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MARKHAM NORTH-SOUTH LINK CORRIDOR PUBLIC TRANSIT IMPROVEMENTS ENVIRONMENTAL ASSESSMENT UPDATE

The Rapid Transit Public/Private Partnership Steering Committee recommends the adoption of the recommendations contained in the following report April 6, 2005, from the Vice President, York Region Rapid Transit Corporation:

1. RECOMMENDATIONS

It is recommended that:

1. Council endorse:
 - The preferred solution of providing Markham North-South Link Corridor Public Transit Improvements as a means of addressing corridor transportation demand.
 - The preferred technology of Bus Rapid Transit (BRT) for the Markham North-South Link Corridor.
 - The recommended Markham North-South Link Corridor alignment for rapid transit service and the associated staging strategy.
2. The pending Class Environmental Assessments for road improvements to Don Mills Road/Leslie Street between Steeles Avenue and Highway 7, identified in the York Region 10-Year Plan include consideration of transit priority as a key component in addressing needs within this corridor.
3. 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 Toronto.

2. PURPOSE

The purpose of this report is to provide an update on the Markham N-S Link Corridor Environmental Assessment (EA) and to present a summary of the study findings including the recommended BRT alignment. With endorsement from Council, the project team will present the EA recommendations to the public for comment at the final open house to be held in May 2005.

3. BACKGROUND

The Ministry of the Environment (MOE), approved the Terms of Reference (TOR) for the Markham N-S Link Corridor Public Transit Improvements EA Study on July 13, 2004.

The basic concept for the Markham N-S Link Corridor, as envisioned in the York Region Transportation Master Plan, is to connect the Markham Centre (Warden Avenue and Highway 7 area) with the Sheppard Subway. Connections with the Sheppard Subway could be made to the existing terminus at Don Mills Station or, if the subway is extended, to a future easterly station.

Reflecting the range of possible alignment options for the undertaking an initial study area was defined to cover the area bounded by Leslie Street/Don Mills Road to the west, McCowan Road to the east, 16th Avenue to the north and Sheppard Avenue to the south (see *Attachment 1*). The study area includes portions of the Town of Markham and the City of Toronto, as well as a small portion of Richmond Hill in the Highway 7 / 404 commercial node.

Recommendations for the Markham N-S Link corridor were developed to take into account recommendations from the Don Valley Corridor Transportation Master Plan being conducted by the City of Toronto. The purpose of this study is to recommend specific road and transit-related improvements for increasing person-carrying capacity in the Don Valley corridor within the City of Toronto. The Draft Final Report for this study, released in February 2005, recommends as a high priority the establishment of a Don Mills Higher Order Transit service to Bloor-Danforth subway. It also recommends surface transit priority measures for Victoria Park Avenue.

4. ANALYSIS AND OPTIONS

4.1 Preferred Strategy For Markham Link Corridor

The preferred strategy for implementing Public Transit Improvements in the Markham N-S Link Corridor was developed following the evaluation of alternative solutions and alternative methods of carrying out the undertaking, but is presented here as context for the remainder of this report.

The preferred strategy is to implement public transit improvements in a staged approach, which is appropriate since the corridor is still evolving and there are some uncertainties about the configuration and timing of rapid transit improvements in the City of Toronto. The proposed staging is as follows:

- Step 1: Implement planned VIVA Phase 1 service.
- Step 2: Implement selected transit priority enhancements in the VIVA Phase 1 corridor (e.g. queue jump lanes), which are not part of the initial service.
- Step 3: Construct transit priority treatments on Don Mills/Leslie Street north of Steeles Avenue to allow for expedited transit services between Don Mills Station and the Highway 404/7 commercial node. These improvements will be defined as part of the Class EA for road improvements to Don Mills Road/Leslie Street, which is planned to start this year.
- Step 4: Construct median transit lanes on Warden Avenue from Enterprise Dr. to Denison Street.

The preferred undertaking is to provide dedicated bus rapid transit service on Warden Avenue between Enterprise Drive and Denison Street, with connections to the Highway 7 Transitway in the north and one or more corridors in the City of Toronto to the south, initially via Denison Street and Esna Park Drive (see *Attachment 2*).

The remainder of this report describes the steps undertaken to develop the preferred strategy and the preferred undertaking, consistent with the approved EA Terms of Reference.

4.2 Alternative Solutions

As part of the EA process, a wide range of broad alternative solutions were considered to address the travel needs in this corridor including a “do nothing” scenario, a current commitments scenario, additional road improvements, enhanced inter-regional transit and York Region Public Transit Improvements.

The preferred alternative solution consisting of Public Transit Improvements was selected because it will:

- Address road capacity shortfalls while building person-carrying capacity for the longer term.
- Increase transit mode shares across the Steeles Avenue screenline (Don Mills Road to McCowan Road) from 10% in 2001 to 23% in 2031.
- Contribute to the social environment by reducing neighbourhood traffic infiltration and offering improved access to community amenities by providing a convenient alternative to auto use.
- Minimize environmental impacts by reducing emissions from single-occupant vehicles and minimizing the need for extensive road widening.
- Support the Region’s Official Plan and centres and corridors urban form and municipal development objectives.

4.3 Alternative Methods of Improving Public Transit

Developing a preferred alternative for improving public transit in the Markham N-S Corridor involved several elements. Alternatives for each of the following elements were developed and evaluated in order to identify the preferred methods for the corridor:

- Transit service quality.
- Transit technologies.
- Transit routings.
- Physical infrastructure.

4.3.1 Assessment of Transit Service Quality Improvements

Various methods of improving transit service quality were assessed in order to determine which elements should be carried forward as part of the preferred undertaking. These included increasing frequency and coverage of transit services, introducing feeder bus services to major employment areas, implementing transit priority measures and improving transit stops.

The alternative methods selected to be developed further as part of this EA included:

- Transit Priority, which is a cost-effective method of improving transit travel times and reliability; and,
- Improved station stops, which will improve the overall attractiveness and usage of transit, and enhance the safety and comfort of transit riders.

Increasing transit frequencies on all routes in the study area and new feeder bus services would complement the phased implementation of rapid transit described in section 4.1, but do not require detailed investigation through this EA.

4.3.2 Assessment of Transit Technologies

A comprehensive range of technologies was initially examined as part of the EA including: Conventional Bus, Bus Rapid Transit (BRT), Light Rail Transit (LRT), Diesel Multiple Units (DMU), Automated Guideway Transit (AGT), Heavy Rail (Subway).

A qualitative assessment of potential technologies was presented to the public at the fourth public meeting on December 7th, 2004. An evaluation of technologies was also presented in the December 2003 YRTP Network Configuration Report.

Bus Rapid Transit (BRT) is the preferred technology because:

- Ridership forecasts developed for a representative rapid transit alignment in this corridor indicate a potential demand of between 2,500 and 3,500 persons per hour in the peak direction, which is lower than that which would be required to support investments in light rail transit or heavy rail transit.
- Bus Rapid Transit allows for flexibility of routing over time as the corridor develops and future rapid transit alternatives are established in the City of Toronto.

- Bus Rapid Transit allows for seamless travel from other rapid transit corridors in York Region.
- Bus rapid transit can be implemented in a phased manner.

4.3.3 Assessment of Alternative Routings

4.3.3.1 Initial Screening of Routing Options

At the outset of the EA all possible routes/corridors that could be considered for public transit improvements, while fulfilling the goal of providing a link between Markham Centre and the Sheppard subway were identified. These essentially included all continuous N-S routes between Don Mills Road/Leslie Street and McCowan Road.

An initial screening process was applied to these routes to eliminate routes that would not address the main objectives in this corridor, or were less acceptable in terms of social, economic or natural environment impacts.

A key factor in selecting routes for further consideration was their potential to significantly improve transit ridership to/from and within the study area.

Routes evaluated and routes selected for more detailed evaluation are shown on *Attachment 3*. These routes were initially presented to the public in June 2003 as part of the Need and Justification work undertaken as part of this EA. They will be presented to the public again at the final public information centres in May 2005.

4.3.3.2 Evaluation and Selection of Preferred Corridors

Three potential corridors emerged from the initial screening of routing options:

- Don Mills Road/Leslie Street.
- Woodbine Avenue/Highway 404.
- Warden Avenue/Victoria Park Ave.

Each of these corridors was assessed in terms of the following:

- Transit Ridership Potential.
- Accessibility Impacts.
- Land Use Impacts.
- Compatibility with other planned transportation improvements.

Based on the assessment, which relied on both quantitative and qualitative measures, Warden Avenue was selected as the preferred corridor for public transit improvements, including rapid transit. Compared to other corridors:

- Warden Avenue has the highest density of population and jobs in the longer term.
- Warden Avenue has the greatest transit ridership potential.
- Warden Avenue has the highest potential for transit-supportive development.

Although Warden Avenue was selected as the preferred corridor for rapid transit, the analysis also demonstrated that transit improvements are warranted in the Don Mills Road/Leslie Street Corridor. Specifically, the Highway 404/7 commercial node currently has the highest concentration of employment in York Region and would benefit from enhanced transit service. There is a need for a transit connection between Don Mills Station on the Sheppard Subway and the Highway 404/7 commercial node in the near term. However, since much of the corridor consists of low-density stable residential development, transit demands could be met by a limited stop express-type service with transit priority measures, in addition to local services.

4.3.3.3 Routing Options in the City of Toronto

As described previously, the EA study area extends to Sheppard Avenue in the City of Toronto. Since the City of Toronto is not a proponent in the EA, this study will not define specific infrastructure to address needs within the higher-order transit and transit priority corridors as envisioned in the Toronto Official Plan. A future study (or studies) will be required by the City of Toronto to define transit service and infrastructure south of Steeles Avenue to address needs within the City of Toronto.

Since York Region does not have the jurisdictional authority to construct any physical infrastructure within the City of Toronto without an agreement with Toronto, an important aspect in the development of alternatives within this EA is to consider how potential services and infrastructure north of Steeles Avenue could be integrated with the long term transit planning objectives of the City of Toronto.

In discussions with the Toronto staff, it was determined that any transit service crossing into Toronto would have to respect the jurisdictional boundary of the TTC. In general, any York Region service crossing into Toronto could drop-off passengers en route to the proposed terminus of the service at the Sheppard Subway. In the northbound direction, any York Region Transit service could only pick-up riders destined for York Region.

With these limitations in mind, this EA will only go as far as identifying the transit service characteristics and any limited infrastructure south of Steeles Avenue required to directly support the York Region undertaking that is being defined in this EA.

The development of rapid transit in Warden Avenue north of Steeles Avenue can be designed to respond to various routing opportunities in the City of Toronto as they evolve. A more detailed discussion of these alternatives and the rationale for the preferred initial route is provided in Section 4.4.5.

4.3.4 Alternative Physical Infrastructure

Given the diversity of conditions in the Markham N-S Link Corridor, it is appropriate to examine a range of physical infrastructure alternatives. Physical infrastructure alternatives essentially consist of alternatives for locating rapid transit, or enhanced transit, within the road R.O.W. and include the following:

- Queue jump lanes, which provide priority for transit vehicles at key intersections.
- Separate curb side lanes that are fully dedicated for buses, or operate as combined transit/HOV lanes.
- An exclusive two-way median transitway in the centre of the roadway with vehicular traffic either side of the transitway.

The result of the evaluation undertaken as part of the EA indicated that a median transitway was generally preferred for the following reasons:

- It had the best transportation service quality.
- It was deemed the safest as it had the least number of conflict points at intersections.
- It provided good opportunity to mitigate the impact of local traffic and property access issues.
- It was also considered more desirable as it allowed for better streetscaping opportunities.

However, the choice of physical infrastructure depends on local conditions including:

- Available R.O.W. width and implementation considerations.
- Flexibility to accommodate routing changes (i.e. in the southern portion of the study area routings may be modified if the Sheppard Subway is extended).

Therefore, all three alternatives were carried forward for more detailed assessment as part of the overall development of the preferred undertaking.

4.4 Alternative Alignments

Given that the Markham N-S Link Corridor is diverse in terms of land uses and existing/potential road infrastructure to accommodate rapid transit, the analysis of alignment options was carried out on a segmental basis using four segments. These segments, and the specific alternative alignments considered within each of these segments are illustrated on *Attachment 4* and described below.

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

- Ridership Potential and 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.

4.4.1 Segment A: Highway 7 to Enterprise Drive

This segment is where the N-S rapid transit service on Warden Avenue will interface with the Highway 7 transitway. The technically preferred alignment for the Highway 7 transitway is to utilize Town Centre Boulevard and a proposed new connection to the east-west Markham Centre Civic Mall north of Enterprise Drive. If this alignment cannot be implemented, the Highway 7 transitway would utilize Warden Avenue to connect from Enterprise Drive to Highway 7.

For the Markham N-S Link, two alignment alternatives were evaluated:

- Locating the transitway in the median of Warden Avenue from north of Highway 407 then utilizing the IBM ramp over Warden Avenue to access the planned station on Town Centre Boulevard (A.1).
- Locating the transitway in the median of Warden Avenue from north of Highway 407 then turning directly into the Civic Corridor north of Enterprise Drive (A.2).

The preferred alignment within this section is the loop alternative (A1). This alternative is preferred because:

- It avoids a complex transition to the Highway 7 transitway north of Enterprise Drive.
- It provides more direct service to IBM, a significant employer and potential transit ridership generator.

4.4.2 Segment B: Enterprise Drive to 14th Avenue

This section includes the crossing of Highway 407 and the CN York Subdivision. In spring 2005, York Region will commence construction to widen Warden Avenue from 4 lanes to 6 lanes from south of 14th Avenue to north of Highway 7.

The preferred alternative for the longer term is to establish a median transitway along this segment of Warden Avenue. Two cross section options were considered for this segment:

- A median transitway plus 6 traffic lanes, which would be accommodated by widening Warden Avenue beyond the planned future 6 lanes (B.1).
- A median transitway plus 4 traffic lanes, which would be accommodated by converting two regular traffic lanes (from a total of 6 in the future) to dedicated transit lanes (B.2).

The preferred alternative is to design for a median transitway plus 6 traffic lanes (B.1) since the analysis undertaken as part of this EA has confirmed the need to maintain 6 traffic lanes.

4.4.3 Segment C: 14th Avenue to Denison Street

Warden Avenue between 14th Avenue and Steeles Avenue has been identified for widening to six lanes in York Region's 10 year capital plan, pending recommendations on rapid transit alignments.

As with the northerly section, two cross section options were considered for this section:

- A median transitway plus 6 traffic lanes, which would be accommodated by widening Warden Avenue beyond the planned future 6 lanes (C.1).
- A median transitway plus 4 traffic lanes, which would be accommodated by widening Warden Avenue for transit only (C.2).

Traffic analyses undertaken as part of the EA indicate that with the planned extension of Rodick Road and Birchmount Road across Highway 407 combined with the planned Kennedy Road widening, future traffic volumes on Warden Avenue south of 14th Avenue can be accommodated with 4 lanes for general traffic. In addition, with an available R.O.W. width of 36m, it would not be possible to accommodate six lanes of traffic plus a median transitway without significant impacts to adjacent properties.

Based on the above, the preferred alternative is to maintain 4 general traffic lanes on Warden Avenue south of 14th Avenue and reserve the remaining R.O.W. for a median transit facility (Alternative C.2).

4.4.4 Segment D: Denison Street to Steeles Avenue

This section is an important connection through the Markham employment lands and is also the transition to routes in the City of Toronto.

Two primary route options were investigated:

- From Warden Avenue, west on Denison Street to Esna Park Dr and then south on Esna Park Drive, continuing south across Steeles Avenue to Pharmacy Avenue (D.1).
- From Warden Avenue, west on Denison Street to Victoria Park Ave, then south on Victoria Park Avenue across Steeles Avenue (D.2).

The Esna Park Avenue alignment follows the planned VIVA Phase 1 routing. It was selected for VIVA Phase 1 because it bisects two large employment centres on Steeles Avenue— IBM Canada and the Liberty Centre. There are merits in maintaining the VIVA Phase 1 alignment for the future rapid transit service because the infrastructure for stations will be in place and VIVA Phase 1 will have built a ridership base along this alignment. Therefore, the Denison Street – Esna Park Drive alternative (D1) was selected as the preferred alignment.

For the preferred alignment, two alternatives were considered for locating the transit service:

- Mixed traffic operations with Queue Jump lanes on Denison Street at Warden Avenue (D.1a).
- An exclusive two-way median transitway in the centre of the roadway with eastbound and westbound vehicular traffic either side of the transitway (D.1b). This option would maintain four lanes for regular traffic as exists today.

Widening Denison Street to provide for a full median transitway would provide the best service for rapid transit. However, it would have significant effects on adjacent properties since additional R.O.W. would be required this would impact parking for adjacent buildings.

Considering the impacts on adjacent properties and the lack of serious congestion problems outside of relatively short peaks, the preferred alternative is to operate the rapid transit system in mixed traffic on Denison Street and Esna Park Drive, but mitigate any traffic capacity issues by providing queue jump lanes (D.1a). Specifically, transit vehicles would access a median transit lane between Hood Road and Warden Avenue, which would allow them to by-pass eastbound traffic queues approaching Warden.

4.4.5 Analysis of Routes South of Steeles Avenue

As discussed in Section 4.3.3.3, the Markham N-S Link will utilize available routes and infrastructure for the portion of the service operating in the City of Toronto. The most advantageous route may change over time as the City of Toronto advances proposals for surface rapid transit, or if the Sheppard subway is extended. In the City of Toronto Official Plan, Don Mills Road, the Finch Hydro Corridor and the Sheppard East corridor are identified for “higher-order transit” facilities. It is understood that these higher order services would operate in exclusive rights of way. Transit priority segments include Victoria Park Avenue to Steeles Avenue, McCowan Road to Finch Avenue and Finch Avenue. This may include HOV lanes or other measures to expedite transit. The establishment of a Higher-Order Transit service on Don Mills Road is a key priority for the City of Toronto as outlined in the Don Valley Corridor Transportation Master Plan.

The Markham N-S Link EA considered all potential routing options for the north-south service south of Steeles Avenue including: Don Mills Road, Highway 404/Gordon Baker Road, Victoria Park Avenue and Warden Avenue. An alignment that would travel south on Pharmacy Avenue, west then south on Gordon Baker Road, west on Finch Avenue and south on Don Mills Road to the Sheppard subway station was considered to be the most preferable for the short term. This alignment would service major attractions including Gordon Baker Business Park, Seneca College and the Fairview Mall area. It would also serve to capitalize on any surface rapid transit infrastructure that is constructed on Don Mills Road by the City of Toronto.

The preferred routing option south of Steeles, which is consistent with the Viva Phase 1 routing, achieves the objective of connecting Markham Centre with the Sheppard Subway. The Preferred Undertaking north of Steeles Avenue in York Region provides flexibility to pursue other options in the City of Toronto in addition to or in replacement of the preferred initial routing south of Steeles Avenue should they become available and are more advantageous. This includes alignments connecting future subway stations on the Sheppard corridor.

5. FINANCIAL IMPLICATIONS

The budget for the consulting services to complete the EA for the Markham N-S Link is 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 the City of Toronto have participated on the Technical Advisory Committee and will be requested to continue their involvement during the preparation of the EA Report.

7. CONCLUSION

The Markham N-S Link Corridor 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 dedicated bus rapid transit service on Warden Avenue between Enterprise Drive and Denison Street, with connections to the Highway 7 Transitway in the north and one or more corridors in the City of Toronto to the south, initially via Denison Street and Esna Park Drive.

The Recommended Alignment and key EA findings will be presented to the public at the final public information centres in May 2005.

The details of the recommended alignment for rapid transit and the effects of its implementation will be documented in the EA report, expected to be completed in early summer 2005 following the final public information centres.

Consistent with the overall intent of implementing a wide range of public transit improvements, in addition to the recommended alignment for the Markham N-S Link Rapid Transit Corridor, the EA report will include a recommended strategy for improving transit in other corridors. Specifically, this study recommends that consideration be given to implementing transit priority measures on Don Mills Road/Leslie Street between Steeles Avenue and Highway 7 to facilitate increases service levels and improved transit travel times for the Highway 404 / Highway 7 employment node.

The Senior Management Group has reviewed this report.

(The attachments referred to in this clause are included with this report.)