



**Value of 407 ETR as a PPP Project  
To Support Sustainable Urban Transportation  
For the GTA**

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**Ministry of Transportation**



Paper prepared for presentation

**Urban Transportation Management Session  
of the  
2008 Annual Conference of the  
Transportation Association of Canada**

**September 2008  
Toronto, Ontario**

## Abstract

In the Greater Toronto Area (GTA), traffic congestion is a significant issue. All levels of government recognize that there is no one approach to deal with congestion, and have attempted to address it through a variety of initiatives including roadway expansion, improving public transit, coordinated land use and transportation planning and travel demand efficiency measures (e.g. HOV). There is also increasing attention and emphasis on having healthy and sustainable communities. An added complication is the challenge for the government to finance sufficient infrastructure to promote trade and address congestion, given other equally worthy budget priorities such as health care and education.

Value pricing infrastructure through public-private partnerships has long been a worldwide means to address demand for roads. Ontario has a road pricing experience with its first toll highway -- 407, which is also the world's first all-electronic toll highway. Highway 407, through its operational and contractual obligations forms a key part of a sustainable transportation plan for the GTA.

The objective of this paper will be to illustrate how and to what degree the development and privatization of Highway 407 has met the government's expectations for delivering infrastructure in a timely fashion, providing congestion relief and assisting in achieving sustainable transportation.

This will be accomplished through a discussion of the tolling mechanism and congestion relief provisions in the contract between the government and Concessionaire 407 ETR, the required actions by 407 ETR to fulfill its obligations, and the role and performance of Highway 407 in the provincial network focusing on how sustainability is being achieved. Operational data will be analyzed to illustrate how Highway 407 contributes to the rationing of travel demand during peak hours as well. Additional discussion will be included on the transitway which has been protected within this corridor, as well as key issues on lessons learned from the 407 experience.

In addition, private sector funding for highway expansion and upgrades enables the province to otherwise redirect highway funding towards public transit initiatives supporting more sustainable transportation.

# **Value of 407 ETR as a PPP Project To Support Sustainable Urban Transportation For the GTA**

## **Introduction**

There is a pressing need in Ontario to build, expand, and renew road and public transit infrastructure in order to facilitate economic growth and address rising congestion.

In the Greater Toronto Area (GTA), traffic congestion is a significant issue. All levels of government in the GTA recognize that there is no single approach to deal with congestion, and have attempted to address it through a variety of initiatives including roadway expansion, improving public transit, coordinated land use and transportation planning and travel demand efficiency measures.

Superior and well-placed infrastructure has long been a prerequisite for the development and enhancement of successful communities in an increasingly global economy, hence the continued construction of highways. Yet there is also increasing attention and emphasis on having healthy and sustainable communities. An added complication is the challenge for the government to finance sufficient infrastructure to promote trade and address congestion, given other equally worthy budget priorities such as health care and education.

The Centre of Sustainable Transportation defines sustainable transportation generally as being affordable, efficient, supportive of a vibrant economy, allowing the basic access needs of individuals and societies to be met safely and in a manner consistent with human and ecosystem health (by limiting emissions and waste), and with equity, while offering choice of transport mode, and supports a vibrant economy. <sup>(1)</sup>

Improving transportation system performance to attain economic, social and environmental goals can be achieved through a number of means and involve several elements -- improving the speed and reliability of trips, shifting discretionary travel to other modes or to off-peak periods, and applying greater user-pay principles to travel. The intent of this paper is to focus on the first and last points.

Value pricing infrastructure through public-private partnerships has long been a worldwide means to address the demand for road space as well as the supply of it by adding and rationing capacity. Ontario has road pricing application experience with its first open road all electronic toll highway – 407 ETR, which was also the world's first such highway. Highway 407, through its operational and contractual obligations and its application of value pricing infrastructure, forms a key part of a sustainable transportation plan for the GTA.

This paper will illustrate how this tolled highway has met expectations for assisting in making transportation more sustainable, particularly with regards to providing congestion relief.

## **Congestion in the GTA**

There are both positive and negative externalities associated with congestion. Congestion is not merely a mismatch between demand and supply. In some ways, a sign of success -- it is where the action is, where everyone wants to be. It cannot always be rectified. However, too much congestion can reduce the attractiveness and competitiveness of a location.

The cost of congestion to the GTA area is high. A Transport Canada study estimated it as being between \$900 million and \$1.6 billion (2002 dollars) <sup>(2)</sup>. The amount of wasted fuel associated with this congestion amounts to between 240 and 270 million liters representing a value of between \$92 million and \$102 million, while the quantity of GHG emissions is on the order of 595,000 to 661,000 tons, with a value of between \$19 million and \$22 million. In Canada, commercial and personal transportation account for 19 per cent of greenhouse gas emissions <sup>(3)</sup>. In addition, it was estimated in 1987 that 30 per cent of the cost of moving goods (or \$2 billion) in Toronto was attributable to congestion on the arterial road system alone.<sup>(4)</sup>

Over the next 25 years, the Greater Golden Horseshoe's population is expected to grow by another 3.8 million people. The growth could result in a 45 percent increase in average commuting times arising from traffic congestion. There could be a 42 percent increase in auto emission that contributes to air pollution and climate change. <sup>(5)</sup> The cost of doing nothing to address this will be equally profound.

The provincial highway network carries goods worth over \$1.2 trillion to national and international markets each year making the flow of traffic central to the health of Ontario's economy. Much of that traffic originates in, is destined to, or passes through the GTA. As such, it was imperative that congestion be addressed in some form. While proposed and significant public transit improvements will benefit personal travel, they cannot be expected to address freight transport in any meaningful way.

The need for Highway 407 was identified in the early 1950's and a route designated during the 1970's and 1980's. The first 9 km section (Highway 427 to 400) only started in 1987. In early 1993, a decision was made to toll the highway. In April 1994, Canadian Highways International Corporation was selected to design, construct and operate 407; \$930 million would be expended to accomplish that.

In addition, given the urban nature of the highway (i.e., highway interchanges generally every 2 km) and desire to address congestion, a decision was made to dispense with manual means of toll collection (i.e., toll booths) and operate as an 'open road' facility. A toll supply contract for \$102 million was issued to provide both a transponder-based system (discounted for frequent travellers) and a license plate video-imaging system (for casual users).

In late 1998, an expression of interest was sought for the lease of Highway 407 by a subsequent government. Legislation and agreements were crafted permitting the transfer of the highway to the private sector as well as identifying obligations and rights of all parties. On May 5, 1999, Highway 407 concession was granted to the 407 ETR Concession Co. Ltd.

## **Overview of 407 ETR**

The 407 ETR is a 108 km, fully electronic tolled highway, running parallel to a couple of major east-west Toronto area highways (Queen Elizabeth Way-QEW and 401) as shown in Figure 1. It consists of four, six, and eight core (basic) lane sections. The initial 36 km of the central section was developed, designed, built and opened in stages ranging from June, 1997; a further 33 km opened September 1998. A 24 km west extension and 15 km east partial extension were constructed by 407 ETR after the acquisition of the highway from the Province in May 1999; they were completed and opened to the public on July 30, 2001 and August 30, 2001 respectively.

Both the initial construction of the highway and its subsequent expansions were completed ahead of schedule, a circumstance in part attributable to the involvement of the private sector and its efficiencies in the delivery process. A proposal to extend the highway further to the east is currently the subject of an Environmental Assessment.

The highway's tolling system is transponder-based supplemented by a secondary, licence plate recognition system. When initiated, it was unique and state-of-the-art. There was no other 'open' tolled highway that permitted post-payment of tolls. Other transponder-based systems require some form of pre-payment. There are many hybrid systems that offer 'open' lanes, but also include 'closed' lanes, providing cash alternative to casual and low-income system users.

## **Role of 407 ETR within the GTA highway network**

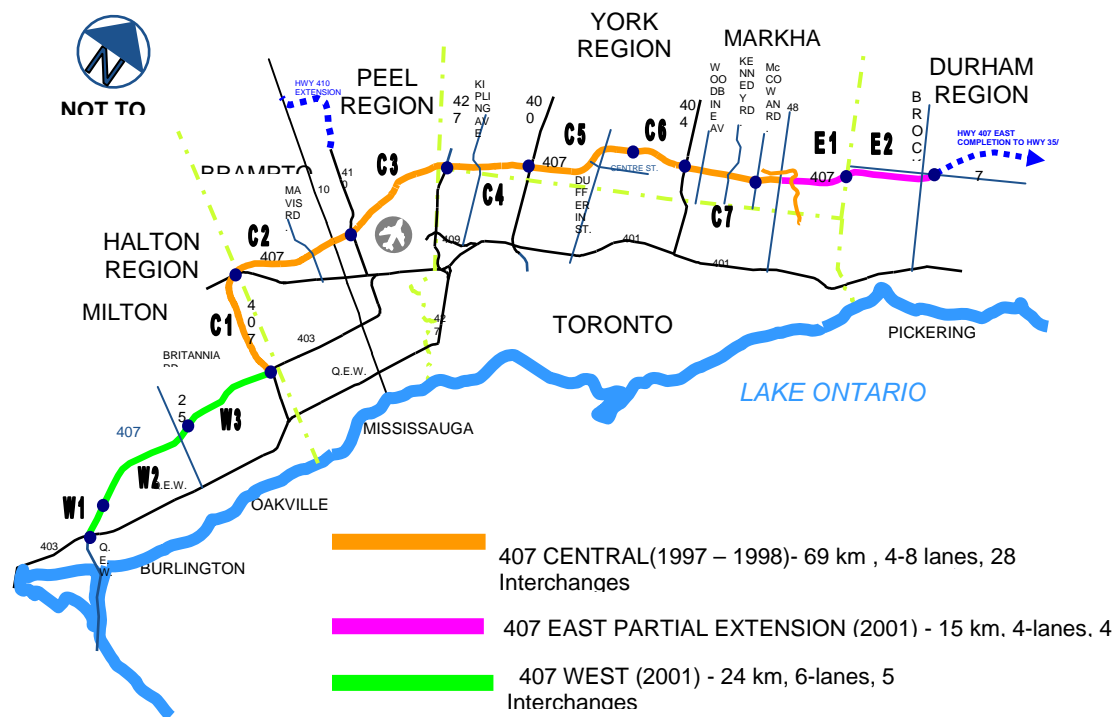
Highway 407 provides congestion relief for other highways in the region and has provided a stimulus for further suburban economic development by supplying much needed high quality transportation capacity to the network.

On the order of 374,000 (average workday trips) vehicles use the highway every day; 2.25 billion vehicle kilometres were travelled in 2007.<sup>(6)</sup> The average trip length was approximately 20 kilometres and over 850,000 transponders have been issued by 407 ETR; approximately 80% of all trips are transponder trips.<sup>(7)</sup>

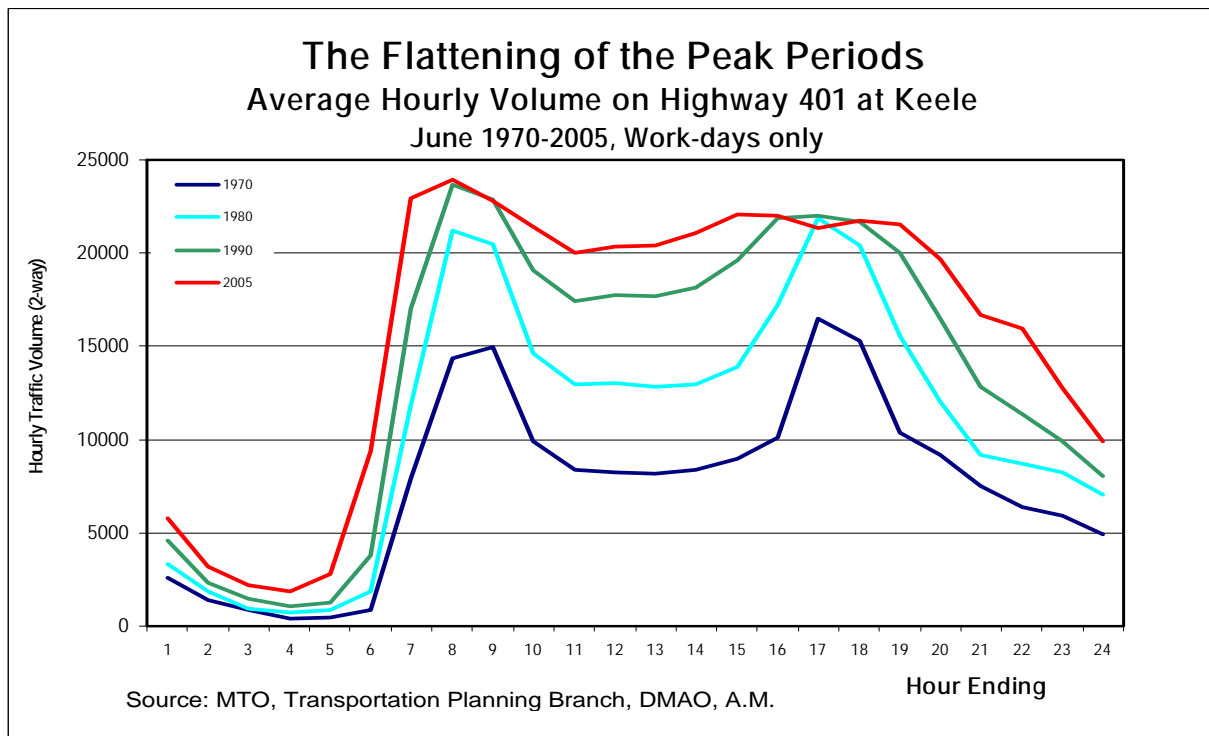
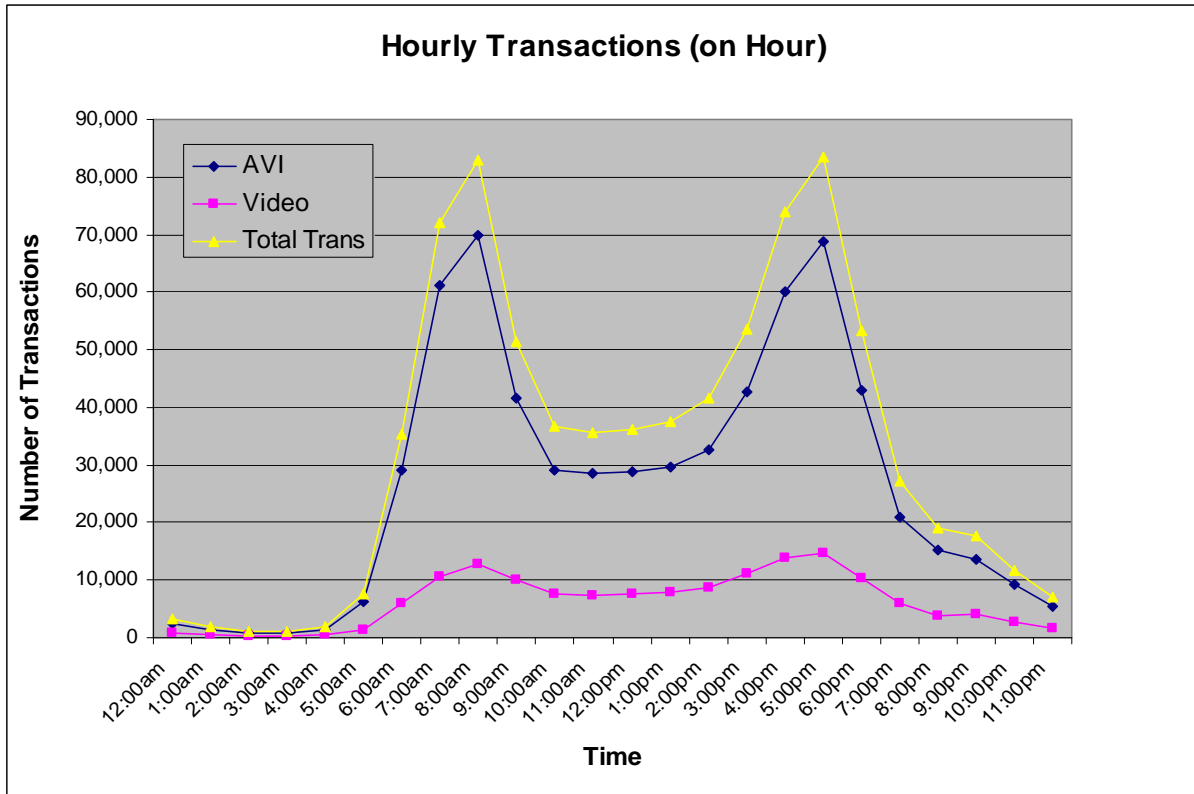
The traffic profile of 407 ETR illustrates the effect of value pricing infrastructure. The greatest use of the highway occurs during the peak a.m. and p.m. hours, when time is at a premium for (primarily) commuters. By contrast, distinct peak periods on Highway 401, which is not tolled and parallels most of the 407 ETR, have eroded over time. (Figures 2 and 3). Notwithstanding this, traffic largely flows at or close to the speed limit on Highway 401 during the off-peak. This could change over the coming decades, given projected increases in road freight traffic and when a further two million people, the majority of which will reside north of 407 ETR, accrue to the Greater Toronto Area. The utilization profile could be altered.

By contrast, peak period travel speeds along the 401 and QEW are considerably inferior to the 407 ETR. Generally a 'buffer' equivalent to one-third of the time needed to complete a trip of comparable distance is necessary (i.e., an off-peak trip of 33 minutes would take 44 minutes during the peak along those two highways).<sup>(8)</sup>

**Figure 1 Highway 407**



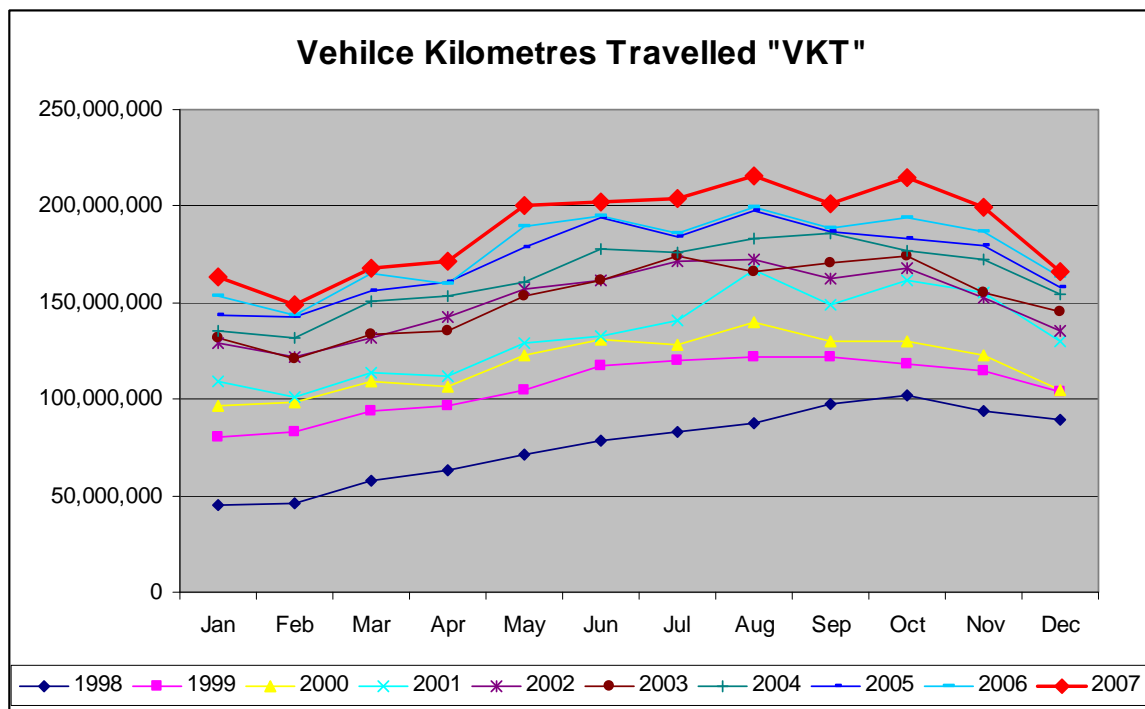
Figures 2 and 3



## Highway 407 ETR Travel Characteristics

Use of 407 ETR continues to grow, as shown in Figures 4 and 5. There has been a steady increase in the vehicle kilometres traveled on the highway and in the number of workday trips. Indeed, traffic demand has been found to be inelastic to increases in toll rates. Between 2002, when the full 108 km of highway was opened and 2007, there was 25% increase in vehicle kilometres travelled and 21% increase in average weekday traffic.

**Figure 4 Vehicle Kilometres Travelled (Historical)**



407 ETR recorded 112.5 million trips on the highway in 2007, an increase of 5.7 million trips compared to the same period in 2006. The growth can be attributed to congested conditions along part of competing routes coupled with the recent addition of 102 kilometres of new lanes in the in 2006-2007 to improve Highway 407 ETR capacity and reduce traffic congestion.<sup>(9)</sup>



There is a direct correlation between enhancement of the highway and growth in travel. Since, Highway 407 was privatized, there has been a significant addition of capacity for this corridor. Besides the east partial extension (60 lane kilometres) & west extension (150 lane kilometres), the construction of which were part of the sale agreement, 407 ETR invested \$272 Million in widening the highway and constructing interchanges and widening bridges structures in response to contractual obligations. Also, additional 133 lane kilometres were added to the highway since 2003. In total, 343 lane kilometres were added since the privatization initiative.

**Figure 5 Work Day Trips (Historical)**

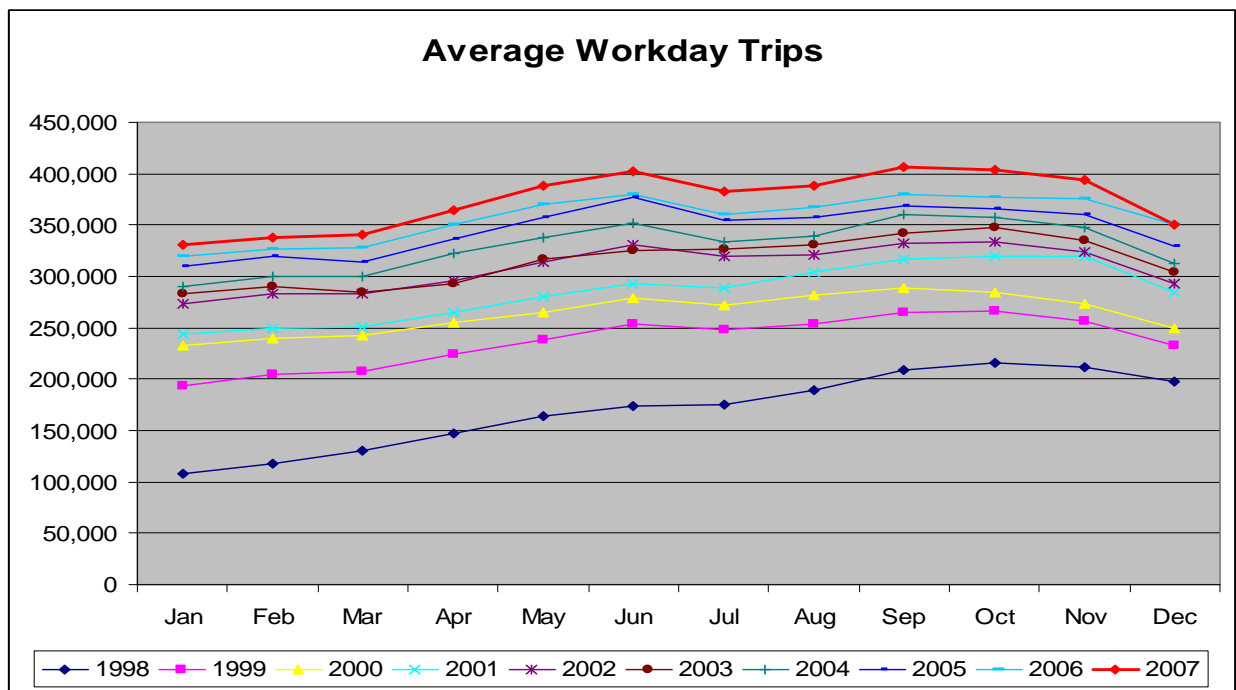
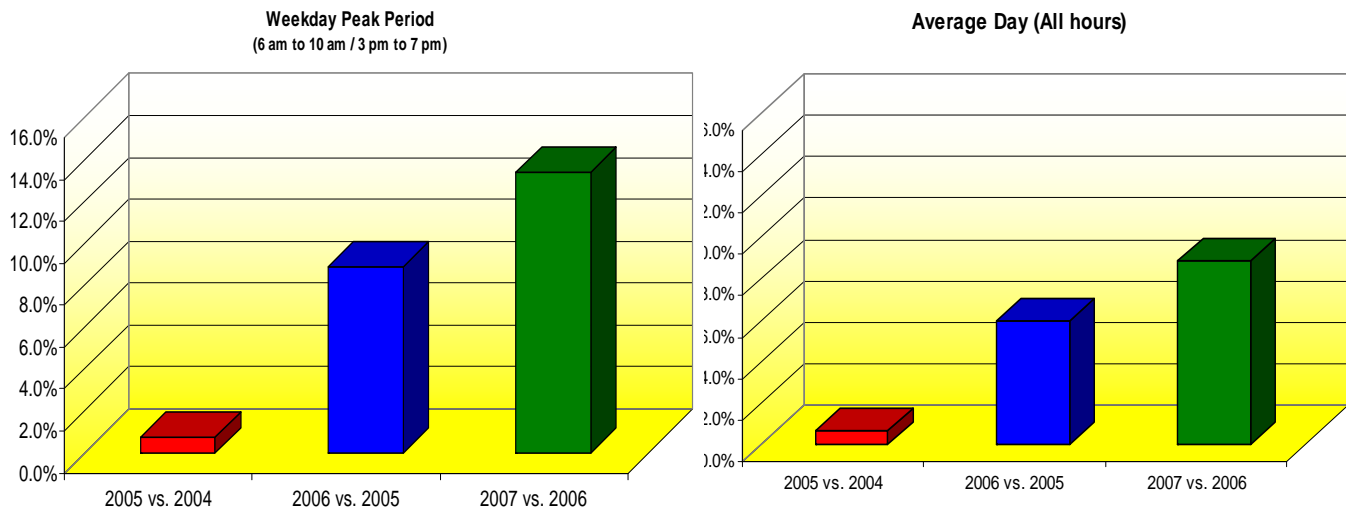


Figure 6 illustrates the rate in change for VKT year over year since 2004. The annual increase in VKT for the period of 2006 to 2007 is significant reflecting the impact of lane widening between Highways 400 and 404, one of the most heavily travelled part of the central section, which was completed in September 2006.

**Figure 6 Year Over Year VKT Growth (Highway 400 to Highway 404)**



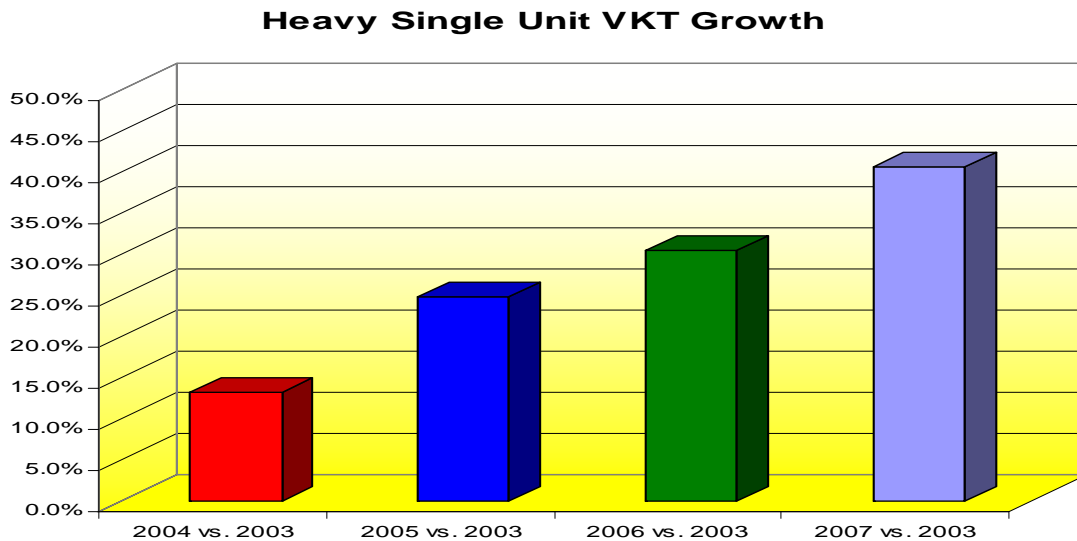
### Trucks Utilization of 407 ETR

There is considerable utilization of the highway by straight trucks engaged in trips along the corridor. These vehicles (e.g., couriers) are attracted to the highway because of its enabling ability to complete more trips in during a day, saving both time and money to their owners, as well as making their products more price-competitive. There is an environmental benefit to this as well. By operating at a higher and more constant level of speed on the highway rather than on a parallel arterial road, there is less pollution (noise and air) and less conflict with local traffic and public transit (who compete for the same curb lane) as well as less equipment degradation (brakes, transmission, etc.) and replacement.

Straight trucks constitute a large percentage of all vehicle kilometres travelled by trucks along 407 ETR. Indeed, the recent rate of growth in vehicle kilometres travelled for this truck class has been comparable or greater than for personal automobiles. Figure 7 illustrates the growth in VKT for the Heavy Single Unit (HSU) since 2003, with an approximately 40% cumulative increase over the latest 4 years. The rate of growth can be attributed to superior and predictable travel speeds that can be attained along the highway – necessary for just-in-time deliveries, as well as the lag in improvements to ‘free’ arterial roads, which first require the collection of lot levies from development before they can proceed.

Insofar as trucks are responsible for a greater amount of pavement damage, as well as spot congestion based on their size and operating characteristics, toll charges applied to them are a reflection of their negative economic and environmental externalities.

**Figure 7: Heavy Single Unit VKT Growth**



The current toll rate is 19.25 cents/Km for the standard vehicles (cars) during the peak and 18.00 cents/Km during the off-peak. Heavy Single Unit trucks are charged twice the rate of cars and Heavy Multiple Unit trucks are charged three times the car rate. There are additional charges applied but they vary depending on whether the user has a transponder or not. (The monthly account fee and video charge for cars without a transponder are \$ 2.55 and \$ 3.60 per trip respectively)

In some jurisdictions achieving greater transportation sustainability is carried a further step. For example in London England, further polluter pay charges are applied to expensive, inefficient vehicles. Older diesel-engine lorries, coaches and other heavy vehicles must pay up to £200 per day to enter a Low Emission Zone covering most of London.<sup>(10)</sup>

Longer distance combination vehicles (i.e., tractor-trailer units) have long been known to be more sensitive to tolls and toll rate increases, given that many of those drivers are compensated on the basis of distance travelled or by trip rather than time. For example, toll increases on the Ohio Turnpike during the late 1990's resulted in a 43% decrease in the number of trucks using the facility in just three years.<sup>(11)</sup>

The toll rates for the highway have been the subject of some debate. It is possible to traverse the entire length of the nearest other major toll road known to Greater Toronto Area residents, the 798-kilometre New York State Thruway for about US\$17, US\$14 using EZ-Pass. By contrast, while the cost to traverse the 108 km 407 ETR is \$20.50 CDN during the peak and \$ 19.30 CDN during the off-peak (for the cars), with an administration fee of \$ 6.15 CDN without a transponder. However, the Thruway is an intercity highway with toll and travel plazas, not an urban one, in particular an open road facility with electronic tolling gantries like the 407 ETR.

Toll rates during peak hours along similar highways in Australia (e.g., Westlink), Mexico (e.g., Entronque Reforma) and the United States (e.g., SR 91, Chicago Skyway, Foothills) are comparable or more expensive, while some others are less expensive (e.g., Dulles Greenway). Thus, one can conclude that it is largely a function of local circumstances, differing user value of time assessments, the degree of application of costly tolling technology, and how the concession was arranged.

Most toll highways do not differentiate between peak and off-peak periods. The A-1 Lille-Paris France highway does, charging a 25 per cent premium during peak hours and a 25 per cent reduction during low-traffic hours.<sup>(12)</sup> The weekday toll rates for SR-91 HOT lanes in California are dynamic and vary considerably throughout the day. Off-peak rates range from \$1.20 to \$4.55 USD, while peak rates range from \$1.90 and \$4.20 (peak direction) to \$10.00 USD.<sup>(13)</sup>

### **Inter-City Commuter Buses Utilization of 407 ETR**

Planners and designers have identified the need and have been protecting for an interregional Transitway paralleling Highway 407 between Burlington and the Highway 35/115 interchange. The Transitway is 150 km in length with 59 stations that include parking and access connections. It is planned to operate as a high-speed fully grade separated transportation facility on a separate right-of-way paralleling Highway 407. Initially it will be a two lane busway with possible future conversion to LRT technology. The 407 Transitway is identified as a key component of the transit strategy for the GTA. It will help assist in supporting broader environmental and transportation goals to achieve sustainability by providing network and gateway transit connections and rapid transit priority service along the corridor.

The 407 Transitway corridor functions support the growth plan for the Greater Golden Horseshoe, provide a key link in the inter-regional transit network in the GTA by connecting with GO commuter rail, commuter bus and bus rapid transit lines, subway lines, carpool lots and other inter-regional transit services and enhance opportunities for integration with other transit facilities and services such as urban transit, surface transit services, commuter parking and HOV facilities.

While work is proceeding with respect to Transitway planning in the protected corridor parallel to the 407 ETR, it will be a staged implementation, with the 68 km central section with 31 stations/stops having a prominent role. Currently, an Environmental Assessment for a 23 km portion of the central section is underway. As a consequence, the tolled highway will still have a prominent role for years to come as a feeder to the Transitway with auto users parking at Transitway stations and using the constructed section. This will continue to help reduce smog and greenhouse gas emissions, providing superior transit service.

With profound increases in suburb-to-suburb commuter movements, and growth in the scale and use of suburban employment attractors/generators, such as colleges/universities and regional shopping malls, there has been improvement in the viability of inter-regional transit service routes, particularly given the superior service (i.e., speed and time trip profiles and trip reliability) offered by use of Highway 407. GO Transit carries some 10,000 passengers a day (2008) on the 407 from 9 bus routes.

Indeed, GO Transit recently purchased 12 double-decker buses to use along Highways 403 and 407 ETR to help address this increase in growth. This type of bus carries 78 passengers, a 37% increase in carrying capacity. <sup>(14)</sup>

## **Concession and Ground Lease Agreement**

### **Tolling Mechanism, Congestion Relief and Expansion Requirements**

The Concession and Ground Lease Agreement (CGLA) between the Province and 407 ETR includes a schedule for tolling, congestion relief and expansion requirements (TCREA). The purpose of the TCREA is to establish a mechanism to manage tolls and expansion requirements. It establishes a toll threshold model up to which any toll rate can be charged while ensuring that Highway 407 carries its fair share of traffic during peak periods.

The highway must meet certain traffic targets as set in the agreement, which is aimed at relieving traffic congestion on major routes. To do this, it must provide open access to all vehicles and provide access on reasonable terms to trucks. Tolls and fees for trucks are not to exceed the prescribed thresholds and tolls charged during the off-peak hour should be less than tolls charged during the peak hour.

The TCREA's pre-defined trigger test applies to all links by direction of travel on the business days. If 407 ETR is not in compliance with the Agreement, it will have to make a congestion payment to the Province to compensate for not meeting the traffic thresholds as per the agreement. To date, only once was a nominal payment required and made by 407 ETR to the Province.

The TCREA also included threshold for expansion requirements of the highway. Expansion is triggered when more than 1700 vehicle per lane per hour are observed on 125 or more 'peak hour' occasions. The Segment that contains the Link with the highest Lane Flow Rate is designated as the expandable segment. 407 ETR is compelled to widen the designated segment for expansion by at least a single core lane and complete such widening within two years. If in any year, two segments are designated for expansion, 407 ETR is not obliged to designate an Expandable Segment in the following calendar year.

As a part of the Lease Agreement (CGLA), 407 ETR was obligated to extend the highway in both directions: the east partial extension of a length of 15 km with 4 lanes cross section and the west extension of a length of 25 km with 6 lanes cross section. These extensions added 210 Lane Kilometers to our highway network in GTA.

The Concessionaire has also, with the support of the government, enhanced the highway over and above the requirements in order to provide un-congested conditions. Since 2003 when the highway was fully extended and opened, additional 133 lane-kilometers was completed by 407 ETR at a cost \$272 million for widening and construction of interchanges and bridges as a result of the agreement's conditions.

Through the contractual obligations in CGLA, the Province ensures that Highway 407 has met the government's expectations for delivering infrastructure in a timely fashion, providing congestion relief and assisting in achieving sustainable transportation.

### **Highway 407's Contribution to Sustainable Transportation**

Highway 407, as a tolled highway, contributes to sustainable transportation in the Greater Toronto Area in a number of ways. Firstly, by its very presence it has provided additional transportation choice for personal and commercial vehicles along the corridor, improving the speed and reliability of trips during the peak hour. Some longer distance trips have been shifted from local arterial roads and regional freeways to the highway, providing a degree of congestion relief to those facilities. The amount to which this is so is difficult to ascertain given the significant growth in GTA and specifically land use development in the vicinity of the highway.

Further, an additional 343 lane-kilometers were added to the 407 corridor since the privatization of the highway in 1999. This addition of lane-kilometers to the GTA highway network would have taken longer to construct using traditional funding mechanisms afforded to the government. Privatization of the highway also precluded the government from annual maintenance and operational costs.

Second, travel along 407 ETR itself is at acceptable level of service (uncongested) compared to its alternatives, and at the posted speed limit during most of the peak hours, with a commensurate impact on fuel consumed and greenhouse gas emissions vis-à-vis its more congested alternatives.

Third, an open road tolled facility such as Highway 407 has a number of significant sustainability attributes. There are no space extensive land plazas, no speed reduction, acceleration or vehicle idling required to approach/leave toll payment booths, and there is no need to pre-pay to use the facility providing convenience and time savings to users and less environmental impacts (wear and tear on cars, fuel wastage).

Fourth, a key benefit of road pricing generally is that it can be used to achieve numerous policy objectives, such as funding the construction and/or operations of infrastructure and replacing or reducing general taxation as a means for financing infrastructure with a system based on direct user-pay. The initial financial model for the 407 (Design Build Operate and Maintain) was successful insofar as it instituted the user-pay principle for new infrastructure, leveraged private sector investment, delivered a quality facility at a lower cost, in a shorter time frame and transferred the risk of financing, design, construction and maintenance.

The subsequent financial model (Privatization) was also successful since additional transportation capacity was provided at private sector risk and expense, the highway provided a measure of congestion relief with an ever-increasing amount of traffic carried, and needs of the customers were being met.

An added benefit of private sector investment is that it has provided the provincial government with financial flexibility. Private sector funding for highway expansion and upgrades enables the province to otherwise redirect highway funding from Highway 407 towards other worthwhile endeavors. While not directly related, it is instructive to note that the provincial government has made significant commitments to enhancing public transit.

The tolled highway recently completed a two-year project to add 100 kilometers of new lanes with a cost approximately \$180 Million, increasing traffic capacity by 33% along the busiest section of the highway. In addition to the construction cost, 407 ETR operating costs including systems, customer, highway operation costs and administrative expenses last year (2007) was in the order of 111.3 Million.<sup>(15)</sup>

Fifth, It has been argued by organizations such as the Reason Institute that private tollway consortia and privately-operated highways themselves are superior to a government toll authority because of their ability to tap into two additional pools of capital: taxable debt and equity, as well as their fiscal prudence, particularly with respect to toll setting – aiding in their ability to address their full costs and risk reward.

The toll rates for 407 are market driven, whereas the Reason Institute found that there is a considerable political interference in toll setting in US public toll authorities. In the 407 situation for example, Go Transit is just another customer with no special status.

Sixth, the tolled highway has influenced travel behavior along the corridor. While it appears that there is an inelastic relationship between toll rates and usage of Highway 407, higher toll rates certainly encourage drivers of single occupant vehicles to seek cheaper alternatives such as carpooling and public transit. The aforementioned growth in intercity bus patronage along Highway 407 is one example of such. It is also known that inter-regional bus service along a parallel arterial road has shown improvement as well. It is possible, but there is insufficient evidence, to conclude that it has reduced the number of discretionary trips or induced a mode shift or greater carpooling.

Seventh, gas taxes and vehicle fees that are traditionally used to fund roads are flat taxes. 407 ETR serves a particular travel niche in the same way that commuter rail works best for primarily for downtown-oriented trips. It's a part of a complex travel network. Some users will always place a higher premium on time and will be willing to pay for that privilege. This is why commuter rail is preferred by many to traveling along two local transit systems in order to reach the downtown core. The same applies for use of a highway or electric power during peak hours or express intercity bus service as well. What 407 ETR as an open road tolled also does is provide an open access to those that can benefit and afford it on an occasional basis, in the same way that a cash alternative is provided for occasional users of tolled facilities in the United States; purchase of a transponder is not a prerequisite for its use.



## Summary

There is a continuous need in Ontario to build, expand, and renew road and public transit infrastructure in order to facilitate economic growth and address rising congestion. All levels of government in the GTA recognize that there is no single approach to deal with congestion, and have attempted to address it through a variety of initiatives.

Value pricing infrastructure through public-private partnerships has long been one of the worldwide means to address demand for roads. Ontario has a road pricing experience with its first open road all electronic toll highway – 407 ETR, which was also the world's first such highway.

Road pricing/Tolling is a tool that can be used to fund new road infrastructure, manage congestion, and support public transit but by itself is not a solution to the infrastructure and congestion challenges. Rather, road tolling is part of a transportation strategy that would include other congestion management measures (e.g., High Occupancy Vehicles lanes), improved transit options, and long-term road network and land-use planning.

A key benefit of road pricing and tolling is that it can be used to achieve numerous economic and environmental policy objectives, such as:

- Funding the construction and/or operations of road and transit infrastructure;
- Replacing or reducing general taxation as a means for financing infrastructure with a system based on direct user-pay
  - This enables the province to otherwise redirect highway funding towards public transit initiatives supporting more sustainable transportation or other worthy public sector initiatives.
- Managing travel demand; and
- Accounting for the external costs of travel (e.g., environmental impacts).

Highway 407 has met the government's expectations for delivering infrastructure in a timely fashion, providing congestion relief and assisting in helping achieve more sustainable transportation:

- It proved that the concept of value pricing would be accepted by the public and that open road, all electronic toll highway would provide operational and environmental benefits.
- The structure of the contract provides the delivery and maintenance of a safe and efficient highway at a lower cost and in a shorter time frame, supports congestion relief and ties the tolling mechanism and traffic levels with provisions for expansion requirements. The highway has been enhanced on several occasions providing travel benefits along the highway itself and environmental benefits by operating at a higher and more constant level of speed causing less pollution

(noise and air) and less conflict with local traffic and public transit (who compete for the same curb lane) as well as less equipment degradation (brakes, transmission, etc.) and replacement.

- The tolled highway has influenced travel behavior. When drivers pay directly for their use of the road, they limit their use of the road and see the benefit and savings when they do not use their cars and encourage. This in turn encourages people to make sustainable choices for travel modes, improving the efficiency of the highway and the prospects of alternative modes. Indeed, inter-city transit service use has increased along the highway 407.
- When Highway 407 was first envisioned, planners and designers identified the need and have been protecting for an interregional transitway paralleling Highway 407 between Burlington and the Highway 35/115 interchange. The 407 Transitway is identified as a key component of the transit strategy for the GTA. It will help assist in supporting broader environmental and transportation goals to achieve sustainability by providing network and gateway transit connections and rapid transit priority service along the corridor.
  
- Having the private sector assume financial risks for the facility ensures that toll rates strike an appropriate balance between maximizing revenue and optimizing road network flow limits and lessens subsidization of toll highway users. Even transit vehicles (Go Transit) are not discounted.
- The provincial government was provided with the financial flexibility if it so chooses to otherwise redirect highway funding from Highway 407 towards other sustainable transportation initiatives.

In summary, Highway 407, through its operational and contractual obligations forms a key part of a sustainable transportation plan for the GTA. Highway 407 provides congestion relief for other highways in the region and has provided a stimulus for further suburban economic development, by supplying high quality transportation capacity to the network, assisting in supporting sustainable transportation for the GTA.

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## **Acknowledgement**

The authors wish to acknowledge the contribution of Imad Nassereddine, P.Eng., Chief Traffic Operations Officer, 407 ETR Concession Company Limited for traffic information on Highway 407.

## **Disclaimer**

The opinions expressed in this paper are solely those of the authors and do not reflect the position or policies of the Ontario Ministry of Transportation.