

5. ROAD NETWORK

Rapid transit alone cannot accommodate projected future growth. In the short term, the road infrastructure will continue to play an important role in accommodating the commuting needs of residents and employees. As the rapid transit system becomes operational, there will be a shift towards greater transit use. The road network will become less significant as the primary means of accommodating traffic demand.

The objective for the road network is to provide for a balanced transportation system, with road widenings and improvements where they are most needed to ensure a reasonable level of service.

5.1 ROAD ANALYSIS METHODOLOGY

The Town's Transportation Model considered the following parameters for each horizon year:

- Detailed population and employment projections;
- Planned improvements to the Regional road network (based on the Region's 10-Year Capital Program);
- Planned modifications to local collector roads (ie. Birchmount Road extension, Yorktech Drive, Rodick Road extension, Bur Oak Avenue)
- A gradual increase in the transit modal split from the current 10% to the targeted 19% by 2021 per **Figure 5-1**.

As different road networks were assessed for each horizon year, the model was utilized to identify any deficiencies. When a deficiency was found, a modification was made with regard to the planned capital works program and the analysis was repeated. This iterative approach was undertaken to identify if any modifications to the Region's program would be required to ensure reasonable service levels on the roadways in Markham.

The basis of measuring the effectiveness of a roadway section was an analysis of the volume-to-capacity ratio (determined by dividing the projected volume by the available capacity). The resulting ratio measures the road section's ability to satisfactorily serve the anticipated demand. Ratios less than 0.80 are considered desirable. A ratio between 0.80 and 1.0 is typical of an urban road.

As the rapid transit system becomes operational, dependence on the road network will start to diminish.

Town of Markham
Transit Modal Split Targets

Year	Transit Modal Split Target*
2003	10%
2006	12%
2011-2021	19%

* inclusive of local transit and GO service

Figure 5-1



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As the ratio approaches the upper limit, efforts should be taken to evaluate and mitigate the situation. A ratio of 1.0 or more implies vehicular demand exceeds available capacity.

As the Region's planned roadway network was examined, it became apparent that by 2011, the 10-Year Region of York Capital Road Program would provide the necessary capacity to meet the projected demands. During the intermediate horizon years, however, advancement of certain sections of the Regional program would be required.

5.2 MODIFIED ROAD NETWORK

At the same time as the road network assessment for MTPS-2002 was being completed, the rapid transit corridors along Highway 7, Yonge Street and Warden Avenue emerged to give definitive direction to the Town's overall transportation plan. As a result, a key question was raised: "Is the 2011 road plan as identified in the 10 Year Capital Program sufficient to support and help deliver the transit network?"

The Town's transportation model was utilized to help answer this question. As numerous road network options (including new links, connections and widenings) were examined, conclusions emerged:

- Public transit must be successful in attracting as a *minimum* the 19% transit modal split or the vehicle demand pressures on most arterial roads will necessitate six lanes;
- Certain arterial road sections will still require widening to six lanes regardless of the success of public transit. These road sections provide important accessibility levels for traffic destined to, from and within the Town of Markham, and are primarily the ones that directly connect to the Highway 404 and 407 interchanges;
- The vehicle turn lane capacities at each of the arterial roads that intersect Steeles Avenue, Highway 7 and 14th Avenue have become the most critical factor in managing congestion on main north-south arterial roads in Markham north of Steeles Avenue;
- The introduction of new east-west mid-block collectors across Highway 404 (between Highway 7 and Elgin Mills Road) could help to relieve demand on Highway 7. This in turn would provide an opportunity to use the existing right-of-way along Highway 7 for the implementation of rapid transit.



The 10-Year Region of York Capital Road Program will provide the necessary capacity to meet projected demands.



Advancement of certain sections of the Region of York's planned roads network will be required.

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A modified road network (shown in Appendix B) began to emerge. This network is based on limiting road widenings to six or seven lanes only within the areas that require them.

Further detailed analysis is required to fully explore the impact on local areas, costs, geometric feasibility, and implications for area development opportunities. The key elements of the modified road network include the mid-block crossings of Highway 404, and a priority to keep four-lane cross sections on arterial roads (with some exceptions along the Highway 404 and 407 corridors).

5.3 EVALUATION OF THE MODIFIED ROAD NETWORK

The comparison of the Region's 10-Year Plan and the modified road network concentrated on:

- Determining the magnitude of vehicle demand on critical road sections and comparing the difference between each road network;
- Determining the volume-to-capacity ratio on critical road sections and comparing the difference between each road network.

The benefit of the modified 2011 road network was immediately apparent, with traffic demand reduced on such key east-west arterial roads as 16th Avenue, Highway 7 and 14th Avenue. The mid-block crossings of Highway 404 helped to achieve a more balanced distribution of traffic demand since they facilitated east-west travel without using capacity on the arterial roads.

A mid-block crossing of Highway 404 between Major Mackenzie Drive and Elgin Mills Road is an option that is suggested, however, this crossing was not included in the computer model runs and is not part of the 2011 road networks assessed due to study time lines. Based on the detailed review of the mid-block collector north of Highway 7, it is reasonable to assume that a similar pattern of benefits to the regional arterials in this area could be expected, and that the need for road widenings would be reduced because of dispersed vehicular movement. The north-south road network particularly Leslie Street, Warden Avenue, Kennedy Road and McCowan Road still require widening to six lanes in areas along the Highway 407 corridor.

The key elements of the modified road network include the mid-block crossings of Highway 404.



The mid-block crossings of Highway 404 help to achieve a more balanced distribution of traffic.



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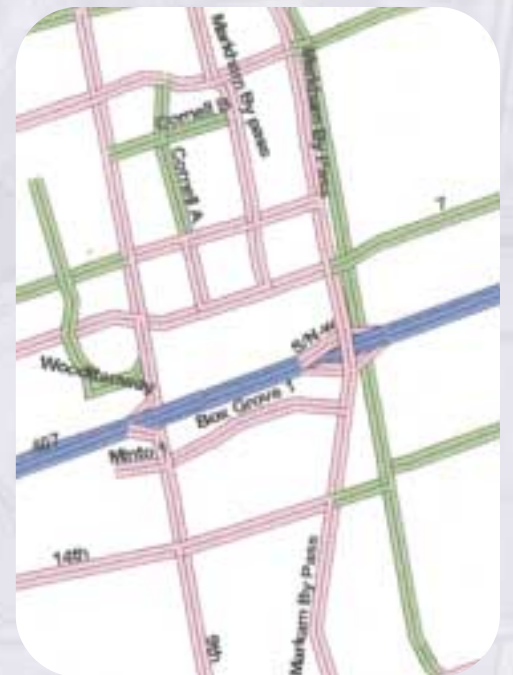
There is an option to maintain these roads as four-lane cross sections north of Steeles Avenue. This will result in congestion, although the level of service is just above the capacity threshold. Given the number of assumptions involved in the modeling of future conditions, it is possible that reasonable levels of service could still be provided. Since there are no plans to widen the roads south of Steeles Avenue, there would be limited benefits to capacity by widening roads immediately north of Steeles Avenue. The funds that would be utilized to widen these roads should be reallocated to such intersection improvements as double turn lanes and better traffic signal operations along Steeles Avenue.

5.4 RESULTS OF ANALYSIS

The analysis conducted for the road network component of the MTPS-2002 provides several conclusions:

- The horizon years of 2003 and 2006 indicate that certain arterial road section improvements and additions will need to be advanced to meet projected travel demands;
- Although the 10-Year Region of York Capital Road Program build-out provides reasonable capacity to serve the anticipated travel demands of the 2021 population, the east end of Markham (particularly south of Highway 7) will continue to experience increased congestion and delays. An extension of the proposed Markham By-Pass to Highway 401 will help to address this issue;
- In each horizon year of 2003, 2006, 2011 and 2021, **the minimum targeted transit modal split levels must be achieved or anticipated travel demands will not be met** and there will be increased pressure to widen regional arterial roads to six lanes;
- 16th Avenue and Kennedy Road will continue to experience increased vehicle congestion as four-lane roads, as will Markham Road, which has only two lanes south of Highway 7. Unless public transit is used to reduce vehicular congestion in these areas, the lack of a mid-block east-west link may necessitate widening these roads;

Since there are no plans to widen the roads south of Steeles Avenue, there would be limited benefits to capacity by widening roads immediately north of Steeles Avenue.



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- Even if the target model splits are achieved by 2011 and 2021, most arterial roads in the Town of Markham will be at or near capacity during peak hours. The collector roads will provide a better level of service, with congestion and delays occurring on only a few sections on Denison Street and John Street.

5.5 ADDITIONAL ROADWAY ISSUES

Several other issues and concerns were brought forth during the course of the study through public consultation.

OPA 5 Mid-Block Collectors

The transportation model outputs show that all OPA 5 mid-block collectors will operate at good levels of service in every horizon year analyzed. To achieve this level of service, it is imperative that each secondary plan adheres to the Town policy which directs that at least two mid-block collectors must connect to two different arterial roads when approximately 25 % of a concession block area is being built out. This policy will also facilitate public transit since the continuous connection of collector roads permits the introduction of transit services at the outset of population and employment occupancy.

Victoria Square

Woodbine Avenue will remain a two-lane road within Victoria Square. In addition, Elgin Mills Road should also remain two lanes through the hamlet. As per OPA 31 adopted by Regional Council in November 2001 a north-south by-pass of Victoria Square, located between Highway 404 and Woodbine Avenue, will be developed in conjunction with the community. The north-south By-Pass is currently the subject of a Regional EA study, which will also review the opportunity to assess the need for an east-west By-Pass.

Potential New East-West Roadway

MTPS-2002 did not include recent information that identifies the potential for the development of a General Aviation Airport and the Seaton Lands in Durham Region. These developments have a significant impact not only on Highway 407 and the Markham By-Pass to Highway 401, but on other arterial roads as well.



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Consideration should be given to examining the 2011 road network in the context of the new information. The current analysis indicates that considerable east-west demand north of Major Mackenzie Drive will result from the two developments. One of the road network options that should be examined is the extension of the Markham By-Pass west to connect with Highway 404.

Verclair Gate, Village Parkway and Sciberras Road

The proposed roads located south of Highway 7 will provide connections to the new Markham Centre downtown core, and are planned to align with Verclair Gate, Village Parkway and Sciberras Road to complete the grid network of north-south connections between Warden Avenue and Kennedy Road.

To mitigate issues of speed and volume along the existing roads, Town staff held focus group sessions with residents who live north of Highway 7 and are now developing a two-phase plan.

The first phase involves the Town's commitment to implement intersection design and traffic calming measures prior to the planned opening of new road connections. Intersection elements may include medians, gateway features and appropriate design of the approach and discharge lanes to ensure that drivers traveling north of Highway 7 are made aware that Verclair Gate, Village Parkway and Sciberras Road serve existing mature neighbourhoods. A traffic calming plan will also be developed for each of the three roads to further minimize travel speed.

In the event it is found that the number of drivers infiltrating through the existing neighbourhoods exceeds the design thresholds, the second phase of the plan will evaluate the causes of the problem (i.e. directional, southbound versus northbound infiltration, time of day) and implement prohibitions to reduce the traffic flow.

Main Street Unionville

This unique heritage roadway includes a vibrant business community north of the railway track and a residential area to the south. The ongoing EA study for Enterprise Drive will examine the impacts to Main St. Unionville in the context of the overall development of Markham Centre. The ultimate configuration of Main Street (south of Highway 7) will be based upon careful consideration of urban design objectives in the heritage area and the overall road network needs to serve the community.



The potential development of a General Aviation Airport in Durham Region will have a significant impact on arterial roads in Markham.



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Yorktech Drive/Enterprise Drive

At the present time, Yorktech Drive is a discontinuous collector road located south of Highway 7 and east of Woodbine Avenue. If feasible, Yorktech Drive should develop into a continuous collector road between Woodbine Avenue and McCowan Road to provide direct mid-block interchanges at Woodbine Avenue, Warden Avenue, Kennedy Road and McCowan Road north of Highway 407. An EA study is being planned to assess opportunities to pursue this important road link.

Main Street Markham (Highway 48)

Between Highway 7 and 16th Avenue, Main Street North consists of four lanes of traffic (two lanes in each direction). This area retains a heritage feeling and village atmosphere. Curbside parking is permitted in the Village throughout the day, including roadway peak hours. South of Highway 7, Main Street South consists of two lanes (one lane in each direction) south to Highway 407 and across the Rouge River.

The technical analysis of future conditions shows a continuing deterioration in levels of service along the entire length of Main Street North and South. Current traffic volumes warrant widening of Main Street South to four lanes between Highway 7 and Highway 407, and along Main Street North between Highway 7 and 16th Avenue by 2011. There is also a need to preserve the heritage character of Main Street Markham.

These competing priorities require careful consideration and discussion. Based on public input, there is a strong desire to maintain the Main Street character north of Highway 7. In this regard, Council has weighed the implications and endorsed, in principle, the Main Street Markham Streetscape Guidelines (December 2001) which will permanently reduce Main Street north of Highway 7 to two lanes. This will result in increased pressure on adjacent local roads, and traffic delays as development continues in the Greensborough planning area north of 16th Avenue. Council and staff will continue to work with the affected communities to provide the best possible traffic management tools through Neighbourhood Transportation Committees.

An EA study is being planned to assess opportunities to develop Yorktech Drive into a continuous collector road.



Based on public input, there is a strong desire to maintain the Main Street character north of Highway 7.



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Main Street South of Highway 7 already experiences congestion during peak periods, although the extension of Highway 407 and the construction of the Highway 407/Ninth Line interchange has provided some relief. Forecast traffic volumes show the need for a four-lane cross section from Highway 7 to Highway 407 even when the Markham By-Pass is in place. It is recommended that the consideration of widening this section of Main Street be deferred until the Markham By-Pass has been constructed and Ninth Line has been widened. Traffic conditions should continue to be monitored to determine if increasing volume dictates a need to widen the roadway sooner.

Steeles Avenue

The analysis shows the need to widen Steeles Avenue, east of Markham Road to the Durham Boundary, from two to four lanes now. Otherwise, the vehicular demands will result in a capacity deficiency with significantly increased delays and congestion. The Town of Markham is pursuing negotiations with York Region in this regard. Even with the widening of Steeles Avenue, the travel demands across the Durham boundary will become so high that additional capacity must be found. The only viable solutions appear to be the ultimate widening of Highway 407, the extension of the Markham By-Pass to connect with Highway 401, and extension of the rapid transit network into Durham Region.

East End Issues

At the time MTPS-2002 was completed, all known GTA population and employment growth forecasts were included. Subsequently, significant land use decisions were made or are about to be made. These land use decisions are likely to have an impact on the major road network (particularly Highway 407, Highway 7, Markham By-Pass, Steeles Avenue, 14th Avenue and Major Mackenzie Drive).

The Federal Government recently announced that it may build a Regional airport in Pickering within the next 10 years. In addition, as part of the OMB decision for the Oak Ridges Moraine, the Seaton Lands are also being considered for development in the near future. Both initiatives will have considerable impact on growth in the eastern



The Region of York has been requested to designate the north-east portion of Markham as a special study area to be included in its five-year plan.

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area of York Region during the next 10 to 30 years, and the travel demands generated by these land uses are likely to be significant.

Markham will be directly affected by these initiatives. It is imperative that the future of the north-east portion of the town be evaluated in order to manage the growth of planned development in connection with the Pickering Airport and Seaton Lands shown in **Figure 5-2**. The Region has been requested to designate, in the YRTMP, the north-east portion of Markham as a “special study area” to be included in its five-year action plan.

A proactive review is warranted. The Town is currently in discussions with Durham, Pickering and the Region of York to initiate the study with these key municipalities and the Federal and Provincial governments to consider the potential impacts and opportunities associated with the Markham By-Pass, Havelock Railway Line and transit connections to the airport. Included in such an assessment would be an evaluation of the potential to provide a north-south rapid transit corridor connecting the east end of Markham to the TTC network via the Scarborough Town Centre.

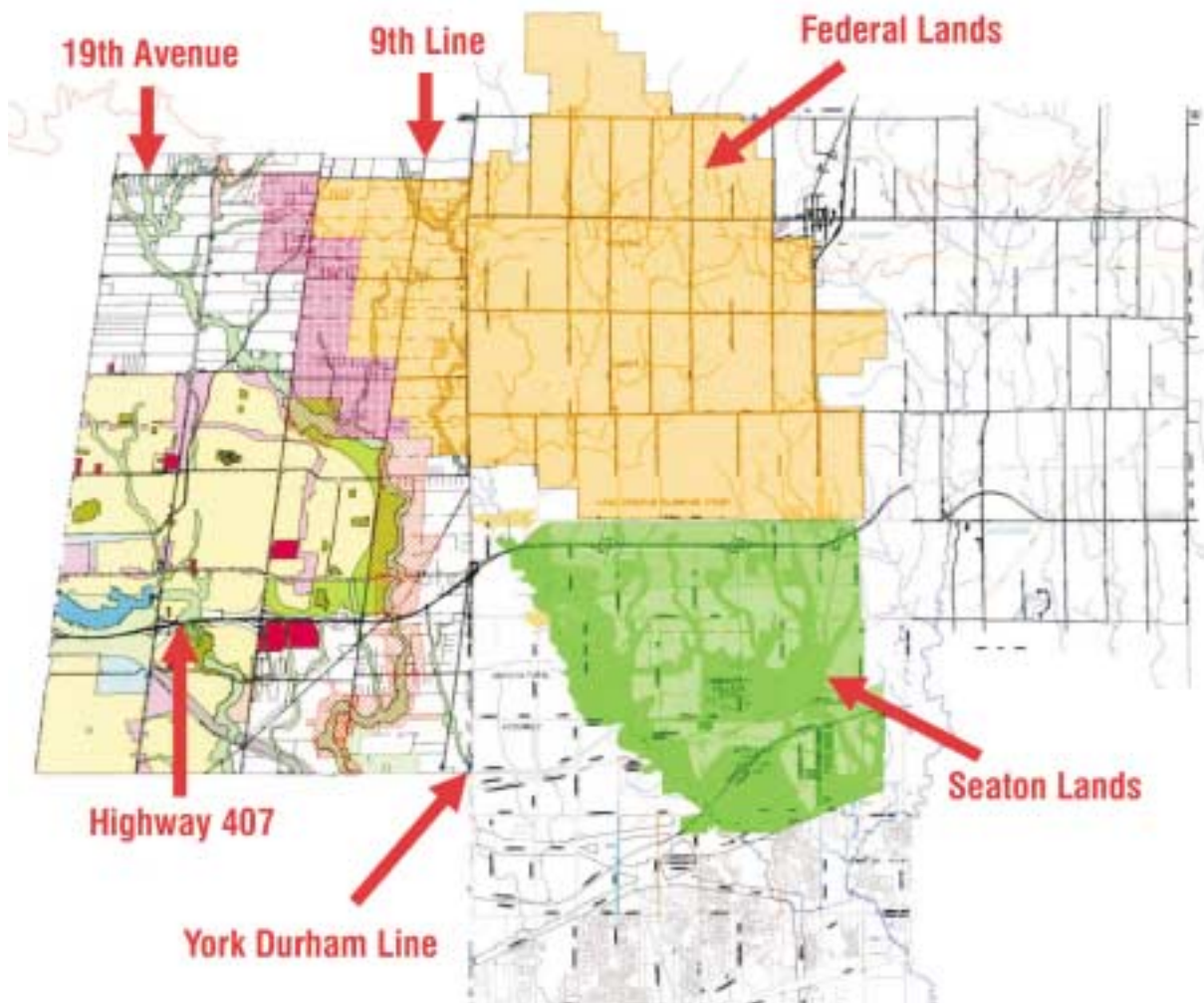


Figure 5-2: Proposed new developments (Seaton Lands and General Aviation Airport) will impact Markham's roads network.

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Intersection Improvements and Signal Optimization

A plan should be developed to systematically examine key intersections and focus on such short-term strategies as double left-turn lanes, special signal controls and demand-responsive intersection control to alleviate the current congestion. This in turn would help to reduce the amount of infiltration on local roads and combat the speeding and volume concerns experienced by communities such as the ones along the Steeles Avenue boundary. The Town will continue to work with the Region of York and City of Toronto to evaluate and implement near-term solutions.

5.6 KEY ROAD NETWORK RECOMMENDATIONS

Study results indicate that the Town of Markham should focus its efforts on the following initiatives:

- Further pursue the modified 2011 road network with the Region of York;
- Ensure that the schedule of road improvements and additions contained in the 10-Year Region of York Capital Road Program is followed;
- Accelerate the completion of the Highway 404 crossing feasibility studies to confirm that the alternative 2011 road network will reduce the necessity of widening some arterial roads beyond four lanes;
- Ensure that every effort is made by the Town of Markham and Region of York to continually improve and add transit services in Markham. The introduction of the recommended rapid transit network is crucial to achieving the targeted transit modal splits used in the road network analysis;
- Address the Additional Roadway Issues identified earlier in this section (5.5);
- Ensure that the Region of York secures and constructs the Markham By-Pass south to Highway 401 by 2011.
- Continue efforts to explore such intersection and road improvements as signal optimization, signal progression, auxiliary turn lanes and additional road links to facilitate traffic flow.



The minimum targeted transit modal split levels must be achieved or anticipated travel demands will not be met.