



AECOM Canada Ltd.  
1000 – 5090 Explorer Drive  
Mississauga, ON L4W 4X6  
Canada

T: 905.238.0007  
aecom.com

**Project name:**  
Dundas BRT TPAP, PD & PDBC

**Project ref:**  
60645291

**From:**  
Mark Reitmeier

**Date:**  
April 9 2021

**To:**  
Kevin Phillips

**CC:**  
Andrew Barr  
David Rahikka  
Hossein Zarei

**DRAFT**

# Memo

**Subject:** Mississauga East Segment Pinch Point - Traffic Input

In support of the assessment of the Cooksville pinch point location in the Mississauga East Segment of the Dundas Street corridor, AECOM has conducted microsimulation modelling to test alternative designs and report on traffic and transit operations.

The analysis was conducted using the VISSIM model for the Mississauga Segment developed as part of the DundasConnects study. The 2041 BRT AM and PM peak model scenarios were used directly as the base models for this alternative testing exercise, with changes in auto and transit operations and volumes, road geometry, and traffic signal timing for each alternative being applied directly to the base model. It should be noted that the use of the DundasConnects VISSIM models for the Mississauga Segment was accepted by both Metrolinx and the City of Mississauga.

Cooksville pinch point analyses were conducted for the PM peak hour only, as this represents the more critical time period at the Dundas Street / Hurontario Street intersection. The following alternatives were assessed for the Cooksville pinch point:

## **Alternative 1: Full Median BRT About Centreline**

For this alternative, the BRT will operate exclusively along the median BRT lanes separated from mixed traffic. The proposed design does not deviate from the DundasConnects model.

## **Alternative 2: Two General Purpose Lane (GPL) Corridor with Full Median BRT**

For this alternative, the BRT will operate exclusively along the median BRT lanes separated from mixed traffic. The mixed traffic lanes are reduced to a single general-purpose lane in both directions. A portion of the traffic is assumed to be diverted to the ring road system. It is assumed that 50% of each of the EBL, EBR, WBL and WBR movements at the Hurontario Street intersection will make the turn upstream and utilize the ring road system (i.e., Confederation Parkway for EB vehicles and Kirwin Avenue for WB vehicles). The EBT and WBT volumes at the Hurontario Street intersection were further reduced by 30% to replicate the likely diversion of traffic away from this segment of Dundas Street altogether in the event of reduced capacity and resulting congestion. Signal timings were adjusted to provide increased left-turn green time at intersections to which additional turning volume was assigned.

## **Alternative 3: Full Median BRT with No Left-Turn from Dundas to Hurontario**

For this alternative, the lane configuration does not deviate significantly from the DundasConnects model, with the exception of the imposed bans on the EBL and WBL turns at Hurontario Street. The traffic for these movements is rerouted to the upstream intersections (i.e., Confederation Pkwy and Kirwin Ave, for EBL and WBL, respectively). At Confederation, the resulting EBL volume was significantly over available capacity and caused the intersection to fail. It was therefore assumed that 1/3 of the EBL volume at Hurontario Street be displaced further upstream (i.e., Mavis Rd) and 2/3 displaced to Confederation Pkwy in the event of banned left-turn movements at Hurontario Street. Signal timings were adjusted to provide increased left-turn green time at intersections to which additional turning volume was assigned.

## Alternative 4: Curbside Mixed-Use GPL and BRT Lanes

For this alternative, the full median BRT lane extends from the east of Kirwin Avenue and terminates on the west in between Sheppard Avenue and Jaguar Valley drive, transitioning to regular lanes. The lane configuration does not deviate significantly from the DundasConnects model with the traffic and storage lanes retained. Priority rules were coded to the model at transition points such that vehicles in the general-purpose lanes yield to incoming busses and allow them to merge.

## Alternative 5: Grade Separated

This alternative assumes a tunnel segment proposed through Cooksville with portals located east of Confederation Parkway and west of Kirwin/Camilla Avenue.

## Results

The Cooksville design alternatives were evaluated for both auto operations and BRT travel times.

Travel time results are presented in **Table 1**. BRT travel times are similar in Alternatives 1, 2 and 3 as they all use a separated median guideway running through the signalized intersections using TSP. Alternative 4, however, is expected to result in approximately 2 minutes of additional delay to BRT vehicles in each direction as they contend with operating in mixed traffic. Alternative 5 is expected to result in minor time savings to BRT run times as the busses avoid intersection delays at Hurontario Street (these are minor to begin with because of TSP).

**Table 1. Cooksville Travel Time Comparison (Minutes)**

Travel Time (minutes)	Alternative 1 - Dundas Connects		Alternative 2 - Single Lane		Alternative 3 - No Lefts		Alternative 4 - Mixed Traffic BRT		Alternative 5 - Grade Separated	
	Auto	Transit	Auto	Transit	Auto	Transit	Auto	Transit	Auto	Transit
<b>EB</b>										
(West of Parkerhill Road to East of Kirwin Avenue)	4.8	3.7	9.6	3.8	3.9	3.9	4.4	5.8	4.8	3.7
<b>WB</b>										
(East of Kirwin Avenue to West of Parkerhill Road)	5.4	4.8	10.9	4.8	6.3	4.7	7.6	6.9	5.4	4.4

Intersection operations results are shown in Table 3. Generally, Alternative 1 operates at capacity for most turning movements. Alternative 2 sees significantly constrained operations due to lowered lane capacity, resulting in a significant increase to overall intersection delays. Overall, auto travel times through the segment approximately doubled. Queuing is prevalent and, at times, extends to Mavis Road in the west and Cawthra Road in the east.

Alternative 3 sees an increase in EBL traffic at Confederation Parkway (displaced from Hurontario Street), and to mitigate these impacts, more green time was allocated to the left-turn. This subsequently degrades the WB operations as less green time is provided, and the overall auto travel time in the WB direction increases relative to Alternative 1. With no left-turns at Hurontario Street, the intersection operates at an acceptable LOS D.

Alternative 4 is expected to operate with similar auto operations to those observed in Alternative 1, however there are some increases in delay due to BRT busses stopping at BRT stops, as a result, blocking traffic.

Alternative 5 is expected to see similar operations as Alternative 1.

**Table 2. Cooksville Intersection Operations Comparison**

	Alternative 1 – Dundas Connects		Alternative 2 – Single Lane		Alternative 3 – No Lefts		Alternative 4 – Mixed-Traffic BRT		Alternative 5 – Grade Separated	
	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
<b>CONFEDERATION PARKWAY</b>										
Overall	<b>85</b>	<b>F</b>	<b>143</b>	<b>F</b>	<b>84</b>	<b>F</b>	<b>72</b>	<b>E</b>	<b>85</b>	<b>F</b>
EBL	142	F	230	F	193	F	90	F	142	F
EBT	68	E	154	F	49	D	59	E	68	E
EBR	61	E	133	F	47	D	59	E	61	E
WBL	125	F	435	F	141	F	162	F	125	F
WBT	57	E	78	E	76	E	65	E	57	E
WBR	54	D	76	E	72	E	61	E	54	D
<b>HURONTARIO STREET</b>										
Overall	<b>74</b>	<b>E</b>	<b>83</b>	<b>F</b>	<b>52</b>	<b>D</b>	<b>80</b>	<b>E</b>	<b>74</b>	<b>E</b>
EBL	61	E	92	F	-	-	217	F	61	E
EBT	72	E	44	D	28	C	70	E	72	E
EBR	232	F	39	D	37	D	53	D	232	F
WBL	123	F	167	F	-	-	162	F	123	F
WBT	61	E	96	F	39	D	88	F	61	E
WBR	63	E	103	F	35	C	98	F	63	E
<b>KIRWIN/CAMILLA AVE</b>										
Overall	<b>50</b>	<b>D</b>	<b>99</b>	<b>F</b>	<b>67</b>	<b>E</b>	<b>62</b>	<b>E</b>	<b>50</b>	<b>D</b>
EBL	120	F	116	F	114	F	81	F	120	F
EBT	21	C	29	C	30	C	14	B	21	C
EBR	17	B	24	C	29	C	15	B	17	B
WBL	95	F	186	F	227	F	111	F	95	F
WBT	54	D	157	F	77	E	79	E	54	D
WBR	55	E	103	F	60	E	73	E	55	E