Memorandum



12 November 2021 Project: (190486)

To

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From

Gene Chartier, P.Eng. Vice President and Chief Development Officer Paradigm Transportation Solutions Limited

RE: REGION OF PEEL – SETTLEMENT AREA BOUNDARY EXPANSION (SABE)
TRANSPORTATION TECHNICAL STUDY – PHASE 2 DETAILED ASSESSMENT
SUPPLEMENTAL TRANSPORTATION ANALYSIS (REVISED)

This memorandum summarizes supplemental transportation analysis completed for the Settlement Area Boundary Expansion (SABE) Transportation Technical Study – Phase 2 Detailed Assessment following release of the report in August 2021. The analysis was undertaken to:

- Address apparent inconsistencies in the findings for Scenario 1; and
- Determine road infrastructure requirements and cost impacts for the draft recommended SABE with and without the proposed GTA West 413 Highway and northerly extension of Highway 410.

Scenario 1 Inconsistencies

Issue

The Transportation Technical Study report¹ summarizes the road infrastructure requirements and cost impacts to serve new projected residential and employment growth between the years 2041 and 2051 in the conceptual SABE area. The study assessed different growth scenarios for 2051 that varied by:

Paradigm Transportation Solutions Limited, Region of Peel Settlement Area Boundary Expansion (SABE), Transportation Technical Study – Phase 2 Detailed Assessment, August 2021

- ▶ Housing intensification rates for the proposed Community Area lands;
- Density of housing in the designated greenfield area (DGA) of the Community Area lands:
- Community Area and Employment Area land needs; and
- Population and employment forecasts by municipality.

The analysis showed somewhat of a correlation between the amount of SABE land and road costs for Scenario 2 (Higher Designated Greenfield Area Density), Scenario 3 (Lower Designated Greenfield Area Density), and Scenario 4 (Minimum Intensification). Scenario 2, which is denser and thus needs less land than Scenario 3 (less dense) and Scenario 4 (less intense) to meet population and employment targets, had lower road widening costs. Costs also increased incrementally between these scenarios as land needs grew.

Counterintuitively, the correlation between land need and roads costs did not hold for Scenario 1 (Updated Land Needs Assessment Base) when compared to Scenario 2 (and Scenarios 3 and 4). Scenario 1 is not as dense and requires more land than Scenario 2 but had (considerably) lower road widening costs. This finding raised the question: why would a scenario that uses more land have significantly lower roads widening costs?

Peel Region staff and the consultant team carried out further detailed diagnosis and discovered errors in the vehicle traffic volumes generated by the Peel Travel Demand Forecasting Model (the Model) that served as the basis for the transportation analysis. The errors were attributed to issues with the modelling software itself, as the tool only incorrectly simulated traffic flows for Scenario 1. The cause of the fault is uncertain, but volumes for Scenario 1 appear more rational after re-running the Model with the same inputs, as elaborated on further below.

Deficiency Analysis with Revised Model Run

Table S.1 (attached) updates **Table 3** from the Transportation Technical Study report, which summarizes the forecast 2051 v/c ratios at the screenline locations shown on **Map 3** (attached) of the report for each growth scenario, with data from the revised model run for Scenario 1. The screenline and sub-screenline numbers referenced in the table correspond to the identifiers noted on the map. The table shows the v/c ratios are still not projected to exceed 0.9 for Scenario 1.

Location-specific needs for Scenario 1 were reassessed based on a link-level analysis of the forecast 2051 v/c ratios using data from the revised model run. **Map S.1** (attached) shows the links with estimated v/c ratios of 0.9 or higher by direction. **Table S.2** (attached) updates **Table 4** from the Transportation Technical Study report, which summarizes the number of links exceeding this threshold, with data from the revised model run for Scenario 1.



General observations from the deficiency analysis include the following:

- ▶ As noted in the Transportation Technical Study report, and reaffirmed for Scenario 1, the absence of screenline deficiencies suggests the 2041 road network set out in the 2019 LRTP may be able to serve projected 2051 travel demands for all scenarios on a broader basis, but localized capacity deficiencies may still exist.
- Scenario 2 now has the fewest links with forecast 2051 v/c ratios of 0.9 or higher at 54.
- Scenario 1 has the second fewest links at 56, then Scenario 3 at 60 links and Scenario 4 at 64 links.
- ▶ Scenario 5 still has the most links with forecast 2051 v/c ratios of 0.9 or higher at 112.
- ▶ The number of links with 2051 v/c ratios of 0.9 or higher do not differ considerably between Scenarios 1, 2, 3, and 4 (56, 54, 60, and 64, respectively).

Potential Road Widening Program with Revised Model Run

Map S.2 (attached) illustrates the updated potential road widening program proposed to address the forecast capacity deficiencies attributed to growth between 2041 and 2051 within the SABE area for Scenario 1 with the revised model run. The list of projects was developed to address the projected deficiencies shown on **Map S.1** using the same approach applied in the original analysis.

Table S.3 (attached) updates **Table 5** from the Transportation Technical Study report, which summarizes the estimated costs for the road infrastructure needed to serve growth in the SABE area from 2041 to 2051 for each growth scenario, for Scenario 1 with the revised model run. These are additional costs over and above the proposed 2041 road capital program outlined in the 2019 LRTP. The updated cost estimates for the study are appended.

General observations from developing the potential road widening programs include the following:

- ▶ Road infrastructure costs to serve the SABE area vary by scenario, in generally the same relative proportions as the link deficiency analysis showed.
- Scenario 2 now has the lowest potential road widening program cost at approximately \$403.3 M.
- Scenario 5 still has the highest potential road widening program cost at approximately \$597.6 M, about 50% higher than Scenario 2.
- ▶ The potential road widening program costs for Scenarios 1, 3, and 4 are slightly higher than Scenario 2 but do not differ considerably (\$463.0 M, \$436.3 M, and \$458.9 M, respectively).
- ▶ The least expensive option, Scenario 2, would also pose the lowest cost for road widening to the Town of Caledon at about \$92.2 M. Regional road widening costs account for the remainder at \$311.15 M. Town costs for other scenarios would be higher, especially for Scenario 5 (No GTA West).



▶ Several road widening projects are common to all scenarios, specifically Project #2 (Dixie Road), #3 (Airport Road), #4 (Airport Road), #7 (Humber Station Road), #8 (Coleraine Drive), #11 (Highway 50), #14 (Healey Road), and #15 (King Street). These roads are mostly in the Bolton area or immediately to the west, consistent with the allocation of new growth. Where the programs differ relate, in part, to the different distributions of new growth to the SABE area.

Sensitivity Analysis with Revised Model Run

Table S.4 (attached) updates **Table 6** from the Transportation Technical Study report, which summarizes the key differences between Scenario 1 and Scenarios 2 to 5, for Scenario 1 with the revised model run.

With updated Scenario 1, the analysis now shows a somewhat better correlation between the amount of SABE land and road costs for Scenarios 1, 2, 3, and 4, which tested different levels of intensification and density. Scenario 2, which is denser and thus needs less land than Scenarios 1 (less dense), 3 (even less dense), and 4 (less intense), has the lowest road widening costs.

Costs also generally increased incrementally between these four scenarios as land needs grew, although Scenario 1 with the revised model run had slightly higher costs than Scenarios 3 and 4, which require more land. Peel Region staff and the consultant team again conducted detailed diagnosis of the vehicle traffic volumes generated by the Model for the other scenarios but found no evidence of the types of errors observed with the original runs for Scenario 1. Given the nature of the modelling process and software, these incongruities could be attributed to any number of factors, such as:

- Variations in the manner the Model assigned traffic to the road network to reach "equilibrium". The Model algorithms apply network solutions to congestion arising in specific locations that can differ slightly between runs;
- Proximity to GTA West Highway 413, particularly the interchanges. With ease of access, the proposed freeway becomes an attractive route for trips made to and from the SABE area (despite likely toll charges). This helps to lessen demand and minimize capacity deficiencies on the adjacent Regional and lower-tier road networks;
- ▶ Distributing new growth more broadly throughout the SABE area. The roads to the north in Caledon carry less traffic today than facilities in Brampton given their somewhat rural nature, meaning more capacity exists to accommodate new travel demand and fewer deficiencies result: and
- ▶ Some costs triggered prior to 2051 in Scenarios 1 may not manifest until after in Scenarios 3 and 4.

Simply put, one cannot presume growth in one or two zones in Caledon will trigger additional expenditures on nearby Regional roads. It may even be bottlenecks arising in Brampton that contribute to the additional costs in Caledon.



Scenario 5 (No GTA West) still has the greatest road widening needs and the highest costs despite having similar new growth assumptions as Scenario 1. This observation can be attributed to the elimination of the proposed GTA West 413 Highway from the future road network, as noted in the Transportation Technical Study report.

Draft Recommended SABE

Description

Peel Region staff has prepared a draft recommended SABE map (attached) based on the results of the technical studies, input from the public and other stakeholders, and Regional Council's resolutions of March 11, 2021 regarding the GTA West Corridor. This land use concept provides for approximately 3,000 hectares of Community lands and 1,400 hectares of Employment lands based on an intensification rate of 55 per cent and a density of 65 persons and jobs per hectare for new designated greenfield areas, like Scenario 1.

Paradigm determined the road infrastructure requirements and cost impacts to serve new projected growth between 2041 and 2051 for the draft recommended SABE land use concept using the same methodology applied in the Transportation Technical Study. The analysis examined scenarios with and without the GTA West 413 Highway and northerly extension of Highway 410 to assess the implications of excluding the proposed provincial highway from a municipal road widening perspective.

Deficiency Analysis

Table S.5 (attached) summarizes the forecast 2051 screenline v/c ratios for the draft recommended SABE land use concept with and without GTA West 413 Highway. The table shows the v/c ratios are not projected to exceed 0.9 for either scenario.

Location-specific needs were assessed based on a link-level analysis of the forecast 2051 v/c ratios. **Map S.3** and **Map S.4** (attached) show the links with estimated v/c ratios of 0.9 or higher by direction for the draft recommended SABE land use concept with and without GTA West 413 Highway, respectively. **Table S.6** (attached) summarizes the number of links exceeding this threshold.

General observations from the deficiency analysis include the following:

- As noted in the Transportation Technical Study report, the absence of screenline deficiencies suggests the 2041 road network set out in the 2019 LRTP may be able to serve projected 2051 travel demands for all scenarios on a broader basis, but localized capacity deficiencies may still exist.
- ► The scenario with GTA West 413 Highway had fewer links with forecast v/c ratios of 0.9 or higher (59) than the scenario without the proposed highway (99).



Potential Road Widening Program

Map S.5 and **Map S.6** (attached) illustrate the potential road widening programs proposed to address the forecast capacity deficiencies attributed to growth between 2041 and 2051 for the draft recommended SABE land use concept with and without the GTA West 413 Highway, respectively. The lists of projects were developed to address the projected deficiencies shown on **Map S.3** and **Map S.4**, respectively, using the same approach applied in the original analysis.

Table S.7 (attached) summarizes the estimated costs for the road infrastructure needed to serve growth in the SABE area from 2041 to 2051 for the draft recommended SABE land use concept with and without the GTA West 413 Highway. These are additional costs over and above the proposed 2041 road capital program outlined in the 2019 LRTP. As noted above, the updated cost estimates for the study are appended.

Not surprisingly, the road infrastructure costs to serve the draft recommended SABE land use concept are considerably lower (about a third) with the GTA West 413 Highway (\$390.8 M) than without the proposed highway (\$600.4 M). Municipal roads would need to serve additional traffic demand without the proposed highway, which would intensify road widening requirements as noted in the Transportation Technical Study report.

Attachments

Tables

Maps

Cost Estimates



TABLE S.1: FORECAST 2051 V/C RATIOS AT SCREENLINE LOCATIONS (WITH UPDATED SCENARIO 1)

		Capaci	ty (vph)		V	/c Ratio fo	or Scenario	0	
Screenline (S/L) and Limits (Sub-Screenline)	Direction	w/ GTA West Highway	w/o GTA West Highway	0	1 (revised model run)	2	3	4	5
East-West Screenlines (South	th to North)								
Screenline 1 – South of May	field Road						Ī	1	
Winston Churchill Boulevard	NB	20,800	15,400	0.28	0.28	0.28	0.28	0.28	0.27
to Hurontario Street (S/L 1A)	SB	20,700	15,300	0.54	0.54	0.54	0.53	0.63	0.55
Heart Lake Road to Kennedy	NB	14,900	14,900	0.36	0.36	0.36	0.36	0.34	0.36
Road (S/L 1B)	SB	14,900	14,900	0.69	0.69	0.67	0.69	0.75	0.67
Goreway Drive to Highway	NB	20,800	15,400	0.35	0.35	0.35	0.35	0.34	0.25
50 (S/L 1C)	SB	21,100	15,700	0.63	0.63	0.64	0.62	0.67	0.68
Screenline 2 - North of Mayf	ield Road								
Winston Churchill Boulevard	NB	13,400	8,000	0.43	0.42	0.44	0.42	0.50	0.44
to Hurontario Street (S/L 2A)	SB	13,300	7,900	0.50	0.50	0.49	0.51	0.68	0.49
Heart Lake Road to Kennedy	NB	13,200	7,800	0.35	0.35	0.33	0.36	0.34	0.64
Road (S/L 2B)	SB	13,200	7,800	0.49	0.50	0.46	0.51	0.55	0.79
Goreway Drive to Albion	NB	18,000	10,800	0.58	0.58	0.59	0.57	0.57	0.51
Vaughan Road (S/L 2C)	SB	18,200	11,000	0.76	0.76	0.75	0.75	0.78	0.82
Screenline 3 - South of King	Street								
Winston Churchill Boulevard	NB	8,200	8,200	0.15	0.14	0.14	0.16	0.18	0.19
to Hurontario Street (S/L 3A)	SB	8,100	8,100	0.36	0.36	0.36	0.45	0.47	0.30
Kennedy Road to Airport	NB	7,000	7,000	0.17	0.18	0.16	0.23	0.23	0.08
Road (S/L 3B)	SB	7,000	7,000	0.42	0.44	0.47	0.58	0.66	0.43
Goreway Drive to Albion	NB	9,200	9,200	0.18	0.18	0.19	0.18	0.19	0.23
Vaughan Road (S/L 3C)	SB	9,400	9,400	0.72	0.72	0.72	0.75	0.77	0.82
Screenline 8 - South of Cast	lederg Side	Road							
Airport to 12th Congasian	NB	6,700	6,700	0.21	0.21	0.24	0.21	0.25	0.28
Airport to 12th Concession	SB	6,800	6,800	0.61	0.61	0.61	0.62	0.62	0.67

TABLE S.1: FORECAST 2051 V/C RATIOS AT SCREENLINE LOCATIONS (WITH UPDATED SCENARIO 1)

		Capaci	ty (vph)		V	/c Ratio fo	or Scenari	0			
Screenline (S/L) and Limits (Sub-Screenline)	Direction	w/ GTA West Highway	w/o GTA West Highway	0	1 (revised model run)	2	3	4	5		
North-South Screenlines (W	est to East)										
Screenline 4 – East of Winston Churchill Boulevard											
Wantage Drive to King Street	EB	6,000	6,000	0.49	0.49	0.50	0.49	0.46	0.45		
Wanless Drive to King Street	WB	6,000	6,000	0.28	0.28	0.28	0.28	0.28	0.34		
Screenline 5 - East of Huron	itario Street										
Conservation Drive to King	EB	14,500	9,100	0.71	0.71	0.73	0.71	0.74	0.83		
Street	WB	14,500	9,100	0.41	0.41	0.39	0.41	0.42	0.39		
Screenline 6 - East of Airpor	rt Road		•		•		•	•			
Countryside Drive to	EB	12,400	7,000	0.64	0.61	0.59	0.63	0.65	0.62		
Castlederg Side Road	WB	12,400	7,000	0.58	0.60	0.63	0.58	0.61	0.69		
Screenline 9 - East of The G	ore Road		,		•		•	•			
Countryside Drive to	EB	13,400	8,000	0.63	0.61	0.61	0.61	0.64	0.63		
Castlederg Side Road	WB	13,400	8,000	0.52	0.54	0.55	0.54	0.54	0.54		
Screenline 7 - West of Albio	n Vaughan	Road									
Countryside Drive to	Drive to EB 8,000 8,000		0.46	0.45	0.46	0.46	0.49	0.50			
Castlederg Side Road	WB	8,000	8,000	0.28	0.28	0.28	0.28	0.27	0.33		

TABLE S.2: LINKS WITH FORECAST 2051 V/C RATIO OF 0.9 OR HIGHER (WITH UPDATED SCENARIO 1)

		Number of Links for Scenario												
v/c Ratio	0	1 (revised model run)	2	3	4	5								
Between 0.9 and 1.0	32	36	31	32	30	59								
Over 1.0	22	20	23	28	34	53								
TOTAL 0.9 or higher	54	56	54	60	64	112								



TABLE S.3: COST ESTIMATES FOR POTENTIAL ROAD WIDENING PROGRAMS, 2041-2051 (WITH UPDATED SCENARIO 1)

D					F	Project Included i	ram for Scenario			
Project No.	Road	Limits	Description	Cost (Rounded)	0	1 (revised model run)	2	3	4	5
North-Sc	outh Roads									
1*	Chinguacousy Road	Mayfield Road to Old School Road	Widen 2 to 4 lanes	\$25,738,100	•	•	•	•	•	•
2	Dixie Road	2 km north of Mayfield Road to King Street	Widen 2 to 4 lanes	\$31,582,400	•	•	•	•	•	•
3	Airport Road	Countryside Drive to Mayfield Road	Widen 4 to 6 lanes	\$14,752,900	•	•	•	•	•	•
4	Airport Road	Mayfield Road to Highway 413	Widen 2/4 to 6 lanes	\$35,346,400	•	•	•	•	•	•
5	Airport Road	King Street to Castlederg Side Road	Widen 2 to 4 lanes	\$49,532,200	•	•	•	•	•	•
6	The Gore Road	Healey Road to King Street	Widen 2 to 4 lanes	\$22,638,100	•	•	•	•	•	•
7*	Humber Station Road	Mayfield Road to Healey Road	Widen 2 to 4 lanes	\$22,412,200	•	•	•	•	•	•
8	Coleraine Drive	Mayfield Road to Healey Road	Widen 4 to 6 lanes	\$29,615,300	•	•	•	•	•	•
9	Coleraine Drive	Healey Road to King Street	Widen 4 to 6 lanes	\$22,363,400	•	•	•	•	•	•
10	Emil Kolb Parkway	King Street to Highway 50	Widen 2 to 4 lanes	\$28,798,400	•		•	•	•	•
11	Highway 50	Emil Kolb Parkway to Castlederg Side Road	Widen 2 to 4 lanes	\$ 9,869,800	•	•	•	•	•	•
16	The Gore Road	King Street to Castlederg Side Road	Widen 2 to 4 lanes	\$22,537,100			•		•	•
17*	Chinguacousy Road	Old School Road to King Street	Widen 2 to 4 lanes	\$20,709,000				•	•	•
20	Emil Kolb Parkway	King Street/Harvest Moon Drive to King Street	Widen 4 to 6 lanes	\$ 9,965,400						•
25	Airport Road	Castlederg Side Road to Olde Base Line Rd.	Widen 2 to 4 lanes	\$10,544,800		•				
East-We	st Roads									
12	Mayfield Road	Heritage Road to west of Mississauga Road	Widen 4 to 6 lanes	\$10,848,800	•	•	•	•	•	
13*	Old School Road	Chinguacousy Road to Hurontario Road	Widen 2 to 4 lanes	\$23,357,200	•		•	•	•	•
14*	Healey Road	The Gore Road to Coleraine Drive	Widen 2 to 4 lanes	\$20,725,400	•	•	•	•	•	•
15	King Street	Airport Road to The Gore Road	Widen 2 to 4 lanes	\$33,210,300	•	•	•	•	•	•
18	King Street	Dixie Road to Airport Road	Widen 2 to 4 lanes	\$34,844,100				•	•	•
19	King Street	The Gore Road to Coleraine Drive	Widen 2 to 4 lanes	\$19,307,600						•
21*	Old School Road	Hurontario Street to Dixie Road	Widen 2 to 4 lanes	\$32,697,800		•				•
22*	Old School Road	Dixie Road to Airport Road	Widen 2 to 4 lanes	\$31,650,200		•				•
23*	Healey Road	Airport Road to The Gore Road	Widen 2 to 4 lanes	\$31,433,000						•
24	King Street	Chinguacousy Road to Hurontario Road	Widen 2 to 4 lanes	\$24,477,000		•				•
26	Mayfield Road	Heritage Road to west of Mississauga Road	Widen 4 to 6 lanes	\$15,309,400		•				
27*	Old School Road	Mississauga Road to Chinguacousy Road	Widen 2 to 4 lanes	\$19,724,700		•				
		TOTAL	•		\$380,790,900	\$463,039,200	\$403,328,000	\$436,344,000	\$458,881,100	\$597,563,300
	Regional Roads				\$288,558,000	\$310,090,800	\$311,095,100	\$323,402,100	\$345,939,200	\$388,840,400
		Town of Caledon Roads (projects denoted w	ith an *)		\$ 92,232,900	\$152,948,400	\$ 92,232,900	\$112,941,900	\$112,941,900	\$208,722,900
		Number of Projects in Potential Road Wideni	ng Program		15	19	16	17	18	23

TABLE S.4: COMPARISON TO SCENARIO 1 (WITH UPDATED SCENARIO 1)

	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Difference from Scenario 1 in:	Higher Designated Greenbelt Area	Lower Designated Greenbelt Area	Minimum Intensification	No GTA West
Total Program Costs	- \$59,711,200	- \$26,695,200	- \$4,158,100	+ \$134,524,100
Peel Region Costs	+ \$1,004,300	+ \$13,311,300	+ \$35,848,400	+ \$78,749,600
Town of Caledon Costs	- \$60,715,500	- \$40,006,500	- \$40,006,500	+ \$55,774,500
Intensification Rate	0%	0%	- 5%	0%
Designated Growth Area Density	+ 10 ppj/ha	-10 ppj/ha	0 ppj/ha	0 ppj/ha
Land Need – Community Area	- 500 ha	+ 200 ha	+ 1,200 ha	0 ha
Land Need – Employment Area	0 ha	0 ha	+200 ha	0 ha
Potential Road Widening Projects	9 different projects. Added 3 and removed 6.	10 different projects. Added 4 and removed 6.	11 different projects. Added 5 and removed 6.	12 different projects. Added 8 and removed 4.

TABLE S.5: FORECAST 2051 V/C RATIOS AT SCREENLINE LOCATIONS FOR DRAFT RECOMMENDED SABE

Screenline (S/L) and Limits	Direction		ΓA West ghway		GTA West ghway
(Sub-Screenline)	Direction	Capacity (vph)	v/c Ratio	Capacity (vph)	v/c Ratio
East-West Screenlines (South to	North)				
Screenline 1 – South of Mayfield	Road				
Winston Churchill Boulevard to	NB	20,800	0.23	15,400	0.35
Hurontario Street (S/L 1A)	SB	20,700	0.32	15,300	0.55
Heart Lake Road to Kennedy	NB	14,900	0.43	14,900	0.43
Road (S/L 1B)	SB	14,900	0.68	14,900	0.69
Goreway Drive to Highway 50	NB	20,800	0.19	15,400	0.27
(S/L 1C)	SB	21,100	0.52	15,700	0.73
Screenline 2 - North of Mayfield I	Road				
Winston Churchill Boulevard to	NB	13,400	0.28	8,000	0.55
Hurontario Street (S/L 2A)	SB	13,300	0.26	7,900	0.51
Heart Lake Road to Kennedy	NB	13,200	0.39	7,800	0.74
Road (S/L 2B)	SB	13,200	0.42	7,800	0.80
Goreway Drive to Albion Vaughan	NB	18,000	0.31	10,800	0.54
Road (S/L 2C)	SB	18,200	0.47	11,000	0.87
Screenline 3 - South of King Stre	et				
Winston Churchill Boulevard to	NB	8,200	0.21	8,200	0.25
Hurontario Street (S/L 3A)	SB	8,100	0.33	8,100	0.30
Kennedy Road to Airport Road	NB	7,000	0.18	7,000	0.10
(S/L 3B)	SB	7,000	0.51	7,000	0.46
Goreway Drive to Albion Vaughan	NB	9,200	0.21	9,200	0.25
Road (S/L 3C)	SB	9,400	0.74	9,400	0.83
Screenline 8 - South of Castleder	rg Side Road				
Airmont to 12th Consocion	NB	6,700	0.28	6,700	0.32
Airport to 12 th Concession	SB	6,800	0.61	6,800	0.67
North-South Screenlines (West to	East)				
Screenline 4 – East of Winston C	hurchill Bou	levard			
Wantaga Drive to King Chast	EB	6,000	0.51	6,000	0.45
Wanless Drive to King Street	WB	6,000	0.34	6,000	0.40
Screenline 5 – East of Hurontario	Street				
Concernation Drive to Vine Street	EB	14,500	0.46	9,100	0.89
Conservation Drive to King Street	WB	14,500	0.23	9,100	0.45

TABLE S.5: FORECAST 2051 V/C RATIOS AT SCREENLINE LOCATIONS FOR DRAFT RECOMMENDED SABE

Screenline (S/L) and Limits	Direction		ΓA West ghway	Without GTA West 413 Highway				
(Sub-Screenline)	Direction	Capacity (vph)	v/c Ratio	Capacity (vph)	v/c Ratio			
Screenline 6 - East of Airport Roa	ad							
Countryside Drive to Castlederg	EB	12,400	0.32	7,000	0.69			
Side Road	WB	12,400	0.39	7,000	0.75			
Screenline 9 - East of The Gore F	Road							
Countryside Drive to Castlederg	EB	13,400	0.35	8,000	0.69			
Side Road	WB	13,400	0.32	8,000	0.56			
Screenline 7 – West of Albion Va	ughan Road							
Countryside Drive to Castlederg	EB	8,000	0.54	8,000	0.56			
Side Road	WB	8,000	0.29	8,000	0.34			

TABLE S.6: LINKS WITH FORECAST 2051 V/C RATIO OF 0.9 OR HIGHER FOR DRAFT RECOMMENDED SABE

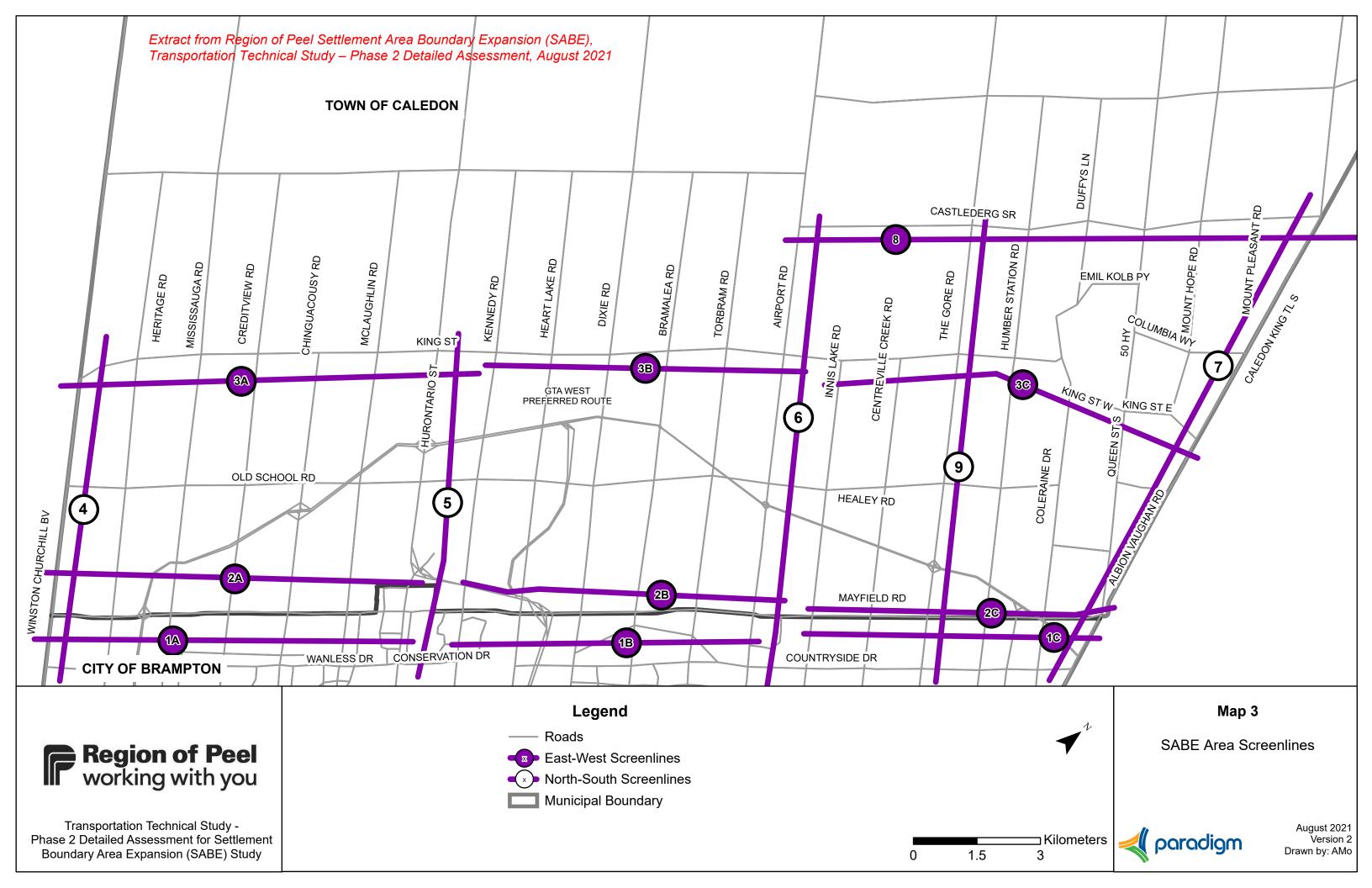
v/c Ratio	With GTA West 413 Highway	Without GTA West 413 Highway
Between 0.9 and 1.0	28	53
Over 1.0	31	46
TOTAL 0.9 or higher	59	99

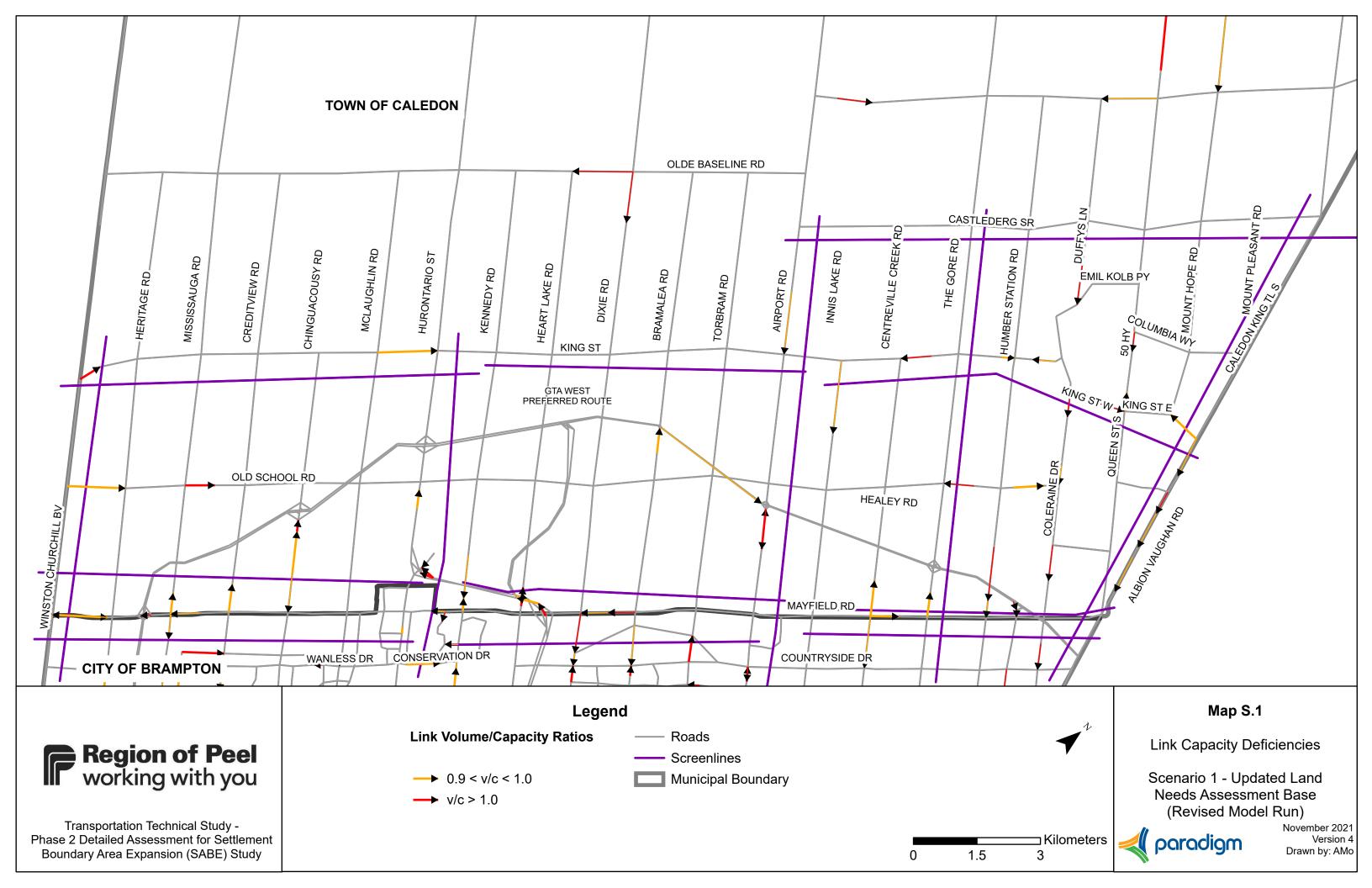
TABLE S.7: COST ESTIMATES FOR POTENTIAL ROAD WIDENING PROGRAMS, 2041-2051 FOR DRAFT RECOMMENDED SABE

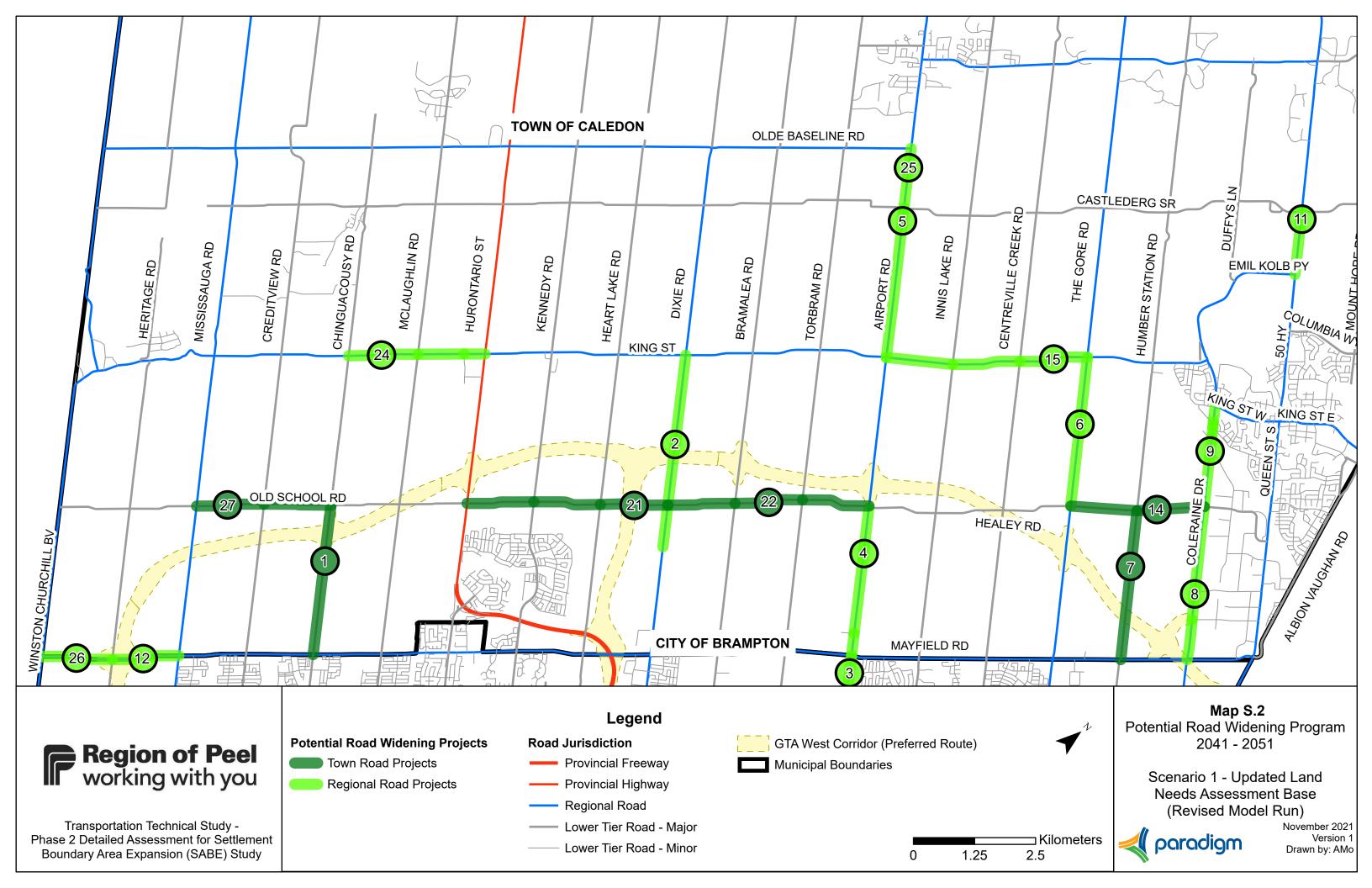
Project No.	Road	Limits	Description	Cost (Rounded)	With GTA West 413 Highway	Without GTA West 413 Highway
North-So	outh Roads					
1*	Chinguacousy Road	Mayfield Road to Old School Road	Widen 2 to 4	\$25,738,100	•	
2	Dixie Road 2 km north of Mayfield Road to King Street		Widen 2 to 4	\$31,582,400	•	•
3	Airport Road	Countryside Drive to Mayfield Road	Widen 4 to 6	\$14,752,900	•	•
4	Airport Road	Mayfield Road to Highway 413	Widen 2/4 to 6	\$35,346,400	•	•
5	Airport Road	King Street to Castlederg Side Road	Widen 2 to 4	\$49,532,200	•	•
6	The Gore Road	Healey Road to King Street	Widen 2 to 4	\$22,638,100	•	•
7*	Humber Station Road	Mayfield Road to Healey Road	Widen 2 to 4	\$22,412,200	•	•
8	Coleraine Drive	Mayfield Road to Healey Road	Widen 4 to 6	\$29,615,300	•	•
9	Coleraine Drive	Healey Road to King Street	Widen 4 to 6	\$22,363,400	•	•
10	Emil Kolb Parkway	King Street to Highway 50	Widen 2 to 4	\$28,798,400	•	•
11	Highway 50	Emil Kolb Parkway to Castlederg Side Road	Widen 2 to 4	\$ 9,869,800	•	•
16	The Gore Road	King Street to Castlederg Side Road	Widen 2 to 4	\$22,537,100		•
20	Emil Kolb Parkway	King Street/Harvest Moon Drive to King Street	Widen 4 to 6	\$ 9,965,400	•	•
28*	28* McLaughlin Road Mayfield Road to Old School Road		Widen 2 to 4	\$27,405,900		•
29*	McLaughlin Road	Old School Road to King Street	Widen 2 to 4	\$21,887,100		•

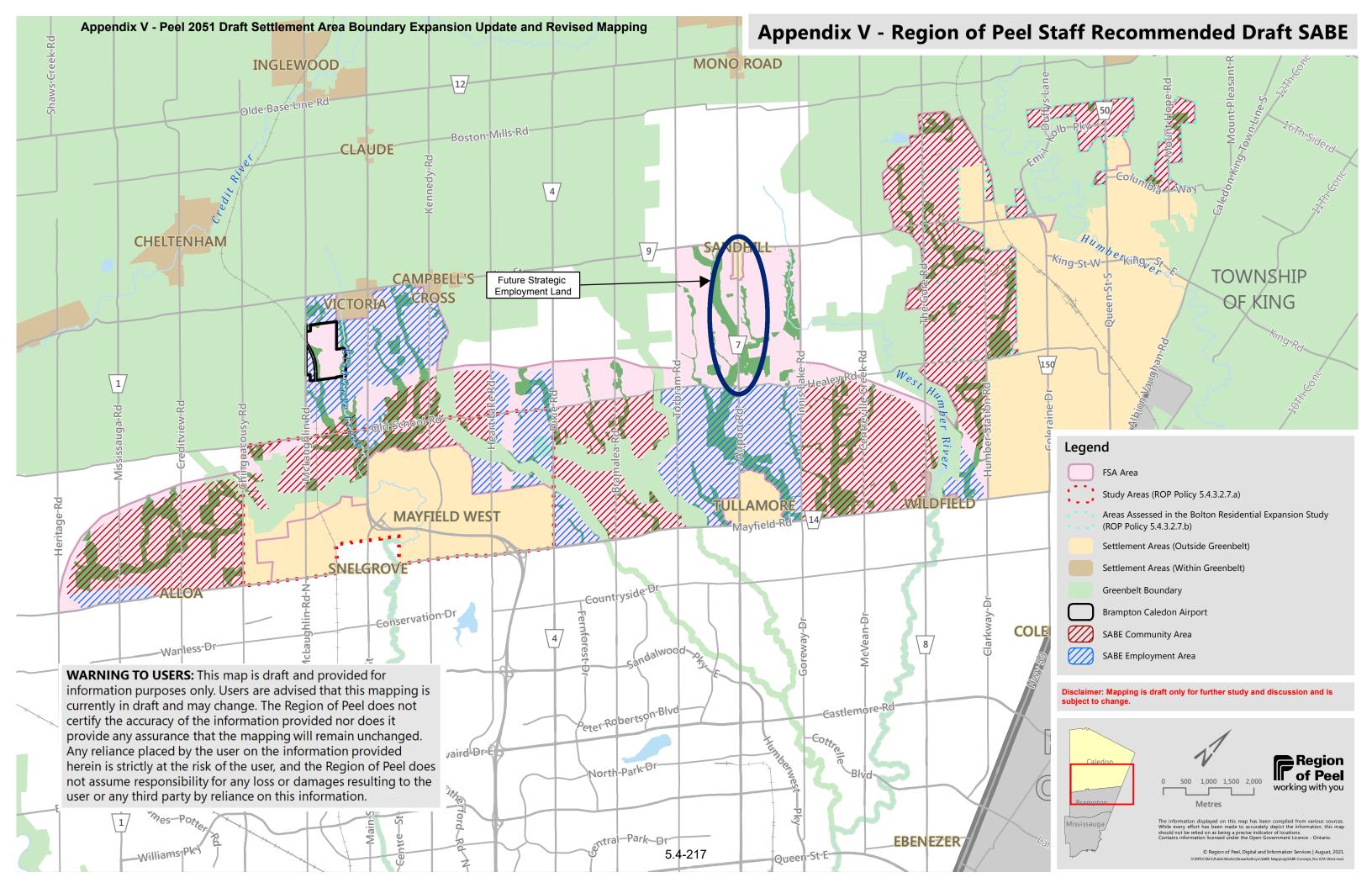
TABLE S.7: COST ESTIMATES FOR POTENTIAL ROAD WIDENING PROGRAMS, 2041-2051 FOR DRAFT RECOMMENDED SABE

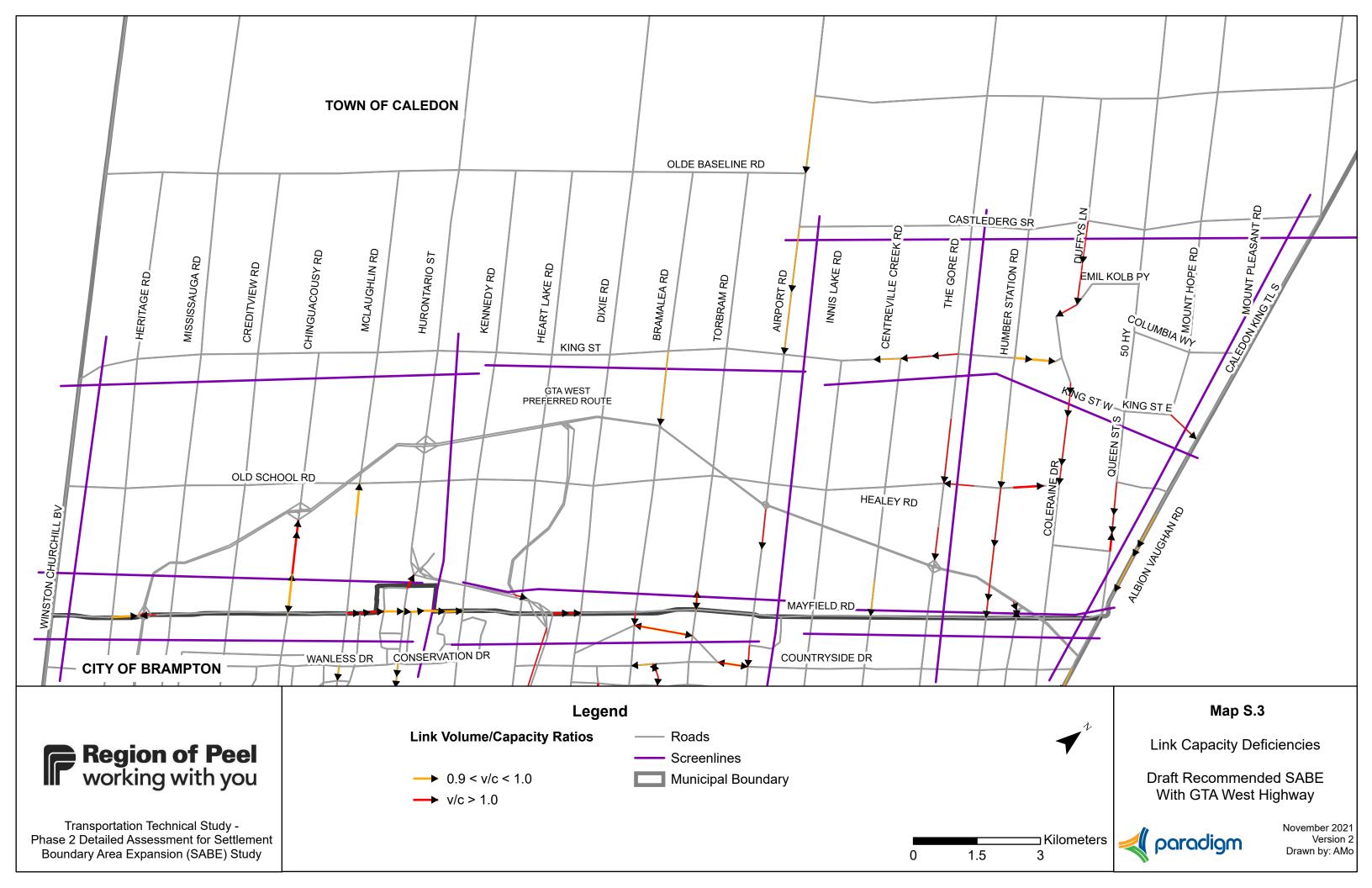
Project No.	Road	Limits	Description	Cost (Rounded)	With GTA West 413 Highway	Without GTA West 413 Highway
East-We	st Roads					
12	Mayfield Road	Heritage Road to west of Mississauga Road	Widen 4 to 6	\$10,848,800	•	
13*	Old School Road	Chinguacousy Road to Hurontario Road	Widen 2 to 4	\$23,357,200	•	•
14*	Healey Road	The Gore Road to Coleraine Drive	Widen 2 to 4	\$20,725,400	•	•
15	King Street	Airport Road to The Gore Road	Widen 2 to 4	\$33,210,300	•	•
18	King Street	·		\$34,844,100		•
19	King Street	The Gore Road to Coleraine Drive	Widen 2 to 4 \$19,307,600			•
21*	Old School Road	Hurontario Street to Dixie Road	Widen 2 to 4	\$32,697,800		•
22*	Old School Road	Dixie Road to Airport Road	Widen 2 to 4	\$31,650,200		•
23*	Healey Road	Airport Road to The Gore Road	Widen 2 to 4	\$31,433,000		•
24	King Street	Chinguacousy Road to Hurontario Road	Widen 2 to 4	\$24,477,000		•
	TOTAL				\$390,756,300	\$600,409,200
	Regional Roads			\$298,523,400	\$388,840,400	
	Town of Caledon	Roads (projects denoted with an *)		\$ 92,232,900	\$211,568,800	
	Number of Project	ts in Potential Road Widening Prog	ram		16	23

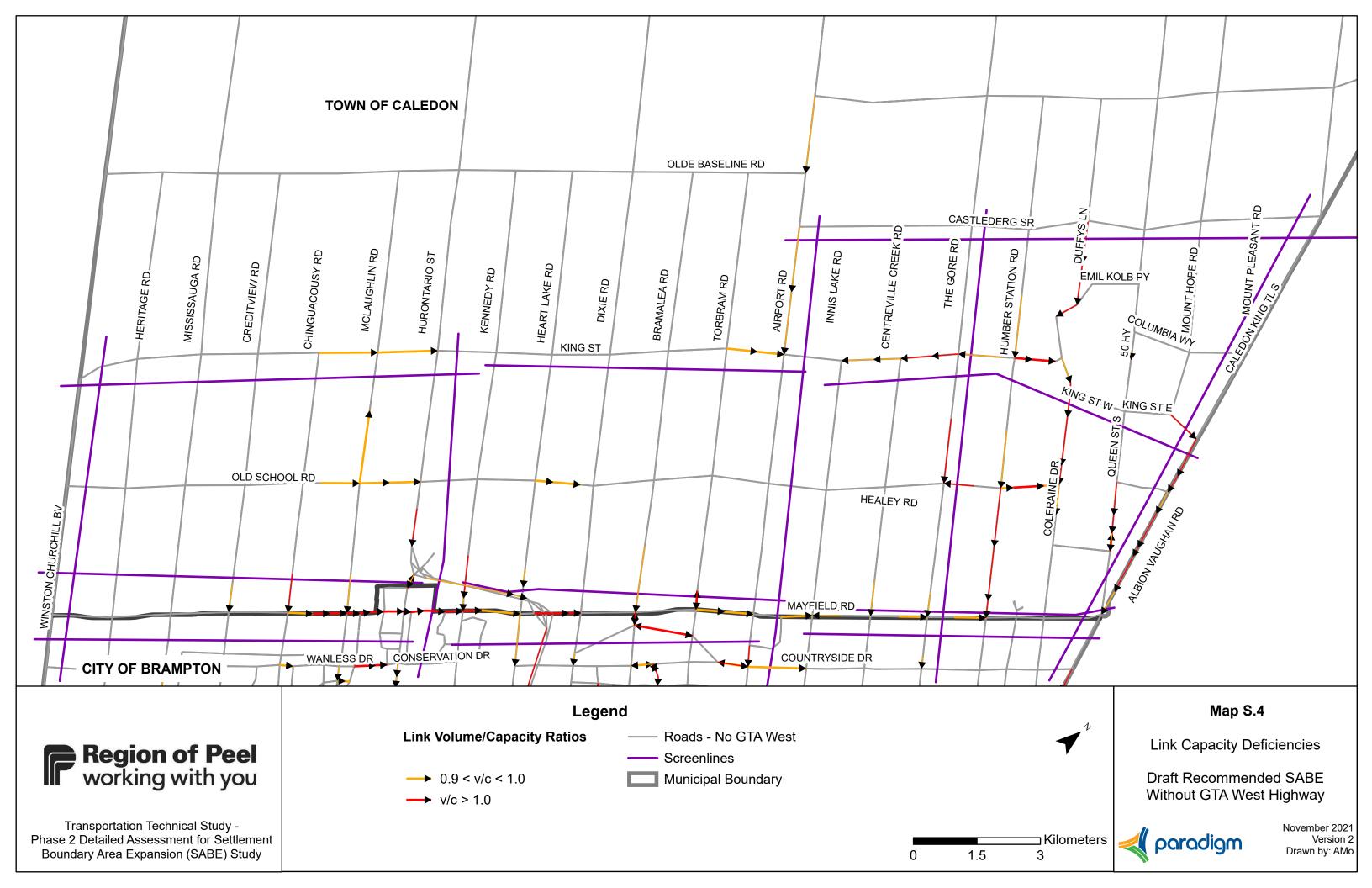


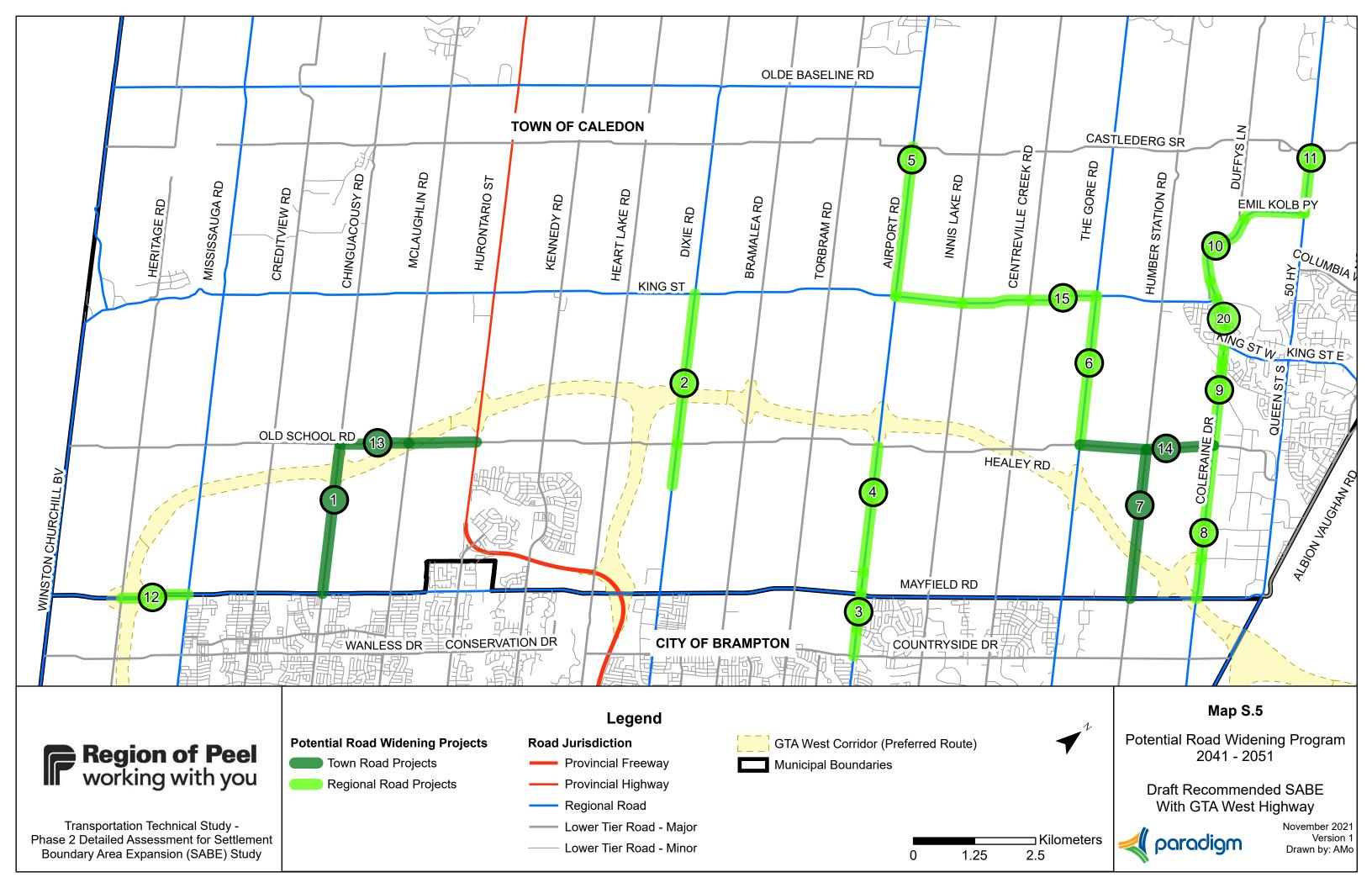


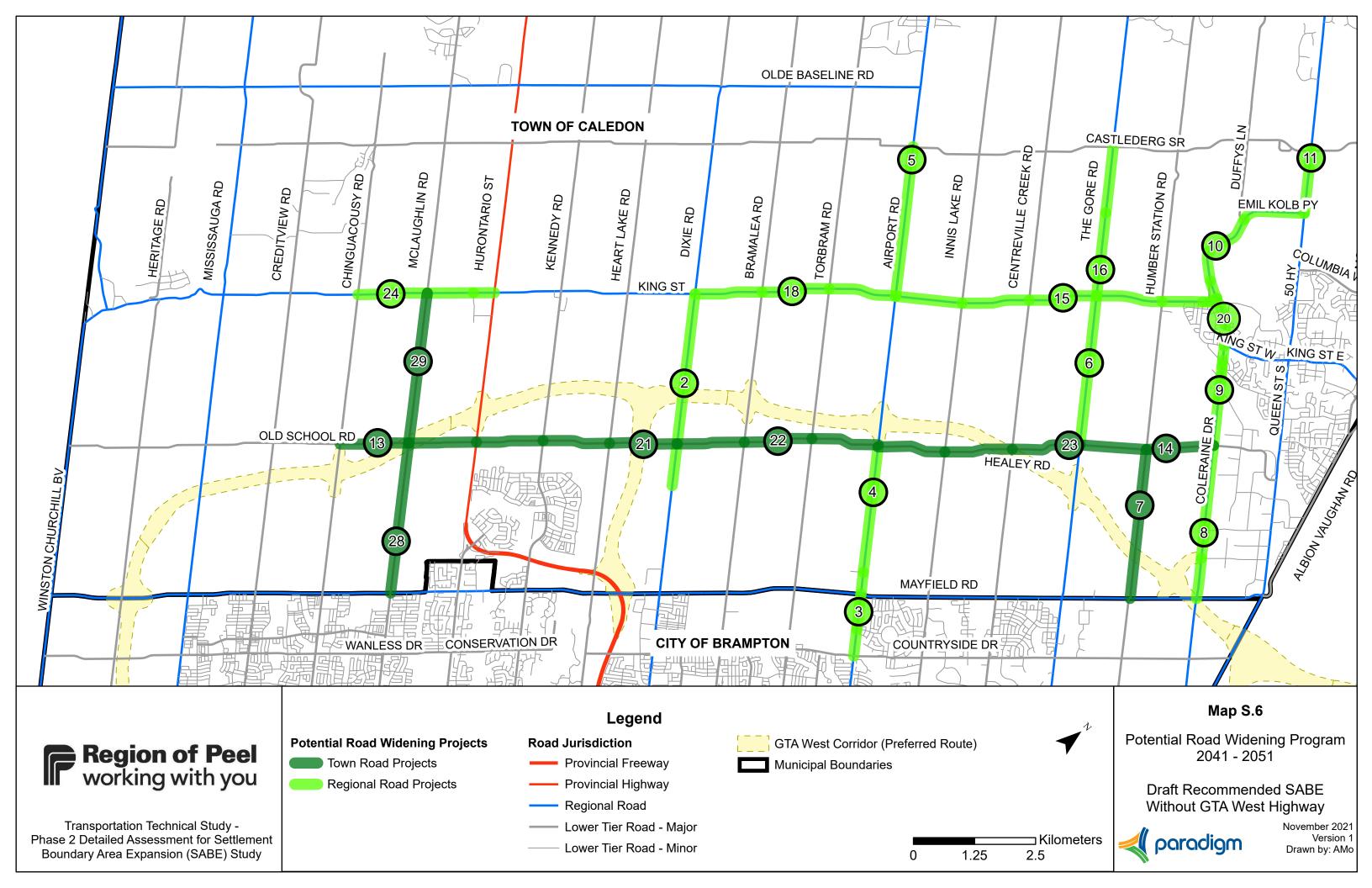












UPDATED APPENDIX B - PROJECT COSTING DETAILS

Peel Region Settlement Area Boundary Expansion Study Transportation Technical Analysis - Phase 2 Detailed Assessment

Table B-1 - Project Descriptions

Project				Length	Number of:					
#	Road Name	Limits	Description	(km)	Intersections	Bridges	Culverts			
1	Chinguacousy Road	Mayfield Road to Old School Road	Widen from 2 rural to 4 rural lanes	3.07	4	0	3			
2	Dixie Road	2 km north of Mayfield Road to King Street	Widen from 2 rural to 4 rural lanes		2	0	1			
3	Airport Road	Countryside Drive to Mayfield Road	Widen from 4 urban to 6 urban lanes	1.27	2	1	0			
4	Airport Road	Mayfield Road to Highway 413	Widen from 2/4 rural to 6 urban lanes	3.27	5	1	0			
5	Airport Road	King Street to Castlederg Side Road	Widen from 2 rural to 4 rural lanes	7.20	2	0	0			
6	The Gore Road	Healey Road to King Street	Widen from 2 rural to 4 rural lanes	3.07	2	0	0			
7	Humber Station Road	Mayfield Road to Healey Road	Widen from 2 rural to 4 rural lanes	3.07	2	0	0			
8	Coleraine Drive	Mayfield Road to Healey Road	Widen from 4 rural to 6 urban lanes	3.15	4	0	1			
9	Coleraine Drive	Healey Road to King Street	Widen from 4 urban/rural to 6 urban lanes	2.05	5	0	0			
10	Emil Kolb Parkway	King Street to Highway 50	Widen from 2 rural to 4 rural lanes	3.28	3	2	1			
11	Highway 50	Emil Kolb Parkway to Castlederg Side Road	Widen from 2 rural to 4 rural lanes	1.10	2	0	0			
12	Mayfield Road	Heritage Road to west of Mississauga Road	Widen from 4 rural to 6 rural lanes	1.10	1	0	0			
13	Old School Road	Chinguacousy Road to Hurontario Street	Widen from 2 rural to 4 rural lanes	2.79	3	0	4			
14	Healey Road	The Gore Road to Coleraine Drive	Widen from 2 rural to 4 rural lanes	2.75	3	0	1			
15	King Street	Airport Road to The Gore Road	Widen from 2 rural to 4 rural lanes	4.14	4	0	3			
16	The Gore Road	King Street to Castlederg Side Road	Widen from 2 rural to 4 rural lanes	3.06	2	0	1			
17	Chinguacousy Road	Old School Road to King Street	Widen from 2 rural to 4 rural lanes	3.07	0	0	0			
18	King Street	Dixie Road to Airport Road	Widen from 2 rural to 4 rural lanes	4.13	4	0	3			
19	King Street	The Gore Road to Coleraine Drive	Widen from 2 rural to 4 rural lanes	2.46	4	0	1			
20	Emil Kolb Parkway	King Street/Harvest Moon Drive to King Street	Widen from 4 urban to 6 urban lanes	0.99	2	0	0			
21	Old School Road	Hurontario Street to Dixie Road	Widen from 2 rural to 4 rural lanes	4.12	4	0	3			
22	Old School Road	Dixie Road to Airport Road	Widen from 2 rural to 4 rural lanes	4.16	4	0	2			
23	Healey Road	Airport Road to The Gore Road	Widen from 2 rural to 4 rural lanes	4.18	4	0	1			
24	King Street	Chinguacousy Road to Hurontario Street	Widen from 2 rural to 4 rural lanes	2.80	4	0	0			
25	Airport Road	Castlederg Side Road to Olde Base Line Road	Widen from 2 rural to 4 rural lanes	1.21	1	0	0			
25	Mayfield Road	Heritage Road to west of Mississauga Road	Widen from 4 rural to 6 rural lanes	1.72	2	0	0			
26	Old School Road	Mississauga Road to Chinguacousy Road	Widen from 2 rural to 4 rural lanes	2.76	3	0	0			
27	McLaughlin Road	Mayfield Road to Old School Road	Widen from 2 rural to 4 rural lanes	3.07	2	1	2			
28	McLaughlin Road	Old School Road to King Street	Widen from 2 rural to 4 rural lanes	3.07	2	0	1			

UPDATED APPENDIX B - PROJECT COSTING DETAILS

Peel Region Settlement Area Boundary Expansion Study Transportation Technical Analysis - Phase 2 Detailed Assessment

Table B-2 - Component Construction Costs

Project				(Con	ponent Cons	tru	ction Costs (Bas	ed on Bench	mar	k Unit Costs)			
#	Road Name	Limits	Roadwork	Bridges				tersections	8	Sidewalks	La	ndscaping	Str	eetlighting	R	Utility Relocation
1	Chinguacousy Road	Mayfield Road to Old School Road	\$ 8,401,209	\$ -	\$	1,539,000	\$	1,977,870	\$	1,117,541	\$	299,878	\$	2,538,767	\$	2,124,440
2	Dixie Road	2 km north of Mayfield Road to King Street	\$ 11,384,048	\$ -	\$	122,000	\$	2,340,030	\$	1,514,323	\$	406,349	\$	3,440,154	\$	2,878,720
3	Airport Road	Countryside Drive to Mayfield Road	\$ 4,140,606	\$ 870,000	\$	-	\$	2,356,260	\$	462,305	\$	124,054	\$	1,050,239	\$	878,840
4	Airport Road	Mayfield Road to Highway 413	\$ 12,063,138	\$ 1,651,561	\$	-	\$	4,526,320	\$	1,190,345	\$	319,414	\$	2,704,159	\$	2,262,840
5	Airport Road	King Street to Castlederg Side Road	\$ 19,703,160	\$ -	\$	-	\$	674,010	\$	2,620,944	\$	703,296	\$	5,954,112	\$	4,982,400
6	The Gore Road	Healey Road to King Street	\$ 8,401,209	\$ -	\$	-	\$	1,349,010	\$	1,117,541	\$	299,878	\$	2,538,767	\$	2,124,440
7	Humber Station Road	Mayfield Road to Healey Road	\$ 8,401,209	\$ -	\$	-	\$	1,191,000	\$	1,117,541	\$	299,878	\$	2,538,767	\$	2,124,440
8	Coleraine Drive	Mayfield Road to Healey Road	\$ 10,270,008	\$ -	\$	85,200	\$	4,115,740	\$	1,146,663	\$	307,692	\$	2,604,924	\$	2,179,800
9	Coleraine Drive	Healey Road to King Street	\$ 6,683,656	\$ -	\$		\$	4,894,700	\$	746,241	\$	200,244	\$	1,695,268	\$	1,418,600
10	Emil Kolb Parkway	King Street to Highway 50	\$ 8,975,884	\$ 3,344,000	\$	300,000	\$	1,022,290	\$	1,193,986	\$	320,390	\$	2,712,429	\$	2,269,760
11	Highway 50	Emil Kolb Parkway to Castlederg Side Road	\$ 3,010,205	\$ -	\$	-	\$	786,870	\$	400,422	\$	107,448	\$	909,656	\$	761,200
12	Mayfield Road	Heritage Road to west of Mississauga Road	\$ 3,586,352	\$ -	\$	-	\$	994,000	\$	400,422	\$	107,448	\$	909,656	\$	761,200
13	Old School Road	Chinguacousy Road to Hurontario Street	\$ 7,634,975	\$ -	\$	1,436,400	\$	1,736,280	\$	1,015,616	\$	272,527	\$	2,307,218	\$	1,930,680
14	Healey Road	The Gore Road to Coleraine Drive	\$ 7,525,513	\$ -	\$	615,600	\$	905,330	\$	1,001,055	\$	268,620	\$	2,274,140	\$	1,903,000
15	King Street	Airport Road to The Gore Road	\$ 11,329,317	\$ -	\$	336,054	\$	3,358,650	\$	1,507,043	\$	404,395	\$	3,423,614	\$	2,864,880
16	The Gore Road	King Street to Castlederg Side Road	\$ 8,373,843	\$ -	\$	364,230	\$	961,290	\$	1,113,901	\$	298,901	\$	2,530,498	\$	2,117,520
17	Chinguacousy Road	Old School Road to King Street	\$ 8,401,209	\$ -	\$	-	\$		\$	1,117,541	\$	299,878	\$	2,538,767	\$	2,124,440
18	King Street	Dixie Road to Airport Road	\$ 11,301,952	\$ -	\$	721,376	\$	4,163,070	\$	1,503,403	\$	403,418	\$	3,415,345	\$	2,857,960
19	King Street	The Gore Road to Coleraine Drive	\$ 6,731,913	\$ -	\$	46,817	\$	1,850,640	\$	895,489	\$	240,293	\$	2,034,322	\$	1,702,320
20	Emil Kolb Parkway	King Street/Harvest Moon Drive to King Street	\$ 3,227,717	\$ -	\$	-	\$	863,720	\$	360,380	\$	96,703	\$	818,690	\$	685,080
21	Old School Road	Hurontario Street to Dixie Road	\$ 11,274,586	\$ -	\$	1,436,400	\$	1,994,280	\$	1,499,762	\$	402,442	\$	3,407,075	\$	2,851,040
22	Old School Road	Dixie Road to Airport Road	\$ 11,384,048	\$ -	\$	1,333,800	\$	1,175,640	\$	1,514,323	\$	406,349	\$	3,440,154	\$	2,878,720
23	Healey Road	Airport Road to The Gore Road	\$ 11,438,779	\$ -	\$	1,231,200	\$	1,032,000	\$	1,521,604	\$	408,302	\$	3,456,693	\$	2,892,560
24	King Street	Chinguacousy Road to Hurontario Street	\$ 7,662,340	\$ -	\$	-	\$	3,908,590	\$	1,019,256	\$	273,504	\$	2,315,488	\$	1,937,600
25	Airport Road	Castlederg Side Road to Olde Base Line Road	\$ 3,311,226	\$ -	\$	-	\$	808,000	\$	440,464	\$	118,193	\$	1,000,622	\$	837,320
25	Mayfield Road	Heritage Road to west of Mississauga Road	\$ 5,607,750	\$ -	\$	-	\$	1,313,000	\$	626,114	\$	168,010	\$	1,422,371	\$	1,190,240
26	Old School Road	Mississauga Road to Chinguacousy Road	\$ 7,552,878	\$ -	\$	-	\$	774,000	\$	1,004,695	\$	269,597	\$	2,282,410	\$	1,909,920
27	McLaughlin Road	Mayfield Road to Old School Road	\$ 8,401,209	\$ 2,605,680	\$	615,600	\$	1,461,870	\$	1,117,541	\$	299,878	\$	2,538,767	\$	2,124,440
28	McLaughlin Road	Old School Road to King Street	\$ 8,401,209	\$ -	\$	307,800	\$	516,000	\$	1,117,541	\$	299,878	\$	2,538,767	\$	2,124,440
		TOTAL	\$ 244,581,143	\$ 8,471,241	\$	10,491,477	\$	53,050,460	\$	31,404,005	\$	8,426,854	\$	71,341,839	\$	59,698,840

UPDATED APPENDIX B - PROJECT COSTING DETAILS

Peel Region Settlement Area Boundary Expansion Study Transportation Technical Analysis - Phase 2 Detailed Assessment

Table B-3 - Total Project Costs

Project #	Road Name	Limits	TOTAL Construction Components	Municipal Class EA Study	Detailed Design		Contingency		TOTAL PROJECT	
1	Chinguacousy Road	Mayfield Road to Old School Road	\$ 17,998,705	\$ 539,961	\$	2,699,806	\$	4,499,676	\$	25,738,148
2	Dixie Road	2 km north of Mayfield Road to King Street	\$ 22,085,624	\$ 662,569	\$	3,312,844	\$	5,521,406	\$	31,582,442
3	Airport Road	Countryside Drive to Mayfield Road	\$ 9,882,305	\$ 400,000	\$	2,000,000	\$	2,470,576	\$	14,752,881
4	Airport Road	Mayfield Road to Highway 413	\$ 24,717,777	\$ 741,533	\$	3,707,667	\$	6,179,444	\$	35,346,421
5	Airport Road	King Street to Castlederg Side Road	\$ 34,637,922	\$ 1,039,138	\$	5,195,688	\$	8,659,481	\$	49,532,228
6	The Gore Road	Healey Road to King Street	\$ 15,830,845	\$ 474,925	\$	2,374,627	\$	3,957,711	\$	22,638,108
7	Humber Station Road	Mayfield Road to Healey Road	\$ 15,672,835	\$ 470,185	\$	2,350,925	\$	3,918,209	\$	22,412,154
8	Coleraine Drive	Mayfield Road to Healey Road	\$ 20,710,027	\$ 621,301	\$	3,106,504	\$	5,177,507	\$	29,615,339
9	Coleraine Drive	Healey Road to King Street	\$ 15,638,709	\$ 469,161	\$	2,345,806	\$	3,909,677	\$	22,363,354
10	Emil Kolb Parkway	King Street to Highway 50	\$ 20,138,739	\$ 604,162	\$	3,020,811	\$	5,034,685	\$	28,798,396
11	Highway 50	Emil Kolb Parkway to Castlederg Side Road	\$ 5,975,801	\$ 400,000	\$	2,000,000	\$	1,493,950	\$	9,869,751
12	Mayfield Road	Heritage Road to west of Mississauga Road	\$ 6,759,078	\$ 400,000	\$	2,000,000	\$	1,689,770	\$	10,848,848
13	Old School Road	Chinguacousy Road to Hurontario Street	\$ 16,333,696	\$ 490,011	\$	2,450,054	\$	4,083,424	\$	23,357,185
14	Healey Road	The Gore Road to Coleraine Drive	\$ 14,493,258	\$ 434,798	\$	2,173,989	\$	3,623,314	\$	20,725,358
15	King Street	Airport Road to The Gore Road	\$ 23,223,953	\$ 696,719	\$	3,483,593	\$	5,805,988	\$	33,210,253
16	The Gore Road	King Street to Castlederg Side Road	\$ 15,760,183	\$ 472,805	\$	2,364,027	\$	3,940,046	\$	22,537,061
17	Chinguacousy Road	Old School Road to King Street	\$ 14,481,835	\$ 434,455	\$	2,172,275	\$	3,620,459	\$	20,709,024
18	King Street	Dixie Road to Airport Road	\$ 24,366,524	\$ 730,996	\$	3,654,979	\$	6,091,631	\$	34,844,129
19	King Street	The Gore Road to Coleraine Drive	\$ 13,501,794	\$ 405,054	\$	2,025,269	\$	3,375,448	\$	19,307,565
20	Emil Kolb Parkway	King Street/Harvest Moon Drive to King Street	\$ 6,052,290	\$ 400,000	\$	2,000,000	\$	1,513,073	\$	9,965,363
21	Old School Road	Hurontario Street to Dixie Road	\$ 22,865,585	\$ 685,968	\$	3,429,838	\$	5,716,396	\$	32,697,787
22	Old School Road	Dixie Road to Airport Road	\$ 22,133,034	\$ 663,991	\$	3,319,955	\$	5,533,258	\$	31,650,238
23	Healey Road	Airport Road to The Gore Road	\$ 21,981,138	\$ 659,434	\$	3,297,171	\$	5,495,284	\$	31,433,027
24	King Street	Chinguacousy Road to Hurontario Street	\$ 17,116,778	\$ 513,503	\$	2,567,517	\$	4,279,195	\$	24,476,993
25	Airport Road	Castlederg Side Road to Olde Base Line Road	\$ 6,515,824	\$ 400,000	\$	2,000,000	\$	1,628,956	\$	10,544,780
25	Mayfield Road	Heritage Road to west of Mississauga Road	\$ 10,327,486	\$ 400,000	\$	2,000,000	\$	2,581,871	\$	15,309,357
26	Old School Road	Mississauga Road to Chinguacousy Road	\$ 13,793,500	\$ 413,805	\$	2,069,025	\$	3,448,375	\$	19,724,704
27	McLaughlin Road	Mayfield Road to Old School Road	\$ 19,164,985	\$ 574,950	\$	2,874,748	\$	4,791,246	\$	27,405,928
28	McLaughlin Road	Old School Road to King Street	\$ 15,305,635	\$ 459,169	\$	2,295,845	\$	3,826,409	\$	21,887,058
		TOTAL	\$ 487,465,860	\$ 15,658,592	\$	78,292,962	\$ 1	121,866,465	\$	703,283,879