Exhibit 8: North Alignment 3

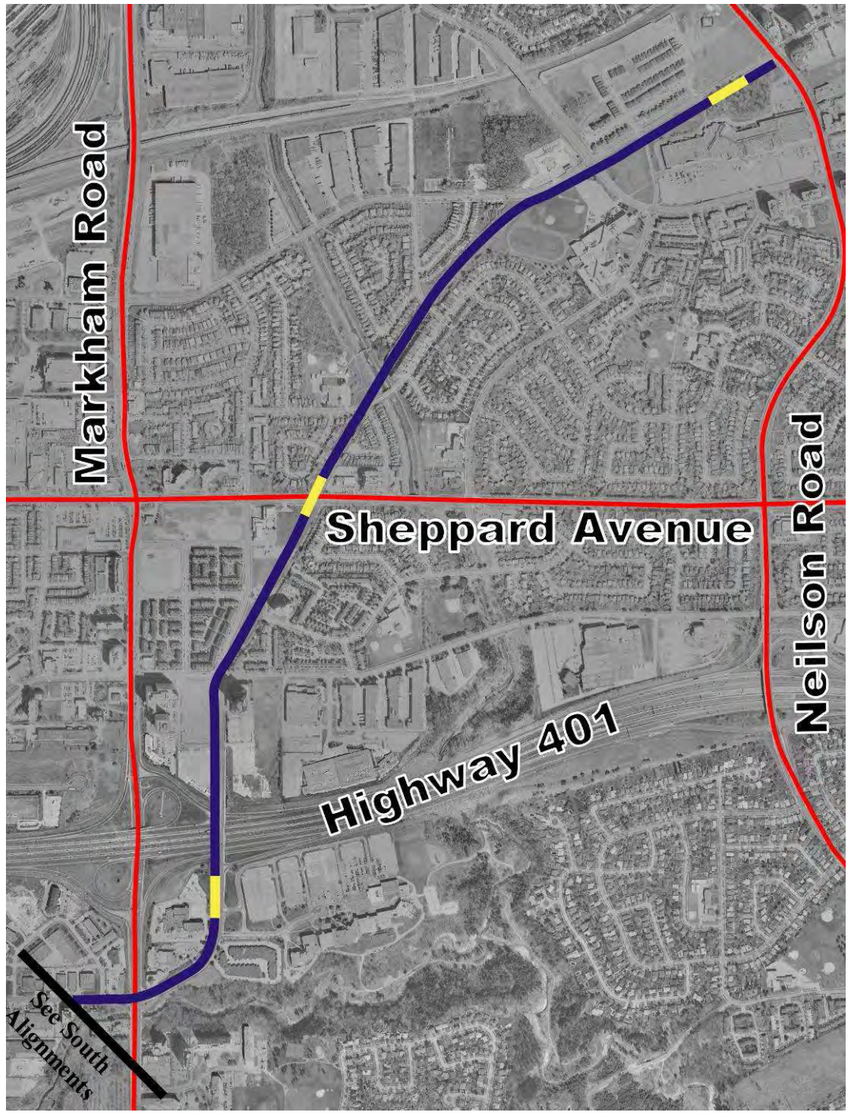


Exhibit 9: North Alignment 4

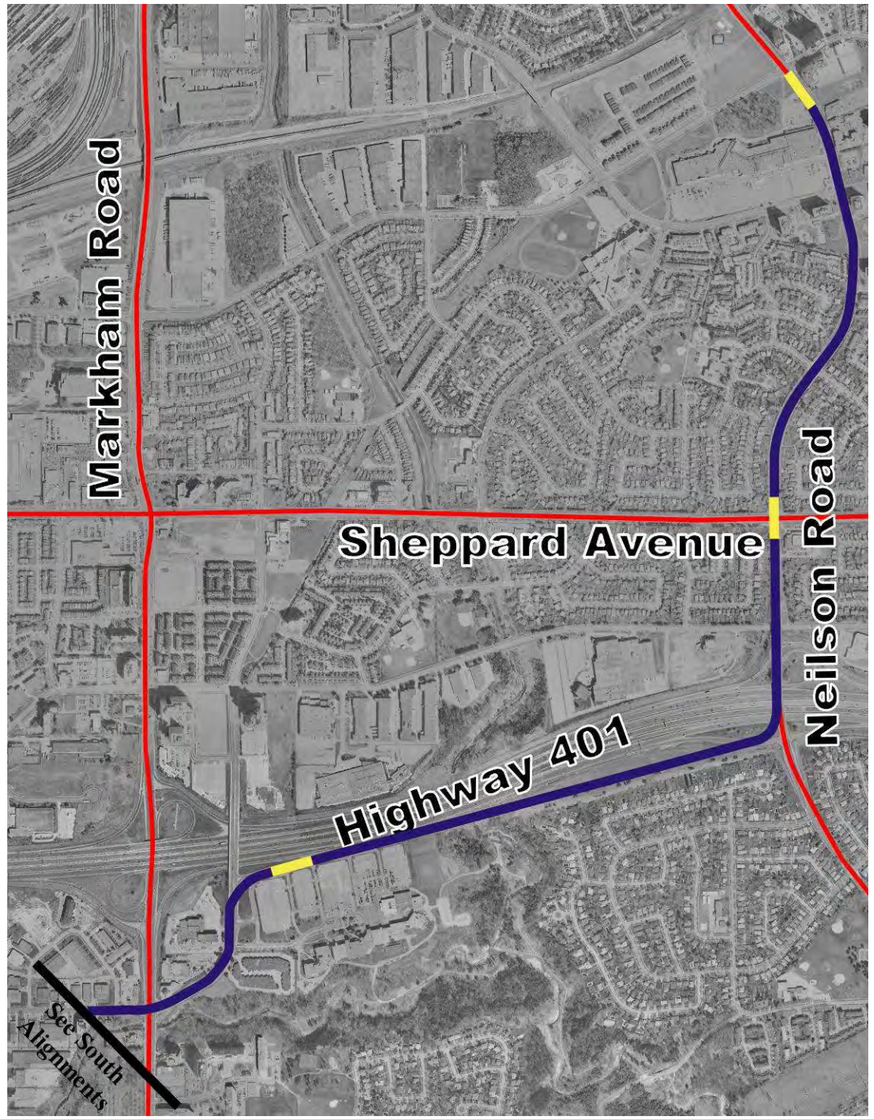
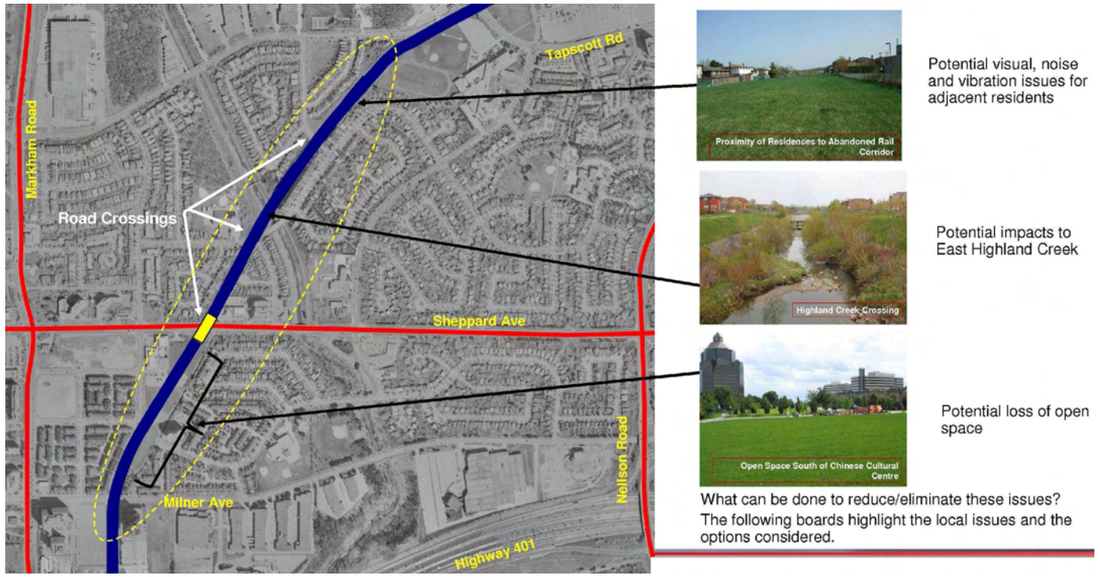
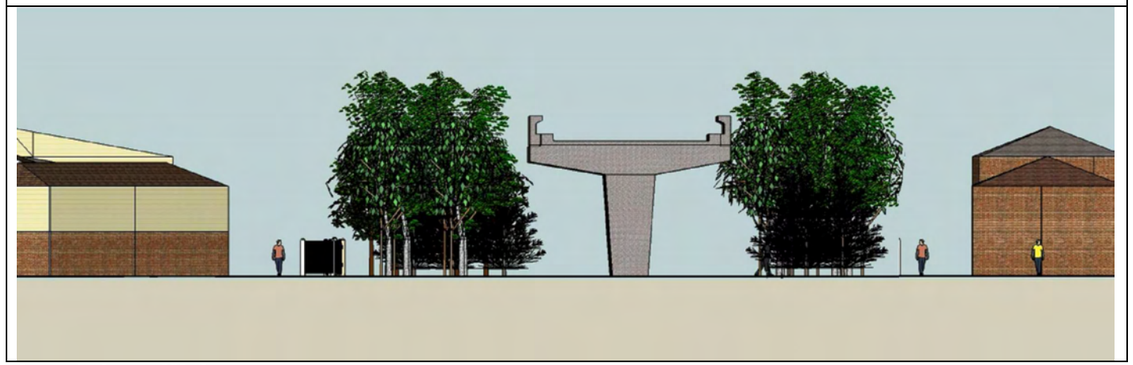


Exhibit 10: Existing Abandoned Rail Corridor, north of Sheppard Avenue



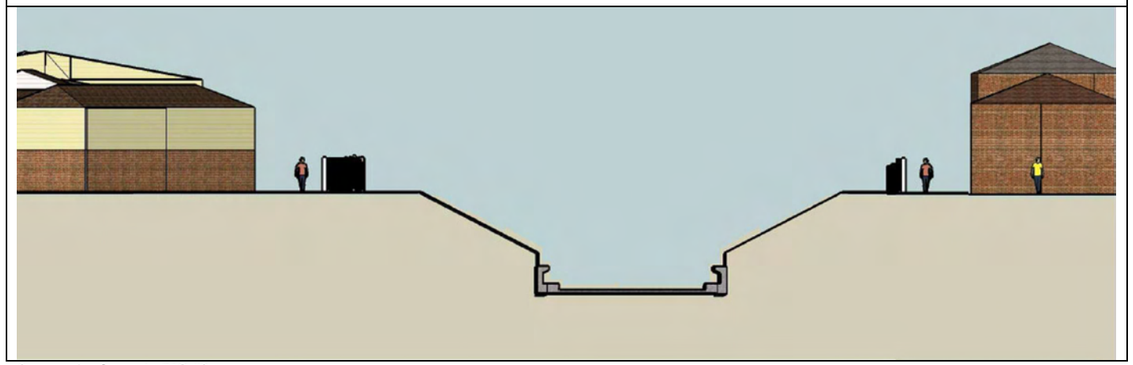
Source: As shown in PIC #3

Exhibit 11: Above Grade Option



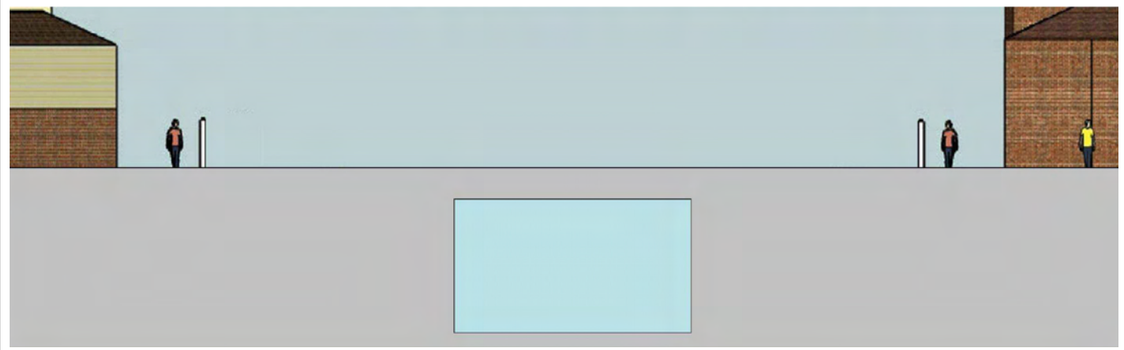
Source: As shown in PIC #3

Exhibit 12: Below-Grade (Open Cut) Option



Source: As shown in PIC #3

Exhibit 13: Below-Grade Optio



Source: As shown in PIC #3

Exhibit 14: Elevated Option

Exhibit 15: Elevated Covered

Exhibit 16: Below Grade Open Cut

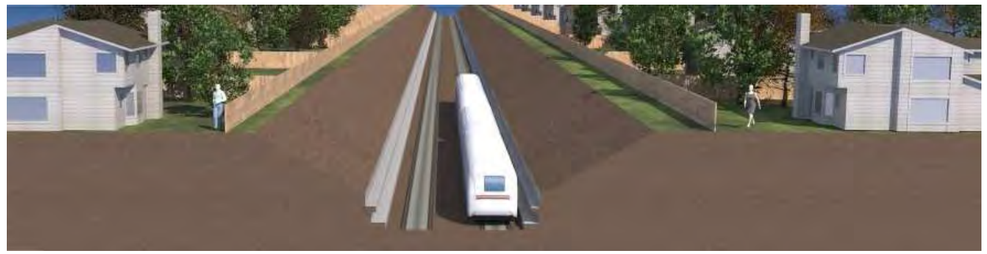
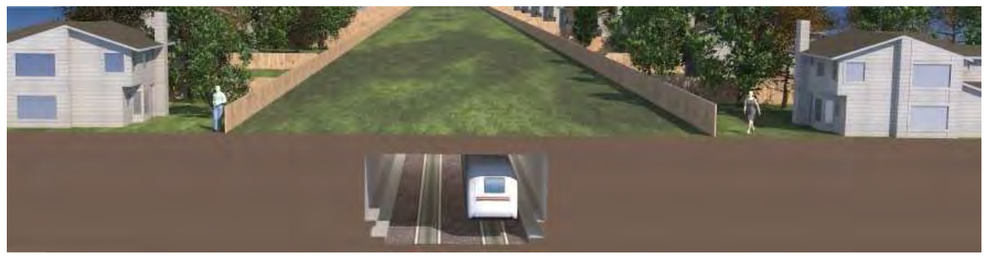


Exhibit 17: Below Grade Covered



Source: Exhibits 14 to 17 are as presented in PIC #3.

Attachment A: South Segment Alignment Analysis

SRT Extension - Alignment Analysis					
Objectives	**South Option 1**	**South Option 2**	**South Option 2 Modified**	**South Option 3**	**Comments**
A) Provide rapid transit service to north east Scarborough	●	◕	◕	◑	The proposed Bellamy station and relocated McCowan Station of alignment S1 provides shortest walking distance to existing higher density development in the area. S2 and S2 (modified) options can provide most of these benefits. S3 provides the least coverage.
B) Support population and employment growth	●	◕	◕	◑	The proposed Bellamy station and relocated McCowan Station of alignment S1 provides the best overall coverage within the Scarborough City Centre Secondary Plan area, thereby provide the greatest support for City planning objectives and transit oriented development opportunities. S2 and S2 (modified) options can provide most of these benefits. S3 provides the least support of the alternative being considered.
C) Accommodate future increase in ridership	–	–	–	–	No difference - not decision relevant
D) Minimize adverse environmental and community effects	◔	◕	●	◑	S2 modified is the most preferred as it has the lowest impacts to the businesses along Progress Avenue and modest adverse effects to the natural environment. Although S3 has the potential to impact the Highland Creek, these impacts can be mitigated whereas the impacts to businesses along Progress (associated with S1) cannot be readily mitigated and therefore S1 is least preferred.
E) Connect SRT to proposed Sheppard LRT	–	–	–	–	No difference - not decision relevant
F) Provide rapid transit service to Centennial College	–	–	–	–	No difference - not decision relevant
G) Achieve reasonable cost	◑	◕	●	●	S1 represents the highest cost due to the reconstruction of McCowan Station, Progress Avenue and associated property acquisition in support of this alignment and therefore is least preferred. Options S2 modified and S3 have similar construction costs.
Summary (Rank)	**2**	**3**	**1**	**4**	S2 modified provides reasonable transit service to existing and future potential higher density population and employment areas at a reasonable cost and low impacts to the environment and therefore it is most preferred. Although S1 provides the best transit service to the immediate area, this option adversely affects the existing business community and costs significantly more to implement and therefore it is the second choice.
			Recommended		

SRT Extension - Alignment Decision Matrices

Objectives	Criteria	Indicators		Data by	South Option 1		South Option 2		Modified South Option 2		South Option 3		
Descriptions					**Along Progress Avenue to Markham Rd. including new McCowan Station**		**Retain existing McCowan Station, Along abandonned rail Corridor, along Progress Ave. to Markham Rd.**		**Retain existing McCowan Station, pass through proposed Yard Alignment (north side), to Markham Rd.**		**Retain existing McCowan Station, pass through proposed Yard Alignment (south side), to Markham Rd.**		**Comments**
A) Provide transit service to north east Scarborough	A1) Minimize travel time to commute into north east Scarborough	A1.1) the travel time along segment.	Total travel time based on average speed . (36 km/h) in minutes.[Lower number is preferred]	URS	2.6		2.5		2.5		2.5		Although there are some differences between each of the alingment, the differences are very minor and therefore this criteria is not considered to be a major deciding factor.
	A2) Maximize convenience for riders	A2.1) Coverage provided by Bellamy Station	Number of Multi-unit residential buildings within 500m Catchment Areas.[Higher number is preferred]	URS	7	●	5	◕	5	◕	1	◑	
			Number of Commercial Buildings within 500m Catchment Areas.[Higher number is preferred]	URS	0	●	0	●	0	●	0	●	
			Number of existing bus routes intercepted by station.[Higher number is preferred]	URS	2		1		1		1		Although there are some differences between each of the alingment, the differences are very minor and therefore this criteria is not considered to be a major deciding factor.
		A2.2) Coverage provided by Centennial Station	Number of Multi-unit residential buildings within 500m Catchments.[Higher number is preferred]	URS	N/A		N/A		N/A		N/A		
			Number of Commercial Buildings within 500m Catchments.[Higher number is preferred]	URS	N/A		N/A		N/A		N/A		
			Number of existing bus routes intercepted by station.[Higher number is preferred]	URS	N/A		N/A		N/A		N/A		
		A2.3) Coverage provided by Sheppard Station	Number of Multi-unit residential buildings within 500m Catchments.[Higher number is preferred]	URS	N/A		N/A		N/A		N/A		
			Number of Commercial Buildings within 500m Catchments.[Higher number is preferred]	URS	N/A		N/A		N/A		N/A		
			Number of existing bus routes intercepted by station.[Higher number is preferred]	URS	N/A		N/A		N/A		N/A		
		A2.4) Coverage provided by Malvern Station	Number of Multi-unit residential buildings within 500m Catchments.[Higher number is preferred]	URS	N/A		N/A		N/A		N/A		
			Number of Commercial Buildings within 500m Catchments.[Higher number is preferred]	URS	N/A		N/A		N/A		N/A		
			Number of existing bus routes intercepted by station.[Higher number is preferred]	URS	N/A		N/A		N/A		N/A		
	A3) Quality of Transit Service	A3.1) Speed and comfort for passengers	Transit Reliabilty[Qualitative]	URS	Exclusive Right of Way provides highest transit reliability		Exclusive Right of Way provides highest transit reliability		Exclusive Right of Way provides highest transit reliability		Exclusive Right of Way provides highest transit reliability		No difference - not decision relevant
	A4) Flexibility	A4.1)Potential for future extension to North/East	Subjective	URS	N/A - see north segments		N/A - see north segments		N/A - see north segments		N/A - see north segments		No difference - not decision relevant
	A5) GO Transit Expansion	A5.1) Potential impacts on future GO transit expansion plans	Subjective	URS	N/A - see north segments		N/A - see north segments		N/A - see north segments		N/A - see north segments		No difference - not decision relevant
SUMMARY					1	●	2	◕	2	◕	3	◑	The proposed Bellamy station and relocated McCowan Station of alignment S1 provides shortest walking distance to existing higher density development in the area. S2 and S2 (modified) options can provide most of these benefits. S3 provides the least coverage.

SRT Extension - Alignment Decision Matrices

Objectives	Criteria	Indicators		Data by	South Option 1		South Option 2		Modified South Option 2		South Option 3		
Descriptions					**Along Progress Avenue to Markham Rd. including new McCowan Station**		**Retain existing McCowan Station, Along abandonned rail Corridor, along Progress Ave. to Markham Rd.**		**Retain existing McCowan Station, pass through proposed Yard Alignment (north side), to Markham Rd.**		**Retain existing McCowan Station, pass through proposed Yard Alignment (south side), to Markham Rd.**		**Comments**
B) Support population and employment growth	B1) Potential effects on projected population/employment growth along the proposed route.	B1.1) The indicators for conformity include whether or not the planned route promotes development intensification in proximity to station locations and subsequently enhances transit ridership.	Qualitative assessment of the redevelopment potential within 500 metres (approximately 5 minutes) of a proposed transit stop/station.	PP	High Development potential was based on a relative evaluation among the four options. Development/intensification potential is considered highest where the capture area (within 500 metre, and 250 metre) is predominantly Employment Area.	●	Moderate Development potential was based on a relative evaluation among the four options. Development/intensification potential is considered highest where the capture area (within 500 metre, and 250 metre) is predominantly Employment Area.	◕	Moderate Development potential was based on a relative evaluation among the four options. Development/intensification potential is considered highest where the capture area (within 500 metre, and 250 metre) is predominantly Employment Area.	◕	Low Development potential was based on a relative evaluation among the four options. Development/intensification potential is considered highest where the capture area (within 500 metre, and 250 metre) is predominantly Employment Area.	◑	
	B2) Conformity with existing Official Plan.	B2.1) The indicators for conformity include whether or not the proposed route is anticipated by the planning document and whether or not the planned route will have a positive or negative impact on the planned urban structure.	Qualitative assessment of the level of conformity with the City's Official Plan.	PP	High All of the South Segment options provide an east-west transit corridor in the general location of the "Potential GTA Transit Corridor" identified on map 1 of the City of Toronto Official Plan, and as identifies on map 4 as a "Transit Corridor".		High All of the South Segment options provide an east-west transit corridor in the general location of the "Potential GTA Transit Corridor" identified on map 1 of the City of Toronto Official Plan, and as identifies on map 4 as a "Transit Corridor".		High All of the South Segment options provide an east-west transit corridor in the general location of the "Potential GTA Transit Corridor" identified on map 1 of the City of Toronto Official Plan, and as identifies on map 4 as a "Transit Corridor".		High All of the South Segment options provide an east-west transit corridor in the general location of the "Potential GTA Transit Corridor" identified on map 1 of the City of Toronto Official Plan, and as identifies on map 4 as a "Transit Corridor".		No difference - not decision relevant
	B3) Conformity with existing Provincial plans and policies.	B3.1) The indicators for conformity include whether or not the proposed route is anticipated by the planning document and whether or not the planned route promotes development intensification in proximity to station locations and subsequently enhances tra	Qualitative assessment of the level of conformity with Provincial plans and policies.	PP	High In a general sense, Provincial policies promote redevelopment/intensification in proximity to both existing and planned high order transit facilities. All of the options support this general Provincial objective. All are considered equal.		High In a general sense, Provincial policies promote redevelopment/intensification in proximity to both existing and planned high order transit facilities. All of the options support this general Provincial objective. All are considered equal.		High In a general sense, Provincial policies promote redevelopment/intensification in proximity to both existing and planned high order transit facilities. All of the options support this general Provincial objective. All are considered equal.		High In a general sense, Provincial policies promote redevelopment/intensification in proximity to both existing and planned high order transit facilities. All of the options support this general Provincial objective. All are considered equal.		No difference - not decision relevant
	B4) Potential to achieve the goals and objectives of applicable Urban Design Guidelines	B4.1) Potential opportunities for urban design and streetscape improvements (including safety considerations at stations).	Qualitative assessment of the level of conformity with applicable Urban Design Guidelines.	PP	High The station locations for the westerly station are considered to have equal opportunity for urban design enhancement. With respect to the existing station, Option 1 has the highest potential for urban design enhancement due to it's proximity to the higher density, mixed use Scarborough Centre Area, while the other three Options are centrally located within an industrial area, and include the potential for an abutting rail yard location.	●	Moderate The station locations for the westerly station are considered to have equal opportunity for urban design enhancement. With respect to the existing station, Option 1 has the highest potential for urban design enhancement due to it's proximity to the higher density, mixed use Scarborough Centre Area, while the other three Options are centrally located within an industrial area, and include the potential for an abutting rail yard location.	◕	Moderate The station locations for the westerly station are considered to have equal opportunity for urban design enhancement. With respect to the existing station, Option 1 has the highest potential for urban design enhancement due to it's proximity to the higher density, mixed use Scarborough Centre Area, while the other three Options are centrally located within an industrial area, and include the potential for an abutting rail yard location.	◕	Moderate The station locations for the westerly station are considered to have equal opportunity for urban design enhancement. With respect to the existing station, Option 1 has the highest potential for urban design enhancement due to it's proximity to the higher density, mixed use Scarborough Centre Area, while the other three Options are centrally located within an industrial area, and include the potential for an abutting rail yard location.	◕	
SUMMARY					1	●	2	◕	2	◕	3	◑	The proposed Bellamy station and relocated McCowan Station of alignment S1 provides the best overall coverage within the Scarborough City Centre Secondary Plan area, thereby provide the greatest support for City planning objectives and transit oriented development opportunities. S2 and S2 (modified) options can provide most of these benefits
C) Accommodate future increase in ridership	C1) Capacity that meet future transit ridership forecasts	C1.1) Capacity that meet future transit ridership forecasts	Yes/No	URS	Yes		Yes		Yes		Yes		No difference - not decision relevant

SRT Extension - Alignment Decision Matrices

Objectives	Criteria	Indicators		Data by	South Option 1		South Option 2		Modified South Option 2		South Option 3		
Descriptions					**Along Progress Avenue to Markham Rd. including new McCowan Station**		**Retain existing McCowan Station, Along abandonned rail Corridor, along Progress Ave. to Markham Rd.**		**Retain existing McCowan Station, pass through proposed Yard Alignment (north side), to Markham Rd.**		**Retain existing McCowan Station, pass through proposed Yard Alignment (south side), to Markham Rd.**		**Comments**
D) Minimize adverse environmental and community effects	D1) Protect existing stable land uses.	D1.1) Proximity of proposed alignments to residential neighbourhoods	D1.1.1) Number and Area of directly affected residential properties (Properties within the alignment and full buyout of property required) [Lower number is preferred]	URS	0		0		0		0		No difference - not decision relevant
			D1.1.2) Number and area of residential properties immediately adjacent to corridor - partial buyout of property required) [Lower number is preferred]	URS	0		0		0		0		No difference - not decision relevant
		D1.2) Proximity of proposed alignments to businesses	D1.2.1) Number and area of directly affected employment properties. (Properties within the alignment and full buyout of property required) (Excluding Yard Properties) [Lower number is preferred]	URS	0	●	0	●	0	●	1 - west side of Bellamy, south of the creek	◕	South 2 (modified) focuses on lands in TTC ownership - current and future (for yard). Therefore it is the most preferred. South Option 1 affects a significant number of properties along Progress so it is the least preferred.
			D1.2.2) Number and area of employment properties immediately adjacent to corridor - partial buyout of property required) (Excluding yard Properties) [Lower number is preferred]	URS	33 Widenings of Progess (north and south sides) from Consillium to Markham	◔	16 Widenings of Progess (north and south sides) from abandonned rail corridor (east of Bellamy) to Markham	◑	1 McDonalds	●	2 McDonalds and vacant parcel on south side of Progress	◕	
		D1.3)Proximity of proposed alignments to institutions	D1.3.1)Number & area of parks, schools, or community centre properties directly affected [Lower number is preferred]	URS	0		1 - City of Toronto Animal Control Centre on Progress		0		0		
		D1.4) Indirect community impacts	D1.4.1) Potential Visual Impacts [Qualitative]	URS	Medium - Given industrial / commercial nature of southern portion of study area elevated structure is not anticipated to have a major adverse impact to the community. Minor impacts may be limited to reduced visibility for signage for businesses fronting onto Progress Avenue		Medium / Low - Given industrial / commercial nature of southern portion of study area elevated structure is not anticipated to have a major adverse impact to the community. Minor impacts may be limited to reduced visibility for signage for businesses fronting onto Progress Avenue east of abandonned rail corridor		Low - Given industrial / commercial nature of southern portion of study area elevated structure is not anticipated to have a major adverse impact to the community. Alignment is predominantly behind businesses .		Low - Given industrial / commercial nature of southern portion of study area elevated structure is not anticipated to have a major adverse impact to the community. Alignment is predominantly behind businesses .		Although there are some differences between each of the alingment. Given the commercial nature surrounding the south alignments, this criteria is not considered to be a major deciding factor.
			D1.4.2) Potential Noise Impacts [Qualitative]	SS Wilson	No known noise sensitive land uses along alignment		No known noise sensitive land uses along alignment		No known noise sensitive land uses along alignment		No known noise sensitive land uses along alignment		No difference - not decision relevant
			D1.4.3) Potential Vibration Impacts [Qualitative]	SS Wilson	No know vibration sensitive land used along alignment		No know vibration sensitive land used along alignment		No know vibration sensitive land used along alignment		No know vibration sensitive land used along alignment		No difference - not decision relevant
			D1.4.4) Impact on accessibility to/from properties [Lower number is preferred]	URS	33	◔	14	◑	0	●	0	◕	Number represents driveways that will be reduced to right in / right out as rasied median is required to accommodate elevated ROW in Progress corridor.
	D2) Minimize the potential effects on important natural features	D2.1) important natural heritage features within the zone of influence of the Network Alternatives.	D2.1.1) Number of Designated Natural Areas ESA, PSW, ANSI.[Lower number is preferred]	LGL	None present		None present		None present		None present		No difference - not decision relevant
			D2.1.2 Number of Watercourse Crossings [Lower number is preferred]	LGL	1 crossing - Markham Branch tributary of Highland Creek at Progress Road	●	1 crossing - Markham Branch tributary of Highland Creek west of Bellamy Road	●	2 crossings of Markham Branch tributary of Highland Creek -one crossing west of Bellamy Road one crossings west of Markham Road,south of Progress Avenue	◕	3 crossings of Markham Branch tributary of Highland Creek -one crossing at Bellamy Road two crossings west of Markham Road,south of Progress Avenue	◑	Through careful design considerations, impacts at the watercourse crossings can be mitigated.
			D2.1.3) Type(s) of terrestrial natural heritage features (ELC classification) [Lower number is preferred]	LGL	CUT1 - Cultural thicket on sloped banks		CUP1 - Cultural deciduous woods, BLO1 - Open bluffs on banks , MAS2-1 -Cattail mineral shallow marsh		CUP1,BLO1,MAS2-1, west of Bellamy Road; alignment would cross through CUT1, CUM1 (Cultural meadow), FOD7-3 (lowland deciduous forest) and BLO1 on northern swing towards Progress, east of Hwy 48		CUP1,BLO1,MAS2-1, west of Bellamy Road; alignment would cross through CUT1, CUM1 (Cultural meadow), FOD7-3 (lowland deciduous forest) and BLO1 on northern swing towards Progress, east of Hwy 48		Although there are some differences between each of the alignment. Given the commercial nature surrounding the south alignments, this criteria is not considered to be a major deciding factor.
			D2.1.4) Significance of natural heritage features) [Lower number is preferred]	LGL	Minimal		Minor - areas are small and disturbed parcels can be satisfactorily mitigated, - provides marginal wildlife habitat		Minor - areas are small and disturbed parcels can be satisfactorily mitigated, - provides marginal wildlife habitat		Minor - areas are small and disturbed parcels can be satisfactorily mitigated, - provides marginal wildlife habitat		Although there are some differences between each of the alignment. Given the commercial nature surrounding the south alignments, this criteria is not considered to be a major deciding factor.
			D2.1.5) Resiliency of natural heritage features (low, medium, high) [Lower number is preferred]	LGL	High		High		High		High - City of Toronto / TRCA are planning restorative works for lowland forest and Low for bluff area (East and west of Markham)		Although there are some differences between each of the alignment. Given the commercial nature surrounding the south alignments, this criteria is not considered to be a major deciding factor.
		D2.2) Potential Effects on Hydrology	D2.2.1) Area of flood storage capacity removed (hectares). [Lower number is preferred]	URS	0.3	●	0.3	●	0.3	●	1.20	◕	Although the right of way will be elevated, the encroachment within the valleylands is significant which present major design challenges. Therefore S3 is least preferred. The other options are comparable in nature.
			D2.2.2) Length of alignment within TRCA regulated area. [Lower number is preferred]	URS	126m	●	80m	●	93m	●	840m	◕	
	D3) Minimize the potential effects on important cultural features	D3.1) important cultural heritage features within the zone of influence of the SRT extension	# of potential cultural heritage features [Lower number is preferred]	URS (Archaeology)	0		0		0		0		No difference - not decision relevant
		D3.2) Archaeological Features	# of potential archaeological features [Lower number is preferred]	URS (Archaeology)	0		0		0		0		No difference - not decision relevant
SUMMARY					4	◔	2	◕	1	●	3	◑	S2 modified is the most preferred as it has the lowest impacts to the businesses along Progress Avenue and modest adverse effects to the natural environment. Although S3 has the potential to impact the Highland Creek, these impacts can be mitigated whereas the impacts to businesses along Progress (associated with S1) cannot be readily mitigated.

SRT Extension - Alignment Decision Matrices

Objectives	Criteria	Indicators		Data by	South Option 1		South Option 2		Modified South Option 2		South Option 3		
Descriptions					**Along Progress Avenue to Markham Rd. including new McCowan Station**		**Retain existing McCowan Station, Along abandonned rail Corridor, along Progress Ave. to Markham Rd.**		**Retain existing McCowan Station, pass through proposed Yard Alignment (north side), to Markham Rd.**		**Retain existing McCowan Station, pass through proposed Yard Alignment (south side), to Markham Rd.**		**Comments**
E) Connect SRT to approved Sheppard LRT	E1) Quality of the connection	E1.1) Potential to establish Quality connection within the Rapid Transit Station	Subjective	URS	Continuous, transferless service from Kennedy Station to MTC.		Continuous, transferless service from Kennedy Station to MTC.		Continuous, transferless service from Kennedy Station to MTC.		Continuous, transferless service from Kennedy Station to MTC.		No difference - not decision relevant
F) Provide rapid transit service to Centennial College	F1) Opportunity to connect to Centennial College	F1.1) Walking distance from centre of college to station. (m)	Linear Meters [Lower number is preferred]	URS	N/A - see north alternative alignments		N/A - see north alternative alignments		N/A - see north alternative alignments		N/A - see north alternative alignments		No difference - not decision relevant
G) Achieve reasonable costs	G1) Total cost	G1.1) Order of Magnitude cost from McCowan Station to Malvern Town Centre (excluding yard)	2008 ($) [Lower number is preferred]	URS	177 million	◕	115 million	●	114 million	●	115 million	●	S1 is more expensive as McCowan station must be reconstructed. All other options are comparable in price.
			Misc. Works (Road Const.) Estimated to be $10 million/km of road length where alignment is within Road R.O.W. [Lower number is preferred]	URS	15	◑	5	◕	0	●	0	●	S1 is most expensive as Progress Avenue must be widened to accommodate the columns for the elevated structure. S2 has similar costs for the eastern portion of Progress.McCowan station must be reconstructed. All other options are comparable in price.
		G1.2) Cost for Yard	2008 ($) [Lower number is preferred]	URS	300 million		300 million		300 million		300 million		No difference - not decision relevant
		G1.3) Property Cost	Area Property required - in m2 (excluding yard) [Lower number is preferred]	URS	5375 m2	◑	4167 m2	◕	1465 m2	●	4600 m2	◕	Anticipated property costs in proportion to the overall area. Therefore, preference is based on lowest area to highest area.
			# of Properties impacted by Yard (both Full & Partial Acquisition) [Lower number is preferred]	URS	11		11		11		11		No difference - not decision relevant
		G1.4) Minimize Operating Costs	Total length of alignment. [Lower number is preferred]	URS	1534.00		1515.00		1485.00		1497.00		Although there are some differences between each of the alingment, the differences are very minor and therefore this criteria is not considered to be a major deciding factor.
	G2) Constructibility of Stations	G2.1) Ease of Station Constructibility	Subjective	URS	Bellamy Station - On Progress and Bellamy intersection (Above Grade) likely requires additional widening and complex traffic staging on Progress to accommodate station over intersection	◕	Bellamy Station spanning Bellamy mid block will require minor traffic staging / detouring.	●	Bellamy Station spanning Bellamy mid block will require minor traffic staging / detouring.	●	Bellamy Station spanning Bellamy mid block will require minor traffic staging / detouring and station is situated close to the flood plan.	●	
	G3) Yard Location/Capacity	G3.1) Opportunity for new yard along alignment.	Subjective	URS	Low - mainline tracks are removed from yard which will likely require spur connection adding to both operational and capital costs	◑	Moderate - non grade separated Wye connection between yard and mainline adding to operational costs	◕	High - mainline through yard allows for quick, efficient grade separated connection.	●	High - mainline through yard allows for quick, efficient grade separated connection.	●	
SUMMARY					3	◑	2	◕	1	●	1	●	S1 represents the highest cost due to the reconstruction of McCowan Station, Progress Avenue and associated property acquisition in support of this alignment and therefore is least preferred. Options S2 modified and S3 have similar construction costs.

Attachment B: South Segment Alignment Analysis

SRT Extension - Alignment Analysis					
Objectives	**South Option 1**	**South Option 2**	**South Option 2 Modified**	**South Option 3**	**Comments**
A) Provide rapid transit service to north east Scarborough	–	–	–	–	No Difference - Not Decision Relevant
B) Support population and employment growth	–	–	–	–	No Difference - Not Decision Relevant
C) Accommodate future increase in ridership	–	–	–	–	No difference - not decision relevant
D) Minimize adverse environmental and community effects	◑	●	◕	●	S2 and S3 is the most preferred as it has the lowest impacts to the businesses along Progress Avenue.Although S3 has the potential to greatly impact the Highland Creek, this option has the least impact to businesses. The impacts to the creek can be mitigated whereas the impacts to businesses along Progress (associated with S1) cannot be readily mitigated and therefore S1 is least preferred.S2 Modified, due to the removal of the yard properties, becomes the option which has the most impact to surrounding businesses.
E) Connect SRT to proposed Sheppard LRT	–	–	–	–	No difference - not decision relevant
F) Provide rapid transit service to Centennial College	–	–	–	–	No difference - not decision relevant
G) Achieve reasonable cost	◑	◕	◕	●	S1 represents the highest cost due to the reconstruction of McCowan Station, Progress Avenue and associated property acquisition in support of this alignment and therefore is least preferred.
Summary (Rank)	**4**	**2**	**3**	**1**	Due to the removal of Bellamy Station and the proposed yar, South Option 2 is no longer preferred. This is due to the fact that properties previously shared for between the alignment and the yard is no longer applicable. The properties would count against South Option 2 due to its location and its impacts to the surrounding properties.
				Recommended	

SRT Extension - Pre-planning Alignment Decisions

Objectives	Criteria	Indicators		Data by	South Option 1		South Option 2		Modified South Option 2		South Option 3		
Descriptions					**Along Progress Avenue to Markham Rd. including new McCowan Station**		**Retain existing McCowan Station, Along abandonned rail Corridor, along Progress Ave. to Markham Rd.**		**Retain existing McCowan Station, pass through proposed Yard Alignment (north side), to Markham Rd.**		**Retain existing McCowan Station, pass through proposed Yard Alignment (south side), to Markham Rd.**		**Comments**
A) Provide transit service to north east Scarborough	A1) Minimize travel time to commute into north east Scarborough	A1.1) the travel time along segment.	Total travel time based on average speed . (36 km/h) in minutes.[Lower number is preferred]	URS	2.6		2.5		2.5		2.5		Although there are some differences between each of the alingment, the differences are very minor and therefore this criteria is not considered to be a major deciding factor.
	A2) Maximize convenience for riders	A2.1) Coverage provided by Bellamy Station	Number of Multi-unit residential buildings within 500m Catchment Areas.[Higher number is preferred]	URS	N/A		N/A		N/A		N/A		
			Number of Commercial Buildings within 500m Catchment Areas.[Higher number is preferred]	URS	N/A		N/A		N/A		N/A		
			Number of existing bus routes intercepted by station.[Higher number is preferred]	URS	2		1		1		1		Although there are some differences between each of the alingment, the differences are very minor and therefore this criteria is not considered to be a major deciding factor.
		A2.2) Coverage provided by Centennial Station	Number of Multi-unit residential buildings within 500m Catchments.[Higher number is preferred]	URS	N/A		N/A		N/A		N/A		
			Number of Commercial Buildings within 500m Catchments.[Higher number is preferred]	URS	N/A		N/A		N/A		N/A		
			Number of existing bus routes intercepted by station.[Higher number is preferred]	URS	N/A		N/A		N/A		N/A		
		A2.3) Coverage provided by Sheppard Station	Number of Multi-unit residential buildings within 500m Catchments.[Higher number is preferred]	URS	N/A		N/A		N/A		N/A		
			Number of Commercial Buildings within 500m Catchments.[Higher number is preferred]	URS	N/A		N/A		N/A		N/A		
			Number of existing bus routes intercepted by station.[Higher number is preferred]	URS	N/A		N/A		N/A		N/A		
		A2.4) Coverage provided by Malvern Station	Number of Multi-unit residential buildings within 500m Catchments.[Higher number is preferred]	URS	N/A		N/A		N/A		N/A		
			Number of Commercial Buildings within 500m Catchments.[Higher number is preferred]	URS	N/A		N/A		N/A		N/A		
			Number of existing bus routes intercepted by station.[Higher number is preferred]	URS	N/A		N/A		N/A		N/A		
	A3) Quality of Transit Service	A3.1) Speed and comfort for passengers	Transit Reliabilty[Qualitative]	URS	Exclusive Right of Way provides highest transit reliability		Exclusive Right of Way provides highest transit reliability		Exclusive Right of Way provides highest transit reliability		Exclusive Right of Way provides highest transit reliability		No difference - not decision relevant
	A4) Flexibility	A4.1)Potential for future extension to North/East	Subjective	URS	N/A - see north segments		N/A - see north segments		N/A - see north segments		N/A - see north segments		No difference - not decision relevant
	A5) GO Transit Expansion	A5.1) Potential impacts on future GO transit expansion plans	Subjective	URS	N/A - see north segments		N/A - see north segments		N/A - see north segments		N/A - see north segments		No difference - not decision relevant
SUMMARY					1	●	1	●	1	●	1	●	Due to removal of Bellamy Station, there are no differences with regards to service for all the options.

Note: This table summarizes the analysis and evaluation undertaken in the spring/summer of 2008 in support of evaluation presented at Public Information Centre # 3 on June 2, 2009

SRT Extension - Pre-planning Alignment Decisions													
Objectives	**Criteria**	**Indicators**		**Data by**	**South Option 1**		**South Option 2**		**Modified South Option 2**		**South Option 3**		
Descriptions					**Along Progress Avenue to Markham Rd. including new McCowan Station**		**Retain existing McCowan Station, Along abandonned rail Corridor, along Progress Ave. to Markham Rd.**		**Retain existing McCowan Station, pass through proposed Yard Alignment (north side), to Markham Rd.**		**Retain existing McCowan Station, pass through proposed Yard Alignment (south side), to Markham Rd.**		**Comments**
B) Support population and employment growth	B1) Potential effects on projected population/employment growth along the proposed route.	B1.1) The indicators for conformity include whether or not the planned route promotes development intensification in proximity to station locations and subsequently enhances transit ridership.	Qualitative assessment of the redevelopment potential within 500 metres (approximately 5 minutes) of a proposed transit stop/station.	PP									No Station
	B2) Conformity with existing Official Plan.	B2.1) The indicators for conformity include whether or not the proposed route is anticipated by the planning document and whether or not the planned route will have a positive or negative impact on the planned urban structure.	Qualitative assessment of the level of conformity with the City's Official Plan. [High is preferred]	PP	High All of the South Segment options provide an east-west transit corridor in the general location of the "Potential GTA Transit Corridor" identified on map 1 of the City of Toronto Official Plan, and as identifies on map 4 as a "Transit Corridor".		High All of the South Segment options provide an east-west transit corridor in the general location of the "Potential GTA Transit Corridor" identified on map 1 of the City of Toronto Official Plan, and as identifies on map 4 as a "Transit Corridor".		High All of the South Segment options provide an east-west transit corridor in the general location of the "Potential GTA Transit Corridor" identified on map 1 of the City of Toronto Official Plan, and as identifies on map 4 as a "Transit Corridor".		High All of the South Segment options provide an east-west transit corridor in the general location of the "Potential GTA Transit Corridor" identified on map 1 of the City of Toronto Official Plan, and as identifies on map 4 as a "Transit Corridor".		No difference - not decision relevant
	B3) Conformity with existing Provincial plans and policies.	B3.1) The indicators for conformity include whether or not the proposed route is anticipated by the planning document and whether or not the planned route promotes development intensification in proximity to station locations and subsequently enhances tra	Qualitative assessment of the level of conformity with Provincial plans and policies. [High is preferred]	PP	High In a general sense, Provincial policies promote redevelopment/intensification in proximity to both existing and planned high order transit facilities. All of the options support this general Provincial objective. All are considered equal.		High In a general sense, Provincial policies promote redevelopment/intensification in proximity to both existing and planned high order transit facilities. All of the options support this general Provincial objective. All are considered equal.		High In a general sense, Provincial policies promote redevelopment/intensification in proximity to both existing and planned high order transit facilities. All of the options support this general Provincial objective. All are considered equal.		High In a general sense, Provincial policies promote redevelopment/intensification in proximity to both existing and planned high order transit facilities. All of the options support this general Provincial objective. All are considered equal.		No difference - not decision relevant
	B4) Potential to achieve the goals and objectives of applicable Urban Design Guidelines	B4.1) Potential opportunities for urban design and streetscape improvements (including safety considerations at stations).	Qualitative assessment of the level of conformity with applicable Urban Design Guidelines.	PP									No Station
SUMMARY					1	●	1	●	1	●	1	●	Since there is no Bellamy Station, this criteria does not apply.
C) Accommodate future increase in ridership	C1) Capacity that meet future transit ridership forecasts	C1.1) Capacity that meet future transit ridership forecasts	Yes/No	URS	Yes		Yes		Yes		Yes		No difference - not decision relevant

SRT Extension - Pre-planning Alignment Decisions

Objectives	Criteria	Indicators		Data by	South Option 1		South Option 2		Modified South Option 2		South Option 3		
Descriptions					**Along Progress Avenue to Markham Rd. including new McCowan Station**		**Retain existing McCowan Station, Along abandonned rail Corridor, along Progress Ave. to Markham Rd.**		**Retain existing McCowan Station, pass through proposed Yard Alignment (north side), to Markham Rd.**		**Retain existing McCowan Station, pass through proposed Yard Alignment (south side), to Markham Rd.**		**Comments**
D) Minimize adverse environmental and community effects	D1) Protect existing stable land uses.	D1.1) Proximity of proposed alignments to residential neighbourhoods	D1.1.1) Number and Area of directly affected residential properties (Properties within the alignment and full buyout of property required) [Lower number is preferred]	URS	0		0		0		0		No difference - not decision relevant
			D1.1.2) Number and area of residential properties immediately adjacent to corridor - partial buyout of property required) [Lower number is preferred]	URS	0		0		0		0		No difference - not decision relevant
		D1.2) Proximity of proposed alignments to businesses	D1.2.1) Number and area of directly affected employment properties. (Properties within the alignment and full buyout of property required) (Excluding Yard Properties) [Lower number is preferred]	URS	0	●	0	●	4 Within areas of proposed Bellamy Yard.	◑	1 - west side of Bellamy, south of the creek	◕	South 2 (modified) focuses on lands in TTC ownership - current and future (for yard). Therefore it is the most preferred. South Option 1 affects a significant number of properties along Progress so it is the least preferred.
			D1.2.2) Number and area of employment properties immediately adjacent to corridor - partial buyout of property required) (Excluding yard Properties) [Lower number is preferred]	URS	33 Widenings of Progess (north and south sides) from Consillium to Markham	◔	16 Widenings of Progess (north and south sides) from abandonned rail corridor (east of Bellamy) to Markham	◑	3 McDonalds Various Parcels along pervious proposed Bellamy Yard	◕	2 McDonalds and vacant parcel on south side of Progress	●	
		D1.3)Proximity of proposed alignments to institutions	D1.3.1)Number & area of parks, schools, or community centre properties directly affected [Lower number is preferred]	URS	0		1 - City of Toronto Animal Control Centre on Progress		0		0		
		D1.4) Indirect community impacts	D1.4.1) Potential Visual Impacts [Low is preferred]	URS	Medium - Given industrial / commercial nature of southern portion of study area elevated structure is not anticipated to have a major adverse impact to the community. Minor impacts may be limited to reduced visibility for signage for businesses fronting onto Progress Avenue		Medium / Low - Given industrial / commercial nature of southern portion of study area elevated structure is not anticipated to have a major adverse impact to the community. Minor impacts may be limited to reduced visibility for signage for businesses fronting onto Progress Avenue east of abandonned rail corridor		Low - Given industrial / commercial nature of southern portion of study area elevated structure is not anticipated to have a major adverse impact to the community. Alignment is predominantly behind businesses .		Low - Given industrial / commercial nature of southern portion of study area elevated structure is not anticipated to have a major adverse impact to the community. Alignment is predominantly behind businesses .		Although there are some differences between each of the alingment. Given the commercial nature surrounding the south alignments, this criteria is not considered to be a major deciding factor.
			D1.4.2) Potential Noise Impacts [Less impact is preferred]	SS Wilson	No known noise sensitive land uses along alignment		No known noise sensitive land uses along alignment		No known noise sensitive land uses along alignment		No known noise sensitive land uses along alignment		No difference - not decision relevant
			D1.4.3) Potential Vibration Impacts [Less impact is preferred]	SS Wilson	No know vibration sensitive land used along alignment		No know vibration sensitive land used along alignment		No know vibration sensitive land used along alignment		No know vibration sensitive land used along alignment		No difference - not decision relevant
			D1.4.4) Impact on accessibility to/from properties [Lower number is preferred]	URS	33	◔	14	◑	4	◕	0	●	Number represents driveways that will be reduced to right in / right out as rasied median is required to accommodate elevated ROW in Progress corridor.
	D2) Minimize the potential effects on important natural features	D2.1) important natural heritage features within the zone of influence of the Network Alternatives.	D2.1.1) Number of Designated Natural Areas ESA, PSW, ANSI.[Lower number is preferred]	LGL	None present		None present		None present		None present		No difference - not decision relevant
			D2.1.2 Number of Watercourse Crossings [Lower number is preferred]	LGL	1 crossing - Markham Branch tributary of Highland Creek at Progress Road	●	1 crossing - Markham Branch tributary of Highland Creek west of Bellamy Road	●	3 crossings of Markham Branch tributary of Highland Creek -one crossing west of Bellamy Road one crossings west of Markham Road,south of Progress Avenue	◕	3 crossings of Markham Branch tributary of Highland Creek -one crossing at Bellamy Road two crossings west of Markham Road,south of Progress Avenue	◕	Through careful design considerations, impacts at the watercourse crossings can be mitigated.
			D2.1.3) Type(s) of terrestrial natural heritage features (ELC classification) [Lower number is preferred]	LGL	CUT1 - Cultural thicket on sloped banks		CUP1 - Cultural deciduous woods, BLO1 - Open bluffs on banks , MAS2-1 -Cattail mineral shallow marsh		CUP1,BLO1,MAS2-1, west of Bellamy Road; alignment would cross through CUT1, CUM1 (Cultural meadow), FOD7-3 (lowland deciduous forest) and BLO1 on northern swing towards Progress, east of Hwy 48		CUP1,BLO1,MAS2-1, west of Bellamy Road; alignment would cross through CUT1, CUM1 (Cultural meadow), FOD7-3 (lowland deciduous forest) and BLO1 on northern swing towards Progress, east of Hwy 48		Although there are some differences between each of the alignment. Given the commercial nature surrounding the south alignments, this criteria is not considered to be a major deciding factor.
			D2.1.4) Significance of natural heritage features) [Lower number is preferred]	LGL	Minimal		Minor - areas are small and disturbed parcels can be satisfactorily mitigated, - provides marginal wildlife habitat		Minor - areas are small and disturbed parcels can be satisfactorily mitigated, - provides marginal wildlife habitat		Minor - areas are small and disturbed parcels can be satisfactorily mitigated, - provides marginal wildlife habitat		Although there are some differences between each of the alignment. Given the commercial nature surrounding the south alignments, this criteria is not considered to be a major deciding factor.
			D2.1.5) Resiliency of natural heritage features (low, medium, high) [Lower number is preferred]	LGL	High		High		High		High - City of Toronto / TRCA are planning restorative works for lowland forest and Low for bluff area (East and west of Markham)		Although there are some differences between each of the alignment. Given the commercial nature surrounding the south alignments, this criteria is not considered to be a major deciding factor.
		D2.2) Potential Effects on Hydrology	D2.2.1) Area of flood storage capacity removed (hectares). [Lower number is preferred]	URS	0.3	●	0.3	●	0.3	●	1.20	◕	Although the right of way will be elevated, the encroachment within the valleylands is signficant which present major design challenges. Therefore S3 is least preferred. The other options are comparable in nature.
			D2.2.2) Length of alignment within TRCA regulated area. [Lower number is preferred]	URS	126m	●	80m	●	93m	●	840m	◕	
	D3) Minimize the potential effects on important cultural features	D3.1) important cultural heritage features within the zone of influence of the SRT extension	# of potential cultural heritage features [Lower number is preferred]	URS (Archaeology)	0		0		0		0		No difference - not decision relevant
		D3.2) Archaeological Features	# of potential archaeological features [Lower number is preferred]	URS (Archaeology)	0		0		0		0		No difference - not decision relevant
SUMMARY					3	◑	1	●	2	◕	1	●	S2 and S3 is the most preferred as it has the lowest impacts to the businesses along Progress Avenue.Although S3 has the potential to greatly impact the Highland Creek, this option has the least impact to businesses. The impacts to the creek can be mitigated whereas the impacts to businesses along Progress (associated with S1) cannot be readily mitigated and therefore S1 is least preferred.S2 Modified, due to the removal of the yard properties, becomes the option which has the most impact to surrounding businesses.

Note: This table summarizes the analysis and evaluation undertaken in the spring/summer of 2008 in support of evaluation presented at Public Information Centre # 3 on June 2, 2009

SRT Extension - Pre-planning Alignment Decisions

Objectives	Criteria	Indicators		Data by	South Option 1		South Option 2		Modified South Option 2		South Option 3		
Descriptions					**Along Progress Avenue to Markham Rd. including new McCowan Station**		**Retain existing McCowan Station, Along abandonned rail Corridor, along Progress Ave. to Markham Rd.**		**Retain existing McCowan Station, pass through proposed Yard Alignment (north side), to Markham Rd.**		**Retain existing McCowan Station, pass through proposed Yard Alignment (south side), to Markham Rd.**		**Comments**
E) Connect SRT to approved Sheppard LRT	E1) Quality of the connection	E1.1) Potential to establish Quality connection within the Rapid Transit Station	Subjective	URS	Continuous, transferless service from Kennedy Station to MTC.		Continuous, transferless service from Kennedy Station to MTC.		Continuous, transferless service from Kennedy Station to MTC.		Continuous, transferless service from Kennedy Station to MTC.		No difference - not decision relevant
F) Provide rapid transit service to Centennial College	F1) Opportunity to connect to Centennial College	F1.1) Walking distance from centre of college to station. (m)	Linear Meters [Lower number is preferred]	URS	N/A - see north alternative alignments		N/A - see north alternative alignments		N/A - see north alternative alignments		N/A - see north alternative alignments		No difference - not decision relevant
G) Achieve reasonable costs	G1) Total cost	G1.1) Order of Magnitude cost from McCowan Station to Markham Road (excluding yard)	2008 ($) [Lower number is preferred]	URS	Moderate cost compared to other options	◕	Lowest cost compared to other options	●	Low cost compared to other options	●	Low cost compared to other options	●	S1 is more expensive as McCowan station must be reconstructed. All other options are comparable in price.
			Misc. Works (Road Const.) Estimated to be $10 million/km of road length where alignment is within Road R.O.W. [Lower number is preferred]	URS	15	◑	5	◕	0	●	0	●	S1 is most expensive as Progress Avenue must be widened to accommodate the columns for the elevated structure. S2 has similar costs for the eastern portion of Progress. All other options are comparable in price.
		G1.2) Cost for Yard	2008 ($) [Lower number is preferred]	URS	Moderate cost compared to other options		Moderate cost compared to other options		Moderate cost compared to other options		Moderate cost compared to other options		No difference - not decision relevant
		G1.3) Property Cost	Area Property required - in m2 (excluding yard) [Lower number is preferred]	URS	5375 m2	◕	4167 m2	●	48300 m2 - Additional 5 Properties	◑	4600 m2	●	Anticipated property costs in proportion to the overall area. Therefore, preference is based on lowest area to highest area. Property Cost for Modified South Option 2 Increased due to additional purcahse required. Land used to be part of yard but the yard is no longer necessary.
			# of Properties impacted by Yard (both Full & Partial Acquisition) [Lower number is preferred]	URS									No Yard
		G1.4) Minimize Operating Costs	Total length of alignment. [Lower number is preferred]	URS	1534.00		1515.00		1485.00		1497.00		Although there are some differences between each of the alingment, the differences are very minor and therefore this criteria is not considered to be a major deciding factor.
	G2) Constructibility of Stations	G2.1) Ease of Station Constructibility	Subjective	URS	Bellamy Station - On Progress and Bellamy intersection (Above Grade) likely requires additional widening and complex traffic staging on Progress to accommodate station over intersection	◕	Bellamy Station spanning Bellamy mid block will require minor traffic staging / detouring.	●	Bellamy Station spanning Bellamy mid block will require minor traffic staging / detouring.	●	Bellamy Station spanning Bellamy mid block will require minor traffic staging / detouring and station is situated close to the flood plan.	●	
	G3) Yard Location/Capacity	G3.1) Opportunity for new yard along alignment.	Subjective [High is preferred]	URS	Low - mainline tracks are removed from yard which will likely require spur connection adding to both operational and capital costs	◑	Moderate - non grade separated Wye connection between yard and mainline adding to operational costs	◕	High - mainline through yard allows for quick, efficient grade separated connection.	●	High - mainline through yard allows for quick, efficient grade separated connection.	●	
SUMMARY					3	◑	2	◕	2	◕	1	●	S1 represents the highest cost due to the reconstruction of McCowan Station, Progress Avenue and associated property acquisition in support of this alignment and therefore is least preferred.

Note: This table summarizes the analysis and evaluation undertaken in the spring/summer of 2008 in support of evaluation presented at Public Information Centre # 3 on June 2, 2009

Attachment C: North Segment Alignment Analysis

SRT Extension - Alignment Analysis					
Objectives	**North Option 1 / Markham - CP**	**North Option 2 / Markham - CP**	**North Option 3 (Abandonned Rail Corridor) Above Grade**	**North Option 4 (401, Neilson)**	**Comments**
A) Minimize Adverse Environmental Effects	◕	●	◕	◑	N2 is most preferred as it utilizes existing transportation corridors to minimize the impact on the socio-economic and natural environment. N1 and N3 have greater impacts on the residential community. N4 is least preferred as it has the most significant impact on the natural environment and some community impacts along Neilson Road.
B) Support Population and Employment Growth	●	●	◕	◑	N1 and N2 are most consistent with current planning policy and offer the greatest opportunity for transit supportive development. N4 is situated in existing transportation corridors and is surrounded by stable low density development with limited opportunity to encourage/attract more transit oriented development.
C) Improve rapid transit service to North East Scarborough	◕	◕	●	◑	N3 provides reasonable service to the existing high density areas of Markham and Sheppard and the fastest service to the high density areas within Malvern and therefore is the most preferred. N1 and N2 provide slightly better service to the Markham / Sheppard Area but much slower service to Malvern.
D) Connect SRT to Proposed Sheppard LRT					No difference - not decision relevant
E) Improve Rapid Transit service to Centennial College	◕	◕	◕	●	Although N4 provides a station closer to the main area of campus, all options provide significantly improved transit service to Centennial College.
F) Accommodate Future Increase in Ridership Demand					No difference - not decision relevant
G) Cost	◑	◔	●	◕	N3 will result in the lowest operating costs, potentially the lowest construction cost and is the simplest to construct and thus is most preferred. Even with an underground section through the stable residential areas of Malvern (to mitigate impacts), this can be constructed at equal or less cost in comparison to N1, N2, and N4 N2 (and N1) will have the highest operating costs, would be the most expensive and complex to construct and therefore is least preferred.
Summary (Rank)	**2**	**2**	**1**	**3**	
			Recommended		

SRT Extension - Pre-planning Alignment Decisions

Objectives	Criteria	Indicators		Data by	North Option 1 (EA Modified, Parkborough, Markham Rd, CP Rail Corridor)		North Option 2 (Markham Rd, CP Rail Corridor)		North Option 3 (Progress, Abandoned Rail/Hydro Corridor) Above Grade		North Option 4 (401, Neilson)		Comments
Descriptions					Follows Progress Ave East of Markham Rd, through Parkborough, along Markham Rd North of Sheppard Ave. Continues east at CPR to Tapscott/McLevin to north side of Malvern Town Centre		Follows Progress Ave East through 401 Bridge. Connects with Markham Road at Milner Ave. Continues east at CPR to Tapscott/McLevin to north side of Malvern Town Centre		Follows Progress Ave through abandonned rail corridor and ends at Malvern Town Centre.		Along south side of 401, north on Neilson to Malvern Town Centre		
A) Minimize Adverse Environmental Effects	A1) Protect existing stable land uses. These properties represent direct property impacts/taking. Any property taking represents a negative impact. The advantages of proximity is captured in Station coverage.	A1.1) Proximity of proposed alignments to residential neighbourhoods	A1.1.1) Number and area of directly affected residential properties (Properties within the alignment and full buyout of property required)[Lower number is preferred]	URS	0		0		0		0		No difference - not decision relevant
			A1.1.2) Number and area of residential properties immediately adjacent to corridor - partial buyout of property required) [Lower number is preferred]	URS	19	◕	0	●	0	●	0	●	N1 least preferred as major modifications to Parkborough Crescent required for support columns which, in turn, affect frontage of properties. All other options more preferred.
		A1.2) Proximity of proposed alignments to businesses	A1.2.1) Number and area of directly affected employment properties. (Properties within the alignment and full buyout of property required) [Lower number is preferred]	URS	2		0		0		0		Although there are some differences between each of the alignment. This criteria is not considered to be a major deciding factor.
			A1.2.2) Number and area of employment properties immediately adjacent to corridor - partial buyout of property) [Lower number is preferred]	URS	2 Leons, Malvern Town Centre		2 Leons, Malvern Town Centre		2 Milner Parking, Malvern Town Centre		0		
		A1.3)Proximity of proposed alignments to institutions	A1.3.1)Number & area of parks, schools, or community centre properties directly affected [Lower number is preferred]	URS	3 Centennial College, McLevin Park, McLevin Forest Pond	◕	3 Centennial College, McLevin Park, McLevin Forest Pond	◕	5 Centennial College, High School, Rosebank Park, Pinetree Park, Chinese Community Centre	◑	1 Centennial College	●	As N4 is situated in transportation corridors, it has the lowest potential for impacts to the community and thus is most preferred. N3 has potentially the greatest. However, it is possible to mitigate some of these impacts through alignment refinements.
		A 1.4) Indirect Community Impacts	A 1.4.1) Potential Visual Impacts [Low is preferred]	URS	High - elevated right of way will be metres from the fronts of the houses on Parkborough and will be visible to houses that back onto Markham Road, plus townhomes at Tapscott and McLevin.	◑	Medium - elevated right of way will be visible to houses and apartments along Markham Road, plus townhomes at Tapscott and McLevin.	◕	High - elevated right of way will be visible to houses that back onto the abandonned rail corridor, plus townhomes at Tapscott and McLevin.	◕	Medium - elevated right of way will be visible to houses that back onto Highway 401 and Neilson Road	●	N2 and N4 are along existing transportation corridors and thus the impact is not considered as significant as N1 (along Parkborough) and N3 (abandonned rail corridor). Recognizing that there may be ways to mitigate the visual impacts along N3 but not for N4, N4 is the least preferred.
			A 1.4.2) Potential Noise Impacts [Low is preferred]	SS Wilson	Low	◕	No impact	●	Low	◕	No impact	●	N2 and N4 are along existing transportation corridors and thus the introduction of transit will not increase ambient noise levels. With special design features, increases in ambient noise levels can be mitigated.
			A 1.4.3) Potential Vibration Impacts [Low is preferred]	SS Wilson	Low		Low		Low		Low		Advancements in track design allows vibration to be mitigated - therefore there is no difference in these options - not decision relevant.
			A 1.4.4) Impact on accessibility to/from properties [Lower number is preferred]	URS	8	◑	16	◔	4	●	7	◕	Number represents driveways that will be reduced to right in / right out as rasied median is required to accommodate elevated ROW in Progress corridor and Markham Corridor.
	A2) Minimize the potential effects on important natural features	A2.1) important natural heritage features within the zone of influence of the Network Alternatives.	A 2.1.1) Number of Designated Natural Areas ESA, PSW, ANSI. [Lower number is preferred]	LGL	None present	●	None present	●	None present	●	1 ESA - Morningside Park Forest	◕	Although impacts to provincially significant ESA can be mitigated through careful design, Option N4 is less preferred as other alternatives do not affect any provincially significant natural areas.
			A 2.1.2 Number of Watercourse Crossings [Lower number is preferred]	LGL	1 crossing of Malvern Branch adjacent to CN rail east of Hwy 48 and 1 parallel section of alignment along Markham Branch immediately east of Hwy. 48	●	1 crossing of Malvern Branch adjacent to CN rail east of Hwy 48 and 1 parallel section of alignment along Markham Branch immediately east of Hwy. 48	●	1 crossing of Malvern Branch at Mammoth Hall Trail and 1 parallel section of alignment along Markham Branch immediately east of Hwy. 48	●	1 crossing of East Highland Creek within ESA and 1 parallel section of alignment along Markham Branch immediately east of Hwy. 48	◕	Through careful design considerations, impacts at the watercourse crossings can be mitigated.
			A 2.1.3) Type(s) of terrestrial natural heritage features (ELC classification) [Lower number is preferred]	LGL	BLO1 - located at parallel alignment area, steep, unstable bank. CUT1, CUM1 adjacent to CN rail line	◕	BLO1 - located at parallel alignment area, steep, unstable bank. CUT1, CUM1 adjacent to CN rail line	◕	BLO1 - located at parallel alignment area, steep, unstable bank. -CUT1 at creek crossing at Mammoth Hall Trail	●	BLO1 - located at parallel alignment area, steep, unstable bank. - possible encroachment on FOD5-9, FOD7-3, FOM7-2 forests and CUM1 at East Highland Creek	◑	Although there are some differences between each of the alignment. This criteria is not considered to be a major deciding factor.
			A 2.1.4) Significance of natural heritage features) [Lower number is preferred]	LGL	Minor for cultural thicket ecosites, Major for bluff area	●	Minor for cultural thicket ecosites, Major for bluff area	●	Minor for cultural thicket ecosites, Major for bluff area	●	Major for bluff area and Major for crossing of East Highland Creek as ESA is unique in an urban environment	◔	Although there are some differences between each of the alignment. This criteria is not considered to be a major deciding factor.
			A 2.1.5) Resiliency of natural heritage features (low, medium, high) [Low is preferred]	LGL	High for cultural ecosites,Low for bluff area as significant mitigation and restoration would be required	◕	High for cultural ecosites,Low for bluff area as significant mitigation and restoration would be required	◕	High for cultural ecosites,Low for bluff area as significant mitigation and restoration would be required	◕	Low for bluff area as significant mitigation and restoration would be required, and Low for ESA	●	Although there are some differences between each of the alignment. This criteria is not considered to be a major deciding factor.
		A2.2) Potential Effects on Hydrology	A 2.2.1) Area of flood storage capacity removed (hectares). [Lower number is preferred]	URS	1022.6 m² Markham/Progress	●	1022.6 m² Markham/Progress	●	1022.6 m² Markham/Progress	●	2260 m² Markham/Progress, 401 crossing	◕	Although there are some differences between each of the alignment. This criteria is not considered to be a major deciding factor.
			A 2.2.2) Length of alignment within TRCA regulated area.[Lower number is preferred]	URS	284 Progress Ave CN/CP Crossing	◕	284 Progress Ave CN/CP Crossing	◕	225 2nd River Crossing Underground	●	302.5 Progress, 401	◑	
	A3) Minimize the potential effects on important cultural features:	A3.1) important cultural heritage features within the zone of influence of the SRT extension	# of potential cultural heritage features [Lower number is preferred]	URS	0		0		0		0		No difference - not decision relevant
		A3.2) Archaeological Features	# of potential archaeological features [Lower number is preferred]	URS	1 - cemetery on east side of Markham	◕	1 - cemetery on east side of Markham	◕	0	●	0	●	Although there are some differences between each of the alignment. This criteria is not considered to be a major deciding factor.
SUMMARY					3	◕	1	●	2	◕	4	◑	N2 is most preferred as it utilizes existing transportation corridors to minimize the impact on the socio-economic and natural environment. N1 and N3 have greater impacts on the residential community. N4 is least preferred as it has the most significant impact on the natural environment and some community impacts along Neilson Road.

Note: This table summarizes the analysis and evaluation undertaken in the spring/summer of 2008 in support of evaluation presented at Public Information Centre # 3 on June 2, 2009

SRT Extension - Pre-planning Alignment Decisions

Objectives	Criteria	Indicators		Data by	North Option 1 (EA Modified, Parkborough, Markham Rd, CP Rail Corridor)		North Option 2 (Markham Rd, CP Rail Corridor)		North Option 3 (Progress, Abandoned Rail/Hydro Corridor) Above Grade		North Option 4 (401, Neilson)		
B) Support Population and Employment Growth	B1) Potential effects on projected population/employment growth along the proposed route.	B1.1) The indicators for conformity include whether or not the planned route promotes development intensification in proximity to station locations and subsequently enhances transit ridership.	Qualitative assessment of the redevelopment potential within 500 metres (approximately 5 minutes) of a proposed transit stop/station. [High is preferred]	PP	High - Options 1 ranks high due to the proximity to Markham Road/Sheppard and Malvern Town Centre lands where a number of high density development opportunities exist.	●	High - Options 2 ranks high due to the proximity to Markham Road/Sheppard and Malvern Town Centre lands where a number of high density development opportunities exist.	●	Moderate / High - Options 3 ranks moderate high due not as central station location to Markham Road/Sheppard node but is central for the Malvern Town Centre lands where a number of high density development opportunities exist.	◕	Moderate / Low - options 4 misses the significant area os Markham and Sheppared. Neilson/Sheppard has no development opportunities as the corridor is surrounded by a stable neighbourhood but still provides service to the Malvern Town Centre lands.	◑	N1 and N2 provide the best opportunity for transit oriented development in the two areas of potential - the Markham / Sheppard node and the Malvern Town Centre. N3 provide the same opportunity at Malvern Town Centre and will serve development opportunities east of Markham well. The lack of service to the Markham / Sheppard area is one of the main reasons why N4 is least preferred.
	B2) Conformity with existing Official Plan.	B2.1) The indicators for conformity include whether or not the proposed route is anticipated by the planning document and whether or not the planned route will have a positive or negative impact on the planned urban structure.	Qualitative assessment of the level of conformity with the City's Official Plan. [High is preferred]	PP	High The City of Toronto Official Plan identifies on maps 1 and 4 Markham Road as the "Transit Corridor". Markham Road is also identified as a "Transit Priority Segment". As such, Options 1 and 2, which utilize the Markham Road corridor for transit are considered to have high conformity. Options 3 and 4, while providing the North-South function, utilize alternative corridors, and that results in a lower conformity rating.	●	High The City of Toronto Official Plan identifies on maps 1 and 4 Markham Road as the "Transit Corridor". Markham Road is also identified as a "Transit Priority Segment". As such, Options 1 and 2, which utilize the Markham Road corridor for transit are considered to have high conformity. Options 3 and 4, while providing the North-South function, utilize alternative corridors, and that results in a lower conformity rating.	●	Moderate The City of Toronto Official Plan identifies on maps 1 and 4 Markham Road as the "Transit Corridor". Markham Road is also identified as a "Transit Priority Segment". As such, Options 1 and 2, which utilize the Markham Road corridor for transit are considered to have high conformity. Options 3 and 4, while providing the North-South function, utilize alternative corridors, and that results in a lower conformity rating.	◕	Moderate The City of Toronto Official Plan identifies on maps 1 and 4 Markham Road as the "Transit Corridor". Markham Road is also identified as a "Transit Priority Segment". As such, Options 1 and 2, which utilize the Markham Road corridor for transit are considered to have high conformity. Options 3 and 4, while providing the North-South function, utilize alternative corridors, and that results in a lower conformity rating.	◕	
	B3) Conformity with existing Provincial plans and policies.	B3.1) The indicators for conformity include whether or not the proposed route is anticipated by the planning document and whether or not the planned route promotes development intensification in proximity to station locations and subsequently enhances tra	Qualitative assessment of the level of conformity with Provincial plans and policies. [High is preferred]	PP	High In a general sense, Provincial policies promote redevelopment/intensification in proximity to both existing and planned high order transit facilities. All of the options support this general Provincial objective. All are considered equal.		High In a general sense, Provincial policies promote redevelopment/intensification in proximity to both existing and planned high order transit facilities. All of the options support this general Provincial objective. All are considered equal.		High In a general sense, Provincial policies promote redevelopment/intensification in proximity to both existing and planned high order transit facilities. All of the options support this general Provincial objective. All are considered equal.		High In a general sense, Provincial policies promote redevelopment/intensification in proximity to both existing and planned high order transit facilities. All of the options support this general Provincial objective. All are considered equal.		No difference - not decision relevant
	B4) Potential to achieve the goals and objectives of applicable Urban Design Guidelines	B4.1) Potential opportunities for urban design and streetscape improvements (including safety considerations at stations).	Qualitative assessment of the level of conformity with applicable Urban Design Guidelines. [High is preferred]	PP	High options 1 (and 2) have the highest potential for urban design enhancement due to its proximity to the higher density mixed use area at Markham Road and Sheppard Avenue and an integrated station with the existing Mall (Malvern Town Centre).	●	High options 1 (and 2) have the highest potential for urban design enhancement due to its proximity to the higher density mixed use area at Markham Road and Sheppard Avenue and an integrated station with the existing Mall (Malvern Town Centre).	●	Moderate Option 3 provides a unique opportunity to enhance an abandoned rail corridor and an integrated station with the existing Mall (Malvern Town Centre).	◕	Low Option 4 creates challenges for streetscape enhancement along Neilson Road and does not relate to any existing or potential development surrounding the Malvern Town Centre.	◑	
SUMMARY					1	●	1	●	2	◕	3	◑	N1 and N2 are most consistent with current planning policy and offer the greatest opportunity for transit supportive development. N4 is situated in existing transportation corridors and is surrounded by stable low density development with limited opportunity to encourage/attract more transit oriented development.

Note: This table summarizes the analysis and evaluation undertaken in the spring/summer of 2008 in support of evaluation presented at Public Information Centre # 3 on June 2, 2009

SRT Extension - Pre-planning Alignment Decisions

Objectives	Criteria	Indicators		Data by	North Option 1 (EA Modified, Parkborough, Markham Rd, CP Rail Corridor)		North Option 2 (Markham Rd, CP Rail Corridor)		North Option 3 (Progress, Abandoned Rail/Hydro Corridor) Above Grade		North Option 4 (401, Neilson)		
C) Improve rapid transit service to North East Scarborough	C1) Minimize travel time to commute into north east Scarborough	C1.1) the travel time along segment.	Total travel time based on average speed . (36 km/h) in minutes.[Lower number is preferred]	URS	7.5	◑	7.5	◑	5.7	●	6.7	◕	
	C2) Maximize convenience for riders	C2.1) Coverage provided by Bellamy Station	Number of Multi-unit residential buildings within 500m Catchments.[Higher number is preferred]	URS									No difference - not decision relevant
			Number of Commercial Buildings within 500m Catchments.[Higher number is preferred]	URS									No difference - not decision relevant
			Number of existing bus routes intercepted by station.[Higher number is preferred]	URS									No difference - not decision relevant
		C2.2) Coverage provided by Centennial Station	Number of Multi-unit residential buildings within 500m Catchments.[Higher number is preferred]	URS	1		1		1		1		No difference - not decision relevant
			Number of Commercial Buildings within 500m Catchments.[Higher number is preferred]	URS	9		9		9		9		No difference - not decision relevant
			Number of existing bus routes intercepted by station.[Higher number is preferred]	URS	1		1		1		1		No difference - not decision relevant
		C2.3) Coverage provided by Sheppard Station	Number of Multi-unit residential buildings within 500m Catchments.[Higher number is preferred]	URS	18	●	18	●	7	◕	0	◑	N1 and N2 and to a lesser extent N3 provide high order transit service to several high density developments within the Sheppard / Markham area. N4 (at Sheppard) is surrounded by reverse frontage, low density residential development. All rankings are in relative terms. The pies are used to compare the options to each other.
			Number of Commercial Buildings within 500m Catchments.[Higher number is preferred]	URS	5	●	5	●	5	●	0	◕	
			Number of existing bus routes intercepted by station.[Higher number is preferred]	URS	1	●	1	●	1	●	1	●	
		C2.4) Coverage provided by Malvern Station	Number of Multi-unit residential buildings within 500m Catchments.[Higher number is preferred]	URS	13		13		13		13		No difference - not decision relevant
			Number of Commercial Buildings within 500m Catchments.[Higher number is preferred]	URS	1		1		1		1		No difference - not decision relevant
			Number of existing bus routes intercepted by station.[Higher number is preferred]	URS	1		1		1		1		No difference - not decision relevant
	C3) Quality of Transit Service	C3.1) Speed and comfort for passengers	Transit Reliabilty [Quantative]	URS	Exclusive Right of Way provides highest transit reliability		Exclusive Right of Way provides highest transit reliability		Exclusive Right of Way provides highest transit reliability		Exclusive Right of Way provides highest transit reliability		No difference - not decision relevant
	C4) Flexibility	C4.1)Potential for future extension to North/East	Subjective	URS	High		High		High		High		No difference - not decision relevant
	C5) GO Transit Expansion GO Transit is hoping to expand its services north of Sheppard Ave.	C5.1) Potential impacts on future GO transit expansion plans	Subjective [fewer potential conflicts wih t GO transit's plans are preferred]	URS	May Affect future GO expansion. There are current plans within that corridor to have expansion.	◕	May Affect future GO expansion. There are current plans within that corridor to have expansion.	◕	No impact - Does not go near GO corridors.	●	No impact - Does not go near GO corridors.	●	The use of the CP corridor (N1 and N2) may preclude the introduction of commuter rail service to Peterborough in the CP corridor and therefore these options are least preferred.
Summary					2	◕	2	◕	1	●	3	◑	N3 provides reasonable service to the existing high density areas of Markham and Sheppard and the fastest service to the high density areas within Malvern and therefore is the most preferred. N1 and N2 provide slightly better service to the Markham / Sheppard Area but much slower service to Malvern.

Note: This table summarizes the analysis and evaluation undertaken in the spring/summer of 2008 in support of evaluation presented at Public Information Centre # 3 on June 2, 2009

SRT Extension - Pre-planning Alignment Decisions

Objectives	Criteria	Indicators		Data by	North Option 1 (EA Modified, Parkborough, Markham Rd, CP Rail Corridor)		North Option 2 (Markham Rd, CP Rail Corridor)		North Option 3 (Progress, Abandoned Rail/Hydro Corridor) Above Grade		North Option 4 (401, Neilson)		
D) Connect SRT to Proposed Sheppard LRT	D1) Quality of the connection	D1.1) Potential to establish Quality connection within the Rapid Transit Station	Subjective	URS	High		High		High		High		No difference - not decision relevant
E) Improve Rapid Transit service to Centennial College	E1) Opportunity to connect to Centennial College	E1.1) Walking distance from centre of college to station. (m)	Linear Meters [shorter walking distance is preferred]	URS	475	◕	475	◕	475	◕	330	●	Although N4 provides a station closer to the main area of campus, all options provide significantly improved transit service to Centennial College.
F) Accommodate Future Increase in Ridership Demand	F1) Capacity that meet future transit ridership forecasts	F1.1) Capacity that meet future transit ridership forecasts	Yes/No	URS	Yes		Yes		Yes		Yes		No difference - not decision relevant
G) Cost	G1) Total cost	G1.1) Order of Magnitude cost from McCowan Station to Malvern Town Centre (excluding yard)	2008 ($) [Low is preferred]	URS	Moderate Cost in comparison to all options	◕	Moderate Cost in comparison to all options	◕	Lowest Cost in comparison to all options	●	Moderate Cost in comparison to all options	◕	It is possible to implement the lowest cost solution in the N3 corridor. Even with consideration of significant mitigation measures, N3 can be implemented for approximately the same cost as N1, N2 and N4
		G1.2) Cost for Yard	2008 ($) - [Low is preferred]	URS	N/A - see south		N/A - see south		N/A - see south		N/A - see south		No difference - not decision relevant
		G1.3) Property Cost	Area Property required (excluding yard) [Lower area is preferred]	URS	6.0 ha	◔	4.5 ha	◑	2.2 ha	◕	1.9 ha	●	Anticipated property costs in proportion to the overall area. Therefore, preference is based on lowest area to highest area.
			# of Properties impacted by Yard (both Full & Partial Acquisition) [Lower area is preferred]	URS	N/A - see south		N/A - see south		N/A - see south		N/A - see south		No difference - not decision relevant
		G1.4) Minimize Operating Costs	Total length of alignment.(m) [Lower length is preferred]	URS	4503.00	◑	4500.00	◑	3415.00	●	4024.00	◕	The shorter alignment of N3 will result in overall lower operating costs and thus is most preferred. N1 and N2 are anticipated to have the highest operating cost and therefore are least preferred.
	G2) Constructibility of Stations	G2.1) Ease of Constructibility	Subjective [Lower complexity is preferred]	URS	Although not as complex as N2, the Sheppard / Markham station will have similar challenges.	◕	Sheppard/Markham Station - station must span very large, busy intersection with significant challenges in providing vertical, barrier free access to the station. Complex traffic staging and management required.	◑	Drainage channel crossing may require pumping / dewatering.	●	Although not as complex as N1, the Sheppard / Markham station will have similar challenges. Long curved bridge over Highway 401 in the vicinity of the Neilson interchange is more complexe than perpendicular crossing required for N1, N2 and N3	◕	
	G3) Yard Location/Capacity	G3.1) Opportunity for new yard along alignment.	Subjective	URS	N/A - see south		N/A - see south		N/A - see south		N/A - see south		No difference - not decision relevant
SUMMARY					2	◑	2	◔	1	●	1	◕	N3 will result in the lowest operating costs, potentially the lowest construction cost and is the simplest to construct and thus is most preferred. Even with an underground section through the stable residential areas of Malvern (to mitigate impacts), this can be constructed at equal or less cost in comparison to N1, N2, and N4 N2 (and N1) will have the highest operating costs, would be the most expensive and complex to construct and therefore is least preferred.

Note: This table summarizes the analysis and evaluation undertaken in the spring/summer of 2008 in support of evaluation presented at Public Information Centre # 3 on June 2, 2009

Attachment D: North 3 Segment Alignment Analysis

SRT Extension - Alignment Analysis				
Objectives	**Above Grade**	**Below Grade - covered**	**Below Grade - open cut**	**Comments**
A) Minimize Adverse Environmental Effects	◑	●	◕	Below Grade (covered) would effectively mitigate all concerns raised by the community, namely visual, noise, vibration and loss of community amenities and therefore is most preferred.
B) Support Population and Employment Growth				No difference - not decision relevant
C) Improve rapid transit service to North East Scarborough				No difference - not decision relevant
D) Connect SRT to Proposed Sheppard LRT				No difference - not decision relevant
E) Improve Rapid Transit service to Centennial College				No difference - not decision relevant
F) Accommodate Future Increase in Ridership Demand				No difference - not decision relevant
G) Cost	●	◑	◕	Above grade is the lowest cost. Below grade is the highest cost.
Summary (Rank)	**2**	**1**	**2**	
		Recommended		

SRT Extension - Pre-planning Alignment Decisions
Evaluation of Grading Alternative

Objectives / Descriptions	Criteria	Indicators		Data by	North Option 3 (Progress, Abandoned Rail/Hydro Corridor, Above Grade) Follows Progress Ave through abandonned rail corridor and ends at Malvern Town Centre.		North Option 3 (Progress, Abandoned Rail/Hydro Corridor, Below Grade) Follows Progress Ave through abandonned rail corridor and ends at Malvern Town Centre.		North Option 3 (Progress, Abandoned Rail/Hydro Corridor, Open Cut) Follows Progress Ave through abandonned rail corridor and ends at Malvern Town Centre.		Comments
A) Minimize Adverse Environmental Effects	A1) Protect existing stable land uses.	A1.1) Proximity of proposed alignments to residential neighbourhoods	A1.1.1) Number and area of directly affected residential properties (Properties within the alingment and full buyout of property required)	URS	0		0		0		No difference - not decision relevant
			A1.1.2) Number and area of residential properties immediately adjacent to corridor - partial buyout of property required	URS	0		0		0		No difference - not decision relevant
		A1.2) Proximity of proposed alignments to businesses	A1.2.1) Number and area of directly affected employment properties. (Properties within the alignment and full buyout of property required)	URS	0		0		0		Although there are some differences between each of the alignment. This criteria is not considered to be a major deciding factor.
			A1.2.2) Number and area of employment properties immediately adjacent to corridor - partial buyout of property required	URS	2 Milner Parking, MTC		2 Milner Parking, MTC		2 Milner Parking, MTC		
		A1.3)Proximity of proposed alignments to institutions	A1.3.1)Number & area of parks, schools, or community centre properties directly affected	URS	5 Centennial College, High School, Rosebank Park, Pinetree Park, Chinese Community Centre	◑	2 Centennial College, High School	●	4 Centennial College, High School, Rosebank Park, Chinese Community Centre	◕	Community has voiced strong opposition to elevated solution from Milner to Tapscott so this option is least preferred. A below grade (covered) solution would allow for the retention of all community facilities with only modest impacts on the High School. Although there would be some effect on the college, the benefits to the college outweigh the impacts.
		A4.1) Indirect Community Impacts	A 1.4.1) Potential Visual Impacts	URS	High	◑	Low	●	Medium	◕	Community has voiced strong opposition to elevated solution from Milner to Tapscott so this option is least preferred. A below grade (covered) solution would mitigate most visual impacts along the corridor.
			A 1.4.2) Potential Noise Impacts	SS Wilson	Low	◑	No impacts	●	Low to no impacts	◕	
			A 1.4.3) Potential Vibration Impacts	SS Wilson	Low		Low		Low		Advancements in track design allows vibration to be mitigated - therefore there is no difference in these options - not decision relevant.
			A 1.4.4) Impact on accessibility to/from properties		4		4		4		No difference - not decision relevant
	A2) Minimize the potential effects on important natural features	A2.1) important natural heritage features within the zone of influence of the Network Alternatives.	A 2.1.1) Number of Designated Natural Areas ESA, PSW, ANSI.	LGL	None present		None present		None present		No difference - not decision relevant
			A 2.1.2 Number of Watercourse Crossings	LGL	1 crossing of Malvern Branch at Mammoth Hall Trail and 1 parallel section of alignment along Markham Branch immediately east of Hwy. 48		1 crossing of Malvern Branch at Mammoth Hall Trail and 1 parallel section of alignment along Markham Branch immediately east of Hwy. 48		1 crossing of Malvern Branch at Mammoth Hall Trail and 1 parallel section of alignment along Markham Branch immediately east of Hwy. 48		No difference - not decision relevant
			A 2.1.3) Type(s) of terrestrial natural heritage features (ELC classification)	LGL	BLO1 - located at parallel alighnment area, steep, unstable bank. -CUT1 at creek crossing at Mammoth Hall Trail		BLO1 - located at parallel alighnment area, steep, unstable bank. -CUT1 at creek crossing at Mammoth Hall Trail		BLO1 - located at parallel alighnment area, steep, unstable bank. -CUT1 at creek crossing at Mammoth Hall Trail		No difference - not decision relevant
			A 2.1.4) Significance of natural heritage features)	LGL	Minor for cultural thicket ecosites, Major for bluff area		Minor for cultural thicket ecosites, Major for bluff area		Minor for cultural thicket ecosites, Major for bluff area		No difference - not decision relevant
			A 2.1.5) Resiliency of natural heritage features (low, medium, high)	LGL	High for cultural ecosites,Low for bluff area as significant mitigation and restoration would be required		High for cultural ecosites,Low for bluff area as significant mitigation and restoration would be required		High for cultural ecosites,Low for bluff area as significant mitigation and restoration would be required		No difference - not decision relevant
		A2.2) Potential Effects on Hydrology	A 2.2.1) Area of flood storage capacity removed (hectares).	URS	2690		1022.6 m² Markham/Progress		2690		Although there are some differences between each of the alignment. This criteria is not considered to be a major deciding factor.
			A 2.2.2) Length of alignment within TRCA regulated area.	URS	289		225m Progress Only 2nd River Crossing Underground		289		
	A3) Minimize the potential effects on important cultural features:	A3.1) important cultural heritage features within the zone of influence of the SRT extension	# of potential cultural heritage features	URS (Archaeology)	0		0		0		No difference - not decision relevant
		A3.2) Archaeological Features	# of potential archaeological features	URS (Archaeology)	0		0		0		No difference - not decision relevant
SUMMARY						◑		●		◕	Below Grade (covered) would effectively mitigate all concerns raised by the community, namely visual, noise, vibration and loss of community amenities and therefore is most preferred.

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SRT Extension - Pre-planning Alignment Decisions
Evaluation of Grading Alternative

Objectives / Descriptions	Criteria	Indicators		Data by	North Option 3 (Progress, Abandoned Rail/Hydro Corridor, Above Grade) Follows Progress Ave through abandonned rail corridor and ends at Malvern Town Centre.		North Option 3 (Progress, Abandoned Rail/Hydro Corridor, Below Grade) Follows Progress Ave through abandonned rail corridor and ends at Malvern Town Centre.		North Option 3 (Progress, Abandoned Rail/Hydro Corridor, Open Cut) Follows Progress Ave through abandonned rail corridor and ends at Malvern Town Centre.		Comments
B) Support Population and Employment Growth	B1) Potential effects on projected population/employment growth along the proposed route.	B1.1) The indicators for conformity include whether or not the planned route promotes development intensification in proximity to station locations and subsequently enhances transit ridership.	Qualitative assessment of the redevelopment potential within 500 metres (approximately 5 minutes) of a proposed transit stop/station.	PP	Moderate / High - Options 3 ranks moderate high due not as central station location to Markham Road/Sheppard node but is central for the Malvern Town Centre lands where a number of high density development opportunities exist.		Moderate / High - Options 3 ranks moderate high due not as central station location to Markham Road/Sheppard node but is central for the Malvern Town Centre lands where a number of high density development opportunities exist.		Moderate / High - Options 3 ranks moderate high due not as central station location to Markham Road/Sheppard node but is central for the Malvern Town Centre lands where a number of high density development opportunities exist.		No difference - not decision relevant
	B2) Conformity with existing Official Plan.	B2.1) The indicators for conformity include whether or not the proposed route is anticipated by the planning document and whether or not the planned route will have a positive or negative impact on the planned urban structure.	Qualitative assessment of the level of conformity with the City's Official Plan.	PP	Moderate The City of Toronto Official Plan identifies on maps 1 and 4 Markham Road as the "Transit Corridor". Markham Road is also identified as a "Transit Priority Segment". As such, Options 1 and 2, which utilize the Markham Road corridor for transit are considered to have high conformity. Options 2 and 4, while providing the North-South function, utilize alternative corridors, and that results in a lower		Moderate The City of Toronto Official Plan identifies on maps 1 and 4 Markham Road as the "Transit Corridor". Markham Road is also identified as a "Transit Priority Segment". As such, Options 1 and 2, which utilize the Markham Road corridor for transit are considered to have high conformity. Options 2 and 4, while providing the North-South function, utilize alternative corridors, and that results in a lower conformity rating.		Moderate The City of Toronto Official Plan identifies on maps 1 and 4 Markham Road as the "Transit Corridor". Markham Road is also identified as a "Transit Priority Segment". As such, Options 1 and 2, which utilize the Markham Road corridor for transit are considered to have high conformity. Options 2 and 4, while providing the North-South function, utilize alternative corridors, and that results in a lower		No difference - not decision relevant
	B3) Conformity with existing Provincial plans and policies.	B3.1) The indicators for conformity include whether or not the proposed route is anticipated by the planning document and whether or not the planned route promotes development intensification in proximity to station locations and subsequently enhances tra	Qualitative assessment of the level of conformity with Provincial plans and policies.	PP	High In a general sense, Provincial policies promote redevelopment/intensification in proximity to both existing and planned high order transit facilities. All of the options support this general Provincial objective. All are considered equal.		High In a general sense, Provincial policies promote redevelopment/intensification in proximity to both existing and planned high order transit facilities. All of the options support this general Provincial objective. All are considered equal.		High In a general sense, Provincial policies promote redevelopment/intensification in proximity to both existing and planned high order transit facilities. All of the options support this general Provincial objective. All are considered equal.		No difference - not decision relevant
	B4) Potential to achieve the goals and objectives of applicable Urban Design Guidelines	B4.1) Potential opportunities for urban design and streetscape improvements (including safety considerations at stations).	Qualitative assessment of the level of conformity with applicable Urban Design Guidelines.	PP	Moderate Option 3 provides a unique opportunity to enhance an abandoned rail corridor and an integrated station with the existing Mall (Malvern Town Centre).		Moderate Option 3 provides a unique opportunity to enhance an abandoned rail corridor and an integrated station with the existing Mall (Malvern Town Centre).		Moderate Option 3 provides a unique opportunity to enhance an abandoned rail corridor and an integrated station with the existing Mall (Malvern Town Centre).		No difference - not decision relevant
SUMMARY											No difference - not decision relevant

Note: This table summarizes the analysis and evaluation undertaken in the spring/summer of 2008 in support of evaluation presented at Public Information Centre # 3 on June 2, 2009

SRT Extension - Pre-planning Alignment Decisions
Evaluation of Grading Alternative

Objectives / Descriptions	Criteria	Indicators		Data by	North Option 3 (Progress, Abandoned Rail/Hydro Corridor, Above Grade) Follows Progress Ave through abandonned rail corridor and ends at Malvern Town Centre.		North Option 3 (Progress, Abandoned Rail/Hydro Corridor, Below Grade) Follows Progress Ave through abandonned rail corridor and ends at Malvern Town Centre.		North Option 3 (Progress, Abandoned Rail/Hydro Corridor, Open Cut) Follows Progress Ave through abandonned rail corridor and ends at Malvern Town Centre.		Comments
C) Improve rapid transit service to North East Scarborough	C1) Minimize travel time to commute into north east Scarborough	C1.1) the travel time along segment.	Total travel time based on average speed . (36 km/h) in minutes.	URS	5.7		5.7		5.7		No difference - not decision relevant
	C2) Maximize convenience for riders	C2.1) Coverage provided by Bellamy Station	Number of Multi-unit residential buildings within 500m Catchments.	URS							No difference - not decision relevant
			Number of Commercial Buildings within 500m Catchments.	URS							No difference - not decision relevant
			Number of existing bus routes intercepted by station.	URS							No difference - not decision relevant
		C2.2) Coverage provided by Centennial Station	Number of Multi-unit residential buildings within 500m Catchments.	URS	1		1		1		No difference - not decision relevant
			Number of Commercial Buildings within 500m Catchments.	URS	15		15		15		No difference - not decision relevant
			Number of existing bus routes intercepted by station.	URS	1		1		1		No difference - not decision relevant
		C2.3) Coverage provided by Sheppard Station	Number of Multi-unit residential buildings within 500m Catchments.	URS	7		7		7		No difference - not decision relevant
			Number of Commercial Buildings within 500m Catchments.	URS	5		5		5		No difference - not decision relevant
			Number of existing bus routes intercepted by station.	URS	1		1		1		No difference - not decision relevant
		C2.4) Coverage provided by Malvern Station	Number of Multi-unit residential buildings within 500m Catchments.	URS	13		13		13		No difference - not decision relevant
			Number of Commercial Buildings within 500m Catchments.	URS	1		1		1		No difference - not decision relevant
			Number of existing bus routes intercepted by station.	URS	1		1		1		No difference - not decision relevant
	C3) Quality of Transit Service	C3.1) Speed and comfort for passengers	Transit Reliabilty	URS	Exclusive Right of Way provides highest transit reliability		Exclusive Right of Way provides highest transit reliability		Exclusive Right of Way provides highest transit reliability		No difference - not decision relevant
	C4) Flexibility	C4.1)Potential for future extension to North/East	Subjective	URS	High		High		High		No difference - not decision relevant
	C5) GO Transit Expansion	C5.1) Potential impacts on future GO transit expansion plans	Subjective	URS	No impact		No impact		No impact		No difference - not decision relevant
SUMMARY											No difference - not decision relevant

Note: This table summarizes the analysis and evaluation undertaken in the spring/summer of 2008 in support of evaluation presented at Public Information Centre # 3 on June 2, 2009

SRT Extension - Pre-planning Alignment Decisions
Evaluation of Grading Alternative

Objectives / Descriptions	Criteria	Indicators		Data by	North Option 3 (Progress, Abandoned Rail/Hydro Corridor, Above Grade) Follows Progress Ave through abandonned rail corridor and ends at Malvern Town Centre.		North Option 3 (Progress, Abandoned Rail/Hydro Corridor, Below Grade) Follows Progress Ave through abandonned rail corridor and ends at Malvern Town Centre.		North Option 3 (Progress, Abandoned Rail/Hydro Corridor, Open Cut) Follows Progress Ave through abandonned rail corridor and ends at Malvern Town Centre.		Comments
D) Connect SRT to Proposed Sheppard LRT	D1) Quality of the connection	D1.1) Potential to establish Quality connection within the Rapid Transit Station	Subjective	URS	High		High		High		No difference - not decision relevant
E) Improve Rapid Transit service to Centennial College	E1) Opportunity to connect to Centennial College	E1.1) Walking distance from centre of college to station. (m)	Linear Meters	URS	475		475		475		No difference - not decision relevant
F) Accommodate Future Increase in Ridership Demand	F1) Capacity that meet future transit ridership forecasts	F1.1) Capacity that meet future transit ridership forecasts	Yes/No	URS	Yes		Yes		Yes		No difference - not decision relevant
G) Cost	G1) Total cost	G1.1) Order of Magnitude cost from McCowan Station to Malvern Town Centre (excluding yard)	2008 ($)	URS	Lowest Cost compared to other options	●	Highest Cost compared to other options	◑	Moderate Cost compared to other options	◕	
		G1.2) Cost for Yard	2008 ($)	URS	N/A - see south		N/A - see south		N/A - see south		No difference - not decision relevant
		G1.3) Property Cost	Area Property required - in m2 (excluding yard)	URS	2.2 ha		2.2 ha		2.2 ha		No difference - not decision relevant
			# of Properties impacted by Yard (both Full & Partial Acquisition)	URS	N/A - see south		N/A - see south		N/A - see south		No difference - not decision relevant
		G1.4) Minimize Operating Costs	Total length of alignment.	URS	3415		3415		3415		No difference - not decision relevant
	G2) Constructibility of Stations	G2.1) Ease of Station Constructibility	Subjective	URS	Drainage channel crossing may require pumping / dewatering.		Drainage channel crossing may require pumping / dewatering.		Drainage channel crossing may require pumping / dewatering.		No difference - not decision relevant
	G3) Yard Location/Capacity	G3.1) Opportunity for new yard along alignment.	Subjective	URS	N/A - see south		N/A - see south		N/A - see south		No difference - not decision relevant
	SUMMARY					●		◑		◕	Above grade is the lowest cost. Below grade is the highest cost.

O:\3-33015779-ScarboroughRapidTransit\Documents\15 - EA\01 - Final Report\03 - Appendices\Appendix A - Alternative Analysis\Working\A-4\[Alignment Analysis North.xls]N3 Alternatives

Appendix A

Alternative Analysis

Appendix A-5 – Alignment Refinement Options

Memorandum

To: Scott Thorburn

From: David Fang

c.c. Eugene Chen

Reference: SRT Extension

Subject: Alignment East of Markham Road

Analysis and Consultation from original 1992 EA

In the 1992 EA, 6 alternative alignments were developed for the section from west of Markham Road to north of Highway 401, as shown on Figure 1. Based on extensive analysis and evaluation, 'Z' and 'T' were chosen for further consideration. Further analysis led to a recommendation of alignment 'T' as the preferred alignment because there were fewer impacts to the natural environment in the area, it provided better operational characteristics and provided a preferable location for the station to capture ridership around Markham Road. The preferred alternative (T) places the station and alignment less than 10 m away from the northwest corner of the Armenian Community Centre and required a walkway along their north property edge to connect Centennial College to the SRT station (see Figure 2).

The Armenian Church and AGBU expressed concerns over the preferred alignment and suggested that alignment Z, Y, X or W be selected instead (see attached correspondence).

Changes since the 1992 EA

Since the completion of the 1992 EA, two major changes have occurred in the immediate study area. Progress Avenue was extended over the 401 and two developments comprising a large manufacturing operation and a multi-storey property were constructed along the eastern side of Progress (between Highway 401 and Milner Avenue).

Also, recognizing the greater potential to attract transit ridership, one of the objectives of this new EA is to provide higher-order transit service to the students and the staff of Centennial College. The preferred alignment of the 1992 EA, which is located west of the Holy Trinity Armenian Church, has no direct connection to Centennial College. Therefore, an alignment that generally follows the 1992 EA second choice (Alignment Z) is preferred as it provides superior service to the Community College and has the lowest impact on the natural environment (relative to the other 1992 alignments of W, X and Y).

Refinements to the Alignment considered as part of the this study

As part of this new EA, URS re-evaluated two alignment options for the section from Markham Road to Highway 401 (See Figure 3).

The first alignment (Option 1) runs north of the McDonald's Restaurant, crosses Markham Road, runs adjacent to the north side of East Highland Creek and subsequently follows Progress Avenue to the north. This alignment is similar to Alignment 'Z' of the 1992 EA.

This alignment crosses East Highland Creek twice to the west of Markham Road. To minimize environmental impacts, the number of crossings of the creek should be minimized and the distance between crossings should be maximized. The alignment, however, is across from the Armenian Holy Trinity Church and will result in less impact due to noise and vibration, as compared to the preferred alignment of the 1992 EA.

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75 Commerce Valley Drive East
Markham, ON Canada L3T 7N9
Tel: 905.882.4401
Fax: 905.882.4399
www.urs.ca

The second alignment (Option 2) runs between the McDonald's Restaurant property and Global Kingdom Ministries' property. The alignment crosses Markham Road, goes through the forest south of East Highland Creek and subsequently realigns with Progress Avenue to the north. This alignment is similar to Alignment 'W' of the 1992 EA.

This alignment requires the removal or more vegetation, as the alignment cuts through part of Morningside Park. In addition, this alignment is located in the vicinity of the condominium building at 1275 Markham Road. During the 1992 EA, the owners of the condominium had concerns over the location of the alignment relative to the building. These concerns included the noise and vibration impacts to the building and the access and egress to and from the building using the center lane of Markham Road. A copy of this letter is provided (see attached).

Due to the adverse impacts that the second alignment option has on the social and natural environment, Option 1 (original 1992 EA – option Z) is the recommended alignment.

Alignment Straightening at Markham and Sheppard

After it was determined that Option 1 was preferred, a second study was conducted to determine if further improvements could be made. As a result, URS evaluated two alignment options for the section from Markham Road to Highway 401 (See Figure 4). While these two options were developed based on Alignment Z of the 1992 EA, the impacts of each option to the surrounding environment varies.

The first alignment (Option 1) is the same alignment as previously described. Technical issues with this alignment include horizontal geometry of the alignment. There is a concern in the pair of reverse curves located west of Markham Road. Operationally, this reverse curve is significant as it would result in a lower operating speed across this section. To achieve this alignment configuration, the radius of the curve at around station 10+000 is restricted to 250m and thus an operating speed of 45km/hr (assuming a maximum 0.1m of superelevation would be imposed). In addition, the second curve is restricted to a radius of 340m, resulting in an operating speed of 55km/hr. With a subsequent 250m radius curve (45km/hr) under 130m away, the maximum possible speed through this section would be about 55km/hr. The resultant time it would take to travel through this section is approximately 32 seconds. In addition, the presence of the reverse curves at a relatively low radius would result in greater wear and tear of the rails and increased noise compared to a tangent section.

The second alignment (Option 1A) runs south of the McDonald's Restaurant and continues in the north east direction on tangent to the curve that transitions into Centennial College Station.

Technical issues with this alignment include the removal of more vegetation, as the Alignment cuts across a part of Morningside Park, impacts to the McDonald's Restaurant, and the placement and height of columns along this section.

A meeting with representatives from McDonald's Corporation was held on February 23, 2010 (see Minutes of Meeting attached) to discuss the alignment options. In this meeting, the representatives showed a preference to the first alignment (Option 1). The second alignment would cross over the driveway into the restaurant and subsequently cross in front of the restaurant, potentially blocking the view of its customers. In addition, they are concerned that potential locations of columns may affect sightline distances for drivers entering and exiting the establishment. A rendering of the possible column impact was created for Option 1A (see Figure 5).

The placement of columns for this alignment is also an area where issues exist. In general, columns should be placed a maximum of 40 – 60m apart from each other. Due to the angle at which the alignment crosses Markham Road, a column will be required within the right-of-way of Markham Road. To avoid impacts to traffic lanes, the column would be located in the centre median of Markham Road. On the west side of Markham Road, the location of the column would be restricted due to the McDonald's Restaurant driveway. On the east side of Markham Road, underground utilities would limit the location of the columns. In order to place a column in this area, various utilities would have to be relocated. Possible locations for the columns in this area are also provided in Figure 6.

In addition to the placement of columns, the underside of the structure reaches over 20m higher than the existing elevation at the creek east of Markham Road. Depending on the location of the columns, the height of some of the columns could be above 20m. This would result in an increased cost to the project.

While there are some issues to this alignment, there are also benefits. The configuration of this alignment allows an increase to the radius of the curve at station 10+000, up to a possible 500m radius. With a 500m radius curve, the operating speed through the curve would be 65km/hr (assuming a maximum superelevation of 0.1m). In addition to the increased speed through the curve, this speed can be maintained along the tangent east of the curve until the approach to the 250m curve leading into Centennial Station, as tangent sections have a designed operational speed of 80km/hr. Within this section, the travel time is estimated to be 22 seconds, which is 10 seconds faster than Option 1. In addition, with a higher radius curve and in the absence of a second curve, general wear and tear of the rails would be reduced, resulting in lower maintenance costs. A comparison of the operating speeds through the curves as well as the travel time through this section is provided in Figure 4.

This option would cross the creek on the east side of Markham Road. According to existing conditions, the alignment would cross the creek in a way such that the crossing would span nearly 100m. However, Toronto Water has approved plans, separate from the SRT Extension, to realign the existing creek. With the realignment of the creek, the impact of the crossing of the alignment above the creek is minimized. The realignment of the creek is shown on Figure 7.

Option 1A is recommended as the preferred alignment through this section.

Centennial Station

A station in the vicinity of Centennial College will serve as the connection for the students and staff of the institution to a higher-order transit system. There are 2 possible locations where this station could be placed - on the east side of Progress Avenue, adjacent to the Centennial College parking lot (E-Option), or on the west side of Progress Avenue, adjacent to the Centennial College Student Residence (W-Option) . These station locations are analyzed in the following section and are shown in Figure 8. The location for the E-Option provides Centennial College students and staff better access to the station compared to the W-Option.

The station location also dictates the location of the alignment north of the station. Figure 8 also shows the alignment opportunities north of Highway 401. The location of the W-Option allows the alignment to cross Highway 401 and subsequently run along the edge of the parking lots to Milner Avenue, where the alignment (Option A) turns and travels north on the east side of Progress Avenue. Through this section, the alignment transitions from an above ground to an underground section. The only impacts associated with this alignment are the displacement of some existing surface parking and the required closure of the Milner Business Court / Progress Avenue intersection. The latter can be mitigated through the introduction of a new set of traffic signals at Milner Avenue and Milner Business Court (see Appendix G).

There are 2 possible alignments running from the E-Option station location. First, similar to the W-Option, the alignment runs north past Highway 401 and continues north past Milner Avenue (Option B). The path of this alignment, however, would run into both buildings on the east side of Progress, south of Milner Avenue. This would require both buildings to be demolished which would be a significant adverse economic impact for the area and the project. As a result this option is not be carried forward for further analysis

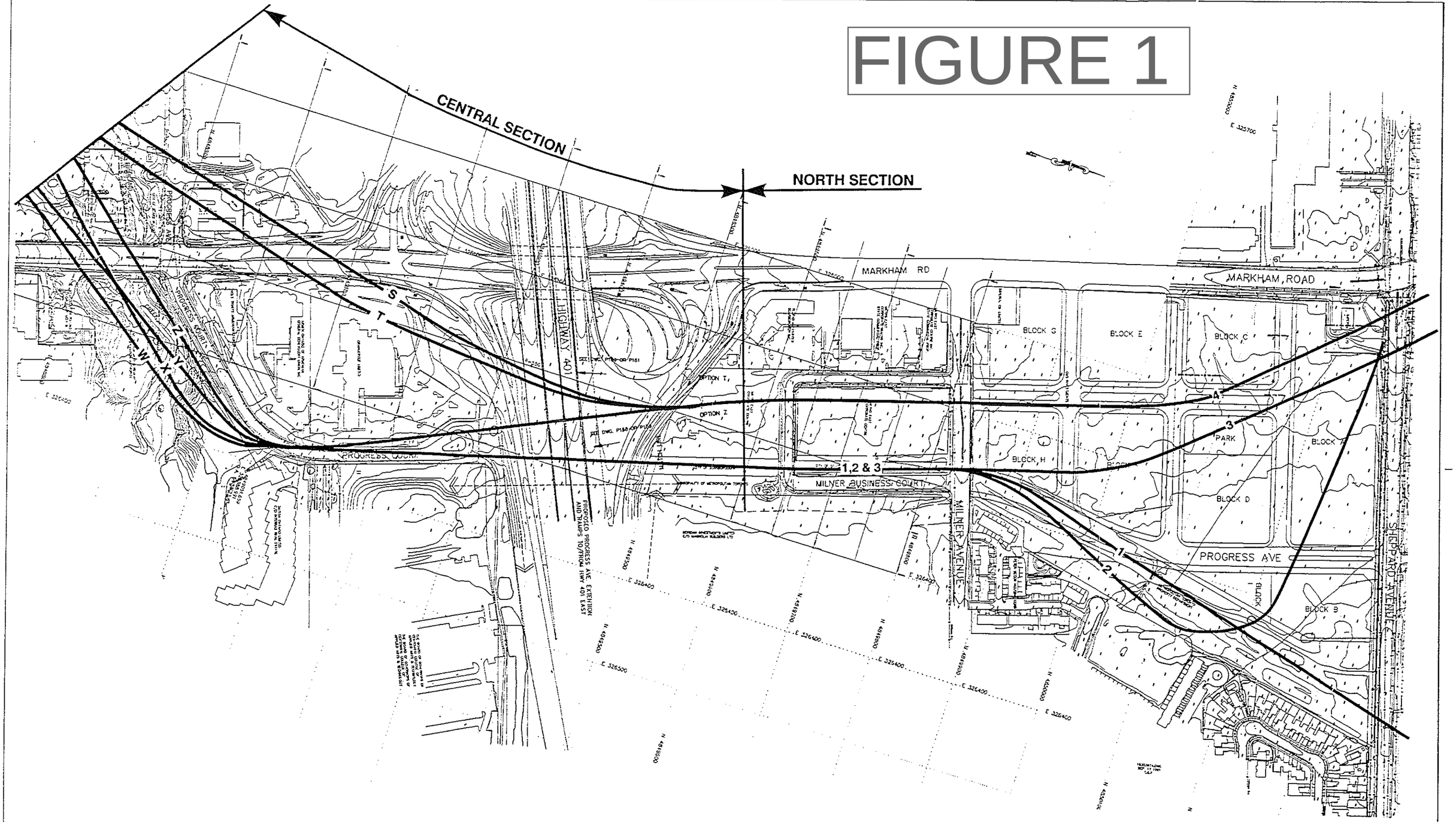
The second alignment running from the E-Option station location (Option C) runs north past Highway 401 and crosses to the west side of Progress Avenue to avoid the buildings on the east side of Progress Avenue, and subsequently follows the same path as the alignment created for the W-Option. While this option avoids property impacts, the clearance required to cross Progress Avenue would prevent transition to a below-grade structure before Milner Avenue. To mitigate this, Progress Avenue would have to be realigned such that the SRT alignment does not cross over the road. This will allow the SRT structure to transition to a below grade running structure before reaching Milner Avenue.

To minimize the impacts to the residents adjacent to the abandoned rail corridor, a below grade structure north of Sheppard Avenue was selected during the preliminary planning stages. Either of Option A or Option C will achieve this. However, Option C would result in significant challenges for future maintenance of both the existing Progress Avenue bridge and the new SRT structure. Furthermore, the realignment of Progress Avenue north of Highway 401 would add costs and adversely affect driveways for the commercial properties on the east side of Progress Avenue, between Highway 401 and Milner Avenue. Option A provides the flexibility to allow the alignment to transition underground while limiting the impacts to residential and commercial buildings.

While the E-Option station location provides better access for Centennial College students and staff, the W-Option would have significantly less impacts to the road and businesses north of Highway 401. As a result, the W-Option station location is the preferred option for the location of Centennial College Station.

The Option 1a alignment coupled with the W-option for Centennial College Station is the preferred option for the SRT alignment through this section (See Figure 9). The combined option satisfies the requirements for higher-order transit access for Centennial College, provides flexibility for the alignment and minimizes impacts to the economic environment to the north.

FIGURE 1



LET'S MOVE

Ontario

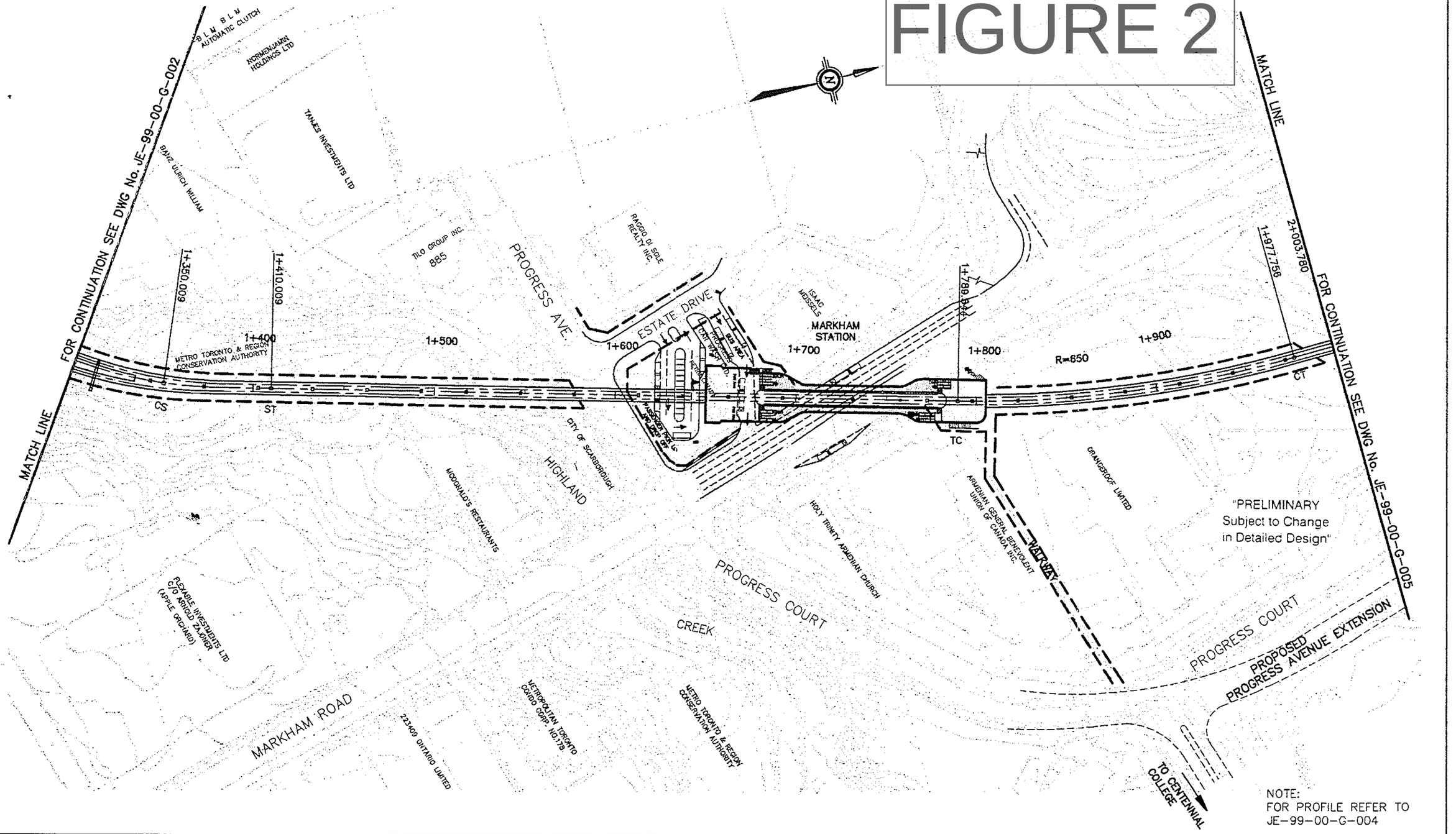
Toronto Transit Commission

Fenco
FENCO ENGINEERS INC.

RECOMMENDED ALIGNMENT T → 4

FIGURE 5.5.2
ALIGNMENT ALTERNATIVES
CENTRAL AND NORTH SECTIONS

FIGURE 2



BLDG. REF. No

FILE

SHEET No

DRAWING No

LET'S MOVE

Ontario

Toronto Transit Commission

Fenco
FENCO ENGINEERS INC.

SCARBOROUGH RAPID TRANSIT LINE EXTENSION
McCOWAN STATION - SHEPPARD EAST STATION
FUNCTIONAL DESIGN

HORIZ. 50m 1 : 2000 50m

DATE : 1992/APRIL/

HORIZONTAL ALIGNMENT
STA. 1+300 TO STA. 2+000

DWG No. JE-99-00-G-003

PLATE No. 3

T.C.P. PLATE 1

CADD FILE NAME: O:\3-33015779-ScarboroughRapidTransit\CADD\DGN\Current Design\Civil\Options\URS_07s_plan_Alignment_Markham_EA_Section.dgn

OPTION 1

HOLY TRINITY ARMENIAN CHURCH

PROGRESS AVE

67.355

117.97

41.486

EAST HIGHLAND CREEK

PREFERRED ALIGNMENT
OPTION 1A

OPTION 2

103.086

130IX

66.863

23.912

1285X

MCDONALDS

MARKHAM RD

GLOBAL KINGDOM MINISTRIES

1240X

1230X

EAST HIGHLAND CREEK

BLDG. REF. No.

FILE

SHEET No.

DRAWING No.

REVISIONS	REVISIONS
	ADDENDUM No. OR CHANGE No. YYYY-MM-DD DESCRIPTION OF CHANGE
	ADDENDUM No. OR CHANGE No. YYYY-MM-DD DESCRIPTION OF CHANGE
	ADDENDUM No. OR CHANGE No. YYYY-MM-DD DESCRIPTION OF CHANGE

URS
URS Architects & Engineers Canada Inc.
75 Commerce Valley Drive East
Markham, Ontario. L3T 7N9
TEL: (905)-882-0160 FAX: (905)-882-1399

DRAWN D. FANG 2009/03/24
CHECKED
CORRECT
SCALE 0 10 20 30 40m

SCARBOROUGH RAPID TRANSIT EA

MARKHAM – PROGRESS ALIGNMENT OPTIONS

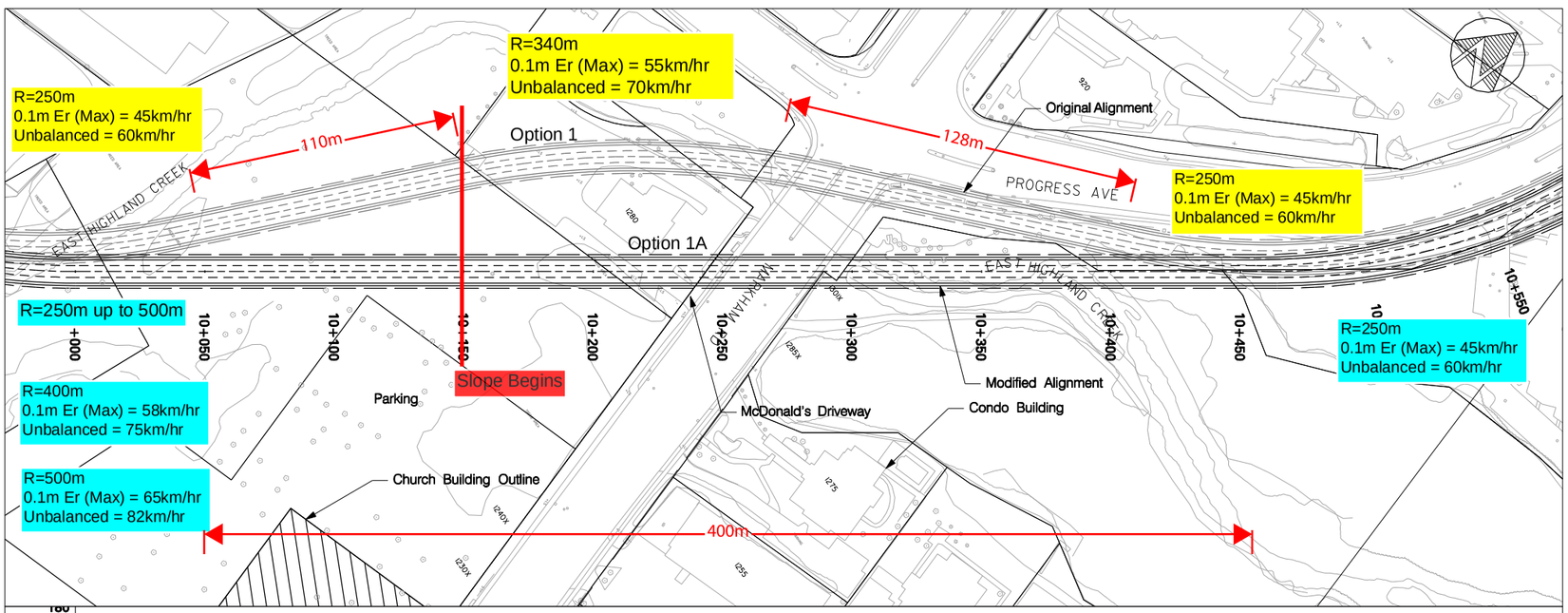
Plot Date: 27/05/2010

TORONTO TRANSIT COMMISSION
ENGINEERING DEPARTMENT

Dwg. No. FIGURE 3

Sheet No.

EAST LOCATION ALIGNMENT REFINEMENT

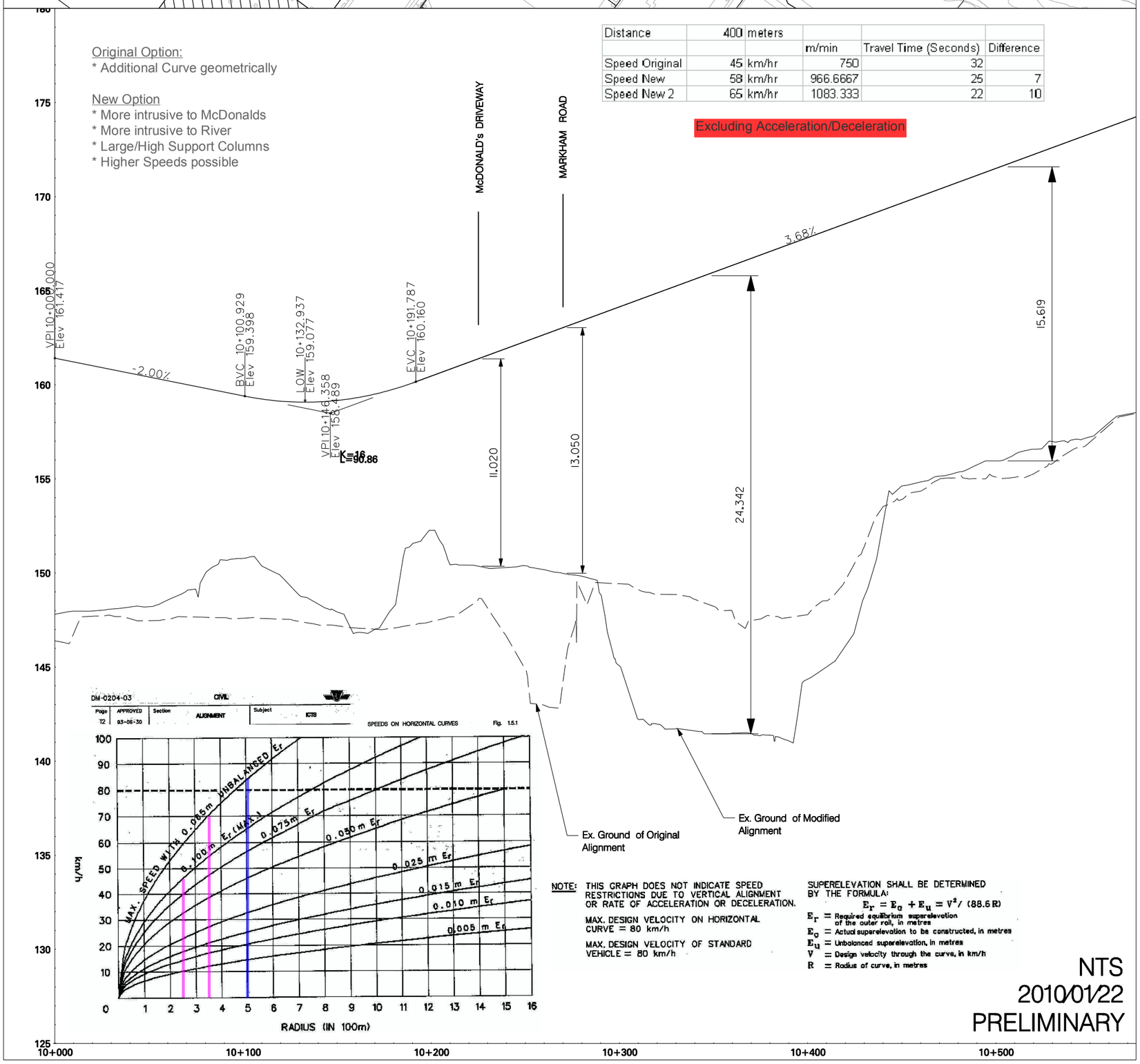


Distance	400	meters			
			m/min	Travel Time (Seconds)	Difference
Speed Original	45	km/hr	750	32	
Speed New	58	km/hr	966.6667	25	7
Speed New 2	65	km/hr	1083.333	22	10

Excluding Acceleration/Deceleration

Original Option:
* Additional Curve geometrically

New Option
* More intrusive to McDonalds
* More intrusive to River
* Large/High Support Columns
* Higher Speeds possible



NOTE: THIS GRAPH DOES NOT INDICATE SPEED RESTRICTIONS DUE TO VERTICAL ALIGNMENT OR RATE OF ACCELERATION OR DECELERATION.

MAX. DESIGN VELOCITY ON HORIZONTAL CURVE = 80 km/h

MAX. DESIGN VELOCITY OF STANDARD VEHICLE = 80 km/h

SUPERELEVATION SHALL BE DETERMINED BY THE FORMULA:

$$E_r = E_a + E_u = V^2 / (88.6R)$$

E_r = Required equilibrium superelevation of the outer rail, in metres
E_a = Actual superelevation to be constructed, in metres
E_u = Unbalanced superelevation, in metres
V = Design velocity through the curve, in km/h
R = Radius of curve, in metres

NTS
2010/01/22
PRELIMINARY

...\URS_07s_plan_Alignment_Centennial Station East Plate 1.dgn 22/01/2010 1:54:36 PM

FIGURE 4

Figure 5: Elevated Structure Across Markham Road