Appendix 2

Sustainable Transportation Initiatives
Additional Background and Details

1. Pedestrian Zones and Streets

Pedestrian Zones and Streets are not a new idea, nor is it new to Toronto. The Kensington Market community has hosted a series of "Pedestrian Sundays" for the past four years and the Baldwin Village and Mirvish Village have initiated and hosted Pedestrian Sundays this year.

The primary reason for establishing pedestrian streets and zones, which can be implemented periodically as in the above examples or on a permanent basis, is to create dynamic public places contributing to a high quality of life for residents and the business communities. Many of the prime shopping districts in European cities are contained within pedestrian areas. These are the areas often sought out by tourists visiting these cities. In addition, pedestrian streets lead to lower volumes of local traffic that can result in less energy consumption and reduced levels of pollution and greenhouse gas emissions. Pedestrian streets are inherently more environmentally friendly than busy shopping streets clogged with vehicular traffic. As a city becomes more intensively developed, the environmental advantages of introducing pedestrian streets in selected high activity areas become even more pronounced. There are parts of Toronto where it now makes increasing sense to look at introducing pedestrianization schemes.

The two most common concerns about creating pedestrian streets are the perceived loss of business by merchants located within the pedestrian area and the fear by those located outside the pedestrian area that displaced traffic will simply be shifted to their streets. Therefore, careful attention to planning, design and promotion must be undertaken to maximize the potential for their success. Several key characteristics are important in the consideration of candidate pedestrian streets and zones, including:

- high existing pedestrian traffic before pedestrianization;
- a mix of retail, residential and office buildings, and cultural attractions;
- narrow streets with short blocks;
- attractive buildings and high quality urban design;
- convenient transit service to, and sometimes within, the pedestrian area;
- some motor vehicle access for commercial deliveries;
- access to automobile parking on the periphery of the pedestrian area; and
- a high level of maintenance.

The first and most important step in planning and designing a pedestrian zone is to engage the local community, including residents, property owners and area businesses. While it is unrealistic to expect unanimous support from the community, it is essential that there be a significant level of support for the initiative before changes are implemented. As a result, we are not recommending the implementation, at this time, of

any pedestrian streets and zones. Instead, it is recommended that staff be directed to assess opportunities to establish a permanent pedestrian street and develop a comprehensive public consultation process to engage local communities in a review of the options and the potential impacts and benefits of such a facility.

In addition to the establishment of pedestrian zones and streets, there are opportunities to promote reduced reliance on the automobile through the support of events such as "Car Free Days." Car Free Days began in France in 1999 and grew to become a pan-Europe event. In 2002 the European Car Free Day was expanded to European Mobility Week, in recognition of the need to broaden the program's objectives. Car Free Day is the signature event of Mobility Week and takes place on September 22nd each year.

There are two basic approaches to planning and hosting a Car Free Day. The simplest event is the voluntary Car Free Day, which depends largely on promotion to encourage residents to leave their cars at home for a day. The second approach, common in Europe, involves restricting cars in a section of the downtown for all or a portion of a single day.

Toronto's first Car Free Day took place on Saturday, September 22, 2001, when St. George Street, between Sussex Street and College Street, was closed to traffic for the day. The inaugural event was co-sponsored by the Sierra Club of Canada and the City of Toronto. The Sierra Club has organized the Toronto Car Free Day event every year since, with little or no support from the City. These events have ranged from neighbourhood-organized street parties to larger events at Dundas Square and along Yonge Street.

2. Pedestrian Enhancements at Intersections

(a) Increasing the Pedestrian Crossing Clearance Time – At signalized intersections, the current practice is to provide a minimum total pedestrian crossing time based on a walking speed of 1.0 m/sec. The total crossing time includes both the "WALK" display and the "FLASHING DON'T WALK" pedestrian crossing clearance display. As a result, a pedestrian starting to cross at the beginning of the WALK indication will always have at least 1.0 m/sec. to cross but a pedestrian who enters the crosswalk lawfully just before the indication changes to "FLASHING DON'T WALK" clearance display will have less than the desirable 1.0 m/sec. crossing time. In order to provide adequate cross time for pedestrians, it is recommended that the crossing time calculation be amended so that a pedestrian beginning to cross the intersection at any time during the "WALK" interval will always be provided sufficient time to cross the intersection safely and comfortably.

(b) Replace "FLASHING DON'T WALK" with "FLASHING WALK" during the pedestrian crossing clearance interval – The "FLASHING DON'T WALK" display is considered the "clearance" interval. In Ontario and almost all other North American jurisdictions, this means that pedestrians are not permitted to begin the crossing when the "FLASHING DON'T WALK" indication is displayed. With the proposed change to the time allocated to the clearance

interval described in 2(a) above, pedestrians will have sufficient time to complete their crossing safely during this clearance interval. To communicate this change in operation, it is proposed that the standard clearance indication be changed from a "FLASHING DON'T WALK" display to a "FLASHING WALK" display. This change has been recently implemented in Quebec. One of the advantages of the "FLASHING WALK" indication is that it sends a message to drivers that pedestrians are permitted within the intersection during this interval and they should exhibit caution accordingly.

To evaluate the effectiveness of this change in Toronto approval is required from the Ministry of Transportation to conduct a pilot project. Ultimately, the Highway Traffic Act would need to be revised to permit the use of the FLASHING WALK indication and to permit pedestrians to begin their crossing when the FLASHING WALK is displayed.

(c) Pedestrian Scramble Phase - A pedestrian scramble phase (also known as the Barnes' dance) enables pedestrians to cross at a signalized intersection in all directions at the same time while drivers are stopped on all approaches to the intersection. The primary advantage of the scramble phase is that pedestrians can cross the intersection without any conflicting motor vehicle movements. Depending upon the individual intersection characteristics, pedestrians may also be able to cross the intersection diagonally, essentially completing two crossings in one movement. There are, however, some disadvantages to this system from a pedestrian perspective, including:

- increased delays for pedestrians who only want to cross one leg of the intersection;

- increased crowding for pedestrians at intersection corners as they await the pedestrian signal phase; and

- difficulties for visually impaired pedestrians who use the sound of traffic as cues to guide themselves when and where to cross an intersection.

From a vehicular perspective, longer delays (including for transit vehicles) and queue lengths can be expected.

For these reasons, the introduction of these Pedestrian Scramble Phases must be considered carefully, and monitored and assessed after implementation. It will be particularly important to involve visually impaired pedestrians in the evaluation of scramble phase installations.

It is recommended that a pedestrian scramble phase be introduced, subject to a further detailed evaluation to determine their suitability, and evaluated at the following two intersections, which both experience very high pedestrian volumes, commencing in the Spring 2008:

- Bloor Street and Yonge Street; and
- Bloor Street and Bay Street.

(d) Leading Pedestrian Interval (LPI) – The LPI (or pedestrian head-start) has proven effective in reducing pedestrian / motor-vehicle conflicts at the intersection of University Avenue and Adelaide Street where it was installed on a trial basis. The purpose of this program is to provide an advance walk signal of several seconds so that pedestrians begin to cross the street first before vehicles get the green signal. It appears to be most effective where there are heavy motor-vehicle turning movements and high pedestrian crossing volumes. The next step is to develop guidelines for the application of this technique at other signalized intersections across the City, where there is potential to reduce conflicts. Transportation Services will identify 20 intersections for implementation in 2008.

3. Major Bicycle Trail Corridors

Toronto has a unique opportunity to significantly expand its network of off-street bikeways through the hydro and rail corridors that crisscross the City. Sections of the trail network already exist within these corridors. For example, the Lower Don Trail runs alongside the active CP Don Branch and sections of the Finch and Gatineau hydro corridors have trails. Parks, Forestry and Recreation staff is currently engaged in the development of bicycle trails within two abandoned rail lines: the West Toronto Railpath immediately west of the downtown area and the CN Leaside Branch in the Don Mills area. One of the next priorities for the Bikeway Network is to extend the trails in the Finch hydro corridor, which spans approximately 30 km from Kipling Avenue in the City's west end to Neilson Road in the east end, situated some 500 metres north of Finch Avenue over most of this distance. The corridor typically consists of green space up to 100 metres in width with hydroelectric towers spaced every 250 metres. An off-road path in this corridor will provide connections across the "top' of the City to the Humber River, Black Creek and Don River trails. It will also serve commuter cyclists travelling to and from York University, the Finch subway station and the North York Civic Centre, Seneca College and the office towers in the vicinity of Highway 404 and McNicoll Avenue. The completion of this route will require new cyclist/pedestrian bridges over Highways 400 and 404, and new signalized crossings of major arterials such as Bathurst Street. The City will need to work closely with Ontario Realty Corporation and Hydro One Networks, the owners and operators of the corridor, to complete this critical bikeway.

The Gatineau hydro corridor, which runs diagonally across Scarborough, will also be extended to connect with the existing network to the west and to the Finch Corridor to the north-east. To a lesser extent, the Richview hydro corridor in Etobicoke also has potential to form a critical part of the Bikeway Network.

These hydro corridor trails will require a considerable investment to develop the detailed design, secure access to the land from the Province, to construct the trails and amenities

and to maintain them. However, these trail corridors can provide a strong central "spine" to connect on-street bicycle lanes and off-street bikeways, particularly in the suburban areas of the City.

4. Car Sharing

Car sharing is a membership-based system of shared access to a group of vehicles. Typically, these vehicles are located in the neighbourhood where the members live but car sharing can also be employment based. Car share subscribers typically pay various administrative fees and a charge for each trip based on the length and duration of travel.

Car share programs typically attract members who drive less than average. For this class of driver the relatively high cost per trip made by car sharing is more than off-set by avoiding the high fixed costs of private car ownership. As long as vehicle use remains low (which pricing by trip encourages), there is an economic advantage to members of car share programs. Given these factors, car sharing has the most potential in the urban core of medium to large metropolitan areas where extensive transit services are available and trip distances relatively short.

Car sharing leads to reduced car ownership, dependency and use. Some members give up owning a car and others avoid the need to buy one. Typically, people in car shares reduce their overall driving by 30 to 50 percent with commensurate environmental benefits in terms of reduced levels of energy consumption and harmful emissions. Car share vehicles are also newer and more environmentally friendly than the average private car. The impacts of car sharing on congestion are less pronounced as car share vehicles are not usually used for commuting purposes.

By separating vehicle use from direct ownership, car sharing may help to reshape society's attitude towards viewing the car in more utilitarian terms and less as a personal statement of fashion and prestige. Car share programs may also increase the opportunities for testing and demonstrating new vehicle technology such as electric and other alternative fuel vehicles. These benefits add to the other environmental reasons for the public support of car sharing initiatives. Overall, car sharing provides a win-win situation: members have lower-cost access to a car when they really need one and society has cleaner air, improved community design and less traffic.

Car sharing programs can operate on a non-profit, cooperative basis or as private, for-profit ventures. The two principal car share programs in Toronto are privately operated Autoshare and Zipcar which between them have a fleet of over 350 vehicles and 11,000 members. Both are in the expansionary phase of development, with operations focussed in the area south of St. Clair Avenue. A key organizational element in car share operations is the location of parking facilities that are centrally located to the membership. Both AutoShare and Zipcar require their vehicles to be returned to the pick-up point.

Finding convenient parking spots, which act as the pick-up and drop-off points, for car sharing vehicles is a key challenge. The City has created a "blanket" class of on-street parking permits that allow car share vehicles to park overnight on City streets where permit parking is in place. The Toronto Parking Authority also allows the use of its lots by car share vehicles for a flat-rate monthly fee. Car share operations would also greatly benefit from having reserved on-street spaces made available to them and the Climate Change Plan recommends the study of this proposal. The Climate Change Plan also recommends the use of car share vehicles by City staff.

By reducing car ownership, car sharing also reduces the need for parking. This fact has been recognized in a number of recent development applications for high-rise condominiums in the City where developers have sought a reduction in the required number of parking spaces in return for providing dedicated parking space(s) for car sharing vehicles. The City has generally supported these requests for lower parking requirements in recognition of the social benefits of car sharing. The City is currently studying, as part of the New Zoning By-law Project, the appropriate amount by which parking standards should be lowered and the types of conditions that may need to be imposed upon the provision of such car share spaces in new developments. In regard to the latter point, for example, there is concern over the use of dedicated car share parking spaces for the exclusive use of the building's occupants which limits the market reach, public effectiveness and potential economic sustainability of the car share facility. City-wide standards and protocols on these matters will be presented to Council upon completion of the study.

5. Road-User Charges

Congested urban road space should be regarded as a scarce good. The easiest way of rationing the use of scarce roads is to do nothing and just let delays get long enough to deter people from moving about. The result, however, will produce inefficiently high levels of congestion and environmental degradation. These inefficiencies arise because, on congested roads, there are some motorists who value their trips at less than the cost of the delay their presence imposes on the others, and the more congested conditions are, the more this is so. Put another way, there are some drivers on congested roads who collectively would be willing to offer a "bribe" that others would accept to get off the road, leaving everyone better off.

Unfortunately, there is no market mechanism for such transactions among motorists and the best way to ration road use is to charge a fee for it. For practical purposes, this congestion fee should be set at a price just high enough to hold traffic down to levels that can move freely. Fees would be highest on the most congested roads at the most congested times, and could also vary by vehicle type. The technology is now available to make sophisticated road pricing schemes practical.

In this manner, road pricing will improve overall economic efficiency. Apart from the benefits of lower congestion levels for road users, there will be environmental benefits in terms of less energy consumption and emissions. In addition, pedestrians will find roads

easier and safer to cross, and there will be greater opportunities for streetscape improvements such as widened sidewalks, enlarged public squares and open spaces, pedestrianization schemes and tree planting.

However, road pricing raises a number of concerns such as fairness, availability of other travel modes, economic competitiveness and the costs of implementation and enforcement. In terms of fairness, road pricing is generally regressive because those who benefit most are the motorists that value their time the highest, a characteristic that is positively correlated with income. Equity concerns can be addressed through the distribution of the revenues generated by road pricing. For example, these revenues could be used to improve transit services (as in the case of London, England where 3000 additional buses were brought into service to provide a cheaper, alternative means of travel for those affected by the road pricing scheme) or reduce gas taxes and/or other vehicle fees.

A major concern, in the Toronto context, relates to economic competitiveness. Introducing road pricing in one relatively small part of the City, such as the Downtown, could deflect economic activity away from this area and undermine all the benefits of road-user charges. Such a road pricing scheme, either Downtown or across the City as a whole, would run counter to Council's strategy to enhance the City's business climate which includes the property tax initiative of a 0.3% annual shift of the tax burden from the business property class to the residential property class. Neither is it clear that the City contains the worst areas of traffic congestion when there are equally, if not more, congested roads and highways elsewhere throughout the Greater Toronto area. For these reasons it is recommended that road pricing be studied at the area-wide scale by the Greater Toronto Transportation Authority. The regional scale also makes more sense when looking at road pricing as a major policy tool to address the environmental impacts of traffic and the achievement of greenhouse gas reduction targets. In the longer term, regional-wide road pricing, in conjunction with other measures, would seem to be one of the most promising means of lowering greenhouse gas emission levels.

As the distinguished economist, J. Michael Thomson observed in a 1998 article, there is still one major drawback to road pricing as a practical means of addressing the problems of congestion, pollution, emissions and road safety:

> *"But there is still an educational gap to be bridged: the gap between economic truth and public comprehension. If it really is true that most, if not all, people in a city will benefit from a system of road pricing, it is for economists to explain this truth so that politicians, administrators and members of the public can understand it."*

This gap in understanding continues, for the most part, to persist.

6. Intelligent Transportation Systems (ITS)

Intelligent Transportation Systems (ITS) use technology (computers, communications and sensor technologies) to provide information to travelers that will assist and/or increase mobility for all users of the transportation network. The overall goal is to improve the safety and efficiency of different elements of the transportation system.

Typically, an ITS solution involves three major functions, namely "measurement", "analysis" and "response".

Measurement – A wide variety of sensors, from loops of wire embedded in roadways to video cameras to weather stations, is used to monitor road and traffic conditions and detect anomalies. This information is merged with other information and analyzed to provide a real time summary of the traffic conditions.

Analysis – The compiling of diverse information from measurements allows us to analyze it in real-time and to look for patterns. The analysis alerts us to action that can be taken to respond appropriately to predicted conditions or to respond to incidents, such as a collision.

Response – Based on the analysis, ITS allows us to make changes that affect transportation services, for example:

- Dispatching emergency services;
- Modifying transit schedules and re-routing transit vehicles;
- Posting a message on overhead changeable message signs to provide information about downstream roadway conditions;
- Changing traffic signal timing to minimize delays for all users;
- Providing information to the media; and
- Dispatching plowing and salting to a roadway to ensure safe operations.

Over the last decade, ITS technology applications have, for the most part, focused on motorized modes of transportation. Recently, the potential for pedestrian and bicycle travel to provide mobility, reduce congestion, improve environmental quality, and promote public health has been receiving increasing attention from researchers, planners, and policymakers. The benefits resulting from the implementation and operation of ITS include:

1. A reduction in the probability of collisions, especially secondary collisions;
2. A reduction in the duration of disruption, thereby reducing travel times and congestion;
3. Enhancements to the safety of pedestrians, cyclists, drivers and passengers;
4. Better deployment of winter maintenance staff, material and equipment;
5. Improvements in response to unsafe roadway winter conditions;
6. Improvements in safety for road workers as well as travelers;
7. A reduction in congestion and an improvement in traffic conditions throughout;
8. An improvement in air quality;

9. A reduction in the impact of road disruptions on travelers;
10 A reduction in user frustration; and
11. An increase in mobility to foster a healthy economy and standard of living.

The application of ITS technology should be a priority given the extent of the benefits outlined above, the increasing transportation needs, and the limited opportunity to expand the infrastructure to accommodate these needs.