INTRODUCTION

A study released by the Toronto Board of Trade reports that Toronto's traffic congestion has grown into a serious and costly problem. It states that Toronto commuters spend about 80 minutes per round trip on the road. That is 24 minutes a day longer than people in Los Angles, 12 minutes longer than those in New York, and 32 minutes longer than commuters of Barcelona. The study also makes reference to a report by the Organization of Economic Co-operation and Development (OECD) estimating that 71% of all Toronto commuters use personal cars and that the congestion cost is about $3.3 billion in lost productivity.

This is very alarming. Although, Toronto has undertaken some measure similar to other major cities to combat traffic congestion, but the problem still exists. Within the jurisdiction of the Metro Toronto, turn restriction, rush-hour parking restriction, rapid transit and subway extension have been implemented. The objective of this memo is to propose other programs that can be implemented to reduce the level of congestion and thus reduce the billions of dollars loss in productivity in Metro Toronto, as well as reduce the negative impact of congestion on the society and environment.

DISCUSSION

It is well documented that the congestion in the City of Toronto has negative impacts on society, environment, and business productivity. It is very important that the city authorities address the congestion problems, at very least, within their jurisdiction. For a broader impact, traffic and transit issues should be dealt with in collaboration with all stakeholders in the Greater Toronto Area and the neighbouring regions. This memo, however, deals and proposes congestion relieving programs that fall within the sphere of influence the city and Mayor of Toronto.

The Toronto Board of Trade study, among other options, suggests that road toll on Gardiner and Don Valley Expressways be imposed as a mean of generating revenue and reducing traffic congestion. Although, based on the polls by media outlets during the 2010 municipal election, this proposal was met with mixed reactions.

I believe that the Toronto Board of Trade's proposal will be successful and acceptable if it is integrated with other programs, and is implemented after the commuters are provided with alternative economical and reliable commuting options. The integrated program that I propose, in addition to imposing tolls on Gardiner and Don Valley Expressways, should include the following actions:

1. Enlarging the existing and building new and parking lots in the subway stations that are at the extreme of the subway lines and close to the major highways; and, where applicable, connecting the new parking lots to the subway stations by covered walkways or surface trains. The target stations are Kippling Station, McCown Station, Wilson Station, and Bessarion Station (Appendix A shows each station on a map).

2. Making all Toronto Transit Commission (TTC) parking lots free
3. Integrating tariff, i.e. having a transfer acceptance agreement, with GO and the neighbouring transit systems, which would allow the commuters to continue their one-way trip across the transit limits without paying again.
4. Creating intercity transit ways, similar to Spadina Avenue, along the major roads; or converting some streets to bus only route during the peak of traffic.
5. Imposing area congestion pricing in the down core, the area bound by Bathurst Street, Bloor Street, Parliament Street, and the lake.

To demonstrated why the present systems do not encourage taking transit, I am presenting the following hypothetical case. Let's assume that for a person commuting from Mississauga to Downtown Toronto (assuming 30 km) the following options are available (along with the cost per one-way trip and estimate of time):

1. Driving directly to Downtown Toronto (**$3**, mainly the variable cost of gas; 1 hour)
2. Taking Mississauga Transit to TTC subway and then riding the subway to downtown ($3+$3 = **$6**; 2 hours).
3. Driving to Kipling Subway Station, parking at the station, and riding the TTC subway to downtown ($1+$5+$3 = **$9**; 1.5 hours)

Looking at the above options and costs, there is no incentive for a commuter to take the transit. Even if we add the cost of a monthly parking pass ($60) in Downtown Toronto, the cost of driving will become $6.

Now let's look as to how the options would change if parking is made free at Kipling Station, a $5 road-toll is imposed for driving on Gardiner Expressway, and a $2 congestion-price is charged for driving into downtown core.

1. Driving to Kipling Subway Station, parking at the station, and riding the subway to downtown ($1+$3 = **$4**; 1.5 hours)
2. Taking Mississauga Transit to TTC subway and then riding the subway to downtown using the transfer ticket from Mississauga transit (**$3**; 2 hours).
3. Driving directly to Downtown Toronto ($3+$5+$2+$3 = **$13**; 1 hour)

Now the options look significantly different, and driving to downtown Toronto becomes the least economical option. However, it should be emphasized that the above changes should be accompanied with improved transit service and synchronization with the adjacent and provincial transit systems. The road toll and congestion pricing should be implemented after the parking expansion at the target subway stations, removal of parking fee, and tariff integration are put in place. The changes and improvement would be later financed and compensated by the revenue generated from the road toll and congestion pricing.

CONCLUSION

It is concluded that with the implementation of an integrated congestion mitigation plan, the congestion on Toronto arteries can be relieved. With the relieving congestion, the city of Toronto will help improving the productivity of businesses operating in the city, will reduce commuters' frustration and accidents, and will reduce the level of pollution and green house gases generated by slow moving and idling traffic on the city's roads.

APPENDIX A

MAPS

PURPOSE:

The purpose of this appendix is to provide maps as visual aid showing the target subway stations for the congestion mitigation program.

SOURCE OF CONTENT:

The maps were obtained from Google Map.

KEY DISCOVERY:

The maps were used to identify areas that can potentially be bought by the city, turned into high density parking lots, and connected to the subway stations.

MAPS

Map of Toronto, Subway, and Proposed Parking Lots

Figure A-1: Subway stations that need parking expansion, expressways to be subject to road toll, and limits of the city that should be subjected to congestion pricing

Figure A-2: Areas in near the subway stations that should be bought by the city and turned into parking lot or in which the parking capacity be increased by building multi-level parking lots.

APPENDIX B

BACKGROUND STUDY

PURPOSE:

The purpose of this appendix is to review the studies on the congestion mitigation in big cities, carry out a critical thinking exercise, and come up with a creative solution for relieving Toronto's congestion.

SOURCE OF CONTENT:

The source of content is listed in the bibliography.

KEY DISCOVERY:

The key discoveries are outline in the sections and subsections of this appendix.

APPENDIX B - BACKGROUND STUDY

Before coming up with a solution to Toronto's congestion problems, a background study was made. First, the Toronto Board of Trade's study was obtained and examined. Then, it was checked what programs are under taken by other big cities for dealing with traffic congestion. Afterwards, some "why" questions were asked to find the root cause of Toronto's traffic problems. Finally, critical thinking techniques were used to come up with a creative and practical solution for Toronto's congestion problems that are within the Toronto Mayor's sphere of influence. The following sections details each of the four steps listed above.

B.1 Summary of the Toronto Board of Trade Study

Realizing that transit congestion is strongly affecting present and future economic activities of Toronto, the Toronto Board of Trade decided to study and raise awareness on the traffic congestion and make it an election issue for the 2010 municipal election [1]. The Toronto Board of Trade also made a note of the Organization of Economic Co-operation and Development (OECD) study which had concluded that Toronto's transportation infrastructure and future expansion had strong effect on Toronto's ability to remain competitive and attractive for foreign investment [2].

The Toronto Board of Trade study lists the federal, provincial, and municipal efforts and plans that are aimed to tackling the transit and congestion problems in the Greater Toronto Area (GTA). At the end, the study lists 16 "revenue tools" for the Toronto that can generate traffic related revenue and would potentially relieve congestion and improve mobility. These revenue generating tools are:

1. Parking Surcharge
2. Regional Sales Tax
3. Gas Tax
4. Vehicle Kilometres Travelled
5. Road Pricing – Tolls
6. Road Pricing – Congestion Pricing
7. National Transit Strategy
8. Predictable, Long-Term Senior Government Funding
9. Infrastructure Bond
10. Employer Payroll Tax
11. Tax Incremental Financing (TIF)
12. Land Value Enhancement
13. High Occupancy Toll (HOT)
14. Vehicle Registration Fee

15. Utility Levy
16. Full-Cost Recovery Transit Fares

A brief description for each of the “revenue tools”, as well as potential level revenue, benefits, drawbacks, and examples of cities using the tools is given in the study; therefore, are not repeated here.

B.2 Programs under Taken by Major Cities for Relieving Congestion

A high level research was made to learn about the measure that major cities such as Toronto, New York, Los Angeles, and Barcelona have put in place for relieving congestion. The following subsections briefly describe the findings.

B.2.1 Toronto

Within the limits of Metro-Toronto, the city introduced and implemented a Vehicle Registration Fee, the revenue of which was to be used for transit and traffic improvement. This measure, however, was repealed by the new Mayor of Toronto. Other measures that have been implemented in the Greater Toronto Area, but is outside the jurisdiction of the City of Toronto, are the imposition of gas tax, the creation of high occupancy vehicle (HOV) lane, that is aimed at reducing peak hour congestion, and the toll road (HWY 407) that is mainly aiming at providing a faster route for commuters at a cost. Both of these measures have had positive impact, but the congestion problem in Toronto has not gone away.

B.2.2 New York City [3]

The New York City Traffic Congestion Mitigation Commission has recommended the implementation of a pricing-based traffic congestion mitigation plan. The objective is to see the revenues raised by congestion pricing to support the Metropolitan Transit Authority (MTA) capital plan. It is worth noting that the Commission recommended that strategic improvements to subway, bus and express bus services be in place before the implementation congestion pricing. However, the improvements would be financed by the revenue generated from the congestion pricing.

Congestion pricing is a mechanism for reducing automobile use, thus relieving congestion, with an imposition of daily or hourly fee on automobiles driving within or into a carefully drawn geographic area. To implement congestion pricing in Manhattan, a fee of $8 would be charged to automobiles, $21 to small trucks and buses, and $42 for large trucks entering the Zone; with fee halved for those originating in and staying within the Zone. Those entering the Zone after crossing on tolled facilities would deduct the tolls from the congestion fees. The system would be enforced by the installation of approximately 1,000 cameras at approximately 350 locations at the perimeter and within the Zone.

B.2.3 City of Los Angeles [4]

It has been reported in the Electronic Product News (EPN) that Los Angeles is infamous for its traffic jams [4]. The EPN states that a study conducted in 2008, on behalf of the American Automobile Association, found that traffic congestion costs the Los Angeles and Orange county region $9.3 billion annually, and traffic accidents cost $10.85 billion.

The county has installed a traffic management system that can modify the traffic conditions in real-time [4]. Additionally, Los Angeles' congestion control plan and program includes rush hour-parking restriction, turn restriction at major intersections, transit way (bus rapid transit), park and ride lots, loop sensors, and smart grids [5].

Los Angeles County' traffic management system provides second-by-second monitoring and control of traffic signals. The system detects traffic signal equipment malfunctions, which allows for very rapid response to traffic signal problems. It can also monitor traffic conditions and collect traffic data from loop sensors that are built into roadways and video detectors to provide real-time modification of traffic signal operational parameters [4].

Loop-sensors are embedded in the pavement allowing for intersection traffic signal timing adjustments to favour the more heavily delayed roadways and the smart-grid traffic control system which allows for the synchronization of traffic signals to improve traffic flow.

B.2.4 Barcelona City [6]

Barcelona is a city with very serious traffic problem, and is considered the second noisiest city in Europe. The transit authority has implemented a number of congestion control measures that include selected control access, park and ride and metro system integration.

The Barcelona Metro is part of the public transportation system of Barcelona that include an extensive network of electrified railways that run underground in central Barcelona and above ground into the city's suburbs. The city under public pressure has extended its metro lines and created a tram system.

The integration of tariffs for the public transport system has been implemented in Barcelona. It started with the introduction of a zoning system, integrated journey tickets with time limitation, integrated unlimited travel with time limit and ticket transfers for integrated journeys with no time limit. These measures have been met with public enthusiasm [7].