

The Car Is No Longer King!

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ABSTRACT

In July 2007, Toronto City Council adopted an 80% reduction target for greenhouse gas (GHG) emissions from 1990 levels by 2050, and a 20% reduction target for locally-generated smog-causing pollutants from 2004 levels by 2012. In establishing these targets, City Council recognized that approximately one-third of the locally-generated GHG emissions and a significant portion of smog-causing pollutants come from the operation of motor vehicles. Consequently, the City is developing a Sustainable Transportation Implementation Strategy that will look to long-term structural changes, such as the implementation of the “Transit City” plan, which will create significant and lasting changes in aggregate travel behaviour. In the meantime, City Council has approved a series of short-term Sustainable Transportation Initiatives.

This report provides a description of the short-term initiatives being considered, the issues and implications associated with these initiatives, and where implemented, their effectiveness and impacts. It is recognized that these short-term sustainable transportation initiatives are modest in scope and, by themselves, do not go very far in achieving the City’s reduction targets for GHG emissions and smog-causing pollutants. However, collectively, they signal a new way of looking at, implementing, and operating the City’s transportation system. The objective is to speed up progress along the path of sustainability, and to build public understanding and support for greening Toronto’s transportation system.

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80% !!!

What does this figure mean to you? Of course it could refer to a multitude of things but at the City of Toronto, and specifically to Transportation staff it represents a target – a very ambitious, perhaps overly optimistic, and (some skeptics claim) an unattainable target.

So, what is this target? In July 2007, Toronto City Council adopted the report titled “Climate Change, Clean Air and Sustainable Energy Action Plan: Moving from Framework to Action.” In doing so, City Council adopted an **80%** reduction target for greenhouse gas (GHG) emissions from 1990 levels by 2050. Council also adopted a 20% reduction target for locally-generated smog-causing pollutants from 2004 levels by 2012.

In establishing these targets, City Council recognized that approximately one-third of the locally-generated GHG emissions and a significant portion of smog-causing pollutants come from the operation of motor vehicles. Estimates for 1990 indicate that the passenger transportation sector in the City of Toronto emitted some 6.4 million tonnes of greenhouse gases. By 2004, this figure is estimated to have increased to 8.6 million tonnes. The 2050 reduction target implies a reduction in GHG emissions to approximately 1.3 million tonnes from the passenger sector which is clearly a major challenge. This challenge is made more difficult by the fact that the City’s Official Plan has targets of 3 million residents and 1.83 million jobs by 2031, which represents 20% and 40% increases over 2006 population and employment levels, respectively.

Therefore, in order to achieve these reduction targets, or attempt to get as close to these targets as possible, the attitude towards the use of cars and the priority we, as transportation professionals in the City of Toronto, have traditionally given to the movement of cars, have to change. This requires a change in culture and mindset and, hence, the title of this paper. While it may be a little premature to make the decree that “the car is no longer king”, this is the attitude we must have if we accept the seriousness of climate change and the urgency with which we must act. There is a tremendous cost of doing nothing and, therefore, we need to accelerate action.

Consequently, the Transportation Services and Transportation Planning Divisions of the City are developing a Sustainable Transportation Implementation Strategy that will look to long-term structural changes, such as the implementation of the Transit City plan (a network of proposed Light Rail Transit lines traversing the City), which will create significant and lasting changes in aggregate travel behaviour. In the meantime, staff submitted, and had approved by City Council, a series of short-term Sustainable Transportation Initiatives. The purpose of this paper is to provide a description of the short-term initiatives being considered, the issues and implications associated with these initiatives, and where implemented, their effectiveness and impacts.

Figure 1 presents an array of sustainable transportation initiatives organized by seven functional categories and further distinguished by the length of time required to implement each initiative. Of the more than twenty initiatives, some are more proven than others, though none represent entirely new ideas. The proposal is to speed up

and expand the application of those initiatives that are already underway in some parts of the City and accelerate the introduction of other, new sustainable transportation initiatives that have, to this point, only been talked about. In selecting initiatives from Figure 1, the focus is on those that are likely to find general public acceptance and which can be put into operation fairly quickly at relatively little cost. The Figure also identifies those initiatives which might require support, coordination or funding from "Metrolinx". Metrolinx was established recently by the Government of Ontario to improve coordination and integration of all modes of transportation in the Greater Toronto and Hamilton Area. To that end, Metrolinx is creating a Regional Transportation Plan (RTP) which will form the basis for a comprehensive, integrated transportation system for the entire region.

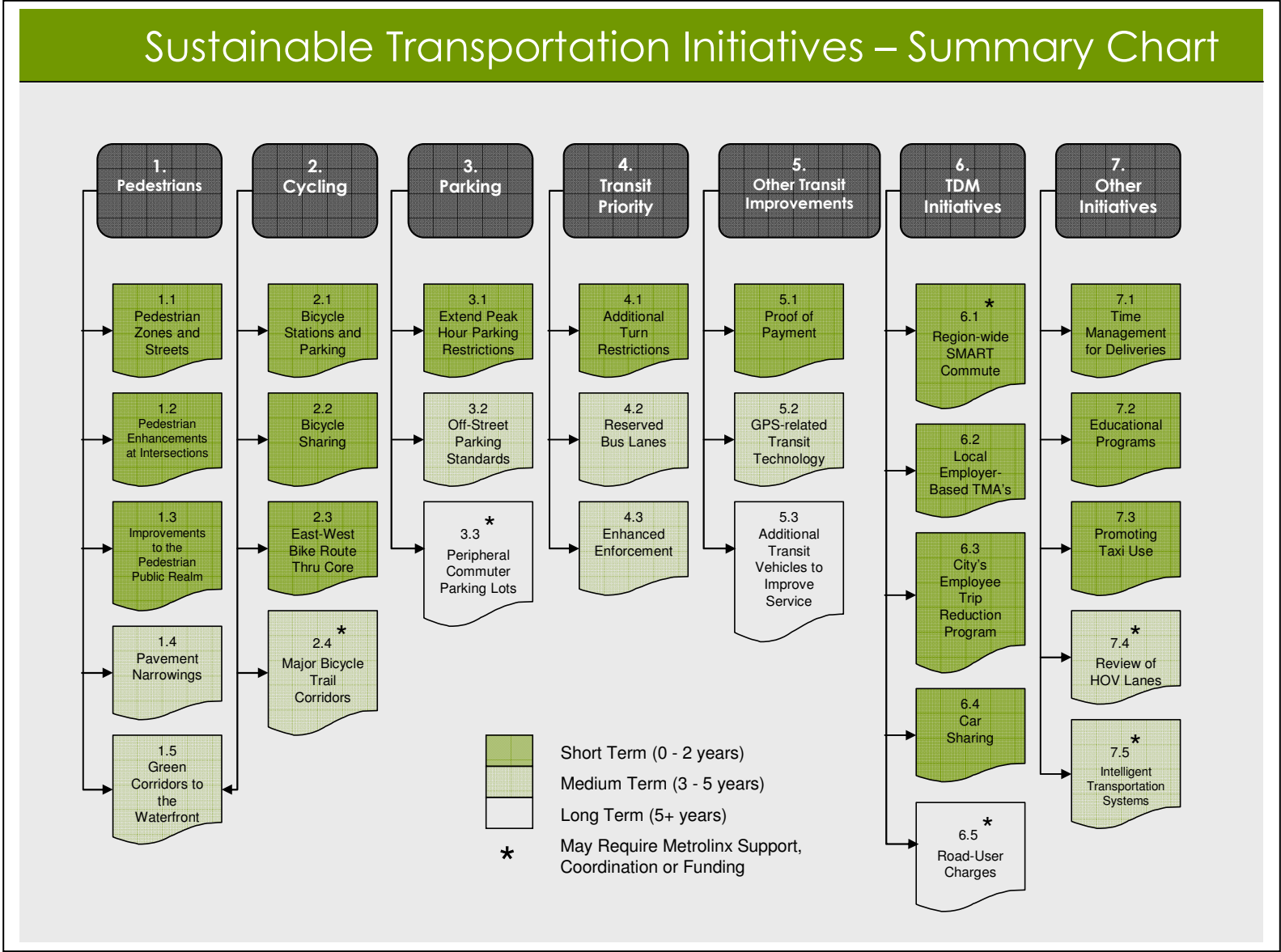
1. PEDESTRIANS

1.1 Pedestrian Zones and Streets

Toronto has enjoyed success with the establishment of pedestrian zones and streets which can be done on a permanent basis or, as in the case of "Pedestrian Sundays" in the Kensington Market area, on a temporary/periodic basis. The success of the Kensington Market event over the past four years has encouraged other areas in the City, including Baldwin Village and Mirvish Village to host their first Pedestrian Sundays in 2007. The City's support for the Kensington Market Pedestrian Sundays has varied from year to year. In order to encourage other communities to organize and host Pedestrian Sundays, staff are developing new criteria for these events, and identifying the appropriate resources to assist in the implementation and promotion of events satisfying these criteria. City support for Pedestrian Sundays could include development of specialized signage and barricades for regularly scheduled locations, coordinated promotion for all events, and assistance in satisfying the permit approval requirements.

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, staff have not recommended any specific permanent pedestrian streets and zones be implemented at this time. Instead, staff are assessing opportunities to establish a permanent pedestrian street and developing 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. To this end, staff are working with Ryerson University to look at the feasibility and issues related to the possible closing of Gould Street, east of Yonge Street, and incorporating these highway lands into part of the University's campus.

Figure 1
Sustainable Transportation Initiatives



1.2 Pedestrian Enhancements at Intersections

Over the last two years, Transportation Services has introduced changes at signalized intersections to give greater emphasis to pedestrian comfort and safety. These improvements include phasing in pedestrian countdown signals over the next three to five years, the installation of zebra crosswalk markings as the new standard for all resurfacing and reconstruction projects, and a pilot program for “leading pedestrian intervals”, which gives pedestrians a several second advance to start crossing before drivers are provided a green signal. Over the next year, Transportation Services proposes to evaluate and implement four types of pedestrian enhancements at signalized intersections which place even greater emphasis on pedestrians, which are outlined briefly below:

- (a) Increasing the Pedestrian Crossing Clearance Time – staff recommended that the current practice used to determine minimum pedestrian crossing clearance times at signalized intersections be modified to increase these minimum times, such that all pedestrians are provided sufficient time to cross the intersection safely and comfortably. While the impacts of this measure might appear minimal, caution must be exercised in the implementation to ensure that there are no significant adverse impacts on transit signal priority. It is expected that 40 to 50 signalized intersections will be modified in this manner each year for the next 5 years.
- (b) Replace “FLASHING DON’T WALK” with “FLASHING WALK” – Currently at signalized intersections, the “WALK” display is followed by a flashing “DON’T WALK” display. This flashing “DON’T WALK” display is considered the “clearance” interval and allows the pedestrian to safely complete their crossing. However, pedestrians are sometimes confused about the meaning of the flashing “DON’T WALK” display and do not realize that they have sufficient time to complete their crossing. The proposed conversion of the flashing “DON’T WALK” with a flashing “WALK” display should give a more positive message to the pedestrians that they can complete their crossing safely. It could also send a message to drivers that pedestrians are permitted within the intersection during this interval and, accordingly, that drivers should exhibit caution and provide the right-of-way to pedestrians. The City will be requesting the Ontario Ministry of Transportation to undertake a pilot project for this modification before deciding whether to implement this change in the City.
- (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 specific locations pedestrians may also be able to cross the intersection diagonally, essentially completing two crossings in one movement.

Staff have been requested to determine the suitability and assess the feasibility of introducing a pedestrian scramble phase at the following four downtown intersections, which all experience very high pedestrian volumes:

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

Staff are assessing, as a priority, the feasibility and implications of the installation at the Yonge/Dundas location. As part of this assessment, staff will be assessing the impact of a pedestrian scramble phase on the TTC's Dundas streetcar operations as well as on the pedestrians themselves because there are potentially 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.

Interestingly, this initiative has probably received the most attention in the media of all the short-term sustainable transportation initiatives. It seems to have symbolized the priority given to pedestrians over the movement of vehicles in the City.

- (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 has been 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 in conflict with high pedestrian crossing volumes. City staff are developing a list of approximately 20 intersections, focusing on T-intersections and offset intersections, where LPI can be implemented in 2008.

1.3 Improvements to the Pedestrian Public Realm

The City's streets and sidewalks are key components of the public realm. A thoughtfully designed public realm with well-placed amenities will result in a beautiful, functional and safe environment for pedestrians. To this end, City Council in dealing with a report on

the “Coordinated Street Furniture Program” approved the establishment of a Public Realm organizational unit that will have strategic responsibility and accountability for planning, design oversight, implementing and managing sidewalk spaces to achieve a beautiful, functional and safe pedestrian realm.

Discussions are underway in the development of this Public Realm organizational unit. In the meantime, staff are investigating ways, identifying problem locations, and implementing changes to improve the public realm on an ongoing and immediate basis. Urban Design staff in the City Planning Division are also in the process of finalizing the “Streetscape Manual”, the elements of which will be incorporated in the design and construction of all City streets. There is a growing awareness of the need to improve the public realm for pedestrians and a greater priority and sense of urgency in implementing these improvements.

1.4 Pavement Narrowings

There may be opportunities throughout the City to widen sidewalks and enhance boulevard landscaping by narrowing the width of the pavements along these streets. There are other advantages to narrowing the width of pavements including a decrease in pedestrian crossing distances at intersections, a decrease in stormwater runoff areas, and discouraging excessive vehicle speeds. The narrowing of the St. George Street pavement, through the University of Toronto’s downtown campus, illustrates the benefits of such proposals.

The implications of narrowing pavements, on the other hand, could have significant implications on cyclists, traffic capacity, parking, loading activity, transit service, emergency vehicles, etc. The extent of these impacts could trigger the need for an Environmental Assessment. Furthermore, these pavement narrowings are costly to implement, particularly if undertaken as standalone projects. Therefore, opportunities for the narrowing of pavements are being considered and assessed in conjunction with the design of all road reconstruction projects and that any feasible narrowings, whether it be through the entire length of the reconstruction or only along short sections, be incorporated accordingly. Of course, appropriate public consultation is required prior to the approval and implementation of any pavement narrowings.

1.5 Green Corridors to the Waterfront

With the renewed focus on revitalizing Toronto’s waterfront there needs to be a more comprehensive approach to developing and implementing green corridors to provide better walking and cycling access to the waterfront. Over the past few years the City has initiated a number of waterfront access improvements, which are at various stages of approval and implementation, including:

- Fort York Boulevard – Wide sidewalks/streetscape and bicycle lanes were incorporated in the design of this new road, which will serve thousands of new residents in the Railway Lands and the Bathurst Strachan neighbourhood.

- Strachan Avenue/Princes' Gate – Bicycle lanes have been implemented on Strachan Avenue and a pedestrian plaza designed and constructed at Princes' Gate. A study is currently underway to examine the feasibility of improved pedestrian and cycling connections along Strachan Avenue further north to King Street West.
- Yonge Street Promenade Plan – Wider sidewalks/streetscaping and bicycle lanes will be implemented.
- Simcoe Street – A new tunnel is currently under construction beneath the railway corridor, which will include bicycle lanes, and provide another connection between the downtown area and the waterfront.
- York Street Promenade Plan – Improved sidewalks, pedestrian crossings and streetscape enhancements will be implemented between the rail corridor and Queens Quay West.

These streetscape improvements are generally tied to funding secured through the development approval process and opportunities to “piggyback” on Capital Works Projects. While staff are continuing to secure appropriate funding through developer contributions, there is a need for an ongoing sustainable source of funding to implement green corridors to the waterfront, not just in the central area but across the entire City. Consequently, Planning staff are developing a comprehensive “green corridor plan” that identifies priority north-south green corridors across the waterfront and which links these opportunities with capital works and development-related projects. In addition to the green corridors to the Waterfront, staff have also identified opportunities for connections to parks, ravines and green spaces. The comprehensive plan should lead to the development of detailed designs and the programming of construction work.

2. CYCLING

2.1 Bicycle Stations and Parking

Concern about bicycle theft is a significant deterrent to bicycle commuting in Toronto. This issue has been addressed in European and Asian cities, and more recently in North America, by the provision of secure, full-service indoor bicycle parking facilities, also known as bikestations. The first U.S. bikestation was opened in Los Angeles in 1996 and several have come into operation since then in San Francisco, Portland, Seattle and Chicago. Bikestations provide a full range of services for cyclists including monitored bike parking, bike locker rentals, bicycle rentals and repair shops, shower and change facilities, and transit and cycling information.

In Toronto, a significant demand for secure bicycle parking facilities has been demonstrated through an ongoing and positive public response to the City's Bicycle Locker Project. The biggest challenge, however, is to secure sufficient property to establish a bikestation. In the last year, two locations have emerged as candidates for a

City-operated bikestation. The redevelopment of Union Station provides an opportunity for a bikestation, linking a major bike parking facility with the City's primary transportation hub. A 180-space bikestation, including change room facilities, is currently being designed and construction is scheduled to commence shortly. The opening of the bikestation is planned for September 2008. The second opportunity comes as part of the revitalization of Nathan Phillips Square. The winning proposal in the design competition includes a bikestation at the south east corner of the square. A new two-storey glass structure in the south façade of the square will house a tourist information and bike rental counter, encouraging visitors to see the sights by bicycle. A new elevator will provide comfortable access to the lower level parking enclosure for 110 bicycles, a bike repair and rental shop and shower and change rooms.

2.2 Bicycle Sharing

Public bicycle programs or bike-sharing provide free bicycles or charge a minimal user fee for the use of bicycles owned by an organization. Stations or hubs house bicycles that are accessed through a variety of methods (e.g., keys, smartcard technology, credit card, security access cards, etc.). These bicycles can be used for daily commutes, one way use (dropped off at a different hub), shopping, business, school, or to combine cycling with transit. Three possible models for a bike share program include: City Staff Bike Share, Commuter Public Bicycles and Community Public Bicycles. A City staff program could have a fleet of 100 bicycles serving every Civic Centre for City staff to use on business trips. Bicycle rooms or cages could be set up and accessed via employee security cards. A commuter program could make bikes available for commuters at major transit stations or hubs. The Community model could place a fleet of bicycles at local stores and organizations in a particular neighbourhood (e.g., 2 km radius of Kensington Market).

City staff are assessing the implementation of a bike share program for City staff at all Civic Centres in the short-term. Although a bike share program for City staff might appear relatively simple to implement, it will be necessary to solicit input from staff of Human Resources, City Legal, Facilities and Real Estate, Fleet Services and Risk Management to determine its feasibility.

Staff will also be developing a business case for future initiatives such as commuter and community public bicycle programs.

2.3 East-West Bicycle Route Through Core

The downtown area has the highest concentration of commuter destinations and is well served by transit. However, reaching downtown workplaces by bicycle can be very challenging for many cyclists due to the limited space for cyclists on congested downtown streets. Establishing bicycle lanes to provide a higher level of service for bicycle commuters to/from the downtown area would likely require a reduction in the motor vehicle capacity along these routes.

The Bike Plan approved by City Council recommends the establishment of an east-west bikeway through the downtown core and that a study be undertaken to determine the preferred location and alignment. Route options include the Richmond-Adelaide and the Wellington-Front corridors. To date, the evaluation of these corridors has not been undertaken due to uncertainty surrounding the future of the F.G. Gardiner Expressway and the effect that potential changes to the expressway could have on the surface road system. Notwithstanding, it is appropriate that the establishment of this east-west bikeway through the core be made a priority. As a result, a consultant will be retained to undertake an Environmental Assessment study in 2008 for the establishment of an east-west bicycle route through the downtown area, with the objective of implementing the bikeway in 2009.

In the last couple of years there has been tremendous interest from the cycling community in establishing an east-west bikeway on Bloor Street and Danforth Avenue. This corridor has some of the highest cycling volumes in the city and is the only east-west street crossing the entire Toronto and East York District that does not have a major surface transit route. Bicycle lanes were installed on Bloor Street East in the early 1990's, connecting from Sherbourne Street across the Prince Edward Viaduct to Broadview Avenue. Extending these bicycle lanes across the city was not proposed in the Toronto Bike Plan because continuous bicycle lanes along this corridor could only be accommodated by removing a significant amount of on-street parking.

Establishing an east-west bikeway along the Bloor-Danforth corridor would be a very important addition to the Bikeway Network. The corridor has several different roadway cross-sections, each of which may support a different design option to improve cycling conditions. Transportation Services staff have begun an investigation of the design options, including "full-time" bicycle lanes, rush hour bike lanes, shared lane markings and wide curb lanes, that could potentially contribute to establishing a continuous bikeway along the corridor. The traffic and parking impacts will be evaluated for each of the design options with a view to determining the most effective design option for each section to achieve a significant improvement for cyclists while balancing the needs of the businesses and communities along the route.

2.4 Major Bicycle Trail Corridors

The Transportation Services Division is committed to implementing the various elements of the approved Bike Plan by 2012. In addition to the provision of an extensive network of on-street bicycle lanes, the Bike Plan includes a comprehensive system of off-street bicycle trails.

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, including parts of the Lower Don Trail and the Finch and Gattineau hydro corridors. 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 will provide connections across the “top’ of the City to the Humber River, Black Creek and Don River trails. 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 development of bike trails in other hydro corridors (e.g., the Gatineau and Richview corridors) 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.

3. PARKING

3.1 Extend Peak Hour Parking Restrictions

Peak period stopping and parking restrictions in the City are relatively short in duration, typically 7:00 to 9:00 a.m. and 4:00 to 6:00 p.m. During the periods immediately before and after these periods, the curb lanes become blocked with cars and trucks legally stopping/parking at these locations. As a result, the capacity of the roadway is dramatically reduced and the TTC’s surface transit service is significantly degraded. These vehicles in the curb lane also make it more difficult for cyclists. Traffic counts and TTC ridership figures show that volumes are still very high during these “shoulder” periods. This fact has been recognized in the downtown area where the peak stopping and parking restrictions were generally amended to the hours of 7:30 to 9:30 a.m. and 3:30 to 6:30 p.m.

Staff are currently assessing opportunities to extend the peak period stopping and parking restrictions throughout the City. It is recognized that merchants along these routes could be affected by these changes to the regulations and, therefore, be resistant to this proposal. Even though the benefits from road congestion, transit service and cyclist safety perspectives, with the resultant environmental benefits, would warrant such consideration, staff are attempting to avoid such business areas and focusing attention on the downtown core, transit routes and roads with bike lanes.

3.2 Off-Street Parking Standards

The City’s Official Plan identifies that, in targeted growth areas, planning for new development will be undertaken in the context of reducing auto dependency and the transportation demands and impacts of such new development assessed in terms of the broader social and environmental objectives of the Plan’s reurbanization strategy. It is within this context, as well as in recognition of the disparate parking standards in the Zoning By-laws of the former municipalities, that the City Planning Division recently

commissioned two studies as part of the Zoning By-law Project to develop new parking standards for selected land uses. One study looked at parking standards for office, restaurant and retail uses and the other study addressed the parking needs of condominium and rental apartments as well as townhouses with common parking areas. The studies drew upon the results of parking utilization surveys of some 800 commercial parking lots and the survey returns from approximately 5,000 households living in apartments across the City. Both studies take into account the policy directions of the Official Plan and have regard for existing parking standards in Toronto and other comparable cities.

The proposed parking standards vary among different parts of the City as defined by the Official Plan's urban structure map. There are separate parking standards for each of the mixed use, transit-oriented, targeted growth areas (Downtown and Central Waterfront, Centres, and Avenues) and the rest of the City. A common aim of the consultant studies was to identify parking standards that require the minimum responsible amount of parking for a given land use. Maximum standards are also proposed in the targeted growth areas to guard against an oversupply of parking in these areas that are well served by transit. Overall, the proposed standards result in a reduction of some minimum parking requirements, with the greatest changes applying to commercial uses located in the targeted growth areas.

The proposed new parking standards support the objectives of the Climate Change Plan and their application should be considered in re-zoning situations where a reduction in parking requirements is being sought. However, even when adopted in their final form, it is recognized that the new standards will only apply to new developments and, therefore, the benefits will be achieved on a long-term gradual and incremental basis. Furthermore, additional study of parking standards is required for various types of targeted housing, live/work units, large retail complexes and places of worship. There is also the need to develop a parking strategy for the Avenues.

3.3 Peripheral Commuter Parking Lots

In order to reduce the number and length of single-occupant vehicle trips in the GTA, it is desirable to increase the number of commuter parking lots in locations beyond and within the City's boundaries on land that is not developable. A limited number of commuter parking lots for carpooling have been established at interchanges along the 400-series of Provincial Highways, which has been effective in reducing the number of single-occupant vehicles on these highways. Additionally, parking lots have been established to encourage motorists to transfer from cars to transit vehicles for part of their trips. It is now time to expand the commuter parking lot concept beyond the current strategies of locating parking lots at subway stations within the City and at GO stations in the GTA to a comprehensive network (including major bus routes) of commuter park-and-ride facilities throughout the GTA.

To achieve this objective, the City must work with the municipalities in the Greater Golden Horseshoe, GO Transit and other motor coach carriers to encourage mixed

mode auto/transit trips and hence reduce car dependency and travel by single-occupant vehicles. This strategy should take advantage of the opportunities provided by parcels of land in the GTA that are difficult to develop for other purposes, such as utility corridors, where comprehensive park-and-ride commuter lots could be established adjacent to high-level transit services and close to the existing developed and future planned communities in the Greater Golden Horseshoe. This commuter parking strategy is consistent with the goals of Metrolinx and could be implemented incrementally as opportunities arise.

4. TRANSIT PRIORITY

4.1 Additional Turn Restrictions

There are a variety of problems contributing to slow and unreliable service on the TTC's streetcar routes throughout the City. A number of measures have been implemented, to varying degrees of effectiveness, to improve the quality of the streetcar service. Left turn prohibitions have been imposed at most intersections in the central area along streetcar routes. Consideration should be given to introduce, wherever possible, additional left turn prohibitions in order to reduce the delay to streetcars throughout the City due to motorists sitting on the streetcar tracks waiting to make a left turn. While it is recognized that these additional left turn prohibitions could impose an inconvenience to motorists, this measure is necessary in order to improve the quality of streetcar service to the greatest extent possible.

In addition to the inconvenience to motorists, the introduction of turn prohibitions would lead to circuitous routing, with the resultant environmental implications, and potential traffic infiltration in abutting neighbourhoods. Therefore, as an alternative to left turn prohibitions, consideration should be given to the introduction of advanced exclusive left turn phases at signalized intersections in order to reduce the delays to streetcars.

The effectiveness of turn prohibitions is limited because of high violation rates, which is addressed further in Section 4.3 – Enhanced Enforcement.

4.2 Reserved Bus Lanes

Ideally, it would be desirable to have a whole network of reserved bus lanes to complement the existing and proposed network of streetcar exclusive rights-of-way. However, when reserved bus lanes are not feasible along the entire length of a route, queue jump lanes for buses at congested locations are a cost-effective localized improvement to reduce transit delays at these specific locations.

In this regard, the TTC has identified locations where their services could be significantly improved through the creation of a long, shared queue jump/right turn lane to allow buses to by-pass queues of through traffic. These queue jump lanes would be implemented in conjunction with the construction of a bus bay on the far side of the intersection, which allows buses to travel through the intersection before stopping to

pick-up/discharge passengers. The physical improvements separate buses from the congested through traffic lanes on the approach to major intersections; signal priority can also be much more effectively utilized in such conditions, since it is much easier to predict when a bus will arrive at an intersection and require a green signal when the variability of traffic congestion – and the variability of the passenger service time at near side bus stops – are removed from the equation. Of course, any proposals to implement TTC queue jump lanes and far side bus bays would have to be assessed against the impacts of these facilities on sidewalks and landscaping at these locations.

In addition to reserved bus lanes or queue jump lanes for TTC buses, there is an opportunity to implement shoulder bus lanes on some sections of the Don Valley Parkway for GO Transit buses. The feasibility assessment of these shoulder bus lanes, for the section between York Mills Road and Lawrence Avenue East, has been completed and detailed design of this facility is underway. It may, however, be necessary to amend the Highway Traffic Act to permit the use of the shoulders of the Don Valley Parkway for this purpose.

4.3 Enhanced Enforcement

The effectiveness of the two initiatives identified in Sections 4.1 and 4.2, above, is a function of the level of enforcement required to minimize violations by motorists. The personnel currently available in the Toronto Police Service and TTC's By-law Enforcement (for stopping and parking violations only) cannot provide the necessary level of enforcement. Consequently, City and TTC staff will be working with the Province to investigate the feasibility of a pilot project that would see the introduction of automated enforcement camera technology to enforce turning, stopping and parking prohibitions that are designed to improve transit service. The cameras could be installed on the transit vehicles or roadside.

In the meantime, TTC has recommended the creation of "Transit Priority Zones", with commensurate increases in fines, and will request Toronto Police Services for increased police staffing and enforcement in these Transit Priority Zones.

5. OTHER TRANSIT IMPROVEMENTS

5.1 Proof-of-Payment (POP) Fare Collection

Passenger Service Time (the time that transit vehicles spend stopped to allow passengers to board and alight) is significant, accounting for approximately 15 to 20 percent of the overall travel time on a typical streetcar route.

Proof-of-Payment fare collection (POP), which has been in place only on the 501 QUEEN streetcar line since 1990, reduces the amount of time required to serve customers at stops, because it allows customers who already have a proof-of-payment (e.g., paper transfer or Metropass) to use all doors for boarding. The issue of passenger boarding and alighting times becomes increasingly important on routes with larger-capacity

vehicles, such as the ALRV streetcars. These vehicles have three sets of doors that, with POP in place, allow for much faster customer boarding and alighting.

The TTC is exploring other applications for POP on its streetcar system. It should be noted, however, that congested traffic conditions on streetcar routes with standard-length streetcars means that the reductions in passenger service time which could be achieved from POP would not likely translate into comparable reductions in travel time. This being the case, the benefits achieved by implementing POP on most streetcar routes under the current conditions of mixed-traffic operations, would not be great enough to warrant the expense of the required additional fare enforcement officers. Instead, more consistent use of rear-door loaders (TTC staff who can check for passes and transfers) will allow reduction of passenger service times at the busiest stops on the route.

The new LRT vehicles that will be purchased by the TTC will be designed to require some form of Proof-of-Payment system.

5.2 GPS-related Transit Technology

The TTC is exploring applications of GPS-related technology as they relate to transit information systems. There are plans currently underway to evaluate such initiatives as a next-bus arrival system in shelters, internet trip planning for customers, service interruption announcements, and “e-commerce” applications (i.e., purchasing TTC fare-media over the internet).

The transit shelters included in the proposal for the Coordinated Street Furniture Program accepted by City Council have been designed to incorporate GPS-related information technology in the future.

GPS-related technology could also be applied to transit signal priority at traffic control signals. Currently at signalized intersections, where this system is in place, all transit vehicles are provided priority. This applies whether the vehicle is on schedule, ahead of schedule or behind schedule. Even if transit vehicles are bunched up, every vehicle is provided signal priority. As a result, this could result in lengthy delays to cross traffic (vehicles, cyclists and pedestrians). GPS-technology exists to provide conditional signal priority to transit vehicles. Under this system, priority would be provided to only those transit vehicles that are behind schedule or when signal priority is required to maintain headways between successive vehicles. Staff are exploring opportunities to improve the current system of traffic signal priority so that it would be provided for transit vehicles on a conditional basis.

5.3 Additional Transit Vehicles to Improve Service

When service was reduced on a system-wide basis during the 1990s, to respond to budget cuts, vehicles were removed from most routes in the system at most times of the day. This resulted in passengers having longer waiting times for vehicles, increased crowding on vehicles, and less-reliable service as the remaining services struggled to

carry the increased passengers. In total, 232 buses and 60 streetcars were removed from morning peak service during this period and overall, service levels fell by 11.5% between 1990 and 1997 while the population in Toronto grew by approximately 10%. This period also saw a ridership drop of close to 100 million annual riders.

The TTC's 2003 Ridership Growth Strategy (RGS) concluded that a simple and direct way to improve service and attract more riders to the TTC would be to reverse what was done in the 1990s: invest in improved service on existing routes by adding vehicles to service. It was found that this would benefit large numbers of existing passengers and attract new passengers to the system due to the overall improvement in quality of service. Failure to implement the Ridership Growth Strategy will result in lost opportunities to increase transit ridership in Toronto, and to promote sustainable transportation.

As part of the RGS, TTC service was increased at off-peak times on busy routes between 2004 and 2005. In addition, 100 buses were recently purchased by the TTC to reduce peak period crowding by approximately 10 per cent. These buses will be put into service in the Fall 2008.

6. TRANSPORTATION DEMAND MANAGEMENT (TDM) INITIATIVES

6.1 Region-wide Smart Commute

The City is a contributing member and lead partner in the region-wide Smart Commute Association (SCA) which was established in 2004 with the help of federal funding. The basic aim of the SCA is to promote transportation demand management (TDM) initiatives aimed at reducing the number of trips made in single-occupant vehicles. To further this goal, the SCA coordinates the functions of a network of local Transportation Management Associations (TMAs) and provides a number of centralized TDM services, most notably the rideshare program known as Carpool Zone. There are currently 6,000 region-wide subscribers in the rideshare database and other municipalities outside the GTA are also interested in joining the Carpool Zone program. The SCA is responsible for marketing and promoting TDM measures across the region. To date, it is estimated that the various Smart Commute initiatives have achieved a reduction of approximately 15,000 tonnes of greenhouse gas emissions. Metrolinx has recently become a funding partner in support of the SCA's activities.

6.2 Local Transportation Management Associations (TMAs)

Currently there are eight local, employer-based TMAs in the region, including two within the City, namely Smart Commute North Toronto, Vaughan (SCNTV) and Smart Commute Northeast. The two TMAs in the City cover most of the large employment areas north of Highway 401. Major employers who are members of SCNTV include York University, Knoll, Seneca College, Parc Downsview Park, MTRCA, Environment Canada and Sanofi Pasteur. Smart Commute Northeast is focused on employers in the Consumers Road area (Victoria Park Avenue and Sheppard Avenue East) and prominent members include Enbridge Gas, ING Direct, CH2M HILL and Dillon

Consulting. Smart Commute Northeast is currently looking at introducing a shuttle bus service to the Don Mills subway station and establishing a car share hub at an employer location on Consumers Road. SCNTV is in discussions with Zipcar regarding car sharing at the York University campus and is also investigating a bike share program.

Discussions are also underway for the establishment of a “Downtown SMART Commute” association.

6.3 City’s Employee Trip Reduction Program (ETR)

The City launched a pilot ETR project for employees at the North York Civic Centre in June 2005. Based on the results of the pilot project, Council authorized the expansion of the ETR project to other civic centres and work sites where feasible. The project is now known as Toronto Smart Commute and a baseline travel survey of 5,000 randomly selected City employees has just been completed and the 1,500 returns are being analyzed. There is a staff project advisory committee and a number of TDM-supportive proposals are being looked at, including adopting a more flexible approach to alternative work arrangements and reviewing current practices regarding the reimbursement of employee transportation costs. Project staff will roll out an educational program and will be promoting the use of the SCA’s Carpool Zone service to encourage ridesharing. Toronto Smart Commute is setting the stage for the City to be seen as a leader in TDM measures and at the vanguard of reducing auto dependency.

6.4 Car Sharing

Car sharing is becoming increasingly popular as an alternative to owning a car in Toronto. There are currently two well-established companies that operate car sharing enterprises in the City with a combined membership of 11,000 subscribers and a total of 350 car share vehicles. The City recognizes the beneficial impacts of car sharing and has shown its support by creating a new “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. A study is currently underway to determine the appropriate reduction in parking standards to be applied, as an incentive, for new developments to incorporate car share parking facilities into their design. The Climate Change Action Plan recommends studying proposals such as reserved on-street parking spaces for car share vehicles, improved signage for off-street parking and the use of car share vehicles by City staff.

6.5 Road-User Charges

A variety of strategies for imposing road-user charges can be found in a number of cities around the world. Such schemes include tolls for the use of a particular road, tolls for accessing a certain area of a city, area-wide road pricing over a network of selected streets and hybrid schemes such as high-occupancy toll lanes. Of most interest to planners are area-wide road pricing schemes that are designed to lower congestion on

the road system and where fees can be varied by time of day, location and vehicle type to achieve a more efficient use of available road capacity. Until quite recently, this type of road pricing was a largely theoretical notion but technological advances, such as Global Navigation Satellite Systems (GNSS), have made sophisticated road pricing schemes a far more practical proposition. Apart from reducing congestion, road pricing can lead to additional benefits by lowering energy consumption, reducing pollution and improving safety. The revenues generated can be used to lower taxes and/or improve public services. However, road-user charges raise some major concerns including those related to: fairness; the availability of alternative, cheaper travel modes; impacts on the economic competitiveness of the area affected; and the costs of implementation and enforcement.

Staff had recommended that the pros and cons of road pricing be studied and evaluated, including extensive public consultation, at the regional scale under the auspices of Metrolinx. There first has to be a better public understanding of road pricing before implementation proposals can be brought forward. Consequently, road-user charges are not seen as a short-term option for the City.

7. OTHER INITIATIVES

7.1 Time Management for Deliveries

In many busy commercial areas of the City traffic congestion, along with increased levels of pollution, is made worse by delivery, service or courier vehicles stopped in the curb lanes. Although these vehicles are typically light trucks, vans or cars, they still take up a lane of traffic. A number of measures have been tried, with limited success, to alleviate this problem including: consolidating delivery points within a building; reserving space in off-street loading bays for use by smaller delivery/courier vehicles, and better enforcement to prevent illegal parking in laneways and loading areas.

One area where there appears to be untapped potential is the shifting of delivery and service activities to off-peak periods in the evenings and overnight. Courier services seem less divertible to off-peak hours as their pick-up/delivery times are more tied to the normal working day and promptness is at a premium. However, couriers typically deal with smaller, lighter loads and it may be possible to encourage a greater proportion of their activities to be conducted by bicycle or, in the downtown area, on foot. The City should re-examine the question of imposing time restrictions on delivery and service vehicles in congested commercial areas as part of the broader issue of how best to accommodate the vehicle servicing needs of commercial buildings.

The City is currently undertaking a consultant study of off-street loading standards for selected commercial uses as part of the New Zoning By-law project. The study will include consultations with representatives of the cartage industry and building managers. This consultation process can be built upon and expanded to establish a permanent City staff committee to liaise with representatives of the cartage and courier industries, building owners, managers and tenants on the full range of commercial

vehicle servicing issues, including the access and parking needs of pick-up, delivery and maintenance vehicles. City staff is also in the process of developing new guidelines for traffic impact studies of major developments and these guidelines would require an assessment of both the off-street and on-street loading / pick-up / delivery / servicing impacts.

7.2 Educational Programs

The implementation of many of the sustainable transportation initiatives described herein could be accompanied by a posting on the City's internet site, a press release or some other type of communication to educate the public of the details, location, purpose, merits, timing of implementation, etc. of these initiatives. In addition, there are other transportation-related educational programs that should be considered in order to help achieve the reduction targets contained in the "Climate Change Plan" adopted by City Council, including the following:

(a) Zerofootprint Toronto

The City of Toronto has recently developed a partnership with Zerofootprint to launch Zerofootprint Toronto, an initiative aimed at engaging citizens to reduce their carbon footprint and thereby reduce their generation of greenhouse gases. The project is currently designed in two phases: in Phase I a limited number of City employees will be engaged in a pilot stage; in Phase II access to Zerofootprint's carbon calculator would be opened to all Toronto residents and feature an inter-active component.

Zerofootprint Toronto uses state-of-the-art software to compute the environmental impact of transportation, food, energy, water use, and waste production. Torontonians will be invited to calculate their environmental footprint using this software and create goals to reduce and track this footprint over time. The program will have an education component that provides users with ideas on how to reduce their environmental impact.

(b) 20/20 – The Way to Clean Air

The goal of the 20/20 is to help Torontonians reduce their energy use by 20 per cent at home and on the road. One of the main resources that 20/20 provides is a "Planner" – a printed guide to help reach the 20 per cent energy reduction goal. This guide starts off with easy-to-do activities and then moves into longer-term, greater impact actions. It also has a "Connector" section which provides listings and contact information for other programs and services in the Greater Toronto Area that will help reduce energy use at home and on the road.

7.3 Promoting Taxi Use

Taxis have an important role to play in the development of a sustainable transportation strategy. The use of taxis by residents can discourage the use, and potentially, ownership of private automobiles. Given these benefits, from an environmental

perspective, the City should promote the use of taxis and examine opportunities to make taxis more convenient and readily available to users including, among other things, changes to on-street stopping/parking regulations to facilitate taxi stands and associated passenger pick-up and drop-off activity.

City Council, in adopting the Climate Change Action Plan, directed staff to “develop a program for shifting all taxis and limousines operating in the City to low emission or hybrid technologies by 2015 or earlier...” With the development and implementation of this program, the City should continue its promotion of taxi use and support for the taxi industry.

7.4 Review of High Occupancy Vehicles (HOV) Lanes

The City has a network of reserved lanes for public transit vehicles, high occupancy vehicles (HOV's), taxis and bicycles. In Toronto, an HOV is defined as a vehicle with three or more passengers. The vehicles permitted to use these lanes vary from facility to facility. For instance, the Bay Street “Urban Clearway” is reserved for transit, taxis and bicycles only (HOV's are not permitted), whereas the reserved lanes on Don Mills and Pape Avenue permit transit, taxis, bicycle and HOV's. Furthermore, the time periods for these reserved lanes also vary: Bay Street from 7:00 a.m. to 7:00 p.m.; Don Mills from 7:00 to 10:00 a.m. and 3:00 to 7:00 p.m.; and Pape Avenue from 7:00 to 9:00 a.m. and 4:00 to 6:00 p.m.

With these different designations and time period restrictions, there is often confusion as to who can use these lanes and when and, not unexpectedly, there is a high degree of non-compliance. Certainly there is no consistency which also makes it difficult for the Toronto Police Service to enforce the regulations. In addition, the HOV lanes on the Province's 400-series of highways, as well as in the surrounding municipalities, permit vehicles with 2 or more occupants. For these reasons, there appears to be a need to review on a City-wide basis the regulations applied to these reserved lanes to ensure consistency and minimize confusion. These regulations and any potential amendments should also be considered in the context of the regulations in the surrounding municipalities and on the Provincial Highways. Accordingly, it has been recommended that Metrolinx take the lead in this review to ensure consistency and continuity on a region-wide basis.

7.5 Intelligent Transportation Systems (ITS)

Intelligent Transportation Systems (ITS) and technology, although traditionally considered to be a way of improving and assisting the motorized modes of transportation, can be implemented to assist and/or to increase mobility for all users of the transportation network. ITS applies information processing, communications, and electronics to transportation problems to provide information that will help travelers make safer decisions. The overall goal is to improve the safety and efficiency of different elements of the transportation system.

Current ITS in Toronto include the traffic monitoring cameras (RESCU) on the Don Valley Parkway, Gardiner Expressway and Lake Shore Boulevard, the adaptive traffic control system that automatically derives and implements the appropriate signal timings in response to prevailing traffic conditions (SCOOT), transit priority at traffic signals, pedestrian count-down signals and accessible pedestrian signals (APS). Given the limitless potential and benefits of ITS for all users of the transportation system, staff recommended that Metrolinx be requested to meet with the transportation agencies in the GTA to explore opportunities for collaborative ITS initiatives.

8. CONCLUSIONS

With the introduction or implementation of these short-term sustainable transportation initiatives, does it signal the end of the reign of the car as king in Toronto? Probably not. But, what it does accomplish is that these initiatives, collectively, signal a new way of looking at, implementing, and operating the City's transportation system and provide a launch for more fundamental city-building changes that will be required to achieve the long-term vision of a truly sustainable transportation system for Toronto.

There are also indirect benefits associated with the proposed sustainable transportation initiatives, such as their educational, groundbreaking and leadership qualities that, although of major importance at this stage in the development of a sustainable transportation strategy, can only be assessed and appreciated in hindsight.

We know, however, that in order to achieve the 80% reduction target for GHG emissions, the City's influence on urban form and the provision of transit, cycling and pedestrian infrastructure are, quite simply, not enough. It will require bold and aggressive action in the form of stronger regulatory and pricing controls that seek to modify behaviour in ways that reduce vehicle-kilometres traveled (VKT). But, it is clear that the City cannot go it alone. The City will need to work closely with all levels of government and be cognizant of technological changes in the vehicle manufacturing and fuel industries that are difficult to predict over a longer time period and largely outside the City's control. The role of technology in reducing carbon emissions from the transport sector will obviously be important but it cannot be relied upon to provide the complete solution.

The result will be to develop an ongoing strategy, rather than a static plan, to tackle transport's carbon emissions challenge. If successful – and the price of failure is extremely high – it may be possible to transform the City and surrounding region from a car-dependent society to a transit/cycling/walking society in which few would find themselves disadvantaged by not owning a car. Only then will we be able to make the socially, environmentally and economically responsible decree that “The Car Is No Longer King!”