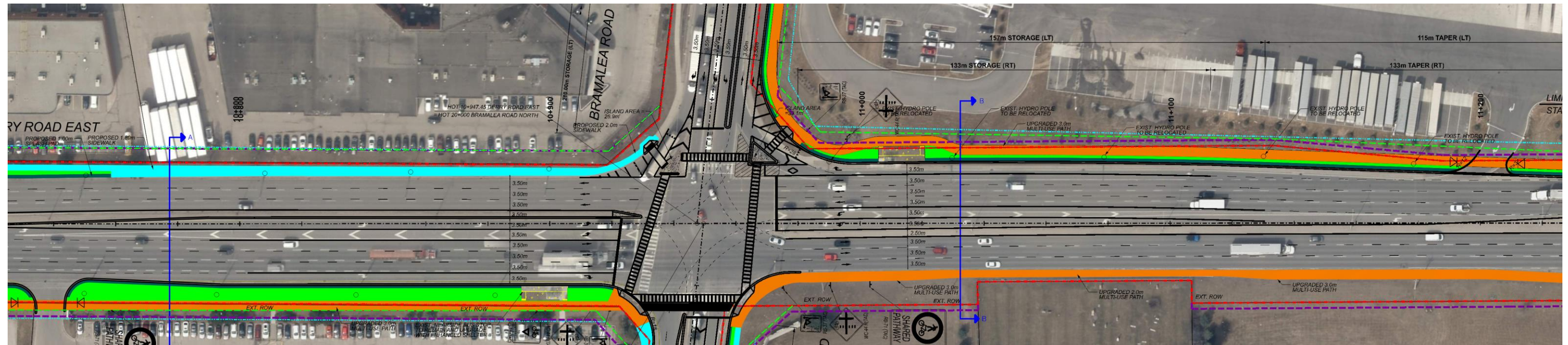


Figure ES-6: Active Transportation Improvements on Derry Road East (East)

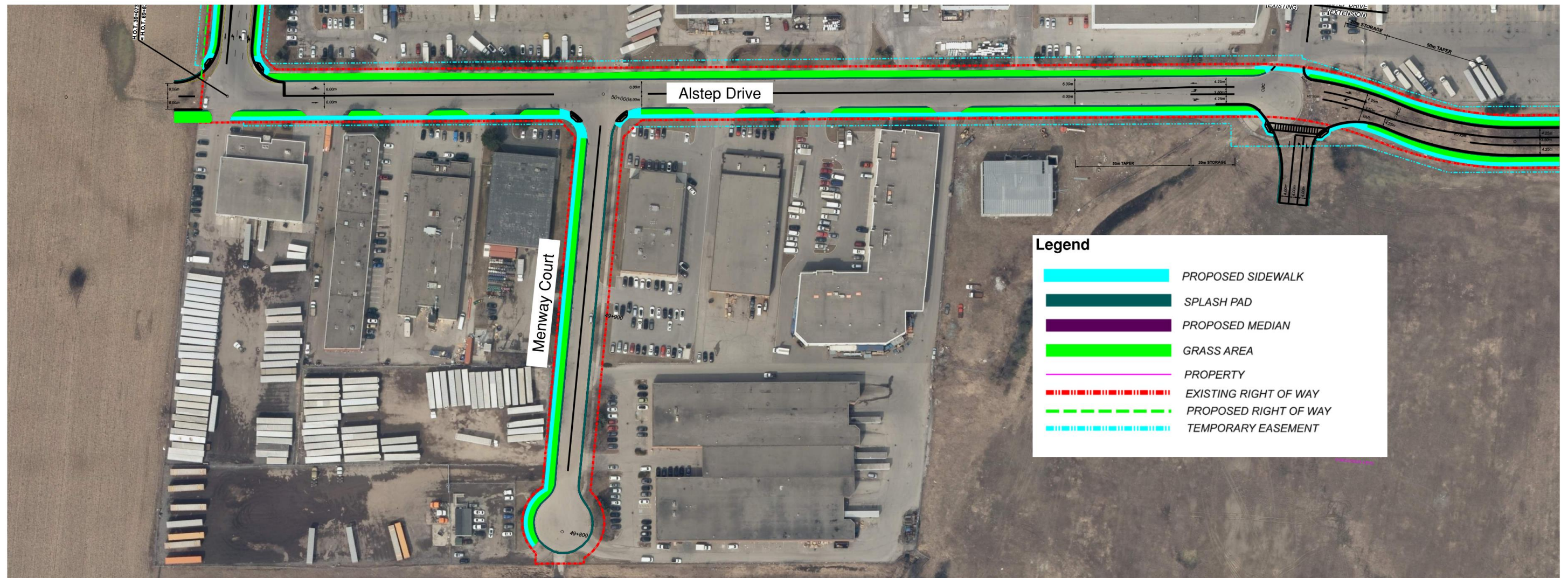


Figure ES-7: Active Transportation Improvements on Alstep Drive (existing) and Menway Court

ES-10. Utilities

Existing overhead utilities will be maintained with the exception of those that are in conflict with the recommended design. The proposed improvements to the study area would require some utility relocations including certain locations along Derry Road, Bramalea Road, Menkes Drive, and Alstep Drive. Coordination and consultation will be required during detailed design with the following utilities to accommodate the proposed design: Alectra, Enersource, Enbridge, Bell Canada, Rogers, Cogeco, water, stormwater, and wastewater. This will occur as required where potential impacts to existing or future utilities are identified. Utility relocations will be confirmed during the detailed design phase.

ES-11. Property Requirements

Based on the City of Mississauga Official Plan, the City may acquire up to 30 m right-of-way for improvements to Bramalea Road. Per the Region of Peel Official Plan, the Region may acquire up to 45 m right-of-way for improvements to Derry Road. However, this may be increased for improvements within the right-of-way near intersections. Additional land may be acquired from the Greater Toronto Airports Authority (GTAA) or private property owners to accommodate the proposed intersection improvements. The recommended design attempts to minimize property requirements.

The proposed improvements to the overall study area will require some property at locations along Derry Road, Bramalea Road, and Menkes Drive. In general, grading will be contained within the proposed right-of-way where feasible, however temporary easements will also be considered for construction and grading purposes. Property owners and tenants will be notified in advance of construction near their access. Communication protocols for construction will be developed during Detailed Design.

ES-12. Preliminary Project Cost

The construction for all recommended works is planned to be completed by 2031. At the time of preparing this report, the phasing of works was being developed and will be confirmed during detailed design through a Tri-Party Agreement between the Region of Peel, City of Mississauga and Bombardier Aerospace. The various project components identified in this Class EA for the preferred alternative design are listed in **Table ES-7**.

Based on the preliminary design, the estimated cost of the recommended improvements is approximately **\$18.3M**. This preliminary estimate includes costs for road work, storm sewer works, water main works, temporary and permanent traffic signals, street light relocation, construction inspection and relocation of hydro line. Expected costs for property acquisition are not included in the estimate. Error! Reference source not found. presents a cost summary based on construction components. The estimated costs will be reviewed and confirmed during detailed design.

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Table ES-7: Project Components

Project	Project Components
Derry Road Active Transportation Upgrades	MUP Upgrades
	Sidewalk Installation (Derry Road East, north side)
	MiWay Bus Stop Relocation and Improvements
Other Active Transportation Upgrades	Alstep Drive Sidewalk Installation (existing portion of Alstep Drive)
	Menway Court Sidewalk Installation
	Telford Way Sidewalk Installation
	Menkes Drive Sidewalk Installation (west side)
	Bramalea Road MUP Installation (east side, north of Derry Road)
Derry Road / Bramalea Road Intersection	Widening of Derry Road to north (east of Bramalea Rd)
	Widening of Bramalea (Derry to Alstep i.e., South Leg)
	Widening of Bramalea (North of Derry i.e., North Leg)
	Bramalea Road Sidewalk Installation (west side, south of Derry Road)
	Bramalea Road Sidewalk Installation (east side, south of Derry Road)
Menkes Drive / Derry Road	Widening of Menkes, including curb repositioning and road surface works
Alstep Drive / Bramalea Road	Widening of Bramalea Rd north and south of Derry, including curb repositioning and road surface works
	Multi-Use Path and Sidewalk upgrades and installations
Alstep Drive	Extension <ul style="list-style-type: none"> • Paved road • Sidewalk

Table ES-8: Construction Cost Estimate for Preliminary (30%) Design

Cost Category	Estimated Cost
Part A: Site Preparation	\$486,400
Part B: Roadworks	\$5,894,818
Part C: Storm Sewer	\$565,880
Part D: Watermain	\$54,540
Part E: Electrical	\$2,650,000
Part F: Miscellaneous Items	\$300,000
Part G: Construction Contingency (20%)	\$1,990,327
Part H: CA/Inspection	\$1,199,000
Part I: Allowance for Region's Inspection	\$888,750
Sub-Total	\$14,029,716
Relocate Hydro Line	\$2,199,000
Cost Estimate Sub-Total (Excluding HST)	\$16,228,716
Hst (13%)	\$2,109,733
Total Estimated Price	\$18,338,449

ES-13. Potential Impacts and Mitigation Measures

The recommended alternative design aims to minimize impacts to the surrounding environment. However, while the benefits of the proposed road and active transportation improvements outweigh the potential negative effects, mitigation of potential impacts will be required as the project continues. The approach to addressing potential impacts is as follows:

- Avoid potential impacts by taking proactive preventive measures. This prevents the occurrence of negative impacts and can result in net positive effects.
- Implement mitigation measures to reduce the magnitude and duration of unavoidable impacts.
- Arrange compensation and/or enhancement measures where required for negative impacts that are unavoidable and cannot be reduced through appropriate mitigation measures.

ES-14. Permits and Approvals

As the project proceeds, the following permits and approvals are expected to be required. These will be obtained prior to construction.

- Natural Environment
 - Based on the Natural Environment Report (**Appendix H**) the typical environmental permits and approvals from the following agencies are not expected to be required.
 - Ministry of Northern Development, Mines, Natural Resources and Forestry (MNRF)
 - Ministry of the Environment, Conservation and Parks (MECP)
 - Fisheries and Oceans Canada (DFO)
 - Toronto and Region Conservation Authority (TRCA)
- Hydrogeological (**Appendix F**)
 - As the dewatering flow estimate is less than 50 m³/day, an online registration with the Environmental Activity and Sector Registry (EASR) with the Ministry of the Environment, Conservation and Parks (MECP) and/or a Category 3 Permit to Take Water (PTTW) from MECP is not required as documented in the Hydrogeological Investigation provided in **Appendix F**. If dewatering exceeds 50 m³/day but is less than 400 m³/day this amount, an online registration with the EASR with the MECP will be required. If dewatering exceeds 400 m³/day, a Category 3 PTTW from MECP will be required.
 - Agreement to discharge to the City of Mississauga / Regional Municipality of Peel will be required prior to discharging dewatering effluent.
- Stormwater Management (**Appendix J**)
 - The City of Mississauga requires an Environmental Compliance Approval (ECA) application for the proposed 675 mm storm sewer from the Alstep Extension to the City's system.
 - Although this site is part of a TRCA regulated watershed, it does not drain directly to Etobicoke Creek nor Spring Creek and is not located within the regulated area and therefore TRCA approval is not required.
 - GTAA approval will be required for modifications to their storm drainage system including any additional proposed catchment areas (Storm Drainage Area 232).
- Cultural Heritage
 - As recommended in the Cultural Heritage Resource Assessment (CHRA) located in **Appendix E**, the City of Mississauga should consider waiving the requirement for a Heritage Impact Assessment (HIA) for the properties at 1840 Derry Road East (BHR 1) and 2030 Derry Road East (CHL 2) if suitable mitigation can be implemented.
 - As recommended in the CHRA, the City of Mississauga should consider waiving the requirement for a HIA for Pearson International Airport at 6301 Dart Drive (CHL 2) since no structures or apparent landscape features of significant cultural value or interest are anticipated to be impacted.
 - Acceptance from the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) based on findings of the CHRA and Archaeological Assessments.

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- Municipal Permits
 - Road Occupancy Permit
 - City of Mississauga Tree Permit under Tree Permit By-Law Number 474-05
- Additional
 - Any borehole drilling that occurs within the TRCA regulated area will require a permit.
 - Permission to enter agreements and any property acquisition requirements.