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**APPENDIX C**  
**Alternatives Feasible Combinations**

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**Evaluation of Alternatives for Longwood Road**

Evaluation of Alternatives for Longwood Road									
	Section A - Including Aberdeen/Longwood area, connections to Hwy 403, and Aberdeen to the TH&B bridge				Section B - Including Longwood Road between Aberdeen/Longwood area and the Hwy 403 bridge		Section C - Longwood Road bridge over Hwy 403 plus Main/Longwood intersection		
									
Alternative	A1a	A1b	A2a	A2b	B1	B2	C1	C2	C3
Description of Alternative	<b>Conventional intersection</b> of Aberdeen/Longwood with distributed active transportation infrastructure Active transportation is non-motorized, including walking and cycling	<b>Conventional intersection</b> of Aberdeen/Longwood with east/north side-weighted active transportation infrastructure	<b>Roundabout</b> at Aberdeen/Longwood with distributed active transportation infrastructure	<b>Roundabout</b> at Aberdeen/Longwood with east/north side-weighted active transportation infrastructure	Four lanes with turn lanes as necessary, with sidewalks and bike lanes on both sides	Four lanes with turn lanes as necessary, with east side-weighted active transportation infrastructure	Retain existing bridge with sidewalk on one side, and add sharrows in curb lanes Sharrows are pavement markings including both chevrons and a cyclist	Replace bridge to provide four lanes plus sidewalks and bike lanes on both sides	Retain existing bridge for motorized vehicles, and add new bridge to the north/east for active transportation
Impact on Existing Land Use and Access	Potential impact on SE corner and east side of existing warehouse building to accommodate right turn lanes on southbound Longwood Road	Potential impact on SE corner and east side of existing warehouse building to accommodate right turn lanes on southbound Longwood Road	Potential impact on SE corner and east side of existing warehouse building to accommodate right turn lanes on southbound Longwood Road South extension of Longwood Road must accommodate truck manoeuvring related to CP building loading docks	Potential impact on SE corner and east side of existing warehouse building to accommodate right turn lanes on southbound Longwood Road South extension of Longwood Road must accommodate truck manoeuvring related to CP building loading docks	Minimal impact, as the four general purpose lanes would be in the same location as at present	Minimal impact, as the four general purpose lanes would be shifted about 2.35m westerly compared to the present	No material impact, as to location of the existing bridge and curbs would be unchanged	Property and/or modification to boulevard leasing agreement would be required in both the southwest and southeast quadrants of the Main/Longwood intersection This may affect the capacity of the new car lot of the Acura dealership and the row of parking closest to Longwood Road at the strip plaza to the east	Property would be required in the southeast quadrant of the Main/Longwood intersection to accommodate the additional active transportation infrastructure This would remove the row of parking closest to Longwood Road at the strip plaza to the east
Impact on Future Land Use and Access	Some property required for corner clearances and additional lanes within the intersection Minimal property impact on CP lands and commercial property in the SW quadrant, but access to the commercial property may be limited to right-in/right-out	Some property required for corner clearances and additional lanes within the intersection Minimal property impact on CP lands and commercial property in the SW quadrant, but access to the commercial property may be limited to right-in/right-out	Significant property required for roundabout, approach lanes, and exit lanes Significant impact on size of commercial property in the SW quadrant Because of roundabout operation, commercial property in the SW quadrant would have access from all directions	Significant property required for roundabout, approach lanes, and exit lanes Significant impact on size of commercial property in the SW quadrant Because of roundabout operation, commercial property in the SW quadrant would have access from all directions	Minimal impact, as the four general purpose lanes would be in the same location as at present Clearance between the curb radius and the NE corner of the proposed McMaster Automotive Research Centre (MARC) will be between 2-3m, depending on final design	Minimal impact, as the four general purpose lanes would be shifted about 2.35m westerly compared to the present Clearance between the curb radius and the NE corner of the proposed McMaster Automotive Research Centre (MARC) will be as little as 1m, depending on final design	No impact, as new accesses to Longwood Road or to Main Street would not be permitted	The lot area available for redevelopment of the Acura Dealership site would be slightly reduced The on-site parking on the strip plaza site would be reduced, which may affect opportunities for site intensification as it relates to required parking under the zoning by-law	The on-site parking on the strip plaza site would be reduced, which may affect opportunities for site intensification as it relates to required parking under the zoning by-law
Impact on the Social Environment, including noise and vibration, and effects on pedestrians and cyclists	Cyclists subject to interaction with SB vehicles destined to Hwy 403 crossing bike lane, and with vehicles within the intersection Pedestrian crosswalks required on north and east legs of the intersection	The vast majority of cyclists and pedestrians would not be using the intersection, because of the pedestrian facilities and cycle track NE of the intersection. Crosswalks would be required at the north and east legs of the intersection for limited pedestrian demand	Cyclists subject to interaction with SB vehicles destined to Hwy 403 crossing bike lane Cyclists would be discouraged from using the roundabout, with separate pathways provided around the perimeter, but crossings/dismounts would be necessary Pedestrian crossings would be provided at the north and east legs of the roundabout At the TH&B rail bridge, there is insufficient space for desired active transportation infrastructure	Cyclists would be accommodated in a cycle track (two-way separated bike lane) NE of the roundabout, and would not be required to use the roundabout itself Pedestrian activity would be focused NE of the roundabout, but pedestrian crossings would be provided at the north and east legs of the roundabout to accommodate limited pedestrian demand At the TH&B rail bridge, there is insufficient space for desired active transportation infrastructure, but it would be all located on the north side where constrained space is available	Bike lanes on both sides may not be fully compatible with the preferred concepts to the south at Aberdeen and to the north at the bridge over Hwy 403, so dismounts and/or separate crossings of Longwood Road may be necessary The pedestrian domain on the west side of Longwood Road may be constrained by the building encroachment for many years.	The pedestrian and bicycle infrastructure would be reflective of the expected desire lines for those using active transportation modes, and more aligned with the available property, i.e. 8m widening on the east and long-term building encroachment on the west This option would allow the option of providing just one crosswalk at Aberdeen/Longwood across the east leg of the intersection	The pedestrian domain would remain poor across the bridge, and the cycling environment would be improved but only poor-to-fair in terms of service to all classes of cyclists	The infrastructure provided for all modes - motorized vehicles, cyclists, and pedestrians - would be adequate The pedestrian prohibition for crossing the west leg of Main/Longwood limits the benefit of providing sidewalks on both sides of Longwood Road - allowing pedestrians across the west leg may negatively impact the vehicular capacity of the intersection	The pedestrian infrastructure would be reflective of the expected desire lines, and the need for adding a pedestrian crosswalk across the west leg of the Main/Longwood intersection would not be as pressing Special features such as a bike box and crosswalks for cyclists may be required to connect to the bike lanes on Longwood Road north of Main Street
Impact on Economic and Cultural Environment, including business and institutional, historical and archaeological resources	There would be no impact on cultural, historic, or archaeological resources	There would be no impact on cultural, historic, or archaeological resources	There would be no impact on cultural, historic, or archaeological resources Property required from CP Rail may affect truck operations, but effects can be mitigated	There would be no impact on cultural, historic, or archaeological resources Property required from CP Rail may affect truck operations, but effects can be mitigated	There would be no material impact on cultural, historic, or archaeological resources	There would be no material impact on cultural, historic, or archaeological resources	There would be no material impact on cultural, historic, or archaeological resources	There would be no material impact on cultural, historic, or archaeological resources There may be some business impacts at the northeast and southeast corners of Main/Longwood due to loss of parking spaces	There would be no material impact on cultural, historic, or archaeological resources There may be some business impacts at the northeast corner of Main/Longwood due to loss of parking spaces
Impact on Natural Environment, including vegetation, wildlife, storm water, landscape features, aquatic resources	Minimal impact on natural resources and storm drainage Storm water quality will be addressed during detail design	Minimal impact on natural resources and storm drainage Storm water quality will be addressed during detail design	Minimal impact on natural resources and storm drainage Landscape or gateway feature would be possible inside the roundabout Storm water quality will be addressed during detail design	Minimal impact on natural resources and storm drainage Landscape or gateway feature would be possible inside the roundabout Storm water quality will be addressed during detail design	Minimal impact on natural resources and storm drainage Storm water quality will be addressed during detail design	Minimal impact on natural resources and storm drainage Storm water quality will be addressed during detail design	No impact on vegetation, wildlife, and landscape features Storm water quality will be addressed during detail design	Minimal impact on vegetation, wildlife, and landscape features Some vegetation including trees and shrubs on the Hwy 403 embankments would require removal for construction of the wider bridge Storm water quality will be addressed during detail design	Minimal impact on wildlife and landscape features Some vegetation including trees and shrubs on the Hwy 403 embankments would require removal for construction of the active transportation bridge Storm water quality will be addressed during detail design

Evaluation of Alternatives for Longwood Road

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Alternative	Section A - Including Aberdeen/Longwood area, connections to Hwy 403, and Aberdeen to the TH&B bridge				Section B - Including Longwood Road between Aberdeen/Longwood area and the Hwy 403 bridge		Section C - Longwood Road bridge over Hwy 403 plus Main/Longwood intersection		
	A1a	A1b	A2a	A2b	B1	B2	C1	C2	C3
Description of Alternative	<b>Conventional intersection</b> of Aberdeen/Longwood with distributed active transportation infrastructure Active transportation is non-motorized, including walking and cycling	<b>Conventional intersection</b> of Aberdeen/Longwood with east/north side-weighted active transportation infrastructure	<b>Roundabout</b> at Aberdeen/Longwood with distributed active transportation infrastructure	<b>Roundabout</b> at Aberdeen/Longwood with east/north side-weighted active transportation infrastructure	Four lanes with turn lanes as necessary, with sidewalks and bike lanes on both sides	Four lanes with turn lanes as necessary, with east side-weighted active transportation infrastructure	Retain existing bridge with sidewalk on one side, and add sharrows in curb lanes Sharrows are pavement markings including both chevrons and a cyclist	Replace bridge to provide four lanes plus sidewalks and bike lanes on both sides	Retain existing bridge for motorized vehicles, and add new bridge to the north/east for active transportation
Transportation, including existing and future travel demand, capacity and levels of service, intersection operations, access to/from Hwy 403, accommodation for pedestrians, cyclists, and transit	Double EB left turn and SB right turn lanes will result in acceptable levels of service, although SB queues may reach Frid Street in the afternoon peak hour Weaving movements between the HWY 403 ramp from Brantford and Longwood Road NB may occasionally be affected by queues, encouraging motorists to enter the CP Rail Yard access and perform a U-turn to head NB on Longwood Road Cyclists would navigate the intersection as a vehicle The SB bike lane would have a dotted line approaching Aberdeen Avenue to permit vehicles going to Hwy 403 to cross the bike path There would be marked crosswalks in the north and east legs of the intersection, although most pedestrian activity would keep to the NE quadrant	Double EB left turn and SB right turn lanes will result in acceptable levels of service, although SB queues will reach Frid Street in the afternoon peak hour Weaving movements between the HWY 403 ramp from Brantford and Longwood Road NB may occasionally be affected by queues, encouraging motorists to enter the CP Rail Yard access and perform a U-turn to head NB on Longwood Road Most cyclists would use the off-road cycle track, although cycle movements through the intersection would not be prohibited There would be marked crosswalks in the north and east legs of the intersection, although most pedestrian activity would keep to the NE quadrant	Separate yield-control slip lanes - two SB and one WB - will result in acceptable levels of service, although SB queues may reach Frid Street in the afternoon peak hour Cyclists would be provided separate paths around the perimeter of the roundabout, although some cyclists may choose to navigate the roundabout as a vehicle The SB bike lane would have a dotted line approaching Aberdeen Avenue to permit vehicles using the separate slip lanes going to Hwy 403 to cross the bike path There would be marked crosswalks for cyclists/pedestrians in all legs of the intersection, although most pedestrian activity would keep to the NE quadrant	Separate yield-control slip lanes - two SB and one WB - will result in acceptable levels of service, although SB queues may reach Frid Street in the afternoon peak hour Cyclists would be provided a cycle track in the NE quadrant to allow them to avoid entering the roundabout, although some cyclists may choose to navigate the roundabout as a vehicle There would be marked crosswalks for pedestrians in the north and east legs of the intersection, although most pedestrian activity would keep to the NE quadrant	The provision of four general purpose lanes plus left-turn lanes at Frid Street plus bike lanes plus a sizeable pedestrian domain provides for a good level of service into the long term	The provision of four general purpose lanes plus left-turn lanes at Frid Street plus bike lanes plus a sizeable pedestrian domain provides for a good level of service into the long term	An adequate level of service would be provided for motorized traffic, but accommodation for pedestrians and cyclists would be poor-to-fair	An adequate level of service would be provided for all modes of transportation	An adequate level of service would be provided for all modes of transportation The cycling environment may be perceived as less risky to cyclists because of the separation from vehicular traffic
Estimated Construction Cost	\$1,338,000	\$1,363,000	\$2,059,000	\$2,069,000	\$1,494,000	\$1,543,000	\$0	\$19,375,000	\$2,579,000



Evaluation of Alternatives for Longwood Road

	A1a - B1 - C1	A1a - B1 - C2	A2a - B1 - C1	A2a - B1 - C2	A1b - B2 - C1	A1b - B2 - C2	A1b - B2 - C3	A2b - B2 - C1	A2b - B2 - C2	A2b - B2 - C3
Combination of Alternatives										
Description of Combination of Alternatives	Conventional intersection of Aberdeen/Longwood with distributed active transportation infrastructure within the intersection and along Longwood Road, and retained use of existing bridge over Highway 403	Conventional intersection of Aberdeen/Longwood with distributed active transportation infrastructure within the intersection and along Longwood Road, and replacement wider bridge over Highway 403	Roundabout at Aberdeen/Longwood with distributed active transportation infrastructure around the roundabout and along Longwood Road, and retained use of existing bridge over Highway 403	Roundabout at Aberdeen/Longwood with distributed active transportation infrastructure around the roundabout and along Longwood Road, and replacement wider bridge over Highway 403	Conventional intersection of Aberdeen/Longwood with pedestrian crosswalks across the east and north legs of the intersection only, east-side-loaded active transportation infrastructure along Longwood Road, and retained use of existing bridge over Highway 403, requiring cyclists to cross Longwood at the pedestrian signal south of the bridge	Conventional intersection of Aberdeen/Longwood with pedestrian crosswalks across the east and north legs of the intersection only, east-side-loaded active transportation infrastructure along Longwood Road, and replacement wider bridge over Highway 403	Conventional intersection of Aberdeen/Longwood with pedestrian crosswalks across the east and north legs of the intersection only, east-side-loaded active transportation infrastructure along Longwood Road, and new second bridge over Highway 403 for active transportation	Roundabout at Aberdeen/Longwood with pedestrian crosswalks across the east and north legs of the roundabout only, east-side-loaded active transportation infrastructure along Longwood Road, and retained use of existing bridge over Highway 403	Roundabout at Aberdeen/Longwood with pedestrian crosswalks across the east and north legs of the roundabout only, east-side-loaded active transportation infrastructure along Longwood Road, and replacement wider bridge over Highway 403	Roundabout at Aberdeen/Longwood with pedestrian crosswalks across the east and north legs of the roundabout only, east-side-loaded active transportation infrastructure along Longwood Road, and new second bridge over Highway 403 for active transportation
Estimated Construction Cost	\$2,832,000	\$22,207,000	\$3,553,000	\$22,928,000	\$2,906,000	\$22,281,000	\$5,485,000	\$3,612,000	\$22,987,000	\$6,191,000
Overall Evaluation										

**Key**

