National Vision for Urban Transit to 2020

Final Report

by IBI Group

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EXECUTIVE SUMMARY

S.1 BACKGROUND

As noted in Chapter 1, throughout the U.S. and Canada, as well as most of the industrialized world, the time has long passed since public transportation can be considered as a profitable operation that provides a return on investment. All Canadian transit operators, for example, rely on subsidies to cover some of their operating and maintenance costs and *all of their capital requirements*. Such subsidies are essentially justified, from the standpoint of elected officials at the municipal level and in a few cases at the provincial level, who must approve budgets, on grounds of direct transportation benefits and broader co-benefits that are generated by the provision of urban transit services to the communities at large. Decisions to subsidize urban transit basically imply that various monetary and non-monetary benefits, in aggregate, are perceived to outweigh public monetary costs.

Justification for urban transit subsidies derives, in part from the growing consensus in Canadian urban areas that:

- The likelihood of meeting future urban transportation needs through road expansion alone appears to be increasingly impracticable from the standpoint of sustainable development, system capability, environmental impacts, liveable communities, and the accessibility to be provided to all groups of society (including the disabled and seniors, shippers, and those for whom travel by automobile is essential).

- Improving urban transit services in ways that increase the competitiveness of transit relative to the private automobile and which reduce the ever increasing growth in car dependence are desirable from economic, social and environmental standpoints.

- Improvements in transit that attract individuals from the private automobile, as well as land use and transportation planning that leads to shorter trips, fewer motorized trips and increased use of cycling and walking are also seen as essential elements of meeting Canada's commitments to reductions in greenhouse gas emissions, improvements in air quality, and related health impacts, while also helping to conserve energy and reduce dependence on fossil fuels.

- Reduction in levels of road congestion are necessary to maintain and improve the competitiveness of urban economies, and thus of the national economy.

Nevertheless, most Canadian municipalities today are unable to find the funding (particularly capital) required to maintain existing transit services, let alone expand transit systems and levels of service, solely from property taxes. As a result, in almost every municipality, there is a growing lobby for financial assistance from senior levels of government to assist in meeting the transit needs of the future.

S.2 PURPOSE OF THE STUDY

Recognizing the above challenges along with the opportunities provided by urban transit for achieving improved economic, social and environmental conditions in Canadian cities, the federal government has singled out urban transit as a new area of federal government interest, stating in the

most recent Speech from the Throne that it will "cooperate with provincial and municipal partners to help improve public transit infrastructure".

Largely on this basis, Transport Canada has initiated three consultant studies that focus, respectively, on developing a national vision for urban transit, an analysis of the current state of urban transit in Canada, and development of a benefit-cost framework for assessing investment in urban transit. This report deals with the development of a national vision for urban transit, drawing on domestic and international experience and on new proposals by the report's authors, as well as limited stakeholder consultation.

It should be noted, as emphasized frequently in this report, that the ability to improve the quality of transit services cost-effectively as a means of reducing congestion and achieving more sustainable urban transportation and development is influenced by a variety of factors related to the demographics, spatial structure, size and complexity of a particular municipality or urbanized region. Clearly, there is no single solution to the varied nature of urban transit and transportation needs that applies universally to all Canadian urban areas. For these reasons, the urban transit vision developed in this report should not be viewed as a panacea, but rather as a construct to be targeted for managing urban transit/transportation and land use development in a manner that is economic, efficient, socially equitable, and environmentally progressive.

S.3 URBAN TRANSIT IN BRIEF

The main obstacles faced by most urban transit operators derive from the dominance of the private automobile for the vast majority of travel in all urban areas. For those who are both physically able to and can afford to do so, an automobile generally provides greater convenience, shorter travel times, and greater comfort for the majority of their travel needs, particularly in low-density urban and suburban areas. Patterns of urban growth (e.g. large single-use areas), generally declining land use densities, and expanded road systems have also contributed to reduced competitiveness of urban transit except under special conditions, particularly in major travel corridors. Moreover, the cost structure of the transit industry itself is high, in part due to the high capital cost of infrastructure and vehicles and, in part, due to the high imbalance in utilization rates reflected in peak period and off-peak period use. In other words, transit services are expected to provide high capacity that requires large numbers of vehicles and workers for relatively short periods of time each day plus lower levels of service throughout the remainder of the day and evening. Some also argue that the institutional constraints such as the lack of fare and service integration across jurisdictional boundaries, as well as differences in methods of financing and taxation, further detract from the competitiveness of urban transit relative to the private automobile.

Nevertheless, governments at all levels recognize that urban transit is an essential part of urban transportation systems, particularly in the larger and mid-size urban areas but also in smaller areas, because of its capability to provide the necessary capacity and service levels for moving people in major travel corridors and accommodating peak period movements, while also providing an affordable choice of travel mode other than the private automobile. Because of these direct transportation benefits, along with broader co-benefits (see Section S.5) governments recognize that public investment is justified to maintain and expand such services. Recognizing the significant benefits and essential nature of urban transit, but also its financial straits owing to competition from the automobile, a number of transportation planners and economists have suggested that this could be

addressed, at least in part, by permitting urban transit to qualify for funding from road user charges. This point of view was strengthened by the Canada Transportation Act Review Panel which recommended in its final report that urban transit should be permitted to qualify for funding from road user charges (Recommendation 12.3) which road users "should pay … by means of appropriate charges and fees" (Recommendation 10.1). [1]

S.4 TRANSIT VISIONS IN CANADA AND ELSEWHERE

Chapter 2 presents a review of the types of transit vision statements, including goals, targets and future scenarios, which have been documented by governments and agencies at the local (e.g. urban areas, transit properties), regional (e.g. provincial) and national (e.g. national governments, transit/transportation associations) levels in Canada, the United States and abroad.

Conclusions drawn on the basis of that review, as input to the process of developing a transit vision and goals/targets for Canadian urban areas, are as follows:

- The exercise of developing vision statements and/or setting goals for urban transit is virtually universal among the urban areas studied and is seen as essential to help generate and evaluate alternative plans and provide a basis for action. The visions and goals tend to be more elaborate in the larger urban areas and more basic (e.g. focussing on transit service/standards and ways of achieving cost-efficiencies) in the smaller areas.

- While most of the vision statements revealed by our research were relatively short statements of intent, fleshed out by various qualitative goals and – in some cases – by quantitative targets, in a few cases a "scenario" approach is taken in which the vision statement describes a desired situation as it might exist in a future (planning horizon) year. Either approach is feasible and can be considered in developing an approach for a national urban transit vision in Canada.

- As noted in the Terms of Reference for this study, it will be important that a national vision for urban transit reflect goals which apply to all Canadian urban areas while providing enough flexibility to recognize important differences among Canada's urban areas based on factors such as size, growth rates, existing types of transit/transportation, urban structure, economic/locational characteristics, etc. The similarities and differences in the types of goals mentioned by various urban areas (see Exhibit 2.6) provide broad indications of the numbers and types of goals which are considered most important by large, medium and small sized Canadian urban areas, respectively, and this provides useful background information for the process of developing a national vision and goals.

- Similarly, the types of quantitative targets and indicators used by various urban areas to define the vision more explicitly and provide a basis for monitoring the extent to which it has been achieved are also useful input to the process of suggesting quantitative targets as part of a national urban transit vision or visions.

[1] ***Vision and Balance: Final Report of the Canada Transportation Review Panel***. June 2001.

- Finally, the discussion in Chapter 2 of success story examples and contributing factors serves as an important reminder that urban transit operates as part of a complex series of urban systems and activities. Thus visions, goals and targets need to reflect this complexity, including the importance of land use and socio-economic visions and policies, transit/transportation infrastructure, transit system expansion and integration, as well as the manner in which the transit and transportation systems are managed (including operations, maintenance/rehabilitation, pricing, revenue sources, funding policies and governance of planning and delivery).

Consideration of the above will be important in developing a national vision, goals and targets for urban transit in Canada to 2020, as summarized below in Section S.7 and described more fully in Chapter 3.

S.5 CO-BENEFITS OF URBAN TRANSIT

Co-benefits of urban transit – that is, broader benefits in addition to the direct *transportation* benefits of transit – are discussed more fully in Chapter 4 under the headings of Economic, Social and Environmental Co-Benefits. The eleven co-benefits described there are listed below:

Economic Co-Benefits

- access to labour;
- maintenance of healthy downtown areas;
- containment of urban sprawl;
- opportunities for export development;
- effects on tourism;
- productive use of time spent commuting.

Social Co-Benefits

- accessibility for the disadvantaged and more choice for all travellers;
- air quality and health;
- reduced need for road construction;
- standby capability.

Environmental Co-Benefits

- reductions in greenhouse gas emissions

The above, while among the most important co-benefits of urban transit, are a partial list only; a more complete treatment may be found in the companion study for Transport Canada on ***Benefit-Cost Assessment of Urban Transit Investment*** and in other sources as noted in Section 4.2

S.6 INTEREST IN A NATIONAL VISION FOR URBAN TRANSIT

As noted in Chapter 3, the review of national and international urban transit/transportation vision statements (or reasonable facsimiles thereof, such as "goals" statements) revealed a number of similarities with respect to a desire for the following types of policy goals:

- fewer and shorter motorized trips;
- a higher proportion of all vehicular trips by public transportation;
- the substitution of walking or cycling for private automobile trips;
- greater energy efficiency and reduced emissions of greenhouse gases and other pollutants;
- more widespread accessibility for the disabled and seniors; and
- more cost-efficient delivery of transit services.

There is, of course, a wide variation in the size and complexity of municipalities within Canada and, as a result, perhaps the single most important difficulty in attempting to reach consensus on a Canadian *transit* vision (as subsumed under a Canadian *transportation* vision) probably derives from the tremendous variation in size, demographic characteristics, and needs of urban communities across the nation.

Thus the challenge in developing a truly national vision statement for urban transit is to define it in terms:

- such that most individuals, regardless of where they reside, can identify with the implied goals;
- which are comprehensive from the standpoint of the complete range of community sizes and complexities representative of the vast majority of Canadian municipalities;
- that do not raise premature expectations as to senior government involvement; but
- which might serve as the basis for selective participation by these levels of government as well as other potential stakeholders.

S.7 PROPOSED STRUCTURE FOR THE VISION

In reviewing the policy goals listed above in Section S.6, we conclude that while the six policy goals are a good start, a larger number of policy goals should be included, thereby giving them more prominence in the vision than the somewhat lesser status of contributing goals/influencing factors. We have defined 15 policy goals based on transit visions developed elsewhere (as described in Chapter 2) and on the judgement and experience of the authors of this report.

In developing and structuring the longer list of 15 policy goals, we went back to first principles regarding the meaning of a sustainable transportation system. We conclude that a sustainable transportation system should be:

- **capable** of providing the necessary speed, capacity, frequency, coverage and connectivity to provide access to all activities in the urban areas with service that is safe, comfortable and convenient;

- **compatible** with liveable communities that support a vibrant economy, walkable streets, people-friendly places, and a high quality-of-life;

- **conserving** of energy and other natural resources and **clean** in terms of waste products; and

- **cost-efficient** in terms of efficient service delivery, appropriate and affordable transportation pricing, and adequate, predictable funding arrangements.

We have defined five policy goals under the first heading above, three under the second, two under the third and five under the fourth in working towards a proposed structure for the national transit vision, as described below in Section S.8 and more fully in Chapter 3, Sections 3.4 and 3.5.

S.8 A PROPOSED NATIONAL URBAN TRANSIT VISION

Based on the range of visions and goals/influencing factors presented in Chapter 2, the assessment, proposals and synthesis provided in Chapters 3 and 4, and the increasing public interest and government initiatives to achieve more sustainable transportation, a proposed urban transit vision for Canada is presented below:

S.8.1 Urban Transit Vision Statement

> *By 2020 Canada's urban transit/transportation policies and initiatives will have achieved: a reduced level of motorized travel per person; less dependence on the private automobile; improved transit accessibility for those who by reason of age, income, or physical disability are unable to drive; more competitive transit service delivered in an effective and cost-efficient manner that attracts users from their cars for a wider variety of trip purposes*; *and, resulting from the above, more capable, compatible, clean, conserving and cost-effective urban transit and transportation systems.*

S.8.2 Urban Transit Policy Goals

The urban transit vision is described more fully in terms of the 15 policy goals which are listed below, in bold type. Also included with each, in plain type, is a key contributing goal or influencing factor to help flesh out the policy goal and what it entails.

A Capable System:

1. ***Door-to-door, "seamless" travel by public transit and related modes within the entire urban area, unimpeded by jurisdictional boundaries or intermodal barriers****, through integration of transit services, pricing, and passenger information systems, as well as intermodal coordination and parking policies.*

2. ***Increased transit speed, capacity, frequency, coverage and connectivity to compete more effectively with the automobile and reduce automobile dependency in serving a wider variety of trip purposes,*** *through general improvements in the network of transit services and increased integration of public and private transportation activities.*

3. ***Improved accessibility to transit service for the disabled and seniors*** *through modifications to new vehicle and infrastructure designs, retrofitting of existing infrastructure, and special services for these individuals in communities with modest or no conventional transit services.*

4. ***Increased comfort, convenience and safety for transit users in both vehicles and waiting areas****, through general improvements in the amenities of transit vehicles and waiting areas.*

5. ***Improved transit service in currently transit-deprived areas,*** *including use of appropriate service structures and technologies to provide transit services in an efficient and cost-effective manner.*

A Compatible System:

6. ***Fewer and shorter motorized trips per person and more trips by transit, walking and cycling,*** *largely through management o*f urban development, regardless of city size, in ways that lead to compact urban form and greater mixed land use plus more pedestrian-, transit- and cycling-friendly streetscapes.

7. ***More transit-friendly and walkable/cyclable streets and streetscapes*** *through integrated planning, design and delivery of those services and facilities.*

8. ***Greater opportunities for accommodating bicycles in connection with transit services*** *through special features of transit stations and vehicles.*

A Conserving and Clean System:

9. ***Reduced transit/transportation energy consumption and resource depletion*** *through an increase in the proportion of vehicle-km involving more energy-efficient vehicles and the use of alternative propulsion systems.*

10. ***Reduced emissions of greenhouse gases and other pollutants from transit/transportation*** *through use of alternative fuels and propulsion systems plus greater reliance on transit, walking and cycling.*

A Cost-Efficient System:

11. ***More efficient operation of transit vehicles and higher vehicle productivity****, through road design and traffic engineering policies, urban development patterns that are more favourable to transit and consideration of alternative service delivery approaches.*

12. ***Transit priority policies that improve average transit travel speed and net revenue per vehicle****, thus increasing vehicle and driver productivity, as well as the attractiveness of transit relative to the private automobile leading to increased transit ridership and revenues and reduced net costs per rider.*

13. ***Cost-effective planning and delivery of new and/or expanded levels of transit service as well as maintenance and rehabilitation of existing services and facilities*** *based on appropriate*

governance which enables an integrated approach to urban development and provision of transit/transportation.

14. ***A level playing field from the standpoint of transit versus auto travel decisions based on consideration of real costs and affordability,*** *including under-priced parking and rationalization of income tax regulations affecting allowable deductions and taxable benefits.*

15. ***Generation of reliable, performance-based revenue streams to fund urban transit thereby making possible more cost-efficient capital investment programs,*** *through public funding policies and drawing on road pricing and/or other user pricing mechanisms that account for the external costs imposed on society by road users and the co-benefits to society of achieving improved and more widely used transit.*

As noted in Chapter 3, it should be stressed that not all elements of this vision statement are applicable in every situation or even within different communities of the same jurisdiction. Transit priority in large urban areas that operate high frequency services in mixed traffic, for example, is not a policy that is likely to be relevant in small municipalities or even in low density communities of a large metropolitan region where existing or potential transit ridership would not justify such measures. Similarly, alternative services that may be appropriate in these latter situations (e.g. smaller, more demand responsive vehicles) are not likely to be relevant for high-density transit corridors.

S.8.3 Targets and a Vision Scenario

More details regarding the proposed vision are presented in Chapter 3, where Exhibit 3.3 lists the 15 policy goals comprising the vision and, for each, the range of urban areas to which it is expected to apply, major contributing goals and influencing factors, potential types of targets for measuring progress, and applicable national programs and activities. Exhibit 3.4 presents five potential national transit targets, each stated as a quantitative range for each of three size categories of Canadian urban areas. Finally, Exhibit 3.5 provides a two-page overview of the vision stated in the form of a scenario description of urban transit in Canada reflecting achievement of the vision's policy goals and quantitative targets by 2020.

1. INTRODUCTION

1.1 BACKGROUND AND PURPOSE OF THE STUDY

In Canadian urban areas, there is a growing consensus that:

- The likelihood of meeting future urban transportation needs through road expansion alone appears to be increasingly impracticable from the standpoint of sustainable development, system capacity, economic viability, environmental impacts, liveable communities, and the accessibility to be provided to all groups of society (including the disabled and seniors, shippers, and those for whom travel by automobile is essential).

- Improving urban transit services in ways that increase the competitiveness of transit relative to the private automobile and which reduce the ever increasing growth in car dependence are desirable from social, economic and environmental standpoints.

- Improvements in transit that attract individuals from the private automobile, as well as integrated planning and delivery of transit/transportation and land use that leads to shorter and fewer trips and increased use of transit, walking and cycling are also seen as essential elements of meeting Canada's commitments to reductions in greenhouse gas emissions, improvements in air quality, and related health impacts, while also helping to conserve energy and reduce dependence on fossil fuels.

- Stabilization and, if possible, reduction in levels of road congestion are necessary to maintain and improve the competitiveness of urban economies, and thus of the national economy.

- Most Canadian cities are unable to find the funding (particularly capital) required to maintain existing transit services, let alone expand transit systems and levels of service, solely from property taxes.

Canada, however, is presently the only G7 country where there are no national government programs that provide financial assistance for municipal transit.[2] This fact has not gone unobserved by municipal officials and such organizations as the Canadian Urban Transit Association and the Federation of Canadian Municipalities. Increasingly, these groups are looking to the federal government for much needed financial assistance, particularly in the area of capital funding for the repair and rehabilitation of existing transit systems, as well as the expansion of these systems to combat the growing dependence on the private automobile.

There are, of course, issues related to the division of powers and responsibilities between the federal and provincial governments that underlie the present lack of federal government participation in urban transit. Nevertheless, the federal government has recently been showing more interest in urban transit, motivated, in part, by Canada's international obligations with respect to the Kyoto Protocol, in

[2] Federal government initiatives have been used for the support of urban transit in a limited way under other programs such as the ***Infrastructure Canada Program*** and, periodically, on an *ad hoc* basis.

part, by the just completed mandatory review of the ***Canada Transportation Act*** (**CTA***)*, and in part by the increasing frequency of requests for financial aid.

The ***Government of Canada's Action Plan 2000 on Climate Change***, for example, includes an ***Urban Transportation Showcase Program*** intended to promote effective strategies for the reduction of greenhouse gas (GHG) emissions. However, although direct provincial involvement is not mandatory (as in the case of both ***Canada Infrastructure Works Programs***), any objection by a provincial government to a municipal submission for funding is sufficient to render that application ineligible.

The report of the CTA Review Panel includes two chapters that deal directly with urban transportation, including recommendations that funding for urban transit be permitted to draw on the Panel's proposed user pay transportation funding approach. Although subsumed under a recommendation that encourages experimentation with innovative forms of service (Recommendation 12.2), the Panel states that "on the key question of whether the federal government should have a funding role, the…proposed solution would involve unprecedented federal action and funding". The report goes on to propose that "urban transit be permitted to qualify for funding from road user charges" (Recommendation 12.3) which road users "should pay…by means of appropriate charges and fees" (Recommendation 10.1).[3]

The most recent Speech from the Throne, which states that the federal government will "cooperate with provincial and municipal partners to help improve public transit infrastructure", singles out urban transit as a new area of federal government interest as do recent statements by the federal Minister of Transport. Largely on this basis, Transport Canada has initiated three consultant studies that focus, respectively, on developing a national vision for urban transit, an analysis of the current state of urban transit, and development of a benefit-cost framework for assessing investment in this component of the Canadian transport sector.

This report deals with the first of these three Transport Canada studies, namely development of a national vision for urban transit, drawing on domestic and international experience with such visioning exercises, as well as on limited stakeholder consultation.

It should be noted, as emphasized frequently in this report, that the ability to improve the quality of transit services cost-effectively as a means of reducing congestion and achieving more sustainable urban transportation and development is influenced by a variety of factors related to the demographics, spatial structure, size and complexity of a particular municipality or urbanized region. Clearly, there is no single solution to the varied nature of urban transit and transportation needs that applies universally to all Canadian urban areas. For these reasons, the urban transit vision developed in this report should not be viewed as a panacea, but rather as a construct to be targeted for managing urban transit/transportation and land use development in a manner that is economic, efficient, socially equitable, and environmentally progressive.

Recognizing the varied nature of the size and structure of Canadian municipalities, the main purpose of the study is to develop a national transit vision statement that will deal comprehensively with the

[3] Canada Transportation Act Review Panel. June 2001, o*p. cit.*

wide range of constituencies and which could help serve as a basis for selecting areas of involvement and actions most appropriate for the federal government.

1.2 "VISION" DEFINED

The terms "vision", "goals", and "strategies" are often used interchangeably to mean a desired achievement or end product. In this study, "vision" means a description of the desired attributes or characteristics of an urban transit system. In particular, the term should be distinguished from strategies that could deal with methods for achieving the vision. Thus, if one component of the urban transit *vision* is to have full accessibility for the disabled, obtaining federal and/or provincial funding may be one of the *strategies* for doing so.

Recognizing the high degree of interdependence among land use, urban design, urban transit and the characteristics of the road system, any vision of transit really has to be defined within the context of a vision for the broader urban transportation systems that serve Canadian cities. A national vision for urban *transit*, for example, that includes greater reliance on transit cannot be disassociated from a vision for urban *transportation* that includes reduced dependence on private automobiles and a related *land use* vision involving transit-oriented urban design and development patterns.

Treating urban transit as a subset of urban transportation, a vision of urban transit involves attributes that have many dimensions including,

- the degree of integration between land use and transportation, roads, parking, and transit, as well as local, inter-regional, and intercity transportation,
- road system characteristics,
- policies and priorities for the use of road space,
- transit system characteristics in terms of service levels, speeds, coverage, connectivity, convenience, comfort, safety, fares, ridership, mode share, cost recovery, and general performance,
- the average length and number of vehicular trips,
- general levels of congestion,
- accessibility to transit for those with special needs and those without cars,
- "friendliness" of road geometry and traffic engineering for transit, pedestrians, and cyclists,
- costs and travel times related to the movement of goods,
- levels of automobile ownership and use,
- parking policies and pricing, both on-street and off-street, energy consumption, air pollution and greenhouse gas emissions related to transportation, and
- methods of finance and funding.

Within this broader context, if the transit vision includes service that is to be faster, more reliable, and delivered more cost-effectively, related attributes such as policies regarding the use of road space and the relative priority given to transit vehicles and private automobiles become essential elements of the urban transit vision.

1.3 A BRIEF HISTORY OF URBAN TRANSIT SERVICE SINCE 1850

Urban transit can be defined as for-hire, collective passenger transportation services provided in urban areas in accordance with published schedules or despatched on a demand-responsive basis. There are also examples of low density transit services, particularly in off-peak periods where municipal public operators have contracted with private taxis to provide service at transit fares.

Prior to the age of electricity, multi-passenger horse-drawn vehicles (e.g. the English "omnibus") were the basic means of providing urban transit, augmented by smaller horse-drawn vehicles (e.g. the London "hackney cab") which could be privately hired for individual trips. The distinction between urban (public) transit and private taxi services remains to this day – although blurred somewhat by the use of "shared cabs" in some municipalities – and the two modes are separately regulated and delivered in most cases.

Another historical distinction also persists to the present: that between *surface* transit in mixed traffic and *rapid* transit, the latter provided by vehicles moving in separate rights-of-way unimpeded by other traffic. From the mid-nineteenth century on, railways have provided commuter rail services in and between urban areas; urban development patterns during the following century showed a distinctive hub-and-spoke structure in such areas, with higher densities in corridors served by rail, reflecting their greatly superior accessibility. Larger metropolitan areas developed underground and elevated rail lines which focussed on serving commuter and other urban trips as well as bringing interurban travellers to and from central stations.

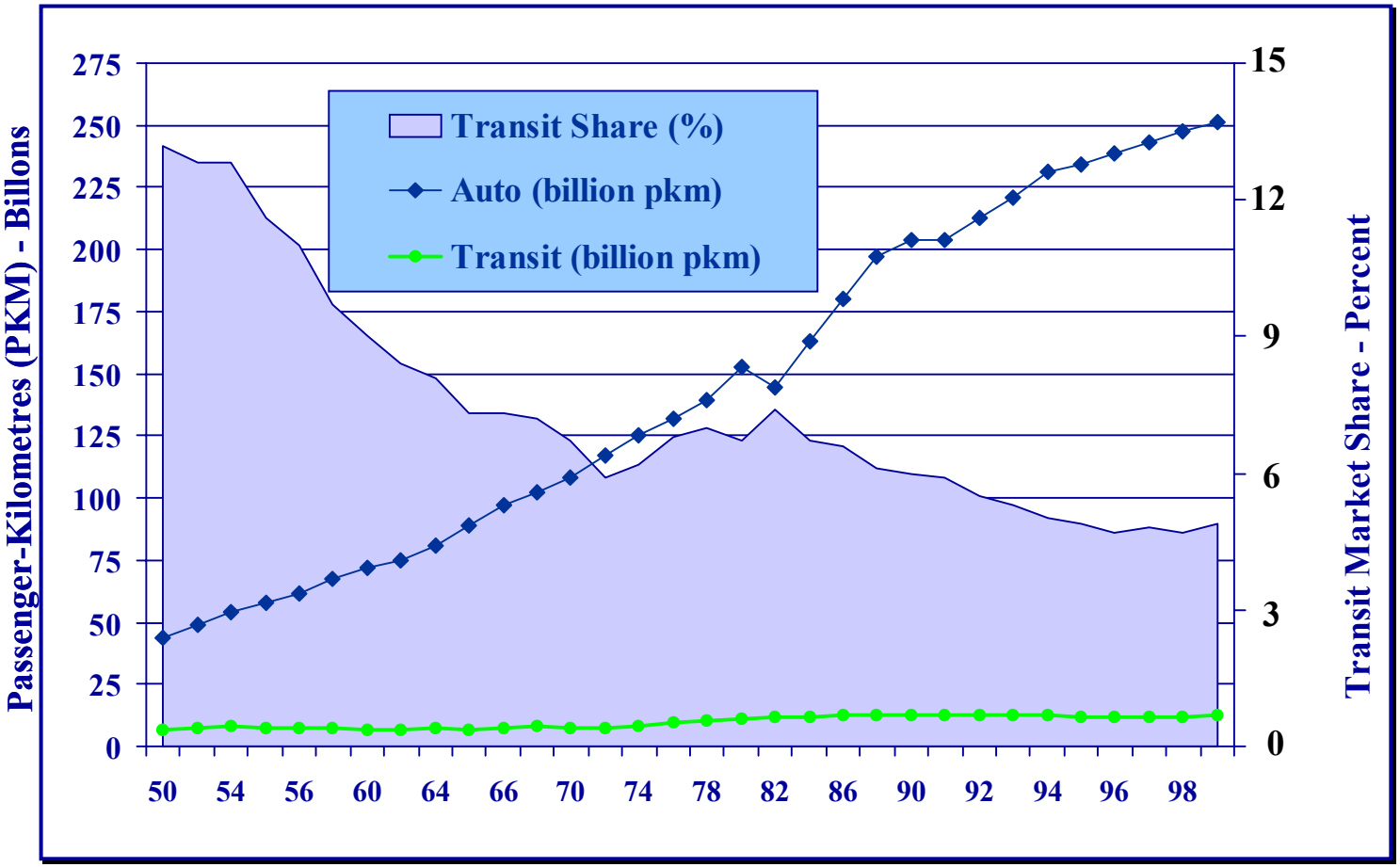
With the introduction of electric traction in the 1880's, electric streetcars began to replace horse-drawn buses, bringing both faster service and cleaner streets. Underground railways were also electrified with similar impacts on air quality both in the tunnels and above ground. The new technology spurred rapid construction of subway networks in large metropolitan areas such as London, Paris and New York during and following the 1890s while more extensive electric street railways were introduced in and between urban centres of all sizes and expanded rapidly during the "golden age of the streetcar", roughly the first third of the 20th century.

Meanwhile the internal combustion engine was successfully applied for railway locomotives, buses and automobiles, and the latter began to compete seriously with streetcars and buses for road space and for the urban travel market, with growing success during the 1920s, less impact during the Depression years of the 1930s and the War years of the 1940s, and explosive force since 1945, as illustrated in Exhibit 1.1. Urban transit, which had been a profitable industry prior to the mass advent of the automobile, became more and more a peak period service with dramatically decreased load factors at other times, and was no longer able to recover its operating costs (let alone capital costs) from fare box revenues.

The transformation from financial viability to government support was essentially complete among Canadian urban transit properties by the early 1960s. This coincided with a period of heavy government investment in road infrastructure during the decades following World War II. The days of the entrepreneurial land development companies which provided not only new subdivisions but also streetcar services linking them to central areas (and made a tidy profit on both) were long over.

Urban transit in Canada is now essentially a government enterprise, owned, managed and subsidized by municipal governments or transit commissions (with provincial financial assistance in some provinces) which took these actions to ensure the continuing availability of transit as an essential component of transportation in our urban areas. Governments recognized that transit is required to provide the necessary capacity for moving people in major travel corridors and to accommodate peak period movements while also providing an affordable choice of travel mode other than the private auto, in order to maintain the economic and social viability of Canada's urban areas. More recently the environmental benefits of transit – in terms of reduced air pollution, less need for road expansion, and other goals of more sustainable transportation – have added to the rationale for government involvement to ensure that urban transit services continue to be provided at appropriate levels.

EXHIBIT 1.1: MODAL SHARE TRENDS IN CANADIAN URBAN TRAVEL



Source: Canada, Royal Commission on National Passenger Transportation, 1992.

Supplemented by Transport Canada estimates for missing or more recent years.

Chapter 4 provides more information on the "co-benefits" of urban transit; that is, benefits which are ancillary to the direct transportation benefits outlined above but are nonetheless critically important for the economic, social and environmental well being of Canadian urban areas.

1.4 TRANSIT IN TODAY'S URBAN CONTEXT

In general terms, private, profit making urban transit services that were once the primary means of travel in most Canadian cities have been replaced by public, subsidized services that have become the secondary means of travel except in major travel corridors. As noted above, this transition reflects changes in living styles, decentralization of employment from the traditional downtowns, decentralization of population, low density suburban development with large single-use areas, substantial expansion of road networks, and widespread ownership and use of private automobiles, along with related auto-oriented infrastructure, traffic engineering and financial support policies, which have led to the dominance of the automobile as the major mode of passenger transportation used both for urban and inter-city travel in Canada.

Nevertheless, dissatisfaction with present transportation systems and uncertainty about their ability to adequately address future needs is one of the major driving forces behind renewed interest in urban transit. It may be useful therefore, to provide the general context within which urban transit services function today.

Although walking constitutes an integral component of almost all trips (and is the most highly used mode for trips made totally within the central areas of many cities), and although the relative importance of cycling is on the rise, the largest proportion of all travel is still made first, by private automobile and second, by public transportation. For this large segment of the total travel market, some modes such as various forms of rapid transit are inherently capable of providing higher line capacity (perhaps as much as 35,000 passengers per hour) than others, such as expressways (perhaps 2200 persons per hour per lane at current auto occupancies). For this reason, large urban areas place considerable emphasis on building and operating these higher capacity and presumably more "efficient" forms of transportation, where demand warrants the large capital investment.

Performance of major trunk facilities, of course, is not the only determinant of travel decisions. Individuals are influenced primarily by the relative travel time, convenience, and cost for the entire "door-to-door" trip. In urban areas with rapid transit, for example, the higher speed and reliability of rapid transit for a downtown work trip may be offset by the added time and inconvenience needed to reach a station, particularly at the origin end of the typical journey to work. The impact of a well-connected transit network that is designed to maximize connections at intermodal stations or transfer points (often coordinated to minimize waiting times) can be an important factor in improving the attractiveness of the transit option in mode choice decisions. Thus it is the entire network of services, including connectivity and coverage, which contributes significantly to how much use is made of the transit *system*.

In many cases, "park-and-ride" or "kiss-and-ride" facilities greatly improve access to stations and terminals of both rapid transit and commuter rail systems. For many other trips, however, walking distances and/or the travel and waiting times associated with feeder bus and streetcar routes often detract from the competitiveness of transit relative to the private automobile. In addition, even for those who have a real choice between private and public transportation, *perceived* differences

between transit and automobile costs (that sometimes affect choice) may understate the *real* differences due to *hidden* subsidies and *external* costs. An obvious example of hidden subsidies is under-priced (often free) parking.

Hidden subsidies may include employer-provided car allowances and parking, as well as income tax regulations that permit deductions for automobile but not transit use. External costs refer to costs imposed on society but not paid for directly by the user (such as publicly-borne costs of accidents, environmental damage, climate change, air pollution, and related health problems).[4]

For some of these reasons, it is not surprising that the majority of urban trips are made by private automobiles. Moreover, because recent trends show a decline in the proportion of trips taken by public transportation (transit mode split), ways of improving both the competitiveness and effectiveness of transit to combat growing dependence on the automobile continues to be one of the major pre-occupations of transportation planners and elected officials.

The effectiveness and efficiency with which public transportation service can be provided in any urbanized area depends primarily upon travel patterns -- the general pattern of origins and destinations being the determining characteristic. Travel patterns are strongly influenced by land use, automobile ownership, demographic characteristics such as age and income, and by the spatial and service characteristics of the road and transit networks, all of which are highly interrelated. Other factors, including integrated "seamless" transit services, pricing and special regulations such as priority treatment for transit vehicles, also influence transit attractiveness and effectiveness.

Practically speaking, the competitiveness or advantages of public transportation relative to the private automobile depend primarily on the following key factors:

- socio-economic and demographic characteristics;
- population and employment densities, development patterns and urban design;
- trip patterns; particularly for the journey to work,
- levels of road congestion,
- the quality of transit service, including service levels, coverage and connectivity;
- the real and *perceived* costs of automobile use and parking;
- transit priority and travel speeds/times relative to those by private auto;
- transit, convenience, comfort and safety including amenities on vehicles and at stops;
- information availability, timelines and reliability for transit users;
- out-of-pocket costs experienced for each mode.

Transit marketing experience and surveys have consistently shown that service levels and quality are more important to customers than the price of the service.

[4] In fact, alleged hidden subsidies and external costs are the subject of considerable interest in so called "full-cost pricing", a method intended to charge road users the full costs of the external impacts they impose on society. It should be noted that urban transit also imposes external costs but these are considerably lower per passenger-km than those imposed by automobile users and the impacts of adjusting user pricing to include external costs would be proportionately less on transit users than on auto users.

1.4.1 Socio-economic Characteristics

The use of transit is certainly influenced by a variety of socio-economic factors including age, income, and automobile ownership. Clearly, those too young or too old to drive or those without automobiles are more likely to use transit and, depending upon trip purpose, may walk or use bicycles.

Although income data are not often obtained directly in travel surveys, other data show a strong (negative) relationship between automobile ownership rates (which, in turn, can be correlated with income) and the use of public transportation. The major exception occurs in the case of long distance commuting by rail (in Montréal, Toronto, and Vancouver) where a large percent of users do have an automobile available as an alternative. Rapid transit lines also carry significant numbers of "choice" riders as do surface transit services in corridors where direct service links major activity concentrations. A recent market research survey shows that 47% of TTC riders resident in Toronto are choice riders in that they have an automobile available for their trip. [5]

Within central cities, however, choice riders are generally outnumbered by those who, for reasons of age or income, do not have access to a private car and by females who, historically, have been less likely to be licensed drivers relative to males. Even for those with access to cars, depending upon income, the costs of operation and parking also influence their choice of travel mode. For these users, of course, transit fares may play an important role in determining how much use is made of the transit system, particularly for discretionary travel.

1.4.2 Population and Employment Densities, Development Patterns and Urban Design

Densities and development patterns largely dictate the frequency of service that can be justified economically on specific routes which, in turn, influences the attractiveness of the service and resulting ridership levels. All other things being equal, higher density residential and employment development with mixed-use development patterns leads to more efficient use of transit and greater productivity (revenue passengers per service hour) than low density development with large single-use areas simply because the total number of *all* trips generated per kilometre of route, from which transit takes its *share*, is higher, and transit's share is also greater because of the higher service levels which can be economically provided. Urban design and street patterns at the community scale, including compact, mixed use centres, corridors and sub-centres and transit- and pedestrian-friendly streetscapes also affect the attractiveness and viability of transit. Reflecting these factors it can be seen that providing effective and efficient transit is much more difficult in low density, single-use suburban areas than in higher density, less auto-dependent areas which were built up before the end of World War II.

1.4.3 Trip Patterns

Trip patterns are often characterized as involving many origins to many destinations ("many-to-many"), many origins to one destination ("many-to-one") or, in some cases, "one-to-many". Effectively serving a dispersed pattern of trip origins destined to a dispersed pattern of job opportunities (many-to-many) by transit, for example, is much more difficult than serving the same

[5] ***Market Tracking Study, Wave 1.*** Toronto Transit Commission. June 2001.

pattern of trip origins destined to one or more highly concentrated employment centres (many-to-one). The same can be said for non-work trips destined to major entertainment, shopping, health, and educational facilities.

Moreover, for work trips, patterns are dominated by highly directional flows, namely, one-way in the morning (typically inbound) and the other way in the late afternoon (typically outbound), leading to relatively lower utilization of services in the opposite direction and during off-peak hours. In addition, work trips are typically longer than trips for other purposes, which reduces the fare revenue per passenger-kilometre in transit systems which charge a fixed fare regardless of distance travelled, as is the case for most Canadian systems.

Within any one city, of course, there is a wide variation in the use of transit. Transit's market share is highest by far for travel to the downtowns where the concentration of employment and commercial activity is also the highest. Where densities are higher, particularly if there is a reasonable mix of residential and other land uses, there is also greater likelihood of trips being made by walking or cycling.

1.4.4 Levels of Congestion

Transit is frequently considered as a more viable alternative to the use of cars in cities where road congestion has reached high and generally unacceptable levels. Unless special priority is given to transit vehicles (such as reserved lanes, queue by-passes, and signal priority), surface transit also suffers from the same congestion. However, where transit service is provided on exclusive or semi-exclusive rights of way (as in the case of subways, LRT, or Ottawa's bus transitway), the greater reliability of transit, even if, on average, travel times are longer) attracts some passengers who simply do not want to put up with the variability and uncertainty associated with travel by automobile.

1.4.5 Route Configuration, Service levels, and Fares

Route configuration refers to the general layout of the network and spacing between routes, two important features that determine how well distinct travel patterns can be served. A grid system of closely spaced surface transit routes, for example, makes it easier to travel from almost any origin to almost any destination with one or two transfers, at most. As a result, closely spaced, grid street systems are well suited for serving both the many-to-many, as well as the many-to-one travel patterns, so long as the term "one" is broadly defined to include major nodes or concentrations of activity.

By contrast, a radial system in which most routes serve a central terminal is best suited to the many-to-one pattern noted above. Essentially, Toronto's subway system, Calgary and Edmonton's LRT systems, and the three commuter rail systems in Montréal, Toronto, and Vancouver can be described in this manner. The ability of radial systems to serve many-to-many travel can be improved by including timed transfers at the focal points and by tying together the radial services by means of cross-town connector routes, as has been done to varying degrees in the above systems.

Route configuration is also an important determinant of the trip purposes for which transit is more likely to be used. In cities like Barcelona, London, New York and Paris, for example, extensive subway networks make it possible to travel rapidly by transit throughout the city, rather than to just

one central area. The Montréal subway system also provides more area-wide coverage than rapid transit systems in other Canadian cities.

Aside from route structure itself, frequency of service, hours of operation, and fare levels obviously influence transit competitiveness. In the case of commuter rail services, for example, service is (with some exceptions in Toronto and Montréal) generally unavailable during off-peak periods or on the weekends, and for many local transit services, low frequency of service in off-peak periods as well as weekends also detracts from transit competitiveness.

Transit fares are also perceived to influence choice of travel mode, particularly where more than one fare must be paid for a "single" trip. There is strong opposition in some circles to any increases in transit fares which are viewed as detrimental to transit competitiveness. Most travel surveys, however, suggest that transit use is more sensitive to convenience and frequency of service than to fares.

1.4.6 Automobile Costs

The costs of automobile ownership, operation and maintenance, and parking pricing (and supply) relative to the costs of transit also influence the use of transit. Generally, transit fares are considerably lower than the costs of using private automobiles depending, of course, on who is actually paying for the use of the automobile. Even though use of the automobile often means a shorter trip and less waiting time, there are examples, where transit can provide more reliable and faster service at lower cost, depending upon such factors as automobile occupancy and the *real* costs of parking. This is particularly so in the case of rapid transit such as subways, commuter rail, and bus transitways.

1.4.7 Transit Priority and More Effective and Efficient Transit

For surface transit (buses and streetcars), the times required for boarding and alighting, as well as delays at traffic signals, further 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.

Unlike typical rapid transit operations where transit priority is guaranteed, the use of transit priority schemes for surface transit offers benefits both to users and operators of the system, 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, productivity and financial viability of the service.

In other words, effective application of transit priority means that higher route capacity and service level can be provided with the same number of vehicles (a more effective system) or, alternatively, the same capacity and service level can be provided with fewer vehicles and drivers (a more efficient system), or an appropriate combination improving both effectiveness and efficiency.

Transit priority can be achieved through a variety of means including reserved lanes, queue-jumping lanes, protected right of way (where other vehicles have no practical means of access), and signal priority at intersections. Obviously, there will be some negative impacts on automobile users and, as with any traffic regulations, the effectiveness of transit priority schemes depends upon adequate enforcement.

1.5 IMPLEMENTATION ISSUES

It perhaps goes without saying that achieving agreement on urban transportation visions appears much easier than actually taking policy and investment decisions that support these ideals. Although examples of visions are treated in Chapter 2, one example, namely the vision developed in 1993 by the Urban Transportation Council of the Transportation Association of Canada (TAC), had already been formally adopted by the councils of sixteen municipal governments and other relevant bodies in Canada by the time it was reprinted in 1998.

Relatively speaking, however, few have taken steps to implement achievement of those ideals, largely due to the important barriers that presently exist, the more important of which are briefly discussed below.

1.5.1 A Perceived "Unlevel" Playing Field

Although improved transit is an important cornerstone of many urban planning visions, in today's environment the automobile has, more or less, been institutionalized as a way of life throughout North America. Most transportation analysts agree that auto use, at least in urban areas during peak times, is subsidized since users do not pay for the congestion and the environmental damage that they cause. As well, a significant proportion of auto users do not pay the full cost of parking as these costs are often borne (at least partly) by employers and other businesses or through tax deductions that cover the costs of ownership, operation, and parking. The size and impact of these subsidies, however, are the subject of intense debate. Where such individuals compare the costs of using transit versus using their cars, however, "their" costs are understated by a significant amount [6]. In addition, although dedicated taxes are not used for road construction in Canada (as they are in the United States), as a general rule of thumb, historically, many provincial governments have equated highway spending to revenues generated from gasoline taxes.

The issue really boils down to a matter of how fuel taxes are treated. If they are considered as charges for the use of roads (as a portion of fuel taxes *are* in the U.S.), then there are conflicting arguments in the literature as to whether auto users are really subsidized at all. If fuel taxes are considered as general taxes, then clearly, auto users do not pay full costs. Fuel taxes, however, do exceed the combined provincial sales taxes and GST and a cogent argument could be made that at least the difference between total fuel taxes per litre and the combined PST and GST can be considered as a user charge. Perhaps, the real issue, however, is whether auto users, regardless of how fuel taxes are treated, pay such externalities as health costs due to air pollution and traffic accidents or those costs associated with ice storms, global warming, floods, etc. which many believe can be attributed to greenhouse gas emissions with automobile emissions recognized as the largest

[6] It should be noted, however, that transit users are also subsidized in that they pay only part of the operating costs and none of the capital costs of transit systems, as pointed out elsewhere in this report.

transportation contributor. As pointed out in Section 1.4, transit users would also pay more if external costs imposed by transit were included in their fares, but the increase would be proportionately less since the external costs imposed by transit are substantially less than those imposed by auto, per passenger-km. [7]

1.5.2 Differing Needs

As noted previously, the attractiveness of transit depends upon a great many factors such as population density, concentration of employment, and street patterns. Since there is a wide variation in such characteristics among municipalities and even within a single municipality, one vision of urban transit probably does not "fit all".

1.5.3 Imbedded Biases

Vision statements are usually developed through consultative processes which, though intended to be broadly based, may be dominated by a variety of single-issue advocates who are not necessarily representative of the true diversity of the entire community. The result may be a vision developed by a small and unrepresentative group of planners and constituents which, therefore, may not always obtain "buy-in" from a much larger segment of the total community.

1.5.4 Conflicting Objectives

Vision setting frequently leads to conflicting objectives. Exclusive bicycle lanes, for example, can conflict with reserved bus lanes and raise safety issues where deliveries of goods are involved. Preservation of neighbourhoods through some forms of "traffic calming", as another example, raises hazards for cyclists, in some cases, and leads to some increase in both fuel consumption and greenhouse gas emissions. Due to the single-issue orientation of most participants in typical consultative approaches to transportation planning (noted above), such conflicts are not easily resolved.

1.5.5 Institutional Constraints

The net operating costs of transit services are funded by municipalities from property tax revenues obtained from *their* constituents. Travel demand, however, is rarely dictated by municipal boundaries. As a result, in many cases, the ability to effectively match the supply and demand for urban transit is constrained by jurisdictional responsibilities that preclude one community spending money to serve the residents of adjacent or nearby communities. Even where regional or inter-regional authorities have been established, achieving agreement on equitable funding and levels of service often means that, in the end, with such fragmented decision making, agreement on improvements lags far behind the increase in needs.

Within Canada, the relative importance of these institutional issues varies considerably. They pose more difficulty in the Greater Toronto Area, comprised of 28 separate municipal governments that

[7] ***Full Cost Transportation and Cost-Based User Pricing.*** IBI Group and Boon, Jones and Associates Inc. September 1995.

operate 12 transit systems, than in cities such as Calgary and Winnipeg which have single municipal administrations and unified transit systems.

In addition, there are a range of institutional constraints on what municipalities can do that are imposed by provincial governments. In Ontario, for example, municipalities are not empowered to raise revenue from other than property taxes whereas in British Columbia, Alberta, and Quebec, municipalities have access to other fees and charges. There are also examples of highway policies applied in urban areas that are in conflict with municipal transit policies.

In addition, within individual municipalities themselves, there are frequently institutional constraints that derive from lack of adequate coordination and integration of programs and policies between planning departments, transit operating agencies, and those responsible for traffic engineering and road construction. Planners, for example, often wish to invest in transit as a precondition for new growth and development whereas the service provider may be more interested in catering to existing demands. Road departments, parking authorities, and transit operators also often have different agendas within the same community.

1.5.6 Fiscal Priorities

Fiscal priorities of both the provincial and federal governments may, in fact, represent the key impediment to achieving new visions for urban transit. In both cases, debt and tax reductions are increasingly seen as more important policy objectives than the expansion of public services. For the provinces, the funding of health care is the number one concern, a sector which has experienced rising costs, rising expectations, and rising public concern that in aggregate, may well exceed public concern about urban transit.

In fact, the same can be said for municipalities that, depending upon the province, are now required to find funding for expanded demands in education, social services, social housing, and policing, as well as transit, primarily or entirely from property tax revenues.

Simply stated, adoption of a vision does not necessarily lead to actions that are consistent with that vision unless the appropriate policies and priorities eventually become part and parcel of *formal or legal* plans, changes in municipal by-laws, and *programmed* budgets. The vision's key role is to help focus the thinking of society's leaders, transportation providers and consumers, and the public at large so that the appropriate policies, plans, programs and budgets are, in fact, developed and implemented.

2. EXISTING URBAN TRANSIT VISION STATEMENTS

This chapter focuses on existing urban transit/transportation vision statements, goals, targets, indicators, levels of success and underlying factors. Following a brief description of the research conducted, findings are presented, initially dealing with vision statements and then with goals, targets and indicators, followed by brief descriptions of transit experience (e.g. periods of rising or falling ridership) and underlying factors.

2.1 RESEARCH CONDUCTED

2.1.1 Purpose of Research

Examples of vision statements and related goals, targets and other factors were researched in order to provide background information for the development of a national vision for urban transit in Canada to 2020. Drawing on information, in particular, from Canadian urban areas and relevant agencies, as well as on selected international sources, provides useful examples of experience elsewhere in developing such statements as well as providing substantive information on the types of goals and targets deemed to be most relevant by others who have been addressing the same issues.

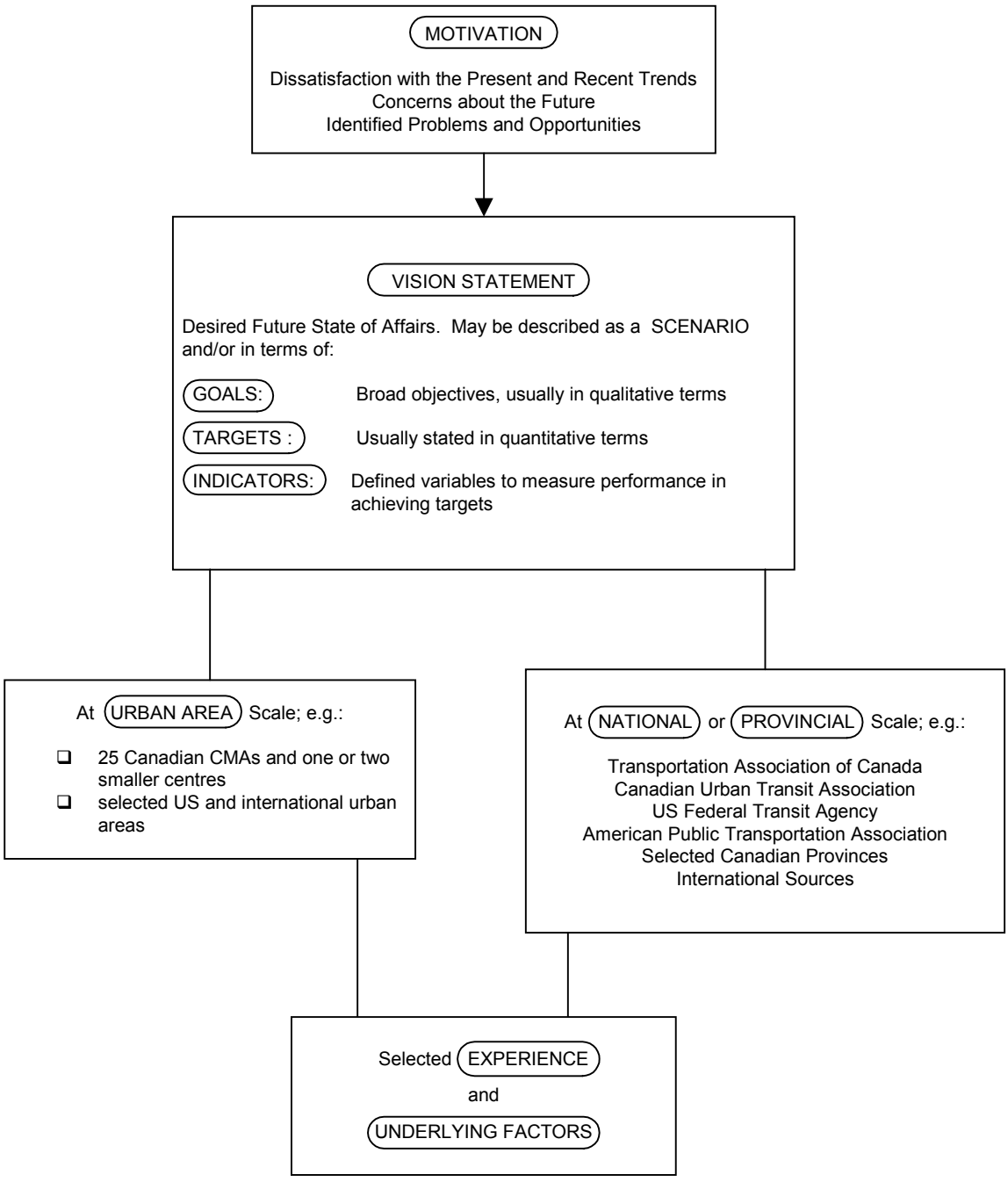
2.1.2 Definition of Terms and Scope of Research

As summarized in Exhibit 2.1, plans for future improvements in transit (and many other areas) are usually motivated by dissatisfaction with the present situation and recent trends, related concerns about the future, and specific problems and/or opportunities which provide a stimulus for thinking about an improved future. Planning studies are carried out to study these possibilities, often based on developing and evaluating several different concepts or scenarios and comparing them in terms of benefits and costs. As input to this process, or sometimes developed in parallel with it, planners often develop a vision statement (sometimes also referred to as a mission statement) which describes fairly succinctly the desired future state of affairs. The vision statement may be presented as a preferred *scenario* or it may be based on a set of *goals*, stating broad objectives, usually in qualitative terms, which are embodied in the vision. In some cases, planners also specify *targets* to be achieved, usually stated in quantitative terms, which requires the definition of *indicators* in order to measure performance in achieving targets.

As also summarized in Exhibit 2.1, the study team drew mainly upon findings for the 25 Canadian Census Metropolitan Areas (CMAs) and a number of smaller centres in Canada [8], augmented by statements of visions and goals/targets produced by government agencies and relevant associations. A smaller number of selected U.S. and international urban areas and relevant agencies/associations were also included. Sources ranged from business plans of individual transit properties to broad master plans and visioning studies by municipalities, regional planning agencies, provincial or national governments or transit/transportation associations.

[8] Including some lower tier municipalities located in the CMAs. A larger list of references is included in the Bibliography at the end of the report.

EXHIBIT 2.1: DEFINITION OF TERMS AND SCOPE OF RESEARCH



The selected urban areas and other agencies and sources are listed in Exhibit 2.2. The study team visited websites and drew on relevant reports in the literature, augmented in some cases by telephone and/or e-mail follow-up. A request for information on transit visions and, goals and indicators was also emailed to the general managers of all Canadian transit properties which are members of the Canadian Urban Transit Association (CUTA) and to selected provincial agencies and other organizations in Canada and abroad. It should be emphasized, however, that the limited time and resources precluded conducting a comprehensive survey of these sources. The results are therefore indicative only and are undoubtedly incomplete and perhaps in some cases outdated. Despite these limitations, the research findings provide useful background to help simulate thinking about a national vision for urban transit in Canada and related goals and targets.

2.2 VISION STATEMENTS

2.2.1 Context and Types of Statements

Urban areas are complex, ever-changing organisms comprised of interacting economic, social, environmental and physical systems. Transportation plays a central role in the functioning of cities and, as noted in Chapter 1, urban transit plays a role secondary to that of private automobiles and commercial goods vehicles, and yet an essential role to provide necessary passenger transportation capacity and service, particularly in major travel corridors and during peak demand periods. Transit also plays a primary role in providing a basic level of accessibility for those unable to travel by private automobile or not wishing to do so. In addition to its competing and complementary roles vis-à-vis the automobile, transit also interacts directly with the pedestrian mode of travel (every transit trip starts and ends as a pedestrian trip) and cycling (which can serve as a feeder and distributor for some transit trips). The convenience and viability of urban transit is also greatly affected by the overall distribution and density of land use in an urban region (i.e. its urban structure at the "macro" scale) and also by urban design at the community scale (transit-oriented development); compact, mixed-use urban subcentres and corridors, with higher densities close to transit stations, can be conveniently and efficiently served by urban transit which, in turn, helps to shape and make possible this type of development.

Interactions of this type are illustrated in Exhibit 2.3. As indicated, primary components affecting urban transportation include urban development policies, infrastructure systems, and transportation management approaches/policies, each of which has important elements some of which are illustrated in the exhibit. Urban transit, as a component of the urban transportation system, interacts with all of these components and subcomponents, and cannot be realistically considered in isolation. As illustrated in city after city, and described briefly in terms of success stories later in this chapter, the success or failure of transit depends on all of the other urban system components with which it interacts. A major challenge in developing a transit vision statement is how best to include these interactions in a meaningful, yet reasonably succinct way.

EXHIBIT 2.2: SELECTED URBAN AREAS, OTHER AGENCIES AND SOURCES

Urban Area	Year 2000 CMA Population (000's)	Major Sources: Transportation/Transit Plan Reports
Canadian CMAs		
Toronto (Ontario)	4,751	A Transportation Vision for the City of Toronto Official Plan (2000); Removing Roadblocks, Greater Toronto Services Board (1999); Year 2021 Plan, GO Transit (1998)
Montréal (Québec)	3,480	Greater Montréal Area Transportation Management Plan (2001) Plan stratégique de développement du transport métroplitain, AMT (1997)
Vancouver (British Columbia)	2,049	Transport 2021: A Long Range Transportation Plan for Greater Vancouver (1993); Liveable Region Strategic Plan (OECD) (1993), Strategic Transportation Plan (TransLink) (2000)
Ottawa–Hull (Ontario–Québec)	1,081	OC Transport Comprehensive Review (1999); Transportation Master Plan (1996); une Vision d'Avenir pour l'Outaouais (1996)
Calgary (Alberta)	953	Calgary GoPlan (1994)
Edmonton (Alberta)	944	Transportation Master Plan (1997)
Québec (Québec)	690	L'Avenir due Transport en Commun (1990)
Winnipeg (Manitoba)	681	Plan Winnipeg: Toward 2010 (1993 updated 2001)
Hamilton (Ontario)	672	Hamilton-Wentworth Official Plan (1998)
Kitchener (Ontario)	422	Region of Waterloo – Regional Transportation Master Plan (1999), Grand River Transit – 5 Year Business Plan (2001)
London (Ontario)	421	London Transportation Plan Review (1994) Vision London: Infrastructure Plan (1996)
St. Catharines–Niagara (Ontario)	390	Strategic Opportunities Plan, St. Catharines Transit Commission (2001); Transfocus 2021 (1974)
Halifax (Nova Scotia)	356	Halifax Regional Municipality Vision 2020 (2000) HRM Transit Services 2001/2002 Business Plan (2000)
Victoria (British Columbia)	318	Integrated Transportation for the City of Victoria – Strategies (1995) Regional Growth Strategy – Capital Regional District (1997)
Windsor (Ontario)	304	Windsor Area Long Range Transportation Study (WALTS) (1996)
Oshawa (Ontario)	298	5 year Business Plan: Oshawa Transit (2001)
Saskatoon (Saskatchewan)	233	Plan Saskatoon Project: Workbook (1995)
Regina (Saskatchewan)	201	Regina's Transportation Strategy (1995)
St. John's (Newfoundland)	175	Internal mission statement, St. John's Transit Commission
Chicoutimi–Jonquière (Québec)	160	CITS Étude de Marché (1988)
Sudbury (Ontario)	157	Transportation Official Plan for Greater Sudbury (1980)
Sherbrooke (Québec)	153	Evolution de Marché de Transport Collectif Urbain (1990)
Trois-Rivières (Québec)	142	
Saint John (New Brunswick)	128	
Thunder Bay (Ontario)	126	Thunder Bay Transit: Transit Strategies and 2000 Service Plan (1999)

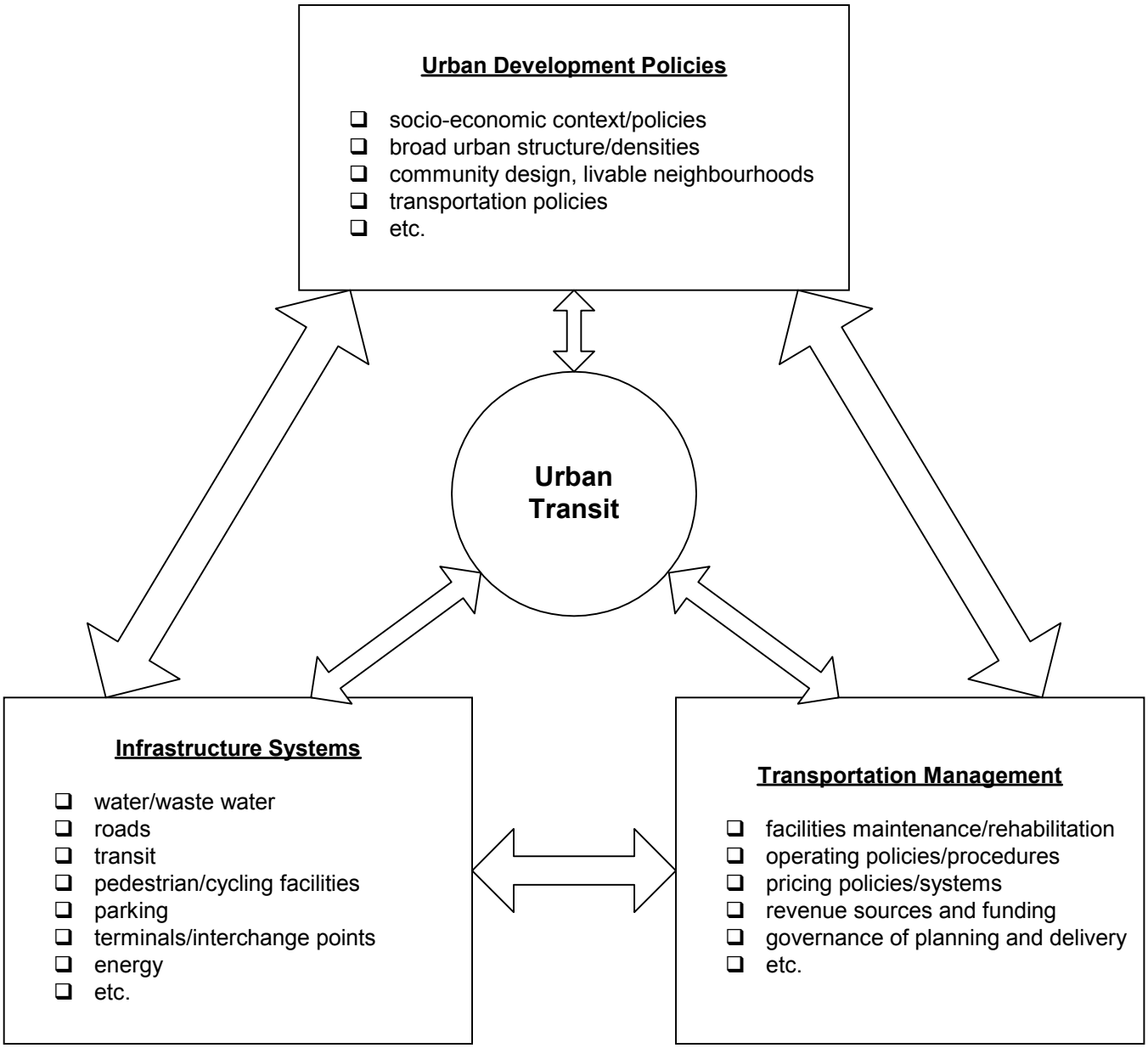
EXHIBIT 2.2: SELECTED URBAN AREAS, OTHER AGENCIES AND SOURCES (Cont'd)

Urban Area	Major Sources: Transportation/Transit Plan Reports, etc.
Other Urban Areas	
Kelowna BC	Kelowna and Central Okanagan Transportation Planning (1995)
Victoria (NSW, Australia)	Linking Victoria (2001)
Brisbane (South East Queensland, Australia)	Integrated Regional Transportation Plan (1997)
NSW Department of Transport	Action for Transport 2010 (for NSW and Sydney) (2001)
Auckland (NZ)	Auckland Regional Land Transport Strategy (1999)
Wellington (NZ)	The Wellington Regional Land Transport Strategy 1999 – 2004
London (U.K.)	Greater London Authority The Mayor's Transportation Strategy (2001)
Washington (DC)	The Vision (1998)
Los Angeles	2001 Long Range Transportation Plan for Los Angeles (2001)
Boston	Access Boston 2000-2010 (2000)
Seattle/Puget Sound	RTA: Sound Move the Ten-Year Regional Transit System Plan (1998)
Portland, Oregon	The Transit Metropolis: A Global Enquiry, by Robert Cervero (1998) pp 416-423
Curitiba (Brazil)	Natural Capitalism, by Paul Hawken, Amory Lovins and Hunter Lovins, (1999) pp 291-295
Vienna (Austria)	APTA International Transit Studies Program Report (1995)
Zurich (Switzerland)	APTA International Transit Studies Program Report (1996)
Canadian Provincial/Territory Governments	
Alberta	Urban Light Rail Transit Initiatives in Alberta (2000) Alberta Transportation Business Plan 2001 – 04 (2001)
British Columbia	BC Transit Performance Plan Fiscal Years 2001 – 2004 (2001)
Manitoba	Manitoba Transportation & Government Services Strategic Direction (2001)
New Brunswick	Department of Transportation Strategic Goals 1999 – 2001 (1999)
Newfoundland	Works, Services & Transportation Department Profile (2001)
Northwest Territories	Department of Transportation Mission 2001
Nova Scotia	Transportation and Public Works Business Plan 2001 – 2002 (2001)
Nunavut	Community Government and Transportation Mission Statement (2001)
Ontario	Ministry of Transportation Business Plan 2001 – 2002 (2001) 2001 Ontario Budget, Paper E SuperBuild: Building Ontario's Future; Transportation Planning for the OECD/HW, OECD (1999)
Prince Edward Island	
Québec	Plan Stratégique du Ministère des Transports 2001 – 2004 (2001)
Saskatchewan	Annual Report 1999 – 2000

EXHIBIT 2.2: SELECTED URBAN AREAS, OTHER AGENCIES AND SOURCES (Cont'd)

	Major Sources: Transportation/Transit Plan Reports
Associations, International Governments	
Transportation Association of Canada (TAC)	A New Vision for Urban Transportation (1993) Financing Urban Transportation (1997)
Canadian Urban Transit Association (CUTA)	At the Crossroads: Towards a Federal Vision for Urban Transit (2001)
Canada Transportation Act Review Panel (CTAR)	Final Report, Canada Transportation Act Review Panel: Vision and Balance (2001)
U.S. Federal Transit Agency (FTA)	Strategic Plan 1998 – 2002 (1998) FY 2002 Performance Plan (2000)
American Public Transit Association (APTA)	Mobility Strategic Goals for the 21st Century (4 scenarios) (1996)
United Kingdom	A New Deal for Transport: Better for Everyone. The Government's White Paper on the Future of Transport (1998)
New Zealand	Statement of Intent 2000/2001 (2000)
European Conference of Ministers of Transport (ECMT-OECD)	Implementing Sustainable Urban Transport Policies (2001)
International Association of Public Transport (UITP)	Mission Statement (2001)
German Federal Government	Basic parameters for an efficient and attractive Local Public Transport (2000)
Commission of the European Communities	Proposal on action by member states concerning public service requirements and the award of public service contracts in passenger transport by rail, road and inland waterway

EXHIBIT 2.3: URBAN TRANSIT: PART OF A COMPLEX URBAN SYSTEM



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2.2.2 Overview of Research Results

Virtually all of the urban areas included in the research had some type of urban transit vision statement, some of which were presented in coherent scenario form while most were in the form of a brief statement of intent or mission statement augmented by a series of goals and in some cases quantitative targets. In other cases the statement is made up solely of a set of goals without an overall summary.

The main overview finding is therefore that, when dealing with transit and the broader context of transportation, most of Canada's larger and medium sized urban areas and many smaller areas have taken the time to describe the desired future state of their transportation/transit system as a basis for planning and delivering improved transit, including the very important requirements of public information and consultation. As described in the remainder of this chapter, while a wide variety of examples exist, most of the vision statements are similar in that they deal with both improved *effectiveness* and improved *efficiency* as desired attributes of future urban transit.

2.2.3 Some Examples

An important early example of the "scenario" type of vision is illustrated in Exhibit 2.4. This is drawn from the 1993 publication ***A New Vision for Urban Transportation***, produced by the Urban Transportation Council of the Transportation Association of Canada (TAC), reprinted in November, 1998. This generic vision illustrates very clearly the interactions affecting urban transit, as indicated by the fact that the vision is based on 13 principles which are stated as follows:

"Urban Structure and Land Use:
Plan for increased density and more mixed land use;

Walking:
Promote walking as the preferred mode for person-trips;

Cycling:
Increase opportunities for cycling as an optional mode of travel;

Transit:
Provide higher quality transit service to increase its attractiveness relative to the private auto

Automobile:
Create an environment in which automobiles can play a more balanced role

Parking:
Plan parking supply and price to be in balance with walking, cycling, transit and auto priorities;

Goods Movement:
Improve the efficiency of the urban goods distribution system;

Intermodal Integration:
Promote intermodal and interline connections;

EXHIBIT 2.4: A GENERIC VISION FOR URBAN TRANSPORTATION

"It is the year 2023:

A long term urban development plan has been approved. It emphasizes multi use town centres and high density, mixed use along connecting corridor. Transit has funding and operating priority in those corridors.

- Short-medium term community/ neighbourhood plans have been approved. They emphasize compact, mixed use communities based on pedestrian, cycling and transit-friendly design.
- Transit, highways, arterials, parking and truck routes are planned and coordinated across the urban area.
- The percentages of trips made by walking, cycling, transit and high occupancy automobiles are all increasing; the percentage of trips made by single occupant automobiles is decreasing.
- The average distance and time for peak hour commuter travel is decreasing.
- an area wide parking strategy is in place and enforced.
- There are very few places which still require on-street goods transfer.
- The physically challenged enjoy universal access to public transport facilities and services.
- Roads and bridges are in a good state of repair.
- Air pollution from motor vehicle sources is declining.
- Urban transportation infrastructure and services are adequately funded from stable and sustainable revenue sources.
- Political leaders have the support of a well informed public when making decisions on urban development and transportation systems to serve the area.

Transit

Provide higher quality transit service to increase its attractiveness relative to the private auto.

More attractive service and increased market share for transit are essential elements in achieving this vision. Better transit can reduce reliance on the single occupant automobile. Current demographics, existing urban designs and funding requirements make this a challenging goal, but many things can be done – especially if improvements are aimed at specific market segments (see Reference 2).

The **key method** lies in new urban structure and land use planning approaches as described in Principle #1 above. **Other methods** include:

- develop a hierarchy of transit services (primary on controlled access ways, secondary on exclusive bus lanes or HOV lanes, a feeder network and auxiliary facilities such as park-and-ride).
- give transit funding and operating priority (e.g.: transit or HOV lanes)
- improve comfort, security, frequency, on time reliability, geographic coverage, access for the physically challenged, and public information services.
- encourage park-and-ride, kiss-and-ride and bike-and-ride by providing appropriate facilities.
- integrate transit stations schedules and fares in areas with more than one transit system.
- introduce preferential income tax treatment for transit use (e.g.: make employer provided transit passes a non-taxable benefit)."

Source: Urban Transportation Council, Transportation Association of Canada (1993).

New Technology:
Promote new technologies which improve urban mobility and help protect the environment

System Optimization:
Optimize use of existing transportation systems to move people and goods;

Special User Needs: design and operate transportation systems which can be used by the physically challenged;

Environment:
Ensure that urban transit decisions protect and enhance the environment; and

Funding/Financing:
Create better ways to pay for future urban transportation systems."

As shown in the bottom part of Exhibit 2.4, more detailed goals for transit (and for each of the other 12 components although not shown here) are a part of the overall vision statement.

Other examples of scenario type visions, developed more recently, include the Calgary ***GoPlan*** (1994) and the American Public Transit Association (APTA) report ***Strategic Goals for the 21st Century*** (1996). As described above for the TAC vision, each of the latter visions comprises a scenario statement of approximately one page, backed up by a number of key goals.

An example of a more goal-oriented statement is the ***Liveable Region Strategic Plan*** (1993***)*** adopted by the Greater Vancouver Regional District (GVRD) which includes the following policies:

"• Managing land use in the region to establish a more compact urban form and complete communities to minimise travel times.

- Applying transportation demand management (TDM), to change the behaviour of travelers in order to make better use of the existing transportation system.
- Adjusting transport service levels, including speed, convenience, frequency of service, and comfort. This can mean among other things allowing congestion to increase for single occupancy vehicles, in part to ensure TDM measures are more effective.
- Supplying transport capacity, including better transit service in dense urban areas, providing special facilities for high occupancy vehicles (HOVs), using bridges and tunnel capacity as a way of limiting use of single occupancy vehicles, and limiting single occupant, long-haul commuting from the valley towns."

"The implications of these GVRD policies for Vancouver are for regional travel to the city to be more dependent on transit, and to set a practical limit to the number of cars which can enter the city during peak periods. Regional access roads to the city are currently operating at close to capacity at peak. Without additional bridge and freeway capacity, the increase in peak trips to the city will need to be accommodated by transit and car pooling."

The Liveable Region Strategic Plan and its stated policies were, in turn, based on the ***Creating Our Future*** vision statement adopted by the GVRD in 1990, as follows:

"Greater Vancouver can become the first urban region in the world to combine in one place the things to which humanity aspires on a global basis: a place where human activities enhance rather than degrade the natural environment, where the quality of the built environment approaches that of the natural setting, where the diversity of origins and religions is a source of social strength rather than strife, where people control the destiny of their community, and where the basics of food, clothing, shelter, security and useful activity are accessible to all."

"In 1995 (Vancouver) City Council adopted **CityPlan** as its vision for the future of the city. CityPlan reasserts the broad regional objective of placing a greater emphasis on transit, walking and biking, within and between neighbourhood centres and the Downtown. In part this is to be achieved by making better use of the existing system for moving people and goods. In order to achieve the transportation directions, the City will support:

- increased transit use into and within the city by improving existing transit service, using smaller buses, innovative services, and implementing new rapid transit lines;
- discouragement of car use by charging car users a larger share of their costs through user fees such as bridge tolls, gas taxes, increased parking rates, or commuter levies.

In its own policies and actions the City will:

- promote walking and cycling by providing better pedestrian and bicycle connections to neighbourhood centres, planning neighbourhood centres for pedestrians and providing more facilities for bicycles;
- make better use of existing streets for bikes, buses, goods movement, and carpools; and
- encourage land use that reduces the demand for travel by creating neighbourhood centres, focusing more jobs in these centres, protecting industrial land, and continuing to develop new residential neighbourhoods planned for Downtown."

An example of a less detailed vision statement is the vision statement adopted in 1996 by the Regional Transit Authority of the Central Puget Sound region, which reads basically as follows:

"The RTA's vision for the region's HCT system and an essential tool for the region's healthy growth is a combined rail and regional express bus system.

That vision is to expand the capacity of our region's major transportation corridors by adding new high-capacity transportation services and facilities. In addition to increasing the people-carrying capacity of the region's most heavily used transportation corridors, the system would also support growth management policies, limit sprawl and provide the mobility needed for a vital economy.

> The long-range vision includes a mix of transportation improvements high-occupancy-vehicle expressways, regional express bus routes, commuter rail and light rail. The vision includes community "gateways" connections in urban and suburban areas for communities to connect to the rest of the region. The long-range vision also includes the supporting services and facilities needed to put such a system in place."

Again, these statements are in most cases backed up by a more detailed list of goals and, in some cases, targets. An example of a statement of Mission, Vision and Strategic Goals 2000 – 2009 prepared by the Edmonton Transit System (ETS) is shown in Exhibit 2.5.

At the national scale in Canada, the federal government's transportation vision statement is:

> To develop and administer policies, regulations and programs for a safe, efficient and environmentally responsible transportation system.

This provides a broad framework within which a national vision for urban transit can be developed, along with further determination of Transport Canada's role, for example regarding urban transportation and transit.

The review of international sources regarding urban transit visions found that most national governments and urban areas (e.g. in Europe, New Zealand, Australia) focussed more on a list of goals rather than on a succinct vision statement. For example, the European Conference of Ministers of Transport (ECMT) and the Organization for Economic Cooperation and Development (OECD) produced a joint ***Strategy for Urban Travel and Sustainable Development*** in 1995. This strategy proposes a flexible, integrated approach based on three reinforcing strands of *good practice*, *innovations* and *pricing* to encourage sustainable urban development by reducing vehicle-km travelled and fuel consumption. All three strands work towards these same goals, but the more progressive policy elements – those of strands two and three – are intended to bring cities closer to achieving a reduction in congestion and energy consumption, improved access, higher environmental standards as well as a reduction in costs. The strategy includes policies aimed at different levels of government. It also tries to account for the different needs of cities of different sizes. The idea is that the three parts of this policy strategy should be applied together to ensure that a comprehensive, long-term approach to urban sustainability is undertaken. The report focuses on the impact of key policy tools, notably the:

- role of economic incentives and disincentives,
- role of land use planning,
- potential of traffic management schemes, and
- use of marketing, telematics and other innovations to improve public transport.

EXHIBIT 2.5: EDMONTON TRANSIT SYSTEM: STATEMENT OF MISSION, VISION AND STRATEGIC GOALS

ETS Mission

We provide customer-focused, safe, reliable and affordable public transit services that link people, jobs and communities.

Vision

By the year 2009, ETS will be a:

Fully integrated, easy to use public transit system that promotes economic development and improves the quality of life in Edmonton.

Strategic Goals 2000-2009

To accomplish this vision we need to put in place and/or sustain over the next ten years:

1. Services that meet community and business needs citywide.
2. Safe and secure service.
3. Barrier free and accessible system to meet diverse needs.
4. Communities that are informed and supportive of public transportation.
5. Advanced technology and practices.
6. Reduced travel time for our riders.
7. An effective organization.
8. A modern fleet and facilities.
9. Environmentally friendly solution.
10. Regional cooperation and coordination.

Source: Edmonton Transit System

The report concludes that all three strands of the policy package are necessary to reduce car travel – especially in cities – to achieve sustainable urban development. Together, the strategy suggests they could substantially reduce the environmental costs of travel in OECD and ECMT countries.

A more specific national statement is contained in a document by the Federal Government of Germany titled ***Basic Concept for Urban Transit*** (May 2000). This is perhaps the best reasonably succinct statement of its type that we have identified among European governments and it is one that takes a balanced approach between effectiveness and efficiency. Key goals/strategies relating to *effectiveness* include:

- modernization of the vehicle fleet;
- consistent realization of traffic priority and acceleration measures (also helps efficiency);
- measures to improve the interconnection of modes of transport;
- detailed information for the customers of public passenger transport;
- removal of access barriers;
- more safety and cleanliness;
- making use of new market opportunities; and
- measures to insure and increase the quality of staff.

In terms of *cost-efficiency*, key goals and strategies include the following;

- use of competition as an instrument to mobilize customer-focussed services;
- granting of more entrepreneurial freedom to local transport operators;
- an emphasis not only on comfort, frequency, punctuality and travel speed but also on value for money as received by customers;
- greater attention by the federal government on achieving efficiency in supporting local public transport through encouraging cost reduction programs, improved profit and loss accounting and benchmarking to identify differences in productivity.

The fundamental importance of providing a stable financial network for public transport, to enable it to be improved and modernized further in accordance with cost-effective plans and delivery programs, is emphasized in the document.

Other European countries and international cities also emphasize the need for both greater *effectiveness* (e.g. improved urban transit services, more transit supportive land use, better customer information, etc.) and achieving improved *cost-efficiency* (e.g. transit priority to help achieve greater productivity of transit vehicles/drivers, competitive tendering where appropriate, and related measures). The United Kingdom introduced major deregulation of its transit services under the

Thatcher government, with mixed results. In London there is controlled competition for bus services (tendering for individual routes, which may be self-financing or require subsidy) and a closed market for subway services. Bus services in the rest of Britain were also deregulated – with less public control than in London – and the policy also included controlled competition or closed markets for light rail. [9]

Urban transit tends to be a mixture of public and private sector operations in some European countries (e.g. Greece, Italy, United Kingdom). Urban transit remains mostly publicly owned in most European countries but there is controlled competition (tendering of exclusive rights for transit operations) in a significant number of countries (e.g. Denmark, France, Finland, Germany, Netherlands, Portugal, Spain and Sweden).

2.3 GOALS, TARGETS AND INDICATORS

2.3.1 Context

As noted above, virtually all of the urban areas studied used goals as a means of fleshing out their transit/transportation visions. An overview of the results regarding goals is presented in the next subsection, and examples of targets are given in the following subsection.

2.3.2 Overview of Research Results: Goals

Reflecting the complexity of urban transportation/transit, a rather large number of goals can be defined. Drawing on the three "cornerstones" of urban transportation illustrated in Exhibit 2.3, and the "goals" documented by the various urban areas and other agencies, we have listed 30 types of goals or influencing factors [10] in Exhibit 2.6: 12 under the combined heading **Infrastructure and Urban Development**, and 18 under the heading **Transportation/Transit Management.** In order to save space on the exhibit, the goals are paraphrased in terms of the subject matter of each; in the vision document, each goal is usually expressed in a normative manner: e.g. "provide more transit-friendly road system characteristics", "increase transit levels of service through reduced headways (increased frequency) on key routes", etc. In order to provide an overview, we are unable to list all the individual goals proposed for each urban area, but the essence of these goals and their subject matter is captured in the 30 types of goals listed in Exhibit 2.6.

[9] The recent financial performance of Railtrack, a private enterprise that owns rail infrastructure, has raised some questions about continued privatization of urban transit in the U.K.

[10] We have adopted this terminology because some of the items referred to as "goals" in the various vision statements reviewed, and paraphrased in the left-hand column of Exhibit 2.6, could more properly be described as influencing factors (e.g. transportation demand management) or means which could be used to achieve a broader goal (e.g. increased transit ridership). This reflects the close association between goals and influencing factors and in many cases their interchangeable use in the various vision statements. In developing a proposed national vision for urban transit, as described below in Chapter 3, we distinguish between broad "policy goals" and the types of contributing goals" or influencing factors (drawn in part from Exhibit 2.6) which could help to achieve each such policy goal.

EXHIBIT 2.6: URBAN TRANSIT GOALS: OVERVIEW OF FINDINGS

Types of Goals or Influencing Factors	Frequency of Mentions				
	Canadian Urban Areas			Other Urban Areas	National/ Associations/ Provinces
	Large	Medium	Small		
Infrastructure & Urban Development					
• road system characteristics	H	H	H	H	H
• transit levels of service	H	H	H	H	H
• transit connectivity and coverage	H	H	M	H	H
• rapid transit and commuter rail	H	L	L	M	H
• surface transit priority	H	H	L	M	M
• infrastructure maintenance and rehabilitation	M	L	L	M	L
• integrated land use and transportation/transit	H	H	M	H	H
• intermodal integration	H	M	M	H	H
• inter-regional integration	M	M	M	H	H
• pedestrian and cycling facilities	H	M	L	H	M
• parking facilities and policies	M	M	L	M	L
• goods movement facilities	H	L	L	M	M
Transportation/Transit Management					
• transit cost recovery from fares	H	L	L	M	M
• transportation pricing and user pay policies	H	L	L	L	M
• transit/transportation funding	H	H	H	H	H
• fare collection systems	M	M	L	M	M
• accessible transit	H	H	M	M	H
• less auto dependence	M	M	L	H	M
• affordability and equity	H	M	L	M	L
• neighbourhood noise and intrusion	H	L	L	M	L
• energy efficiency	H	L	L	H	H
• reduced emissions	H	M	M	H	H
• transit ridership levels	H	M	M	M	M
• transit market share	H	M	L	M	M
• transportation demand management	H	M	L	M	M
• information technology applications (ITS)	M	M	L	M	M
• public education, consultation, relations	H	H	M	M	H
• performance monitoring/data collection	M	M	M	M	H
• safety and security	H	M	M	H	H
• transit productivity	L	L	L	M	M

Legend

Large – Greater than 900,000 regional population in 2000 *
Medium – 200,000 – 900,000 regional population in 2000
Small – Less than 200,000 regional population in 2000

H = Mentioned by >80% of urban areas/other agencies
M = Mentioned by 40 – 80% of urban areas/other agencies
L = Mentioned by < 40% of urban areas/other agencies

Note: This overview should be interpreted as broadly indicative only, reflecting the fact that goals not specifically mentioned in the documents reviewed may be considered important in the relevant urban area but not listed in those particular documents, or may be subsumed as part of another broader goal.

Again, in order to provide an overview, we have listed the frequency of mentions for each goal, as provided by each of five categories of urban areas and other agencies. The first three categories are Canadian urban areas, and these are defined as **Large –** greater than 900,000 regional population in 2000 (Greater Toronto, Greater Montréal, Greater Vancouver, Ottawa-Hull, Calgary, Edmonton), **Medium** – between 200,000 and 900,000 regional population in 2000 (Quebec, Winnipeg, Hamilton, Kitchener, London, St. Catharines-Niagara, Halifax, Victoria, Windsor, Oshawa, Saskatoon, Regina), and **Small** – less then 200,000 regional population in 2000 (St. John's, Chicoutimi–Jonquière, Sudbury, Sherbrooke, Trois-Rivières, Saint John, Thunder Bay and Kelowna). The fourth group, labelled "Other Urban Areas" in Exhibit 2.6, includes the international urban areas listed in Exhibit 2.2, and the fifth category is Statements by National Transit Agencies, Associations or Provincial Agencies.

As shown in Exhibit 2.6, the symbol **H** indicates that a particular type of goal was mentioned by more than 80% of the urban areas or other agencies in each category, the symbol **M** indicates that the goal was mentioned by 40 – 80% of the areas/agencies studied, and the symbol **L** indicates that fewer than 40% of the areas/agencies mentioned the goal in question.

While the three categories defined by the symbols, **H**, **M** and **L** (High, Medium and Low frequency of mentions) are relatively broad, this level of resolution is in line with the indicative nature of the research program, but it has enough resolving power to show some interesting patterns of similarity and differences among the five categories of urban areas/agencies studied.

Numbers of Goals Mentioned

Turning first to the three size categories of Canadian urban areas, it will be noted that, for the largest six Canadian CMAs, 22 of the 30 goals were mentioned by more than 80% of the urban areas, seven were mentioned by 40 – 80%, and only 1 was mentioned by fewer than 40% of the urban areas. In contrast, only 8 of the goals were mentioned by more than 80% of the medium size category of Canadian urban areas, 14 goals by 40 – 80% of the urban areas, and 8 goals by fewer than 40%, and the corresponding numbers for the small size category of Canadian urban areas are 3 goals mentioned by more than 80%, 10 by between 40 and 80%, and 17 by fewer than 40% of the urban areas. While these numbers are based on non-comprehensive data as noted at the beginning of this chapter, they appear to indicate a stronger level of interest in urban transit and a desire to achieve a larger number of goals relative to transit in the larger urban areas, with corresponding lower levels of interest and numbers of goals proposed by the medium and small areas. This finding is not altogether surprising, given the fact that urban transit becomes increasingly important and, indeed, essential as the size of an urban area increases, resulting in corridors with high traffic densities which cannot be served efficiently or effectively by automobiles alone.

The results for other (international) urban areas fall somewhere between those for large and medium Canadian urban areas, as do the results for the national/provincial agencies and transit associations. Again, these results appear to be consistent with the fact that the international urban areas are generally in the large/medium categories in terms of size, and the viewpoint of national/provincial agencies and transit associations could be expected to reflect the average viewpoints of their constituent urban areas, with a bias towards the large size category, bearing in mind the greater importance of transit to those urban areas.

Types of Goals Mentioned

The above results may provide some useful insights in developing vision and goal statements which reflect the different characteristics and requirements of various size categories of Canadian urban areas. It is recognized that the level of interest in various goals could reflect differences in attributes other than the *size* of urban areas, for example growth rates, geographical context, types of transit and levels of transit use, and/or average income levels could also be used to define categories; however, the nature and accuracy of the available information does not support this increased level of analytical detail, and the size categorization is seen as most useful as background for developing a Canadian vision statement and goals.

In addition to the numbers of goals receiving frequent and less frequent mentions, it is equally and perhaps more instructive to examine which *types* of goals are mentioned more frequently by the various sizes of urban areas. For example, only three of the goals are mentioned with high frequency by all three size categories of urban areas: road system characteristics; transit levels of service; and transit/transportation funding. Significantly, these three goals also receive high frequency of mentions by the international urban areas and the national/provincial agencies and associations.

At the next level of apparent importance, five goals are mentioned by two of the three Canadian urban area size categories (large and medium in all cases): transit connectivity and coverage; surface transit priority; integrated land use; accessible transit; and public education, consultation and customer relations. These results are reflected also in those from the international urban areas and the national/provincial agencies and associations: for each of the five goals, one or both of the latter two categories treats them with high frequency mentions or with one high and one medium frequency.

At the other extreme, eight of the goals receive a low frequency of mention by at least two of the Canadian urban area size categories (the medium and small categories in all cases): rapid transit and commuter rail; infrastructure maintenance and rehabilitation; goods movement facilities; transit cost recovery from fares; transportation pricing and user pay policies; neighbourhood noise and intrusion; energy efficiency; and transit productivity. The latter goal receives low frequency of mention from all three Canadian size categories [11]. The international urban areas tend to mention these goals with medium frequency in most cases as do the national/provincial agencies and transit associations, except that the latter category mentions rapid transit and commuter rail with high frequency and energy efficiency with high frequency also, in contrast to the medium and small Canadian urban areas.

[11] We suspect that the relatively low frequency of mentions for transit productivity reflects the emphasis on broad, strategic goals in many of the vision documents and planning reports reviewed, rather than a lack of interest in productivity by transit managers and others. For example, most of the transit business plans reviewed tended to mention this goal, while broader plan reports were less likely to do so.

2.3.3 Overview of Research Results: Targets and Indicators

Exhibit 2.7 summarizes the quantitative urban transit targets and indicators which were a part of the visions/goals/targets statements provided by six of the Canadian urban areas. No other targets were identified in the Canadian material reviewed/received, although it is quite likely that a more complete survey would have revealed others. Again, the types of targets, the indicators used to quantify them and the range of quantitative levels aspired to are quite useful as background information for developing proposed targets for Canadian urban areas.

As shown in the exhibit, the most commonly quoted target is for increased ridership, expressed either in terms of total annual ridership or annual rides per capita. Targets falling in this category were documented by Greater Vancouver, Ottawa, Hamilton, London and Windsor. Modal split targets were also set out by Ottawa and Windsor. Reductions in congestion levels relative to trend (business-as-usual) values by a target year or reductions in peak period auto use expressed in the same manner were set out by Edmonton and London, respectively.

Other targets documented are a percentage increase in the bus fleet and in HandyDART services by Greater Vancouver; increases in productivity (passengers per service hour) and in average revenue per passenger, by Ottawa; a "modest" increase in emissions above 1990 levels by 2010, mentioned by Edmonton; and decreases in peak period headways on key routes and increased cost recovery, by Windsor.

By far the most complete set of targets is provided by the U.S. Federal Transit Agency in its fiscal year 2002 Performance Plan: of the 22 goals documented in this plan from the 30 transit goals shown in Exhibit 2.6, 12 are stated as quantitative targets as well as qualitative goals. The Plan also goes on to list proposed performance activities to help achieve the stated targets.

2.4 SELECTED EXPERIENCE

2.4.1 Six Canadian Transit Systems

As pointed out earlier, it is instructive to describe briefly a small number of success stories with a brief assessment of contributing factors. As dynamic, complex organisms in a continuing state of evolution, cities are subject to "ups and downs" in their levels of economic success, social trends, environmental conditions, physical systems, and other factors affecting the quality of life of their inhabitants. As one component of the urban system, transit is subject to similar ups and downs; this decade's "failure" may change into next decade's "success" or vice versa. Underlying factors may include "external" factors affecting the city and the country (e.g., wars, economic depressions and booms, major levels of immigration and rates of population growth, explosive growth of car ownership) and/or "internal" factors relating to the planning, delivery, funding and management of the urban transit system and the broader transportation and urban systems of which it is a part.

EXHIBIT 2.7: URBAN TRANSIT TARGETS: REPRESENTATIVE EXAMPLES

Greater Vancouver: Translink targets for 2005:

- ridership up 30%, bus fleet up 48%, HandyDART service up 21% relative to 2000 levels

Ottawa–Hull: City of Ottawa targets

- ridership to 120 rides/capita/year by 2005 (currently 111 rides/capita/year)
- modal split to 20% by 2021 (from 15.2% in 1995)
- productivity to 38 passengers/service hour and $1.10 average revenue/passenger (no date)

Edmonton:

- 2%/year infrastructure replacement rate (in accordance with OECD standard)
- 40 – 47% reduction in congestion versus trend levels by 2020
- emissions "modestly" above 1990 levels by 2010

Hamilton:

- ridership to 100 rides/capita/year (no date) (currently 44 rides/capita/year)

London, Ontario:

- 40% increase in ridership by 2011, walking trips up 15%, cycle trips doubled
- reduce peak period auto use by 15% versus trend levels by 2011

Windsor:

- 12 million transit rides/year by 2016 (versus 6.5 million in 1996)
- 39 transit rides/capita/year by 2016 (versus 35 in 1996)
- transit modal split to 6% by 2016 (similar to level in late 1980's)
- peak period headways on key routes to 15 minutes by 2003 (versus 30 minutes in 1996)
- peak period headways on key routes to 10 minutes by 2007
- cost recovery (R/C) ratio to equal or exceed 60% (no date)

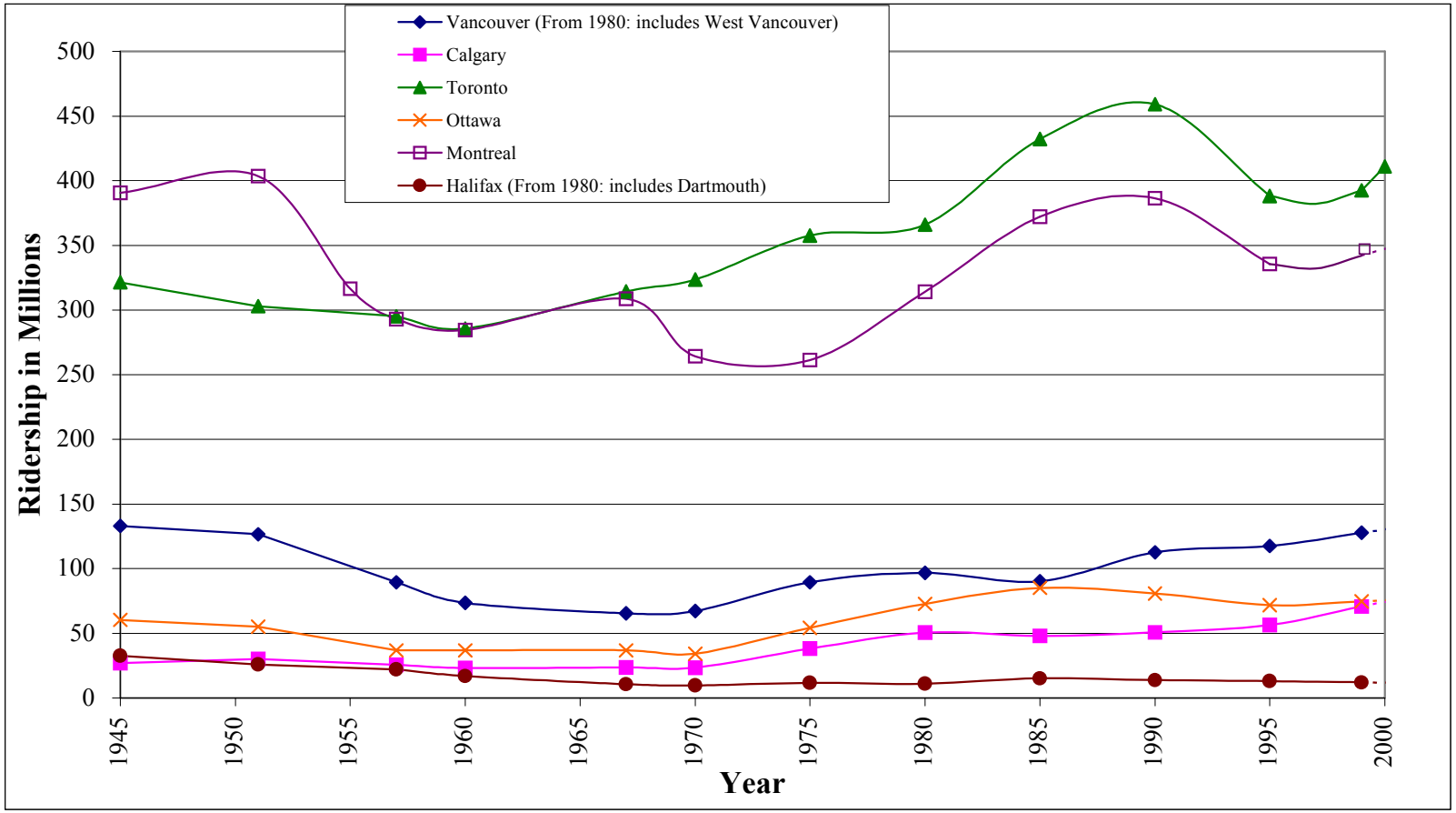
The following examples might therefore more aptly be called "adventure stories" rather than success stories, since in most cases they include some periods of decline as well as growth. The examples are outlined very briefly, using trends in total annual ridership and in annual rides per capita as measures of success, and focussing on underlying factors, as background information for developing a Canadian urban transit vision statement, goals and targets.

We have selected six Canadian transit systems – Vancouver, Calgary, Ottawa, Toronto, Montréal and Halifax – as examples drawn from across the country and from a range of city sizes, locations, economic contexts and population growth rates. Following a brief review of urban transit in the United States and a description of experience in Portland, Oregon, a unique international example, Curitiba, Brazil, is also presented, for reasons which will become clear, followed by two other international examples, Vienna and Zurich, representing mid-size European urban areas.

Ridership Trends and External Underlying Factors

Setting the stage for the Canadian examples, Exhibit 2.8 shows trends in total annual transit ridership for the six selected Canadian transit systems over the period 1945 – 2000. In general, these show the effects of a number of major external factors: high transit ridership levels during World War II reflecting gasoline rationing and the unavailability of new automobiles; and subsequent ridership declines as incomes and car ownership rose during the 1950s and 1960s, accompanied by massive government road building programs to make up for the "lost" years of the 1930s Depression and the War. The 1970s and early 1980s saw a resumption of ridership growth, reflecting significant financial support from governments for transit infrastructure and equipment. Increasing fiscal constraints during the late 1980s and the 1990s led to the curtailment of many of these programs (for example, reduced funding of some provincial support programs for transit) and this, plus reduced employment levels, increased auto ownership and use (especially among the baby boom generation) and reduced numbers of student riders (reflecting the baby "bust" following the boom, and also reflecting government school busing policies) were contributing factors to widespread ridership declines which, however, appear to have bottomed during the latter half of the 1990s followed by resumption of an increasing trend. The high rates of immigration to Canada throughout this period (drawn in particular to Canada's larger centres) and rapid rates of natural increase following the War, as well as periodic recession periods (in the early 1970s, early 1980s and early 1990s) and the two "energy shocks" (1974, 1979) are also seen as important external factors contributing to these trends.

EXHIBIT 2.8: TRENDS IN TOTAL ANNUAL TRANSIT REVENUE PASSENGERS 1945 – 2000: SELECTED TRANSIT SYSTEMS



Source: Data provided by Canadian Urban Transit Association (CUTA)

Annual Rides Per Capita

The trends in annual transit rides per capita shown in Exhibit 2.9 are similar to those for total ridership except that they show an overall declining trend reflecting the fact that urban populations and car ownership and use grew more rapidly than transit trips. (Note that the ways in which rides are counted vary among the operators and, even when normalized, there may be small differences.) The downward trends in rides per capita and market share are a matter of serious concern in the context of this report, although there are hopeful signs of stabilization or a slight upward trend since 1995 in five of the six selected transit systems. This reflects, for example, the increase of 3.4% in overall urban transit ridership across Canada last year, as recently reported by CUTA.

Internal Underlying Factors

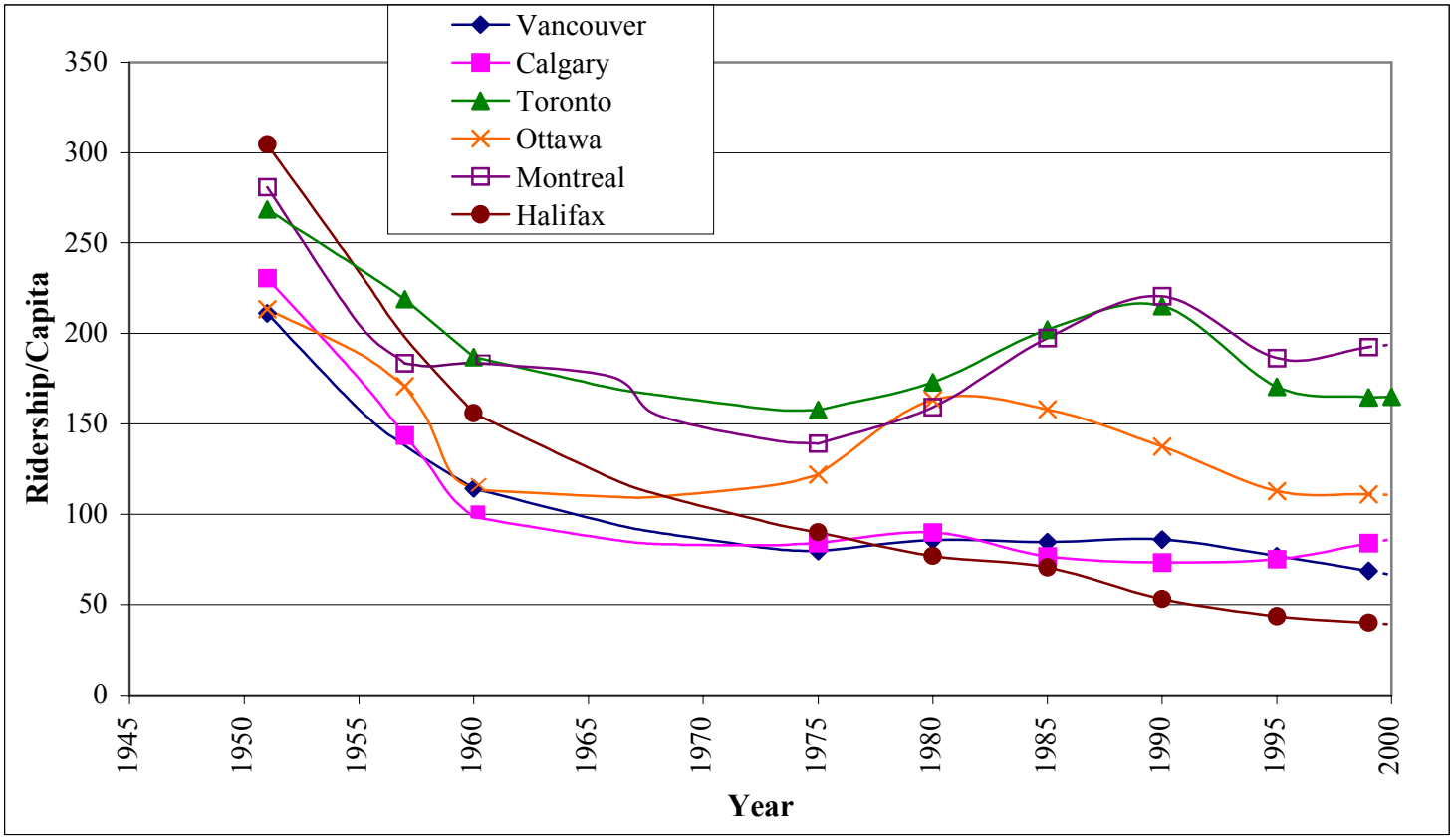
The above comments regarding external underlying factors relating to ridership trends should be interpreted with caution, since it is extremely difficult to demonstrate that a specific factor or set of factors did, in fact, cause an observed ridership trend, given the overall complexity of interacting systems and factors. A similar comment applies to internal underlying factors (that is, initiatives taken within the urban area and/or by its transit/transportation system managers). The following comments regarding how such initiatives may relate causally to ridership increases should also, therefore, be treated with caution.

Having acknowledged this, we feel nevertheless that there is considerable evidence suggesting that transit ridership in a particular area tends to increase during periods when transit system coverage and service levels are being increased and/or when a more integrated and "seamless" service is offered to riders in terms of factors such as schedule coordination and fare integration. For example, following formation of Metropolitan Toronto in 1953, the Toronto Transit Commission constructed the first leg of its subway system and continued to expand the system during the subsequent 25 years. At the same time, the system's bus routes were extended into the rapidly growing suburban areas of Metropolitan Toronto feeding the subway system and integrated with, and often leading, new urban development which was (in the first decade or two following the War) designed with street layouts and land use densities/patterns which were reasonably transit-supportive.

The steady upward trends in ridership between 1960 and 1990 can reasonably be ascribed at least in part to these initiatives, reinforced by an active financing and transit-supportive policy program by the Province of Ontario and magnified by the energy crises of 1974 and 1979. The significant reduction in ridership between 1990 and 1995 is ascribed to a combination of a sharp and relatively prolonged economic downturn coupled with a lack of continuing transit expansion and financial support. The subsequent stabilization and the modest increase in ridership during the past few years is seen as mainly due to economic recovery. A recent provincial announcement of increased future funding for transit is a positive sign.

The ridership profile experienced in Montréal is fairly similar to that described above for Toronto, with the exception of a decline during the period 1967 – 1970, which may have been associated with the aftermath of Expo '67. It seems reasonable to assume that, with this exception, similar initiatives

EXHIBIT 2.9: TRENDS IN TRANSIT ANNUAL RIDES PER CAPITA 1950 – 2000: SELECTED TRANSIT SYSTEMS



Source: Data provided by CUTA

in Montréal (e.g. construction of its extensive subway system and development of an integrated transit service throughout the City of Montréal, Laval and the South Shore), contributed to the overall profile along with the various external factors outlined above. Predictable funding arrangements for the Agence Métropolitaine des Transports by the Québec government, based on fuel tax and other specified revenue sources, are enabling ongoing transit system improvements.

The variations in ridership are somewhat less dramatic for the remaining four systems, although Vancouver, Ottawa and Calgary all demonstrated a rising trend between 1970 and 1980, with a moderate reduction in ridership during the following five years in the Vancouver and Calgary systems. With that exception, ridership in Vancouver shows an uninterrupted rising trend between 1970 and 1999. It seems reasonable to attribute this, at least in part, to partial containment of uncontrolled sprawl by the provincial agricultural preserve program, initiatives towards transit-oriented development patterns through the liveable region planning policies of the Greater Vancouver Regional District, and construction of the SkyTrain rapid transit system and curtailment of freeway expansion as well as rapid population growth. Ridership increases in the future (the just-completed strike notwithstanding) may also be anticipated due to the significant and predictable transit funding program negotiated between the Province of the British Columbia and the GVRD under which substantial annual revenues from fuel taxes, energy surcharges and other sources are dedicated to urban transportation under the control of the Greater Vancouver Transportation Authority, now known as TransLink.

There seems little doubt that the significant ridership increase in Ottawa between 1970 and 1985 can be attributed in part to the introduction of express bus services (based, in part, on use of National Capital Commission expressways) followed by construction of the Region's transitway system, a system of radial busways with integrated feeder/distributor bus services, along with a successful program to stagger peak period work trip demands carried out in cooperation with the federal government which encouraged its employees to adopt a range of arrival and departure times to/from federal offices in order to spread peak demands allowing the transit system to serve them more effectively and efficiently. During this period also the availability of free parking for civil servants was reduced substantially. Ottawa's declining ridership between 1985 and 1995 may be attributed to a softening of the flex-time program, a reduction in the size of the federal civil service, and, more importantly, to a lack of continuing expansion of system coverage and integration, coupled with the economic downturn during the first half of the 1990's.

Calgary's transit ridership also showed a very significant increase during the 1970s, attributable in part to a booming economy, expanded transit services, and other improvements in service levels and integration. Following a slight dip in ridership between 1980 and 1985 (probably reflecting the recession in the early 1980s which was felt severely in Alberta), steady growth has been achieved which may be attributable to ongoing improvements in system integration, the introduction of express buses, and related transit management initiatives plus construction of the LRT system (the first line, serving the south corridor, opened in 1981) and subsequent LRT extensions to the northwest and northeast. More recently the Alberta government's transportation funding program for Calgary and Edmonton, based on 5¢/litre for fuel sold in each city, is providing predictable revenue streams for ongoing system improvements.

As shown in Exhibit 2.8, Halifax has maintained a relatively stable ridership level since the mid 1960s, reflecting ongoing provision of bus services but without the impetus of the types of rapid

transit and related integration with bus services that were able to be achieved in the five larger systems as described above. As noted earlier, stable transit ridership with increasing population means that transit's market share and annual rides per capita are declining, and it is clear from Exhibit 2.9 that this is a continuing challenge in all six urban areas.

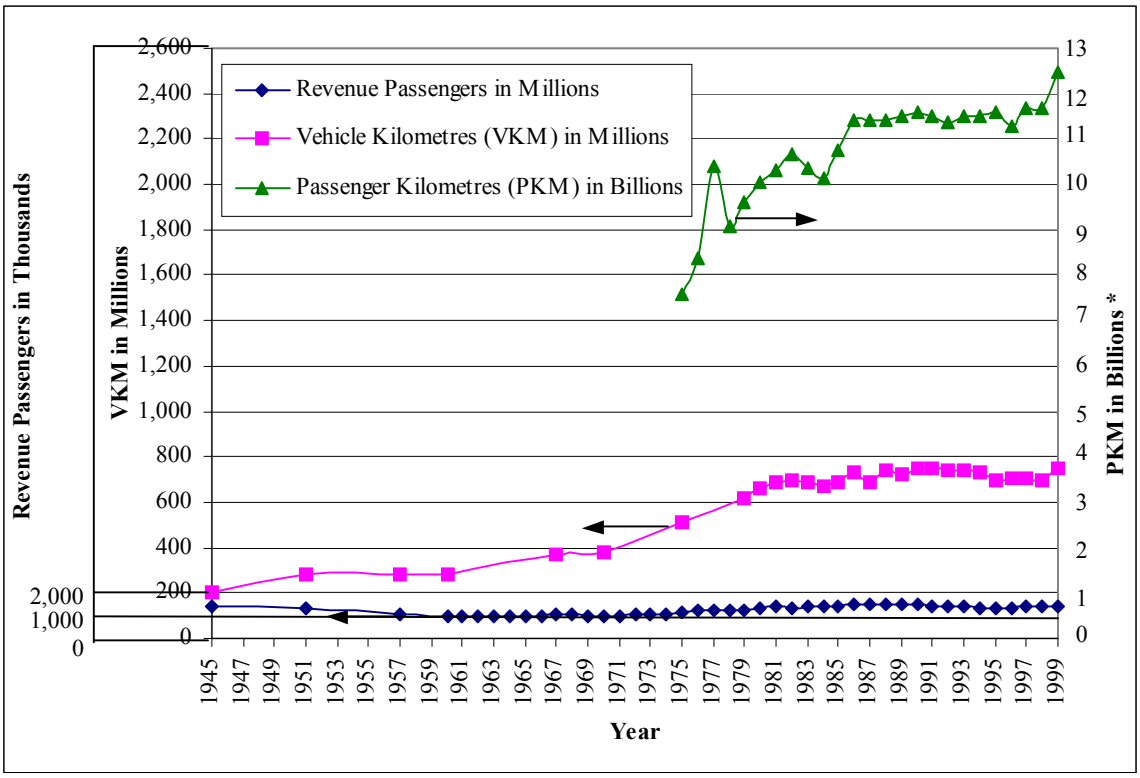
Another challenge is the cost-efficiency with which urban transit services are delivered. As shown in Exhibit 2.10(a) while annual revenue passengers carried by Canadian urban transit systems increased by about 24 percent between 1975 and 1999, the annual transit passenger-km (PKM) increased by about 47 percent (reflecting longer trips as urban areas expanded with large single-use areas forcing longer trips between widely separated activity areas) and the annual transit vehicle km (VKM) provided increased by about 65 percent (reflecting lower passenger load factors in low density, single-use, auto-dependent suburban areas) over the same period. As shown in Exhibit 2.10(b) this has contributed to an increase of about 76 percent in transit system costs (expressed in real, non-inflating dollars) per passenger- carried. Recovering the costs of longer trips from the fare box is difficult because of the policy of a single (uniform) fare in the entire transit service area for most Canadian systems, adopted for simplicity and in order to provide uniform, affordable fares throughout the area.

As illustrated by these trends and mentioned in Chapter 1, transit cost-efficiency (for example measured in terms of passengers carried or fare revenues earned per vehicle-km or similar productivity indicators) is influenced by many factors including average speed achieved by buses (affected by traffic congestion levels and bus priority measures), average trip lengths (affected by average land use densities and large single-use development patterns as opposed to compact, mixed-use development which generates shorter trips and more transit revenue), and average load factors (affected by average land use densities and transit frequency of service). While transit management practices (e.g. controlled competition) may also help, a wide ranging package of actions is therefore desirable to improve transit cost-efficiency; there is no single "magic bullet". It should be recognized in this context that Canadian urban transit systems have achieved revenue-cost (R/C) ratios among the highest in OECD countries; e.g. about 80 percent for the Toronto Transit Commission and the GO Transit system, double the levels achieved by most U.S. and many European systems.

As stated earlier, a number of the goals and targets documented in our research on transit vision statements reflect the desire to achieve improved transit productivity and cost recovery from fares while also maintaining wide service coverage, frequent service and affordable, equitable fare structures. This suggests that improved cost-efficiency of service delivery will require consideration as part of a national urban transit vision. Recent reductions in real transit costs per PKM (about 10 percent between 1996 and 1999) as shown in Exhibit 2.10(b) may indicate the beginning of a promising trend. This is also reflected in a reduction of about 18 percent in transit operating costs per capita (net of government subsidies for Canadian urban transit properties) between 1992 and 1997.

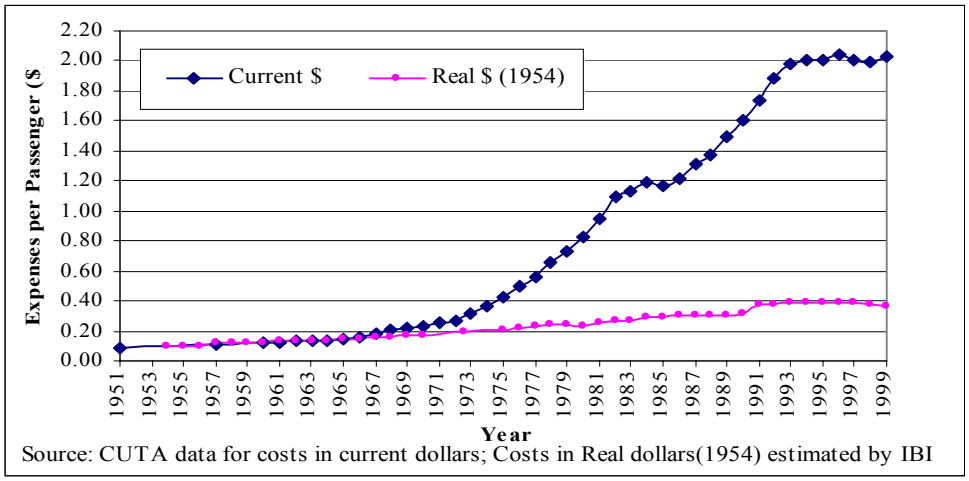
EXHIBIT 2.10: ECONOMIC TRENDS IN CANADIAN URBAN TRANSIT

(a) Revenue Passengers, Revenue Vehicle Kilometres (VKM) and Revenue Passenger Kilometres (PKM)



Source: CUTA data
* Note: PKM data in earlier years should be treated with caution owing to definitional and reporting issues.

(b) Cost per Revenue Passenger



Source: CUTA data for costs in current dollars; Costs in Real dollars(1954) estimated by IBI

Conclusions Regarding Representative Canadian Transit Trends and Underlying Factors

While emphasizing again that our comments regarding underlying factors are not based on rigorous causation analysis, we suggest that a number of broad conclusions may be drawn from the six Canadian transit system examples cited above and similar trends experienced in other Canadian cities:

- External factors, including economic and demographic cycles, wars and energy price/supply fluctuations, as well as immigration levels, population growth and strongly increasing auto ownership and use, have had a profound impact on transit ridership as illustrated by the trends shown during the past half century.

- Superimposed on these externally-influenced trends, however, there is considerable evidence that transit/transportation local initiatives and related land use and transportation management programs can also significantly affect transit ridership and related performance measures. Perhaps most important among such initiatives are programs to expand the coverage and frequency/level of transit service on an integrated basis with land use throughout the urban area, along with introduction of rapid transit and/or express bus services and related policies to provide transit priority and transit- and pedestrian-friendly streetscapes and networks.

- It is difficult to ascribe periods of transit "success" (e.g. as measured by increasing ridership) to the articulation of a vision and related goals, in any direct sense. Nevertheless, most of the Canadian urban areas studied, and certainly the six areas whose ridership trends are discussed in this section, carried out a series of master planning studies during the half century considered above (on average, such studies are often carried out approximately every ten or fifteen years in a given urban area), and virtually all of these studies involved the development and articulation of a set of goals relating to transit/transportation which were reflected in the study recommendations and subsequent actions.

- However, as pointed out in Chapter 1, visions and goals without resources and programs are of little use. It is no accident, we suggest, that periods of ridership expansion and related transit performance improvements – as described above in this section – have tended to occur during periods of system expansion and improved integration (which requires significant capital funding for equipment and infrastructure) while ridership declines have tended to coincide with periods of little or no system expansion and, in some case, reductions in service reflecting reduced transit funding. *In short, public policies and actions have had, and will continue to have a critically important impact on the success or otherwise of urban transit, and visions and goals provide the intellectual underpinning and public articulation necessary to mobilize such actions.*

- In the context of ongoing financial constraints, governments in Canada and elsewhere have focused increasingly on means of achieving greater cost-efficiency in urban transit, to help ensure that government investments in transit are well-spent. As demonstrated by the Canadian trends shown in Exhibit 2.10, key strategies aimed at achieving more ridership (e.g. more compact, mixed-use urban development and integrated planning and delivery of development patterns/densities, transit facilities/services and the underlying road system) are also important means of improving the cost-efficiency of transit. Transit management practices (e.g. controlled

competition) may also contribute to higher revenue-cost (R/C) ratios, although some Canadian properties are already achieving very high R/C ratios relative to those in other western countries.

- Factors other than system expansion/integration and improved cost-efficiency are also extremely important, however, including improved transit service reliability and passenger information, public attitudes towards improved transit and its increased use in response to environmental and liveable-community concerns, and recognition by many living in our larger urban areas that increasing auto-dependence contributes to significant declines in many quality-of-living measures. The transit/transportation master planning exercises carried out periodically – and the resulting visions, goals, public consultation/input and public information/education programs – undoubtedly contribute strongly to positive developments affecting transit whether these be in terms of funding availability, system expansion/integration and/or public attitudes and behaviour. The development of transit visions and goals/targets can contribute strongly to this process both as a guide and an important stimulus.

2.4.2 Urban Transit in the United States: A Brief Overview

The urban transit scene in the United States differs from that in Canada in many respects, while exhibiting a number of fundamental similarities. Among the differences are the wide diversity of experience (e.g. over 90% of peak period trips to Manhattan are by transit with less than 10% by auto, while the percentages are reversed for trips to the central area of Detroit) reflecting the large number and diversity of urban areas in the United States, and a very different historical experience since the Second World War and also reflecting, in part, the stronger role of the U.S. federal government in urban affairs relative to the situation in Canada.

Greater per capita income (and automobile ownership), massive highway building funded from gasoline taxes (including many urban freeways), and urban redevelopment programs that often replaced downtown neighbourhoods with relatively inhospitable commercial and institutional activities, all contributed to declining transit use. In addition, these developments, coupled with the downtown racial ghettos, which were forming in the decades before the World War II as low income black rural populations migrated northward and which expanded during and after the War, [12] led to racial tensions and segregation which greatly weakened downtown areas throughout the country.

These developments affected the viability of transit, as the relative importance of many downtown areas declined as workplaces, to be replaced by "edge cities" whose "many-to-many" travel patterns and low trip densities could not be served effectively or efficiently by transit. The racial issue also affected ridership as middle income whites retreated not only from central areas and inner suburbs but also from the bus routes serving them. The demise of urban transit was also hastened by the very rapid and almost complete removal of America's urban street railway networks which had served many urban areas well during the first half of the 20th century. By 1960 the remnants of old trolley systems survived in seven U.S. cities. While Canada also experienced removal of much of this network, the approach in Canadian urban areas was typically more conservative, in that the removal was not as quick or as complete.

[12] ***The Origins of the Urban Crisis: Race and Inequality in Postwar Detroit.*** Thomas J. Sugrue. Princeton University Press. 1996.

Some of the key factors which led to a rapid reduction in the viability and importance of transit in most American cities following World War II have also been instrumental in a noticeable revival of transit investment during the past two decades. A major factor in this development has been the extensive federal funding available under the ISTEA and TEA-21 transportation/transit funding programs and related transit-supportive activities by the Federal Transit Agency and other federal agencies. These federal initiatives have helped to focus and encourage matching funding programs at the state level, with the result that bus systems have been refurbished and expanded and light rail transit (LRT) lines/systems have been introduced in some 13 urban areas across the country since 1960. More recently, bus rapid transit (BRT) has been receiving strong federal support, with early results leading to increased coverage by means of higher-speed and more attractive rapid bus services.

Underlying these major trends during the past six decades have been the same types of external factors (e.g. the Great Depression and other economic cycles, the Second World War and the Vietnam War, explosive growth in auto ownership and use, rapid population and economic growth in many urban regions, etc.) as were experienced in Canada. The negative impact on transit use was greater, however, with the result that (with some notable exceptions such as New York City) transit modal split levels in American cities are typically less than those in comparable-sized Canadian urban areas. The growth in gridlock has been correspondingly greater which has led to growing support for "smart growth", a recognition that road building alone will not solve the urban transportation problem in large- and medium-sized urban areas, and broadening support for improved transit as an essential contributor to the continuing economic, social and environmental health of America's urban areas.

2.4.3 Portland, Oregon

Within this context, the experience of Portland is a notable example of land use/transit integration, which combines concerted and carefully integrated programs to contain sprawl, strengthen public transit, and revitalize the urban core. The brief description which follows is drawn largely from ***The Transit Metropolis: A Global Enquiry***, by Robert Cervero (1998), pages 416-423.

Urban Structure and Governance

In the early 1970s Oregon passed America's first state-wide land use law which explicitly called for preserving farm and forest land and containing urban growth. For metropolitan areas with more than 50,000 inhabitants, an Urban Growth Boundary (UGB) had to be designated. Resulting from this policy, more than 90% of the State's population growth during the 1980s took place inside UGBs. The average size of farms in the State's prime agricultural belt has increased and the productivity per hectare has gone up. In 1991 Oregon passed the Transportation Planning Rule which requires urbanized areas to take steps that will reduce per capita vehicle-km of travel by 10% in 20 years and by 20% in 30 years, failing which infrastructure funding may be not forthcoming from the State.

An integrated approach to land use and transportation has been furthered in Greater Portland by the formation in 1978 of a metropolitan form of governance. This government, known as Metro, has powers to override municipal zoning decisions when they are inconsistent with regional plans. Metro has worked closely with local governments, the business community, environmental interests and citizens to reach agreement on an adopted growth strategy, Framework 2040, which calls for concentrating future growth in regional centres that are served by multi-modal arteries and high

capacity transit. Nine regional centres are to be interconnected by light rail links. Some of the 25 smaller mixed-use centres are to be rail-served. Up to 85% of new growth in the region is to occur within a 5-minute walk of a transit stop.

Transit and Parking

In the early 1970s, following cancellation of a major freeway project, the decision was made to build a light rail (LRT) network to serve and help shape the region's 2040 plan. The Tri-County Metropolitan Transit District (Tri-Met) plans, manages and operates the region's rail, bus and paratransit services. The light rail system, MAX (short for Metropolitan Area Extension), is the backbone of the network. The eastside line was opened in 1989, connecting downtown Portland to the suburban community of Gresham, 24 km to the east. A westside line to the fast-growing, prosperous community of Hillsboro opened in 1998. An extension to the airport opened in 2001 and a new central area "streetcar" was also opened in 2001. By some time during the first decade of the 21st century, light rail backers hope to have a 93-km network in place that serves all quadrants of the region.

Parking is rationed in Portland's transit-served areas and it was one of the first U.S. cities to place a ceiling on downtown parking including tight maximums but no minimums. Downtown parking standards are tied to transit access: buildings fronting on the bus mall are zoned for the lowest ratios (0.7 spaces per 1,000 sq.ft. of building floor space) and those farther away have higher ratios (up to 2 spaces). While five of the 16 stops along the eastside line have park-and-ride facilities, Tri-Met prefers to encourage bus-and-ride access to MAX. Some 35 bus routes tie into four timed-transfer centres along the eastside line. The downtown bus mall serves as the connection point for the region's remaining 45 bus routes. Parking is also being restricted along the westside extension, and traffic calming programs are in place to moderate traffic speeds and volumes on neighbourhood streets.

Downtown Revitalization

Based on the 1972 Downtown Plan, Portland's downtown is an extremely successful people-place, far more than any similar-sized U.S. cities according to Mr. Cervero. A bus mall, civic spaces, the public space known as Pioneer Square, a very successful in-town shopping centre, Pioneer Place, a restored riverfront and the preservation of heritage buildings have created a European-like urban milieu which is pedestrian- and transit-friendly. Since the Plan's adoption, downtown employment has grown from 50,000 to more than 105,000 jobs in 1998. Over the same period, retail sales in downtown are reported to have increased dramatically from 5% to 30% of the regional total. In spite of this growth, no new road capacity has been added in the core since the early 1970s.

While Portland's growth management and transit policies have their critics (e.g. concerns that housing prices are higher than they would have been without the UGB and that the influx of middle income people to the central area has forced out lower income groups) there is a considerable consensus both among local residents and planning professionals across the country that Portland is one of the most liveable urban areas in the United States, resulting from its forward-looking and comprehensive vision of urban development, transit and downtown revitalization and thanks to steady adherence to this vision for almost 30 years.

Results and Outlook

In spite of the region's strong commitment to transit, however, the private automobile still reigns supreme. In 1990 6% of employed residents in the Tri-Counties and 11% from Portland journeyed to work by transit while the automobile carried 73% and 65% of commuting trips, respectively. Critics point out that, during the 1980s, transit lost a larger share of the commuter market in Metropolitan Portland than in most regions of the country (from 8% to 5%, and among Portland's employed residents from 16% to 11%). For all trip purposes, transit carried just 3% of trips in 1990. Transit supporters are quick to note, however, that the statistics reflect only a few years of operating a single 24-km rail line and that when the complete network is in place and transit-oriented neighbourhoods take form, modal shares should increase dramatically. They also point out that Portland's transit modal split for work trips to the downtown core exceeded 40% in 1990; transit has played a key role in helping to revitalize the core and make it attractive to people rather than allowing it to be dominated by the automobile including high-volume downtown roads and parking.

The outlook for Portland, as reported by Mr. Cervero, appears to be promising in that it is a prosperous, growing region (the current population of about 1 million is expected to expand by about 50% over the next 20 years), it has a cogent vision for the future, a very supportive institutional/governance environment, and a remarkable consensus on how it should grow, including broad-based support for using light rail as a lever to guide growth.

Portland's relatively modest transit modal split level, in spite of these successful initiatives, points up the significant differences between Canada and the United States in terms of the role of transit (generally substantially less in comparable-sized U.S. cities), the relative strength of downtown areas and transit systems (considerably stronger in comparable Canadian cities) and the resulting levels of sprawl and auto-dependent suburban development (very significant in both countries but relatively more so in the United States). It might be argued that Canada was "just lucky" that we did not move so quickly to reduce transit following World War II and our downtown areas were not subject to the same stresses as have wracked many American cities. As has been the case since both countries were formed, Canada has much to learn from the United States – both good and bad – and this experience is very relevant to developing a national vision for urban transit in Canada and related policies, plans, and programs.

2.4.4 Curitiba, Brazil

While the above Canadian and U.S. examples are extremely pertinent as background for developing a national transit vision and goals/targets for Canadian cities, it is also useful to include a unique international example. Perhaps the most outstanding urban transit success story on the world stage during the past 30 years is that of Curitiba, which is also a rich source of insights into factors which have contributed to this success. The following description is drawn largely from ***Natural Capitalism*** by Paul Hawken, Amory Lovins, and L. Hunter Lovins (1999), pages 288-295.

Context, Goals and Initiatives

The capital of the southeastern Brazilian state of Paraná, Curitiba's metropolitan area population has increased from about 300,000 in 1950 to about 2.5 million currently. Rapid population growth continues as rural immigrants crowd into the city bringing with them problems of poverty,

unemployment, disease, illiteracy and despair. Rather than succumbing to these problems, Curitiba has managed to turn them into opportunities by a combination of visionary planning, practical leadership and grassroots initiatives.

The central figure in this saga is Jaime Lerner, an architect engineer and urban planner who became mayor in 1971 at the age of 33, served three terms totalling 12 years, and mentored his successors subsequently, having twice served as Governor of Paraná. Prior to his political career, Lerner was President of the Curitiba Research and Urban Planning Institute (IPPUC), a group of similarly minded planners, architects and engineers which developed innovative and integrated urban design/management concepts that formed the basis of an evolving plan to improve the city on many fronts, including social, economic, environmental and municipal management initiatives.

From the beginning, transportation was seen as a major factor in shaping land use and affecting the liveability of streetscapes and neighbourhoods as well as an essential means of providing access. Rather than eviscerating the urban core with major highways, Mayor Lerner's administration modified five existing radial corridors to form three parallel avenues in each corridor: the one in the middle carries express buses in both directions, separated from other traffic, while the other two, located one block away on either side, are one-way roads leading to or from downtown. The existing streetscapes and buildings have been largely preserved, including refurbishment of historic buildings and preservation of ethnic neighbourhoods. Additional density – up to two additional stories – was allowed in areas close to transit stations and part of its value was captured by the City and then reused to build low income housing and renew parks.

Results: Ridership and Other Trends

The axial trunk transportation corridors were based on a unique bus rapid transit concept using triple-length express buses (articulated at two points for manoeuvrability in turning corners) with up to five wide doors and able to carry up to 270 passengers. The Lerner team invented a unique "tube station", an elevated glass cylinder adjacent and parallel to the bus lane with matching doors at the same level as the buses which open simultaneously on both the bus and the station. Fares are paid in the station before the bus arrives and passengers enter the station from one end and leave it from the other. These measures greatly reduce the dwell time of the bus at each stop, to an average of about 30 seconds; this, plus the reserved bus lanes and provision of bus priority at traffic signals means that average speeds are about three times that of traditional buses, with similar increases in the productivity of each bus in terms of passengers per service hour. The capacity of each express bus lane is about 20,000 passengers per hour, similar to the loads carried by Canadian subways, but the system's capital cost is less than 1% of typical subway costs and 10% of typical surface train costs, with construction time as short as six months rather than 10 years. As of the late 1990s, the system had some 2000 buses on 277 integrated radial, loop and connector routes identified by twelve colour codes and linked by 25 terminals. The bus system recovers all of its operating costs from fares and the City contributes the streets plus capital costs of the stations ($4.5 million U.S. for about 200 stops) and lights. The City also sets the fare, routes, schedule and operating standards but retains 10 private firms to operate the system. Fare revenues cover a profit to the operating firms as well as all other operating costs and a sinking fund of 1% of the fleet investment per month.

The bus system in Curitiba carries about 75% of the City's commuter traffic – 1.9 million passengers per weekday – with 89% user satisfaction. By 1991, enough auto drivers were attracted to decrease

car drivers by about 25%; about 28% of bus users own cars but choose not to use them for their work trips. While Curitiba has a car ownership rate of 1 per 2.6 persons – over half a million cars and the highest rate of auto ownership in Brazil except for the capital city, Brazilia which was designed around cars – Curitiba has Brazil's lowest rate of car drivership, its cleanest urban air, and uses 25% less fuel per capita than other Brazilian cities while achieving better access.

Factors Contributing to Successes

Among the factors contributing to these successes are the following:

- innovative, visionary leadership on a sustained basis over three decades, combined with grassroots public and stakeholder involvement not only in planning but also in delivering the plan;

- a flexible approach, making maximum use of the existing infrastructure and urban fabric with low capital costs and an integrated, evolutionary approach to developing new neighbourhoods and the transportation/transit facilities to serve and help shape them;

- an entrepreneurial approach which harnesses the private sector to meet public goals and matches revenue sources with costs in order to provide continuing, predictable funding to meet both capital and operating needs;

- benign policy support and financial involvement from the senior government (the State of Paraná) to ensure that the City has adequate financial resources for its transportation and other needs.

The Outlook

There are, of course, ongoing challenges to be addressed by Curitiba including the continuing rapid influx of poor rural migrants, slums and shortages of appropriate housing with water/sewer services, nearly half of its children not yet completing grade school, and continuing pressures for increased car ownership and use. On the basis of its successes since 1971, however, and given a continuation of its visionary leadership, there is every evidence that Curitiba will continue to make progress in spite of these challenges.

2.4.5 Other International Examples

Western European cities have historically been dependent on urban transit, with the automobile a relatively late arrival on the transportation scene. Consequently, there is a tradition of government support for public transportation, and European cities have long taken an integrated approach to the planning and delivery of land use and transportation systems. They have also taken innovative approaches to developing a full hierarchy of transit services on an integrated basis, with coordinated schedules and fare integration throughout major urban regions, and have successfully introduced private sector involvement to provide services on a contracted basis while retaining public control of service levels and coverage. Two examples, Vienna and Zurich, are included below, excerpted from reports prepared by U.S. transit professionals who visited Vienna in 1995 and Zurich in 1996, as part of the U.S. Transit Cooperative Research Program International Transit Studies program.

Vienna, Austria

Vienna (population. 1.5 million), the capital of Austria, has a modal split of 37 percent public transit, 37 percent private vehicles, and 26 percent non motorized traffic. Its goal is to have reduced private vehicle traffic to 25 percent and cut CO_2 emissions in half by the year 2010. The focus on its transport efforts is to reduce traffic congestion by encouraging alternatives to use of cars whenever possible.

Incentives to reduce private car use in-city include 50 percent reductions in weekend car rental fees for owners of annual transit passes and a goal of 42,000 peripheral park-and-ride spaces. Public transit (including the U-Bahn [Metro], Schnellbahn [commuter rail], Strassenbahn [light rail], and a bus network) is being continually modernized and expanded. Shared track for railroad and transit use, as in Germany, is under consideration. Expansion of intersection priority for public transit in the central districts is a policy objective. The same is true of the establishment of the Tempo 30 kmh (18 mph) speed limitation for private vehicles in the city's residential neighbourhoods. Fifty-seven percent of the intersections in the city are equipped with signal pre-emption. To provide additional convenience to night time users of transit, bus driver can call ahead on their radio phones at night to arrange for passengers returning to their homes to be met by a taxi at designated suburban bus stops. The city of Vienna and its surrounding region (population. 2.5 million) were the first in Austria to form a regional transit association 10 years ago. VOR, the eastern regional transport association, carried 741 million passengers in 1994, a gain of about 19 percent since its inception. Like the other regional associations that followed it, the integration of fares is standard practice. Additional operating costs are absorbed equally by the national and regional governments.

The city and its suburbs are committed to improving the quality-of-life in the whole region. They faced declining population, poor air quality and serious congestion in the late 1960s and 1970s. These conditions led planners to take a close look at solutions. They developed a plan to build a subway system and provide mobility and access to many popular destinations. Officials believe that this plan has contributed greatly to the improvement in mobility and the quality-of-life for residents. The planners also focused on air and water quality and noise pollution. Projects were planned and implemented to preserve the natural resources of the country. (The city consistently capitalizes on its historic and architectural heritage through historic preservation). Although the planning for infrastructure was well thought out, it was clear that a balance of economic activity was required to sustain a liveable community. The goal has been to keep a 50-50 balance between residential and commercial/industrial activity.

To achieve a liveable community and maintain this balance, the Viennese have used zoning regulations; long-range planning, including the development of an urban development plan; the political process; and public participation. The expectation is that, by 2010, there will be doubling or tripling of the demand for public transport. This is mostly due to the increasing geopolitical importance of Vienna since the fall of the Eastern Bloc. Vienna's position as a centre of multinational activity will test all aspects of the plan put in place in the Viennese region.

To ensure that the citizens of the region buy into the long-range plans, as well as the major projects under consideration, a public participation process is used. Once a master plan is developed, it is discussed with the community. This is followed by site plans that are debated between the architects/planners and the community affected. A learning process for both sides, this interaction is

critical to building grass roots support for the projects. (one project has an 85 percent participation level by the local residents).

The city of Vienna, the VOR, and the individual transit service providers are also changing and improving the transportation system to ensure the quality of service necessary to attract and keep riders. Some of these changes are attempts to calm the traffic and alleviate the threat to pedestrians. Some officials characterized existing traffic as "brutal". These changes include raising the sidewalks at transit stops and reducing the floor height of buses and trams, installing islands to make it safer for pedestrians and transit users to wait in the street, and reducing speed and installing traffic-calming measures in some neighbourhoods. Significant efforts to improve the speed of transit vehicles have been undertaken; they include signalization and pre-emption for vehicles operating in city traffic. Automatic vehicle control systems, where a driver is not needed, have been implemented for the subway system and other transit modes that operate in their own rights of way. These efforts have been well received by the public, and the public transit system is well kept and well used. Information and transit maps can be found in all stations, bus stops, and major public places. The public transport system is easy to use.

Zurich, Switzerland

Zurich is the largest city in Switzerland, with a population of 341,000 (1991 estimate). The city's fast-growing suburbs have brought the population of the metropolitan area to nearly 1 million.

The canton of Zurich has been served by the Zurcher Verkehrsverbund (Zurich Transport Association or ZVV) since 1990. This system is made up of more than 40 public and private transit providers, operating a total of 262 commuter rail, light rail, bus and trolley bus, mountain rail, and cable car lines and paddle-wheel lake steamers.

Since a popular referendum in 1988 authorized an integrated rail network, daily public transit passenger totals have increased by more than one-third in Zurich and by about 14 percent in the ZVV region to just under 1 million. The modal split among daily commuters to Zurich as increased from 50 percent to 59 percent public transit. Farebox receipts, which covering 56 percent of the system's current annual operating costs, amount to SFr 800 million (U.S. $715 million); the shortfall is covered equally by the canton and its 171 communities. Calculation of the local contributions involves a complicated 80/20 formula that takes into account the number of daily departures from station stops in each community and the community's tax base.

The network contains a total of 2,700 route km. The regional rail (S Bahn) serves as the main distributor, with 27 station stops inside the city limits. Neighbourhood feeder buses and vans bring passengers to the main stop.

Transit operators in Zurich are very conscious of air and water quality and noise control. The system consists mostly of electrified trams and trolley buses, but much of the bus fleet is diesel. A recent proposal called for the electrification of all bus lines, removing diesels from the system. Given the very high front-end fixed cost of the overhead power grid and the conversion or replacement of buses, the proposal was determined to be too expensive.

A system objective is to have a bus stop within 300 m of each doorstep. Throughout the region, there are more than1,400 bus stops, served by more than 600 buses and trolley buses operated by 28 companies that together operate more than 30 million km a year.

Another objective of the Zurich S Bahn light rail system is to provide a seat for every passenger. Standing is considered an exception to be tolerated only for brief periods. This requirement reflects the desire for comfortable travel and an amenable, egalitarian transit environment for all passengers.

There is full-fare integration throughout the region, which is divided into 45 tariff zones. Zurich uses the honour system; tickets are purchased off the vehicle, and fare inspectors randomly check tickets. About 35 million single, multiple, monthly, and annual tickets are sold each year according to a study conducted by an independent research institute, this works out to 560 public transit trips per inhabitant per year, a level which exceeds that registered by other metropolitan regions in western Europe.

In Zurich, the same organization is in charge of transit and land use planning. Coordination of these two function is considered a high priority. Officials are working to increase densities at commuter rail stations. In the long term, they see the need to get people closer to transit services to increase ridership, and to affect the economy in a positive manner.

In the canton of Zurich, the cities, the canton, and the federal government make up the difference between fare revenues and costs. Fares are fully integrated. Regional and local bus operators and the federally operated rail systems use the same prepaid fare within the canton. All revenues collected in Zurich are retained by the ZVV, which reimburses transport companies for their costs.

Zurich is a pioneer in prioritizing intersection signals. The country's computer system sets traffic signals at intersections throughout Zurich to optimize transit, automobile, and bicycle flow. The system has special transit signals, giving light rail vehicles (trams) and buses special priority. In addition there are a significant number of streets that are dedicated solely for use by rail transit and pedestrians.

An innovative program in many of the cities studied is a car sharing arrangement, organized as a membership cooperative, which facilitates short-term car rental. The program in Zurich appears to be the most mature. A small fleet of micro cars is based at a rail station. By using an interactive voice-response telephone system, a customer can make a reservation for a car at a certain date and time.

To encourage consumer input, Zurich surveys transit passengers, nonusers, and businesses for their opinions regarding routes, headways, and suggestions for improvements

2.5 CONCLUSIONS

Based on this brief examination of existing urban transit vision statements, goals, targets/indicators and success stories, we draw a number of preliminary conclusions as input to the process of developing a transit vision and goals/targets for Canadian urban areas:

- The exercise of developing vision statements and/or setting goals for urban transit is virtually universal among the urban areas studied and is seen as essential to help generate and evaluate alternative plans and provide a basis for action. The visions and goals tend to be more elaborate

in the larger urban areas and more basic (e.g. focussing on transit service/standards and ways of achieving cost-efficiencies) in the smaller areas.

- While most of the vision statements revealed by our research were relatively short statements of intent, fleshed out by various qualitative goals and – in some cases – by quantitative targets, in a few cases a "scenario" approach is taken in which the vision statement describes a desired situation as it might exist in a future (planning horizon) year. Either approach is feasible and can be considered in developing an approach for a national urban transit vision in Canada.

- As noted in the Terms of Reference for this study, it will be important that a national vision for urban transit reflect goals which apply to all Canadian urban areas while providing enough flexibility to recognize important differences among Canada's urban areas based on factors such as size, growth rates, existing types of transit/transportation, urban structure, economic/locational characteristics, etc. The similarities and differences in the types of goals mentioned by various urban areas (Exhibit 2.6) provide broad indications of the numbers and types of goals which are considered most important by large, medium and small sized Canadian urban areas, respectively, and this provides useful background information for the process of developing a national vision and goals.

- Similarly, the types of quantitative targets and indicators used by various urban areas to specify the vision more exactly and provide a basis for monitoring the extent to which it has been achieved are also useful input to the process of suggesting quantitative targets as part of a national urban transit vision or visions.

- Finally, the discussion of success story examples and contributing factors serves as an important reminder that urban transit operates as part of a complex series of urban systems and activities, and visions, goals and targets need to reflect this complexity – adapting to the unique characteristics of a given urban area – including the importance of land use and socio-economic visions and policies as well as transit/transportation infrastructure, transit system expansion and integration, and the manner in which the transit and transportation systems are managed (including operations, maintenance/rehabilitation, pricing, revenue sources, funding policies and governance of planning and delivery).

Consideration of all of the above will be important in developing a national vision, goals and targets for urban transit in Canada to 2020, as described in the next chapter.

3. DEVELOPING A NATIONAL VISION FOR URBAN TRANSIT

3.1 THE RATIONALE FOR A NATIONAL VISION

A variety of arguments can be raised in support of developing a national vision for urban transit, some of which, of course, are posed by constituencies such as national organizations that see a "national vision" as justification for federal financial aid. Others may simply argue that the majority of Canadians live in urbanized areas and that the federal government has an implicit obligation to look at urban transportation to ensure national goals are met.

There is widespread recognition in all levels of government that plans and policies in many sectors should be increasingly sensitive to changing environmental, economic and social goals. Within this context, the general interest in sustainable development, including sustainable transportation, reflects objectives that are as relevant to the federal government as to local and provincial governments. Evidence of this interest is given by the federal government's commitment to endorse the targets established for greenhouse gas emissions under the *Kyoto Protocol*.

A study undertaken by the Federation of Canadian Municipalities (FCM), for example, found that the majority of Canadian municipalities set specific objectives *to reduce dependence on the private automobile and increase the use of public transit, cycling, and walking*. According to the FCM report, the municipalities cited *inadequate financial resources as a key barrier to achieving these objectives*.[13]

Of the various relevant associations such as the Canadian Urban Transit Association and the Federation of Canadian Municipalities, a briefing of the Transportation Association of Canada (noted previously in Chapter 2) probably presents one of the most cogent and truly objective arguments for a new, nation-wide vision of urban transportation in the following terms:

> The wealth of nations is largely generated in cities and will become more so in…the future. Urban transportation systems will have to be very productive, efficient, cost-effective and accessible to allow cities to generate the wealth needed….To achieve that goal will require new approaches to…transportation planning and financing. Continuation of present trends will not work.[14]

This concept of the well-being of cities (for which the federal government has no jurisdictional responsibilities)[15] as being important to the wealth of the nation (for which the central government *does* have responsibilities) is supported by what may be considered as perhaps a more objective and independent assessment, based on a less self interested motivation by the recently completed review of the *Canada Transportation Act* (CTA). Paraphrasing the final recommendations of the CTA Review Panel which was appointed by Parliament for a limited term of one year:

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[13] ***Federal Budget Submission.*** Federation of Canadian Municipalities. August 2001.

[14] ***A New Vision for Urban Transportation***. Transportation Association of Canada. 1993, reprinted 1998.

[15] The federal government does play an indirect role in urban transportation in areas of motor vehicle design and safety regulations, research and development relevant to urban transportation, and special programs oriented around energy efficiency and emissions (of which urban transportation is an important component).

> The federal government does have an interest in the economic health and functioning of Canada's urban engines of growth. Moving people and goods efficiently….affects the economic and social well-being of cities. The Panel sees …urban transit as a key component of comprehensive multi-modal transport policy.[16]

And, as discussed in Chapter 1, new interest in urban transportation on the part of the federal government is reflected in:

- announcements by the Minister of Transport;
- the Speech from the Throne;
- Transport Canada's Transportation Blueprint Initiative;
- the Prime Minister's Caucus Task Force on Urban Issues;
- Transport Canada's Sustainable Development Strategy;
- the Infrastructure Canada program;
- the FCM managed Green Municipal Funds; and
- Transport Canada's recently announced *Urban Showcase Program*.

3.2 COMMON THEMES AMONG TRANSPORTATION VISION STATEMENTS

The survey of national and international vision statements (or reasonable facsimiles thereof, such as "goals" statements) treated in Chapter 2 demonstrates that there is a general interest in achieving more sustainable transportation and less dependence on the automobile, with emphasis on the following types of policy goals:

- fewer and shorter motorized trips;
- a higher proportion of all vehicular trips by public transportation;
- substitution of walking and cycling for private auto trips;
- greater energy-efficiency and reduced emissions of greenhouse gases and other pollutants;
- more widespread accessibility for the disabled and seniors; and
- more cost-efficient delivery of transit services.

Underlying objectives include increased transportation safety and, where feasible, stabilized or reduced levels of congestion and delay.

Perhaps the single most important difficulty in attempting to reach consensus on a Canadian transit vision probably derives from the tremendous variation in size, demographic characteristics, and needs of urban communities across the nation. Converting automobile users to transit users is a very different challenge in Haliburton, Ontario than in Markham, Ontario, as it is between some residential areas of the same region such as White Rock and the community of Kitsilano in British Columbia. Location, independently of size, moreover, affects the practicality of using small, more fuel-efficient automobiles in built up urban areas, as opposed to large, four wheel drive vehicles that are more of a necessity in rugged, rural municipalities.

[16] Canada Transportation Act Review Panel. July 2001, *op. cit.*

Exhibit 2.6 shows some significant differences among communities, by size, with respect to the frequency with which different goals are reflected in official policy statements and plans. A few inferences can be drawn from these ratings.

Some federal government strategic objectives, for example, are not necessarily shared by the majority of municipalities. Energy efficiency, an important determinant of greenhouse gas (GHG) emissions, as one case in point, appears to be cited much more frequently in the large municipalities than in the small and medium communities (even though the differences are smaller in the case of emissions which, for the major GHG [CO_2], are almost directly related to energy consumption).

Another example occurs in the case of transit cost recovery and transit productivity. For the large cities, there appears to be a basic contradiction between frequent mention of cost recovery but only minor mention of transit productivity, simply because cost recovery is directly influenced by productivity in the use of both physical infrastructure and vehicles.

These examples of apparent inconsistencies, however, should be examined in their proper context. As noted on Exhibit 2.6, failure to specify a particular goal (such as transit cost recovery) does not necessarily mean it is considered to be unimportant. The absence of a particular goal within the construct of Exhibit 2.6 may merely reflect the fact that it is implicit in or subsumed under another goal (such as transit productivity). In other words, the issue of transit productivity may not have been considered explicitly by the drafters of the goals statements.

The six policy goals listed above (so-called because they are seen as broader than many of the goals listed in Exhibit 2.6) are typically influenced by a variety of factors including those shown in Exhibit 3.1. Clearly, the relative importance of these contributing goals or influencing factors will depend upon the previously noted variations in size and physical structure of the community. Thus, in some cases, only a few factors, such as improved fuel efficiency (and corresponding reductions in emissions) may be seen as relevant whereas in other cases the full spectrum of factors could apply.

Exhibit 3.1 also includes a largely judgemental assessment of the feasibility of achieving each contributing goal or influencing factor by 2020, stated in terms of low, medium or high. It will be noted that most of the ratings are medium, reflecting the expectation that there will be growing pressure to achieve the various contributing goals or influencing factors as congestion pressures and related economic, social and environmental issues become more prominent in the public's eye, but also reflecting the difficulty of achieving some contributing goals *quickly* (e.g. mixed land use, compact urban form, street continuity and connectivity)and reluctance of governments to raise taxes or create new user charges (e.g. fuel taxes and/or road pricing). Other factors which may delay achievement of policy goals by 2020 include the integrated nature of the North American automotive industry (e.g. fuel consumption standards), and/or the high costs of achieving the contributing goal or influencing factor (e.g. improved coverage, connectivity and service levels of transit as well as transit priority where road widening or special transitways are required, distribution systems for alternative fuels, elevators and escalators in transit stations). Some of the contributing goals/influencing factors are also rated medium based on the challenges of achieving greater transit priority relative to the private automobile and trucks (e.g. traffic signal timing and phasing, sidewalk design, transit priority). Only one contributing goal/influencing factor is rated as low; this is the balance of residents and local jobs, and the rating reflects the fact that a large proportion of households have two or more persons working outside of the home, making it very difficult to achieve locational decisions which

result in a short work trip for all. While the overall balance of resident labour force and jobs within a given part of a metropolitan area may be quite reasonable, the very fact that the metropolitan area offers a wide variety of job opportunities means that many work trips will be quite long since the best job will not be close-by in all cases. This is, of course, a major advantage and *raison d'étre* for large metropolitan areas, but it makes it difficult and not necessarily desirable to try to minimize the length of work trips.

The contributing goals/influencing factors which are rated high tend to be those which are relatively low in cost, are expected to have a strong influence in attracting more transit riders and/or are able to be implemented by one level of government. Goals/factors receiving a high rating include passenger information systems, vehicle monitoring and response systems, transit system integration, improved bicycle facilities at stations and on vehicles, financial incentives for more fuel-efficient vehicles and cleaner fuels, mandatory emission tests, and transit vehicle design for improved accessibility by the disabled and seniors.

It will be recognized that the achievability by 2020 of any one of these contributing goals or influencing factors could be changed depending on the economic, social and environmental issues of the day and the manner in which governments choose to address these in the context of urban transit initiatives.

EXHIBIT 3.1: COMMONLY CITED TRANSPORTATION GOALS AND RELATED FACTORS

Policy Goals	Contributing Goals or Influencing Factors	Achievability by 2020
fewer and shorter motorized trips	mixed land use	medium
	compact urban form	medium
	balance of residents and jobs	low
	substitution of communications for travel	medium
a higher proportion of all vehicular trips by public transportation	density of development	medium
	concentration of employment	medium
	transit priority for use of roads	medium
	coverage, more attractive transit including connectivity, service levels, transit infrastructure and vehicles	medium
	pricing and supply of transit, parking, and road use	medium
	taxation policies and enforcement	medium
	passenger information systems	high
	vehicle monitoring and response systems	high
	intermodal connections	medium
	transit system integration	high
substitution of, walking and cycling for private auto trips	traffic signal timing and phasing	medium
	street continuity and connectivity	medium
	sidewalk design	medium
	cycle paths and exclusive lanes	medium
	cycle storage at transit stations	high
	cycle storage (racks) on transit vehicles	high
greater energy-efficiency and reduced emissions of greenhouse gases and other pollutants	fuel taxes and/or road pricing	medium
	financial incentives for more fuel-efficient vehicles, cleaner fuels	high
	fuel consumption standards	medium
	mandatory emission tests	high
	distribution systems for alternative fuels	medium
more widespread accessibility for the disabled and seniors	transit vehicle designs	high
	elevators and escalators in stations	medium
	sidewalk design	medium
	traffic signal timing and phasing	medium
more cost-efficient delivery of transit services.	transit priority	medium
	alternative service delivery	medium
	transit and land use integration	medium

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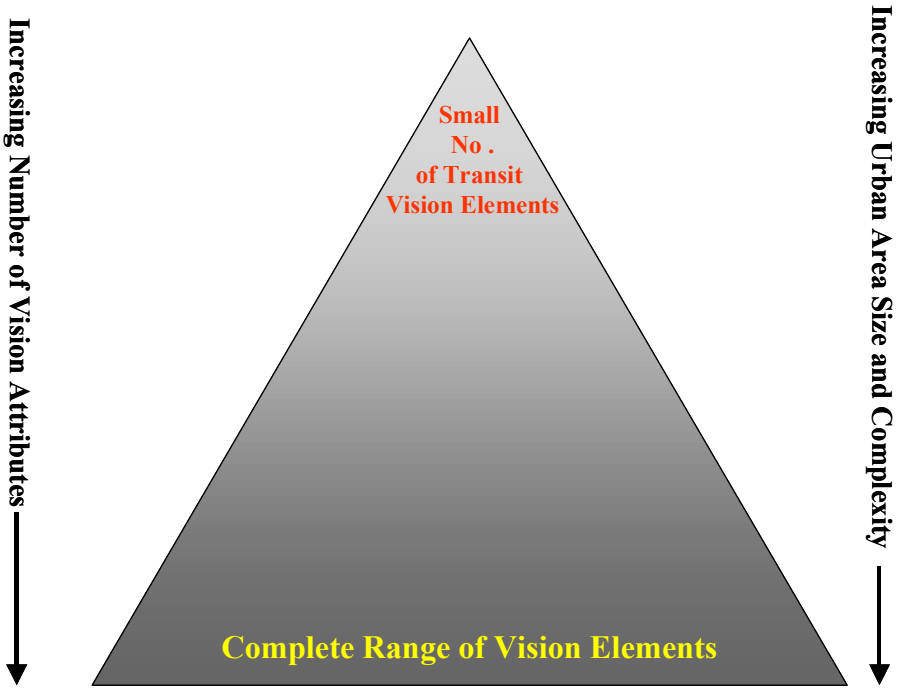
3.3 THE CONCEPTUAL APPROACH

The common goals and influencing factors noted above suggest that construction of a national vision *for transit* could involve a pyramidal structure, illustrated in Exhibit 3.2, where the attributes at the top would be representative of smaller and more remote communities and the base of the pyramid would reflect a vision for the larger metropolitan municipalities and regions. In other words, moving down the pyramid essentially means embracing more of the broad scale transit vision.

EXHIBIT 3.2: THE VISION PYRAMID



This pyramidal concept suggests, for example, that increased fuel-efficiency, improved accessibility for the disabled and handicapped, high standards of safety, and more cost-efficient delivery of transit services can be considered as universal elements of a national vision. Even in small communities, for example, accessibility for the disabled can be enhanced through the use of specially equipped taxis. Greater dependence on vehicles which use alternative fuels, by contrast, requires a market large enough to support the necessary distribution systems for alternative fuels.

Thus the challenge in developing a truly national vision statement for urban transit is to define it in terms:

- such that most individuals, regardless of where they reside, can identify with the implied goals;
- which are comprehensive from the standpoint of the complete range of community sizes and complexities representative of the vast majority of Canadian municipalities;
- that do not raise premature expectations as to senior government involvement; but

- which might serve as the basis for selective participation by these levels of government as well as other potential stakeholders.

The draft urban transit vision described in the following two sections draws on this conceptual approach in the context of our findings, as presented in Chapter 2, regarding transit and transportation vision statements and related goals articulated by urban areas, national governments and others in Canada and other countries.

3.4 A PROPOSED STRUCTURE FOR THE VISION

In reviewing the policy goals listed in Exhibit 3.1, we conclude that, while the six policy goals are a good start, a larger number of policy goals should be included, thereby giving them more prominence in the vision than the somewhat lesser status of contributing goals/influencing factors. We have defined 15 policy goals based on transit visions developed elsewhere (as described in Chapter 2) and on the judgement and experience of the authors of this report.

In developing and structuring the longer list of 15 policy goals, we went back to first principles regarding the meaning of a sustainable transportation system. We conclude that a sustainable transportation system should be:

- **capable** of providing the necessary speed, capacity, frequency, coverage and connectivity to provide access to all activities in the urban areas with service that is safe, comfortable and convenient;

- **compatible** with liveable communities that support a vibrant economy, walkable streets, people-friendly places, and a high quality-of-life;

- **conserving** of energy and other natural resources and **clean** in terms of waste products; and

- **cost-efficient** in terms of efficient service delivery, appropriate and affordable transportation pricing, and adequate, predictable funding arrangements.

We have defined five policy goals under the first heading above, three under the second, two under the third and five under the fourth in working towards a proposed structure for the national transit vision, as follows:

- **A Capable System**

    1. door-to-door seamless travel by public transit and related modes within the entire urban area, unimpeded by jurisdictional boundaries or intermodal barriers;

    2. increased transit speed, capacity, frequency, coverage and connectivity to compete more effectively with the automobile and reduce automobile dependence in serving a wider variety of trip purposes;

    3. improved accessibility to transit service for the disabled and seniors;

4. increased comfort, convenience and safety for transit users in both vehicles and waiting areas; and

5. improved transit service in currently transit-deprived areas.

- **A Compatible System:**

6. fewer and shorter motorized trips per person and more trips by transit, walking and cycling;

7. more transit-friendly and walkable/cyclable streets and streetscapes; and

8. greater opportunities for accommodating bicycles in connection with transit services.

- **A Conserving and Clean System:**

9. reduced transit/transportation energy consumption and resource depletion; and

10. reduced emissions of greenhouse gases and other pollutants from transit/transportation.

- **A Cost-Efficient System:**

11. more efficient operation of transit vehicles and higher vehicle productivity;

12. transit priority policies that improve average transit speed and net revenue per vehicle;

13. cost-effective planning and delivery of new and/or expanded levels of transit service as well as maintenance and rehabilitation of existing services and facilities;

14. a level playing field from the standpoint of transit versus auto travel decisions based on consideration of real costs and affordability; and

15. generation of reliable, performance-based revenue streams to fund urban transit thereby making possible more cost-efficient capital investment programs.

The above structure is carried forward as the underlying basis for the proposed national urban transit vision, as described in the next section.

3.5 PROPOSED NATIONAL URBAN TRANSIT VISION

Drawing on the basic structure outlined in the previous section, the proposed vision is expressed in four parts, as follows:

1. A succinct vision statement;

2. Policy goals applicable to various sizes of urban areas, plus relevant contributing goals and influencing factors, potential targets, and relevant national programs and activities;

3. Proposed quantitative targets to help assess achievement of the vision for urban areas of various sizes; and

4. An overview of the vision in scenario form.

The four components of the vision are presented below.

3.5.1 Vision Statement

Based on the above approach and structure, and given the national interest in achieving more sustainable transportation, we propose the following vision statement for urban transit in Canadian municipalities:

> *By 2020, Canada's urban transit/transportation policies and initiatives will have achieved: more competitive transit service, delivered in a safe, effective and cost-efficient manner that attracts users from their cars for a wider variety of trip purposes; improved transit accessibility for those who, by reason of age, income or physical disability, are unable to drive; a reduced level of motorized travel per person and less dependence on the private automobile; a more energy-efficient and less polluting transit/transportation system; and, resulting from the above, more capable, compatible, clean, conserving and cost-efficient urban transit/transportation systems.*

3.5.2 Policy Goals, Contributing Goals and Influencing Factors

The 15 policy goals are listed below, in bold type. Also included with each, in plain type is a key contributing goal or influencing factor to help flesh out the policy goal and what it entails.

A Capable System:

1. **Door-to-door, "seamless" travel by public transit and related modes within the entire urban area, unimpeded by jurisdictional boundaries or intermodal barriers**, through integration of transit services, pricing, and passenger information systems, as well as intermodal coordination and parking policies.

2. **Increased transit speed, capacity, frequency, coverage and connectivity to compete more effectively with the automobile and reduce automobile dependency in serving a wider variety of trip purposes,** through general improvements in the network of transit services and increased integration of public and private transportation activities.

3. **Improved accessibility to transit service for the disabled and seniors** through modifications to new vehicle and infrastructure designs, retrofitting of existing infrastructure, and special services for these individuals in communities with modest or no conventional transit services.

4. **Increased comfort, convenience and safety for transit users in both vehicles and waiting areas**, through general improvements in the amenities of transit vehicles and waiting areas.

5. **Improved transit service in currently transit-deprived areas,** including use of appropriate service structures and technologies to provide transit services in an efficient and cost-effective manner.

A Compatible System:

6. **Fewer and shorter motorized trips per person and more trips by transit, walking and cycling**, largely through management of urban development, regardless of city size, in ways that lead to compact urban form and greater mixed land use plus more pedestrian-, transit- and cycling-friendly streetscapes.

7. **More transit-friendly and walkable/cyclable streets and streetscapes** through integrated planning, design and delivery of those services and facilities.

8. **Greater opportunities for accommodating bicycles in connection with transit services** through special features of transit stations and vehicles.

A Conserving and Clean System:

9. **Reduced transit/transportation energy consumption and resource depletion** through an increase in the proportion of vehicle-km involving more energy-efficient vehicles and the use of alternative propulsion systems.

10. **Reduced emissions of greenhouse gases and other pollutants from transit/transportation** through use of alternative fuels and propulsion systems plus greater reliance on transit, walking and cycling.

A Cost-Efficient System:

11. **More efficient operation of transit vehicles and higher vehicle productivity**, through road design and traffic engineering policies, urban development patterns that are more favourable to transit and consideration of alternative service delivery approaches.

12. **Transit priority policies that improve average transit travel speed and net revenue per vehicle**, thus increasing vehicle and driver productivity, as well as the attractiveness of transit relative to the private automobile leading to increased transit ridership and revenues and reduced net costs per rider.

13. **Cost-effective planning and delivery of new and/or expanded levels of transit service as well as maintenance and rehabilitation of existing services and facilities** based on appropriate governance which enables an integrated approach to urban development and provision of transit/transportation.

14. **A level playing field from the standpoint of transit versus auto travel decisions based on consideration of real costs and affordability,** including under-priced parking and rationalization of income tax regulations affecting allowable deductions and taxable benefits.

15. **Generation of reliable, performance-based revenue streams to fund urban transit thereby making possible more cost-efficient capital investment programs,** through public funding policies and drawing on road pricing and/or other user pricing mechanisms that account for the external costs imposed on society by road users and the co-benefits to society of achieving improved and more widely used transit.

Not all elements of this vision statement are applicable in every situation or even within different communities of the same jurisdiction. Transit priority in large cities that operate high frequency services in mixed traffic, for example, is not a policy that is likely to be as relevant in small municipalities or even in low density communities of a large metropolitan region where existing or potential transit ridership would not justify such measures. Similarly, alternative services that may be appropriate in these latter situations (e.g. smaller, more demand-responsive vehicles) are not likely to be relevant for major transit corridors.

Some of these differences are reflected in Exhibit 3.3 which illustrates the anticipated applicability of different elements of the draft national vision. This exhibit also relates the 15 policy goals of the proposed vision to some of the more important contributing goals or influencing factors identified previously in Exhibit 2.6. Since many of these contributing goals and influencing factors are highly inter-related, there is some degree of duplication, particularly where there are strong similarities between the policy goal itself and the contributing goals or influencing factors.

In addition, Exhibit 3.3 provides an indication of the nature of targets that could be established related to these vision components. Targets for transit mode split have already been adopted in many municipal transportation plans. In the case of accessibility for the disabled and seniors, replacing the existing vehicle fleet with accessible vehicles could take some time (and expense) depending upon the average age of the vehicle fleet. But it would be possible to establish close to 100 percent accessibility by the end of the service lives of transit vehicles now in use. For other measures, such as fewer and shorter trips, it is more difficult to establish meaningful targets.

Exhibit 3.3 also indicates relevant areas of activities of *existing* federal government programs and policies. To cite one example, depreciation allowances for vehicles that are used for community transit or special services for the disabled and seniors affect the viability of engaging private firms for alternative transit service delivery. A higher depreciation rate for smaller vehicles used for some of these services, matching the shorter economic life of smaller vehicles relative to conventional transit vehicles, would increase the economic feasibility of private sector involvement.

EXHIBIT 3.3: APPLICABILITY OF VARIOUS ELEMENTS OF A NATIONAL TRANSIT VISION

	Policy Goals	Applicable Urban Areas	Relevant Contributing Goals and Influencing Factors	Types of Potential Targets	Relevant Existing National Programs and Activities
A Capable System	1. door-to-door seamless travel by public transit and related modes within the entire urban area, unimpeded by jurisdictional boundaries or intermodal barriers;	Almost all	Transit funding Connectivity and coverage Public education		Research & Development
	2. Increased transit speed, capacity, frequency, coverage and connectivity to compete more effectively with the automobile and reduce automobile dependence in serving a wider variety of trip purposes;	Medium to large	Road system characteristics Connectivity & coverage Intermodal integration	Reductions in the number of transfers Increases in average transit speed	
	3. Improved accessibility to transit service for the disabled and seniors;	All	Accessible transit	Increasing percentage of accessible vehicles and infrastructure based on vehicle replacement and new infrastructure programs	ICP incentives * Operations on federally regulated railways Depreciation allowances for special vehicles Research & Development
	4. Increased comfort, convenience and safety for transit users in both vehicles and waiting areas; and	All	Safety and security Information technology applications		Research and Development
	5. Improved transit service in currently transit-deprived areas.	All	Transit cost recovery Transit productivity Intermodal integration		Depreciation allowances for transit vehicles Research & Development
A Compatible System	6. Fewer and shorter motorized trips per person and more trips by transit, walking and cycling;	Almost all	Integrated land use and transportation/transit	Reductions in average trip length Increased use of transit, walking and cycling	CMHC financing ICP incentives* Conditions on the transfer of federal lands
	7. More transit-friendly and walkable/cyclable streets and streetscapes; and	Medium to large	Transit levels of service Connectivity and coverage Public education	Targeted increases in transit mode split and/or annual rides per capita	
	8. Greater opportunities for accommodating bicycles in connection with transit services.	Almost all	Safety Public education Accessible transit	Percent of vehicle fleet that accommodates bicycles	

* ICP denotes Infrastructure Canada Program

EXHIBIT 3.3: APPLICABILITY OF VARIOUS ELEMENTS OF A NATIONAL TRANSIT VISION (continued)

	Policy Goals	Applicable Urban Areas	Relevant Contributing Goals and Influencing Factors	Types of Potential Targets	Relevant Existing National Programs and Activities
A Conserving and Clean System	9. Reduced transit/transportation energy consumption and resource depletion; and	Almost all	Energy efficiency Alternative fuels More use of transit, walking and cycling Reduced auto dependence	Increasing percentage of more energy-efficient vehicles based on vehicle replacement	Vehicle specifications Fuel taxes Vehicle purchase taxes
	10. Reduced emissions of greenhouse gases and other pollutants from transit/transportation.	All	Energy efficiency Alternative fuels More use of transit, walking and cycling Reduced auto dependence	Reduced production of greenhouse gas and other pollutants per capita	Vehicle specifications Fuel taxes Vehicle purchase taxes
A Cost-Efficient System	11. More efficient operation of transit vehicles and higher vehicle productivity;	Medium to large	Road system characteristics transportation demand management Compact, mixed use development	Ridership levels Transit productivity	
	12. Transit priority policies that improve average transit speed and net revenue per vehicle;	Medium to large	Road system characteristics Transit-supportive traffic operations	Proportion of road km and traffic signals with transit priority Average transit speed Transit cost recovery	Research & Development (e.g. ITS)
	13. Cost-effective planning and delivery of new and/or expanded levels of transit service as well as maintenance and rehabilitation of existing services and facilities;	All	Governance for integrated planning and delivery of transit/transportation and urban development patterns Transit funding programs		None
	14. A level playing field from the standpoint of transit versus auto travel decisions based on consideration of real costs and affordability; and	All	Cost-based pricing of transportation Transit funding	3 to 5 year program to reduce distortions	Canada Customs & Revenue regulations
	15. Generation of reliable, performance-based revenue streams to fund urban transit thereby making possible more cost-efficient capital investment programs.	All with regional exemptions	Transit funding programs drawing in part on automobile user charges		Research & Development (ITS)

3.5.3 Targets

A set of proposed potential national urban transit targets is presented in Exhibit 3.4. As shown in the left hand column, these are expressed, in some cases, as desired target levels by 2020 and, in other cases, as percent changes by 2020 from the existing (2000) conditions. A range of proposed quantitative target levels is shown, respectively, for small, medium and large Canadian urban areas, where the urban area size definitions are as presented earlier in Exhibit 2.6 and shown in the legend on Exhibit 3.4. Reflecting the visionary objectives and national scope of this document, the stated targets emphasize broad measures of effectiveness and cost-efficiency rather than more detailed performance indicators.

Generally, the quantitative targets are more ambitious for the larger urban areas, reflecting the greater importance of transit in these areas and the greater scope for transit-supportive actions and results in the larger areas. It should be recognized that major increases in transit ridership by 2020 (e.g. 40-80% in large urban areas) will require a significant change in current planning and transportation policies and a significant investment in added vehicles to handle the growth.

A range of proposed target levels is given for each size of urban area, recognizing the range of existing transit performance indicators experienced by urban areas within a given size group as a result of other factors including location, growth rate, average density and previous/existing levels of support for improved transit. Four of the targets are measures of transit *effectiveness* - increases in annual ridership between 2000 and 2020, targeted levels of annual rides per capita by 2020 and targeted transit modal split levels by 2020 – and one of the targets (ratio of revenue earned to operating costs) is a measure of *cost-efficiency*. The broad relationships among these measures of effectiveness and efficiency have been considered in proposing the target ranges.

The proposed draft targets are presented for discussion and should be subject to review and comment by transportation operators as well as transportation planners and others concerned with the planning and delivery of transportation/transit and urban development in Canada's urban areas. It will be noted that some of Canada's urban areas are already achieving target levels within the indicated range, although the upper end of the range in each case is intended to provide a basis for positive action and it is intended that urban areas and transit operators would strive to move upward within the indicated range and even exceed the top level, if possible, by 2020.

EXHIBIT 3.4: POTENTIAL NATIONAL URBAN TRANSIT TARGETS BY SIZE OF URBAN AREA

2020 Target or Change from 2000, and Quantitative Indicators	Size of Urban Area*		
	Small	Medium	Large
Percent increase in annual transit ridership by 2020 from 2000	20-40%	30–60%	40-80%
Annual transit rides per capita in 2020	20-50	30-100	100-250
24-hour transit weekday modal split in 2020	2-10%	5-15%	10-25%
Peak hour modal split to central area in 2020	10-30%	30-50%	50-80%
Transit revenue/cost (R/C) ratio in 2020	40-60%	50-70%	60-80%

* Legend (CMA Population):

Small – Less than 200,000 regional population in 2000
Medium – 200,000-900,000 regional population in 2000
Large – Greater than 900,000 regional population in 2000

3.5.4 A 2020 Scenario of the Vision

The proposed national vision for urban transit to 2020 is made up of the policy goals presented earlier in this section and summarized in Exhibit 3.3 as well as the quantitative target ranges presented in Exhibit 3.4. Of necessity, and reflecting the complex nature of urban transit and its interactions with other urban systems, the proposed vision has a significant number of policy goals and targets: 15 of the former and five of the latter.

Exhibit 3.5 presents an overview of the vision in scenario form, illustrating the attributes of urban transit in 2020 if the vision is achieved. In effect, Exhibit 3.5 is a two page overview of the vision, summarizing it in terms of four integrated policy goals and some of the more significant target levels, along with factors which will influence the achievement of the various goals. While proposing strategies and actions to achieve the vision is beyond the scope of this report, the influencing factors listed in Exhibit 3.5 provide a preliminary list of key strategy components.

EXHIBIT 3.5: A SCENARIO OF URBAN TRANSIT IN 2020 AS REPRESENTED BY THE VISION

It is the year 2020: Canada's population has increased by 4 million people since the beginning of the century and virtually all of this increase has occurred in the country's urban areas, most of it in the six largest urban areas which had more than 900,000 regional population in 2000: Greater Toronto, Greater Montreal, Greater Vancouver, Ottawa-Hull, Calgary and Edmonton. During the latter decades of the previous century, it had been recognized that most or all of the resulting travel growth in major travel corridors would have to be carried by public transit rather than private automobiles because of the extensive space requirements, pollution, neighbourhood disruption, accidents, congestion and other social, environmental and economic problems of over-dependence on automobiles in urban areas. Governments at the federal, provincial and municipal levels, working with the private sector, put in place appropriate policies and action programs to achieve more sustainable urban transportation and less dependence on the private automobile, with emphasis on large metropolitan areas but also including Canada's mid-sized and smaller urban areas.

POLICY GOALS	INFLUENCING FACTORS
• More compact, mixed-use and transit-supportive urban development and redevelopment integrated with higher speed, more frequent and ubiquitous urban transit services have moderated the growth of automobile travel and increased transit's share of the travel market. By 2020 transit is carrying 10-25% of daily travel in Canada's largest six urban centres (up from 5-20% in 2000) and 50-80% of travel in major corridors (up from 40-60%). Transit's market share has also increased to 5-15% in Canada's mid-sized urban areas, and to 2-10% in smaller urban areas, building on lower initial market shares in 2000. Transit-supportive parking supply and pricing policies in urban centres and sub-centres have contributed to these trends. Reurbanizing Canada's main streets, sub-centres and major travel corridors has also resulted in fewer and shorter vehicular trips in urban areas of all sizes.	• Compact, mixed use urban form. • Transit-supportive development in central areas, sub-centres and along major arteries. • Priority transit along major arteries and rapid transit linking sub-centres. • A hierarchy of transit services including rapid transit, priority bus services, conventional bus, and demand-responsive services as appropriate throughout the urban area. • Parking supply and pricing management.
• Canada's urban areas are served by continuous grid networks of arterial and collector roads capable of serving goods movement, transit and emergency services as well as reasonable levels of automobile use. Road design and traffic engineering, plus people-oriented streetfront activities and urban design have produced faster and more frequent transit services and pedestrian-friendly streetscapes that encourage more transit, walking and cycling. By 2020, substantially more trips in the central areas, subcentres and neighbourhoods of Canada's urban regions are made by walking and cycling, as well as transit, than was the case in 2000.	• Street continuity and connectivity. • Streetscape, sidewalk and related urban design. • Transit priority lanes and operational arrangements. • Traffic signal timing, phasing and crosswalk arrangements. • Cycle paths/lanes, storage at transit stations and racks on transit vehicles.
• A higher proportion of transit providers are using either more fuel-efficient vehicles or	• Fuel taxes, road pricing and other user charges

vehicles that rely on alternate fuels and/or hybrid technologies. Pricing incentives and corporate average fleet efficiency regulations have decreased the fleet average fuel consumption per passenger-km for all vehicles. Greater transit/transportation energy-efficiency and reduced emissions of greenhouse gases and other pollutants per person have been achieved through both improved technology and the travel market share increases for transit, walking and cycling.

- Fuel consumption standards.
- Financial/R&D incentives.
- Support for cleaner fuel distribution systems.
- Incentives for less auto-dependence
- Incentives for more efficient use of transit/transportation infrastructure

- More cost-efficient delivery of transit services, and predictable, adequate funding sources have been achieved along with local governance able to plan and deliver more sustainable transit/transportation and urban development in an integrated and mutually supportive manner. By 2020 the average transit revenue-cost (R/C) ratios have increased to 40-60% in the country's smaller urban areas, to 50-70% in its mid-sized areas and to 60-80% in its largest six urban areas.

- Grid layout of arterial and collector roads.
- Compact, mixed use urban development.
- Transit-supportive development in sub-centres/corridors.
- Rapid transit linking sub-centres and central areas.
- Priority transit along major arteries.
- Applying a mix of public and private operators to achieve efficient service delivery while retaining public control.
- Establishing revenue streams from dependable user-pay sources (e.g. full-cost pricing for use of automobiles, revenues from public utilities, value-capture funding) to provide dependable funding sources for urban transit and to help achieve the other initiatives for more sustainable urban transportation.

As a result of these policies and programs, urban transit infrastructure and services are adequately funded from stable and sustainable revenue sources while being delivered cost-efficiently; roads, terminals and other transit facilities are in a good state of repair; air pollution from motor vehicle sources is declining; transportation energy-efficiency has increased significantly; and political leaders have the support of a well-informed public in making decisions for more sustainable transit/transportation and urban development throughout urban Canada.

4. CO-BENEFITS AND STAKEHOLDER COMMENTS

4.1 THE NATURE OF CO-BENEFITS

Previous chapters have focussed on the history and current status/issues relating to urban transit in Canada, existing urban transit vision statements in Canada and other countries, and a proposed statement of a transit vision, goals and targets for Canadian urban areas. In this chapter, we provide a brief summary and discussion of the co-benefits of achieving the transit vision. As noted earlier in Section 1.3 the term "co-benefit" refers to benefits which are ancillary to the direct transportation benefits of urban transit: namely its capability of providing the necessary capacity and service levels to move people in major travel corridors and to accommodate peak period movements while also providing an affordable choice of travel mode other than the private automobile). The co-benefits are discussed under the three major headings of Economic**,** Social and Environmental Co-benefits**.** As noted, a number of the co-benefits summarized below have relevance under more than one of these major headings, reflecting the significant synergies among them.

As also noted earlier in Section 1.3, governments in Canada (and elsewhere) recognized, as urban transit enterprises ceased being commercially viable during the years following the Second World War, that public investment is justified to maintain and expand such services. These decisions were presumably made – and there has been continued and expanding public support since then – in recognition that they are justified by the important direct transportation benefits of urban transit, as outlined above, plus the significant number and variety of co-benefits, as outlined in the sections following. It may be argued by some that the need for public investment would be removed if economically efficient pricing were applied to transportation options so that pricing signals would take into account congestion, safety, environmental considerations and other benefits associated with public transit. As pointed out in the final report of the Canada Transportation Act Review Panel, this market failure could be addressed, at least in part, by permitting urban transit to qualify for funding from road user charges (recommendation 12.3) which road users "should pay … by means of appropriate charges and fees" (recommendation 10.1). [17]

Since a separate Transport Canada consultant study is examining the value of urban transit from the standpoint of a benefit-cost framework, this section of the report concentrates more on the qualitative implications of urban transit for other aspects of urban life in Canadian cities. Readers wishing to delve further are also referred to Transport Canada's ***Guide to Benefit-Cost Analysis***. [18]

4.1.1 Economic Co-Benefits

Access to Labour

Surveys of business show that access to labour is one of the most important factors affecting the location decisions made by firms and industries. The availability of reliable transit service is thus often an important condition for maintaining or expanding the economic base of a community. In extreme cases, this could lead to industries moving out with corresponding reductions in the property

[17] Canada Transportation Act Review Panel. July 2001, *op. cit.*

[18] ***Guide to Benefit-Cost Analysis in Transport Canada***. Transport Canada. September 1994.

tax base and increases in vacant parcels of land that cannot be effectively used for alternative purposes. With good transit service for their employees - and often for their customers- firms can also reduce the expense of providing parking, allowing land to be used for higher economic purposes. The choice of an alternative travel mode for daily commuting which reduces or eliminates the need to fight growing road traffic as a driver – is also a significant social benefit as well as being critically important to the economy of the urban area.

Maintenance of Healthy Downtown Areas

In contrast to cities of comparable size in the U.S., most of the larger Canadian cities have been successful in maintaining the vibrancy of their downtowns as centres of employment and enjoyment. Even where adjacent municipalities compete for jobs and residents, most agree that a healthy city core, as well as regional sub centres are essential for the good of the regional economy and thus the Canadian economy as a whole.

Strong central cores depend upon good internal transit services, inter-regional commuting by transit rather than by car, and more opportunities to reside within the downtowns so as to achieve a better balance between living and working and less need to commute long distances daily. Living within the city is enhanced by the availability of higher levels of transit service and less need for multiple car ownership. This provides social and environmental benefits as well as its major economic impact. [19]

Containment of Urban Sprawl

Numerous studies and articles have demonstrated that compact urban form and carefully managed growth patterns result in greater efficiency for a wide variety of urban services including water and waste disposal, fire and police protection, health and educational facilities, and infrastructure management.[20] Due to the basic inter-relationship between transportation and land use, transit is recognized as one of several means of achieving more compact urban form by using existing services to encourage "infill" of abandoned industrial and commercial sites (thereby making use of other existing urban infrastructure, as well), as well as the development of more concentrated nodes of residential and commercial activity.

While in their entirety, the economic benefits of reduced urban sprawl cannot be attributed to transit alone, in the case of Greater Toronto, for example, the IBI ***GTA Urban Structure Concepts Study*** estimated capital cost savings of over $7 billion for transportation and water/waste water system investments over the period to 2021 in comparing a "nodal" urban development concept, with a greatly improved transit system, to a continuation of sprawl and auto-dependent greenfields settlement patterns. The same study estimates that annual operating costs for automobile travel in

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[19] ***Sustainability and Cities: Overcoming the Auto Dependency.*** Peter Newman and Jeff Kenworthy. Island Press. 1998.

[20] See, for example, ***Greater Toronto Report of the GTA Task Force,*** Province of Ontario. January 1996, as well as ***Greater Toronto Area Urban Structure Concepts Study***. IBI Group et al. 1990 and ***The GTA Urban Structure Concepts Study Revisited: Broad Revision of Selected Cost Estimates***. IBI Group. 1995 .

2021 would be about $1 billion less under the nodal development concept than under a continuation of sprawl. These savings would contribute significantly to increased economic efficiency, competitiveness and prosperity. Again, reduced sprawl provides many social and environmental benefits as well as the economic benefits noted.

Opportunities for Export Development

Although treating the employment effects of transit construction and operation as a co-benefit may be questionable unless the analysis is sufficiently comprehensive, as noted at the beginning of this chapter, there are economies of scale in the manufacture of transit vehicles to serve local needs that frequently lead to export sales that would otherwise not be cost competitive. Historically, similar co-benefits occurred in the case of aircraft manufactured to fill specific Canadian needs in the far north (Dehavilland's Otters and Beavers, for example) which subsequently led to large scale exports to other countries for both military and commercial purposes.

In the same way, Hawker Siddeley's innovative designs for new commuter rail equipment in the Greater Toronto Area (push-pull control in the 1960s and bi-level designs in the 1970s) led to exports (from an Ontario perspective) to Vancouver and Montreal and (from a national perspective) to the U.S. and Israel. Similarly, UTDC/Bombardier's successful application of advanced light rail transit (Skytrains) for Toronto and Vancouver have led to export sales in the U.S. and Southeast Asia with future prospects elsewhere in the world. In other words, these co-benefits derive from successful application of new technologies and methods to serve domestic transit needs. Canadian expertise developed during the course of planning and design of Canadian transit facilities has also led to export sales of such services.

Effects on Tourism

Tourism is an important economic generator in many Canadian cities, many of which devote considerable attention to improving the attractiveness of their community for major conventions, conferences, trade shows and special sporting, entertainment, and cultural events. High quality downtown areas supported by good, safe (particularly for American tourists) and easily understandable transit services are considered important factors that influence the choice of locational decisions made by organizations responsible for such events, as well as decisions made by individual tourists. [21] Coupled with the low dollar, for example, the ability to use transit instead of taxis or rental cars makes Canadian destinations particularly competitive for tourism relative to U.S. locations. There are also social benefits to local inhabitants who are able to enjoy the increased attractiveness and range of entertainment available in their community.

Productive Use of Time Spent Commuting

As argued in Transport Canada's ***Guide to Benefit-Cost Analysis***, commuting to work on urban transit may increase productivity since it is possible to conduct work en route, while commuting via private vehicle does not allow for this (except possibly by the use of cell phones while driving, which

[21] ***Travel Activities and Motivation Survey***. Lang Research for an association of Canadian governments. March 2001.

is increasingly recognized as a significant safety hazard and is thereby facing growing pressure to be made illegal). It is difficult to assess the magnitude of this productivity enhancement since, clearly, it depends on the level of crowding in the transit vehicle and the choice made by the commuter to spend the available time on "work" rather than reading a novel or daydreaming. One of the co-authors of this report (Neal Irwin) commutes regularly to and from work via subway in Toronto and routinely uses the time spent (about one hour per day for the return trip) to catch up on professional reading for which there is not time during regular office hours; daily observation (on the Yonge Street subway) suggests that possibly 5-10% of those using this urban transit mode employ their commuting time as an extension of working hours, but a more comprehensive survey would be necessary to quantify the resulting gain in productive working hours.

4.1.2 Social Co-Benefits

Accessibility for the Disadvantaged and More Choice for All Travellers

Transit service provides accessibility to employment, recreation, shopping, health care facilities, and schools and universities for those who by reason of age, income, or physical disability would otherwise be unable to travel. Such services enable these individuals and groups to participate as members of the urban community in which they live in a wide variety of activities and functions. Transit also extends the range of accessibility and travel mode choices available to *all* travellers, whether or not they fall into the above groups. Thus transit service contributes to the quality of life for many, even though the level of service may be insufficient to satisfy demands in all cases. While listed here as a social benefit, this service provided by urban transit also delivers significant economic benefits by effectively expanding the size of the available workforce and reducing the number of people who are dependent on public welfare funds for their income.

Air Quality and Health

The relationship between emissions of particulate matter and other pollutants (e.g. nitrogen oxides and volatile organic compounds) and air quality is widely recognized as having a major impact on smog and the corresponding dangers for the elderly and those with respiratory or other serious physical ailments. The substitution of travel by transit for automobile trips is considered to be one of the more important contributors to better health, less overloading of hospital emergency facilities and even reductions in fatalities. During periods of "smog alerts", for example, most large municipal governments urge individuals to use transit rather than automobiles as a measure to help reduce automotive emissions which are the main ingredients leading to smog formation. While better health is an obvious social benefit, it is also a significant economic benefit in terms of reduced health care costs and less lost time from work. Better air quality, is of course, also a major environmental benefit not only for humans but also for other fauna and flora and the entire biosphere.

Reduced Need for Road Construction

Road congestion continues to be one of the major concerns of residents and officials in medium to large municipalities throughout Canada. Congestion leads to time losses, increased emissions, more costly urban goods movement and, to some extent, an alarming increase in examples of so called "road rage". Successful application of improved transit services that divert automobile users to transit, particularly in the case of long distance commuting, helps reduce overall congestion, provides

more capacity for trucks and commercial vehicles, and delays the need for expansion of the road system. (For example, it has been estimated that some 30 percent of the cost of moving goods in the Greater Toronto Area in 1987 was due to congestion and that this added about $1.8 billion to the goods movement costs in that year[22]. Statistics of this nature lead to political pressures for the construction of more roads in spite of evidence that metropolitan areas which invest primarily in roads experience levels of congestion (annual hours of delay per capita) which are similar to or greater than those experienced in metropolitan areas which substitute transit for roads to provide additional transportation capacity. [23]

Bearing in mind that 15 to 20 buses per hour have a carrying *capacity* equivalent to one lane of an urban arterial road and that 35-40 buses per hour provide capacity equivalent to one lane of an urban expressway, these transit services are directly substitutable for road expansion, the associated community disruption, and loss of land for other purposes provided, of course, that reasonable *utilization* can be achieved. While listed as a social benefit, reduced road construction has clear economic benefits in heavily travelled urban corridors (where transit yields reduced costs plus superior benefits in many cases as a more cost-effective means of providing additional capacity), and the increased reliance on transit also yields environmental benefits as described further below.

Standby Capability

Under winter weather conditions that typify the majority of Canadian cities, transit (notably rapid transit) serves as an alternative travel mode for essential work, school and other trip purposes in times of major road and street closures due to storms. Transit also provides important standby capacity for major events such as parades, exhibitions, street festivals, and sporting events where road access, including parking, must be closed off to specific areas of a community for limited durations. This is also an economic benefit as a means of avoiding or reducing work interruptions during winter storms and other weather events.

4.1.3 Environmental Co-Benefits

Reductions in Greenhouse Gas Emissions

Although there are ongoing challenges in meeting the Kyoto protocol for reductions in greenhouse gas emissions, Canada remains committed to achieving its targets over the next ten years or so. Emissions resulting from the consumption of fossil fuels for urban transportation have frequently been identified as a significant source of these emissions. Thus transit serves national objectives for greenhouse gas reductions in two ways.

First, *to the extent that automobile users are diverted to transit*, there are corresponding reductions in emissions. As an illustration of the reductions in emissions possible through such diversions, using some typical measures of fuel consumption (the CAFC standard of 8.6l/100km) and vehicle

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[22] ***Metropolitan Toronto Goods Movement Study***. Metropolitan Toronto Roads & Traffic Department. March 1988.

[23] ***Easing the Burden: A Companion Analysis of the Texas Transportation Institute's Congestion Study.*** Surface Transportation Policy Project. May 2001.

occupancy (1.1) for automobiles, relative fuel-efficiencies have been estimated at 60, 44, and 10 passenger-km of travel per litre for bus, commuter rail, and passenger car, respectively.[24] Greenhouse gas (GHG) emissions per passenger-km are approximately six times less for trips diverted from auto to bus and four times less for trips diverted from auto to rail, based on these relative fuel-efficiencies, with existing fossil fuels. The report of the Climate Change Table [25] presents estimates that the "most promising" and "promising" initiatives involving greater reliance on or use of urban transit would reduce Canada's emissions of GHG's by about 13 million tonnes annually by 2010.

Second, to the extent that improved transit alters urban form in ways that reduce the average length of all vehicular trips, as well as the substitution of transit, walking and cycling for vehicular travel, there are further co-benefits related to Canada's commitments under the Kyoto agreement. Resulting reductions in vehicle-km of travel per capita produce proportionate reductions in tonnes of greenhouse gas emitted per capita. As noted earlier, these results create economic and social, as well as environmental benefits.

4.2 SYNTHESIS

The eleven benefits discussed in the previous section, while among the most important co-benefits of urban transit, are only a partial list. For example, the companion study for Transport Canada on ***Benefit Cost Assessment of Urban Transit Investment*** by HLB Decision Economics Inc. lists 17 transit benefits criteria (Section 3.3.2, Table 3) and other sources describe and quantify greater numbers of benefits[26].

In summary, throughout North America and most of the industrialized world**,** the time has long passed since public transportation can be considered as a profitable operation that provides a commercial return on investment.[27] As shown in Exhibit 4.1, for example, none of the transit operations illustrated meet their full operating and maintenance costs from revenues, let alone make a contribution to capital. (In this regard, Canadian operators generally achieve higher cost recovery than for comparable size operations in the U.S.). All Canadian transit operators thus receive subsidies from municipal governments and, in the case of B.C., Alberta, and Quebec, from provincial governments to cover their operating losses and capital requirements.

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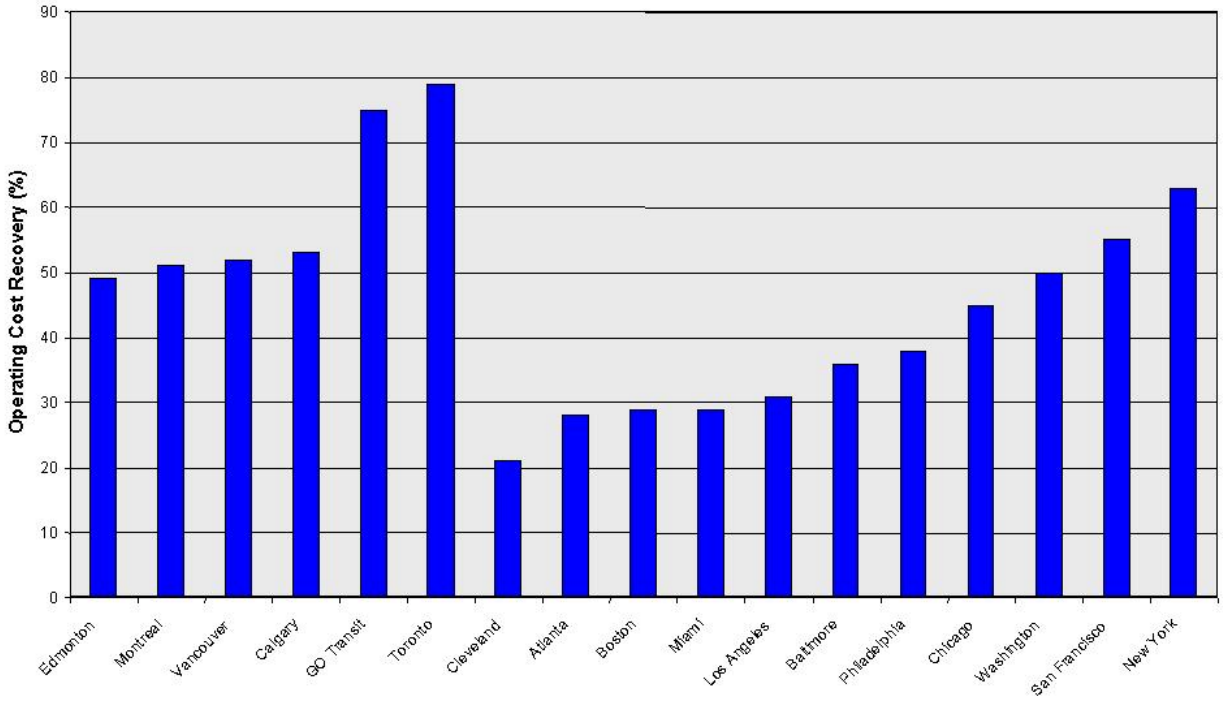
[24] ***Understanding GO Transit***. Richard M. Soberman for GO Transit. 1998, p.12

[25] ***Transportation and Climate Change: Options for Action***. Options Paper of the Transportation Climate Change Table. Transport Canada. November 1999.

[26] ***Evaluating Public Transit Benefits and Costs***. Todd A. Litman, Victoria Transport Policy Institute. December 1999. www.vtpi.org

[27] In many developing countries, urban transit services are profitable and are provided by private sector operators. The level, quality, safety, and reliability of many of these services, however, would not be considered acceptable in most industrialized nations. Moreover, in most cases, the profitable services concentrate only on high density routes, often providing no service in large areas of a community.

EXHIBIT 4.1 COST RECOVERY FOR SELECTED TRANSIT OPERATORS 1998



These subsidies are essentially justified, from the standpoint of elected officials who must approve budgets, on grounds of direct transportation benefits and broader co-benefits that are generated by the provision of such subsidized services to the communities at large. Although subsidy needs can be altered by political decisions on fare policies and levels of service to be provided (which certainly differ from community to community), any decision to subsidize urban transit basically implies that the various monetary and non-monetary benefits summarized above, in aggregate, are perceived to outweigh the monetary costs.

4.3 STAKEHOLDER COMMENTS

Earlier draft forms of this urban transit vision report were circulated to a number of stakeholders, in addition to those represented on the Study Steering Committee, for comments and suggestions. The timeframe for receiving stakeholder responses was limited due to the study schedule, and the comments reflect earlier draft sections of the report, which underwent a constant process of refinement as comments were received from both the Steering Committee and the stakeholders. For this reason, stakeholder comments which have been addressed during the report editing process are not referred to here. A number of more general comments were also received and these are summarized briefly below, as stated by one of the stakeholders:

- Overall, the report provides a reasonable framework for the Federal Government to develop a national vision for urban transit

- As with many reports of this nature, this is just a starting point for discussion. The key question is how can the information in this report be translated into an actionable plan that will create effective policy changes that will benefit transit. Without this link, this is just another report that may sit on the shelf.

- The policy and decision-makers need to understand that there is no simple, one-stop solution to improving the transportation problems that face our urban areas. The report must clearly indicate that an overall strategy needs to be developed that reflects action on a number of fronts.

- Having said this, there is a great deal of information that should assist those new to transit/transportation about some of the key issues facing transit, and the number of factors that interact to influence the demand for transit services.

- It is therefore important that if the main benefit from this report is to contribute to a learning curve for policy and decision-makers, that follow-up continue on a more direct basis to address their questions.

As stated elsewhere in the report, agreement on a national urban transit vision, while no guarantee of results, will be a significant step towards the significant actions needed to achieve more sustainable transit/transportation and development patterns in Canadian urban areas.

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