APPENDIX 7:

Post-Construction Congestion Cost Calculation
City of Toronto, February 2014

From a 2008 study by HDR Corporation on behalf of Metrolinx (Costs of Road Congestion in the Greater Toronto and Hamilton Area: Impact and Cost Benefit Analysis of the Metrolinx Draft Regional Transportation Plan, Final Report, December 1, 2008, HDR Corporation), it has been widely published that the "cost of congestion" in the GTHA is $6 billion annually (based on travel figures in 2006). This "cost of congestion" which has often been referred to as "lost productivity", is comprised of two components: the cost borne by commuters annually (estimated to be $3.3 billion) and the annual cost to the economy (estimated to be $2.7 billion). HDR forecasts this figure to rise from $6 billion in 2006 to $15 billion per year by 2031 in the absence of any major transportation system improvements.

The HDR study defines the congestion cost to commuters as the difference between the cost to commuters travelling in the peak hours versus the cost to commuters travelling in free flow conditions. In other words, it is not the total cost of travel, but the relative travel costs under various conditions and scenarios. Therefore, for the purpose of this EA Study, a comparative analysis was undertaken using the methodology in the HDR study to determine whether there is a discernible difference in the "cost of congestion" amongst the four options. As applied to the Gardiner East EA, results indicate little difference in congestion cost among EA options.

The cost of congestion to commuters in the GTHA, as noted above, was estimated to be $3.3 billion of which approximately $1.4 billion (42%) was estimated to occur in the City of Toronto. These figures also include the delay to transit users, so when factoring out these transit delays the costs of congestion to auto commuters in the GTHA and Toronto are $3.0 billion and $1.2 billion (40%) respectively. This cost of congestion to auto commuters, as outlined in the HDR study, was assumed to consist of the following elements:

- **Delay Cost**

Longer travel times result in a cost to motorists in the form of the value placed on this excess time spent travelling. This is referred to as an "opportunity cost" which is equivalent to the value of activities foregone. The added unpredictability of travel times is included in this cost.

- **Increased Vehicle Operating Costs**

Vehicle operating costs increase in congested traffic conditions due to the stop-and-go nature of travel; additionally, the higher traffic volumes represent operating costs in excess of the socially optimal level.

- **Excess Vehicle Emissions Externality Costs**

As with operating costs, vehicle emissions increase with congestion due to the stop-and-go driving conditions, and the total amount of emissions is inefficiently high due to the excess traffic volume.

- **Excess Accident Externality Costs**

Congested traffic conditions result in a higher accident rate, which translate into additional cost to auto users.

At an overview level, the City of Toronto a.m. peak period vehicle kilometres of travel (vkt) on all roads was estimated to be 9.3 million in 2006. This represents approximately 30% of the vkt in the GTHA during a.m. peak period. During this same period, the Gardiner East vkt is currently approximately 50,000 during the a.m. peak period which represents approximately 0.5% of the a.m. peak period vehicular travel in the City.

In 2031, according to the HDR report, the vkt in Toronto is expected to decrease to 8.4 million with the implementation of the transit improvements included in the Metrolinx draft Regional Transportation Plan. This vkt total represents approximately 23% of the total GTHA vkt as significant growth and auto travel occur in the surrounding regions.

With these assumptions, the estimated "cost of congestion" to auto commuters is summarized below:

Cost Component	Excess Cost due to Congestion ($M per year)						
	GTHA		City of Toronto		Gardiner East Study Area		
	2006	2031	2006	2031	2006	2031 Maintain	2031 Remove
Time Cost for auto users	$2,245	$5,231	$988	$2,218	$5.3	$11.9	$11.7
Vehicle Operating Costs	$479	$1,116	$136	$317	$0.7	$1.7	$1.7
Cost of Accidents	$256	$596	$73	$170	$0.4	$0.9	$0.9
Cost of Vehicle Emissions	$29	$68	$8	$19	$0	$0.1	$0.1
Total	**$3,009**	**$7,011**	**$1,205**	**$2,808**	**$6.5**	**$14.6**	**$14.4**

The figures in the table above indicate that the cost of congestion to auto commuters in the Gardiner East study area is approximately $6.5 million annually. With the growth in auto demand to 2031, the expected cost of congestion is estimated to increase to $14.6 million annually in the study area with the Maintain option. Results would be similar for

Improve and Replace, since they all retain the elevated Gardiner. With the Remove option, the cost of congestion for those commuters who continue to use auto will decrease slightly to $14.4 million annually for the Gardiner East study area. It is important to note, however, that this is not an indication of reduced traffic congestion in the area with the Remove option. Congestion will increase with the removal of the east section of the Gardiner. Instead, it is a reflection of the reduced vkt in the study area due to the required diversion of trips from auto to other modes, travel times or alternative routes.

It is also important to note that the methodology used by Metrolinx to assess the cost of congestion is appropriate on a system-wide basis for a large area. The methodology is not intended to assess the cost of congestion for a specific facility. This methodology, however, was used strictly for comparative purposes to assess the relative merits of each option from a congestion cost perspective.