Competing Interests
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Implementing Change in Mississauga

Paper prepared for presentation at the 2012 Annual Conference of the Transportation Association of Canada Fredericton, New Brunswick

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Abstract

The City of Mississauga is at a cross road and is transitioning from a suburb to an urban centre. We are implementing LRT, BRT, Cycling facilities, Accessibility and Place making. The change from moving Traffic to moving People and Goods is a challenge, particularly when most of the change is retrofit.
This paper will highlight the changes that are happening in Mississauga and will focus on the competing interests and how the change management is being handled. It will also highlight the geometric design challenges being faced by road practitioners.

Introduction

Mississauga was incorporated as a City in 1974 and since that time has evolved into Canada's sixth largest City. It is home to 738,000 residents and 55,000 businesses, including 63 Fortune 500 companies with Canadian head offices or major divisional head offices. Much of the growth and development was made with the car as the primary form of transportation. In more recent years, the City of Mississauga has embraced the ideals of urban form and has ambitions to transform strategic areas into destinations by taking an approach that combines multi-modal planning and place making. This is a dramatic about face from a more traditional suburban development tendency. It has been an exciting change for all stakeholders, including road engineers. This paper is written from the perspective of a road engineer.

Figure 1: Port Credit to Sunnyside Street Car

Background of Mississauga

Mississauga is a relatively new City and has experienced some rather unique growth that has helped shape the way things are today. Prior to incorporation, Mississauga was a series of smaller towns and townships, connected to each other by smaller roadways and dotted with farms between. The City grew from the outside in, meaning that the City Centre was chosen in a green field location and the towns and townships grew, merged and expanded toward the City Centre. The market demand throughout this period was typically low density single family housing, complete with large driveways and designs suited to multiple car families. The City Centre itself developed in a car oriented manor and a major regional mall, Square One, was

built. Figure 2 shows the early days of the Square One shopping centre in the middle of green field development. Figure 3 shows the view of the Downtown in 2011.

Figure 2: Mississauga City Centre in the early 1970's

Figure 3: Mississauga Downtown in 2011

Road System

The City's road system was based on a large arterial grid pattern with a predominant pattern of traffic gravitating toward Toronto in the morning peak and returning from Toronto in the afternoon peak. There was also a tendency for traffic to gravitate toward the freeway system in the morning and return in the afternoon. This resulted in a major imbalance of traffic in Mississauga in the early years. Traffic gravitated east and toward the freeways in the morning and west and from the freeways in the afternoon.

The mid-block road system tended to be curvilinear, with the hopes of preventing cut-through traffic. Initially, when traffic volumes were relatively low, this worked out well. As traffic volumes grew, the major road grid and its large, widely spaced intersections took the brunt of both turning and through traffic. The large spacing of arterial roadways also placed a high importance of providing good traffic progression. With such large intersections and through and turning volume demands, it tended to promote traffic signal timing with very high cycle lengths and multiple signal phases. The emergence of new and competing traffic demands, namely increased pedestrian, transit and cycling demands, only exacerbated the problem. The very road system that had attracted residents in the early years (relatively fast and convenient car travel) is now being changed to facilitate other traffic objectives.

Vision

Mississauga as a City is in a relatively good financial position. During the rapid years of growth, the City prided itself on its strong business acumen. The service levels were reviewed and well understood, and the City took advantage of the development process to collect development charges and build a sizable reserve. The market for low density housing was strong and the City rapidly grew. Roads were widened and supporting infrastructure was incorporated at a relatively high speed.

Mississauga has had many strengths, but has often been criticized for being relatively pedestrian, transit and cycling unfriendly. The City has had a major change in vision in the past several years and has placed a strong focus on place making and endeavouring a place where people choose to be. The City's vision statement is shown in Figure 4. This vision is to be anchored by six pillars that include; Move, Belong, Prosper, Connect and Green. An emphasis is placed on quality of life and less on the fast efficient movement of cars. It is important to note that the City is not abandoning the car and recognizes that much of the mature City will remain very car dependant. It does, however, also recognize that for growth, quality of life, and efficiency purposes, the emphasis must change.

Figure 4: Mississauga's Vision Statement

The change in vision has been seeded at the strategic level and has been percolating down into the Official Plan, Area and Master Plans and is now influencing business plans and more tactical operations. Figure 5 illustrates the alignment through the Mississauga Planning Framework.

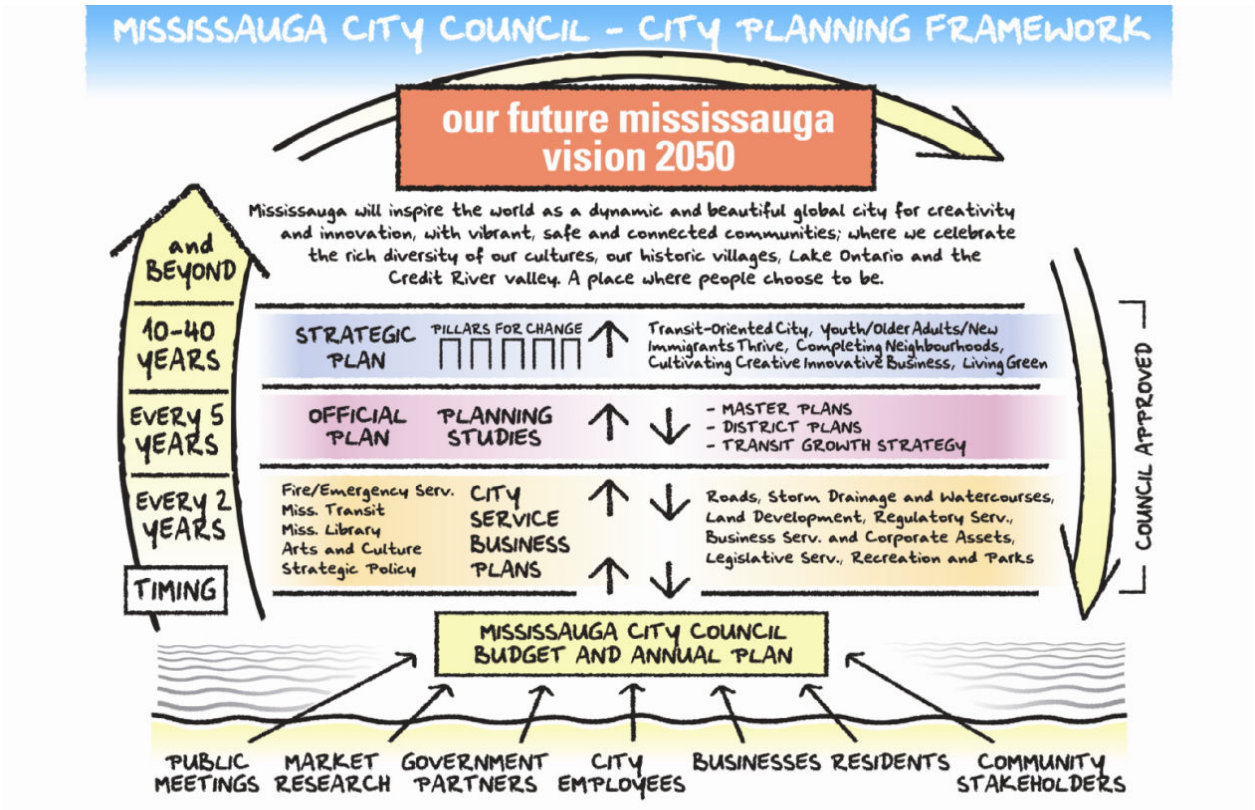

Figure 5: Mississauga Planning Framework

Objectives/Values

The objectives and values of the City have changed dramatically and this has had a direct effect on the work of designers and builders, including those in transportation. Where pedestrian, cyclists and transit were more of an afterthought in the design process, pedestrians, cyclists and transit are now prominently held in the list of design considerations.

Challenges

<u>Dealing with Change</u>

One of the biggest challenges faced by the City is the re-balance of traffic and road design. The pressures for change are enormous and unfortunately the tools for change are not always readily available.

The City has been blessed with an abundance of freeways, an international airport, several major rail lines, rivers and Lake Ontario to the south. From a design and build viewpoint, these same features present big challenges. Most of the major roadways are built out and the airport is mature and is here to stay. The existing roadway bridges were designed and built mainly for cars and trucks, and retrofitting to better accommodate pedestrians, cyclists and Transit is extremely difficult and very expensive.

The municipalities surrounding Mississauga are also in a state of rapid development, much like Mississauga was in the not too distant past. Mississauga is a net importer of people destined to work, meaning that more people arrive to go to work than leave the City to go to work. This is a big change since the days of being a suburb to Toronto. The challenge here is that the demand for road network capacity for motor vehicles will tend to grow and there will be a prolonged periods of congestion during the day.

Making changes to the road network to better accommodate pedestrians, cyclists and transit will tend to erode the capacity of the road network to facilitate cars and trucks. The combination of growing demand and eroding of motor vehicle capacity will result in a major lowering of level of service for traditional motor vehicle users. To ensure that the City remains competitive with other Cities, and to ensure sustainability, changes must be made regarding how people and goods movement are handled.

Paradigm Shift

A paradigm shift from moving traffic to moving people and goods helps to explain the value in making these changes. For example, a bus with 60 passengers versus 2 or 3 single occupant vehicles moves less traffic but significantly more people. This rationale is further exemplified with Light Rapid Transit, which the City is currently investigating as a transportation alternative. Figure 6 illustrates a comparison of moving single occupant vehicles versus LRT vehicles through a network. LRT is clearly a more efficient method of moving people through a given space.

Figure 6: Comparison of Single Occupancy Vehicle versus LRT

Competing Interests

The issue of competing interests is a major theme emerging in many of the new challenges facing the City. Making changes to accommodate one form of traffic most often results in compromise for other forms of traffic. In most instances, the traffic being most compromised is the car. Most of Mississauga has developed with the car as the major mode of transportation and that will likely go unchallenged for most of the areas of the City. Many residents and businesses will likely resist change that will inhibit car mobility and this will present a major challenge to staff that are involved in the transition to moving people and goods rather that just traffic. It is hoped that through an effective communication and education program, people can be made aware of the need for change. A similar and successful comparison of change is the societal support of recycling. Waste has been significantly reduced through recycling and it has been embraced by most residents and businesses. It is hoped that a similar change can be made with people and goods movement.

Rapid Transit

The City has two major rapid transit initiatives underway. A Bus Rapid Transit (BRT) corridor has been designed and is currently being built in partnership with GO/Metrolinx and runs in an east/west direction across the City. The City is also in the environmental design phase for a Light Rapid Transit (LRT) line running north south from Downtown Brampton to Port Credit

along the Hurontario Street/Main Street corridor. Figure 8 illustrates the Mississauga BRT and Figure 9 shows the Hurontario-Main LRT.

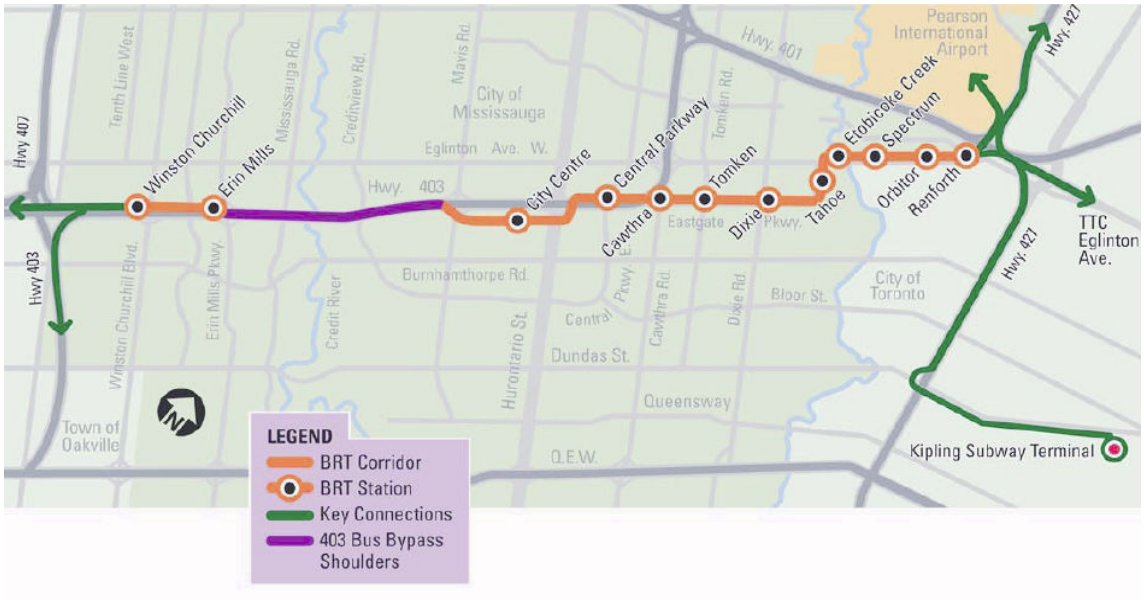

Figure 8: Mississauga Bus Rapid Transit Project

Figure 9: Mississauga Hurontario-Main LRT Project

The two rapid transit lines create a central spine for future rapid transit in Mississauga and are part of a larger planned greater Toronto rapid transit grid. The introduction of this rapid transit spine will transform both development in Mississauga and how local transit operates. Local transit will tend to transition from a grid and spoke pattern to more of a rapid transit with feeder lines. The incorporation of rapid transit will tend to promote transit oriented development along the rapid transit corridors, particular the LRT corridor. Rapid transit is expensive and it is important to ensure that it is well utilized. An emphasis will be placed on feeding it and this will include improving local feeder bus service. Road network improvements will include transit priority, which can take the form of physical design and softer measures such as signal phasing and timing. Again, accommodating transit will tend to compete with road capacity currently allocated to all motor vehicle traffic and will need to be communicated well in order to receive wide support from all road users.

The BRT is a separated busway and presented many challenges during its design and on-going build. The corridor that it is being located in has a plethora of utilities traversing both on, below and above grade. It also included lands owned by many other stakeholders, including other levels of government and private companies. For the Mississauga portion, over 100 parcels of land needed to be secured and many utilities relocated. This is a large project and involved both roadway and building features, which presented challenges for engineering and purchasing staff that were typically used to dealing with either roads or buildings but not both.

The Mississauga BRT is part of a larger transit network being built. Until critical connections are made and efficiencies realized, the value of the BRT will be reduced. In the short term, the full value of the BRT may not be readily apparent from a resident's perspective, but as road congestion increases, the true value of the BRT will be obvious. Many parts of the BRT are visible from adjacent roadways and highways, and during periods of future congestion, buses passing rapidly on the adjacent BRT will be the best form of advertising the merits of transit travel.

Cycling

Cycling in Mississauga has evolved significantly in the City over the past 20 years. In the early years, cycling was considered a recreational activity and there was practically no emphasis placed on it during road design. Most of the City's roads and bridge infrastructure do not accommodate cyclists, though cyclists can utilize roadways as a vehicle where not restricted. The challenge is that most cyclists do not feel comfortable or safe co-mingling with motor vehicles. Similarly, drivers are not accustomed to sharing the roadway with cyclists and have a general limited awareness and appreciation for cyclist's needs and presence.

The City has changed its stance on cycling over the years and recently approved a Cycling Master Plan, which will see a growth in cycling facilities from 350 km to 891 km over the next 20 years. Much of the new cycling network will include a transverse grid, which is basically a grid pattern of cycling facilities along major road corridors in the City. This presents huge challenges at locations with restricted right-of-ways and at locations with bridge or tunnel crossings. It also presents challenges for designating right of way and capacity for cyclists, and

in effect a reduction in capacity for motor vehicles. Cycling advocacy in Mississauga is growing and helping to drive cycling accommodation. Figure 10 is a photo of cyclists advocating a new crossing of the Credit River.

Figure10: Mississauga Cycling Advisory Committee advocating for a new river crossing

Accessibility and Demographics

The accommodation of persons with disabilities is a major initiative at the City as it is in most places in North America. Ideally, there should be no limitation or boundaries for all people to travel. In practice, there are many hurdles to overcome to truly rid the City of its barriers. Disabilities take many forms and the City is endeavouring to design, build and educate to better remove these barriers. Some of these changes are simple and relatively inexpensive, but many are difficult and require significant financial resources to make a change. The change does require that designers and builders be aware of special needs and incorporate them into new designs and rebuilds.

The demographics of Mississauga are also changing rapidly. More than half the residents of the City were born outside Canada. English as a second language is very common and has a significant impact on how communications are conducted, including signage and way-finding. Aging population will also present challenges for designers. Reduced walking speeds and the need to design for mobility carts and other mobility devices (two mobility carts approaching from opposing directions along a sidewalk would be a good example). The safety issues with mixing mobility carts and pedestrians on the same facilities will also present a challenge.

Road engineers are being educated on the special needs of persons with disabilities and the many demographic changes and needs that are taking place. The increased awareness helps to ensure that special needs are recognized and that actions taken to best accommodate these needs.

Place making

Mississauga is endeavouring to be a place where people choose to be. This is a major change in vision and values from the years of running it like a business, particularly as it applies to public spaces, like the extensive network of City streets. This change includes a major focus on quality of life and pedestrian/transit/cycling oriented development and movement. This is most evident in the downtown core. The change from designing for cars and trucks to more of a balance with pedestrians, transit and cyclists presents a huge change for road designers. Good urban form doesn't always mesh with high capacity and mobility for motor vehicles. The traditional design manuals and practices are not always practical for the new demands for transit and pedestrian oriented development.

<u>The Need for New Tools</u>

The demand for radical design philosophy changes and the lack of cohesive and up to date design standards to meet these changing demands are creating challenges for road designers, builders and operators. In many instances, the existing standards and regulations are based on work that was done decades ago and may not be current with respect to needs balance. Mississauga has recognized the need for roadway design guidelines that are based on multi-modal and context sensitive principles and is endeavouring to develop them.

The lack of current local standards and regulations that meet changing needs has resulted in municipalities looking to other sources of information, including that from other jurisdictions and sources both nationally and internationally. This can help produce new and innovative designs, but can present risk and liability challenges for municipalities. When something goes wrong, courts tend to use local regulations and standards as a basis for judgement and then weigh in precedents from other sources. Road practitioners not only design, build and operate roadways; they also must defend them when things go wrong. This can be very stressful, particularly when new or innovative designs are used and there is little established defence available.

As with most things, road design and operations are getting more complicated, not only are there now more types of users to design for (pedestrians, cyclists, cars, buses, trains etc…) but there is a definite trend to integrate the road design process with the development process. A good example of this in Mississauga is the Downtown21 initiative (building a city for the 21st Century). Incorporating transit oriented development in conjunction with a pedestrian oriented build philosophy has had a big impact on roadway design. Recent examples in Mississauga include flush streets, urban roundabouts, narrowed arterials transit priority techniques, reduced parking provision and a number of other similar applications.

Not everyone is on board with the new philosophy. The traditional resident base in Mississauga is still very auto dependant and though there is some change happening, there are still strong expectations that moving general traffic (cars and trucks) is the prime directive. In fact, the City has started to apply the practice of being more multi-modal (smoother travel for those that choose a combination of travel; walking, cycling and transit). New initiatives must take into

account existing Master Plans, including Downtown21, Cycling, Living Green and a host of others that are not in alignment with the traditional way of doing things. All of the new changes are positive but are often in conflict with each other.

A good way to illustrate some of the challenges being faced by Mississauga is to look at an example.

Downtown Mississauga

The Downtown 21 Master Plan is guiding the development infill of the downtown. It calls for high density development with a finer road system to service it. The plan includes narrower roadways and a general design premise that is friendlier for pedestrians and less convenient for cars and trucks. This presents positive benefits for pedestrians but conversely creates challenges for trucks and other large vehicles. It also presents challenges for traditional emergency service vehicles and emergency maintenance, including snow removal. For the road engineer, it is a very different situation and one that is often stressful. Development philosophy is driving change and is putting a lot of pressure on road operators to adapt and respond. Examples from other jurisdictions and countries are cited as examples of what can be done. It is often not as clear what the repercussions are should something go wrong with the initiative.

It is very difficult for a practitioner to leave an area of comfort and take a leap of faith that things will end up safe and efficient. It is also very difficult to be pressured into making changes that do not feel comfortable. Mississauga has had the benefit of having a new philosophy that is driven from the top down. From the City vision, through the various strategies, official plan, master plans, business plans and tactical operations, the City has established an internal alignment that helps to support the change. The City has also done a good job in communicating the change to its staff, and to the many stakeholders that are impacted by the changes, including the City's residents. Change is slow and a change in the attitudes of all stakeholders can take a lot of time.

The City has been good at creating multi-disciplinary groups from various service areas of the City. These would typically include Steering Committees at the strategic level, Core Groups at the intermediate levels, and working groups at the service delivery level. Constructive debate is a good thing, but at times there are some passionate differences of opinion and these must be handled or risk losing control of the situation. Fortunately there have been a number of early successes using this approach and with each major initiative; staff becomes more skilled at dealing with change, and dealing with each other.

Change will be a regular occurrence in Mississauga and road engineers will need to become skilled at dealing with change and the pressures associated with it. Fortunately organizations like the Transportation Association of Canada and other similar national and international organizations help provide support and resources to meet these challenges. Similarly, it is hoped that the City can share its experiences with the transportation industry and help build and maintain a solid body of knowledge.

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