

# RETHINKING TRANSPORTATION TARGETS – A CASE FOR MOVING BEYOND BASIC MODAL SHARE TARGETS

by

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## **ABSTRACT**

Most Transportation Master Plans for major urban areas in Canada establish targets for transportation demand management. Typically these targets focus on transit modal shares or transit use; however, approaches for developing the actual targets vary considerably. Some municipalities “back-calculate” required mode split targets by examining future peak hour road capacity deficiencies on a screenline basis. Other areas adopt a broader approach and simply assume that if rapidly growing auto use is bad, then more transit use must be good, and consequently set very high goals for transit mode shares.

While there appears to be little consistency in approaches for setting transportation demand targets, there is some consistency in the fact that modal share targets are generally not being achieved. At best, most urban transit systems struggle to maintain existing mode shares, let alone increase their mode shares. Perhaps more alarming is the fact that auto use continues to grow at a staggering rate. The most recent Transportation Association of Canada (TAC) Urban Indicators Survey [1] revealed that gasoline fuel use per capita, a measure of auto dependency, grew by more than 11% between 1991 and 2001.

This paper will present a critical review of how and why traditional transportation mode share targets are failing to result in more sustainable transportation, as measured by reduced growth in auto usage and increased transit use. A proposed approach is outlined for establishing and achieving urban transportation targets, including a framework that bases transportation targets on auto use as well as transit mode shares. It is argued that this fundamental target better reflects the objectives that most municipalities are trying to achieve when they are setting targets. It is also expected that this approach will assist municipalities in establishing transportation policies and plans that help achieve federal commitments for reducing greenhouse gas emissions, address a growing link between auto dependency and health problems, and prepare for a possible future wherein the availability of energy supply may not sustain current auto behaviour.

**Key Words:** transportation targets, mode split targets, transportation planning, sustainable transportation

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## **INTRODUCTION AND DEFINITIONS**

A *target* is generally defined as a “goal for an activity.” Targets are often used in transportation planning processes to help define a path towards achieving a specific goal or objective. For example, a goal may be to reduce congestion in which case one target may be to reduce single occupant vehicle use by X%. The establishment of targets usually implies that change from the status quo is required.

Targets often overlap with *indicators*; however, it is important to make a distinction between targets and indicators. Targets are usually employed to focus or define future actions whereas indicators are used to measure progress towards the stated targets. The focus of this paper is on the development and use of targets, although some discussion of revealed outcomes is provided for context.

## **USE OF TRANSPORTATION TARGETS IN CANADA**

The concept of setting targets to provide directions for long range transportation plans has been around for a long time. As far back as the 1960's, the Metropolitan Toronto and Region Transportation Study [2], dubbed “Choices for a New Generation” established targets that aimed to achieve a more balanced approach between auto and transit travel. More recently, albeit for much broader purposes than urban transportation, the establishment of targets for reducing greenhouse gas emissions under the Kyoto protocol has served to re-ignite discussions around the appropriateness and use of targets for transportation planning.

In the context of transportation planning, transportation targets are applied in numerous ways. Based on a review of numerous long range planning documents, there appear to be three general types of transportation targets used for planning purposes:

- Mode share targets – The percentage of trips that are carried by each mode in order to achieve desired objectives. These may be specified at a point location (e.g. screenline or cordon), by area, by trip purpose or by trip linkage (e.g. trips into the downtown);
- Mode-specific targets – These would apply to a particular mode such as auto, transit, walking or cycling (e.g. transit trips per capita, auto occupancy, auto ownership).
- Transportation supply targets – Including targets related to the supply of infrastructure.
- Transportation performance targets – These types of targets may specify performance objectives for a particular mode (e.g. transit revenue passengers per kilometre, average travel time, etc.)

- External or secondary targets – These may address objectives for air quality or climate change (e.g. reduced CO<sub>2</sub> emissions from transportation).
- Integrated transportation/land use targets – These targets may relate urban structure to transit ridership performance (e.g. 90% of residents within 400 m of a transit stop).

The primary focus of this paper is on transportation targets that relate to transportation demand.

Transportation targets may be specified in quantitative terms (e.g. AM peak hour transit mode shares at screenline X), or they may simply be a stated qualitative target, such as reducing the growth of automobile use.

Table 1 provides a sampling of some of the types of transportation targets used in Canada to guide urban transportation planning decisions. These are intended to be representative examples, as opposed to a comprehensive summary or best practices. Some of the examples were chosen because the plan to which they belong is considered to be progressive in terms of promoting more sustainable transportation. Most of the examples shown are also from plans that have been around for 10 years or more, so it is possible to measure progress towards the achievement of the targets, which is the focus of the discussion in the next section.

Based on a review of the plans shown in Table 1, as well as a review of numerous other plans, the most common type of targets established for transportation master plans are related to transit mode splits. This finding is supported in by other research; for example, Abouhenidy et. al. [3] noted that “historically, transportation plans in Ottawa and other Canadian cities expressed transit targets at screenlines across key corridors. These were based upon travel demand model forecasts of auto trips and transit trips, which were then factored to identify desired transit targets.”

Typically, transit mode split targets are set to achieve a desired objective. For example, the 1997 Vancouver Transportation Master Plan [4] set a goal of “keeping the number of the cars in the city close to present levels by significantly increasing the use of transit, walking and biking.” The plan then works backwards to determine how much transit mode shares will need to increase by to achieve this objective and the result is quite dramatic – an increase from 19% to 27%. What is interesting in the development of mode split targets for this plan is that the walking and cycling mode shares are only expected to increase by 1 percentage point each (in absolute mode share terms).

Another common theme in the development of long-range targets is that targets for transit are typically very aggressive. Examples of this include the new City of Ottawa Transportation Master Plan [5] which foresees an increase in peak hour transit mode shares from 17% to 30%, and the York Region Official Plan [6] which calls for a 30% transit mode split target for urban areas compared to a mode split for the entire region

of about 5% at the time the plan was developed. The merits of establishing aggressive targets for transit mode splits are debatable. On one hand, establishing high targets helps build the case for increased funding for transit in relation to roads expansion and other competing objectives. On the other hand, creating a false sense of security that transit will be able to handle the majority of travel demand growth may result in significant road congestion problems if the transit services are not expanded as planned, or are not as attractive as envisioned. The scarcity of resources for transportation investments means that one cannot assume that infrastructure will be developed in a timely manner and at targeted locations. Moreover, it is dangerous to assume an increase in transit mode shares for a specific location (e.g. a screenline) without some assurance that the trips affecting demand at that location could in fact be accommodated by transit. For example, if a person starts their trip in a suburban location where local transit services are poor or non-existent, it is less likely that they will transfer to transit at some mid-point location in their journey.

One theme that is consistently absent from most of the urban transportation plans in Canada is the development of targets that relate to actual vehicle use and corresponding environmental impacts. Some targets describe values for automobile trips, but few translate this into vehicle kilometres of travel. This is an issue since it is possible to have constant vehicle trips but rising vehicle-kilometres of travel if people are travelling further. It is also an issue if targets focus only on the peak period of travel and do not address the growing number of off-peak trips that are occurring in urban areas, mainly by automobiles.

The absence of transportation targets that are tied to environmental issues such as air emissions, energy use and greenhouse gas emissions is somewhat understandable since most of Canada's urban areas are focused on improving mobility at the local level. However, there is a clear disconnect between Federal government priorities, which are now focused on the Kyoto objectives and major urban transit investments, versus transportation targets at the City level. This is illustrated by the recent TAC Urban Transportation Survey [1] wherein only 2 out of 27 urban areas indicated that they had (or were aware of) any targets that had been established for greenhouse gas emissions at the city level, whereas the remaining 25 urban areas indicated these were not a priority or were "being studied" (rather than being acted on).

The disconnect between transportation targets at the local level and goals at the federal level in Canada differs somewhat from the experience in the United States. In the US, federal transportation funding for Metropolitan Areas (MPOs) is tied to air quality standards, as determined initially through the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) and later the 1998 Transportation Efficiency Act for the Twenty-First Century (TEA-21). However, this paper does not attempt to describe these differences in detail as the overall jurisdictional structure for transportation planning and funding in the US differs significantly from Canada's.

## **PROGRESS TOWARD ACHIEVING URBAN TRANSPORTATION TARGETS**

Despite the strong emphasis on the promotion of more sustainable transportation and the establishment of transportation targets that have been presented in the numerous transportation planning documents over the last 10-20 years, there have been few actual success-stories of cities achieving these targets. While some cities have made some commendable investments in infrastructure for transit and other non-auto modes, almost all cities across Canada are struggling to maintain existing transit mode shares, let alone increase transit shares.

Figure 1 provides a perspective on changes in transit mode shares between 1996 and 2001. During this period, about half of Canada's urban areas experienced increases in transit mode shares for work trips by a small amount while others experienced decreases. Only three urban areas (Ottawa-Gatineau, Montreal and Oshawa) saw increases of more than 1 percent in absolute terms. While encouraging in some cases, these short term trends present a more positive picture than longer term trends. For example, in the Greater Toronto and Hamilton Area local transit mode shares in the morning peak period decreased from 21% in 1986 to 14% in 2001 [7]. This is mainly a result of the relative growth of the suburban regions compared to the City of Toronto, and the differences in transit services available for these two areas.

Trends in reducing reliance on single occupant auto travel are generally similar in urban areas across Canada and the intention of this paper is not to single out specific areas. However, it is insightful to comment on the progress of the urban areas for which transportation targets have existed for some time, as listed in Figure 1 previously.

In 1992, the City of Hamilton (formerly the Region of Hamilton-Wentworth) endorsed Vision 2020 [8], which is described as a "collection of goals, strategies, actions and measurements to make the VISION a reality and track our progress along the way". Since this time, VISION 2020 has received several awards and international designations as a best practice related to sustainable community planning. One of the features of VISION 2020 was the establishment of targets to track progress, including two targets for the transportation system: transit ridership per capita and auto ownership per capita. The target for transit ridership per capita was set at 100 rides per capita compared to the 1991 value of 57 rides per capita per annum. Since 1991, transit ridership per capita has decreased to 47 rides per capita as opposed to increasing. As in most other cities, this decrease is a result of residential growth occurring in areas not well served by transit combined with transit service cuts and fare increases that could not be avoided in times of fiscal restraint.

Although Vancouver's plan has not existed as long as Hamilton's, Vancouver has not made significant progress towards the achievement of modal share targets. In the total Greater Vancouver District, the overall travel patterns of commuters have remained relatively static over the past decade: transit's rush-hour share is unchanged at 11% [9]. This is somewhat surprising given the significant investments that Translink has

made in the transit system, but is noteworthy in that a decline in mode share was avoided.

Overall, Canada is not making progress towards one of its most significant and publicized targets – the Kyoto target. This is partially due to the fact that greenhouse gas emissions from urban transportation are increasing significantly. Based on 1995 data, it has been estimated that approximately 7.5% of the total Canadian GHG emissions are due to personal urban transportation, of which 97% is attributed to private automobiles and light trucks in personal use [10]. Between 1991 and 2001, GHG emissions from urban passenger travel increased by 25%, or 11% per capita [1]. Thus, it can be concluded that urban passenger travel is a significant area of concern for the achievement of the Kyoto Protocol commitments for Canada.

### **WHY TRANSPORTATION TARGETS ARE NOT BEING ACHIEVED**

Based on the above, it is fairly safe to say that, despite the best intentions, many of the targets established for urban transportation, and specifically travel behaviour and mode shares, are not being achieved. In fact, in some cases, progress has been in the opposite direction from the targets. This section presents a qualitative discussion of some of the factors that may explain why the targets are not being achieved, as background for the development of a recommended approach or framework presented in the next section. As stated previously, it is not necessarily a negative outcome if targets are not achieved since it is recognized that targets may have to be aggressive in order to change the status quo.

***Funding is insufficient relative to targets:*** In many cases, targets that have been established for urban transportation systems are simply too high and could not be achieved under current funding climates. For example, in the case of the per capita transit ridership target for Hamilton established in the 1990's, it would require at least doubling the number of buses operating in the City. Transit funding, both capital and operating, will have to be very significantly increased (e.g. doubled) to compete with the massive annual spending on purchasing/operating private autos and providing infrastructure for their movement, parking and maintenance.

***City-wide targets do not account for changing land use patterns:*** Even if all else remains equal in terms of the supply of services and infrastructure for sustainable transportation, targets such as City-wide transit mode shares and transit use per capita will decrease. This is due to the fact that the majority of population growth in most of Canada's urban areas is occurring in suburban locations where existing transit services are less established and less attractive. Table 2 presents a simple example of how city-wide transit targets are affected by disproportionate growth in outer-lying areas. While this is a hypothetical example, the values are indicative of many rapidly growing cities in Canada.

***There is a lack of understanding of the factors that influence the targets:*** As noted previously, in some cases targets may be set, but it is unclear how the targets will be

achieved or what the external factors are that influence the targets. A classic example is where a municipality within a larger urban area identifies targets for transit mode shares or auto occupancies coming into the municipality, but has no jurisdiction or influence on infrastructure or policy decisions that would affect travel choices in the adjacent municipality.

***Actions required to achieve targets are being implemented selectively.*** This is perhaps the biggest challenge in achieving transportation targets. Several urban areas have identified policies to manage travel demand and travel behaviour, including pricing mechanisms. These may include the implementation of road user charges or parking fee increases, as was the case for the 1995 Calgary GoPlan [11]. Unfortunately, these “more challenging” policies are often abandoned by politicians in favour of infrastructure-based projects that are seen as more acceptable to constituents.

***There may be a disconnect between individuals developing targets and those responsible for implementing actions:*** Similar to the above, despite the best intentions, it is often the case that targets quoted in long range transportation plans are never to be referenced beyond the submission of the final plan. Many cities have identified targets for increased transit use only too soon after cutting funding for transit. This is partly a result of the fact that there is currently no legislation or incentives to ensure that cities that propose transportation targets actually meet these targets. It may also be a result of the fact that transportation planners and others involved in setting the targets do not have direct control over decisions that affect infrastructure funding (which may lie with politicians, other departments, etc.).

***Mechanisms are not in place to track transportation targets:*** Although transportation plans commonly identify transportation targets, they are less specific in how these targets will be tracked and monitored. Having been involved in all three of the TAC Urban Indicator Surveys (for 1991, 1996 and 2001), this author is well aware of the challenges that exist in collecting and summarizing urban transportation data. The latest TAC Urban Transportation Indicators Survey [1] revealed that eight of the 27 urban areas surveyed in 2004 had not completed an urban travel origin-destination survey in the last two decades. In many cases, this means that City staff, politicians and citizens are not aware of whether or not the objectives of their transportation plans (or other plans) are being achieved, and are less in a position to react if they are not. Also, as stated previously, in some cases targets may simply be a mechanism to define a preferred planning direction, and it is not seen as necessary to track specific progress towards achieving the actual targets.

## **A RECOMMENDED APPROACH FOR ESTABLISHING AND ACHIEVING TRANSPORTATION TARGETS**

Given the lack of significant progress toward achieving more sustainable urban transportation targets, one may ask the question: why establish the targets in the first place? However, it is the author’s belief that there is a role for the use of targets to

help guide transportation planning decisions, provided the targets are tied to specific objectives and there is a clear path outlined on how the targets will be achieved.

If one examines any multimodal urban transportation plan that has been prepared in Canada in the last five years, it is likely that each plan will acknowledge the need to reduce reliance on the private automobile in some form or other. Some plans may suggest this for reasons of reducing congestion while others may justify this on the basis of helping to reduce emissions, promote more active and healthy living or improve mode choice. What is interesting is that very few plans actually explicitly say that automobile usage – or even its rate of growth – will be reduced. Rather, the majority, in summarizing their plans, focus on planned increases for transit mode shares. Although important, focusing solely on targets for transit mode shares may constrain the development of other options for walking, cycling, ridesharing or even reducing the number of motorized trips that people make on a daily basis. Simply promoting transit for the sake of promoting transit may not be the most sustainable transportation direction. In fact, it is possible to have increases in transit ridership and increasing vehicle-kilometres of travel at the same time if vehicles are travelling farther and in markets not captured in the transportation targets (e.g. intercity travel, off-peak travel, etc.)

With the renewed emphasis by the federal government on urban transportation as well as the obvious conclusion that urban transportation must be part of the solution to achieving Canada's commitments under the Kyoto Accord, it is appropriate that municipalities at least start to consider these realities (and hopefully opportunities) in the development of their transportation plans and associated targets. Although not yet stated, it is also not out of the realm of possibility that the federal government may be selective in directing transportation improvement funds to municipalities that demonstrate progress in key areas such as the reduction of greenhouse gas emissions or other accountability objectives. Such an approach has been used by the Province of Ontario in allocating funds from the recently established gas tax program.

Given the challenges identified in this paper with existing approaches to defining targets, and the emerging policy directions of the federal government, a proposed approach for establishing and achieving urban transportation targets is outlined below.

***Base transportation targets directly on goals and objectives:*** If the goal of the planning process is to simply increase transit ridership, then it is appropriate to restrict targets to transit. However, if goals are broader and are focused on reducing growth in automobile use and promoting more sustainable transportation, then it is important that the targets reflect this. In particular, many cities are now highlighting the need to reduce energy for transportation in light of anticipated energy constraints and price increases in the coming decades. Therefore, it would be appropriate to develop a target related to vehicle-kilometres of travel or fuel used, probably on a per capita basis.

**Clearly establish how the targets will be achieved.** As mentioned previously, it is important to understand the factors and actions that will lead to the achievement of specific targets. Targets such as city-wide transit mode shares are problematic since there are so many factors that could influence this target and they also change very slowly. On the other hand, if the target is to reduce the growth in auto trips from the suburbs to the downtown, than the actions that could lead to this are more tangible (e.g. introduce/expand transit from downtown to suburbs, increase downtown parking charges, establish carpool lots, etc.)

**Consider infrastructure-based targets in addition to demand targets:** In many cases, transportation demand targets are simply an interim step to help define an infrastructure plan. It may be appropriate in some cases to base the targets directly on the actual infrastructure. For example, a city may see benefits in increasing cycling as a mode of travel, in which case the target could specify the length of cycling paths/lanes to be constructed over a certain period. These types of targets are advantageous in that it is easier to understand them and track progress.

**Identify a staged timeline for the targets:** One of the challenges with a 20 or 30 year target is that it is so far out that people tend to forget about the targets after the planning process has been finalized. While the Kyoto Targets were never forgotten, they were generally overlooked (or at least not acted upon) for much of the time between the date the Kyoto accord was signed in 1997 and the present, some eight years later. It is now difficult to imagine how these targets will be achieved given that Canada must reduce GHG emissions by some 25-30% over just a few years. Whether targets are for GHGs, auto use or transit ridership, it is recommended that intermediate targets be established to show where values should be in order to achieve the long term targets. For example, if the goal is to increase transit ridership per capita by 50% in 10 years, than ridership per capita should be increasing at about 5% per year. Accordingly, transit service levels, which are tangible and measurable, should also be increased by at least 5% per year, including necessary expansion to accommodate population growth.

**Identify roles and responsibilities:** Each entity within the larger entity establishing the targets should know what actions are required of them to achieve the targets. This may include transit departments, transportation and works departments, urban planning, TDM coordinators and others. For example, if the target is to reduce the growth of single occupant vehicle use and one of the actions is to reduce the growth of parking supply, then those individuals responsible for reviewing parking supply for new developments should be aware of these targets.

**Identify how targets will be measured and tracked.** If it is the intent to achieve a specific transportation target, then it should be possible to measure and track progress. Targets such as mode shares usually require a passenger travel survey, which are typically conducted at a minimum of 5 year intervals in large urban areas and usually at 10 or 15 year intervals in smaller urban areas. This makes it difficult to track interim progress in achieving the target. Conversely, a target such as fuel use by

passenger vehicles can be tracked on an annual basis using readily available fuel sales data. Whatever the target, the unit of measurement and associated data requirements should be clearly defined and measurable, preferably annually.

## **CONCLUSIONS**

There are a variety of ways that targets are used for transportation planning. A review of recent and historical transportation plans suggests that there is no one standard approach for developing targets for transportation demand, nor is there a consistent way in which the targets are used and monitored during and after the planning process.

If targets are to be used to guide transportation planning decisions, it is important that they are selected and defined using a clear rationale and an understandable approach and, in particular, that the targets appropriately reflect the true goals and objectives that the plan is attempting to achieve.

The planning process in Canada has matured and we will soon be at a point where it is no longer acceptable to state goals and/or targets and then continue to implement actions that go against these targets or goals. Citizens are now aware of the need for municipalities to be accountable, fiscally responsible and environmentally conscious, and the setting of, and adherence to, realistic targets for the transportation system is one way to establish credibility.

Canada is also now in a period where funding from senior governments through programs such as the Climate Change Fund, Canada's Infrastructure Funds, and the gas tax sharing funds are starting to flow. Municipalities that tailor their transportation planning decisions to those of senior governments, and demonstrate meaningful progress toward established targets, will likely be in a better position to receive these funds.

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## TABLES

**Table 1: A Sampling Targets Related to Urban Transportation in Canada**

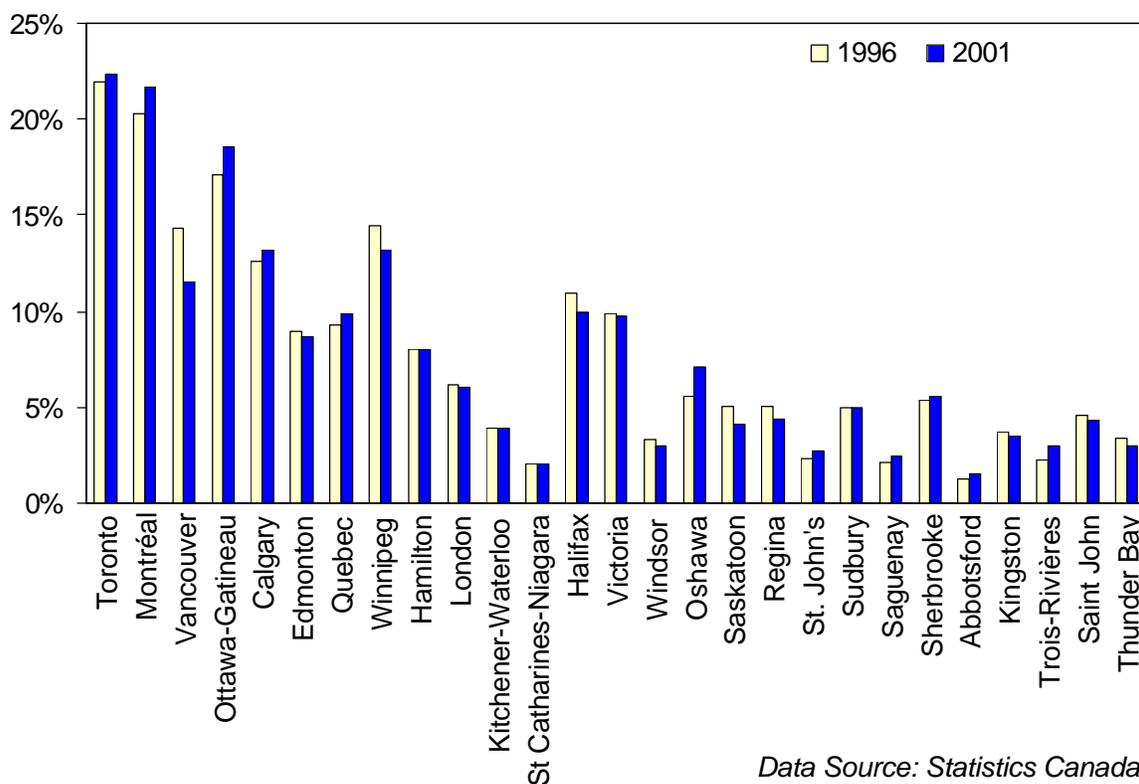
Plan/Location	Description of Targets	Stated Goals or Objectives	Sample targets
Vision for Urban Transportation, Transportation Association of Canada, (1998) [12]	Establishes a generic vision for transportation in 2003	To provide transportation systems that better serve the economic and social needs of urban residents and protect the environment.	<p>Percentages of trips made by walking, cycling transit and HOVs are all increasing, percentage of trips made by SOVs are decreasing</p> <p>The average distance and time for peak hour commuter travel is decreasing</p> <p>Air pollution from motor vehicle sources is declining</p>
A Vision for Urban Transit in Canada Transport Canada [13]	Targets are established for 2020 by size of urban area and include i) % increases in transit ridership per capita, ii) annual transit rides per capita, iii) 24 hr weekday transit modal split, iv) peak hr modal split to central area and transit revenue/cost ratios.	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.	<p>24-hour transit weekday modal split in 2020:</p> <p>Small Urban Areas 2-10%</p> <p>Medium Urban Areas 5-15%</p> <p>Large Urban Areas 10-25%</p>
Vancouver Transportation Plan: 1997 Report [4]	Established targets by mode (auto driver, auto passenger, transit, walking, cycling and auto occupancy) and sub-area (Downtown, Central Broadway, UBC, rest of City). Targets are established for the AM peak period and the whole day in 2021.	"keep the number of the cars in the city close to present levels by significantly increasing the use of transit, walking and biking"	<p>City-wide AM peak period auto driver mode shares – 52% -&gt; 43%</p> <p>City-wide AM peak period transit mode shares – 19% -&gt; 27%</p>
York Region Official Plan (1994) [6]	A number of targets are established in the Official Plan, including transit targets	"to provide transit service that is convenient, accessible and equitable to all residents of York"	33% of all peak period trips to be made by transit in urban areas
Ottawa 20/20 Transportation Master Plan, 2003 [5]	Modal share targets are established for transit, walking and cycling	"minimize the future need for new and widened roads while avoiding levels of congestion that would have unacceptable implications..."	<p>City-wide PM peak hour auto mode shares – 83% -&gt; 70%</p> <p>City-wide PM peak hour auto mode share – 17% -&gt; 30%</p>
(Former) Region of Hamilton Wentworth Regional Transportation Review, 1996 [14]	Specific targets were established for transit mode shares by screenline	Improve existing transit services to encourage and accommodate the Official Plan target goal of 100 annual trips per capita through provision of high operating speeds, reliable service and good passenger amenities	AM Peak hour transit mode split targets range from 20% to 25% depending on the screenline

**Table 2: A Example of How Current Growth Patterns Impact City-wide Transit Mode Split Targets**

Area Type	Existing				Population	Future				
	Households	Trips	Mode Share	Transit Trips	Growth Factor	Households	Trips	Mode Share	Transit Trips	
Central	100,000	200,000	30%	60,000	1.0	100,000	200,000	30%	60,000	
Urban	100,000	200,000	10%	20,000	1.5	150,000	300,000	10%	30,000	
Sub-urban	100,000	200,000	5%	10,000	2.0	200,000	400,000	5%	20,000	
Total	300,000	600,000		90,000		450,000	900,000		110,000	
<b>City-Wide Transit Mode Share</b>			15%					12%		

## FIGURES

**Figure 1: Journey-to-work transit mode shares in 1996 and 2001**



Source: Transportation Association of Canada [1]

**Notes:**

- a) This data is from the Journey to Work questions included in the 1996 and 2001 census. Since 1996 was the first census where these questions were asked, a longer timeframe is not available.
- b) Vancouver was affected by a Transit Strike in 2001