Chapter 5 – Final Project Description

407 TRANSITWAY – WEST OF BRANT STREET TO WEST OF HURONTARIO STREET

MINISTRY OF TRANSPORTATION - CENTRAL REGION

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5. FINAL PROJECT DESCRIPTION

The purpose of this Chapter is to describe the functional plan and Preliminary Design of the infrastructure and system components for which MTO is seeking approval from the MECP, of this EPR.

The technically preferred Transitway alternative has been planned for the operation of an intermediate capacity, regional rapid transit service provided by BRT technology. The functional plan and design were developed allowing for conversion to LRT technology if required in the future. This EPR is seeking approval for the construction and operation of BRT. Should a conversion to LRT in the future be planned, MECP will be consulted pursuant to **Section 15 (1) of the Transit Regulation** to define the assessment process that would apply.

The primary components of the Transitway infrastructure are 43 km of runningway, 8 station facilities and a maintenance storage facility. The runningway is a fully-grade separated guideway consisting of a two-lane road with paved shoulders and additional stopping lanes through station platforms. The fully fenced runningway will incorporate access for emergency response vehicles at stations and appropriate intervals.

5.1. Description of the Runningway Alignment and Cross-Sections

Following the alignment and station alternatives assessment described in **Chapter 4: Identification of Alternatives and Evaluation Process**, and the results of the detailed field investigations, the runningway alignment was defined. **Plates 1 to 71** at the end of **Chapter 5: Final Project Description**, illustrate the preferred horizontal and vertical alignment and corresponding footprint based on the Preliminary Design of the facility. **Figure 5.13** to **Figure 5.20** illustrate the different typical cross-sections proposed along the runningway.

Note: Along this section of the 407 Transitway (Brant Street to Hurontario Street), the magnetic north direction relative to the 407 corridor varies constantly. To avoid confusion, for purposes of this report, the corridor is referred as follows:

- Traveling west to east from Brant Street to East Lower Base Line.
- Traveling south to north from East Lower Base Line to Derry Road (segment parallel to Ninth Line)
- Traveling west to east from Derry Road to Hurontario Street

The section below describes the alignment and proposed cross-sections of the runningway.

SEGMENT 1: WEST OF BRANT STREET TO EAST OF DUNDAS STREET

SEGMENT 2: EAST OF DUNDAS STREET TO EAST OF APPLEBY LINE

SEGMENT 3: EAST OF APPLEBY LINE TO EAST OF TREMAINE ROAD

SEGMENT 4: EAST OF TREMAINE ROAD TO WEST OF SIXTEEN MILE CREEK

SEGMENT 5: WEST OF SIXTEEN MILE CREEK TO EAST OF TRAFALGAR ROAD

SEGMENT 6: EAST OF TRAFALGAR ROAD TO NORTH OF LOWER BASE LINE

SEGMENT 7: NORTH OF LOWER BASE LINE TO NORTH OF BRITANNIA ROAD

SEGMENT 8: NORTH OF BRITANNIA ROAD TO NORTH OF DERRY ROAD

SEGMENT 9: NORTH OF DERRY ROAD TO WEST OF HERITAGE ROAD

SEGMENT 10: WEST OF HERITAGE ROAD TO EAST OF CREDIT RIVER

SEGMENT 11: EAST OF CREDIT RIVER TO WEST OF HURONTARIO STREET

SEGMENT 1: WEST OF BRANT STREET TO EAST OF DUNDAS STREET

FIGURE 5.1: SEGMENT 1, WEST OF BRANT STREET TO EAST OF DUNDAS STREET ALIGNMENT LAYOUT.

HORIZONTAL ALIGNMENT

The segment from Brant Street to Dundas Street is bounded by residential developments on the north side and 407 ETR to the south. East of Dundas Street, the runningway travels through agricultural areas. The runningway alignment in this segment is located within the north side of 407 ETR right of way to avoid impact on the residential properties.

Just north of the 407 ETR-Dundas Street Interchange, an interlining access road is proposed to connect Dundas Street to the 407 Transitway providing local and regional transit agencies opportunity at access the 407 Transitway runningway, at this location.

The Dundas Street stop platform is located between two Shoreacres Creek tributaries (watercourses BU05 to BU07), approximately 950 m east of Dundas Street.

The alignment crosses the Hydro Corridor west of Upper Middle Road without impacting the Hydro One infrastructure or electromagnetic zone.

In this segment, one private property is affected by the runningway/interlining access. Speed reduction to 60-70 km/h is required in Dundas Street area.

VERTICAL ALIGNMENT

To minimize visual and potential noise impact to adjacent residential developments, the profile of the runningway generally follows the elevation of 407 ETR, crossing under Brant Street, Upper Middle Road, Guelph Line and Dundas Street (**Figure 5.2**) illustrates a cross-section in the area, showing that most or part of the existing berm will remain.
After crossing under Dundas Street, the profile rises to cross over the Shoreacres Creek tributaries.

The profile is illustrated in the Plan and Profile plates (**Plates 1 to 9**).

FIGURE 5.2: TYPICAL SECTION BETWEEN BRANT STREET TO DUNDAS STRET

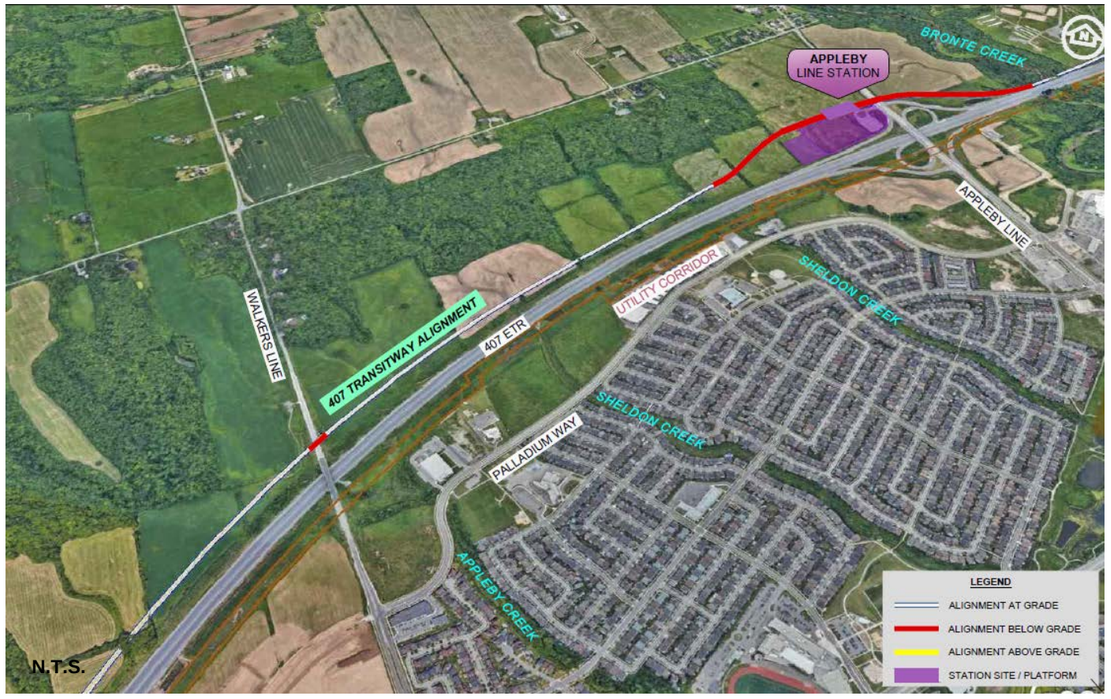
CROSS-SECTION

The types of typical cross sections through this segment is described below. Illustrations of these typical cross-sections are included in **Figure 5.13** through **Figure 5.20**.

- From west limit of project to west of Dundas Street Station area – see **Figure 5.2** and **Figure 5.14**.
- Dundas Street Station area – see **Figure 5.15** and **Figure 5.16**.
- Brant Street, Upper Middle Road, Guelph Line and Dundas Street crossings – see **Figure 5.18.**
- From east of Dundas Street Station area to Shoreacres Creek tributaries – see **Figure 5.13**.

SEGMENT 2: EAST OF DUNDAS STREET TO EAST OF APPLEBY LINE

FIGURE 5.3: SEGMENT 2, EAST OF DUNDAS STREET TO EAST OF APPLEBY LINE ALIGNMENT LAYOUT.



HORIZONTAL ALIGNMENT

The runningway alignment in this segment continues on the north side of 407 ETR. It travels in close proximity to the 407 ETR right of way, through agricultural lands.

The geometric alignment is similar to the 407 ETR geometric alignment in this segment.

The alignment geometry complies with MTO 407 Transitway Design Standards.

VERTICAL ALIGNMENT

The profile of the runningway mostly follows the elevation of 407 ETR, crossing under Walkers Line and Appleby Line, crossing over Appleby Creek (watercourse BU08) and Sheldon Creek tributaries (watercourses BU09 to BU11).

Profile is illustrated in the Plan and Profile plates (**Plates 10 to 15**).

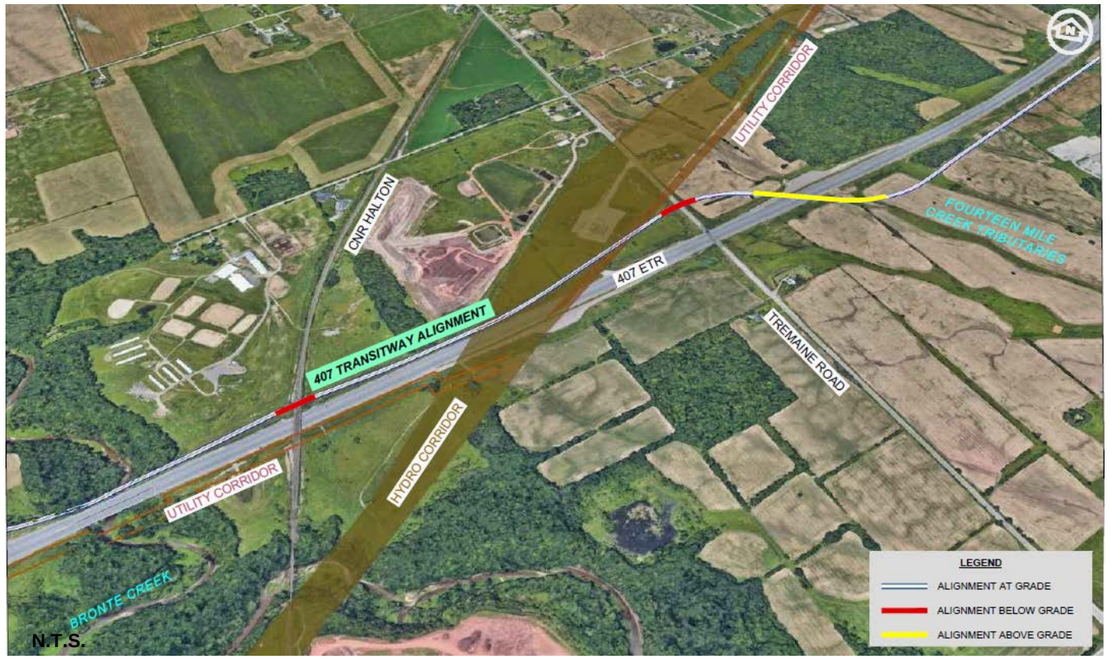
CROSS-SECTION

The types of typical cross-sections through this segment are described below. Illustrations of these typical cross sections are included in **Figure 5.13** through **Figure 5.20**.

- From east of Dundas Street to west of Appleby Line Station area – See **Figure 5.13** .
- Appleby Line Station area – See **Figure 5.15** and **Figure 5.16**.
- From east of Appleby Line Station area to east of Appleby Line – See **Figure 5.18**.

SEGMENT 3: EAST OF APPLEBY LINE TO EAST OF TREMAINE ROAD

FIGURE 5.4: SEGMENT 3, EAST OF APPLEBY LINE TO EAST OF TREMAINE ROAD ALIGNMENT LAYOUT.



HORIZONTAL ALIGNMENT

This segment travels mostly through agricultural lands. The runningway alignment continues on the north side of 407 ETR past the Tremaine Road crossing; east of Tremaine Road, the alignment crosses to the south side of 407 ETR. At the crossing of the Bronte Creek valley, the alignment is located as close as possible to 407 ETR to minimize impact to this valley which is part of the Zimmerman Valley Life Science Area of Natural and Scientific Interest (ANSI) and is designated by the City of Burlington as an Environmentally Sensitive Area. The crossing of the Hydro Corridor was designed to comply with Hydro One's minimum transmission towers clearance requirements. The alignment requires relocation of three distribution monopoles located in the Parkway Belt Utility Corridor. In addition, to minimize impacts to the Trafalgar Moraine east of Tremaine Road (north side of 407 ETR), the runningway alignment crossed the 407 ETR to be on the south side of the highway. This alignment avoids impacts to the Oakville-Milton Weltands and Uplands Candidate ANSI and the provincially significant wetlands of the North Oakville-Milton West Wetland Complex.

No station is planned in this segment. Speed reduction to 60-70 km per hour is required in the approach curves to the bridge over 407 ETR.

VERTICAL ALIGNMENT

The runningway profile bridges over Bronte Creek (watercourse BR02), it crosses under the CNR Halton Subdivision track, and it follows the 407 ETR profile east of the CNR tracks, crossing the Hydro Corridor and Utility Corridor at grade, and under Tremaine Road, before bridging over 407 ETR and over the Fourteen Mile Creek tributaries.

Profile is illustrated in the Plan and Profile plates **(Plates 15 to 20)**.

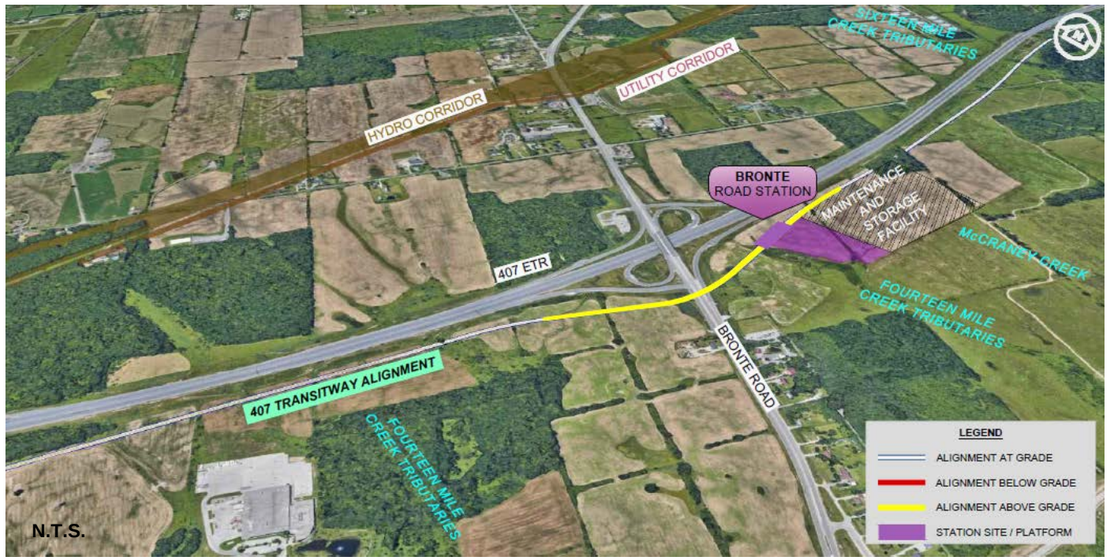
CROSS-SECTION

The types of typical cross-sections through this segment are described below. Illustrations of these typical cross sections are included in **Figure 5.13** through **Figure 5.20**.

- Bronte Creek crossing – See **Figure 5.17.**
- CNR Halton Subdivision crossing – See **Figure 5.18.**
- From east of CNR Halton Subdivision to west of Tremaine Road – See **Figure 5.14.**
- Tremaine Road crossing – See **Figure 5.17.**
- 407 ETR crossing – See **Figure 5.17.**
- From east of 407 ETR crossing to Fourteen Mile Creek tributaries area – See **Figure 5.13 .**

SEGMENT 4: EAST OF TREMAINE ROAD TO WEST OF SIXTEEN MILE CREEK

FIGURE 5.5: SEGMENT 4, EAST OF TREMAINE ROAD TO WEST OF SIXTEEN MILE CREEK ALIGNMENT LAYOUT.



HORIZONTAL ALIGNMENT

This segment travels mostly through rural lands adjacent to 407 ETR, which are designated as Employment District in the Town of Oakville Official Plan. The alignment is located on the south side of 407 ETR.

A station facility is proposed in this segment east of Bronte Road, and a Transitway Maintenance and Storage Facility (MSF), east of the station. The runningway alignment adequately connects to both facilities.

The alignment geometry complies with MTO 407 Transitway Design Standards.

VERTICAL ALIGNMENT

The profile of the runningway mostly follows the elevation of 407 ETR, bridging over Fourteen Mile Creek tributaries (watercourses OW07 to OW11), Bronte Road and over Sixteen Mile Creek tributaries (watercourse S01).

Profile is illustrated in the Plan and Profile plates **(Plates 20 to 25)**.

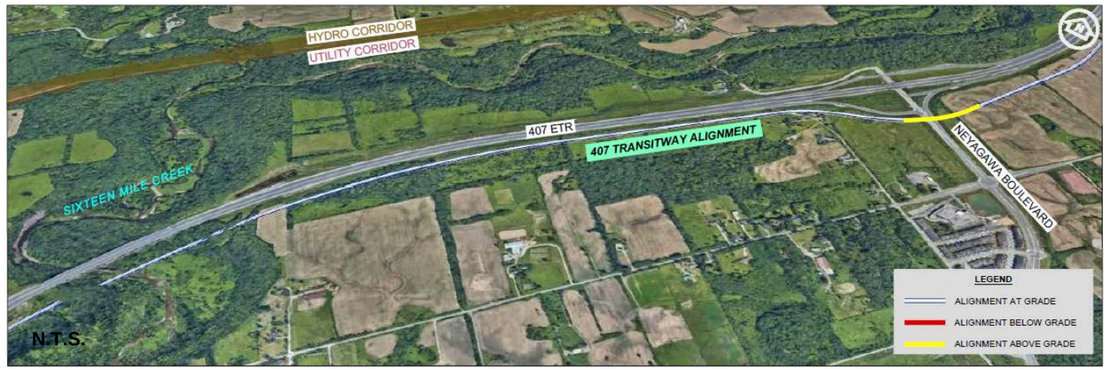
CROSS SECTION

The types of typical cross sections through this segment are described below. Illustrations of these typical cross sections are included in **Figure 5.13** through **Figure 5.20**.

- Fourteen Mile Creek tributaries area – See **Figure 5.13 .**
- Fourteen Mile Creek tributaries crossings – See **Figure 5.17.**
- Bronte Road crossing – See **Figure 5.17.**
- Bronte Road Station area – See **Figure 5.15** and **Figure 5.16.**
- From east of Bronte Road Station area to west of Sixteen Mile Creek – See **Figure 5.13 .**

SEGMENT 5: WEST OF SIXTEEN MILE CREEK TO EAST OF TRAFALGAR ROAD

FIGURE 5.6: SEGMENT 5, WEST OF SIXTEEN MILE CREEK TO EAST OF TRAFALGAR ROAD ALIGNMENT LAYOUT.



HORIZONTAL ALIGNMENT

The runningway in this segment travels on the south side of the 407 ETR right of way, on a corridor protected for the 407 Transitway on the north edge of the North Oakville East Secondary Plan. The alignment geometry is similar to the alignment geometry of 407 ETR, connecting to the ~~proposed~~ 407 Transitway Trafalgar Station at the location of the existing GO bus station and carpool facility.

The alignment geometry complies with MTO 407 Transitway Design Standards.

VERTICAL ALIGNMENT

The profile of the runningway in this segment mostly follows the 407 ETR profile crossing over Neyagawa Boulevard and Trafalgar Road, and under Sixth Line. It crosses over Sixteen Mile Creek (watercourse S02) and Joshua's Creek (watercourse OE02). The profile is illustrated in the Plan and Profile plates (**Plates 25 to 36**).

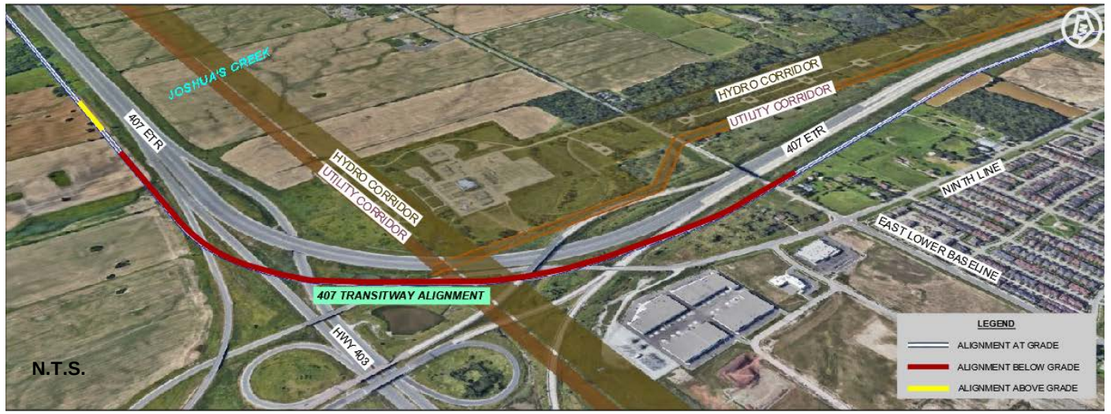
CROSS SECTION

The types of typical cross sections through this segment is described below. Illustrations of these typical cross sections are included in **Figure 5.13** through **Figure 5.20**.

- Sixteen Mile Creek crossing – See **Figure 5.17.**
- From east of Sixteen Mile Creek to west of Neyagawa Blvd– See **Figure 5.13.**
- Neyagawa Blvd crossing – See **Figure 5.17.**
- From east of Neyagawa Blvd to west of Sixth Line – See **Figure 5.13 .**
- Sixth Line crossing – See **Figure 5.18.**
- From east of Sixth Line crossing to Trafalgar Road Station area – See **Figure 5.13.**
- Trafalgar Road Station area – See **Figure 5.15** and **Figure 5.16.**
- From east of Trafalgar Road Station area to Joshua's Creek – See **Figure 5.13.**

SEGMENT 6: EAST OF TRAFALGAR ROAD TO NORTH OF LOWER BASE LINE

FIGURE 5.7: SEGMENT 6, EAST OF TRAFALGAR ROAD TO NORTH OF LOWER BASE LINE ALIGNMENT LAYOUT.



HORIZONTAL ALIGNMENT

Approaching the 407 ETR/Highway 403 Interchange, the runningway travels adjacent to 407 ETR right of way. At the Interchange crossing, the Transitway alignment crosses six ramps of the Interchange with two close curves in the same direction (broken-back curves) designed to avoid impact to structure elements of the existing Interchange, and the Hydro One Trafalgar Transformer Station.

No station is included in this segment; however, integration with the Mississauga Transitway will be analyzed in a separate study to assess feasible connection location. The design speed is reduced to 100 km per hour at the 407 ETR/Highway 403 underground crossing.

VERTICAL ALIGNMENT

The profile of the runningway through most of this segment is underground. Tunneling type and construction method will be defined in the Detail Design phase. This tunnel crosses under six existing Interchange ramps, Ninth Line, Lower Base Line, the Hydro Corridor, and the Utility Corridor. The profile bridges over Joshua Creek tributaries (watercourse OE03 to OE05). Profile is illustrated in the Plan and Profile plates (**Plates 36 to 43**).

CROSS SECTION

A type of typical cross section through this segment is described below. Illustrations of typical cross sections are included in **Figure 5.13** through **Figure 5.20**.

- From east of Joshua's Creek to north of Lower Base Line – See **Figure 5.19.**

SEGMENT 7: NORTH OF LOWER BASE LINE TO NORTH OF BRITANNIA ROAD

FIGURE 5.8: SEGMENT 7, NORTH OF LOWER BASE LINE TO NORTH OF BRITANNIA ROAD ALIGNMENT LAYOUT.

HORIZONTAL ALIGNMENT

The runningway is located between Ninth Line and 407 ETR. In this segment, the alignment follows the City of Mississauga's *Highway 407 Transitway Corridor Assessment Within The Ninth Line Lands* (2018) alignment which was determined considering the various existing watercourse meanders, floodplain, existing water ponds, and potential development areas. It travels through mostly open space and agricultural areas, adjacent to potential development zones in the vicinity of the 407 Transitway. This segment includes Britannia Road station facility located south of Britannia Road.

The alignment geometry complies with MTO 407 Transitway Design Standards.

VERTICAL ALIGNMENT

The profile of the runningway mostly follows the 407 ETR profile crossing over Britannia Road to minimize impacts on the existing watercourse meanders and flood plain. It crosses over watercourses S-E01 to S-E03 south and north of Britannia Road. Profile is illustrated in the Plan and Profile plates (**Plates 43 to 46**).

CROSS SECTION

The types of typical cross sections through this segment are described below. Illustrations of these typical cross sections are included in **Figure 5.13** through **Figure 5.20**.

- From north of Lower Base Line to Britannia Road Station area – See **Figure 5.13.**
- Britannia Road Station area – See **Figure 5.15** and **Figure 5.16.**
- Britannia Road crossing – See **Figure 5.17.**

SEGMENT 8: NORTH OF BRITANNIA ROAD TO NORTH OF DERRY ROAD

FIGURE 5.9: SEGMENT 8, NORTH OF BRITANNIA ROAD TO NORTH OF DERRY ROAD ALIGNMENT LAYOUT.

HORIZONTAL ALIGNMENT

Similar to the previous segment, the runningway is located between 407 ETR and Ninth Line, following the City of Mississauga's *Highway 407 Transitway Corridor Assessment Within The Ninth Line Lands (2018)* alignment. As with the previous segment, the alignment borders extensive floodplain areas. This segment includes a high demand station facility located at the northeast quadrant of the 407 ETR/Derry Road Interchange.

The alignment geometry complies with MTO 407 Transitway Design Standards.

VERTICAL ALIGNMENT

The profile of the runningway in this segment mostly follows the elevation of 407 ETR. raising to cross over Derry Road to minimize the impacts to the existing meanders and flood plain. The profile bridges over watercourses S-E04 to S-E06 west of Derry Road. Vertical alignment is illustrated in the Plan and Profile plates (**Plates 46 to 52**).

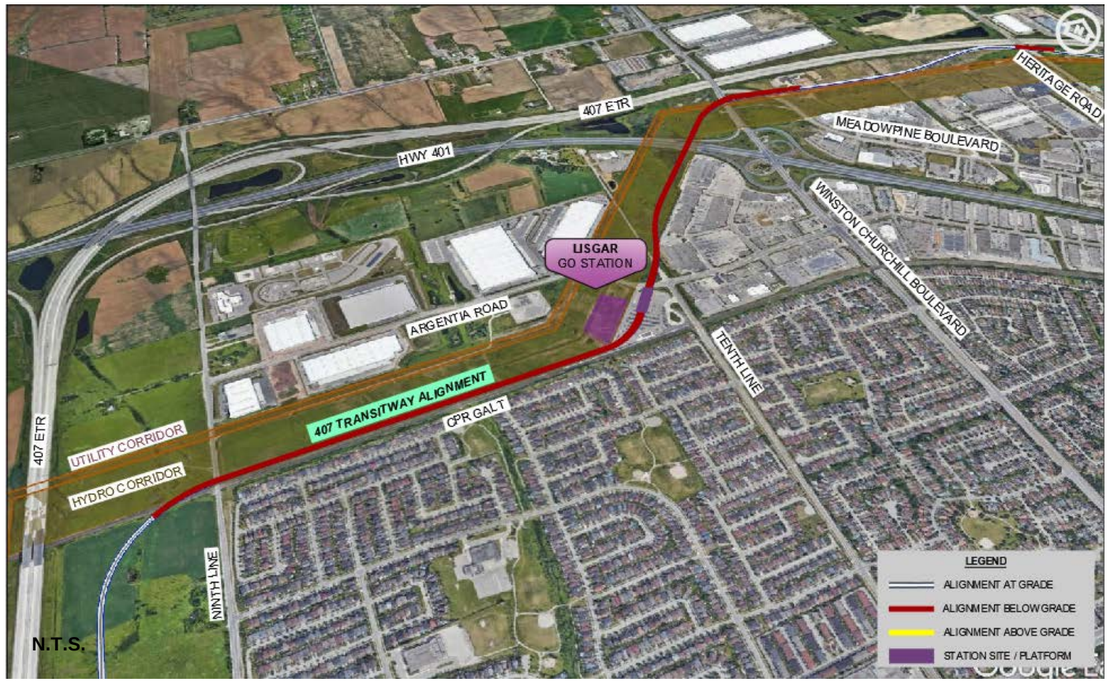
CROSS SECTION

The types of typical cross sections through this segment are described below. Illustrations of these typical cross sections are included in **Figure 5.13** through **Figure 5.20**.

- From north of Britannia Road to south of Derry Road – See **Figure 5.13.**
- From south of Derry Road to Derry Road Station area - See **Figure 5.15** and **Figure 5.16.**
- Derry Road Station area – See **Figure 5.16.**

SEGMENT 9: NORTH OF DERRY ROAD TO WEST OF HERITAGE ROAD

FIGURE 5.10: SEGMENT 9, NORTH OF DERRY ROAD TO WEST OF HERITAGE ROAD ALIGNMENT LAYOUT.



HORIZONTAL ALIGNMENT

After crossing the CPR Galt Subdivision tracks, the alignment travels within the Hydro Corridor, parallel to the CP tracks, connecting with the GO Transit Milton Rail Line at the Lisgar GO Station. The alignment continues within the Hydro Corridor, crossing to its north side after crossing Highway 401 and Winston Churchill Boulevard. The ~~proposed~~ alignment does not conflict with the existing or potential future Hydro One transmission facilities.

This segment does not have any major environmental concerns. There is no impact on private properties. Traveling speed is reduced to 70 km per hour at Lisgar GO station.

VERTICAL ALIGNMENT

The vertical alignment of this segment is underground to comply with Hydro One electromagnetic requirements. The design speed along a crest vertical curve between Derry Road Station and CP tracks is reduced to 100 km per hour. The vertical alignment is illustrated in the Plan and Profile plates (**Plates 52 to 60**).

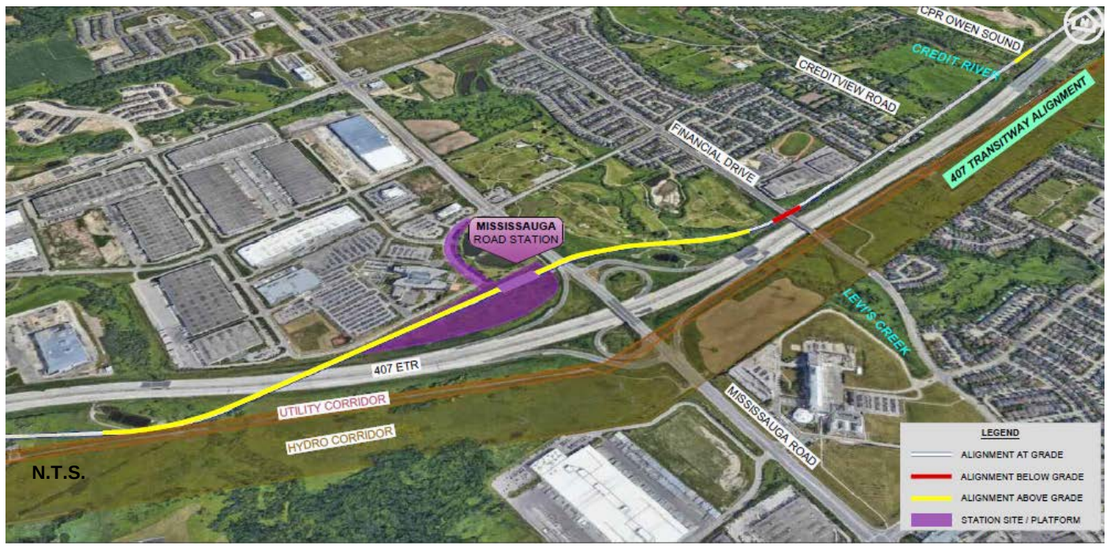
CROSS SECTION

The types of typical cross sections through this segment are described below. Illustrations of these typical cross sections are included in **Figure 5.13** through **Figure 5.20**.

- From north of Derry Road to south of CPR Galt Subdivision – See **Figure 5.14.**
- From south of CPR Galt Subdivision to east of Meadowpine Boulevard – See **Figure 5.19.**
- Lisgar GO Station area – See **Figure 5.15** and **Figure 5.16.**
- From east of Meadowpine Boulevard to west of Heritage Road – See **Figure 5.13.**
- Heritage Road crossing – See **Figure 5.18.**

SEGMENT 10: WEST OF HERITAGE ROAD TO EAST OF CREDIT RIVER

FIGURE 5.11: SEGMENT 10, WEST OF HERITAGE ROAD TO EAST OF CREDITVIEW ROAD ALIGNMENT LAYOUT.



HORIZONTAL ALIGNMENT

The alignment in this segment crosses the 407 ETR from south of 407 ETR to north west of Mississauga Road to connect to the proposed Mississauga Road Station, remaining on the north side of the Highway, connecting to the alignment of the next segment east of Creditview Road.

The alignment geometry complies with MTO 407 Transitway Design Standards.

VERTICAL ALIGNMENT

In the west portion of this segment, the profile is mostly elevated bridging over Mullet Creek (watercourse M01), 407 ETR (twice), and Mississauga Road. In the east portion of the segment, the profile mostly follows the 407 ETR elevation crossing over Levis Creek (watercourse L01), under Financial Drive, over Credit River (watercourses NP01 and NP02, and CPR Owen Sound Subdivision tracks. The profile is illustrated in the Plan and Profile plates (**Plates 60 to 66**).

CROSS SECTION

The types of typical cross sections through this segment are described below. Illustrations of these typical cross sections are included in **Figure 5.13** through **Figure 5.20**.

- From west of Mississauga Road to east of Creditview Road – See **Figure 5.17.**
- Mississauga Road Station area – See **Figure 5.15** and **Figure 5.16.**
- CPR Owen Sound Subdivision crossing – See **Figure 5.18.**
- Financial Drive crossing – See **Figure 5.18.**

SEGMENT 11: EAST OF CREDIT RIVER TO WEST OF HURONTARIO STREET

FIGURE 5.12: SEGMENT 11, WEST OF CREDITVIEW ROAD TO WEST OF HURONTARIO STREET ALIGNMENT LAYOUT.

HORIZONTAL ALIGNMENT

The alignment remains on the north side of 407 ETR, crossing to the south side of it, east of Credit River. The runningway continues on the south side of 407 ETR along vacant land between 407 ETR and Utility/Hydro Corridors, connecting to Hurontario Street Station which was included in the 2018 TPAP approved 407 Transitway Hurontario Street - Highway 400 Section.

The alignment geometry complies with MTO 407 Transitway Design Standards.

VERTICAL ALIGNMENT

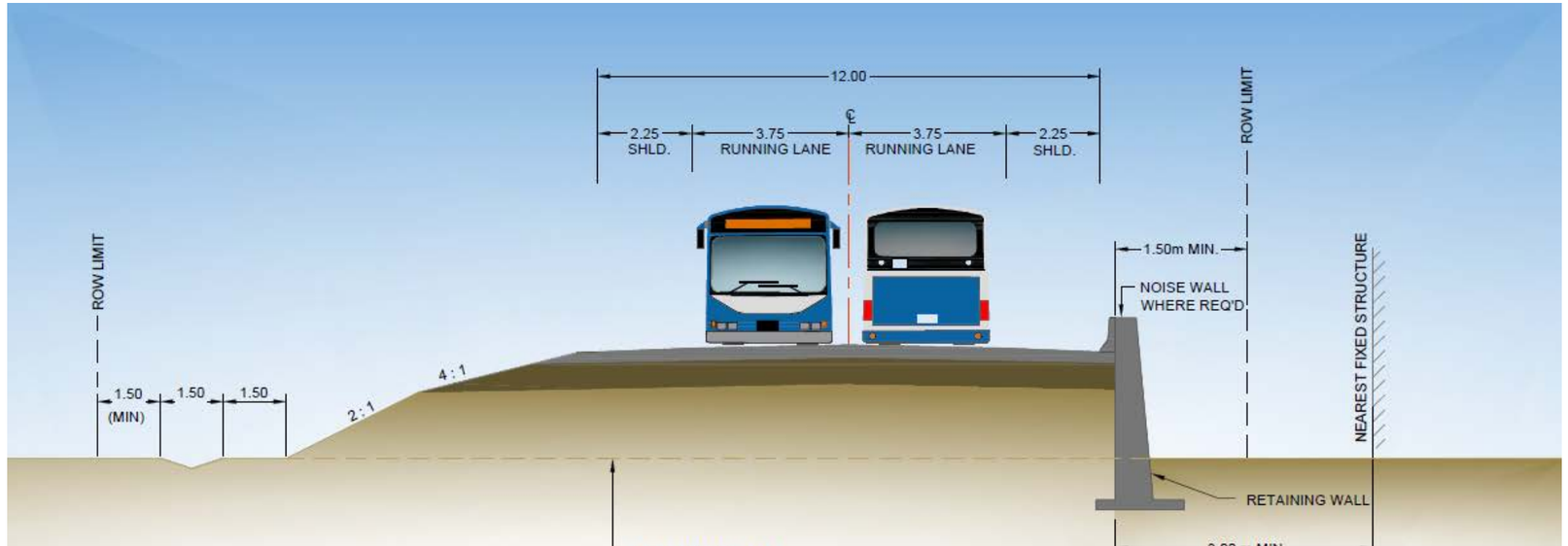
The runningway profile bridges over 407 ETR and then maintains similar elevation of the Highway, crossing under the 407 ETR/Mavis Road interchange, and McLaughlin Road, raising to reach the elevation of 407 ETR to bridge over Fletchers Creek (watercourse F03), connecting to the runningway profile of the Hurontario Street - Highway 400 Section. The profile is illustrated in the Plan and Profile plates (**Plates 66 to 71**).

CROSS SECTION

The types of typical cross sections through this segment are described below. Illustrations of these typical cross sections are included in **Figure 5.13** through **Figure 5.20**.

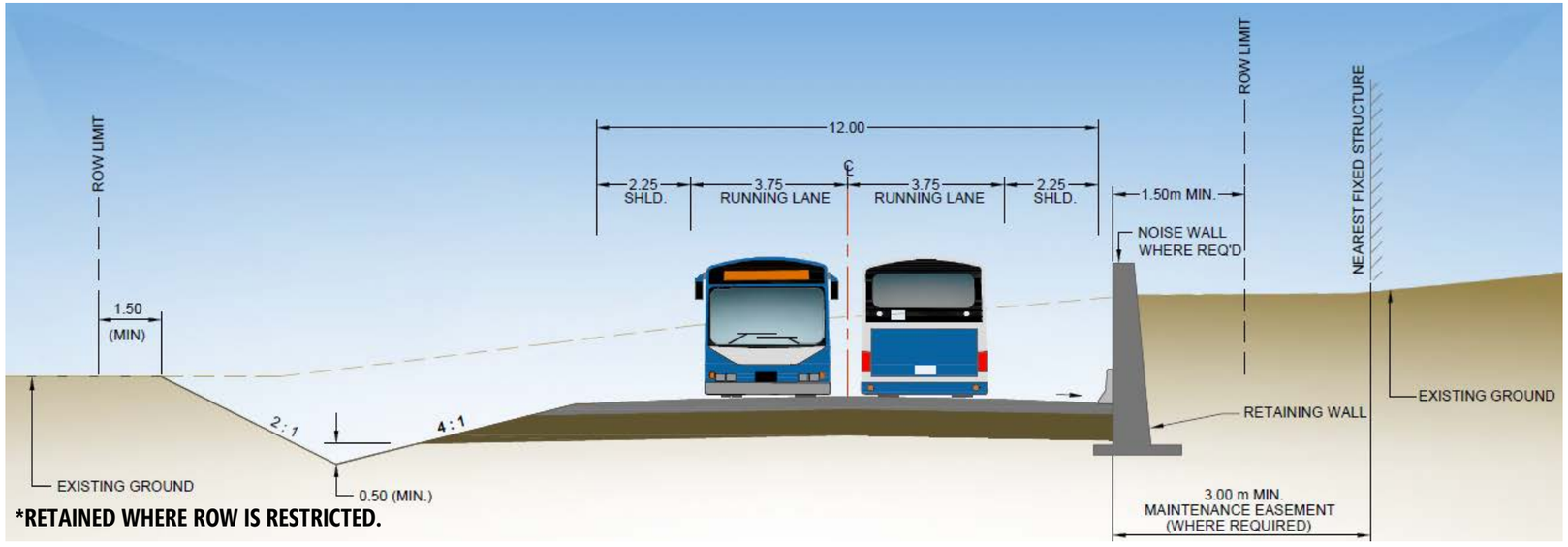
- From east of Creditview Road to east of McLaughlin Road – See **Figure 5.18** and **Figure 5.19.**
- From east of McLaughlin Road to east limit of project – See **Figure 5.13.**

FIGURE 5.13: FILL SECTION BETWEEN STATIONS



*RETAINED WHERE ROW IS RESTRICTED.

FIGURE 5.14: CUT SECTION BETWEEN STATIONS



*RETAINED WHERE ROW IS RESTRICTED.

FIGURE 5.15: CROSS-SECTION THROUGH STATION PLATFORMS

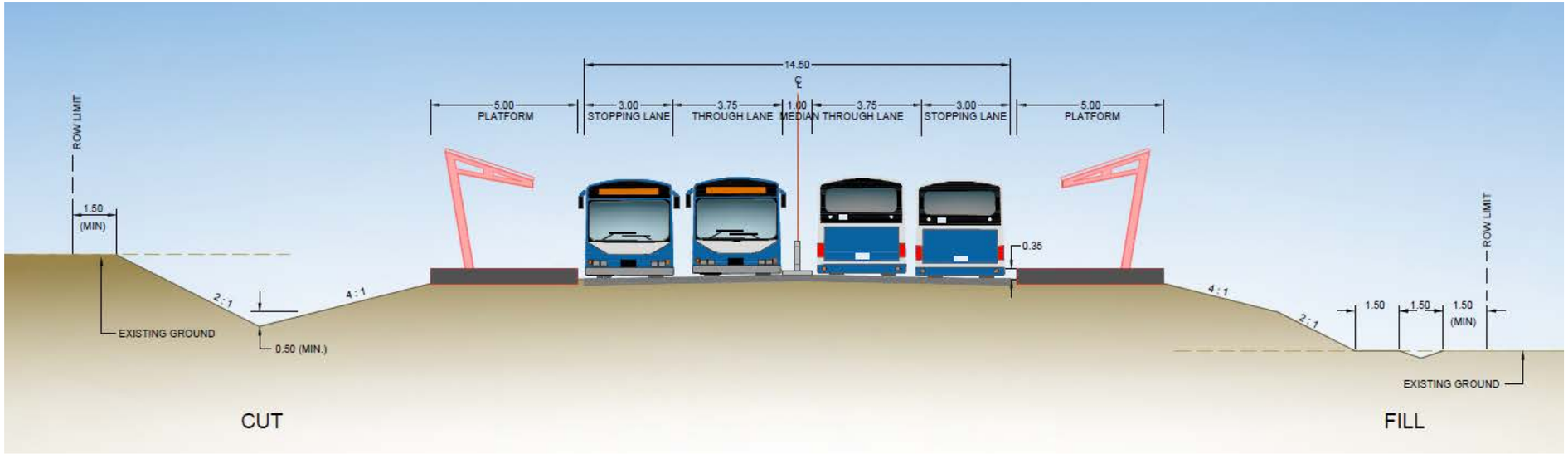


FIGURE 5.16: CROSS-SECTION AT STATION APPROACH

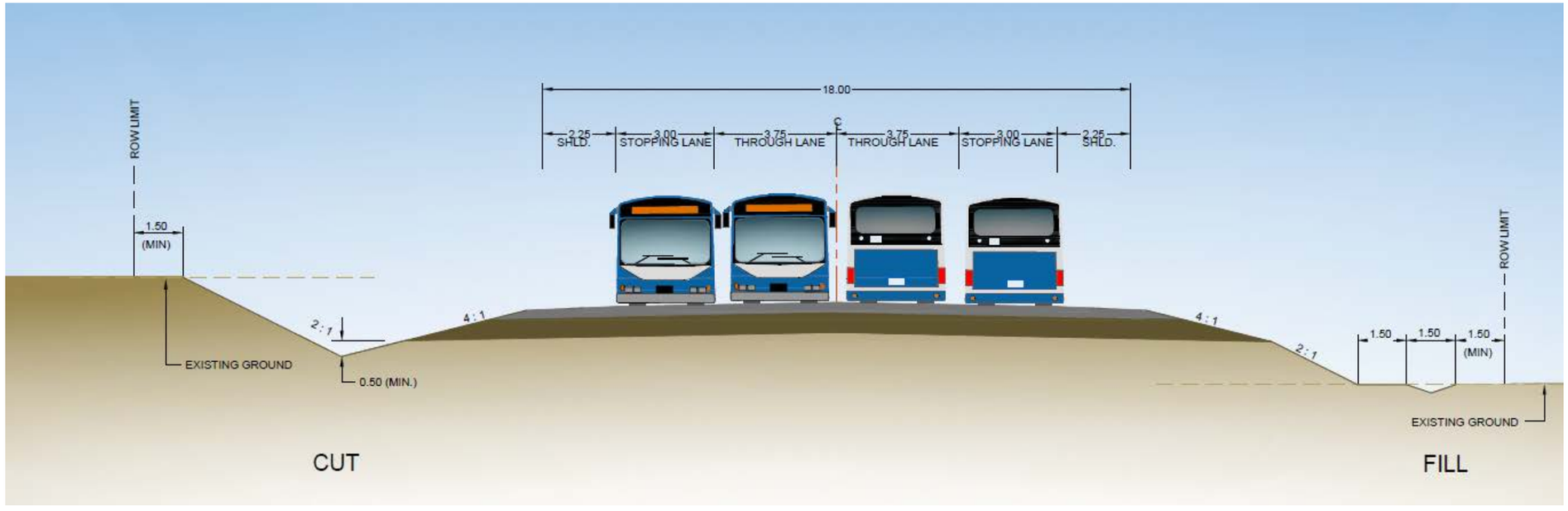
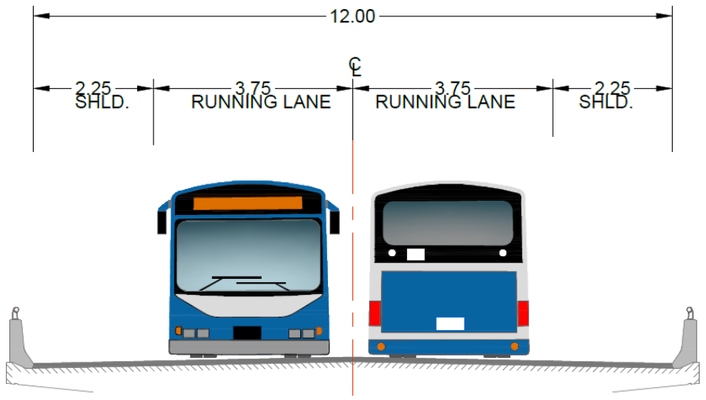


FIGURE 5.17: CROSS-SECTION ON OVERPASS



NOTE:

STRUCTURES WITH A LENGTH SHORTER THAN 60m WILL HAVE A REDUCED SHOULDER WIDTH OF 1.75m

FIGURE 5.18: CROSS-SECTION THROUGH UNDERPASS

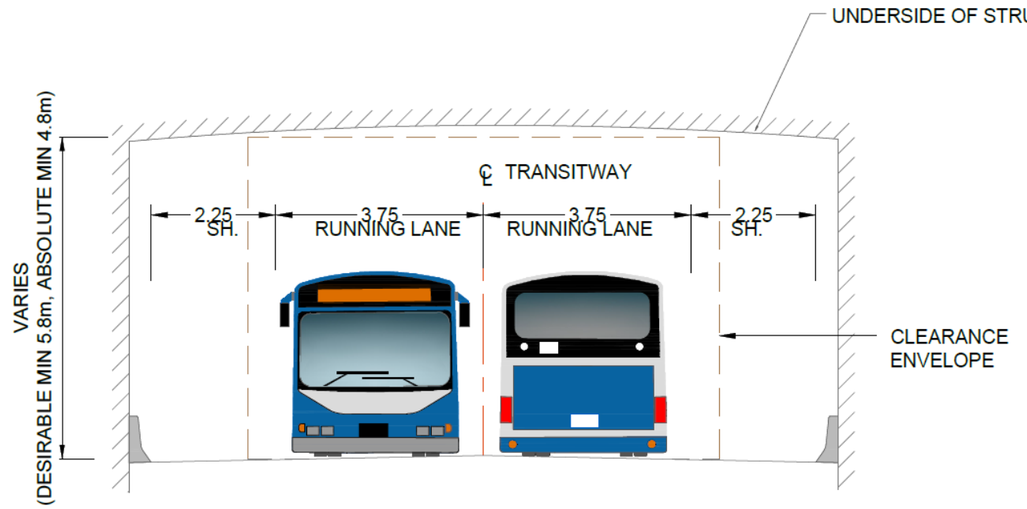


FIGURE 5.19: CROSS-SECTION THROUGH TUNNEL SECTION

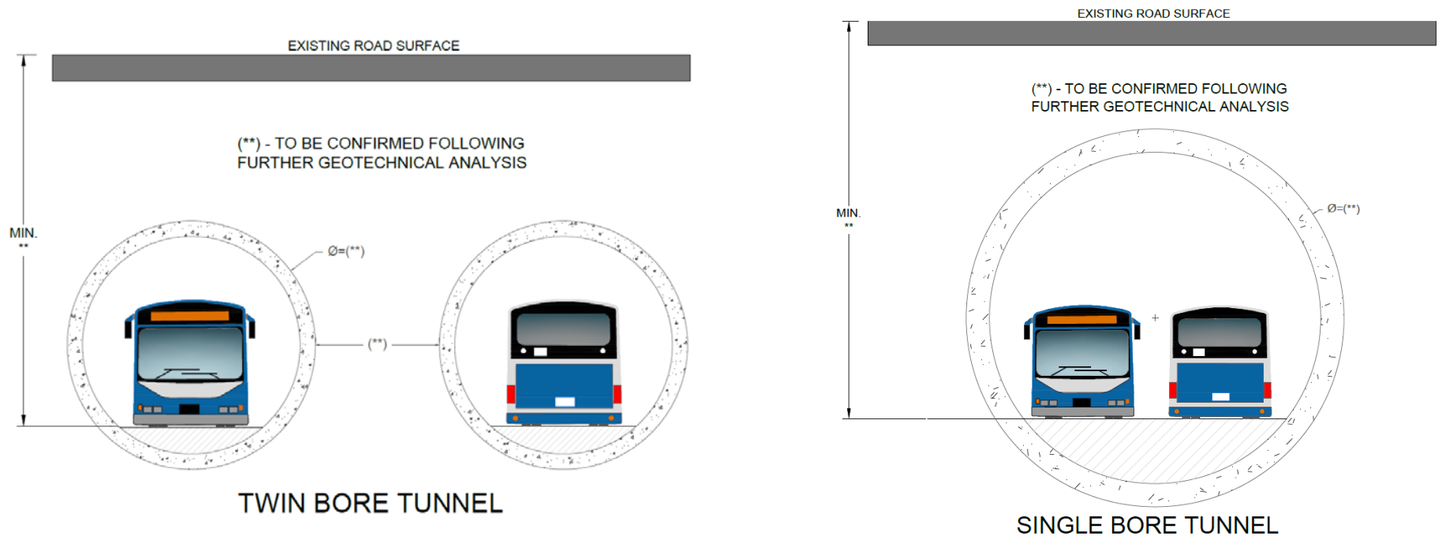
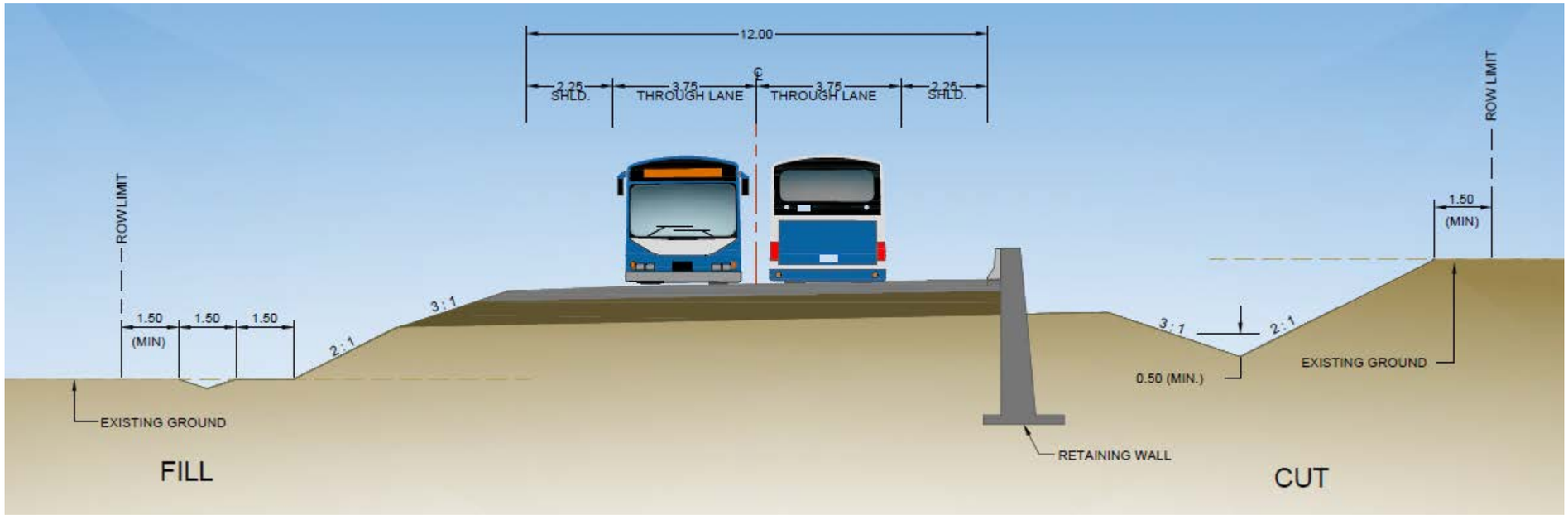


FIGURE 5.20: SUPERELEVATED SECTION BETWEEN STATIONS



5.2. Stations

5.2.1. Conclusions and Recommendations of Station Sites Evaluation

5.2.1.1. Station Nodes Screening Results

As a result of the screening of the potential station nodes located at all ETR Interchanges, stations at the ETR Interchanges with Neyagawa Boulevard, Winston Churchill Boulevard and Mavis Road were not carried forward for reasons described in **Chapter 4: Identification of Alternatives and Evaluation Process.** The nodes carried forward are Dundas Street, Appleby Line, Bronte Road, Trafalgar Road, Britannia Road, Derry Road, and Mississauga Road. Additionally, the existing GO Transit Milton Rail line Lisgar GO Station is proposed to be expanded to provide for a future connection between the GO rail line and the 407 Transitway.

5.2.1.2. Station Sites Evaluation Results

After completion of the station nodes screening process, potential available sites were evaluated for all carried forward station nodes. The process and results of the evaluation of station sites is described in **Chapter 4: Identification of Alternatives and Evaluation Process.** As a result of the evaluation, the following sites were selected to be carried forward:

STATION NODE	SELECTED STATION SITE
DUNDAS STREET STATION	SOUTHEAST QUADRANT OF THE 407 ETR
APPLEBY LINE STATION	NORTHWEST QUADRANT OF THE 407 ETR
BRONTE ROAD STATION	SOUTHEAST QUADRANT OF THE 407 ETR
TRAFALGAR ROAD STATION	SOUTHWEST QUADRANT OF THE 407 ETR
BRITANNIA ROAD STATION	SOUTHEAST QUADRANT OF THE 407 ETR
DERRY ROAD STATION	NORTHEAST QUADRANT OF THE 407 ETR
LISGAR GO STATION (EXPANSION)	EXISTING LISGAR GO STATION
MISSISSAUGA ROAD STATION	NORTHWEST QUADRANT THE 407 ETR

5.2.1.3. Stations Design Principles

The design principles for transit station facilities support the ultimate goals of facilitating effective transit service, enhancing user experience and minimizing negative environmental impacts. The EPR includes a functional design of all selected stations and a general layout of the surface components, including bus facilities, park and ride facilities, passenger pick-up/drop-off (PPUDO) facilities, access, as well as major circulation patterns, and approximate location and sizing of SWM ponds. It is important to note that any new station design standards, environmental guidelines and specific requirements in place following completion of this EPR, shall be followed during project implementation phases.

Table 5.1 lists and describes the design principles to be followed during the Detail Design and Construction phases of the 407 Transitway stations.

TABLE 5.1: STATION CONSIDERATION FACTORS AND DESIGN PRINCIPLES

COMPONENT	STATION DESIGN PRINCIPLES
PASSENGER	Clear, direct (single point of transfer) and / or short transfers between transit modes, services and routes by minimizing walking distances and removing physical barriers within transit stations.
	Stations and station areas that are universally accessible and that can accommodate the needs of all members of society in accordance with The Accessibility for Ontarians with Disabilities Act (AODA).
ACTIVE TRANSPORTATION AND PEDESTRIAN SAFETY	Prioritized, safe and direct pedestrian and cycling routes to rapid transit stations from major destinations and regional cycling and pedestrian networks.
	Convenient, comfortable, direct and safe pedestrian linkages to and from all transit stations in order to support a walkable station area and promote the use of transit.
	A high level of pedestrian priority, safety and amenities within and around the transit facility to enhance customer comfort, safety and information.
VEHICULAR FACILITIES	Clearly marked and protected access for pedestrians and cyclists at station areas to minimize conflicts, particularly at PPUDOs, bus facilities and parking access points.
	PPUDO located to utilize the parking circulation system while unloading pedestrians close to the station or transit plaza.
	Parking lots and PPUDOs designed to promote easy navigability with sufficient queuing distances at intersections.
	Carpooling and alternate fuel vehicles priority parking in close proximity to the station entrance.
	Well-lit parking lots and station areas with unobstructed sightlines.
	Layby and looping bus facilities for local and regional buses entering the station. Bus stops at the crossing arterial road will also be provided for buses not entering the facility.
RECOMMENDATIONS FOR STATION ARCHITECTURE DESIGN	A high-quality station architecture and public realm that is sensitive to the surrounding built context and projects a clear, identifiable 407 Transitway brand and vision.
	Transitway bridges, structures and retaining walls as prominent visual elements with good design potential. Extensive use of glass in shelters and station areas to enhance the natural surveillance and lighting of these areas.
STATION DESIGN	Weather-protected station areas through the use of plant screens, wall canopies and heated station areas for waiting.

COMPONENT	STATION DESIGN PRINCIPLES
	Station and plaza oriented to maximize levels of natural lighting.
	Legible and permeable transit stations through consistency and clarity in station entrances and interfaces, spaces, layout and visual cues connected by barrier-free movement spaces.
	A unified way-finding and signage strategy to support the legibility and permeability of the transit station.
	Station and the Transitway elements to act as landmarks both locally and for passing transit.
	Extending the design continuity of the transit station areas, including paving patterns, colours and materials, to adjacent sidewalks, plazas and pedestrian crossings.
	A high level architectural and landscape design for parking facilities to reduce its environmental impact and to improve pedestrian connections and access.
	The station building will feature ticketing facilities, fully accessible/unisex washrooms (TBD).
	Other amenities - ITS equipment, such as fare collection and passenger information systems to display service status will be accommodated.
	Prioritization and implementation of proven and innovative sustainable energy, water, landscape and waste management practices in the design of intermodal station, transit facilities and station areas.
	High-quality materials in both the station and landscape design that will "stand the test of time" and continue to maintain a positive image of the system.
	Mitigating visual presence of parked cars by concealing them appropriately through screening, landscaping, or design treatments.
	Optimum bus accessibility minimizing operational conflict with private vehicles where possible"
COMMUNITY EFFECT	Facilities designed to minimize traffic and noise impacts on adjacent neighbourhoods.

5.2.1.4. Station Layouts

This section describes the main characteristics and components of the proposed layouts for the eight stations sites being carried forward. The general criterion used to size the different station elements is focused on meeting the ridership demand forecast for 2041.

In sites with insufficient land availability, the station layout is providing as many parking and PPUDO spaces as possible. The sizing and capacity allocated to the bus facilities is conceptual since it is premature for the local and regional transit agencies to provide future requirements. The station layouts may be optimized once design requirements, particularly those relating to the provision of bus loops, are determined.

DUNDAS STREET STATION

LOCATION AND TRANSPORTATION CONTEXT

The Dundas Street Station will be located off Palladium Way east of Dundas Street, just south of the 407 ETR as shown in **Plate S-1A.** From the ridership forecast and transportation integration perspective, Dundas Street Station is highly important. A future BRT service is planned by the Province on Dundas Street, and Halton Region's "Defining Major Transit Requirements in Halton" (Report No. LPS45-19/PW-18-19) identifies the existing commuter parking lot as a proposed Regional Transit Node at this location.

TYPE OF FACILITIES AND SERVICES

Dundas Street Station facilities, detailed in **Table 5.2**, will include a passenger parking area, a passenger pick-up/drop-off (PPUDO), a bus transfer facility, and active transportation shelter facilities. The station includes a pedestrian bridge over 407 ETR, connecting the 407 Transitway platforms with the facility.

Additionally, there will be an exclusive bus access from Dundas Street (north of 407 ETR) to the Transitway runningway to provide interlining opportunities for regional and local transit services.

The station will be fully accessible. As shown in **Plate S1-B**, the station truss structure spans the runningway and utilizes stairs and a pair of elevators, one at the south and the other on the north side of the runningway, connecting to the station facility through a pedestrian bridge to be built over 407 ETR. A continuous canopy along both the westbound and eastbound platforms provides weather protection.

TABLE 5.2: DESIGN ELEMENTS AT DUNDAS STREET STATION

DESIGN ELEMENTS	REQUIRED	PROVIDED
BUS BAYS	TBD	6 (in Metrolinx facility)
REGULAR PARKING SPACES	800	811
ACCESSIBLE PARKING SPACES	12 (1.5%)	33
PPUDO (LINEAR METERS/SPACES)	240m/40 spaces	240m/40 spaces
MTO CARPOOL	200 (by policy)	Existing carpool being expanded (project in progress)
OPPORTUNITY TO ADD MORE PARKING	-	Yes
INTERLINING / RUNNINGWAY ACCESS	-	No runningway access from the Station site. Interlining access to runningway from Dundas Street, available on north side of 407 ETR.

VEHICULAR AND ACTIVE TRANSPORTATION ACCESSIBILITY FROM LOCAL ROAD NETWORK

Vehicular and active transportation accessibility to the selected site is complicated due to long distances from the road network to the station site. The 407 Transitway alignment is located on the north side of 407 ETR while the station facility is on the south side of 407 ETR. To connect the Transitway stop platforms with the station, a pedestrian bridge will be constructed over 407 ETR; consequently, the station surface layout has been designed as close as possible to 407 ETR to reduce pedestrian walking distance to the Transitway platforms.

The vehicular, pedestrian and cyclist access will be provided from Palladium Way (opposite Northampton Blvd.)

STAGED IMPLEMENTATION – TRANSITWAY BUSES OPERATING ON 407 ETR.

While the 407 Transitway service operates on 407 ETR, the existing carpool/bus facility, currently being expanded by Metrolinx and the City, will serve Transitway users. As Transitway ridership grows, the existing Metrolinx facility will be expanded to the north as required. Ultimately, when the Transitway exclusive runningway is constructed on the north side of 407 ETR, the Dundas Street Station will be built.

The City of Burlington in considering the potential future implementation of a BRT service on Dundas Street, has identified plans to establish a major multimodal transit hub at this location, It is expected that there will be coordination between Metrolinx, the City, the Region, and MTO regarding the plans and schedules for each of the transit initiative to facilitate integrated transit planning by all Agencies.

STORMWATER MANAGEMENT

The site will drain to a SWM pond located on the west side of the station site. Drainage design information is included in **Appendix C** of the EPR.

APPLEBY LINE STATION

LOCATION AND TRANSPORTATION CONTEXT

The Appleby Line Station will be located in the northwest quadrant of the 407 ETR - Appleby Line Interchange, as shown in **Plate S-2A.** The station will provide the community in the future with park and ride, pick up and drop off services. It will also provide bus transfer service, if/when local transit operates on Appleby Line.

TYPE OF FACILITIES AND SERVICES

Appleby Line Station's facilities, detailed in **Table 5.3**, will include a passenger parking area (additional to the existing carpool parking), a PPUDO, a potential local bus facility (if required in the future), and active transportation shelter facilities. Vehicular, pedestrian and bus access will be provided at the current access to the existing carpool facility with required modifications.

The station will be fully accessible. As shown in **Plate S-2B**, the station overpass crosses the runningway and utilizes stairs and a pair of elevators, one at the south and the other on the north side of the runningway, both provide full accessibility to the eastbound and westbound platforms. A continuous canopy along both the westbound and eastbound platforms provides weather protection.

TABLE 5.3: DESIGN ELEMENTS AT APPLEBY LINE STATION

DESIGN ELEMENTS	REQUIRED	PROVIDED
BUS BAYS	TBD	4
REGULAR PARKING SPACES	310	312
ACCESSIBLE PARKING SPACES	6 (2.0%)	10
PPUDO (LINEAR METERS/SPACES)	90m /15 spaces	90m /15 spaces
MTO CARPOOL	200 spaces (by policy)	105 (Existing carpool)
OPPORTUNITY TO ADD MORE PARKING	-	Yes
INTERLINING / RUNNINGWAY ACCESS	-	Yes

VEHICULAR AND ACTIVE TRANSPORTATION ACCESSIBILITY FROM LOCAL ROAD NETWORK

The only access to/from the station site, by car, bus, bicycle or walking will be from Appleby Line, using the (reconfigured) access to the existing carpool facility located adjacent to the future Appleby Line 407 Transitway Station.

STAGED IMPLEMENTATION – TRANSITWAY BUSES OPERATING ON 407 ETR.

Access from the 407 ETR - Appleby Line Interchange is very convenient. This will allow efficient service in the interim stage when the 407 Transitway operates on 407 ETR. The station facility will be constructed when the 407 Transitway demand requires expansion of the existing carpool facility, and if/when the regional/local bus service on Appleby Line requires the construction of a municipal bus facility at this location.

STORMWATER MANAGEMENT

The site will drain to a SWM pond located on the south side of the station adjacent to the N-W on-ramp of the 407 Appleby Line Interchange. Drainage design information is included in **Appendix C** of the EPR.

BRONTE ROAD STATION

LOCATION AND TRANSPORTATION CONTEXT

The Bronte Road Station will be located in the southeast quadrant of the 407 ETR Bronte Road Interchange, as shown in **Plate S-3A.** This station will provide community access to the 407 Transitway with park and ride, pick up and drop off, walk-in and cycling accessibility, and transfer opportunity with local transit, when local transit is implemented on Bronte Road.

TYPE OF FACILITIES AND SERVICES

Bronte Road Station's facilities, detailed in **Table 5.4**, will include a passenger parking area, a passenger pick-up/drop-off (PPUDO), a bus transfer facility, and active transportation shelter facilities .

The station will be fully accessible. As shown in **Plate S-3B**, the station underpass crosses the runningway and utilizes stairs and a pair of elevators, one at the south and the other on the north side of the runningway, both provide full accessibility to the eastbound and westbound platforms. A continuous canopy along both the westbound and eastbound platforms provides weather protection.

TABLE 5.4: DESIGN ELEMENTS AT BRONTE ROAD STATION

DESIGN ELEMENTS	REQUIRED	PROVIDED
BUS BAYS	TBD	4
REGULAR PARKING SPACES	140	368
ACCESSIBLE PARKING SPACES	3 (2.0%)	14
PPUDO (LINEAR METERS/SPACES)	42/7 spaces	48/8 spaces
MTO CARPOOL	200 (by policy)	Existing carpool being expanded (project in progress)
OPPORTUNITY TO ADD MORE PARKING	-	Yes
INTERLINING / RUNNINGWAY ACCESS	-	Yes

VEHICULAR AND ACTIVE TRANSPORTATION ACCESSIBILITY FROM LOCAL ROAD NETWORK

The only access to/from the station site, by car, bus, bicycle or walking will be from Bronte Road, directly opposite to the existing W-N/S off-ramp. The access road will be shared with the 407 Transitway Maintenance and Storage Facility (MSF) yard. There are no current local transit routes traveling on Bronte Road. Pedestrian connectivity to the site will serve the existing religious facility to the south and future development on the lands west of Bronte Road.

STAGED IMPLEMENTATION – TRANSITWAY BUSES OPERATING ON 407 ETR.

There is an existing GO bus stop and provincial carpool lot located on the northwest quadrant of the 407 ETR/Bronte Interchange which is planned to be decommissioned and moved to the southeast quadrant of the 407 ETR/Bronte Interchange, close the 407 Transitway Station. While the 407 Transitway operates on 407 ETR, the existing or relocated carpool/bus facility will serve Transitway users. As Transitway ridership grows, the new planned Metrolinx facility (EA Approved) will be expanded to the east as required. Ultimately, when the Transitway exclusive runningway is constructed, the Bronte Road Station will be built.

STORMWATER MANAGEMENT

The site will drain to a SWM pond located on the west side of the station site. Drainage design information is included in **Appendix C** of the EPR.

TRAFALGAR ROAD STATION

LOCATION AND TRANSPORTATION CONTEXT

The Trafalgar Road Station will be located in the southwest quadrant of the 407 ETR - Trafalgar Road Interchange, as shown in **Plate S-4A.** The station will provide additional park and ride to the existing GO 407 Oakville/Carpool facility, pick up and drop off, walk-in and cycling accessibility, and transfer opportunity to users of municipal transit when implemented on Trafalgar Road.

TYPE OF FACILITIES AND SERVICES

The existing GO 407 Oakville/Carpool facility is located within the future 407 Trafalgar Road Station site. The existing facility will be reconfigured as shown in **Table 5.5**, to include a passenger parking area, a passenger pick-up/drop-off (PPUDO), a bus transfer facility, active transportation shelter facilities, and a bus access from the station surface facility to the Transitway runningway to provide interlining opportunities for potential future regional and/or local transit .

The station will be fully accessible. As shown in **Plate S-4B**, the station underpass crosses the runningway and utilizes stairs and a pair of elevators, one at the south and the other on the north side of the runningway, both provide full accessibility to the eastbound and westbound platforms. A continuous canopy along both the westbound and eastbound platforms provides weather protection.

TABLE 5.5: DESIGN ELEMENTS AT TRAFALGAR ROAD STATION

DESIGN ELEMENTS	REQUIRED	PROVIDED
BUS BAYS	TBD	3
REGULAR PARKING SPACES	680	743
ACCESSIBLE PARKING SPACES	14 (2%)	26
PPUDO (LINEAR METERS/SPACES)	204m/34 spaces	204m/34 spaces
MTO CARPOOL	200 (by policy)	200
OPPORTUNITY TO ADD MORE PARKING	-	No
INTERLINING / RUNNINGWAY ACCESS	-	Yes

VEHICULAR AND ACTIVE TRANSPORTATION ACCESSIBILITY FROM LOCAL ROAD NETWORK

The two accesses off Trafalgar Road, serving the existing carpool facility, will serve the 407 Transitway Trafalgar Station facility as shown in **Figure S-4A**. Active transportation demand at this location is currently low; however, future Trafalgar Corridor development is planned around the station site. Adequate active transportation access design will be integrated with the development plans when defined.

STAGED IMPLEMENTATION – TRANSITWAY BUSES OPERATING ON 407 ETR.

Access from the ETR Bronte Road Interchange is very convenient. This will continue to provide efficient service in the interim stage while the 407 Transitway service operates on 407 ETR.

STORMWATER MANAGEMENT

The site will drain to a SWM pond located on the southwest side of the station site. Drainage design information is included in **Appendix C** of the EPR.

BRITANNIA ROAD STATION

LOCATION AND TRANSPORTATION CONTEXT

The Britannia Road Station will be located in the southeast quadrant of the 407 ETR - Britannia Road Interchange, as shown in **Plate S-5A.** This station will serve the southern Ninth Line Corridor residential developments and the existing residential areas east of Ninth Line extending to Winston Churchill Boulevard and beyond, providing community access to the 407 Transitway with park and ride facilities, pick up and drop off, walk-in and cycling accessibility, and transfer service to users of MiWay operating on Britannia Road.

TYPE OF FACILITIES AND SERVICES

Britannia Road Station's facilities, detailed in **Table 5.6**, will include a passenger parking area and a PPUDO (number of spaces provided a function of land area, configuration of the facility and access), and active transportation shelter facilities. Integration with local transit services will be achieved through a bus loop and a direct access to the Transitway allowing for interlining opportunities.

The station will be fully accessible. As shown in **Plate S-5B**, the station underpass crosses the runningway and utilizes stairs and a pair of elevators, one at the east and the other on the west side of the runningway, both provide full accessibility to the eastbound and westbound platforms. A continuous canopy along both the westbound and eastbound platforms provides weather protection.

TABLE 5.6: DESIGN ELEMENTS AT BRITANNIA ROAD STATION

DESIGN ELEMENTS	REQUIRED	PROVIDED
BUS BAYS	TBD	6
REGULAR PARKING SPACES	140	140
ACCESSIBLE PARKING SPACES	3 (2.0%)	11
PPUDO (LINEAR METERS/SPACES)	42m/7 spaces	54m/9 spaces
MTO CARPOOL	200(by policy)	148
OPPORTUNITY TO ADD MORE PARKING	-	No
INTERLINING / RUNNINGWAY ACCESS	-	Yes

VEHICULAR AND ACTIVE TRANSPORTATION ACCESSIBILITY FROM LOCAL ROAD NETWORK

This station offers optimum vehicular and pedestrian accesses off Ninth Line. The main access is across from McDowell Drive, providing convenient access for the Ninth Line residents.

STAGED IMPLEMENTATION – TRANSITWAY BUSES OPERATING ON 407 ETR.

Access from the ETR - Britannia Road Interchange is very convenient. This will allow efficient service in the interim stage while the 407 Transitway service operates on 407 ETR.

STORMWATER MANAGEMENT

The site will drain to a SWM pond located on the south side of the station site. Drainage design information is included in **Appendix C** of the EPR.

DERRY ROAD STATION

LOCATION AND TRANSPORTATION CONTEXT

The Derry Road Station will be located in the northeast quadrant of the ETR Derry Road Interchange, as shown in **Plate S-6A.** This station will serve residential developments in the northern section of the Ninth Line Corridor and the existing residential development on the east side of Ninth Line, extending to Winston Churchill Boulevard and beyond, providing to the community access to the 407 Transitway with park and ride facilities, pick up and drop off, walk-in and cycling accessibility, and transfer service to users of MiWay operating on Derry Road.

TYPE OF FACILITIES AND SERVICES

Derry Road Station's facilities, detailed in **Table 5.7**, will include a passenger parking area and a PPUDO (number of spaces provided a function of land availability, configuration of the facility and access), and active transportation shelter facilities. Integration with local transit services will be achieved through a bus loop and a direct access to the Transitway allowing for interlining opportunities.

The station will be fully accessible. As shown in **Plate S-6B**, the station underpass crosses the runningway and utilizes stairs and a pair of elevators, one at the east and the other on the west side of the runningway, both provide full accessibility to the eastbound and westbound platforms. A continuous canopy along both the westbound and eastbound platforms provides weather protection.

TABLE 5.7: DESIGN ELEMENTS AT DERRY ROAD STATION

DESIGN ELEMENTS	REQUIRED	PROVIDED
BUS BAYS	TBD	5
REGULAR PARKING SPACES	520	520
ACCESSIBLE PARKING SPACES	(11) 2%	21
PPUDO (LINEAR METERS/SPACES)	156m/26 spaces	378m/63 spaces
MTO CARPOOL	200 (by policy)	94
OPPORTUNITY TO ADD MORE PARKING	-	No
INTERLINING / RUNNINGWAY ACCESS	-	Yes

VEHICULAR AND ACTIVE TRANSPORTATION ACCESSIBILITY FROM LOCAL ROAD NETWORK

This station offers optimum vehicular and pedestrian accesses off Ninth Line. The main access is approximately 250 m from the Derry Road and Ninth Line intersection. Additionally, a right-in/right-out access off Ninth Line, approximately 120 m. from the Derry Road and Ninth Line intersection will be provided.

STAGED IMPLEMENTATION – TRANSITWAY BUSES OPERATING ON 407 ETR.

Access from the ETR Derry Road Interchange is very convenient. This will allow efficient service in the interim stage while the 407 Transitway service operates on 407 ETR.

STORMWATER MANAGEMENT

The site will drain to a SWM pond located on the southwest side of the station site. Drainage design information is included in **Appendix C** of the EPR.

LISGAR GO STATION (EXPANSION)

LOCATION AND TRANSPORTATION CONTEXT

The existing GO Transit Milton Line Lisgar GO Station is located between Ninth Line and Winston Churchill Boulevard, south of the Hwy 401-407 ETR Interchange. The proposed preferred alternative of the 407 Transitway connects to the GO Milton rail service at Lisgar GO Station. Since there is no direct access to Lisgar Station from 407 ETR, the Transitway connection to Lisgar GO Station will occur when the 407 Transitway exclusive runningway is built in the future providing users of both facilities, the opportunity to transfer from one service to the other in both directions. The 407 Transitway project proposes building additional parking to accommodate the estimated 407 Transitway forecast demand as required,

TYPE OF FACILITIES AND SERVICES

The proposed preliminary layout, includes a short segment of the 407 Transitway runningway and the stop platforms located underground within the Lisgar GO Station surface facility, using cut-and-cover construction method, that would impact a section of the station's park and ride area, mostly during construction. However, the park and ride expansion (including active transportation shelter facilities) being proposed within the Hydro Corridor, could be constructed first to ensure that the park and ride capacity is not decreased during construction of the Transitway. After construction, only the pedestrian access facilities to the underground Transitway platforms would impact the existing station parking; however, this would be resolved by including additional parking in the Hydro Corridor.

DESIGN ELEMENTS AT LISGAR GO STATION (EXPANSION)

When this connection is implemented in the future, an updated ridership assessment to define the size of the additional parking required and Detail Design of the station reconfiguration will be developed in consultation and coordination with Metrolinx. **Plate S-7A** includes a preliminary layout of the parking expansion for 217 spaces. There will be an opportunity in the future to expand park and ride within the Hydro Corridor as required.

Due to land availability limitations and the vertical difference between the surface facility and the underground 407 Transitway runningway, an interlining connection to provide local buses access to the runningway at this location is not feasible. Interlining is provided at Derry Road Station, Britannia Road Station and Mississauga Road Station.

VEHICULAR AND ACTIVE TRANSPORTATION ACCESSIBILITY FROM LOCAL ROAD NETWORK

At this stage, no changes to the existing access to Lisgar GO Station is being proposed. This will be reviewed at the implementation phase.

STAGED IMPLEMENTATION – TRANSITWAY BUSES OPERATING ON 407 ETR.

There is no feasible access from 407 ETR; consequently, this Transitway station facilities will be built only when the Transitway exclusive runningway in this segment is built. In the interim stage, while the 407 Transitway buses operate on 407 ETR, the Lisgar GO Station will not serve the 407 Transitway.

STORMWATER MANAGEMENT

The site will drain to a SWM pond located on the north side of the proposed additional parking site. Drainage design information is included in **Appendix C** of the EPR.

MISSISSAUGA ROAD STATION

LOCATION AND TRANSPORTATION FUNCTION

The Mississauga Road Station will be located in the northwest quadrant of the 407 ETR - Mississauga Road Interchange, as shown in **Plate S-8A.** This station will serve residential and commercial developments in northwest Mississauga providing vehicle access, parking opportunity, bus transfer service to MiWay and Brampton transit, as well as walk-in and cycling accessibility.

TYPE OF FACILITIES AND SERVICES

Mississauga Road Station's facilities, detailed in **Table 5.8**, will include a passenger parking area and a PPUDO (number of spaces provided for both a function of land availability configuration of the facility and access), and active transportation shelter facilities. Integration with local transit services will be achieved through a bus loop.

The station will be fully accessible. As shown in **Plate S-8B**, the station underpass crosses the runningway and utilizes stairs and a pair of elevators, one at the north and the other on the south side of the runningway, both provide full accessibility to the eastbound and westbound platforms. A continuous canopy along both the westbound and eastbound platforms will provide weather protection.

TABLE 5.8: DESIGN ELEMENTS AT MISSISSAUGA ROAD STATION

DESIGN ELEMENTS	REQUIRED	PROVIDED
BUS BAYS	TBD	4
REGULAR PARKING SPACES	130	301
ACCESSIBLE PARKING SPACES	3 (2%)	18
PPUDO (LINEAR METERS/SPACES)	42m/7 spaces	54m/9 spaces
MTO CARPOOL	200 (by policy)	200
OPPORTUNITY TO ADD MORE PARKING	-	No
INTERLINING / RUNNINGWAY ACCESS	-	Yes

The outdoor area will be designed to provide the public with a safe, well defined pedestrian environment, outdoor amenity areas, and an aesthetically pleasing environment. This will be accomplished using a variety of landscape techniques including, species diversity, upgraded pedestrian paving and a coordinated 'palette' of outdoor furnishings.

VEHICULAR AND ACTIVE TRANSPORTATION ACCESSIBILITY FROM LOCAL ROAD NETWORK

The main access to the site will be located off Hereford Street which connects with Mississauga Road.

Pedestrian and cyclist access will be provided via a shared walkway (multi-use path) alongside the main station access road. Connecting bike path and bike shelters will be installed.

ACCESSIBILITY FROM 407 ETR

Good access is available from 407 ETR since the Mississauga Road Interchange is located just south of the station. The station will enable staged implementation of Transitway with buses operating on 407 ETR in the interim.

STORMWATER MANAGEMENT

The site will drain to a SWM pond located on the south side of the site, adjacent to the 407 ETR Interchange right of way. Drainage design information is included in **Appendix C** of the EPR.

5.3. Maintenance and Storage Facility

The main Maintenance and Storage Facility approved by MECP in 2011 as part of the 407 Transitway Central Section – Highway 400 to Kennedy Road TPAP will serve the Hurontario Street to Highway 400 section of the Transitway. The section between Brant Street and Hurontario Street will be served by a facility located south of 407 ETR, just east of the proposed Bronte Road Station. As illustrated in **Plate S3-C,** the facility includes a storage area with capacity of 35 buses, a cleaning section with 8 bays, office area, employee parking and an area for additional potential parking or additional potential bus storage, to be used as required when the yard is implemented. Repairs and maintenance will be conducted in the main 407 Transitway Maintenance and Storage Facility located at Jane Street. Rationale to define bus storage capacity required is discussed in **Chapter 2: Transportation Needs**.

5.4. Structures

Since the runningway is an at-grade separated facility, a bridge or underpass was identified for every road or railway crossing. Crossings of watercourses will be bridged. There is a total of thirty-two new structures identified along this section of the Transitway.

5.4.1. Overpasses and Underpasses

A total of thirty-two new structures have been identified along the Transitway route. Bridge and underpass widths were defined based on lanes and sidewalk widths and side clearances following the *407 Transitway Design Standards*.

Where applicable, the existing structures of the 407 ETR were used for comparison purposes. The profile of the Transitway was designed following the profile of the Highway wherever possible. Exceptions were made at specific locations due to presence of major underground utilities or natural features that prevented the runningway to cross under existing arterial roads. Factors such as capital cost, life cycle cost, durability, constructability and traffic staging, future maintenance and widening were assessed in determining the optimum solution for each road crossing structure.

The proposed crossing structures have been classified in three categories: Watercourse crossings, freeway, arterial and minor road crossings, and rail crossings.

Watercourse crossings: The crossing configuration was determined through an assessment of ecological constraints, and both hydraulic and structural requirements. A hydraulic analysis (refer to **Appendix C**) was undertaken to establish the design flood levels at the crossing, the opening required for the watercourse through the bridge and the required bridge deck clearance. This information was used to identify the preferred structure type and prepare the preliminary design. Prior to construction, the actual bridge spans will be confirmed based on additional field surveying, updated hydraulic modelling, the actual shape of the section under the bridge, a detailed assessment of long-term channel movement (via meander belt analysis), erosion effects, and provision for wildlife and fish passage.

Freeway, arterial and other minor road crossings: A grade separation in which the Transitway will pass over or under an intersecting road. As explained above, at most road crossings the Transitway is proposed to travel under the intersecting road. This category includes the on and off ramps for 407 ETR. **Chapter 7: Implementation** describes the conceptual construction staging of the underpasses, necessary to minimize traffic effects on the affected roadways**.**

Rail crossing: Grade separations whereby the Transitway will grade separate a railway. There are three rail crossings of the Transitway along this segment including CNR Halton Subdivision tracks between Appleby Line and Tremaine Road, CPR Galt Subdivision tracks near Ninth Line, and CPR Owen Sound in the east of Creditview Road.

Similar to road crossings, crossing over/under the track was assessed considering various operational, physical and environmental factors.

Using the crossing categories described above, **Table 5.9** summarizes the proposed structures for all crossings.

TABLE 5.9 : PROPOSED STRUCTURES

STRUCTURE REFERENCE NO.	STATIONING	LOCATION	CROSSING CLASSIFICATION	PROPOSED STRUCTURE TYPE
5.1.1	12+754	Under Brant Street	Arterial	Existing bridge to be replaced (by others).
5.1.2	13+933	Under Upper Middle Road	Arterial	Existing bridge to be replaced (by others)
5.1.3	15+443	Under Guelph Line	Arterial	Existing bridge to be replaced (by others)
5.1.4	16+426	Under Dundas Street – 407 W Ramp and Dundas Street	Arterial	Cast-in-place box tunnel, cut-and-cover construction with traffic staging
5.1.5	18+560	Under Walkers Line	Arterial	Cast-in-place box tunnel, cut-and-cover construction with traffic staging
5.1.6	20+720	Under Appleby Line	Arterial	Long bored tunnel entering and exiting an underground station
5.1.7	21+312	Over Bronte Creek	Watercourse	Multi-span slab on steel plate girder bridge
5.1.8	21+721	Under CNR Halton Subdivision	Railway	Cast-in-place box tunnel, cut-and-cover construction with track staging
5.1.9	22+831	Under Tremaine Road	Arterial	Cast-in-place box tunnel, cut-and-cover construction with traffic staging
5.1.10	23+164	Over 407 ETR and OW03	Freeway	Single tied arch span over 407 and approach spans over OWO3
5.1.11	24+972	Over Bronte Road	Arterial	Viaduct over Bronte Road and entering into an elevated station
5.1.12	27+560	Over Sixteen Mile Creek	Watercourse	Concrete arch with approach spans
5.1.13	30+007	Over Neyagawa Boulevard	Arterial	Single span slab-on-girder bridge over ramp and through lanes
5.1.14	31+970	Under Sixth Line	Arterial	Cast-in-place box tunnel, cut-and-cover construction with traffic staging
5.1.15	33+231	Over Trafalgar Road	Arterial	Single span cast-in-place slab on NU girders with integral abutments and false RSS abutment
5.1.16	36+000	Under 407 ETR/Highway 403 Interchange and East Lower Base Line	Freeway	A combination of cast-in-place box tunnel and bored tunnel with active ventilation
5.1.17	39+999	Over Britannia Road	Arterial	Single span cast-in-place slab on NU girders with integral abutments and false RSS abutment
5.1.18	40+300	Over Creek S-E03	Watercourse	Single span cast-in-place slab on NU girders with integral abutments
5.1.19	42+000	Over Creek S-E04	Watercourse	Single span cast-in-place slab on NU girders with integral abutments

STRUCTURE REFERENCE NO.	STATIONING	LOCATION	CROSSING CLASSIFICATION	PROPOSED STRUCTURE TYPE
5.1.20	42+600	Over Creek S-E05	Watercourse	Single span cast-in-place slab on NU girders with integral abutments
5.1.21	43+100	Over Derry Road and S-E06	Arterial, Watercourse	Multi-span viaduct structure with cast-in-place slab on NU girders simple spans
5.1.22	46+000	Under CPR Galt Subdivision, Ninth Line, Argentia Road, Tenth Line, Highway 401, Winston Churchhill Boulevard, Meadowpine Boulevard	Railway, Arterial, Freeway	A combination of cast-in-place box tunnel and bored tunnel with active ventilation
5.1.23	48+586	Under Heritage Road	Arterial	Cast-in-place box tunnel, cut-and-cover construction with traffic staging
5.1.24	49+100	Over Mullet Creek and 407 ETR	Watercourse, Freeway	Multi-span viaduct structure with cantilever constructed cast-in-place post tensioned variable depth box girder over Mullet Creek and tributary, and extradosed girder over 407 ETR
5.1.25	50+061	Over West of Mississauga Road to East of Levi's Creek	Arterial	Cast-in-place, multi span on girder bridge
5.1.26	50+735	Under Financial Drive	Arterial	Cast-in-place box tunnel, cut-and-cover construction with traffic staging
5.1.27	52+060	Over Credit River and CPR Owen Sound Subdivision	Watercourse, Railway	Multi-span slab-on-girder bridge
5.1.28	52+700	Over 407 ETR	Freeway	Single tied arch span over 407
5.1.29	53+500	Under 407 ETR/Mavis Road Interchange and Ramps, Mclaughlin Road	Arterial, Freeway	A combination of cast-in-place box tunnel and bored tunnel with active ventilation
5.1.30	54+900	Over Fletcher's Creek	Watercourse	Multi-span slab-on-girder bridge
5.1.31	-	Pedestrian Bridge Over 407 ETR at Dundas Street Station	Freeway	HSS truss footbridge

5.5. Stormwater Management and Drainage

The 407 Transitway traverses numerous tributaries within the jurisdiction of Conservation Halton (CH), including North Shore, Burlington Urban Creeks, Bronte Creek, Oakville West Urban Creeks, Sixteen Mile Creek and Oakville East Urban Creeks Watersheds and within Credit Valley Conservation (CVC), Mullet Creek, Levis Creek, Credit River – Norval to Port, Fletchers Creek Watersheds. The total upstream watershed area is around 1400 km^2. The approximate drainage divides between conservation authorities (CA) is also illustrated in **Figure 5.21.**

The complete Drainage, Hydrology, Stormwater Management, and Floodplain Hydraulics Report (referred here in as "Drainage Report") is included in **Appendix C** of the EPR. The objective of the Drainage and Hydrology Engineering component of the study is to achieve a comprehensive Preliminary Design of the proposed Transitway, associated 8 stations and Maintenance and Storage Facility (MSF), which minimizes adverse impacts on downstream receivers in respect to water quality and quantity, flood risk, or potential erosion. The focus of this study is to analyze and characterize the site drainage associated with the proposed 407 Transitway under existing and design conditions, and to develop stormwater management plans to minimize post-development impacts on the downstream receiving watercourses. The major tasks included in this project are as follows:

- Review all existing information including flood mapping studies and reports from previous watercourse crossing studies.
- Conduct field assessment of existing drainage features.
- Analyze and characterize pre-development and post-development site drainage to assess impacts of the proposed 407 Transitway project.
- Develop SWM plan for the proposed project.
- Provide updated floodplain maps.
- Provide recommendations.

The Drainage Report illustrates how the drainage system is affected by the proposed 407 Transitway and to identify possible mitigation measures required to ensure the SWM criteria can be met. In addition, preliminary hydrologic and hydraulic models have been developed to calculate the storage requirements of SWM facilities to ensure Ministry of the Environment, Conservation and Parks (MECP) and CA quality and quantity control criteria are achieved for each site.

5.5.1. Watercourse Crossing Design Analysis

For hydraulic purposes, the proposed 407 Transitway is designed as a freeway under the jurisdiction of MTO. The following standards from MTO Highway Drainage Design Standards (HDDS), Gravity Pipe Design Guidelines (GPDG), and Canadian Highway Bridge Design Code (CHBDC) are applied to the design of the 407 Transitway.

TABLE 5.10: SUMMARY OF HYDRAULIC DESIGN CRITERIA

CROSSING TYPE	CRITERIA	CONDITION	VALUE	REFERENCES
Bridges & Culverts	Design Flow	Total Span ≤ 6.0m	50-year	WC-1 HDDS
		Total Span > 6.0m	100-year	
	Regional Flow	-	Hurricane Hazel	
	Check Flow	-	130% of 100-year	
Bridges	Minimum Freeboard	Design Flow	1m	WC-2, HDDS
	Minimum Clearance	Design Flow	1m	
	Water Level	Check Flow	≤ Edge of Travelled Lane	
	Design Service Life (DSL)		75 years	CHBDC
Culverts	Minimum Freeboard	Design Flow HWL	1m	WC-7, HDDS
	Desirable Freeboard	Design Flow EGL	1m	
	Water Level	Check Flow	≤ Edge of Travelled Lane	
	Flood Depth at Culverts	Diameter/Rise < 3m	HW/D ≤ 1.5	
		Diameter/Rise 3m to 4.5m	HW ≤ 4.5m	
		Diameter/Rise > 4.5m	HW/D ≤ 1.0	
	Minimum Diameter	Circular	800 mm	WC-8, HDDS
	Minimum Rise	Box	900 mm	
	Minimum Rise	Elliptical or Arch	800 mm	
	Design Service Life (DSL)	Freeway	75 years	GPDG

5.5.2. Hydrologic Analysis

A hydrologic model was developed in Visual OTTHYMO 5 (VO5) to quantify the peak flows for watercourse crossings in Regional, 100-year and 50-year storm events. As the information on SWM facilities is not available in most watersheds, pre-development condition is assumed for all upstream catchments. 24-hour SCS Type II design storms are adapted in VO5 modelling as it has been recommended for rural watershed runoff calculation. A summary of the computed flow for proposed crossings is given in **Table 5.11**. Detailed modelling results are presented in the Drainage Report included in **Appendix C** of the EPR.

TABLE 5.11 : PEAK FLOWS – PROPOSED CROSSINGS

CROSSING ID	APPROX. CHAINAGE	WATERSHEDS	DESIGN FLOW	DRAINAGE AREA (ha)	FLOWS (m^3/S)			
					CHECK	REGIONAL	100-YR	50-YR
Culverts								
BU05	17+100	Burlington Urban Creeks	50-year	126.8	9.60	12.00	7.38	6.63
BU06	17+450	Burlington Urban Creeks	100-year	103.8	8.10	9.98	6.23	5.59
BU07	17+850	Burlington Urban Creeks	50-year	57.3	9.27	7.15	7.13	6.41
BU08	18+450	Burlington Urban Creeks	100-year	217.0	18.34	21.51	14.11	12.68
BU09	18+800	Burlington Urban Creeks	50-year	61.5	5.82	6.34	4.47	4.03

CROSSING ID	APPROX. CHAINAGE	WATERSHEDS	DESIGN FLOW	DRAINAGE AREA (ha)	FLOWS (m^3/S)			
					CHECK	REGIONAL	100-YR	50-YR
BU10	19+200	Burlington Urban Creeks	50-year	85.5	11.90	10.08	9.16	8.24
BU11	19+890	Burlington Urban Creeks	50-year	56.4	5.33	5.84	4.10	3.69
BU12	20+300	Burlington Urban Creeks	Tunnel	48.5	5.62	5.36	4.32	3.89
OW01	22+520	Oakville West Urban Creeks	50-year	102.2	7.35	9.18	5.66	5.10
OW02	22+760	Oakville West Urban Creeks	50-year	22.1	3.68	2.77	2.83	2.55
OW03	23+310	Oakville West Urban Creeks	100-year	121.2	8.53	10.86	6.56	5.90
OW04	23+540	Oakville West Urban Creeks	50-year	10.9	1.41	1.27	1.09	0.97
OW05	23+780	Oakville West Urban Creeks	50-year	33.4	2.15	2.93	1.65	1.48
OW06	24+020	Oakville West Urban Creeks	50-year	40.9	5.80	4.88	4.46	4.00
OW07	24+390	Oakville West Urban Creeks	50-year	170.3	17.23	17.99	13.25	11.94
OW08	24+700	Oakville West Urban Creeks	50-year	9.4	1.67	1.20	1.28	1.15
OW09	24+940	Oakville West Urban Creeks	100-year	67.3	6.68	7.00	5.14	4.65
OW10	25+250	Oakville West Urban Creeks	100-year	107.4	11.63	11.43	8.95	8.13
OW11	25+730	Oakville West Urban Creeks	50-year	37.7	6.22	4.70	4.79	4.32
S01	26+730	Sixteen Mile Creek	50-year	134.2	14.93	14.56	11.49	10.37
S03	31+850	Sixteen Mile Creek	50-year	64.7	12.34	8.46	9.50	8.57
OE02	33+800	Oakville East Urban Creeks	50-year	23.7	3.69	2.89	2.84	2.57
OE03	34+050	Oakville East Urban Creeks	50-year	10.3	2.80	1.45	2.15	1.95
OE04	34+330	Oakville East Urban Creeks	50-year	24.8	4.02	3.06	3.09	2.80
OE05	34+600	Oakville East Urban Creeks	50-year	36.9	4.83	4.19	3.72	3.37
OE06	35+200	Oakville East Urban Creeks	Tunnel	96.7	10.29	10.28	7.91	7.17
S-E01	38+790	Sixteen Mile Creek	50-year	75.0	5.60	8.09	4.31	2.84
S-E02	39+350	Sixteen Mile Creek	50-year	122.8	10.96	13.25	8.43	4.82
S-E04a	42+250	Sixteen Mile Creek	Culvert Extension	29.0	4.03	3.62	3.10	2.69
S-E07	43+970	Sixteen Mile Creek	50-year	332.0	23.35	35.38	17.96	14.98
NP02	52+450	Credit River	50-year	238.2	21.36	23.18	16.43	14.94
F01	53+950	Fletcher Creek	Tunnel	44.2	6.09	5.05	4.69	4.27
Bridges								
BR02	21+350	Bronte Creek	100-year	29979.6	225	898	173	137
S02	27+500	Sixteen Mile Creek	100-year	33251.7	389	1109	299	269
M01	49+100	Mullet Creek	100-year	559.8	52	45	40	35
L01	50+430	Levi Creek	100-year	2177.4	147	130	113	95
NP01	52+050	Credit River	100-year	68091.2	547	694	421	350
F03	54+860	Fletcher's Creek	100-year	3250.9	87	231	67	57
S-E03	40+300	Sixteen Mile Creek	100-year	1010.4	51.04	99.87	39.26	35.04
S-E04	42+000	Sixteen Mile Creek	100-year	387.0	23.42	38.96	18.02	15.05
S-E05	42+600	Sixteen Mile Creek	100-year	332.0	22.42	35.28	17.25	14.45
S-E06	43+000	Sixteen Mile Creek	100-year	332.0	23.35	35.38	17.96	14.98

5.5.3. Hydraulic Analysis

A hydraulic assessment of culverts for existing and proposed conditions was completed using GeoHEC-RAS. Available hydraulic models on regulated watercourses were obtained from CAs and adapted for analysis. The results for existing and proposed conditions are summarized in **Table 5.12.**

FIGURE 5.21: DRAINAGE STUDY AREA MAP

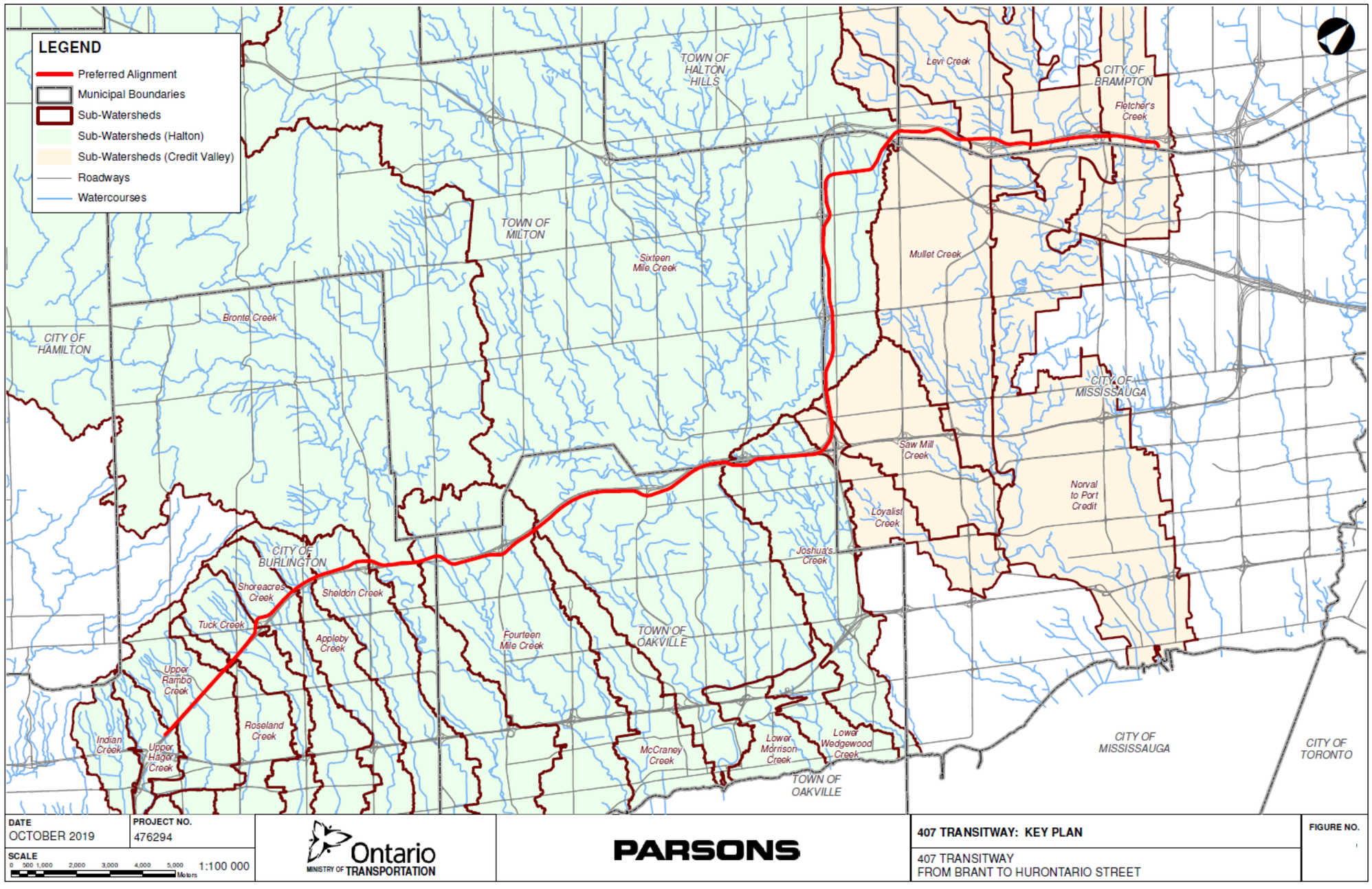


TABLE 5.12: WATER CROSSINGS (CULVERTS/BRIDGES) DESIGN PARAMETERS AND STRUCTURE HYDRAULIC PERFORMANCE

CROSSING ID	APPROX. CHAINAGE	EXST HWL				PROP TWY4 STRUCTURE							PROP HWL				PROFILE ELEV. (m)	EMBEDDED INV. (m)	MEET MTO CRITERIA			
		CHECK	REGIONAL	100YR	50YR	U/S	D/S	LENGTH	SLOPE (%)	RISE	SPAN	TYPE	CHECK	REGIONAL	100YR	50YR			CHECK FLOW WL≤ EDGE OF TRAVELLED LANE	HW/D≤1.5	FREEBOARD/ CLEARANCE ≥1.0 m	COVER≥0.6m
BU05	17+100	-	-	-	-	160.80	160.31	25	1.96%	1800	4800	2-cell Conc. Box	161.85	162.05	161.63	161.55	165.388	160.50	Yes	Yes	Yes	Yes
BU06	17+450	163.67	163.69	163.63	163.63	163.25	162.72	25	2.12%	1800	6000	2-cell Conc. Box	164.27	164.40	164.10	164.04	166.453	162.95	Yes	Yes	Yes	Yes
BU07	17+850	164.28	164.25	164.25	164.20	162.60	162.00	30	2.00%	1800	2400	Concrete Box	164.61	164.29	164.28	164.17	167.603	162.30	Yes	Yes	Yes	Yes
BU08	18+450	164.83	164.89	164.73	164.70	164.00	163.77	30	0.77%	2400	6000	2-cell Conc. Box	165.59	165.77	165.34	165.25	167.575	163.70	Yes	Yes	Yes	Yes
BU09	18+800	165.89	165.92	165.82	165.79	165.30	165.08	18	1.22%	1500	3000	Concrete Box	166.59	166.66	166.37	166.29	167.689	165.00	Yes	Yes	Yes	Yes
BU10	19+200	164.09	163.72	163.57	163.48	161.50	161.19	20	1.55%	2400	3000	Concrete Box	164.31	163.88	163.70	163.53	167.855	161.20	Yes	Yes	Yes	Yes
BU11	19+900	162.67	163.10	161.91	161.79	160.80	160.20	20	3.00%	3500	4000	Concrete Box	162.76	163.19	161.96	161.84	166.810	160.50	Yes	Yes	Yes	Yes
BU12	20+350	165.28	165.26	165.21	165.19	Tunnel																
OW01	22+520	160.19	160.37	160.09	160.07	159.00	158.40	20	3.00%	1800	2400	Concrete Box	160.54	160.81	160.26	160.16	161.246	158.70	Yes	Yes	Yes	Yes
OW03	23+310	154.98	155.02	154.89	154.86	Overpass																
OW04	23+540	153.88	153.87	153.86	153.85	153.77	153.65	25	0.48%	1200	1800	Concrete Box	154.48	154.43	154.37	154.32	157.980	153.47	Yes	Yes	Yes	Yes
OW05	23+780	155.03	155.06	155.00	154.99	154.40	154.37	36	0.08%	1800		Circular	155.50	155.71	155.36	155.30	158.638	154.10	Yes	Yes	Yes	Yes
OW06	24+020	154.75	154.73	154.71	154.70	154.14	153.97	33	0.52%	1800		Circular	155.97	155.79	155.70	155.61	158.985	153.84	Yes	Yes	Yes	Yes
OW07	24+390	159.48	159.50	159.38	159.34	158.20	158.07	20	0.65%	2400	3000	Concrete Box	160.63	160.70	160.24	160.10	163.579	157.90	Yes	Yes	Yes	Yes
OW08	24+660	161.93	161.90	161.90	161.90	161.50	161.09	30	1.37%	1200	1800	Concrete Box	162.22	162.07	162.10	162.05	168.611	161.20	Yes	Yes	Yes	Yes
OW09	24+930	165.80	165.84	165.15	165.01	Overpass																
OW10	25+250	165.41	165.41	165.33	165.31	Overpass																
OW10a	Bronte Road Station access	-	-	-	-	-	-	-	-	2400	3000	Concrete Box	-	-	-	-	-	-	-	-	-	-
OW11	25+730	166.77	166.71	166.72	166.70	165.70	165.62	35	0.23%	1200	2400	Concrete Box	167.29	166.99	167.01	166.92	171.400	165.40	Yes	Yes	Yes	Yes
S01	26+710	167.06	167.06	167.01	166.99	166.10	166.00	25	0.40%	3000		Circular	168.55	168.55	168.21	168.09	170.414	165.80	Yes	Yes	Yes	Yes
OE02	33+800	185.36	185.33	185.33	185.32	184.30	184.17	25	0.52%	1200	1800	Concrete Box	185.64	185.44	185.43	185.35	187.222	184.00	Yes	Yes	Yes	Yes
OE03	34+100	182.36	182.32	182.34	182.34	182.00	181.95	25	0.20%	1200	1800	Concrete Box	183.12	182.72	182.94	182.88	185.616	181.70	Yes	Yes	Yes	Yes
OE04	34+330	181.83	181.80	181.80	181.78	181.10	181.04	30	0.20%	1200	2400	Concrete Box	182.27	182.07	182.07	182.01	184.765	180.80	Yes	Yes	Yes	Yes
OE05	34+600	181.03	181.02	181.00	181.01	180.20	180.11	30	0.30%	1200	2400	Concrete Box	181.52	181.40	181.31	181.23	182.750	179.90	Yes	Yes	Yes	Yes
OE06	35+200	179.04	179.12	178.95	178.92	Tunnel																
S-E01	38+790	-	-	-	-	186.23	186.17	25	0.24%	3500	4000	Concrete Box	189.57	189.98	189.25	188.88	190.940	185.93	Yes	Yes	Yes	Yes
S-E02	39+380	-	-	-	-	186.61	186.61	25	0.00%	3500	4000	Concrete Box	189.71	190.15	189.33	188.90	195.361	186.31	Yes	Yes	Yes	Yes
S-E04a	42+250	-	-	-	-	193.89	193.50	30	1.29%	2000	3700	Concrete Box	194.91	194.93	195.05	194.99	197.301	193.59	Yes	Yes	Yes	Yes
S-E07	44+000	202.58	202.47	202.48	202.27	201.51	201.27	50	0.48%	1200	4800	2-cell Conc. Box	203.84	203.10	203.23	202.53	204.290	201.21	Yes	Yes	Yes	Yes
NP02	52+450	170.43	170.45	170.37	170.34	169.50	169.06	20	2.20%	3000	4000	Concrete Box	172.04	172.18	171.63	171.50	177.601	169.20	Yes	Yes	Yes	Yes
BR02	21+350	138.09	141.57	137.69	137.38	Bridge													Yes	-	Yes	-
S02	27+500	135.61	137.05	135.34	135.24	Bridge													Yes	-	Yes	-
S-E03	40+300	189.92	191.03	189.58	189.31	Bridge													Yes	-	Yes	-
S-E04	42+000	194.32	194.55	194.21	194.14	Bridge													Yes	-	Yes	-
S-E05	42+600	195.67	195.92	195.54	195.46	Bridge													Yes	-	Yes	-
S-E06	43+000	197.90	198.24	197.73	197.62	Bridge													Yes	-	Yes	-
M01	49+100	191.26	191.32	191.18	191.15	Bridge													Yes	-	Yes	-
L01	50+430	177.84	178.05	177.37	177.15	Bridge													Yes	-	Yes	-
NP01	52+050	171.07	171.38	170.23	169.89	Bridge													Yes	-	Yes	-
F03	54+860	196.88	197.71	196.75	196.67	Bridge													Yes	-	Yes	-

As shown in **Table 5.12**, all crossings meet the MTO's hydraulic criteria. As the road surface was not designed at this stage, the edge of travelled lane elevation is assumed to be 0.15 m lower than the road profile elevation listed in the table to account for crossfall. The hydraulic criteria need to be checked when cross-fall grading is designed for the 407 Transitway corridor.

Notably, N01 is a large concrete storm trunk designed for Rambo-Hager creek diversion. It starts from south of Upper Middle Road collecting road runoff from 407 ETR and runs to the south parallel to ETR while intercepting stormwater drainage from adjacent residential areas. The outlet is located north of North Service Road where it crosses the ETR and drains into the Hager Creek. As the propose transitway is not in conflict with the storm trunk, existing flow conveyance at N01 will be maintained.

Two creek realignments including BU05 and OW02 are considered to relocate the culvert crossing to low point along the corridor and resolve conflicts between crossing and runningway design.

The head water level increases no more than 0.3 m within the 407 Transitway ROW for majority of the proposed cross structures during regional storm. Significant headwater level increase occurs at crossing BU06, as the creek channel is poorly defined, and the floodplain is significantly wider than the culvert width. Channel regrading that lower the inlet elevation by 1 m within the 407 Transitway ROW could mitigate the impact. However, a detailed geomorphologic evaluation is needed to examine the soil stability and potential erosion due to slope changes in streambed. Slope stability assessment is to be completed for major crossings to inform the design of structures and to ensure that erosion hazards are considered and appropriately mitigated. Erosion protection measures such as rip-raps are also needed to avoid adverse impacts on downstream receiving waterbodies.

Crossing OW05, OW06, OW07, S01, and NP02 are located immediately downstream of 407 ETR, where the increase in head water level affects the tailwater conditions of 407 ETR. To better understand the potential impacts to the upstream crossing structure, 407 ETR's head water level was further evaluated against MTO's hydraulic criteria in proposed condition and it is found that increase in head water level of 407 Transitway's crossing structure does not affect ETR's hydraulic performance. Therefore, it is safe to conclude the hydraulic design of 407 Transitway minimizes impacts to upstream and downstream systems.

5.5.4. Corridor Drainage and Stormwater Management

For drainage purposes, the proposed 407 Transitway is designed as a freeway under the jurisdiction of MTO. Major system conveyance is considered at this stage of design. Open ditching is provided to convey surface runoff where land is available. Underground piping system is proposed west of Dundas St. as the space available for the Transitway corridor is limited. Minor system needs to be evaluated at later stages when road cross-fall is designed. Following standards from MTO Highway Drainage Design Standards (HDDS) and Gravity Pipe Design Guidelines (GPDG) are followed for the design of surface drainage systems within the corridor.

TABLE 5.13 : SUMMARY OF CORRIDOR DRAINAGE CRITERIA

DRAINAGE SYSTEM TYPE	CRITERIA	FUNCTIONAL ROAD CLASSIFICATIONS	VALUE	REFERENCES
Major System	Design Flow	Freeway	100-Year	SD-1, HDDS
	Design Flow	Depressed Roadways	100-Year	SD-7, HDDS
Side Storm Sewer	Design Service Life (DSL)	Freeway	75 years	GPDG

Through consultation with the Ministry of Transportation (MTO) Drainage, CH and CVC, the following SWM criteria applies to the 407 Transitway corridor and stations. MTO or the 407 Transitway operator will be responsible for the Long-term maintenance of the SWM ponds and LIDs following MECP Stormwater Management and Design Manual. Together with Stormwater Quality Control Measures, operation of the Transitway will incorporate the use of best practices for the application of road salt on provincial roads following Halton Region and Hamilton Region Source Protection Plan Policy T-36-S.

TABLE 5.14: SWM CRITERIA

CONTROL OBJECTIVES	REQUIREMENTS
Quantity Control	For all watersheds within the jurisdiction of CVC, Post to Pre peak flow control for all return periods and regional storm are required
	CH did not specify water quantity control target for each watershed. Control targets from subwatershed studies and municipalities are followed.
Quality Control	Enhanced protection (Level-1) criteria to determine the minimum permanent pool size for wet pond facilities
	Table 3.2 of the Stormwater Management Planning and Design Manual
	Where applicable, water quality controls should be further informed by goals and objectives arising out of applicable subwatershed studies and source water protection plans.
Erosion Control	At minimum detain 5 mm on site where conditions do not warrant a detailed analysis
	For sites with SWM ponds, 25mm – 48hr detention may be required. A minimum of 12 hour detention is needed if site is limited by minimum orifice size.

5.5.5. Corridor Drainage

Open ditching is proposed along both sides of 407 Transitway as Major System to accommodate surface runoff when capacity of Minor System is exceeded. Notably, four large storm trunks are proposed upstream of N01, BU02, BU04, and OW02. Storm trunks upstream of N01, BU02, and BU04 are running from the road low point to adjacent Municipal Drains crossings to provide gravity outlets for the depressed roadway. Storm trunk upstream of OW02 diverts external runoff upstream of 407 Transitway corridor and provides a gravity outlet for the depressed roadway. **Table 5.15** lists the results of storm trunk capacity evaluation.

TABLE 5.15 : RESULTS OF UNDERGROUND STORM PIPE CAPACITY ANALYSIS

OUTLET LOCATION	DRAINAGE AREA (ha)	INVERT ELEVATION U/S NODE (m)	INVERT ELEVATION D/S NODE (m)	PIPE LENGTH (m)	SLOPE (%)	PIPE ROUGHNESS (MANNING'S N)	PIPE DIAMETER (m)	PIPE CAPACITY (m^3/s)	1 IN 100-YEAR FLOW RATE (m^3/s)

N01	6.858	116.200	115.00	541	0.22%	0.013	1200	1.84	1.17
BU02	2.449	155.902	153.45	145	1.69%	0.013	750	1.45	0.62
BU04	5.594	154.380	152.96	250	0.57%	0.013	750	0.84	0.07
OW02	3.604	155.400	155.00	350	0.11%	0.013	1650	3.08	3.35

5.5.6. Stormwater Management

The stormwater management strategy proposed for the 407 Transitway corridor is to implement enhanced swales. The strategy was proposed in previous 407 Transitway studies and is an accepted mitigation solution. The stormwater management for transit stations was achieved by a combination of wet ponds and Low Impact Development (LID) features.

5.5.7. 407 Transitway Corridor

The proposed SWM plan for 407 Transitway corridor utilizes enhanced swales at locations where feasible to provide quality and quantify control to runoff. The total increase in pavement area associated with the proposed Transitway development is approximately 42 ha. For all subcatchments less than 5 ha, a treatment train approach instead of wet ponds was proposed. The design consists of grassed embankments to promote sheet flow, grassed swales on both sides of the 407 Transitway and enhanced grassed swales/dry ponds located before each outlet from the 407 Transitway.

The drainage areas along the proposed 407 Transitway were delineated based on the high points and low points along the road profile.

The methodology for determining the post-development controlled peak flow rates for the Transitway sub-areas was conducted as follows:

- In post-development condition the assumption is sub-areas are draining from high points to low points, in cases where a sub-area crosses a potential water feature, the strategy was to discharge at such point. If this was the case the area was further subdivided.
- The resulting sub-areas could potentially cross-over two or more larger subwatersheds.

Modelling results indicate that SWM facilities are required to meet the existing/allowable release rates within each subwatershed as shown in **Table 5.16**. A treatment train approach is implemented consisting of grassed embankments to promote sheet flow and enhanced grassed swales on both sides of the Transitway before each outlet from the Transitway.

TABLE 5.16: SUMMARY OF POST-DEVELOPMENT DISCHARGE IN 1 IN 100-YEAR STORM

CULVERT ID	SUBCATCHMENT ROW AREA (ha)	PROP. PAV. AREA (ha)	PRE-DEVELOPMENT PEAK RUNOFF (m^3/s)	UNCONTROLLED POST-DEVELOPMENT RUNOFF (m^3/s)	CONTROLLED POST-DEVELOPMENT RUNOFF (m^3/s)
N01	6.86	3.43	0.09	1.25	0.08
BU02	2.45	1.22	0.08	0.62	0.07
BU04	5.59	1.12	0.09	0.63	0.09
BU05	2.80	0.56	0.08	0.37	0.08
BU06	1.80	0.36	0.08	0.27	0.07
BU07	3.20	0.64	0.08	0.41	0.08
BU08	2.40	0.48	0.08	0.33	0.08
BU09	2.40	0.48	0.08	0.33	0.08
BU10	4.79	0.96	0.09	0.56	0.08
BU11	1.78	0.36	0.08	0.27	0.07
BR02	13.27	2.65	0.10	1.14	0.09
OW01	1.77	0.35	0.08	0.26	0.07
OW02	3.60	0.72	0.09	0.45	0.08
OW04	3.00	0.60	0.08	0.39	0.08
OW05	1.48	0.30	0.08	0.23	0.07
OW06	1.94	0.39	0.08	0.28	0.08
OW07	4.98	1.00	0.09	0.58	0.08
OW11	7.79	1.56	0.09	0.80	0.09
S02	24.58	4.92	0.37	1.61	0.10
S03	14.44	2.89	0.34	1.20	0.09
OE01	3.79	0.76	0.09	0.47	0.08
OE02	2.14	0.43	0.08	0.30	0.08
OE03	2.14	0.43	0.08	0.30	0.08
OE04	1.32	0.26	0.08	0.22	0.07
OE05	1.41	0.28	0.08	0.22	0.07
S-E01	13.78	2.76	0.10	1.16	0.09
S-E03	19.22	3.84	0.10	1.41	0.10
M01	8.42	1.68	0.09	0.84	0.09
L01	12.00	2.40	0.10	1.07	0.09
NP01	19.25	3.85	0.10	1.41	0.10
F03	3.70	0.74	0.09	0.46	0.08
Total	**198.09**	**42.41**			

Grassed swales are proposed along the entire length of the Transitway. Since the swales follow the slope of the road, which in some instances is steep, segments of enhanced swales are proposed before any stormwater discharge to a watercourse or other type of outlet. The enhanced swales would be approximately 50 m in length and are designed to have a trapezoidal cross-section, flat bottom (4 m

wide), 2:1 side slope and a depth of 1.5 m. A longitudinal slope of maximum 0.2% is proposed for all swales to provide settlement of sediment and to reduce flow velocities from upstream segments. In order to increase the retention time of the swales and to promote infiltration, two cells were designed with a 0.5 m layer of clear stone covered by 0.3 m of topsoil below the invert of the swale. The enhanced swales were designed in the form of dry ponds with a formal outlet control structure to provide quality and quantity control for the Transitway sub-areas.

Modelling results indicate that no increases in peak flows are expected and in some instances the volumes required are expected to be less than the maximum volume provided by the swale. The approach is conservative since the minimum allowable orifice is used and more storage is provided than required.

5.5.8. 407 Transitway Stations and Maintenance and Storage Facility (MSF)

Eight transit stations are proposed along the Transitway including Dundas Street, Appleby Line, Bronte Road, Trafalgar Road, Britannia Road, Derry Road, Lisgar GO (Expansion), and Mississauga Road. The station layouts include vehicular and pedestrian access, PPUDO facilities, bus lay bay facilities, on-street integration with local transit, shelters, buildings, and other amenities. The majority of the Transitway stations are controlled by wet ponds to achieve SWM objectives as the imperviousness is relatively high. Dry ponds are designed for Lisgar GO, Appleby Line and Bronte Road Stations as the drainage area is too small to sustain the permeant pool volume.

Goals and objectives arising from subwatershed studies and source water protection plans also apply to the design of transit stations. **Table 5.17** lists the applicable subwatershed studies and proposed SWM types for each station.

TABLE 5.17: APPLICABLE SUBWATERSHED STUDIES AND DESIGN ASSUMPTIONS

PROPOSED STATIONS	GUIDING DOCUMENTS	SWM TYPE	DRAINAGE AREA (ha)	ACTIVE STORAGE VOLUME (m^3)	1 IN 100-YEAR RELEASE RATE (m^3/s)
Mississauga Road	CVC SWM Design Criteria	Wet Pond	5.58	5154	0.144
Lisgar GO Station Expansion	9th Line Subwatershed Study	Dry Swale	0.96	-	0.020
Derry Road	9th Line Subwatershed Study	Wet Pond	4.57	3374	0.160
Britannia Road	9th Line Subwatershed Study	Wet Pond	2.97	2882	0.071
Trafalgar Road	North Oakville Creek Subwatershed Study	Wet Pond	5.55	3885	0.149
Bronte Road*	North Oakville Creek Subwatershed Study	Dry Pond	2.55	2509	0.024
Appleby Line	City of Burlington	Dry Pond	2.55	1924	0.011
Dundas Street	City of Burlington	Wet Pond	6.17	3924	0.185

**Station and Maintenance and Storage Facility*

A Maintenance and Storage Facility (MSF) is proposed immediately adjacent to Bronte Road Station, where stormwater runoff is managed together with the station. Runoff from future expansion of the MSF to the east will be managed through a separated SWM facility designed at later stages.

5.5.9. Creek Realignment

Substantial creek realignment and enhancement have been proposed on watercourses within the Ninth Line Lands. Requirements and recommendations for watercourse management from Ninth Line Lands Scoped Subwatershed Study need to be followed at later design stages.

5.5.10. Headwater Drainage Features (HDFs)

Two HDFs on regulated watercourses are identified for potential realignment. The project site for the Dundas Street Station conflicts with a watercourse corridor in the tributary of Shoreacres Creek. A creek section of 300 m needs to be realigned to the east to allow lands for the development of the Transitway Station. The watercourse is classified as low sensitivity and not a direct fish habitat with an upstream drainage area of 54 ha. Fluvial geomorphic review is needed to implement bio-engineering for channel enhancement at detailed design stage. Natural channel design will be incorporated into the realignment of the tributary of Shoreacres Creek at the Dundas Street Station.

A tributary of Shoreacres Creek between Station 16+900 to 17+100 of the 407 Transitway is considered for realignment as the watercourse corridor is near the Transitway at this section. The creek runs close to and parallel to the Transitway resulting in a 100 m long crossing structure to carry the water under the Transitway. Creek realignment that relocates the crossing location from Station 16+960 to 17+100 allows shorter creek run between the Transitway and 407 ETR providing better flood protection for both highways. Fluvial geomorphic review is needed to implement bio-engineering for channel enhancement at detailed design stage.

The project site for the Dundas Street Station conflicts with a watercourse corridor of Shoreacres Creek. A creek section of 300 m needs to be realigned to the east to free up lands available for the development of the Transitway station as shown in **Plate S-1A**.

An HDF on non-regulated watercourse have been identified to be impacted by the proposed Transitway development. A tributary of Sheldon Creek between Station 19+200 to 19+450 is considered for realignment. The existing creek was realigned through the north ditch of 407 ETR to a crossing structure on a major branch 250 m westwards. Realigning this section to the north ditch of 407 Transitway eliminates a creek run of 250 m between the two facilities, providing more floodplain storage and reducing flood risks. As the upstream creek is ephemeral and not regulated, the creek realignment is to be accommodated by the north road ditch of the Transitway. Protocols have been developed by the CVC/TRCA to provide structure for the evaluation of HDFs and guidance on management recommendations for each feature, which needs to be followed at the detailed design stage.

5.5.11. Conclusions and Recommendations

1. Due to the road profile sloping underground, pumping may be required at two locations along the proposed 407 Transitway: Road tunnels under 407 ETR - Highway 403 interchange and Highway 401 - 407 ETR interchange. Details related to pump sizes will be provided during Detail Design.
2. A treatment train approach is proposed for the Transitway corridor consisting of grass embankments, long grassed swales, and enhanced swales. Quantity control of Transitway runoff is proposed to be provided through enhanced swales. These were designed as dry ponds with a formal outlet control structure consisting of 100 mm perforated pipe, hickenbottom structure and a 75 mm orifice plate. A single typical enhanced swale design was used throughout the roadway drainage analysis; however, a more detailed analysis will be undertaken during Detail Design.
3. The SWM strategy for the stations includes wet ponds with control structures consisting of multiple orifices and/or weirs. Wet ponds were designed for each station to provide quantity, quality, and erosion and sediment control. All of the SWM facilities meet MOECC and MTO criteria.
4. The Hydraulic analysis was undertaken using GeoHEC-RAS for thirty crossings within the study limits. All models were developed based on existing CH and CVC HEC models. All crossing designs meet MTO criteria.
5. The results of the hydraulic analysis show that water levels increase from existing conditions to proposed conditions at some crossings; however, these increases are confined within MTO's ROW and have no impacts on upstream nor downstream riparian and private properties.
6. Shoreacres Creek runs parallel to the proposed Transitway between stations 16+900 and 17+100 and is considered for realignment due to its proximity to the Transitway.
7. The needs for EASR or PTTW will be assessed prior to construction in detailed design stage. ESC measures and ESC plans will be provided in the permit application process.

5.6. Utility Relocation

The majority of the 407 Transitway alignment lies on vacant strips of land located on either side of 407 ETR. Potential requirement of utility and municipal service relocation will only occur at underground grade separation crossings with arterial roads.

Chapter 6: Impact Assessment, Mitigation and Monitoring includes the effects and proposed mitigation measures for utilities that may be affected by the Transitway, for cases considered significant due to size and importance of the facility or degree of relocation difficulty and/or complexity during the construction stage.

Hydro One has a list of general requirements for facilities to be built near its transmission lines to ensure the compliance of safety regulations, electromagnetic clearances and maintenance access to the structures. These requirements have been considered during the evaluation of alternatives and Preliminary Design of the Transitway, following discussions and coordination with Hydro One.

In case the regional and local municipalities propose future water and sewer services that may affect the 407 Transitway proposed facilities, MTO will discuss and coordinate solutions with the corresponding municipality or agency to ensure the design of the Transitway is maintained, as early as possible.

5.6.1. Emergency Response Services (ERS) Considerations

Along the Transitway, access to and egress from the runningway will be available for buses and emergency response vehicles at specific locations. Such locations will occur at each Transitway station by way of a circulation road and/or a restricted access point from specific arterial roads that surround the Transitway. However, emergency response vehicles and access points will not be allowed through private property or residential neighborhoods regardless of the compatibility of the arterial road.

In order to increase the safety factor of the Transitway, the route will have access/egress points, where required, in between stations, where presence of adjacent streets will allow, and where physically possible. Prior to construction, the location of these points will be defined in coordination with the corresponding municipalities. The purpose of these points will be to provide enter/exit opportunity to emergency response vehicles such as fire trucks, emergency medical response vehicles (ambulances), and police cars to the Transitway as efficiently as possible.

5.7. Illumination

Illumination for the Transitway facilities will follow Metrolinx and MTO (OPS) Guidelines and Standards. Along the runningway, only the stop platforms and the underpasses longer than 60m. will be illuminated, since the Transitway runs basically parallel to 407 ETR, consequently the runningway will be illuminated by light spillage from the high mast lighting of the Highway.

All station facility components will be illuminated including vehicular and pedestrian access and circulation roads and paths, bus facilities, commuter and PPUDO parking facilities and station platforms, as well as interior elements such as public areas within station building, ticket/passenger information areas, etc., which will be defined in the Architectural Design of the station interior. The design criteria for exterior illumination, as well as hardware, will follow Metrolinx standards as listed in **Table 5.18.**

TABLE 5.18: METROLINX STANDARDS FOR ILLUMINATION

LOCATION	POLES	LUMINAIRES	ILLUMINATION LEVEL (LUX)
Transitway Platforms	6.0m Steel poles	Approved LED Luminaire equivalent of 250W HPS	50
Bus Loops, Access Roads & Platforms	12m Steel poles	Approved LED Luminaire equivalent of 250W HPS	20

Underpasses and Tunnels	NA	Approved Linear LED equivalent of Fluorescent Luminaires with 1219mm long TS lamps	150

Illumination of parking areas will be in accordance with MTO standards as outlined in **Table 5.19**.

TABLE 5.19: MTO STANDARDS FOR ILLUMINATION OF PARKING LOTS

LOCATION	POLES & LUMINAIRES	ILLUMINATION LEVEL	UNIFORMITY	LIGHTING CONTROL
Parking lots where more than 35 vehicles park on a regular basis and there is a transit stop within or adjacent to the parking lot.	12.0m Steel poles with Approved LED Luminaire equivalent of 250W HPS 25m High Mast Approved LED Luminaire equivalent of 750W HPS	Full Enhanced 25 lux	Avg/Min – 3:1 Max/Min – 6:1	Adaptive lighting controls to enhance energy conservation by reducing lighting levels to 10 lux between. 11 PM and 4 AM

High mast poles should not be used at parking areas located beneath hydro transmission lines unless required Hydro One clearance can be achieved. Interior illumination will also follow GO Transit guidelines and standards and will be coordinated with the station architectural design. Life Cycle Cost Analysis will be done for Conventional Illumination and High Mast Illumination and recommendations will be made considering the two options.

5.8. Intelligent Transportation Systems

The incorporation of ITS is the application of technology to address the operational needs of transportation agencies. ITS has become synonymous with safety, cost effectiveness and operational efficiency in higher order transit systems such as that envisioned for the 407 Transitway. Pre-planning ensures that the maximum benefits can be appreciated by the widest number of users. The 407 Transitway ITS is expected to include: management of transit fare collection; common electronic payment; interactive traveler information; parking management and information; transit signal priority; real-time operations monitoring; and, passenger security.

5.9. Landscaping

The landscape design for this new transit facility will focus on mitigating the impacts of the corridor and station sites on the local natural and cultural environments. The design will also strive to integrate the facility into the urban fabric and natural landscape surrounding the corridor and station sites.

The proposed landscape treatments for the project are to be divided into two distinct components, one for the transit corridor and the other for the station sites. The landscape design (including figures presenting the existing landscape composition analysis and the proposed planting layout) is presented in **Appendix L**.

The general intent of the corridor landscape treatment is to utilize the available lands along the corridor that are outside of the right of way as an opportunity to provide an ecologically diverse planted environment. The corridor provides an excellent opportunity to increase canopy cover and enhance the local vegetation diversity through an ecological planting program. This is to be accomplished by planting a variety of locally native, non-invasive, trees shrubs and grasses.

The landscape planting treatments are to be designed to accomplish a number of functions including slope stabilization; compensation for vegetation removal; stream crossing, wetland, and woodland edge restoration; providing naturalization planting; creating visual/wind buffers; and, generally improving the general aesthetics of the corridor.

The outdoor environments in the vicinity of the stations and the associated parking facilities are to be designed to optimize the aesthetics for the station sites, providing 'greening' landscape solutions in available open spaces. These 'greening' initiatives may include permeable paving, surface water retention, green roofs, solar reflective surface materials, the use of recycled materials, and the introduction of 'soft' landscape treatments where space is available. The landscape treatments will provide the public with a safe and pedestrian friendly environment and outdoor amenity areas, in an overall environment that is aesthetically pleasing. This is to be accomplished using a variety of landscape techniques including, a diversity of plants and other landscape materials, upgraded pedestrian paving and a coordinated 'palette' of outdoor furnishings.

Thoughtful landscape design of the Transitway corridor, station sites and associated parking areas will be an important component in the development of this new infrastructure as a visual and environmental asset to the surrounding natural and cultural environment. Landscaping may also occur in the protected sites for environmental benefits.

5.10. Flexibility in the Design of the Proposed Footprint

Assessment of existing environmental conditions and detailed field investigations covered an area sufficiently broad to minimize potential addenda to the TPAP in case of station facility expansions and/or variations in the footprint of the runningway and associated facilities. For all cases where further field investigations may be required prior to construction e.g.: Archeological Stages 3 and 4, conceptual alignment options were assessed to ensure alternate opportunities are feasible if necessary. If variations to the design included in this EPR are proposed in the future, Section 15.1 of the Ontario Regulation 231/08 Transit Projects and Metrolinx Undertakings would be followed.

5.11. Sites Protected for Environmental Compensation

Certain sites that are under Provincial ownership or are landlocked as a result of the Transitway design are being protected for environmental compensation. These sites include:

- North of Dundas Street – 407 ETR Interchange
- West of Walkers Line
- West of Appleby Line Station

- West of Tremaine Road
- East of Bronte Road
- Southwest side of Trafalgar Road – 407 ETR Interchange
- Southeast side of Trafalgar Road – 407 ETR Interchange
- South of CP Railway Galt Subdivision
- Between Winston Churchill Boulevard and Heritage Road
- Southwest of Hurontario Street

All sites being protected for environmental compensation are illustrated in **Plate P-0 to P-10**. As discussed in **Section 6.2.1**, compensation/offsets will be provided at a compensation ratio to be determined through further discussion with regulatory agencies (e.g., MNRF, MECP, Conservation Halton and Credit Valley Conservation Authority), as part of implementing the project.

5.12. Property affected by the 407 Transitway

Table 5.20 summarizes the type of ownership of the land being affected by the footprint of the proposed 407 Transitway facilities. **Appendix Q** of the EPR includes detailed information of the property owners and illustrates the affected property. Most of the 407 Transitway facilities footprint fall within provincial lands protected by MTO through the 1998 and 2005 Corridor Protection Studies.

TABLE 5.20: OVERALL PROPERTY IMPACT

SEGMENT DESIGNATION	SEGMENT DESCRIPTION	TYPE OF OWNERSHIP	APPROX. AFFECTED AREA (ac)
1	WEST OF BRANT STREET TO EAST OF DUNDAS STREET	PROVINCIAL PRIVATE MUNICIPAL	11.3 3.0 0.3
2	EAST OF DUNDAS STREET TO EAST OF APPLEBY LINE	PROVINCIAL PRIVATE MUNICIPAL	36.9 30.7 0.2
3	EAST OF APPLEBY LINE TO EAST OF TREMAINE ROAD	PROVINCIAL PRIVATE MUNICIPAL FEDERAL	7.0 6.0 0.03 0.2
4	EAST OF TREMAINE ROAD TO WEST OF SIXTEEN MILE CREEK	PROVINCIAL PRIVATE MUNICIPAL	33.9 6.9 0.2
5	WEST OF SIXTEEN MILE CREEK TO EAST OF TRAFALGAR ROAD	PROVINCIAL PRIVATE MUNICIPAL	41.0 23.8 0.6
6	EAST OF TRAFALGAR ROAD TO NORTH OF LOWER BASE LINE	PROVINCIAL PRIVATE MUNICIPAL	11.6 7.9 0.1
7	NORTH OF LOWER BASE LINE TO NORTH OF BRITANNIA ROAD	PROVINCIAL PRIVATE MUNICIPAL	14.6 5.7 4.3
8	NORTH OF BRITANNIA ROAD TO NORTH OF DERRY ROAD	PROVINCIAL PRIVATE MUNICIPAL	17.7 8.9 0.2
9	NORTH OF DERRY ROAD TO WEST OF HERITAGE ROAD	PROVINCIAL PRIVATE MUNICIPAL	16.7 0.3 6.9
10	WEST OF HERITAGE ROAD TO WEST OF CREDIT RIVER	PROVINCIAL PRIVATE MUNICIPAL	30.9 0.5 0.3
11	WEST OF CREDIT RIVER TO WEST OF HURONTARIO STREET	PROVINCIAL PRIVATE MUNICIPAL	8.6 0.6 0.2

*Affected area to be updated after MTO review the Property Plates.