

4.1.5 OBJECTIVE B: To protect and enhance the social environment in the corridor

Overall, the various goals set to protect and enhance the social environment can be achieved. The assessment, in terms of the related environmental values, indicates that most adverse effects are generally mitigated by the built-in attributes of the design and benefits for the existing and future communities served by the route can be maximized. The assessment for Objective B is tabulated in **Table 4-2**.

In general, the subway extension will improve community mobility, in particular, access to commercial and community facilities planned at the end of the extension, the VCC and Steeles Avenue Corridor environs. The effect on the current road capacity and traffic operation will be mitigated by the Region undertaking the widening of Jane Street from four to six lanes as planned. Additionally the Region is planning early implementation of the East-West Collector road running parallel to the Hydro Corridor from Jane Street to Keele St. The planned road system improvement will address the vehicular traffic operational and capacity needs associated with accessing the station facilities. Additional traffic generated from the future land development at VCC, will be addressed as part of the road network improvements planned by the City of Vaughan as part of the Vaughan Corporate Centre infrastructure. Also, a reduction in north-south vehicular demand is anticipated when the subway extension is placed into service. In summary, the impact on traffic is not expected to be significant; however, further analysis will be carried out using up-dated volumes and ridership figures during the design phase to confirm the effectiveness of the associated, planned road improvements.

Preserving and improving public safety and security along the route was an important consideration in development of the design concept. While fulfilling its role as a major transit interchange node in VCC, the features of the VCC Station are compatible with a pedestrian-friendly environment as planned in the recently-completed VCC Streetscaping Study. In addition, noise and vibration studies at representative sensitive receptors (performed as part of the original Highway 7 and VNSL EA study) have demonstrated that the use of the TTC's standard floating slab track support system will mitigate any noticeable increase in noise or vibration levels for residents of future developments that may be implemented along the route. Cultural heritage work will be completed at detailed design in order to assess the impact of the proposed works including the construction of Steeles West Station and the subway alignment on TRCA buildings at Black Creek Pioneer Village, and at the northwest corner of Jane Street and the railway tracks. In particular the affects of noise, vibration, dust, and traffic flow on these buildings and the operation of the village both during construction and operation of the subway will need to be considered.

A Stage 1 Archaeological Assessment, conducted during the study, indicated the absence of archaeological sites within the project impact area. As is usually the case, a Stage 2 archaeological study will be conducted during the design/construction phase for the subway extension. Finally, the predominantly underground subway infrastructure, even in a highly developed urban context, will have no effect on the visual aesthetics of the route. In consultation with the municipalities and the public, a concerted effort will be made to incorporate landscaping and streetscaping principles developed for the VCC in the station area design.

**Table 4-2
Effects and Mitigation for Social Environment**

GOAL	Environmental Value/ Criterion	Project Activity/ Issue	Project Phase ¹			Location	Assessment of Effect on the Environment	Built-In Positive Attributes and/or Mitigations	Potential Residual Effects	Further Mitigation	Level of Significance after Mitigation	Monitoring and Recommendation
			P	C	O							
OBJECTIVE B: To protect and enhance the social environment in the corridor												
B1	Minimize adverse effects on, and maximize benefits for, communities in corridor	Potential displacement of community features.		✓	✓	Entire route	Potential displacement or loss of unique features.	Avoids known distinct community features. To minimize impact; incorporate landscaping and furniture into streetscape to enhance corridor community environment.	None expected	None expected	Negligible	Future municipality and VCC community consultation
		Potential displacement of community features.		✓	✓	VCC planned Transit Square urban park at Millway Ave.	Potential displacement or loss of planned unique features by transit infrastructure (passenger pick-up/drop-off (PPUDO)).	PPUDO will be incorporated into a future urban park (Transit Square) that will include significant landscaping.	None	None expected	Negligible	Future municipality and VCC community consultation
		Community facility utilization			✓	VCC area	Improved transit access could increase demand on facilities and services within the VCC.	Municipality can expand services and facilities and recoup cost from development charges	None expected	None expected	Positive effect	Monitoring of activity levels at the various facilities.
B2	Maintain or improve road traffic and pedestrian circulation	Reduction in overall road capacity			✓	407 Station Facility	Reduced capacity at Jane Street/Access Road Intersections.	Jane St./Main Access Road Intersection improvements will be built in advance of the subway construction when Jane Street is widened to six lanes. The new intersection will be controlled by a traffic signal.	None expected	None expected	Impact on traffic will be limited to Jane Street widening construction phase.	Monitor traffic volumes and intersections operation to confirm assumptions

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				✓		Reduced capacity at Jane Street	After widening to six lanes, Jane Street will have the capacity to support traffic generated by the subway extension. New intersection will operate at acceptable levels of service. Implementation of subway should reduce north-south traffic volumes.	None expected	None expected	Positive effect	Monitor traffic volumes to confirm assumptions	
				✓	VCC Station Facility	Reduced road capacity in the area of influence.	In preparation for the VCC development, the City of Vaughan has prepared a plan to address the needs of the VCC including road network expansion.	Potential for delays in the construction of portions of the road network expansion.	Local transit routes in VCC may need to be re-routed.	Neutral	Vaughan should construct the minimum road links (part of City's road network expansion plans) indicated in Chapter 3 prior to commencement of the subway operations.	
				✓		Traffic impact on road network resulting from the operation of the Passenger Pick-Up and Drop-off.	To be further examined during the design stage – potential mitigation measures could include changes to entrance/exit locations or road improvements.	None expected	None expected			
			✓			Traffic congestion during construction	A Comprehensive traffic management plan will be prepared during the detail design phase addressing the needs to manage and maintain traffic movements and access during construction..	None expected	None expected	Moderate effect during construction		
				✓	Northwest Gate (Steeles Avenue)	Under 2021 considerations, the intersection will operate at capacity during the AM peak hour.	None required.	Intersection will continue to operate at capacity.	None expected	Moderately Significant	None required.	
		Pedestrian Crossings		✓	Jane St./ Hwy 7;	Due to the width of the proposed "main street" at the intersection, pedestrians may not be able to cross the intersection in one signal phase based on the standard pedestrian walking speed.	These intersections may require two-stage crossing in the future to accommodate heavy main street traffic. The decision to implement these special provisions should be deferred until post-operation conditions are monitored and the need is identified.	None Expected	None Expected	Moderately Significant	Monitoring is required to determine if the implementation of two-stage is a necessity.	
B4	Minimize adverse noise and vibration effects	Noise effects due to construction and operation of subway extension		✓	Portions of route where alignment is in the proximity of future development.	Subway may result in increased noise levels	Control of noise during construction by use of: soundproof enclosures for any noise producing machinery; use of exhaust mufflers and silencers on combustion engines and air equipment, lining material on hoppers and storage bins. Abide by local noise by-laws.	None expected	None necessary	Insignificant	For all noise effects, undertake confirmation monitoring to verify compliance once the subway extension is fully operational.	
				✓			Ambient noise level increase due to future subway operations will not exceed the 5dB threshold with TTC floating slab track support and double tie (used in sections of straight track) systems	None expected	None necessary	Insignificant		
				✓	Electrical substations	Noise level produced by transformers	Proper enclosure and orientation of the transformers will mitigate the effect.	None expected	None necessary	Insignificant		

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					✓	VCC Station Facility	Ventilation Shafts noise impact	The fans are not located in a noise-sensitive area and the noise effect will only be occasional. During the design phase the exact location of the fans will be defined and any necessary noise mitigation measure will be identified.	None expected, it will be re-addressed during design phase	Depending on the findings.	Very occasional		
					✓			In general, sound level increases in future adjacent developments can be limited to acceptable levels by conditions during site plan approvals;					
		Vibration effects due to construction and operation of subway extension			✓	✓	Tunnel sections of the subway where alignment is in the proximity of future development.	Subway operations may result in increased vibration levels particularly for an optics company located north of Highway 407.	The use of double ties and a floating slab track will mitigate any vibration effect. Modeling of future subway operations indicates that expected vibration increases will not exceed the protocol limit of 0.1 mm/sec.	None expected	None necessary	Negligible	Undertake confirmation monitoring to verify compliance once the subway extension is fully operational.
B5	Minimize adverse effects on stakeholders and property owners directly affected by the subway	Effects on structural integrity of existing or planned facilities			✓		Crossing under UPS facilities	Portion of the subway may be built under part of a future building	In the event that the expansion of the UPS plant occurs prior to subway construction, tunnelling under the finished building would be possible without major disruption to the UPS operations. The tunnelling could be undertaken using EPB-TBM's for each track as used for the main lines, or by using other proven tunnelling techniques, such as NATM, or Sequential Excavation Techniques (SEM). In either case, provision could be made in the design and construction of the building expansion footings and foundations to allow for the maximum potential settlement that may occur during the later tunnelling construction. Alternatively, pre-construction of the future subway structure walls could be undertaken during the building expansion construction, to allow for future top-down cut-and-cover subway construction under the new building. Extensive soils investigation, co-ordination of designs, a continuous monitoring program, and negotiations between UPS and the subway Program Manager would be undertaken to minimize disruption to either party during all construction phases. In case of tunnelling it is recommended that cover of 1.5 to 2 diameters be provided from the tunnel crown to the underside of the foundations; if this envelop is less than desirable, special settlement control measures will be taken to ensure stability of the building while building the tunnels.	Unexpected ground conditions	Use of special construction techniques if necessary, suitable to overcome unexpected ground conditions.	Rare	Depending on the ground conditions and construction techniques used.
					✓		Crossing under the Hydro Corridor.	Potential effects of tunnelling beneath or near transmission towers.	Tunneling with EPB-TBM's, in conjunction with continuous monitoring, can be successfully undertaken in close proximity to tower foundations, on either spread footings and/or on piles or caissons. The recommended clearance envelope from the tunnel crown to the underside of the foundations is 1.5 to 2 tunnel diameters (approximately 9m to 12m in this situation). Not being able to meet this desirable envelope in one 540 KV tower, special settlement control measures will be taken to ensure stability of the tower during the construction of the tunnels. Depending on the results of detailed soils investigation in the vicinity of the tower foundations, ground improvement techniques may also be undertaken in advance of tunnelling to prevent potential ground	Unexpected ground conditions	Use of special construction techniques if necessary, suitable to overcome unexpected ground conditions.	Rare	Depending on the ground conditions and construction techniques used.

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OBJECTIVE B: To protect and enhance the social environment in the corridor												
							loss and subsidence.					
				✓		Crossing under CN Halton Subdivision tracks.	Potential effects of tunnelling under the tracks	The depth of cover from top of tunnel excavation to top of rail is approximately 13.5m. Tunnelling with EPB-TBM's in conjunction with continuous monitoring should not produce settlement of the rail bed beyond acceptable limits for continued operation over the rail lines during tunnel construction.	Unexpected ground conditions	Use of special construction techniques if necessary, suitable to overcome unexpected ground conditions.	Rare	Depending on the ground conditions and construction techniques used.
				✓		Crossing under Toromont light equipment maintenance building	Cut and cover special track section is sited at the location of the existing building.	The Region will negotiate with the owner to address concerns regarding removal of building.	None expected	Use of special construction techniques if necessary, suitable to overcome unexpected ground conditions.		
				✓		Tunnel crossing near Bentall buildings north of Highway 407.	Potential structural effect tunnelling near existing buildings.	It is recommended that clearance of 1.5 to 2 diameters from the tunnel crown to the underside of the foundations be provided; if this envelop is less than desirable, special settlement control measures will be taken to ensure stability of the building while building the tunnels.	Unexpected ground conditions	Use of special construction techniques if necessary, suitable to overcome unexpected ground conditions.	Rare	Depending on the ground conditions and construction techniques used.
				✓		VCC Station north of Highway 7 crossing near a Future Shop Store.	Potential structural effect building a cut and cover station near an existing building.	Based on the prevailing ground conditions, temporary cuts for open-cut construction may be made with side slopes in the range of 1H:1V to 1.5H :1V. However, in this situation, due to space restrictions, vertical excavation sides are expected. To provide horizontal support during construction some form of temporary shoring is anticipated along with internal braces or drilled anchors that extend into the ground behind the supporting walls.	None expected			
						Crossings under Jane St., Hwy 407, Interchange Way.	Possibility of settlement effects during tunnel construction.	The depth of cover between the roadway surfaces, as well as any associated utilities such as sewers and water-mains, and the top of the tunnel excavation, is sufficient that damage from minor settlement due to tunnel construction is unlikely. The use of EPB-TBM's in conjunction with continuous monitoring should prevent settlement problems.	Unexpected ground conditions	Use of special construction techniques if necessary, suitable to overcome unexpected ground conditions.	Rare	Depending on the ground conditions and construction techniques used.
				✓		Highway 7 Crossing	Potential effects of cut and cover construction on utilities.	Alternate access and temporary re-arrangement of the vehicular and pedestrian circulation as well as the internal parking operation will be addressed during the design phase, based on the up-dated status of the VCC road network expansion and surrounding development plans.	None expected	None necessary	Rare	Make sure that the design phase of the subway extension addresses temporary arrangements to mitigate the operation of the Toromont's facilities
	Effects to the operations of industrial/commercial facilities during construction			✓		Crossing under Toromont facilities	Impact on the entrance to the facility, internal circulation roads and parking during construction.	The Region discussed with Toromont the potential construction site boundary, worksite area and liner segment storage area, as well as potential options of temporary access for Toromont users as well as construction access. The location of accesses and construction sites will be negotiated and defined between the Owner, the Contractor, Project Manager and the regional and local municipalities once the implementation phase is contracted, responding to all parties interests.	Mutual agreement required			

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				✓		Crossing under Smart Centres facilities	Impact to Future Shop Millway Ave. access to main entrance.	Potential temporary access options were discussed with Smart Centres. The selected option will be negotiated and defined between the Owner, the Contractor, the Project Manager and the regional and local municipalities once the implementation phase is contracted.	Mutual agreement required			
				✓		Crossing under UPS facilities.	Partial impact to the existing circulation area and the future parking expansion on the north side of their facility, during construction.	Temporary measures to provide access around the affected open area of UPS will be developed with UPS and included in the project during the design phase.	None expected	None necessary	Minor	Make sure that the design phase of the subway extension addresses temporary arrangements to mitigate the operation of the UPS facilities.
		Effects to private property (at grade facilities)	✓	✓	✓	VCC Station area	PPUDO for VCC Station will require property acquisition south of future Ring Road.	Land required for the PPUDO will be acquired.	None expected	None necessary	None	
				✓	✓	Hydro Corridor	Future East-West Collector Road to be built along the south edge of the Hydro easement east of Jane Street.	Maintenance access to all Hydro Facilities will be maintained. An area around the towers for parking and manoeuvring of maintenance vehicles will also be respected.				
		Effects to business activities		✓		VCC Station area	Possible disruption of business activities during construction.	Appropriate temporary measures and construction techniques will maintain access and circulation in the vicinity of the station work.	None expected	None necessary	Minor	
				✓	✓	407 Station area	407 Station and station facilities (PPUDO, Parking etc) will require property acquisition west of Jane Street between the Hydro Corridor and the 407.	The Region will negotiate with the ORC to address concerns regarding removal of ORC tenant (i.e. farmer) and any associated buildings, and land acquisition. Note, depending on timing, and the status of the MTO transitway design/study, MTO will be invited to participate in discussions and identification of land requirements.	Mutual agreement required		Minor	
		Effect to Beechwood Cemetery activities	✓			Beechwood Cemetery	Possible disruption of business activities during construction.	The subway alignment is outside of the cemetery property and as such no negative effects are expected. Jane St./Main Access Road Intersection improvements will be built in advance of the subway construction when Jane Street is widened to six lanes. The new intersection will be controlled by a traffic signal.	None expected	None expected	Impact on traffic will be limited to Jane Street widening construction phase.	Monitor traffic volumes and intersections operation to confirm assumptions
B5	Minimize adverse effects on cultural resources	Disruption of Built Heritage Features (BHF)		✓			The potential introduction of rapid transit operation may cause changes in visual, audible and atmospheric environment around built heritage features.	None required – Subway facilities will be integrated with existing streetscape and VCC road network.	None expected	None necessary	Insignificant	None required

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OBJECTIVE B: To protect and enhance the social environment in the corridor												
B5	Minimize adverse effects on cultural resources	Disruption of Cultural Landscape Units (CLU)		✓			The potential introduction of rapid transit operation may cause changes in visual, audible and atmospheric environment to the cultural heritage features in the Cultural Landscape.	None required – Subway will be integrated with existing streetscape and road traffic operations.	None expected	None necessary	Insignificant	None required
B6	Minimize disruption of community vistas and adverse effects on street and neighbourhood aesthetics	Visual Effects	✓		✓	VCC Station	Introduction of surface transit facilities serving the VCC station may reduce visual aesthetics of Highway 7.	Transit intermodal facilities are being developed in consultation with Vaughan Municipality. A preliminary short-stay bus lay-over location has been identified on a local minor road,	None expected	None necessary	Insignificant	Monitor VCC planning and development applications and acquire property for facilities and streetscape enhancement through redevelopment applications
		Landscaping	✓		✓	Station precincts	Landscaping species may not survive in winter months.	Choose appropriate species for both winter and other months to maintain greenery throughout corridor. Where necessary, place landscaping in planters and incorporate buried irrigation systems.	Species may still not survive	Change species', irrigation patterns, etc.	Insignificant	Monitor health of landscaping continuously

Notes: P – Pre construction, C – Construction, O – Operation