BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix B

Evaluation of Alternatives

Municipal Class Environmental Assessment – Hwy 52 & Powerline Road West Intersection Improvement (C11 60 24)
Evaluation of Alternatives

Type of Environment	Criteria for Evaluating Alternatives	**Do Nothing** The road corridor and intersections would remain in their existing configuration, continuing to function as a 2-lane, 2-way roadway with stop control on the minor approaches. Routine maintenance would be performed as required to ensure the road remains in a serviceable condition	**Alternative Solution 1: New Turning Lanes and Signals** New signals and left-turning lane for northbound movement at the Powerline Road West & Hwy 52 intersection and a southbound left-turning lane at the Powerline Road East & Hwy 52 intersection	**Alternative Solution 2: North Roundabout and South Left Turning Lane** Roundabout at the intersection of Powerline Road West & Hwy 52. Adding a new southbound left-turning lane at Powerline Road East & Hwy 52	**Alternative Solution 3: North Roundabout and extend Powerline Road East Across the Existing Ravine** Roundabout at Powerline Road West & Hwy 52 intersection and extend Powerline Road East westerly across the ravine lands to a new roundabout at the existing Powerline Road East. Southern intersection of Powerline Road East would be closed, trail crossing relocated near the new Powerline Road West roundabout	**Alternative Solution 4: Two Roundabouts and New bridge to Carry Powerline Rd West Across Hwy 52** Alternative Solution 4: Two Roundabouts and New bridge to Carry Powerline Road West Across Hwy 52	**Alternative Solution 5: North and South Roundabouts on Hwy 52** One roundabout at Hwy 52 & Powerline Road West and one roundabout at Hwy 52 & Powerline Road East
A – Natural Environment	**Potential Impact to Vegetation, Trees**	No impact over existing conditions	New turning lanes and signals would have a minimal impact to vegetation and trees as improvements are located within the existing right-of-way.	New turning lane and roundabout would have some impact to vegetation; the roundabout could be placed to avoid/minimize impacts to significant woodland.	Roundabout would have some impact to vegetation; the roundabout could be placed to avoid/minimize impacts to significant woodland. The extension of Powerline Road East would impact a vegetation and trees through the ravine lands	New roundabouts would have some impact to vegetation; the roundabout could be placed to avoid/minimize impacts to significant woodland. The support piers of a bridge to extend Powerline Road East would have some impact to vegetation	New roundabouts would have some impact to vegetation; the roundabout could be placed to avoid/minimize impacts to significant woodland.
1	***Rating***	●	◕	◕	◔	◕	◕
	Potential Impact to Designated Natural Features	No impact over existing conditions	No anticipated impact to Significant Woodlands. No direct impact to the Provincially Significant Wetlands within the study area are anticipated. This alternative has minimal impact within Escarpment Protection Area, Hamilton Official Plan Environmentally Sensitive Area, and GRCA regulated area.	No anticipated impact to Significant Woodlands. No direct impact to the Provincially Significant Wetlands within the study area are anticipated. This alternative has minimal impact within Escarpment Protection Area, Hamilton Official Plan Environmentally Sensitive Area, and GRCA regulated area.	The extension of Powerline Road would impact lands adjacent to the Copetown Bog and significant woodlands. No direct impact to the Provincially Significant Wetlands within the study area are anticipated. Impact within Escarpment Protection Area, Greenbelt Natural Heritage System, Hamilton Official Plan Environmentally Sensitive Area, and GRCA regulated area.	The extension of Powerline Road would impact lands adjacent to the Copetown Bog and significant woodlands. No direct impact to the Provincially Significant Wetlands within the study area are anticipated. Potential impact within Hamilton Official Plan Environmentally Sensitive Area. Significant impact within the Escarpment Protection Area, Greenbelt Natural Heritage System, and GRCA regulated are not anticipated.	No anticipated impact to Significant Woodlands. No direct impact to the Provincially Significant Wetlands within the study area are anticipated. This alternative has minimal impact within Escarpment Protection Area, Hamilton Official Plan Environmentally Sensitive Area, and GRCA regulated area.
2	***Rating***	●	◕	●	◔	◕	●

Municipal Class Environmental Assessment – Hwy 52 & Powerline Road West Intersection Improvement (C11 60 24)
Evaluation of Alternatives

Type of Environment	Criteria for Evaluating Alternatives	**Do Nothing** The road corridor and intersections would remain in their existing configuration, continuing to function as a 2-lane, 2-way roadway with stop control on the minor approaches. Routine maintenance would be performed as required to ensure the road remains in a serviceable condition	**Alternative Solution 1: New Turning Lanes and Signals** New signals and left-turning lane for northbound movement at the Powerline Road West & Hwy 52 intersection and a southbound left-turning lane at the Powerline Road East & Hwy 52 intersection	**Alternative Solution 2: North Roundabout and South Left Turning Lane** Roundabout at the intersection of Powerline Road West & Hwy 52. Adding a new southbound left-turning lane at Powerline Road East & Hwy 52	**Alternative Solution 3: North Roundabout and extend Powerline Road East Across the Existing Ravine** Roundabout at Powerline Road West & Hwy 52 intersection and extend Powerline Road East westerly across the ravine lands to a new roundabout at the existing Powerline Road East. Southern intersection of Powerline Road East would be closed, trail crossing relocated near the new Powerline Road West roundabout	**Alternative Solution 4: Two Roundabouts and New bridge to Carry Powerline Rd West Across Hwy 52** Alternative Solution 4: Two Roundabouts and New bridge to Carry Powerline Road West Across Hwy 52	**Alternative Solution 5: North and South Roundabouts on Hwy 52** One roundabout at Hwy 52 & Powerline Road West and one roundabout at Hwy 52 & Powerline Road East
A – Natural Environment Cont'd	**Potential Impact to Wildlife Habitat and Habitat of Species at Risk**	No impact over existing conditions	New signals and turning lanes would have a minimal impact to wildlife habitat.	New turning lane and roundabout anticipated to have a minor impact to wildlife habitat	The extension of Powerline Road would impact on the environmentally significant area, watercourse, and associated wildlife habitat	The bridge extension of Powerline Road would have minor impact to environmentally significant area, potential indirect impact to watercourse and associated wildlife habitat	New turning lane and roundabout anticipated to have a minor impact to wildlife habitat
3	***Rating***	●	◕	◕	◔	◕	◕
	Potential Impact to Water Resources and Drainage	No impact over existing conditions	New turning lanes are not anticipated to impact water resources. New overland drainage/ditches would be required.	New roundabout and new turning lanes are not anticipated to impact water resources. New overland drainage/ditches are required.	The extension of Powerline Road would impact watercourse and existing drainage. New overland drainage/ditches would be required.	New roundabouts and bridge extension is not anticipated to directly impact water resources. New overland drainage/ditches are required.	New roundabouts are not anticipated to impact water resources. New overland drainage/ditches are required.
4	***Rating***	●	◕	◕	◔	◕	◕
	Potential Climate Change Impact and Resilience - Emission of Greenhouse Gases, Impact on Carbon Removal, Carbon Storage/ Sink (Trees and Vegetation). Resilience and Climate Change Impact on the Undertaking	No impact over existing conditions. No impact to carbon sink. No opportunity to improve active transportation connection.	Minor impact to carbon sink through tree removal. However, the increased accessibility for active transportation may mitigate some impact to the carbon sink.	Minor impact to carbon sink through tree removal. However, the increased accessibility for active transportation may mitigate some impact to the carbon sink.	Minor impact to carbon sink through tree removal. However, the increased accessibility for active transportation may mitigate some impact to the carbon sink.	Minor impact to carbon sink through tree removal. However, the increased accessibility for active transportation may mitigate some impact to the carbon sink.	Minor impact to carbon sink through tree removal. However, the increased accessibility for active transportation may mitigate some impact to the carbon sink.
5	***Rating***	◑	◕	◕	◕	◕	◕
	Summary Natural Environment	◕	◕	◕	◔	◕	◕

Municipal Class Environmental Assessment – Hwy 52 & Powerline Road West Intersection Improvement (C11 60 24)
Evaluation of Alternatives

Type of Environment	Criteria for Evaluating Alternatives	**Do Nothing** The road corridor and intersections would remain in their existing configuration, continuing to function as a 2-lane, 2-way roadway with stop control on the minor approaches. Routine maintenance would be performed as required to ensure the road remains in a serviceable condition	**Alternative Solution 1: New Turning Lanes and Signals** New signals and left-turning lane for northbound movement at the Powerline Road West & Hwy 52 intersection and a southbound left-turning lane at the Powerline Road East & Hwy 52 intersection	**Alternative Solution 2: North Roundabout and South Left Turning Lane** Roundabout at the intersection of Powerline Road West & Hwy 52. Adding a new southbound left-turning lane at Powerline Road East & Hwy 52	**Alternative Solution 3: North Roundabout and extend Powerline Road East Across the Existing Ravine** Roundabout at Powerline Road West & Hwy 52 intersection and extend Powerline Road East westerly across the ravine lands to a new roundabout at the existing Powerline Road East. Southern intersection of Powerline Road East would be closed, trail crossing relocated near the new Powerline Road West roundabout	**Alternative Solution 4: Two Roundabouts and New bridge to Carry Powerline Rd West Across Hwy 52** Alternative Solution 4: Two Roundabouts and New bridge to Carry Powerline Road West Across Hwy 52	**Alternative Solution 5: North and South Roundabouts on Hwy 52** One roundabout at Hwy 52 & Powerline Road West and one roundabout at Hwy 52 & Powerline Road East
B – Socio-cultural	**Potential Impact to Heritage Resources Such as Archaeology and Cultural Heritage**	No impact over existing conditions	Low potential to impact cultural and archaeological resources as footprint of signals and turning lanes located within disturbed area of ROW	Low potential to impact cultural and archaeological resources as footprint of roundabout and turning lanes are located within disturbed area of ROW	Impact to trail (cultural heritage landscape) and potential archaeological resources in undisturbed areas through ravine lands	Low potential to impact cultural and archaeological resources in disturbed areas within the right of way. Footprint of bridge is anticipated to be located in previously disturbed area with low potential to impact trail (cultural heritage landscape) and potential archaeological resources	Low potential to impact cultural and archaeological resources as footprint of roundabouts are located within disturbed area of ROW
1	***Rating***	●	◕	◕	◑	◕	◕
	Nuisance Impacts Such as Noise, Visual, and Construction Impacts	No impact over existing conditions	Temporary nuisance impacts anticipated during construction	Temporary nuisance impacts anticipated during construction	Temporary nuisance impacts anticipated during construction	Temporary nuisance impacts anticipated during construction	Temporary nuisance impacts anticipated during construction
2	***Rating***	●	◕	◕	◕	◕	◕
	Land Acquisition Needs, Impacts to Driveway Access	No land acquisition or driveway access changes	Minimal impact to adjacent properties	Minimal impact to adjacent properties	Land acquisition needed	Land acquisition needed	Potential property acquisition needed for south roundabout
3	***Rating***	◕	◕	◕	◑	◑	◑

Municipal Class Environmental Assessment – Hwy 52 & Powerline Road West Intersection Improvement (C11 60 24)
Evaluation of Alternatives

Type of Environment	Criteria for Evaluating Alternatives	**Do Nothing** The road corridor and intersections would remain in their existing configuration, continuing to function as a 2-lane, 2-way roadway with stop control on the minor approaches. Routine maintenance would be performed as required to ensure the road remains in a serviceable condition	**Alternative Solution 1: New Turning Lanes and Signals** New signals and left-turning lane for northbound movement at the Powerline Road West & Hwy 52 intersection and a southbound left-turning lane at the Powerline Road East & Hwy 52 intersection	**Alternative Solution 2: North Roundabout and South Left Turning Lane** Roundabout at the intersection of Powerline Road West & Hwy 52. Adding a new southbound left-turning lane at Powerline Road East & Hwy 52	**Alternative Solution 3: North Roundabout and extend Powerline Road East Across the Existing Ravine** Roundabout at Powerline Road West & Hwy 52 intersection and extend Powerline Road East westerly across the ravine lands to a new roundabout at the existing Powerline Road East. Southern intersection of Powerline Road East would be closed, trail crossing relocated near the new Powerline Road West roundabout	**Alternative Solution 4: Two Roundabouts and New bridge to Carry Powerline Rd West Across Hwy 52** Alternative Solution 4: Two Roundabouts and New bridge to Carry Powerline Road West Across Hwy 52	**Alternative Solution 5: North and South Roundabouts on Hwy 52** One roundabout at Hwy 52 & Powerline Road West and one roundabout at Hwy 52 & Powerline Road East
B – Socio-cultural Cont'd	**Conformity to Municipal and Provincial Agency Policy**	No change over existing conditions. Improvements to safety would align with Vision Zero policies from the Transportation Master Plan	Improvements to safety align with Vision Zero policies from the Transportation Master Plan. This alternative anticipated to have minor impact to regulated conservation lands and the Niagara Escarpment Protection Area	Improvements to safety align with Vision Zero policies from the Transportation Master Plan. This alternative anticipated to have minor impact to regulated conservation lands and the Niagara Escarpment Protection Area	Improvements to safety align with Vision Zero policies from the Transportation Master Plan. This alternative is anticipated to impact regulated conservation lands and the Niagara Escarpment Protection Area.	Improvements to safety align with Vision Zero policies from the Transportation Master Plan. This alternative anticipated to have minor impact to regulated conservation lands and the Niagara Escarpment Protection Area	Improvements to safety align with Vision Zero policies from the Transportation Master Plan. This alternative anticipated to have minor impact to regulated conservation lands and the Niagara Escarpment Protection Area
4	***Rating***	◔	●	●	◕	●	●
	Levels of Service for Local Residents and Business, Impact to Municipal Services	No changes to existing condition. Traffic delays on the westbound approach to the Hwy 52 and Powerline Road West intersection	Improves levels of service for local residents and businesses and does not have a negative impact to municipal services	Improves levels of service for local residents and businesses and does not have a negative impact to municipal services	Improves levels of service for local residents and businesses and does not have a negative impact to municipal services	Improves levels of service for local residents and businesses and does not have a negative impact to municipal services	Improves levels of service for local residents and businesses and does not have a negative impact to municipal services
5	***Rating***	◔	●	●	●	●	●
	Multi-modal Transportation Connectivity and Safety	"No changes to existing infrastructure No changes to vehicular connectivity	Opportunity for improvement of multi-modal transportation connectivity and safety including pedestrian, cyclist	Opportunity for improvement of multi-modal transportation connectivity and safety including pedestrian, cyclist	Opportunity for improvement of multi-modal transportation connectivity and safety including pedestrian, cyclist	Opportunity for improvement of multi-modal transportation connectivity and safety including pedestrian, cyclist	Opportunity for improvement of multi-modal transportation connectivity and safety including pedestrian, cyclist
6	***Rating***	◕	●	●	●	●	●
	Summary Socio-cultural Environment	◑	◕	◕	◕	◕	◕

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C – Financial Factors	**Estimated Capital Costs**	No capital costs associated	Low capital cost associated with new turning lane / signal	Moderate capital cost associated with new roundabout and turning lane	Moderate to high capital cost associated with new roundabout and road extension	High capital cost associated with two new roundabouts and new bridge	Moderate to high capital cost associated with two new roundabouts
1	***Rating***	●	●	◕	◑	O	◑
	Estimated Operation and Maintenance Costs	No change to operation and maintenance costs	Moderate maintenance cost associated with new turning lane / signal	Moderate maintenance cost associated with new roundabout and turning lane	Moderate to high maintenance cost associated with new roundabout and road extension	High maintenance cost associated with two new roundabouts and new bridge	Moderate to high maintenance cost associated with two new roundabouts
2	***Rating***	◕	◕	◕	◑	O	◑
	Property Acquisition Costs	No property acquisition costs	No property acquisition costs anticipated to accommodate new turning lane / signal	Property acquisition costs not anticipated to accommodate new roundabout	High property acquisition costs required to accommodate new roundabout and road extension	High property acquisition costs required to accommodate roundabouts and bridge	Moderate property acquisition costs required to accommodate roundabouts
3	***Rating***	●	●	●	◑	◑	◕
	Summary Financial Factors	◕	◕	◕	◑	O	◑

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D – Technical Factors	**Operational / Traffic Congestion**	'No improvement to traffic operation. The existing conditions analysis revealed significant delays, particularly on the westbound approach of Powerline Road East, operating at LOS E and F due to high volumes on Highway 52.	Signalizing the north intersection improves the traffic operation. All movements operate with LOS C or better at the intersection of Power Line Road West and Highway 52 under signalized conditions. Whereas at the intersection of Highway 52 & Powerline Road East, the westbound left-right movement operate with LOS F. This may be due to heavy traffic on Highway 52. All north-south approaches on Highway 52 operate with LOS B or better, as they are uncontrolled and allow free-flow movement.	Roundabout at the north intersection improves the traffic operation. The intersection of Powerline Road West and Highway 52 northbound left-through movement operates with LOS E and a v/c ratio of 0.94 during AM peak hour, and the southbound through-right operates with LOS F and a v/c ratio of 1.0. At the intersection of Powerline Road East and Highway 52, the westbound left-right movement operates with LOS F under both AM and PM peak hours, with delays of around one minute.	The roundabout at the north intersection improves the traffic operation. The intersection of Powerline Road West and Highway 52, the eastbound left-through-right movement operates with LOS E and a v/c ratio of 0.95 during AM peak hour, and the southbound left-through-right movement operates with LOS F and a v/c ratio of 1.00 during PM peak hour. At the intersection of Powerline Road East and Highway 52, operates with LOS A under both peak hours.	The two roundabouts improve the traffic operation. Intersection of Powerline Road West and Highway 52, all movements operate at Level of Service (LOS) A. The intersection of Powerline Road East and Highway 52, the northbound through-right movement operates at LOS F with a volume-to-capacity (v/c) ratio of 0.97 during the AM peak hour. Similarly, the southbound left-through movement also operates at LOS F, with a v/c ratio of 1.05 and an average delay of approximately 2 minutes.	The two roundabouts improve the traffic operation. At the intersection of Powerline Road West and Highway 52, the northbound left-turn movement operates at Level of Service (LOS) E with a volume to capacity (v/c) ratio of 0.94 during the AM peak hour. During the PM peak hour, the southbound through-right movement operates at LOS F with a v/c ratio of 1.01 and experiences delays exceeding one minute. At the intersection of Powerline Road East and Highway 52, the northbound through right movement operates at LOS E with a v/c ratio of 0.95 during the AM peak hour, while the southbound left-through movement operates at LOS F with a v/c ratio of 1.01 and also experiences delays greater than one minute.
1	***Rating***	O	◕	●	●	◑	●

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D – Technical Factors Cont'd	**Operational Safety / Roadside Safety**	No improvements greater than existing conditions	Due to high north-south traffic volumes, a signal is somewhat safer than a stop control.	Roundabouts are moderately safer than signal / stop control intersections, generally recognized due to their reduced number of conflict points for both vehicles and pedestrians. The lower operating speeds within roundabouts make it easier for drivers to yield, requiring less stopping distance and enhancing pedestrian safety. Additionally, the circular geometry minimizes the risk of high-severity collisions, such as angle (T-bone) and Head-on crashes and reduces the impact of rear-end and sideswipe crashes.	Roundabouts are moderately safer than signal / stop control intersections, generally recognized due to their reduced number of conflict points for both vehicles and pedestrians. The lower operating speeds within roundabouts make it easier for drivers to yield, requiring less stopping distance and enhancing pedestrian safety. Additionally, the circular geometry minimizes the risk of high-severity collisions, such as angle (T-bone) and Head-on crashes and reduces the impact of rear-end and sideswipe crashes. Road extension through ravine may reduce operational safety due to steep slope	Roundabouts are moderately safer than signal / stop control intersections, generally recognized due to their reduced number of conflict points for both vehicles and pedestrians. The lower operating speeds within roundabouts make it easier for drivers to yield, requiring less stopping distance and enhancing pedestrian safety. Additionally, the circular geometry minimizes the risk of high-severity collisions, such as angle (T-bone) and Head-on crashes and reduces the impact of rear-end and sideswipe crashes.	Roundabouts are moderately safer than signal / stop control intersections, generally recognized due to their reduced number of conflict points for both vehicles and pedestrians. The lower operating speeds within roundabouts make it easier for drivers to yield, requiring less stopping distance and enhancing pedestrian safety. Additionally, the circular geometry minimizes the risk of high-severity collisions, such as angle (T-bone) and Head-on crashes and reduces the impact of rear-end and sideswipe crashes.
2	***Rating***	O	◕	●	◔	●	●
	Design Constraints	No improvements greater than existing conditions	Not anticipated to have significant design constraints	roundabout in an area with steep slope with potential need for cut and fill	Significant design constraints with extension of Powerline Road through ravine	Design constraints associated with new bridge.	No significant design constraints.
3	***Rating***	O	●	●	O	◕	●
	Summary Technical Factors	O	◕	●	◔	◕	●

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Evaluation of Alternatives

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E – Problem Statement	**Address Problem Statement**	No	Yes	Yes	Yes	Yes	Yes
1	**Summary Problem Statement**	Meets POS	Meets POS	Meets POS	Meets POS	Meets POS	Meets POS

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Scoring System	**Less Preferred**	**More Preferred**	**Most Preferred**	**Least Preferred**	**Somewhat Preferred**	**More Preferred**
Most Preferred	●					
More Preferred	◕					
Somewhat Preferred	◑					
Less Preferred	◔					
Least Preferred	O					
Overall Summary						
Natural Environment	◕	◕	◕	◔	◕	◕
Socio-Cultural Environment	◑	◕	◕	◕	◕	◕
Financial Factors	◕	◕	◕	◑	O	◑
Technical Factors	O	◕	●	◔	◕	●
Problem Statement	**Meets POS**	**Meets POS**	**Meets POS**	**Meets POS**	**Meets POS**	**Meets POS**
Overall Summary	**Less Preferred**	**More Preferred**	**Most Preferred**	**Least Preferred**	**Somewhat Preferred**	**More Preferred**

	Criteria for Evaluating Alternatives	Indicators	**Alternative Design Concept 1: Roundabout maintaining current approach** This alternative would involve the development of a roundabout with the approach centred along the current roadway.	**Alternative Design Concept 2: Roundabout with approach shifted west** This alternative would involve the development of a roundabout with the approaching lane shifted towards the west	**Alternative Design Concept 3: Roundabout with approach shifted east** This alternative would involve the development of a roundabout with the approaching lane shifted towards the east
A	**Natural Environment**				
1	**Impact to vegetation, trees**	Removal of existing trees and vegetation.	No anticipated impact to the Dry - Fresh Sugar Maple Deciduous Forest (FODM5) on the west end of the intersection. Minor impacts to the ecological communities are anticipated on north end due to maintained approach.	This alternative would be anticipated to have a very minor impact to the Dry - Fresh Sugar Maple Deciduous Forest (FODM5) on the west end of the intersection.	No anticipated impact to the Dry - Fresh Sugar Maple Deciduous Forest (FODM5) on the west end of the intersection. May have indirect impacts to the Reed Canary Grass Mineral Shallow Marsh (MASM1-14) at the east end of the corridor. Anticipated impact to the Dry - Fresh Forb Meadow (MEFM1) on the north and east of the intersection and impact to the Moist Manitoba Maple Deciduous Woodland (WODM53) and Dry - Fresh Mixed Meadow (MEMM3) on the south end of the intersection.
	Rating		◕	◕	◔
2	**Impact designated natural features**	Disturbance to significant woodlands and wetlands. Disturbance to Key Natural Heritage Features, ANSI, PSW, Greenbelt Natural Heritage System, NEP Protection Area.	No anticipated impact to Significant Woodlands. No direct impact to the Provincially Significant Wetlands within the study area are anticipated. This alternative has the least impact within Escarpment Protection Area, Hamilton Official Plan Environmentally Sensitive Area ,and GRCA regulated area.	This alternative would be anticipated to have a very minor impact to Significant Woodlands. No direct impact to the Provincially Significant Wetlands within the study area are anticipated. This alternative has moderate impact within Escarpment Protection Area, Hamilton Official Plan Environmentally Sensitive Area, and GRCA regulated area.	No anticipated impact to Significant Woodlands. No direct impact to the Provincially Significant Wetlands within the study area are anticipated; however, there may be indirect impacts due to the close proximity. This alternative has the greatest impact within Escarpment Protection Area, Hamilton Official Plan Environmentally Sensitive Area, and GRCA regulated area.
	Rating		◕	◑	◔
3	**Impact to wildlife habitat and habitat of species at risk**	Direct or Indirect effect on wildlife, Species of Special Concern Impact or change to habitat, Significant Wildlife Habitat Changes to habitat connectivity.	This alternative would be anticipated to have no impact to the Dry - Fresh Sugar Maple Deciduous Forest (FODM5) on the west end of the intersection which is confirmed habitat for Eastern Wood-pewee and candidate habitat for Bat Maternity Colonies, Bald Eagle & Osprey Nesting, Foraging & Perching Habitat, and Perfoliate Bellswort. Minor impacts to the ecological communities are anticipated on north end due to maintained approach.	This alternative would be anticipated to have a minor impact to the Dry - Fresh Sugar Maple Deciduous Forest (FODM5) on the west end of the intersection which is confirmed habitat for Eastern Wood-pewee and candidate habitat for Bat Maternity Colonies, Bald Eagle & Osprey Nesting, Foraging & Perching Habitat, and Perfoliate Bellswort.	This alternative has no anticipated impact to the Dry - Fresh Sugar Maple Deciduous Forest (FODM5) on the west end of the intersection which is confirmed habitat for Eastern Wood-pewee and candidate habitat for Bat Maternity Colonies, Bald Eagle & Osprey Nesting, Foraging & Perching Habitat, and Perfoliate Bellswort. Anticipated impact to the candidate Monarch habitat within the Dry - Fresh Forb Meadow (MEFM1) on the north end of the intersection and confirmed Monarch habitat within the Dry - Fresh Mixed Meadow (MEMM3) on the south end of the intersection.
	Rating		◕	◕	◕
4	**Impact to water resources and drainage**	Change or impact to surface water, disruption or changes to drainage, impact to groundwater resources, source water protection.	This alternative is within close proximity to the Provincially Significant Wetland (Copetown Bog) and may have potential impacts to the associated water resources.	This alternative is furthest in proximity from the Provincially Significant Wetland (Copetown Bog) and is unlikely to impact the associated water resources.	This alternative is closest in proximity to the Provincially Significant Wetland (Copetown Bog) and may have potential impacts to the associated water resources.
	Rating		◑	●	◔

	Criteria for Evaluating Alternatives	Indicators	Alternative Design Concept 1: Roundabout maintaining current approach This alternative would involve the development of a roundabout with the approach centred along the current roadway.	Alternative Design Concept 2: Roundabout with approach shifted west This alternative would involve the development of a roundabout with the approaching lane shifted towards the west	Alternative Design Concept 3: Roundabout with approach shifted east This alternative would involve the development of a roundabout with the approaching lane shifted towards the east
5	**Potential climate change impact and resilience – emission of greenhouse gases, impact on carbon removal, carbon storage / sink (trees and vegetation). Resilience and climate change impact on the undertaking**	Impact to carbon sinks (impact to wetland / vegetation removal). Potential for greenhouse gas emissions. Resilience or vulnerability. Change in air quality.	Minor impact to carbon sink through tree removal. However, the increased accessibility for active transportation may mitigate some impact to the carbon sink.	Minor impact to carbon sink through tree removal. However, the increased accessibility for active transportation may mitigate some impact to the carbon sink.	Minor impact to carbon sink through tree removal. However, the increased accessibility for active transportation may mitigate some impact to the carbon sink.
	Rating		◕	◕	◕
	Summary Natural Environment	**Summary**	◑	◕	◔

	Criteria for Evaluating Alternatives	Indicators	Alternative Design Concept 1: Roundabout maintaining current approach	Alternative Design Concept 2: Roundabout with approach shifted west	Alternative Design Concept 3: Roundabout with approach shifted east
B	**Socio-Cultural Environment**				
1	**Impact to cultural heritage resources such as archaeology and cultural heritage**	Potential impact to build heritage and cultural heritage landscapes. Potential to impact archaeology resources.	No anticipated impact to potential cultural heritage resources (BHR2) or to potential cultural heritage (CHL3). No anticipated impact to archaeological resources pending confirmation through reporting. None of the alternatives have an anticipated impact to known registered non-designated property within study area.	No anticipated impact to potential cultural heritage resources (BHR2) or to potential cultural heritage (CHL3). No anticipated impact to archaeological resources pending confirmation through reporting. None of the alternatives have an anticipated impact to known registered non-designated property within study area.	No anticipated impact to potential cultural heritage resources (BHR2). No anticipated impact to potential cultural heritage (CHL3). Minor anticipated impact to archaeological resources pending confirmation through reporting. None of the alternatives have an anticipated impact to known registered non-designated property within study area.
	Rating		◕	◕	◕
2	**Nuisance impacts such as noise, visual, and construction impacts**	Perceivable changes to existing noise levels. Visual impacts / aesthetics. Temporary disruption to residents during construction.	Temporary construction nuisance impacts may be present. Temporary nuisance impacts as a result of construction / temporary road closures for road improvements.	Temporary construction nuisance impacts may be present. Temporary nuisance impacts as a result of construction / temporary road closures for road improvements.	Temporary construction nuisance impacts may be present. Temporary nuisance impacts as a result of construction / temporary road closures for road improvements.
	Rating		◕	◕	◕
3	**Land acquisition needs, impacts to driveway access**	Financial and social effects of property acquisition. Change in use or layout. Temporary changes to driveway access during construction.	No land acquisition anticipated. Impacts to driveway access to be confirmed.	No land acquisition anticipated. Impacts to driveway access to be confirmed.	Anticipated land acquisition in addition to property within conservation lands. Impacts to driveway access to be confirmed.
	Rating		◕	◕	◔

	Criteria for Evaluating Alternatives	Indicators	Alternative Design Concept 1: Roundabout maintaining current approach	Alternative Design Concept 2: Roundabout with approach shifted west	Alternative Design Concept 3: Roundabout with approach shifted east
4	**Conformity to municipal and provincial agency policy**	Conforms to federal, provincial and local agency policy e.g. Conservation Authority, NEP, Greenbelt permitted uses.	Improvements to safety align with Vision Zero policies from the Transportation Master Plan. This alternative has a minor to moderate anticipated impact to regulated conservation lands. Alternative 1 has a minor anticipated impact within the Niagara Escarpment Protection Area.	Improvements to safety align with Vision Zero policies from the Transportation Master Plan. This alternative has a minor anticipated impact to regulated conservation lands and natural features. Alternative 2 has the least anticipated impact within the Niagara Escarpment Protection Area and Greenbelt Protected Countryside.	Improvements to safety align with Vision Zero policies from the Transportation Master Plan. This alternative has a moderate anticipated impact to regulated conservation lands and natural features. Alternative 3 has the greatest anticipated impact within the Niagara Escarpment Protection Area.
	Rating		◕	●	◑
5	**Levels of service for local residents and business, impact to municipal services**	Disruption to municipal services (accommodates winter maintenance and snow removal / storage, waste pick up). Accommodates emergency vehicles. Access to community mailbox.	Improves levels of service for local residents and businesses and does not have a negative impact to municipal services.	Improves levels of service for local residents and businesses and does not have a negative impact to municipal services.	Improves levels of service for local residents and businesses and does not have a negative impact to municipal services.
	Rating		●	●	●
6	**Multi-modal transportation connectivity and safety**	Pedestrian / Cyclist Safety Facilitates connectivity of active transportation (e.g. Trail).	Opportunity for improvement of multi-modal transportation connectivity and safety including pedestrian, cyclist, and equestrian needs	Opportunity for improvement of multi-modal transportation connectivity and safety including pedestrian, cyclist, and equestrian needs. Greatest improvement to safety through improvement of sightlines.	Opportunity for improvement of multi-modal transportation connectivity and safety including pedestrian, cyclist, and equestrian needs.
	Rating		◕	●	◕
	Summary Socio-Cultural Environment	**Summary**	◕	◕	◑

	Criteria for Evaluating Alternatives	Indicators	Alternative Design Concept 1: Roundabout maintaining current approach	Alternative Design Concept 2: Roundabout with approach shifted west	Alternative Design Concept 3: Roundabout with approach shifted east
C	**Financial Factors**				
1	**Estimated Capital Costs**	Estimated Capital Costs.	Moderate estimated capital cost.	Moderate estimated capital cost.	Highest estimated capital cost.
	Rating		◔	◔	○
2	**Estimated Operation and Maintenance Costs**	Estimated Operation and Maintenance Costs.	Moderate estimated operation and maintenance costs.	Moderate estimated operation and maintenance costs.	Moderate estimated operation and maintenance costs.
	Rating		◕	◕	◕
3	**Property Acquisition Costs**	Property Acquisition Costs.	No property acquisition costs anticipated with maintenance of existing road platform.	No property acquisition costs anticipated.	Greatest quantity of property acquisition anticipated.
	Rating		●	●	◔
	Summary Financial Factors	**Summary**	◑	◑	◔

	Criteria for Evaluating Alternatives	Indicators	Alternative Design Concept 1: Roundabout maintaining current approach	Alternative Design Concept 2: Roundabout with approach shifted west	Alternative Design Concept 3: Roundabout with approach shifted east
D	**Technical Factors**				
1	**Operational and Roadside Safety**	Effects on layout / operation of intersection and roadway. Improved sightlines. Ability to address roadside safety requirements. Ability to improve cyclist and pedestrian safety.	The roundabout improves the traffic operation moderately. Roundabouts are generally recognized as safer than traditional signalized or stop-controlled intersections due to their reduced number of conflict points for both vehicles and pedestrians. The lower operating speeds within roundabouts make it easier for drivers to yield, requiring less stopping distance and enhancing pedestrian safety. The centred approach has moderate visibility in comparison to the shifted alternatives. The circular geometry of a roundabout minimizes the risk of high-severity collisions, such as angle (T-bone) and head-on crashes; the geometry also reduces the impact of rear-end and sideswipe crashes.	The roundabout improves the traffic operation moderately. Roundabouts are generally recognized as safer than traditional signalized or stop-controlled intersections due to their reduced number of conflict points for both vehicles and pedestrians. The lower operating speeds within roundabouts make it easier for drivers to yield, requiring less stopping distance and enhancing pedestrian safety. The west shifted approach has the best visibility between alternatives. The circular geometry of a roundabout minimizes the risk of high-severity collisions, such as angle (T-bone) and head-on crashes; the geometry also reduces the impact of rear-end and sideswipe crashes.	The roundabout improves the traffic operation moderately. Roundabouts are generally recognized as safer than traditional signalized or stop-controlled intersections due to their reduced number of conflict points for both vehicles and pedestrians. The lower operating speeds within roundabouts make it easier for drivers to yield, requiring less stopping distance and enhancing pedestrian safety. The east shifted approach reduces visibility from Alternative 1 (centred roundabout). The circular geometry of a roundabout minimizes the risk of high-severity collisions, such as angle (T-bone) and head-on crashes; the geometry also reduces the impact of rear-end and sideswipe crashes.
	Rating		◕	●	◑
2	**Design Constraints / Geometry**	Professional opinion on the design limitations and restrictions.eg. Need for cut / fill / retaining walls. Conformance to City policy and Design Elements (e.g. Median design, boulevards, lane widths, landscaping). Ease and efficiency of construction, including ease of construction staging and relative construction traffic management.	This alternative proposes the roundabout in an area with steep slope requiring cut and fill.	This alternative is not anticipated to have significant design constraints.	This Alternative's close proximity to the wetland may pose a design constraint. This alternative proposes the roundabout in an area with steep slope requiring cut and fill.
	Rating		◑	●	◔
3	**Utility Impacts**	Effects on utilities (e.g. relocations).	Alternatives will have equivalent impact to utilities within the corridor (Bell, Enbridge, Hydro One). This will have a minor impact.	'Alternatives will have equivalent impact to utilities within the corridor (Bell, Enbridge, Hydro One). This will have a minor impact.	'Alternatives will have equivalent impact to utilities within the corridor (Bell, Enbridge, Hydro One). This will have a minor impact.
	Rating		◑	◑	◑
4	**Goods Movement**	Facilitates Goods Movement Roadway alignment implications on positive guidance.	City of Hamilton's 2022 Truck Route Master Plan designates Highway 52 as a fulltime truck route, with no truck restrictions on Powerline Road. Peak-hour turning movement data indicates significant truck traffic at the intersection of Highway 52 and Powerline Road. A roundabout will benefit goods movement in the corridor and will be a moderate improvement.	City of Hamilton's 2022 Truck Route Master Plan designates Highway 52 as a fulltime truck route, with no truck restrictions on Powerline Road. Peak-hour turning movement data indicates significant truck traffic at the intersection of Highway 52 and Powerline Road. A roundabout will benefit goods movement in the corridor and will be a moderate improvement.	City of Hamilton's 2022 Truck Route Master Plan designates Highway 52 as a fulltime truck route, with no truck restrictions on Powerline Road. Peak-hour turning movement data indicates significant truck traffic at the intersection of Highway 52 and Powerline Road. A roundabout will benefit goods movement in the corridor and will be a moderate improvement.
	Rating		●	●	●
	Summary Technical Factors	**Summary**	◑	◕	◑

	Criteria for Evaluating Alternatives	Indicators	Alternative Design Concept 1: Roundabout maintaining current approach	Alternative Design Concept 2: Roundabout with approach shifted west	Alternative Design Concept 3: Roundabout with approach shifted east
E	**Problem Statement**				
1	**Addresses problem Statement**	Addresses problem statement	Yes	Yes	Yes
	Summary Problem Statement	**Summary**	**Meets POS**	**Meets POS**	**Meets POS**

Criteria for Evaluating Alternatives	Alternative Design Concept 1: Roundabout maintaining current approach	Alternative Design Concept 2: Roundabout with approach shifted west	Alternative Design Concept 3: Roundabout with approach shifted east
Overall Summary	**Somewhat Preferred**	**Most Preferred**	**Least Preferred**

Order of Preference

Most Preferred	●
More Preferred	◕
Somewhat Preferred	◑
Less Preferred	◔
Least Preferred	○