REDUCING CAR DEPENDENCE
Transportation Options for the City of Toronto

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Summary

This report summarizes the development of options for the transportation component of the new City of Toronto Official Plan based on a future vision outlined in *Toronto at the Crossroads: Shaping our Future*, a report on proposed directions for the new Official Plan. The main attributes of the transportation vision are:

1. Integrated land use and urban design that leads to fewer and shorter trips,
2. Public transit service that is more competitive with the private automobile,
3. Improved transit accessibility for the disabled and seniors,
4. Efficient goods movement that enhances economic competitiveness,
5. Traffic engineering and street design that encourage walking and cycling,
6. Less need to own or use an automobile,
7. Safeguards for the protection of the natural environment,
8. Reduced air pollution and emissions from transportation, and
9. Equitable pricing and financing of transportation services.

The main thrust of this vision is to reduce automobile dependence and improve the competitiveness of transit. For this reason, in contrast to traditional approaches to plan development that focus on reducing or eliminating projected capacity deficiencies at key locations, transportation alternatives are formulated on the basis of improving overall accessibility of the transit system within the City. This means identifying those areas with the poorest transit access and subsequently attempting to:

- penetrate areas that now have poor transit coverage (possibly through alternative forms of transit delivery),
- improve connectivity (as between the Yonge and Spadina Subways and between the terminal of the new Sheppard Subway and Scarborough), and
- enhance connections with regional transit services (including park and ride for long distance commuting from low density suburban areas).

To illustrate the application of this approach, Figure S.1 describes one dimension of accessibility by highlighting those specific geographic areas known as traffic zones that are ‘transit disadvantaged’ in the sense that only a small proportion of all jobs in the City can be reached within 30 minutes by transit. In other words, the more darkly shaded zones indicate the location of those residents who have good transit accessibility in terms of the number of jobs that can be reached. Other measures of accessibility are also treated in Section 3.

Achieving the goal of reduced automobile dependence therefore suggests that these are the same areas where attempts should be made to improve transit competitiveness, particularly for those areas identified in the Official Plan as opportunities for accommodating more residents and jobs. Merely improving transit access to areas that are now poorly served, however, provides no guarantee that transit use will improve if land use characteristics (notably, densities) and travel patterns are not conducive to effective transit service.
Elements of changes and/or improvements to the existing transportation system include land use policies and specific transportation investments and policies that can be grouped into “building blocks”, as shown in Figure S.2.

Some of these changes/improvements involve significant capital expenditure, as in the case of new roads and expansion of the rapid transit system, whereas others may involve more modest investment to modify traffic signals and acquire additional transit vehicles.

Figure S.2 also shows certain linkages between these elements, as in the case of on-street parking regulations and transit priority, or between land use intensification policies and rapid transit expansion. Other linkages relate to local urban design and new transit routes (including alternative means of service delivery), development incentives around transit stations, and traffic control and signal pre-emption for transit vehicles. A more detailed description of the various building blocks is provided in Section 4.

**Options**

Using these building blocks to achieve the general thrust of the future transportation vision leads to a number of preliminary transportation options. These *options* involve both policies and infrastructure improvements, treated in Section 5, which include the following:
Building Blocks for the Transportation Plan

Figure S.2
1. **Road Use Policies**
   - expansion of the network of bicycle lanes where demand justifies such action, taking into account the change in congestion likely to result from any reduction in automobile carrying capacity due to lane restrictions, as well as possible impacts on surface transit operations,
   - examination of opportunities for auto free zones or pedestrian precincts in conjunction with local area planning and urban design,
   - expansion of parking restrictions on existing roads and streets (perhaps until 10 AM and between 3 and 7 PM) to reduce congestion over a broader peak period and permit a safer cycling environment and improved transit performance, and
   - evaluation of the high occupancy vehicle (HOV) lanes network in terms of its potential to improve surface transit operations and increase auto occupancy.

2. **Accessibility for the Disabled and Seniors**
   - incorporation of adequate accessibility in designs and associated costs for all users in any new transit infrastructure, and
   - improved accessibility, particularly in the case of buses and streetcars both for replacement vehicles and new vehicles acquired for service expansion.

3. **Surface Transit Priority**
   Based on the single criterion of service frequency of 20 or more vehicles per hour, Figure S.3 shows those TTC route segments that could be considered as initial candidates for transit priority treatment. Treatment options include:
   - expansion of traffic signal priority for transit vehicles at intersections,
   - evaluate the potential of HOV lanes.
   - dedication of exclusive transit lanes on all existing streetcar routes (including the elimination of on-street parking where necessary),
   - introduction of reserved bus lanes on all routes that operate with frequencies of 25 or more buses per hour,
   - selection of one or more routes that already attract high ridership and experience high levels of congestion for very aggressive transit priority policies that include ‘auto free’ transit malls, and

4. **Alternative Service Delivery**
   - development of a pilot project to determine whether transit accessibility in some transit disadvantaged areas can be improved through some type of public/private partnerships in which private operators provide service that augment TTC service and ridership.

5. **Expansion of Commuter Rail Services**
   - additional parking at suburban stations,
   - increased train frequency during broadened peak periods for all existing services,
   - expansion of Union Station platform and access track capacity,
   - new interchanges with TTC rapid transit services, and
   - new commuter rail service through Toronto’s midtown.
Initial Candidates for Surface Transit Priority Treatment

Figure S.3

No. of Buses/Streetcars per Hour A.M. Peak Period Sept. 2000

- 20 to 29
- 30 and over
6. **Road Expansion**
- limited road expansion based upon a review of the proposals contained in existing secondary plans and the City’s Capital Works Programme among which the major ones are the widening of Steeles Avenue East and the Front Street West extension, and
- new roads now being considered in a separate study of transportation related to the Waterfront development initiative.

7. **Higher Order Transit**
   A number of higher order transit options are shown in Figure S.4, encompassing a range of possible technologies including subway, LRT and busway. These technologies generally involve significant capital expenditures.

   At this stage, the options shown in Figure S.4 are presented for discussion purposes and to test public reaction to them. If they are to be pursued further, each option or set of options will need to be formally evaluated in terms of cost effectiveness and consistency with the main directions of the City’s Official Plan.

**Evaluating The Options**
Table S.1 summarizes the kinds of impact measures and indicators that might generally be used to characterize and assess the proposed options listed above. It should be noted from Table S.1 that there will be trade-offs to be made in the evaluation process regarding the allocation of roadspace among different users (autos, transit vehicles, trucks, cyclists, pedestrians). These trade-offs should be made within the context of the overriding aim of reducing auto dependence.

In the case of higher order transit options which involve large capital expenditures, the main transportation indicators to be tested include:

- effects on transit ridership and mode share,
- relative improvements in accessibility for transit disadvantaged areas,
- impacts on air pollution and greenhouse gas emissions,
- cost effectiveness, and
- funding requirements.

The accessibility measures will require particular attention in order to determine relative priorities of potential transportation initiatives from the standpoint of a broader range of land use and non-transportation criteria. Based on the preliminary methods developed thus far, it will be important to estimate:

- overall effects on access to employment (or other activities) as a function of transit travel time for the different transit alternatives, and
- changes in accessibility by specific geographic area.
Figure S.4
Preliminary Infrastructure Options
Table S.1  
Option Evaluation Template

<table>
<thead>
<tr>
<th>Component</th>
<th>Impacts and Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 Road Use Policies:</strong></td>
<td>bicycle lane km</td>
</tr>
<tr>
<td>Pedestrians</td>
<td>pedestrian precincts/auto free zones</td>
</tr>
<tr>
<td>Cycling</td>
<td>inconvenience to other road users</td>
</tr>
<tr>
<td>On-street parking</td>
<td>impacts on transit operations</td>
</tr>
<tr>
<td></td>
<td>effects on congestion, air pollution &amp; GHG emissions</td>
</tr>
<tr>
<td><strong>2 Accessibility for the Disabled &amp; Seniors:</strong></td>
<td>percent of fully accessible transit vehicles</td>
</tr>
<tr>
<td>Replacement vehicles</td>
<td>percent of fully accessible rapid transit stations</td>
</tr>
<tr>
<td>New infrastructure</td>
<td>impacts on transit operations</td>
</tr>
<tr>
<td>Existing retrofits</td>
<td>capital costs</td>
</tr>
<tr>
<td><strong>3 Surface Transit Priority:</strong></td>
<td>increase in average speed and route capacity</td>
</tr>
<tr>
<td>Turn restrictions</td>
<td>savings in vehicle requirements</td>
</tr>
<tr>
<td>Reduced parking</td>
<td>increase in ridership</td>
</tr>
<tr>
<td>Exclusive lanes</td>
<td>inconvenience to other road users</td>
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<tr>
<td>Signal priority</td>
<td>capital costs for priority signals</td>
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<tr>
<td><strong>4 Alternative Service Delivery:</strong></td>
<td>market potential</td>
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<tr>
<td></td>
<td>supplementary TTC ridership</td>
</tr>
<tr>
<td></td>
<td>labour and management issues</td>
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<tr>
<td><strong>5 Expanded Commuter Rail:</strong></td>
<td>increased ridership and transit mode split</td>
</tr>
<tr>
<td>Union Station expansion</td>
<td>specific areas of improved transit accessibility</td>
</tr>
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<td>Higher peak frequency</td>
<td>capital costs</td>
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<tr>
<td>Expansion of parking</td>
<td>consistency with land use initiatives</td>
</tr>
<tr>
<td>New stations in the City</td>
<td>residential development potential</td>
</tr>
<tr>
<td>New services</td>
<td>commercial development potential</td>
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<tr>
<td></td>
<td>inter-regional impacts and cross boundary connections</td>
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<tr>
<td><strong>6 Road Expansion</strong></td>
<td>reductions in congestion, air pollution, and GHG emissions</td>
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<tr>
<td></td>
<td>impacts on transit operations</td>
</tr>
<tr>
<td></td>
<td>capital costs</td>
</tr>
<tr>
<td><strong>7 Higher Order Transit:</strong></td>
<td>increased ridership and transit mode split</td>
</tr>
<tr>
<td>Busways</td>
<td>cumulative change in transit accessibility</td>
</tr>
<tr>
<td>LRT</td>
<td>specific areas of improved transit accessibility</td>
</tr>
<tr>
<td>Subways &amp; RT</td>
<td>consistency with land use initiatives</td>
</tr>
<tr>
<td></td>
<td>capital costs</td>
</tr>
</tbody>
</table>
Funding
Finally, to the extent that some of these policy and infrastructure alternatives constitute preconditions for achieving the vision characterized by reduced auto dependence, there will obviously be a requirement for substantial funding. (Even without any major shift in transportation policy, of course, there will be significant funding needs just to keep up with natural growth.) As shown in Figure S.5, the TTC and GO Transit already achieve the highest operating cost recovery ratios of any major transit operator in Canada and the U.S. Thus, any expectation that these additional funding needs can be met without subsidies is clearly unrealistic. In fact, among comparable size cities throughout North America and most of the world, Toronto is the only city that does not receive financial assistance for public transportation from any senior level of government.

Figure S.5
Comparison of Cost Recoveries

In view of the funding uncertainty resulting from the Ontario government’s 1998 decision to discontinue transit support programs for both the TTC and GO Transit, it is becoming increasingly clear that funding both for existing and much needed expansion of transit services cannot continue as a burden on property owners alone. There is also an increasing consensus
throughout most OECD countries, that at least some of the burden for financing public transit should fall directly on the backs of transportation beneficiaries, namely, users of automobiles. Possible remedies for funding transit improvements within Toronto include the following.

First, recognizing that provincial government policies do change over time, the City should, in concert with other GTA municipalities, maintain pressure to have funding responsibility for GO Transit returned to the Ontario government, thereby freeing up some of the City’s commitments (about $55 million annually) for its own transit expansion priorities.

Second, recognizing that in downloading funding responsibility for transit to the municipalities, the government of Ontario failed to provide municipalities with the tools needed to meet their new responsibilities, the City, again in concert with other GTA municipalities, should pursue initiatives with the provincial government that would empower municipalities, regional governments, or the newly formed Greater Toronto Services Board to generate funding from sources other than, or in addition to, local property taxes. Such initiatives could include special automobile fees (as recently introduced in Vancouver) and road pricing schemes based on information technology similar to the system now used on Highway 407.

Finally, the federal government has special interests in urban transportation related to airport access, VIA Rail services, and recent international commitments to reduce carbon dioxide and other greenhouse gas emissions that result from our increasing dependence on automobiles. Thus, carefully targeted requests for specific projects that deal with some of those issues may be successful in attracting capital contributions from the federal government, as in the case of Waterfront development.

The present uncertainty associated with funding, however, is no reason not to plan for the future. If the vision of the City is one that includes reducing automobile dependence and accommodating “a million more people but not a million more cars”, it will be important for the City to have priorities for capital investment in transportation already approved within a reasonable period of time, particularly if opportunities for federal financial support on a selective basis arise in the near future. In the meantime, there is no reason not to expedite the matter of increasing transit priority on existing high volume transit routes.
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1. **Background**
A previous report developed a statement of desirable transportation system attributes and related principles intended to guide formulation of the transportation component of the City of Toronto’s Official Plan. These attributes collectively define the future ‘vision’ of transportation for the City, as one characterized by:

1. Integrated land use and urban design that leads to fewer and shorter trips,
2. Public transit service that is more competitive with the private automobile,
3. Improved transit accessibility for the disabled and seniors,
4. Efficient goods movement that enhances economic competitiveness,
5. Traffic engineering and street design that encourage walking and cycling,
6. Less need to own or use an automobile,
7. Safeguards for the protection of the natural environment,
8. Reduced air pollution and emissions from transportation, and
9. Equitable pricing and financing of transportation services.

Essentially, this vision is intended to respond to perceived weaknesses of the existing system and likely trends. The principles summarized in Table 1.1 also form part and parcel of the vision.

This report attempts to translate both the vision statement and the guiding principles into the formulation of alternative transportation options to be evaluated and eventually incorporated into the final transportation plan.

2. **Traditional Plan Formulation**
As illustrated in Figure 2.1, the formulation of changes, additions, and enhancements to the existing system (that is, the alternatives to be assessed) derive from the combination of anticipated growth, the existing or committed transportation system, and the transportation vision statement itself.

Transportation alternatives derived in this manner are usually subject to various types of analyses, testing, and evaluation to form the basis of final recommendations. Methods of analysis used in testing and evaluation are reasonably well established and traditionally, they have typically consumed an extremely large component of the total resources and efforts devoted to transportation planning. In fact, preoccupation with testing (generally involving the use of forecasting models) often produces detailed analyses of what might be the wrong alternatives.

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1 *A Vision of Transportation for the City of Toronto*, was released in April, 2000 as background to *Toronto at the Crossroads: Shaping Our Future*, a report on proposed directions for the new Official Plan, released in June, 2000 by City of Toronto Urban Development Services.
Table 1.1
Land Use and Transportation Principles Implied by the Proposed Vision

**Land Use and Urban Design**
1. Confirmation of the concept of transit supported concentrated development with higher density development allowances and appropriate parking standards in the vicinity of major transit nodes.
2. Zoning related to transit supported development finalized *prior* to budget approval for the construction of routes and stations.
3. Approval of new development applications based on considerations that include desirability with respect to pedestrians and cyclists, as well as access to transit stops and stations.
4. Built form and street design that encourage walking and cycling.

**Transit Expansion and Operations**
5. Priorities for capital investment in new public transportation services and facilities based on:
   - increases in *overall* transit system ridership and mode split or, in special cases,
   - contributions to achieving overall goals and objectives of major *public policy* initiatives such as redevelopment of the Waterfront.
6. Maximization of opportunities for cost effective inter-connections between the TTC, inter-regional bus services, and GO Rail.
7. Encouragement of alternative transit service delivery in areas that supplement existing TTC services and which cannot be served effectively by conventional services.
8. Improving access for the disabled and seniors to the existing system and accounting for the needs of these individuals in new facilities and the acquisition of replacement vehicles.

**Roads, Parking, and Traffic Engineering**
9. Transit priority for the use of street space expanded to include:
   - all roads and major intersections involving streetcar service, and
   - high frequency bus routes.
10. Introduction of HOV and reserved bus lanes without necessarily widening streets.
11. Preferential treatment for high occupancy, ‘car share’, and fuel efficient automobiles in all publicly owned parking facilities.
12. Expansion of the bicycle lane network in areas of highest bicycle use.
13. Recognition of the increasing importance of efficient truck movement for the economic competitiveness of the City and the GTA.

**Funding and Governance**
14. Development of innovative alternatives for funding improvements to the City’s transportation system based on sources other than property taxes.
15. Solicitation of provincial approval to implement more equitable methods of pricing the complete range of transportation services provided by the City.
16. Clarification of the City’s position with respect to its relationship to priority setting activities of the Greater Toronto Services Board for GTA-wide transportation policies and funding.
The formulation stage, by contrast, is usually based on less analytical approaches that may involve some combination of predicted capacity deficiencies, previously proposed improvements, independent suggestions that find their way into the planning process, and special purpose projects. These approaches are briefly discussed below.

Figure 2.1
Transportation Plan Development

Options Based on Capacity Deficiency
Though somewhat analytical, assessments of capacity deficiency still incorporate an arbitrary (but usually logical) definition of specific locations where predicted demand is compared to available capacity. These locations may include screenlines, cordons, or obvious bottlenecks. Instances where demand exceeds capacity by a significant amount then become candidates for such improvements as road widenings, expanded transit services, or transportation demand management.

Figure 2.2 illustrates a hypothetical comparison of capacity, predicted demand, and net deficiency for two locations in the City, one across the outer cordon, the other across an inner cordon. Possible road and transit improvements may then be formulated for dealing with these deficiencies. However, since most facilities in these general areas already operate at or near capacity, the magnitude of travel growth itself can be used as an indicator of where the greatest ‘needs’ are likely to occur.
Although deficiency analysis of this type certainly can provide a useful check on the overall impact of alternative transportation proposals on performance, little information is actually generated with respect to how various travel patterns (origins and destinations) are accommodated or, in the case of transit, how overall accessibility is affected. In other words, increasing transit capacity at one particular location does not guarantee that the transit improvement satisfies the origin-destination patterns that contribute to the capacity deficiency at that point.

**Previous Proposals**

Previously proposed improvements generally include those ideas that have already been studied and analyzed, or even incorporated in official documents such as the Official Plan of the former Metropolitan Toronto. Extension of the Sheppard Subway to the Scarborough City Centre (approved by the former Metro Council but never authorized in its entirety), as well as the Eglinton West Subway (approved by the former Metro Council, partially funded and constructed, and then cancelled) are both examples of transportation improvements that will likely be re-examined in the current process for preparing any new transportation plan.

Here again, however, there is some degree of arbitrariness in determining which of the previous proposals remain on the table for further analysis and consideration. For example, the current TTC study of rapid transit priorities, shown in Figure 2.3, includes a large number of projects, some of which appeared in the former Metropolitan Toronto Official Plan, some of which did not (such as subway extensions beyond the City’s boundaries), but excludes others studied in the past, such as the Downtown Relief Line.
Figure 2.3
Rapid Transit Proposals Currently Being Studied by the TTC
Another example of previous proposals is illustrated in Figure 2.4 which shows a plan recently adopted by the Greater Toronto Services Board for improved inter-regional transit elsewhere in the GTA.²

Moreover, depending on how far back one goes, there are many other proposals developed in a variety of earlier studies by both Metro Toronto and the Provincial Ministry of Transportation that have never been treated in any conclusive manner. Some, of course, have already been formally rejected, most notably, almost all of the expressways included in the first Metropolitan Toronto Transportation Plan (1966), as well as the Queen Street subway.

Independent Proposals
Another element of plan formulation often involves independent proposals, some, but not all of which may have to be assessed in further detail. Such proposals may be brought forward by special interest groups suggesting such concepts as using railway corridors for bus services, others who propose using these same corridors for streetcars, and political commitments for rail access to Pearson Airport. What distinguishes this independent group from others is that typically, although they may have some intuitive appeal, as yet, they have not been subject to any serious planning analyses or assessment of need.

Examples of specific projects in this category include:

- a rail link between Union Station and Pearson Airport,
- a network of busways serving Pearson Airport,
- replacement of selected GO Rail services by LRT,
- use of abandoned railway rights of way for new bus routes, and
- an east-west busway across the City within the Finch Hydro corridor.

Special Purpose Projects
Special purpose proposals deal largely with single objectives although, in many cases, impacts throughout the system can be widespread. Examples include projects intended to:

- alleviate congestion and improve capacity of the Yonge Street subway,
- support major initiatives such as the Waterfront Development Plan and the City’s bid for the 2008 Olympics, and
- relieve congestion experienced by transit vehicles at key locations and in key corridors.

Some of these special purpose projects are treated here because they bear directly on future alternatives such as the frequently raised possibility of extending the Yonge Street subway north of the City boundary, an idea that cannot be considered independently of current subway capacity limitations.

**Yonge Subway Capacity**
The Yonge subway, Toronto’s first ‘experiment’ with rapid transit, is the backbone of the entire TTC transit service and consistently experiences the highest volumes of ridership anywhere on the system. Much of the surface transit system focuses on this subway as a major transfer facility, as do several cross boundary transit services from the Region of York.

Additions to the subway system such as the Sheppard subway, as well as proposals for northern extensions have the potential of exacerbating existing capacity problems.
Although in theory, the Yonge subway is capable of operating trains every 90 seconds (40 trains per hour), in practice, about 28 trains per hour are presently operated. The theoretical capacity is limited primarily by:

- turnaround times required at the Finch and Downsview terminals,
- long station dwell times at Bloor and Yonge attributable to transfers between the Yonge and Bloor subways and, to a lesser extent,
- capabilities of the existing train control system (signalling) and methods of train operation.

Aside from technological solutions related to signalling, operations, and turnaround procedures, there are options that involve reductions in transfers at the Bloor/Yonge station through diversion of some traffic to alternative routes and facilities. Two examples are:

- enhanced streetcar or LRT service from one of the Danforth stations such as Broadview that provides direct service to the downtown, possibly via Queen Street, and
- rapid bus service to the downtown connecting reserved bus lanes on Don Mills Road through Thorncliffe Park to downtown via the under-utilised Bayview Extension.

In addition to possibly ‘freeing up’ of some Yonge subway capacity for other purposes, such special purpose projects serve other, more general transit needs as well.

**Major Development Initiatives**

The City’s Official Plan places considerable emphasis on the Waterfront as an important development initiative intended to accommodate growth in population and employment and enhance City living. Reclaiming the waterfront, including a complete reorganization of transportation facilities such as the Gardiner Expressway, has attracted even greater profile as a result of recently announced tri-level funding arrangements that derive primarily from the well known Fung Waterfront Commission.

This waterfront redevelopment initiative, as well as others such as the combined revitalization of the Keele Street corridor and the Downsview Airport lands, have implications for transit improvements that both facilitate and lead implementation of such concepts, somewhat analogous to earlier decisions to expand rapid transit service to Scarborough so as to ‘lead’ development of the Scarborough City Centre. In practical terms, what this means is that if development goals for the waterfront are to be achieved,

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3 In fact, the University Avenue subway between Union Station and Bloor was originally viewed almost as a means of ‘double tracking’ the Yonge Street subway and shifting transfer traffic away from Bloor/Yonge prior to construction of the Bloor-Danforth subway. Subsequently, an underground subway grade separation was constructed at the Museum station to enable alternate Bloor-Danforth trains to access Union Station directly via the University subway, an operation that functioned for about 6 months in 1964.
substantial investment in transit may be required as a ‘precondition’, even though potential ridership is presently limited.

**Site Specific Transit Improvements**

Although expansion of transit service to new areas receives a great deal of attention from the standpoint of *long range planning*, the TTC is faced with *present day operating* problems of expanding capacity to better meet the needs of existing users. In a word, there are some important tradeoffs between ‘chasing’ new markets in an attempt to achieve the vision versus improving service for those already using the system. In its own studies, TTC service planning staff have already identified a number of so called ‘hotspots’ where transit volumes are high but where service suffers from road and/or intersection congestion. Examples of these are shown in Figure 2.5.

**Figure 2.5**

TTC Hot Spots

3. **Plan Development Based on Transit Accessibility**

Given the main thrust of the transportation vision, namely, to reduce automobile dependence and improve the competitiveness of transit, transportation alternatives can also be formulated on the basis of improving overall accessibility of the transit system within the City. This means identifying those areas with the poorest transit access and subsequently attempting to:

- penetrate areas that now have poor transit coverage (possibly through alternative forms of transit delivery),
- improve connectivity (as between the Yonge and Spadina Subways and between the terminal of the new Sheppard Subway and Scarborough), as well as
• enhance connections with regional transit services (including park and ride for long distance commuting from low density suburban areas).

To illustrate the application of this approach, four diagrams are presented in Figures 3.1 to 3.4, all of which are displayed in relation to specific geographic areas known as traffic zones. In Figure 3.1, the more darkly shaded zones indicate the location of those residents who have good transit accessibility in terms of the number of jobs that can be reached within 30 minutes by transit. The lightly shaded zones indicate a smaller proportion of jobs accessible within the same transit time commute. In other words, the lightly shaded zones represent traffic areas that are ‘transit disadvantaged’ at least with respect to employment opportunities within the City. Both the estimated transit travel times and the distribution of population and employment shown in Figure 3.1 are based on 1996 data obtained from the Transportation Tomorrow Survey.

For some of these areas, of course, transit accessibility may not be particularly important if a specific traffic zone contains low or negligible resident population. From among the lightly shaded areas of Figure 3.1 (those zones with access to the fewest number of jobs) therefore, Figure 3.2 emphasizes those areas where poor transit accessibility is weighted by the size of the populations affected.

These two figures, however, deal only with transit travel times without providing any information related to actual travel patterns. They also only deal with jobs within the City. For this reason, Figures 3.3 and 3.4 present similar information in a different manner. Figure 3.3 shows average transit time for all AM peak hour trips regardless of the mode of transportation used or whether the destination is within the City or elsewhere in the GTA. In other words, for auto trips, the comparable travel time by transit is shown. Obviously, where these times are high relative to auto travel times, mode splits are lower as, in fact, is shown in Figure 3.4. Thus, with relatively minor variations, the predominant transit disadvantaged traffic zones shown in Figure 3.2, are the same as those where high transit travel times would be involved if trips were made by transit, and where corresponding mode splits are low.

Achieving the goal of reduced automobile dependence therefore suggests that these are the same locations where attempts should be made to improve transit competitiveness. It is important to emphasize, however, that merely improving transit access to areas that are now poorly served provides no guarantee that they will be used more intensively if land use characteristics (notably, densities) and travel patterns are not conducive to effective transit. If, for example, most travel from a poorly served area is characterized by destinations dispersed throughout the GTA, it will be much more difficult to improve transit competitiveness by any means.
Figure 3.1
Employment Accessibility within 30 Minutes by Transit

Figure 3.2
Areas with Poorest Transit Accessibility to Employment based on Affected Population
Figure 3.3
Average Transit Travel Time for All AM Peak Period Trips by Traffic Zone

Figure 3.4
Average Mode Split for All AM Peak Period Trips by Traffic Zone
As opposed to option development based on the traditional deficiency analysis illustrated in Figure 2.2, transportation alternatives can be formulated treating the poorly served areas illustrated in Figures 3.1 to 3.4 as prime ‘targets.’ This approach is particularly relevant for those areas identified in the Official Plan as opportunities for accommodating more residents or jobs. In addition to indicators of accessibility to employment opportunities, indicators of priority for investment in social infrastructure could also be incorporated in this approach.

4. Building Blocks
Elements of changes and/or improvements to the existing transportation system include land use policies and specific transportation investments and policies that can be grouped on the basis of the following categories, shown in Figure 4.1:

- parking,
- road improvements,
- transit priority (for existing road space),
- improvements in transit service, and
- land use planning.

Some of these changes/improvements involve significant capital expenditure, as in the case of new roads and expansion of the rapid transit system, whereas others may involve more modest investment to modify traffic signals and acquire additional transit vehicles.

Figure 4.1 also shows certain linkages between these elements, as in the case of on-street parking regulations and transit priority, or between land use intensification policies and rapid transit expansion. Other linkages relate to local urban design and new transit routes (including alternative means of service delivery), development incentives around transit stations, and traffic control and signal pre-emption for transit vehicles.

Although these building blocks comprise both road and transit improvements, the general thrust of the Vision report stresses reduced automobile dependence and improved transit competitiveness throughout the City. This view is reinforced in a recent study by the Neptis Foundation which states in its findings:

> It is difficult to see how one can look at our current levels and trends of automobile usage and believe they represent a sustainable system for the long run, given their high environmental, ecological and social costs. In addition, it is far from clear whether even the benefits of the automobile-based system are sustainable in the long run as the efficiency of the system is degraded by ever-increasing levels of congestion.

---

Figure 4.1: Building Blocks for the Transportation Plan

- Road Improvements
- Parking
- Transit Improvements
- Land Use Planning
- Local Design

- Mixed Uses
- Intransitication
- Removing Impediments
- Incentives

- Fare Integration
- Alternative Services
- Reduced Pricing
- New Rapid Transit

- Enforcement
- Signal Preemption
- Reduced Parking
- New Roads

- Traffic Control
- New Roads
- Reserved Lanes
- Widenings

- Pedestrian
- Access for Disabled & Seniors
- Pedestrian & Cycling

- Policy
- Modest Investment
- Capital Intensive
In terms of development options, the *Neptis* study reaches conclusions that are very similar to those embodied in the *Vision* report namely, that development options include some combination of:

- transit-supportive urban development (higher residential densities; high density employment/activity centres at key nodes within the transit network; focussed population and employment development along well defined transit corridors, etc.),

- reinvestment in transit infrastructure and services, particularly in areas in which land use and other factors make transit a viable alternative to the automobile; use of road pricing to “internalize” the social and environmental costs of auto travel, thereby making auto users conscious of the “true” costs of their actions,

- more extensive and more aggressive use of parking charges and parking supply restrictions (zoning *maximum allowable parking spaces in buildings rather than high* minimums, as is currently the typical case),

- reform of tax laws which provide tax incentives for many people for auto use but which do not provide comparable incentives for transit use, and

- promotion of non-motorized modes of travel (walk, bicycle) wherever these are viable.

Development of transportation options that emphasize increased transit competitiveness consistent with the *Vision* basically involves some combination of:

- deficiency and accessibility analyses,
- consideration of previously proposed projects, and
- various policies and investments that comprise the range of building blocks shown in Figure 4.1.

Some of these policies and investments, namely, the transit priority and transit improvement building blocks of Figure 4.1 that are most supportive of the *Vision*, are treated in general terms in the following paragraphs so as to provide a broader context for the specific options treated in Section 5.

**Alternative Service Delivery**

As noted in the *Vision* report, poor accessibility is often associated with the origin end of a trip (for example, to work or shopping) for individuals who might otherwise find transit convenient at the destination end. Typically, this situation occurs in lower density residential areas where long walking distances are involved or where existing transit service is too infrequent.
In such areas, the lack of adequate transit service derives in part from the nature of the
TTC’s cost structure (both operating costs and vehicle investment) which may not be
well suited to these types of needs. Although the TTC may not be able to justify service
in such areas, there may well be opportunities for engaging other operators with different
cost characteristics and more appropriate equipment to serve these areas in ways that
increase TTC ridership at no public cost. Either private operators or some form of
private/public partnerships could be considered, as for example, where vehicles are
owned by the TTC and leased to the private operator.

The real question is whether or not there is an untapped market for transit that would be
prepared to pay supplementary fares to access the main TTC system, perhaps by mini-
bus, perhaps by shared taxis. Such approaches are particularly relevant in view of the
funding uncertainty created by recent changes in provincial policy.

**Transit Priority**

For surface transit, the time required for boarding and alighting, as well as delays at
traffic signals, reduce travel time competitiveness relative to the private car. Methods of
fare collection such as exact fare and passes can shorten transit vehicle time at stops, but
random delays at traffic controlled intersections, often caused by automobile turning
movements, further detract from transit competitiveness.

As treated in the *Vision* report, the main benefit of transit priority is higher speed.
Priority treatment may involve such measures as reserved lanes, protected right of way
(where other vehicles have no practical means of access), and signal priority at
intersections. Very modest investment is required for this type of priority treatment.
Obviously, there would be some negative impacts on automobile users which is the main
reason why municipal officials are reluctant to introduce such measures. As with any
traffic regulations, of course, the effectiveness of transit priority schemes depends upon
adequate enforcement.

Nevertheless, unlike rapid transit where priority is guaranteed, priority for surface transit
offers benefits to both users and operators, largely as a result of economies of scale that
can be achieved. For example, through priority treatment,

- travel times by transit are reduced,
- the increase in speed attracts additional users, and
- frequency of service can be increased without any increase in either the number of
  vehicles or drivers which, in turn,
- further adds to the attractiveness of the service.

Consider, for example, a streetcar service that runs every 5 minutes over a 10 km route
and now requires 60 minutes to complete one round trip. Under these conditions, 12
vehicles and drivers are required. If, as illustrated in Figure 4.2, 5 minutes can be saved
in each direction (30 seconds at 10 intersections, for example), the following changes
occur:
In other words, for this example, using the same number of vehicles and drivers, priority measures reduce waiting times and increase capacity by 20 percent at practically no additional cost to the TTC. (Alternatively, the same number of passengers could be served with fewer vehicles and drivers.)

Naturally, as noted above, these measures result in additional inconvenience and delay for other road users but, overall, such transit priority measures yield net benefits for high volume services. The precise break-even point (in terms of bus or streetcar frequency), where the benefits to transit users outweigh the disadvantages to other road users, depends upon a number of assumptions related to the distribution of traffic between cars, buses, and trucks, as well as vehicle occupancy. It is clear, however, that the justification for transit priority increases as transit vehicle frequency increases.

TTC collects figures on the number of riders over the entire length of each surface route over the course of a day. Based on the most recent available data, Table 4.1 shows current bus and streetcar routes that now carry more than 15,000 passengers per day to
provide some indication of where transit priority schemes are likely to yield the greatest benefits. Figure 4.3 focuses on route segments that are serviced by more than 20 buses or

<table>
<thead>
<tr>
<th>Table 4.1</th>
<th>Surface Transit Routes With More Than 15,000 Daily Passengers</th>
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<tbody>
<tr>
<td>Route</td>
<td>Daily Weekday Passengers</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Streetcars</strong></td>
<td></td>
</tr>
<tr>
<td>504 King and 508 Lake Shore</td>
<td>51,400</td>
</tr>
<tr>
<td>501/502/503 Queen-Kingston Rd</td>
<td>49,100</td>
</tr>
<tr>
<td>510 Spadina</td>
<td>40,700</td>
</tr>
<tr>
<td>506 Carlton</td>
<td>40,300</td>
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<tr>
<td>505 Dundas</td>
<td>36,000</td>
</tr>
<tr>
<td>512 St Clair</td>
<td>30,700</td>
</tr>
<tr>
<td>511 Bathurst</td>
<td>15,900</td>
</tr>
<tr>
<td><strong>Buses</strong></td>
<td></td>
</tr>
<tr>
<td>29 Dufferin</td>
<td>44,600</td>
</tr>
<tr>
<td>39 Finch East</td>
<td>41,100</td>
</tr>
<tr>
<td>35 Jane</td>
<td>39,000</td>
</tr>
<tr>
<td>36 Finch West</td>
<td>38,300</td>
</tr>
<tr>
<td>32 Eglinton West</td>
<td>37,400</td>
</tr>
<tr>
<td>25 Don Mills</td>
<td>34,800</td>
</tr>
<tr>
<td>85 Sheppard East</td>
<td>31,300</td>
</tr>
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<td>54 Lawrence East</td>
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<td>95 York Mills</td>
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<td>34 Eglinton East</td>
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<tr>
<td>41 Keele</td>
<td>22,600</td>
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<tr>
<td>60 Steeles West</td>
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</tr>
<tr>
<td>24 Victoria Park</td>
<td>21,900</td>
</tr>
<tr>
<td>96 Wilson</td>
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</tr>
<tr>
<td>52 Lawrence West</td>
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<td>45 Kipling</td>
<td>18,600</td>
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<td>17,400</td>
</tr>
<tr>
<td>116 Morningside</td>
<td>15,900</td>
</tr>
<tr>
<td>106/196 York University</td>
<td>15,600</td>
</tr>
<tr>
<td>165 Weston Rd North</td>
<td>15,600</td>
</tr>
<tr>
<td>68 Warden</td>
<td>15,000</td>
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</tbody>
</table>
streetcars in the peak hour to further suggest where transit priority measures might be warranted on the basis of transit vehicles affected.

Through considering a combination of factors, such as surface passenger volumes (Table 4.1), bus and streetcar frequencies (Figure 4.3) and known congestion “hot-spots” that delay transit service (Figure 2.5), an initial list of routes and route segments can be identified as candidates for transit priority treatments. For example, this list would include all streetcar routes.

**Figure 4.3**

*Initial Candidates for Surface Transit Priority Treatment*

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**Rapid Transit Expansion**

Ever since Toronto’s first 6 km subway route was opened in 1954, subways have been the preferred form of public transportation within the City of Toronto and have attracted the most attention in subsequent transportation studies. Because they are constructed entirely within fully protected rights-of-way and because they are capable of multiple unit operation, subway service is characterized by the highest capacity and reliability of any of the transit technologies currently found in Toronto.

Nevertheless, although the subway network has now grown to 66 km and is really the backbone of a system of public transportation that is the envy of comparable size cities throughout North America, high construction costs and uncertain funding raise questions as to the viability of continuing to base future planning entirely on this technology. Expansion of the subway network is most likely to involve extensions of existing routes including the soon to be completed Sheppard subway.
The Scarborough RT is also part of the existing rapid transit system. This unique technology has lower capacity than a subway but, because of the shorter train lengths and therefore smaller stations, may be more acceptable as an elevated facility which generally involves lower costs and shorter implementation times than underground construction.

The real benefit of this technology thus depends upon the extent to which it would be acceptable as an elevated structure in cases where a subway would not. Costs, however, are still high and there are also disadvantages related to the need for passengers to transfer. In addition, unit costs of vehicles are high due to the relatively small orders for new vehicles to service an extension of the existing route.

Commuter Rail

The GTA is served by a network of railway corridors, shown in Figure 4.4, owned and operated by Canadian National and Canadian Pacific. Both are private railway companies subject to safety and declining economic regulation by the Government of Canada through the Canadian Transportation Agency.5

Of the various railway subdivisions (railway terminology for sections of route), GO Transit commuter rail services first introduced in 1967 along the lakeshore (the Kingston and Oakville subdivisions) have been expanded to include service on CN’s Bala, Uxbridge, Weston and Newmarket subdivisions, as well as CP’s Galt subdivision. These services all terminate at Union Station. As treated in the Vision report, there are strong indications that existing commuter rail services are limited in capacity from the standpoint of:

- access to Union Station and both train and passenger capacity of the terminal itself,
- the availability of additional time slots from the railways who use these same facilities for their own services and for VIA Rail intercity trains,
- parking constraints at suburban stations, and
- insufficient rolling stock (passenger cars and locomotives).

Simply stated, unconstrained by these limitations, there is fairly widespread agreement that GO Transit’s commuter rail services could attract a substantial increase in ridership and divert commuters from automobiles for long distance trips.

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5 The relevant legislation that governs railways and other modes of transportation (The Canada Transportation Act) is currently undergoing a mandatory 5 year review which must be completed by the end of June, 2001.
Figure 4.4
CN and CP Railways in the GTA

- Potential CN/CP Interchange
- GO Rail
- GO Rail Station
- Expressways
Proposals for the expansion of each of these services have now been published in a recent GO Transit report.\(^6\) For most routes, proposed service frequencies generally include all day service. As noted above, clearly, there is a latent demand for greater frequency during expanded peak periods, as well as for additional parking at suburban stations, since the majority of suburban commuter parking lots are already fully utilized.

CP’s Belleville and North Toronto subdivisions comprise one major railway corridor in which no GO service is now provided. (CP’s Mactier subdivision also presently carries no commuter traffic but is less interesting because three other commuter rail services, the Newmarket, Richmond Hill, and Stouffville services, now operate to the north.) The Belleville/North Toronto corridor is of interest to the City’s long term future not simply because it expands capacity of the commuter rail network, but because it also opens possibilities for a major new midtown rapid transit service. This route, however, also happens to be one of, if not the, busiest routes in the entire CP railway network.

Removing freight traffic from this important route to permit operation of urban transit services, either commuter rail or other technologies, would basically require rerouting some or all CP trains to bypass the City via CN’s York and Halton subdivisions. Such arrangements would only be possible through mutual agreement of both railway companies and would require substantial capital investment for new connections between the two, as well as expansion of track capacity in the York/Halton corridor. It should also be noted that added traffic on CN’s Toronto bypass route would likely generate significant opposition in nearby communities. Possible locations for transfers between CN and CP are indicated in Figure 4.4 and are now being analysed in a separate study.

In the early 1960s, this type of rerouting of freight trains formed the basis of the first proposal for commuter rail in the GTA, as a result of CN’s decision to relocate its classification yards from downtown Toronto to Maple in combination with construction of the York/Halton bypass route. That proposal, incidentally, was initiated by Canadian National Railways which saw an opportunity to generate revenue from what became unused capacity along the lakeshore into Union Station.

**Light Rail Transit**

Streetcars (often referred to as light rail vehicles) have greater seating and standing capacity than buses, last about twice as long, but have much higher initial costs (perhaps 5 to 6 times the cost of a conventional transit bus). In mixed traffic, streetcars offer no advantages over buses with respect to either service reliability or average speed. However, generally speaking, streetcars are preferred to buses from the standpoint of most passengers and they certainly are more environmentally friendly with regard to air pollution and greenhouse gas emissions.

Light Rail Transit (LRT) by contrast, is based on the use of streetcars or similar vehicles that:

\(^6\) Details are provided in *Route Map to the Future*, Toronto: GO Transit, August 2000.
• can be coupled to form trains,
• operate in exclusive rights of way,
• receive priority treatment at signalized intersections, and
• may even involve grade separations at selected intersections.

Depending upon the particular combination of these factors actually used, LRT is capable of providing higher capacity and better quality of service than conventional streetcar or bus services.

Largely due to overhead power supply, the principal advantages of LRT relate to flexibility of operation in a variety of environments including mixed traffic (depending on train length), partially or fully segregated rights of way and, for limited sections of route, on either underground or elevated structures. Under the right circumstances, LRT service can also be considered as pre-subway service so long as new routes incorporate appropriate standards for geometric design. Because capital investment in LRT is much less than for subways, in terms of expanding transit coverage, anywhere from 5 to 10 km of LRT can be constructed at a cost equivalent to one km of subway provided, of course, that the capacity of a subway is not required.

**Busways**

Busways should not be confused with reserved bus lanes, although combinations of the two can certainly be considered for specific routes by using reserved lanes in less congested areas and busways in more congested sections. In some respects, a busway may be considered as a variant of LRT -- exclusive lanes within the centre of a street, protected from other traffic by geometric design elements such as curbs, with provision for passenger loading platforms, but without track or overhead electrification. In other cases, busways may be similar to fully protected roadways, but obviously much narrower than a limited access freeway.

The key advantage of busways relate to relatively low costs for both construction and vehicles and the fact that mainline service can be combined with local access without the need for transfer. Ottawa’s transit service, for example, is based almost exclusively on this type of operation. Buses, which cost about $500,000 each, of course, have shorter economic lives (about 15 to 17 years) than either streetcars (about $3 million each) or subway cars (about $2 million each), which generally last at least twice as long. In addition, within the regional context, unlike rail facilities, busways can be used by a variety of different municipal operators.

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7 These unit costs for vehicles are cited in the TTC’s Capital Program dated 13 December 2000. Although unit costs for subway and streetcars are based on procurement from domestic suppliers, the difference between streetcar and subway car costs seems somewhat puzzling. In addition, lower cost vehicles can be acquired from foreign suppliers.
The key disadvantage of busways appears to be that buses themselves are generally perceived to provide lower ‘quality’ and image than any form of rail service (LRT, subway, or commuter rail). As a result, at least in Toronto, many doubt the potential of any bus based service to serve as an effective alternative for diverting automobile users to transit.

5. Preliminary Transportation Options

Based on the general thrust of the vision statement endorsed by City Council, and in response to the analysis of transit deficiencies by geographic location, the main elements of the preliminary transportation options for the City can be described in terms of such policies as road use, alternative service delivery, transit priority, and accessibility for the physically disadvantaged, as well as various higher order transit alternatives. In the case of some higher order transit projects, as treated below, alternative technologies can be considered for the same route.

1. Road Use Policies

Recognizing area wide concerns about increasing congestion and recognizing, as well, that such congestion contributes to both air pollution and greenhouse gas emissions, key road use policies for the Official Plan should focus on priorities for transit, bicycles, pedestrians, and parking.

The City is currently reviewing its development of a high occupancy vehicle (HOV) lane network and associated road use policies. Currently, HOV lanes in the City are lanes restricted to use by buses, taxis, bicycles and autos carrying three or more occupants during the rush hours. The objectives behind HOV lanes are to improve surface transit operations, increase auto occupancy and reduce energy use and pollution. Where effectively enforced and promoted, HOV lanes have the potential to improve the speed and reliability of bus services.

Recommendations for cycling improvements have already been made by a special task force of the City which includes the proposed network shown in Figure 5.1. Expansion of the bicycle network is consistent with the vision statement, where demand justifies such action. Implementation should obviously take into account changes in congestion likely to result from any reduction in automobile carrying capacity due to lane restrictions, as well as possible impacts on surface transit operations.

Pedestrian ‘friendliness’ of street design and traffic engineering has been raised during recent “townhall” meetings on the Official Plan Directions report. Examples of auto free zones or pedestrian precincts in other cities have frequently been cited as successful examples that should be considered for Toronto. The recent redesign of St. George Street within the University of Toronto area has also generally been well received by both users and the local community, suggesting that other opportunities for improving the general pedestrian environment should be pursued in conjunction with local area planning and urban design.
On-street parking obviously reduces road capacity, increases congestion on major thoroughfares, and interferes, as well, with objectives for bicycle use and transit priority. It has long been recognized that high traffic volumes consistently occur outside of the ‘traditional’ 7 to 9 AM and 4 to 6 PM peak periods with the result that high levels of congestion are now experienced on the ‘shoulders’ of these time periods.

Despite the fact that parking is one of the most contentious issues faced by residents and businesses alike, an argument can be made for extending on-street parking restrictions to permit freer flow of traffic over a broader peak period. Such policy changes would be consistent with objectives for reduced congestion, more reliable and faster transit service, and less air pollution and greenhouse gas emissions. Setting aside the issue of enforcement, simple observation of traffic congestion throughout the City suggests that, at least on arterial roads, parking restrictions should be expanded substantially, perhaps until 10 AM and between 3 and 7 PM.8

2. Accessibility for the Disabled and Seniors
Although the term ‘accessibility’ can be defined in terms of geographic location, socio-economic status, age, and physical disabilities, increasingly, the term ‘accessibility’ is associated with physical difficulties encountered in using public transportation. At present, some of these needs are met by specialized Wheeltrans services operated by the TTC, services that are available only on an advanced reservation basis to those who meet certain eligibility criteria. These services are also oversubscribed.

Throughout the world, greater emphasis is being placed on making all transit service accessible in ways that do not differentiate among those who do, and those who do not, have special needs. Recognizing that retrofitting all existing facilities and vehicles to accommodate individuals with special needs is likely to be a lengthy and costly process, it is fairly clear that with respect to the future transportation system:

- new transit infrastructure, designs and associated costs will, to the extent possible, incorporate adequate accessibility for all users, and
- capital planning both for replacement vehicles and service expansion must allow for improved accessibility, particularly in the case of buses and streetcars.

3. Surface Transit Priority
As noted in the previous section, transit priority introduces significant economies of scale for heavily used surface transit routes inasmuch as increased capacity and higher average speeds can be achieved without the need for additional vehicles or drivers. In view of the current state of uncertainty around funding resulting from the elimination of provincial transit subsidies, improvements in on-street transit performance may be the single most effective way of increasing transit competitiveness without the need for major capital

8 There is a counter argument that expanded parking restrictions on arterial roads relieves congestion and may therefore, improve the attractiveness of car travel. The approach here, however, is improve the relative attractiveness of transit by improvements to transit rather than by increasing congestion which is already growing. Reducing road congestion, of course, also improves surface transit performance and does lead to reduced greenhouse gas emissions.
investment at a scale typical of subway construction. For these reasons, transit priority options should be a cornerstone of transportation policy for the new Official Plan including consideration of:

- expansion of traffic signal priority for transit vehicles at intersections,
- introduction of HOV lanes for faster and more reliable surface transit,
- dedication of exclusive transit lanes on all existing streetcar routes (including the elimination of on-street parking where necessary),
- introduction of reserved bus lanes on all routes that operate with frequencies of 25 or more buses per hour,\(^9\) and
- selection of one or more routes that already attract high ridership and experience high levels of congestion for very aggressive transit priority policies that include ‘auto free’ transit malls.

With regard to this more aggressive treatment, note that as shown previously in Table 4.1, the combined daily passenger volume on the King and Queen streetcar routes is about 100,000. For such high passenger volumes and service frequencies, at least one of these routes should be considered as an exclusive transit mall during expanded peak periods. Changes in fare collection methods would also be needed so as to reduce times at stops and permit more uniform loading and unloading of vehicles. In fact, the current situation is somewhat analogous to conditions in the Yonge Street corridor that served as the original justification for construction of Toronto’s first subway more than 50 years ago.\(^10\)

4. **Alternative Service Delivery**

Particularly in the light of experience elsewhere, examining opportunities for enriching the mix of transit services available in the City as another means of reducing automobile dependence appears to be a worthwhile undertaking at this time. There would be very little cost in developing a pilot or demonstration project to determine whether accessibility to the TTC system can be improved in some areas by allowing private companies to supplement transit ridership without detracting from services already provided by the TTC. Clearly, to be successful, the TTC itself would have to endorse the concept as well as initiate and be responsible for any call for proposals.

5. **Expansion of Commuter Rail Services**

Ridership on most existing commuter rail services is now limited by the supply of service and there are very high transit mode splits for long distance commuting to the City. Both

\(^9\) 25 buses per hour are, more or less, equivalent to the passenger carrying capacity of 2 lanes of arterial road for typical automobile occupancy levels. Obviously, these roads could accommodate the same number of buses without reserved lanes, but with poorer quality service. Given a sufficient number of buses, reserved lanes could also be considered on some segments of expressways such as the Don Valley Parkway.

\(^10\) In the case of Queen Street, partial underground construction undertaken during the building of the Yonge and University subways also affords an opportunity for limited sections of below grade operation.
conditions point to the importance to the Official Plan of commuter rail improvements such as:

- additional parking at suburban stations,
- increased train frequency during broadened peak periods on all routes,
- expansion of Union Station platform and access track capacity, and
- new interchanges with TTC rapid transit services.

Expansion of Union Station train and passenger platform capacity, as well as access capacity to the terminal itself, of course, is already a well recognized need in view of the anticipated increase in GO rail ridership and the fact that all seven routes now converge on this terminal. Plans for such expansion are presently underway.

In addition, new commuter rail service through Toronto’s midtown can also be considered in conjunction with rerouting a significant portion of CP’s freight traffic via the York/Halton subdivisions as shown previously in Figure 4.4 (a matter that would involve major capital investment in railway interchanges and expansion of York/Halton subdivision track capacity -- projects that might become candidates for provincial and/or federal government financial participation).

6. Road Expansion
Consistent with the overall objective of reducing auto dependency, there should only be limited plans for expanding the capacity of the City’s road system, particularly for peak period commuters. However, there are a considerable number of planned and potential road widenings and extensions in various secondary plans, the City’s Capital Works Programme and other proposals either endorsed or approved by City Council(s) prior to and following amalgamation. This list of road expansions is currently under review by City staff. There is a separate study of transportation (both road and transit) needs in the Waterfront, which includes an evaluation of reconfiguring the elevated section of the downtown Gardiner Expressway.

Among the more substantial road expansion proposals that are likely to proceed at this time are the Front Street West extension and the widening of Steeles Avenue East. Where land is to be acquired for future road widenings and extensions, it is important that these be identified in the new Official Plan. The current review process and the next, “options evaluation” stage, of developing the transportation plan will determine the road expansions that need to be designated in the Plan. Further road additions can be expected through the secondary plan process as a result of the development of large brownfield/greenfield sites where new street access is required.

7. Higher Order Rapid Transit
The general network of higher order transit under consideration, shown in Figure 5.2, comprises exclusive busways, LRT, and subways as discussed in the following sections.
Figure 5.2 - Preliminary Infrastructure Options

- New GO / TTC Interchange
- New Busway
- New LRT / Transitway
- Subway / RT Extension

Key:
- Blue: Subway / RT Extension
- Red: New LRT / Transitway
- Green: New Busway
- Black: New GO / TTC Interchange
Busways

*Thorncliffe Park/Bayview Extension/ Downtown*

This facility enhances the HOV/bus lanes on Don Mills Road by providing a direct connection to the downtown via a 2 lane busway shown in Figure 5.3.\(^\text{11}\)

Reserved bus lanes on Don Mills Road would be continued west on Overlea Blvd. to join a 2 lane busway on the south side of the CP railway in the general vicinity of Millwood Drive. Constructing a short section of busway on Thorncliffe Park Drive and Banigan would significantly improve bus operations at modest cost by eliminating left turns on Millwood Drive. Other buses originating within Thorncliffe Park could, of course, also use the busway.

A section of road (Redway) already exists immediately west of Millwood Drive which could be extended and connected to the Bayview Extension by new single lane ramps in each direction. On the Bayview Extension itself, reserved lanes would be dedicated for express bus service. South of the River Street exit from the Bayview Extension, the entire existing 2 lane road could be dedicated for bus use during extended peak periods. Figure 5.3 shows access to the downtown via the Richmond and Adelaide one-way system. Alternatively, Queen/King and Wellington/Front could be used for such access as far as University Avenue.

In addition to providing faster and more direct service to the downtown for traffic originating in the Don Mills Rd. corridor and the densely populated Thorncliffe Park area, construction would be relatively inexpensive and some relief would be provided to the interchange of the Bloor/Danforth and Yonge subways.

*Finch Hydro Corridor*

A busway located within this corridor would provide for express/limited stop service between intersections where buses enter or leave this exclusive roadway as well as between subway, GO rail and major development nodes. Ideally, it would be implemented in conjunction with reserved bus lanes on major cross streets, thereby improving the overall transit network both for the TTC and any other transit operator.

Design could range from a basic 2 lane, bus only road, with no preferential treatment at cross streets, to pre-emptive signals favouring buses at most intersections, supplemented by grade separations at critical bottlenecks. Relatively low in cost, there could be considerable community opposition to the construction of any transit facility within some sections of this corridor. The central portion of such a busway would be redundant if the subway loop discussed below were to be implemented.

\(^\text{11}\) This concept actually combines the use of reserved lanes with some of the lower cost elements of the previously proposed Leslie Street Extension.
LRT
For the elements described below, LRT refers to streetcars, operating either as single or multiple units in dedicated lanes and, in some cases, with grade separations and/or sections of underground construction.

Broadview/Parliament Relief Route
This service involves a combination route originating at the Broadview subway station (or some other north-south route such as Parliament) serving both the Waterfront via the Port area and the downtown by tying into the Queen streetcar route. Potential also exists for taking advantage of underground structures constructed when the Yonge and University subways were built to provide a below grade segment. In addition, some relief would be provided to the
interchange of the Bloor/Danforth and Yonge subways. Alternatively, similar service could be provided based on busway technology.

Waterfront/Kingston Road
In conjunction with the Broadview relief route, a variety of LRT or busway alternatives can be considered as part of the development initiatives for the Toronto waterfront which are now being examined by consultants in an independent study for the City’s Works and Emergency Services Department.

Eglinton Avenue
Once proposed as a major crosstown subway route (prior to approval of the Sheppard subway), this corridor is already characterized by high volumes of surface transit ridership. It would provide a crosstown connection between the Lakeshore East GO rail line in Scarborough and the Georgetown commuter rail line, intersecting with the Stouffville GO rail service, as well as the Bloor-Danforth, Yonge, and Spadina subways. It would also facilitate inter-regional transit between the City and Mississauga. Some portions of underground construction could also be considered, particularly to connect the Yonge subway with the Eglinton West station.

Sheppard West from Yonge to Jane
In addition to improving connectivity between the Yonge and Spadina subways, this route improves accessibility to some of the most transit disadvantaged areas of the City.

Subways
Spadina Extension to York University
Already included in the official plan of the former Metro, the proposed alignment deviates somewhat from that included in the original Environmental Impact Assessment, as shown in Figure 5.4. The main differences relate to:

- a potential interchange with increased GO service nearer to the Downsview development site,
- a station at the intersection of Finch and Keele to allow for better integration with feeder bus services,
- a major park and ride facility immediately north of Steeles Avenue, and
- an alignment closer to Keele Street to support planned development initiatives within the Keele corridor (now under study).

This route should have substantial potential for increased cross boundary travel by transit (related to park and ride generated by Highway 407) and also has considerable reverse flow potential, particularly to York University.
Proposed Alignment for the Spadina Subway Extension to York University

**Yonge-Spadina Loop**
Extension of the Spadina subway to York University is a precondition for eventually constructing an east-west connection to the Yonge subway. This costly project could be located somewhere between Steeles Avenue to the south and Highway 7 to the north. Aside from providing additional major railheads for cross boundary services at Bathurst and Dufferin, by eliminating turnaround operations, there would be a significant increase in train frequency and capacity of the entire Yonge-University-Spadina system, as well as better equalization of ridership between the two north-south components. Implementation of the subway loop would undoubtedly make some portions of the Hydro corridor busway treated above redundant, at least between Yonge and Keele streets.

**Sheppard East Extension to the Scarborough City Centre**
A 2 km extension to the east of the present Sheppard subway terminal would provide access to major employment at Victoria Park and Sheppard (as originally envisaged in the planning for this route by the former Metropolitan Toronto). Further extension to the Scarborough City Centre would also enhance general connectivity of the subway network.
**Bloor west Extension to Sherway Gardens**
Originally included as part of the *Let’s Move* announcements, this extension would presumably improve inter-regional connections. Without an extension to the Mississauga City Centre, however, it is by no means clear that large numbers of *new* riders would be attracted to transit. It could, however, provide a new gateway for Mississauga bus service, improving accessibility to the subway system and thereby increasing transit attractiveness for Mississauga commuters.

**Scarborough RT Extension to Markham and Steeles**
Though transit disadvantaged, the areas served by such an extension of the Scarborough RT are characterized by relatively low population densities. Ridership potential is therefore somewhat doubtful. Expanded commuter rail service (in conjunction with new stations within the City) on the Stouffville line may be a better alternative.

6. **Future Assessment of the Transportation Options**
The preceding section covers a range of policy and infrastructure alternatives that will eventually have to be assessed from the standpoint of their consistency with the main directions of the City’s Official Plan (including the *Vision* for transportation within that plan). For each of the seven components of the transportation options treated above, Table 6.1 summarizes the kinds of impact measures and indicators that might be used to characterize and assess the proposed improvements.

In many cases, indicators will be derived from the analysis of data and projections developed through the use of transportation forecasting models. In other cases, such as improvements for pedestrians, cyclists, and the disabled and seniors, as well as consistency with land use planning objectives, more qualitative judgements will be necessary.

In the case of transportation options that involve significant capital expenditure, the main *transportation* indicators to be tested include:

- effects on transit ridership and mode share,
- relative improvements in accessibility for transit disadvantaged areas identified previously,
- impacts on air pollution and greenhouse gas emissions,
- cost effectiveness, and
- funding requirements.

At present, the intention is to assess these indicators on the basis of 1996 *actual* travel data and information as well as for a range of future *projections* of population and employment.
### Table 6.1
**Option Evaluation Template**

<table>
<thead>
<tr>
<th>Component</th>
<th>Impacts and Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 Road Use Policies:</strong></td>
<td></td>
</tr>
<tr>
<td>Pedestrians</td>
<td>pedestrian precincts/auto free zones</td>
</tr>
<tr>
<td>Cycling</td>
<td>inconvenience to other road users</td>
</tr>
<tr>
<td>On-street parking</td>
<td>impacts on transit operations</td>
</tr>
<tr>
<td></td>
<td>effects on congestion, air pollution &amp; GHG emissions</td>
</tr>
<tr>
<td><strong>2 Accessibility for the Disabled &amp; Seniors:</strong></td>
<td>percent of fully accessible transit vehicles</td>
</tr>
<tr>
<td>Replacement vehicles</td>
<td>percent of fully accessible rapid transit stations</td>
</tr>
<tr>
<td>New infrastructure</td>
<td>impacts on transit operations</td>
</tr>
<tr>
<td>Existing retrofits</td>
<td>capital costs</td>
</tr>
<tr>
<td><strong>3 Surface Transit Priority:</strong></td>
<td>increase in average speed and route capacity</td>
</tr>
<tr>
<td>Turn restrictions</td>
<td>savings in vehicle requirements</td>
</tr>
<tr>
<td>Reduced parking</td>
<td>increase in ridership</td>
</tr>
<tr>
<td>Exclusive lanes</td>
<td>inconvenience to other road users</td>
</tr>
<tr>
<td>Signal priority</td>
<td>capital costs for priority signals</td>
</tr>
<tr>
<td><strong>4 Alternative Service Delivery</strong></td>
<td>market potential</td>
</tr>
<tr>
<td></td>
<td>supplementary TTC ridership</td>
</tr>
<tr>
<td></td>
<td>labour and management issues</td>
</tr>
<tr>
<td><strong>5 Expanded Commuter Rail:</strong></td>
<td>increased ridership and transit mode split</td>
</tr>
<tr>
<td>Union Station expansion</td>
<td>specific areas of improved transit accessibility</td>
</tr>
<tr>
<td>Higher peak frequency</td>
<td>capital costs</td>
</tr>
<tr>
<td>Expansion of parking</td>
<td>consistency with land use initiatives</td>
</tr>
<tr>
<td>New stations in the City</td>
<td>residential development potential</td>
</tr>
<tr>
<td>New services</td>
<td>commercial development potential</td>
</tr>
<tr>
<td></td>
<td>inter-regional impacts and cross boundary connections</td>
</tr>
<tr>
<td><strong>6 Road Expansions</strong></td>
<td>reductions in congestion, air pollution, and GHG emissions</td>
</tr>
<tr>
<td></td>
<td>impacts on transit operations</td>
</tr>
<tr>
<td></td>
<td>capital costs</td>
</tr>
<tr>
<td><strong>7 Higher Order Transit:</strong></td>
<td>increased ridership and transit mode split</td>
</tr>
<tr>
<td>Busways</td>
<td>cumulative change in transit accessibility</td>
</tr>
<tr>
<td>LRT</td>
<td>specific areas of improved transit accessibility</td>
</tr>
<tr>
<td>Subways &amp; RT</td>
<td>consistency with land use initiatives</td>
</tr>
<tr>
<td></td>
<td>capital costs</td>
</tr>
</tbody>
</table>
The accessibility measures for the transit disadvantaged areas discussed previously will require particular attention in order to determine relative priorities of potential transportation initiatives from the standpoint of achieving the vision of the future City in terms of a broader range of land use and non-transportation criteria. Based on the preliminary methods developed thus far, it will be important to estimate:

- route changes for surface transit that will be necessary in conjunction with any major new capital projects such as subway extensions,
- overall affects on access to employment (or other activities) as a function of transit travel time for the different transit alternatives, and
- changes in accessibility by specific geographic area resulting from the different options.

7. Funding Implications

Transit funding is obtained from two basic sources, namely, revenues from passengers (as well as other relatively minor revenues from advertising, etc.) and government subsidies to cover both operating deficits (the difference between operating costs and revenues) and all capital investment in vehicles and infrastructure. Periodically, of course, both the TTC and GO transit adjust fares in order to reduce projected operating deficits, recognizing, of course, community opposition and impacts on ridership that result from any fare increase.

In this regard, however, it should be noted that for existing fare levels, as shown in Figure 7.1, the TTC and GO Transit already achieve the highest operating cost recovery ratios of any major transit operator in Canada and the U.S. Thus, any thought of funding transit infrastructure improvements and vehicle replacements through fare increases alone, without subsidies, is clearly unrealistic.

Prior to 1972, subsidies were funded almost entirely from municipal tax revenues. With the introduction of the provincial government’s Municipal Transit Program, Toronto’s shares of operating losses and capital funding were reduced to 50 percent and 25 percent, respectively.

Ever since the Ontario government ‘realigned’ financial responsibility for public transportation early in 1998, however, Toronto has been struggling with the problem of finding sufficient funding for the TTC which, net of revenues, has almost doubled from about $250 million to $500 million annually. In addition, the City now provides its share of GO Transit operating deficits, about $55 million annually. Prior to 1998, there was no direct contribution made by the City (or former Metro) to the financing of GO Transit.

In both cases, these amounts are sufficient only to maintain existing services and include no flexibility for system expansion beyond presently committed projects such as the Sheppard Subway.
For its part, the provincial government argues that by assuming many of the costs previously borne by cities for education and other services, municipal governments should have sufficient budgetary flexibility to take care of transit funding. Most municipal officials, however, remain deeply concerned about transit. They are also well aware of the fact that, of comparable size cities throughout North America and most of the world, Toronto is the only city that does not receive financial assistance for public transportation from any senior level of government.

There is also widespread agreement that cost effective transit service is essential to the GTA’s economy and to the general quality of life, both in Toronto itself, as well as in the suburban areas of the GTA. Additionally, transit improvements are viewed as an important means of reducing air pollution and smog, as well as emissions of other gases that contribute to global warming and climate change.

As a result, there are growing pressures to find alternative sources of transit funding. Ontario -- which once led the way in supporting public transit in the early 1970s -- has now taken a back seat to new funding initiatives in British Columbia, Alberta and Quebec where some portion of provincial gasoline taxes and automobile registration fees are now dedicated to public transit.
Unfortunately, using gasoline taxes to fund transit, may involve nothing more than ‘robbing Peter to pay Paul’. Without actually increasing fuel taxes, dollars diverted to transit mean fewer dollars for other important provincial programs in health and education.

Nevertheless, it is becoming increasingly clear that funding both for existing transit services and much needed expansion cannot continue as a burden on property owners alone. There is also an increasing consensus throughout most OECD countries, that at least some of the burden for financing public transit should fall directly on transportation beneficiaries, namely, users of automobiles -- a notion endorsed by the reputable and generally influential Transportation Association of Canada.

Although there are important differences between the TTC, which is owned by the City, and GO Transit, which now has 28 owners, there are a few potential remedies for funding transit improvements within the City of Toronto.

First, recognizing that provincial government policies do change over time, there is some value in continuing formal approaches to have funding responsibility for GO Transit returned to the Ontario government, thereby freeing up some $55 million annually for the City’s commitments to its own transit expansion priorities.

Since GO Transit is the only inter-regional transit operator in Ontario, the provincial government could recant its present position and support GO without setting precedents for other regions. Setting aside only a few cents per litre of the gasoline taxes collected by the provincial government within the GTA for GO Transit makes a great deal of sense. In fact, 2 or 3 cents per litre -- far less than day to day changes in gasoline prices -- would cover GO’s entire operating and capital deficits.

Provincial support for GO Transit can also be justified on grounds that it would parallel provincial support for inter-regional highways which, in turn, is justified on grounds of maintaining the competitiveness of the GTA economy. Good inter-regional transit access is equally important from the standpoint of economic benefits, particularly since effective transit service reduces the need for highways that the provincial government would otherwise need to build for commuters and frees up lane capacity for goods movement.

At present, for example, GO’s services take about 40,000 cars off the road each day and in the not too distant future, that number could double if the right decisions are taken. Politically, allocating some of the gasoline tax to inter-regional transit is a winner because it is an action that would very likely be welcomed by regional mayors and chairs, local politicians, the media, and the public at large.

Second, together with other Ontario municipalities, the City could pursue initiatives with the provincial government that would empower municipalities, regional governments, or the newly formed Greater Toronto Services Board to generate funding from sources other than or in addition to local property taxes. The real problem in downloading funding responsibility for transit to the municipalities, fundamentally, is that the Province failed
to give either municipal or regional governments the tools needed to meet their new responsibilities.

Those tools involve such sources as special gasoline taxes, automobile registration fees (as recently introduced in Vancouver), or various forms of electronic road pricing similar to those now used on Highway 407. The details are not important. The concept of allowing those with the responsibility for public transportation to develop dedicated sources of funding is.

Finally, the federal government has certain special interests in urban transportation related to airport access, VIA Rail’s services, and recent international commitments to reduce carbon dioxide and other greenhouse gas emissions that result from our increasing dependence on automobiles. Targeted requests for specific projects that deal with some of those issues may be successful in attracting capital contributions from the federal government, as in the case of Waterfront development. In addition, the Canada Transportation Act is currently under review through a process that provides opportunities for the City, as well as organizations with which the City is associated, to make formal representations.

In a word, based on the status quo with respect to transit funding, the likelihood of achieving the transportation vision for the City appears somewhat questionable. However, the downloading of all provincial programs for municipal transportation, amalgamation of the City of Toronto, and establishment of the Greater Toronto Services Board, are relatively recent important institutional changes. Allowing a bit more time for the dust to settle may improve the prospects of convincing the provincial government to allocate some of its gasoline tax to GO Transit, as well as to empower the municipalities to become more innovative in meeting their own transit funding needs. Under such conditions, the chances of realizing the transportation vision and the broader liveability objectives the vision is intended to support would be greatly enhanced.

The present uncertainty associated with funding, however, is no reason not to plan for the future. If the vision of the City is one that includes reducing automobile dependence and accommodating “a million more people but not a million more cars”, it will be important for the City to have priorities for capital investment in transportation already approved within a reasonable period of time. This will be particularly true if opportunities for federal financial support on a selective basis arise in the near future. Meanwhile, there is no reason not to expedite the matter of increasing transit priority on existing high volume transit routes as a first step in moving towards the transportation vision.

\[12\] Road pricing, or tolling, in fact, is now receiving serious consideration as one mechanism for funding the proposed new Waterfront development.