

## Stop Layout

The Victoria Park Stop will include one centre platform located on the east side of the intersection. A centre platform is provided at this location because the geometric configuration (i.e. horizontal curvature) of the west side of the intersection makes it a less advantageous location to provide farside or nearside platforms.

## Road Layout and Traffic Operations

Under existing conditions, eastbound and westbound left turns are permitted at the intersection of Eglinton Avenue and Victoria Park Avenue. A detailed traffic analysis was conducted at this location, comparing operation with traditional left turns to various left turn rerouting scenarios, and also considering impacts on truck routing. The scenarios were compared based on the delays experienced by the Eglinton Crosstown LRT, cross-street transit vehicles, truck routing, general traffic, and pedestrians to determine which scenario was most beneficial to the travellers. Based on this analysis, the preferred scenario was a four phase signal operation at Eglinton Avenue and Victoria Park Avenue with rerouted east-west and north-south left turn movements as follows:

- Northbound and southbound left turns to remain prohibited as existing
- Eastbound left turns rerouted through Eglinton Square
- Westbound left turns rerouted through Eglinton Square

Redesign of the intersection of Eglinton Avenue and Eglinton Square is proposed to accommodate the rerouted eastbound right turns. **Exhibit 142** illustrates the recommended Victoria Park Stop layout and rerouted east-west left turns.

**Exhibit 142: Victoria Park Stop Layout**



### 3.5.8.5 Pharmacy Stop

The Pharmacy Stop will be located at the intersection of Eglinton Avenue and Pharmacy Avenue. The Pharmacy Stop is shown on Sheets No. 82 and 83. Currently, the northwest corner of this intersection is occupied by a shopping plaza, which includes a supermarket. The northeast corner of the intersection is occupied by a gas station, and is adjacent to big-box retail store. The southeast corner of the intersection is currently occupied by an industrial development, and the southwest corner of the intersection is occupied by a shopping plaza.

## Stop Layout

The Pharmacy Stop will include one centre platform located on the east side of the Eglinton Avenue and Pharmacy Avenue intersection.

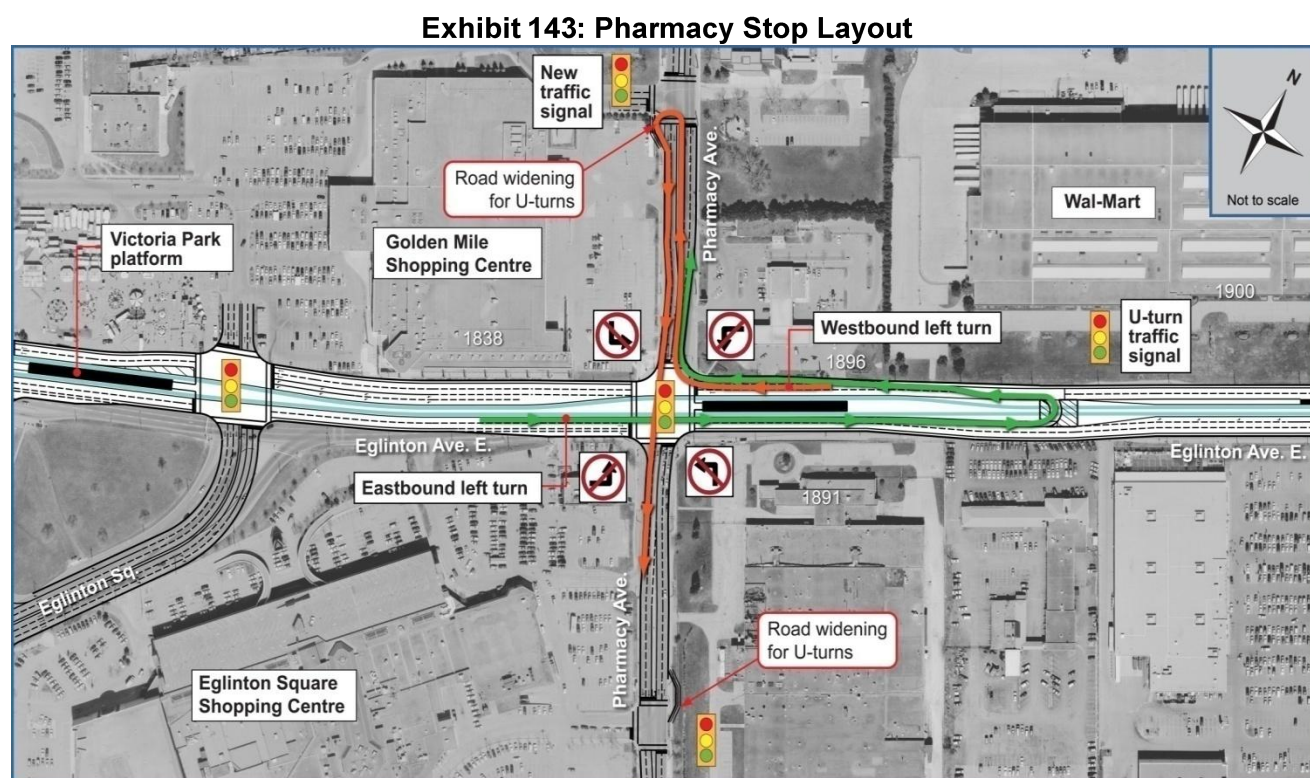
## Road Layout and Traffic Operations

Under existing conditions, left turns are permitted in all directions at the intersection of Eglinton Avenue and Pharmacy Avenue. A detailed traffic-traveller analysis was conducted at this location, comparing operation with traditional left turns to various left turn rerouting scenarios, and also considering impacts on truck routing. The scenarios were compared based on the delays experienced by the Eglinton Crosstown LRT, cross-street transit vehicles, general traffic, and pedestrians to determine which scenario was most beneficial to the travellers. Based on this analysis, the preferred scenario was a four phase signal operation at Eglinton Avenue and Pharmacy Avenue with rerouted east-west and north-south left turn movements as follows:



- Northbound left turns rerouted to U-turn at a new traffic signal at Craigton Drive;
- Southbound left turns rerouted to U-turn at an existing traffic signal at the shopping plaza access;
- Eastbound left turns rerouted to U-turn at a new midblock U-turn signal on Eglinton Avenue approximately 200 metres east of Pharmacy Avenue; and
- Westbound left turns rerouted to U-turn at a new traffic signal at Craigton Drive.

**Exhibit 143** illustrates the recommended Pharmacy Stop layout and rerouted east-west left turns.



### 3.5.8.6 Lebovic Stop

The Lebovic Stop will be located at the intersection of Eglinton Avenue and Lebovic Drive. The Lebovic Stop is shown on Sheets No. 83 and 84. This location is surrounded by commercial retail development. The northwest corner of this intersection is currently occupied by commercial shopping plaza. The northeast corner is occupied by a car dealership, which is adjacent to a big-box shopping plaza further east. The southeast corner of the intersection is occupied by a commercial retail plaza, and the southwest corner of the intersection is occupied by Eglinton Town Centre.

### 3.5.8.7 Warden Stop

The Warden Stop will be located at the intersection of Eglinton Avenue and Warden Avenue. The Warden Stop is shown on Sheets No. 84 and 85. Currently, the northwest corner of this intersection is occupied by a financial office building, and the northwest corner of this intersection is occupied by a commercial office

building. The southeast corner of the intersection is occupied by small commercial strip adjacent to a car dealership and the southwest corner is occupied by a larger commercial shopping strips.

### Road Layout and Traffic Operations

Under existing conditions, left turns are permitted in all directions at the intersection of Eglinton Avenue and Warden Avenue. A detailed traffic-traveller analysis was conducted at this location, comparing operation with traditional left turns to various left turn rerouting scenarios, and also considering impacts on truck routing. The scenarios were compared based on the delays experienced by the Eglinton Crosstown LRT, cross-street transit vehicles, truck routing, general traffic, and pedestrians to determine which scenario was most beneficial to the travellers. Based on this analysis, the preferred scenario was a traditional eight phase signal operation at Eglinton Avenue and Warden Avenue with existing left turn movements remaining at the intersection.

### Stop Layout

This stop will have far side platforms.

### 3.5.8.8 Birchmount Stop

The Birchmount Stop will be located at the intersection of Eglinton Avenue and Birchmount Road. The Birchmount Stop is shown on Sheet No. 87. Currently, the northwest corner of this intersection is occupied by a parking lot connected to an office building. The northeast corner of the intersection is occupied by Toronto Police 41 Division. The southeast corner of the intersection is occupied by a place of worship and the southwest corner of the intersection is occupied by a large institutional development.

### Stop Layout

The Birchmount Stop will include two nearside platforms located before the intersection in the direction of travel. Nearside stops are provided at this location because eastbound and westbound left turn lanes are not provided, and the nearside stops prevent the LRVs from double-stopping (i.e. stopping once at a red light, and then stopping again at the platform).

### Road Layout and Traffic Operations

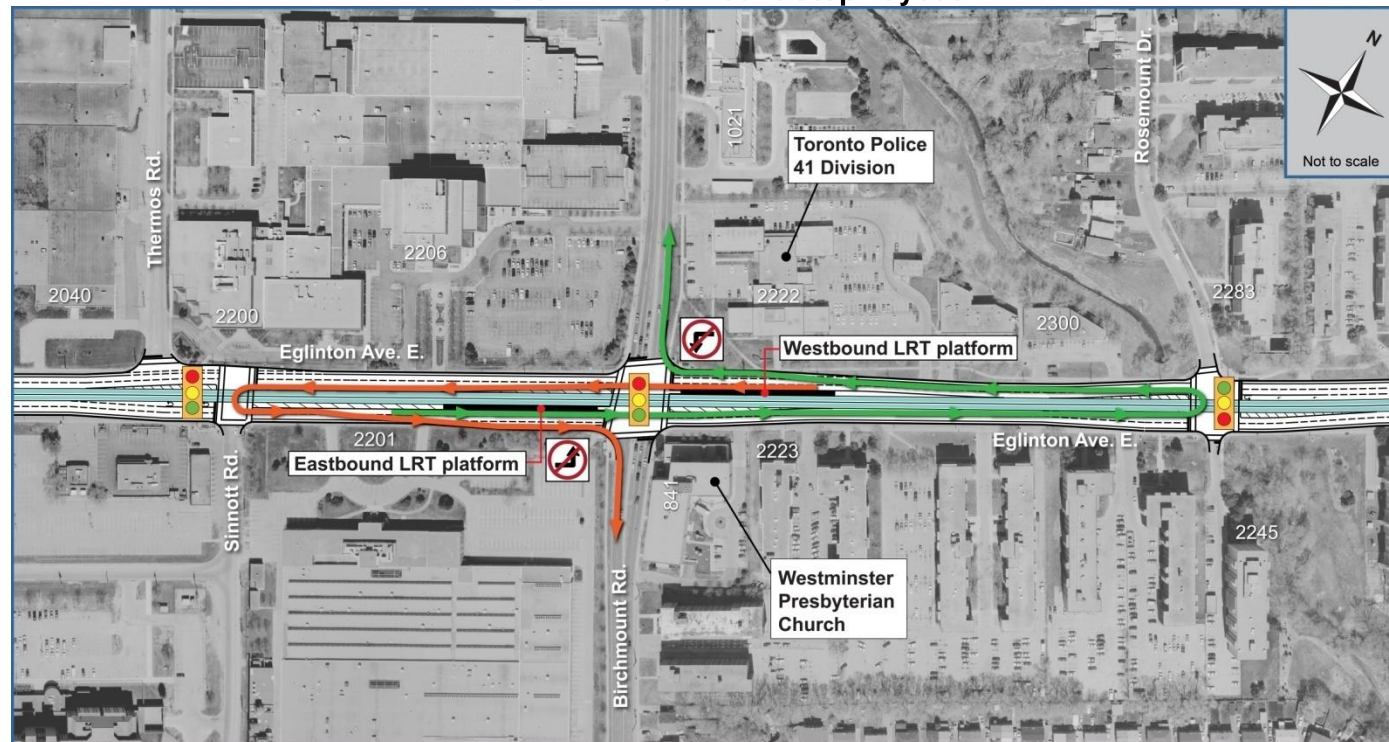
Under existing conditions, left turns are permitted in all directions at the intersection of Eglinton Avenue and Birchmount Road. A detailed traffic-traveller analysis was conducted at this location, comparing operation with traditional left turns to various left turn rerouting scenarios, and also considering impacts on truck routing. The scenarios were compared based on the delays experienced by the Eglinton Crosstown LRT, cross-street transit vehicles, truck routing, general traffic, and pedestrians to determine which scenario was most beneficial to the travellers. Based on this analysis, the preferred scenario was a five phase signal operation (four phase during the AM peak) at Eglinton Avenue and Birchmount Road with rerouted east-west left turn movements as follows:

- Eastbound left turns rerouted to U-turn at an existing traffic signal at Rosemont Drive; and
- Westbound left turns rerouted to U-turn at an existing traffic signal at Sinnott Road.

**Exhibit 144** illustrates the recommended Birchmount Stop layout and rerouted east-west left turns.



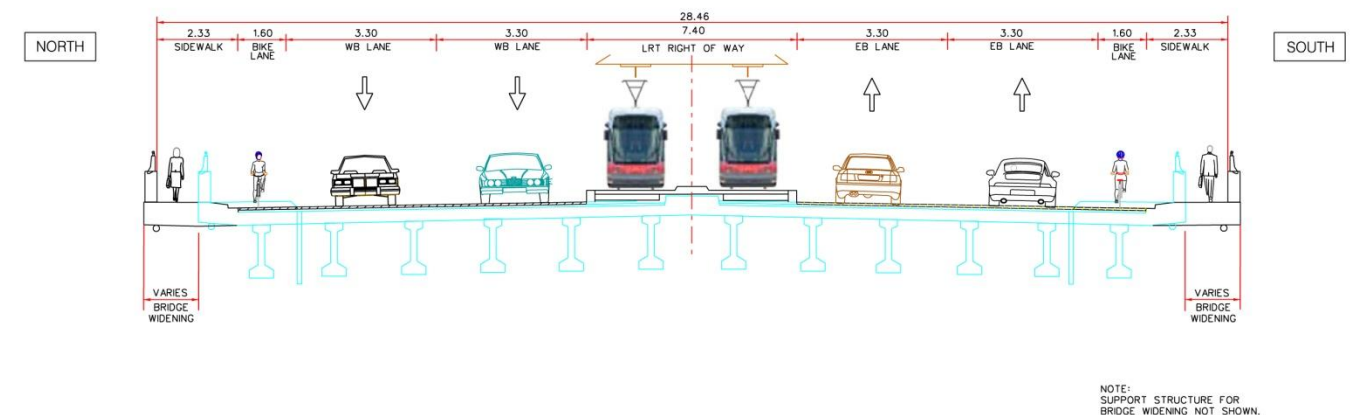
**Exhibit 144: Birchmount Stop Layout**



- West Don River Bridge - Girders are adequate to accommodate LRT right-of-way and required deck widening. Supplementary support or deck strengthening may be required to accommodate deck widening. Widening of 1.05 metres on both sides required.
- Eglinton Avenue West over Black Creek - Widening of 1.55 metres on both sides required. Widening will be accomplished by widening abutments and adding new deck and girders outside current bridge.
- Eglinton Avenue West over Mimico Creek - No girder strengthening required to accommodate centre line right-of-way and platform. Significant widening is required. Widening will be accomplished by widening abutments and adding new deck and girders outside current bridge. Widening of 5.55 metres on the south side and 5.50 metres on the north side required.
- Eglinton Avenue West Underpasses under Highway 427 and Ramps (8 underpass bridges) - Modification required on the south side of each underpass, entailing construction of retaining wall in side slope to accommodate sidewalk. Eastbound and westbound LRT tracks are separated to clear centre bridge support piers.

The bridge modifications will be further developed in the design phase. A typical bridge widening cross section is shown in **Exhibit 145**.

**Exhibit 145: Typical Cross Section for Bridge Widening**



### 3.5.8.9 Ionview Stop

The Ionview Stop will be located at the intersection of Eglinton Avenue and Ionview Drive. The Ionview Stop is shown on Sheets No. 88 and 89. The northwest corner of the intersection is currently occupied by apartment buildings and the northeast corner of the intersection is occupied by a strip of retail development. The southeast and southwest corners of the intersection are occupied apartment buildings.

### 3.5.8.10 Kennedy Station

The Eglinton Crosstown LRT route will terminate at Kennedy Subway Station. The connection to Kennedy Station subway is being addressed in a separate study.

### 3.5.8.11 Bridge Modifications

The following sections describe the proposed modifications to existing bridges.

- East Don River Bridge - Interior girders are adequate to accommodate LRT along centre line of Eglinton Avenue without strengthening, providing lightweight trackbed is utilized. Exterior girders require strengthening to accommodate widening. Widening of 1.15 metres on both sides required.
- Wynford Drive - Bridge to be removed.
- CP Rail Subway (Don Mills & Leslie) - Restricted opening requires reduction in sidewalk width.

## 3.6 Construction Methods

Once the preferred design is identified, it is important to address the construction methods for both the surface sections and the underground section.

### 3.6.1 Surface Construction

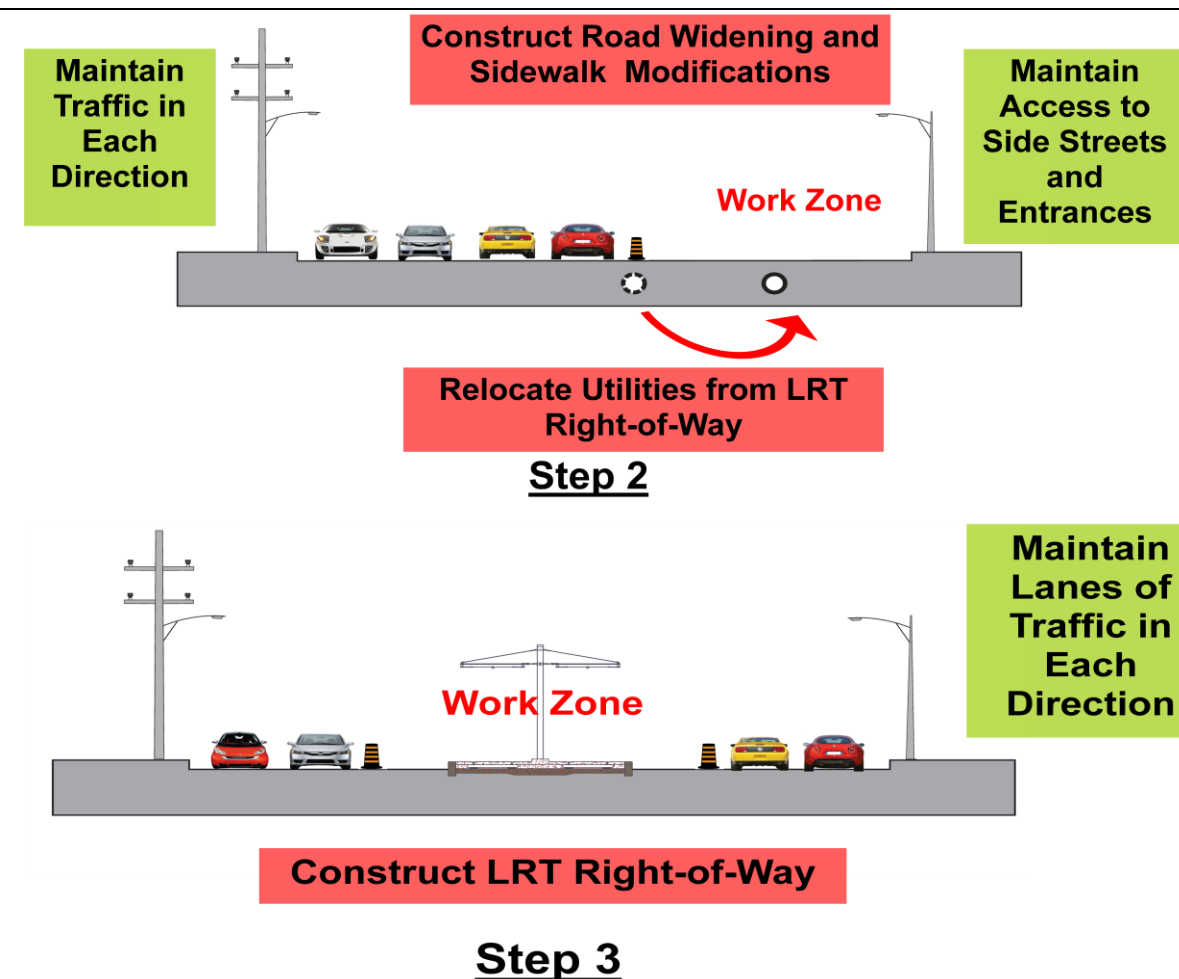
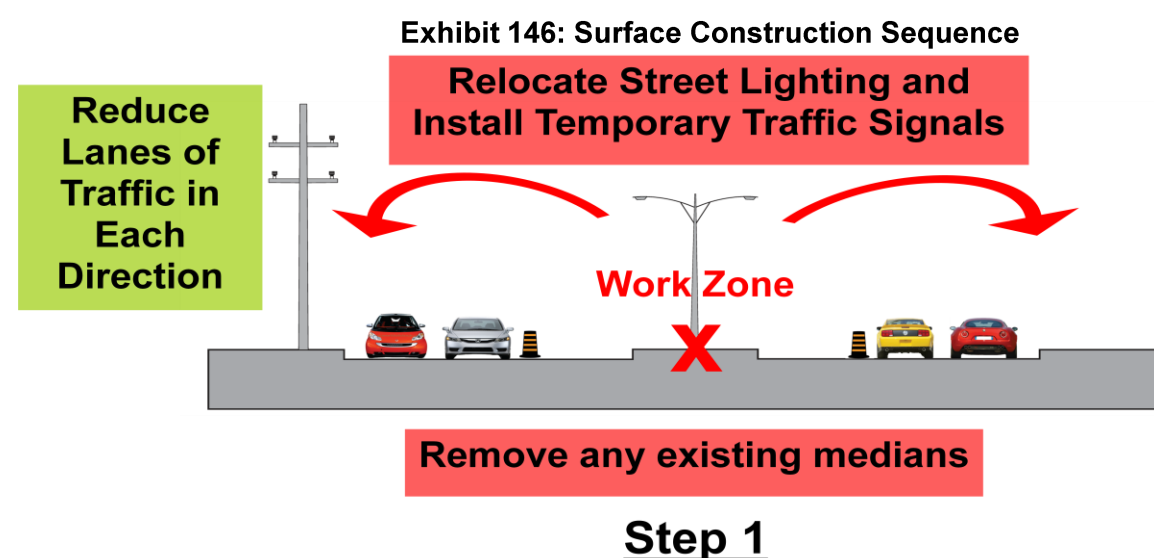
The construction in the surface sections is very similar to a typical road widening construction project. Construction staging for the east and west surface sections will likely proceed as follows:

- Reconstruct the curb line on one side of the roadway and provide continuous traffic lanes on the other side of the roadway. The reconstruction will include rebuilding the curb lines,

gutters, catch basins etc. It should be noted that the reconstruction of the curb line may potentially occur simultaneously during the utility relocation.

- Relocate the underground utility plant as required. This will include relocation of illumination poles and above ground utility poles, relocation of traffic signals and provision for temporary traffic signals where required.
- Reconstruct the other side of the roadway after the first side is completed. Traffic lanes in each direction on Eglinton Avenue will be maintained where feasible. A minimum of one lane in each direction will be provided at all times. Resurface the roadway after the roadway reconstruction.
- Construct new LRT facilities within the LRT right-of-way, including the track bed, track slab, tracks, LRT curbs, poles, platforms, etc.
- Construct streetscaping and urban design elements and provide bicycle lanes on both sides of the roadway as included in the plan.

Exhibit 146 illustrates this sequence.



The bridge construction methods will vary between bridges depending on the extent of modification and structure type. The Mimico Creek and Black Creek Bridges are single span structures. In these cases, girders and abutments can be added without entering the watercourse. The West Don River and East Don River Bridges are multi span structures. The widening required for these bridges is minor and can be done from the bridge deck without entering the watercourse by adding a cantilever deck on the existing structure. The exact construction required for these structures will be determined during design.

### 3.6.2 Underground Construction

The underground section will be constructed using the tunnelling method between stations, and the cut and cover method at stations and special tracks work areas.

Cut and cover construction can be very disruptive and needs to be carefully planned. The construction sequence shown in this section allows portions of the roadway to be available at all times and minimizes the impact of construction to the extent possible.

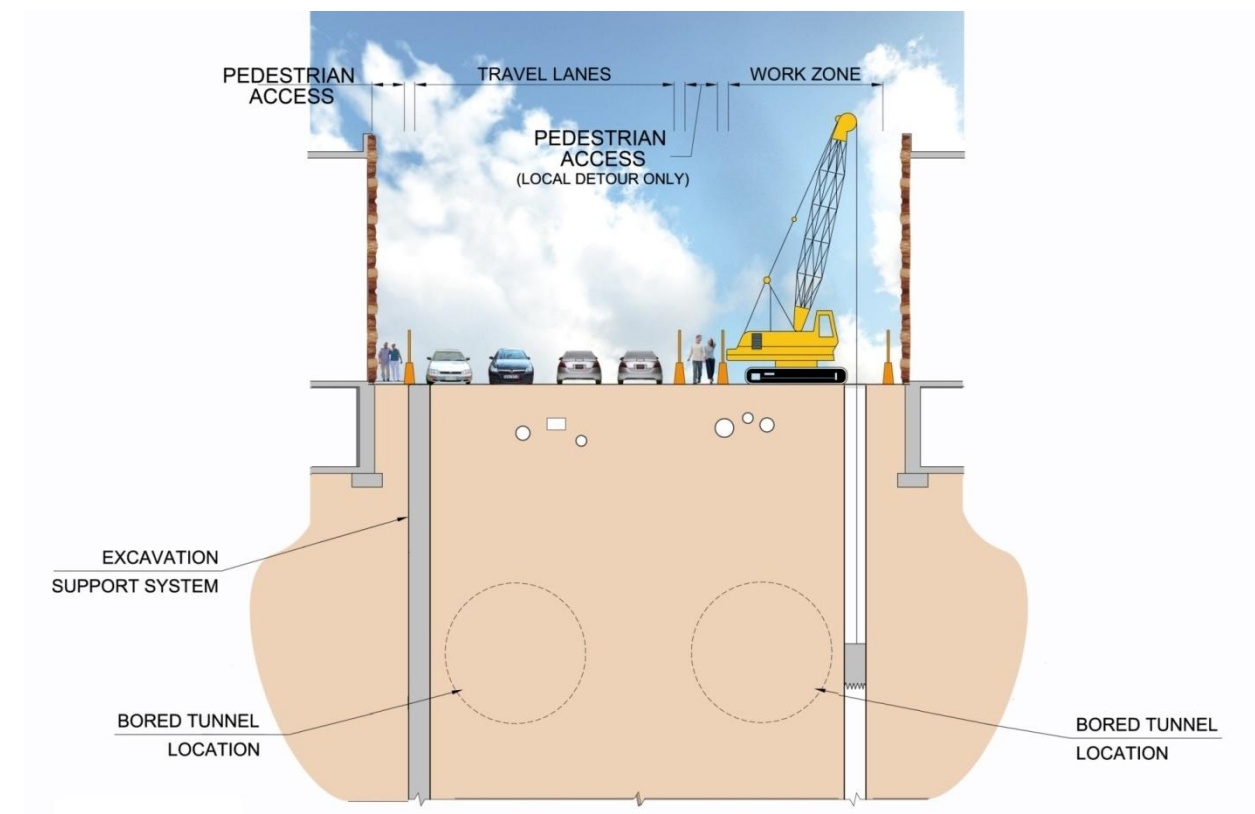
#### 3.6.2.1 Cut and Cover

The cut and cover method will be used at all 13 underground stations and will typically be 150 metres at eight stations. Cross over tracks and storage (pocket) tracks will be included in the design of the

underground section, which will extend the cut and cover length to a total of 440 metres at Keele; Eglinton West (Allen); Eglinton (Yonge); Laird and Don Mills stations. Cut and Cover construction of underground stations will proceed in the following steps:

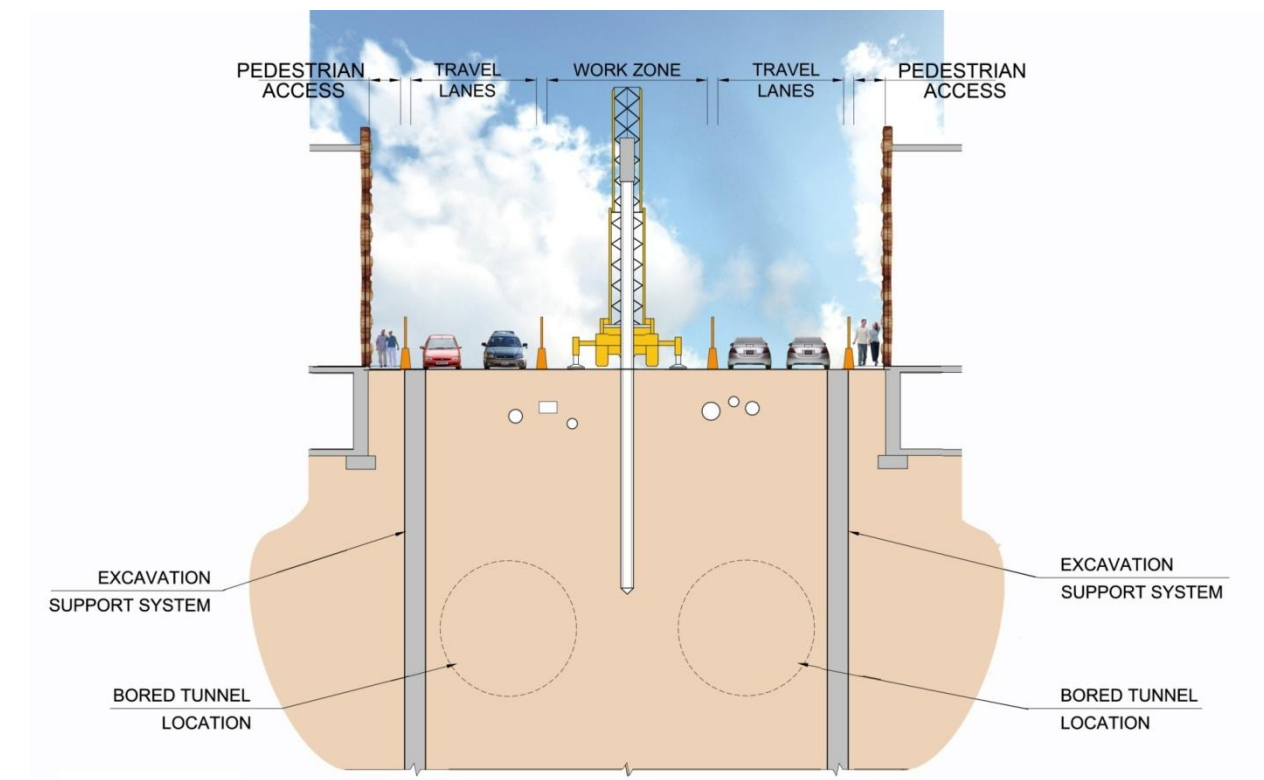
### Step 1: Construct South Wall

- An excavation support wall will be constructed along the south side of Eglinton Avenue;
- Traffic lanes will be realigned to the north side of Eglinton Avenue and operate between protective barriers; and
- Utilities in the path of the support wall will be relocated.



### Step 2: Construct Centre Wall

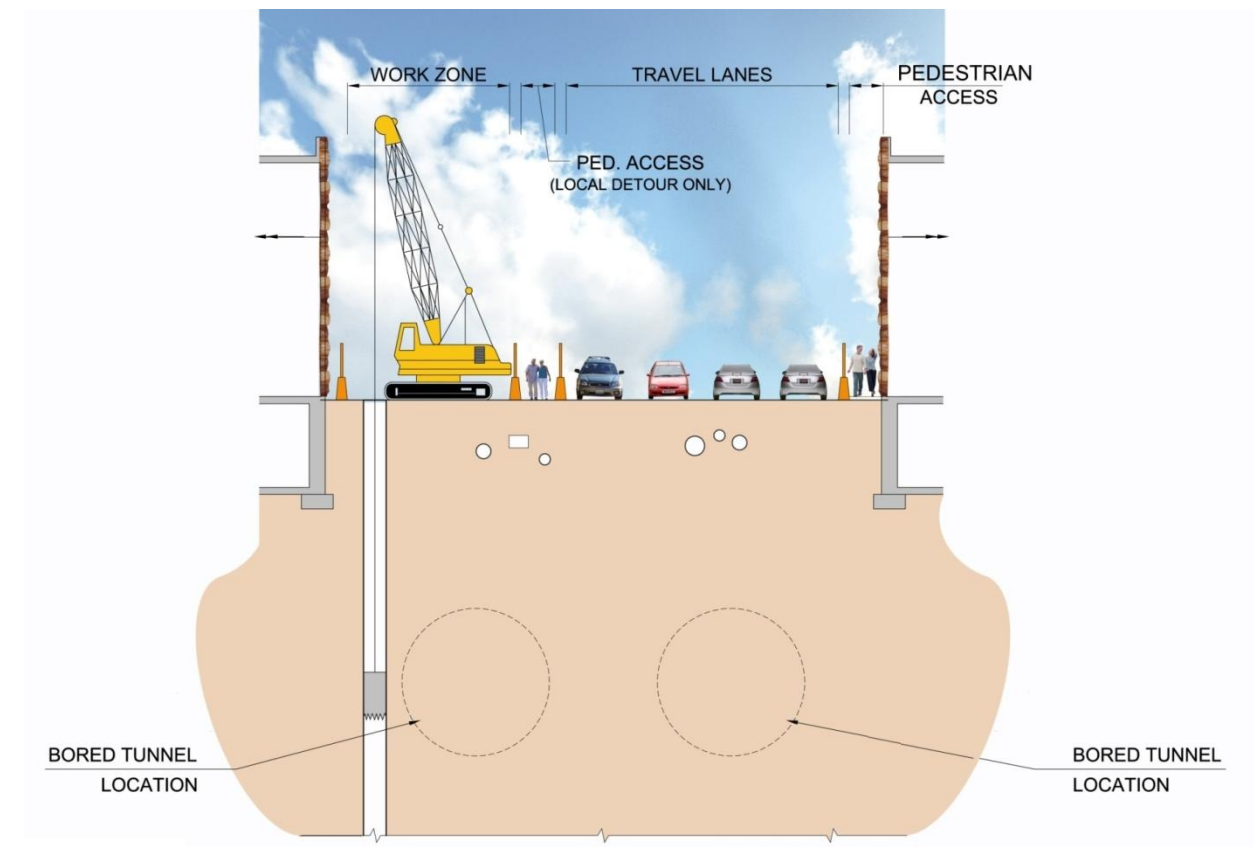
- The work zone moves to the centre of the street where centre supports are constructed;
- Traffic is split along either side of the centre work zone and barriers are erected; and
- Utilities in the path of the support wall will be supported.





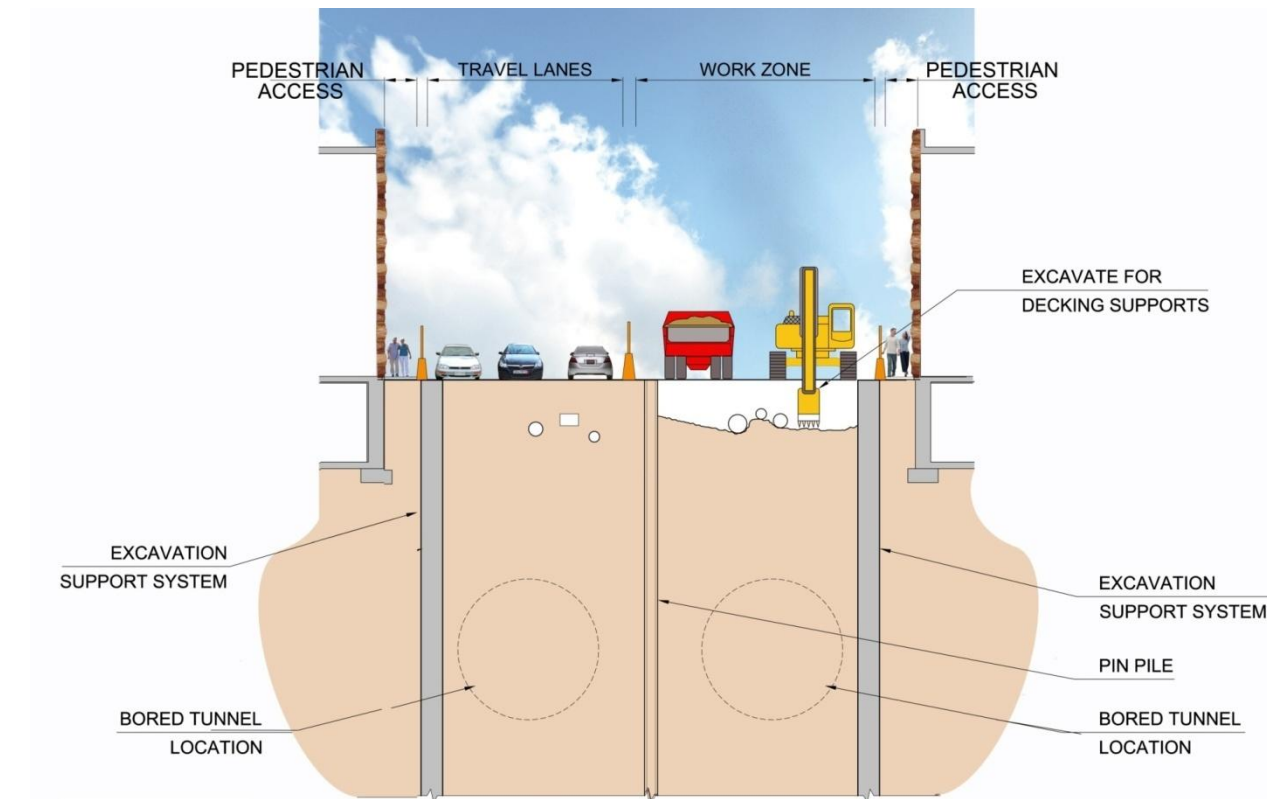
### Step 3: Construct North Wall

- An excavation support wall will be constructed along the north side of Eglinton Avenue;
- Traffic lanes will be realigned to the south side of Eglinton Avenue and operate between protective barriers; and
- Utilities in the path of the support wall will be supported.



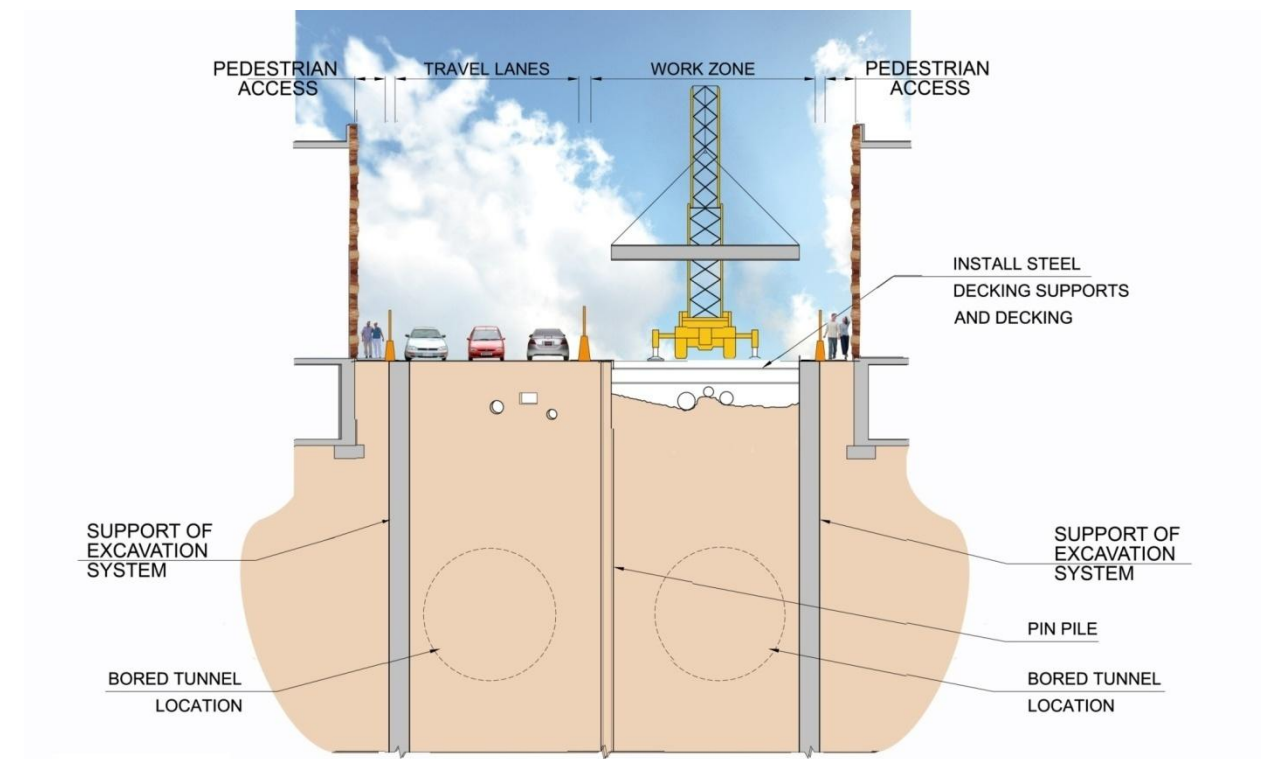
### Step 4: Excavate South Side for Decking Support

- Traffic is again realigned to the north side of Eglinton;
- Shallow excavation to prepare for erecting decking supports begins on the south side; and
- Utilities in the path of decking supports will be relocated.



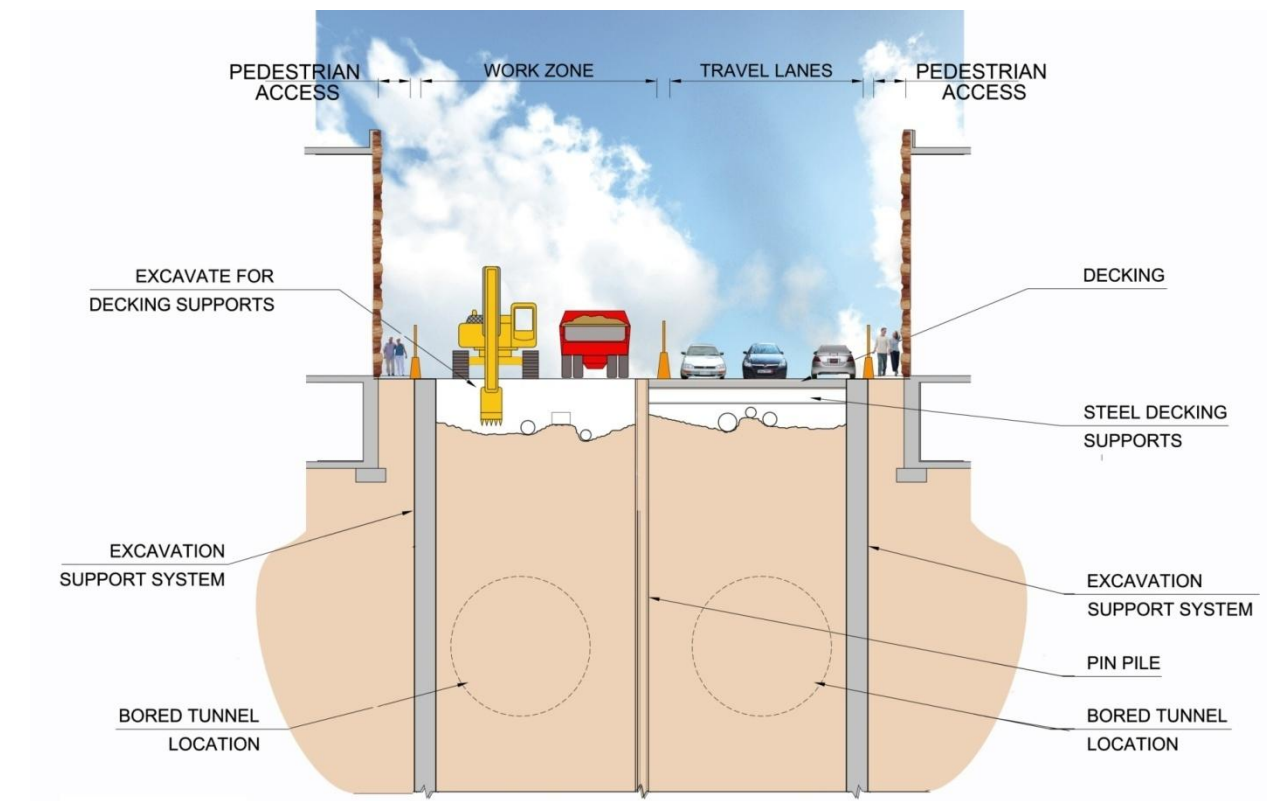
### Step 5: Install Decking-South Side

- Steel supports are installed on south side;
- Utilities are suspended from supports; and
- Surface decking is installed on south side.



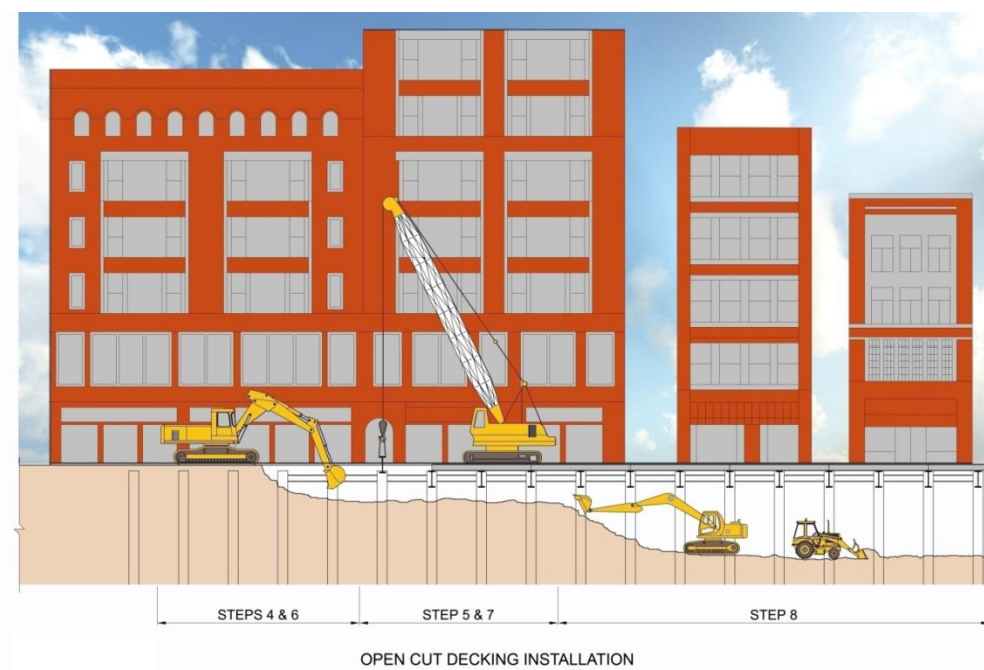
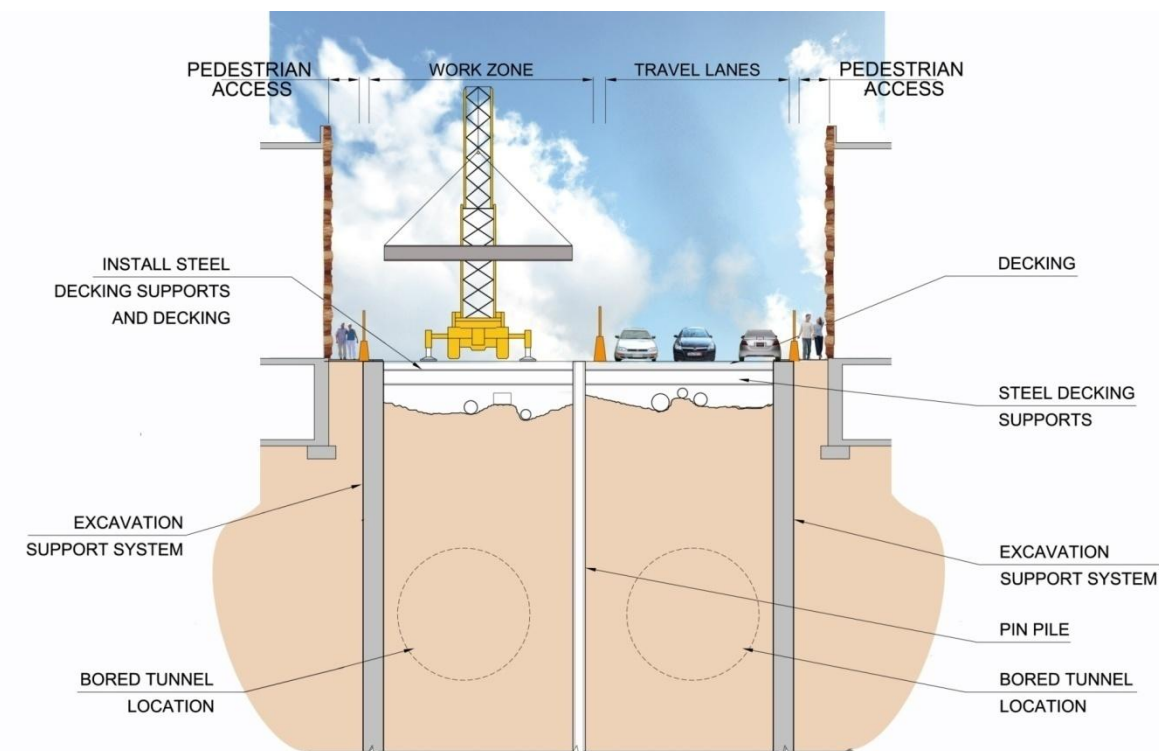
### Step 6: Excavate North Side for Decking Support

- Shallow excavation to prepare for erecting decking support begins on the north side;
- Traffic is again realigned to the south side of Eglinton; and
- Utilities in the path of decking supports will be relocated.



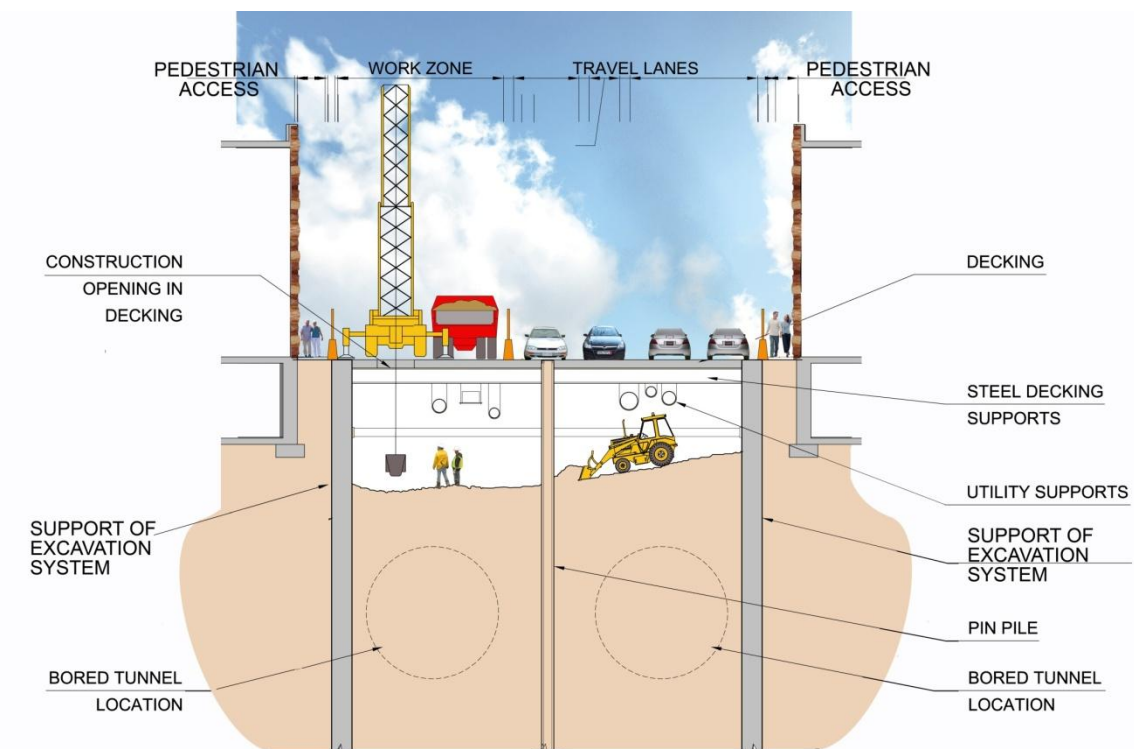
### Step 7: Install Decking North Side

- Steel supports are installed on the north side; and
- Surface decking is installed on the north side.



### Step 8: Decking Complete – Excavate Below

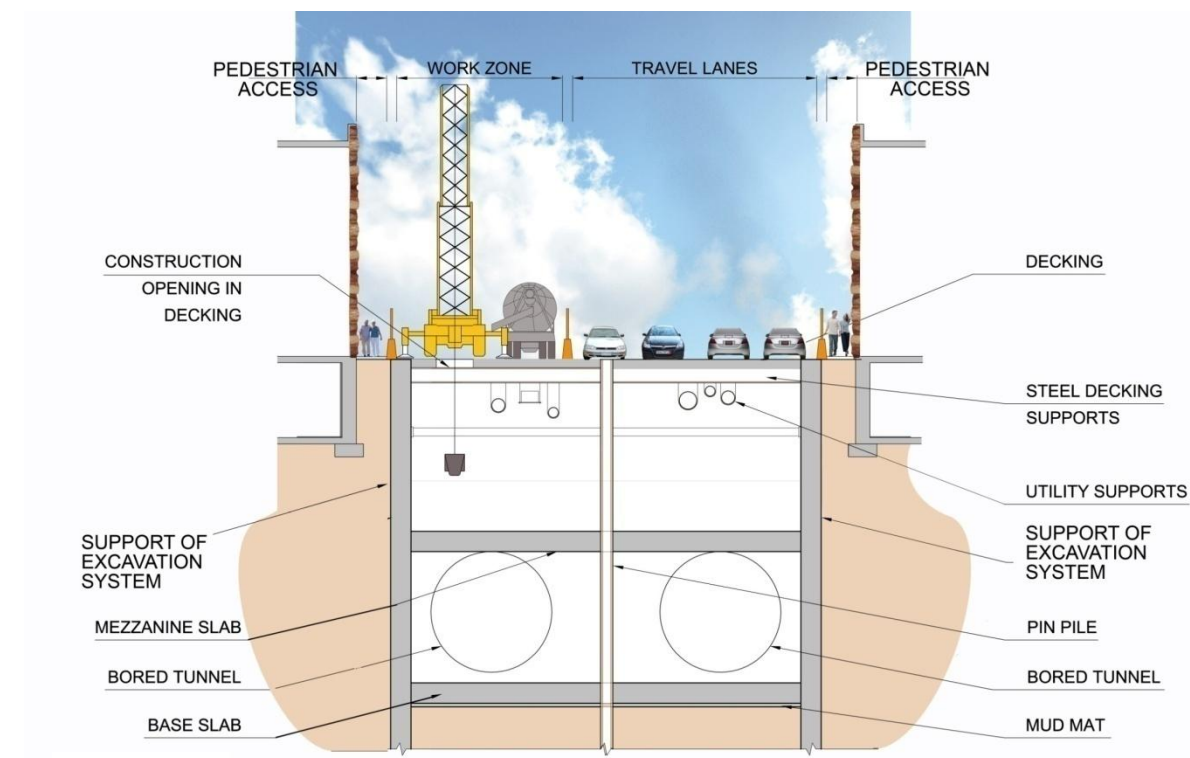
- With all decking installed, deep excavation can begin;
- The work zone becomes narrower and more traffic can be accommodated;
- Utilities are held in place with supports; and
- As excavation deepens, temporary struts are installed for additional support.





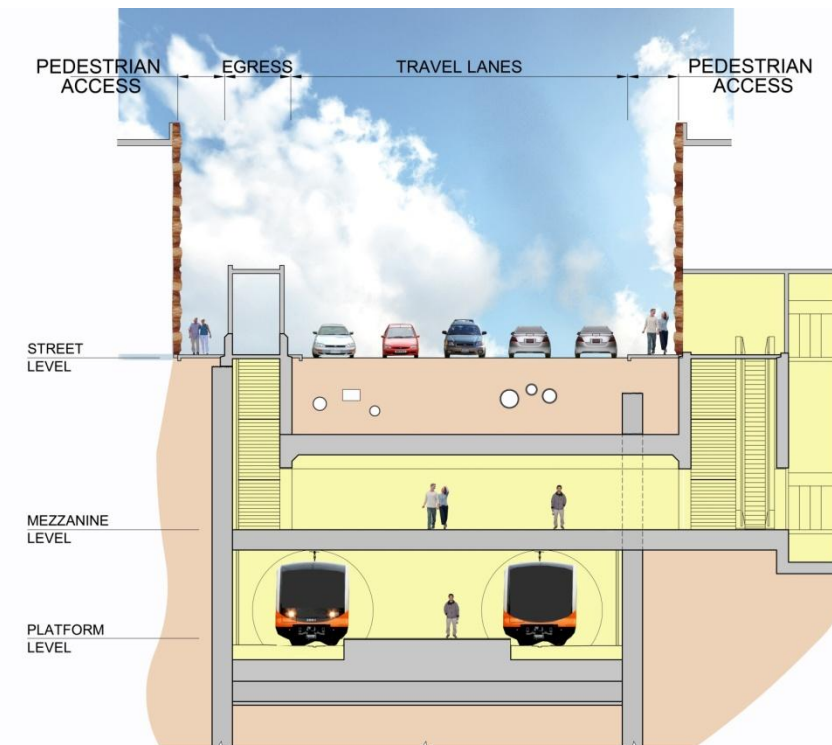
## Step 9: Station Construction

- Construction of the final station structure can begin; and
- Twin tunnel construction is coordinated with station construction.



## Step 10: Completion

- Hanging utilities are back-filled;
- Decking and steel supports are removed;
- As the surface roadway is restored, traffic lanes will shift similar to the early stages of construction; and
- Station entrances are constructed as well as passages, vent shafts etc.



During these stages of construction, traffic will be maintained in each direction, though not all current lanes will be available. Pedestrian access will also be maintained. Due to space constraints, no on-street parking will be available

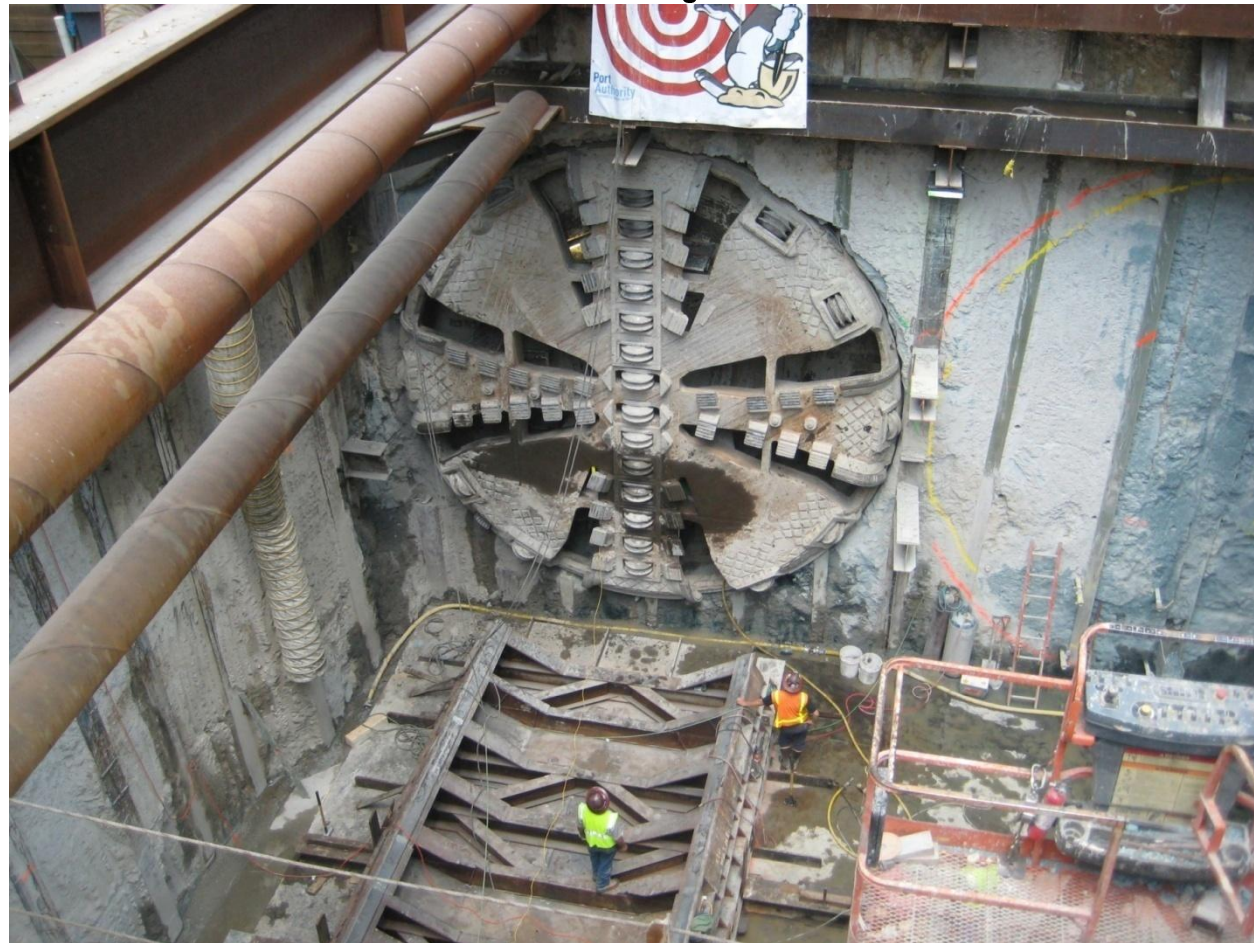
### 3.6.2.2 Tunnel Construction

#### Technology

As mentioned previously, the central section of the LRT corridor will be underground. The tunnel portion will be constructed with a tunnel boring machine (TBM) and the stations will be constructed by the cut and cover method. The TBMs will be launched at the west and east ends, bore towards the middle of the tunnel and be extracted at Chaplin Station, which is approximately the midpoint of the tunnel. **Exhibit 147** shows TBM entering cut and cover section.



**Exhibit 147: TBM Entering Extraction Shaft**

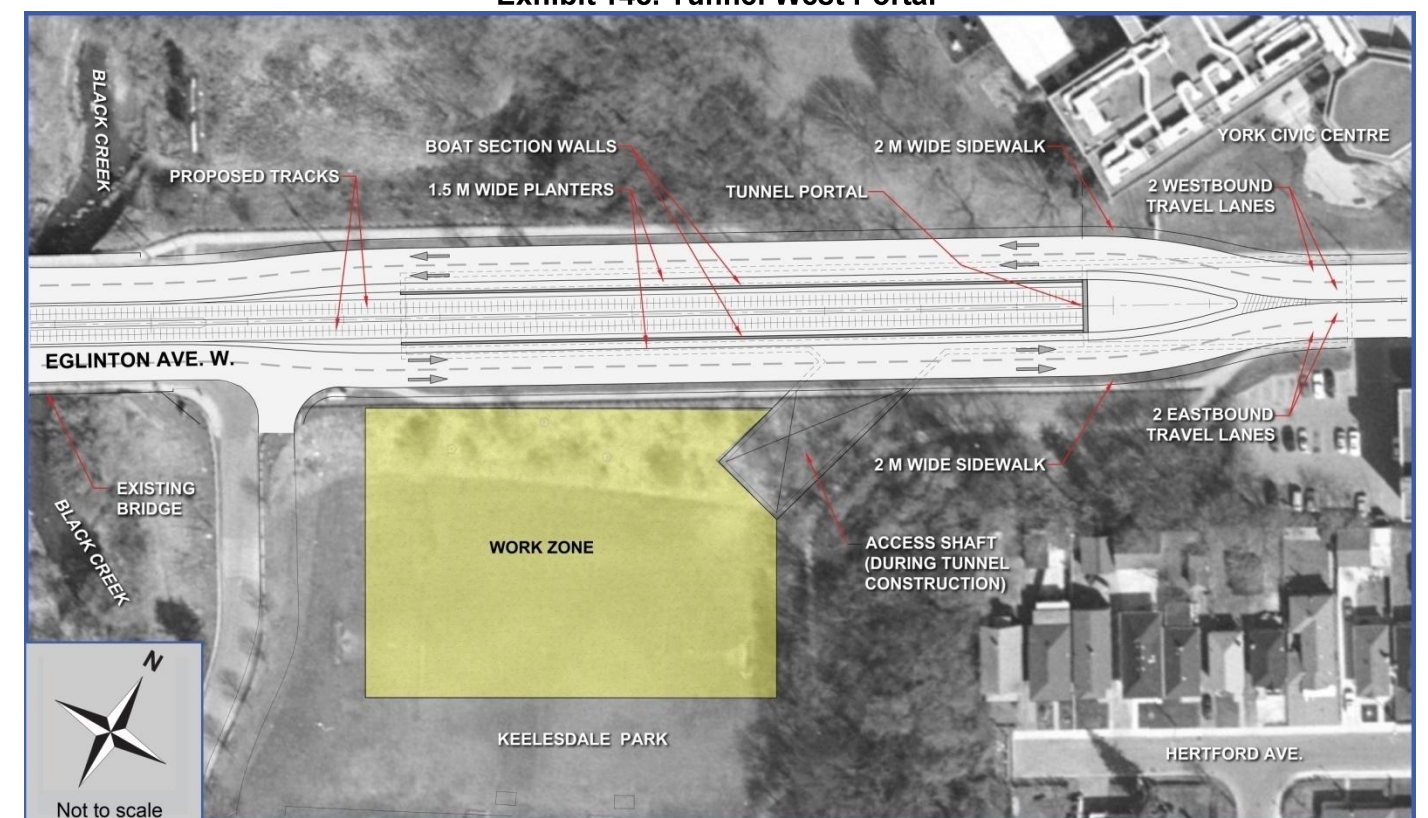


The portals for the main tunnel will be located east of Black Creek Drive in the west and east of Brentcliffe Road in the east. These portals provide the location for the launching of the tunnel boring machines. As such, they will require a large nearby work site to facilitate tunnel access, material delivery and storage (pocket).

The work site in the west will be located at Keelesdale Park; since Keelesdale Park is at a lower grade than the roadway, direct access from the work site to the tunnel will be underneath Eglinton Avenue. The work site in the east will be located on vacant land east of Brentcliffe Road on the south side of Eglinton Avenue; an access shaft will be constructed at this work site to facilitate the transportation of materials in and out of the tunnel.

**Exhibits 148 and 149** present plan views of the works sites and the portals of the main tunnel portion.

**Exhibit 148: Tunnel West Portal**



### **TBM Operation**

The tunnel structure is constructed using precast concrete tunnel liner segments. Tunnel liner segments are installed by the TBM as it progresses, which provides the structural support of the tunnel. Typical TBM advancement rates are in the range of 10-15 metres per day. The TBM advancement rate will be coordinated with the station cut and cover operations.

Removal of excavated soils during tunneling generally includes a conveyor system that transports soils from the TBM to the work site. The soils will be transported by trucks from the work site to a disposal site.

#### **3.6.2.3 Work Sites and Portal Locations**

Portals are the approach entrances where the LRT surface section transitions into the underground section. There are four portals planned as part of the Eglinton Crosstown LRT project: two portals for the main tunnel portion of the LRT corridor and two portals for the underground segment at Don Mills Station. The underground segment at Don Mills Station will be built by cut and cover construction and not by a tunnel boring machine. As such the portals associated with the Don Mills Station will be different than the main tunnel portals and will not require a dedicated work site.



Exhibit 149: Tunnel East Portal

