



City of Brantford

Development of Transportation Strategy for the City of Brantford

DRAFT

April 10, 2006

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1 INTRODUCTION AND BACKGROUND

The City of Brantford at its meeting on February 21, 2005 approved a resolution directing the completion of a Transportation Master Plan update, Official Plan update and associated public consultation program. The City's intention was that the transportation master plan study and Official Plan review program be carried out in an integrated manner due to the interrelationships between the two studies. The City is also undertaking a Growth Management Study. Together, these initiatives provide the opportunity to address changing circumstances and directions in the community and to plan for the long-term.

1.1 Study Approach

The purpose of the Transportation Master Plan Update is to review the transportation needs of Brantford for the next 25 years, based on updated forecasts of future growth, and the changes to transportation patterns and infrastructure that have occurred since 1997. The study will determine if the previously recommended projects are still the most appropriate for the community, and will develop recommendations to address new or emerging transportation issues.

The Transportation Master Plan Update is being undertaken following a four phase approach, designed to exceed the requirements of Municipal Class Environmental Assessment process. The four phase process includes:

Phase 1: The Development of a Study Foundation

Phase 2: Examining Transportation Impacts Associated with Strategic Land Use Planning

Phase 3: Developing and Testing Alternative Transportation Strategies

Phase 4: The Development of an Implementation Strategy

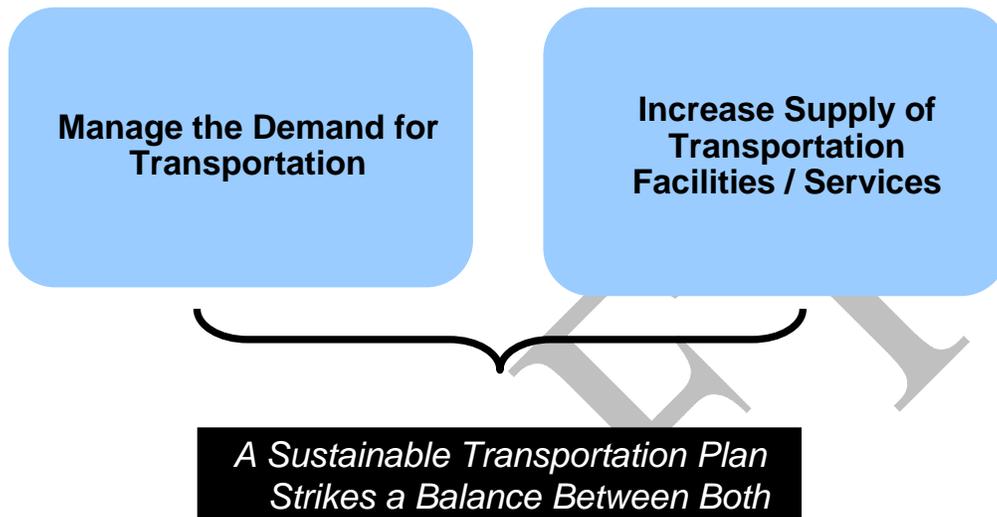
Phase 1 and 2 of this study have already examined existing and current trends in transportation, and have assessed the impacts associated with future land use decisions. As a result, the City has decided to direct its growth towards a more compact urban form, achieved through the designation of higher densities in new "greenfield" development areas, intensification along key transportation corridors, and higher densities within the existing urban core area in the downtown.

With a planning direction towards a more sustainable growth pattern, the next step in the development of a "Transportation Master Plan" is to examine the effectiveness of a series of transportation strategies, designed to meet future transportation needs while capitalizing on the benefits and opportunities created by a more compact urban form. The development of these strategies is the topic of this report.

2 DESIGNING A TRANSPORTATION STRATEGY

In the most simple of terms, there are two basic strategies to address a growing demand for transportation. A municipality can either increase the supply of transportation infrastructure and services, or they can attempt to manage or reduce the demand for

transportation in the community. An effective and sustainable transportation system attempts to strike a balance between the economic and social benefits of transportation with the need to protect the environment¹. A sustainable transportation strategy therefore, attempts to strike a balance between these two strategies in recognition of the fact that implementation of only one of these approaches cannot achieve the sustainability objectives, while continuing to service a growing population.



Why is balance important?

- ⇒ *A transportation strategy must be achievable – otherwise the system can be over designed or over capacity*
- ⇒ *The transportation system should improve mobility and accessibility for all residents regardless of car availability*
- ⇒ *An effective transportation system and high quality of life are key factors in business location / retention*
- ⇒ *Alternative transportation modes, such as walking and cycling, offer significant health / quality of life benefits*
- ⇒ *A more balanced transportation system can reduce adverse environmental impacts from road widening / construction, air quality, etc*
- ⇒ *An active and mobile community is a vibrant community*

¹ Strategies for Sustainable Transportation Planning: A Review of Practices and Options, Transport Canada, September 2005

3 STRATEGIES TO INCREASE SUPPLY

There are three main ways to increase the supply of transportation infrastructure and services: Optimize Existing System, Expand Existing Facilities/Services, and Add New Facilities/Services.

3.1 Optimizing Existing System

This approach attempts to maximize the use and capacity of existing transportation assets to allow them to serve more demand and extend their service life. There are a number of different approaches that can be used to optimize the effectiveness of an existing transportation system, as outlined below.

Optimize Existing System	<ul style="list-style-type: none">• Traffic Signal Coordination• Access Management• Improve Transit Routes / Frequency / Accessibility• Designated Truck Routes• Operational Improvement to Existing Roads / Intersections
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Traffic Signal Optimization and Coordination

Intersections controlled by traffic signals can be optimized through the installation of detectors that the traffic signal to timing to adjust for actual demand. This can be as simple as installing presence detectors on the sideroad approaches to an intersection, which only allow the signal to change when there is a vehicle waiting to enter or cross the main road. This is known as actuation. More complicated systems can also be installed which monitor traffic volumes over a series of roadways and optimize the traffic signal settings automatically to adjust to traffic demand. The City of Brantford already uses traffic actuated signals at many of its major intersections.

The use of co-ordinated traffic signals can also be an effective way to optimize the capacity of an existing arterial road. Traffic signal coordination essentially provides a connection between a series of traffic signals that allows for the signal timing to coordinate the green indication to provide a consistent “band” of green, which allows for the smooth flow of traffic along the major roadway. Studies have indicated that traffic signal coordination along a busy arterial road can improve capacity and reduce vehicle delays along major corridors by 10-15% during peak periods. Not only does this help to reduce air and noise pollution, caused due to frequent stops and acceleration, but an arterial road network that provides effectively coordinated flow, can significantly reduce traffic infiltration or “short cutting” through local neighbourhoods.

Transit System Optimization

System optimization could also include improving the transit routes and schedules or reallocating transit related resources to better serve peak demands in high demand corridors without adding new buses or increasing the number of routes. Investments in GPS tracking and real time scheduling of transit routes can improve on time performance and reliability, a key factor in maintaining current ridership and building new ridership.

Access Management

Access management is a technique used in conjunction with land use policies to control the number of entrances that are permitted on key arterial road corridors. This strategy recognizes that the primary purpose of arterial roads is to move traffic, while collector roads and local roads are intended to provide access to adjacent properties. By managing the location, type, and number of entrances along a major arterial road the capacity of the road can also be improved.

A recent study, undertaken as part of the City of London Transportation Master Plan, found that arterial road optimization, including coordinated signals and access management strategies could increase the capacity of an arterial road by up to 5%, depending on the density of entrances and the degree of access control used. Further capacity benefits were achieved with other improvements such as turning lanes, to minimize the impact of existing entrances.

Designated Truck Routes

The use of designated truck routes is one form of system optimization that the City of Brantford is currently using. By designating routes as truck routes, other roadways that are not suited to carry trucks (due to structural conditions, geometric constraints, impacts to residential areas) can operate more efficiently in carrying auto traffic and serving pedestrian and cycling demands. From a capacity perspective, one truck is roughly equivalent to 2 cars. Thus, truck traffic can have a significant impact on the capacity of arterial roads, particularly those that are not designed to carry trucks. A further review of the current system of designated truck routes within the City of Brantford will be undertaken during phase 4 of the study.

Operational Improvements to Existing Roads

In medium sized communities, such as Brantford, the operation of the key intersections in the City will often deteriorate sooner than the roadway will reach its functional capacity. For example, the capacity of an arterial lane of traffic is approximately 1700-1800 vehicles per hour under ideal conditions. However, at a signalized intersection where the available green time is evenly split between two arterial roads, the through capacity of each road is reduced roughly in half, since the traffic signal alternates the flow between roadways. Therefore the effective capacity of the roadway under ideal conditions is between 850 and 900 vehicles per hour. Where there is a significant volume of turning traffic, this capacity can often be drastically reduced, particularly where left turning vehicles block the through movement.

One very effective optimization strategy is to construct turning lanes at key intersections with heavy turning volumes. Not only do turning lanes remove left or right turning vehicles from the through lanes, the use of left turning lanes at key intersections can allow for specialized traffic signal phasing such as advance green arrows, to address left turn capacity issues. For roadways with heavy truck traffic, short sections of additional through lanes, through these intersections, can minimize the capacity reduction associated with the slow moving trucks accelerating up to speed. While this strategy can be very effective for roads with moderate traffic volumes, at higher volumes, additional through lanes through intersections can cause congestion due to excessive merging traffic and vehicles “jumping the queue.”

3.2 Expansion of Existing System

This approach attempts to increase the capacity of existing transportation assets by increasing existing service or adding capacity. Expanding existing facilities does not just mean widening roads. There are a number of different approaches that can be used to expand existing facilities to accommodate future transportation needs, as outlined below.

Expand Existing Facilities	<ul style="list-style-type: none">• Widen Existing Roads• Add Transit / Cycling Lanes• Add New Transit Routes / Longer Hours of Service• Expand Use of Airport
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Some of these strategies are not as economical as strategies aimed at optimizing the existing system as they typically require large capital investments to expand existing facilities. Implementation of these strategies requires more planning and may not be as easily acceptable to the public as the impacts to the environment and neighbourhoods are typically greater. However, these strategies also have broader effect and can result in a greater impact on the performance of transportation system.

Widen Existing Roads

Widening of existing roads can mean widening the number of through lanes or widening to implement continuous turning lanes, commonly known as Two Way Left Turn Lanes (TWLTL). Widening existing roads can often reduce the need to build new roads through undeveloped lands and “greenspace” areas, and is therefore considered to be somewhat more environmentally friendly than building new roads. However, in some areas, widening of an existing roadway can have significant social and cultural impacts to neighbourhoods or can result in economic impacts to businesses along the route.

Widening an existing roadway to install a TWLTL, can increase capacity while also offering improved access, and economic and safety benefits to local residents and businesses in some corridors. Providing a safe refuge to accommodate turning traffic can increase the attractiveness of some properties that generate high turning demands. The Arterial Optimization Study, undertaken as part of the City of London Transportation Master Plan, also found that the through capacity of a four lane arterial road could be increased by up to 15% through the construction of a continuous TWLTL, depending on the traffic volumes and entrance density along the route.

Add Transit / HOV Lanes

Adding a dedicated transit lane, known as a Reserved Bus Lane (RBL), or constructing a High Occupancy Vehicle (HOV) lane are two other examples of specialized road widening approaches.

Reserved Bus Lanes allow transit vehicles to use a separate dedicated lane, which not only reduces the impact of buses on through traffic, but allows for effective transit signal priority measures at intersections. Transit Signal Priority provides a specialized traffic signal phase for buses only, which allows them to by-pass a queue of cars at an intersection and improve their travel time. Studies have shown that one of the key factors that can encourage greater transit use is to improve the competitiveness of

transit compared to the private auto in terms of travel time. By giving the transit vehicles an advantage over auto traffic, the longer travel times often experienced using transit can be reduced.

High Occupancy Vehicle (HOV) lanes are separate dedicated lanes which are reserved for use by vehicles carrying more than one person. In some jurisdictions, such as Toronto, taxis and buses are also permitted to use the HOV lanes. The first freeway application of HOV lanes in Ontario were recently implemented on Highway 403, through Mississauga, and on Highway 404 Southbound, in Markham. The implementation of a new HOV facility requires careful planning, an aggressive marketing campaign, and good understanding of current auto occupancies (average number of persons per car) within a specific corridor to ensure the lanes will be sufficiently used upon opening. HOV lanes are typically best suited to applications where the HOV lane can be operated for a significant length, to generate enough travel time savings to encourage carpooling. Studies in the U.S. have found that an HOV lane must save at least 5 minutes from a typical commuter trip in the peak period to encourage single occupant vehicle drivers to consider carpooling.

Add Cycling Lanes

The addition of cycling lanes to an existing roadway is an important step in promoting increased multi-modal usage of transportation corridors. In 2000, the City completed a Multi-Use Trail / Bikeway Master Plan that identified a series of proposed off-road and on-road cycling facilities throughout the City. In total the study recommended a total network of 162 km of on road and off road trails throughout the City.

Although the City has done a good job in implementing the proposed off road facilities, to date, none of the on-road cycling facilities have been completed, despite the fact that almost 6% of daily trips in the City are made by cycling and/or walking. On road cycling lanes are obviously more controversial and difficult to implement, due to concerns over conflicts with vehicular traffic, safety, and neighbourhood on-street parking issues.

Add New Transit Routes / Longer Hours of Service

Expanding transit services within a community can include the addition of new transit routes to serve new growth areas, the additional of new routes to serve existing high demand corridors, increasing the frequency of service, increasing the hours of service, or provided enhanced transit services such as Rapid Transit. The City of Brantford Transit system currently operates on a 30 minute schedule during peak periods

Expanding Use of the Brantford Municipal Airport

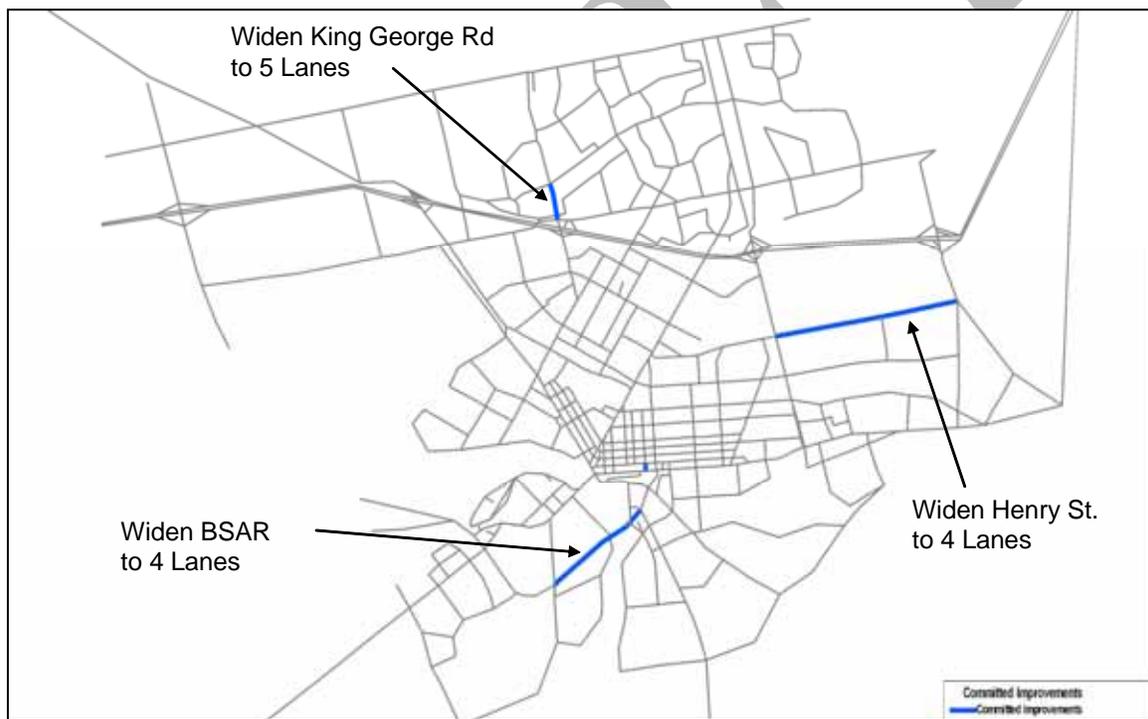
The current Brantford Municipal Airport largely serves recreational aviation activities with much of its activity focused on the Brantford Flying Club (accounts for 72 %-76% of the annual aircraft movement). There are also a number of corporate users (which account for 8%-12% of the annual aircraft movement) and the airport provides a base of operations for limited charter and freight operations (12% -16% account for of the annual aircraft movement). While there are opportunities to increase the role that the airport plays in serving the City's Transportation needs, this mode of travel is obviously suited to serving inter-city demands rather than local demands generated as a result of new growth.

3.3 Construction of New Transportation Facilities

The construction of new transportation facilities can include new roads, new sidewalks and trails, bicycle lanes, and the construction new or enhanced transit facilities. These are the most “aggressive” strategies that not only require extensive capital investment, but may require an extensive planning and implementation process. Depending on the location and nature of the new facilities, the public may not accept these strategies readily, due to the potential for significant environmental, social, and sometimes cultural impacts. While these strategies are typically more difficult to implement, they also tend to have broader effect and greater impact on the capacity of the transportation system.

Committed Projects

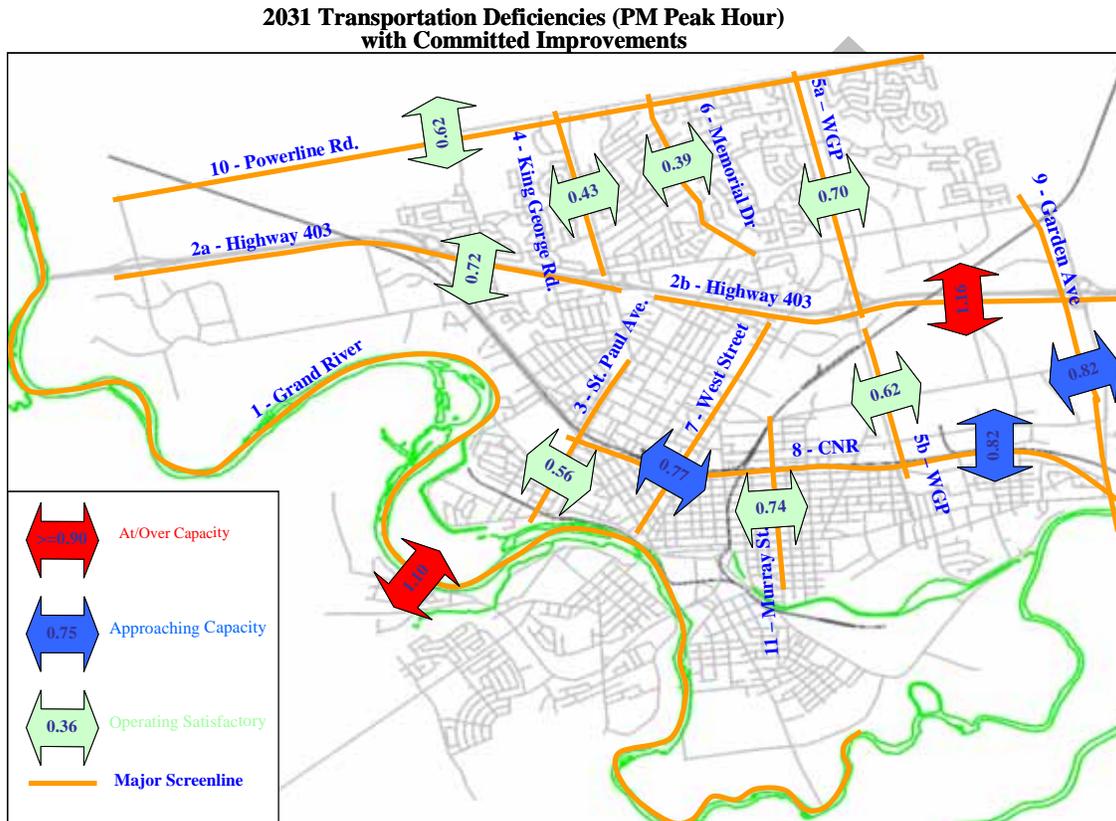
The City of Brantford already has a list of “Committed Projects” that form their current 5 year capital project forecast. Most the projects on this list are classified as Schedule A or B projects, involving rehabilitation and small to medium sized operational improvements, such as the addition of turning lanes, etc). The major projects form this listing that will have a large influence on the capacity of the transportation network are illustrated in the figure below.



Other larger road widening projects on this list were identified and recommended as part of the 1997 Transportation Master Plan Study. While these projects do not necessarily have EA approval to proceed, the City intends to undertake the necessary EA studies to enable the commencement of design and construction within the 5-10 year horizon. For the purpose of this project, these committed projects are being treated as base improvement scenario that may be enhanced by other transportation strategies (increased transit usage, transportation demand management, etc) or other infrastructure recommendations.

Longer Term Transportation Corridor Needs

The implementation of planned and committed projects will address some of the future transportation needs in the community; however, many of the screenlines will still be approaching or over capacity in 2031 with these improvements in place. The figure below illustrates the future volume-to-capacity ratio of the major screenlines with committed improvements in place.



Depending on the recommended transportation strategy for the City of Brantford, including an assessment of the effectiveness of non structural measures such as Transportation Demand Management and increased transit use, there may still be a need to implement further transportation infrastructure improvements to address future travel demands. These improvements could include the widening of existing facilities, the construction of new facilities, or the construction of new transit / HOV lanes. The next phase of the project will undertake an assessment and evaluation of alternative transportation improvements.

4 STRATEGIES TO MANAGE TRAVEL DEMAND

Since the 1970's, the demand for travel throughout North America has steadily increased at a rate higher than the population growth rate. Increased affluence has resulted in a dramatic increase in automobile ownership making travel by car much more accessible to people. Over the same period, the increasing number of women entering the workforce has significantly increased the number of trips made during peak periods.

Over the past 10 to 15 years, the concept of Transportation Demand Management (TDM) has emerged. TDM is described as a series of initiatives and policies designed to reduce or control the increase in the overall demand for travel within a community. TDM emphasizes the movement of people and goods, rather than motor vehicles, and therefore gives priority to public transit, ridesharing and nonmotorized travel, particularly in congested urban conditions.

There are many different TDM strategies with a variety of transportation impacts. Some improve the transportation options available to consumers. Some cause changes in trip scheduling, route, destination or mode. Others reduce the need for physical travel through more efficient land use, or transportation substitutes. Although most individual TDM strategies only affect a small portion of total travel, the cumulative impacts of a comprehensive TDM program can be significant².

Transportation Demand Management Strategies are generally classified under 3 general categories:

- Market Based
- Behaviour Based
- Land Use Based

Each of these strategies uses different types of incentives to encourage people to re-think their travel choices, including the need to travel at all. A listing of some of the most common Demand Management strategies that fall within each of the categories are summarized below.

Strategies to Manage Demand

Market Based	<ul style="list-style-type: none">•User Pay (tolls)•Parking Supply / Cost
Behavior Based	<ul style="list-style-type: none">•Increase Use of Transit Service•Increase Walking / Cycling•Flexible Work Hours•Telecommuting (work from home)•Ridesharing (carpooling)
Land Use Based	<ul style="list-style-type: none">•Increase Densities & Encourage Mixed Land Use•Neighbourhood Design to Support Transit / Cycling / Walking•Support Walking / Cycling / Transit at Key Destinations•Enhance Accessibility

4.1 Market Based Strategies

Market based strategies tend to use economic incentives to encourage the desired behaviour. Some market based strategies are relatively simple and can be implemented at a local level, or even at a particular workplace or destination. Market based strategies tend to be the most effective strategies to encourage change, because the incentive is direct and affects the motorists pocketbook. However, they are also the most controversial, for precisely the same reason. For example, one of the most powerful incentives to encourage use of alternative modes in urban areas is the increasing the cost of long term parking.

Other market based strategies are broad in nature and would require a significant shift in public policy, often beyond the scope of a single municipality to implement. For example, some economists suggest that vehicle registration costs, along with insurance, plate renewal, etc should be scaled to reflect the amount of driving a person does within a year. While this makes sense from a logic perspective (since the wear and tear, pollution impacts, collision risk, and other transportation impacts are related to amount travelled) the implementation would require changes to provincial policies and a municipality would have limited ability to implement such a strategy in isolation.

Other types of market based strategies are outlined below.

Parking Pricing

This strategy typically can reduce vehicle trips by 10-30% compared to free parking³. Structuring parking rates in a way to favour short-term uses in core areas to encourage higher turn-over rate, and shift long-term uses to other locations, or discourage vehicle trips altogether. Controlling the supply of long term parking can also encourage a shift to other modes of travel where there is no alternative parking available. While this strategy leaves flexibility to provide special rates to serve appropriate uses, such as for evening and weekend events, or to maximize mid day utilization, retail business owners in downtown areas are often concerned with any measures that would drive customer traffic away from the downtown and out to suburban malls with free parking.

Parking Cash-Out

One innovative market based incentive program is a “Parking Cash Out”, which essentially offers a subsidy to users of other modes, that is equivalent to the value of a free parking space. A parking space subsidy can be offered in other forms such as cash or other equivalent benefits. For instance, employees can choose between a free parking space, a vanpool subsidy, free monthly transit pass, or monthly cash subsidy. These incentives could reduce automobile commuting by 10-30%⁴.

Road Pricing

Motorists pay directly for driving on a particular roadway, (such as toll roads) or in a particular area.

Highway 407 is a local example of a toll road. Variable toll rates are used during different periods of the day, which can have some influence on the time of travel. Although this variable toll rate may provide some benefit to the congestions levels on

² Why Manage Transportation Demand?, Todd Litman, Victoria Transport Policy Institute, May 10, 2005

³ Ibid.

⁴ “Win-Win Emission Reductions”, Todd Litman, Victoria Transport Policy Institute, December 2, 2005.

surrounding roads, the intent of the tolling in this application is not to reduce demand, but to finance the facility. The variable toll rates by time of day is an example of a demand management strategy used by 407 ETR to optimize the toll rates versus the volumes to maintain a congestion free state.

Congestion Pricing

Congestion pricing (a.k.a. Value pricing or Peak Hour Road Pricing) refers to variable road pricing applied in an area to modify traffic usage and congestion level of the roads.

Area based road pricing was implemented in Central London England, in October 2003. After two years of operation, Transport for London found that congestion within the charging zone had reduced by an average of 30% and the total volume of traffic entering the charging zone was reduced by 18% against pre-charging levels in 2002⁵. There was no reported evidence of detrimental traffic effects on roads outside of the charging zone due to diverting traffic and the report notes improvements in traffic accidents and reductions to emissions of key traffic pollutants in and around the charging zone. The congestion charging area is no being expanded to an adjacent area in London, although there are a number of groups in opposition to the plan.

In summary, market based strategies tend to have broad effect and can have moderate to great impact because the costs of market based strategies are borne by the transportation user rather than society at large. Since the costs to users are great these types of aggressive strategies may not be easily accepted by the public. Some of the more broad based market strategies, such as increasing vehicle fees, cannot be implemented within a municipal context as they fall under provincial/federal jurisdiction.

4.2 Behaviour Based Strategies

Behaviour based strategies tend to use a combination of marketing, incentives, and improved infrastructure / services to provide a wider range of transportation choices, and encourage residents to re-consider the transportation choices they make.

Behaviour based strategies can also be structured to achieve a number of different, yet related, objectives. For example, one approach could emphasize a reduction in the number of trips people take in a day, while other approaches could try to encourage people to use alternative modes besides the private automobile. Other strategies may try to encourage travel outside of peak periods, to conserve existing capacity (similar to efforts used to conserve energy during peak periods). Therefore, behaviour based strategies are very flexible, in that a number of different approaches can be used to try and achieve similar objectives. On the down side, behaviour based strategies are also largely dependent on voluntary change, and therefore the success of these types of approaches is largely dependent on prevailing public attitudes and the ability of a municipality to market the benefits of change.

⁵ Congestion Charging: Third Annual Monitoring Report, April 2005, Transport for London

The Public Attitude Survey undertaken as part of this study found that approximately 31% of Brantford residents would be willing to consider changing their current mode of travel to and from work.

Some of the common behaviour based strategies are briefly discussed below.

Marketing Alternative Modes of Transportation

Encouraging auto users to shift to another mode of transportation is a complex task that that may require a number of initiatives and strategies to be implemented as a package. Even with physical, operational, or institutional changes designed to increase the attractiveness of alternative modes, many jurisdictions have still struggled with the development of marketing campaigns to build awareness and encourage the change to occur. Many communities participate in programs like the “Clean Air Day”, “One Tonne Challenge” and “Commuter Challenge”. With the exception of the “one Tonne Challenge” these are programs designed to encourage people to try to make environmentally-friendly lifestyle choices by using a different mode of travel for one day. While these are good programs, they often do not result in lasting change to personal behaviour. To some extent, many of these types of programs are aimed at encouraging users to change their habits for the “broader good”. While this type of marketing approach will appeal to a segment of the population, many of these programs do not attract longer term support when people consider their individual circumstances and the reason for their transportation choices.

Some of the leading jurisdictions in implementing successful TDM programs are using a social or individualized marketing campaign to encourage people to make more sustainable transportation choices. These programs are premised on the idea that each member of the public will have different motivations and reasons for the transportation choices they make. Therefore, you need to understand these motivations and target your strategies to make it attractive for “them” to use another mode of travel.

By segmenting the population into groups with similar motivations, key messages about the benefits that the individual could realize are then marketed to them. For example, employers in the area were encouraged to support flexible work hours and work at home programs as a means to improve morale, productivity, and employee retention.

Employees who were trying to balance the demands of work and home were encouraged to use flexible work hours, telecommute, or ride the LRT system due to the potential time savings that could be better spent at home with their families. Similar marketing initiatives have also been used in Portland, Oregon and Sydney, Australia with a higher degree of acceptance than some of the more traditional, “standard” marketing initiatives.

Encouraging Shifts to Walking and Cycling

Walking and cycling improvements not only can substitute for some auto vehicle trips, it can support other alternative modes such as public transit and help support parking management.

Across North America, cycling has evolved into a practical, cost effective, environmentally sensitive and healthy mode of transportation for both recreational and utilitarian purposes. Cycling is one of the top three recreational pursuits across Ontario with 20% participation rate and a growth of approximately 2.3% annually.⁶ The demand for cycling and walking facilities is high in communities across Ontario and municipalities such as Ottawa, London, Milton and Brampton are actively developing networks to encourage cycling and walking in an effort to lower their reliance on the automobile. The promotion of cycling and walking has significant individual, social, environmental and economical benefits. Such benefits include, but are not limited to, congestion reduction and parking cost savings, improved mobility for non-drivers, improved public health, and tourism development.

The development of walking and cycling strategy must recognize the primary types of cyclists within a community:

- Experienced Cyclists who are comfortable riding in traffic typically prefer wide lanes or demarcated lanes on the roads.
- Casual Adult Cyclists, including teenagers who are occasional cyclists with limited skills and training. They cycle mainly for recreation, preferring residential streets, bike lanes and trails.
- Child Cyclists use cycling and walking as their own independent mode of transportation. They generally lack experience, training and judgement, and can be unpredictable on the street.

Careful consideration must be given to bicycle and trail facilities design and maintenance practices, with understanding of the characteristics of a bicycle and trail users, knowledge of safety issues, and awareness of the Highway Traffic Act as it applies to cyclists. For less experienced cyclists, signed routes on quiet residential streets, bike lanes on busier two-lane wide roads, and paved shoulders on rural roads are more ideal. These bikeways will also appeal to more experienced cyclists, along with proposed wide lanes to share with motorists on busy roads.

There are many ways to improve walking and cycling, including the improvement of facilities (i.e. pedestrian facilities such as sidewalks, paths, and crosswalks), traffic calming, encouragement programs, bike parking, and more attractive streets. In essence, the elements in cycling strategies should include⁷:

- A Cycling Network for bike lanes, multi-use trails and signed bicycle routes.
- Promoting Cycling Awareness through education, encouragement and enforcement and advertisement.
- Improving the Cycling-Transit Link to increase commuter and long-distance cycling trips.
- Providing End of Trip Facilities to meet the needs of cyclists such as secure parking for bicycles.

Communities with good walking and cycling conditions typically have residents who drive 5-15% less vehicle miles than in more automobile dependent communities.⁸

⁶ Culture and Recreation, Ministry of Citizenship, 1998

⁷ Draft Report – City of Windsor: Bicycle Use Master Plan (BUMP) Study, Marshall Macklin Monaghan, ESB International, Stantec, Paradigm Transportation Solutions Ltd., Jan 2001.

⁸ “Win-Win Emission Reductions”, Todd Litman, Victoria Transport Policy Institute, December 2, 2005.

While land use and urban design is recognized as key factor in providing a walkable community, there are a number of other strategies and policies that have been used in other municipalities to encourage shifts to walking and cycling. The most obvious is the provision of multi-use trails, sidewalks, and other facilities that link between key origin and destination locations within the community.

The City of Brantford completed a Multi-Use Trail/Bikeway Design Plan in March 2000, which recommended a series of off road and on road cycling / walking trails across the City. The plan identified key infrastructure required to implement a City-wide trail system, including trail related amenities, such as benches, rest areas, bicycle parking areas, and staging areas. Most of the recommendations dealt with trail related infrastructure needs but recommendations to address systemic barriers to walking and cycling as a mode of transportation were not covered to a great extent.

Beyond infrastructure requirements, people often note systemic barriers to walking and cycling as reasons for continuing their use of the auto for trips to/from work. One of the common barriers to walking and cycling for work related trips is the availability of showers, change rooms, and secure bike racks at workplace locations; to enable employees to change into work clothes. While the implementation of such facilities within private buildings is beyond the City to control, policies to encourage employers to provide these types of services in new developments or in retrofit situations may encourage some movement.

Another common concern is the need to travel for work, or the need to have a car in case of emergency (i.e. a child at school). Many organizations have provided a guaranteed ride home program or have provided pool cars / taxi vouchers at a workplace to overcome this barrier and support their employees in making alternative travel choices.

The Public Attitude Survey undertaken as part of this study found that encouraging a shift to walking and cycling for trips to and from work may be a challenge in Brantford. Of the 31% of residents that indicated they would consider the use of an alternate mode of travel, almost 72% indicated that the provision of new cycling / walking trails would not provide enough incentive for them to shift. When asked if they would consider cycling to/from work if their employer provided showers and other facilities on site, a similar response was obtained.

From the survey results, almost half of the respondents that indicated they would be willing to shift to an alternative mode currently travel greater than 5km to and from work. These trips are not likely to shift to more active transportation modes due to the increased travel time. At an average cycling speed of 18 km/h, a trip of 5 km would take would take about 17 minutes. A similar trip on foot would take roughly 70 minutes. For trips around 10 km in length, the time by bicycle would increase to over half an hour.

Of the 31% of respondents that indicated they would consider using an alternate mode, only 27% of them currently travel less than 5km to and from work. Of these respondents, only half indicated they would consider a shift to walking / cycling, putting the potential market for this shift at around 4% of the population.

Despite these relatively low results, the residents in the City of Brantford do participate in active forms of transportation. Almost 55% of residents in the same survey indicate that they regularly (a few times per week or more) walk for pleasure or to get somewhere in particular. This would suggest that the majority of residents treat walking and cycling as a recreational pursuit as opposed to a viable alternative for work related travel. These relatively low results may also reflect the fact that the survey was undertaken in late fall, and one might expect a slightly higher participation rate during the spring and summer months.

Once upon a time, walking and cycling to school was commonplace; now it is a rarity. The Federal Highway Administration has reported that roughly half of all 5 to 18 year olds either walked or biked to school in 1969. The journey to school has changed dramatically since then. By 2001, nearly 9 out of 10 children between the ages of 5 and 15 were driven to school by either a parent or a bus driver, adding additional traffic to the morning commute and negatively affecting communities around schools.

The reasons for this decline in walking and biking trips to school are multifold. For one, the journey between home and school has become longer and more treacherous because of decades of auto-oriented suburbanization. The trend towards consolidated school facilities, rather than local neighbourhood schools, has also increased school trip lengths. In today's world, there are also the fears and concerns of parents about exposing their children to threats from strangers and motor vehicles. And finally, in many communities, sidewalks, crosswalks, bike lanes, and trails are either missing or inadequate.

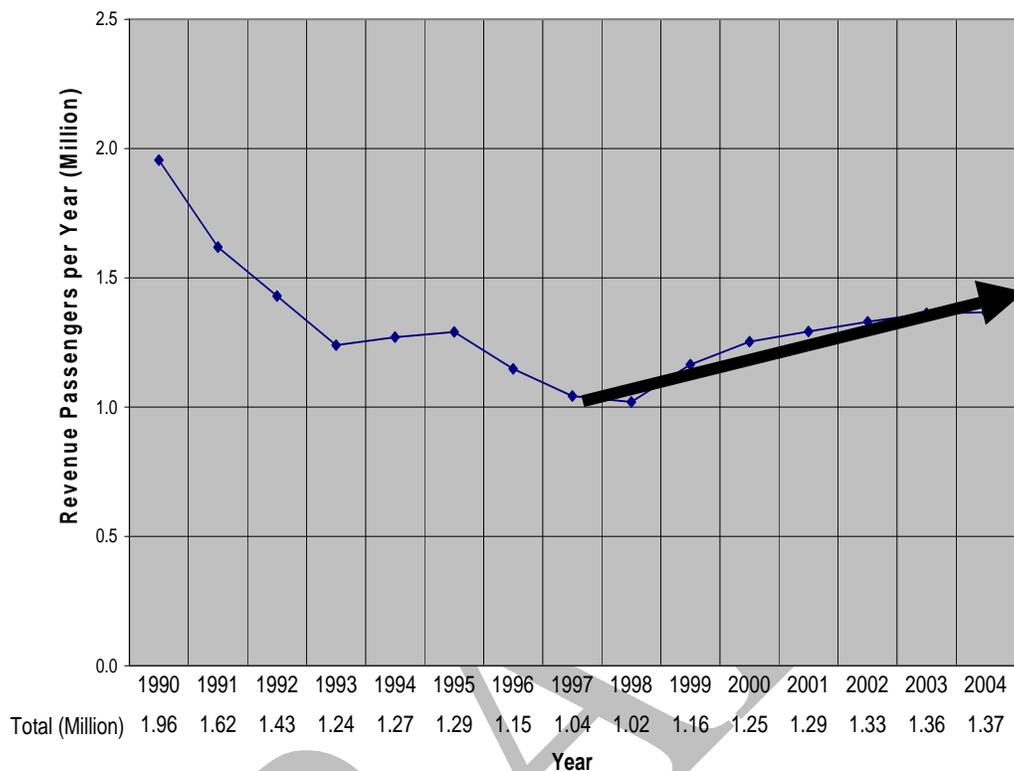
To address the special pedestrian needs of school-aged children, Active and Safe Routes to School (ASRTS) has been developed as a nationwide program to encourage the use of walking, and other safe transportation modes to and from school. In addition to reducing traffic congestion around schools, these programs have been credited with:

- Improving the level of physical activity for children and adults
- Encouraging a healthier family lifestyle,
- Safer, calmer streets and neighbourhoods, and
- Improved air quality and a cleaner environment

Encouraging Shifts to Transit

The Brantford transit annual ridership has seen a steady increase since completion of 1997 Transportation Master Plan. A comparison of 1996 and 2001 census data, shows that there has been a 10% increase in total work trips and 14% increase in work trips by transit.

Brantford Transit Annual Ridership



In the Public Attitude Survey completed for this study, valuable information on how the 'average resident' feels about transportation, growth, the environment, and the viability of non-auto modes in meeting their transportation needs was collected.

There are a few key findings from the Public Attitude Survey regarding transit usage:

- Only 16% of respondents said that transit currently meets their needs
- 37% of respondents feel it is important to increase transit use
- 31% of respondents indicated that they would consider changing their current travel mode and almost 60% of them are currently auto users.
- Respondents also feel that improving information/ frequency, and financial incentives are the two major changes that the City can make to encourage transit usage.

These findings suggest that there is an opportunity to increase transit ridership if the proper incentives are provided.

There are a number of strategies that can be used to encourage people to shift to transit for some or most of their travel. The provision of readily obtainable information about routes and schedules is one of the simplest ways to build awareness about transit services in a community. The City of Brantford has recently developed special transit maps that provide routes, schedules and highlight key origin-destination locations across

the City. The maps are made available at key public buildings and on the internet free of charge. This is an excellent start.

The Public Attitude Survey results suggest that of the 31% of residents who would consider a change in travel modes to /from work, 40% would consider a shift to transit if the new the routes and schedules better. To build awareness of transit services some communities have implemented “trip finder” applications on the internet, to help residents find out how to travel between their origin and destination on the transit system. These applications work similar to map based applications that provide driving directions between two points.

Many transit systems are now incorporating secure cycling racks at bus station terminals and are provide bicycle racks on their buses. For example, the Region Waterloo has installed bicycle racks on all of their bus routes. This is a simple and relatively easy way to provide additional transportation choices to those who have to travel longer distances but do not have access to a car or prefer to use alternative modes. Not only can this strategy increase transit usage but it can also work to increase cycling usage as well.

Flexible use of transit passes is another way to provide an incentive to shift to transit that can also combine market based incentives along with behaviour based programs. Many communities, including the City of Brantford, provide a variety of different transit pass options that offer discounts from the single fare price. Student passes, multi-ride tickets, monthly passes, swipe cards, and daily passes are used in Brantford. In many communities, the passes are sold not only at transit terminal but at the local convenience stores, malls, and other locations throughout the community. In an effort to improve transit ridership among college / university students, some communities have included the cost of an annual transit pass (for the months when school is in) into the cost of annual tuition fees. In this way, students receive a transit pass as part of their enrolment.

The City of Peterborough has a similar program as part of its transit service. For example, Trent University has a student pass program included in it's tuition fee. This program not only provides basic transit service to the University, but includes special Trent Express Routes – designed to around the location of student residences and campus locations, along with popular student housing and rental housing locations. The service provides increased frequency, with the Trent Express Service running on a 20 minute schedule compared to the 30 minute schedule for the rest of the City Transit routes. Special services are also provided in the evenings, on weekends, and during exams. There have been some discussions with Laurier University about implementing a program of this nature in Brantford, but there are also some concerns with the additional cost this would add to already high tuition fees.

Many transit operators are also providing discounted transit passes for sale at major employment locations. For example, Grand River Transit (in the Region of Waterloo) is in the process of implementing an employer transit pass program which offers discounts to monthly pass purchasers. These types of programs can be effective where the transit routes and schedules can be coordinated with shift changes at the employment locations. Where 31% of Brantford residents indicated they would consider changing their mode of travel, approximately 80% of these suggested that financial incentives provided by their employer, the City, or government, would encourage them to use transit to travel to/from work. That represents a potential market of 25% of the

population. The current Federal Government also promised to make the provision of transit passes by employers a non-taxable benefit, one of the barriers that have often been identified with employer funded pass programs.

From a marketing perspective, this type of program can be seen as an incentive to attract and retain employees, and an employer based pass program can be marketed as a “green” initiative, which may be important for some employers. In combination with other market based strategies, such as reduced parking requirements for major employers / paid parking at major employment locations, the effectiveness of employment pass programs could be increased.

Flexible Hours and Peak Spreading

The use of flexible work hours can also be key part of transportation demand management program. Flexible work hours could be implemented in a number of ways depending on the type of business, and type of employee. For professional / management staff, flexible hours could allow for work start / finish times that do not follow traditional 9-5 office hours. By defining core business hours (say 10am to 3pm) where employees are expected to be at work, and allowing flexibility on start and end times, employees can adjust their schedule away from peak times or can have flexibility to accommodate other family related needs. This can be an important consideration in low income families, where the stress of getting children to/from school or daycare, can take away from employee productivity and morale.

For non management staff, including skilled trades and production employees, varying the shift change times away from peak roadway travel times may improve employees travel times to and from work, and reduce congestion at key locations. For example, staggered shift times have been used for a number of years at the Oshawa GM assembly plant, to avoid conflicting with peak travel times on the road network. A solution like this could be looked at as part of the solution for addressing future industrial growth in the Northwest industrial area, due to the limited number of local access roads.

To ensure this type of strategy does not restrict transportation options for those without access to cars, the transit schedules should be aligned with the shift change schedules for major employers to the extent possible.

Telecommuting

Telecommuting has been growing in popularity over the past 5 to 10 years, although with the wider availability of high speed internet service, serious interest in telecommuting has risen dramatically over the past few years. The implementation of telecommuting programs is typically initiated at the employer level; however, municipalities can provide incentives and assistance to companies wishing to set a program at their location. In the City of Ottawa area, Nortel Networks ran a telecommuting program for many of their employees, and recently some innovative variations like hoteling, satellite offices, and remote business hosting have been introduced by private companies in some markets.

Hoteling essentially treats office space like a hotel, where many of the employees, who work from home or off site, are not assigned to a specific office space, but call in to reserve an office only when needed. Obviously this type of program would be most attractive for sales staff or other employees who are frequently out of the office and do not have a direct supervisory role in the organization.

In 1995 Consulting and Audit Canada (CAC) in Ottawa launched a hoteling strategy with three simple objectives; reduce overhead expenses while maintaining or enhancing employee productivity and customer satisfaction. The CAC hotel was created, complete with an informal drop-in/brainstorming area, a secured storage area which housed files and personal effects, including portable filing units, access to a hotel office "suite" or smaller "booths" which could be electronically reserved on the LAN and a formal meeting room. In addition, an automated reservation system was implemented to provide hoteling staff with access to space. Part of the money saved in the first year was reinvested to purchase new computers, telephony, and associated training.

AT&T has supported teleworkers for more than a decade, using a system something like this throughout the United States. In 2000 AT&T reported that over 55% of their employees participated in the telework program at least a few days per month. They credit this program with savings of \$3000 per employee per year in reduced real estate costs, along with improved productivity and staff retention, in addition to the transportation benefits that accrue to society. In 2006 AT&T reported that their popular telework program helped the company slash its annual real estate costs by US\$30 million and rake in US\$150 million in extra hours of productive work from teleworkers

Research shows AT&T tele-workers are much less likely to jump ship than in-office staff, according to Joseph Roitz, AT&T's telework director.

"Turnover in our virtual office population is half that of the turnover in our general salaried employee population," Roitz says.

"Lemmings make leap to teleworkers", Ann Bednarz, Network World (20 Jan 2006)

The most common barrier to telecommuting is corporate culture, where many supervisors feel uncomfortable trusting their employees to work at home or off site. Not all employees are suited for this type of work arrangement either, and those that do telework report that they need to have access to a separate "home office" to be truly productive. Many organizations have overcome these barriers to implement successful teleworking programs through top down support for the program and an active program of removing barriers to implementation. A similar type of program may be popular in the growing call centre business, provided that companies can implement programs and technology to allow for seamless processes and effective quality control monitoring for remote employees.

Some enterprising businesses, such as Telsec Business Centres Inc. in Toronto, have also established temporary satellite office space for rent in a number of locations. These satellite offices are designed to provide all of the amenities of a corporate office including fax, printing services, meeting room space, temporary office space, and some reception and mail handling services.

Employment growth forecasts for the City of Brantford suggest that almost 8% of new employment in the City will fall into the "work at home" category. This includes home

based business, and employees that work for larger companies but work from their homes. With an aggressive marketing effort to improve the attractiveness of teleworking and to ensure that basic infrastructure (such as high speed internet services) is in place, it is expected that the potential market could be increased to 10% of all employees by 2031.

Ridesharing

Ridesharing, also referred to as carpooling, is an effective transportation strategy for implementation at large employment centres. Ridesharing in the City of Brantford makes up an important component of the overall transportation demand today, as almost 9% of all work trips in the City are made by auto passengers. Ridesharing can be informal, such as a couple sharing the same car to drive to work, or one spouse dropping off a child at school. This is the most common form of ridesharing that occurs, and is often tied to household auto ownership levels.

Ridesharing among co-workers is much more difficult to organize and sustain, with many people indicating that finding a suitable person to carpool with is one of the biggest challenges. Work in the 21st century also presents a series of challenges to forming and maintaining carpools amongst colleagues. With the increasing number of hours that some employees are spending on the job, and the need for more flexible work arrangements (to accommodate travel, client needs, etc) many employees are finding it hard to maintain a regular commuting schedule, which is critical to maintaining an effective carpool arrangement.

Despite some of the challenges with rideshare programs, there are a number of very successful examples of ridesharing in action throughout Ontario. Large manufacturing operations appear to be one of the best workplaces to encourage the formation of carpools. The GM plant in Oshawa, the Chrysler plant in Windsor, and the Ford plant in Mississauga all have a number of employees that regularly participate in carpools and vanpools. Some of these programs are sponsored and/or supported by the company.

One of the key barriers to the formation of carpools is finding someone suitable to drive with. Since the internet has become much more widespread, there are now a number of formal ride matching services on the internet (such as www.carpool.ca, and www.carpooltool.com) that will try to match drivers that travel during the same time periods and have origin and destination points within close proximity of each other. As with any internet based matching service, security is a key concern for many thinking of carpooling.

4.3 Land use Based Strategies

“Land use and transportation are two sides of the same coin. Transportation affects land use and land use affects transportation.”⁹

Land use strategies come under a variety of names and descriptions (as summarized in the table below), but all of them attempt to use land use at a variety of geographic scales to provide transportation choice to residents and encourage non auto modes of transportation.

⁹ “Land Use Impacts on Transportation: How Land Use Factors Affect Travel Behavior”, Todd Litman, Victoria Transport Policy Institute, November 16,2005

Land Use Management Strategies¹⁰

Strategy	Scale	Description
Smart Growth	Regional and local	More compact, mixed, multi-modal development
New Urbanism	Local, street and site	More compact, mixed, multi-modal, pedestrian friendly development.
Transit-Oriented Development	Local, neighborhood and site	More compact, mixed, development designed around quality transit serve, often designed around <i>transit villages</i> .
Location-Efficient Development	Local and site	Residential and commercial development located and designed for reduced automobile ownership and use.
Access Management	Local, street and site	Coordination between roadway design and land use to improve transport.
Streetscaping	Street and site	Creating more attractive, pedestrian friendly and transit-oriented streets.
Traffic calming	Street	Roadway redesign to reduce traffic volumes and speeds.
Parking management	Local and site	Various strategies for encouraging more efficient use of parking facilities and reducing parking requirements.

The transportation benefits of a more compact form of development are recognized in the Province's recent "Places to Grow" legislation, which requires Greater Golden Horseshoe municipalities to accommodate a higher proportion of their future growth through intensification and requires higher density targets in new Greenfield development areas and existing urban core areas. Phase 1 of the City of Brantford Transportation Master Plan and Official Plan Review adopted a "Compact City" growth scenario as the preferred land use growth strategy to accommodate future population and employment demands. This strategy is modeled after and complies with the density targets outlined in the "Places to Grow" legislation.

Density, however, is only one aspect of the land use solution. To have a significant affect on transportation behaviour increased densities must be combined with other strategies to improve the mix of land uses within neighbourhoods, promote safe and pleasant environments to support walking and cycling, provide transit supportive land use design, and reduce the amount of and impact of parking.

In numerous small towns throughout the province, neighbourhood design principles that support alternative modes of transportation can be readily found. While these small towns and villages do not offer transit services, the mix of land uses and the scale of development patterns can often make walking and cycling much more attractive than some of today's suburban "master planned" communities. Some strategies to achieve these types of benefits within our urban neighbourhoods of today could include:

- Encouraging a variety of land uses within a neighbourhood, such as neighbourhood stores and services,
- Encourage the redevelopment of single uses into mixed-use developments,

¹⁰ Ibid.

- Accommodate the reuse of closed, decommissioned, or obsolete institutional uses,
- Provide incentives for ground-floor retail and upper-level residential uses in existing and future development,
- Design communities so that kids can walk to school,.
- Use trees and other green infrastructure to provide shelter, beauty, urban heat reduction, and separation from automobile traffic,
- Encourage and provide safe and direct pedestrian routes to transit stops,
- Use visual cues and design elements to indicate pedestrian rights of way and minimize conflicts,
- Avoid use of large scale parking lots and situate parking to enhance the pedestrian environment and facilitate access between destinations,
- Make places walkable for aging populations in response to new demographics and special needs,
- Retrofit existing streets to provide sidewalks to promote more walkable communities in both residential and employment areas.
- Concentrate critical services near homes, jobs, and transit.
- Require building design that makes commercial areas more walkable and connected to the community,
- Plan neighbourhood street networks in a grid patterns with high levels of connectivity and short blocks rather than long blocks with looping street segments and numerous cul-de-sacs
- Locate mixed use activity centers around transit hubs,
- Require sidewalks in all new developments and on both sides of all collector and arterial roads,
- Cluster freight facilities near ports, airports, and rail terminals.

4.4 Summary of Transportation Demand Management Strategies

The following tables provide a summary of some of the common transportation demand management strategies currently in use, along with an assessment of the jurisdictional means of implementation.

Strategy	Example	Implementation
Market-Based		
Peak Hour Road Pricing	Highway 407 ETR	Municipality / Province
Increase Auto Costs	Fuel Taxes / Vehicle Registration	Province / Federal Gov't
Increase Long-Term Parking Costs	Existing Municipal Parking Garage	Municipality
Behaviour-Based		
Shift Peak Travel Hours	Flex Hours	Employers
Telecommute	Work at Home	Employers
Restrict Vehicle Use	Vehicle Restrictions	Municipality / Province
HOV Lanes	New HOV Lanes on GTA Freeways	Municipality / Province
Transit-Priority Systems	Special Transit Signal Phases / Lanes	Municipality / Province
Ride-Sharing	Existing Carpool Lots	Municipality / Province
Land-Use-Based		
Increase Densities	Downtown	Municipality / Developers
Shorten Home/Work Distance	Mixed Use Development	Municipality / Developers

An assessment of the effectiveness, in terms of extent and degree of impact, along with costs, and implementation issues is provided below.

Strategy	Effectiveness		Costs		Implementation	
	Extent	Impact	To Users	To Society	Ease to Administer	Public Acceptance
Market-Based						
Peak Hour Road Pricing	Broad	Great	Great	None	Moderate	Poor
Increase Auto Costs	Broad	Moderate	Great	Moderate	Easy	Poor
Increase Long-Term Parking Costs	Broad	Great	Great	None	Easy	Poor
Behaviour-Based						
Shift Peak Travel Hours	Variable	Minor	None	None	Moderate	Moderate
Telecommute	Broad	Minor	None	None	Moderate	Good
Restrict Vehicle Use	Variable	Minor	Great	None	Hard	Poor
HOV Lanes	Variable	Moderate	None	Great	Hard	Moderate
Transit-Priority Systems	Variable	Moderate	None	Minor	Hard	Moderate
Ride-Sharing	Narrow	Moderate	None	Minor	Hard	Good
Land-Use-Based						
Increase Densities	Broad	Moderate	None	Minor	Moderate	Moderate
Shorten Home/Work Distance	Broad	Minor	None	Moderate	Moderate	Moderate

5 TRANSPORTATION STRATEGY OPTIONS

There are many ways to utilize the strategies discussed in section 4 to create a more sustainable transportation system and improve the liveability of our communities. The key to the development of a successful transportation strategy is finding the right balance between managing demand and providing new transportation capacity, and exploiting the synergies that can exist between complimentary strategies.

Many of these strategies work hand in hand with one another and could have broader and more effective achievements when implemented in conjunction with other improvements. For instance, transit ridership to urban centres can be greatly improved with an effective parking management strategy that limits the supply and controls the cost of longer term commuter parking. Similarly improvements designed to enhance walking and cycling can also benefit transit ridership.

In the following sections, a series of transportation strategy alternatives have been outlined for the City of Brantford for the key modes of travel in the community. Within each area, different visions of the transportation system have been described, and an assessment of each alternative vision has been provided. The intent of these options are to stimulate discussion amongst the various transportation stakeholders and residents in the community to design a “made in Brantford” transportation strategy that reflects community constraints, opportunities, and residents visions of what makes a community liveable. Based on feedback received from the public, a transportation strategy and detailed transportation policies and improvement plans will be developed that reflect the relative emphasis within each area.

Alternative transportation strategies are provided for:

- The future role of walking and cycling
- Downtown parking
- The future transit system
- Optimization of the existing road network
- Implementation of a city-wide Transportation Demand Management strategy
- Truck Routing

5.1 Walking and Cycling in 2031

Currently in the City of Brantford, almost 6% of the work trips are made by walking/cycling and the majority of the current trail system is “off road”.

From these figures, it can be concluded cycling serves more as a recreational role in the City rather than an option for traveling to work, which is also an important element in supporting healthy living in the City.

Pedestrian with special needs is one of the most important considerations when planning pedestrian facilities. The level of energy required by a wheelchair user to push a given distance is about 30% higher than needed by a walker. A person on crutches or with artificial legs requires 70% more energy to go the same distance.¹¹ If a person in a wheelchair travels a full city block to find no curb cut, doubles back and travels that same distance in the street, it is the equivalent of an ambulatory person going 4 extra blocks, not to mention the extra time and inconvenience. This illustrates the importance of creating barrier-free environments.

Pedestrian supportive land use planning is also a very important consideration. Land use patterns conducive to walking include:

- Greater housing densities allow more residents to live closer to neighbourhood destinations such as stores and schools.
- Mixed-use zoning allows services such as stores and professional buildings to be closer to residential areas, making it easier to access these facilities on foot.
- Multiple-use zoning allows residences and businesses to share the same structure, reducing travel demands.
- Locating buildings close to the street allows easy access by pedestrians, and parking areas planned to minimize walking in vehicle space and the backing up of vehicles reduces the potential for vehicle/pedestrian conflicts.
- The preservation of open spaces between communities creates a greenbelt, a natural buffer that helps prevent urban sprawl
- Resolving conflicts with neighbourhood street management, including traffic calming techniques, makes streets more inviting to walkers.

The City’s existing subdivision policy requires the provision of sidewalks on both sides of all streets in new residential areas, except for cul-de-sacs under 150 meters in length. Also, in Section 9.6 of Brantford’s official plan, it stated that safe and secure pedestrian, bicycle, and special mobility needs be considered in new development and redevelopment proposals.

Given the benefits of cycling, improving cycling paths plays an important role in a balanced transportation system.

The cycling paths should be a visible component of the transportation system and should be connected to form an overall cycling network. To make the cycling routes attractive to commuters as an alternate transportation mode, the routes should be easily accessible and the routes should provide access to major destinations. To also serve recreational and tourism purposes, the cycling routes should be built through as much attractive scenic areas as possible.

¹¹ City of Brantford Transportation Master Plan: Part 4, IMC consulting group, March 1997

There are generally three different roles cycling can play in the City.

5.1.1 Current Multi-Use Trail/ Bikeway Network in City of Brantford¹²

The City of Brantford has an extensive off-road cycling network that is oriented around the recreational areas on both sides of the Grand River. A multi-use trail has also been incorporated into the existing right-of-way along Wayne Gretzky Parkway, which allows for off-road cycling, walking, and rollerblading within this multi-modal transportation corridor.

Existing Cycling / Trail Network in Brantford



Currently in the City of Brantford, the Highway 403 corridor creates a major barrier to north-south cycling and pedestrian movements in the City. The Highway 403 creates a break in the multi-use trail along Wayne Gretzky Parkway and the City is currently exploring alternatives to provide a separate pedestrian connection across Hwy 403. It is desirable to make the hwy 403 interchanges safer and more comfortable for cyclists and pedestrians to cross, in order to encourage the use of the trail connecting residential areas to the north and the south, and industrial areas, institutions and Lynden Park Mall in the middle. For that reason, the development of a new trail connection in this corridor is common to all alternative strategies.

¹² Final Report: Multi-Use Trail/Bikeway Implementation and Design Plan, Stantec Consulting Ltd., ESG International, March 2000

In 2000, the City completed a Multi-Use Trail / Bikeway Master Plan that identified a series of proposed off-road and on-road cycling facilities throughout the City. The City of Brantford multi-use trail /bikeway plan consists of 12 primary routes (designed to connect major destinations within the City), 14 neighbourhood routes (designed to connect neighbourhood parks and other destinations), and 12 connecting links (designed to join primary routes). There are 115km of primary routes and 47 km of neighbourhood routes and connecting links for a total network of 162 km. Thirty-seven kilometres of existing trails are included in this network. The final network would provide 7 distinct trail crossing of Highway 403, between Garden Avenue and the Grand River.

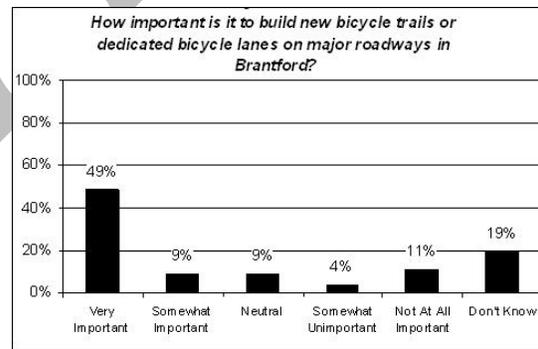
Each route or link was defined as a multi-use trail, hiking trail, signed route, bike lane, or wide shared lane based on the type of users targeted, the surrounding environment, roadway cross-section, speed and volume of traffic. The total cost to construct the Multi-use Trail/ Bikeway concept was estimated to be \$6.7 million dollars (1999 Dollars).

Since 2000, the City has been successful in implementing many of the proposed off-road cycling / trail facilities, but has had difficulties garnering enough support to implement any of the on road cycling routes.

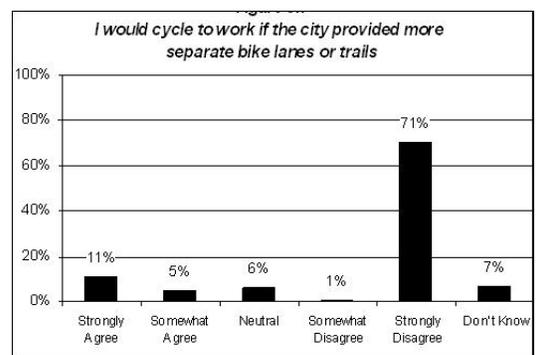
A survey of North American cities showed that those considered successful in initiatives for cycling all had the following three elements:

1. Staff committed to cycling initiatives.
2. Politicians and the public supportive of cycling initiatives.
3. An active cycling committee.

A random household survey, undertaken as part of Phase 1 of the Transportation Master Plan, examined public attitudes towards travel habits and patterns in the City of Brantford. Almost 58% of those surveyed supported the construction of new cycling trails or dedicated cycling lanes on City roadways although this high level of support may not necessarily translate into a significant number of commuters shifting to cycling.



Approximately 31% of those surveyed indicated they would be willing to consider the use of alternative modes of travel to and from work or school. When asked if more bicycle lanes or trails would encourage them to cycle to work or school, 16% of these respondents said yes, while a further 12% were unsure. This represents a potential cycling market of approximately 5% of the population. While these responses appear to suggest that the average resident views cycling as a good recreational activity, the 5% of current auto users that may consider a shift to cycling does offer some opportunity to encourage additional utilitarian cycling if appropriate facilities are implemented.



5.1.2 Relevant Experiences

Cycling Facilities Improvement Programs

Across North America, many cities in industrialized countries have experienced dramatic increases in the level of cycling following significant investment in bicycle facilities. For example, Eugene, Oregon experienced an increase of 75%, and Toronto experienced an increase of 75%.¹³

There is evidence that trails also provide significant economic benefits for adjacent landowners and local businesses. Trails provide benefits to the local economy during both the construction and operation phases. Trail construction results in direct benefits such as jobs; and economic benefits from expenditures by trail users during operation of the trail. A few examples are¹⁴:

- Approximately 1500 people are employed for an average of 6 months per year working on trails in New Brunswick
- 70% of Bruce Trail users cite the trail as the main reason for visiting the area, and they spend an average of \$20.00 per visit within a 10km corridor on either side of the trail.
- As the anchor of the tourism industry in San Antonio, Texas, the San Antonio Riverwalk contributes \$1.2 billion annually to the local economy.
- More than 600,000 Americans took a bicycle vacation in 1985, and when traveling in a group spent \$17 per day (camping), and \$50 per day (staying in motels). Cyclists traveling alone spent an average of \$22 per day (camping) and \$60 per day (motels).
- In Ontario, Eastern Ontario Trails Alliance estimated that at the end of a ten year build-out period, 320 km of their system, constructed at a cost of \$5.4 million will generate approximately \$36 million in annual economic benefits in the communities through which it passes, and create/ sustain over 1100 jobs.

5.1.3 Walking and Cycling Strategy Alternatives

Using the above considerations as the basis for the policy options, there are three general policy options available to support walking and cycling in the City; promote walking/cycling as a preferred mode for person trips, promote walking/cycling in downtown area / selected areas and through a recreational trail system, or promote walking/cycling for leisure and recreation.

Option 1 – Cycling & Walking is a preferred mode of travel for local trips under 5km in length and are important recreational activities that supports the health and wellness of the City. The recommendations of the Multi-Use Trail and Bikeway Master Plan will form the basis for updated cycling and pedestrian trail network in the City. Sidewalks within new residential, commercial and industrial areas be introduced as a priority and a sidewalk retrofit program will eventually provide full

¹³ New York City Bicycle Master Plan, New York City, 1997

¹⁴ York Region Transportation Mater Plan: Policy Paper No. 3 – Transportation Demand Management & Telecommuting, Cansult, Marshall Macklin Monaghan, October 2000

accessible sidewalks and crossing within key existing residential, commercial and industrial areas.

Option 2 – Cycling & Walking is a preferred mode of travel within the downtown core and in key neighbourhoods, and are important recreational activities that supports the health and wellness of the City. The recommendations of the Multi-Use Trail and Bikeway Master Plan will be modified to focus on pedestrian and cycling connections to/from and within the downtown. Outside of the downtown, the cycling / trail system will focus on recreational cycling routes. Sidewalks within the downtown will be maximized to the extent possible and a sidewalk retrofit program will eventually provide sidewalks and fully accessible crossings throughout the downtown.

Option 3 – Cycling and Walking are important recreational activities that support the health and wellness of the City and existing facilities will be made accessible throughout the downtown and in key areas of the City. The recommendations of the Multi-Use Trail and Bikeway Master Plan will be modified to focus on pedestrian and cycling connections to/from existing recreational trail facilities.

5.2 Parking Strategies for the Downtown

Parking management refers to the supply, price and regulation of parking facilities. How parking is managed can significantly affect travel behaviour. Parking supply and pricing have significant impact on modal split. When appropriately applied, parking management can significantly reduce the number of parking spaces required, the cost of building new parking facilities, and provide a variety of economic, social and environmental benefits.

For example, studies have shown that municipalities with higher than average transit ridership to their downtown also have a restricted supply of long term downtown parking for employees, and higher parking prices. Although examples of this relationship typically involve large cities like Ottawa, Vancouver, and Toronto, the correlation between supply and price of parking, and transit ridership is noted.

Outside the downtown area, parking can also be a controversial issue for developments that require an adequate supply of affordable parking to attract users. While the City owns and manages municipal lots, it also regulates the provision of all private parking spaces through the comprehensive Zoning Bylaw 160-90. The parking standards of this Bylaw can be used to manage the supply of parking in ways that may discourage automobile use and encourage other modes.

However, in smaller uncongested cities such as Brantford, discouraging automobile use through the use of parking standards may also impact on the market attractiveness of areas where these standards are applied, especially downtown.

5.2.1 Current Downtown Parking in the City of Brantford¹⁵

The demand for on-street parking has greatly increased in two years. The increase in demand is for the most part the result of the increase in enrolment at Laurier University. The block faces around Victoria Park have gone from having no problems to all being problem areas. Most of the block faces that have an average capacity equal to or greater than 80% are centrally located in the downtown. In addition, off street parking facilities in the downtown core are reaching their practical capacity, and new employment growth in the downtown core will increase the demand. The need for additional parking spaces in the downtown was identified in the 2004 Downtown Parking Study, completed by the City.

In addition, low turnover rate continues to be a problem in the eastern and western fringes of the downtown. This indicates that vehicles are parking for long periods of time, which is not desirable for a downtown commercial area.

Most growing downtowns experience parking problems. Most downtown parking is un-priced or under-priced. During peak periods, 90% of the core-area parking spaces are occupied and by commuters or long-term visitors. Instead of building costly new parking structures which maybe underutilized due to low or no cost on-street parking, parking programs should be developed to encourage more efficient use of parking facilities, insure that parking is convenient for priority uses, and maintain parking utilization at around 85%. Such program may include¹⁶:

- Increase friendly and fair enforcement of regulations.
- Reduce on-street parking time limits (i.e. reduce 2-hours to 90 minutes) where needed to increase turnover.
- Encourage businesses to share parking facilities.
- Encourage use of alternative modes. The city may partner with the downtown business organizations to support commute trip reduction programs and downtown shuttle service.
- Develop special regulations as needed, such as for disabled access, delivery and loading areas, or to accommodate other particular land uses.
- Implement a residential parking permit program if needed to address spillover problems in nearby residential areas, but accommodate non-residential users as much as possible.
- Provide signs and maps showing motorists where they may park.
- Have an overflow parking plan for occasionally special events that attract large crowds.
- Price parking, using convenient pricing methods. Adjust rates as needed to maintain optional utilization (i.e., 85% peak occupancy). Structure rates to favor short-term uses in core areas and encourage longer-term parkers to shift to other locations. Provide special rates to serve appropriate uses, such as for evening and weekend events. Use revenues to improve enforcement, security, facility maintenance, marketing, and mobility management programs that encourage use of alternative modes.

¹⁵ “2004 Downtown Brantford Parking Study”, City of Brantford, Apr 12, 2005

¹⁶ Ibid.

5.2.2 Relevant Experiences

Tri-Met Parking Management¹⁷

The Tri-Country Metropolitan Transportation District, which manages transportation in Portland, Oregon, has implemented various parking management strategies around transit stations to minimize costs and encourage transit development. These strategies include sharing of parking facilities with Park & Ride and other types of land uses, using lower minimum parking requirements around transit stations, allow reduction in Park & Ride capacity around transit stations to encourage walk/ bike trips instead of auto trips.

Time-Based Pricing¹⁸

The City of Chicago brought the cost of parking at municipal parking lots more in line with commercial operators by raising parking rates at municipal parking lots by 30-120%. As a result, parking demand decreased by 35% and duration of parking decreased. Local planner concluded that the reduction represent a shift from driving to transit or ridesharing, or shorter parking duration, since the parking at nearby commercial lots did not change significantly. A more detail study in the City of Eugene shows that by raising the monthly parking rate from \$16 to \$30, monthly parking sales declined by almost 36%. About half this 36% shifted to ridesharing or riding transit, and the other half changed parking locations.

5.2.3 Downtown Parking Strategy Alternatives

Option 1 – Improve the supply of on street and off street parking through the construction of new lots, a new parking garage, or additional on street parking in the core area.

Option 2 – Manage the demand for parking in the downtown to encourage alternative modes of travel through the implementation of higher parking rates for long term (all day) parking and management of the supply of long term parking. Continue to manage short term parking to maximize turnover in commercial districts.

Option 3 – Implement a combination of both approaches, by increasing the supply of long and short term parking to address growth requirements but implementing price increases to encourage more transit use.

5.3 Transit and Rideshare Improvements

The current transit system serves the city which has a current population of about 96,800 people. The service is offered through nine fixed routes a number of school

¹⁷ www.tri-met.org

¹⁸ ‘Parking Management Strategies, Evaluation and Planning’, Todd Litman, Victoria Transport Policy Institute, March 13, 2006.

specials during weekdays. The entire fixed route services operate from the transit terminal located at 64 Darling Street. There are different routings and levels of service for transit operations during evenings, and weekend service. The transit system currently consists of 27 buses.

In 2005, the system carried 1.39 million fare paying passengers. This represents the market penetration (measured as rides per capita) of 15.2. It is estimated that the current transit modal share is 3%.

Key Strengths of Current System

- The City has recently undertaken a transit service improvement and service standards study, and has implemented many of its recommendations.
- For the last three years, the city has been renewing its aging fleet.
- Current service structure with all routes converging to the city terminal, it provides an excellent opportunity to integrate the city's transit service with the inter-city transit service. It is critical since 54% of city's population commutes outside of the city to places like Hamilton, Kitchener, and Toronto.
- There has been significant growth (roughly 33%) in ridership over the last eight years.

Key Weaknesses of Current System

- Average age of bus fleet is relatively high at 12 years (Recommended level of 6 to 8 years). There are 10 buses with over 21 years of service.
- Current modal share by transit is low compared to a similar size city. Part of it can be attributed to the fact that a large portion of city's population works outside of the city.
- Currently, there is a poor perception about transit service by public.
 - 58% view transit meeting their transportation needs poorly.
 - Better bus system and transit service was quoted as the number one issue in a recent public attitude survey.
 - 43% of people consider expanding the transit routes important, 38% consider increasing the frequency of current service important.
- The transit system has an old fare collection system.
- It appears from the attitudinal survey that people would like improved information on routes and schedules.

Major Opportunities

- Significant population growth; City population of 108,500 by year 2016, and 132,000 by 2031 from its current population of about 96,800.
- High level of future industrial activity, such as Ferro plant in the north-west area of the city.
- Existence of growing post secondary campus of Laurier Brantford, and affiliated campuses of Nipissing University and Mohawk College.
- A policy for secondary schools allowing students to attend any school in the city helps higher utilization of transit by students.
- Aging of general population would help transit ridership for non-work trips, requiring improved serve during evenings and weekends.
- Recent attitudinal survey suggests that there is willingness by auto users to shift to transit provided there was improved level of transit service, better transit information, or financial incentive to use transit.

Major Challenges

- A large proportion of population commutes outside of the city, thereby reducing the potential market for local transit.
- Some of the future growth especially in the industrial sector is taking place in the low density environment which is difficult to serve by transit in a cost-effective manner.
- Refurbishing of existing rolling stock, terminal, and other infrastructure, along with expanded service would require a significant capital and operating expenditures.
- Certain initiatives to improve transit ridership such as employer transit pass would require cooperation of private sector.
- A number of supportive land use and parking policies would have to be put in place to realize significant transit ridership.

A review of existing transit system, its strengths and weaknesses, along with an assessment of opportunities available to enhance transit use, and some of the major challenges that need to be overcome provided the framework for developing alternate transit strategies. The following section outlines a range of alternative strategies, along with their key elements, a rough estimate of resultant ridership level over the next 10 and 25 years, and capital cost requirements (order of magnitude) over the next 10 years for each strategy. In assessing the future ridership levels, the following population and employment forecasts have been used.

Year	Population	Employment
Current	96,800	42,800
2016	108,000	54,200
2031	132,000	N/A

For estimating the capital cost requirements, much of the information has been extracted from the city's recent Transit Asset Management Plan.

5.3.1 Future Transit Strategy Alternatives

Option 1 – Status Quo - Maintain transit services at current levels while maintaining current rides per capita and mode share (3% of peak period trips). Upgrade existing transit fleet to meet 100% accessibility target by 2031, and reduce the average age of the transit fleet.

Under this scenario, current service would be maintained. Minimal amount of refurbishing activity would take place, and this would include replacement of rolling stock when its useful life has been reached, and refurbishing activities for the terminal. No new services would be added, and there would not be any change to the current fleet size.

Ridership Levels

Much of the new population and employment under this scenario would not be served by transit, since the existing transit services have not been expanded. There would be some attraction by the new population and employment growth that would occur within the existing urbanized areas since these areas are currently being served by transit.

Based on our estimation of the distribution of population and employment growth, and the expected market penetration by transit to this growth, the following future ridership levels have been projected:

- Current Annual Ridership 1.39 Million
- Est. 2016 Annual Ridership 1.45 Million
- Est. 2031 Annual Ridership 1.54 Million

10-Year Capital Requirements (2006 \$)

Under this scenario, capital needs include the replacement of rolling stock to maintain the average age of the transit fleet, and necessary repairs to the existing transit terminal and transit service centre. Capital cost estimates over the next 10 years is listed below, and similar level of capital investments can be expected beyond the 10-year period.

- 10 buses (Bus replacement @ 1 per year) \$4.5 Million
- Repairs to Transit Terminal \$0.2 Million
- Repairs to Transit Service Centre \$0.8 Million
- **Total \$5.5 Million**

Option 2 – Modest Improvement – Implement service improvements on key performing routes and add additional routes or optimize routes to improve mode share to 4% of peak period travel demands. Upgrade existing fleet to meet 100% accessibility target by 2031 and reduce the average age of the transit fleet.

Under this scenario the following improvements are assumed:

- Expanded service to areas with new growth.
- Marginal improvement to the quality of existing rolling stock by replacing two buses per year.
- Improving the service on existing routes to match the population and employment growth
- Repairs and minor upgrades to the transit terminal and transit service centre.
- Upgrades to bus stops and shelters.

Ridership Levels

Under this scenario, the current service level would be available to the new growth areas. Also, service on current routes would be increased to reflect higher population and employment within the catchment area. For this scenario therefore, we have assumed the current market penetration level (15 rides per capita) for the future.

- Current Annual Ridership 1.39 Million
- Est. 2016 Annual Ridership 1.62 Million
- Est. 2031 Annual Ridership 1.98 Million

10-Year Capital Requirements (2006 \$)

Under this scenario, capital needs include the replacement of rolling stock to marginally improve the quality of existing rolling stock, service improvements to match growth, and minor upgrades to the existing infrastructure. Capital costs breakdown is outlined below:

-
- 20 buses (Bus replacement @ 2 per year) \$9.0 Million
 - 2 buses for service expansion \$0.9 Million
 - Bus stops/shelter upgrades \$0.1 Million
 - Repairs/upgrades to Transit Terminal \$0.5 Million
 - Repairs/upgrades to Transit Service Centre \$1.5 Million
 - **Total \$12.0 Million**

Option 4 – Transit Focus - Implement service improvements on key performing routes and add additional trunk routes along major arterial roadways. Provide a new downtown transit terminal and implement a satellite terminal at the Lynden Park Mall to shorten route times in the north end of the City. Improve overall mode share to 6% of peak period travel demands. Provide enhanced service levels in the downtown core area, and provide a downtown transit shuttle service to improve accessibility within the downtown core. Upgrade existing fleet to meet 100% accessibility target by 2031 and reduce the average age of the transit fleet.

Under this scenario, transit would be aggressively promoted, major service improvements would be put in place, a new transit terminal would be developed and complementary land use, parking and financial incentive policies would be implemented. Transit service would be significantly improved both in terms of its quality (comfort, convenience, etc.) and amount of service (frequency, coverage, and duration). Services would be improved for all time periods, i.e., am and pm peak periods, evenings as well as week-ends.

A number of transit trunk routes would be established where 15-20 minutes service would be provided with all the amenities (bus shelters, bus stops with schedule, benches, etc.) that would make transit an attractive modal choice. Based on our quick assessment of the route ridership data (November 9th to December 12th) and major attractors within the City, the following street would be a strong candidate for these trunk routes:

- Colborne Street and Fairview Dr. as East-West trunks
- West Street, King George Road/North park Street as North-South trunks.

Obviously, these have to be reviewed in the context of new growth areas, and more importantly the development of new terminal.

The following summarizes the listing of improvements assumed under this scenario:

- 28 buses to replace older vehicles
- 6 buses to expand service on existing routes, establish transit trunks, and provide new service to the expanded areas of the city. (please note that the Ridership Growth and asset Management Plan indicates 4 additional buses for service expansion)
- Development of new terminal in the north-western part of the city, potentially in the Lynden Park Mall area.
- Redesigning of transit routes to account for growth areas and the new terminal.
- Establishment of transit trunk routes and providing the necessary service level and transit amenities along these trunk corridors.

- Refurbishing and upgrading of existing terminal to address future expanded service.
- Refurbishing and upgrading of transit service centre to accommodate expanded fleet and improved customer service.
- Replacement of existing fare box system with modern equipment that provides convenient payment methods, and has a capability to gather information to create a transit user profile for marketing and planning purposes.
- Improvements to bus shelters and bus stops with improved information on route maps and transit schedule as well as ensuring that these are adequately accessible by side walks.
- Consideration of transit signal priority for strategically located intersections.
- Encourage the use of transit by providing incentives to frequent users, student passes, and encouraging major employers to provide subsidized transit passes.
- Develop and implement transit supportive land use and parking policies.
- Improve coordination with inter-city bus service and VIA rail service.
- Continue to monitor service performance and make changes to services to maximize transit usage.
- Develop and implement transit marketing and promotional program.

Ridership Levels

Under this scenario, transit would be promoted aggressively. For this scenario therefore, we have assumed that there would be 20 % increase to the current market penetration level (15 rides per capita) within 10 years, and 30% increase over the next 25 years. This would mean that in 2016, the estimated market penetration (rides per capita) would be 18 (please note that the Ridership and Asset Management Plan of the city has estimated it to be 20%). We believe that the 20 rides per capita level is more realistic for year 2031. Bases on these rides per capita level, the future transit ridership levels translate to the following:

- Current Annual Ridership 1.39 Million
- Est. 2016 Annual Ridership 1.94 Million
- Est. 2031 Annual Ridership 2.64 Million

10-Year Capital Requirements (2006\$)

For this scenario, the following summarizes the capital improvements that would be needed over the next 10 years. It is to be noted that there are other supportive policies and programs that are critical for this scenario, but are not reflected in the capital improvement listing.

- 28 buses (Bus replacement @ 2 per year) \$12.6 Million
- 6 buses for service expansion \$2.7 Million
- Development and upgrades to New terminal \$1.6 Million
- Bus stops/shelter upgrades \$0.2 Million
- Repairs/upgrades to existing Transit Terminal \$3.5 Million
- Repairs/upgrades to Transit Service Centre \$2.0 Million
- Fare box replacement \$0.8 Million
- Marketing/Promotion Related Activities \$1.0 Million
- **Total \$24.4 Million**

5.4 Optimization of Existing Transportation System

The need for optimization of the existing transportation network is a key requirement for any municipality in times of fiscal restraint. Optimization of the existing transportation system, includes maximizing the capacity of existing facilities, improving the performance and reliability of existing services, and making minor operational improvements to improve system performance. For the purpose of this assessment, optimization of transit services and facilities has been considered within the transit section of this report.

5.4.1 Current Status of System Optimization in the City of Brantford

The City of Brantford has an ongoing program of transportation optimization activities that are undertaken on an ad hoc basis. Many of the traffic signals in the City are controlled by a City wide traffic control system, which allows for the implementation of co-ordinated signal timing plans that can be adapted to traffic conditions at different times of the day, and different days of the week. Many of the signalized intersections in the City used actuated signal control, which can adjust to prevailing traffic conditions and varying side road demands.

The City has implemented operational improvements at a number of intersections in the City and most major intersections feature separate left turn lanes and left turn signal phasing where required. There are a number of sections along key arterial roads in the City that could benefit from the installation of Two Way Left Turn Lanes (TWLTL) to improve through capacity. For example, the section of King George Road, between Tollgate Road and Dunsden Road was recommended for widening to a 5 lane cross section in the 1997 Transportation Master Plan to improve capacity within the existing corridor. To date this improvement has not been implemented.

Access Management tends to be applied on a selective basis on some corridors in the City. Wayne Gretzky Parkway has been maintained as a limited access facility throughout it's length, although there has been recent pressure from development interests to allow additional intersections and access points to this high capacity arterial from adjacent lands. The city has policies in place to restrict access on this facility, but there is limited provisions for access management within the City's current road network classification system and official plan policies.

5.4.2 Road Network Optimization Strategies

Option 1 – Status Quo - Maintain current practices with respect to installation of intersection improvements and traffic signal coordination. Access management polices will continue to be applied to major facilities such as Wayne Gretzky Parkway and the Brantford Southern Access Road and any new entrances to these facilities will be limited to municipal road connections.

Option 2 – Enhance Existing Road Capacity in Key Corridors – The capacity of key arterial road corridors in the City will be enhanced through an active program of intersection improvements, signal coordination, and arterial road access management policies. Key arterial roads in the City will be given signal priority during peak hours to maintain adequate progression regardless of increased delays that may occur to sideroad traffic. Access Management policies will encourage shared entrances for new developments and will encourage consolidation of existing entrances where redevelopment occurs. These measures will improve the capacity of key arterial roads by an average of 5%.

Option 3 – City Wide Corridor Optimization – The capacity of all arterial roads in the City will be enhanced through an aggressive program of intersection improvements, signal system coordination, and arterial road access management policies and improvements. All arterial roads in the City will be given signal priority during peak hours to maintain progression regardless of increased delays to side road traffic. Access Management policies will require shared entrances for new developments where possible and will encourage consolidation of existing entrances where redevelopment occurs. On key arterial road corridors with entrance densities greater than 25 entrances per km, TWLTL lanes will be constructed where physically feasible to improve through capacity. These measures will improve the capacity of key arterial roads by an average of 10-12%.

5.5 Other Transportation Demand Management Programs (TDM programs)

A TDM Program is an institutional framework for implementing a set of TDM strategies. Travel demand management (TDM) strategies involve the use of policies or incentives to encourage residents to either reduce the amount they travel, shift their time of travel to avoid peak periods, or change their mode of travel instead of rely solely on building new infrastructure to accommodate growing transportation.

5.5.1 TDM and the City of Brantford

Brantford does not currently have any formal TDM programs in place, although there have been some discussions about using some selective TDM programs in the Northwest development area, due to the current limited road and transit service in this growing employment node. Implementation of a TDM program would initially require the development of marketing material to raise awareness of alternative transportation choices the residents currently have, and a series of policy initiatives would need to be developed and approved by council for implementation.

The results of the Public Attitude Survey of Brantford residents indicates that there may be a market for the promotion of alternative transportation modes, if the right incentives and marketing campaign can be implemented and targeted to these potential users.

5.5.2 Relevant Experiences

TDM in the GTA¹⁹

Forecasts for the Greater Toronto Area estimate that its population will increase by 2 million and its employment will increase by 1.5 million from the year 1996 to the year 2021. Such increase in population and employment will increase traffic volume during peak periods causing deficiencies. In an attempt to make more efficient use of the City's existing transportation system and reduce private auto usage, several policies which provide support to TDM strategies have been outlined:

- To support the objective of reducing overall use of the private automobile from present-day levels and take appropriate measures towards this end as acceptable strategies are developed;
- To support measures to increase the capacity, enhance the attractiveness and improve the operating efficiency of surface transit routes through:
 - Reserved transit lanes;
 - Priority for transit vehicles at traffic signals;
 - Improved fare collection methods;
 - Improved access to and shelter at transit stops;
 - Premium and express transit service; and
 - Additional routes and connections;
- To encourage greater fare and service integration between the TTC and GO transit systems and support a more coordinated to make better and more efficient use of the existing City roads aimed primarily to benefit transit riders, cyclists and pedestrians;
- To promote more efficient use of the private automobile by supporting measures to increase automobile occupancy levels such as promoting ride sharing and reserving the use of traffic lanes for HOVs; and
- Within the central area, emphasis will be placed on the provision of adequate short-term parking spaces while recognizing the need for a minimal level of all-day parking facilities to accommodate essential parking demand.

Throughout the GTA, a number of Transportation Management Associations have been formed through partnerships with the Federal Government (through the Transportation Showcase Program), the Provincial Government, and various area municipalities and private businesses.

Greater Vancouver's Go Green Choices Program (www.gogreen.com/choices)

This program supports employer-based TDM programs through training and program development assistance, information sharing events, promotional events, and cycling skills training. Go Green Choices also encourages ridesharing programs of the Jack Bell Foundation, an independent provider of vehicles and ride-matching services for carpools and vanpools.

Region of Ottawa-Carlton and Nortel Networks – Green Commute²⁰

In 1999, the Region of Ottawa-Carlton in coordination with Nortel Networks implemented a pilot program as part of a "Green Commute" strategy to promote alternative

¹⁹ York Region Transportation Mater Plan: Policy Paper No. 3 – Transportation Demand Management & Telecommuting, Cansult, Marshall Macklin Monaghan, October 2000

²⁰ York Region Transportation Mater Plan: Policy Paper No. 3 – Transportation Demand Management & Telecommuting, Cansult, Marshall Macklin Monaghan, October 2000

transportation modes to reduce air pollution and manage travel demand. Nortel Networks, as the Region's largest private-sector employer, involved in shaping TDM efforts. A TDM strategy was included as a requirement of the site approval process for an operation facility expansion. The intention was to promote alternative transportation modes for Nortel employees through making a variety of commuting options available. Nortel provided a number of tools for commuting options, including a new transit hub with routing changes, expanded or enhanced bicycle and walking trails, a carpooling parking garage and a web-based carpool matching program. In its second year, the proportion of non-drivers at Nortel Ottawa-Carleton area has increased from one in five to one in four employees.

5.5.3 Transportation Demand Management Strategies

Option 1 – Passive TDM – The City will support TDM through a series of passive measures designed to encourage awareness of transportation choices and alternatives. This will include the development of marketing materials for distribution by community groups and the City Transportation Department to interested parties and employers. Support for TDM will focus on behaviour based policy approaches that try to encourage additional transit ridership and healthy transportation choices. Increased TDM marketing and awareness will reduce auto demands during peak periods by 2%, with half of the trips shifting to transit.

Option 2 – Targeted TDM Program – the City will undertake a targeted TDM program aimed at encouraging the development of a formal TDM program for some of the largest employers in the City. This will include the development of marketing materials for distribution by community groups and the City Transportation Department to interested employers. TDM initiatives will focus on a combination of land use and behaviour based policy approaches that try to encourage the use of alternative transportation modes, attract additional transit ridership, and encourage an overall reduction in trip making. TDM policies and active promotion will reduce auto demands during peak periods by 5%, with half of the trips shifting to transit, 40% shifting to alternative modes, and 10% avoid travel during peak periods.

Option 3 – Aggressive TDM Program – The City will spearhead an aggressive TDM program that will target all major employers and traffic generators in the City. The strategy would require the hiring of a full time TDM coordinator on staff, who will champion TDM measures, develop marketing materials for distribution by the City Transportation Department to interested community groups and employers, and build support throughout the community. The City would invest in TDM measures to provide incentives to encourage trip reductions and would target all major employers (over 100 employees) to develop formal TDM programs in the workplace. Incentives would be used to encourage corporate participation. TDM initiatives will focus on a combination of land use, market based, and behaviour based policy approaches that try to encourage the use of alternative transportation modes, attract additional transit ridership, encourage increased auto occupancy, and

encourage an overall reduction in trip making. TDM policies and active promotion will reduce auto demands during peak periods by 10%, with half of the trips shifting to transit, 40% shifting to alternative modes, and 10% avoiding travel during peak periods.

5.6 Truck Routes

Generally when a public survey or information is collected, it is indicated that their concerns were primarily associated with safety, noise and vibration impacts that trucks were having on their street or neighbourhood. While it maybe desirable to remove all trucks from City streets, it is not practical to do this as the commercial, industrial and manufacturing sectors of the City's economy are very dependant on the movement of goods to and from their businesses.

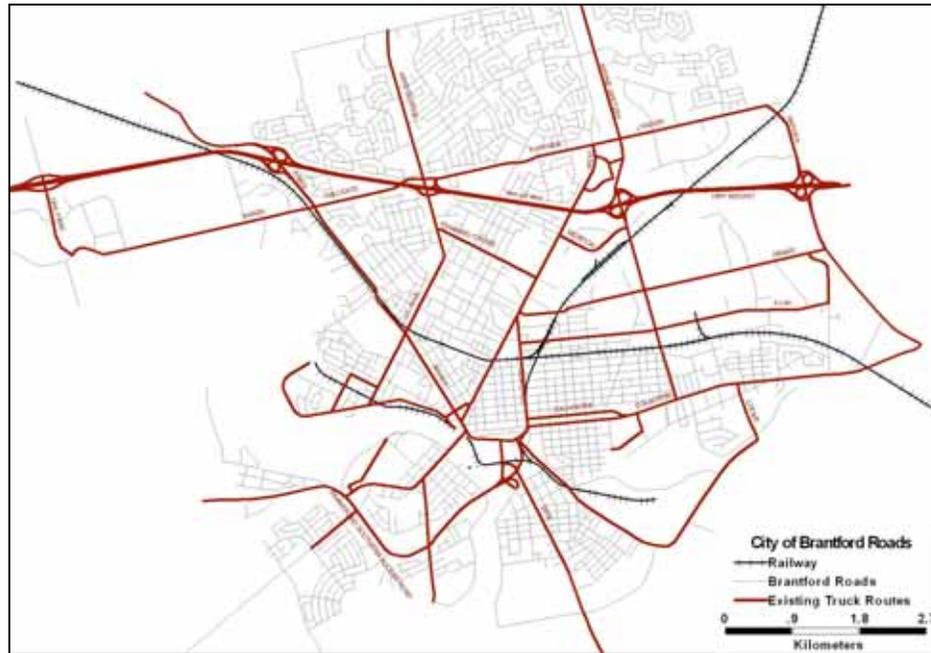
The location of truck routes is dictated by the land use patterns that generate truck traffic. Industrial areas are generally high generators of goods movement activity. Downtown offices, government employment, institutions and residential areas usually generate low volumes of truck movements. In terms of truck size, heavy trucks generally serve terminal/ warehouse types of industrial and "power center" retail areas. They are used mostly for loading and unloading of cargo at trip ends. Lighter trucks tend to serve larger institutions and more conventional retail areas such as shopping malls for service deliveries and personal business. The selection of actual truck routes is determined largely by engineering and socio-environmental considerations. Specific factors influencing truck route planning include:

- Impact on abutting lands.
- Availability of driver and vehicle facilities along the route.
- Service to major truck traffic generators.
- Provide for network continuity via inter-connecting links.
- Adequate structural strength and geometric design to accommodate truck weights and dimensions.
- Clearance of overhead structures and obstructions
- Provide traffic lanes at least 3.5m wide.
- Avoid steep grades where practical to a preferable maximum of 4 percent
- Provide adequate roadway capacity so that travel time along a truck route should be comparable to, or less than motor vehicles travel time on alternative routes.

5.6.1 Current Truck Routes in the City of Brantford

In the City of Brantford, truck movements are largely directed through the use of a permissive truck routing system. The current truck route by-law designates existing roadways as suitable for truck traffic, and signs are posted that indicate the route is acceptable for truck traffic. The by-law prohibits trucks from using non-designated routes, although there are some provisions that allow for local deliveries and use of non posted routes where the route forms part of the short path to the truck's destination. These provisions, enacted to address concerns of fairness raised by truckers and industry, have resulted in a truck route by-law that can be, at times, difficult to enforce.

The current truck route network is strongly oriented to the industrial districts at the west (North Ward/Holmedale) and the east (Cainsville/ Braneida) edges of the City. Major retailing areas are served by truck routes along arterials, and provide a number of inter-connecting links. The following map illustrates the currently designated truck routes in the City.



5.6.2 Truck Route Strategies

Based on experiences in a wide variety of cities, truck route management falls into two basic types: restrictive and permissive.

Policy Basis:

- Truck routes should be established and amended from time to time to regulate the movement of commercial vehicles.
- The selection of truck routes for inclusion in this Bylaw should consider: impact on abutting land use, suitability of the existing roadway surface condition, suitability of the existing roadway geometrics and grade, and minimized travel distance required on non-truck routes.
- Work with other levels of government, agencies and private sector to minimize risks and ensure the safe and efficient movement of goods by rail or road
- Encourage the location of activities that require heavy truck traffic to areas near or adjacent to freeways and major arterials.
- Provide a truck goods movement network which connects to adjacent municipalities and which utilizes provincial highways and regional arterial roads.
- Discourage truck routes on local roads in residential neighbourhoods in order to protect residents from noise and emission pollution.

Option 1 – Continue Permissive Truck Route System – The City will continue to use a permissive truck route system and will review designated routes to ensure accessibility to all commercial / industrial areas of the City. The existing by-law will be reviewed with a view to tighten up provisions which allow trucks to use non designated routes, and consider time of day restrictions where truck may use these routes.

Option 2 – Develop a Restrictive Truck Route System – The City will convert their existing truck route system to a restrictive system that restricts truck movements from certain collector and local roads through truck restriction signage. The current by-law will identify roadway where trucks are restricted although exemptions will be allowed for local deliveries only.

Option 3 – Utilize a hybrid system – The City will continue to use a permissive truck route system and will review designated routes to ensure accessibility to all commercial / industrial areas of the City. The City will review areas that may require the use of additional truck restriction signing to discourage inappropriate truck movements. The current by-law will be reworked to include a listing of roadways with truck prohibitions, and exemptions will be allowed for local deliveries only.

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