

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.)