



**TRANSPORTATION MASTER PLAN**

Policy Paper No. 3

**TRANSPORTATION DEMAND  
MANAGEMENT  
&  
TELECOMMUTING**

For Discussion Purposes Only

October 2000

---

## TABLE OF CONTENTS

<b><u>1.0</u></b>	<b><u>INTRODUCTION &amp; BACKGROUND</u></b> .....	<b>1</b>
<b><u>2.0</u></b>	<b><u>CURRENT ISSUES REGARDING TDM</u></b> .....	<b>1</b>
<u>2.1</u>	<u>Transportation Demand Management &amp; Telecommuting</u> .....	1
<u>2.2</u>	<u>TDM in the GTA</u> .....	2
<u>2.3</u>	<u>TDM in York Region</u> .....	3
<b><u>3.0</u></b>	<b><u>YORK REGION OFFICIAL PLAN POLICIES</u></b> .....	<b>4</b>
<b><u>4.0</u></b>	<b><u>RELEVANT EXPERIENCE IN TDM &amp; TELECOMMUTING</u></b> .....	<b>6</b>
<u>4.1</u>	<u>Portland, Oregon – Commuter Choice</u> .....	6
<u>4.2</u>	<u>Seattle, Washington – Riderlink</u> .....	6
<u>4.3</u>	<u>Greater Vancouver Regional District – Livable Region Strategic Plan</u> .....	7
<u>4.4</u>	<u>Region of Ottawa-Carleton and Nortel Networks – Green Commute</u> .....	7
<u>4.5</u>	<u>Europe and Toronto – Car Sharing</u> .....	7
<u>4.6</u>	<u>Video Conferencing and Telework</u> .....	8
<b><u>5.0</u></b>	<b><u>POLICY DIRECTIONS FOR TDM &amp; TELECOMMUTING IN YORK REGION</u></b> .....	<b>9</b>
<u>5.1</u>	<u>Integration of Transportation &amp; Land Use Planning</u> .....	9
<u>5.2</u>	<u>Reducing Automobile Use &amp; Dependency</u> .....	10
<b><u>6.0</u></b>	<b><u>MOST PROMISING DIRECTIONS FOR CHANGE</u></b> .....	<b>12</b>
<u>6.1</u>	<u>Improved Public Transit</u> .....	13
<u>6.2</u>	<u>Alternative Work Hours and Telecommuting</u> .....	13
<u>6.3</u>	<u>Ridesharing</u> .....	13
<u>6.4</u>	<u>Parking Management</u> .....	14
<u>6.5</u>	<u>Land Use Planning</u> .....	14
<b><u>7.0</u></b>	<b><u>CONCLUSION</u></b> .....	<b>14</b>
<b><u>8.0</u></b>	<b><u>BIBLIOGRAPHY</u></b> .....	<b>15</b>

**Prepared By:** Cansult Limited  
October 2000

## **1.0 INTRODUCTION & BACKGROUND**

Transportation Demand Management is a concept useful in controlling growth in travel demand. With current peak period transportation trends in York Region and the Greater Toronto Area as a whole largely focused on private automobile use, measures to decrease the number of vehicles on the road, balance traffic flows and encourage travel during the off-peak periods are essential. Strategies such as transportation demand management (TDM) and telecommuting are viable solutions towards reducing peak period traffic congestion and maximizing the use of the existing transportation system.

## **2.0 CURRENT ISSUES REGARDING TDM**

The following section provides an overview of current trends and issues in transportation demand management.

### **2.1 TRANSPORTATION DEMAND MANAGEMENT & TELECOMMUTING**

Transportation demand management and telecommuting are two measures that aim to influence the demand for use of the transportation system of a region. Both TDM and telecommuting are measures to control the trend of high traffic volumes and traffic congestion ensnaring the road network. TDM is becoming an increasing presence in transportation plans for regions across North America. Past initiatives for transportation plans have focused upon increasing the physical capacity of the transportation system to meet the existing and forecast future travel demand. The inclusion of TDM into regional transportation plans takes an opposing perspective. TDM points to an approach which aims to manage and shape the future demand for use of the transportation system in order to improve the efficiency of existing transportation facilities, address financial and physical constraints and reduce energy consumption and the emission of pollutants into the air (TDM Technical Overview, 1993, p.1). In effect, TDM attempts to alter travel mode choice, frequency of travel and time of travel to ease congestion occurring within the transportation network, by providing incentives to use alternative forms of transportation and disincentives to decrease the number of single occupancy vehicles (SOVs) on the road. TDM also aims to alter the timing of trips, in order to spread out the concentration of peak period trips over a longer period, and thereby taking pressure off existing transportation system infrastructure during peak periods. Since the greatest demand on the transportation system generally occurs during the morning and evening peak periods, largely in the form of commute trips, TDM strategies typically are directed at managing journey-to-work trips (TDM Technical Overview, 1993, p.1).

TDM is a strategy that aims to modify travel demand and maximize the ability of the transportation system to efficiently move both people and goods, with a focus on commuting for work purposes. The main objective is to improve the operation of the transportation system without requiring increases on the supply side, such as infrastructure or service expansion. Hence, the focus is to shift travel demand by the creation of policies to encourage a reduction in auto dependency and the number of vehicles travelling on the road network and spread out peak period travel. With the principle of planning for the movement of people and goods rather than vehicles, TDM aims to provide alternative modes of transportation for commuting purposes, such as use of the public transit system, ridesharing, cycling and walking. TDM policies and

programs benefit regional and local governments as reduced reliance on the private automobile decreases the demand on the road network, and as such, reduces or defers the associated infrastructure construction and maintenance costs. TDM is often regarded in relation to transportation system management (TSM) initiatives intended to maximize the throughput of the road network, which may include intersection improvements and optimizing traffic signal timing.

Telecommuting, also known as teleworking, is a relatively new direction for providing alternative work schedules for employees. Telecommuting is one form of TDM that involves employees working from home or at an employer's regional satellite work centre, through the use of technology providing remote access to the central office. Telecommuting permits flexibility for employees as the time required for them to be present in the office is often reduced, perhaps only for meetings. Telecommuting can range from one day per week working away from the office to the entire week, however telecommuters on average telework on one or two days per week (TDM Technical Overview, 1993, p.34). Telecommuting is advantageous for managing transportation demand as it serves to reduce the number of automobiles on the road network during peak periods on a daily basis.

TDM measures originate from the energy crisis of the 1970s, where many suburban areas were almost entirely dependent on the private automobile for travel, transit services were not widespread, and there was minimal coordination between transit planning and land use planning (TDM Technical Overview, 1993, p.1). Alternative modes of travel were necessary under the threat of an energy scarcity, and as such TDM strategies were initiated. TDM strategies have persisted over time, and are now referred to as essential implements to sustain the existing transportation system. The main goals of TDM point to improvements in the transportation network and the environment, and include the following:

- more effective use of transportation facilities and services;
- to mitigate traffic congestion through:
  - changing the modal split to reduce automobile modal share;
  - increasing automobile occupancy; and
  - shifting travel out of peak periods;
- to increase the capacity to move people without increasing vehicular capacity;
- to reduce energy consumption; and
- to improve air quality (TDM Technical Overview, 1993, p.2 and p.6).

## **2.2 TDM IN THE GTA**

The implementation of TDM measures and the promotion of telecommuting are integral to maintaining the road network and transit system in the Greater Toronto Area (GTA). As demand for efficient travel on the Region's road network increases, a system needs to be initiated to effectively manage the movement of people. Forecasts for the GTA estimate that its population will increase from nearly 5 million in 1996 to approximately 7 million by 2021. Similarly, employment in the GTA is forecast to increase from 2.3 million in 1996 to approximately 3.8 million workers in 2021 (Toronto Plan Report, 2000). York Region forecasts suggest that the population will increase from 611,000 in 1996 to approximately 1.3 million in 2026, and employment is forecast to increase from 290,000 in 1996 to nearly 700,000 in 2026 (York Region Population, Households and Employment Forecasts, 1996-2026, 2000, p.4).

Between 1986 and 1996, daily passenger travel in the GTA increased from 7.3 million to 9.1 million person-trips on a typical weekday, an increase of approximately 24%. During this period the morning and evening rush hour volumes increased by 19 and 22% respectively. It is forecast that over the next quarter century in the GTA, daily passenger travel will further increase by 55% to 14.1 million person-trips per day, whereby the morning and evening peak period volumes will see an increase in traffic of 49 and 51% respectively (Removing Roadblocks – Congestion and Economic Competitiveness, 2000, p.11). Such further increases in traffic volume during peak periods will result in slower travel speeds, longer travel time and amplification of peak periods, signaling a dire need for TDM strategies to improve the capacity of the existing transportation network.

Based on the Metro Toronto TDM Technical Overview, the City of Toronto Official Plan sets out policies with respect to encouraging the use of TDM strategies in an attempt to make more efficient use of the City's existing transportation system and reduce private automobile use. Several policies related to automobile usage, public transit and city parking have been outlined, which can provide support to TDM strategies. These include the following (City of Toronto Official Plan, 1994):

- 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 approach to transit services at a regional level;
- to promote the development of additional GO stations;
- to support traffic management measures designed 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.

Other supportive measures include increased enforcement with respect to illegal parking and stopping on bus routes (which hinder bus movements) and the provision of additional parking facilities at subway terminals.

### **2.3 TDM IN YORK REGION**

Current trends in land and community development in the GTA have led to urban sprawl in the form of low-density suburbanization on the fringe of the urbanized area. Many

employees within the suburban GTA commute into the City of Toronto, the Toronto Central Business District (CBD) or across regional boundaries. Residents of York Region commute longer distances to work, drive their cars more often and use public transit, bicycle and walk less than the average Ontario resident. The 1996 Census cites the mode of transportation used for commute purposes in York Region as driving (81%), passenger (7%), public transit (9%), walking (2%), bicycling (0%) and other methods (1%) (Our Environment Our Home, 2000, pp.2-17,p.2-18). Auto dependency is largely due to low housing densities rendering journey-to-work on public transit inefficient. In addition, many people do not live and work in the same municipality (poor live-work relationships) and as such lengthy automobile trips are more often than not the most viable option for travelling across boundaries. However, it is recognized that urban sprawl is typically the first stage in urban development. As development progresses, higher densities and an increased mix of uses are likely to prevail – the ensuing transportation benefits will thus mitigate the initial transportation impacts of urban sprawl.

With forecasts for significant increases in population and employment throughout York Region and the GTA as a whole, the current trend towards the use of SOV trips is likely to grow accordingly. The number of motor vehicles and the number of trips made continue to rise in York Region, with traffic volumes increasing at a rate slightly higher than the rate of population and employment growth (Our Environment Our Home, 2000, p.2-17). As such, alternatives to private automobile use for commuting purposes are essential, as are altering the demand for travel on the GTA's transportation network. Increased pressure on the road network may lead to uncontrollable traffic congestion if left unchecked and escalating amounts of vehicle emissions contributing to air pollution. The City of Toronto has implemented HOV lanes on high volume arterial roads, such as Yonge Street between the Finch subway terminal and Steeles Avenue, and Allen Road between Highway 401 and Finch Avenue, as well as many others, to encourage greater use of transit and ridesharing. A comprehensive transit system also supports efficient travel throughout the City. York Region needs to implement a variety of the initiatives outlined as TDM measures to alter the modal split, encourage alternative travel options, and ensure manageable travel demand on an efficient and effective transportation network.

### **3.0 YORK REGION OFFICIAL PLAN POLICIES**

At present, the York Region Official Plan does not specifically address policies and programs to promote TDM and telecommuting. However, it does recognize the importance of public transit, walking and cycling as tools to manage transportation demand, and identifies the need for a coordinated road network and transit system to provide high-capacity inter-municipal service. Objectives in the Official Plan that pertain to the transportation system and that are relevant to TDM include the following (York Region Official Plan, 1999, p.64, p.68 and p.70):

- to plan and protect street and road corridors so that they can be developed in a manner that is supportive of the future urban and rural structure of York Region and that can accommodate future transportation demands;
- to ensure that roads are improved in a manner that is supportive of all modes of transportation including walking, cycling, automobile, transit and truck and that minimizes conflicts between these different modes;

- to increase the total person-carrying and goods-carrying capability of the regional street and road network in a manner that is consistent with the overall goals and objectives of this plan;
- to provide transit service that is convenient, accessible and equitable to all residents of York; and
- to promote and facilitate walking, cycling and trails.

Numerous policies of Council indicate the importance of TDM and its associated measures to promote effectively managed transportation in the Region. These include:

- to continue to improve the York Region road network subject to the following:
  - that all road improvements take into account the needs and requirements of all forms of transportation including automobiles, transit vehicles, trucks, bicycles and pedestrians; and
  - that in identified centres and corridors, priority be given to the needs of transit, pedestrians and cyclists and the integration of adjacent land uses to promote these forms of transportation;
- mid-concession block collector roads are implemented east-west and north-south in all new urban developments; such continuous collector roads are required to not only serve automobile traffic in the local areas but also to serve efficient and effective transit systems;
- to identify and implement a network of HOV lanes on regional roads and other roads as appropriate (this network should be designed to integrate with networks in the City of Toronto and other regions);
- to develop a fully coordinated public transit system that links the major residential, employment and community activity areas within York Region and makes suitable connections with transit systems in the City of Toronto and adjacent area regions;
- to plan communities on the basis of significantly increasing public use of transit, where the 30 year target will be for one third of all peak period trips by transit;
- to achieve higher transit usage by supporting improvements in service, convenient access and good urban design, including:
  - minimizing walking distance to anticipated transit stops through the provision of walkways and more direct road patterns, where in urban areas the distance to a transit stop should be no more than 500 metres for 90% of residents and no more than 200 metres for 50% of residents;
  - locating medium and higher density urban development adjacent to transit-intensive urban arterial roads;
  - providing for and promoting parking and drop off facilities for commuters in appropriate locations and in close proximity to commuter trip origins; and
  - providing transfer facilities at appropriate locations;
- to cooperate with area municipalities, GO Transit, the TTC, the Ministry of Transportation and adjacent municipalities in the planning, coordination, integration and operation of existing and new transit services;
- to support a consistent and equitable transit fare strategy throughout York Region and to ensure that this fare structure is integrated with transit services in adjacent regions and with GO Transit;
- to provide preferential treatment for transit on regional roads, including construction of HOV lanes, reserved bus lanes and bus priorities at traffic signals; and
- to ensure the integration of bicycle path and walkway systems into the design of transportation facilities including protected bicycle storage areas at stations, places of employment and major community, institutional, educational, cultural and shopping locations.

## 4.0 RELEVANT EXPERIENCE IN TDM & TELECOMMUTING

Throughout Europe, TDM measures to control urban traffic congestion have been in place for many years, including carpooling and car sharing programs, road pricing and comprehensive rapid transit systems. Many North American cities have implemented innovative systems for managing urban growth and travel demand, most notably, Portland, Seattle, Vancouver and Toronto. Telecommuting is a concept of TDM that has gained substantial credit in parts of the United States and Canada and implemented in part to reduce the demand for travel on area road networks. Examples of programs and policies that have acted in part to efficiently manage travel demand in other cities can help direct policy making for York Region to cope with increasing travel demand forecast for the 21<sup>st</sup> century.

### 4.1 PORTLAND, OREGON – COMMUTER CHOICE

Employer induced benefits towards more efficient commuter choice options is a program presently in place for businesses in the City of Portland. Several options are available to area employers to promote TDM measures and encourage their employees to use alternative modes of transportation to SOV use. An employer may provide up to the entire annual amount of a public transit pass on Portland's Tri-Met or CTRAN transit service, tax-free to employees; in effect this will also lower federal and state income taxes paid by the employer. As such, in the Portland area, 400 employers offer reduced cost transit passes to over 150,000 employees. A program entitled "*PassPort*" allows companies to provide free transit passes based on a cost related to current ridership and transit pass revenue at the worksite. Other programs are in place, such as an "*Employee-Paid Pre-tax Benefit Option*". If employers cannot cover the costs of transit pass benefits, they may set up a payroll program and permit employees to exchange part of their gross income for transit passes. Employees pay for the benefit with pre-tax dollars thereby saving federal and state income taxes. Another practice implemented to market Tri-Met or CTRAN use is a "*Parking Cash Out*" program. In effect this program allows employees to forego the free or subsidized parking provided by employers and cash out the value of the parking benefit. The value of the parking benefit is subject to taxes, however, if up to \$65 of the value is converted to a transit pass, the amount converted will not be taxed. In addition to the promotion of transit use, the City of Portland also supports organized car sharing and carpooling programs. Car sharing and carpooling programs are promoted to save the average resident up to \$2400 per year related to the costs of automobile ownership, and to provide such benefits as reduced rates at downtown Portland parking facilities and parking meters (City of Portland, Office of Transportation, [www.city.portland.or.us](http://www.city.portland.or.us)).

### 4.2 SEATTLE, WASHINGTON – RIDERLINK

Riderlink, a joint venture between King County Metro Transit and the Overlake Transportation Management Association, an organization of a variety of suburban employers (including Microsoft) provides 15,000 employees of member companies information regarding a broad range of travel options. Information provided by this initiative includes: bus routes and schedules, ridesharing services, carpool matching assistance and real-time freeway congestion updates and road construction reports generated by the Washington State Department of Transportation. This transportation system information is available at touch-screen kiosks at employer sites as well as internet web sites (Orski, 1995, p.58).

### **4.3 GREATER VANCOUVER REGIONAL DISTRICT – LIVABLE REGION STRATEGIC PLAN**

The Greater Vancouver Regional District (GVRD) has recognized the important link between transportation and land use in its 1996 *“Livable Region Strategic Plan”* which includes measures aimed at containing urban sprawl and the promotion of transportation alternatives. This Plan was generated in part to influence travel demand and behaviour of the 1.8 million residents living within the Region’s 21 municipalities. The Plan recommends:

- protecting a “green zone” to provide an urban growth boundary;
- building complete communities that support a better distribution of jobs and housing opportunities; and
- increasing transportation choice – to manage growth and development to reduce travel distances, and emphasize transit, cycling and walking.

The Plan proposes a \$1.43 billion program of capital investments over the next five years. TransLink, the Greater Vancouver Transportation Authority (GVTA) is looking at alternative sources of revenue to pay for these projects, such as vehicle levies, additional provincial fuel taxes and system-wide electronic tolling on major roads and bridges (Henry, 2000, pp.1-3).

The GVTA is looking at another initiative related to TDM. A *“Station Car”* pilot program is in the works, to locate a number of cars at mass transit stations. These cars are designed to move transit users to and from well-served transit corridors to low density areas of the region that are difficult to serve with conventional transit, including residential areas and employment districts. Station cars can be shared throughout the day and over peak periods by a number of transit commuters. In addition, station vehicles that are energy efficient will be used, providing a more sustainable option for travel.

### **4.4 REGION OF OTTAWA-CARLETON AND NORTEL NETWORKS – GREEN COMMUTE**

In Spring 1999, the Region of Ottawa-Carleton in coordination with Nortel Networks implemented a pilot program as part of a *“Green Commute”* strategy to promote alternative forms of transportation to reduce air pollution and influence travel demand. As the Region’s largest private-sector employer, Nortel Networks involvement was integral to shape TDM efforts. As a requirement of the site approval process for an expanded operations facility, a TDM strategy was included, with intent to promote alternative methods of transportation for Nortel employees through making available a variety of commuting options. 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 (*Getting There*, 2000). In its second year, the program has already increased the proportion of non-drivers at Nortel’s Ottawa-Carleton area offices to one in four employees from one in five employees (Noxon, 2000, p.21).

### **4.5 EUROPE AND TORONTO – CAR SHARING**

Extensive car sharing networks have emerged across Europe, involving more than 200 organizations including 15,000 members. Originally initiated in Switzerland, European car share systems offer such services as guaranteed delivery of a vehicle within 15

minutes, 24-hour reservations, discounts on urban and inter-urban transit service and reduced taxi rates. Membership in one city allows access to car sharing facilities in over 70 other cities. The first and largest car share program, Berlin's "Stattauto" has had an annual growth rate in membership of over 50%. After joining, 54% of the participants sold their own car. In the Netherlands, car share participants reduced their private automobile usage by approximately 30% (Smog: Make It or Break It, 1998, 19).

Established in 1998, AutoShare is a car sharing service initiated in the City of Toronto that is largely used by its members for travel within the GTA. In August 2000 AutoShare had 300 members and 22 vehicles to its name. Members have 24-hour access to a fleet of cars stationed at locations around the City of Toronto. AutoShare handles all administration, financing, insurance, maintenance and gas for the automobiles, while the members pay a \$500 one-time membership fee, refundable if members wish to leave, and a very small fee for application processing and key deposit. In addition, three "plans" are available based on frequency of automobile use where a monthly fee and fee per trip kilometre is charged. Longer distance trips are also available where cars can be borrowed for weekend or week long periods at slightly higher rates. Members receive a monthly itemized bill for car use, similar to a utility bill, and receive discounts from AutoShare's partner companies. Eventually, members of AutoShare will receive discounts when using public transit and other means of transportation in the GTA. AutoShare is promoted as a smart alternative to owning a car; it is less expensive if one travels less than 12,000 kilometres per year, and the program works well for those who do not require a vehicle for daily use. The program is touted as a means to reduce pollution and congestion from over-reliance on the private automobile, as every AutoShare automobile replaces 5-6 private automobile trips on the City's roads. Future directions for AutoShare include the addition of hybrids, alternative fuel and electric vehicles to its fleet. A car reservation system with telephone and internet access is under development, and eventually, smart cards and on-board computers will make AutoShare even more efficient ([www.autoshare.com](http://www.autoshare.com)).

#### **4.6 VIDEO CONFERENCING AND TELEWORK**

British Columbia's Ministry of Transportation and Highways has implemented a video conferencing network for Ministry staff as an initiative to reduce air pollution, car travel and traffic congestion. This initiative served to reduce the amount of time employees were required to physically be at the office, and encouraged work at home, or telecommuting.

Neighbourhood telework centres have been set up in Chula Vista, California with all of the necessary office and telecommunications equipment and on-site administrators, allowing residents of the neighbourhood to telecommute if permitted by their employer. With neighbourhood locations, residents can reach the telework centre by other means of transportation than the private automobile. Various incentives to walk or bike to the telework centres are provided and supplemented with a 'zero-emission shuttle vehicle' to further curtail the need for telecommuters to drive their vehicles to work for the day (Smog: Make It or Break It, 1998, 19).

The above examples of TDM strategies employed by other municipalities across North America and Europe, illustrate the importance of controlling traffic congestion and managing travel demand. Policies and programs targeted at reducing private automobile use have attempted to redirect travel demand to higher occupancy modes of

transportation, which in effect aim to reduce pressure on existing transportation infrastructure. Influencing travel demand behaviour can in effect improve traffic congestion found on the road network and improve the quality of life in a given region.

## **5.0 POLICY DIRECTIONS FOR TDM & TELECOMMUTING IN YORK REGION**

The *York Region HOV/Rapid Transit Study* prepared in 1995 by McCormick Rankin and Delcan outlined a series of policies and complementary initiatives that are required to support an HOV and rapid transit network in York Region in both the short and long terms. Several of these policies relate to TDM, in that they provide for innovative solutions to demand management. Supporting policies directed at this result include:

- develop a Regional strategy or contribute to a GTA plan for demand management including a ride sharing system; and
- enact policies to promote transit supportive land use and a pedestrian friendly environment at the regional and local municipal levels.

Transportation planning documents and reports produced for York Region and the GTA as a whole emphasize the need for TDM strategies to influence travel behaviour and demand in the region. A myriad of tools may be implemented to reduce the need for expansion of the existing transportation network. Growth management is essential to create alternatives to SOV use in York Region, which is forecast to double its transportation demand on the road network in peak periods over 25 years. York Region and area municipalities are working towards a Growth Management Strategy to ensure controlled and defined areas for growth (*Refining the Region's Growth Management Strategy*, 1999, p.4).

### **5.1 INTEGRATION OF TRANSPORTATION & LAND USE PLANNING**

Land use planning is pivotal to shaping travel demand and behaviour, as it helps to achieve a better directional balance for transportation facilities. The majority of the communities developed in York Region between the 1970s and the present have been planned with very low housing densities and rigorous land use separations, where convenience retail, commercial, employment and institutional land uses have been separated from residential areas. In the very essence of low density development, pedestrian activity, cycling and transit use is discouraged. As such, private automobile commuting and shopping trips are the only viable means for residents to travel.

TDM measures can provide a better integration of transportation planning and land use planning. Higher density developments, such as Cornell in the Town of Markham, aim to create stronger live-work relations within communities and municipalities, and in effect can reduce trip generation. As such, more emphasis should be placed on the development of communities that focus on higher density land uses, such as apartment dwellings and commercial uses, and are better integrated with transit service. In addition, more comprehensive travel opportunities, such as improved transit networks, need to be explored to alter the choice of travel mode and direct travel to higher occupancy means of transportation for the many existing low density communities found in York Region. Policies included in the York Region Official Plan and the Official Plans of area municipalities attempt to encourage transit accessibility. York Region policies

require that walkways and more direct road patterns be included in new subdivision plans to minimize the walking distance to transit stops. In urban areas the distance to a transit stop should be no more than 500 metres for 90% of all residents, and no more than 200 metres for 50% of all residents (York Region Official Plan, 1999, p.68).

## **5.2 REDUCING AUTOMOBILE USE & DEPENDENCY**

Reducing the number of automobiles on the road, decreasing the reliance on the private automobile and reducing the number of vehicles travelling at peak periods are key objectives of TDM strategies. Several methods to meet these objectives, and thus provide manageable capacity on the Region's road network, include: improved transit, parking management, increased automobile occupancy, congestion/road pricing, flexible work hours and telecommuting.

### **5.2.1 Public Transit**

At present, the public transit system serving York Region is comprised of a number of municipal transit services (eg. TTC, Vaughan Transit, Markham Transit, Richmond Hill Transit, Newmarket Transit, Brampton Transit) in addition to GO service. However, despite this, transit service is only offered in half of the Region's municipalities and many systems stay within their own municipal boundaries. Inter-municipal service and service that crosses the boundaries with the City of Toronto and other neighbouring Regions is essential for increasing transit ridership in York Region and enticing auto drivers out of their cars. A well integrated and coordinated GTA transit network can ensure reduced travel times for commuters who previously drove across regional and municipal boundaries, provide a more cost-effective mode of travel than the private automobile and reduce overall levels of traffic congestion (a single bus carries as many persons as approximately 30-40 automobiles). Commuter rail services provided by GO Transit may also be expanded to include extension of rail lines to reach stations in growing communities in northern sections of the Region, and expansion of services to include all-day service and extended rush hour service, which may encourage previous private automobile commuters to use GO transit for part or all of their journey-to-work trips. Expansion of commuter parking lots at transit stations can further attract commuters to use transit as part of their commute, especially if adequate parking is provided at no or a very low cost. Modification to the existing fare structure can potentially influence transit use. A price per distance travelled structure (eg. GO Transit) may be more encouraging than the present flat fee for transit use (eg. TTC). In addition, employer subsidized transit passes may encourage the use of public transit.

Transit service enhancements can further increase the attractiveness of public transit as a viable alternative to the private automobile. Automated vehicle location systems that track buses and report their position to a central control station can serve to convey real-time information to passengers such as bus schedule information and when the next bus will arrive, thus eliminating a common source of rider dissatisfaction with public transit. Transit agencies can also use such systems to identify where improvements in productivity and operations are needed. Comparable systems can also be implemented with vanpool or carpool services to further enhance their appeal (Orski, 1995, p.60).

### **5.2.2 Parking Management**

Parking management is another method that can serve to modify travel behaviour in favour of public transit, if coordinated with efficient and effective transit services. Parking availability, location and cost are significant factors in modal choice and discretionary trip

making. Many employers offer free or low-cost parking at their sites which induces employees to drive their vehicles to work. By introducing parking management policies, including pay lots and reduced parking ratios, this would optimally reduce automobile dependency, especially in the form of single occupant trips. Single occupant trips become less cost effective and as such, this will increase the relative attractiveness of other modes of travel, such as ridesharing. Preferential parking for HOVs and rideshare programs, in terms of cost and location within parking lots, can further serve to reduce SOV trips arising at a work site. Durham Region's Mobility Study report identifies key initiatives that may be useful in creating parking management policies. These recommendations, as listed below, may be useful for implementation in York Region:

- reviewing and amending the minimum/maximum parking requirements;
- promoting the concept of shared-parking for mixed use developments;
- identifying strategies (incentives) that reward car/vanpools at parking lots;
- identifying incentives that reward parking lot operators who provide incentives/priority to car/vanpools;
- identifying policies with respect to the provision and management of parking in downtown areas; and
- identifying development types that can benefit from reduced parking standards.

### **5.2.3 Increasing Automobile Occupancy**

Increased automobile occupancy, facilitated by HOV lanes and ridesharing programs, is an excellent method to reduce the number of cars travelling on the road network. Ridesharing can be advocated by both the private and public sectors with the help of company and government policies and programs. Users benefit by sharing the costs for parking and vehicle operation. With the irregularity of some jobs, a "guaranteed ride home" program is useful to ensure that carpoolers will always have a free or reduced cost ride home. Increased automobile occupancy programs are most effective when supported by other strategies, such as HOV facilities and travel lanes, preferential parking, an on-site coordinator, carpool subsidies and parking pricing (Durham Mobility Study, 2000, p.21).

### **5.2.4 Road Pricing**

Road pricing is another mechanism to relieve traffic congestion on the road network and influence travel demand and behaviour. Road pricing may help to decrease the demand for road space as tolls tend to discourage single occupancy vehicle use. Increasing the cost of driving alone may cause a shift to other modes of transportation or result in increased auto occupancies, both of which are positive outcomes. Road price schedules that reflect an increase in traffic congestion during peak periods (ie. highest tolls during peak hours) can also be used to influence travel behaviour, as some motorists will seek to travel during the off-peak periods. Implemented as a user fee, road pricing can be an effective method of raising revenue for transportation or transit system improvements.

Highway 407, recently constructed in the GTA, is an example of road pricing close to home. While expansion of toll roads in York Region is not a policy that will likely be seen in the future, modification of policies for the use of Highway 407 may be useful for east-west travel in the GTA. One consideration may be to reduce or eliminate the fee for HOVs travelling on Highway 407 in peak periods in effect to improve east-west travel conditions in the GTA (Durham Mobility Study, 2000, p.23).

### **5.2.5 Flexible Work Hours**

Flexible work hours is a method that has an effect on reducing peak period travel. Compressed work weeks, staggered hours or flextime programs are effective at shifting peak period travel demand. However, to be an effective TDM measure, care must be taken so that the introduction of flextime meets transportation objectives, and does not encourage existing transit users and ridesharers to switch to SOV trips in off-peak times. A useful method to achieve this is to offer off-peak transit fare reductions. Compressed work weeks also must be carefully thought out. With employees compressing the work week into four rather than five days, what is often found is that employees make more trips on their days off, which may actually increase the number of vehicles on the road. However, during the compressed work days, employees made fewer trips and travelled fewer miles (TDM Technical Overview, 1993, p.32). As a whole, alternative work hours do provide a reduction of peak period travel, and is especially useful when implemented by large employers in any region. The rush hour period may be lengthened but traffic congestion may also be dispersed.

### **5.2.6 Telecommuting**

Telecommuting also permits flexibility regarding the times in which employees must be present at the work site. Although telecommuting may not be suitable for all industries, with the introduction of many technological advances, such as the internet and e-mail, working from home or a satellite office has been enabled. As such, telecommuting reduces the need for employees to commute to work on a daily basis. In turn an increase in telecommuting activities will reduce traffic congestion during peak periods, and decrease the need for parking spaces at employer parking lots. Although telecommuting may reduce trip generation in terms of the number of automobiles on the road network, it also may have an effect on decreasing transit ridership for journey-to-work trips. It should be noted that telecommuting may actually increase travel to an extent. Telecommuting can allow teleworkers to move their place of residence further from the city centre, fostering urban sprawl. As such travel distances will increase on days in which employees must be present at the work site, and for discretionary travel in general (TDM Technical Overview, 1993, p.34).

## **6.0 MOST PROMISING DIRECTIONS FOR CHANGE**

TDM strategies have been identified as a method for altering travel demand and travel behaviour. York Region and the GTA need to encourage TDM measures in order to maximize the use of the existing transportation system. Expansion of the public transit system is crucial to creating an integrated and comprehensive transit system in the Region, one which may be accessible by all. However, expansion of the road network to support current automobile volumes, ultimately leads to increased urban sprawl, creating a vicious cycle of more and more automobiles on the road, and as such, necessitating more road expansion. The main goal of TDM strategies is to reduce the number of vehicles trips and the number of vehicles on the road network. TDM measures need to be implemented in response to the York Region population and employment trends forecast for the next 25 years, to manage the demand expected for capacity on the road network. TDM measures must be offered and promoted in order to provide attractive alternatives to the current state of SOV use and traffic congestion during peak periods. The result should be that people are not “forced” out of using their automobiles, but should be glad to trade the expense and frustration of SOV trips for a more sustainable

solution (*Getting There*, 2000, p.7). The following are directions that can prove most successful for such change in York Region.

## **6.1 IMPROVED PUBLIC TRANSIT**

Improved public transit systems are key to implementing an attractive alternative to SOV journey-to-work trips. A coordinated regional transit system is needed to provide an integrated and comprehensive transit network throughout York Region and to cross the boundaries of other municipalities within the GTA. Expansion of the existing GO Rail network can prove useful in altering the modal split towards transit usage – extension of rail lines and expansion of services to provide all-day two-way service on the rail lines extending into York Region can bring commuters out of their automobiles and encourage the use of a more efficient and hassle-free mode of travel. Transit-related TDM strategies focus on increasing transit ridership, improving the efficiency of existing services and identifying potential new services appropriate to the area's traffic concerns (*Getting There*, 2000, p.18). The Greater Toronto Services Board (GTSB) is presently working on the creation of a regional public transportation system to cross GTA boundaries, which can serve to influence the modal split in York Region away from private automobile commuting.

Improved transit services coupled with transit incentives, such as fare by distance, reduced fares during non-peak periods and subsidized transit passes can support transit use by employees and induce SOV users to commute using alternative forms of transportation. The introduction of real time information conveyed to passengers regarding transit operation and wait times at transit stations may also be useful in creating a highly attractive and convenient public transportation system.

## **6.2 ALTERNATIVE WORK HOURS AND TELECOMMUTING**

Flexible hours and telecommuting are methods of TDM that in York Region will mainly consist of employer-based solutions. Large companies, such as Nortel Networks in the Ottawa-Carleton Region can influence travel demand of employees based on company policy and incentives. Flexible hours and telecommuting may already be in place in many businesses within York Region, however, expansion of these programs on a larger scale will need to be promoted and encouraged by public or private sector employers. Alternative work hours and telecommuting will cause lower traffic congestion on the road network at peak periods by decreasing the number of automobile trips taken during these periods. Flexible hours can serve to flatten out peaks in traffic levels on the road network, while still sustaining the demand for public transit use. Telecommuting, on the other hand, may decrease transit ridership, as previous transit users may now telework from home.

## **6.3 RIDESHARING**

Ridesharing may also be largely employer-based, where large companies and public sector employers can encourage ridesharing and provide ridesharing services to match up employees as a measure to control traffic demand. Shifting SOV to HOV use can maintain the number of commuters travelling at peak periods but can serve to decrease the number of automobiles using the road network, easing traffic congestion. When policies are implemented to promote HOV use, either by the public or private sector, the use of SOVs for commuting purposes becomes less attractive. Guaranteed ride home programs can increase the attractiveness of ridesharing as a commuting option.

Dedicated HOV traffic lanes on busy roads can influence decisions for employees to carpool given a decrease in travel time. A GTA-wide ride matching service may be desirable to help control increasing inter-regional travel. Direction for the conversion of HOV lanes on existing lanes of arterial roads in York Region should be identified in the Regional Official Plan. HOV lane locations for implementation in York Region in both the short and long terms are outlined in the *York Region HOV/Rapid Transit Study*. Many routes identified for HOV use are to serve as a continuation of HOV travel lanes in the City of Toronto and neighbouring regions to complete a comprehensive, integrated HOV network for the GTA.

#### **6.4 PARKING MANAGEMENT**

Other parking management strategies, such as parking pricing for new and existing commercial developments, make SOV travel unattractive for journey-to-work and discretionary trips. In addition, reduced short term parking rates decreases the amount of parking spaces available for use by commuters, often making automobile trips less feasible. As such, with less parking available and therefore less cost efficient for the majority of commuters, alternative forms of transportation will need to be explored in place of SOV commuting. Policies such as preferential parking for HOVs at work sites and at transit hubs and reduced parking fares for HOVs decreases the transportation costs associated with parking a vehicle and may discourage SOV trips.

#### **6.5 LAND USE PLANNING**

Land use planning policies in the Regional and municipal Official Plans should promote site design standards that would require developments to include transit-oriented characteristics and provide for pedestrian and bicycle trails as a viable means of transportation. Mixed use developments, planned with mid-block collectors, are key to promoting transit oriented development. Zoning by-law parking requirements should ensure that appropriate minimum and maximum parking requirements for different land uses are set, as well as consideration for shared parking, in order to limit excessive free parking at work sites and other developments. Official Plan policies should also permit and promote home-based work or telecommuting opportunities within York Region as a means of travel demand management.

## **7.0 CONCLUSION**

As Ontario's fastest growing region faces rising traffic volumes, TDM strategies are needed in York Region to control the demand for more and more road capacity. Direction is needed to improve alternative forms of transportation in order to maintain the existing capacity of the transportation system, and therefore not incur large infrastructure costs associated with building more roads or travel lanes. Conversion of existing traffic lanes to HOV lanes, expansion of a regional public transit system and programs to promote HOV use offer the most promising route for change. Telecommuting is an innovative way to decrease the number of automobiles on the road, however its use is not widespread in York Region. In addition, improved live-work relationships are needed in order to develop more balanced directional flows of traffic during peak periods. TDM strategies can create a more sustainable transportation system, which benefits municipal and Regional governments. Reducing the demand for private automobile use reduces or defers costs to build and maintain transportation infrastructure.

## 8.0 BIBLIOGRAPHY

AutoShare, [www.autoshare.com](http://www.autoshare.com).

City of Portland, Office of Transportation, [www.city.portland.or.us](http://www.city.portland.or.us).

City of Toronto, *Toronto Plan – A Vision for the City of Toronto Official Plan*, Transportation Planning, City Planning Division, Urban Development Services, April 2000.

City of Toronto, *Official Plan*, 1994.

Durham Mobility Study, *Working Paper Number 3 – Transportation Demand Management and Transit*, May 2000.

Greater Toronto Services Board, *Removing Roadblocks – A Strategic Transportation Plan*, January 2000.

Greater Toronto Services Board, *Removing Roadblocks – Congestion and Economic Competitiveness*, January 2000

Henry, Reid, “Vancouver Offers a Model for GTSB Future,” in *GTA Municipal News*, Wednesday, August 23, 2000, Vol. 3, No. 33, 1-3.

Malone, M.E., “Telecommuting breaks out of a jam,” in *The Globe and Mail*, Thursday, March 2, 2000, T6.

McCormick Rankin in Association with Delcan, *York Region HOV/Rapid Transit Study*, June 1995.

Metropolitan Toronto, *TDM Technical Overview*, Planning Department, Transportation Division, 1993.

Noxon, Geoff, “TravelWise: A New Direction for Transportation Demand Management,” in *Ontario Planning Journal*, May/June 2000, Vol. 15, No. 3, 20-21.

Orski, C. Kenneth, “Thinking Small: Applying ITS Technologies to TDM,” in *ITE Journal*, December 1995, 57-60.

University of Waterloo, 2000. *Getting There: A Transportation Demand Management Assessment of the University of Waterloo Community*, [www.adm.uwaterloo.ca](http://www.adm.uwaterloo.ca)

York Region, *Official Plan*, 1999.

York Region, *Our Environment Our Home*, 2000.

York Region, *York Region Population, Households and Employment Forecasts, 1996-2026*, 2000.