

E. SUMMARY

E.1 BACKGROUND

York Region's Official Plan places a strong emphasis on significantly increasing public transit use to accommodate future transportation needs and support the Plan's vision of sustaining the natural environment, optimizing economic vitality and ensuring healthy communities.

The Region's 2002 *Transportation Master Plan* (TMP) has reaffirmed the need to achieve a balanced transportation system by implementing rapid transit in four corridors. The TMP incorporates the Government of Ontario's Growth vision for fostering and managing growth.

In the planned rapid transit network, shown in Figure E-1, three of the corridors comprise north-south rapid transit facilities. These are the Yonge Street corridor connecting Newmarket Regional Centre to the Yonge Subway, a link from the Vaughan Corporate Centre to the Spadina Subway and a link from the proposed Markham Centre to the Sheppard Subway.

Figure E-1
York Region Rapid Transit Network



The fourth corridor is an east-west rapid transit facility in the Highway 7 corridor connecting to all three of the north-south rapid transit lines, to the Region of Peel in the west and to the Region of Durham in the east.

In June 2002, Regional Council endorsed the proposal of York Consortium to establish a public private partnership for implementation of the York Rapid Transit Plan (YRTP), a program of rapid transit projects designed to form a transit network in York Region. Transportation and environmental planning studies for the Markham North-South Link Corridor were commenced in September 2002.

On July 13th, 2004, the Ministry of the Environment (MOE) approved the Terms of Reference for the Environmental Assessment of Public Transit Improvements in the Markham North-South Link Corridor. These Terms of Reference set out the requirements for the Environmental Assessment in accordance with Section 6.1(2) of the Ontario Environmental Assessment Act.

Reflecting the range of possible alignment options for the undertaking, as described in the Terms of Reference, 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. This study area, including its context with the Greater Toronto Area, is shown on Figure E-2. 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 Beaver Creek Business Park area.

The purpose of this report is to document the scope and findings of the EA study assessing the effects on the environment of both construction and subsequent operation of improved public transit service along the corridor.

E.2 PURPOSE OF THE UNDERTAKING

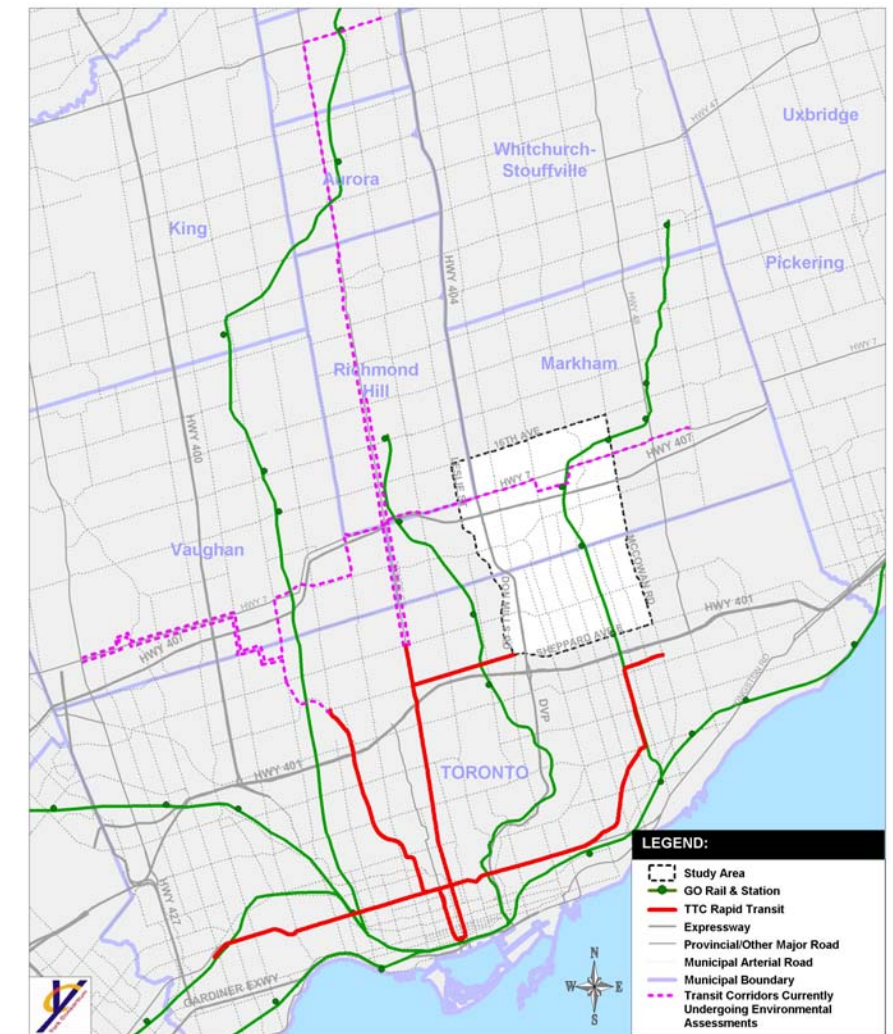
The purpose of the "Undertaking", Public Transit Improvements in the Markham North-South Link Corridor, encompasses two fundamental objectives:

- to respond to growth pressures by providing a high quality improved public transit alternative to reduce automobile dependence, and
- to help make the Region's urban centres more liveable, pedestrian-oriented and economically viable by providing a valuable tool for structuring and achieving land use and social objectives.

In the Markham North-South Link Corridor, the purpose of the undertaking can be summarized as:

- Providing improved public transit infrastructure and service in this north-south corridor, capable of producing significant increases in transit ridership both within the corridor and across the network and regional boundary. This objective will be supported by interconnection with other corridors and GTA transit systems such as the Highway 407 transitway, GO Transit and the TTC Sheppard Subway.
- Integrating improved transit facilities in a manner that enhances and enriches streetscapes with new amenities by using a holistic urban design approach to support the Region's goals for mixed-use transit-oriented development along the corridor.

Figure E-2
Study Area for Public Transit Improvements in the Markham North-South Link Corridor



E.3 RATIONALE FOR THE UNDERTAKING

E.3.1 Need and Justification

Chapter 2 of this EA document presents an overview of existing conditions in the study area. This work confirms and supports the general problems highlighted in the York Region Transportation Master Plan (TMP) and can be summarized as follows:

- Road capacity constraints, which lead to increased travel times, congestion and air pollution;
- Low transit accessibility, both in terms of service levels and service coverage connecting major destinations, which in turn leads to low transit mode shares and a high reliance on automobiles;
- Limits on urban development, due to the fact that the road system alone cannot support the levels of development anticipated in the Region, particularly key centres such as Markham Centre;
- Sustainability issues, which stem from a high dependence on automobiles, including air pollution, greenhouse gas emissions, and inability to respond to changes such as fuel supply limitations/price increases, which are anticipated over the next 30 years;
- Lack of accessibility, for those individuals who cannot afford to drive a car, or do not have access to a car (e.g. students, elderly persons);

Improving public transit in the corridor has the potential to address these problems.

In the context of York Region's Official Plan objective of achieving a significant increase in transit's share of peak period travel, this initial study and subsequent further analysis using updated modelling in 2004, investigated a range of transportation solutions for the Corridor. In accordance with the requirements of the EA Act, these solutions were defined and evaluated as alternatives to the proposed Undertaking.

E.4 ALTERNATIVES TO THE UNDERTAKING

Five alternatives were defined and compared in terms of their ability to address the shortfall in transportation system capacity and other social and environmental issues such as a lack of modal choice and environmental impacts of vehicle use. These included:

- a "Do Nothing" alternative,
- a "Current Commitments" or base case solution comprising committed improvements to highway and arterial road networks along with on-going increases in local conventional bus service,

- an auto-focussed alternative adding enough road system capacity beyond that currently committed to eliminate the capacity shortfall,
- the current commitments alternative combined with enhanced inter-regional bus and rail transit service and capacity on the existing GO commuter rail lines and the 400-series highways,
- the proposed undertaking, namely current commitments plus public transit improvements such as the Region's planned rapid transit network comprising dedicated transitways on the surface along with extensions of Toronto's existing subway system into the Region.

Evaluation of these alternatives led to the conclusion that:

- Both the Do Nothing alternative and the Current Commitments solution would not address the estimated road capacity deficiency and further expansion of the road system beyond the current commitments was not possible without unacceptable disruption of the social environment, degradation of the natural environment and cost,
- Enhancing inter-regional bus and rail services in the corridor will not reduce the road capacity shortfall significantly because more frequent rail service attracts primarily downtown-Toronto destined trips and inter-regional bus service on Highway 404 bypasses the core development nodes along the corridor. In addition, the location of the inter-regional transit routes does not support the urban form envisioned in the Region's Official Plan and thus will not encourage transit-oriented development within the region.
- If the Region's Official Plan urban form and development vision is to be achieved in a sustainable manner, public transit improvements in the form of a higher order rapid transit facility, fully integrated with the GTA rapid transit network will be required.
- The rapid transit alternative is best able to meet long-term growth needs and planning objectives while offering the opportunity to mitigate high costs and local environmental impacts by maximizing the use of existing transportation corridors.

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, reducing traffic accident potential, 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 widenings;*
- support the Region's Official Plan and centres and corridors urban form and municipal development objectives.*

E.5 ALTERNATIVE METHODS OF CARRYING OUT THE UNDERTAKING

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

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

E.5.1 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 – increasing the frequency of existing bus services and expanding the number of routes serving the study area;
- Circulator buses – providing service to employment areas using smaller circulator buses;
- Transit priority – expediting transit services through traffic signal priority and/or queue jump lanes;

- Improved transit stops – providing more shelters and improving access to/from transit stops (e.g. constructing sidewalks, making stops wheelchair accessible).

E.5.1.1 Evaluation and Section of Preferred Alternative Service Quality Improvements

In isolation of other improvements, increasing the frequency of transit may not be enough to make people switch to transit, since buses would still be impacted by traffic congestion. As a result, this method is not considered to be an acceptable stand-alone option for improving public transit. However, service improvements would complement other transit improvements and would be an integral part of the network of services including the preferred undertaking.

Similarly, introducing circulator buses into employment areas is only effective if there are high-quality and high frequency services to connect to. The preferred undertaking of implementing rapid transit would support the implementation of neighbourhood/employment area circulator bus services in the future. However, these services are not included as part of the preferred undertaking and can be pursued outside of the EA process.

Introducing **transit priority measures** has the potential to improve transit travel times, thereby increasing the overall attractiveness of transit. **Improving transit stops** will also serve to improve comfort and safety for transit riders. Transit priority measures and improved transit stops are an integral part of the preferred undertaking.

E.5.2 Transit Technologies

A comprehensive range of technologies was initially examined as part of the EA including:

- **Conventional Bus** - an integral part of any enhanced transit system, either serving to feed a rapid transit system or as an integral part of a bus-based system.
- **Bus Rapid Transit (BRT)** - a flexible form of rapid transit that combines transit stations, vehicles, services, running way, and ITS elements into an integrated system.
- **Light Rail Transit (LRT)** - a flexible transportation mode that can operate in a variety of settings. LRT is a relatively low cost form of rail technology, usually obtaining electric power from overhead wires.
- **Diesel Multiple Units (DMU)** - a modern form of a diesel-powered rail car. DMU's are self-propelled and distinguished from current commuter rail equipment with each vehicle motorized rather than pushed or pulled by a heavy diesel engine. This type of technology would operate on conventional rail tracks, for example the GO Stouffville Line.

- **Automated Guideway Transit (AGT)** – this technology uses fully automated driverless trains, with fully grade-separated operations, typically on an elevated guideway.
- **Heavy Rail:** - this technology would consist of high capacity rail cars operating in trains of two or more cars on fixed rails in separate rights-of-way (ROW). This concept is used to serve very high volume corridors with capacities requirements in the order of 30,000 to 50,000 peak hour passengers per direction.

E.5.2.1 Evaluation and Selection of Preferred Technology

Ridership forecasts indicate a potential peak transit demand of approximately 3,000 passengers per hour per direction (pphpd) for the segment on Warden Avenue south of Enterprise Drive in 2021. The proposed two lane exclusive transitway, with at-grade intersections and either BRT or LRT technology, is able to accommodate these volumes.

E.5.3 Alternative Routings

E.5.3.1 Initial Screening of Routing Options

The York Region Transportation Master Plan identified several options for providing a connection between Markham Centre and the Sheppard Subway, but did not conduct a detailed screening of potential 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, or its extensions, were identified (See Exhibit 5-2 in Chapter 5)

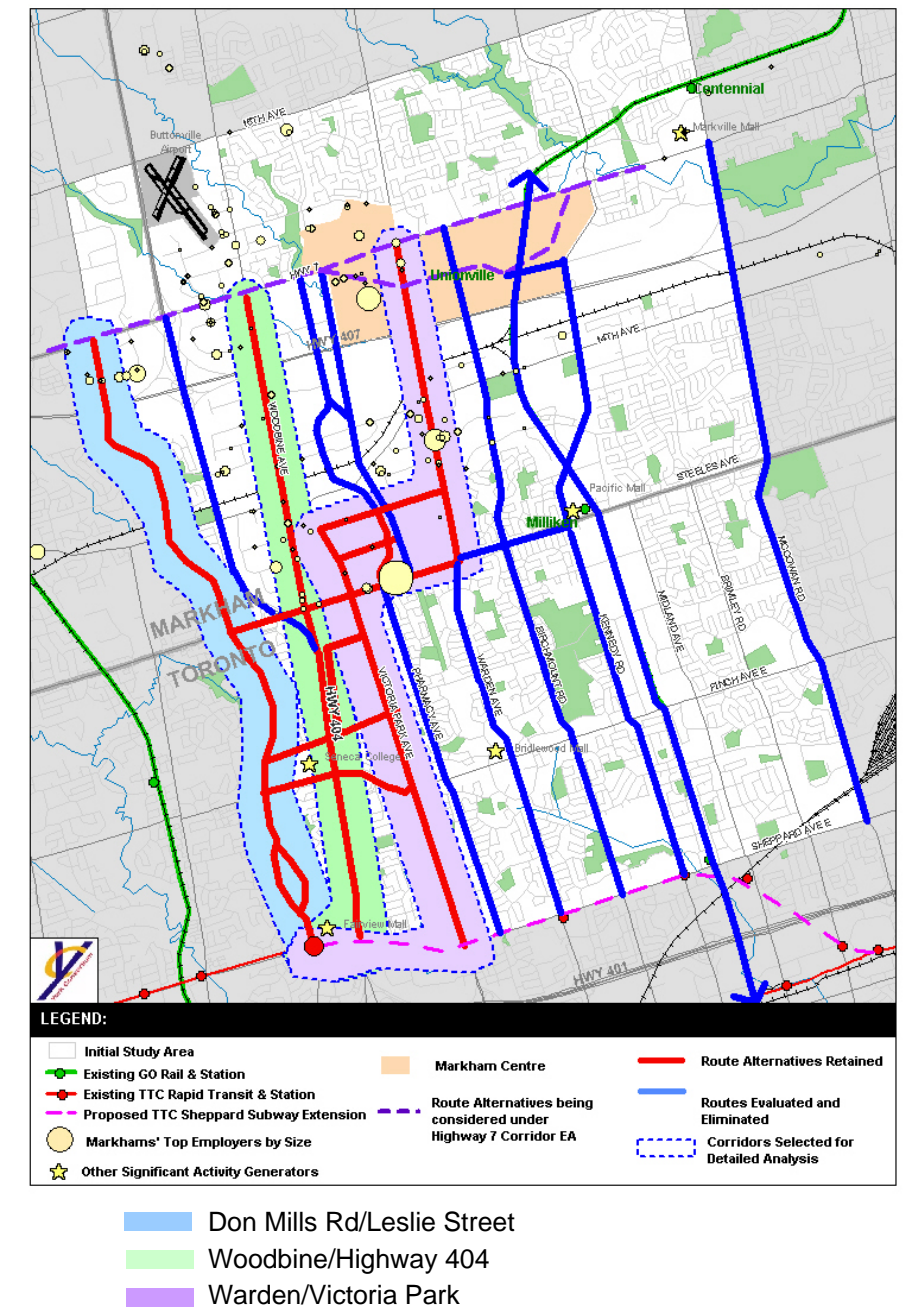
An initial screening process was applied to these routes to eliminate routes that were clearly not suitable for facilitating improved transit, or were less acceptable in terms of social, economic or natural environment impacts. The initial screening of routes considered the ability of the alignment alternatives to respond to five primary objectives. These included:

- Protecting and enhancing the social environment;
- Protecting and enhancing the natural environment;
- Promoting smart growth, economic development;
- Providing an effective transportation service; and,
- Maximizing cost-effectiveness.

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

A key factor in selecting routes for further consideration was their potential to significantly improve transit ridership to/from and within the study area. Other considerations included the type of land use adjacent to the route. Routes selected for more detailed evaluation are shown on Figure E-3. These routes were presented to the public in June 2003 and again for comment at the final public information centre in April 2005.

Figure E-3
Short-Listed Transitway Corridor Options



E.5.3.2 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:

- Accessibility Impacts
- Impacts on Natural Environment
- Land Use Impacts
- Transit Ridership Potential
- Compatibility with other planned transportation improvements
- Costs

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, as measured by total boardings;
- 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. 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. This will be investigated in greater detail by the Region through a separate EA for transportation improvements in the Don Mills/Leslie Street corridor from Steeles Avenue to 16th Avenue.

E.5.3.3 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.

E.5.4 Alternative Physical Infrastructure

Given the diversity of conditions in the Markham North-South Corridor, combined with the fact that the analysis of travel patterns indicated that public transit improvements should be considered in more than one 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 intersections or other bottle-necks;

- Separate curbside 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.

E.5.4.1 Evaluation and Selection of Preferred Physical Infrastructure

A detailed evaluation of alternative physical infrastructure alternatives was undertaken for the Markham North South Link Corridor. This evaluation was based on three main factors; transportation, human environment and economic considerations. The factors were further divided into indicators that were considered most pertinent to the evaluation.

The result of the evaluation 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; and
- 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;
- Number of driveways and type of traffic using the driveways (e.g. cars or heavy trucks); and,
- Potential for 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 are carried forward for more detailed assessment as part of the preferred design. However, the preferred configuration for the ultimate rapid transit network is a median transitway.

E.5.5 Preferred Alternative Method for Improving Public Transit In the Markham Link Corridor

The preferred alternative method of improving public transit in the Markham North-South Link Corridor is to implement surface rapid transit in the Warden Avenue Corridor, with connections to existing and potential future rapid transit services in the City of Toronto. This corridor improvement will be supported by the implementation of transit priority on parallel routes, consistent with the York Region Transportation Master Plan.

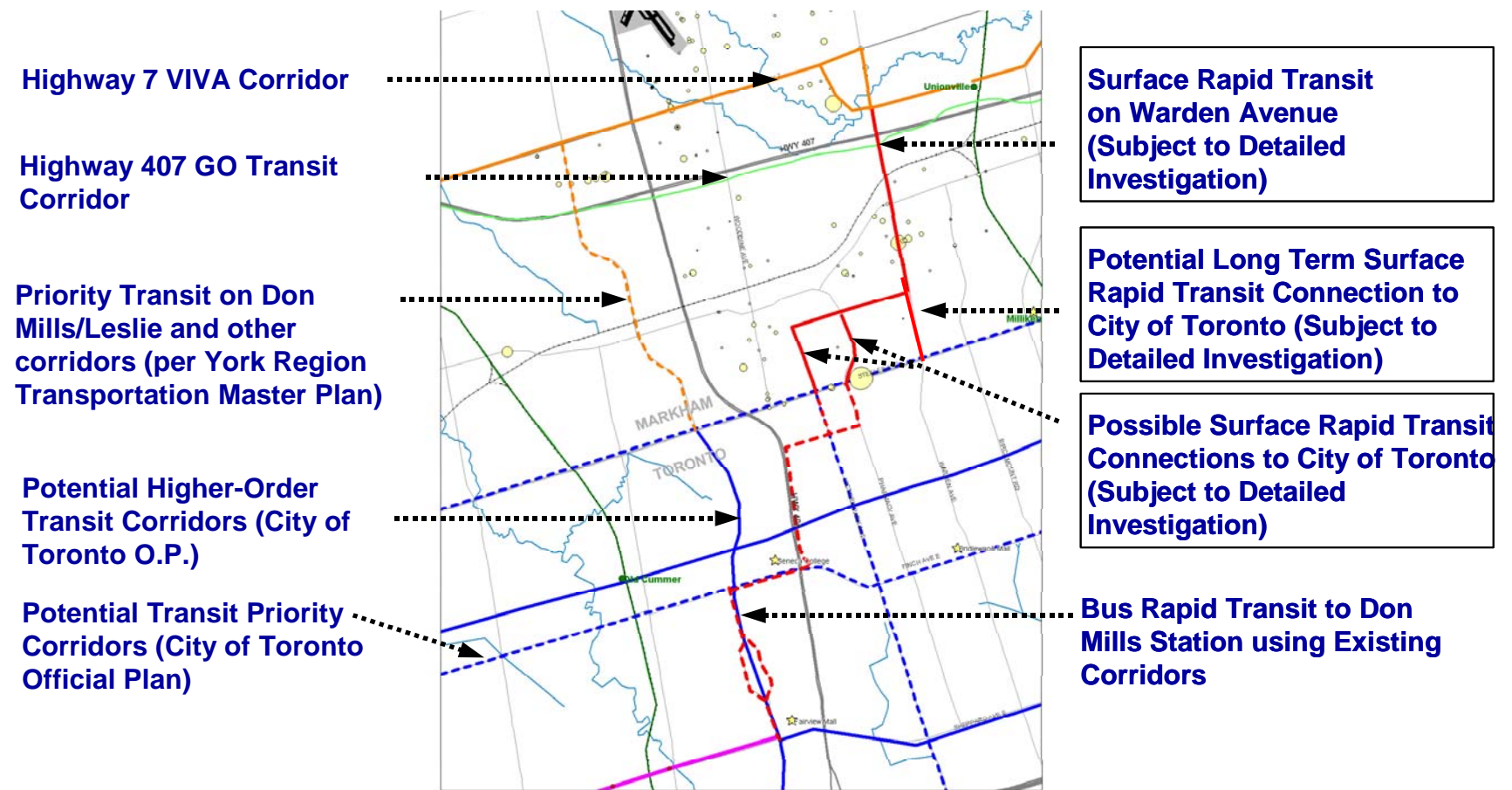
The preferred strategy for the Markham North-South Link Corridor illustrated on Figure E-4.

The first stage of the evolution of rapid transit corridor is the implementation of a higher frequency, limited stop service utilizing modern buses to establish a transit connection between Markham Centre and the Sheppard Subway. This is referred to as the VIVA Phase 1 service, which has been in operation since Fall 2005.

At such time when demand warrants, the next step for the preferred corridor would be to construct median transit lanes on Warden Avenue from Enterprise Drive to Denison Street. In the longer term, these median transit lanes could be extended south to connect with a future higher order transit service in Toronto such as the Finch Hydro corridor or an extension of the Sheppard Subway.

Although not part of the preferred undertaking, an important enhancement to public transit in the study area would be the implementation of transit priority improvements 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 services would connect to the planned Don Mills Higher Order Transit corridor south of Steeles Avenue and be integrated with future initiatives in that corridor. Transit priority measures would also be implemented on other roadways as identified in the York Region Transportation Master Plan. The City of Toronto has initiated an EA to examine transit needs for Don Mills south of Sheppard.

Figure E-4
Preferred Alternative Method of Improving Public Transit in the Markham N-S Corridor and Relation to Other Corridors



E.5.5.1 Technology Strategy

The preferred strategy is to implement surface rapid transit in the Warden Avenue corridor with connections to existing and future rapid transit systems in the City of Toronto.

The initial technology will be **Bus Rapid Transit (BRT)**. This technology provides sufficient capacity to handle the projected transit ridership demands while allowing 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 also allows for seamless travel from other rapid transit corridors in York Region and can be implemented in a phased manner.

In the longer term, **Light Rail Transit (LRT)** could also perform the function of providing surface rapid transit. LRT has similar operating characteristics and physical requirements as BRT, but generally provides for higher capacities. In order to maintain flexibility for evolving needs, and potential future opportunities in the corridor over the longer term, LRT technologies were carried forward as an alternative method of improving public transit. The decision to convert to LRT technology as defined in this EA would be subject to Regional Council Approval during an open session. The introduction of LRT in the York Region portion of the corridor would be predicated on the availability of LRT facilities connecting to the Sheppard Subway. The development of LRT in the City of Toronto would require a separate study and approvals process.

E.6 DEVELOPMENT AND EVALUATION OF ALTERNATIVE DESIGNS

The Alternatives Analysis phase of the EA identified Warden Avenue as the preferred corridor for the implementation of surface rapid transit. The next stage in the analysis was to identify specific alignment options and the physical design of the transitway and associated roadway components.

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 basic segments. These segments are as follows:

- Segment A – Warden Avenue: Highway 7 to Enterprise Drive
- Segment B – Warden Avenue: Enterprise Drive to 14th Avenue
- Segment C – Warden Avenue: 14th Avenue to Denison Street
- Segment D – East/South Connecting Routes
- Segment E – Denison Street to Steeles Avenue

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

- Protecting and enhancing the social environment.
- Protecting and enhancing the natural environment.
- Promoting smart growth, economic development;
- Providing an effective transportation service; and,
- Maximizing cost-effectiveness.

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.

E.6.1 Segment A: Highway 7 to Enterprise Drive

The Technically Preferred route for the Highway 7 Transitway (separate EA) is to travel across Warden Avenue on Enterprise Drive to a new dedicated transit facility that would swing north into Town Centre Boulevard. Stations would be located east of Warden Avenue as well as in front of IBM opposite IBM's private access road. The extension of dedicated transit lanes across Warden Avenue and the proposed Rouge River valley is included as part of the Highway 7 Transitway EA.

The most direct route to connect the Markham N-S Link into the Highway 7 Transitway is to do so at the intersection of Warden Avenue and Enterprise Drive with the station just east of Warden Avenue being used for passenger transfer. This alignment has been selected as the preferred design. However, at such time as the Highway 7 Transitway connection west of Warden Avenue becomes available, other routing options using these corridors may be pursued for the Markham N-S Link.

Figure 8-1 in Chapter 8 of this report illustrates a potential concept that would provide for the routing integration of the Markham N-S Link and the Highway 7 Transitway services while providing improved access for IBM. This routing option would utilize the IBM ramp and the proposed new crossing of the Rouge River west of Warden Avenue and opposite Enterprise Drive.

E.6.2 Segment B: Enterprise Drive to 14th Avenue

This section includes the crossing of Highway 407 and the CN York Subdivision. In 2005, York Region commenced 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.

E.6.3 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).

E.6.4 Segment D: East/South Connecting Routes

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.

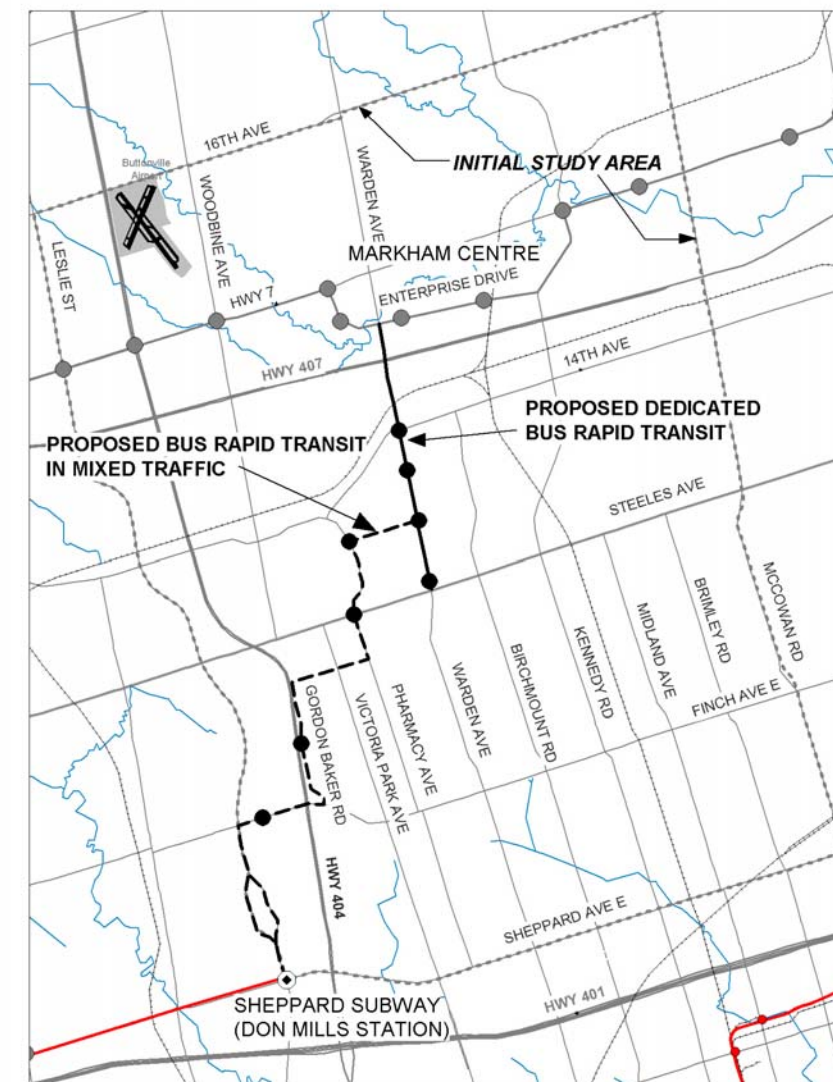
E.6.5 Segment E – Denison Street to Steeles Avenue

In the evaluation and selection of potential routing options, Warden Avenue was chosen as the preferred routing. In the short term, Denison Street is the preferred routing for the east-west connection to Pharmacy Avenue and Gordon Baker Road (to connect with the VIVA Phase 1 alignment) and existing/future City of Toronto transit corridors.

In the longer term, it would be logical to connect surface rapid transit routes using Warden Avenue north of Steeles Avenue to potential future rapid transit services in the City of Toronto, specifically the planned extension of the Sheppard Subway and a potential rapid transit network in the Finch Hydro corridor. For this reason, the preferred undertaking includes the portion of Warden Avenue between Denison Street and Steeles Avenue in the Region of York. This segment could augment or replace the routing using Denison Street and Esna Park Drive. Within the City of Toronto, the system could operate in mixed traffic or potential future dedicated lanes.

The impacts of providing dedicated transit lanes on Warden Avenue between Denison Street and Steeles Avenue are detailed in Chapter 9.

Figure E-5 Preferred Alignment and Station Locations



Note: Preferred alignment south of Steeles Avenue will be confirmed upon completion of future studies of potential transit improvements by the City of Toronto/TTC.

E.7 THE UNDERTAKING

From analyses and evaluations of alternative transportation solutions, alternative methods and alternative designs, a dedicated facility for rapid transit service located along the existing Warden Avenue was recommended as the preferred undertaking. The service would connect to similar services in the Highway 7 corridor and also connect to existing rapid transit services in the City of Toronto along existing routes. The length of dedicated transitway would extend from Enterprise Drive south of Highway 7 to Steeles Avenue.

The preferred alignment with station locations is illustrated in Figure E-5. The preferred undertaking for which York Region is seeking approval consists of:

1. A median transitway on Warden Avenue between Enterprise Drive and Denison Street that will initially utilize BRT technology with potential conversion to LRT subject to ridership demands;
2. Transit operation in mixed traffic from Warden Avenue, west on Denison Street to Esna Park Drive, south on Esna Park Drive across Steeles Avenue to Pharmacy Avenue; and
3. The protection of the right of way on Warden Avenue south of Denison Street to Steeles Avenue for potential future transit expansion.

E.7.1 Supporting Initiatives

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, it is recommended that improved transit services be pursued in other corridors. Specifically, it is recommended 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 (to be addressed in detail through a separate EA).

E.8 PROJECT RELATED EFFECTS AND MITIGATION

The evaluation of project-related effects was performed using the same general objectives used to evaluate alternatives to the undertaking and alternative methods. These objectives are:

- To protect and enhance the social environment in the corridor
- To protect and enhance the natural environment in the corridor

- To promote smart growth and economic development in the corridor
- To provide an effective transportation service

The issue of cost-effectiveness was considered qualitatively in selecting the preferred undertaking.

Goals defined by professionals in the study team are subsets of these objectives and refer to an environmental value or criterion. The effect of the proposed undertaking in terms of each environmental value was rated using a qualitative scale ranging from a positive or beneficial effect through negligible to a potentially significant negative effect in is presented in detail in Section 10.4 of the main report.

E.9 IMPLEMENTATION CONSIDERATIONS

The Markham N-S Link Corridor Public Transit Improvements undertaking, described in Chapter 9, is one of three north-south corridors in York Region's proposed four-corridor Rapid Transit Plan. Travel demand modelling has indicated that rapid transit service on Warden Avenue will attract a high level of transit ridership contributing to the overall network. Consequently, the Region's plans for the evolution of the network place a high priority on early implementation of facilities and service in this corridor.

This Environmental Assessment Study constitutes the first step in the implementation process, which will include all the traditional phases of preliminary and detailed design, construction, testing and commissioning of systems and installations and finally operation of rapid transit service.

The Construction Phase

Pending funding, the first priorities for the construction of transitway segments are south Yonge Street (Steeles Avenue to Langstaff Road) following by Highway 7 East. The timing of construction of the Markham Link is less certain, but is expected to occur within the next 5 to 10 years.

It is assumed that, if approved, construction of York's Rapid Transit Network will begin immediately after receiving funding.

E.9.1 Public Outreach

The Markham North-South Link Corridor Public Transit Improvements Environmental Assessment has conducted a public consultation program comprising five series of information centres. These have afforded the general public and other stakeholders the opportunity to view design alternatives and their evaluation, express concerns related to environmental effects and provide input to the development of mitigation measures.

A major challenge with the study area is that few residents live along the corridor, which is comprised mainly of commercial uses and employment lands. This made it difficult to generate interest among the general public. One of the steps that was taken to overcome this was to essentially go to the public by holding PCCs in the Markham Civic Centre on evenings where other activities were scheduled, and to hold additional PCCs in First Markham Place, a busy mall within the study area. Since employees and business owners are un-inclined to come out to evening events, a project description and request for comments was dropped-off by walk-about to all properties along the corridor, with a mail-back comment form.

Overall, from the verbal and written comments received, there is strong support for improved transit in the Markham Corridor, and York Region as a whole.