York Region

Clause No. 7 embodied in Report No. 7 of the Rapid Transit Public/Private Partnership Steering Committee was adopted, without amendment, by the Council of The Regional Municipality of York at its meeting on September 18, 2003.

7
HIGHWAY 7 CORRIDOR AND VAUGHAN N-S LINK ENVIRONMENTAL ASSESSMENT RECOMMENDED ALIGNMENT

The Rapid Transit Public/Private Partnership Steering Committee recommends the adoption of the recommendations contained in the following report, September 8, 2003, from the Executive Co-ordinator, York Rapid Transit Plan:

1. RECOMMENDATIONS

It is recommended that:

1. Council endorse, for the purpose of developing the Draft Environmental Assessment (EA) Report.

   - The recommended alignment for surface rapid transit service and the use of both BRT and LRT technologies on portions of that alignment to accommodate the potential for transition from BRT to LRT at some point during the YRTP network evolution.

   - The recommended alignment, within York Region, of an extension of the Spadina Subway from the Downsview Station through York University to the Vaughan Corporate Centre.

2. Copies of this report be forwarded by the Regional Clerk to the Clerks of the Towns of Markham and Richmond Hill and the City of Vaughan.

2. PURPOSE

The purpose of this report is to inform Committee and Council that the Preliminary Preferred Alignment Alternative as described in the report to Steering Committee on August 26, 2003 has been presented to the public and based on the analysis of alternatives and public comments, a preferred alignment has been determined and is recommended for endorsement by Council.

3. BACKGROUND

The Ministry of the Environment (MOE) on June 13, 2003, approved the Terms of Reference for the Highway 7 Corridor and Vaughan N-S Link Environmental Assessment Study.

At the request of the City of Vaughan, the scope of the EA Study for the Vaughan N-S Link included assessment of alignment alternatives for two phases of the YRTP network evolution to facilitate property protection by the City. These comprised, initial implementation of surface rapid transit and, at some point in the future, fully grade-separated rapid transit in the form of an extension of the TTC Spadina Subway into York Region to link with the Highway 7 corridor at Vaughan Corporate Centre.

The Need and Justification Study and the Terms of Reference completed previously, recommended the study area for evaluation of the route alternatives. As illustrated in *(Attachment 1)*, the area extends from the Peel boundary in the west to the Durham boundary in the east and between Steeles Avenue and the 16th Avenue-Carrville Road-Rutherford Road in the north-south direction.

The City of Toronto and the TTC are conducting a parallel Municipal Class EA for improved bus-based rapid transit between York University and the Downsview Subway Station as a precursor to extension of the Spadina Subway Line to the University. The study area for their EA extends to Steeles Avenue opposite the University. In addition the City is seeking Council approval to request proposals for an update of the EA for an extension of the Spadina Subway to York University.

Recently, the City of Vaughan completed two land-use policy and planning studies for the Highway 7 corridor. The first covered the lands between Highway 50 and Bathurst Street and included a major redevelopment study of the lands in the southeast quadrant of the Jane St./Highway 7 intersection. The second studied the lands north of Steeles Avenue between Jane and Keele Streets. The recommendations of these studies have been considered in evaluating rapid transit routes. Markham is planning to initiate a similar study of its portion of the Highway 7 corridor.

The results of the evaluation of alignment alternatives will be presented at Public Information Centres (PIC's) scheduled for Sept 18, 19 and 20th.

4. ANALYSIS AND OPTIONS

Given that the Highway 7 Corridor study area extends over 44 km east-west across three municipalities, the analysis of alignment options was done on a segmental basis using the four segments identified for the preliminary screening described in the Terms of Reference. The first phase of the EA developed alignment alternatives along the route options in each of the four Highway 7 linear segments and the Vaughan N-S Link shown in *(Attachment 1)*.

These alignment alternatives were first presented to the Public at the second series of Public Information Centres held at three locations in April. The results of the evaluation

of the route alternatives will be presented for public review at the subsequent final series of centres in mid-September.

It should be noted that the alignment analysis was neutral regarding the type of technology and the findings would apply to either a BRT or LRT technology option given that the alignments were developed to accommodate design standards of both technologies. For the Vaughan N-S Link, separate alignments were analysed for the surface technologies and the potential subway extension.

4.1 Description of Route Alternatives

4.1.1 Segment A: Highway 50 (Peel Boundary) to Highway 400

In this segment, the only feasible route alternative is to locate the transitway in the median of the existing Highway 7 cross-section. It will comprise two new lanes reserved exclusively for transit vehicles with all intersections crossed at-grade and traffic signals modified, where beneficial, to give priority to transit vehicles. The existing and planned general traffic lanes will be retained.

For most of its length, the Highway 7 right-of-way is wide enough to accommodate the addition of the transit lanes by a reduction in the width of the existing boulevard between the curbs and property lines. The one exception is the approximately 0.75 km section between Kipling Avenue and the Humber River. As this section is too narrow to permit the insertion of transitway lanes without significant property acquisition and reconstruction of CP Rail's MacTier subdivision overpass, the only alternative is to operate the rapid transit in mixed traffic lanes. Options for mixed traffic operation include either Highway 7 itself or, as planned for the Quick Start phase, a diversion along Kipling Ave., Woodbridge Ave. and Islington Avenue before returning to Highway 7.

From the Islington Ave. intersection, the route continues eastward in the Highway 7 median to Highway 400. In this 9 km segment, stations are proposed at Highways 50 and 427, Highway 27, Martin Grove Road, Kipling Ave., Islington Ave., Helen Street, Pine Valley Drive, Aberdeen Ave., Ansley Grove Road and Weston Road. With the exception of Highway 427, Kipling and Islington Ave., where station platforms will be parallel, platforms will be positioned diagonally opposite each other on the far-side of the intersections.

4.1.2 Segment B: Highway 400 to Yonge Street including the Link to York University/Spadina Subway

This segment required analysis of three primary route alternatives in each of two sections. In the first western section, between Hwy 400 and Centre Street, the alternatives are:

- to place the transitway entirely in the Highway 7 right-of-way for the full 4 km length of the segment to Centre Street, (B1). This alternative was assessed in combination with an option for the Vaughan North-South Link, a transitway in the median of Jane

Street from Highway 7 to the Hydro ROW and the planned regional transit terminal north of Steeles Avenue opposite York University.

- to locate the transitway on Highway 7 through the Vaughan Corporate Centre and then turn south at Jane Street to follow one of the Vaughan N-S Link alignments to the proposed regional terminal on Steeles Avenue opposite York University. From the University, the route continues east in the Hydro One right-of-way or on Steeles Avenue as far as Keele Street, which it then follows northward to return to Highway 7. For the remainder of the segment, the route continues eastward in the Highway 7 median to Centre Street, (B3).

- to follow the same route as the second option above to the University and eastward to Keele Street but then use the Hydro One right-of-way in a north-easterly direction returning to the Highway 7 corridor in the vicinity of Centre Street, (B2).

On the above routes, the transitway is assumed to be in the median of roadways or on a separate running way, in or adjacent to the Hydro right-of-way.

For the second section, to the east, between Centre Street and Yonge Street, three alternatives were again compared:

- continuing north and east along the Highway 7 right-of-way in the median to the planned Langstaff intermodal terminal at Yonge Street, (B4).

- leaving highway 7 at Centre Street and continuing eastward in the median of Centre Street as far as Bathurst Street. At the Bathurst Street intersection turning north into the median of Bathurst Street to return to the Highway 7corridor. The route then turns east using the existing ramp to reach the median of Highway 7, in which it continues 2 km east to Yonge Street, (B6).

- continuing northeast in the Hydro One right-of-way up to and across Bathurst Street and then crossing Highway 407 to rejoin Highway 7 to reach the terminal at Yonge Street, (B5).

The above Segment B route alternatives and potential station locations are shown in *(Attachment 2.)*

4.1.3 Segment C: Yonge Street to Kennedy Road

Local Alignment Alternatives

In the western half of this segment, two local alternative alignments are available between Yonge Street and Bayview Avenue and a further two options to cross Highway 404 between Leslie Street and Woodbine Avenue. These alternatives are:

- From the Langstaff intermodal terminal, south to the median along Highway 7 with a loop up Silver Linden Drive and returning to Highway 7 for the section from Bayview Avenue to Leslie Street.

- From the Langstaff intermodal terminal northeast across CN Rail's Bala Subdivision into the High Tech Road median and then south on Silver Linden Drive, rejoining Highway 7 to continue east from Bayview Avenue to Leslie Street.

- Crossing Highway 404 in the Highway 7 median through the existing interchange structure with signal priority for the section between the interchange ramp intersections.

- Crossing Highway 404 by leaving Highway 7 at East Beaver Creek Road to reach a new transit-only overpass of the highway, approximately 0.5 km north of the interchange. East of the highway, a new right-of-way across a vacant lot would allow the transitway to reach Allstate Parkway, which would be used to return to the Highway 7 right-of-way.

Segment Route Alternatives

In the eastern half of Segment C, between Woodbine Avenue and Kennedy Road, three primary route alternatives were compared. These included:

- Placing the transitway in the median of Highway 7 for the entire length of the eastern half of the segment. (C1)

- From the median of Highway 7 at Cochrane Dr., south on Cochrane to Lanark Rd turning east across Woodbine Avenue into Yorktech Dr. and continuing east along Yorktech Dr. to Enterprise Drive at Warden Avenue, then through the Markham Centre Civic Mall to the Unionville GO Station. From the station the alignment follows Helen Ave. to Unionville main Street where it turns north to rejoin Highway 7 immediately west of the Rouge River crossing. (C2)

- Locating the transitway in the median of Highway 7 from Woodbine Avenue to Town Centre Blvd. and then turning south to Enterprise Drive. The alternative then continues east through the Markham Centre Civic Mall, passes under the Stouffville GO Line north of Unionville GO Station and joins Kennedy Road north of Helen Avenue, (C3)

Both alternatives passing through the Markham Centre provide convenient interconnection with GO Rail service and the proposed inter-regional BRT service on Highway 407. This is not possible with a route entirely on Highway 7.

Routing and station locations for the above alternatives are shown on (*Attachment 2.*)

4.1.4 Segment D: Kennedy Road to the York-Durham boundary

For this remaining 12 km segment, the Terms of Reference recommended Highway 7 as the most logical continuous route to serve major trip generators such as Markville Mall and the Markham-Stouffville Hospital. A transitway in the median has been assumed for the 4 km section from Kennedy Road to Markham Road. Between Markham Road and Wooten Way, cemeteries on both sides of Highway 7 make widening impossible hence a 1 km section of mixed traffic operation has been assumed for this section. In the remaining 5 km section east of Wooten Way widening of Highway 7 for a median transitway is feasible and is assumed.

The study considered two options for access to the Hospital, either a route on Ninth Line and Church Street or via a branch from Highway 7 to a transit terminal on Burr Oak Dr. east of the hospital property. Discussions with hospital planning staff indicated that the latter option could be made compatible with their expansion plans.

4.2 Evaluation Methodology for Selection of Preferred Alignment

The detailed evaluation within each segment, summarized in this report, considered the ability of the alignment alternatives to respond to the five main objectives of YRTP. These included:

- Improving mobility.
- Protecting and enhancing the social environment.
- Protecting the natural environment.
- Promoting smart growth, economic development and Regional/Municipal planning objectives.
- Maximizing cost-effectiveness of the rapid transit system.

For each of the above objectives, a range of goals and indicators was established to provide a measure of the effectiveness of each alternative in meeting the objectives.

4.3 Alignment Evaluation Findings

A synopsis of the detailed evaluation in each segment is presented in Table 1 *(see Attachment 3).* The effectiveness of each alternative in meeting the goals and objectives is reflected in the qualitative assessments summarizing the quantitative analysis carried out under each objective.

4.4 Preferred Alignment Alternative

Attachment 4 illustrates the preferred alignment alternatives for the entire corridor and the rationale for the recommendation in each segment is outlined below.

4.4.1 Segment A:

In this 8.5 km segment, the EA should seek approval for a transitway alignment mostly in the median of Highway 7 between Highways 50 and 400. Building on the Quick Start works and service, it is recommended that measures to achieve transit priority through the Woodbridge Village at Islington Avenue be included in the scope of the undertaking in this segment.

The EA will also assess effects of potential facilities at the Regional boundary to interface with future rapid transit service developed by Peel Region and City of Brampton.

4.4.2 Segment B:

The alignment evaluations in the west and east sections of this segment lead to the following recommendations:

Segment B West:

Alignment alternative B1, in combination with a partially segregated rapid transit service on Keele Street between Highway 7 and Steeles Avenue, is preferred because:

- Projections show that the combination will attract the highest ridership on east-west Highway 7 service by providing a direct link from Richmond Hill and Markham to both the Vaughan Corporate Centre and York University, which could include access to an extension of the Spadina Subway to Steeles Ave.
- The alignment conforms to the Official Plan's "nodes and corridors" policy by linking Vaughan Corporate Centre to the eastern YRTP network and the TTC system as well as serving the Jane/Highway 7 and Keele/Steeles redevelopment nodes on the corridors.
- The continuation of Quick Start service as partially segregated rapid transit on Keele Street between Hwy 7 and Steeles Avenue would offer an attractive routing for trips from the east, especially if Spadina Subway is extended initially to York University.
- The alignment combination supports Vaughan's vision for the ultimate development of land use along Avenue 7 and serves the planned major redevelopment to the south and east of the Jane Street intersection.
- A connection to a future Hwy 407 BRT service is possible at either Jane or Keele Street interchanges.
- A connection to a future station on GO Transit's Bradford Line is feasible.
- Adverse effects on the social and natural environment are either minimal or able to be mitigated.

The EA will protect opportunities for transit-oriented development by incorporating optional local alignment variations at the Highway 7/Jane and Steeles/Keele intersections.

Segment B East:

Alignment alternative B6 is preferred in this segment because:

- It has the potential to attract ridership from existing commercial and residential land uses on both sides of the alignment, as well as future transit-oriented intensification and redevelopment at the Dufferin and Bathurst nodes on Centre Street.
- The alignment serves existing community facilities and a major shopping area while also providing the opportunity for urban design improvements in the rights-of-way.
- A connection to a future 407 BRT service can be achieved at the Bathurst and Highway 7 intersection.
- Connections to local transit serving large residential areas north of Highway 7, such as the Carrville Community, can be made at the Bathurst and Dufferin nodes on the alignment. The local services will need to be configured as feeders to the rapid transit stations, using parts of Highway 7 where beneficial.
- Effects on the natural environment are negligible or minor and traffic management measures and improved transit vehicle technology can mitigate social environmental impacts.

Protection for measures to implement parallel express segregated rapid transit service entirely on Highway 7 is also recommended for this section between Bathurst and Centre Streets.

4.4.3 Segment C:

In this segment, the evaluation of options for crossing Highway 404 indicates that a short section of mixed-traffic operation between the inner ramps of the interchange could be feasible with transit signal priority. However, given that traffic volumes on Highway 7 may make this impractical, it is recommended that the EA also seek approval of an alignment bypassing the interchange to the north. From the east, this alignment uses Allstate Parkway to reach a new 404 overpass and returns to Highway 7 on East Beaver Creek Road on the west of the 404.

Evaluation of alignment alternatives between Woodbine Avenue and Kennedy Road has led to the selection of Alternative C3 as the preferred alternative because:

- It provides direct service to, and through, the planned Markham Centre from both east and west.
- It provides the best linkage of the existing Markham Civic Centre facilities to the major mixed-use Markham Centre development.
- A good connection to GO Transit's Stouffville Rail service and a future 407 BRT service can be achieved at Unionville GO Station.
- Proposed station locations will offer convenient access to both existing and future mixed-use development along most of the route.

- It offers the greatest potential for urban design improvements in the Highway 7 corridor through a combination of arterial road and civic mall rights-of-way.
- Although, not as minimal as a Highway 7 only route, effects on the natural environment are confined to a single new crossing of a Rouge River tributary.
- Capital costs are estimated to be similar to the other alternatives and land acquisition costs are limited to approx. 0.6 km of the route.
- Traffic interface concerns on the Highway 7 and Kennedy sections can be mitigated and attenuation of noise and vibration on the civic mall is feasible if required.

Protection for measures to implement parallel express rapid transit service entirely on Highway 7 is also recommended for this section between Town Centre Blvd. and Kennedy Road. These measures would build on Quick Start facilities to minimize congestion delays in this segment.

4.4.4 Segment D

Developing the transitway, mostly in the median of Highway 7 offers good access to stations and local transit, and can support a major improvement in the urban design of the corridor.

Assuming the urban structure of the east-west corridor through this segment is to be concentrated around Highway 7, rapid transit service entirely on the highway will best support this planning objective. Local diversions to access Markham-Stouffville Hospital and the planned, Markham East business and commercial are recommended.

4.4.5 Vaughan North-South Link Subway Alignment

Subway alignment alternatives developed during prior studies for the City of Vaughan were reviewed to confirm that the preferred alignment recommended in these studies responded well to the primary objectives adopted for the YRTP. As well, the compatibility of the alignment with current land use planning for the lands north of Steeles and the York University was verified. Alignments evaluated and the preferred alignment are illustrated in *Attachment 5*.

The preferred alignment, Alternative 'A', is recommended because:

- It conforms to the "nodes and corridors" policy of both the York Region and City of Vaughan Official plans
- It is consistent with the findings of subway expansion studies to date by the TTC
- It will achieve convenient access to the subway from the planned regional inter-modal centre north of Steeles Avenue and east of Jane Street.
- The alignment permits a connection with a future Hwy 407 transitway service at the Jane Street interchange
- It is the shortest lowest cost link between the planned regional terminal and the Vaughan Corporate Centre

- A station at the crossing of Highway 7 will provide service to both the Corporate Centre and the proposed Jane/Hwy 7 redevelopment area.

4.5 Characteristics of Preferred Transitway Alignment

4.5.1 System Capacity

By the year 2021, ridership forecasts indicate that the transitway service will require a capacity of 800-1500 passengers per hour per direction (pphpd) through and west of the Vaughan Corporate Centre in Segment A, 1600 pphpd approaching the York University from the east in Segment B, 1900-2600 pphpd in Segment C between Yonge Street and Kennedy Road and 2,400 pphpd in Segment D approaching Markham Centre from the east. The proposed two lane exclusive transitway, with at-grade intersections and either BRT or LRT technology, is able to accommodate the above volumes as well as some additional growth beyond 2021.

4.5.2 System Technology

In order to carry the projected ridership volumes in 2021, the following service levels would be required on the Highway 7 transitway for each technology under consideration:

Segment	Bus Rapid Transit (BRT)	Light Rail Transit (LRT)
A:	20 articulated buses (18m length) per hour Buses at approx. 1 km spacing	Projected demand does not justify LRT in this segment through a 2021 timeframe.
B:	20 articulated buses (18m length) per hour	Projected demand does not justify LRT in this segment through a 2021 timeframe unless intensification efforts are greater than anticipated.
C:	30 articulated buses (18m length) per hour	While projected demand alone does not justify LRT in this segment through a 2021 timeframe as part of the overall network analysis, to be evaluated in depth after 2008, LRT on this segment in conjunction with a Yonge Street LRT will warrant consideration
D:	30 articulated buses (18m length) per hour	Projected demand does not justify LRT in this segment through a 2021 timeframe.
Vaughan N-S Link	20 articulated buses (18m length) per hour	Projected demand does not justify LRT in this segment

		through a 2021 timeframe. Also, an extension of the Spadina subway may become viable during this period.

As noted previously, terminal access improvements at Downsview Subway Station or a subway extension would be required to accommodate the vehicle frequencies listed above for the Vaughan Link service to the TTC subway network when they are combined with future TTC BRT volumes.

4.5.3 System Infrastructure

The preferred transitway alternative for Rapid Transit comprises:

- A 44 km two-lane, median transitway on the preferred alignments in the Highway 7 corridor between Highway 50 and Locust Hill designed to both BRT and LRT standards.
- Short sections of transit operation in mixed traffic through existing underpasses of major north-south arterial roads (e.g. Bathurst and Bayview).
- Stations at approximately one kilometre spacing, located generally at major intersections.
- Access to an intermodal terminal facility in the Langstaff area and at Markham Centre to provide connection to GO Transit and the proposed Yonge Street Transitway.
- Access to a maintenance facility for transit vehicles, potentially located south of Hwy 407 on the east side of Yonge Street.
- Park and Ride and passenger pick up/drop off facilities at selected stations.

Typical Highway 7 cross-sections and photo-simulations in *Attachment 6* illustrate the integration of these facilities.

5. FINANCIAL IMPLICATIONS

The budget for the consulting services to complete the EA for the Highway 7 Corridor and Vaughan N-S Link are included as part of the first stage agreement between York Consortium and York Region. No additional costs will be incurred as a result of completion of this work.

6. LOCAL MUNICIPAL IMPACT

Representatives from the Towns of Markham and Richmond Hill and the Cities of Toronto and Vaughan have participated on the Technical Advisory Committee and will be requested to continue their involvement during the assembly of the Draft EA Report.

This report is to be circulated to Markham, Richmond Hill and Vaughan for review and comment.

7. CONCLUSION

The Highway 7 & Vaughan N-S Link EA study has completed a detailed evaluation of alignment alternatives for a rapid transit facility within the study area. The evaluation has identified a Recommended Alignment for a rapid transit service.

The Recommended Alignment and its effects on the environment have been thoroughly reviewed by the public and it has been selected with consideration of their comments. The Recommended Alignment can accommodate either bus rapid transit (BRT) or light rail technology (LRT).

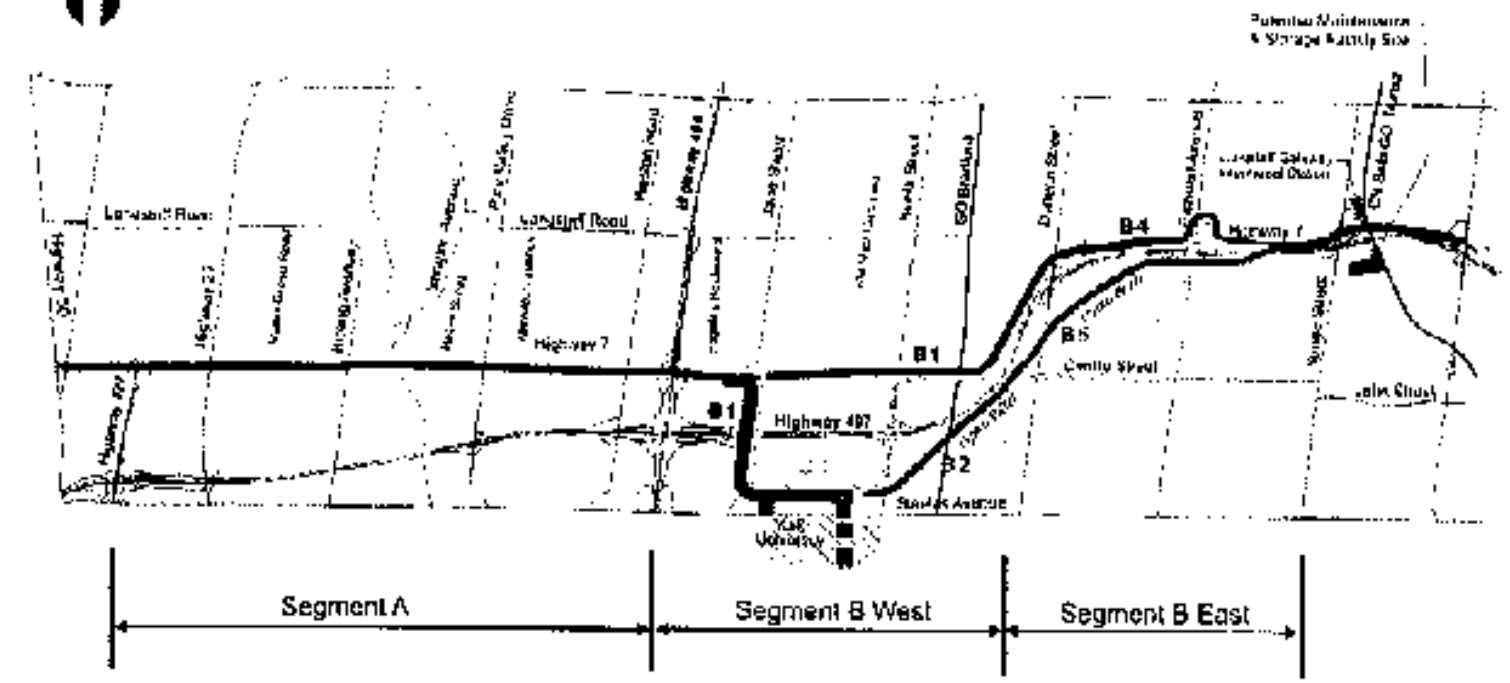
The details of the recommended alignment alternative for rapid transit and the effects of its implementation will be tabled in the Draft EA report, expected to be completed in July. This EA will seek approval for the use of both technologies on the Recommended Alignment to accommodate the potential for transition from BRT to LRT at some point during the YRTP network evolution.

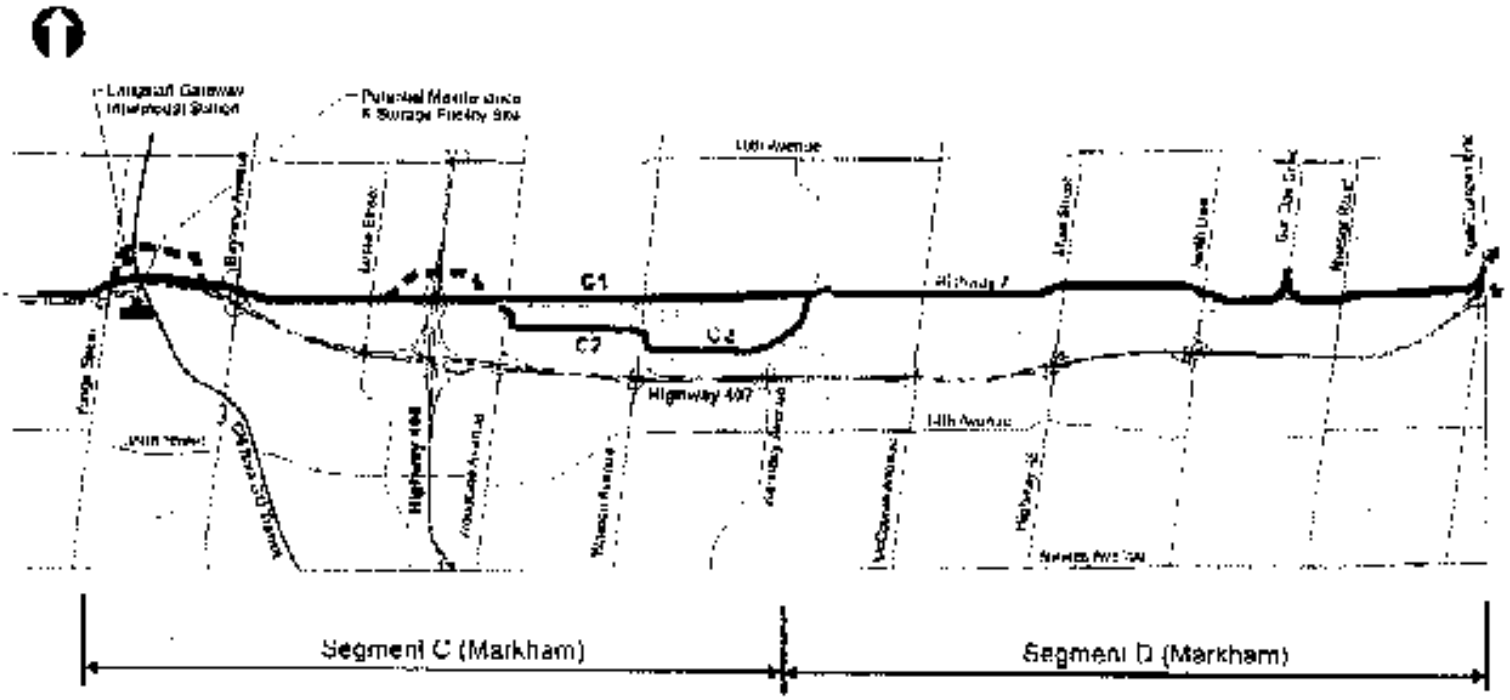
The Highway 7 Corridor and Vaughan N-S Link are important transit initiatives to stimulate transit use, accommodate the growing travel demand and foster a number of urban form initiatives in the study area, specifically in three of the four Regional Centres and the lands north of Steeles Avenue at York University.

The Senior Management Group has reviewed this report.

(A copy of the attachments referred to in the foregoing has been forwarded to each Member of Council with the September 10, 2003 Rapid Transit Public/Private Partnership Steering Committee agenda and a copy thereof is on file in the Office of the Regional Clerk.)

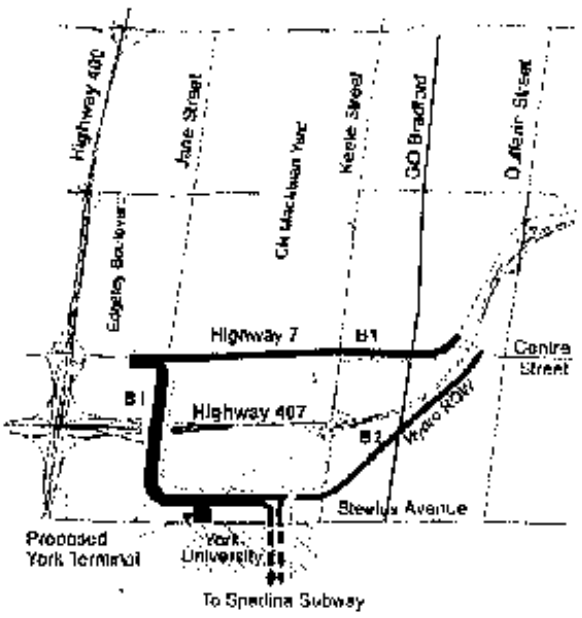
Attachment 1





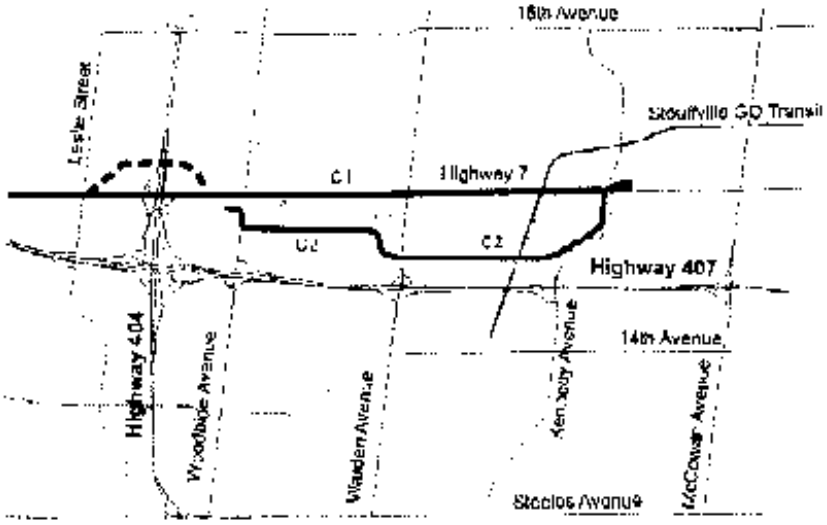
Highway 7 Corridor and Vaughan N-S Link
Segments for Analysis and Evaluation

Attachment 2



Segment B West

Segment B East



Segment C (Markham)

Alignments Evaluated

Table 1: SYNOPSIS OF ALIGNMENT EVALUATION FINDINGS SEGMENT 'B' WEST

Objectives And Goals	Alternative B1: Hwy 7: Jane-Centre St. and Jane St./Hydro ROW to York U.	Alternative B2: Jane St./Hydro ROW to York U. & north-east in Hydro ROW - Centre St.	Alternative B3: Jane-Steeles-York U.-Keele and Hwy 7 to Centre St.
Improve Mobility • Inter-regional transit connectivity • System expansion flexibility • Speed, safety, ride comfort • Service quality and reliability • Station catchment • Convenience of access	• Circuitous route to York U. for trips from the east reduces Hwy 7 service daily boardings by 7-10%. • Transfer required to connect future 407BRT service to Hwy 7 service origins/ destinations east of Jane St. • Alignment geometry good, station access reasonable. • Major road intersections may affect system reliability	• Circuitous route to VCC from the east but direct route to York U. from the east maximizes Hwy 7 boardings • Connects Hwy 7 and Vaughan N-S link service directly to future 407BRT service at Jane interchange. • Alignment geometry fair, some stations less accessible. • Better system reliability due to fewer road intersections	• Circuitous route to VCC from the east but direct route to York U. maximizes Hwy 7 boardings • Connects Hwy 7 and Vaughan N-S link service directly to future 407BRT service at Jane interchange. • Alignment geometry fair, station access good • Major road intersections may affect system reliability
Protect & Enhance Social Environment • Effects on communities • Road traffic and pedestrian circulation • Public safety and security • Noise and vibration • Effects on cultural resources • Community vistas and street aesthetics	• Alignment largely in road ROW minimizes effects on community features • Alignment largely in major road median requires more mitigation of traffic/access impact and safety concerns • Adverse noise and vibration effects are minimized • Median transitway will have minimal effect on vistas and no effect on cultural resources	• Alignment in Hydro ROW will have a minor effect on public open space • Alignment partially in Hydro ROW reduces traffic/access impact but intersections still result in safety concerns • Adverse noise and vibration effects are minimized • Median and Hydro ROW transitway will have minimal effect on vistas and no effect on cultural resources	• Alignment in road median has minimal effect on community features • Alignment entirely in road median requires most mitigation of traffic/access impact and safety concerns • Noise and vibration effects likely unnoticeable at the few residential areas • Median transitway will have minimal effect on vistas Black Creek cultural resources on route
Protect Natural Environment • Effect on aquatic ecosystems • Effect on terrestrial ecosystems • Effect on Local Air Quality • Effect on Hydro-geological conditions	• Potential for minor effects on aquatic ecosystems due to widening of the road over 7 crossings • Potential for some effects on terrestrial ecosystems • Some potential for minor effects on air quality but few receptors	• Has the least adverse effect on aquatic ecosystems with only 3 widening of crossings • Has no effects on terrestrial ecosystems • Lower potential for adverse effects on hydrological and geological conditions • Potential for minor effects on air quality but few receptors	• Potential for minor effects on aquatic systems due to widening of the road over 6 crossings • Most potential for minor effects on air quality and more receptors
Promote Smart Growth / Economic Development • Regional/Mun. Plans and Urban Structure • Access to community facilities • Effect on business activities • Goods movement • Promote transit-oriented development	• Conforms best with planning policies and provides good access to community facilities • Provides positive effects on business activities but affects access to businesses • Provides the best opportunities for transit-oriented-development around stations and along the corridor	• Does not conform as well with planning policies and some stations are remote from community facilities • Offers least interference with business activities but also minimal potential for increased business activities • Provides the least opportunity for transit oriented-development around stations and along the corridor	• Conforms well with planning policies and provides good access to community facilities • Optimized for positive effects on business activities at stations and within the corridor • Provides good opportunities for transit oriented-development and some redevelopment
Maximize Cost-effectiveness of rapid transit • Effect on Capital Costs • Property required • Effect on operating and maintenance costs	• Capital cost +/- $170 million plus slightly higher vehicle fleet cost due longer route • Minimal property cost, some Hydro easement cost • 7.3 km route results in slightly higher O&M costs	• Capital cost +/- $144 million plus lowest vehicle fleet cost • Hydro easement cost to be carried • 6.7 km route yields lowest O&M costs	• Capital cost +/- $165 mill. plus higher vehicle fleet cost due to longest route • Minimal property cost • 8.2 km route results in marginally higher O&M costs

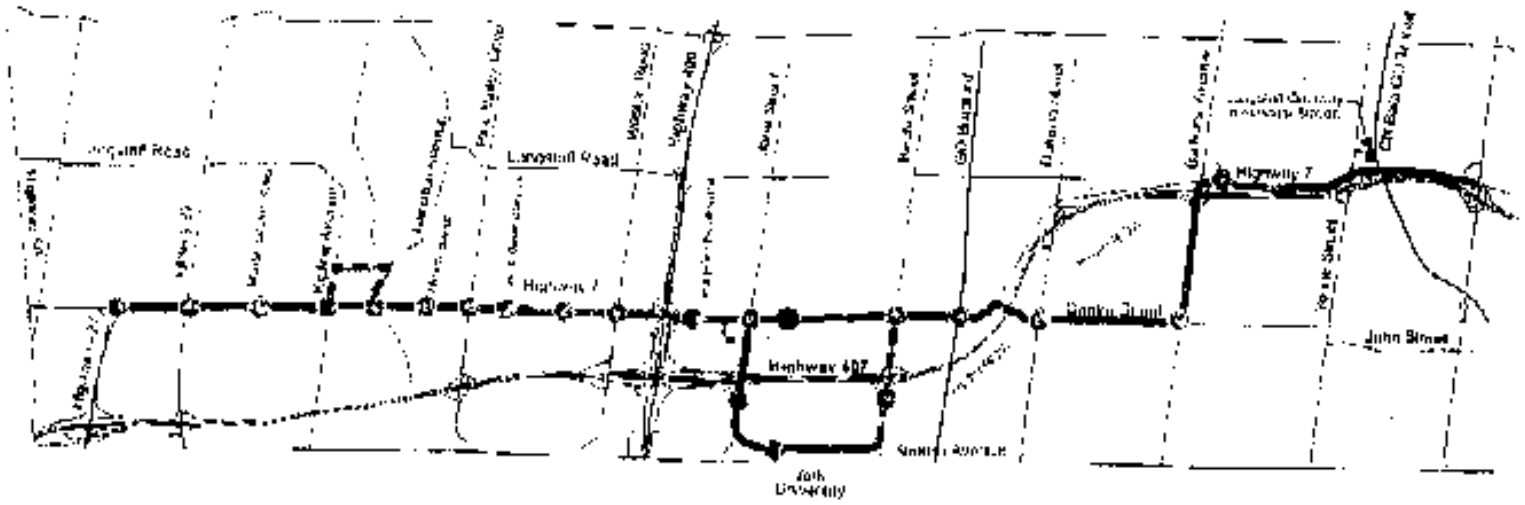
Table 1: SYNOPSIS OF ALIGNMENT EVALUATION FINDINGS SEGMENT 'B' EAST

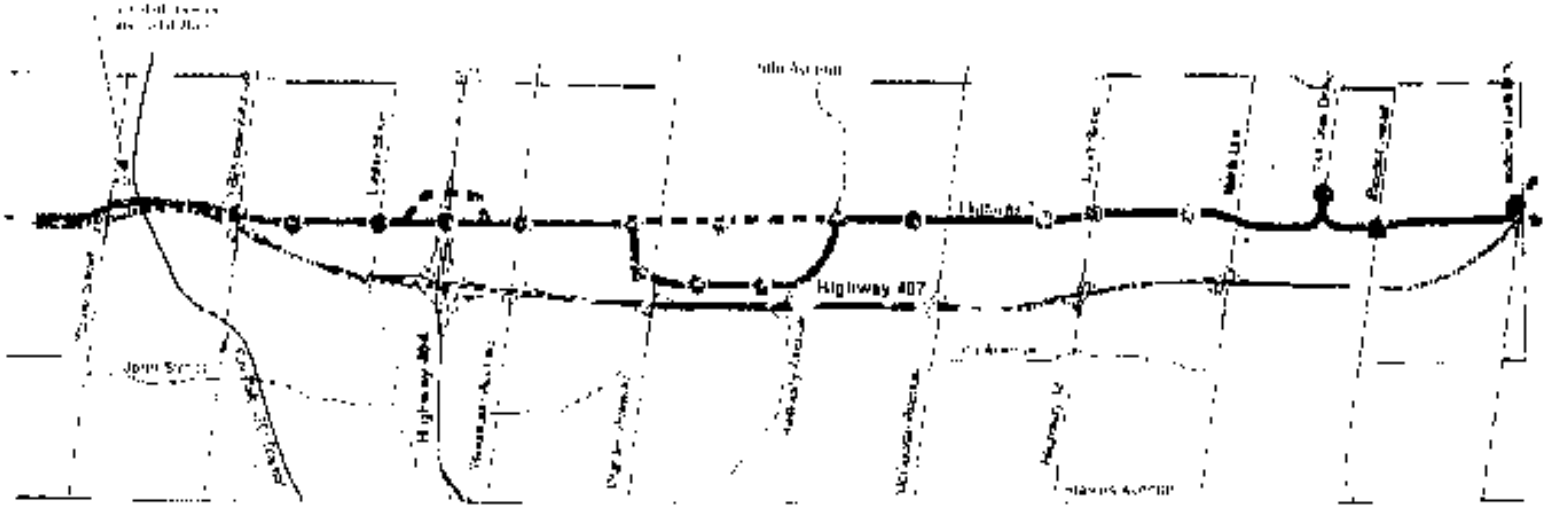
Objectives And Goals	Alternative B4: Hwy 7 between Centre St. and Bathurst St. (Hunters Point Rd.)	Alternative B5: Hydro ROW between Centre and Bathurst Sts. (Hunters Point Rd.)	Alternative B6: Centre St. and Bathurst St. to Hwy 7 at Hunters Point Rd.
Improve Mobility • Inter-regional transit connectivity • System expansion flexibility • Speed, safety, ride comfort • Service quality and effectiveness • Station catchment • Convenience of access	• Connects to future 407 BRT service at Bathurst and possibly Dufferin. Good alignment geometry and attracts marginally lower daily boardings than Centre-Bathurst route option. • Development served by stations on north side only • Limited opportunities for station access facilities	• 407 BRT connection indirect • Good alignment geometry but will attract least daily boardings on Hwy 7 service • Good service reliability due to separation of alignment from major road traffic • Access less convenient due to remoteness from road system	• Connects to future 407 BRT service at Bathurst • Has reasonable alignment geometry and is projected to attract slightly higher daily boardings than other routes. • Higher potential for loss of service reliability due to traffic interference at intersections • Station access very convenient with some opportunity for station drop-off/park and ride
Protect & Enhance Social Environment • Effects on communities • Road traffic and pedestrian circulation • Public safety and security • Noise and vibration • Effects on cultural resources • Community vistas and street aesthetics	• No effect on community interaction or community features • Moderate impact of median transitway on traffic circulation/access • Minimal adverse noise and vibration effects • Some urban design opportunity to improve vistas and no effect on nearby cultural resources	• No effect on community interaction, minor intrusion on public open space • Minimal impact of Hydro ROW transitway on traffic circulation/access • Minimal adverse noise and vibration effects • Minor intrusion on open space vistas and no effect on nearby cultural resources	• Minor effect on community interaction, improves access to community features • Moderate impact of median transitway on traffic circulation/access • Adverse noise and vibration effects likely unnoticeable • Significant urban design opportunity to improve vistas and no effect on nearby cultural resources
Protect Natural Environment • Effect on aquatic ecosystems • Effect on terrestrial ecosystems • Effect on Air Quality • Effect on Hydro-geological conditions	• Has least adverse effect on aquatic ecosystems • Has negligible effects on terrestrial ecosystems • Very low potential effect on air quality • Low potential for adverse effects on hydrological and geological conditions	• Potential for minor effects on aquatic ecosystems • Has negligible effects on terrestrial ecosystems • Low potential effect on air quality • Low potential for adverse effects on hydrological and geological conditions	• Potential for minor effects on aquatic ecosystems • Has negligible effects on terrestrial ecosystems • Highest potential for adverse air quality effects given the number of receptors in prevailing downwind direction • Minor hazardous material risk
Promote Smart Growth / Economic Development • Regional/Mun. Plans and Urban Structure • Access to community facilities • Effect on business activities • Goods movement • Promote transit-oriented development	• Conforms well with planning policies and provides good access to community facilities • Provides some potential for increase in business activities • Provides some opportunities for TODs around stations and along the corridor	• Conforms least with planning policies and does not provides good access to community facilities • Provides the least positive effects on business activities • Provides very little opportunities for TODs and re-development along the corridor	• Conforms very well with planning policies and provides good access to community facilities • Has the best potential for increase in business activity and little effects on business access • Provides most opportunities for TODs and re-development around stations and along the corridor
Maximize Cost-effectiveness of rapid transit • Effect on Capital Costs • Property required • Effect on operating and maintenance costs	• Capital cost +/- $100 million • Minimal property cost • O&M costs marginally higher due to longer alignment	• Capital cost +/- $90 million • Hydro easement cost • Lowest O&M costs due to alignment being shortest.	• Capital cost +/- $110 mill. • Minimal property cost • O&M costs marginally higher due to longer alignment.

SEGMENT C (MARKHAM)

Objectives And Goals	Alternative C1: Hwy 7 between Woodbine Ave. and Kennedy Rd.	Alternative C2: Woodbine Ave., Yorktech Dr. to Markham Centre & Kennedy Rd. to Hwy 7	Alternative C3: Hwy 7 from Woodbine Ave. to S. Town Centre Blvd. to Markham Centre & Kennedy Rd. to Hwy 7
Improve Mobility • Inter-regional transit connectivity • System expansion flexibility • Speed, safety, ride comfort • Service quality and effectiveness • Station catchment • Convenience of access	• Indirect service to future Markham Centre reduces daily boardings by 4-5% • Has no direct connection to Stouffville GO service • Good alignment geometry but Hwy 7 traffic activity could affect reliability • Convenient access from residential use north of and mixed-use on Hwy 7	• Provides direct service to future Markham Centre and direct connection to GO Stouffville rail service • Fair alignment geometry on partially exclusive ROW but still requires several at-grade intersections • Station catchment is mainly employment and Markham Centre mixed-use	• Provides direct service to future Markham Centre and direct connection to GO Stouffville rail service • Fair-good alignment geometry requiring several intersections and partial interface with Hwy 7 traffic activity • Convenient access to mixed-uses along most of route
Protect & Enhance Social Environment • Effects on communities • Road traffic and pedestrian circulation • Public safety and security • Noise and vibration • Effects on cultural resources • Community vistas and street aesthetics	• Causes very few adverse community effects after construction • Hwy 7 median location has most traffic interface with greater safety risk • Alignment entirely in Hwy 7 minimizes effect of system noise and vibration and offers good urban design potential • Minimal effect on community vistas	• Some intrusion in river/ creek valleys but few other adverse community effects • No Hwy 7 traffic interface but route requires most intersections • Noise & vibration attenuation may be required in Markham Centre civic mall and river valleys. • Urban design potential mainly in Markham Centre and Kennedy Road.	• Minor intrusion in river valley and few other adverse community effects • Some Hwy 7 traffic interface and several intersections increases safety risk • Noise & vibration attenuation may be required in Markham Centre civic mall • Good urban design potential in Markham Centre, on Kennedy Road and Hwy 7, particularly at Civic Centre
Protect Natural Environment • Effect on aquatic ecosystems • Effect on terrestrial ecosystems • Effect on Air Quality • Effect on Hydro-geological conditions	• Has little adverse effect on aquatic & terrestrial ecosystems • Some potential for minor effect on air quality • Highest number of potentially hazardous material sites	• Potential for some effects on aquatic ecosystems due to the alignment requiring new crossings at Beaver Creek and Apple Creek • Least potential for adverse effect on air quality (fewer receptors) • Few potentially hazardous material sites	• Potential for some effects on aquatic ecosystems due to the alignment requiring bridge widening at Beaver Creek and Apple Creek • Minor potential for adverse air quality effects • Few potentially hazardous material sites
Promote Smart Growth / Economic Development • Regional/Mun. Plans and Urban Structure • Access to community facilities • Effect on business activities • Goods movement • Promote transit-oriented development	• Conforms well with planning policies and provides acceptable access to community facilities, but by-passes Markham Centre • Provides good potential for increase in existing business activities along Hwy 7 • Provides opportunities for higher order uses	• Conforms with planning policies and supports urban structure of Region • Provides good access to community facilities • Serves Markham Centre well, Civic Centre less convenient • Provides some potential for increase in existing business activities (Kennedy, Woodbine • Provides good opportunities for TODs / higher order use	• Conforms best with planning policies and supports urban structure of Region • Provides very good access to community facilities • Serves both Civic Centre and Markham Centre well • Provides good potential for increase in existing business activities (Hwy 7, Kennedy) • Provides good opportunities for TODs / higher order use
Maximize Cost-effectiveness of rapid transit • Effect on Capital Costs • Property required Effect on operating and maintenance costs	• Capital cost +/- $147 million • Minor property cost • Lowest vehicle and O&M costs due to alignment being shortest.	• Capital cost +/- $154 million • Property cost for 2.5km ROW • Vehicle and O&M costs marginally higher due to longer alignment	• Capital cost +/- $156 million • Property cost for 0.6 km ROW • Vehicle and O&M costs marginally higher due to longer alignment

Attachment 4

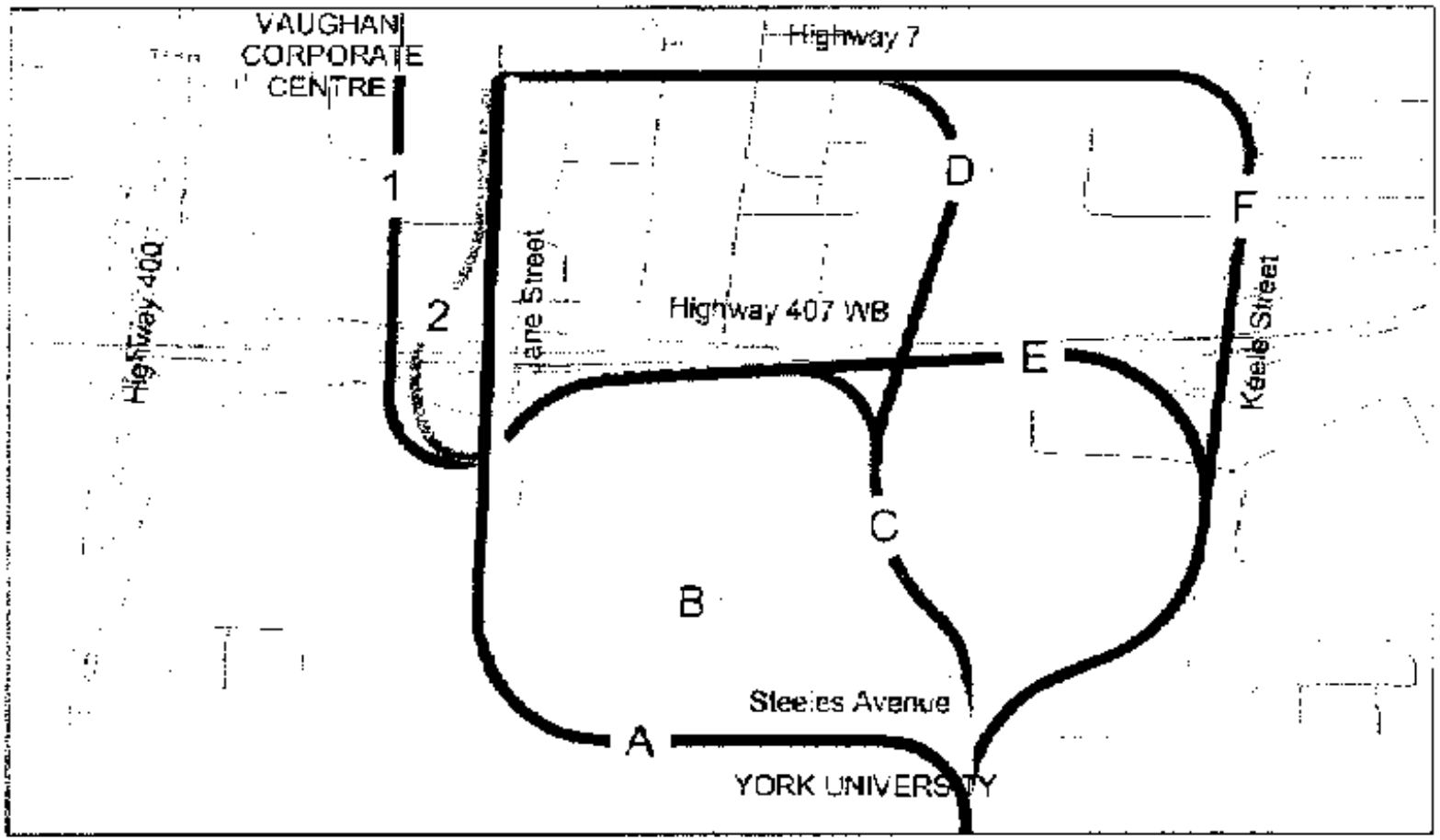




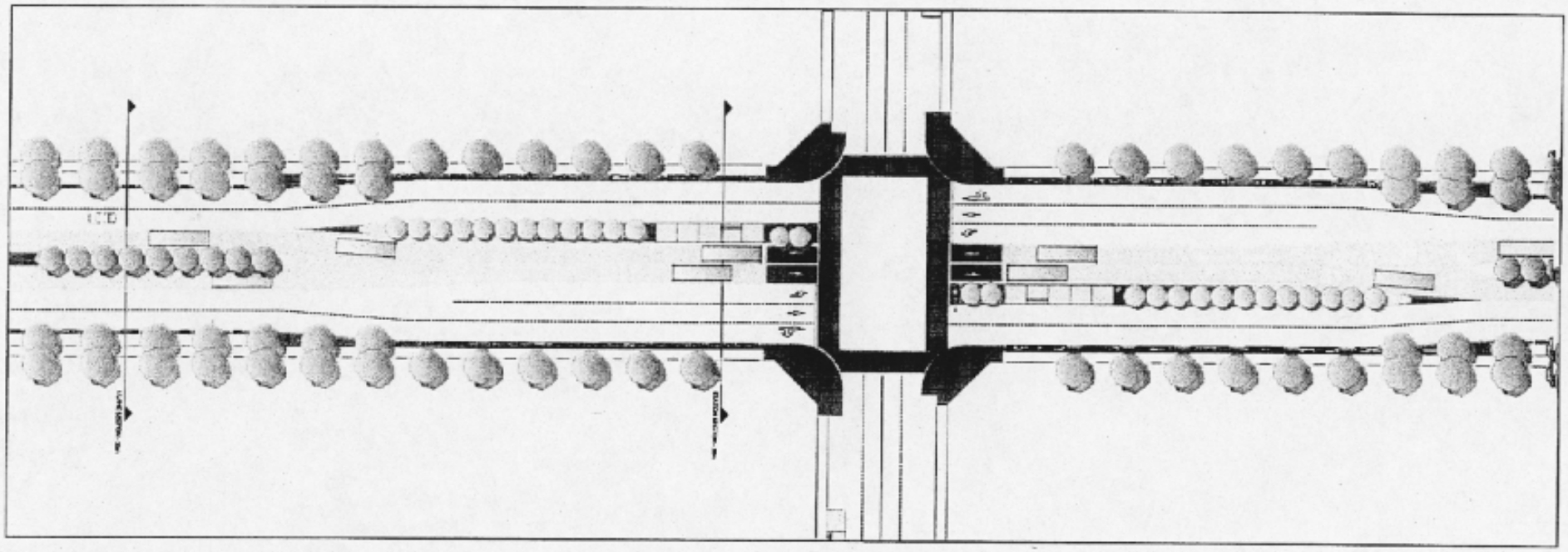
Transitway Alignment
and Station location

Highway 7 Corridor and Vaughan N-S Link
Preferred Alignment from Evaluation

Vaughan North-South Link Subway Alignments Evaluated



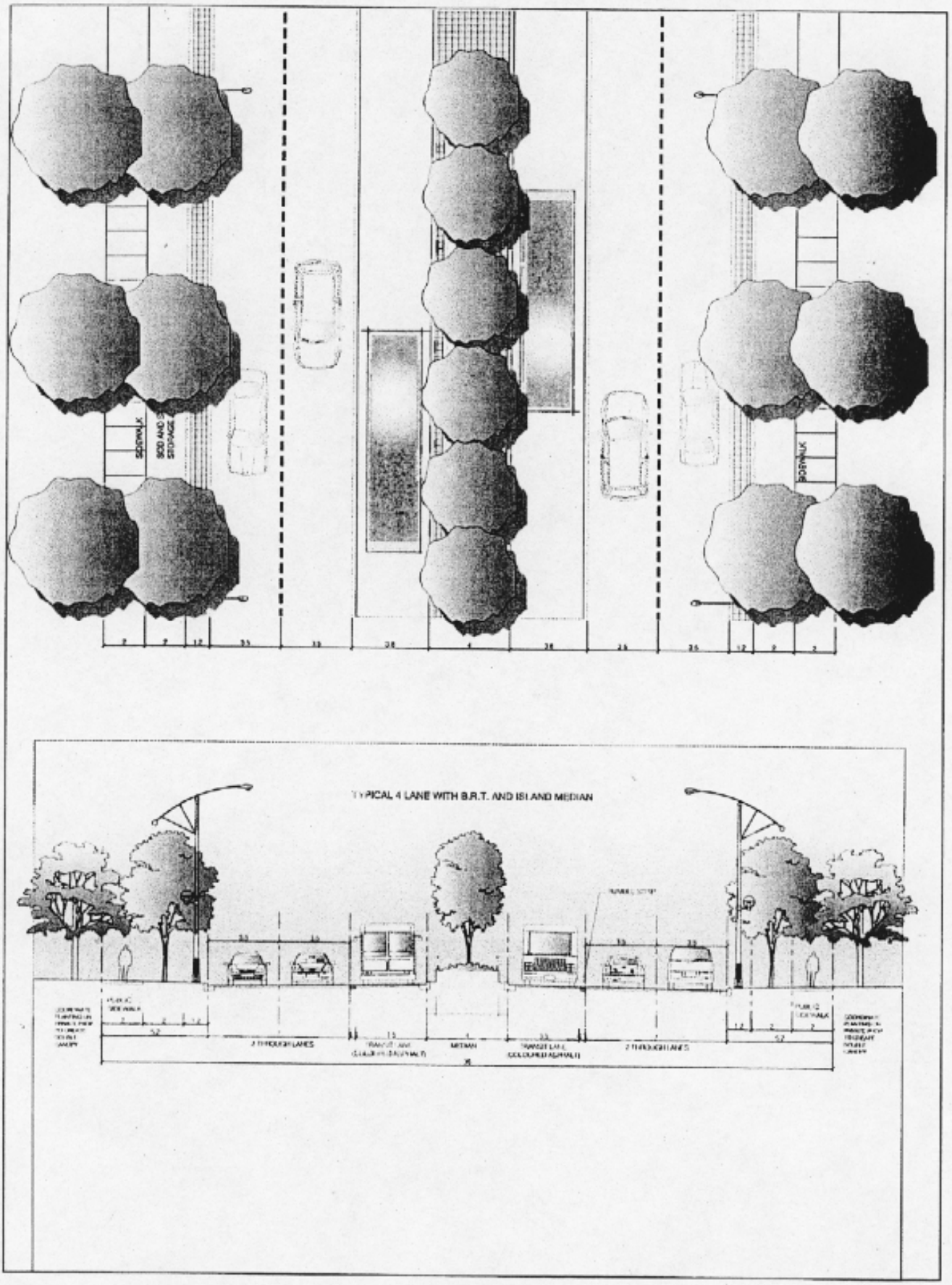
A Preferred Alignment



TYPICAL MEDIAN TRANSITWAY STREETSCAPING CONCEPT

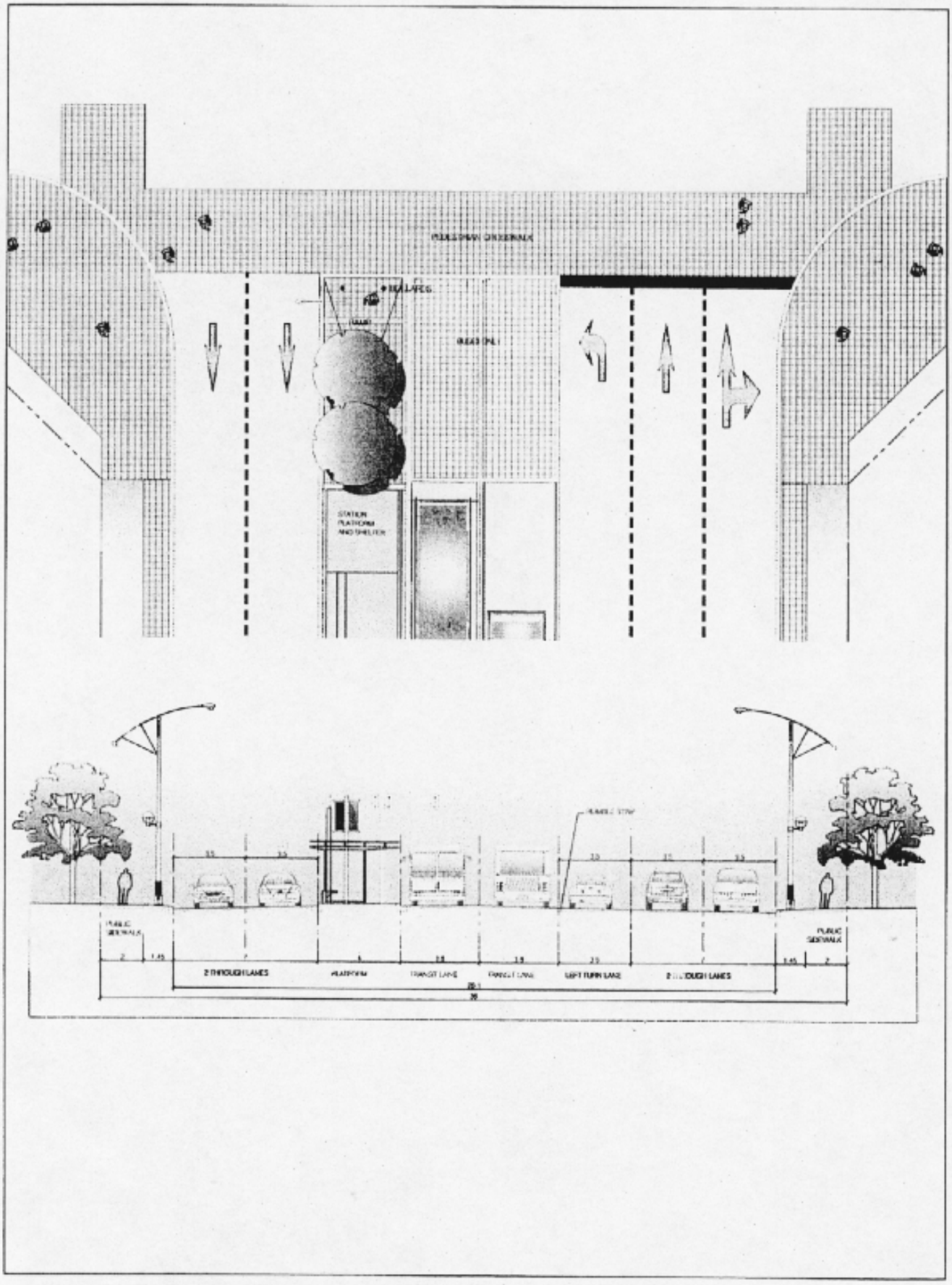
HIGHWAY 7 TRANSITWAY

Attachment 6



TYPICAL 36M CROSS-SECTION BETWEEN STATIONS

HIGHWAY 7 TRANSITWAY



TYPICAL MEDIAN STATION CROSS-SECTION

HIGHWAY 7 TRANSITWAY

TYPICAL MEDIAN STATION CROSS-SECTION

Clause 7

COPY

Office of the Regional Clerk
Corporate Services Department

September 22, 2003

Mr. Bob Panizza
Director, Corporate Services/Municipal Clerk
Town of Aurora
P.O. Box 1000
100 John West Way
Aurora, Ontario L4G 6J1

Dear Mr. Panizza:

Re: Highway 7 Corridor and Vaughan N-S Link Environmental Assessment Recommended Alignment

The Council of the Regional Municipality of York, at its meeting held on Thursday, September 18, 2003, adopted the following recommendations of the Rapid Transit Public/Private Partnership Steering Committee with respect to the Highway 7 Corridor and Vaughan N-S Link Environmental Assessment Recommended Alignment:

1. Council endorse, for the purpose of developing the Draft Environmental Assessment (EA) Report.

    - The recommended alignment for surface rapid transit service and the use of both BRT and LRT technologies on portions of that alignment to accommodate the potential for transition from BRT to LRT at some point during the YRTP network evolution.

    - The recommended alignment, within York Region, of an extension of the Spadina Subway from the Downsview Station through York University to the Vaughan Corporate Centre.

2. Copies of this report be forwarded by the Regional Clerk to the Clerks of the Towns of Markham and Richmond Hill and the City of Vaughan.

Council also directed that a copy of this report be forwarded to the Towns of Aurora and Newmarket for information.

A copy of Clause No. 7 of Report No. 7 of the Rapid Transit Public/Private Partnership Steering Committee is enclosed for your information.

Please contact Paul May, Director, Infrastructure Planning, at 905-830-4444, ext. 5029, if you have any questions with respect to this matter.

Sincerely,

Denis Kelly
Regional Clerk

K.Price
Attachment

Copy to: M-F. Turner, Executive Co-ordinator
P. May, Director

York Region

Office of the Regional Clerk
Corporate Services Department

COPY

September 22, 2003

Mr. John Leach
City Clerk
City of Vaughan
2141 Major Mackenzie Drive
Vaughan, Ontario L6A 1T1

Dear Mr. Leach:

Re: Highway 7 Corridor and Vaughan N-S Link Environmental Assessment Recommended Alignment

The Council of the Regional Municipality of York, at its meeting held on Thursday, September 18, 2003, adopted the following recommendations of the Rapid Transit Public/Private Partnership Steering Committee with respect to the Highway 7 Corridor and Vaughan N-S Link Environmental Assessment Recommended Alignment:

1. Council endorse, for the purpose of developing the Draft Environmental Assessment (EA) Report.

    - The recommended alignment for surface rapid transit service and the use of both BRT and LRT technologies on portions of that alignment to accommodate the potential for transition from BRT to LRT at some point during the YRTP network evolution.

    - The recommended alignment, within York Region, of an extension of the Spadina Subway from the Downsview Station through York University to the Vaughan Corporate Centre.

2. Copies of this report be forwarded by the Regional Clerk to the Clerks of the Towns of Markham and Richmond Hill and the City of Vaughan.

Council also directed that a copy of this report be forwarded to the Towns of Aurora and Newmarket for information.

A copy of Clause No. 7 of Report No. 7 of the Rapid Transit Public/Private Partnership Steering Committee is enclosed for your information.

Please contact Paul May, Director, Infrastructure Planning, at 905-830-4444, ext. 5029, if you have any questions with respect to this matter.

Sincerely,

Denis Kelly
Regional Clerk

K.Price
Attachment

Copy to: M-F. Turner, Executive Co-ordinator
P. May, Director

York Region

COPY

Office of the Regional Clerk
Corporate Services Department

September 22, 2003

Mr. Robert Prowse
Town Clerk
Town of Richmond Hill
Box 300, 225 East Beaver Creek Road
Ground Floor, South Side
Richmond Hill, Ontario L4C 4Y5

Dear Mr. Prowse:

Re: Highway 7 Corridor and Vaughan N-S Link Environmental Assessment Recommended Alignment

The Council of the Regional Municipality of York, at its meeting held on Thursday, September 18, 2003, adopted the following recommendations of the Rapid Transit Public/Private Partnership Steering Committee with respect to the Highway 7 Corridor and Vaughan N-S Link Environmental Assessment Recommended Alignment:

1. Council endorse, for the purpose of developing the Draft Environmental Assessment (EA) Report.

    - The recommended alignment for surface rapid transit service and the use of both BRT and LRT technologies on portions of that alignment to accommodate the potential for transition from BRT to LRT at some point during the YRTP network evolution.

    - The recommended alignment, within York Region, of an extension of the Spadina Subway from the Downsview Station through York University to the Vaughan Corporate Centre.

2. Copies of this report be forwarded by the Regional Clerk to the Clerks of the Towns of Markham and Richmond Hill and the City of Vaughan.

Council also directed that a copy of this report be forwarded to the Towns of Aurora and Newmarket for information.

A copy of Clause No. 7 of Report No. 7 of the Rapid Transit Public/Private Partnership Steering Committee is enclosed for your information.

Please contact Paul May, Director, Infrastructure Planning, at 905-830-4444, ext. 5029, if you have any questions with respect to this matter.

Sincerely,

Denis Kelly
Regional Clerk

K.Price
Attachment

Copy to: M-F. Turner, Executive Co-ordinator
P. May, Director

York Region

Office of the Regional Clerk
Corporate Services Department

COPY

September 22, 2003

Ms. Anita Moore
Town Clerk
Town of Newmarket
395 Mulock Drive
P.O. Box 328
Newmarket, Ontario L3Y 4X7

Dear Ms. Moore:

Re: Highway 7 Corridor and Vaughan N-S Link Environmental Assessment Recommended Alignment

The Council of the Regional Municipality of York, at its meeting held on Thursday, September 18, 2003, adopted the following recommendations of the Rapid Transit Public/Private Partnership Steering Committee with respect to the Highway 7 Corridor and Vaughan N-S Link Environmental Assessment Recommended Alignment:

1. Council endorse, for the purpose of developing the Draft Environmental Assessment (EA) Report.

    - The recommended alignment for surface rapid transit service and the use of both BRT and LRT technologies on portions of that alignment to accommodate the potential for transition from BRT to LRT at some point during the YRTP network evolution.

    - The recommended alignment, within York Region, of an extension of the Spadina Subway from the Downsview Station through York University to the Vaughan Corporate Centre.

2. Copies of this report be forwarded by the Regional Clerk to the Clerks of the Towns of Markham and Richmond Hill and the City of Vaughan.

Council also directed that a copy of this report be forwarded to the Towns of Aurora and Newmarket for information.

A copy of Clause No. 7 of Report No. 7 of the Rapid Transit Public/Private Partnership Steering Committee is enclosed for your information.

Please contact Paul May, Director, Infrastructure Planning, at 905-830-4444, ext. 5029, if you have any questions with respect to this matter.

Sincerely,

Denis Kelly
Regional Clerk

K.Price
Attachment

Copy to: M-F. Turner, Executive Co-ordinator
P. May, Director

COPY

Office of the Regional Clerk
Corporate Services Department

September 22, 2003

Ms. Sheila Birrell
Town Clerk
Town of Markham
101 Town Centre Boulevard
Markham, Ontario L3R 9W3

Dear Ms. Birrell:

Re: Highway 7 Corridor and Vaughan N-S Link Environmental Assessment Recommended Alignment

The Council of the Regional Municipality of York, at its meeting held on Thursday, September 18, 2003, adopted the following recommendations of the Rapid Transit Public/Private Partnership Steering Committee with respect to the Highway 7 Corridor and Vaughan N-S Link Environmental Assessment Recommended Alignment:

1. Council endorse, for the purpose of developing the Draft Environmental Assessment (EA) Report.

    - The recommended alignment for surface rapid transit service and the use of both BRT and LRT technologies on portions of that alignment to accommodate the potential for transition from BRT to LRT at some point during the YRTP network evolution.

    - The recommended alignment, within York Region, of an extension of the Spadina Subway from the Downsview Station through York University to the Vaughan Corporate Centre.

2. Copies of this report be forwarded by the Regional Clerk to the Clerks of the Towns of Markham and Richmond Hill and the City of Vaughan.

Council also directed that a copy of this report be forwarded to the Towns of Aurora and Newmarket for information.

A copy of Clause No. 7 of Report No. 7 of the Rapid Transit Public/Private Partnership Steering Committee is enclosed for your information.

Please contact Paul May, Director, Infrastructure Planning, at 905-830-4444, ext. 5029, if you have any questions with respect to this matter.

Sincerely,

Denis Kelly
Regional Clerk

K.Price
Attachment

Copy to: M-F. Turner, Executive Co-ordinator
P. May, Director

York Region

Clause No. 4 in Report No. 8 of the Rapid Transit Public/Private Partnership Steering Committee was adopted, without amendment, by the Council of The Regional Municipality of York at its meeting on October 21, 2004.

4

HIGHWAY 7 TRANSITWAY EA: ALIGNMENT AT HIGHWAY 404

The Rapid Transit Public/Private Partnership Steering Committee recommends the adoption of the recommendation contained in the following report, October 7, 2004, from the Vice President of the York Region Rapid Transit Corporation:

1. RECOMMENDATION

It is recommended that Council endorse a fully segregated rapid transit corridor alignment at the Highway 404 interchange as part of the Highway 7 Environmental Assessment document.

2. PURPOSE

This report is presented to inform the Rapid Transit Public Private Partnership Steering Committee and York Region Council of the background to and rationale for, the preferred Highway 7 Transitway alignment through the Highway 404 interchange.

3. BACKGROUND

The individual Environmental Assessment (EA) being conducted to obtain Ministry of the Environment (MOE) approval of the proposed rapid transit infrastructure in the Highway 7 Corridor requires development of an alignment across Highway 404 at the existing interchange with Highway 7.

On September 23, 2004 Council endorsed for MOE approval, a short (400m) length of rapid transit operation in mixed traffic under the existing bridges and between the Highway 404 interchange ramp terminals as the preferred alignment option for the Highway 7 transitway to cross Highway 404. Council requested that staff report back with additional options for optimal alignment, particularly the potential utilization of a planned new mid-block collector crossing north of the Highway 404 Interchange.

The analysis summarized below provides the findings of an evaluation of the potential rapid transit alignment options through the Highway 404 Interchange and the rationale for the recommended strategy to obtain the necessary EA approvals.

4. ANALYSIS AND OPTIONS

There are three primary alignment options to cross Highway 404:

1. The use of the existing bridges and Highway 7 roadway between the interchange ramp terminals for operation of transit in mixed traffic.

2. Development of a new alignment through the interchange, either above, below, or alongside the existing bridges without using adjacent local road rights-of-way. Increasing the span of the existing bridges to accommodate a transitway at-grade through them is also a variation of this option.

3. Development of a new alignment across Highway 404 north of the interchange using the Allstate Parkway and East Beaver Creek Road rights-of-way and privately-owned land to reach a crossing point coinciding with the proposed new overpass of Hwy 404 currently the subject of an EA for the Towns of Markham and Richmond Hill and the Region of York.

These are shown conceptually on *Attachment 1* and are described in section 4.1.

4.1 Description of Alignment Options

4.1.1 Operation in Mixed Traffic on Existing Highway 7

This option assumes that new, dedicated median transit lanes would be constructed through most of the heavily-congested blocks of Highway 7 either side of Highway 404 up to the ramp terminal intersections immediately east and west of the interchange bridges. This would leave approximately 400 metres of Highway 7 to be travelled in mixed traffic. Given that this portion of the highway is part of one of the most heavily-congested zones along the corridor, a field survey of traffic movements and modelling of traffic behaviour with and without transit priority was carried out to assess this option's feasibility. This investigation revealed that, although the queues at the East Beaver Creek Road and Allstate Parkway signalized intersections extend into the central 400 m portion of the interchange in peak periods, vehicles in this portion are cleared within one 90 second signal cycle. Rapid transit vehicles in mixed traffic in this portion would be advanced in the same way.

4.1.2 A Segregated Alignment Through the Interchange

For this option, the median transitway would remain in the Highway 7 median but either be elevated over the interchange or depressed under the existing road and ramp terminal intersections. A third variation for this option would elevate the transitway on an alignment crossing the interchange ramps and Highway 404 north or south of the existing bridges.

A further option to segregate rapid transit from traffic through the interchange would be a lengthening of the span of the existing Hwy 404 bridges to achieve an opening wide enough for the two dedicated lanes to pass under the Highway 404 in the median of Highway 7.

4.1.3 A Bypass Alignment North of the Interchange

This third option comprises a new transit-only overpass of Highway 404 at the northern limit of the interchange. The transitway alignment would have to leave Highway 7 median and follow East Beaver Creek Drive right-of-way to the East Pearce intersection area where it would turn east across private land to a Highway 404 overpass which could be integrated with Markham/Richmond Hill's proposed collector road if the Town's and Region's EA recommends a compatible location for the road crossing.. After crossing the highway, it would continue east across private property to the Allstate Parkway right-of-way. From this point the transitway would follow Allstate Parkway to the existing Highway 7 intersection where it would turn east and continue into Markham.

4.2 Evaluation of Alignment Options

The advantages and disadvantages of each option are summarized below:

4.2.1 Operation In Mixed Traffic on Existing Highway 7:

Advantages

- Dedicated lanes separate transit from congestion through most of the Woodbine Leslie zone, eliminating most of the delay experienced at present in this portion of Highway 7.
- Avoids widening of local road rights-of-way (East Beaver Creek and Allstate Parkway) and has no impact on access to properties as would be required by the northern bypass option.
- Minimizes the number of signalized intersections on the rapid transit route.(2 req'd)
- Minimizes initial and potentially ultimate capital cost of rapid transit through Highway 404 interchange.
- Defers decision on high capital investment until effect of new municipal overpass and proposed interchange ramp improvements is known.
- Analysis of peak-period traffic movements and signal operation indicates that, with reasonable signal advance times (8 seconds), delays to transit vehicles will not exceed 1.5 minutes (a full signal cycle), with the westbound AM peak representing the worst-case scenario.
- Permits full segregation of rapid transit, if required with minimal throw-away cost for initial solution.

Disadvantages

- Rapid transit service could be further delayed by a traffic incident in the Highway 7 interchange affecting the mixed traffic section (e.g. a collision or stalled vehicle).
- Requires MTO approval of changes to ramp terminal signal timing.
- Municipal road improvements may not defer traffic congestion on Highway 7 significantly.

4.2.2 A Segregated Alignment Through the Interchange

Advantages

- Dedicated lanes separate transit from congestion entirely in the Woodbine-Leslie zone.
- Separates rapid transit service from all road traffic between East Beaver Creek Road and Allstate Parkway avoiding the up to 90 second delay of mixed traffic operation.
- No delay during off-peak periods.
- Eliminates potential for delay due to general traffic incidents within the interchange.
- Minimizes travel time through the Woodbine-Leslie zone for all transit riders from/to the east.

Disadvantages

- Depending on structural solution selected, $20-$50 million capital cost to get rapid transit through Highway 404 interchange.
- Requires high rapid transit capital investment prior to the effect of planned new road overpass and interchange improvements being known.
- Minor visual intrusion if 2-level elevated transitway option is adopted although impact is mainly within interchange
- Some disruption of traffic during construction with severity dependent on the structural solution adopted.

4.2.3 A Bypass Alignment North of the Interchange

Advantages

- Separates rapid transit service from all road traffic between East Beaver Creek Road and Allstate Parkway
- Eliminates potential for delay due to general traffic incidents within the interchange but more intersections on this route raises the potential for incidents.
- Offers opportunity for an additional station serving development north of the interchange.

Disadvantages

- Requires widening or reduction in general traffic capacity of local road rights-of-way (East Beaver Creek Road and Allstate Parkway) and dedication/acquisition of private property to reach northern location of new Highway 404 overpass.

- Requires 5 at-grade signalized traffic intersections along the rapid transit route on East Beaver Creek Road, new east-west road and Allstate Parkway.
- Requires resolution of property access conflicts on East Beaver Creek Road and Allstate Parkway.
- Transit turning movements at Allstate Parkway and East Beaver Creek constrained to left turn phases of these Highway 7 intersections increasing delay potential.
- Increases length of rapid transit route by 0.6 km over shortest route in Highway 7 median adding 2-3 minutes to travel time depending on traffic signal wait times and dwell time at additional station.
- Delay would also occur during off-peak periods when not required.
- Adds $20-30 million to capital cost of initial rapid transit through Highway 404 interchange depending on land cost for new right-of-way.
- Requires high rapid transit capital investment prior to the effect of planned new road overpass and interchange improvements being known.

4.3 Recommended Approach

This report sets out the rationale for the conclusion that the partial mixed-traffic option should be adopted as the preferred alignment for the section through the Highway 404 interchange because it:

- Is an operationally feasible and acceptable low-cost solution.
- Offers the flexibility to avoid or defer higher system capital costs until they are shown to be warranted.
- Does not preclude future implementation of a fully grade separated option if planned road improvements do not manage growth in traffic congestion by redistribution of traffic flows through the area.

In addition, approval of an optimum fully grade separated alignment through the Highway 404 interchange should be sought in the EA to be available for implementation without a separate EA in the event that reliability of mixed traffic rapid transit service cannot be assured at some point in the future.

5. FINANCIAL IMPLICATIONS

The capital funding required for the Highway 7 transitway across the Highway 404 interchange will be affected by the alignment option selected to the levels indicated above for each option analyzed.

6. LOCAL MUNICIPAL IMPACT

Selection of the northern bypass alignment would require the use of approximately 0.6 km. of local municipal road right-of-way to achieve the transitway alignment.

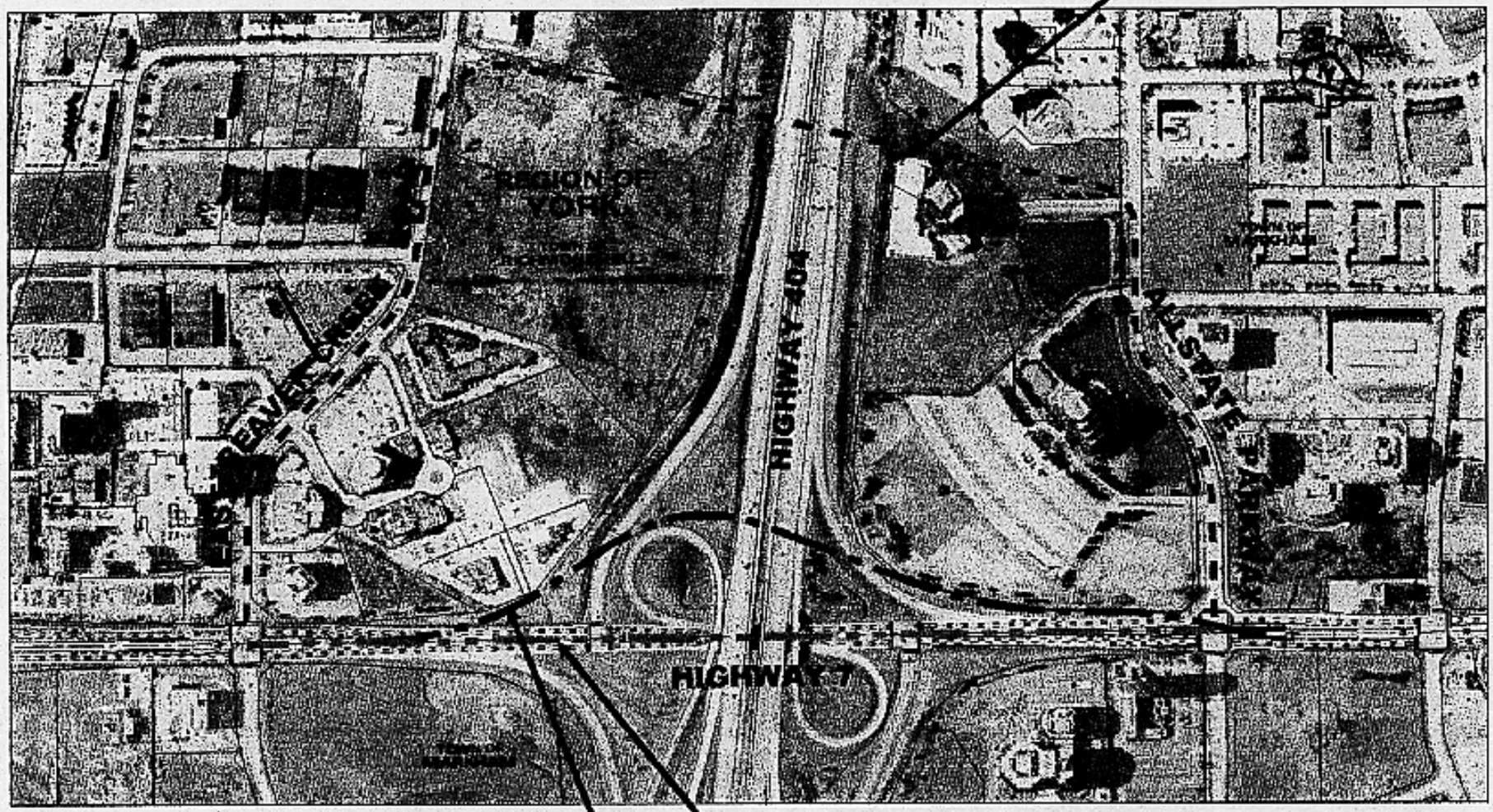
The evaluation has assumed that Richmond Hill, Markham and York Region will complete construction of the planned mid-block Highway 404 overpass within the next 5-10 years. The EA for this proposed overpass is currently underway.

7. CONCLUSION

The technically preferred alignment, approved by Regional Council last September, was presented to Markham Council in April this year. Markham Council requested a separate report on the analysis leading to the recommendation to cross Highway 404 interchange partially in mixed traffic. This report recommends two options for MOE approval; (1) a short (400m) length of rapid transit operation in mixed traffic under the existing bridges and between the Highway 404 interchange ramp terminals and, (2) an optimum fully grade separated alignment through the Highway 404 interchange to be available for implementation without a separate EA in the event that reliability of mixed traffic rapid transit service cannot be assured at some point in the future.

(The attachment referred to in this clause was included in the Agenda for the October 14, 2004 Committee meeting.)

Highway 404 Crossing Options



Attachment 1