Ontario

407 TRANSITWAY

From East of Highway 400 to Kennedy Road

Environmental Project Report

Section 2: Transportation Need and Travel Demand

Delcan IBI GROUP

in association with

LGL

2. TRANSPORTATION NEED AND TRAVEL DEMAND

This section confirms the need for the 407 Transitway and its role in the GTA transportation network by examining future land use, population and employment, and developing the future travel demand. The demand analysis illustrates key travel patterns and growth areas that lead to the need for and justification of, the 407 Transitway.

2.1 407 Transitway Role in the Greater Toronto Area (GTA)

The primary role of a major investment in rapid transit in the Highway 407 Corridor is to offer a viable alternative to fundamentally change travel behavior in the 905 area. The corridor's location within the GTA, as illustrated in **Figure 2-1,** provides an ideal opportunity to enhance connectivity with the existing and future primarily radial transportation network. In this role, the continuous corridor will become the much-needed, second east-west spine across the GTA parallel to the Lakeshore corridor. Given the importance of this role, planning of high-order rapid transit in this corridor must focus on the objectives of transportation, land use, natural and social environments, and coasts, as outlined below:

Figure 2-1: Role of 407 Transitway within the GTA

Transportation

- Enhance east-west cross-regional mobility for medium to longer distance trips >10-15 km;
- Offer a safe, high speed, more efficient way of moving people between GTA population and employment zones, north or south of the corridor;
- Improve integration with the regional transportation network;
- Improve the ability to increase capacity to meet additional travel demand; and,
- Maximize utilization of protected Highway 407 Corridor.

Land Use

- Improve accessibility to existing/planned major urban centres/nodes; and,
- Increase support for a more compact urban structure maximizing opportunities for TOD.

Natural and Social Environments

- Minimize adverse effects on the natural environment;
- Minimize adverse effects on the social environment; and,
- Reduce reliance on energy resources, and reduce automobile dependence and gas emissions.

Costs

- Increased cost-effectiveness of moving people in corridor.

2.2 Land Use, Population & Employment

The Growth Plan is based on the premise of encouraging more compact, mixed-use development while controlling greenfield developments to contain urban sprawl. The Growth Plan specifies that at least 40% of new development should be concentrated within existing urban areas, preferably in UGCs and activity corridors with controlled development of designated greenfield areas to minimum density standards. Under the Growth Plan, the GGH is projected to grow by 2.7 million to 11.5 million persons over the thirty-year period from 2001 to 2031. Employment is projected to increase by 1.75 million to 5.56 million jobs over the same time period. Over three-quarters of the population and employment growth is projected to occur within the GTHA.

2.2.1 Population and Employment Growth

Table 2-1 shows the 2001 and 2031 projected population and employment growth for GTHA municipalities, as documented in the Growth Plan. Population is projected to grow by 48% from 5.81 million to 8.62 million, with employment increasing at a similar rate, from 2.95 million to 4.33 million jobs. It is projected that 26% of the population growth and 28% of the employment growth will be located in York Region, and as a result is the region that will face the largest growth over the 30 year period. This distribution of growth has significant implications for transit in the Highway 407 Corridor.

Table 2-1: 2001 to 2031 Population & Employment by Municipality

Municipality		Population			Employment		
		2001	2031	Growth	2001	2031	Growth
Toronto	Total GTHA %	2,590,000 (45%)	3,080,000 (36%)	490,000 (17%)	1,440,000 (49%)	1,640,000 (38%)	200,000 (14%)
Durham	Total GTHA %	530,000 (9%)	960,000 (11%)	430,000 (15%)	190,000 (6%)	350,000 (8%)	160,000 (12%)
York	Total	760,000	1,500,000	740,000	390,000	780,000	390,000

Table 2-1: 2001 to 2031 Population & Employment by Municipality

Municipality		Population			Employment		
		2001	2031	Growth	2001	2031	Growth
	GTHA %	(13%)	(17%)	(26%)	(13%)	(18%)	(28%)
Peel	Total GTHA %	1,030,000 (18%)	1,640,000 (19%)	610,000 (22%)	530,000 (18%)	870,000 (20%)	340,000 (25%)
Halton	Total GTHA %	390,000 (7%)	780,000 (9%)	390,000 (14%)	190,000 (6%)	390,000 (9%)	200,000 (14%)
Hamilton	Total GTHA %	510,000 (9%)	660,000 (8%)	150,000 (5%)	210,000 (7%)	300,000 (7%)	90,000 (7%)
TOTAL		5,810,000 (100%)	8,620,000 (100%)	2,810,000 (100%)	2,950,000 (100%)	4,330,000 (100%)	1,380,000 (100%)

2.2.2 Allocation of Growth and Density

At present, the Growth Plan only provides 2031 population and employment control totals for single-or upper-tier municipalities. The MOI is currently in the process of detailing the Growth Plan in terms of geographic distribution, physical boundaries and allocation of population and employment. Meanwhile local municipalities are providing their comments on the Growth Plan. A detailed allocation of land use will be developed by municipalities and finalized at some time in the near future. Demand forecasts in this report are less sensitive to local changes in land use, as control totals input into the travel demand model are fixed.

For transportation modelling and for the purposes of this study, the 2031 population and employment was allocated to the 3,100 traffic zones comprising the GTHA. The regional municipalities were allocated using the methodology described below which reflects Growth Plan principles, targets and guidelines, as follows:

- **Urban Growth Centers** – The 17 centers in the GTHA are identified in the Growth Plan to have a density target of 400 persons plus jobs per hectare for the centers located in Toronto and 200 persons plus jobs per hectare in other GTHA centers. The geographic boundary for density target measurement will be established for each centre by the municipality. There are no population and employment targets. For this study, growth centre boundaries were based on the ones developed by MOI in consultation with municipalities as shown in their respective official plans, with refinements, as appropriate, to ensure that the density target was achievable;

- **Intensification Areas** – At least 40% of the population growth for single- or upper-tier municipalities is designated to occur in existing urban areas or intensification areas under the Growth Plan. For this study, 40% of the municipality's growth was allocated to traffic zones within intensification areas based on each municipality's projection of population growth to traffic zones, consistent with their official plan. A conceptual boundary of the existing urbanized area was provided by the MOI; and,

- **Designated Greenfield Areas** – Up to 60% of the population growth for single-or upper-tier municipalities is allowed to occur in designated greenfield areas under the Growth Plan. For this study, 60% of the growth projected for each municipality was allocated to designated greenfield areas based on its projection of population growth to traffic zones, consistent with its official plan. The density target for designated greenfield areas is 50 persons plus jobs per hectare. Conceptual boundaries of designated greenfield areas were provided by MOI.

The Highway 407 Corridor existing (2001) and future (2031) density is shown in **Figure 2-2(a) and Figure 2-2(b)**, based on the allocation of population and jobs to traffic zones as discussed above. The density is based on gross density but excluding areas where development is prohibited (e.g. wetlands, woodlands, etc.). The plots indicate the increasing scale of developed areas in the Highway 407 Corridor between 2001 and 2031 and the increasing development densities that are to be achieved notably in the areas surrounding the UGCs along the Highway 407 Corridor.

Figure 2-2(a): 2001 Urban Density

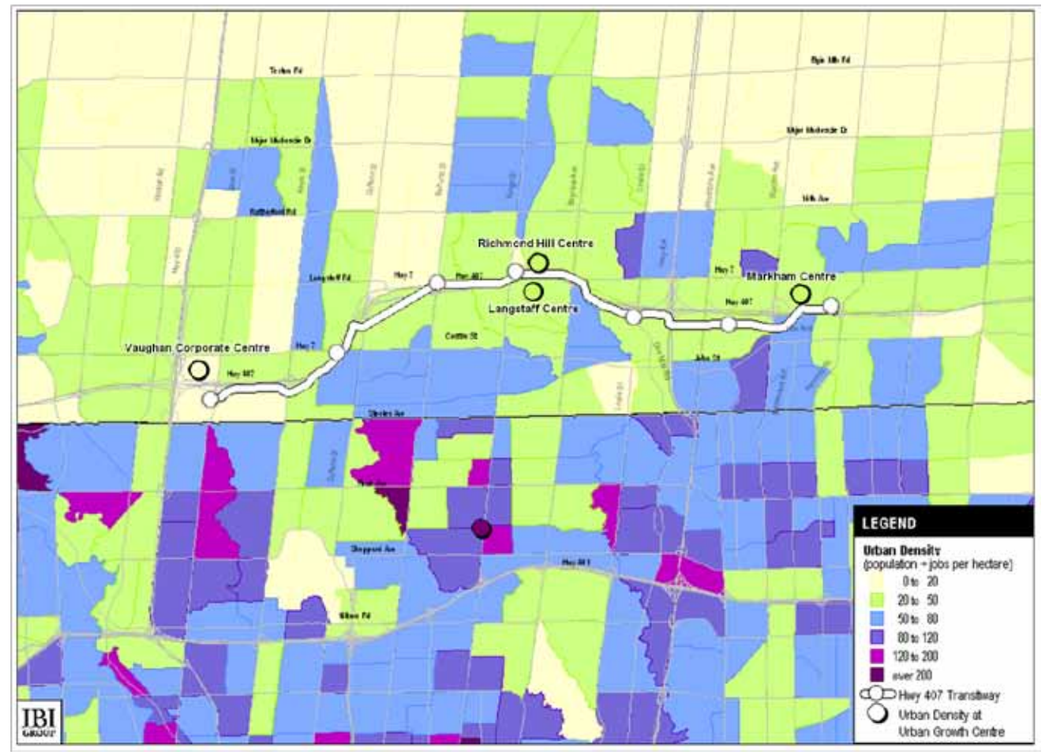
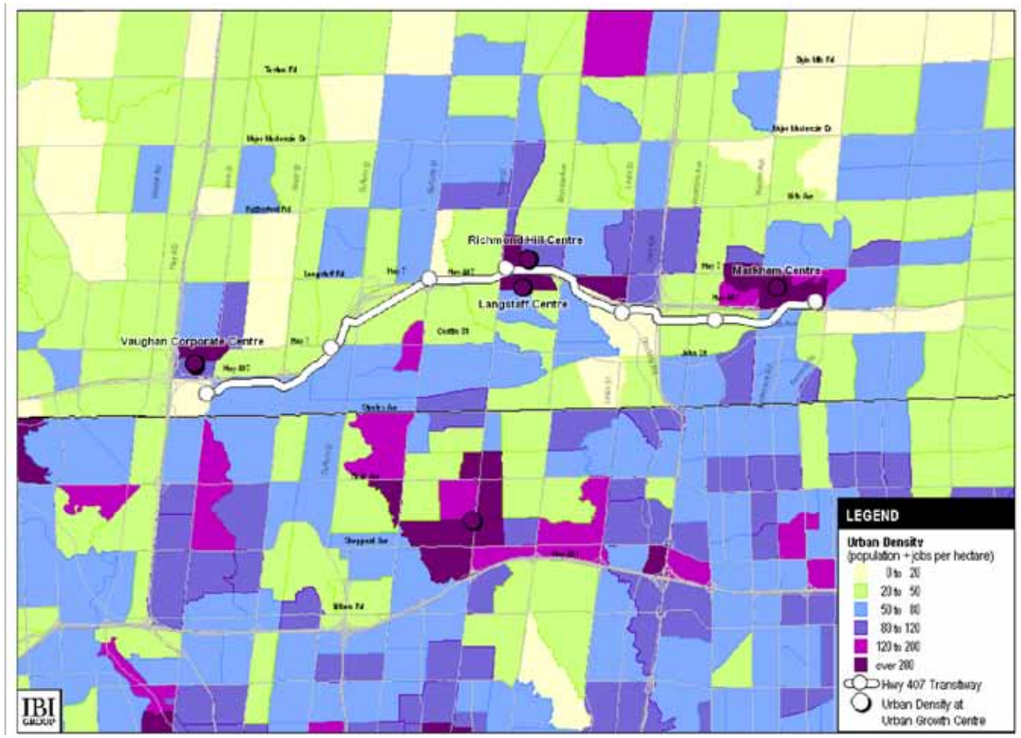


Figure 2-2(b): 2031 Urban Density



There is a strong correlation between development density and transit use in the GTHA. This is reflected in the Growth Plan through the density targets for UGCs and designated greenfield areas. The plot of 2031 densities indicates that a higher proportion of the land surrounding the Highway 407 Corridor than at present will achieve a density of 50-120 persons plus jobs per hectare, a density level that can support bus-based or LRT service. Various sources describe the relationship between development density and the ability to support different levels of transit services. In **Table 2-2**, transit potential and types of services are related to urban density person plus jobs per hectare. This table is presented solely to provide a general understanding and not to prescribe or suggest where certain levels of transit service can be supported in the GTHA. Based on previous experience in the GTHA, land use densities that exceed 200 person plus jobs per hectare are needed to support transit mode splits of 30%, typically associated with higher-order transit.

2.3 Forecasting Approach & Assumptions

2.3.1 Model Background

A comprehensive, state-of-the-art travel demand forecasting model has been developed for the GGH. The GGH model has been developed to forecast passenger and freight demand on the transportation network for the a.m. and p.m. peak periods. This model has been calibrated with the 2001 Transportation Tomorrow Survey (TTS) data and successfully validated as a valuable multi-modal transportation forecasting tool for evaluation of alternatives for major infrastructure planning and EA studies.

Table 2-2: Urban Density & Transit Potential

Density Range (Gross Density in Persons plus Jobs per Hectare)	Transit Potential	Appropriate Type of Service
Less than 20	Low	No public transit. Requires dial-up cabs, jitneys, etc.
20 to 40	Modest	Marginal public transit. Buses every half-hour. Rush hour express buses.
40 to 80	Good	Good bus service.
80 to 120	Very Good	Excellent bus, possibly BRT/LRT.
120 to 200	BRT/LRT	Higher-order transit.
Over 200	Subway	Higher-order transit.

Source: Toronto-Related Region Futures Study, Neptis Foundation, 2002, as compiled/derived from Revitalization Guidelines, Metro Toronto Building Ltd., 1990, GTA Report – House Forms and Density, Hemson et al., 1993, Urban Density Study for OGTA, Lehman & Associates with IBI Group et al., 1995, Public Transit and Land Use Policy, Boris S. Pushkarev and Jeffrey Zupan, Regional Plan Association, 1977.

The GGH Model significantly advances the state-of-practice in transportation modelling in the following manner:

- The GGH Model is a major breakthrough in the Province's transportation-land use planning in that it directly links with the Growth Plan and provides a transportation demand and forecasting tool to assess the ability of transportation alternatives and supportive options and policies to support the Growth Plan and promote sustainable transportation, reduce urban sprawl, protect the environment, enhance the economy through a more efficient transportation system and other objectives.

- The GGH Model encompasses a rapidly growing mega-region and captures the economic, land use, socio-economic linkages and interactions that influence growth over the regions and cities within the GGH. The model predicts travel demand for the entire GGH area, covering both the morning and evening peak periods and travel choices encompassing service levels in both periods. Previous models developed for the GTHA or for parts of it have dealt with a single peak period and with interactions between the GTHA and rest of the GGH has been dealt with through external zones or gateways in a static manner.

- The model is multi-modal in nature being able to forecast passenger travel by various modes such as auto driver, auto passenger, transit sub-modes (GO Transit, local transit) and non-motorized modes (walk and bicycle). It is also designed to predict combined modes, i.e., park-and-ride on the GO Rail or rapid transit stations and capture the characteristics of transit and walk cycle modes at a refined level to assess the viability of these modes. This is done reflecting the complex trip-making characteristics of today's travel, household composition, types of people and jobs, urban form and the available transportation options and sub-options.

- The model is specifically designed to be sensitive to key variables that influence use of sustainable modes and the benefits of more compact, mixed-use land use and the promotion of nodes and corridors. This is captured in the representation of costs, land use, population, employment demographics and socio-economics at a detailed traffic zone level and takes into account future trends such as aging of the population, changes in household structure, changes in the spatial location of and types of employment in the Region. The model is also designed to capture the Growth Plan land use, including mobility hubs, built-up areas, designated greenfield areas and reflects the density, density targets and urban design of existing and new developments.

The GGH model system follows the standard **four-stage** modelling approach which remains the standard regional forecasting modelling approach world-wide. The four stages are: **generation**, which determines the number of trips by zone that are made; **distribution**, which determines the origin-destination flows of trips from zone to zone given the number of trips generated; **mode choice**, which "splits" these O-D flows by mode of travel; and **assignment**, which determines the paths used by the modal O-D flows through the road and transit networks.

2.3.2 Model Sensitivity

While land use/urban form is a very significant determinant of travel behaviour, there are several other factors that would affect these estimates, some of which are and some of which are not explicitly represented within the travel demand model. These include, among others:

- Changes in the relative costs of auto and transit modes. For auto, the perceived costs that generally affect mode choice include fuel and parking costs, as these are immediate, out-of-pocket costs. Road tolls are also significant, although these currently only exist on Highway 407 within the GTHA. For transit, fare is the only cost factor, however the existing situation within the GTHA is more complex than normal as users pay extra fare when crossing municipal boundaries. The forecasts presented assume a modest increase in the price and geographical extents of parking charges while holding transit fares constant (in 2001 dollars);

- Increased TOD/urban design within the Highway 7/Highway 407 Corridor. With limited sidewalks, large parking lots and non-street-facing developments set well back from the street, the current environment is not very pedestrian friendly, which discourages transit use by making it difficult to access. These features describe and are more applicable to Highway 407 than Highway 7 (which is slated to become more pedestrian friendly under the York Region policy and will be supported by the existence of YRT/Viva services). However, Highway 407 will more likely benefit if efficient connections are provided between both highways;

- Changes in travel behavior attitudes. The model has been calibrated to existing behaviour, which reveals a significant bias toward travel by car even when time and cost factors have been accounted for. This bias is composed of many intangible factors such as the perceived greater comfort, security, etc. provided by the car or a low image associated with transit use (e.g. dirty, only for use by the poor). The provision of a high-quality transit service would serve to reduce this bias. The emergence of an increasingly environmentally-conscious public may also do the same; and,

- Job/worker balance. The modelled trip distributions are sensitive to the numbers of jobs and employment labour force within specific geographical areas (e.g. traffic zones). For instance, the more jobs are allocated in a traffic zone, the more workers who reside in that zone would likely work within the same traffic zone. According to the land use projections in the Growth plan, Durham Region is expected to become the biggest employment labour force exporter in 2031 due to considerable imbalance between jobs and workers. This indicates that significant trip making growth originates in Durham Region and destined to the major employment areas in Toronto and east Markham.

2.3.3 Transportation Network Assumptions

For the purposes of this analysis, the following programmed transportation improvements were assumed by 2031:

- Highway improvements in the MTO capital program, including improvements to 400-series highways in the GTAH:
  - Highway 404 northbound HOV lane from Sheppard Avenue to Beaver Creek (ready to open);
  - Highway 404 extension (4 lanes) from Green Lane to Ravenshoe Road;
  - Highway 401 eastbound collector rehabilitation and additional lanes from Avenue Road to Leslie Street;
  - Highway 401 westbound express rehabilitation and collector additional lanes from Jane Street to Kipling Avenue;
  - Highway 400 widening (6 to 8 lanes) from Major Mackenzie Drive to Teston Road;
  - Highway 410 extension (4 lanes) from Mayfield Road to Highway 10;
  - Queen Elizabeth Highway (QEW) HOV lanes from Trafalgar Road to Guelph Line;
  - Highway 427 extension from Highway 7 to Major Mackenzie; and,
  - Highway 407 Easterly Extension to Highway 35/115 and north-south links in Whitby and Oshawa.

- Regional road improvements (e.g. widenings/extensions) as reflected in the transportation master plans of the GTHA municipalities and funded through development charges;

- Higher-order transit improvements where funding or commitment to funding has been provided:
  - GO Rail service improvements under the 10-Year Capital Plan;
  - Mississauga Transitway – first stage;
  - Spadina subway extension to Vaughan Metropolitan Centre;
  - St. Clair streetcar lanes (complete);
  - Yonge subway extension to RHC; and,
  - Brampton Züm (a new Brampton BRT service).

Surface bus service level increases with population growth and extensions to provide service in designated greenfield areas not presently served by transit.

2.3.4 Transitway Station Locations and Parallel Transit Services

A process was undertaken to develop and define the transitway stations in terms of number of stations, relative station spacing, and location of stations. Eleven potential transitway stations were identified based on the presence of nearby developments, major roads serviced by local transit (including YRT/Viva or TTC), or perceived gaps in existing service. Generally, stations are feasible at all 11 locations due to the available land on the corridor resulting from property protection measures, although depending on the station there are trade-offs regarding available space for parking or transfer facilities. The main approach for evaluation of stations is therefore forecasted ridership.

The 407 Transitway demand was optimized using a reduced number of stations than the 11 locations evaluated. It was found through modeling review that demand would be approximately 10% higher with the seven-station concept than the eleven-station concept given the higher attainable transit operating speed of 65 km/h versus 50 km/h.

The 407 Transitway combined with Highway 7 YRT/Viva Services will bring higher transit demand for the Highway7/Highway 407 Corridor than a scenario without the 407 Transitway. Three station concepts (five-station, seven-station and eleven-station) were analyzed and findings are summarized as below:

1. The eleven-station scenario has the largest impact on Highway 7 YRT/Viva ridership, reducing the number of morning peak period boardings on YRT/Viva by 40%;
2. The impact of the other two scenarios is significantly less, with about 20% reduction due to greater separation of markets; and,
3. The seven-station scenario has the highest peak point ridership among all three scenarios.

As a result, the seven-station concept was selected as the preferred scenario and adopted in the EPR. The resulting station location plan provides an average station spacing of about 3.5 kilometres, better suited for longer distance users while stops proposed by the YRT/Viva service are at 0.8 to 1.2 kilometres apart, more suitable for local users. This fact will minimize competition between the two services. The route structure, conceptual station location and operating characteristics are described below.

2.3.5 Route Structure and Operating Characteristics

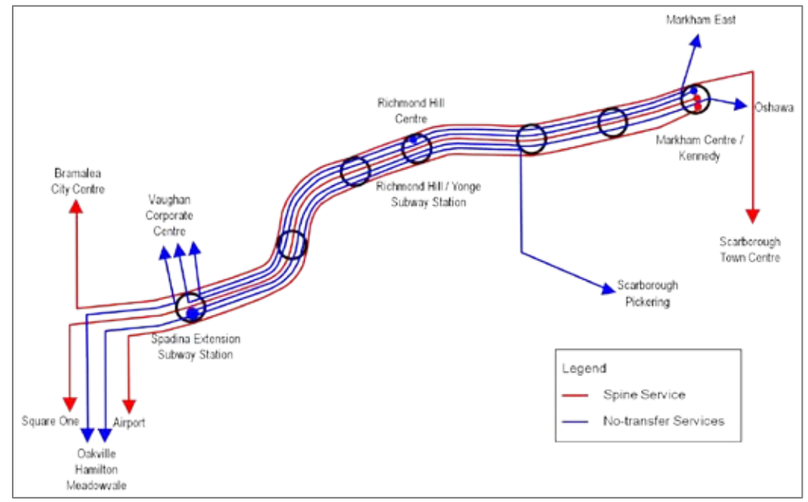
Figure 2-3 shows the proposed conceptual route structure for the 407 Transitway developed based on the projected 2031 transit demand between major origins and destinations. This route structure depicts the Highway 407 corridor bus operation and does not include network transit connections. Travel patterns are largely dispersed in the Highway 407 Corridor because of the nature of the development. Major trip destinations include the business parks in Markham, Vaughan and Richmond Hill UGCs, York University, Toronto, central North York and Scarborough. To serve various transit markets in the corridor, the transitway routes would consist of two types of services: base spine services and no-transfer services.

Base spine services would provide continuous line-haul service on the transitway at a combined headway of approximately three minutes. Destinations for spine routes are also assumed beyond the corridor to UGCs and major attractions including:

- Mississauga Square One;
- Pearson International Airport;
- Markham Centre/Unionville GO Station;
- Bramalea City Centre in Brampton; and,
- Scarborough Town Centre.

Some trips on these spine routes should be considered to be designated as express runs serving major stations in order to provide service with reduced travel time between major activity centres. These express services would require the provision of passing lanes at skipped minor transitway stations.

Figure 2-3: Conceptual Route Structure



No-transfer services would provide direct connections between major residential areas, activity centres and intermodal stations. There would be great focus on post-secondary student and commuter markets connecting to major schools and other activity centres in and adjacent to the corridor. Similar to the existing Highway 407 GO Bus service, these would serve long-distance trips connecting local transit services at the major transfer points including GO Transit stations and transit terminals as well as carpool lots.

Conceptual no-transfer services include:

- Markham Centre/Unionville GO Station to Spadina subway 407 Station;
- Meadowvale/Oakville/Hamilton to Spadina subway 407 Station;
- RHC to Spadina Subway 407 Station;
- RHC to Markham East;
- Meadowvale/Oakville/Hamilton to Spadina subway/407 Station;
- Oshawa GO Station/Durham University to Spadina subway 407 Station; and,

- Pickering GO Station to Scarborough Town Centre/Centennial College/University of Toronto Scarborough Campus to Spadina Subway 407 Station.

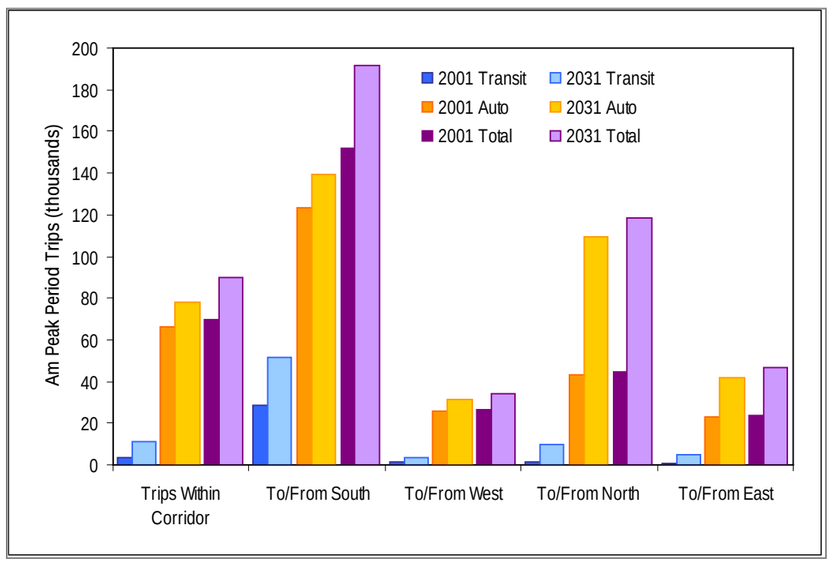
All these routes would operate on the transitway facility and divert into major destinations adjacent to the transitway such as Markham Centre and RHC to provide passengers with direct, no-transfer connections. There will be a connection to Vaughan Metropolitan Centre and York University via transfer to the Spadina Subway Extension (one and two stations away). It is assumed that the no-transfer services would operate at 65 km/h on the transitway facility between Jane Street and Markham Centre.

2.4 Future Travel Demand

2.4.1 Total Trips

Figure 2-4 presents the trends for major trip interchanges using the Highway 407 Corridor. Based on the GGH model projections, significant trip making growth is forecasted in the corridor with total trip making projected to increase by 52% from 315,900 trips in 2001 to 480,800 trips in 2031. As a result of the land use intensification under the Growth Plan, transit use is expected to more than double over the 30 years. The transit mode split for trips servicing the corridor is projected to increase from 11% to 17%. This indicates that with some further transit investment in the corridor (i.e. the 407 Transitway) there is a significant shift in travel mode from automobile to more sustainable public transit.

Figure 2-4: 2001 & 2031 AM Peak Period Transit, Auto & Total Volumes



Sources: 2001 Transportation Tomorrow Survey, Data Management Group, University of Toronto; IBI Group model run of 2031 using the GTHA Travel Forecast Model.

One of the fastest growing trip markets is trips from the east (Durham Region and east Markham). Total trips between these areas are expected to double by 2031. Since there is more dispersed land use patterns found in northern York Region, this trip market is projected to have the lowest transit mode split of 8% in 2031. In general, the existing transit usage patterns are projected to remain in the year 2031 with strong transit usage for radial trips to and from Toronto (Downtown Toronto in particular). For the other more circumferential trip interchanges, mode splits of around 10% are expected indicating that transit use in the corridor will remain largely dominated by captive transit riders. In general, while the largest flows will remain bound for Toronto in the south, the flows to the north are growing fastest and will become the second largest trip interchange surpassing flows to the west in Peel and Halton Regions and beyond, and flows to the east in Durham Region.

Figures 2-5(a) (b) provides schematics of the growth in travel flows to and from the 407 Transitway. The schematics show that for flows into the corridor, significant growth is seen entering the corridor from the east (from eastern Markham and Durham Region), and from Peel Region in the west. There is additionally a growth in reverse commute trips, leaving Toronto and destined to the corridor, particularly in the eastern portion of the transitway corridor. For trips originating in the corridor, trips into downtown Toronto will continue to be the dominant movement with significant growth to most other areas surrounding the corridor.

Figure 2-5(a): 2001 to 2031 AM Peak Period Corridor Travel Flow Growth, Flows to Highway 407 Corridor

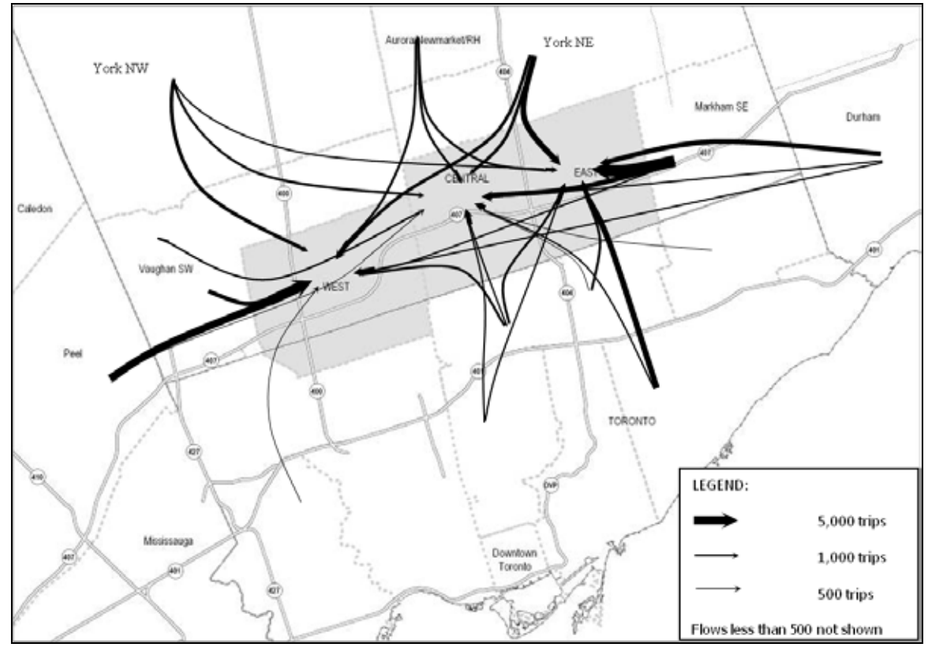
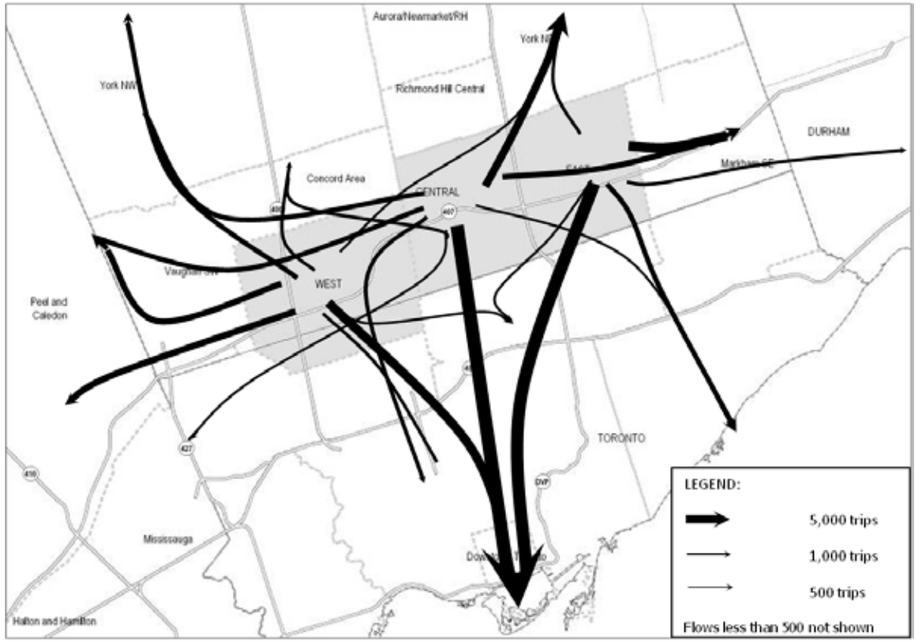


Figure 2-5(b): 2001 to 2031 AM Peak Period Corridor Travel Flow Growth, Flows from Highway 407 Corridor

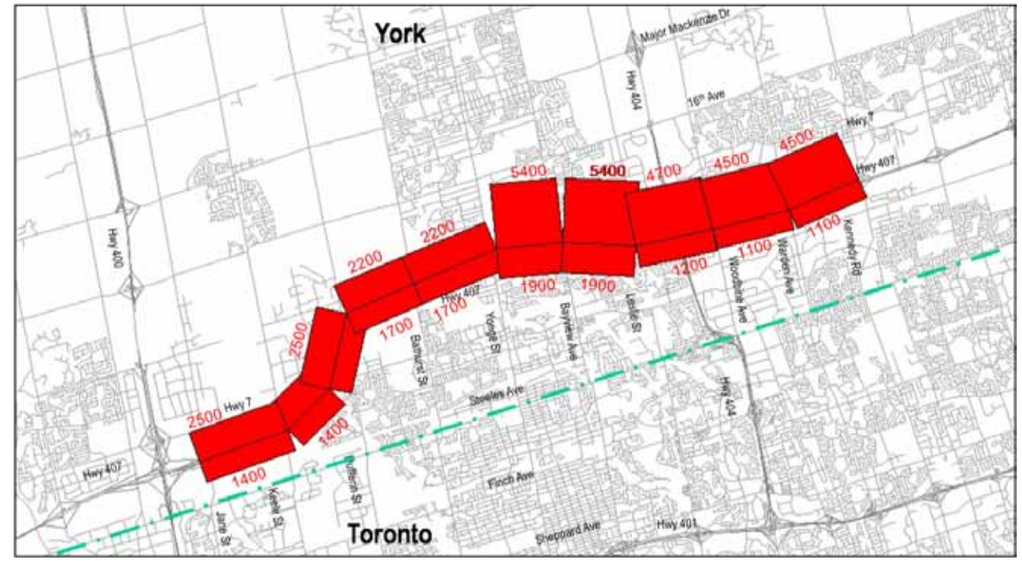


2.4.2 407 Transitway Ridership Forecasts

Detailed ridership forecasts have been prepared for the seven-station scenario in 2031 using the GGH travel demand model discussed in **Section 2.2.1**. The resulting ranges of 407 Transitway ridership forecasts are presented in **Figure 2-6** for the 2031 morning peak hour. Ridership is taken as the total of trips passing through any portion of the 407 Transitway. The peak point, peak direction load of 5,400 riders is located to the east of Yonge Street.

The morning peak hour boardings and alightings are shown in **Table 2-3**. Of the stations in the central section, RHC and Markham Centre have the highest boarding and alighting demands. Woodbine and Bathurst stations have the lowest boarding and alighting demand of approximately 750 riders in the peak direction. Volumes illustrated in the figure above are for the central section from Jane Street to Markham Centre.

Figure 2-6: 2031 Projected A.M. Peak Hour 407 Transitway Link Volumes



The 407 Transitway would be accessible by transit (transfers from other services and no-transfer vehicles), park-and-ride facilities, and by walking/bicycling.

Table 2-3: 2031 Projected A.M. Peak Hour Boardings & Alightings at 407 Transitway Stations

Station	Total	
	Boardings	Alightings
Jane Station	2,180	2,510
GO Barrie (Concord) Station	1,150	450
Bathurst Street	750	450
Yonge Station	3,300	5,750
Leslie Station	2,650	1,650
Woodbine/Rodick Station	750	300
Kennedy Station	4,950	3,800
Total	15,730	14,910

Note: Ridership is taken as the total of trips passing through any portion of the 407 Transitway. The total number of riders on all transit services using the transitway for some portion of their route is higher.

Table 2-4 presents the estimated proportions of 407 Transitway trips by access and egress mode in the 2031 morning peak hour. The demand from other transit services would account for majority (74%) of total demand in the 2031 a.m. peak hour. Among them, the intermodal stations Jane, GO Barrie (Concord), Yonge, and Kennedy would have relatively higher transit access mode share reflecting large passenger volumes transferring from subways, YRT/Viva or GO Rail. Under the seven-station scenario, it was assumed that there would not be a park-and-ride facility provided for 407 Transitway users at Yonge Station. The park-and-ride demand would represent approximately 19% of total 407 Transitway boardings.

Table 2-4: 407 Transitway Ridership Access & Egress Modes, 2031 AM Peak Hour

A. Access Modes						
Station	Transit		Park-and-Ride		Walk	
	No.	%	No.	%	No.	%
Jane Station	1,980	91%	90	4%	110	5%
GO Barrie (Concord) Station	750	65%	350	30%	50	5%
Bathurst Station	250	33%	450	60%	50	7%
Yonge Station	2,950	89%	0	0%	350	11%
Leslie Station	1,650	62%	700	26%	300	12%
Woodbine/Rodick Station	150	20%	550	73%	50	7%
Kennedy Station	3,850	78%	850	17%	250	5%
Total	11,580	74%	2,990	19%	1,160	7%

B. Egress Modes				
Station	Transit		Walk	
	No.	%	No.	%
Jane Station	2,130	85%	380	15%
GO Barrie (Concord) Station	400	89%	50	11%
Bathurst Station	400	89%	50	11%
Yonge Station	4,600	80%	1,150	20%
Leslie Station	1,500	91%	150	9%
Woodbine/Rodick Station	250	83%	50	17%
Kennedy Station	3,300	87%	500	13%
Total	12,580	84%	2,330	16%

The current planning period for the 407 Transitway is to 2031, which is in line with the timeframe found in the Growth Plan. The Regional Municipality of York is expected to experience substantial growth in both population and employment beyond 2031. By 2051, which is considered the full built-out horizon, there will be 1.8 million people and 969,000 jobs in York Region. This represents growth of approximately 20% from 2031 to 2051. As shown in **Table 2-5**, other regions will experience similar growth between 2031 and 2051 except Toronto and the City of Hamilton, which show growth of approximately 5% and 9% respectively.

Table 2-5: 2031 to 2051 Population & Employment by Municipality

Municipality	Population			Employment		
	2031	2051	Growth	2031	2051	Growth
Toronto	3,080,000	3,224,000	5%	1,640,000	1,701,000	4%
Durham	960,000	1,124,000	17%	350,000	415,000	19%
York	1,500,000	1,796,000	20%	780,000	946,000	21%
Peel	1,640,000	1,854,000	13%	870,000	999,000	15%
Halton	780,000	937,000	20%	390,000	477,000	22%
Hamilton	660,000	707,000	7%	300,000	332,000	10%
TOTAL	8,620,000	9,641,000	12%	4,330,000	4,868,000	12%

Sources: York Region 2051 Population/Employment projections were extracted from York Region Committee Report "York Region 2031 population and Employment Forecasts", dated January 7, 2009. Other regions' 2051 land use forecasts were estimated based on the annual growth rates between 2001 and 2031 plus the decline rate of growth shown in York land use projections between 2031-2051 and 2001-2031.

In order to estimate the overall travel demand increase on the Highway 407 corridor, the trip ends were increased by the above population increases in each municipality (i.e. fratar process). The resulting demand increase in corridor related trips (trips from and to the corridor) is from 480,800 trips in 2031 to 558,600 trips in 2051, an increase of 17%.

A sketch planning approach can be applied to assign growth among travel modes. By 2031 the road network in the GTHA will become capacity constrained, severely limiting the potential for auto travel to increase beyond 2031. Furthermore, the implentation of Transporation Demand Management (TDM) supporting policies and programs (e.g. work-at-home, carpooling, and flexible work schedule, etc.) will also limit auto travel growth. Given these limitations auto trips will likely grow within a range of 0% to 10%, the latter possible if some efficiencies or technologies are implemented that raise roadway capacity. Using these growth figures the total growth in demand can be assigned partially to auto trips and the remaining growth assigned to transit. The corresponding percentage increase for transit is significantly higher than for auto. For the 10% auto increase scenario, transit trips thereby increase to 117,000 trips in 2051, an increase of 44%. For the 0% auto increase, transit trips would increase to approximately 160,000, or an increase of 95%, as shown in **Table 2-6.**

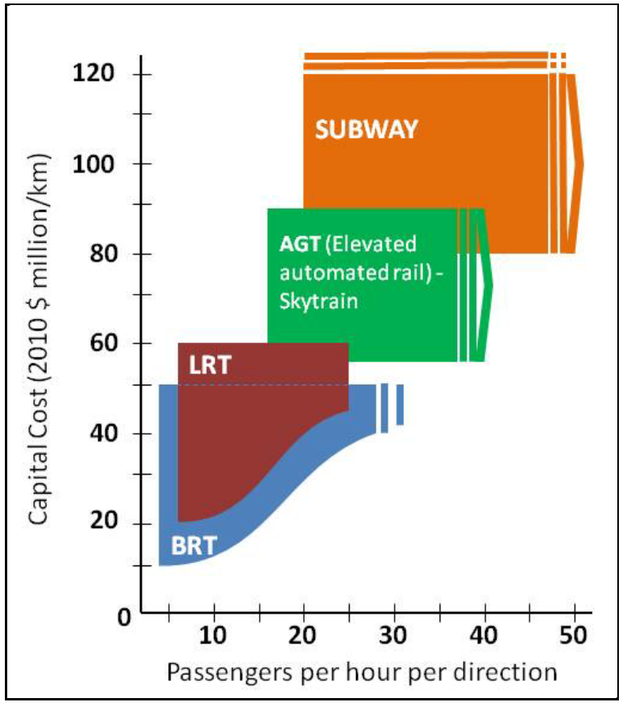
Table 2-6: 2051 Corridor Trips by Auto and Transit

Scenario	Total Trips	Auto Trips	Transit Trips
2031	480,800	400,000	80,800
2051 - 0% auto growth	558,600	400,000	158,600
2051 - 10% auto growth	558,600	440,000	118,600

Based on the above, the transit ridership on the Highway 407 corridor will increase between 44% and 95%, given the auto increases of 10% or 0% respectively. The resulting peak point 407 Transitway passenger load east of Yonge Street will therefore range between 7,800 riders and 10,500 riders in the 2051 horizon.

Figure 2-7 illustrates the typical capacity ranges of higher order transit technologies relative to the implementation capital costs which vary with the degree of exclusivity of the system ROW. Experience around the world indicates that both BRT and LRT technologies can provide the capacities likely to be required in the Highway 407 Corridor both in the medium and long-term provided investment is made in a fully exclusive, grade separated ROW with overtaking capability at stations in the case of BRT.

Figure 2-7: Transit Demand Requirements for Rapid Transit Technology



Notwithstanding the BRT technology's greater flexibility and high capacities achieved elsewhere in the world, protection for eventual conversion to LRT is recommended for the corridor to accommodate ridership capacity needs beyond 2031 at lower operating cost. In addition to providing higher capacity, it is noted that conversion to LRT would bring additional benefits to the corridor such as, the currently assumed, greater potential for TOD, and improved public perception of the technology, which could further increase ridership and provide additional environmental benefits.

Table 2-7 shows the predicted park-and-ride demands in 2031, which take into account uncertainty factors including ridership diversion from Highway 7 YRT/Viva service, land use, and other transit service improvements. This demand equates to approximately 4,600 spaces and reflects the long range transitway need based on approximately 25 years of operation. Under the seven-station scenario, it was assumed that there would not be a park-and-ride facility provided at Yonge Station. As a result, extra park-and-ride demands have been added to Bathurst Station and Leslie Station. It has been indicated that MTO will require additional 200 car-sharing parking spaces at each transitway station except Yonge Station. The total proposed park-and-ride capacity for the seven-station 407 Transitway including carpool spaces will be close to 5,800 spaces.

Table 2-7: Predicted Park-and-Ride Demand of 407 Transitway in 2031 (Daily Parking Demands)

Station	2031 Demand	2031 Demand + Carpool Spaces
Jane Station	310	510
GO Barrie (Concord) Station	430	630
Bathurst Station	900	1,100
Yonge Station	0	0
Leslie Station	1,090	1,290
Woodbine/Rodick Station	750	950
Kennedy Station	1,120	1,320
Total	4,600	5,800

This design demand for park-and-ride assumes that the future transit system in York Region will be a mature and integrated system with significantly higher transit modal shares for inter- and intra-regional travel. As such, the proportion of persons accessing the transitway by automobile will be much less than currently exhibited by current GO Rail services, but higher than traditional subway/rapid transit services.

2.5 Future Transportation System Needs and Opportunities

From 2001 to 2031, in York Region, travel demand is projected to increase by 85% in terms of total vehicle-kilometres travelled, while transportation supply in terms of total lane kilometres is only projected to increase by 26%. Congestion in 2001 was already quite significant during peak periods, but will worsen considerably by 2031 spreading to almost all major arterials and highways in the corridor.

The continuing development of the GGH in accordance with Provincial policies will further increase longer distance, cross-regional travel demand, particularly in the Highway 407 Corridor. This demand will be characterized by strong growth in commuting outflow from areas east of Toronto and strong growth for trips within York Region, from York Region to Toronto, and from York Region to other parts of Toronto.

Together these needs present an opportunity for the 407 Transitway to become a key element of the proposed future GGH rapid transit network. It would have a character substantially different to existing rapid transit facilities, and other planned rapid transit facilities, in that it would depart from the traditional rapid transit role of serving radial travel demands destined to downtown Toronto. As a cross-regional service it would target key growth centres and provide a realistic and attractive alternative to the private auto.