Sugar, Alissa(ENE)

From: Callan, Dennis [DCallan@mrc.ca]
Sent: September 11, 2009 10:04 AM
To: Sugar, Alissa(ENE)
Cc: Bricks, Mike; Lam Watt, Dana; Mike.Lepage@rwdi.com; Scott Shayko; James O'Mara; Colleen Bell
Subject: GO Georgetown S. EPR _ Assumptions behind GHG calculations
Importance: High
Attachments: GSSE displaced emissions -- Original Analysis.pdf; GSSE displaced emissions -- UPRL.pdf; Summary Assumptions for EPR GHG Emissions .doc; Locomotive emmission factors summary table.xlsx

Alissa

Attached please find the data requested concerning the assumptions behind the GHG calculations in section 6.2.4.3 of the EPR. While some of the assumptions behind this are indicated on page 387 of Section 6.2.4, I have attached a consolidated summary of the main assumptions. In addition the full analysis is attached indicated by "original analysis" in the file heading. There is also a spreadsheet related to the locomotive emission factors. These calculations were prepared by RWDI for us.

GHG emissions calculations related the Union Pearson Rail Link were not in the EPR but are included here ("UPRL" is in the file title) for your further reference.

Please feel free to call me if you require any clarification.

Regards
Dennis

Dennis Callan, P.Eng., Manager, Planning & Transportation Services
McCormick Rankin Corporation | A member of MMM Group
2655 North Sheridan Way | Mississauga ON L5K 2P8
MRC: 905.823.8500 Direct: 905.829.6235|F: 905.823.8503|Cell: 647.280.6073

Trip Distance	30	km
Trips/Day	184	
Passenger trips/day	349600	
Days/year	260	

GO Transit

Power	5000	bhp	
Fuel Consumption	20.8	bhp-hr/Us gal	5.50 bhp-hr/litre
Vehicle Speed	76	km/hr	
Passengers	1900	people/vehicle	
CO2e	2.7	kg/litre	0.49 kg/bhp-hr
CO	1.5	g/bhp-hr	
NOX	5.50	g/bhp-hr	
PM	0.19	g/bhp-hr	
HC	0.3	g/bhp-hr	
CO2e	32	kg/km	
CO	99	g/km	
NOX	362	g/km	
PM	13	g/km	
HC	20	g/km	
CO2e	0.51	kg/passenger trip	
CO	1.56	g/passenger trip	
NOX	5.71	g/passenger trip	
PM	0.20	g/passenger trip	
HC	0.31	g/passenger trip	
CO2e	**46**	kilotonnes/year	
CO	**142**	Tonnes/year	
NOX	**519**	Tonnes/year	
PM	**18**	Tonnes/year	
HC	**28**	Tonnes/year	

Light Duty Passenger Vehicles (gasoline)

Fuel consumption	8	L/100 km *small cars*
	11	L/100 km *large cars*
Vehicle mix	57%	small cars
Ave. fuel consumption	9.3	L/100 km
Vehicle Speed	50	km/hr
Passengers	1.1	people/vehicle
CO2e	2.4	kg/litre
CO	6.5	g/mile
NOX	0.39	g/mile
PM	0.033	g/mile
HC	0.24	g/mile
CO2e	0.22	kg/km
CO	4.04	g/km
NOX	0.24	g/km
PM	0.02	g/km
HC	0.15	g/km
CO2e	6.08	kg/passenger trip
CO	110.18	g/passenger trip
NOX	6.61	g/passenger trip
PM	0.56	g/passenger trip
HC	4.07	g/passenger trip
CO2e	**553**	kilotonnes/year
CO	**10015**	Tonnes/year
NOX	**601**	Tonnes/year
PM	**51**	Tonnes/year
HC	**370**	Tonnes/year

Trip Distance	30	km				
Trips/Day	140					
Passenger trips/day	7840					
Days/year	365					
UPRL Trains				**Light Duty Passenger Vehicles (gasoline)**		
Power	2000	bhp		Fuel consumption	8	L/100 km *small cars*
					11	L/100 km *large cars*
				Vehicle mix	57%	small cars
Fuel Consumption	20.8	bhp-hr/Us gal	5.50 bhp-hr/litre	Ave. fuel consumption	9.3	L/100 km
Vehicle Speed	76	km/hr		Vehicle Speed	50	km/hr
Passengers	56	people/vehicle		Passengers	1.1	people/vehicle
CO2e	2.7	kg/litre	0.49 kg/bhp-hr	CO2e	2.4	kg/litre
CO	1.5	g/bhp-hr		CO	6.5	g/mile
NOX	5.50	g/bhp-hr		NOX	0.39	g/mile
PM	0.1	g/bhp-hr		PM	0.033	g/mile
HC	0.3	g/bhp-hr		HC	0.24	g/mile
CO2e	13	kg/km		CO2e	0.22	kg/km
CO	39	g/km		CO	4.04	g/km
NOX	145	g/km		NOX	0.24	g/km
PM	3	g/km		PM	0.02	g/km
HC	8	g/km		HC	0.15	g/km
CO2e	6.93	kg/passenger trip		CO2e	6.08	kg/passenger trip
CO	21.15	g/passenger trip		CO	110.18	g/passenger trip
NOX	77.54	g/passenger trip		NOX	6.61	g/passenger trip
PM	1.41	g/passenger trip		PM	0.56	g/passenger trip
HC	4.23	g/passenger trip		HC	4.07	g/passenger trip
			equivalent 30 km			
CO2e	**20**	kilotonnes/year	2.9E+06 car trips	CO2e	**17**	kilotonnes/year
CO	**61**	Tonnes/year	4.8E+05	CO	**315**	Tonnes/year
NOX	**222**	Tonnes/year	2.9E+07	NOX	**19**	Tonnes/year
PM	**4**	Tonnes/year	6.3E+06	PM	**2**	Tonnes/year
HC	**12**	Tonnes/year	2.6E+06	HC	**12**	Tonnes/year

Assumption for GHG Emission Estimates in the EPR

For Maximum Annual GHG Emission Calculation

1. Three types of passenger trains (VIA, GO, and UPRL) and two types of freight trains (CPR, and CNR) are considered for the analysis;
2. The number of trains per day for UPRL, VIA, CPR, and CNR are 140, 12, 21, and 4 respectively;
3. The numbers of Georgetown, Bolton, Milton, and Barrie GO trains per day are 109, 12, 88, and 86 respectively.
4. The number of operating days per year is considered 365 days
5. Please refer to the attached spreadsheet for emission factors

For Net Impacts of GHGs

1. Automobile emissions based on winter temperatures. Overestimates actual annual emissions.
2. Locomotive emissions based on full power. Overestimates actual emissions.
3. Criteria contaminant emissions for automobile based on anticipated emissions in 2024
4. CO2e emissions based on present day fuel consumption data (2006)
5. Trips per day based on average number of GO trips along the Georgetown South Corridor, Strachan to Highway 427, in the year 2024
6. Days per year based on 5 days/week of operation
7. Passengers per train based on load of 1900 riders
8. Assumed 1.1 passengers per automobile
9. Average trip length in the Georgetown corridor is 30 km. based on 2006 TTS data
10. Train speed based on average of 76 km/hr along Georgetown South Corridor, Strachan to Highway 427
11. Car speed was based on an average of 50 km/hr. Has a small effect on the criteria pollutant emissions. No effect on CO2e calculation.
12. Automobile fuel consumption based on national average for 2006, from NRCan. Mix of highway and city driving.

Note:. UPRL trains were not included in these calculations

Mobile Locomotive Emission Factors

Emission factors have been collected from the various sources listed below the table.

	CPR, CNR, VIA		GO	UPRL	
Pollutant	**Tier 0[1]**	**Tier 1[1]**	**Tier 2[1]**	**Tier 3[2]**	**Units**
Carbon Monoxide (CO)	5	2.2	1.5	1.5	g/bhp-hr
Nitrogen Oxides (NO_x)	9.5	7.4	5.5	5.5	g/bhp-hr
Total Particulate Matter (PM)	0.6	0.45	0.2	0.1	g/bhp-hr
Fine Particulate (PM_{10})	0.582	0.4365	0.194	0.097	g/bhp-hr
Inhalable Particulate ($PM_{2.5}$)	0.56454	0.423405	0.18818	0.09409	g/bhp-hr
Hydorcarbons (HC)	1	0.55	0.3	0.3	g/bhp-hr
Volatile Organic Compounds (VOC)	1.053	0.57915	0.3159	0.3159	g/bhp-hr
Formaldehyde[3]	0.0272	0.0272	0.0272	0.0272	g/bhp-hr
Acetaldehyde[3]	0.015	0.015	0.015	0.015	g/bhp-hr
1,3 Butadiene[4]	0.07	0.0385	0.021	0.021	g/bhp-hr
Benzene[4]	0.079	0.04345	0.0237	0.0237	g/bhp-hr
Acrolein[3]	0.0035	0.0035	0.0035	0.0035	g/bhp-hr
Benzo[a]Pyrene[6]	2.5608E-06	1.9206E-06	8.536E-07	4.268E-07	g/bhp-hr
Sulphur Dioxide (SO_2)[5]	0.00085	0.00085	0.00085	0.00085	kg/L
Carbon Dioxide (CO_2)[5]	2.663	2.663	2.663	2.663	kg/L
Nitrous Oxide (N_2O)[5]	0.0011	0.0011	0.0011	0.0011	kg/L
Methane (CH_4)[5]	0.00015	0.00015	0.00015	0.00015	kg/L

[1] Standard for original manufacture, taken from Section 1.2.2 of the US EPA's, "Regulatory Impact Analysis: Control of Emissions of Air Pollution from Locomotive Engines and Marine Compression Ignition Engines Less than 30 Liters Per Cylinder", May 2008.

[2] Taken page 37120 of the US EPA's, "Control of Emissions of Air Pollution From Locomotive Engines and Marine Compression-Ignition Engines Less Than 30 Liters per Cylinder; Republication; Final Rule", June 30, 2008.

[3] Taken from Pechan Report No: 07.10.001/9452.000, "COMPILATION OF DIESEL EMISSIONS SPECIATION DATA", October 2007.

[4] Based on speciation of VOCs from the EPA's Speciate 3.2 program.

[5] Taken from page ix of the Railway Association of Canada (RAC), Environment Canada (EC), Transport Canada (TC) and Pollution Probe document, "Locomotive Emissions Monitoring Program 2007", 2007.

[6] Taken from Table C4 of the U.S. EPA's, "DOCUMENTATION FOR AIRCRAFT, COMMERCIAL MARINE VESSEL, LOCOMOTIVE, AND OTHER NONROAD COMPONENTS OF THE NATIONAL EMISSIONS INVENTORY", September 30, 2005.

Frieght Train Volumes

2009 CPR Daily Train Volumes

The table below is a summary of average CPR movements along the Mactier Sub. For the purposes of this air quality assessment, the 'Total' column has been taken as the volumes that apply to the entire study corridor.

Data Year	Applicable Modelling Scenario	Time Period	CPR Movement Counts*		
			NW	SW	Total
2009	2024 no-build & 2024 build	24:00 - 06:00	3	3	**6**
		06:00 - 12:00	3	2	**5**
		12:00 - 18:00	2	3	**5**
		18:00 - 24:00	2	3	**5**
		Total Daily	10	11	**21**

*Data received via email from Mike Bricks on 13/02/2009 12:11 pm.

2009 CNR Train Volumes

The table below is a summary of average CNR movements along the study corridor. The 4 movements were assumed to be evenly distributed throughout the day.

Data Year	Applicable Modelling Scenario	Time Period	CNR Movement Counts**
2009	2024 no-build & 2024 build	24:00 - 06:00	1
		06:00 - 12:00	1
		12:00 - 18:00	1
		18:00 - 24:00	1
		Total Daily	4

**Data received via email from Dennis Callan on 27/02/2009 3:50 pm.

Appendix ##: Passenger Train Volumes - Raw Data

Raw data as provided by MRC. Projected volumes based on RTP data. Includes 10-car equivalent trains for both directions.
Timed relative to arrival/departure from Union Station.

				AM Peak				Midday	PM Peak				Evening
Data Year	Applicable Modelling Scenario	Corridor Segment (Approximate)	Carrier	5:30 6:29	6:30 7:29	7:30 8:29	8:30 9:29	9:30 15:29	15:30 16:29	16:30 17:29	17:30 18:29	18:30 19:29	19:30 1:29
2013	2024 No-build	HWY 427 - West Toronto Diamond	UPRL	0	0	0	0	0	0	0	0	0	0
			VIA	0	0	1	0	4	0	1	2	1	3
		(=Georgetown GO)	GO	0	3	3	3	12	2	3	2	2	12
			Total	0	3	4	3	16	2	4	4	3	15
		West Toronto Diamond - Lansdowne Ave.	UPRL	0	0	0	0	0	0	0	0	0	0
			VIA	0	0	1	0	4	0	1	2	1	3
		(=Georgetown + Milton GO)	GO	0	5	6	5	12	4	6	3	3	12
			Total	0	5	7	5	16	4	7	5	4	15
		Lansdowne Ave. - Strachan Ave.	UPRL	0	0	0	0	0	0	0	0	0	0
			VIA	0	0	1	0	4	0	1	2	1	3
		(=Georgetown + Milton + Barrie GO)	GO	0	6	8	6	18	5	8	4	3	14
			Total	0	6	9	6	22	5	9	6	4	17
2021	2024 Build	HWY 427 - Weston Rd.	UPRL	0	8	8	8	48	8	8	8	8	36
			VIA	0	0	1	0	4	0	1	2	1	3
		(=Georgetown GO)	GO	0	10	14	6	24	8	12	7	4	24
			Total	0	18	23	14	76	16	21	17	13	63
		Weston Rd. - Toronto West Diamond	UPRL	0	8	8	8	48	8	8	8	8	36
			VIA	0	0	1	0	4	0	1	2	1	3
		(=Georgetown + Bolton GO)	GO	0	11	18	7	24	9	15	8	5	24
			Total	0	19	27	15	76	17	24	18	14	63
		Toronto West Diamond - Lansdowne Ave.	UPRL	0	8	8	8	48	8	8	8	8	36
			VIA	0	0	1	0	4	0	1	2	1	3
		(=Georgetown + Bolton + Milton GO)	GO	0	16	27	12	48	14	22	13	9	48
			Total	0	24	36	20	100	22	31	23	18	87
		Lansdowne Ave. - Strachan Ave.	UPRL	0	8	8	8	48	8	8	8	8	36
			VIA	0	0	1	0	4	0	1	2	1	3
		(=Georgetown + Bolton + Milton + Barrie GO)	GO	0	21	36	16	72	18	29	18	13	72
			Total	0	29	45	24	124	26	38	28	22	111

Appendix ##: Passenger Train Volumes - 24 Hour Distributions

Data from MRC distributed over a 24 hour period. Projected volumes based on RTP data. Includes 10-car equivalent trains for both directions.
Timed relative to arrival/departure from Union Station.

Data Year	Applicable Modelling Scenario	Corridor Segment (Approximate)	Carrier	5:30 6:29	6:30 7:29	7:30 8:29	8:30 9:29	9:30 10:29	10:30 11:29	11:30 12:29	12:30 13:29	13:30 14:29	14:30 15:29	15:30 16:29	16:30 17:29	17:30 18:29	18:30 19:29	19:30 20:29	20:30 21:29	21:30 22:29	22:30 23:29	23:30 0:29	0:30 1:29	1:30 2:29	2:30 3:29	3:30 4:29	4:30 5:29	DAILY TOTAL
2013	2024 No-build	HWY 427 - West Toronto Diamond	UPRL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			VIA	0	0	1	0	0.67	0.67	0.67	0.67	0.67	0.67	0	1	2	1	0.5	0.5	0.5	0.5	0.5	0.5	0	0	0	0	12
		(=Georgetown GO)	GO	0	3	3	3	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	0	0	0	0	42
			Total	0	3	4	3	2.67	2.67	2.67	2.67	2.67	2.67	2	4	4	3	2.5	2.5	2.5	2.5	2.5	2.5	0	0	0	0	54
		West Toronto Diamond - Lansdowne Ave.	UPRL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			VIA	0	0	1	0	0.67	0.67	0.67	0.67	0.67	0.67	0	1	2	1	0.5	0.5	0.5	0.5	0.5	0.5	0	0	0	0	12
		(=Georgetown + Milton GO)	GO	0	5	6	5	2	2	2	2	2	2	4	6	3	3	2	2	2	2	2	2	0	0	0	0	56
			Total	0	5	7	5	2.67	2.67	2.67	2.67	2.67	2.67	4	7	5	4	2.5	2.5	2.5	2.5	2.5	2.5	0	0	0	0	68
		Lansdowne Ave. - Strachan Ave.	UPRL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			VIA	0	0	1	0	0.67	0.67	0.67	0.67	0.67	0.67	0	1	2	1	0.5	0.5	0.5	0.5	0.5	0.5	0	0	0	0	12
		(=Georgetown + Milton + Barrie GO)	GO	0	6	8	6	3	3	3	3	3	3	5	8	4	3	2.33	2.33	2.33	2.33	2.33	2.33	0	0	0	0	72
			Total	0	6	9	6	3.67	3.67	3.67	3.67	3.67	3.67	5	9	6	4	2.83	2.83	2.83	2.83	2.83	2.83	0	0	0	0	84
2021	2024 Build	HWY 427 - Weston Rd.	UPRL	0	8	8	8	8	8	8	8	8	8	8	8	8	8	6	6	6	6	6	6	0	0	0	0	140
			VIA	0	0	1	0	0.67	0.67	0.67	0.67	0.67	0.67	0	1	2	1	0.5	0.5	0.5	0.5	0.5	0.5	0	0	0	0	12
		(=Georgetown GO)	GO	0	10	14	6	4	4	4	4	4	4	8	12	7	4	4	4	4	4	4	4	0	0	0	0	109
			Total	0	18	23	14	12.67	12.67	12.67	12.67	12.67	12.67	16	21	17	13	10.5	10.5	10.5	10.5	10.5	10.5	0	0	0	0	261
		Weston Rd. - Toronto West Diamond	UPRL	0	8	8	8	8	8	8	8	8	8	8	8	8	8	6	6	6	6	6	6	0	0	0	0	140
			VIA	0	0	1	0	0.67	0.67	0.67	0.67	0.67	0.67	0	1	2	1	0.5	0.5	0.5	0.5	0.5	0.5	0	0	0	0	12
		(=Georgetown + Bolton GO)	GO	0	11	18	7	4	4	4	4	4	4	9	15	8	5	4	4	4	4	4	4	0	0	0	0	121
			Total	0	19	27	15	12.67	12.67	12.67	12.67	12.67	12.67	17	24	18	14	10.5	10.5	10.5	10.5	10.5	10.5	0	0	0	0	273
		Toronto West Diamond - Lansdowne Ave.	UPRL	0	8	8	8	8	8	8	8	8	8	8	8	8	8	6	6	6	6	6	6	0	0	0	0	140
			VIA	0	0	1	0	0.67	0.67	0.67	0.67	0.67	0.67	0	1	2	1	0.5	0.5	0.5	0.5	0.5	0.5	0	0	0	0	12
		(=Georgetown + Bolton + Milton GO)	GO	0	16	27	12	8	8	8	8	8	8	14	22	13	9	8	8	8	8	8	8	0	0	0	0	209
			Total	0	24	36	20	16.67	16.67	16.67	16.67	16.67	16.67	22	31	23	18	14.5	14.5	14.5	14.5	14.5	14.5	0	0	0	0	361
		Lansdowne Ave. - Strachan Ave.	UPRL	0	8	8	8	8	8	8	8	8	8	8	8	8	8	6	6	6	6	6	6	0	0	0	0	140
			VIA	0	0	1	0	0.67	0.67	0.67	0.67	0.67	0.67	0	1	2	1	0.5	0.5	0.5	0.5	0.5	0.5	0	0	0	0	12
		(=Georgetown + Bolton + Milton + Barrie GO)	GO	0	21	36	16	12	12	12	12	12	12	18	29	18	13	12	12	12	12	12	12	0	0	0	0	295
			Total	0	29	45	24	20.67	20.67	20.67	20.67	20.67	20.67	26	38	28	22	18.5	18.5	18.5	18.5	18.5	18.5	0	0	0	0	447

Appendix #1: Passenger Train Volumes - Shifted 24 Hour Distributions

Data from MRC distributed over a 24 hour period. Presented volumes based on RTP data. Includes 10-car equivalent trains for both directions.
Timed relative to arrival/departure from Union Station.

Data Year	Applicable Metrolinx Scenario	Corridor Segment Denominator	Context	1:00 to 2:00	2:00 to 3:00	3:00 to 4:00	4:00 to 5:00	5:00 to 6:00	6:00 to 7:00	7:00 to 8:00	8:00 to 9:00	9:00 to 10:00	10:00 to 11:00	11:00 to 12:00	12:00 to 13:00	13:00 to 14:00	14:00 to 15:00	15:00 to 16:00	16:00 to 17:00	17:00 to 18:00	18:00 to 19:00	19:00 to 20:00	20:00 to 21:00	21:00 to 22:00	22:00 to 23:00	23:00 to 24:00	Total
2013	2024 No-build	HWY 427 - West Toronto Diamond	UPX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			VIA	0	0	0	0.5	0.5	0.33	0.67	0.67	0.67	0.67	0.67	0.67	0.33	0.5	1.5	1.5	0.75	0.5	0.5	0.5	0.5	0.33	0	12
		(+Georgetown GO)	GO	3	3	3	2.5	3	3	2	2	2	3	3	3	3.5	3	3	2.5	3	3	2.5	2	2	1	0	54
			Total	3	3	3	3	3.83	3.67	2.67	2.67	2.67	3.67	3.67	3.67	3.33	3.5	4.5	4	3.75	3.5	3.5	3	2.5	1.33	0	66
		West Toronto Diamond - Lansdowne Ave.	UPX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			VIA	0	0	0.5	0.5	0.33	0.67	0.67	0.67	0.67	0.67	0.33	0.5	1.5	1.5	0.75	0.5	0.5	0.5	0.5	0.5	0.33	0	0	12
		(+Georgetown + Milton GO)	GO	6	7.5	7.5	7.5	7.5	3	3	3	3	3	3	3	4.5	3	3	4.5	3	3	3	3	3	1	0	96
			Total	6	7.5	8	8	7.83	3.67	3.67	3.67	3.67	3.67	3.33	4	6	4.5	3.75	3.5	4	3.5	3.5	3	3	1.33	0	108
		Lansdowne Ave. - Strachan Ave.	UPX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			VIA	0	0	0.5	0.5	0.33	0.67	0.67	0.67	0.67	0.67	0.33	0.5	1.5	1.5	0.75	0.5	0.5	0.5	0.5	0.5	0.33	0	0	12
		(+Georgetown + Milton + Barrie GO)	GO	6	7.5	7.5	7.5	7.5	3	3	3	3	3	3	3	4.5	3	3	4.5	3	3	3	3	3	1	0	96
			Total	6	7.5	8	8	7.83	3.67	3.67	3.67	3.67	3.67	3.33	4	6	4.5	3.75	3.5	4	3.5	3.5	3	3	1.33	0	108
2021	2024 Build	HWY 427 - Weston Rd.	UPX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			VIA	0	0	0.5	0.5	0.33	0.67	0.67	0.67	0.67	0.67	0.33	0.5	1.5	1.5	0.75	0.5	0.5	0.5	0.5	0.5	0.33	0	0	12
		(+Georgetown GO)	GO	6	7.5	11	10	7	4	4	4	4	4	4	6	10	9.5	9.5	6	4	4	4	4	2	0	0	129
			Total	6	7	10.5	10.5	11.33	12.67	12.67	12.67	12.67	12.67	12.67	14.33	18.5	17	15	11.75	10.5	10.5	10.5	10.5	5.33	0	0	261
		Weston Rd. - Toronto West Diamond	UPX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			VIA	0	0	0.5	0.5	0.33	0.67	0.67	0.67	0.67	0.67	0.33	0.5	1.5	1.5	0.75	0.5	0.5	0.5	0.5	0.5	0.33	0	0	12
		(+Georgetown + Bolton GO)	GO	6	9.5	11	11	11.83	12.67	12.67	12.67	12.67	12.67	14.83	18.5	11	16	12.25	10.5	10.5	10.5	10.5	10.5	5.33	0	0	279
			Total	6	9.5	11	11	11.83	12.67	12.67	12.67	12.67	12.67	14.83	18.5	11	16	12.25	10.5	10.5	10.5	10.5	10.5	5.33	0	0	279
		Toronto West Diamond - Lansdowne Ave.	UPX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			VIA	0	0	0.5	0.5	0.33	0.67	0.67	0.67	0.67	0.67	0.33	0.5	1.5	1.5	0.75	0.5	0.5	0.5	0.5	0.5	0.33	0	0	12
		(+Georgetown + Bolton + Milton GO)	GO	9	12	10	10	10.33	10.67	10.67	10.67	10.67	10.67	10.67	17.33	16.5	17	10.5	11.25	14.5	14.5	14.5	14.5	7.33	0	0	261
			Total	9	12	10	10	10.33	10.67	10.67	10.67	10.67	10.67	10.67	17.33	16.5	17	10.5	11.25	14.5	14.5	14.5	14.5	7.33	0	0	261
		Lansdowne Ave. - Strachan Ave	UPX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			VIA	0	0	0.5	0.5	0.33	0.67	0.67	0.67	0.67	0.67	0.33	0.5	1.5	1.5	0.75	0.5	0.5	0.5	0.5	0.5	0.33	0	0	12
		(+Georgetown + Bolton + Milton + Barrie GO)	GO	9	12	10	10	10.33	10.67	10.67	10.67	10.67	10.67	10.67	17.33	16.5	17	10.5	11.25	14.5	14.5	14.5	14.5	7.33	0	0	261
			Total	9	12	10	10	10.33	10.67	10.67	10.67	10.67	10.67	10.67	17.33	16.5	17	10.5	11.25	14.5	14.5	14.5	14.5	7.33	0	0	261

Data Year	Applicable Metrolinx Scenario	Corridor Segment Denominator	Context	0:00 to 1:00	1:00 to 2:00	2:00 to 3:00	3:00 to 4:00	4:00 to 5:00	5:00 to 6:00	6:00 to 7:00	7:00 to 8:00	8:00 to 9:00	9:00 to 10:00	10:00 to 11:00	11:00 to 12:00	12:00 to 13:00	13:00 to 14:00	14:00 to 15:00	15:00 to 16:00	16:00 to 17:00	17:00 to 18:00	18:00 to 19:00	19:00 to 20:00	20:00 to 21:00	21:00 to 22:00	22:00 to 23:00	23:00 to 24:00	Total
2013	2024 No-build	HWY 427 - West Toronto Diamond	UPX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			VIA	0.5	0.33	0	0	0	0	0	0.5	0.5	0.33	0.67	0.67	0.67	0.67	0.67	0.67	0.33	0.5	1.5	1.5	0.75	0.5	0.5	12
		(+Georgetown GO)	GO	3	3	0	0	0	0	3.5	3	3	2.5	3	3	3	3	3	3	3	3	2.5	2	2	1.33	3	54
			Total	3.5	3.33	0	0	0	0	3.5	3.5	3.5	2.83	3.67	3.67	3.67	3.67	3.67	3.67	3.33	3.5	4	3.5	2.75	2.5	3.5	66
		West Toronto Diamond - Lansdowne Ave.	UPX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			VIA	0.5	0.33	0	0	0	0	0	0.5	0.5	0.33	0.67	0.67	0.67	0.67	0.67	0.67	0.33	0.5	1.5	1.5	0.75	0.5	0.5	12
		(+Georgetown + Milton GO)	GO	3	3	0	0	0	0	3.5	3	3	2.5	3	3	3	3	3	3	3	3	2.5	2	2	1.33	3	54
			Total	3.5	3.33	0	0	0	0	3.5	3.5	3.5	2.83	3.67	3.67	3.67	3.67	3.67	3.67	3.33	3.5	4	3.5	2.75	2.5	3.5	66
		Lansdowne Ave. - Strachan Ave.	UPX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			VIA	0.5	0.25	0	0	0	0	0	0.5	0.5	0.33	0.67	0.67	0.67	0.67	0.67	0.67	0.33	0.5	1.5	1.5	0.75	0.5	0.5	12
		(+Georgetown + Milton + Barrie GO)	GO	2.33	1.17	0	0	0	0	1	7	7	6.5	1	3	3	3	3	6	6.5	6	4.5	3	2.33	1.33	6	84
			Total	2.83	1.42	0	0	0	0	1	7.5	7.5	6.83	1.67	3.67	3.67	3.67	3.67	6.67	6.83	6.5	6	4.5	3	1.67	2.33	96
2021	2024 Build	HWY 427 - Weston Rd.	UPX	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			VIA	0.5	0.25	0	0	0	0	0	0.5	0.5	0.33	0.67	0.67	0.67	0.67	0.67	0.67	0.33	0.5	1.5	1.5	0.75	0.5	0.5	12
		(+Georgetown GO)	GO	4	2	0	0	0	0	1	12	10	5	4	4	4	4	4	6	12	9.5	5.5	4	4	4	4	129
			Total	4.5	2.25	0	0	0	0	1	12.5	10.5	5.33	4.67	4.67	4.67	4.67	4.67	6.67	12.33	10	7	5.5	4.75	4.5	4.5	141
		Weston Rd. - Toronto West Diamond	UPX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			VIA	0.5	0.25	0	0	0	0	0	0.5	0.5	0.33	0.67	0.67	0.67	0.67	0.67	0.67	0.33	0.5	1.5	1.5	0.75	0.5	0.5	12
		(+Georgetown + Bolton GO)	GO	4	2	0	0	0	0	1	11.5	10.5	5	4	4	4	4	4	6	11	9.5	5.5	4	4	4	4	127
			Total	4.5	2.25	0	0	0	0	1	12	11	5.33	4.67	4.67	4.67	4.67	4.67	6.67	11.33	10	7	5.5	4.75	4.5	4.5	141
		Toronto West Diamond - Lansdowne Ave.	UPX	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			VIA	0.5	0.25	0	0	0	0	0	0.5	0.5	0.33	0.67	0.67	0.67	0.67	0.67	0.67	0.33	0.5	1.5	1.5	0.75	0.5	0.5	12
		(+Georgetown + Bolton + Milton GO)	GO	4	2	0	0	0	0	1	11.5	10.5	5	4	4	4	4	4	6	11	9.5	5.5	4	4	4	4	127
			Total	4.5	2.25	0	0	0	0	1	12	11	5.33	4.67	4.67	4.67	4.67	4.67	6.67	11.33	10	7	5.5	4.75	4.5	4.5	141
		Lansdowne Ave. - Strachan Ave	UPX	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			VIA	0.5	0.25	0	0	0	0	0	0.5	0.5	0.33	0.67	0.67	0.67	0.67	0.67	0.67	0.33	0.5	1.5	1.5	0.75	0.5	0.5	12
		(+Georgetown + Bolton + Milton + Barrie GO)	GO	4	2	0	0	0	0	1	12	10	5	4	4	4	4	4	6	12	9.5	5.5	4	4	4	4	129
			Total	4.5	2.25	0	0	0	0	1	12.5	10.5	5.33	4.67	4.67	4.67	4.67	4.67	6.67	12.33	10	7	5.5	4.75	4.5	4.5	141