

**URBAN TRANSPORTATION:
AN ESSENTIAL FACTOR**

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ABSTRACT

A basic message of this paper is that effective transportation is an essential factor contributing to the success of urban areas. The paper discusses major socio-economic benefits of improved urban transportation and relates the implications of these to Canada's 27 Census Metropolitan Areas (CMAs), grouped in terms of size and growth rate.

Five requirements for sustainable urban transportation are outlined, plus a discussion of the importance of integrated transportation and urban development in order to achieve smart growth. The experience of Metropolitan Toronto during its years of major build-out (1953 – 1985) is quoted as an example of past success in achieving smart growth, and key messages are drawn from this and more recent experience in the Greater Toronto Area plus Hamilton (GTA/H).

While provincial-municipal working groups produced a "GTA Vision" for smart growth in 1992, the paper comments that major objectives of the Vision have not been achieved since then to the extent anticipated, and attributes much of this experience to the lack of investment in improved transportation, particularly high-order transit. In the absence of an integrated network of trunk transit lines, the compact, mixed-use development nodes and corridors essential for sustainable transportation and smart growth in a large metropolitan area have not been occurring as planned.

Two major reasons for the lack of the required transportation investment integrated with land use development are identified:

1. Insufficient funding; and
2. Fragmented planning and implementation of transportation and related land use.

Transportation user fees based on full costs for fuel, road space, parking and/or vehicle registrations are suggested as an important component of improved funding programs, essential to provide multi-year reliability. A Greater Toronto Transportation Agency is proposed as the governance mechanism to plan, fund and deliver integrated transportation and related land use for the entire urban region comprehensively and consistently over time.

The paper concludes by noting that continuing funding shortfalls and fragmented governance carry major environmental, economic and social risks; in contrast, adequate, reliable funding and appropriate governance leading to more sustainable transportation and land use will greatly enhance the liveability and economies of Canada's urban areas.

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WHY IS URBAN TRANSPORTATION IMPORTANT?

Urban areas depend on and are shaped by transportation, and urban size, form and growth rate in turn affect transportation effectiveness and efficiency. Congestion has the potential to retard economic growth, while appropriate transportation infrastructure and services contribute to the liveability of urban areas. Quality of life is a key factor in business location decisions, particularly for the rapidly growing knowledge-based industries. Transportation also has major environmental and health impacts. In short, high quality transportation is essential for the environmental, economic and social success of Canada's urban areas. The fact that 80 percent of Canadians live in urban areas underlines this importance.

For most urban trips, automobiles and trucks provide convenient and relatively affordable transportation. But automobile/truck congestion and environmental impacts increase with urban size and in major travel corridors. Roads alone are not enough in such corridors owing to the significant space requirements of automobiles relative to the number of people carried on a typical road (particularly with the preponderance of single-occupant vehicles for work trips and other purposes) and because of the disruption caused by new or expanded roads in existing built-up areas.

For these reasons, improved urban transit is increasingly essential as cities grow, and compact, mixed-use nodes and corridors of urban development are necessary to improve the convenience and viability of transit as well as the liveability of urban communities. Unfortunately, financial constraints have limited transportation investments – particularly required investments in high-order transit networks – and this, in turn, has contributed to spread, single use patterns of suburban growth which have increased dependence on the automobile and reduced the competitiveness of transit.

Exhibit 1 illustrates recent population growth trends in Canada's 27 Census Metropolitan Areas (CMAs) during the 1996 – 2001 period. The ten CMAs that experienced population growth of five percent or more (Toronto, Vancouver, Ottawa-Hull, Edmonton, Calgary, Hamilton, Kitchener, Windsor, Oshawa and Abbotsford) are all either large metropolitan areas in their own right or are closely related to such metropolitan areas. In contrast, seven of the smaller CMAs experienced negative growth during the five year period and the others had positive growth lower than five percent.

Urban growth in Canada appears to follow the old adage "them that has gets". Much of this can be attributed to the fact that international immigration is the major driving force of population growth in Canada (fertility levels having dropped beneath the "break-even" level over 30 years ago) and new immigrants tend to locate in our larger metropolitan areas where they can draw on existing ethnic communities and related social services, while also experiencing greater economic opportunities.

In considering the major benefits of improved transportation, some of which are summarized for this paper in Exhibit 2, it is useful to consider the relative importance of each benefit as experienced by the larger (and generally more rapidly growing) CMAs which tend to face greater traffic congestion and environmental impact problems, and the smaller CMAs which in many

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cases are experiencing lower rates of growth but also may have fewer problems in terms of traffic congestion and environmental/health impacts.

As shown in Exhibit 2, all of the major benefits listed under the headings Environment, Economy and Community are considered to be of major importance in the larger metropolitan areas and those which are experiencing robust growth. In contrast, while all three Community benefits (encourages people-friendly streets/neighbourhoods; provides mode choice and equitable access; contributes to improved quality-of-life) are seen as major benefits for both smaller and larger CMAs, the importance of some benefits listed under the Environment and Economy headings are considered to be less for the smaller CMAs.

For example, under the Environment heading, it is argued that the importance of transportation improvements to reduce pollution and contribute to better health and to use resources efficiently (e.g., land, energy) is less in smaller CMAs than in larger metropolitan areas. However, the major benefit of providing safe, convenient service and a people-friendly ambience (e.g., low levels of noise, vibration and dust) is seen as equally important for both CMA size groups. Similarly, while for some smaller CMAs it may be less important to make transportation changes to shape and support smart growth and to move people and goods more efficiently, it is seen as essential for both size groups that transportation improvements be provided in order to attract and retain investments, jobs and income.

There is an important difference, however, in the manner that improved transportation can contribute to economic growth for the two categories of CMAs. In the larger CMAs, particularly those that are growing rapidly, it is essential that transportation capacity and modal balance improvements be made in order to reduce the negative impacts of congestion on the movement of people and goods. Without such investments, transportation capacity and service levels become degraded over time (as has happened in Greater Toronto and the other rapidly growing CMAs), with the real danger that economic growth may be choked off as new and expanding businesses choose to locate in areas with lower traffic congestion and better accessibility.

In contrast, the argument for improved transportation in the smaller and often less rapidly growing CMAs is not generally that congestion may slow economic growth, but rather that improved accessibility and mode choice (often to and from the CMAs) are necessary to attract new investments and jobs. While the need to address growing congestion is seen as critical in the rapidly growing CMAs, the need for improved accessibility and/or renewed transportation facilities is more often cited in the less rapidly growing CMAs as justification for the improved transportation in hopes that this will stimulate more robust economic growth.

There is an extensive literature on the implications of improved transportation for economic growth, and it is beyond the scope of this paper to address this topic in more detail. The important point is that improved transportation is essential for the economic health and competitiveness of both large and small urban areas across Canada (although often for different reasons as noted above) and the benefits of transportation improvements under the headings of Environment and Community are also critically important as well as those under the heading of Economy, for both size groups of CMAs.

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SUSTAINABLE TRANSPORTATION AND SMART GROWTH: THE TORONTO EXPERIENCE

The question then arises, what do we mean by improved transportation? TAC's *New Vision for Urban Transportation*¹, first published in 1993, admirably summarizes 13 attributes of an improved and more sustainable urban transportation system. A somewhat less detailed assessment² suggests that, to be sustainable in the long term, a transportation system will have to be:

- **capable** of delivering the required capacity, level of service and safety;
- **compatible** with the kinds of places we want to live in;
- **conserving** (and ultimately renewable) in terms of energy and other resources;
- **clean** in terms of its environmental impacts; and
- **cost-effective**, i.e., affordable relative to value added.

Improvements under each of the above five headings will lead directly to socio-economic benefits such as those listed in Exhibit 2, and improvements under all five headings will be necessary to achieve more sustainable urban transportation.

The concept of smart growth⁴ also involves a number of key principles which can be summarized as follows:

- Integrated urban development and transportation, including compact, mixed used nodes and corridors served and shaped by roads and high-order transit;
- Choice of community and housing types;
- Choice of effective travel modes;
- A robust, competitive economy;
- More efficient use of land, energy and materials;
- Cleaner air, water, soil; and
- More liveable communities.

The experience of Metropolitan Toronto during its 1953 – 1985 period of build-out was ahead of its time in achieving a number of smart growth objectives. It produced relatively compact, mixed-use development, particularly in the 1950s and 1960s, which was served and shaped by integrated transit and roads based, in particular, on expanded bus and subway systems, an extensive commuter rail system and integrated policies to produce transit-supportive land use. It

¹ See References listed at the end of the paper. A more comprehensive definition of sustainable transportation³ has been developed by Canada's Centre for Sustainable Transportation (CST) and a version of the CST's definition was subsequently adopted as a working definition by the transport ministers of all 15 countries of the European Union.

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was labelled “The City that Works” and “New York run by the Swiss” by visitors from other countries.

One important result has been a significantly higher use of urban transit by residents of Metro Toronto than by residents of adjacent suburban areas, thereby achieving a more sustainable transportation system (as defined under all five headings listed above) and contributing to most of the smart growth principles also listed above.

As the supply of new land for urbanization within Metropolitan Toronto dwindled during the late 1980s, the locus of rapid growth moved increasingly to the surrounding suburban areas. The formation of separate upper-tier municipalities surrounding Metropolitan Toronto, carried out by the provincial government during the 1970s, meant that there was no longer a single municipal government responsible for the planning, funding and delivery of urban transportation and related land development. A more fragmented approach resulted, in which each municipality focussed on its local development and transportation issues and there was an increasing lack of leadership to develop a vision for the entire Greater Toronto Area and Hamilton (GTA/H).

The provincial government formed the Office for the Greater Toronto Area (OGTA) in an attempt to address this situation and, in 1990, the OGTA commissioned a major study⁵ of alternative growth concepts and the infrastructure requirements, costs and performance levels which could be anticipated for each alternative during the following twenty years. The three concepts were labelled “**Spread**” (a continuation of existing relatively low density, single-use suburban development trends), “**Central**” (establishment of an urban envelope, with increasing density of development inside the boundary), and “**Nodal**” (establishment of compact, mixed-use nodes and corridors served by a network of high-order transit). There was a strong preference for the nodal concept among provincial/municipal staff, political leaders and other stakeholders.

Drawing on this result, the provincial government set up provincial/municipal working groups during the following year to develop the nodal concept in more detail, which resulted in the publication of reports documenting the “GTA Vision”, both in terms of the nodal land use concept⁶ and required infrastructure to service this concept in 2021⁷. Official plans and amendments developed by municipalities in the GTA and approved by the Minister of Municipal Affairs during the 1990s reflected these concepts. In 2000 the Greater Toronto Services Board published a strategic transportation plan⁸ for the GTA/H which included similar thinking.

While development during the past decade has reflected some aspects of the nodal development concept, there is a general recognition that major objectives of the Vision have not been achieved to the extent anticipated. An important reason for this is seen as the lack of investment in improved transportation, particularly high-order transit. In the absence of an integrated network of trunk transit lines, the compact, mixed-use development nodes and corridors essential for smart growth and sustainable transportation have not been occurring as planned.

The key message from Toronto’s experience during those years is that, in order to experience the benefits of integrated transportation and land use (e.g., more cost-efficient transportation, greater choice and more liveable communities), an integrated approach to planning and delivering transportation and related land use is required for the entire urban region, with the following requirements:

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- studies to understand implications of differing futures (e.g., sprawl versus nodal development);
- emphasis on land use/transportation integration, at both the regional and local scales, achieving shorter trip lengths and reduced growth rates of motorized transportation activity – for both passenger and freight movements – through more compact, mixed-use development and greater choice of travel modes;
- adopting a “level playing field” approach to policies and programs, including transportation demand management to encourage more efficient use of the transportation system;
- assessing public values and preferences and ensuring that the public is well informed and aware of the choices to be made and their implications; and
- planning for future evolution of built form and infrastructure in corridors and nodes so that, for example, transportation in major corridors can evolve from an earlier reliance on automotive traffic to a greater reliance on urban transit and rail-based services as the metropolitan area grows and traffic densities increase.

In 2001, the Neptis Foundation funded work by IBI Group et al to define and assess several alternative future development/infrastructure concepts for a larger urban region including the GTA/H plus adjacent upper-tier municipalities. The resulting *Toronto-Related Region Futures Study* has produced two reports: *Interim Report: Implications of Business as Usual Development*⁹ and *Sketch Modelling of Four Alternative Development Concepts*¹⁰. The four concepts studied were: “**Business-As-Usual**” (a continuation of spread development trends); “**Consolidated**” (a nodal concept with compact, mixed-use nodes and corridors, emphasizing considerable infill as well as some development on new lands); “**Multi-Centred**” (similar to Consolidated, but with more emphasis on growth of employment and population in urban centres at the edge of the study area such as St. Catharines, Waterloo, Guelph, Barrie and Peterborough); and “**Dispersed**” (more extensive exurban development at low densities, reflecting the influence of extensions of major highways).

For each concept, the reports describe the projected urban development pattern, postulated transportation system and water/waste water system, and the cost and performance attributes of these infrastructure systems. The results of the *Toronto-Related Region Futures Study* were used as input to the deliberations of the Central Ontario Smart Growth Panel, formed in the Spring of 2002 to develop a smart growth strategy for the Central Ontario Zone, an area slightly larger than the Toronto-Related Region as defined for the Neptis reports.

In April 2003, the Central Ontario Smart Growth Panel produced its final report *Shape the Future*¹¹, which lays out a smart growth strategy for the Central Ontario Zone including not only the Cities of Toronto and Hamilton, but also the Regions of Niagara and Waterloo and the Counties of Haldimand, Brant, Wellington, Dufferin, Simcoe, Haliburton, Peterborough and Northumberland as well as the City of Kawartha Lakes. The proposed growth concept to 2035 and beyond, as illustrated in Exhibit 3 drawn from that report, includes an urban structure involving more compact, mixed-use nodes and corridors and a very extensive series of transportation improvements to support the proposed smart growth development patterns and serve the growing urban region in a more sustainable manner.

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The transportation improvements include a greatly expanded network of commuter rail and rapid transit services supporting key development nodes, and expansion of the 400 series highway network to carry increasing goods movement in and through the area, as well as serving recreational traffic and other passenger movement requirements.

FINANCIAL AND GOVERNANCE ISSUES

While the transportation investment requirements of this concept have not been reported, the capital costs of a more modest set of transportation improvements for the GTA/H are shown in Exhibit 4. These are adapted from the report *Funding Transportation in GTA & Hamilton-Wentworth*¹² by IBI Group and Hemson Consulting Ltd. dated April 1999. As shown in the exhibit, the total estimated capital investment required to keep pace with development would be \$1.77 billion per year, of which almost half would be required to renew and rehabilitate the existing system and optimize its use, with the remainder required to expand the system. The same study reported that total existing/budgeted transportation capital expenditures by municipalities in the GTA/H in the period 1998 – 2007 averaged \$570 million per year; adding an estimated provincial capital requirement and expenditure of \$400 million per year in 400-series highways in the GTA/H leads to the conclusion that there was a capital funding shortfall of some \$800 million per year at the municipal level.

There has been considerable discussion of the implications of this shortfall by political leaders, municipal staff and citizen groups throughout the area, including deferred maintenance, delayed expansion and increasing congestion levels as well as lack of support for smart growth as noted earlier. The funding report stated that demand-related, cost-based, reliable, multi-year funding sources are required which will overcome the shortfall and provide a firm basis for achieving improved transportation in the area. Among the possible sources identified are the following:

- increased municipal charges including property taxes and development charges;
- transfers from senior governments;
- transportation user fees, based on full costs for fuel, road space, parking, vehicle registrations, etc., with the revenues dedicated to fund transportation improvements.

It was concluded that a combination of funding sources will be required while recognizing that there is little or no scope for increased municipal charges and that transfers from senior governments require multi-year continuity and local coordination to be truly effective.

There is a growing acceptance in the area that, in order to achieve a reliable, multi-year funding program, the program will have to include revenue streams from transportation user fees, at the very least drawing on an allocation of revenues from existing (or somewhat increased) fuel taxes, but that other fees including road pricing, parking surcharges and vehicle registration fees should also be considered. It is noteworthy that some of these fee-based funding sources are now dedicated for urban transportation improvements in the Lower Mainland region of British Columbia (through TransLink as the coordinating and integrating agency), in Alberta (where annual provincial grants are made to Calgary and Edmonton based on five cents per litre of fuel tax revenues from locally sold gasoline) and in Greater Montréal (where the Agence

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Métropolitaine de Transport (AMT) administers a program of transit improvements drawing on revenues provided by the province, including fuel taxes and other sources).

There is also growing acceptance in the GTA/H and other major metropolitan areas that a single agency is required to plan, fund and deliver improved transportation and related land use with a mandate for the entire urban region. This is based, in part, on the experience of the past 15 – 20 years in the GTA/H, which has included fragmented planning and delivery arrangements and lack of sufficient funding, with resulting transportation consequences including declining transit ridership, supply-limited commuter rail ridership, auto-dependent suburbs, and significantly growing traffic congestion, particularly in suburban areas where existing transit services (with the exception of the GO Transit commuter rail system) are in most cases unable to provide service competitive with the convenience and coverage provided by private auto travel.

Toronto provides perhaps the most extreme example of this governance problem among Canadian CMAs. The other two CMAs with populations of about 2 million or more – Montréal and Greater Vancouver – are now benefiting respectively from the TransLink and AMT coordinating agencies which were put in place based on provincial legislation and reflecting provincial-municipal negotiations. Developments of this type are long overdue in Greater Toronto and it is to be hoped they will be forthcoming as part of the smart growth strategy initiatives. Many other Canadian CMAs, notably those located in the Prairie provinces, benefit from having single municipal governments with jurisdiction over the entire urban region, which means that the government has the necessary planning and delivery mandate and a special transportation authority is not required.

In Greater Toronto, however, assuming that a single municipal government for the entire urban region is unlikely in the foreseeable future, there is an urgent requirement for provincial-municipal action to establish and fund a Transportation Agency (TA) with a broad mandate for integrated planning, funding and delivery of improved transportation and related land use. The TA would set priorities for transportation investments and related land use initiatives, working with municipal governments/agencies and the private sector as appropriate to implement the program. Initially, the agency's mandate could be limited to high-order transit and related land use and local transit improvements, with the intent to include road transportation at a later date. It would act to preserve and expand all transportation modes, with different levels of balance between roads and transit in various parts of the urban region, reflecting the overall smart growth/sustainable transportation strategy. The transportation improvements would be designed to serve and help shape urban development patterns based on smart growth principles.

The transportation agency would be the funnel through which increased transportation investment funds would be channelled, and it is anticipated that these will include not only transfers from senior governments but also arrangements to draw on transportation user fees such as those that already exist in British Columbia, Alberta and Quebec as outlined above. Similar arrangements may prove to be desirable in other Canadian CMAs, particularly those in which the overall urban region is not controlled by one municipal government.

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CONCLUSIONS

To sum up, this paper emphasizes that effective urban transportation is an essential factor – arguably one of the most important – for maintaining and improving the success of Canada’s urban regions. There is a growing recognition that sustainable transportation integrated with smart land use are key factors in achieving this outcome. The other two essential factors relate to adequate funding and integrated governance:

- reliable, multi-year **funding** is required, at levels which will address existing funding shortfalls such as, for example, those that have been identified for the GTA/H urban area; and
- an institutional/**governance** arrangement is required to achieve integrated planning, funding and delivery of transportation and related land use for the entire urban region.

For urban regions involving more than one municipal government, this will require either municipal amalgamation to achieve a single municipal government or (more likely) development of a coordinating Transportation Agency with the necessary planning, funding and delivery powers, working with existing municipal and provincial agencies and transportation providers as well as the private sector.

If the existing funding shortfalls for urban transportation and fragmented governance currently experienced in some CMAs are not addressed in the near future, Canadian urban areas face major environmental, economic and social risks affecting up to 80 percent of Canada’s population directly where they live and work.

For example, there is a growing consensus in the energy industry that annual world production of conventional crude oil will likely peak in the next two decades and production of natural gas in North America appears to have peaked already. As demand continues to rise thereafter, significant price increases can be anticipated. Canada’s economy is currently based on continuing availability of non-renewable fuels at relatively cheap prices, and the impact of such trends on our urban areas needs to be considered in our transportation and land use planning. Those urban areas with more efficient transportation/urban structure and which depend less on non-renewable fuels will fare better, another argument for moving as quickly as possible to more sustainable transportation and urban development.

Legislative action will be required at the provincial level, where this has not already occurred, to address the governance issue, and both provincial governments and the federal government will have to address the urgent funding shortfall issue including, it is suggested, drawing on transportation user fees as a source of multi-year, reliable funding for more sustainable transportation.

Experience in various parts of Canada and in other countries demonstrates that these proposed initiatives are not beyond our capabilities in Canada, and are achievable in relatively short order given the political will and effective leadership. The resulting delivery of more sustainable urban transportation and development patterns will greatly enhance the liveability and economies of Canada’s urban areas.

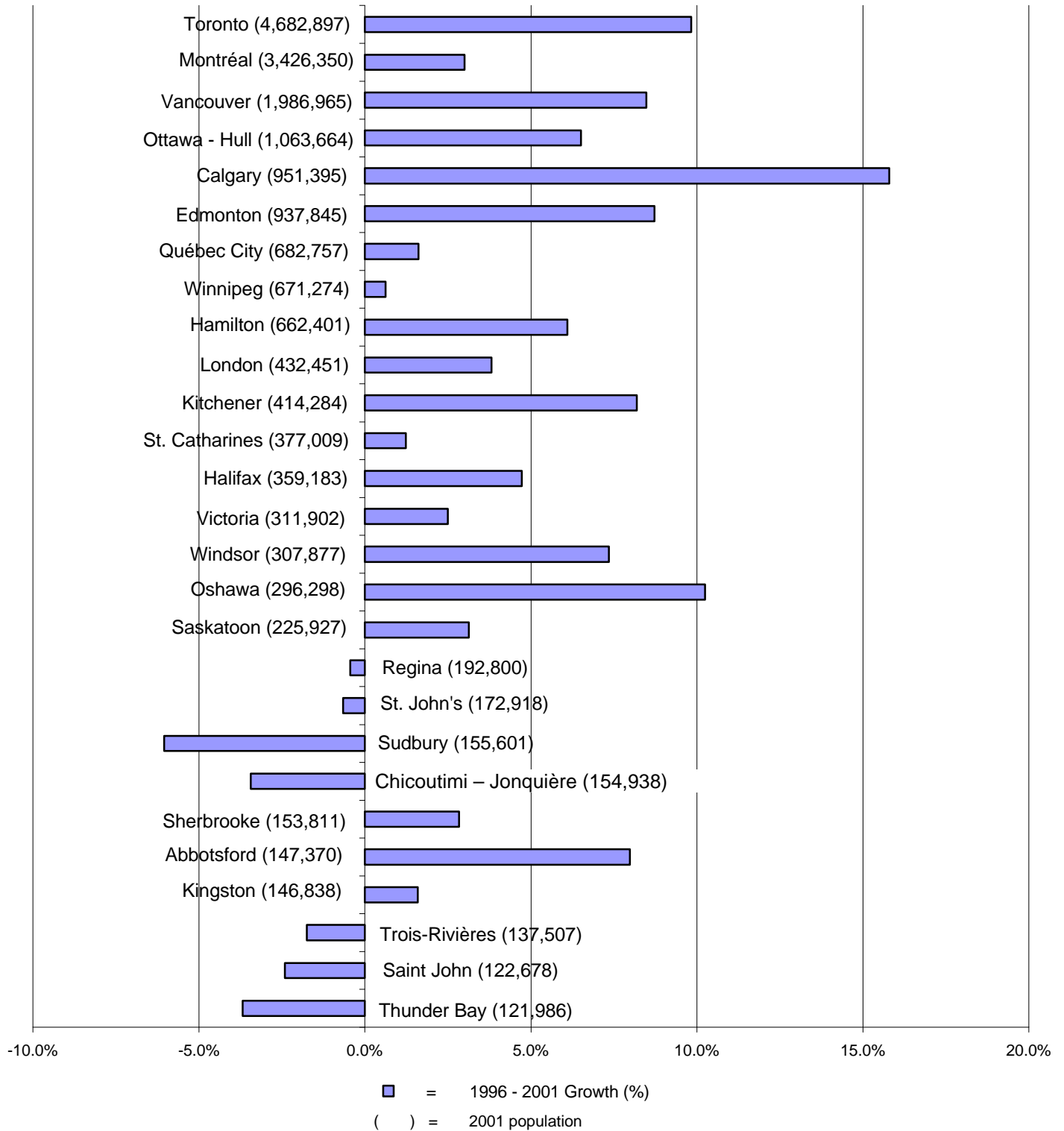
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Exhibit 1: SIZE AND GROWTH TRENDS OF CANADIAN CENSUS METROPOLITAN AREAS (CMAs)



Source: Census 2001, Statistics Canada

Exhibit 2: MAJOR BENEFITS OF IMPROVED URBAN TRANSPORTATION

	Urban Size and Growth Rate Categories	
	<u>Large/ Robust Growth</u>	<u>Smaller/ Slower Growth</u>
□ ENVIRONMENT		
• Reduces Pollution and aids better health	#)
• Uses resources efficiently, e.g., land, energy	#)
• Provides safe, convenient service and ambience	#	#
□ ECONOMY		
• Shapes and supports smart growth	#)
• Moves people and goods efficiently	#)
• Helps attract investment, jobs and income	#	#
□ COMMUNITY		
• Encourages people-friendly streets/ neighbourhoods	#	#
• Provides mode choice, equitable access	#	#
• Contributes to improved quality of life	#	#

Legend:

= *very important benefit*

) = *moderately important benefit*

Source: IBI Group

Exhibit 3: GREATER TORONTO GROWTH CONCEPT TO 2035 AND BEYOND



Source: Central Ontario Smart Growth Panel *Shape the Future* Final Report, April 2003

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Exhibit 4: AN INTEGRATED PACKAGE OF IMPROVEMENTS IS REQUIRED

\$ millions/year	Preserve: <ul style="list-style-type: none"> • Renew • Rehabilitate 	Optimize: <ul style="list-style-type: none"> • Use Efficiently • TDM¹, TSM² 	Expand: <ul style="list-style-type: none"> • Widen, Add Service • Extend Coverage 	Total: Capital Cost per Year
Expressways	180	20	200	400
GO Transit	90	10	150	250
Regional Roads	200	20	280	500
TTC ³	280	20	200	500
Local Transit	25	5	30	60
Priority Transit	15	5	40	60

Source: Adapted from: *Funding Transportation in the GTA and Hamilton-Wentworth* by IBI Group and Hemson Consulting Ltd., April 1999

- Notes:
- 1 TDM = Transportation Demand Management
 - 2 TSM = Transportation Systems Management
 - 3 TTC = Toronto Transit Commission