Appendix F-1
Description of the Long-Term Alternatives

Project No. **9309** Phase **280** Date **June 2, 2015**

From **Chris Sidlar (LEA)** To **Edward Presta / City of Toronto** C.C. **Terry Wallace (LEA)**

Subject **Appendix Outlining the Development of the Long-Term Alternatives**

This memorandum has been prepared to outline in greater detail the development of the long-term alternatives in the St. Clair Avenue West at the Georgetown GO Underpass Transportation Infrastructure Planning Study.

1. Development of Long-Term Alternative Solutions

1.1 Option 1: Widen St. Clair Avenue West at Underpass

The widening of St. Clair Avenue West at the underpass involves replacing the St. Clair West underpass with a longer structure (**Option 1A**), adding a new span to the south to serve eastbound traffic lanes (**Option 1B**) or replacing the entire bridge altogether with a flyover structure on the south side (**Option 1C**). The following sub-sections describes each option in detail.

1.1.1 Sub-option (A): Replace Existing Underpass with a Longer Bridge

The options that involve a replacement of the existing St. Clair underpass structure has been filtered down to the following based on the current review:

- **Option 1(A)(i)** – Widen both sides
- **Option 1(A)(ii)** – Widen to the south
- **Option 1(A)(iii)** – Widen to the north

Option 1(A)(i) – Widen on Both Sides

a) Plan & Profile

This option maintains the existing centerline of the St. Clair Avenue West roadway. The TTC streetcar lanes and the center traffic lanes are maintained at its current location (both horizontal and vertical alignments) while the existing roadway is widened to provide an additional traffic lane in each direction on either sides of roadway. This allows for two (2) continuous through traffic lanes in each of the eastbound and westbound directions along St. Clair Avenue between Keele Street and Old Weston Road. The current design considers for separated bike lanes and sidewalks on both sides of the roadway. A minimum vertical clearance of 4.8 m is provided between the underside of the new structure and the new eastbound and westbound traffic lanes. Detailed plan and profile drawings of this option can be found in **Appendix D-2.**

b) Structural Requirements

Option 1(A)(i) considers a new 4-span cast-in-place post-tensioned concrete bridge that is 41.3 m long, 44.0 m wide, and 1.35 m deep from bottom of deck slab to the top of ballast. The height of railway tracks has not been included. The bridge is configured into the following span lengths: 8.00 m - 12.65 m – 12.65 m – 8.00 m. **Table 1.1** summarizes the structural requirements.

c) Property Requirements

Additional right-of-way (ROW) is required on either sides of St. Clair Avenue through the acquisition of private properties. This includes the 6 Lloyd Avenue property which has an active development application. The provision of bike lanes on St. Clair Avenue will require additional ROW width of 1.8 m to 2.0 m on each side of the roadway. If bicycle lanes are not provided, impacts to the townhouse properties can be minimized.

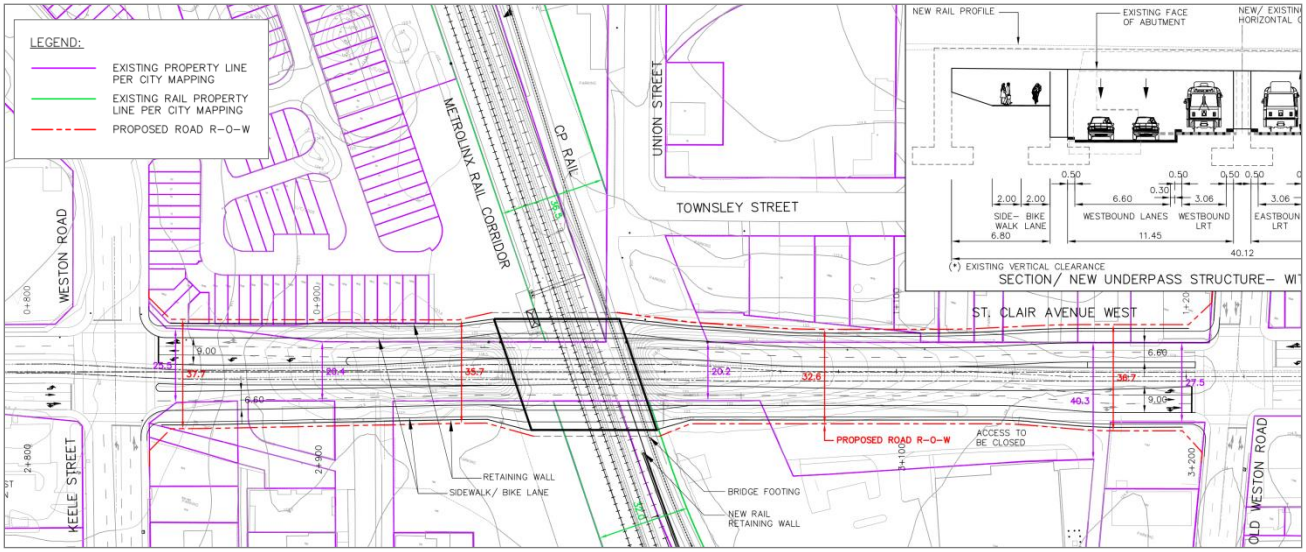


Figure 1.1: Option 1(A)(i) - Horizontal Alignment

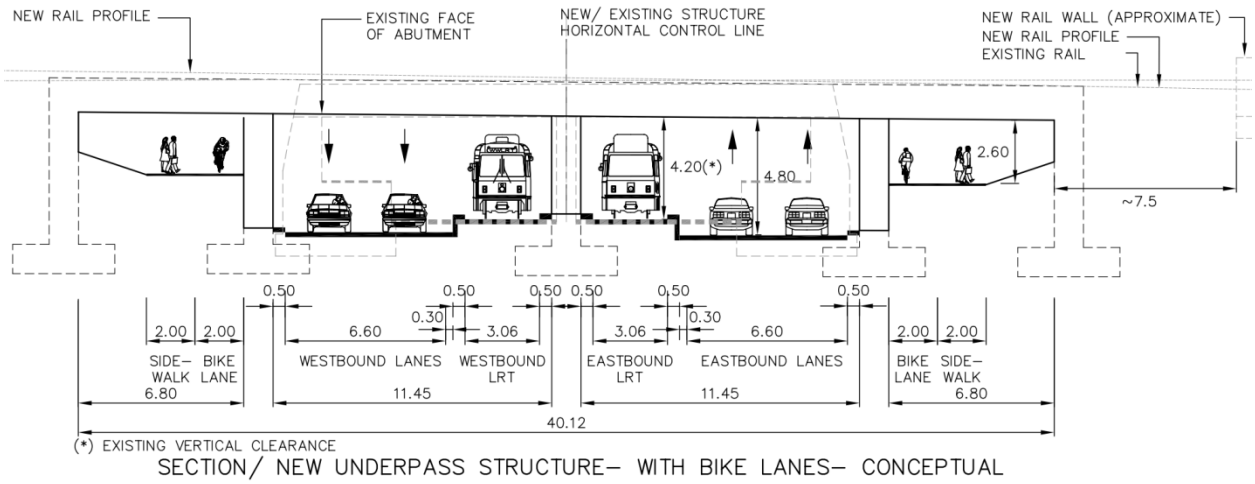


Figure 1.2: Option 1(A)(i) - Cross-Section at New Underpass Structure

New Structure Location:	Replace existing St. Clair Underpass
Structure Type	Cast-in-Place Post-Tensioned Concrete
Number of Spans	4
Span Configuration	8.00 m – 12.65 m – 12.65 m – 8.00 m
Length:	41.3 m
Width:	44.0 m
Depth:	1.35 m to Underside of Rails (includes 0.55 m ballast)

Table 1.1: Option 1(A)(i) - Structural Requirements

Option 1(A)(ii) – Widen to the South

a) Plan & Profile

This option considers a southerly shift of the existing centreline of the St. Clair Avenue roadway plus a southerly shift of the TTC streetcar tracks between Keele Street and Old Weston Road. The existing roadway is widened to provide an additional traffic lane in each direction to allow for two (2) continuous through traffic lanes. Separated bicycle lanes are provided in each direction. It can be noted that the retaining wall located within the rail corridor south of St. Clair Avenue will be in close proximity to the proposed footing of the new underpass structure. Detailed plan and profile drawings of this option can be found in **Appendix D-2.**

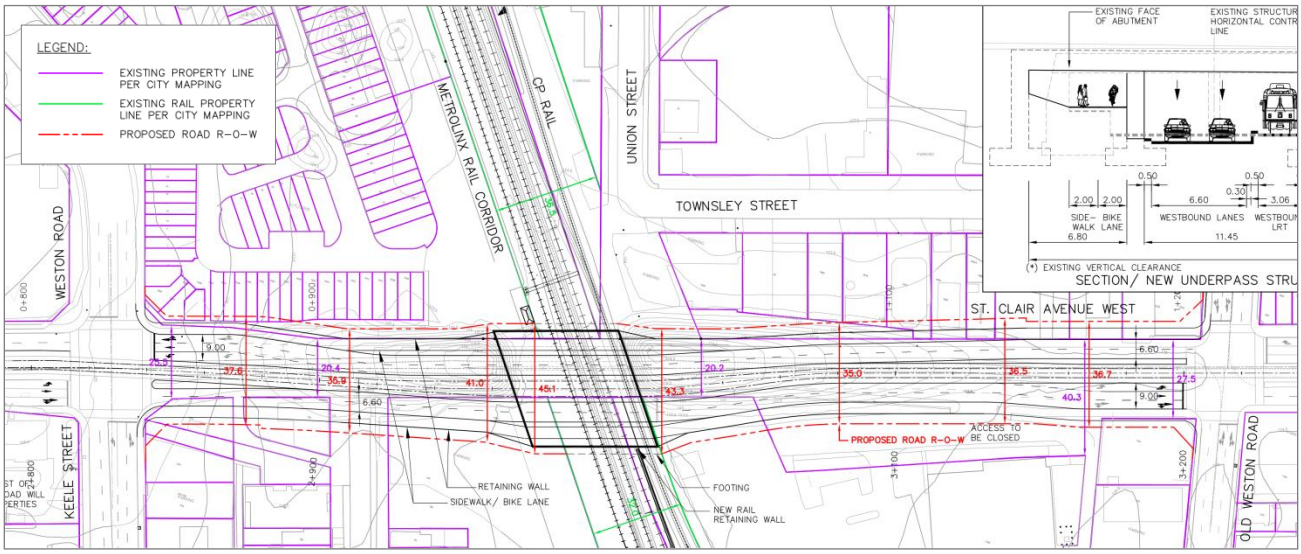


Figure 1.3: Option 1(A)(ii) - Horizontal Alignment

b) Structural Requirements

This option will have the same structural requirements as **Option 1(A)(i)**.

c) Property Requirements

Additional right-of-way (ROW) is required on the south side of St. Clair Avenue through the acquisition of private properties. This includes the 6 Lloyd Avenue property which has an active development application. Compared to **Option 1(A)(i)**, this option will have less impact to the private properties located on the north side of St. Clair Avenue.

Option 1(A)(iii) – Widen to the North

This option involves the widening of St. Clair Avenue West to the north. Although similar in design to variations **(i) and (ii)**, this option involves high impacts to townhouses North of St. Clair Avenue West between Weston Road and Old Weston Road. It will also greatly impact the heritage building located at the north-western quadrant of the intersection of Old Weston Road and St. Clair Avenue West. It was recommended this option not be carried forward for further consideration.

1.1.2 Sub-option (B): Maintain Existing St. Clair Underpass and Construct Additional Structure on South Side of St. Clair Avenue West for Eastbound Traffic

Option 1(B) maintains the existing St. Clair underpass structure and adds a new structure on the south side of St. Clair to accommodate the eastbound traffic lanes. The existing streetcar tracks will be shifted southerly to accommodate an additional westbound traffic lane north of the realigned streetcar tracks. All eastbound traffic lanes will be accommodated by a new underpass or overpass structure on the south side of St. Clair Avenue. Hence, the following variations have been identified for this option.

- **Option 1(B)(i)** – New Underpass Structure South of St. Clair for Eastbound Traffic Lanes
- **Option 1(B)(ii)** – New Overpass Structure South of St. Clair for Eastbound Traffic Lanes

Option 1(B)(i) – New Underpass Structure South of St. Clair for Eastbound Traffic Lanes

a) Plan & Profile

As described above, this sub-option will require a southerly shift of the existing streetcar tracks between Keele Street and Old Weston Road. The existing St. Clair Avenue West streetcar stops at Keele Street/Weston Road and Old Weston Road will be maintained at its current location while modifications to the traffic lanes will be required at both intersections. Two (2) westbound traffic lanes will be provided north of the streetcar tracks. Two (2) eastbound traffic lanes and a sidewalk will be provided within the underpass structure. A minimum vertical clearance of 4.8 metres is provided for the eastbound traffic lanes below the new underpass structure**.** It can be noted that the retaining wall located within the rail corridor south of St. Clair Avenue will be in close proximity to the proposed footing of the new underpass structure. Detailed plan and profile drawings of this option can be found in **Appendix D-2**.

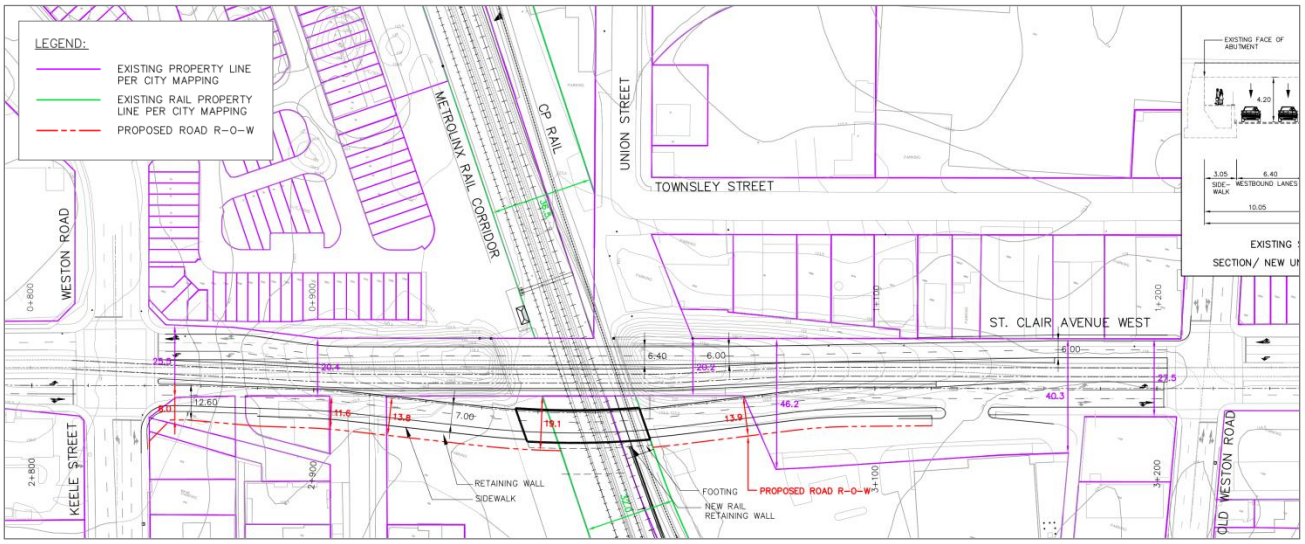


Figure 1.4: Option 1(B)(i) - Horizontal Alignment

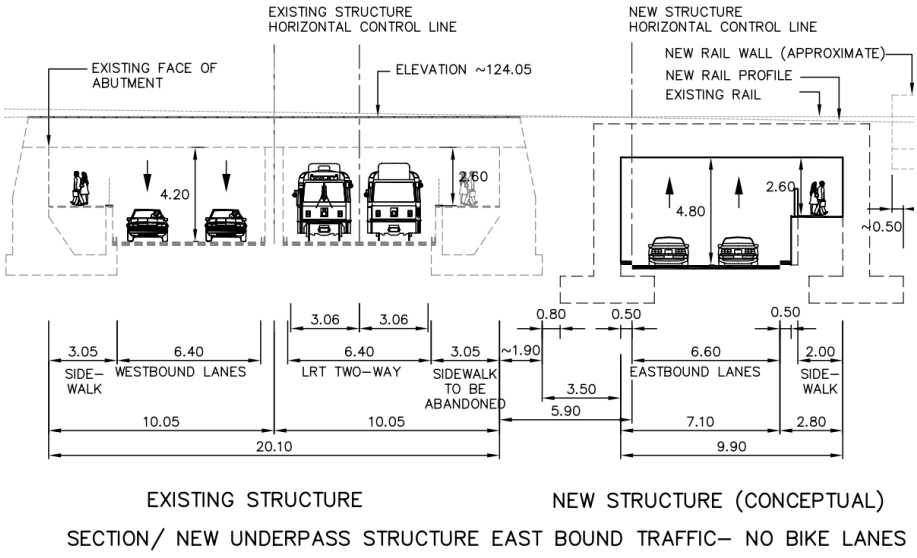


Figure 1.5: Option 1(B)(i) - Cross-Section at Existing and New Underpass Structure

b) Structural Requirements

This option considers a single span cast-in-place concrete rigid frame that is 11.1 m long, 44.0 m wide, and 1.30 m deep from bottom of deck slab to the top of ballast. The height of railway tracks has not been included. The caisson wall to the south of the existing crossing within the Metrolinx/GO rail property may impact the design of the south footing.

New Structure Location:	South of existing St. Clair Underpass
Structure Type	Cast-in-Place Concrete Rigid Frame
Number of Spans	1
Span Configuration	11.1 Single Span
Length:	11.1 m
Width:	44.0 m
Depth:	1.30 m to Underside of Rails (includes 0.55 m ballast)

Table 1.2: Option 1(B)(i) - Structural Requirements

c) Property Requirements

Additional right-of-way (ROW) is required on the south side of St. Clair Avenue through the acquisition of private properties. This includes the 6 Lloyd Avenue property which has an active development application. The existing St. Clair right-in/right-out access to Bingo Hall located at 1799 St. Clair Avenue West will be maintained.

Option 1(B)(ii) – New Overpass Structure South of St. Clair for Eastbound Traffic Lanes

a) Plan & Profile

This sub-option will take a similar to alignment to the **Option 1(B)(i)** underpass option but the eastbound traffic lanes will be provided on a new overpass structure. The overpass structure will accommodate two (2) eastbound traffic lanes, a bi-directional bike lane and a sidewalk. A vertical clearance of 7.01 metres is provided over the rail corridor. Detailed plan and profile drawings of this option can be found in **Appendix D-2**.

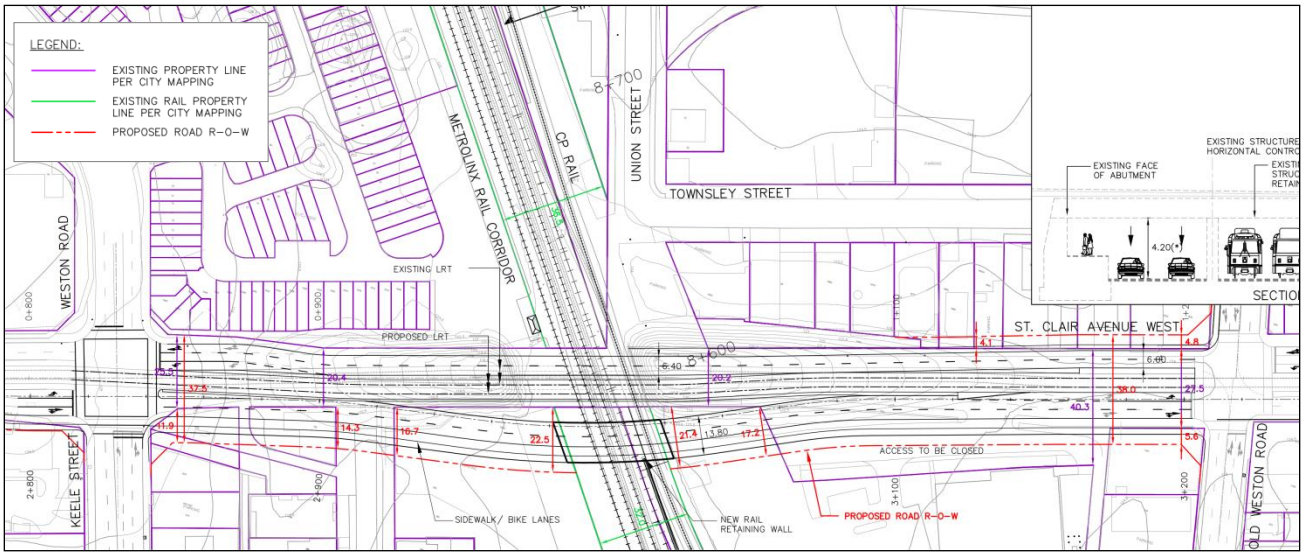


Figure 1.6: Option 1(B)(ii) - Horizontal Alignment

In order to accommodate the minimum vertical clearance over the rail corridor and the proposed depth of the overpass structure, two scenarios have been proposed for the slope of the overpass roadway: 6% and 7%. It should be noted that the maximum slope for roadways is 6% per *Transportation Association of Canada* guidelines. **Table 1.3** below summarizes the impacts with respect to the two roadway scenarios.

Roadway Slope	**6%**	**7%**
Intersection Impacts		
Keele Street/Weston Road/St. Clair Avenue West	Yes. Existing grades raised. Intersection realignment.	Yes. Existing grades raised. Intersection realignment
Old Weston Road/St. Clair Avenue West	Yes. Existing grades raised. Intersection realignment	Yes. Existing grades raised. Intersection realignment
Impacts to TTC Stops		
West of Keele Street/Weston Road	Yes	No
West of Old Weston Road	Yes. Existing grades raised	Yes. Existing grades raised

Table 1.3: Option 1(B)(ii) - Comparison of Impacts Between 6% and 7% Roadway Slope Scenarios

The 7% roadway slope scenario will avoid impacts to the streetcar stop west of Keele Street/Weston Road. However, the 7% roadway slope exceeds maximum roadway slope guidelines per TAC which would be subject to the City's review and approval.

b) Structural Requirements

This overpass option considers a single span steel box girder bridge that is 40.0 m long, 13.8 m wide and 2.15 m deep from the bottom of the girder to the top of asphalt pavement. The deck consists of 225 mm thick concrete deck slab with 90 mm asphalt and water-proofing system. The bridge also includes concrete parapet walls with railings that are in accordance with City of Toronto standard details.

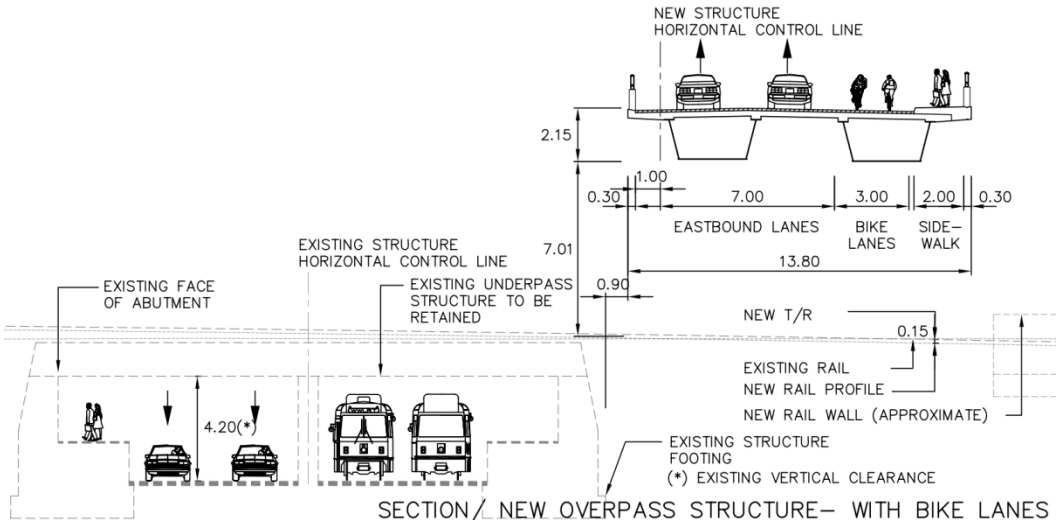


Figure 1.7: Option 1(B)(ii) - Profile at New Underpass Structure

Structure Type	Steel Box Girders
Number of Spans	1
Span Configuration	40.0 m Single Span
Length:	40.0 m
Width:	13.8 m
Depth:	2.15 m including deck and asphalt

Table 1.4: Option 1(B)(ii) - Structural Requirements

c) Property Requirements

Additional right-of-way (ROW) is required on the south side of St. Clair Avenue through the acquisition of private properties. This includes the 6 Lloyd Avenue property which has an active development application. The existing St. Clair right-in/right-out access to Bingo Hall located at 1799 St. Clair Avenue West will be closed due to the proposed grade differences. Access for this property will be maintained by their full movement access from Old Weston Road.

1.1.3 Sub-Option (C): New Overpass Structure for All Streetcar and Traffic Lanes on St. Clair Avenue West

a) Plan & Profile

This option considers a southerly shift of the all traffic and streetcar lanes on St. Clair Avenue to a new overpass structure over the rail corridor. Two (2) traffic lanes, a dedicated streetcar track, bike lanes and sidewalks will be provided in each direction on the overpass structure. A vertical clearance of 7.01 metres is provided over the rail corridor. The remnant area within the existing St. Clair ROW surrounding the rail corridor can potentially be filled and repurposed for uses other than a roadway. Detailed plan and profile drawings can be found in **Appendix D-2.**

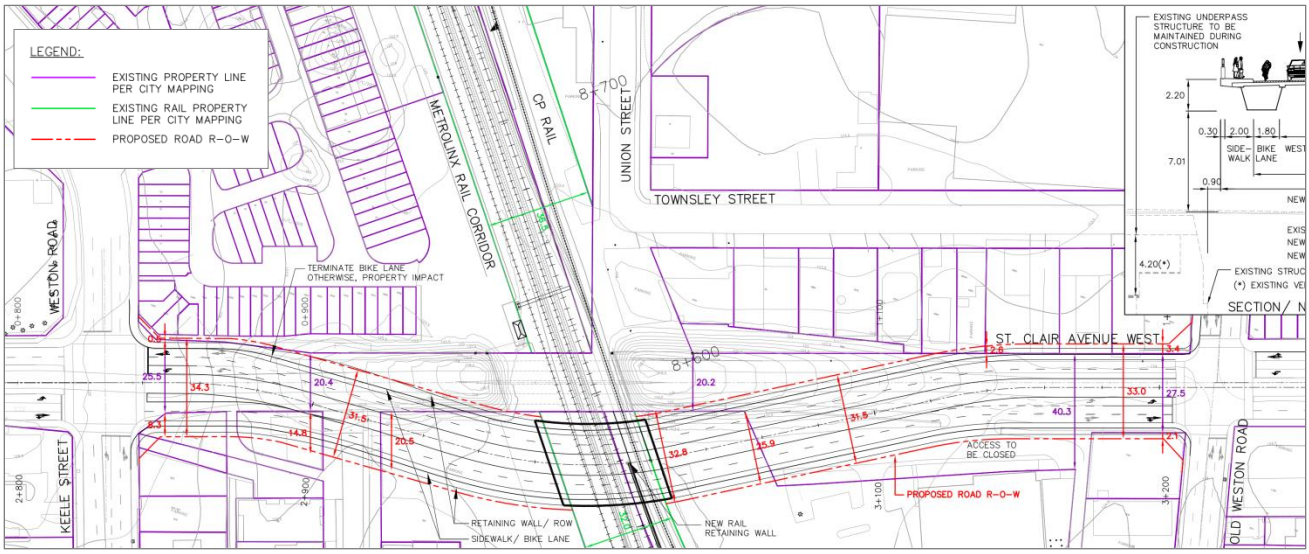


Figure 1.8: Option 1(C) - Horizontal Alignment

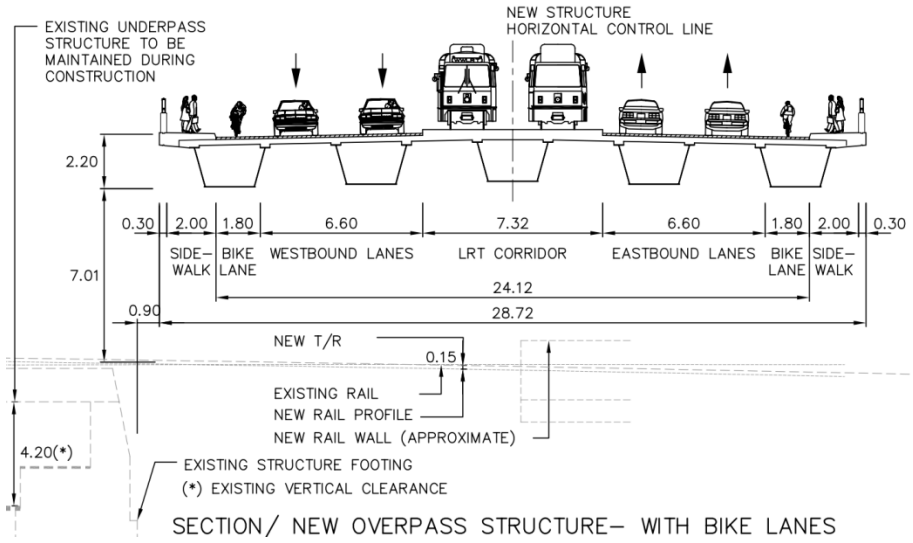


Figure 1.9: Option 1(C) - Cross-Section for New Overpass Structure

Similar to Option 1(B)(ii), two scenarios have been proposed for the slope of the overpass roadway: 6% and 7%. It should be noted that the maximum slope for roadways is 6% per TAC guidelines while the maximum slope for streetcar tracks is 5% per TTC guidelines. **Table 1.5** below summarizes the impacts with respect to the two roadway scenarios.

Roadway Slope	6%	7%
Intersection Impacts		
Keele Street/Weston Road/St. Clair Avenue West	Yes. Existing grades raised. Intersection realignment.	Yes. Existing grades raised. Intersection realignment
Old Weston Road/St. Clair Avenue West	Yes. Existing grades raised. Intersection realignment	Yes. Existing grades raised. Intersection realignment
Impacts to TTC Streetcar Platform		
West of Keele Street/Weston Road	Yes	No
West of Old Weston Road	Yes. Existing grades raised	Yes. Existing grades raised

Table 1.5: Option 1(C) - Comparison of Impacts Between 6% and 7% Roadway Slope Scenarios

The feasibility of carrying forward this option would be subject to TTC's review of the maximum slope accepted for the streetcar track operations understanding that the existing St. Clair streetcar tracks operate at a slope of 6.4% and 5.1% west and east of the existing St. Clair underpass, respectively.

b) Structural Requirements

This overpass option considers a single span steel box girder bridge that is 40.0 m long, 28.72 m wide and 2.20 m deep from the bottom of the girder to the top of asphalt pavement. The deck consists of 225 mm thick concrete deck slab with 90 mm asphalt and water-proofing system. The bridge also includes concrete parapet walls with railings that are in accordance with City of Toronto standard details.

Structure Type	Steel Box Girders
Number of Spans	1
Span Configuration	40.0 m Single Span
Length:	40.0 m
Width:	28.72 m
Depth:	2.20 m including deck and asphalt

Table 1.6: Option 1(C) - Structural Requirements

c) Property Requirements

Additional right-of-way (ROW) is required on the south side of St. Clair Avenue through the acquisition of private property. This includes the 6 Lloyd Avenue property which has an active development application. The existing St. Clair right-in/right-out access to Bingo Hall located at 1799 St. Clair Avenue West will be closed due to the proposed grade differences. Access for this property will be maintained by their full movement access from Old Weston Road.

1.2 Option 2: Construct Additional Rail Crossing North of St. Clair Avenue West

This option involves constructing an additional rail crossing north of St. Clair Avenue West involves the extension of Gunns Road. This can be accomplished either through the use of an Underpass (**Option 2A**) or an Overpass (**Option 2B**) at the crossing of the Metrolinx/GO and CP Rail corridor.

1.2.1 Sub-Option (A): Extend Gunns Road-Union Street with Underpass

Option 2(A) constructs an additional east-west rail crossing north of St. Clair using an underpass that extends from Gunns Road. Traffic along Gunns Road will be linked to Union Street and tied back into the road network. The following variations have been identified for this option:

- **Option 2A(i) –** Extend Gunns Road to Union Street with Underpass
- **Option 2A(ii) –** Extend Gunns Road to Turnberry Avenue with Underpass

Option 2A(i) – Extend Gunns Road to Union Street with Underpass

a) Plan & Profile

This option considers an easterly extension of Gunns Road to Union Street from the Gunns Road/Weston Road intersection. The roadway extension will contain a varying right-of-way of 21.6 to 25.0 metres with an underpass structure at the rail corridor. One (1) traffic lane, a dedicated bike lane and sidewalk are provided in each direction. This option provides a direct vehicular connection between St. Clair Avenue west of Keele Street to Union Street. A vertical clearance of 5.0 metres is provided between the roadway and the underside of the underpass structure. Detailed plan and profile drawings of this option can be found in **Appendix D-2**.

b) Structural Requirements

This underpass option considers a single span cast-in-place post-tensioned concrete bridge that is 17.0 m long, 37.0 m wide, and 2.00 m deep from bottom of deck slab to the top of ballast. The height of railway tracks has not been included.

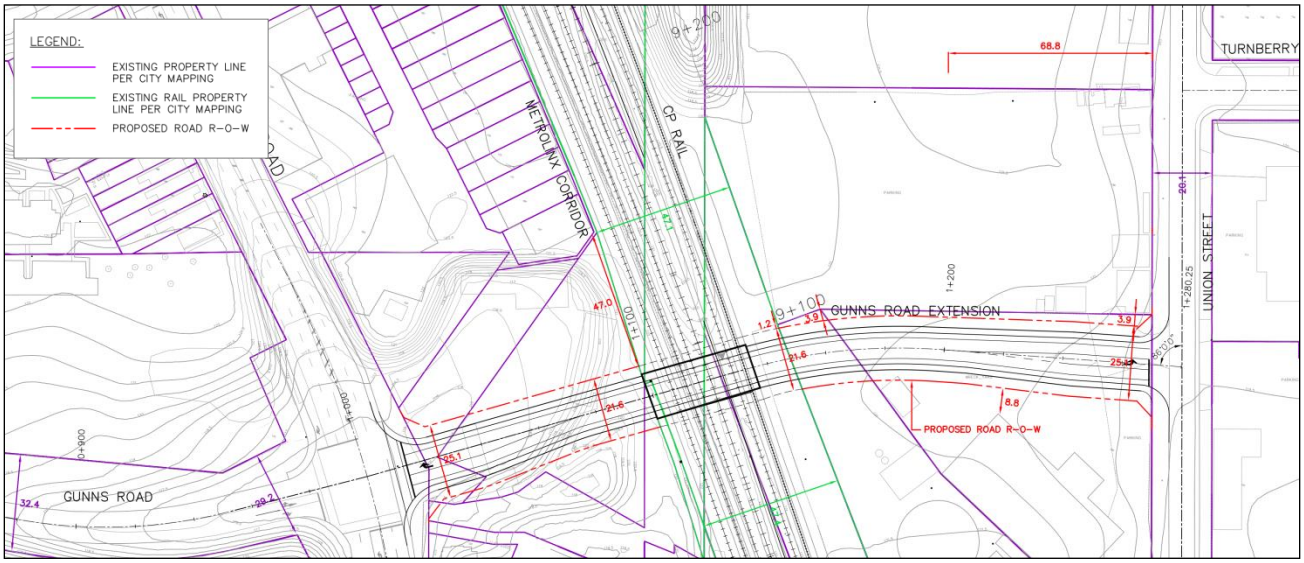


Figure 1.10: Option 2(A)(i) - Horizontal Alignment

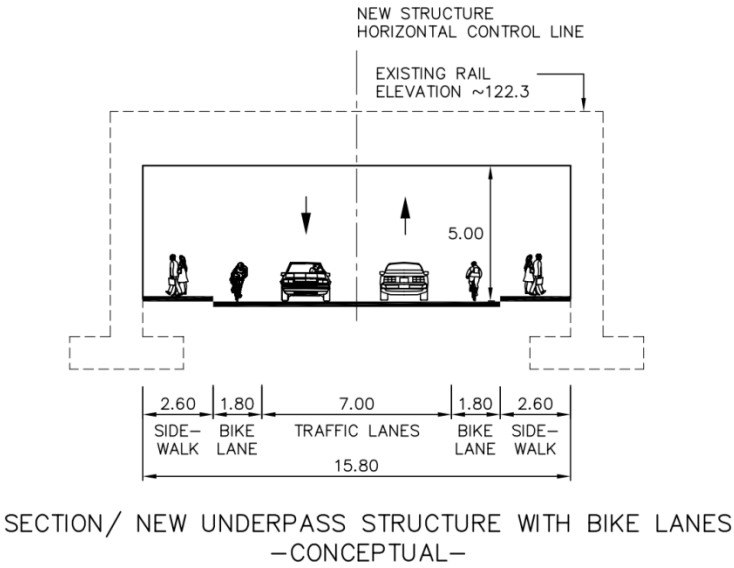


Figure 1.11: Option 2(A)(i) - Cross-Section at New Underpass Structure

Structure Type	Cast-in-Place Post-Tensioned Concrete
Number of Spans	1
Span Configuration	17.0 m Single Span
Length:	17.0 m
Width:	37.0 m
Depth:	2.00 m to Underside of Rails (includes 0.55 m ballast)

Table 1.7: Option 2(A)(i) - Structural Requirements

c) Property Requirements

Lands from existing private properties located on the east side of Weston Road, the Hydro corridor and at 100 Union Street will be required for the proposed right-of-way (ROW). The ownership and usage of the affected properties should be confirmed with City Real Estate and Hydro One.

Option 2(A)(ii) – Extend Gunns Road to Turnberry Avenue with Underpass

a) Plan & Profile

In a similar fashion to **Option 2(A)(i)**, this option considers an easterly extension of Gunns Road to the Turnberry Avenue/Union Street from the Gunns Road/Weston Road intersection. The roadway extension will contain a similar ROW and cross-section as **Option 2(A)(i).** Under this option, a north-east/southwest roadway connection can be provided between St. Clair Avenue west of Weston Road and Old Weston Road north of St. Clair Avenue via Gunns Road and Turnberry Avenue. This option capitalizes on the use of the existing traffic signal at the intersection of Turnberry Avenue and Old Weston Road.

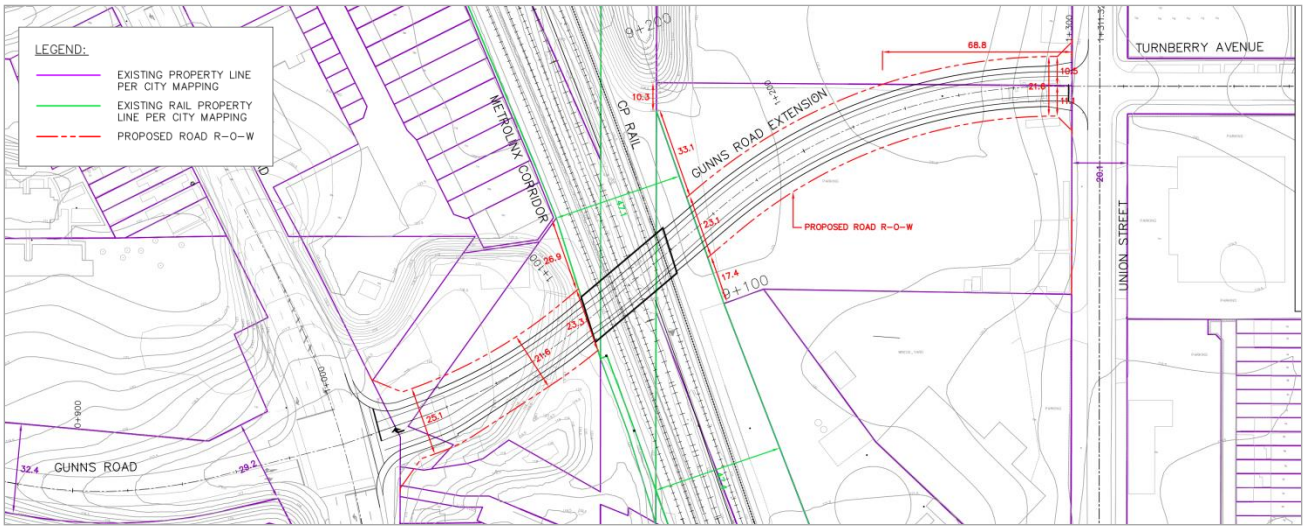


Figure 1.12: Option 2(A)(ii) - Horizontal Alignment

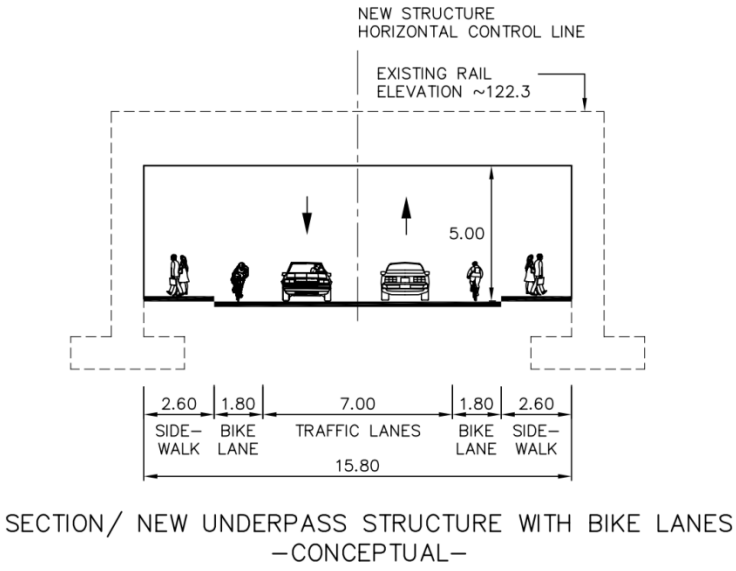


Figure 1.13: Option 2(A)(ii) - Cross-Section at New Underpass Structure

b) Structural Requirements

This underpass option considers the same structural requirements as **Option 2(A)(i)**.

c) Property Requirements

Lands from existing private properties located on the east side of Weston Road, the Hydro corridor, 126 Union Street and 144 Union Street will be required for the proposed right-of-way (ROW). The ownership and usage of the affected properties should be confirmed with City Real Estate and Hydro One.

1.2.2 Sub-Option (B): Extend Gunns Road-Union Street with Overpass

This option shares the same variations as **Sub-Option 2(A)**. However, the construction of an overpass will requires the existing grades at the Weston Road/Gunns Road intersection to be raised by approximately 3 metres which would significantly impact the surrounding road network and land uses. It was recommended that this option not be carried forward for further evaluation.

1.3 Option 3: Construct Additional Rail Crossing South of St. Clair Avenue West

The construction of an additional rail crossing to the south of St. Clair Avenue West involves the extension of Davenport Road. This can be accomplished either through the use of an Overpass (**Option 3A)** or an Underpass **(Option 3B)** at the crossing of the Metrolinx/GO and CP Rail corridor.

1.3.1 Sub-Option (A): Davenport Overpass Extension

Option 3(A) constructs an additional east-west rail crossing south of St. Clair using an overpass that stems from a Davenport Road extension. Traffic along Davenport Road will be tied back into the road network via Keele Street. The following variations have been identified for this option:

- **Option 3(A)(i) –** Extend Davenport Road to Lloyd Avenue with Overpass
- **Option 3(A)(ii)** – Extend Davenport Road to West Toronto Road with Overpass

Option 3(A)(i) – Extend Davenport Road to Lloyd Avenue with Overpass

a) Plan & Profile

This option considers a westerly extension of Davenport Road at Old Weston Road over the rail corridor to Lloyd Avenue. The added traffic at the Lloyd Avenue and Keele Street intersection will warrant a traffic signal to be considered at this location. That being said, it is recognized that the spacing (approximately 100 metres) is not ideal. Options for the signal coordination are discussed as part of the option evaluation. One (1) traffic lane, a dedicated bike lane and sidewalk are provided in each direction. Detailed plan and profile drawings can be found in **Appendix D-2**.

A minimum vertical clearance of 7.01 metres is provided over the rail corridor. A roadway slope of 6% is required to achieve the vertical clearance over the rail corridor due to the distance between the Old Weston Road/Davenport Road intersection and the rail corridor. The existing grades at this intersection will be raised by 1.9 metres and will result in a re-grading or closure of the intersection. Alternate vehicular access configurations will need to be considered for the existing private properties surrounding this intersection. Grade impacts along Davenport Road are expected to extend easterly to Ford Street.

West of the rail corridor, the existing grades at Mulock Avenue will be raised up to 1.6 metres which may require a re-grading or closure of the Mulock Avenue/Lloyd Avenue intersection. The roadway connectivity of Lloyd Avenue between Mulock Avenue and Cawthra Avenue can be further investigated as additional design details are developed.

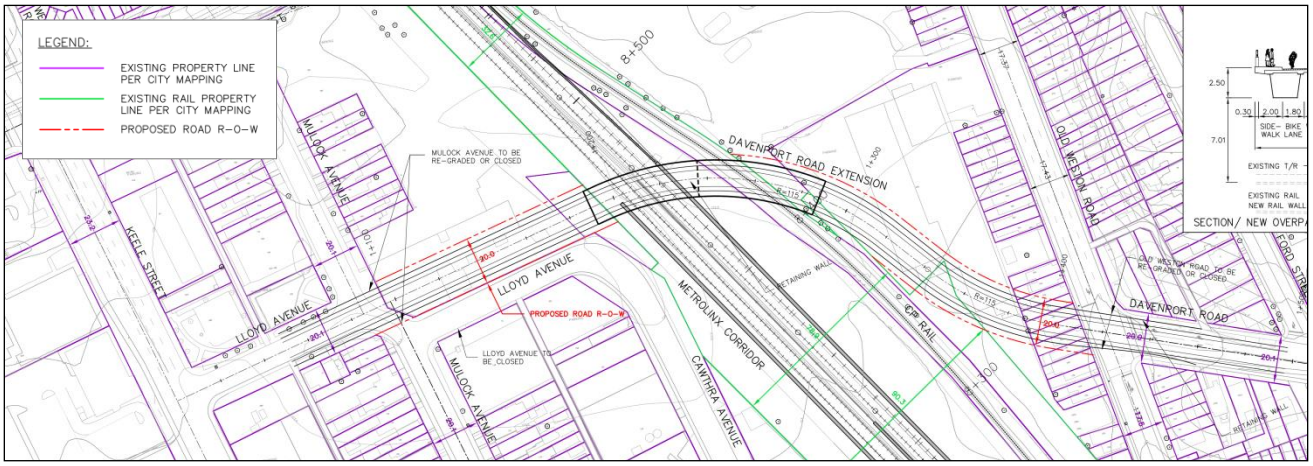


Figure 1.14: Option 3(A)(i) - Horizontal Alignment

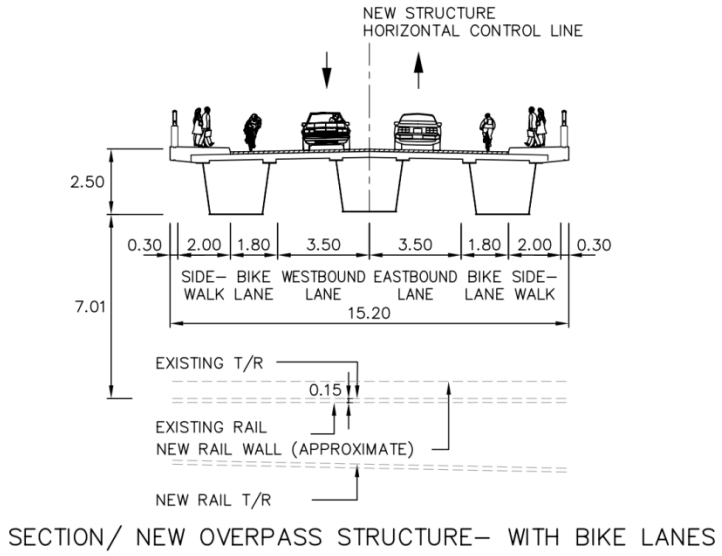


Figure 1.15: Option 3(A)(i) – Cross-Section at New Overpass Structure

b) Structural Requirement

This overpass option considers a 2-span steel box girder bridge that is 97.0 m long, 15.2 m wide and 2.50 m deep from the bottom of the girder to the top of asphalt pavement. The bridge is configured into the following span lengths: 45.0 m – 52.0 m, with a pier located within the rail corridor. The deck consists of 225 mm thick concrete deck slab with 90 mm asphalt and water-proofing system. The bridge also includes concrete parapet walls with railings that are in accordance with City of Toronto standard details.

Structure Type	Steel Box Girders
Number of Spans	2
Span Configuration	45.0 m – 52.0 m
Length:	97.0 m
Width:	15.2 m
Depth:	2.50 m including deck and asphalt

Table 1.8: Option 3(A)(i) - Structural Requirements

c) Property Requirements

The proposed ROW associated with this overpass option will require the acquisition of private properties located east and west of the Metrolinx/GO Georgetown rail corridor. This includes the 6 Lloyd Avenue property which has an active development application.

Option 3(A)(ii) – Extend Davenport Road to West Toronto Road with Overpass

a) Plan & Profile

This option considers a westerly extension of Davenport Road at Old Weston Road over the rail corridor to West Toronto Street. One (1) traffic lane, a dedicated bike lane and sidewalk are provided in each direction. This option will have a similar roadway cross-section to **Option 3(A)(i)**. Detailed plan and profile drawings can be found in **Appendix D-2.**

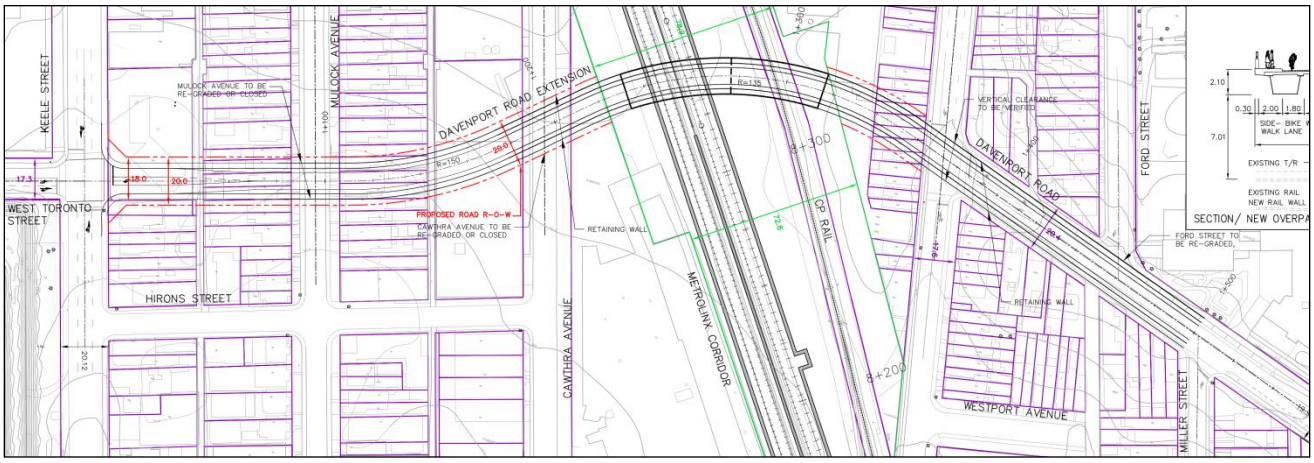


Figure 1.16: Option 3(A)(ii) - Horizontal Alignment

A minimum vertical clearance of 7.01 metres is provided over the rail corridor. A roadway slope of 6% is required to achieve the vertical clearance over the rail corridor due to the distance between the Old Weston Road/Davenport Road intersection and the rail corridor. Grade impacts along Davenport Road are expected to extend easterly to Miller Street. The roadway surface of the new overpass at the Old Weston Road/Davenport Road intersection will be approximately 5.7 metres above the existing intersections grades. This will close the existing Old Weston Road/Davenport Road intersection while an option to maintain north-south traffic flow along Old Weston Road to Junction Road can potentially be considered by lowering the grades along Old Weston Road to create a north-south roadway connection below the new overpass structure. The amount of re-grading required will be subject to the depth of overpass structure required at this location. However, it is anticipated that the lowering of roadway grades along Old Weston Road can be done to achieve a roadway vertical clearance of 4.8 metres below the Davenport Road overpass structure. Alternate vehicular access configurations will need to be considered for the existing private properties surrounding the Old Weston Road/Davenport Road intersection.

West of the rail corridor, the roadway surface of the overpass at Cawthra Avenue will be approximately 5.1 metres above existing grades. This will result in a closure of Cawthra Avenue or the potential re-grading of the roadway maintain north-south traffic flow below the overpass structure. Grading impacts associated with the new overpass structure are expected to extend west to Mulock Avenue.

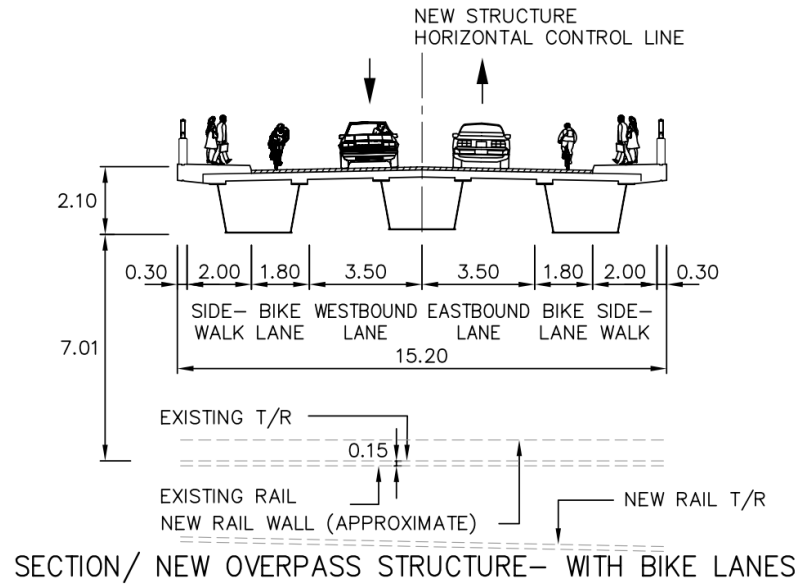


Figure 1.17: Option 3(A)(ii) - Cross-Section at New Overpass Structure

b) Structural Requirements

This overpass option considers a 2-span steel box girder bridge that is 85.0 m long, 15.2 m wide and 2.10 m deep from the bottom of the girder to the top of asphalt pavement. The bridge is configured into the following span lengths: 45.0 m – 40.0 m, with a pier located within the rail corridor. The deck consists of 225 mm thick concrete deck slab with 90 mm asphalt and water-proofing system. The bridge also includes concrete parapet walls with railings that are in accordance with City of Toronto standard details.

Structure Type	Steel Box Girders
Number of Spans	2
Span Configuration	45.0 m – 40.0 m
Length:	85.0 m
Width:	15.2 m
Depth:	2.10 m including deck and asphalt

Table 1.9: Option 3(A)(ii) - Structural Requirements

c) Property Requirements

The proposed ROW will require the acquisition of a number private properties located east and west of the Metrolinx/GO Georgetown rail corridor.

1.3.2 Sub-Option (B): Davenport Underpass Extension

This sub-option shares the same variations as **Sub-Option 3(A).** However, the construction of an underpass will require a reconstruction of a newly installed caisson wall structures along the Metrolinx/GO corridor. It was recommended that this option not be carried forward for further evaluation.

1.4 Option 4: Extend Keele Street to the South

The extension of Keele Street to the south involves a connection to Union Street or Turnberry Avenue North of St. Clair Avenue West (**Option 4A**), or to Davenport Road South of St. Clair Avenue West (**Option 4B**). The following sub-sections describe each option in detail.

1.4.1 Sub-Option (A): Extend Keele Street to the south to Union Street or Turnberry Avenue North of St. Clair Avenue West

a) Plan & Profile

The roadway portion of Keele Street North currently terminates a point approximately 40 metres south of Lavender Road. However, the right-of-way of Keele Street extends south of this point to the rail corridor. It is anticipated that a 180 metre southerly extension of the Keele Street roadway can be accommodated within the existing City right-of-way (ROW) before reaching the Metrolinx/GO rail corridor. Then the roadway extension can take a south-easterly alignment to meet Turnberry Avenue or Union Street. Should the alignment use Turnberry Avenue, it will capitalize on the use of the existing traffic signal at the intersection of Turnberry Avenue and Old Weston Road, but would require the consideration to be upgraded from a local road. The alignment of the Keele Street extension has been developed with a 20 metre ROW with consideration to minimize land and infrastructure impacts on rail, Hydro and private properties.

For the alignment that terminates further south at Union Street, a horizontal clearance of 11.0 metres from the existing Hydro tower was considered. This alignment intends to avoid impacts to the existing structures in the Hydro corridor. Property from the rail corridor outside of the existing crash wall will be required for the proposed Keele Street ROW.

It can be noted that there have been slight differences identified between the property lines shown on the City base mapping and Metrolinx/GO Georgetown rail drawings at the Hydro corridor property. The exact property limits of the Hydro corridor should be confirmed to verify the property impacts associated with this option. In addition, the specific usage and ownership of the infrastrucutre located within the Hydro corridor should be confirmed.

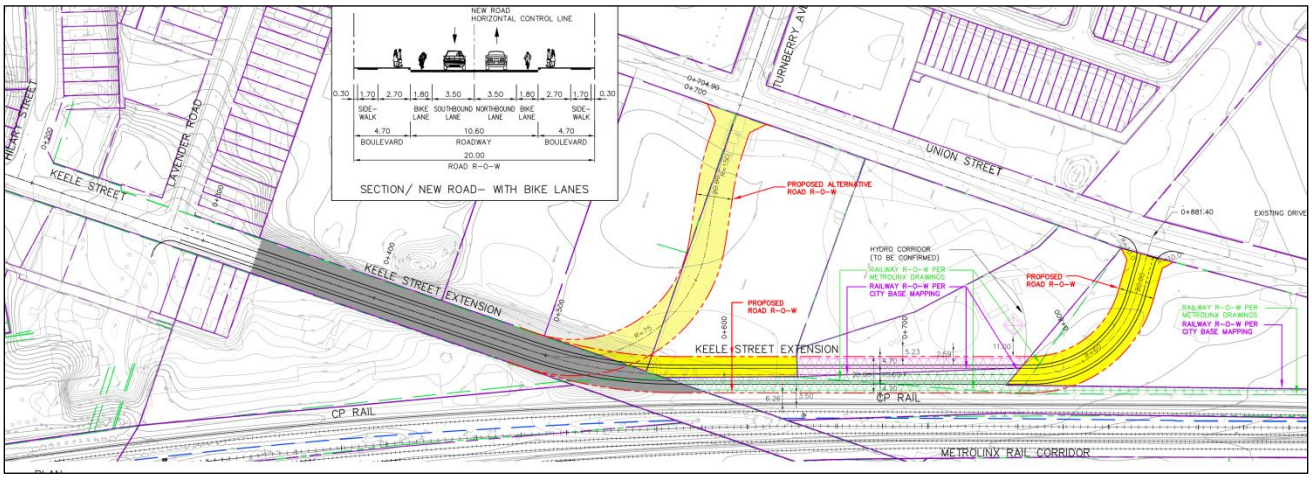


Figure 1.18: Option 4(A) - Keele Street Extension to Union Street/Turnberry Avenue

b) Structural Requirements

No new structures are required for this option

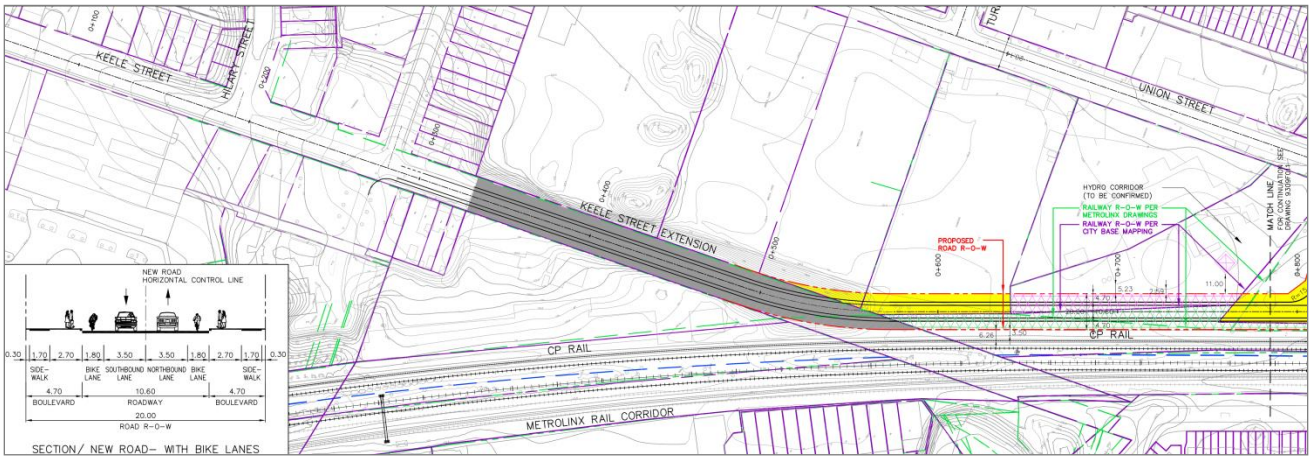
c) Property Requirements

The Keele Street extension to Turnberry Avenue will require property from two different private properties located at 144 and 126 Union Street while the Hydro property is unaffected. The Keele Street extension to Union Street will impact the aforementioned private properties and in addition, the Hydro corridor, rail corridor and the 80 Union Street private property.

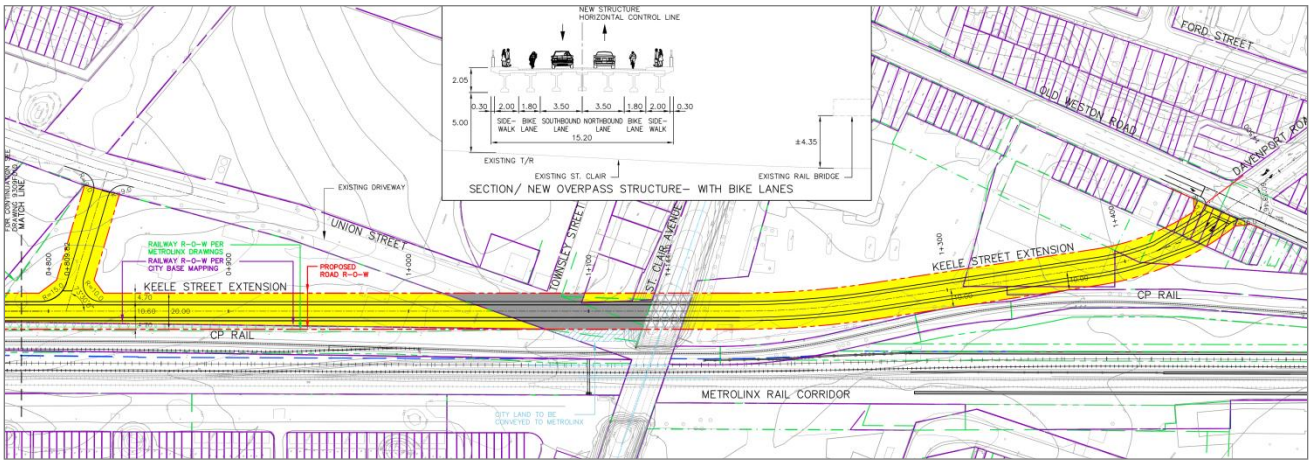
1.4.2 Sub-Option (B): Keele Street Extension to Davenport Road

a) Plan & Profile

This option will take a similar alignment to **Option 4A** north of the Hydro corridor. A horizontal clearance of 11.0 metres between the proposed ROW and the existing Hydro Tower has been considered. South of the Hydro corridor, **Option 4B** will continue southerly outside of the rail corridor to St. Clair Avenue. Keele Street will not intersect St. Clair Avenue under this option but an overpass structure will be required at St. Clair Avenue to allow Keele Street to connect south of St. Clair Avenue to Davenport Road. A minimum vertical clearance of 5.0 metres between the underside of the new overpass structure and the existing St. Clair Avenue has been assumed in the current design.



Lavender Road to Hydro Corridor



Hydro Corridor to Davenport Road

Figure 1.19: Option 4(B) - Keele Street Extension to Davenport Road

b) Structural Requirements

This overpass option considers a single span precast concrete girder bridge that is 30.0 m long, 15.2 m wide, and 2.05 m deep from the bottom of the girder to the top of asphalt pavement. The deck consists of 225 mm thick concrete deck slab with 90 mm asphalt and water-proofing system. The bridge also includes concrete parapet walls with railings that are in accordance with City of Toronto standard details.

Structure Type	CPCI Girders
Number of Spans	1
Span Configuration	30.0 m Single Span
Length:	30.0 m
Width:	15.2 m
Depth:	2.05 m including deck and asphalt

Table 1.10: Option 4(B) - Structural Requirements

c) Property Requirements

Similar to Option 4A, a portion of the Keele Street extension can be provided within the existing Keele Street ROW and Union Street ROW north of St. Clair Avenue. **Option 4B** will require lands from the Hydro and rail corridors and from the following private properties north of St. Clair Avenue: 144 Union Street, 126 Union Street, 80 Union Street and 1900 St. Clair Street West. The proposed Metrolinx acquisition of the Union Street ROW northeast of the existing St. Clair underpass does not impact the alignment of this option.

South of St. Clair Avenue, lands from additional private properties will be required from the lands to form the connection between St. Clair Avenue and Davenport Road.

1.5 Revisions to Option 4A and 4B

Following TAC meeting #3, it was decided that **Options 4A and 4B** should be modified into **Option 4 and Option 5** respectively. The following sections provide a summary of the revisions.

1.5.1 Option 4: Extend Keele Street to a Gunns Road Extension Only

a) Plan & Profile

This revision of option 4A (henceforth referred to as **Option 4)** considers a southerly extension of Keele Street to a proposed Gunns Road extension. One (1) traffic lane, a dedicated bike lane and a sidewalk are provided in each direction. The intersection with the Gunns Road extension will form a T-intersection. This option requires a lowering of Keele Street to the level of the Gunns Road Underpass or a realignment of Keele Street further to the east. Detailed plans and profile drawings can be found in **Appendix D-2**.

b) Structural Requirements

This option shares the same structural requirements as **Option 2(A)(ii).**

c) Property Requirements

The Keele Street extension to Gunns Road extension will require property from two different private properties located at 160 and 144 Union Street.

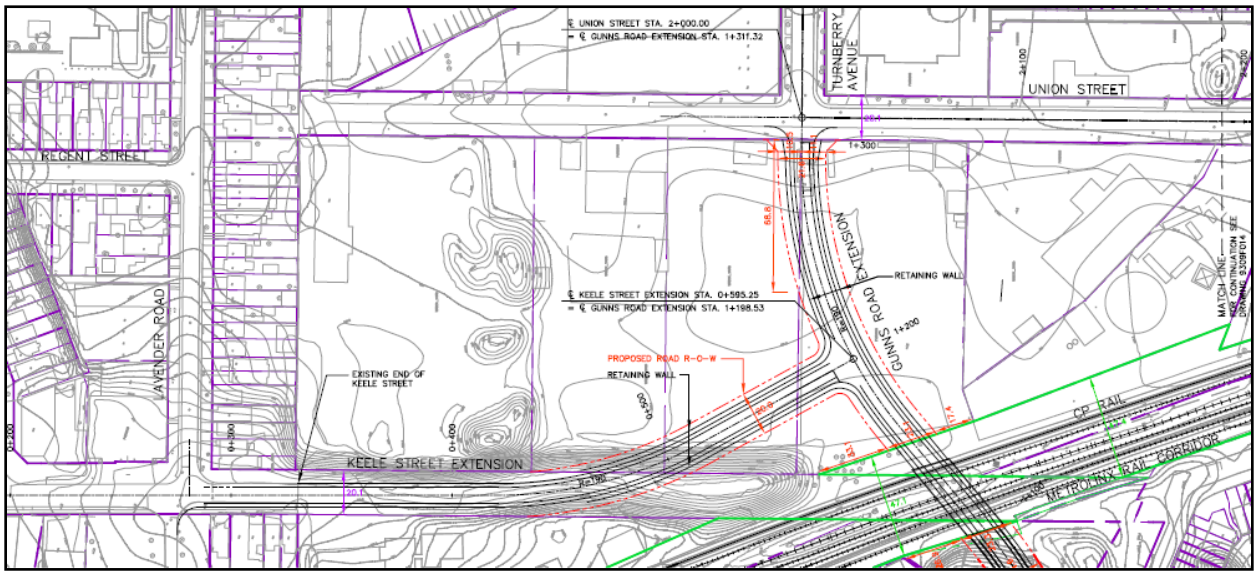


Figure 1.20: Option 4 & 5(1/2) - Extend Keele Street to a Gunns Road Extension

1.5.2 Option 5: Extend Keele Street to a Gunns Road Extension and Union Street Crossing Over St. Clair Avenue West to Connect with Davenport Road

a) Plan & Profile

This option consists of all the parameters mentioned in **Option 5(4).** It also considers a southeasterly extension of Union Street at Townsley Street over St. Clair Avenue West. One (1) traffic lane, dedicated bike lane and sidewalk are provided in each direction. Detailed plan and profile drawings can be found in **Appendix D-2.**

A minimum vertical clearance of 5.0 metres is provided over St. Clair Avenue .A roadway slope of 4% north of the crossing is required to achieve the vertical clearance over St. Clair Avenue due to the proximity between Union Street/Townsley Street and St. Clair Avenue West. Townsley Street will also be required to be closed off and turned into a cul-de-sac for this alternative to be implemented.

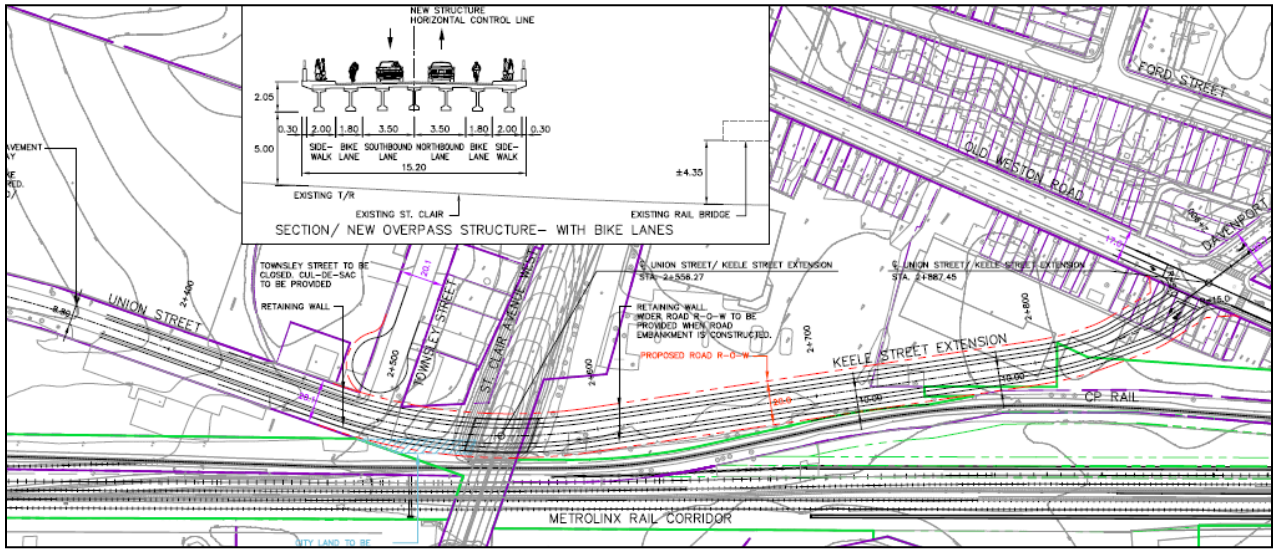


Figure 1.21: Option 5(2/2) - Union Street Crossing over St. Clair Avenue West to connect with Davenport Road

b) Structural Requirements

This option shares the same structural requirements as **Option 2(A)(ii)**. It also features a second overpass which considers a single span precast concrete girder bridge that is 30.0 m long, 15.2 m wide, and 2.05 m deep from the bottom of the girder to the top of asphalt pavement. The deck consists of 225 mm thick concrete deck slab with 90 mm asphalt and water-proofing system. The bridge also includes concrete parapet walls with railings that are in accordance with City of Toronto standard details.

Structure Type	CPCI Girders
Number of Spans	1
Span Configuration	30.0 m Single Span
Length:	30.0 m
Width:	15.2 m
Depth:	2.05 m including deck and asphalt

Table 1.11: Option 5 - Structural Requirements

c) Property Requirements

Option 5 will require lands from the rail corridor and from the following private properties north of St Clair Avenue: 160 Union Street, 144 Union Street, and 1900 St. Clair Avenue West. The proposed Metrolinx acquisition of the Union Street ROW northeast of the existing St. Clair underpass does not impact the alignment of this option.

South of St. Clair Avenue, lands from additional private properties will be required from the lands to form the connection between St. Clair Avenue and Davenport Road.