










Table 1: Evaluation of Alternative Design Concepts – Engineered Environment

Criterion	Metric	Alternative 1 Hybrid Centreline with Multi-Use Pathways on Both Sides	Alternative 2 Hybrid Centreline with Multi-Use Pathway on North Side and Sidewalk on South Side	Alternative 3 Hybrid Centreline with Sidewalk & Cycle Track on Both Sides
Impact on Future Transportation Network	Potential to improve future traffic operations within the greater transportation network.	<p>Equally Preferred</p> <p>All alternatives widen this section of Rymal Road to five lanes, which is expected to mitigate existing traffic issues and allow for more efficient movement of transit, goods movement and personal vehicles within the corridor.</p>	<p>Equally Preferred</p> <p>All alternatives widen this section of Rymal Road to five lanes, which is expected to mitigate existing traffic issues and allow for more efficient movement of transit, goods movement and personal vehicles within the corridor.</p>	<p>Equally Preferred</p> <p>All alternatives widen this section of Rymal Road to five lanes, which is expected to mitigate existing traffic issues and allow for more efficient movement of transit, goods movement and personal vehicles within the corridor.</p>
Conflict Points Between Modes	Conflict points between transportation modes (vehicle-cyclist, cyclist-cyclist, cyclist-pedestrian)	<p>Moderately Preferred</p> <p style="text-align: center;"></p> <p>Cyclists are separated from vehicular traffic but share space with pedestrians throughout the corridor, creating a higher risk of cyclist-pedestrian conflicts when compared to Alternative 3.</p> <p>Two-way cyclist travel on the multi-use pathway increases the risk of bike-vehicle conflict at driveways and intersections as fast-moving cyclists approaching vehicles head-on are not as visible as those that the driver will pass on approach to the conflict zone. Two-way cyclist travel also increases the risk of cyclist-cyclist conflicts throughout the corridor.</p>	<p>Least Preferred</p> <p style="text-align: center;"></p> <p>Similar to Alternative 1 overall, with cyclist separated from vehicular traffic but sharing space with pedestrians on the north multi-use pathway. While the number of cyclist-pedestrian and cyclist-vehicle conflict points is halved because the multi-use pathway is only on the north side of the road, the lack of cycling facilities on the south side would double the volume of cyclists on the north side. Additionally, there is the risk of cyclists using the south sidewalk or the roadway to access mid-block destinations.</p>	<p>Most Preferred</p> <p style="text-align: center;"></p> <p>Cyclists, pedestrians, and vehicles have their own dedicated spaces throughout the corridor. Pedestrians will need to cross the cycle track to access transit stops; however, tactile surface indicators, pavement markings and signs can be used to alert cyclists and pedestrians of the conflict zone.</p> <p>One-way cyclist travel on the cycle track reduces risk of conflict with vehicles and other cyclists compared to two-way travel on a multi-use pathway.</p>

Criterion	Metric	Alternative 1 Hybrid Centreline with Multi-Use Pathways on Both Sides	Alternative 2 Hybrid Centreline with Multi-Use Pathway on North Side and Sidewalk on South Side	Alternative 3 Hybrid Centreline with Sidewalk & Cycle Track on Both Sides
Transportation Network Construction Impacts	Anticipated duration of construction activities	Equally Preferred Time required to complete utility relocations and roadway construction are anticipated to be substantially the same between alternatives. Minor differences in the time it would take to construct the different types of active transportation facilities is negligible in comparison to the overall construction timeline.	Equally Preferred Time required to complete utility relocations and roadway construction are anticipated to be substantially the same between alternatives. Minor differences in the time it would take to construct the different types of active transportation facilities is negligible in comparison to the overall construction timeline.	Equally Preferred Time required to complete utility relocations and roadway construction are anticipated to be substantially the same between alternatives. Minor differences in the time it would take to construct the different types of active transportation facilities is negligible in comparison to the overall construction timeline.
	Anticipated traffic disruptions during construction	Equally Preferred It is anticipated that roadway reconstruction would be staged similarly between all alternatives and therefore does not provide a distinction between alternatives. Anticipate shortened periods of traffic impact at entrances will be required for construction of multi-use pathways relative to constructing separate sidewalks and cycle tracks.	Equally Preferred It is anticipated that roadway reconstruction would be staged similarly between all alternatives and therefore does not provide a distinction between alternatives. Anticipate shortened periods of traffic impact at entrances will be required for construction of single active transportation facilities on the north and south sides relative to constructing separate sidewalks and cycle tracks.	Equally Preferred It is anticipated that roadway reconstruction would be staged similarly between all alternatives and therefore does not provide a distinction between alternatives. Anticipate slightly longer periods of traffic impact at entrances to construct separate sidewalks and cycle tracks relative to constructing single facility types on both sides of the roadway.

Criterion	Metric	Alternative 1 Hybrid Centreline with Multi-Use Pathways on Both Sides	Alternative 2 Hybrid Centreline with Multi-Use Pathway on North Side and Sidewalk on South Side	Alternative 3 Hybrid Centreline with Sidewalk & Cycle Track on Both Sides
Transit Rider Experience	Available space to accommodate experience-enhancing stop amenities	<p style="text-align: center;">Most Preferred</p> <p style="text-align: center;"></p> <p>Adequate space is identified in the proposed design to provide appropriate transit amenities at existing and future stops - including larger shelters and pads at future S-Line Transit stops. Multi-use pathways provide strong first and last mile active transportation connections to all transit stops.</p>	<p style="text-align: center;">Moderately Preferred</p> <p style="text-align: center;"></p> <p>Adequate space is identified in the proposed design to provide appropriate transit amenities at existing and future stops - including larger shelters and pads at future S-Line Transit stops. Multi-use pathways provide strong first and last mile active transportation connections to all transit stops on the north side. With exception of stops at Sumona Drive and Derby Street, all other eastbound transit stops are located in close proximity to signalized intersections and can be readily accessed by cyclists.</p>	<p style="text-align: center;">Most Preferred</p> <p style="text-align: center;"></p> <p>Adequate space is identified in the proposed design to provide appropriate transit amenities at existing and future stops - including larger shelters and pads at future S-Line Transit stops. Sidewalks and cycle tracks provide strong first and last mile active transportation connections to all transit stops along the corridor.</p>

Criterion	Metric	Alternative 1 Hybrid Centreline with Multi-Use Pathways on Both Sides	Alternative 2 Hybrid Centreline with Multi-Use Pathway on North Side and Sidewalk on South Side	Alternative 3 Hybrid Centreline with Sidewalk & Cycle Track on Both Sides
Construction Complexity	Relocation of utilities	<p style="text-align: center;">Moderately Preferred</p> <p style="text-align: center;"></p> <p>Both sides of the road have a multi-use pathway with a total width requirement of approximately 7.0 metres (m). Any above-ground utilities within the footprint of the multi-use pathway will require relocation.</p> <p>Anticipated utility relocations are based on a 0.5 m offset from the project edge and have been identified as follows:</p> <ol style="list-style-type: none"> 1) Utility Poles (0.3 m buffer): 310 2) Telecom Box and Pedestals (0.3 m buffer): 44 3) Concrete Utility Poles (0.3 m buffer): 73 4) Hydro Access Vaults and Manholes: 22 5) Hydro Transformer Box: 8 6) Hydro Duct: 5.79 kilometres (km) 7) Fibre Cable: 3.72 km 8) Gas Main: 6.00 km 	<p style="text-align: center;">Most Preferred</p> <p style="text-align: center;"></p> <p>The north side of the road has a multi-use pathway and the south side has a sidewalk with total width requirements of approximately 5.5 m. Any above-ground utilities within the footprint of the multi-use pathway and sidewalk will require relocation.</p> <p>Anticipated utility relocations are based on a 0.5 m offset from the project edge and have been identified as follows:</p> <ol style="list-style-type: none"> 1) Utility Poles (0.3 m buffer): 227 2) Telecom Box and Pedestals (0.3 m buffer): 35 3) Concrete Utility Poles (0.3 m buffer): 71 4) Hydro Access Vaults and Manholes: 15 5) Hydro Transformer Box: 6 6) Hydro Duct: 5.01 km 7) Fibre Cable: 3.13 km 8) Gas Main: 5.67 km 	<p style="text-align: center;">Least Preferred</p> <p style="text-align: center;"></p> <p>Both sides of the road have a sidewalk and cycle track with total width requirements of approximately 8.0 m. Any above-ground utilities within the footprint of the sidewalk and cycle track will require relocation.</p> <p>Anticipated utility relocations are based on a 0.5 m offset from the project edge and have been identified as follows:</p> <ol style="list-style-type: none"> 1) Utility Poles (0.3 m buffer): 377 2) Telecom Box and Pedestals (0.3 m buffer): 63 3) Concrete Utility Poles (0.3 m buffer): 76 4) Hydro Access Vaults and Manholes: 24 5) Hydro Transformer Box: 12 6) Hydro Duct: 5.98 km 7) Fibre Cable: 4.10 km 8) Gas Main: 6.45 km





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	Construction staging	<p>Equally Preferred</p> <p>Set up and construction staging will be required to maintain continuous traffic flow during construction. Road width is consistent throughout. No significant difference with other alternatives based on preferred cross-section. Construction of utilities has little impact with the overall staging of the project.</p>	<p>Equally Preferred</p> <p>Set up and construction staging will be required to maintain continuous traffic flow during construction. Road width is consistent throughout. No significant difference with other alternatives based on preferred cross-section. Construction of utilities has little impact with the overall staging of the project.</p>	<p>Equally Preferred</p> <p>Set up and construction staging will be required to maintain continuous traffic flow during construction. Road width is consistent throughout. No significant difference with other alternatives based on preferred cross-section. Construction of utilities has little impact with the overall staging of the project.</p>
Drainage	Anticipated change in impervious surface area	<p>Moderately Preferred</p> <p></p> <p>Impervious surface area is anticipated to increase by approximately 35 percent (or 40,300 square metre [m²]) as a result of road widening and active transportation and transit amenity improvements.</p>	<p>Most Preferred</p> <p></p> <p>Impervious surface area is anticipated to increase by approximately 29 percent (or 33,400 m²) as a result of road widening and active transportation and transit amenity improvements.</p>	<p>Least Preferred</p> <p></p> <p>Impervious surface area is anticipated to increase by approximately 39 percent (or 44,800 m²) as a result of road widening and active transportation and transit amenity improvements.</p>
	Available space to accommodate low-impact development (LID) measures	<p>Most Preferred</p> <p></p> <p>Proposed grassed boulevards have a total boulevard length of approximately 1,900 m that is wide enough for LID features (i.e., greater than 4 m wide). This space is moderately interrupted by driveways.</p>	<p>Most Preferred</p> <p></p> <p>Proposed grassed boulevards have a total boulevard length of approximately 2,300 m that is wide enough for LID features (i.e., greater than 4 m wide). This space is moderately interrupted by driveways.</p>	<p>Least Preferred</p> <p></p> <p>Proposed grassed boulevards have a total boulevard length of approximately 800 m that is wide enough for LID features (i.e., greater than 4 m wide). This space has limited driveway interruptions.</p>

Table 2: Evaluation of Alternative Design Concepts – Natural Environment





Criterion	Metric	Alternative 1 Hybrid Centreline with Multi-Use Pathways on Both Sides	Alternative 2 Hybrid Centreline with Multi-Use Pathway on North Side and Sidewalk on South Side	Alternative 3 Hybrid Centreline with Sidewalk & Cycle Track on Both Sides
Tree Removals	Number of large trees (diameter at breast height greater than 30 centimetres) requiring removal	<p>Moderately Preferred</p>  <p>Removal of 26 large trees would be required.</p>	<p>Most Preferred</p>  <p>Removal of 10 large trees would be required.</p>	<p>Least Preferred</p>  <p>Removal of 34 large trees would be required.</p>
Terrestrial Species and Habitat	Anticipated impacts to woodlands, wetlands, candidate Significant Wildlife Habitat, and potential Species at Risk (SAR) and/or SAR habitat	<p>Equally Preferred</p> <p>Limited natural heritage features are present along the corridor.</p> <p>Minor edge impacts to vegetation surrounding Chippewa Trail are anticipated (approximately 550 m² of total area adjacent to the trail will be impacted). Tree/shrub removals have the potential to impact SAR bats and/or nesting birds. There is potential to impact one SAR Butternut tree on private property south of Rymal Road. Further study is required to assess the health of the Butternut.</p>	<p>Equally Preferred</p> <p>Limited natural heritage features are present along the corridor.</p> <p>Minor edge impacts to vegetation surrounding Chippewa Trail are anticipated (approximately 500 m² of total area adjacent to the trail will be impacted). Tree/shrub removals have the potential to impact SAR bats and/or nesting birds. There is potential to impact one SAR Butternut tree on private property south of Rymal Road. Further study is required to assess the health of the Butternut.</p>	<p>Equally Preferred</p> <p>Limited natural heritage features are present along the corridor.</p> <p>Minor edge impacts to vegetation surrounding Chippewa Trail are anticipated (approximately 600 m² of total area adjacent to the trail will be impacted). Tree/shrub removals have the potential to impact SAR bats and/or nesting birds. There is potential to impact one SAR Butternut tree on private property south of Rymal Road. Further study is required to assess the health of the Butternut.</p>
Aquatic Species and Habitat	Potential impacts to features containing fish and fish habitat, including SAR	<p>Equally Preferred</p> <p>No watercourse or water body features observed along the length of the corridor.</p>	<p>Equally Preferred</p> <p>No watercourse or water body features observed along the length of the corridor.</p>	<p>Equally Preferred</p> <p>No watercourse or water body features observed along the length of the corridor.</p>
Hamilton Conservation Authority Approvals	Need for approvals from Hamilton Conservation Authority	<p>Equally Preferred</p> <p>Approvals are anticipated to be required from Hamilton Conservation Authority for work within its regulated area.</p>	<p>Equally Preferred</p> <p>Approvals are anticipated to be required from Hamilton Conservation Authority for work within its regulated area.</p>	<p>Equally Preferred</p> <p>Approvals are anticipated to be required from Hamilton Conservation Authority for work within its regulated area.</p>

Table 3: Evaluation of Alternative Design Concepts – Socio-Economic Environment

Criterion	Metric	Alternative 1 Hybrid Centreline with Multi-Use Pathways on Both Sides	Alternative 2 Hybrid Centreline with Multi-Use Pathway on North Side and Sidewalk on South Side	Alternative 3 Hybrid Centreline with Sidewalk & Cycle Track on Both Sides
Planning Policy	Alignment with Provincial Policy Objectives	<p>Equally Preferred</p> <p>Alternative is consistent with the Ontario Municipal Class Environmental Assessment process and Provincial Policy Statement.</p>	<p>Equally Preferred</p> <p>Alternative is consistent with the Ontario Municipal Class Environmental Assessment process and Provincial Policy Statement.</p>	<p>Equally Preferred</p> <p>Alternative is consistent with the Ontario Municipal Class Environmental Assessment process and Provincial Policy Statement.</p>
	Alignment with Regional Planning Objectives	<p>Equally Preferred</p> <p>Alternative is consistent with the Metrolinx Regional Transportation Plan (RTP, 2018), as the affected portion of Rymal Road will ultimately function as a ‘Transit Priority Corridor’. Transit Priority Corridors include features such as high occupancy vehicle (HOV) lanes and queue jump lanes, with the objective of allowing transit vehicles to operate at a faster speed than vehicles in mixed traffic.</p> <p>Alternative is consistent with the Growth Plan: A Place to Grow for the Greater Golden Horseshoe that aims for growth and development in a way that supports economic prosperity, protects the environment, and helps communities achieve a high quality of life.</p>	<p>Equally Preferred</p> <p>Alternative is consistent with the Metrolinx Regional Transportation Plan (RTP, 2018), as the affected portion of Rymal Road will ultimately function as a ‘Transit Priority Corridor’. Transit Priority Corridors include features such as high occupancy vehicle (HOV) lanes and queue jump lanes, with the objective of allowing transit vehicles to operate at a faster speed than vehicles in mixed traffic.</p> <p>Alternative is consistent with the Growth Plan: A Place to Grow for the Greater Golden Horseshoe that aims for growth and development in a way that supports economic prosperity, protects the environment, and helps communities achieve a high quality of life.</p>	<p>Equally Preferred</p> <p>Alternative is consistent with the Metrolinx Regional Transportation Plan (RTP, 2018), as the affected portion of Rymal Road will ultimately function as a ‘Transit Priority Corridor’. Transit Priority Corridors include features such as high occupancy vehicle (HOV) lanes and queue jump lanes, with the objective of allowing transit vehicles to operate at a faster speed than vehicles in mixed traffic.</p> <p>Alternative is consistent with the Growth Plan: A Place to Grow for the Greater Golden Horseshoe that aims for growth and development in a way that supports economic prosperity, protects the environment, and helps communities achieve a high quality of life.</p>

Criterion	Metric	Alternative 1 Hybrid Centreline with Multi-Use Pathways on Both Sides	Alternative 2 Hybrid Centreline with Multi-Use Pathway on North Side and Sidewalk on South Side	Alternative 3 Hybrid Centreline with Sidewalk & Cycle Track on Both Sides
	Alignment with Municipal Planning Objectives	<p style="text-align: center;">Moderately Preferred</p> <p style="text-align: center;"></p> <p>Compared to Alternative 3, this alternative is less closely aligned with Official Plan policies aimed at maximizing safe and convenient passages for cyclists and a high standard of connectivity through continuous improvement and expansion of the cycling network.</p> <p>Alternative is consistent with Transportation Master Plan designation that provides for multi-use pathways along Rymal Road from Upper James Street to Upper Sherman Avenue.</p>	<p style="text-align: center;">Least Preferred</p> <p style="text-align: center;"></p> <p>Alternative is least aligned with Official Plan policies aimed at maximizing safe and convenient passages for cyclists and a high standard of connectivity through continuous improvement and expansion of the cycling network.</p> <p>Alternative is consistent with Transportation Master Plan designation that provides for multi-use pathways along Rymal Road from Upper James Street to Upper Sherman Avenue.</p>	<p style="text-align: center;">Most Preferred</p> <p style="text-align: center;"></p> <p>Alternative is most closely aligned with Official Plan policies aimed at maximizing safe and convenient passages for cyclists and a high standard of connectivity through continuous improvement and expansion of the cycling network.</p> <p>Alternative differs from Transportation Master Plan designation that provides for multi-use pathways along Rymal Road from Upper James Street to Upper Sherman Avenue; however, cycle tracks are generally consistent with the intent to create safe cycling facilities as cycle tracks will be separate from vehicular traffic.</p>
Existing Communities	Improvement to access to existing communities adjacent to the study area.	<p style="text-align: center;">Equally Preferred</p> <p>Improved active transportation facilities, reduced traffic delays with resultant improvements in transit travel times will provide enhanced access to communities along the corridor. No difference between alternatives.</p>	<p style="text-align: center;">Equally Preferred</p> <p>Improved active transportation facilities, reduced traffic delays with resultant improvements in transit travel times will provide enhanced access to communities along the corridor. No difference between alternatives.</p>	<p style="text-align: center;">Equally Preferred</p> <p>Improved active transportation facilities, reduced traffic delays with resultant improvements in transit travel times will provide enhanced access to communities along the corridor. No difference between alternatives.</p>

Criterion	Metric	Alternative 1 Hybrid Centreline with Multi-Use Pathways on Both Sides	Alternative 2 Hybrid Centreline with Multi-Use Pathway on North Side and Sidewalk on South Side	Alternative 3 Hybrid Centreline with Sidewalk & Cycle Track on Both Sides
Existing Residential Areas	Alternative requires minimal residential property and minimal impact to residential access.	<p>Moderately Preferred</p>  <p>More residential property impacts associated with this alternative than Alternative 2. All minor property takings. No significant difference in long term residential access impacts between alternatives.</p>	<p>Most Preferred</p>  <p>Least residential property impacts associated with this alternative. All minor property takings. No significant difference in long term residential access impacts between alternatives.</p>	<p>Least Preferred</p>  <p>Greatest residential property impacts associated with this alternative. All minor property takings. No significant difference in long term residential access impacts between alternatives.</p>
Recreational Facilities	Alternative requires minimal property from recreational facilities and minimal impact to facility access.	<p>Most Preferred</p>  <p>Recreational facilities within the study area are limited to the Les Chater Family YMCA and the Chippewa Trail.</p> <p>No impacts to the YMCA property are anticipated. Minor encroachment is anticipated at the Chippewa Trail (approximately 550 m²); however access to the trail is improved through implementation of a pedestrian crossover.</p>	<p>Most Preferred</p>  <p>Recreational facilities within the study area are limited to the Les Chater Family YMCA and the Chippewa Trail.</p> <p>No impacts to the YMCA property are anticipated. Minor encroachment is anticipated at the Chippewa Trail (approximately 500 m²); however, access to the trail through is improved implementation of a pedestrian crossover.</p>	<p>Moderately Preferred</p>  <p>Recreational facilities within the study area are limited to the Les Chater Family YMCA and the Chippewa Trail.</p> <p>Minor changes to the Turner Skatepark entrance will be needed along the YMCA property. Minor encroachment is anticipated at the Chippewa Trail (approximately 600 m²); however, access to the trail is improved through implementation of a pedestrian crossover.</p>
Noise and Vibration	Identification of significant changes in anticipated noise and vibration impacts between alternatives.	<p>Equally Preferred</p> <p>All design alternatives include the same roadway widening limits and intersection configurations. No significant difference in noise and vibration impacts between alternatives. Technical assessment of noise did not identify the need for new or additional mitigation.</p>	<p>Equally Preferred</p> <p>All design alternatives include the same roadway widening limits and intersection configurations. No significant difference in noise and vibration impacts between alternatives. Technical assessment of noise did not identify the need for new or additional mitigation.</p>	<p>Equally Preferred</p> <p>All design alternatives include the same roadway widening limits and intersection configurations. No significant difference in noise and vibration impacts between alternatives. Technical assessment of noise did not identify the need for new or additional mitigation.</p>




Criterion	Metric	Alternative 1 Hybrid Centreline with Multi-Use Pathways on Both Sides	Alternative 2 Hybrid Centreline with Multi-Use Pathway on North Side and Sidewalk on South Side	Alternative 3 Hybrid Centreline with Sidewalk & Cycle Track on Both Sides
Air Quality	Identification of significant changes in anticipated air quality impacts between alternatives.	<p>Equally Preferred</p> <p>All design alternatives include the same roadway widening limits and intersection configurations. No significant difference in air quality impacts between alternatives.</p>	<p>Equally Preferred</p> <p>All design alternatives include the same roadway widening limits and intersection configurations. No significant difference in air quality impacts between alternatives.</p>	<p>Equally Preferred</p> <p>All design alternatives include the same roadway widening limits and intersection configurations. No significant difference in air quality impacts between alternatives.</p>
Aesthetics / Streetscaping	Opportunities for aesthetic enhancements (plantings, decorative pavement materials, streetlights)	<p>Moderately Preferred</p> <p></p> <p>Anticipated boulevard widths exceed 1.5 m for 52 percent of the corridor, providing adequate space to plant new trees if soil cells are used. Boulevard widths exceed 2.5 m for 35 percent of the corridor, providing adequate space to support mature trees without the need for soil cells.</p>	<p>Most Preferred</p> <p></p> <p>Anticipated boulevard widths exceed 1.5 m for 52 percent of the corridor, providing adequate space to plant new trees if soil cells are used. Boulevard widths exceed 2.5 m for 40 percent of the corridor, providing adequate space to support mature trees without the need for soil cells.</p>	<p>Moderately Preferred</p> <p></p> <p>Anticipated boulevard widths exceed 1.5 m for 52 percent of the corridor, providing adequate space to plant new trees if soil cells are used. Boulevard widths exceed 2.5 m for 35 percent of the corridor, providing adequate space to support mature trees without the need for soil cells.</p>

Table 4: Evaluation of Alternative Design Concepts – Cultural Heritage



















Criterion	Metric	Alternative 1 Hybrid Centreline with Multi-Use Pathways on Both Sides	Alternative 2 Hybrid Centreline with Multi-Use Pathway on North Side and Sidewalk on South Side	Alternative 3 Hybrid Centreline with Sidewalk & Cycle Track on Both Sides
Built Heritage Resources and Cultural Heritage Landscapes	Potential for impacts to known or potential built heritage resources and cultural heritage landscapes	<p>Most Preferred</p>  <p>Avoids impacts to Mount (Mt) Hamilton Cemetery and Saint (St) George's Cemetery. Cultural Heritage Evaluation Report is required prior to construction due to adjacent cemeteries.</p>	<p>Most Preferred</p>  <p>Avoids impacts to Mt Hamilton Cemetery and St George's Cemetery. Cultural Heritage Evaluation Report is required prior to construction due to adjacent cemeteries.</p>	<p>Least Preferred</p>  <p>Avoids impacts to Mt Hamilton Cemetery. Minor encroachment into St George's Historic Cemetery. Cultural Heritage Evaluation Report is required prior to construction due to adjacent cemeteries.</p>
Archaeological Resources	Potential for impacts to archaeological sites and areas of archaeological potential	<p>Moderately Preferred</p>  <p>With exception of St George's Cemetery, no archaeological potential has been identified within the study area. Impacts to approximately 300 m² of land beyond the existing edge of pavement adjacent to St George's Cemetery are anticipated; this area would require a Stage 3 archaeological assessment.</p>	<p>Moderately Preferred</p>  <p>With exception of St George's Cemetery, no archaeological potential has been identified within the study area. Impacts to approximately 300 m² of land beyond the existing edge of pavement adjacent to St George's Cemetery are anticipated; this area would require a Stage 3 archaeological assessment.</p>	<p>Least Preferred</p>  <p>With exception of St George's Cemetery, no archaeological potential has been identified within the study area. Impacts to approximately 350 m² of land beyond the existing edge of pavement adjacent to St George's Cemetery are anticipated; this area would require a Stage 3 archaeological assessment. The proposed infrastructure encroaches onto the southeast corner of the cemetery property.</p>

Table 5: Evaluation of Alternative Design Concepts – Cost

Criterion	Metric	Alternative 1 Hybrid Centreline with Multi-Use Pathways on Both Sides	Alternative 2 Hybrid Centreline with Multi-Use Pathway on North Side and Sidewalk on South Side	Alternative 3 Hybrid Centreline with Sidewalk & Cycle Track on Both Sides
Estimated Capital Costs	Capital infrastructure costs	<p>Most Preferred</p>  <p>Estimated capital construction cost of \$82.4 million, including engineering design, internal City costs, and 40 percent contingency.</p>	<p>Most Preferred</p>  <p>Estimated capital construction cost of \$82.0 million, including engineering design, internal City costs, and 40 percent contingency.</p>	<p>Moderately Preferred</p>  <p>Estimated capital construction cost of \$83.4 million, including engineering design, internal City costs, and 40 percent contingency.</p>
	Utility relocation costs	<p>Moderately Preferred</p>  <p>Alternative has the least impact on existing surficial and subsurface infrastructure. Cost estimated at \$9.9 million.</p>	<p>Most Preferred</p>  <p>Alternative has the least impact on existing surficial and subsurface infrastructure. Cost estimated at \$8.2 million.</p>	<p>Least Preferred</p>  <p>Alternative has the least impact on existing surficial and subsurface infrastructure. Cost estimated at \$11.3 million.</p>
	Property acquisition costs (assumed value of \$650/m ²)	<p>Moderately Preferred</p>  <p>Approximately 3,000 m² of property will be required, not including easements. Estimated value of \$1.96 million.</p>	<p>Most Preferred</p>  <p>Approximately 2,200 m² of property will be required, not including easements. Estimated value of \$1.43 million.</p>	<p>Least Preferred</p>  <p>Approximately 3,700 m² of property will be required, not including easements. Estimated value of \$2.48 million.</p>

Criterion	Metric	Alternative 1 Hybrid Centreline with Multi-Use Pathways on Both Sides	Alternative 2 Hybrid Centreline with Multi-Use Pathway on North Side and Sidewalk on South Side	Alternative 3 Hybrid Centreline with Sidewalk & Cycle Track on Both Sides
Estimated Operations and Maintenance Costs	Operations and maintenance costs	<p style="text-align: center;">Most Preferred</p> <p style="text-align: center;"></p> <p>Operation and maintenance will be required for 25.6 lane km of roadway (5 lanes x 5.2 km, less narrowing between Nebo and Dartnall), and 10.4 km of multi-use pathways. Estimated annual operations and maintenance cost of \$815,000.</p>	<p style="text-align: center;">Most Preferred</p> <p style="text-align: center;"></p> <p>Operation and maintenance will be required for 25.6 lane km of roadway (5 lanes x 5.2 km, less narrowing between Nebo and Dartnall), and 5.2 km each of multi-use pathways and sidewalk. Estimated annual operations and maintenance cost of \$815,000.</p>	<p style="text-align: center;">Moderately Preferred</p> <p style="text-align: center;"></p> <p>Operation and maintenance will be required for 25.6 lane km of roadway (5 lanes x 5.2 km, less narrowing between Nebo and Dartnall), 10.4 km of sidewalks and 10.4 km of cycle track. Estimated annual operations and maintenance cost of \$852,000.</p>

Preferred Design Concept

The preferred design concept for Rymal Road between Upper James Street and Dartnall Road is **Alternative 2**. While all three design alternatives include a five lane cross-section (two lanes in each direction plus centre turn lanes), Alternative 2 is unique in that it includes a 3.5 metre wide multi-use pathway on the north side and a 2.0 metre wide sidewalk on the south side. The advantages of Alternative 2 are primarily related to its smaller footprint when compared to the other alternatives that were considered. Key advantages of Alternative 2 can be summarized as follows:

- Least impact to existing mature vegetation along the corridor;
- Greatest remaining surface area to accommodate green stormwater management features (such as bioswales), new street trees, and other streetscaping;
- Lowest estimated capital cost, including the least impact to existing utilities; and
- Lowest estimated long-term operations and maintenance costs.

One potential issue with the preferred design concept is the lack of cycling connectivity along the south side of the roadway. Due to the relatively low existing cyclist volumes in the area, the benefits listed above are considered to outweigh this potential issue. It is recommended that the need for cycling improvements on the south side of Rymal Road be continuously monitored as the area develops.